

**Laying a Net Across Mountain Valleys and Plains:  
Managing Water Through Distributed Property Rights,  
Wyoming 1890-2010**

Dissertation

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## **Zusammenfassung**

MacKinnon Diss:

Vor dem Hintergrund der aktuellen Herausforderungen im Management natürlicher Ressourcen und dem Bedarf geeigneter Institutionen, um diesen Herausforderungen gerecht zu werden, untersucht die vorliegende Arbeit ein Managementsystem für Wasserressourcen im Bundesstaat Wyoming, USA.

Die Autorin untersucht die über 100-jährige Geschichte der Wasserrechte im landwirtschaftlichen Bewässerungssektor. Die Studie zeigt, wie und warum die Verfügungsrechte zwischen privaten Nutzern und der staatlichen Administration hin und her geschoben wurden und welche Konsequenzen dies brachte. Sie kommt zu dem Schluss, dass das System im Laufe des letzten Jahrhunderts gegenüber seinem Hauptzweck – der Bewässerung – als resilient gelten kann. Was jedoch andere neuere Funktionen angeht, im Besonderen die Nutzung ohne Verbrauch ist das System als weniger resilient einzustufen. Die Arbeit trägt zu einer Weiterentwicklung der Theorien des institutionellen Wandels bei. Die Autorin zeigt die Wichtigkeit von extremen physischen Bedingungen, wie geringer Niederschlagsmenge, kurzen Wachstumsperioden oder schwierigen Bodenverhältnissen, für den institutionellen Wandel. Solche Gegebenheiten können zu pfadabhängigen Veränderungen führen. Gleichzeitig diktieren sie den Rahmen, innerhalb dessen ein stärkerer institutioneller Wandel im natürlichen Ressourcenmanagement möglich wäre.

## **Abstract**

MacKinnon Diss:

Given the need for institutions managing natural resources that can be foundations for dealing with challenges like climate change, this dissertation examines more than 100 years of a water resource management system in the Western U.S., in the state of Wyoming. The dissertation identifies the key actors in this system as water users and the water administrators in the state government. The study determines that the Wyoming system distributes property rights in water between users and the state. The study finds that over a century the system has proved itself resilient towards its most longstanding users, in irrigated agriculture. However, the system has lacked a resilient response to new demands, particularly non-consumptive uses of water. In a contribution to theories of institutional change, the dissertation demonstrates the important role in natural resource management systems played by harsh physical conditions such as lack of precipitation, short growing seasons, and difficult terrain. These conditions can create path dependency and dictate the circumstances that allow path-breaking in natural resource management institutions.

**Schlagwörter:**

wasserressourcen, institutionellen Wandels, Eigentumsrechte, West U. S.

**Keywords:**

water resources, institutional change, property rights, Western U. S.

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# **1. Introduction**

## **1.1 Research Problem**

This study examines in detail the water management institution in a little-known, low-population state in the United States. The study is presented in the belief that it is through investigation of such local institutions - their roots, their history, and their capabilities - that it may be possible to discover key building blocks for water management institutions that can meet major environmental challenges like climate change.

International scholarship suggests that to handle today's environmental challenges, natural resource management institutions need to have a "complex systems," rather than a linear, view of natural resources (Folke, Berkes and Colding 1998). And to work with the complex ecosystems that surround them, these institutions need to have what social scientists call robustness (Anderies, Janssen and Ostrom 2004).

Examining existing institutions to determine if they can be useful for future water management therefore means understanding the institutions and determining if they can take a complex systems approach and have at least the potential for robustness.

The term "robustness" is borrowed from engineering work, and describes a system that can continue to perform even when it experiences unpredictable disturbance (Anderies, Janssen and Ostrom 2004). It is closely related to the idea of resilience, which comes from ecosystem studies, and means the capacity to deal with variability and unpredictability, to absorb major change and disturbance – before having to self-destruct and rebuild (Gunderson and Holling 2001; Brand and Jax 2007). It is a capacity crucial to building natural resource management institutions that bring about sustainability – institutions that can guide people towards making use of natural resources without threatening the future of the resource and therefore themselves (Hagedorn, Arzt, Peters 2002).

In natural resource management institutions, robustness or resilience means that people have to be able to adapt their rules and governance structures in a way that matches the adaptations of the ecosystem around them, without having to tear their institutions apart. Scholarship suggests that such institutions have to have some key features. First, they have to provide ways for communication and mutual learning between two sets of people - those with local knowledge of an ecosystem and those with professional scientific expertise. Second, the institutions must make room for innovation and evolution. They must make

it easy for people to experiment with, discover and implement adaptation in the rules governing their activities (Gatzweiler, Hagedorn et al, 2002). They must also make it possible to accept disturbance and change among variables within the institution that function at a fast pace, and allow innovation and experience there to transfer and connect into the slower workings of variables at another level in the institution (Holling, Gunderson, Peterson, 2002). Essentially the institutions must be able to “embrace opposites” – to be the home of both stability and change (Holling and Gunderson, 2002, at 47). Then the institutions may become institutions that can bring about sustainability, by providing a process for “searching, learning and gaining experience” (Hagedorn, Arzt, Peters, 2002, at 7).

Resource management institutions in the United States present puzzles for a researcher looking for institutions that have this capacity. The U.S. population is accustomed to steady economic growth, via highly competitive natural resource exploitation powered by a very linear, cause-and-effect view of the resources. A desire for maximum economic growth tends to conflict with the potential for institutions that can bring about sustainability (Hagedorn 2003: 14). Accordingly it would appear that a society focused on economic growth alone typically would not be the home of institutions attuned to ecosystem changes, providing avenues for communication between users and scientists, and for experimentation with new rules (Hagedorn 2003).

In the last few decades, however, the most prominent U.S. natural resource management institutions – governing mining, commercial agriculture, or fuel and chemical production, for instance – have begun to adopt the idea of assessing the impacts of resource use on the larger ecosystem. New laws requiring consultation with a wider group of stakeholders, and resultant negotiations among groups with divergent interests and different understandings of ecology have led to communication and experimentation in rules governing resource use (Fairfax, Ingram and Raymond 2010).

Water management in the U.S. has followed a similar path. Particularly in the West of the country, where water is scarce, negotiations and new governance efforts are ongoing, from small water drainages to major river basins, in an effort to create management that responds to ecosystem needs and can adapt to ecosystem changes. (Kenney 2001; Tarlock 1988; Schlager and Bloomquist 2008). This effort gains increasing urgency as the population grows and as climate change begins to shift the timing and volume of supplies.

This study examines one of the institutions that demands consideration in all the new work on Western U.S. water management - the institution governing water through property rights, known generally as “water rights systems.” There are such institutions in each Western state;



they are particular to each state, with special aspects that apply only there. They act in each state as a baseline that helps shape other institutions of water management, from the management of chains of massive reservoirs to the management of small networks of irrigation canals.

If water management in the U.S. is to become sustainable, these foundational institutions governing water through property rights must have the characteristics that lead to sustainability. They must, then, provide means for communication between locals and experts, avenues for experimentation in governance rules, and channels for communication of change between levels in the institution that operate at different speeds. The problem of whether these property rights institutions can do so is a pressing one, given the growing challenge of water management in an era of climate change.

This study takes on the case of one such institution governing water through property rights - in the Western U.S. state of Wyoming. In Wyoming, key institutional features are relatively easy to track because of the state's low population and well-kept records: a concise study appears feasible. What is an accurate characterization of this institution, and can the institution be considered robust? That is the research problem of this study.

## **1.2 Objectives**

It is a prime objective of this study simply to arrive at an accurate characterization of the Wyoming institution for governing water through property rights. Such institutions in the Western U.S. are peculiar to each state, and are worthy of study precisely for that reason. The peculiarities of the water rights institutions reflect the extent to which these institutions are shaped by the particular conditions found in each state – the land, the water, the people, the economy and the politics. The institutions are complex, and the administrators, the water users, and the occasional lawyer who make their way through them are often considered a breed apart – “water people” who deal in a language and a culture foreign to the rest of the population.

Characterizing these institutions therefore means exploring a territory unique unto itself. There are some guideposts in the formal water laws as memorialized in statute books, but of course there are also many informal rules, understood by all those who work with the institution. Coming up with an adequate description of the institution that conveys a sense of its workings as a whole is therefore (as in the case of many institutions) a challenge. Though it sounds simple, it is not.

The problem at hand calls for not only characterizing the Wyoming water rights institution, but adding to that characterization an assessment, as to whether the institution can be considered robust. The assessment will be aided by looking at not only at the institution's current characteristics, but at its past behavior. History is usually, in fact, helpful to understanding any institution. As discussed below in Chapter 2, Methods, the history of this institution is relatively short – about 120 years – and extraordinarily accessible. Accordingly, another prime objective of this study is to trace the history of this institution.

That effort, in turn, brings with it a new objective, to identify what may be the causes of changes within this institution over time. An understanding of those causes, of course, will help in assessing the robustness of the institution. It will also, however, make it possible for this study of a single institution to contribute to the broader theory of institutional change. The final objective of this study is to elaborate some key drivers in institutional change, drawing upon observations made in this case.

### **1.3 Research Questions**

The problem of the robustness of this institution and the resulting objectives of the study give rise to a number of research questions.

Since property rights are the means through which this institution governs water, the initial question must focus on the history of the property rights regimes in water in this institution. This will include examination of both formal and informal sets of rules on property rights in water. The span of time runs to the present from the 19th century, when Wyoming was settled and became a state after conquest of the Native American population.

The next question must focus on change and reasons for change in these regimes. Since rights regimes typically govern myriad aspects of property in resources, it is appropriate to select which sets of rights on which to focus. Schlager and Ostrom (1992: 251) have pointed out that the most potent property rights are those that give their holders the power to choose rules in three crucial areas: management of the resource, exclusion from the resource, and alienation of the resource. This study focuses on change and causes of change in those areas of property rights.

The next question involves seeing those rules in action. The study must arrive at a sketch of the structure of the overall water management institution that employs this governance system. How these rules are implemented and enforced (or not), and who takes what role in this process, need to be described, in an overall characterization of the institution.

Having examined key property rights rules in water, how and why they have changed over time, and the structure of the institution that governs water through property rights, it should then be possible to take the final step, analyzing what capacity or incapacity this institution has for robustness.

#### **1.4 Outline of the Dissertation, with Abstract of Articles**

The dissertation describes a research setting and then presents a series of independent articles written in the course of the study. The dissertation cumulates in conclusions as to the appropriate characterization and the extent of robustness of the Wyoming water management institution.

Following the present introduction, *Part I: Research Setting* contains two chapters that set the stage for the subsequent chapters.

Chapter 2 describes the physical, social, and economic features of Wyoming and Wyoming water resources. It then proceeds to describe the method employed for researching the institution that governs property rights in water in this location. Since the study arose in the course of the author's experience with this institution over some 25 years, the method employed is not typical and understanding it requires some description of how the institution developed, as well as some description of how the research problem itself arose. It was the author's experience with this institution that led to research into theories that could help in understanding it. Accordingly the discussion of methodology is presented in Chapter 2, preceding discussion of theory and framework.

Chapter 3 describes the theory and framework used in the study. The theory involved includes not only property rights theory in economics, but also theories of property rights in law, and theories of legal history and the emergence of water law in the Western U.S., since the formal rules in this governance system are embedded in a larger legal system. Theory of robustness or resilience is described, as well as the theories of institutional change drawn upon for this study, with attention to issues of path dependency and the drivers that produce change which either follows or breaks from established paths. To identify elements that need to be considered in understanding the particular institution involved, and to organize the inquiry into the workings of the institution, the framework used in this study includes a central focus on the physical aspects of water use and the hydrology of water resources, which are fundamental to the relations between people that arise with use of the resource.

*Part II: Property Rights to Water in Wyoming* contains three chapters that are separate articles written by the author, already published or submitted for publication. The papers contain the empirical research done for the study, as well as some analyses of the data. Since they were written over time, they also reflect the evolution of the author's analysis done over the course of the dissertation work.

Chapter 4<sup>1</sup> presents an overview of the history of the institution in Wyoming that governs water through property rights. Covering approximately the years 1876-2006, the chapter highlights key developments in the rules regarding property rights in water and causes for those developments. The chapter also describes current challenges to the institutions, and routes by which the institution might accommodate new needs.

Chapter 5<sup>2</sup> focuses in detail on two sets of property rights rules noted in Chapter 4. These are rules on management of water and rules on alienation of water. These rules developed in the first quarter of the 20<sup>th</sup> century in response to the physical and economic environment. The chapter argues that the crafting of these rules reflected an increasing recognition of water as a common-pool resource that creates interdependency among users. The property rights rules that developed had to reflect that interdependency if they were to be effective.

Chapter 6<sup>3</sup> focuses on another sequence of rule development in Wyoming water rights that was introduced in Chapter 4. The rules investigated here are rules on exclusion from water use and (once again) rules on alienation of water – examined in a time period that proved fertile for their development and change, 1925-1985. The article posits that the form these rules have taken over time is tied together by a deepening understanding of water users' interdependence, an understanding that includes a sense of how the individual hydrology of each stream can affect users.

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<sup>1</sup> MacKinnon, A. (2006). Historic and Future Challenges in Western Water Law: The Case of Wyoming. 6 Wyoming Law Review 2, 291-330. This chapter uses a conversational style requested by the journal editors, since it appeared in an issue documenting a 2005 colloquium on Western water. The citation style of the article reflects the requirements of the journal which published it.

<sup>2</sup> MacKinnon, A. 2011. Making Their Own Way: Recognizing the commons in water management. Wyoming 1900-1925. 3 Water History 3, 187-212. The citation style of the article reflects the requirements of the journal to which it is submitted.

<sup>3</sup> MacKinnon, A. (pending) Loss vs. transfer of water rights: A local history of two interlocking doctrines and what it says about water law. Submitted April 2012 to Natural Resources Journal (see <http://lawschool.unm.edu/nrj/> ) The citation style of the article reflects the requirements of the journal to which it is submitted.

*Part III: Characteristics and Potential of Wyoming's Water Rights Institution* consists of Chapter 7, setting out the findings of the study. The first section of the chapter summarizes the property rights regimes in water in Wyoming and how they have changed over time, drawing upon the detailed examinations set out in *Part II*. The second section of the chapter describes, again based on the detailed examinations in *Part II*, the overall characteristics of the institution that governs water through these property rights regimes. The chapter then continues with an analysis of the potential of this institution for robustness, and a discussion of what the examination of this institution and its history contributes to an understanding of the drivers of institutional change.

## **PART ONE: RESEARCH SETTING**

## **2. Method**

### **2.1 Case Study and Data**

The approach chosen for this research is one of a single-case study. As noted by Blaikie (2010: 200), the choice of method flows from the research problem and the goals of the research.

One of prime types of problems for which case studies are appropriate are problems whose solutions require descriptions of phenomena (Blaikie 2010: 191). A central piece of the research problem in this study is to achieve an accurate description of Wyoming system of governing water through property rights. The study goes on to draw conclusions about the robustness of the institution, but those conclusions must stand on the accuracy of the description achieved.

Descriptive case studies are specifically appropriate where they can be what Yin (2003: 39-45, cited in Blaikie 2010: 190) describes as “revelatory” – examining a phenomenon that has not been studied before. Similarly, Stake (2005), as cited by Blaikie (2010: 191), notes that an appropriate use of a single-case study is in an “intrinsic” situation, when the phenomenon studied are of a particular interest in themselves.

As noted below, the Wyoming institution of water management through property rights has only been incidentally reviewed in the literature. Yet, when it was first adopted about 120 years ago, it was heralded as the modern model for other water rights system in its region or similar regions (Dunbar 1983: 113, 123-24, 132). Thus, when dealing with a problem motivated by a search for potentially robust entities among U.S. water management institution, the Wyoming water rights institution appears worthy of study in its own right.

In addition, the Wyoming water institution is particularly accessible for a case study of this nature that also takes on a “holistic” approach, identified by Yin (2003: 39-45, as cited by Blaikie 2010: 190) as one which looks at only one unit of analysis. In this case, the unit is regimes of property rights in water.

The state of Wyoming covers a little over 25 million hectares. It is a high, cold desert, with agricultural lands averaging 1- 1.8 km in altitude, and about 125 frost-free days (Curtis and Grimes 2004). It has had a consistently small population and a limited water-using economy for nearly 140 years, since the last battles in the 1870s to take control of the area from its original Native American population. The population of new settlers that in

1890 won recognition for Wyoming as a state ready to participate in the U.S. federal system was only 60,000 people. As of 2011, the U.S. Census estimated that barely over half a million people (568,200) occupy this large area of land (U.S. Census 2011).

The state has consistently had a markedly rural society, dependent on use of natural resources via agriculture and mineral extraction. The largest city today has just under 60,000 people (U.S. Census 2011). As one historian of the state has noted, the settlers of the state as a group went “against the grain” of a rapidly urbanizing nation when they tried to create family farms and ranches in a difficult landscape in Wyoming in the late 19<sup>th</sup> and early 20<sup>th</sup> centuries (Cassidy 2011). The state remained something of an anomaly in the U.S. for decades afterwards. Family farm and ranch numbers have fallen or grown with changing patterns of consolidation and dispersal of ranch units, but the family operations have continued to dominate the agricultural sector. The population has remained isolated from much of the rest of the U.S. The economy and society saw minimal change in its first 100 years, and single-source change (intensive mineral development) in the last 40 years.

The state of Wyoming encompasses headwaters of three major river systems in the U.S. – the Columbia, the Colorado, and the Missouri. State estimates show that nearly 20 billion kiloliters of flowing water in the state originate from in-state precipitation, while only about 2.5 billion kiloliters of water flow into the state from neighboring states (Jacobs and Brosz 2000). Wyoming people and its ecosystems do not use much of the water that comes from in-state precipitation, however: about 18.5 kiloliters flow out of the state into the major national river systems noted. Total human water uses of all kinds amount to less than 4.4 billion kiloliters (Jacobs and Brosz 2000). Wyoming people tend to be very conscious of being a low water-using and limited-economy society sitting at the headwaters of large rivers that eventually reach states with climates more attractive to both agriculture and urban populations. That situation tends to make Wyoming people, as well as the inhabitants of some other largely mountainous states nearby, concerned about those downstream states and the possibility they might demand use for themselves of even the relatively small amount of surface flows that Wyoming people do manage to put to use (Tarlock 2001: 784-785).

Of the surface water flows that Wyoming people do put to use, the vast majority – nearly 84 percent - are used for irrigation. Surface water use in turn is much greater than groundwater use (the 4.4 billion kiloliters of surface water used for all purposes is nearly six times as much as the groundwater used). Yet what groundwater is used is also primarily (75 percent) dedicated to irrigation (Jacobs and Brosz 2000; Wyoming Framework Water Plan 2011). Irrigated land, because of topographical and climate restrictions, amounts to only a



little over 3 % of the state's entire land area (Wyoming Water Plan 2012, Chs. 31, 52). By far the largest crop raised on this irrigated land – 79% - is forage: alfalfa, grass hay, and pasture (Wyoming Water Plan 2012, Ch. 52).

Most of the water originating from in-state precipitation is due to snowfall in the mountains. The typical natural hydrograph for Wyoming streams of all sizes is, as a result, a hump with high flows from May-July rapidly decreasing by September. Water storage is therefore sought-after, to flatten and lengthen the period of availability of water. Flood irrigation is also considered advantageous in some areas (rather than pivot sprinkler irrigation) because (depending on the hydrology involved) it can have some of the same effect on small streams – temporarily “storing” water in soil for later release and use.

Water used for agriculture is accordingly the prime focus of water management in Wyoming, and that management has developed in relatively quiet isolation. At the same time, for reasons explained below, data on Wyoming property rights schemes for water management are exhaustive and accessible. Accordingly Wyoming provides a little-studied but accessible example of property rights regimes used for water management, in slow motion, with the opportunity to identify causes of change.

One of the goals of this research is to elaborate some key drivers in institutional change, as a contribution to theory on institutional change. Blaikie (2010: 196) cites Connelly (1998) to note that case studies, by documenting some social processes in-depth, can be useful in revealing some of the causes that lead to change. Blaikie also notes that research problems that look beyond understanding the details of a particular case, to finding some explanations that may have wider application, are advisable for case studies. Characterization of the particular institution in Wyoming for managing water via property rights in water may be useful, as suggested in Chapter 6 below, for those designing or evaluating water management institutions in other locations marked by similar circumstances. The articles contained in this study provide the kind of “thick description” that can be used to draw general statements related to other cases (Blaikie 2010: 193, following Lincoln and Guba 1985, and Bassey 1981).

Qualitative data, appropriate to “thick description” and suitable for the kind of exploratory work and inductive reasoning involved in descriptive studies (Blaikie 2010), is the prime type of data used in this study. The qualitative data used includes: documents and archival material, from the 1870s to the present; observation, with various degrees of observer participation, of administrators, water users and others discussing water rights issues; and literature specific to Wyoming water management.

## **2.2 Methods Used**

### **2.2.1 Introduction**

This section describes not only the empirical methodology of the study, but the history of how that methodology developed – and with that, some of the history of the institution studied, and the problems that have been associated with it.

This unorthodox combination of topics in a methodology section arises from the fact that the author did not begin this study as a researcher, but as a journalist; and later, the author became a participant in a related institution. This sequence began some 25 years ago, and accordingly the recent history of the institution examined, and the history of how the author examined it, are necessarily intertwined with an overall description of the method employed for the study.

Since the research began with observation of the institution and associated problems, it was that experience which, step by step, led the author to search for and discover theories that could help explain the material encountered. Accordingly, to represent properly the process of research involved, this chapter on method precedes the discussion of theory and framework, presented in Chapter 3.

With this explanation in mind, what follows describes in sequence over time the methods employed in this study and the reasons for their use.

### **2.2.2 Exploratory interviews**

Initial interviews began some 25 years ago when, as a journalist, the author first encountered the Wyoming water rights system. These interviews were unstructured, as appropriate to exploration and a single-case study (Miles and Huberman 1994). This type of interview has also continued, as necessary, in the 25 years since.

The interviewees included: the top state water rights administrator and his chief assistant (the state engineer and deputy state engineer); their state-appointed attorneys; the chief officer of the state water-facility funding agency (which has to verify relevant water rights before funding construction projects); water users from various parts of the state who were seeking or opposing new or repaired facilities; non-water-rights holders promoting recognition of rights for new non-consumptive uses of water; university researchers working on a variety of water issues and water law; and the counterparts of all these people in neighboring states, when possible.

Topics varied from the general structure and history of the water rights regimes and the institution that manages water through water rights, to specific issues focusing the attention of administrators and users of the day. Those issues ranged from proposals for new or upgraded canals and diversion structures to water rights litigation in the U.S. Supreme Court between Wyoming and its neighboring state Nebraska, prompted by a Wyoming proposal to build a new reservoir on a river system already heavily used. Thus the interviewees presented views ranging from considered perspectives on institutional function to topical arguments designed to support specific objectives. The information gleaned had to be weighed accordingly, but did over time provide an overall picture generating more questions that guided research.

### **2.2.3 Archives work**

Documents and archival material on Wyoming water rights are extensive. Because the Wyoming system depends in part on the dates on which water rights were permitted or otherwise established, records ranging from water measurements and land surveys to scraps of penciled correspondence have been carefully preserved on every water right and water right decision. Written records include administrative reports (many of which waxed philosophical in early decades), water rights records, correspondence and memoirs of users, legislative actions, and court filings and decisions.

Much of this material is housed in the files and vaults of the administrative agency handling water rights since 1888, known (since 1890) as the Wyoming State Engineer's office, in the state capitol, Cheyenne. Since 1985 the author made at least 50 visits to the State Engineer's office to review and copy documents and archives. The Wyoming State Archives, in addition, house correspondence of State Engineers, as well as the original testimony and briefs filed in district court and Wyoming Supreme Cases. At least 20 visits have been made to the state archives.

Following Platt (1981), the authors and contexts of each of the documents and archival items have been considered to determine the confidence level appropriate to each.

### **2.2.4 Participatory observation and informal interviews**

Wyoming's water rights institution also boasts a strong oral tradition. Users quote their grandfathers; administrators, who have experienced far less turnover than, say, governors of the state, quote their predecessors. Despite the heavy load of documentary and

archival material attached to the institution, there are many actions and decisions for which there is scant written record of the reasoning behind the action, making the oral tradition valuable.

Water users meet by the ditch-bank or in a ranch-house living room to decide how much water to take when in a given year, but they keep only the minimal records they need to operate. The key water rights administrative panel is the Wyoming State Board of Control. The board honors its precedents, even if in the breach, but commits its policy discussions largely to memory, handed down verbally from member to member. The written records of the decisions are indexed not by the principle at stake but by the stream and the water user affected – so that the available archival material is nearly inaccessible without field inquiry and observation regarding which individual streams and users have been involved in water rights decisions.

Accordingly the research for this study has involved substantial field work, undertaken as time and funding were available. As David & Sutton (2011: 158) have noted, field work can cover a wide range of approaches, from “the outsider looking in” to “the insider looking out.” Gans (1968: 41) similarly describes a researcher playing roles ranging from the “total researcher” to the “total participant.” In research for over 25 years in the study site, the author has played most of the roles those authors describe.

#### **2.2.4.1 Total researcher or complete observer – the outsider looking in**

The term “total researcher” (Gans, 1968: 41) can be used to describe the work of a “complete observer,” who has the status of an “outsider looking in” (David and Sutton 2011: 158, following Hammersley and Atkinson, 1995: 104). The author played this role from initial exploratory interviews onward for a number of years.

For 18 years from 1981 to 1999, the author attended a variety of public meetings in which water rights administrators and water users discussed water rights issues with each other and with elected members of the Wyoming legislature. The issues involved ranged from the status of water rights depended upon for water-use facilities proposed for construction to lawsuits and court hearings regarding the water rights held by individuals or entities (from municipalities to Native American tribes) and the management of those water rights by Wyoming water administrators. Debates and votes of the Wyoming legislature on water rights issues were also observed. From 1981-1995 the author attended these meetings in the capacity of a newspaper reporter acknowledged publicly as such - a form of “overt” observation (David and Sutton 2011: 158). From 1995 to 1999 the author attended these

meetings as a researcher “interested in Wyoming water history and policy,” also overtly acknowledged. Detailed notes were taken, and these as well as printed news reports by the author of the events observed have been preserved in the author’s files.

From 1999 to 2005, the author organized and ran 7 public conferences dealing with water rights issues in Wyoming. The conferences were intended as educational conferences for water users wanting to learn more about water rights administration, and for the general public. They were organized under the auspices of the University of Wyoming, in the author’s position as adjunct professor for the School of Environment and Natural Resources at the university. Five of the conferences were held in five different major river basins. The author researched relevant documents and interviewed water users and administrators, as well as others involved in water issues, to determine the issues most important to water users at the time of the conference, and then arranged for speakers on those issues to give presentations at the conference. Typically the author also gave a presentation at each conference, on water rights history relevant to the basin in question. The discussion period after the author’s talk, and after other presentations, as well as informal discussions with audience members and presenters, provided opportunity to hear other perspectives on and challenges to the author’s description of water rights development in the area. The author also supervised research and report writing by 1-3 students per conference, usually local water users (and the occasional traditional university student) who signed up for university credit for attending the conference and writing a paper. The two additional conferences on water rights organized by the author that did not focus on the water rights issues of a particular Wyoming river basin were on water rights issues of interest to particular groups of water users: the state wildlife protection agency and its employees; and agricultural water users, organized into irrigation districts, and facing increasing encroachment from nearby municipal residential areas. Notes from the organization and presentations for all 7 conferences are in the author’s files.

#### **2.2.4.2 Researcher-participant or observer as participant**

Gans’ (1968: 41) “researcher-participant” – David and Sutton’s “observer as participant” – is the first step on a continuum away from the role of “outsider looking in” (David and Sutton 2011: 158, following Hammersley and Atkinson, 1995: 104). The author played this role following the years of “outsider looking in.”

For 12 years from 1999 to 2011, the author has attended and on occasion participated in most of the quarterly meetings of the Wyoming State Board of Control. This board is the key

water rights administrative panel in Wyoming. The board consists of the top water-rights Administrator (the Wyoming State Engineer) and four superintendents responsible for water rights administration in the four major river basins of the state (see generally, Wyoming State Engineer's Office webpage).

The State Engineer is appointed by the elected governor of the state, but serves 6-year terms which tend to protect this official from the political preferences of the governor, whose office is set in 4-year terms (Wyoming Constitution, Art. 8, Sec. 5). The Engineer is required by the state constitution to have both theoretical knowledge and practical experience and skills. The governor, on the recommendation of the Engineer, also appoints the four superintendents, who have to take a test examining their knowledge of water rights and water measurement issues, and who typically have previous experience in employment by the State Engineer's Office (Wyo. Const. Art. 8, Sec. 2; Wyo. Stats. 41-3-501 through 504; 41-4-201).

The five-member board – the Engineer and the four superintendents – make decisions on the establishment, maintenance and loss of water rights statewide. They review evidence to determine whether there is sufficient and documented water rights use, covered by an initial permit from the state, to “adjudicate” the right as an official right to use water that can be recorded and recognized by the state (Wyo. Stats. 41-4-301 through 331). They review and approve or disapprove user proposals to move water extraction and conveyance facilities (head-gates, ditches, water wells, etc.) for recognized rights from one location to another (Wyo. Stats. 41-3-114). They determine whether a water right can be transferred from one location or one kind of use to another, and whether all or part of a water right may have been lost due to extended non-use (Wyo. Stats. 41-3-103 through 104; 41-3-401 through 402).

The board meets only four times each year – three times a year in the state capitol, and once each year in a different major river basin of the state. Each quarterly meeting, where the board reviews over 100 “petitions” from users asking the board to take one or another of the above actions, is typically scheduled to last five days. Board decisions are recorded by its secretary, and the decisions and original petitions plus any supporting documentation, and testimony from any related hearings, are preserved by the board in its archives.

Records of board decisions, however, contain the “what,” but rarely the “why,” of this body's rulings. Board member discussion of policy and precedent regarding water rights is extensive at the meetings (which is why five days are allotted for each meeting). In

the official decision documents, as well as the “minutes” of the meetings, however, descriptions of these discussions are either entirely absent or remarkably meager.

Informed by the State Engineer of the significance of the meetings as well as the inadequacy of the records to convey the policy heart of the decisions, the author began in 1999 to attend meetings of the Board of Control. Though these meetings are public, the public is notified of their schedule only in condensed legal notices in small type in the back pages of local newspapers, or on websites that only water administrators and the well-informed water user visit. The meetings are rarely attended by anyone other than members of the water rights administration agency or individual users with a particularly problematic petition, and their attendant engineer or lawyer. The author attended her first board meeting in 1999 at the invitation of the State Engineer (an invitation which included instruction on where to find the meeting, which was being held at the unusual location of a motel meeting room in the home town of one of the superintendents because of his wife’s ill health). After that the author had her name placed on the list of those receiving notice of locations and agendas for upcoming board meetings.

Because attendance by someone not required or needing to attend was unheard of, the author was personally introduced to board members and their staff, and she explained that her interest was in research (again, into “Wyoming water history and policy.”) Once the author began to attend regularly, board members began to address her as “the public,” and to introduce her as such to the occasional other attendees. The author consistently took detailed notes, organized by the water rights questions and policy issues involved in each petition before the board, so that her files now contain the only records of 12 years of board decisions organized by topic rather than by petitioner name and stream location.

Within a year the author moved from being a “total researcher” or “complete observer” to being a “researcher-participant” or “observer as participant,” as those classifications are identified by the scholars cited above. The observer working as participant spends considerable time with a group, and occasionally may get involved in certain events, but is “never really a full- time participant” (David and Sutton 2011: 158). The author went to lunch and the occasional dinner with board members, particularly when the board met at field locations away from the capitol, where they too were isolated from their ordinary companions. Board members in the midst of meetings, as well as in conversations before or after meetings, occasionally asked for the author’s opinion – first as “the public” and then eventually as someone they began to consider familiar with their precedents, including the philosophy of board members who had retired since the author’s attendance at meetings

began. The author's primary role as researcher was acknowledged, however, and was continually demonstrated by her seat to the side of the meetings, and the incessant typing at her computer keyboard.

In attending board meetings the author did not take on one possible role, of the "participant as observer" – where a researcher might actually be taken on as a member of the group studied, perhaps as an employee (David and Sutton 2011: 158).

#### **2.2.4.3 Total participant or complete participant, the insider looking out**

Gans (1968: 41) also describes a possible researcher role as "total participant." David and Sutton (2011: 158, following Hammersley and Atkinson, 1995: 104) describe this role as "complete participant," or the "insider looking out."

The author played this role not in the water rights institution in Wyoming, but in the agency tasked with recommending water use facilities deserving of public financial support. This role did not give the author "insider" status as part of the institution governing water rights, but did give her access to documentary materials such as preliminary reports on proposed facilities, which deal with water rights and are not generally accessible to the public or to outside researchers.

The Wyoming Water Development Commission was created by the Wyoming Legislature in the late 1970s to authorize a sequence of studies on proposed water use facilities that sought state funding. The commission was required to make recommendations annually to the legislature on studies and on actual construction of facilities statewide considered deserving of public financial aid (Wyo. Water Development Commission website 2012). In the 20-plus years since its creation, the commission has recommended and the legislature has authorized the investment of over \$2 billion in public funds in water project studies and construction (Wyo. Water Development Comm. Legislative Reports). The projects range from storage tanks and well-fields for small towns to rehabilitation of old dams and reservoirs, and construction of new ones, for municipalities and for agriculture. The funding comes from taxes imposed by the state of Wyoming on the extraction of coal, oil and gas from lands in the state of Wyoming. Thus no federal authorization of the funding is required (although actual construction of projects may require federal environmental and other reviews and permits).

The commission consists of ten members, two from each of the four main river basins in the state, one "at-large," and one representing the two Native American tribes that live on federally-reserved land in Wyoming (Commission website 2012). Commission members are



appointed by the elected governor of the state, and typically serve two 4-year terms, unless removed by the governor. The commission typically meets five times per year – usually for 2 days, but once a year for a week when reviewing consultant proposals for project studies. A director and staff of over 20 engineers and economists supervise and recommend the actual project studies and construction proposals reviewed by the commission, which in turn decides whether to recommend project studies or construction to the state legislature. In 2003, the governor appointed the author as a member of the commission, representing the major river basin where she lives, based on her work as a researcher and conference organizer in Wyoming water rights issues. The author served two terms on the commission, ending in 2011.

In the course of the commission's work, a commissioner receives detailed proposals from consultants proposing studies, and discusses potential projects with water users and would-be water users from around the states. Water rights are issues that typically, though not always, come up in the course of project review. The commission also on at least three occasions each year meets jointly with a legislative committee in reviewing proposals, giving a commissioner an opportunity, both formally and informally, to observe and reflect upon legislative views of water and water rights policy. Documents and notes on all these encounters are in the author's files.

As a commission member, the author of course was obligated to become involved in taking action to affect the direction of commission decisions. She thereby engaged in a form of "action research" (Kelly 1985: 201-02). Since those decisions did not actually affect water rights, the author was not taking action to affect the development of the property rights schemes regarding water, through which water is managed in Wyoming. The author was however in a position to encourage the creation of data, via studies done by consultants, on issues relevant to an understanding of water rights issues, as well as to the work of the commission. Those studies were supported by other members of the commission in the belief they would help water users and commission staff in their continuing quest to see Wyoming water used effectively, which has traditionally been one of the commission's goals. In particular she could and did propose and see funded studies which examined 1) the transaction involved in a specific area as water was extracted for irrigation, spread upon the land, seeped into and raised the groundwater table, and became available at certain times for other users (Aqua 2006); and 2) the value, qualitative and quantitative, put on water in its various uses (from consumptive agricultural use to non-consumptive recreational use) in another part of the state (Niemi 2006). Both these studies, as well as others reflecting similar

considerations that the author put forward as the commission made recommendations on proposed studies and construction projects, have been useful in the author's study of the Wyoming institution of water management via property rights in water.

#### **2.2.4.4 Structured interviews/empirical survey**

Towards the end of the research, a small set of structured interviews was done as a check on the analysis of the data. The results are incorporated primarily into Chapter 7, Findings.

The interviews were intended to draw upon the experience and perception of people involved in that institution over the last 40-50 years (fortunately some of the key players from that long ago are still living). The interviews were structured as a set of questions, asked uniformly of each interviewee. The questions focused on two topics: 1) the roles of different people interacting with each other within the Wyoming institution for governing water via property rights regimes; and 2) the capacity of this system to adapt to changes and challenges it has faced over time (see Annexe for interview questions).

The interviews were undertaken from November 2011 through January 2012 with 20 individuals: 8 water users; 8 administrators (5 current, 3 past); 2 water user-administrators (local water users who are hired by the state administrative agency to administer water in a nearby area where they do not use water); and 2 administrators from the independent Native American tribal water management system that is geographically surrounded by the Wyoming system.

#### **2.2.5 Ethical issues**

Ethical issues have arisen in the course of this research. One significant issue is the danger of romanticizing or idealizing the past, while instinctively dealing more skeptically with the recent time period. This problem is exacerbated by participatory observation, since the author has now observed at length the players and policy at work in water management in this region (and familiarity tends to discourage romanticism).

Another major, and related, ethical issue is the danger of giving more weight to the observations of some people than to others, based not on their experience, expertise or apparent honesty, but on whether some individuals are more personally appealing or have views more consistent with views held by the researcher. The author has attempted to guard against both those dangers.

The author has also attempted to consider how citations for specific statements could affect interviewees. Most interviewees will be affected only generally by the research results, but where it appears some could be affected directly by others' reactions to what this paper reports that they have said, those statements have been kept anonymous.

### **2.2.6 Deductive research process**

Analysis of the data collected by the various methods above took the circular or spiral process that scholars find is typical of analysis of qualitative data: describing Wyoming regimes of property rights in water (which have varied over time), classifying the data on those regimes into different categories, and identifying connections between these categories (Blaikie 2010: 211, following Dey 1993).

Analysis began with an attempt to arrive at an initial description of what a water user had in what both users and administrators called a "Wyoming water right." That immediately involved categorizing the different powers and duties that users had, and also categorizing the authorities and duties of water administrators, since it was apparent from all initial data that the administrators played a very active role in implementing "water rights." Identifying connections between the tentative categories thus created involved seeking regularities and singularities in the data. That in turn could help to find evidence to support known theories of what water rights are (Blaikie 2010: 212, following Dey 1993).

The work became necessarily deductive, as is often the case in analyzing qualitative data when the issues at hand are "why" as well as "what" (Blaikie 2010: 212). In this study, a "why" research objective (seeking some drivers in institutional change), accompanies a "what" research problem (arriving at a characterization of the institution). Using a deductive approach called for the author putting forward a conjecture, or the rudiments of a theory, as to what kind of regime of rights in water resources is at work in Wyoming. A theory would imply certain results in what actions users and administrators could and did take, and accordingly the theory could be tested and adopted or discarded depending on how well it fit the data on those actions.

The analysis also employed some aspects of an abductive approach (Blaikie 2010: 212). Water users and administrators have a special language that describes how "water rights" operate in Wyoming. They share some of this language; other terms are technical and are understood and employed more often by administrators than by users. To understand what a Wyoming "water right" means in action required the author to learn and enter into the fine points of this language, observing its use and practicing using it to describe different events

and operations, translating it into more general terms that people outside the Wyoming water rights system can understand, and using a “feedback process” to check those terms with the members of the system to ensure that they could recognize themselves and their views in the account given of them by the researcher (Blaikie, 2010: 90-91). The author then fed the resulting descriptions of “water rights” in operation back into the deductive process.

All informants, and the documents, spoke of “water law” as the body of knowledge that captured what is meant by “water rights” in Wyoming. In the U.S. legal context, then, theory would dictate that the expected scheme for rights in a natural resource would be a scheme of private property rights, subject to some special restrictions imposed by the government that might be tied to the physical nature of water.

The author found, however, that a conventional legal understanding of U.S. private property rights did not fit the data collected on systems of water law and management in Wyoming. Accordingly the next potential source of applicable theory was the writings of the still-revered 19th century drafter of the basic Wyoming water laws. Those writings made it clear that what was intended in the first statutes was not any adaptation of U.S. private property law to water, but an entirely new system. The drafter proposed essentially a state-owned and regulated approach to water resources (Reports of Territorial Engineer and State Engineer 1889-1899; Mead 1903: 248-68; Mead 1902; Shields and MacKinnon 2000). This scheme for Wyoming water rights fit the context of its time, exemplified by the thinking of the Progressive movement across the United States in the late 19th-early 20th centuries (Hays 1969) – putting resources in the hands of the state, whose scientific experts would guide private parties in the use of the resource.

The system of state ownership described by its 19th-century drafter did not, however, fit the data on modern Wyoming water rights. Since it was the brainchild of the initial drafter of the Wyoming water rights system, however, the author then came up with a revised theory of Wyoming’s system, positing that Wyoming’s institution governing water through property rights today is the product of the slow erosion of the state-ownership system of water by individuals or groups imbued with more standard U.S. private property concepts – judges and lawyers, no doubt, and perhaps users and administrators as well.

That theory led the author to collect additional historical data in order to test it – and the historical data proved the theory false. At this point, an additional tool to aid the analysis was needed. The author found that tool was found in the array of property rights, for analysis of rights in resources, set out by Schlager and Ostrom (1992). This tool was the product of their

work on common property regimes. It is particularly useful for analyzing rights in common pool resources, such as water. That usefulness, however, does not mean that all property rights regimes which it helps to illuminate are common property regimes. It became clear over the course of further data collection, reading in common property theory, and reflection, that the design principles that Ostrom (1990: 90-91) postulated as characterizing common property regimes did not apply to the Wyoming data. Nonetheless the property rights analysis tool Ostrom and Schlager developed from review of common property regimes has been extremely helpful in identifying what property rights in water are held by whom in Wyoming.

Identifying rights and their holders has led to the author ultimately to the crafting of the description of the water management institution put forward in this dissertation. It has also allowed the tracing of institutional change in Wyoming, when applied to the historical data collected to test theory that was ultimately discarded. Persistent attention to the context of changes in Wyoming regimes of property rights in water, and the direction that those changes took, has in turn allowed the identification of some drivers of institutional change. The following chapter, Theory and Framework, presents more detail on the theories considered and the framework used to seek relevant data in this study.

### 3. THEORY AND FRAMEWORK

#### 3.1 Theory

##### 3.1.1 Property rights

Property rights are “social relationships between people with relation to some object” or resource (Meinzen-Dick and Nkoma 2007: 14). The rights give individuals or groups the authority to undertake specific actions towards that object or resource (Ostrom and Schlager 1992, citing Commons 1968). They involve both entitlements and obligations, claims and duties towards other people (Bromley 1992; Meinzen-Dick and Nkoma 2007).

Property rights, whether in land, water, or other resources, do not necessarily create a uniform block of relationships, a simple “ownership” of an object or resource – typically, they are an assemblage of different rights. Those rights, in turn, can be held by different people, and they impose differing obligations on other people (Meinzen-Dick and Nkoma 2007; Bromley 1992; Barzel 1989). No property rights are absolute, or complete, because it is always too costly to delineate them fully; as more useful attributes of an object or resource are understood, however, or as the object or resource becomes more scarce, the property rights are likely to become more fully delineated (Barzel 1989: 90).

Property rights systems vary immensely over history and geography. They play a central role in institutions of natural resource management. Folke, Berkes and Colding (1998), in fact, suggest that property rights systems may be the most important social institutions to focus on as scientists seek ways to bring natural resource managers to adopt the “complex systems” rather than “linear” cause-and-effect approach to the natural sciences.

One helpful approach to analyzing property rights regimes is to consider property rights under an array of five types laid out by Schlager and Ostrom in 1992. Those types are rights of: access, withdrawal, management, exclusion, and alienation. Schlager and Ostrom found that property right holders, in turn, can be usefully classified into five different groups, depending on how many of the types of rights they hold. *Authorized entrants* hold merely access rights (they may, for instance, enter and walk in a national park); *authorized users* hold both access and withdrawal rights (they can, for instance, harvest a resource – often under constraints imposed by those in the following two categories of right-holders); *claimants* hold access, withdrawal and management rights (they can make decisions on construction of facilities and creation of rules to govern withdrawal of the resource);

*proprietors* have not only access, withdrawal and management rights but also rights of exclusion (they can decide who can be authorized users of the resource); and finally full *owners* have all the first four rights plus the right of alienation (they can transfer rights of management and exclusion in the resource, as long as they do not harm the uses of other *owners*) (Schlager and Ostrom 1992; Ostrom and Schlager 1996: 133). Ostrom and Schlager note that the types of rights can be grouped into “operational” rights and “collective choice” rights.

Governance structures are employed to oversee and enforce these rights. Governance structures provide the organization and co-ordination that people need in order fully to put their rights to use, and meet their obligations (Hagedorn, Arzt, and Peters 2002). There are many different governance structures, employed with the many different property rights regimes.

Ostrom did considerable work on one category of governance structures, which deal with property rights in common pool resources. Common pool resources are defined by their subtractability (one person’s use of the resource leaves less for the next person to use) and their difficulty of exclusion (it can be difficult to keep people from accessing and using the resource) (Ostrom 1990). It was research into the governance systems of this kind of resource that led Schlager and Ostrom to identify the five classic types of property rights that can be combined and/or distributed in a property rights regime.

Ostrom was able to demonstrate that people have built governance systems that operate successfully for decades or centuries without wasting a common pool resource, by creating a regime of common property rights in the resources. Thus she was able to prove that Hardin’s “tragedy of the commons,” however famous an idea (Hardin 1968), is in fact not the inevitable fate for common pool resources, but the predictable result of the lack of a governance system for those resources. Ostrom successfully posited that there can be and there are property rights regimes and governance systems for such resources that are neither complete state ownership and control nor complete private ownership and control, though Hardin had argued those were the only two options (Hardin 1978, cited by Ostrom 1990).

In sorting through a property rights regime in a common pool resource, it is important to identify who has what Ostrom and Schlager identified as the “powerful” rights. They identified the “powerful” rights as the collective choice rights to decide who can get rights to the resource and what kinds of rights are possible. For common pool resources, those

powerful collective choice rights are management, exclusion and alienation rights, Ostrom and Schlager posited (Schlager and Ostrom 1992: 251).

The work of Ostrom and her colleagues in investigating common property governance has implications, however, far beyond the realm of common property regimes or common pool resources. Common property research has documented the factors in human actors that make such governance systems possible – factors such as trust, communication, and expectation of future interaction (Dietz et al. 2002).

The important role those qualities play in shaping human behavior regarding the use of resources in turn suggests the inadequacy of the classical model of “economic man” governed by self-interest in the effort to understand and design human institutions (Dietz et al. 2002). The work of Ostrom and her colleagues, especially Vincent Ostrom, has suggested that a far better model for humans creating institutions is that of a person with “bounded rationality” and fallibility, but ability to learn (Ostrom 2005: 118).

Rose, a leading property law thinker in the U.S., recently commented that Ostrom’s key impact on lawyers there was to help them see that there are other – potentially many other – options for managing common pool resources: that there are “institutions that fall somewhere between individually-held property and a dirigiste state” (Rose 2010: 6). Ostrom’s work also has been a “tonic” to legal scholars frustrated with the pure rational-man image they found in what they know of classical economics, Rose wrote. She suggests that what lawyers, in turn, can contribute back to economics and political science is persistent inquiry into the equity of common pool resource management institutions, and how much potential for exit (or for participation in collective choice) they provide to the people they affect (Rose 2010). Perhaps the lawyers’ contribution might be summarized as a caution against finding any romantic appeal in the concept of common property.

Understanding human actors in natural resource use settings as more than simply rational beings, producing more than just simple forms of institutions, does feed back into efforts to understand different regimes of property rights. So does Ostrom’s clarification of terms and categories to help sort out the types of property rights found in those regimes.

The subject of this study is water, primarily flowing water. Flowing water is a typical common pool resource, but it need not necessarily be governed by a common property regime. It can, however, be useful to keep in mind, in analyzing property rights in water, some of the lessons from common property research: that water property regimes, like other systems, are created by boundedly rational people who are fallible but can learn from their mistakes; and that the regimes may consist of various combinations and



distributions of the classic use types, centering on the question of who gets the powerful rights, the rights to determine what kinds of uses there are and who can get them. And, as suggested in one study of the varying kinds of property rights systems produced by communities sharing water resources, those regimes may have both strengths to build upon and weaknesses – particularly in the realm of equity for all community members – to overcome (Van Koppen et al. 2007).

### **3.1.2 Property law**

The institution examined in this study governs water through a system of rules both formal and informal, rules that create property rights in water. The system of rules manifests itself in a combination of the statutes of the state of Wyoming and of the United States, the decisions of state and federal courts, the decisions and practice of Wyoming water administrators, and the actual practice of water users. There are many dealings back and forth between the formal and the informal rules – between “law” and customary activities, the actual practice of water users. The theory of property law is therefore one of the tools useful for understanding the property rights regimes that have prevailed in Wyoming water management.

The value of property law for an economic understanding of property rights is particularly strong in the U.S. or Great Britain. The U.S. and Great Britain are “common law” countries in contrast to “civil law” countries like Germany or France. In common law countries the customs of a community can be openly considered and sometimes adopted by the courts (often with caveats or simplification). Common law countries recognize custom, court decisions, and statutes as sources of law; thus the practices of the people and the decisions of the courts are themselves a source of law, taking their place alongside the statutes written by the legislature. Such a system is in sharp contrast to civil law systems, in which the only legitimate source of the law is considered to be the written statutes (Merrill and Smith 2000). The difference between common law and civil law systems on this point, Smith notes, is rooted in history. Civil law, a product of post-Revolutionary France spread through Europe by Napoleonic conquest, made a consciously sharp break with the feudal past represented by the weight of custom and the discretion of courts. Britain and the U.S. went through a much less violent parting with the past, and were able to pick and choose among traditions to apply to the present what seemed suitable (Smith 2008).

Posner, in a basic treatise on an economic analysis of law, argues that modern Anglo-American property law has one prime goal: to encourage the most efficient use of resources.

An attendant goal is to encourage transfer of rights to resources (to achieve the efficiency goal). The extent to which these goals are pursued by the law are dictated by the costs of implementing and enforcing the requisite system of property rights, compared to the benefits gained from efficient use of the resource (Posner 1992). The encouragement of efficient use, and attendant emphasis on transferability, are the two goals of property law most explicitly cited by U.S. courts dealing with property cases.

Recent scholarship, however, has highlighted another concern that is rarely articulated by the courts. The scholars involved, however, make a convincing argument that this concern is significant in its own right, fundamental to the very nature of property law, and a motivator for the courts. It is a concern that also guides property law in its pursuit of encouraging efficient use of resources. This third goal of property law is described as a goal of keeping information costs about the property rights in a resource as reasonable as possible (Merrill and Smith 2000).

Putting resources to productive use would, if fully pursued, require the intellectual and financial capital of all kinds of people. To offer that vast audience the potential of productive involvement with resources, the law has to consider the cost of their involvement with the resource. One of the important costs those people incur is the cost of getting information about property rights. The goal of keeping those information costs reasonable, though less familiar than the goal of encouraging efficient use of resources, deserves further examination here because of its value in examining property rights regimes in natural resource management institutions.

Thomas Merrill and his colleague Henry Smith in 2000 showed that audience is a critical aspect of property law. The role of audience distinguishes property law from contract law (contract law enforces only deals made between parties to a contract, with an occasional nod to affected third parties; property law has to enforce one party's rights against the world). Audience also explains a remarkable feature of property law: its penchant for standardization.

As the potential audience to whom property law must speak widens, Merrill and Smith noted, the law becomes more standardized. That is done to minimize the costs faced by a stranger encountering a resource and attempting to determine what property rights exist in it. To keep that stranger's information costs low, property law recognizes only a limited set of forms for what Merrill and Smith (2000: 14) describe as the "legal dimensions" of property (involving duration, powers of alienation, inheritance, etc.). And, significantly for research into informal and formal rules of property, another result is that, even where custom (an

informal rule) is recognized as a source of law, a custom related to property will be standardized and stripped of its idiosyncrasies if it is adopted as formal law that must reach a more general audience than the isolated community to which the custom first applied (Smith 2008). Thus Smith further developed the information-cost theory of property law in a way that can be particularly helpful in reaching an understanding of how the law will treat informal rules in common law countries, where custom is recognized as a source of law.

Smith also explores, with this theory, an issue which is particularly helpful in understanding American property law. American law makes a distinction between acceptable “regulation” of a property right, a restriction on a property right which governments may impose for the sake of public protection, and a “taking” of a property right, which governments may not do, even for a public purpose, without compensating the owner for impairing the value of the right. What is a “taking” is always a matter of hot debate, reflecting broad social and economic conflicts: in the U.S. it is contested territory now, as it has been in the past. Bromley (in heatedly joining a recent debate) has commented that American property law, and takings law with it, is fortunately “fluid” (Bromley 2010: 11). Smith notes that the line drawn to make the distinction between “regulation” and a “taking” typically takes custom into consideration, today as it did in the past (often drawing on nuisance law, part of the common law) (Smith 2008).

Property law as a means of encouraging productive use of property, and property law as a means of making information costs reasonable for potential productive users, are a complementary set of theories that provide considerable insight into the concerns of property law. With them in mind it is possible to move on to review theories of legal history and history of water law, in particular.

### **3.1.3 Legal history and the emergence of water law**

As has been noted, common law countries see the historical roots of their law in custom, as well as positive statutes (Merrill and Smith 2000). American and British common law systems reflect a history of a less dramatic and more incremental break with a feudal past than do the civil law systems emanating from France (Smith 2008).

Smith has shown that British law retained its willingness to rely on courts as a key source of the law, and courts were expected on occasion to draw upon reasonable and longstanding customs to craft legal rules. Similarly, Smith notes, American lawyers and judges of the Revolutionary period were concerned not with breaking away from British

law but with protecting what they considered the rights it created. They treated custom – even locally-grown American custom - with more skepticism than did the British courts, but still were willing to treat it as a possible source of rules that a court could draw upon (Smith 2008). The common law recognition of courts as a source of law survives intact in the U.S. today, even with the proliferation of statutes and “uniform codes” that seem to be demanded by modern society and commerce.

American law has been subject to a variety of contesting pressures which have helped determine the shape of the institution. Horwitz, pre-eminent historian of American law, describes how, in the 30 years after the American Revolution, the concept of the role of the law completely changed. Described in the 18<sup>th</sup> century in both Britain and America as rules to govern conduct that derived from “an eternal set of principles expressed in custom,” the law in America by 1820 was viewed as something quite different: a policy instrument. It should help promote conduct that was desirable – desirable from many points of view, including the economic; courts, as one source of law, should promote change if necessary (Horwitz 1977: 30, 33). Property law in particular underwent this shift. Property law was originally seen as the protector of stability providing property owners with “undisturbed enjoyment” of their resource. But by 1820 property law came to be seen as a dynamic vehicle to promote productive use and development of resources (Horwitz 1977: 31).

Land law in America demonstrated this trend. The classic example is the land law that grew up around the expansion of the nation - from the original colonies clinging to the middle of the eastern coast of the North American continent, to a succession of states covering the mid-section of the continent from the eastern to western coasts. As economist North (1990) points out, the original statute enacted to govern this expansion in 1787 set the framework for that expansion, and people and their organizations then interacted with that framework to create an evolving institution of land law. The original statute laid out basic rules of property ownership and of inheritance. The 1787 statute also set out the rules for creating governments for the “territories” just being settled, and rules for how those territories could gradually become states with a voice in the federal government. Experience with actually settling the territories led to a variety of new customs and statutes to set the property law regimes for land in different areas, and for special resources like minerals, which could be held separately from ownership of the land. The basic elements,

however, including the insistence that property rights in land were full ownership rights,<sup>4</sup> were set in place by the 1787 statute (North 1990: 97-98).

Among the subsequent statutes passed in response to settlement needs were a variety of laws aimed at encouraging settlement and the establishment of homes and farms by people with little capital. A prime example was the Homestead Act, adopted by the federal Congress in 1862 in the midst of the Civil War, when Southern states opposing widespread free settlement were no longer part of the federal government. The Homestead Act, embodying the themes of expansion and opportunity for all, that were so powerful in American political life, set a pattern of thinking about land rights. The process for land acquisition that the Act sanctioned required simply that an individual file an application for a describe piece of land within the Act's acreage limitations, improve the land (typically, with construction of a home), live on it for five years, and then file for legal title as fee owner (Homestead Act 1862; Robbins 1976). Some 420,000 square miles of land were acquired under 1.6 million homestead titles in the 70-some years after the Act went into effect (U.S. National Park Service 2012).

Land offices set up by the federal government to oversee this process handled vast numbers of claims. Contests over their rulings went to court and produced volumes of treatises on public land law, indexing and analyzing the decisions (see for instance, Spaulding 1884).

Public land law was essentially the land law that counted, for places where the population was primarily engaged in acquiring new land and putting it to use. Wyoming was one of those places in the late 19th century. The aridity and climate of the area had delayed its settlement. Would-be citizens of new territories, crossing the continent by foot or wagon, primarily passed through Wyoming, to reach some place further West. Wyoming became a territory on its own only in 1869, when California was already a state and Colorado was soon to become one. The last major battles in conquest of the Native American tribes in Wyoming were in 1876. Wyoming did not achieve the status of state until 1890; new settlement under the Homestead Act continued well into the 20th century (Larson 1978: 101-05; 260; 414-15).

Water law in the Western U.S. was created, in turn, of necessity at the time that new settlers were in the midst of acquiring land and putting it to use. Water law had its roots in the territorial days of each Western state – in California, in the 1840s, and in Wyoming in the 1880s. It

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<sup>4</sup> Under the 1787 Ordinance rights were held in what was called “fee simple”– embracing all the rights identified by Schlager and Ostrom (1992). “Fee simple” is a classic standard property right form that, as Merrill and Smith (2000) note, is one of the small set of standard forms recognized in American property law.

developed, unlike the land law, as law peculiar to each place. The federal Congress in the 1860s deferred to the states, allowing them to establish their own water law (Dunbar 1983: 76). The Congress was, after all, beset with the problems of the Civil War and its aftermath; and it was increasingly aware of the aridity of the West – a place known popularly as the Great American Desert, very strange compared to the humid east which was more familiar to the population with their primarily Northern European roots.

In the water law of the American states in the West, therefore, are found the results of the forces affecting all American law, and affecting property law in land in particular – plus the impacts of the unfamiliar aridity. Each state ended up with its own water law variations, but the water law of the states in the core of the region has some consistent features. Prime among the features consistent among most Western U.S. states are: water can be had without paying a fee (unless for use of some particular facility for extraction, requiring a fee); and water rights are allocated by the system of “prior appropriation” (Dunbar 1983: 59-61).

The second feature requires the most explanation. It means that the first-comer to take water has “prior rights,” and a seniority of claim, in relation to the second-comer and those that follow; the second-comer has seniority of claim in relation to the third-comer and those that follow – and so on. A would-be user may or may not have to get a permit, and is likely to be subject to restrictions on how much water he can claim, based on the use intended and the need for that use. But within the ranks of water users, if the water itself becomes scarce, the “senior” user has the first claim to get all the water she needs, even if that means the junior user(s) get none (Trelease 1979: 23-4). The nickname for this feature is “first-in-time, first-in-right.”

The prior appropriation system is primarily one of risk allocation, as water law scholar Tarlock has pointed out (Tarlock 2001). In an arid country, water is likely to become scarce, so a risk allocation scheme is of prime importance. But the rights allocated through this risk allocation scheme set up relations between people in regard to a resource - they are property rights. They are created and governed by informal and formal rules, they have become a body of law known as water law, and they have been subject to all the forces that have historically affected U.S. law in general and property law in particular. The course of their development has, of course, its own peculiar twists because the rights in question involve water, not land or other resources.

The prior appropriation water law in the Western states had roots in American experience – partly in the customs developed in mining camps in California in the 1840s and 1850s, and partly perhaps from the court-made common law that arose from competition between mill owners using water for power on streams in the east. In both situations, the basic prior

appropriation rule developed: in competition for scarce resources, the (reasonable) first-comer gets seniority. Reasonableness was expressed in what was called the rule of “beneficial use:” the resource had to be used in the amount and manner needed for the proposed use; it was not to be wasted (Dunbar 1983: 59-61; Tarlock 2001; Horwitz 1977: 34-42; Pisani 1992: 11-32).

In addition, two special rules for water rights emerged in all the core Western states in some form:

- Loss of rights, called abandonment (or sometimes forfeiture): From the mining camp rules, reflecting the pressure of fierce competition, came the rule that a claim left unused for a short period of years (in some places, two years, in some places, five years) was completely lost (Dunbar 1983: 61).
- Limits on change of rights, called restrictions on transfer: From initial experience using water not for gold mining but for irrigation, and in reaction against the pressure for accumulation of wealth through speculation, came the rule that transfers of a right to use water, moving the water to new uses or to new places, were allowed only if no other users’ water rights were injured (MacDonnell 1990: v.1, 42). Accumulation of wealth through speculation in land was rampant, and led to abuses of such systems as the homestead laws, in the formative period of water law (Robbins 1976).

From the point of view of the basic theories of property law, it is these two rules, rather than the allocation of rights to those “first in time,” that could be considered the most problematic and even shocking aspect of water law.

Both rules appear to frustrate a prime goal of modern property law – the goal of encouraging the productive use of resources. First, in the case of the abandonment rule: It seems impossible to encourage productive use if the right to a resource that someone has invested in could be quickly lost due to failure to use the resource. A favorite adage of the traditional common law of property in land and other goods is “the law abhors a forfeiture” (West 1998). However, on further consideration, it becomes clear that property law itself, in pursuit of the encouragement of productive use, often has to perform a balancing act between two kinds of incentive systems. One system would provide stable property rights, to encourage investment. The other would shift property rights when possible to new ideas and new directions of investment, to encourage productivity. The two might not always complement each other. Stability might turn out to be the fortress of stodgy parties who,

once their investment is long sunk, don't much care how much they manage to produce from their resource.

The abandonment rule, in water law, could be viewed as simply striking a different balance between these two incentive systems that does the law of property in land and most other items. The balance struck is likely to be a reflection both of the nature of the water resource and of the historical moment in which the original abandonment rule was formed, in the mining camps and the irrigation fields. At that time, competition for a very scarce and valuable resource was high, and the result was "you snooze, you lose" as a modern American adage would put it. Similarly, in the historical development of water law, the abandonment rule might be expected to change as the need is perceived for a different balance to be struck amongst the incentives to use water productively.

Meanwhile, the restrictions on transfer in water law seem to be a more straightforward, bald-faced affront to the principles of property law. Obstacles to using property in a new way or in a different place make no sense in an institution that seeks to encourage productive use of property. The law of property typically prides itself on discouraging restraints on alienation, refusing to enforce such restraints that appear in wills or contracts. But again, on closer inspection, property law that applies to land and other items does of course admit of restraints – not restraints on alienation to another party (which water law also avoids), but restraints on what can be done with *what* things *where*. They are the restrictions of the old nuisance laws, and the modern zoning codes, which make it difficult to operate a pig sty near a residential area (and make rules against it a "regulation" rather than a "taking"). Again, the transfer restrictions of water law, restraining changes in the purpose or place of use, are simply appropriate to the nature of the resource and the time and place in which the rules developed. These rules too can be expected to have changed with changing times.

So, with these initial rules in hand, water law in the Western U.S. originated in the 19<sup>th</sup> century and has grown and changed since then. In that development, the information cost concerns that Smith (2008) posits as a key driver in property law also play a role.

Scholars have generally accepted the analysis of Western water law summarized by Tarlock (1988, 2001). Tarlock is a close and often critical observer of how Western water law has met the challenges of new and increasing demands in the late 20<sup>th</sup> – early 21<sup>st</sup> centuries. In this analysis, as settlement moved into the arid West, early pockets of common property systems in water (associated with Native American, Spanish, and Mormon communities) gave way to the prior appropriation system. That system in turn quickly created what was perceived as a system of private property in water. Tarlock explains that



the original prior appropriation system created what could be called “semi-exclusive” rights (since one individual’s rights were circumscribed by others’), but that the quick development of administrative systems in reaction to (or anticipation of) rapid increases in water use, plus the construction of major reservoir systems, created in users a strong expectation of regular access to reliable amounts of water. That in turn created a sense of entitlement or of an “absolute property right” in users (Tarlock 2001: 785-86; Wilkinson 1992; Kenney 2001).

Such a right could be viewed as the full ownership right described by Schlager and Ostrom (1992). However, the right retained the caveats of prior appropriation – the amount of the resource used could be limited by the concept of beneficial use, diminished by shortages, or even displaced by other uses. The proper description, Tarlock proposed, is an “incomplete” property right (Tarlock 2011). But, though alert to those limits, users relied on having something they considered reasonably close to a full property right.

It was, of course, a right subject to “regulation,” as was true of all property rights in U.S. law. This means regulation in the sense discussed by Smith as a matter of American law (Smith 2008), discussed in the previous section of this chapter. That is, their property rights were subject to certain restraints imposed by the government for the sake of protecting the public. The limit on regulation is that the government could not perform a “taking” of the property without compensation (Smith 2008). Rules peculiar to water law, that allow loss of the right for failure to use water, and that limit user power to alienate water rights, could be regarded as simply examples of this sort of regulation.

Accordingly, with their rights subject to regulation as were all property rights, water users in the West could consider themselves as having private property rights in water reasonably comparable to rights in land. So could their lawyers. As Tarlock has pointed out, the lawyers who argued what the law is, and what water rights are, in language that influenced the courts, had a strong incentive to see the prior appropriation system as a private property system creating such rights. That picture was in the interest of their clients, whether the clients were farmers or cities (Tarlock 1988).

Essentially, lawyers, their clients, and the courts they influenced, could be regarded as imbued with a notion that Bromley and Cernea (1989) noted has long been embraced by American policymakers and economists. That notion is that the only possible form of property in natural resources is either national government ownership or private property. The lawyers, their clients, and the courts therefore appear to have mistaken the holding of a property right in a resource for ownership of a resource. That is a mistake of over-

simplified thinking – particularly problematic when applied to a common-pool resource like water – that is warned against by the work of Bromley and Cernea (1989), Ostrom (1990), and Schlager and Ostrom (1992).

The influence of how private parties view water rights has been significant in a number of Western states. Court decisions have been a major source of water law in the Western U.S., as is appropriate in a common law country. Notably, in many states it was typically only private interests (individuals or groups) who appeared before the courts, and thereby had their interests addressed. A font of water law decisions frequently cited and relied upon by other courts was Colorado. Colorado is Wyoming's near neighbor – the Wyoming capitol where Wyoming's Supreme Court sits is only 20 kilometers from Colorado's northern border. In water cases, the Wyoming court frequently cites Colorado court decisions. In Colorado, meanwhile, water decisions – from establishment to change to loss of water rights – are made by “water courts.” In those water courts, for most of Colorado's history, only private interests have been represented (MacDonnell 1990, v. II).

By contrast, the way that private parties view water rights may have had less influence on the basic workings of Wyoming's system of property rights in water. And though Wyoming courts cite Colorado cases, Wyoming courts and the views they reflect have had a smaller role to play in Wyoming's water system. One of the salient features of Wyoming water management is the deliberate choice made in 1890 to keep water decisions in the hands of water administrators, with whom water users meet, and can present their proposals to the administrative panel (the Board of Control) with explicitly no need for a lawyer in attendance. Further, in Wyoming from the early years on, if a decision led to a court appeal, state administrators were not left out. They were expected to appear in court, and their interests were represented by a state government lawyer (Mead 1902). Since it would be their decisions being contested, their interests were often not the same as the interests of an individual user who brought the appeal.

Tarlock notes that in most of the West, decades rolled by producing both population growth and construction of major dam, reservoir and pipeline systems that only the federal government could fund. He posits that as a result, allocation of water became by the mid-20<sup>th</sup> century primarily a matter of negotiation between the federal government and the states. Rights to water were considered a firm if complicated form of private property, and, perhaps as a result, markets for water and for water rights themselves developed. New developments including the growth of a preference for water left in streams for ecosystem purposes, and evidence of a changing climate, while population continues to increase, have led to

negotiations in which players other than the federal and state governments have growing clout. In the deals cut, the prior appropriation system and the rights to water it created fill the role of the default incentive: if a deal is not reached, prior appropriation rights could be enforced. Otherwise, Tarlock reports that enforcement of prior appropriation rights to water is decreasing. He expects prior appropriation to persist, but to revert to a single function, as a risk-allocation mechanism, rather than a source of ownership of property (Tarlock 2002; Reisner 1986).

Schlager and Blomquist (2008) have noted, however, that the 20<sup>th</sup> century history of water management in the Western U.S. shows that it is a polycentric system, with a number of different institutions wielding independent authority, negotiating with each other in a way that forms regular patterns of behavior. With that understanding, water management institutions operating through property rights regimes (the various states' versions of prior appropriations system) could be regarded as one of the independent authorities in this polycentric system, rather than only a risk-allocation scheme.

The 20th century history of water management in the Western U.S. also reveals the operation of what Smith (2008) describes as the concern in property law to keep information costs low. As the water rights system in the West graduated from mining camps and early irrigated fields to big-time agriculture backed by millions of dollars in infrastructure investment, the audience for property rights rules in water grew, and the rules became more formal and more standardized. Right holders could see their rights in water as becoming comparable to rights in land, at least in terms of security. Markets in the resource and the rights to the resource became possible and developed, in part because of the standardization of the rights themselves.

The development of the rules of abandonment and transfer of water rights, not addressed in Tarlock's studies cited above, also reflect the influence of information-cost concerns. The abandonment rule has been severely circumscribed by the courts, making it difficult in many cases for a water right to be lost (Trelease 1979: 194-5; see Chapter 6). As what Smith would call the audience widened, the need for a standardized rule that strangers to the world of irrigation could anticipate and understand became greater. And, it appears, the courts borrowed from the property law most familiar to them and to the newly expanded audience: the common law of property that "abhors a forfeiture," and the specific rules of the public land law interpreting the Homestead Act, in which courts repeatedly held that good faith effort to build improvements and live on a homestead, even if that effort failed, would protect the would-be homesteader from losing her claim (Spaulding 1884: 44, 52-3). Meanwhile,

the rule that transfers of water rights to new uses or new places could take place only if there were no injury to others' water rights remained, because the definition of injury had similarities to nuisance law. The courts refined, and standardized, over time, the definition of what constitutes an injury to others' rights (Trelease 1979: 208-212; MacDonnell 1990: v.1, 43). Arguably, all that occurred as the audience grew to include all kinds of people outside an originally small irrigation community. The information burden that the modern transfers rule places onto strangers who want to propose new use of a water right remains somewhat high: he has to determine what water rights others have, and what might happen that could be considered an injury to them. Perhaps, however, the burden is not much higher than that faced by a stranger who wants to propose a new use of a right to land: she has to determine what are the zoning regulations, and possibly the disposition of neighbors who might come to a hearing, that affect the land she has in mind.

The trends described by Tarlock, and the suggestions made here as to how the concerns of property law played out, apply to the majority of Western water law – but not to all of it, and specifically not to water law in Wyoming. In the process of analyzing data and testing hypotheses in the current research, crucial distinctions between the Wyoming case and the general Western U.S. case of water law and its history became apparent. One, the smaller role played in the Wyoming system by private party views of their water rights, has been noted above; another is the fact that the audience for Wyoming water rights did not broaden until the end of the 20<sup>th</sup> century; more will appear in the course of this study. Thus the theory of what water law is in most Western states is a spur rather than a guide to understanding Wyoming water law, while the economic theories of property rights and the legal theory of property are tools to help probe the peculiarities of Wyoming water law and their possible roots.

#### **3.1.4 Robustness**

The concept of robustness comes from engineering work, and denotes the capacity of a system to continue to perform when exposed to unexpected disturbance, or when some internal design constraint is uncertain (Anderies, Janssen and Ostrom 2004). Ostrom and colleagues argue that robustness is a helpful term for analysis of social-ecological systems, along with the closely-related concept of resilience, which arose out of ecological studies (Holling 1973). They note that social-ecological systems include some consciously-designed features which do not appear in ecosystems (Anderies, Janssen and Ostrom 2004).

Analyses of the quality of the features that allow a system to continue to perform in the face of unexpected disturbance, however, can be assisted by what has been learned of resilience in ecological studies. In the 40 years since ecological studies of resilience began, the term has gathered many levels of meaning and uses in scholarly and public dialogue. It has become mixed with concepts of sustainability (Strunz 2011). In the last decade, some scholars, notably Brand and Jax (2007), have called for settling some of the resulting confusion by recognizing resilience as a descriptive term, and sustainability as a normative term.

Though scholars have pointed out that resilience when applied to social-ecological systems tends to have some normative content (Brand and Jax 2007), this study employs primarily a descriptive understanding of resilience, typically applied to ecological systems but also serving as a basis for analyzing the resilience of social-ecological systems (Carpenter et al. 2001). The work of Gatzweiler, Hagedorn, et al. (2002) refines this approach for analysis of natural resource management institutions. That approach has been applied to the data collected in this study. Results are qualitative rather than quantitative, but are supported by multiple instances.

An assessment of resilience is identified as a measure of the amount of internal change and external shocks and disturbances a system can undergo and still retain the same controls on structure and processes (Brand and Jax 2007, Carpenter et al. 2001, Gatzweiler, Hagedorn et al. 2002). Initially, to examine an empirical case for evidence of resilience, it is important to determine resilience “of what” (Carpenter et al. 2001). Cumming et al. (2005) suggest that to make the idea of resilience operational in a specific case, the “of what” should be the “identity” of the system. The “identity” of a system is determined by its key components and relationships and their continuity over time and space, supported by the combination of both innovation and memory of the past (Cumming et al 2005).

When considering institutions for natural resource management, Gatzweiler, Hagedorn, et al. (2002) point out that there are several key features necessary for resilience. First, an institution must have a capacity for self-organization. Further, an institution has to provide ways for people with local knowledge of an ecosystem and people with professional scientific expertise to communicate and learn from each other. Still further, an institution must make room for innovation and evolution. An institution must make it easy for people to experiment with, discover and implement adaptation in the rules governing their activities (Gatzweiler, Hagedorn, et al. 2002).

While these characteristics are necessary conditions for resilience, however, there is considerable work by ecologists and social scientists to suggest these characteristics alone are not sufficient to indicate that a social-ecological system – or the human institutions and ecosystems it encompasses – has the kind of resilience required in order to be a system that can truly adapt to change. C.S. Holling, who originated scientific investigation of resilience in ecology in the 1970s, has in the 21st century partnered with Lance Gunderson and other colleagues to take a major step in describing what more must be present (Holling and Gunderson, editors, 2002).

In their work on what they term “panarchy” these scholars view healthy social-ecological systems as dynamic complexes in which experiment, creativity, and careful conservation play up and down a many-leveled array of resources. That form of organization allows the continued performance of the system even as it may be transformed over time in response to challenges. Holling, Gunderson and colleagues describe resilience as one key factor in a system that is able to adapt to change – but a factor that should wax and wane in different phases of that system. Thus resilience must be viewed over time, and in its relation to other factors. A phase of creative use of resources (human or natural) in building a system – a time of considerable resilience – is typically followed by a phase of conservation, when connections in a system are strengthened, and resilience drops as a system is consolidated and maintained. But as change or challenge occurs, the system may be upset, forced to release some of its components in “creative destruction” followed by reorganization and renewal. In the course of that last phase of reorganization and renewal, resilience starts to build again (Holling and Gunderson 2002: 45). This dynamic image of systems is potentially applicable to ecosystems and human institutions and especially to social-ecological systems where the two are intertwined. The image is the foundation for the idea that systems that can deal well with challenges or shocks are systems that “embrace opposites” – both stability and change (Holling and Gunderson 2002: 47).

To recognize such systems, the most telling characteristic to look for is the capacity for experience to transfer from one portion of a system to another, and evoke a response. This is the characteristic that, if present, is sufficient to identify a system as an overall adaptive one, able to handle challenge. It is built upon the necessary characteristics other scholars have noted – capacities for self-organization, experimentation and learning – but those are not enough. A system that has those necessary capacities yet is incapable of transferring and responding to experience internally will not ultimately prove itself able to adapt and evolve over time to handle changing circumstances (Holling, Gunderson and Peterson 2002).

Analyzing the capacity for transferred experience, Holling, Gunderson and colleagues argue, requires a three-dimensional view – typically, tracking three or more sets of variables, characterized by their different “speeds.” And it is the transfer of and response to experience between the different levels in a system encompassing each kind of variable that is crucial. The common three sets of variables can be characterized as fastest, slower, and slowest. In a study of disease issues in a forest system, for instance, insect pests would be the fastest variables, foliage growth the slower variable, and the trees themselves the slowest variable (Holling, Gunderson and Peterson 2002). In a water management institution, it appears the three key variables might be human resources, land resources, and water resources. The fastest variable then would be the work of people, who can quickly – within a matter of moments or days - change how they employ their energy. The slower variable would be the human use of land, which may change in a matter of months or a few years. The slowest variable would be human use of water, which changes most typically over years or decades because of the physical infrastructure that water use requires and the multiple interests that water use creates and which in turn must be addressed in any shift of uses.

A healthy system encompasses change and experimentation at the level of the fast variables – it is “invigorated from below,” while its slower levels “stabilize and conserve accumulated memory of past successful, surviving experiments,” Holling, Gunderson and colleagues posit (Holling, Gunderson and Peterson 2002: 76). At all three levels, there are dynamic processes – but the cycles of creative construction, consolidation, destruction and reorganization may be more rapid, numerous and various at the level of the fast variables. In fact, *long-term* social-ecological resilience may best occur where a system allows disturbance to happen at small-scale, fast-variable levels, Holling and Gunderson’s colleagues Berkes and Folke point out in the *Panarchy* volume. If a system can accept disturbance at the fast levels, the slower levels can help modulate the release and reorganization of resources at the fast level, and nurture renewal that will allow new creative growth (Berkes and Folke 2002). Thus if what is new and valuable that emerges from the disturbance and adaptation cycles at that level can move to inform activity at the slower levels, while the accumulated resources at the slower levels help organize the opportunities and constraints discovered at the faster levels, that is the kind of transfer of and response to experience that characterizes a healthy panarchy (Holling, Gunderson and Peterson 2002: 76).

At this point, the analysis by Holling, Gunderson and Peterson has gone beyond resilience, to a discussion of sustainability, which is embodied by a healthy panarchy. In a sustainable social-ecological system, as these scholars describe it, resilience is only one factor, which

should wax and wane in different phases at each level. Tracing resilience and its fluctuations, the focus of this research, is however key to the eventual step of determining sustainability

In relation to tracing resilience, these scholars make an important point. They note that resilience that persists too long in the cycle at any one level of a system can be a problem. “A great ability for a system to resist external disturbances” to the point where it is no longer adaptive and creative can, when combined with a wealth of resources and highly effective social control, land that system in a “rigidity trap,” where the system manages to sustain itself but does not adapt well to challenge (Holling, Gunderson and Peterson 2002: 96). Such a system could find itself en route to a collapse into an unproductive state. Notably, Holling, Gunderson and Peterson suggest that systems likely to fall into a “rigidity trap” might include “agro-industry” (ibid) – a category not quite apt for Wyoming’s water-using agriculture, but still a reminder that a rigidity issue might appear in Wyoming’s water institutions.

In a human institution, effective transfer of and response to experience, which scholars find so important to resilience, will necessarily be affected by a number of factors. Those factors include the room the institution provides for entrepreneurs to launch new activities, or for powerful individuals to capture the benefits of an institution for themselves. Those factors and their role in institutional change are examined in the next section.

### **3.1.5 Institutional change**

While no theory has yet been able fully to explain institutional change (North 1995), there are several theories from which to select in an attempt to understand institutional change. These include evolutionary, efficiency, distributional and public choice theories of institutional change. Evolution if understood as a scientific term does not succeed in applying ideas of variation, inheritance and selection well to human institutions (Schmid 2004). A combination of North’s (1990) post-efficiency theory and Knight’s (1992) distributional theory of institutional change, plus a borrowing from public choice theory and theory of change in the agricultural sector appear to provide the best guides for understanding Wyoming’s institution for governing water through property rights regimes.

North (1990) expanded on his own earlier theory of institutional change, to move it beyond a focus on a drive for economic efficiency. North helpfully describes institutions as a matrix of rules that constrain human behavior in a society and help make it possible for people to function in a world that is uncertain, and about which people inevitably have imperfect information and inadequate mental models. The actors in a society are seeking sustenance and if possible, growth – eager for survival, and if possible, profit. They pay



attention to keeping the costs of their transactions as low as possible. Actors interact with each other, and their interactions help create the rules that constitute the institution. Actors are often not just individuals but organizations of individuals (North 1990, North 1995).

North's theory as of 1990, here called his post-efficiency theory, focuses on the interaction between the institutions and the actors within them (North 1990: 7). Increasing returns for at least some of the actors will mean the institution has some success and can persist. To have that success the institution needs some key features. Those include rule enforcement as well as capacity to change rules – in other words, a combination of stability and flexibility. Rules themselves are both formal and informal (and interdependent); enforcement or lack of enforcement of all these rules can occur in many ways and through many possible actors. Lack of enforcement can provide an opportunity for some enterprising actors to experiment with rule change, and that may be evidence of the institution's capacity for change. Capacity for change depends on the institution's ability to allow or encourage adaptation – trials of new ideas, dissolution of failed ideas – and the opportunity available for exercise of collective choice, where actors can impact rules by making known their needs. Those needs, North notes, most typically respond to changes in the costs and benefits of their transactions. There are also instances, however, when a need responds to something less tangible - often, to a change in preferences or beliefs (North 1990).

Given this understanding of institutions, it makes sense that, as North points out, most institutional change is incremental. There can be revolutionary, sudden, dramatic and wholesale institutional change, but most change is not that. It is also not "evolutionary," in the strict sense of a process of selection in which unsuccessful forms fall by the wayside. Rather, an institution changes by means of alterations "at the margins," which slowly results in a changed form (North 1990: 96).

The varied institutions that have developed to serve people in similar circumstances, the persistence of institutions that have only limited success in supporting their actors to move beyond survival and into growth, and the difficulty of importing from another society an institution that has been successful there, suggest that there are significant forces guiding institutional change and affecting what alterations are actually made at the margins. Those forces, North posits, are the returns that an institution is able to achieve and the particular imperfections – the lack of good information, the size of transaction costs – of the market in which the institution operates. To achieve their goals, actors need a significant stock, and good distribution, of knowledge useful in whatever transactions offer them the chance of survival and profit. What returns the institution provides are understood and acted upon only

by virtue of whatever information actors have and the transaction costs they face. The actors construct a mental model of the world and act upon it, and that begins to set the path that change in the institution can follow (North 1990).

As investments are made, reciprocal obligations are undertaken, and certain interests are benefited and become vested in an action. With an action that creates a rule, the choices downstream of that initial choice become increasingly constrained. The initial path taken is the path on which the institution begins to depend – this is the concept of path dependency vividly demonstrated by David (1985). For North, path dependency accounts for the variation among institutions, the persistence of institutions that produce few benefits, and the difficulty of importing institutions from another society. Change in an institution may follow only the path set in the past. In turn, however, there can be path-breaking, in which powerful factors allow a society to change an institution in a way that breaks away from the path set in the past (North 1990).

This theory of institutional change is helpful in its emphasis on the incremental nature of change and the constraints on what changes can occur. It applies to both formal and informal rules, and helps describe the slow changes that took place in the Wyoming institution for governing water through property rights regimes. The history of the Wyoming institution reflects the influence of the constraints North highlights, ranging from the particular kinds and costs of transactions taking place in water use, to the difficulty of rule enforcement over great distances with low populations, to the limits that physical isolation puts on actor knowledge, to the power of an initial rule choice for keeping future actors on the path of that choice.

Other kinds of developments in the Wyoming institution examined in this study also require explanation, however. Most significant are the original formal establishment of an administrative system that formulated and enforced the property rights scheme and, some 80-90 years later, the persistent deference to the needs of agricultural use of water in the incremental changes that occurred in the property rights regime.

Knight's distributional theory of institutional change becomes helpful here (Knight 1992). Knight argues that a weakness in North's theory is that ultimately it focuses on collective benefits as the aim of institutions (Knight 1992: 13). This, in Knight's view, fails to address the real questions of the power of different actors in a society to seek results that will disproportionately benefit them.

Knight calls the theory he proposes a distributional theory of institutional change because it places primary importance on how the institutions in a society distribute to

different actors the benefits of transactions that take place in that society. Knight notes that there are many forms that could be taken by institutions that produce the collective benefits North cites. Which institutional forms actually develop (and when), Knight posits, is the side result of conflicts between actors over who will get the benefits of the transactions at issue. In those conflicts, power over other actors, and the potential achievement of such power, is a crucial determinant (Knight 1992).

Knight describes power over another person or group as the ability to “affect by some means the alternatives available to that person or group” (Knight 1992: 41). In the conflict that affects the shape of institutions, power is used in an attempt to ensure that the alternatives available to others will limit the benefits they can obtain from the transactions governed by the institution. Essentially, actors interact in bargaining situations, to obtain the outcome they seek – and power translates into bargaining power. The considerations involved in such bargaining, and thereby shaping the institutions, are many – including expectations of future events and expectations of how others will behave in future. Since institutions in turn provide a basis for expectations of future events and behavior, institutions once in place will then change very slowly, absent a revolutionary event that changes power relationships (Knight 1992).

To understand Wyoming’s institution governing water through property rights regimes, Knight’s distributional theory is a helpful addition to North’s insights into incremental change and institutional constraints. It recognizes and explains the moments – most evident at the establishment of initial water administration laws, and again 80-90 years later when outside forces brought major economic change – when locally powerful groups had direct effect, to their benefit, on property rights rules in water.

Meanwhile, however, public choice theory, related to institutional change, also helps explain an additional important factor in Wyoming water use that has affected the institution for governing water. This factor is related to the funding of major dam-and-reservoir infrastructure that made irrigation possible in key areas in Wyoming. These large works were typically beyond the scope of private financing, and required public funds, at either the national or state level. Accordingly, how political decisions on a national or state level are brought to serve the interests of a group such as agricultural water users – the subject of the public choice theory on institutional change – becomes of interest.

As Theesfeld (2005: 71) points out, public choice theory on institutional change stems directly from Downs (1957), who describes politics as a marketplace, and politicians as creating policies, or institutional proposals, to win votes. The policies and institutions in

question are of course formal ones, and they can in turn can help to consolidate and maintain voter support for those politicians (Downs 1957). Such support often involves personal relationships between voters and politicians, particularly for voters in the agricultural sector (Theesfeld 2005: 80, citing Hagedorn 1996: 423-424). Public choice theory also posits voters and politicians working in a world of uncertainty. Public choice scholars have therefore explored, in the decades since Downs' work, problems of how voters act when information is limited, costly to acquire, or unhelpful in distinguishing between politicians or political parties (Rowley 2004).

Public choice theory therefore suggests that the opportunists who work at the margins looking for openings for change in North's world, and the powerful who seek to ensure the most return for themselves in Knight's world, must also make room for some political entrepreneurs, people who intentionally propose or create institutions in order to win voter support in the political marketplace. Those political entrepreneurs can in fact be seen operating with effect in the investment in major infrastructure which had its own impact on the Wyoming institution for governing water through property rights.

Another theory, specific to change in the agricultural sector, will also be helpful here, since agriculture dominates water use in Wyoming. Hagedorn (2003) has pointed out a key to understanding why it is difficult for people in the agricultural sector to join the economic change that takes place in market-based economies. He calls for recognition that families operating farms (or ranches) are "integrative institutions" (Hagedorn 2003: 7-12). All the potential economic and social concerns related to the family – from employment, income, or inheritance to education of children and care of the elderly – are tied into the farm and its economic issues of natural resource productivity, markets and profitability. The employment prospects of a family member are not segregable from the productivity potential of the farm. One member choosing to move to a new location to secure better-income employment is not like the decision made by someone working in a different industry. To the family, it can mean loss of a caregiver or meal-preparer; to the farm, it can mean loss of a manager as well as of a laborer, with resultant losses in the capital asset of the farm itself. It is the "cumulation of transaction costs," and the incentives inherent in an integrative institution to internalize rather than externalize such costs, that make it difficult for family farmers (or ranchers) to embrace and take part in economic change in market-based economies, Hagedorn points out (2003: 7-12).

Hagedorn has also explored the role played by the farm sector in politics. One key factor he notes is that family farmers who have limited opportunity to exit farming because of

the nature of the family farm institution, as just described, will increase their voice in political protest as their opportunities for exit decrease (Hagedorn 2003: 13, following Hirschman, 1970, 1982).

Hagedorn's work suggests that the agricultural sector, if it has a significant number of family- owned operations, may often make it difficult for the institutions that affect this sector to break whatever path-dependencies the institution may have developed. Since the Wyoming water management institution serves primarily the agricultural sector, change in that institution is likely to be affected by the tendencies of the agricultural sector to impede path-breaking in institutions relevant to their operations.

This influence of an agricultural sector in impeding path-breaking may of course be due to the role of the family farmers in the relevant institution itself, or due to the political voice of the family farmers in other institutions whose actions can affect that institution.

The bulk of this dissertation focuses on the role that Wyoming family farmers and ranchers, as water users, play in the water management institution. As discussed in Findings, Chapter 7, they are one of two key players in the institution. While the political institution of the Wyoming legislature has for the most part had very little role in the water management institution, it has played a part in the moments mentioned above regarding establishment of the water administration system, and in the funding of infrastructure, 90 years later, that buttressed agricultural dominance of the water governance institution. This latter event was possible because the legislature was and is still dominated by farm and ranch family interests, due to its own institutional history.<sup>5</sup> That is a key moment when consideration of the political voice of family farmers and ranchers, and their few opportunities to exit their situation, is of major assistance in grasping the factors affecting the development of the Wyoming water management institution.

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<sup>5</sup> Interestingly, the domination of the legislature by ranch and farm interests was and is due in part to the institutional structure of the Wyoming Legislature. Set up in the 1890s when agriculture was the prime driver in the state's economy, the Legislature meets every year (originally it was every two years) for only a maximum of two months, in January-February. Its members receive no annual salary, just per-diem salary and per-diem compensation for expenses. In the decades since the 1970s their work has included 4 to 6 committee meetings per year, requiring travel, to review issues and prepare legislation (Wyoming Legislative Handbook, 2007: 3.2-3.3). Being a Wyoming legislator is the classic part-time job appealing to family farmers or ranchers, the more so since family farmers and ranchers have a strong need for political voice (Hagedorn 2003). By contrast, would-be legislators in other professions have to weigh the benefits of voice against the considerable costs of taking this low-paid part-time work that reduces their opportunity for earning income at their full-time job. Legislators ranging from owners of a private oil company to workers in a mine have noted that the decision is not an easy one and has forced some to quit the legislature, as well as barring others from even attempting the task (Personal communications to author, anonymous 1988, 2010).

Thus, understanding of the Wyoming case is aided by theories of institutional change ranging from those of agricultural economics and public choice, to both distributional and post-efficiency theories. The Wyoming case can, in turn, make a contribution to theory of institutional change, on the question of path dependency and path breaking. Path dependency is a phenomenon acknowledged by all these theories. The Wyoming case illuminates, in particular, the role played in both path dependency and path breaking by physical conditions that constrain actors.

Accordingly, the case helps answer one of the questions raised by North when he laid out a further research agenda on institutional change, in the mid-1990s. North called for research into the question of how the experience, mental constructs and incomplete information of actors, as they interact with their institutions, helps constrain subsequent collective choice of rules in that institution (North 1995). A complement to that agenda item would examine what factors, potentially affecting the experience, mental constructs and information of actors, can allow collective choice action that breaks the path from the past. Throughout the following chapters, it will become apparent that the difficult terrain and climate conditions faced by Wyoming people attempting to use water for agriculture had a strong influence on rule choices they made, affecting both the creation and the breaking of path dependency in the water management institution over time.

### **3.2 Framework**

A framework that helps identify key factors in a system, like property rights regimes, can make it possible to characterize an institution that makes use of those regimes - and why it has changed over time. Frameworks help a researcher keep in mind key elements and relationships that must be examined to understand a variety of institutions.

Hagedorn (2008) proposes drawing upon two frameworks to identify features of institutions that govern human transactions related to nature, particularly complex transactions like those often found in agriculture.

One of these frameworks is that proposed by Ostrom (2007). Her “SES framework” for analyzing socio-ecological systems (SES) is built upon her initial Institutional Analysis and Development (IAD) framework (Ostrom 2005). That framework put forth the concept of focusing on the actor (whether an individual or a group) in an “action situation” and then working to “unpack” the factors that affect what the actor does in that situation – including such factors as the resources available to that actor, rules in use that determine what actions are possible to actors in certain positions, the amount of information and

understanding an actor has – and how the situation changes over time depending on what has happened in this situation in the past (Ostrom 2011a). “Biophysical conditions” were considered an important external variable affecting action situations but were not further “unpacked” in the IAD framework (Ostrom 2011a: 22).

Scholars working with natural resource management institutions, Ostrom notes, found a need for a framework that further laid out variables to be considered when actors in situations involving action with the biophysical world (Ostrom 2011a: 21). She and colleagues who examine natural resource management institutions have therefore worked out the SES framework which sets forth a series of layers of variables to be considered that affect and are affected by actors in action situations. Those variables include the resource system (examining for example its productivity and predictability), the resource units (for instance how mobile they are), the governance system, related ecosystems, and related attributes of the actors (including how much they know about the entire socio-ecological system, and how important it is to them) (Ostrom 2011a). In a recent discussion of irrigation issues in the early 20th century U.S. West, Ostrom pointed out that problems recognized at the time demonstrated that how important actors’ knowledge of the ecosystem, as well as their trust for each other, both considered in SES, are to understanding how people can build governance systems in irrigation (Ostrom 2011b). The SES framework therefore is extremely helpful as a structured and multi-dimensional catalogue of the many variables that can be involved and influential for the development and operation of human institutions for managing natural resources.

Williamson, meanwhile, has also helped revolutionize economic thinking by his work focusing on transactions – on exchange relationships between people – and on the costs of transactions (Williamson 1985). Williamson identifies a transaction as occurring “when a good or service is transferred across a technologically separable interface. One stage of activity terminates and another begins” (Williamson 1985: 1). The cost of that transference is what Williamson calls “the economic equivalent of friction in physical systems” (Williamson 1985: 19). He posits that reducing transaction costs is the goal of economic organizations. This transaction-costs economics (TCE) contrasts with neoclassical economic analysis focusing on reduction of production costs as the goal of an organization. It has led Williamson to work on business organization issues as a question of governance, rather than of competition (Williamson 1985: 30-32). Of significance to scholars studying other kinds of institutions is his resulting analysis showing that asset specificity – the extent to which actors have invested significantly in assets that are specific to a particular transaction – is crucial in

creating a situation calling for governance, and in affecting how a governance system develops (Williamson 1985: 30-32, 1998). Like North and Ostrom, Williamson states that the human actors involved in a governance system focused on transaction costs operate in a world of uncertainty, and should be considered to have bounded rationality - plus a tendency to pursue self-interest opportunistically (Williamson 1985: 30-31).

Hagedorn moves from Williamson's examination of transaction costs in business operations to apply some of that approach to the transactions that people (or their business organizations) undertake in relation to nature – in sectors such as agriculture, fishing, or forestry. In those transactions, Hagedorn identifies a special kind of cost that he argues should be a central consideration in analyzing natural resource management institutions. Where Williamson sees transaction costs as a kind of friction, Hagedorn notes that it is to human- engineered systems that the idea of friction best applies. In transactions related to nature, he argues, the cost question must be construed differently. The crucial fact of nature, Hagedorn argues, is the interconnectedness of natural systems, the “linkages” between various activities found in a natural system. Transactions that human actors undertake related to nature have an effect on that interconnectedness. That effect, Hagedorn says, should be called the “coherence cost” (Hagedorn 2008: 362). He argues that the coherence cost is a central factor affecting institutional arrangements that govern transactions related to nature, and it must be considered as important as the more familiar transaction costs equivalent to friction, from TCE (Hagedorn 2008: 362). Hagedorn also notes the usefulness of Ostrom's SES framework in its focus on the attributes of natural resources as well as of human actors, and its emphasis on continually “unpacking” those attributes to appreciate their complexity and therefore to understand the complexity and necessary diversity of institutions that manage human action in varying contexts.

In institutions governing human actions that involve nature, Hagedorn describes a cyclical relationship between the physical properties of the transaction and the interdependence (whether recognized or not) among the people undertaking such transactions. He suggests that this “transaction-interdependence cycle” leads to the emergence of institutions and their governance structures (Hagedorn 2008: 378). He identifies a number of physical properties of transactions that should be considered, relating both to structure (examining the “decomposability” of a transaction) and to function (examining the “functional interdependency of processes”) (Hagedorn 2008: 373).



If those two dimensions are kept in mind, the properties of the physical transaction under consideration might be thought of as the extent of the coherence cost of that transaction. It will have a major impact on the people involved with it, and the institutions that manage it.

For, as Hagedorn (2008) notes, following Williamson (1985, 2004), the regularizing capacity of the institution – the rules that make it possible for people to keep functioning in an uncertain and not-completely-knowable world (North 1990) – must match the properties of the transaction involved. Interestingly, in describing the “transaction-interdependence cycle” that generates institutions governing how people work with natural resources, Hagedorn posits that the cycle is not necessarily continuous. If people end up satisfied with the “public and private ordering” that is reached, the cycle will end – but if they are not (or, presumably, if new factors make them dissatisfied at some future point) the cycle starts anew and is likely to lead to institutional change (Hagedorn 2008: 379).

When the cycle is in process, it would seem that, as far as the actual coherence costs of a transaction with nature is understood by the human actors, the trend in the influence on institutions would be towards maximizing the positive impacts and minimizing negative impacts of those costs. The question of how well understood is the extent of the coherence cost in any given transaction is a crucial one. Given the complexity of the structure and function of natural systems, human understanding of the coherence cost of a transaction with those systems is always limited and in need of expansion. The growth in scientific understanding over the last 60 years of the pollution impacts of industrial activities, for instance, demonstrates how much there always is to be learned.

Hagedorn’s “transaction-interdependence cycle” would suggest that increasing human understanding of natural systems and the coherence costs of transactions with them leads to increasing recognition by human actors of their interdependence with each other due to those transactions – and increasing effort to fashion institutional rules accordingly. Whether those efforts can successfully move from recognition of the issue to rule-making and rule-governing will depend on the many other factors detailed in such work as Ostrom’s SES framework.

When considering water use transactions in Wyoming, it becomes clear that the coherence cost of those transactions is rather large. Both the structural and the functional properties of the typical transaction feature significant interconnectedness. By far the largest percentage of transactions regarding water in Wyoming involve using water for irrigation, so the example considered here will focus on irrigation use. Irrigation is a transaction in the original sense Williamson uses – water is “transferred across a technologically separable

interface” several times (Williamson 1985: 1) as it moves from stream to soil to plant – or to air and subsurface as well. The irrigator, meanwhile, may have an investment in infrastructure that means there can be considerable asset specificity for him, so that his transactions require a governance system.

In Hagedorn’s terms, the irrigation transaction is not easily decomposable, structurally: the water is diverted from the stream, transported to a field, and spread onto a field, but no one of those actions would or could occur without the other. Perhaps most significantly, the functional properties of the transaction are extremely interconnected: the water removed from a stream and transported and placed onto soil in a particular spot is then used by plants, evaporated into the air, or absorbed by the soil. What plants can be grown (and of course, what markets served) depend on the amount of water that can be extracted and delivered. How much water evaporates depends on the plants in the field, the soil structure and the climate and temperature. How much water is absorbed and where it goes – whether into a groundwater table, perhaps raising that table, or back into the stream – depends on the soil structure and its underlying geology.

Where the water goes (as well as what plant growth it supports and how much is left to move through the soil) is of great importance to other irrigators – who thereby are dependent on the action of each irrigator on a stream they share. Wyoming irrigators discussing formal and informal rules on their streams always refer to the structure and function of their transactions with the streams as a crucial causal factor.

“This whole area is so sandy and gravelly,” says one man (B. Bousman 2011): he and his neighbors try to undertake certain patterns of irrigation to make that feature work for them so that their water supply from the stream stretches into late summer, long beyond the time of peak flows in the stream. “It’s in my interest to have that water in the ground and in the alluvium,” says a man on a creek in a very different part of the state (Scott 2012): though he formally has the first right to water in the stream, he informally defers to upstream neighbors with inferior rights early in the irrigation season. The reason is that the soils upstream in his neighbors’ fields will absorb water and then slowly release it back directly to the stream in “return flows” that he will see coming down the stream to him when he most needs them one or two months later, again after the time of peak flows in that stream.

Studies of how water used for irrigation behaves in plant consumption, evaporation, and movement through soils and subsurface geology are now increasingly undertaken in Wyoming. These studies examine questions varying from the impact on neighbors of an irrigation district seeking to improve the yield from its water rights by lining key

canals (Aqua 2006), to whether Wyoming and a neighboring state are meeting their cross-border water allocation obligations (Nebraska v. Wyoming settlement, App. G, 2002).

Accordingly Hagedorn's concept of the coherence cost of transactions with nature is particularly useful in application to the Wyoming institution governing water through property rights. This study uses that concept, and the idea of the "transaction-interdependence cycle" to identify features of the institution and causes of institutional change.

## **PART TWO:**

### **PROPERTY RIGHTS IN WYOMING WATER**

## 4. HISTORIC AND FUTURE CHALLENGES IN WESTERN WATER LAW: THE CASE OF WYOMING<sup>6</sup>

**Abstract:** *This article presents an overview of the history of the water management institution in Wyoming that pertains to rights to use water, given as a talk at a conference titled “The Culture of Water.” The overview focuses on key trends in the law governing water rights – statutes, court decisions, and administrative decisions - over the period 1876-2006. The article develops a series of themes: early conscious attempts to craft a water management institution focused on creating a system of water rights that would bring order out of the chaos in water use that contemporaries perceived in 19th century Wyoming; the institution thus founded then changed and grew slowly and incrementally in the 20th century, in response to a variety of pressures from the physical environment and the economic and social environment; and finally, due to difficulty in accommodating new social and economic forces, the institution became by the 21st century an institution at risk of becoming irrelevant to the people it served. The article also suggests some routes for further incremental change in the institution so that it might better accommodate current needs.*

### 4.1 Introduction

It was as a reporter for the *Casper Star-Tribune* in the 1980s that I was first struck by the “Culture of Water” in Wyoming--in two ways. First, there was the hushed silence that overcame the normally obstreperous Agriculture, Public Lands and Water Resources Committee in the Wyoming House when the State Engineer came to testify. The Committee was ready to authorize whatever change the State Engineer wanted in Wyoming water law.<sup>7</sup>

Second, there was the way that even in the depths of the last bust in the 1980s and 1990s - when oil prices had crashed and at times the state’s budget would be rescued only by such things as the death intestate of someone with substantial holdings - bills authorizing tens

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<sup>6</sup> MacKinnon, A. (2006). Historic and Future Challenges in Western Water Law: The Case of Wyoming. *Wyoming Law Review* 2, 291-330. This chapter uses a conversational style requested by the journal editors, since it appeared in an issue documenting a 2005 colloquium on Western water. The citation style of the article reflects the requirements of the journal which published it.

<sup>7</sup> In 1985, for example, State Engineer George Christopoulos appeared before a respectfully quiet House Agriculture Committee to seek changes to Wyoming Statute §41-4-514(a) pertaining to amendment of water permits, following the Wyoming Supreme Court’s decision in *Green River Development Co. v. FMC Corp.*, 660 P2d 339 (Wyo. 1983). Christopoulos’ proposal, adopted by the committee and the full Legislature, laid out standards for permit amendment in a section that up to that time had been very general. The intent of the engineer’s proposal was to reflect the limits the court had prescribed regarding engineer authority to amend permits, while retaining engineer authority for permit amendments that had typically received routine approval. See 1985 Wyo. Sess. Laws, ch. 108, §1, pp. 134-136. The case had been highly controversial and emotion-charged for Christopoulos, and perhaps because of that the engineer’s proposal was received in hushed silence.

of millions of dollars of spending on water projects breezed through the Legislature with no major challenge.<sup>8</sup>

What added to my curiosity was a number of events in the 1980s and 90s which suggested that the water management system, however longstanding and revered, was not addressing modern social and environmental concerns. Two examples were the state's water rights litigation with the Native American tribes in Wyoming and the public initiative for an in-stream flow law. These conflicts arose in the 1970s and were still very much alive in the mid-1980s and into the 1990s. It was clear that the state's water law system clashed repeatedly with the water interests of the tribes and with the views of a significant chunk of the population who had no part in agriculture and no water rights. These people included miners, refinery and oilfield workers, schoolteachers, government employees, and others whose real wages in Wyoming may not be their paychecks, but their access to the outdoors and its top-notch hunting and fishing.<sup>9</sup> In addition, into the 1990s, the state water system tended to collide with the national will expressed in Congressional directives to protect clean water and endangered species. The state became embroiled in years of disputes over the Wyoming plan to build Sandstone Dam in Carbon County (which ultimately failed its Clean Water Act review), Deer Creek Dam on a tributary to the North Platte River, and the federal effort to protect bird habitat on the Platte in central Nebraska.

It was about 1985 when I first went to the State Engineer to start trying to figure all this out. The State Engineer at the time was George Christopoulos.<sup>10</sup> George handed me a stack of thick, calf-leather bound books - the early Biennial Reports of the State Engineer to the Governor of Wyoming - and sent me off. He was a smart man. The best way to deal with questions from a reporter is to load the reporter down with much more information than it is possible to digest. And here I am, twenty years later, still toiling through the books George gave me, and the issues they raise.

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<sup>8</sup> Oil prices had crashed in 1982, but annual appropriations from the mineral-tax fueled water accounts ranged from \$70 million to over \$100 million in 1985-88. WYO. WATER DEV. COMM'N, LEGISLATIVE REPORTS (1985-1988). On file with author and the Wyoming Water Development Commission, Cheyenne, WY. The water development funding bills are most easily found in the annual compilation of session laws. In the indices, under Water, construction projects appear under the name of each project, while study and design bills appear under "omnibus water bills" or (in much of the 1980s) similar general titles.

<sup>9</sup> Ernie Niemi, Wyo. Water Dev. Comm'n, *Water and Economic Value: A Conceptual Framework* (Sept. 2005 draft report: on file with author). A final version of that report should be available in summer 2006 as a product of the commission's study, "The Economic Value of Water," which focuses on the Green River Basin. See <http://wwdc.state.wy.us/draftreports/GRBWATERVALUEANALYSIS.html>

<sup>10</sup> State Engineer, 1974-1987

Water law in the western U.S. is very local, very particular to each state. That is what makes it satisfying to study. You learn about the place and its people, and how the two have interacted, by studying water law. In this discussion, I am going to focus on the water law that was developed in Wyoming. In the 1890s, when Wyoming water law was new, it was regarded as what you might call the cutting edge of the avant-garde in water management in the West. Wyoming water law was held up as a model for other states to follow (though not many did follow it in its entirety).<sup>11</sup> If you look at Wyoming's constitution, written in 1889, it is clear that the water language absorbed much of the creative energies of the constitution writers.<sup>12</sup> The Wyoming Constitution in many places repeats the boiler-plate language found in other constitutions from the many Western states that achieved statehood at the same time.<sup>13</sup> But the language on water is different, clearly coming straight from people's experience here. Wyoming is a place where people have thought about water.

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<sup>11</sup> Robert G. Dunbar, *Forging New Rights in Western Waters* 113, 123-24, 132 (1983). [hereinafter Dunbar]. See also Elwood Mead, *Irrigation Institutions* 274 (1903), reprinted 1972 (citing Smythe, which follows), [hereinafter Mead], and William E. Smythe, *The Conquest of Arid America* 230-31 (1905), reprinted 1970.

<sup>12</sup> The key water provisions of the Wyoming Constitution read:

Water being essential to industrial prosperity, of limited amount, and easy of diversion from its natural channels, its control must be in the state, which, in providing for its use, shall equally guard all the various interests involved. Wyo. Const. art. I, §31.

The water of all natural streams, springs, lakes or other collections of still water, within the boundaries of the state, are hereby declared to be the property of the state. Wyo. Const. art. VIII, §1.

Priority of appropriation for beneficial uses shall give the better right. No appropriation shall be denied except when such denial is demanded by the public interests. Wyo. Const. art. VIII, §3.

A compilation of the water debates at the Constitutional Convention, made by former Wyoming Attorney General Archibald McClintock, totals fifty pages and is titled: "Extracts From Journal and Debates of the Constitutional Convention, State of Wyoming: Containing all References to Water and Water Officials." (n.d.) On file with author, gift of A.C. McClintock.

William E. Chaplin, a delegate to the convention, commented forty-five years later, "Four subjects occupied the most of the time of the members in debate: Suffrage, irrigation and water rights, taxation and revenue, and apportionment." (American Heritage Center, University of Wyoming, W.E. Chaplin biographical file, B-C365-we, newspaper clipping, "Survivor of Constitutional Convention Tells of Meeting," Aug. 26, 1934.)

For a short description of the drafting and debates over the water language in the Wyoming Constitution, see Dunbar, *supra* note 11, at 106-08.

<sup>13</sup> Lewis L. Gould, *Wyoming: A Political History 1868-1896* 112-13 (1968) (citing John D. Hicks, *The Constitutions of the Northwest States* (1923)).

This paper is best understood as a discussion of the development of Wyoming's water law as a "water management system" rather than as a body of statutory and case law. A complicated water management system, with only its barest features noted in the statutes and court decisions, is in fact what the state has. Frank Trelease, former dean of the UW College of Law and dean of water law commentators, pointed the way for consideration of Wyoming water law in this manner, with his studies of the actual practices of the Wyoming Board of Control, whose cases may never reach the courts.<sup>14</sup>

With a focus on surface water,<sup>15</sup> I plan to discuss here several themes from the development of Wyoming water law as a water management system:

First, at its origins: the idea of Wyoming water law, as the constitution and the statutes were written in 1889-90, was to bring *order out of chaos*. The idea was that by managing a key resource, it would be possible to create and sustain communities.

Second, as the water law evolved in practice: a *locally-rooted institution, tenacious yet often flexible*, was created. Wyoming's water law has inevitably changed, moving away from some of the early precepts, and shaped by the pressures of the place and the times. It was and is multi-layered, creating roles and room for significant action for people operating at the local creek-side level, at the superintendent and state engineer level, at the legislative level, and at the court level. It is interactive, with people at each level responding to each other. Most changes, however, are initiated at the ground level. As a result, Wyoming's system, for many years, has been vigorous and able to adapt to needs of particular streams and users. It has been an effective system for managing the complex resource that is water.

Third, today: Wyoming's water law system is *in danger of becoming marginalized*, that is, less and less relevant to the needs of Wyoming communities. For the past thirty years or so the water law system has faced major new challenges in the form of social and economic changes. The national economy has changed sufficiently so that the key products (agricultural) for which Wyoming's water has been managed in the past are less and

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<sup>14</sup> See, e.g., F.J. Trelease, Priority and Progress - Case Studies of the Transfer of Water Rights. 1 Land and Water L. Rev.1(1966).

<sup>15</sup> This paper discusses essentially the rules pertaining to agricultural use of surface water, which is by far the largest use of water in Wyoming. Surface water use was approximately seven times the volume of groundwater use as of about 2000. Water Planning Team ,Wyo. Water Dev. Comm'n, pocket Water Facts. Largely the same rules apply to industry, municipalities, and other water users. The priority and permit system has also applied to groundwater. See, e.g., Wyo. Stat. Ann. §41-3-901 to -938(LexisNexis 2005) (enacted 1957). Groundwater has been used for irrigation and by municipalities largely in the post-World War II period.



less valuable on their own. Water itself, however, is seen as increasingly valuable, and Wyoming people are recognizing many more ways (such as recreation and wildlife habitat) to value and use it than were envisioned in 1890. However, these new views on water use, and in some cases the people who hold them, are largely excluded from playing a role in Wyoming's water law system. That does not bode well for managing this resource to sustain the state's communities as they change in this new century.

Fourth, the take-home message: the water law system in Wyoming has considerable value in itself, yet it must continue to evolve and adapt if it is not to be ultimately sidelined. Wyoming's water law is a unique institution that has developed out of the needs of the people and the places where they live. As such, it has much to offer in helping everyone in the state meet a wide range of needs, whatever those may be, in the future. The system must, however, meet current challenges in order to remain vital and valuable and to continue to sustain Wyoming communities. There are undoubtedly ways it can adapt and evolve, if those who care about water in the state become engaged in the task.

I will discuss those four themes in more detail, with reference to examples from a variety of places in the state – including Buffalo, Cody, Cheyenne, the North Platte and the Wind River.

## **4.2 Order Out of Chaos**

In the years that preceded statehood and the adoption of the water language of the constitution, Wyoming was very much a post-war landscape. Many of the major and minor figures in territorial and early statehood years had fought in the Civil War.<sup>16</sup> They came to Wyoming to fight in the Indian Wars or to find a new life and make their fortunes. After the last battles with the Native American tribes in 1876, herds of Texas cattle were waiting to be driven over the North Platte and into the prime grazing lands of northeast Wyoming, where the big herds of buffalo were no longer there to compete for the grass.<sup>17</sup> Onto this

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<sup>16</sup> The classic example is Francis E. Warren, a Massachusetts farmer's son who enlisted in the Civil War at age seventeen, rose to corporal, won the Congressional Medal of Honor, and arrived in Cheyenne in 1868 at age twenty-four to work in a dry goods store. He soon took over the dry goods operation and plunged into almost every kind of business he could think of from ranching to urban real estate and municipal lighting – but his real talent was politics, and he became territorial governor, first state governor, and eventually U.S. Senator for over thirty years. Francis E. Warren, Biographical Folder 3, American Heritage Center, University of Wyoming, Laramie, WY. Anne C. Hansen, *The Congressional Career of Sen. Francis E. Warren from 1890-1902*. 20 *Annals of Wyoming* 1, 3-8. T.A. Larson, *History of Wyoming* 448 (1978). [hereinafter Larson].

landscape, suddenly bereft of the people who had inhabited it, entered the newcomers, who saw the chance here to start fresh and make something new—a new life, or new profits.<sup>18</sup>

They went at it with a will, and water was not left out of their designs. A number of them made use of the notion of prior appropriation. The prior appropriation system had its origins in California and Colorado, places transformed by gold miners and settlers years before new settlement came to Wyoming, as described by Charles Wilkinson in his symposium paper. Prior appropriation for water was a system that made sense here, too. Essentially, prior appropriation means just that, a kind of squatter's right – you reach out and *appropriate* something for yourself, prior to anyone else doing it, and you've got a right to it better than the right of anyone who comes along later.

In Wyoming's early years as a territory, all that was required to reach out and appropriate that water you saw in a stream was to post a sign up on a nearby tree, saying in effect, I hereby claim this water and here's how much of it I claim.<sup>19</sup> Later, the Territorial Legislature decided it might be good to get some record of those claims, so people had to go file them in the county courthouse. That meant someplace 50 or 150 miles or more away, not a handy place for others to go check when they wanted to get water out of that same stream.<sup>20</sup>

The man hired as Territorial Engineer, who traveled around the state in 1888 to sort out the water rights situation, commented decades later on his findings: “[T]he virtue of self-denial had not been conspicuous” among Wyoming's early settlers.<sup>21</sup> Of course not.

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<sup>17</sup> Larson, *supra* note 16, at 106, 166. Future U.S. Senator and Governor J.M. Carey was one of the first to take his herds north over the Platte. See Agnes Wright Spring, *Carey Story is a Wyoming Saga*, *Hereford Journal* 10 (July 15, 1938).

<sup>18</sup> By the 1830s, the Native Americans in what became Wyoming included the Shoshoni, Crow, Cheyenne, Arapaho and Sioux tribes. In treaties of 1868, the Shoshoni accepted a reservation on the Wind River, and the Sioux and Arapaho a reservation in the Dakotas, with hunting territory reserved in Wyoming's Powder River Basin. Continuing battles over white inroads into those valuable hunting grounds, climaxing in the battles of 1876, resulted by spring 1877 in the Crow and Cheyenne pushed into Montana, the Arapaho forced onto the Shoshoni reservation, and the Sioux in the Dakotas. See Larson, *supra* note 16, at 12-35, 95-106.

<sup>19</sup> Mead, *supra* note 11, at 69-71, 248-49. “The law says that the appropriator must post his notice in writing in a conspicuous place at the point of intended diversion. Now usually the conspicuous place where the water is diverted is in some willow thicket, or along the cottonwood-bordered banks in some lonesome bend of the stream . . . .” *Id.* 70.

<sup>20</sup> Wyoming Territory did not require notices to be recorded at the courthouses until 1886. 1886 Wyo. Sess.Laws 297-98.

<sup>21</sup> Elwood Mead, *Recollections of Irrigation Legislation in Wyoming* An enclosure in a letter to Grace Raymond Hebard, March 27, 1930. Mead Collection, American Heritage Center, University of Wyoming, reprinted in Anne MacKinnon and John Shields, *Selected Writings of Elwood Mead on Water*

People who came here were enthusiastic, ambitious, and imaginative. They had big ideas. It was not uncommon to see someone claiming more water than actually flowed in a stream. In one case, someone claimed from one stream more water than actually flowed in the entire state of Wyoming, and he proposed to divert that water with a ditch two feet wide and six inches deep.<sup>22</sup>

When people started arguing over conflicting claims, and the fight left the creek-bank and went to court, the territorial courts (where the judges knew little about water) found themselves allocating water by the amount stated on paper in the claim, or perhaps the size of the ditch. They didn't worry about the fact that such a system resulted, among other things, in more water per acre for one irrigator than for his neighbor just down the stream.<sup>23</sup>

Further, with the expansive claims filed at the courthouses, and confirmed by judges, came the danger of speculation. Someone might file on a sizeable amount of water, use a little or none, and plan to sell it to latecomers, based on the value of that "prior right" date. One man said he figured he would use less than half of his claim now and the rest later, "if farming becomes more profitable" in his neighborhood. Imagine how his neighbors who came a little later to the stream (whose irrigated farms would help bring on the railroad and the access to markets that made farming "more profitable") were going to feel when that man decided to double the acreage he farmed and put them out of business by ballooning the amount of water he used based on the priority of his early date right.<sup>24</sup> Wyoming Territory was rife with excess water claims, covering much more water than people were using or could use.<sup>25</sup> This generated conflict, wasted time, money and energy, bred inequity that would lead to more conflict, and offered an attractive opportunity for speculators.<sup>26</sup>

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Administration in Wyoming and the West 8 (2000), available at <http://seo.state.wy.us/PDF/FinalMeadBooklet.pdf>. [hereinafter Mead, Recollections].

<sup>22</sup> 1891-1892 Biennial Rep. of the St. Engineer, at 61-62.

<sup>23</sup> Mead, *supra* note 11, at 5-9.

<sup>24</sup> Mead, *supra* note 11, at 260-62.

<sup>25</sup> Mead, Recollections, *supra* note 21 at 5 ("If the amount of water claimed had existed, Wyoming would have been a lake.").

<sup>26</sup> By 1890, as Mead reported later: The fever of speculative filings had run its course and hundreds of claims had been recorded by parties who had done nothing more than file the statement. The name of one individual was found in the water-right records of every county in the State, although he built only one ditch and that in the county where he lived. Mead, *supra* note 11, at 253.

The final straw for the demise of the early water system was the famous drought and hard winter of 1886-1887. The open-range stock industry, led by the men who had driven those herds across the Platte in 1876, was suddenly crushed with loss. Cattlemen had tried since 1876 to organize themselves through the Wyoming Stock Growers' Association to manage the incredible resource of rich grasslands.<sup>27</sup> Their ignorance of the place that they and their herds had so suddenly come to inhabit, however, got the better of them in 1886-87. The free year-round fodder they had banked on (some, via pyramid investment schemes) was wiped out by drought followed by months of freezing, unrelenting blizzards.<sup>28</sup> It began to appear to those whose stock operations survived that it might be a good idea to grow some hay in summer to tide the herds over the winter. Further, some started to think about encouraging irrigated agriculture in general as a new endeavor that might be a little more stable than cattle raising, for the sake of future growth in the state's economy.<sup>29</sup> Wyoming stockman and two-time Governor Francis E. Warren helped recruit the first territorial engineer, whom the legislature charged with drafting new water laws.<sup>30</sup> Warren and his friends wanted a system that would both confirm their own water claims and build a basis for new development of larger-scale irrigation.

How to bring order to this scene? The stockmen brought in Elwood Mead to be Territorial Engineer. Mead was young, in his late 20s.<sup>31</sup> He grew up on a southern Indiana farm on the Ohio River, where the main problem with water was getting rid of it, but he had spent his first years out of engineering school along the Front Range in Colorado learning about irrigation.

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<sup>27</sup> The rich grasslands, emptied of their buffalo, were left by Congress available to all comers at no charge. The cattlemen used their system of branding, of roundups, and what became the draconian rules on maverick unidentified calves and admittance to the Wyoming Stock Growers' Association in an attempt to manage both the grass and the critical question of who got to use it under what conditions. Larson, *supra* note 16, 168-190. See also Samuel P. Hays, *Conservation and the Gospel of Efficiency, the Progressive Conservation movement 1890-1920*, 49-53 (1959).

<sup>28</sup> Larson, *supra* note 16, 190-194

<sup>29</sup> *Id.* at 162.

<sup>30</sup> Mead, *Recollections*, *supra* note 21 at 3-5.

<sup>31</sup> Elwood Mead (1858-1936), trained as an engineer at Purdue University, came to Colorado in 1882 to teach math and physics, and became assistant to Colorado's State Engineer in 1885. In 1888, he became Wyoming's first Territorial Engineer and in 1890 the first State Engineer. He left Wyoming in 1898 for a career in Washington, Australia and California in irrigation investigation and promotion of rural settlement through irrigation. A prominent critic of the U.S. Bureau of Reclamation, he was named Commissioner of the Bureau in 1924 and eventually masterminded the Bureau work on the Colorado River that included the Hoover Dam, which created the giant Lake Mead named for him. He died while still in office in 1936. For a complete biography, see James R Kluger, *Turning on Water with a Shovel: The Career of Elwood Mead* (1992).

He had also read much about water issues in California, and he had many ideas on how to manage irrigation better.<sup>32</sup> Mead believed that wise management of natural resources like water could provide a basis for building and maintaining communities.<sup>33</sup> Real communities were scarce in Wyoming – most of its few towns were cowboy watering holes near old forts or ports of call for railroad crews along the Union Pacific lines. Mead saw wise management of water as a way to change that. Like the intellectuals and reformers who created the nationwide Progressive movement only a few years later,<sup>34</sup> Mead believed that in managing water as a resource to support communities, it should be possible to strike a balance between private and public interests. Mead wanted to see the resource put in the hands of private individuals, with continuing oversight by the public via their government.<sup>35</sup> He wanted to achieve both the stability that would encourage private investment and the flexibility that could adapt to change. With these goals in mind, Mead introduced two key elements new to water law in Wyoming and the West. First, he insisted on the idea of active state ownership of water.<sup>36</sup> Many western constitutions talked blandly of how the water belonged to the state. Mead, however, pumped life into that empty language by establishing, in the constitution and then in the water laws of Wyoming, that no one could acquire rights to

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<sup>32</sup> J. R. Kluger, *Turning on Water with a Shovel: The Career of Elwood Mead*, 6-13 (University of New Mexico Press 1992). See also Dunbar, *supra* note 5, 99-108. By the end of the water filings of the territorial period in Wyoming, Mead wrote, "The result was a chaos which all recognized should be brought to an end." Mead, *supra* note 11 at 251-252. As an old man, Mead recalled his role in ending that chaos as follows:

In my contact with county officials, in examining the claims to water rights, and with the irrigators in their homes and on the banks of their ditches, I became the voice of John crying in the wilderness for a more adequate public control, and for a better understanding of the principles which should govern the determination of water rights and the limitations on those rights.

Mead, *Recollections*, *supra* note 21, at 9.

<sup>33</sup> See Mead's comments as State Engineer in Wyoming State Engineer's Office, *Biennial Report*, 57-61 (1895-96); see also, Mead, *Irrigation Institutions*, *supra* note 24, Preface, v-viii; Elwood Mead, *Government Aid and Direction in Land Settlement*, *American Economic Review*, March 1918, at 72-74. All of these available on line at MacKinnon and Shields, *supra*, note 21.

<sup>34</sup> For a discussion of the Progressive movement, see Hays *supra* note 21, 51-53, 69, 74-77 and 265-276 (1959).

<sup>35</sup> Mead, *Irrigation Institutions*, *supra* note 21, Preface, v-ix.; Wyoming State Engineer's Office, 1892 *Biennial Rep. of the St. Engineer*, at 34, 65-66; 1894 *Biennial Rep. of the St. Engineer Report*, at 30-35, 42, 46-48, 124.; 1896 *Biennial Rep. of the St. Engineer*, at 22.; Letter from Elwood Mead to Clarence Johnston, State Engineer (July 30, 1908), 1907-1908 *Biennial Rep. of the St. Engineer*, at 76.; For easy access to these and other Mead writings, see MacKinnon and Shields, *supra* note 21.

<sup>36</sup> 1889 *Second Annual Report of the Territorial Engineer*, at 96-98 (available on line in MacKinnon and Shields, *supra*, 13; 1894 *Biennial Rep. of the St. Engineer*, at 46-48.

use water without a permit from the state.<sup>37</sup> No longer could someone claim water by simply taking the water out of the stream and posting or filing a notice. Rather, people would have to apply to the state for the right to take water. The state's trained engineers would examine the diversion plans to see if they were likely to succeed, and send them back for correction if necessary.<sup>38</sup> Here was the Progressive ideal of expert civil servants helping the settler, saving them from costly mistakes.<sup>39</sup> The requirement for a permit, however, also meant that an application could be denied – if the “public interests” so demanded, as the constitution put it.<sup>40</sup>

From 1890 on, the state's engineers and water superintendents have stuck zealously to the principle of permit requirements: no matter for how many decades you may put water to use in Wyoming, there is no such thing as acquisition of a water right by adverse possession of water. If you have no permit to use the water, you have no legal right to it that can be protected.<sup>41</sup> Mead was consciously attempting to get away from the common law of prior appropriation.<sup>42</sup>

The second key element Mead introduced to water law was the substitution of a lay board for the courts as the arbiters of water disputes. Courts in Wyoming do, of course, review water cases and make decisions on water law. But the vast majority of water disputes do not get that far.<sup>43</sup> That, as Mead told contemporaries in 1903, was as it should be: a lack of court decisions on water rights should be regarded as a sign, not of a lack of action on water issues, but of a wise decision to keep the courts out of the action as much as

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<sup>37</sup> Wyo. Const. Art. 8, §§1,3; see *supra*, note 6. Wyo. Stat. Ann. §41-4-501 (for the original version see Laws 1890, Ch. 8, §34). See Dunbar, *supra* note 5, 109-110.

<sup>38</sup> 1889 Biennial Rep. of the St. Engineer, at 96-98.; Mead, *supra* note 5, 266-68.

<sup>39</sup> *Id.* at 3.

<sup>40</sup> Wyo. Const. Art. 8, §3. Permit denial procedures are discussed in the statutes, Wyo. Stat. Ann. §41-4-503; see also Laws 1890-91, ch. 8, § 34 and subsequent amendments.

<sup>41</sup> *Lewis v. State Board of Control*, 699 P.2d 822, 823-24 (Wyo. 1985). The Board of Control, the district court, and the Supreme Court all held that, as the Supreme Court put it, “water rights may not be acquired by adverse possession or prescription in this state.”

<sup>42</sup> In *Irrigation Institutions*, Mead described the Wyoming Legislature has, by adopting the constitutional and 1890 statutory language on water that he drafted, “in effect abandoned the doctrine of appropriation, although retaining the word in their statutes.” Mead, *supra* note 5 at 82

<sup>43</sup> From 1890-1902, Wyoming had reportedly settled 3,900 water rights cases with only five district court and three supreme court appeals. Brian Shovers, “Divisions, Ditches, and District Courts: Montana's Struggle to Allocate Water.” *Montana – The Magazine of Western History*, Spring, 2005, at 7.

possible.<sup>44</sup> Mead created what he called a board of “practical men” (and there have been no women on the Board of Control) consisting of the State Engineer and the superintendents of each of the four main hydrologic basins that compose the state. The board, which now hears approximately 150 petitions or cases a year, controls the establishment, the change, and the loss of water rights.<sup>45</sup> Irrigators can usually send their petitions before the board without a lawyer – another of Mead’s ideas, in order to keep irrigators’ costs down.<sup>46</sup> Most important was his plan to have the decision-makers be people who knew water, knew the streams, and knew irrigation. The leading contemporary commentator on water law, Clesson Kinney of California, commented admiringly that “[i]n the State of Wyoming, at least, there will no longer be the ludicrous spectacle of learned judges solemnly decreeing the rights to from two to ten times the amount of water flowing in the streams . . . .”<sup>47</sup>

There was one key principle on which the Board of Control was to operate, as Mead and his superintendents worked out quickly in the early days of the board’s work. It was the principle of tying water rights to actual use.<sup>48</sup> Water rights would be measured by what was actually put to use, when, and where – not by a paper claim describing what someone simply hoped to use. That principle was in Mead’s mind a guard against speculators, whom he saw as the worst threat to development of stable communities in frontier Wyoming.<sup>49</sup> The touchstone of actual use was also a way to keep the water management system responsive to change.<sup>50</sup>

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<sup>44</sup> Mead, *supra* note 5 at 247, 259. Mead was proud that in Wyoming it was not the case that “litigation went with irrigation, as fever with malaria.” *Id.* at 247.

<sup>45</sup> The agendas for the four meetings of the Board of Control for the year 2005, for instance, note 165 new cases that came before the board. Board of Control, Wyoming. Board Meeting Agendas: February 2005, May 2005, August 2005, November 2005. On file with author and at the office of the Board of Control, Cheyenne, Wyoming.

<sup>46</sup> See Mead’s discussion of the low costs for irrigators in Wyoming’s initial stream-wide adjudications. Mead, *supra* note 5, at 256-59.

<sup>47</sup> Clesson S. Kinney, *A Treatise on the Law of Irrigation*, §493 (W.H. Lowdermilk & CO., Law Publishers and Booksellers) (1894). Quoted with approval by the Wyoming Supreme Court in the landmark case upholding Mead’s system, *Farm Investment v. Carpenter*, 61 P. 258, 142-43 (1900).

<sup>48</sup> See 1891-1892 Biennial Rep. of the St. Engineer, at 59-62, 68, and 1893-1894 Biennial Rep. of the St. Engineer, at 33-35.

<sup>49</sup> See 1891-1892 Biennial Rep. of the St. Engineer, at 58-59, and 1895-1896 Biennial Rep. of the St. Engineer, at 40.

<sup>50</sup> 1891-1892 Biennial Rep. of the St. Engineer, at 56-62; Mead, *supra* note 5, at 253-59.

The rules and procedure embodying the “actual use” principle were laid out in the statutes, which Mead wrote and which were adopted the first year of statehood. Those rules included:

- *time limits on permits* Permits were merely permits and could be cancelled for failure to meet set time limits for commencing construction of irrigation works, for finishing construction, for commencing use, and for accomplishing use;<sup>51</sup>
- *adjudications of water rights* Both pre-existing territorial claims and new water uses authorized by the new state permits were to be adjudicated, by the Board of Control.<sup>52</sup> Stream-wide adjudications by the superintendents – the kind of work only now being undertaken in some of Wyoming’s neighboring states—were undertaken immediately.<sup>53</sup> The superintendents took testimony, did inspections, and cut territorial paper claims back to what the evidence showed was actually being used. Water use undertaken under new permits similarly was inspected to determine how the use was actually being made.<sup>54</sup> The adjudicated rights were what eventually went down in the tabulation of rights, the “tab book” listing priority dates, which superintendents and water commissioners have used for decades (in regularly updated form) to regulate streams when necessary.<sup>55</sup>
- *abandonment of water rights* This concept was retained from prior appropriation tradition as developed in other Western states and as practiced in Wyoming before statehood.<sup>56</sup> But in the new state of Wyoming, for the first fifteen years or so, abandonment could by

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<sup>51</sup> Wyo. Stat. Ann. § 41-4-506 (Wyo Session Laws, Ch. 8, §34 (1890-91) and amendments in subsequent years.)

<sup>52</sup> Supervision of Water, Wyo. Session Laws, Ch.8 §§ 20-26, 36 (1890-91). For a description of the processes and issues involved in early adjudications, see Mead, *supra* note 11, 252-269.

<sup>53</sup> For a discussion, for instance, of Montana’s failure to undertake general adjudication efforts in the early 20th century, while instead irrigators seemed to prefer to live with “a jumble of conflicting claims,” (p.9), see Shovers, *supra* note 37, at 2. See also R. G. Dunbar, The Search for A Stable Water Right in Montana, *Agricultural History*, October, 1954, at 138-149.

<sup>54</sup> Wyo. Stat. Ann. §§ 41-4-301- 317 (2006).

<sup>55</sup> Wyo. Stat. Ann. § 41-4-208 (2006). Mead’s intention seems to have been to see re-adjudications on a stream-wide basis occur regularly, to make sure the water rights on the state’s books conformed to the actual uses being made in the field. 1895-1896 Annual Report of the State Engineer, at 40-43. Regular re-adjudications did not occur, apparently due largely to budget and personnel constraints. Updates, however, have been noted in the tabulation books as the board acted to adjudicate individual permits or to rule on petitions for change or abandonment of rights. See Tabulation of Adjudicated Water Rights of the State of Wyoming, on file in State Engineer’s Office, Cheyenne, WY.

<sup>56</sup> Wyo. Stat. Ann. § 41-3-401 (2005).



terms of the statute occur quite quickly: lack of use for two years was the standard Mead set.<sup>57</sup>

Mead's concept clearly was to encourage both active investment and new ideas. If a plan for diverting and using water did not work, an irrigator should lose the water right and its priority so someone else with a better idea could put that water to work. Mead hoped that water users would come to regard their water rights as merely on lease from the state, not something they owned.<sup>58</sup> While the concept of the state as a lessor of water and water users as lessees never fully emerged in Wyoming water law, property rights in water remain distributed between the state and water users. For example, the Board of Control retains the right to control whether a water right can be changed to another location or to a different use.<sup>59</sup> Mead's concept of the state as lessor of water is a window on the sense of the private- public, stability-flexibility balance that he sought to build into Wyoming water law.<sup>60</sup>

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<sup>57</sup> Craig Cooper, A History of Water Law, Water Rights and Water Development in Wyoming, 1868-2002, Wyoming Water Development Commission and State Engineer's Office, June, 2004, available at [http://wwdc.state.wy.us/history/Wyoming\\_Water\\_Law\\_History.html](http://wwdc.state.wy.us/history/Wyoming_Water_Law_History.html). The change to 5 years, made in 1905, was against the better judgment of the State Engineer's office. See 1909-1910 Biennial Rep. of the St. Engineer, at 121-22.

<sup>58</sup> 1895-1896 Biennial Rep. of the St. Engineer, at 59-60. Mead wrote:

There is another provision, found in European irrigation laws, which is worthy of careful consideration by our legislators. Under these laws there is no such thing as a free appropriation. Every user of water must pay the state a rental therefor. (sic) These rentals are, in most cases, very small, being only intended to pay the expenses of supervision and to prevent the salaries of Water Commissioners and Superintendents becoming a burden to the general tax-payer. (sic) The great value of the system is its influence in promoting economy. The man who pays for what he gets will not be wasteful. It also places the doctrine of public ownership in a form to be comprehended by all, something not true of our method of free grants in perpetuity.

It is probably too early to seriously consider its adoption. That it will come, however, when increased use and augmented value make systematic distribution a more important consideration than it is at present, is confidently expected.

<sup>59</sup> Wyo. Stat. Ann. § 41-3-104.

<sup>60</sup> Here again Mead shows his kinship to other Progressives, who introduced forest leases and water power permits to federal law, with the idea that they would have to be renewed and that the time of renewal would afford the public interests to be weighed via federal government review, in order to determine whether it still made sense to allow that lease. The significance of such renewals, provided for in legislation from the 1890s through the early 1920s, is very apparent in water issues in modern times. Issues involving endangered species on the Platte River have been brought to a head by the authority of the federal government not only to reorganize the operations of its own dams, but to change or deny longstanding U.S. Forest Service reservoir and diversion use permits and leases, and Federal Energy Regulatory Commission water power permits – often held by private entities – as those leases and permits come up periodically for renewal.

It is important to realize just what a radical change all of this new water law was for Wyoming. That is what takes us to Buffalo.

Clear Creek, running through Buffalo, was one of the streams slated for stream-wide adjudication of the many claims on water that had been taken out there since about 1879. The adjudication process reached Clear Creek in about 1892, which was also the year of the Johnson County War in Buffalo. The war, familiarly known as the Invasion, was the last desperate move by cattlemen against the tide of settlement. Leading cattlemen killed two men they considered “rustlers” and then found themselves facing the outraged citizenry of Johnson County. Unfortunately for Mead, his superintendent for that water division had joined the cattlemen Invaders.<sup>61</sup> The superintendent was arrested by federal troops, and the adjudication records were lost.

Mead started afresh with the appointment of a new, young superintendent: Edward Gillette, who had surveyed for the railroad that brought prosperity to northeast Wyoming.<sup>62</sup> Gillette undertook the work of adjudicating Clear Creek, examining everyone’s claims versus their actual use. In 1895 he ended up, as was typical of board adjudications around the state, cutting people’s water rights to a good deal less than they had claimed for rights with valuable early priority dates.<sup>63</sup>

That was quite a shock. It was not a decision likely to win support quickly in a place where Mead and the new water system were identified with the stockmen and therefore with the Invaders. The entire new water law system was challenged before the Wyoming Supreme Court. The plaintiff was Mead’s ideal nemesis: A company from Fort Collins that dealt in foreclosed property, a speculator.

The company, the Farm Investment Company, had acquired by foreclosure properties in Buffalo that included early, substantial water rights on Clear Creek, though how much the water had been used was unclear.<sup>64</sup> The company didn’t present any claim in Gillette’s

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<sup>61</sup> 61 See Smith, H. H. (1966). *The War on Powder River: The History of an Insurrection*. Lincoln, NE, University of Nebraska Press.

<sup>62</sup> Edward Gillette was more popular with the farmers and townspeople than with the cattlemen. He married the daughter of Henry Coffeen of Sheridan, who won a seat in the U.S. Congress on the wave of the anti-Invasion reaction. Larson, *supra* note 17, at 287. The town of Gillette was named for Edward. Edward Gillette, *Locating the Iron Trail*, 75 (Christopher Publishing House, Boston, 1925).

<sup>63</sup> 1895-1896 Biennial Rep. of the St. Engineer, at 150-151. (Report of Superintendent E. Gillette, Div. II). See also Wyoming Board of Control Order Record Book 2, 186-187, on file with the Wyoming Board of Control, Cheyenne, WY.

<sup>64</sup> The Buffalo property involved in the Wyoming case was acquired by the company via foreclosure. Brief of Plaintiff Farm Investment Co. at 76, *Farm In. Co. v. Carpenter*, 61 P. 258 (Wyo. 1900). Farm

proceeding, and Gillette accordingly left that particular claim off the tab book list of adjudicated rights.<sup>65</sup> The company argued that Gillette's omission amounted to a taking of its valuable and vested property right.<sup>66</sup> It further charged that the new water law of Wyoming was simply a young man's brainchild in a statutory reform effort that could not simply change the longstanding common law of prior appropriation.<sup>67</sup>

The Wyoming Supreme Court, however, upheld Mead's system in *Farm Investment v. Carpenter*.<sup>68</sup> The court ruled that it was perfectly appropriate for the state to regulate and register water claims and to determine their extent.<sup>69</sup> Over the years in Wyoming, "the welfare of the entire people became deeply concerned in a wise, economical and orderly regulation of the use of the waters of the public streams," the court said.<sup>70</sup> It also noted that Wyoming via its new water law system was simply exercising its police power to regulate for the sake of that public welfare.<sup>71</sup> Through an adroit reading of territorial statutes, the court found a steady progression over time of increasing recognition of the importance of centralized state control over the management of this important resource.<sup>72</sup>

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Investment claimed "continued use" of the water rights associated with the property. *Farm Inv. Co. v. Carpenter*, 61 P. 258 (Wyo. 1900). The supreme court (to whom the case had been promptly certified by the lower court, which made no ruling or finding of fact of its own) made no finding of fact on water use. Rather, the undisputed fact critical to the case was that the company, though holding territorial water claims filed at the county courthouse, and having received notice of Gillette's adjudication under the new state process, failed to appear and submit evidence to that adjudication. Brief of Defendant at 5, *Farm Inv. Co. v. Carpenter* Record, 61 P. 258 (Wyo. 1900); *Farm Investment*, 61 P. at 268, 269.

<sup>65</sup> Id. at 268.

<sup>66</sup> Brief of Plaintiff at 10,24-25, 72, *Farm Inv. Co., v. Carpenter* Record, 61 P. 258 (Wyo. 1900); *Farm Investment*, 61 P. at 258.

<sup>67</sup> The lawyers for *Farm Investment* recognized Mead's system as a comprehensive departure from the common law prior appropriation doctrine in the Western U.S., and as such vehemently opposed it: The prior appropriation doctrine was a "solid, harmonious and beneficial system" of common law based on the environment and the people's experience, and statutory law that departs "radically" from such common law "is but the invention of the theorist or the device of the selfish, and is but a proposal to try an experiment which is generally rejected upon the trial." Brief of Plaintiff at 26-27, *Farm Inv. Co., v. Carpenter* Record, 61 P. 258 (Wyo. 1900). "The act as a whole is an ingenious (sic) combination of provisions supposed to be adapted for the advancement of an enlightened public policy intermixed with others in conflict with the fundamental law and constitutional principles." Id. at 51

<sup>68</sup> *Farm Inv. Co. v. Carpenter*, 61 P. 258 (Wyo. 1900).

<sup>69</sup> Id. at 266-67.

<sup>70</sup> Id. at 260; see also Id. at 266, 267.

<sup>71</sup> Id. at 266.

<sup>72</sup> Id. at 260-61.

At least as important as the court decision, however, was the decision of the irrigators themselves. Gillette's Clear Creek adjudication was followed only a year later, in 1896, by a severe drought. It was then that people, disgruntled by the cutback of their claims by an average ninety percent, realized the value of Mead's system. Cutting them, and more importantly cutting their neighbors, to their actual uses made it possible for more people to make it through the drought than would have been possible otherwise. If the old system had been in place, the first few priority claims on the creek could have taken all the water they claimed on paper and perhaps extorted high prices for it from the desperate neighbors. The superintendent reported to the state engineer a remarkable turn-around in local public feeling, favoring the new water law system.<sup>73</sup>

The depth of the loyalty of Wyoming irrigators to the new system they had adopted at the instance of the young engineer Mead was illustrated a decade later by a unique survey of irrigators' views.

The survey was prompted by a water dispute northeast of Cheyenne on Little Horse Creek. Two irrigation companies, well-connected in the capitol, had come up with a deal to share between them the water rights of the company that had the earliest priority water on the stream. In a somewhat simplified sketch, this was the situation: one company was the senior, there was a local farming family ditch with the next priority, and the second company had the junior right of the three. The first company sold a half-interest in its water right to the second one. The Wyoming Supreme Court thought that was fine. The farming family in between, the State Engineer's office, and Elwood Mead (who by then had moved on to in Australia but wrote outraged letters back to the court) were horrified.

The pattern of use on the creek was that the first company, with its water right of ten cubic feet per second (cfs), had been diverting that much for irrigation perhaps every other week in the summer. The plan under the companies' new deal was that the first company would keep using the ten cfs that way, but the second company would use ten cfs in the off-weeks, that is, every second week all summer. Thus the water that was usually available during the off-weeks for the in-between junior would no longer be there. The first company had in effect doubled its right.<sup>74</sup>

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<sup>73</sup> 1895-1896 Biennial Rep. of the St. Engineer, at 150-152. (Report of Superintendent E. Gillette, Div. II).

<sup>74</sup> *Johnston v. Little Horse Creek Irrigating Co.*, 79 P. 22 (Wyo. 1904); Indenture of 10-30-1894 between Springvale Ditch Co. and Little Horse Creek Irrigating Co. Records of the Laramie County District Court, *Johnston v. Little Horse Creek*, Docket # 6-233, Box 2, Wyoming State Archives (explaining the week-by-week rotation the companies had arranged). Mead described his interpretation of these facts in Mead *supra* note 11, at 262-65 (written while the case was pending before the supreme court).

The court simply interpreted ten cfs as ten cfs of continuous use all summer, the way it looked on paper. The irrigators, the state engineer's office, and Mead pointed out the pattern of actual use of the ten cfs, and urged that the pattern be protected. Any "practical irrigator" would understand that, Mead thundered from abroad.<sup>75</sup> The court did not get the idea, though, and ruled to uphold the companies' agreement in *Johnston v. Little Horse Creek Irrigating Co.*<sup>76</sup>

The decision did not stand for long, however. The Legislature appointed a committee to investigate irrigators' views of the water law. The committee did an opinion survey among irrigators which resulted in a resounding "no" to the proposition that a sale such as the one on Little Horse Creek was acceptable.<sup>77</sup> The Legislature, accordingly, in 1909 passed language to reverse the court's decision, explicitly stating that water rights could not be transferred away from the land or the purpose for which they were originally acquired without loss of priority.<sup>78</sup> In response to recommendations by the State Engineer's office, the new statutes included the oft-quoted provision that "beneficial use shall be the basis, the measure and the limit of the right to use water" in Wyoming.<sup>79</sup> "Measure" and "limit" were important features. The kind of property rights that Wyoming water law put in the hands of water users

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<sup>75</sup> The Board of Control had refused to recognize the sale, and the Laramie County District Court overruled it and held the sale valid. While the Wyoming Supreme Court decision was pending, Mead wrote in *Irrigation Institutions*:

It is not believed, therefore, that (the district court opinion) will be sustained by the supreme court [sic]. If it is, water rights acquired during the Territorial period will become personal property. The water of the public streams will become a form of merchandise, and limitations to beneficial use a mere legal fiction ... If water is to be so bartered and sold, then the public should not give streams away, but should auction them off to the highest bidder.

MEAD, *supra* note 11, at 64

When the Supreme Court ruled in favor of the Little Horse company's transfer, Mead described the implications of the decision as "mischievous." Mead further stated that, "[n]ot only did that decision render meaningless and practically inoperative some of the most important features of the State's water law, but, if carried to its logical conclusion, it would throw Wyoming back into the ruck of the arid States of America, whose water laws belong to the lower Silurian period." Mead letter to State Engineer's Office, July 30, 1908, reprinted in the 1907-1908 Biennial Rep. of the St. Engineer, at 76.

<sup>76</sup> *Johnston*, 79 P. at 28.

<sup>77</sup> Report of Commission Appointed to Revise, Codify and simplify the Laws of Wyoming Relating to Water Rights, 1905-1906 Biennial Rep. of the St. Engineer, at 87-91.

<sup>78</sup> Wyo. Stat. Ann. § 41-3-101, ch. 68, §1 (1909). For State Engineer Clarence T. Johnston's exposition of the ideas behind the "beneficial use" language enacted in 1909, see "What is a Water Right?" 1909-1910 Biennial Rep. of the St. Engineer, at 17-29.

<sup>79</sup> Wyo. Stat. Ann. § 41-3-101.

was limited to the pattern, the fabric, of water use on a stream, how much water, when it was used, and for how long—all that was part of the right.

### 4.3 Evolution under Pressure

The original tenets of Wyoming water law evolved into a very locally-rooted system, which proved to be both tenacious and flexible. From the beginning as Wyoming water law went into practice, many forces shaped the system's evolution. They included the climate, the terrain, Wyoming's economy, and the economy of the larger nation. Further, Wyoming was a headwaters state, and downstream neighbor states on each river were developing their economies and their water faster than Wyoming could. The demands of those states might limit Wyoming's ability to develop its water later, unless Wyoming water people kept zealous (and jealous) watch. That motivated the State Engineer's office to try to do everything it could to get Wyoming water put to use and kept in use, whatever it took.

To watch the effect of all these pressures on Wyoming's new water law system, we go to Cody, in the first decade of the new system.

The problem of the 1890s, for Wyoming and the entire West, as Charles Wilkinson has described, was how to get big irrigation projects built. The Stinking Water River (whose name was soon changed to the more marketable Shoshone River) illustrated the problem. Through the terrain of semi-level bench lands east of Yellowstone ran this nice big river that was hard for a few farmers and their mules to divert, particularly when the river carved a canyon soon after it exited the mountains. George Beck, the son of a Kentucky senator who created a hunting ranch near Buffalo, went west over the Big Horn Mountains in the early 1890s to the Stinking Water and saw potential. He got Buffalo Bill Cody involved to help sell the idea of a long canal that tapped the river in the mountains before it carved its canyon. They got help from the new Carey Act, initiated by Wyoming Senator Joseph Carey, who had, in turn, received drafting assistance from Mead.<sup>80</sup> But despite all the help, Beck and Cody failed and their New York investors lost their money, though the Cody Canal they

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<sup>80</sup> Joseph M. Carey was Wyoming's territorial representative to Congress, a U.S. Senator from 1890-95, and Wyoming Governor, 1911-1915. Larson, *supra* note 10, at 447-48. The goal of the 1894 Carey Act named for him was to help provide financial incentives and protection—via sequestration of public lands for future project use—for private companies and investors to undertake big irrigation projects in the West. Mead joined Carey in drafting the act, which grew partly out of the experience of Carey, Warren, and other stockmen in their financial losses and struggles to develop the Wyoming Development Co. irrigation colony project begun in 1883 near Wheatland. 1891-1892 Biennial Rep. of the St. Engineer, at 22-25; 1893-1894 Biennial Rep. of the St. Engineer, at 25-30.

built still serves Cody and surrounding area.<sup>81</sup> Buffalo Bill, hard to discourage, went ahead and applied for other water rights to build a bigger, more ambitious project with water pulled up onto the flats from a diversion to be sited in the river canyon. He couldn't raise the money, and the people of Cody demonstrated on the streets in favor of the federal government taking over that project in 1904.<sup>82</sup> The crowds wanted to take advantage of the new federal Reclamation Act of 1902, which had been fueled by the agitation of Wyoming's Senator Warren and other Western senators, newly powerful as more Western territories won statehood. The new act made building big irrigation projects the job of the federal government. Though the new act went further than the Western bloc originally intended, it recognized what many had grudgingly come to admit after experiences like Cody's were repeated all over the West: only the federal government could take on the job of big irrigation projects and succeed.<sup>83</sup>

Still, the federal government and the eager citizens of Cody had to face reality: the climate, the terrain, the U.S. economy were all forces arrayed against easy and fast transformation of the desert terraces around the Shoshone into fruitful irrigated farms. Eventually it happened (though *all* the land once imagined ripe for irrigation in the Shoshone valley has never been watered), but it took decades longer than anyone expected. It took years of hardship of the settlers. It also took the unique ability of the federal government to weather the disappointments that would force a private company into bankruptcy. On many a Reclamation project, the federal government was able to stay the course, swallow major costs, delay irrigators' loan repayments, and finally wipe out the irrigators' obligation to pay interest on project loans.<sup>84</sup>

All those hopes, and all that disappointment and delay, had a notable effect on Wyoming water law. Mead and his successors were engagingly eager to see Wyoming developed

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<sup>81</sup> The project failed partly due to Mead's inept practical advice on how big the project should be and what it would cost. Mead apparently was better at thinking through the theory and structure of water management than at practical engineering. Robert E. Bonner, *Elwood Mead, Buffalo Bill Cody, and the Carey Act in Wyoming, Montana*, *The Magazine of Western History*, Spring 2005, at 1, 36-51.

<sup>82</sup> Robert E. Bonner, *Buffalo Bill Cody and Wyoming Water Politics*, 33 *Western Historical Quarterly* 4, 433 (2002), available at <http://www.historycooperative.org/journals/whq/33.4/bonner.html>.

<sup>83</sup> Lilley, William III, and Lewis L. Gould, *The Western Irrigation Movement, 1878-1902: A Reappraisal*, in Gene M. Gressley, *The American West: A Reorientation*, U. Wyo. Pub. XXXII, at 71-74 (1966).

<sup>84</sup> Bonner, *supra* note 82, at 9; See also, M.C. Robinson, *Water for the West: The Bureau of Reclamation 1902-1977*, Chicago Public Works Historical Society, at 37-48 (1979); R.W. Wahl, *Markets for Federal Water: Subsidies, Property Rights and the Bureau of Reclamation*, 27-46, (Resources for the Future, Washington D.C., 1989); Kluger, *supra* note 31, at 115-128.

into the leading agricultural state they believed it could be (State Engineer reports did not lack for flowery language on Wyoming's agricultural prospects).<sup>85</sup> They worked personally to make that dream come true. In the 1890s, Mead did the survey for both of Buffalo Bill's projects.<sup>86</sup> Mead also pushed the idea that investors, whether they be private companies or the federal government, needed to be able to pre-empt public lands and keep them out of settlement until the new canals were ready.

That idea of pre-emption was a critical one. It took hold and broadened in the years that followed, with impact on Wyoming water law.

When the U.S. Reclamation Service took over Buffalo Bill's second, bigger project on the Shoshone, the federal engineers and lawyers were very careful to acquire Buffalo Bill's original water right for the project – a permit dated May 1899, signed by Mead.<sup>87</sup> They wanted that date. The permit, of course, had all kinds of time limits built into it, as the new Wyoming water law system required. There were deadlines, with permit expiration dates attached, for the start and the finish of project construction and the start and completion of the job of putting project water to use. It turned out it was impossible for the Reclamation Service to meet either those timetables, or its own rosy predictions of a quick blooming of irrigated farms.

Yet the State Engineer's Office never canceled the 1899 Buffalo Bill permit. Nor was it ever limited to just the amount of acreage that had been irrigated by the permit deadline. Successive state engineers tried to accomplish that in 1909, in 1922, and in 1935, but

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<sup>85</sup> Mead wrote:

No State of the arid region excels [Wyoming] in the distribution and volume of its water supply, and no section of this country is better adapted to growing grain or raising stock. If these resources are rightly employed, the farmers of this State ought to, not only fully supply the home market, but successfully compete with eastern farmers in the markets of the world. . . . [Proper use of irrigable lands and grazing lands in combination] would make Wyoming one of the most attractive and prosperous stock raising districts on this continent.

1895-1896 Biennial Rep. of the St. Engineer, at 18.

<sup>86</sup> In the survey work, Mead once again proved that his best qualities were not those of a practical engineer. See Robinson, *supra* note 84.

<sup>87</sup> Bonner, *supra* note 82, at 5, 8.



failed.<sup>88</sup> Instead, they extended the permit regularly. Only in 2006 is the old permit expected to be closed out, with a final adjudication.<sup>89</sup>

So, early on, the original statutory rules began to bend. Successive state engineers agonized over the Buffalo Bill permit example. They were torn between their fidelity to a system they believed in and the individual irrigators who had rights under it, and their worries about downstream states and the need to get Wyoming's water in use before downstreamers demanded it.

The duty to other irrigators was real. There were a number of other irrigators on the Shoshone in Wyoming, who came in a little later and whose rights could be affected by steady expansion of irrigation (and therefore water demand) under the senior Buffalo Bill permit. They complained enough about the extension of the Buffalo Bill permit to prompt State Engineer (and future governor) Frank Emerson to hold a lengthy hearing on the matter in Cody in 1922. The concern about downstream states was very real as well. Emerson wrote:

*In considering problems of this nature the State Engineer has a large responsibility. He is primarily charged with the protection of the public interest. In such a situation as is now presented upon the Shoshone River the public interest must be viewed in two principal ways. First, there is a responsibility to every appropriator of water upon the river. Second, there is a responsibility to the State of Wyoming by reason of the fact that the Shoshone River is an important tributary of the Big Horn River, an interstate stream. The individual appropriator is entitled to the full protection of the laws of this State, and his valid rights should not be prejudiced by others. The State of Wyoming, for its part, is materially interested in the interstate phase of the question, and in having priorities sustained in this State as far as possible. . . . [T]he State Engineer of Wyoming must consider the interests of the State and sustain priorities to the use of water so far as same can be validly held. . . . Without question permit 2111 should apply just as far as it can be validly held, and that far only, in fairness both to the interests of all appropriators of water from the Shoshone River and to the interests of the State of Wyoming.*<sup>90</sup>

In the end it was that concern about getting Wyoming water put to use, whatever it took, that won out. The rights under Buffalo Bill's 1899 permit were "sustained," and the permit was extended beyond the limits that Emerson proposed to impose in 1922. The engineers bet on the federal government as the best horse to get that water put to use. Also, the federal government – the only fount of cash in an impoverished state in the 1920s, 30s and

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<sup>88</sup> E.W. Burritt, Report on Water Rights of Shoshone Irrigation District, State Engineer Rep. (1935); 1921-1922 Biennial Rep. of the St. Engineer, at 51-58.

<sup>89</sup> Telephone interview with Nancy McCann, Big Horn Manager in the office of the Wyoming Board of Control, Cheyenne, WY., Jan. 23, 2006. Buffalo Bill's original 1899 permit # 2111 is well known in the State Engineer's office for its tortured history, reflected by year after year of notations on the permit books. See Permit # 2111, on file in the Wyoming State Engineer's Office, Cheyenne, WY.

<sup>90</sup> 1921-1922 Biennial Rep. of the St. Engineer, at 54-55.

long after -- could and did put considerable pressure on the engineer to leave the old permit alone.<sup>91</sup>

The Buffalo Bill permit decision signaled an important change in Wyoming's water rights system. Mead had put in place a system that clearly saw permits as a temporary permission from the state for individuals or companies or the federal government to attempt a water use scheme. If the scheme did not quickly succeed, it could be replaced by the next applicant for a water right, who had a better idea for using water in the same area. The persistence of a permit like Buffalo Bill's of 1899 meant that the first comer with a likely scheme could, once granted state permission, obtain a water right which would pre-empt the next comers from attempting their plans on that stream. It made a water permit a little more like property right in land - more like water rights were treated in other states. In effect, it put in place a water right serving an acreage number that could balloon over time. The actual use of water under that right would grow as the project backers slowly got more land under irrigation. The initial permit might not, and most probably would not, result in diversion or use of all the water covered under the permit *right away*. Over time, however, the water actually diverted and used could grow within the limits of that permit, up to the total amount of water originally applied for.

That is quite a different principle than the original idea of recognizing only actual use and protecting the pattern of actual uses that are thereby created. It is the reason that state engineers like Emerson were torn. They felt strongly their duty to the junior appropriators who came along on the Shoshone River soon after 1899, and who might years later have their water cut back due to expansion of the Buffalo Bill permit use.<sup>92</sup>

In fact, the Shoshone River Buffalo Bill 1899 permit did not wreak that kind of havoc on junior appropriators. A key part of the federal proposal, which had been so attractive to Cody people, was the construction of the Shoshone Dam (now known as the Buffalo Bill Dam) and a big reservoir on the Shoshone. Buffalo Bill's original permit was only for direct flow; the dam, with its own later permit, made the federal project a success.<sup>93</sup> The dam

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<sup>91</sup> See, e.g., Burritt, *supra* note 88 (outlining key activities of the Reclamation office regarding permit #2111 and includes copies of its correspondence with the State Engineer's Office from 1904-1935 regarding the permit).

<sup>92</sup> 1921-1922 Biennial Rep. of the St. Engineer, at 53-54.

<sup>93</sup> Buffalo Bill's original 1899 permit, #2111, is a permit for only a direct flow right. However, water supply for the Reclamation projects on the Shoshone depends heavily on stored water under the reservoir right taken out by the Reclamation Service a few years later. Permit #2111 covers rights to substantial volumes of water, though only as direct flow, and Reclamation has always treated it as a permit integral and crucial

effectively kept everyone downstream on the river in plenty of water, whether they had rights under the federal project or not. The passage of years after 1920 or so helped, too, giving federal engineers some practice in managing their reservoir to keep everyone in water. Protests over the extensions of the 1899 permit were almost literally drowned out.<sup>94</sup>

The pressures on Wyoming that changed the water management system via permit extensions, however, set an important precedent in the expectations of users. Irrigators in the Shoshone River valley, for instance, with a steady and indeed over-abundant water supply, ended up in a placid complacency and the general belief that *they* held all the significant property rights in that water. State plans in 2004 to protect winter in-stream flows in the river, via releases of water through recent expansion of the old dam, met with some shocked resistance.<sup>95</sup> In summer 2004, the State Engineer in response wrote Shoshone River users a strict reminder that despite their customary ability to make use of several fills of the Buffalo Bill Reservoir each year, Wyoming law entitles irrigators to only a single reservoir fill.<sup>96</sup> Thus, a second fill could serve the state of Wyoming's right under the reservoir expansion authorized in 1983, providing the state with water to use for winter in-stream flows.

Meanwhile, the federal government harbored the expectation that its money was so important to Wyoming water development that the state would never interfere with federal plans. Elwood Mead found this expectation to be sound--to his sorrow. In the 1920s, as head of the U.S. Bureau of Reclamation, he could not rely upon Wyoming or any other state to provide a credible threat of turning down federal reclamation dollars in order to force Congress to attend effectively to the socio-economic problems of irrigator-settlers, who were living in squalid conditions on federal projects.<sup>97</sup>

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to the overall operation of Reclamation's irrigation projects on the Shoshone River. See Burritt, *supra* note 85.

<sup>94</sup> 1921-1922 Biennial Rep. of the St. Engineer, at 55-56; R. E. Bonner, *The Dam and the Valley: Land, People, and Environment Below Buffalo Bill Dam in the Twentieth Century*, 76 *Agric. Hist.* 272-88 (2002).

<sup>95</sup> Letters received by the Wyoming Water Development Commission, July-August 2002, re "Proposed Winter Release Operation Agreement" for the Buffalo Bill Reservoir. On file with author and the Wyoming Water Development Commission, Cheyenne, WY.

<sup>96</sup> Letter from Patrick Tyrrell, State Engineer, to Lawrence M. Besson, Director, Wyoming Water Development Commission, titled "Re: Multiple Fills at Buffalo Bill Reservoir." July 1, 2004. On file in State Engineer's Office and Wyoming Water Development Commission.

<sup>97</sup> E.g., Mead discussed proposals he put before Congress that failed, in a speech in Cheyenne in 1925: Wyoming S. Tribune and Cheyenne St. Leader, (June, 1925), Elwood Mead Collection, Scrapbooks, Box

The precedent set in Cody probably had its worst impact in other parts of the state where other permits were similarly extended. One such place was the Wind River, where an oft-extended permit exacerbated tension over water rights litigation between the state and the Shoshone and Arapahoe tribes. (See later discussion, part III).

The state's financial picture, which was dismal enough that Mead often had to dig into his own pocket to keep the state engineer's office going, also influenced the development of Wyoming water law. The re-adjudication and extensive monitoring of actual use that were originally envisioned were not possible given budget considerations. The engineer's office had to rely more and more on irrigators to manage their own affairs, without intervention from the regional-state office unless dry seasons, drought, and therefore irrigator complaints called them in. Most likely, this was largely to the liking of both the irrigators and the legislators who controlled the engineer's budget.

That "self-help" feature gave Wyoming's water law system, in the end, a good deal of its vitality – its tenacity and its flexibility. It became a system where the initiative for action has depended a good deal on irrigators at the ground level – and that has made the system responsive to the requirements of individual streams and the people who live along them.

A change in rules in Wyoming's water law typically occurs from the bottom up. A key example is the evolution of rules on whether a water right can be transferred to another place and use while keeping its original priority date - the issue met on Little Horse Creek in Cheyenne, discussed earlier in this article.

The transfer issue has remained a live one, and despite the Legislature's effort to settle it with the "no transfer" statute in 1909, the Wyoming rule has continued to change. Though the 1909 statute has remained on the books, it has seen amendments, exceptions, and finally the birth of new sections.<sup>98</sup> As a result, it is no longer true that water rights cannot be transferred off the land in Wyoming without loss of priority. The impetus for that change came from the water users.<sup>99</sup>

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1, item no. 3, American Heritage Center, University of Wyoming, Laramie, WY. For a report Mead authorized which revealed the squalid living conditions on Shoshone River federal projects which had not received the kind of socio-economic program work Mead sought, see Dorothy Lampen, *A Report of an Economic Investigation of Home Conditions on Federal Reclamation Projects*, (1929).

<sup>98</sup> See Wyo. Stat. Ann. §§ 41-3-101-04 (2005). Frank Trelease, dean of the School of Law at the University of Wyoming, ably traced these changes through Board of Control and court decisions in the inaugural edition of this law journal, in 1966. Trelease, *supra* note 14, at 29-76.

<sup>99</sup> See generally Trelease, *supra* note 14

Despite the emphatic opinion of the water users that resulted in the 1909 “no transfer” statute, people who needed to make more effective use of water eventually succeeded in making transfers happen. For example, water-short irrigators in the Wheatland district pushed the envelope, looking for ways to get more good early-date water on their lands.<sup>100</sup> Similarly, the needs of growing towns like Lander led to transfer of agricultural rights to the town governments, and the needs of new coal-fired power plants for secure water supplies led power companies to acquire senior agricultural rights to provide water for boilers and cooling towers.<sup>101</sup> The Board of Control, in cases over several decades, slowly puzzled over how to make such obviously necessary transfers work under Wyoming water law. The question was how to allow some transfers without injuring junior appropriators and the patterns of actual water use upon which Mead’s system suggested the juniors should be able to rely.<sup>102</sup>

The board’s own internal unwritten rules on approving transfers changed as the board worked its way through the transfer proposals made by water users. In the 1940s and 1950s the board allowed “one-to-one” transfers of water rights. In other words, a transfer of a 10-cfs right from a farm to a town or to a power plant meant the town or the power plant ended up with a 10-cfs right. But over time, as the board considered and lived with the implications of such transfers, it began to make its rules more sophisticated, considering when the water was used for irrigation, exactly how much had been diverted, how much water had really been consumed by the crops, and what kind of return flows there had been.<sup>103</sup>

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<sup>100</sup> Trelease noted that the needs of state agencies led to exceptions that appeared in the form of water transfer authorizations - sometimes in other, non-water statutes. Trelease, *supra* note 14 at 11-19, 61-68. For exceptions in non-water statutes, see Frank J. Trelease, *Transfer of Water Rights – Errata and Addenda – Sales for Recreational Purposes and to Districts*, 2 *Land & Water L. Rev.* 321-26 (1967). Further, the needs of water-short irrigators, like the Wheatland district, led to transfer attempts and the slow working out, at the Board of Control, of ways to allow transfers that did not injure other water rights. Trelease, *supra* note 14, at 40-46, 57-61.

<sup>101</sup> For the Lander transfer, see *In the Matter of the Petition of the Town of Lander*, Wyo. Bd. of Control, Ord. Rec. Book 7 593 (1933), on file in the Wyoming Board of Control, Cheyenne, WY. Current State Engineer’s Office Director of the Surface Water Division, John Barnes, has documented the board’s changing approaches to water transfers sought by Pacific Power and Light Co. for its power plants, from the 1940s to the 1990s. John Barnes, *Pacific Power and Light Company and Water Transfers in Wyoming*, Plan B thesis, Public Administration (199-) (University of Wyoming) (on file with author and with J. Barnes, State Engineer’s Office, Cheyenne, WY.)

<sup>102</sup> The board made use of the “preference” for domestic and industrial uses over irrigation, which was part of the 1909 enactments, to help make transfers happen while emphasizing the limits on when they could happen. Wyo. Stat. Ann. § 41-3-102 (2005).

<sup>103</sup> Barnes, *supra* note 101

That sophisticated approach, the product of decades of water user proposals and Board of Control experience, was put into statute by the Legislature in 1973.<sup>104</sup> The new provision said, in brief, that any water right holder seeking to change the use of the water or the place where the water is used can do so if a test of special scrutiny is met. Specifically, all that can be transferred is the amount of water actually consumed, in the season it was consumed, by the crops historically grown, and there can be no increase in water diverted or change in the return flow patterns created by the former use.<sup>105</sup>

It is important to emphasize, again, the direction of innovation – it comes from below. Only after a new practice is worked out by the users and the board is it then codified into statute. That process appears to be typical of the route of change in Wyoming water law, once the original statutes were in place.<sup>106</sup>

From the beginning, the Wyoming statutes have left ample room for changing the definition of a key term – the “beneficial use” of water. No Wyoming statute proposes a laundry list of beneficial uses.<sup>107</sup> The recognition of beneficial use for the most part is left to the eye of the state engineer who beholds it in the proposal of a water user. As with other rules in the system, the list of purposes considered beneficial has evolved into a longer and longer catalog over time as the State Engineer ruled on various proposals and permit

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<sup>104</sup> Wyo. Stat. Ann. §41-3-104 (2005).

<sup>105</sup> In most western states, prior appropriation has generally evolved to mean that users have the right to change the place or manner of their use as long as there is “no injury” to other users. In Wyoming, as demonstrated by the Board of Control practice codified into the 1973 statute, the test of “no injury” is applied with special scrutiny. That is because of the history of the Wyoming system and the frontier antipathy to speculation that was built into it at the outset and embodied by the 1909 statute. The Wyoming pattern of evolution started from a ban on transfers, rather than the common law prior appropriation acceptance of transfers.

<sup>106</sup> Evolution on the transfers issue did not stop in 1973. As of 2005, for instance, the Board of Control declined to read the portion of the statute that calls for special scrutiny of proposals to change the place of use of water to mean that the Board will require a proponent of a change in use to file a consumptive use report. Remarks at the Meeting of the Wyoming Board of Control in Thermopolis, Wyoming: Action on Petition II-2004-4-1 (Aug. 2005) The board’s interest in excruciating detail is aroused only by a proposal to change the type of use (known in Wyo. Stat. Ann. §41-3-104 (2005) as a “change of use”) to which the water is put, not the place of use. In recent years, other states, which have allowed transfers more easily, have considered adding more restrictions, generally described as “basin of origin protection” statutes, to require consideration of what it means to have a functioning water right moved out of a basin where it has supported a local pattern of water use and the local economy. Concerns over water rights moved out of Colorado’s Arkansas River agricultural valley to serve municipal needs (often, simply green lawns) on the Front Range have prompted such discussion in Colorado. Wyoming water law had in this arena generally been considered backward by economists concerned about making water rights more freely transferable to the “highest and best use.” Wyoming, however, may now have become the envy of other states, which now see some disadvantages to “too-free” transfers of water rights.

<sup>107</sup> An exception is the 1986 action of the legislature to define flows left in-stream for fish as a beneficial use. Wyo. Stat. Ann. §§41-3-1001—14 (2005). See *infra* notes 141 and accompanying text.

applications. By the late 1990s, the number of recognized beneficial uses totaled more than forty.<sup>108</sup> The evolving definition of beneficial use opens the door for a great deal of flexibility in Wyoming's water system management in the future.

This brief review sketches a picture of how Wyoming's water law system functions. Rules and changes in rules run through layers of people who interact: from the users, to the State Engineer and the Board of Control, to the legislature, and to the courts. After decades of evolution in the system, it is clear that property rights in Wyoming water are not held exclusively by users or by the state – the rights are distributed between them.<sup>109</sup>

Individual water users can access the water, divert it, manage it to a great extent, propose transfers, and seek to get others' rights declared abandoned. The State Engineer and the Board of Control retain the right to decide who gets to be a user – who gets a water permit or a water right – and retains its own major say in water management, including how much water is used and when, if supplies are short. The board also determines (with considerable caution) whether the transfer or other change in a right will be allowed. Meanwhile, the board alone can declare a water right abandoned, in response to a neighbor's request. The Legislature typically acts to change water law only at the instance of the State Engineer. Wyoming courts, meanwhile, intervene occasionally to readjust the rules and the distribution of rights.<sup>110</sup>

The water users operate on the local level and can create all kinds of entities with their own local rules--from a few people who each have their own canal or who share stretches of canal, to canal companies and mutual ditch companies and reservoir companies, to irrigation

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<sup>108</sup> Todd Rhodes, Wyoming Water Rights Consulting, Inc., Presentation in Buffalo, Wyoming (June 2000), available from T. Rhodes, through <http://wyoagcenter.com/wywater>.

<sup>109</sup> The view of traditional economists that water rights are simply private property rights that should be part of a free market, and therefore freely transferable, is the root of the problem many states are experiencing in trying to prevent large scale water transfers from "basins of origin." A completely different view of water, originating in political science decades ago, suggests that what water rights in fact may represent is the right to have a say in the management of this unique resource – in a way, a right to a vote on what happens. See Vincent Ostrom & Elinor Ostrom, *Legal and Political Conditions for Water Resource Development*, in *Polycentric Governance & Dev., Readings from the Workshop in Political Theory & Policy Analysis*, 42, 48-51 (1999). That view may explain why many water users in Wyoming, 100 years ago and today, welcome state supervision of how water rights change hands, and why many fear, rather than seek, a "free market in water rights."

<sup>110</sup> The Board of Control has continued to be willing to find abandonment due to non-use under Wyoming Statute § 41-3-401, only to be overruled by the Wyoming courts. See, e.g., *Scott v. McTiernan*, 974 P.2d 966 (Wyo.1999), appeal after remand, *McTiernan v. Scott*, 2001 WY 87, 31 P.3d 749 (Wyo. 2001). Although non-use of water rights may be common, abandonment cases are not. The board considers abandonment only if one user brings such a claim to them, filed against another user. Although the State Engineer technically has the power independently to bring an abandonment action (Wyoming Statute § 41-3-402), that power has been used, abortively, only once.

districts where irrigators elect a governing board which has powers to assess their irrigators to pay expenses. At that local level, water users set the normal pattern of water use. They can take as much water as they can get when the stream runs high (a “free river” in the eyes of the State Engineer), they can share water surpluses and shortages equally, they can leave a little water in the stream for stock or fish, they can distribute water according to priority, they can (within the boundaries of an irrigation district, at least) move water around to better lands, they can work with a senior right holder to allow junior rights to get water out of priority for the sake of the return flow they generate later, or, sometimes, they can get water only at the whim of a bully on the creek who takes his when and however he wants it.

All that and more can and does go on, as long as no one calls in the aid of the state water commissioners and their superintendents (the members of the Board of Control,) or the State Engineer himself. Once these representatives of the state are called upon--which happens typically in dry seasons of the year or in drought years--then there is no more “free river.” The official priority system and the rights prescribed in the books of tabulations of rights go into effect. The stream goes “into regulation,” as the superintendents say. Some streams never do, some always do – it depends upon the streams and often upon the people using them. Due to the recent drought, some streams have lately gone into regulation that have rarely or never been regulated. While many of the Board of Control’s powers are called into play only by initiative of the water users, some can be used at the board’s instigation. A regional superintendent can prompt irrigators to apply for changes in water rights by exerting steady pressure on irrigators to submit their water rights for board “clean-up,” so the tabulation book matches the diversions and the rights in use. If they hang back, irrigators may face the prospect of no state regulation in time of dry seasons or drought.<sup>111</sup> Meanwhile, the State Engineer, with occasional supportive bursts of funding from the legislature, retains the authority to negotiate or litigate with other states in an attempt to secure certain amounts of water in each river basin for Wyoming’s potential future use.

It is a complicated system, and it needs to be. Governing water resources so as to serve many different needs is notoriously difficult. In the case of flowing streams in particular, it is hard to exclude people from using water, and yet one person’s use may make the water completely unavailable to anyone else. Political scientists and economists call this kind of

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<sup>111</sup> See, e.g., Edward Fenus et al., Docket # IV-99-2-2 in Division IV, (Aug. 2005) for a series of board cases, on file with the Board of Control, Cheyenne, WY.



resource a “common pool resource.” If everyone can have “open access” to such a resource, simply using it at will, it will be destroyed. To keep the resource in general use, some form of management is needed. Yet how to decide who has what rights in such a resource is not an easy task. Still tougher is the job of continuing to decide who has what rights, so that the water can keep supporting stable communities as time moves on, people and technology come and go, and the economy changes.<sup>112</sup>

Wyoming has developed its own special version of such water management. When the “free grass” of the 19th century open range - another, famous common pool resource – was Wyoming Territory’s prime resource, Wyoming stockmen failed to figure out how to manage it so as to prevent its destruction. But where water is concerned, the system that started up in Wyoming soon after has been far more successful. Wyoming’s water law system as managed water as a common property reasonably well for over a century. It is a valuable system, worth keeping, if we can.

#### **4.4 The Danger of Becoming Irrelevant**

Despite its success in accommodating change through much of the last century, Wyoming’s water system is now in danger of becoming marginalized. Wyoming has traditionally valued water primarily as a commodity, with its chief use seen as generating a rather limited range of commodity products—mostly hay for cattle and certain row crops suitable to the climate. These products no longer have the prime value they once had. It is not that water itself, and its many uses, are not valued. If anything, they are probably valued more highly now than in the past. However, the dominant value placed on water by people in Wyoming may be changing. If the water law system cannot adapt to manage for a wider variety of water uses and values, people in Wyoming may begin to see it as irrelevant and turn elsewhere for a means of managing water.

There is a series of causes for this potential marginalization. The shifting global and, in turn, national economy--where information and services, rather than heavy industry and manufacturing, have become the most promising arena for the United States--presents new pressures as well as opportunities for Wyoming. At the moment the state is reveling in budget

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<sup>112</sup> For an introduction to the work of political scientists and economists on common property management of water and other resources, see E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (1990); S. Y. Tang, *Institutions and Performance in Irrigation Systems*, in *Rules, Games and Common-Pool Resources* (1994); A. Agrawal, *Common Resources and Institutional Sustainability*, in *The Drama of the Commons* (2002); T. Dietz et al., *The Struggle to Govern the Commons*, 302 *Science* 1907, 1907-12 (2003).

surpluses (like no other state in the nation) because of its role producing the fuels that are bringing in high prices. The optimistic expectations are that Wyoming will continue to play the role of well-paid energy provider for years to come. In the modern economy, however, energy production is not necessarily a driver for in-state economic growth. No major energy corporation offices, no mid-management jobs, need be situated in the state to get the fuels produced.

In other fields, the state's communities, whether supported by the energy or the ranching industries, find themselves at a competitive disadvantage. Improved transportation, telecommunications, and education have reached the state as a spin-off of the national information and services economy and Wyoming's own energy wealth. Those improved services mean that even though the state remains isolated and rural, many people in it, including ranchers, compete in worldwide markets. Local communities, too, compete with much of the rest of the world to attract consumer purchases of food, clothing, vehicles, and entertainment, and (particularly important in many people's minds) to attract young people with challenging places to live and work. Wyoming's rural population is "graying," the agricultural producers in particular.<sup>113</sup>

It is not clear that the ranching way of life (and its ways of using water), or the little towns that ranching has supported, will survive. At the same time, however, the scarcely populated, open landscapes and green valleys of Wyoming, preserved as if in a time warp by that ranching way of life, offer intense attractions to an increasingly urban and fast-moving population in the rest of the country. Second homes in Wyoming are growing quickly-- led by Jackson, but not at all limited to that area.<sup>114</sup> The CEOs of both Pepsi and Coca-Cola each have bought massive irrigated ranches in Wyoming, in counties away from Jackson (and suitably far away from each other).<sup>115</sup> Part of what those people are buying is the landscape produced by the water management system.

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<sup>113</sup> Eight percent of Wyoming's population was over sixty-five in 1980; as of 2004 that figure is over twelve percent. Population Estimates Branch of the U.S. Bureau of the Census, Wyoming Population Estimates by Age and Sex: 1980 - 1990, (Aug. 1995), available at <http://eadiv.state.wy.us/pop/a&sx8090.htm> (last visited Apr. 22, 2006); Economic Analysis Division of the Wyoming Dept. of Admin. & Information, Wyoming 2005 - Just the Facts!, (Mar. 10, 2006), available at [http://eadiv.state.wy.us/Wy\\_facts/facts06.pdf](http://eadiv.state.wy.us/Wy_facts/facts06.pdf) (last visited Apr. 22, 2006).

<sup>114</sup> David T. Taylor & Scott Lieske, Second Home Growth in Wyoming, 1990-2000, Wyoming Open Spaces (Apr. 2002), available at <http://www.uwyo.edu/ces/PUBS/B1120.pdf> (last visited Apr. 22, 2006).

<sup>115</sup> Sublette and Johnson Counties, on the Green and Powder Rivers, respectively.

But can the ranchers stay on that land to keep producing the landscape? Can they live (and resist selling out the home place) on production of only hay and cows? More important, can their children take over and live there? How will the new owners manage the land? Some, who have enough wealth to do it, are determined to keep the land in agriculture, and hire locals to keep on irrigating despite losing money. Others subdivide, not always with concern about protecting the landscape that attracts home seekers. What about the former “incidentals” that now attract people – riparian areas, wildlife habitat, fishing in isolated canyons or on a creek right through town? Some of those attractions are enhanced, some reduced, by the water use practices that have prevailed thus far; some may be lost by changes out of irrigated agriculture.<sup>116</sup>

In the past 30 years or so, Wyoming’s water law system has already faced some major challenges stemming from social and economic change. In several instances the system has not handled those challenges well.

The prime example is the water rights of the two Native American tribes in Wyoming, the Eastern Shoshone and Northern Arapaho. The short history up until the 1970s is that the tribes were forced to live on the same reservation, they were convinced to cede a considerable portion back to the federal government to be opened for non-Indian settlement, and they then saw more federal investment go into the settlers’ irrigation systems than into tribal systems. By the 1970s, the Wyoming tribes began to assert more rights, as part of a growing Indian rights consciousness nationwide borne on the crest of the civil rights movement.<sup>117</sup> In 1977, the tribes questioned the right of Riverton to tap into groundwater, which the tribes considered theirs under the broad water rights granted by the 1868 treaty establishing the reservation. The Legislature, at the behest of Riverton people, eagerly passed an emergency measure to take the question of determining the tribes’ water rights into

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<sup>116</sup> Nationally, attention is being increasingly focused on the economic value of water uses that have until recently been left out of most economic analyses. See National Research Council, *Valuing Ecosystem Services: Toward Better Environmental Decision-Making* (2004); R. A. Young, *Determining the Economic Value of Water: Concepts and Methods* (2005). In Wyoming, the Water Development Commission has underway in 2005-06 a study of the “Economic Value of Water in Wyoming’s Green River Basin,” (final report due June 2006): see <http://wwdc.state.wy.us/draftreports/GRBWATERVALUEANALYSIS.html>. See Trout Unlimited, *The Economic Value of Healthy Fisheries in Wyoming: A Trout Unlimited Wyoming Water Project Report in Support of the Creation of the Wyoming Wildlife and Natural Resources Funding Act* (2005), available at <http://www.tu.org/site/pp.asp?c=7dJEKTNuFmG&b=275420>.

<sup>117</sup> John Echohawk, Remarks at the Buffalo Bill Historical Center Conference on The Culture of Water: The Evolution of Ownership, Control and Conflict in the West, (Oct. 2005) (transcript on file with Wyoming Law Review).

state court.<sup>118</sup> The Legislature clearly expected the state court to rule in favor of non-Indian rights.

The state district and supreme courts did not perform quite as the Legislature hoped. They did limit the tribes' rights to water needed for agriculture, ignoring environmental or fisheries claims, and they restricted the rights from being marketed off the reservation. But they also awarded the tribes an amount of water much greater than the state had anticipated, based partly on agricultural lands that could be irrigated in the future. The courts dated the water right back to 1868, so that it has priority over any other right in the Wind River.<sup>119</sup> These decisions were upheld (just barely – by default, under a tie vote) by the U. S. Supreme Court.<sup>120</sup>

The state courts' award to the tribes was significant, though smaller than the tribes sought. However, the restrictions were significant as well. To restrict the tribes to agricultural use of their water in the late 1980s, when no new irrigation project in that area could make economic sense, was a very narrow interpretation of the original treaty goal of creating a home place for the tribes. To restrict them from marketing that water to others (including nervous non-Indian irrigators on the Wind River with later rights – the most likely buyers) was equally blind to modern economic reality.

In the early 1990s, the tribes tried to put in place a use of their water award that expressed a fundamental aspect of the way they value water. It was an in-stream flow right, created under the tribes' new water code and designed to allow the tribes' "future" water rights to be used to keep water flowing through the reservation in stretches of the Wind River that were often dried up by the diversions of major projects on the river.<sup>121</sup> Those included federal projects built to serve off-reservation lands and settlers – though the picture is complex: a number of tribal members are among the irrigators farming under the off-reservation federal canals. The tribes envisioned that federal and private projects

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<sup>118</sup> As the Wyoming Supreme Court has noted of the McCarran Amendment, 43 U.S.C. § 666 (1976), regarding Wyoming courts' jurisdiction to adjudicate the tribes' rights in the Wind River case: "Congress's policy under the McCarran Amendment is to allow state courts to adjudicate Indian water rights as part of general stream adjudications," ie adjudications of water rights in the entire river basin in the state involved. *In re Gen. Adjudication of All Rights to Use Water in the Big Horn River Sys.*, 753 P.2d 76, 87 (Wyo. 1988) [hereinafter *Big Horn I*]

<sup>119</sup> *Ibid*

<sup>120</sup> *Wyoming v. United States*, 492 U.S. 406 (1989).

<sup>121</sup> *In re Gen. Adjudication of All Rights to Use Water in the Big Horn River Sys.*, 835 P.2d 273, 275-76 (Wyo.1992).

would have to divert less in order to keep the senior 1868 right flowing in the river. They planted fish to swim in those flows. The State Engineer and the regional superintendent adamantly opposed all those moves, and the tribes took the matter back to the court.<sup>122</sup> Though the district court sided with the tribes, the Wyoming Supreme Court reversed and ruled for the state, refusing to recognize what the state considered the tribes' unilateral declaration of a tribal in-stream flow right. If the tribes wanted to protect flows in-stream, that could only be done in compliance with Wyoming water law, the court said.<sup>123</sup> Though the tribes were appalled by this Wyoming Supreme Court decision, they did not appeal to the U.S. Supreme Court for fear of an adverse opinion, which would impose such limits on tribal water rights nationwide.<sup>124</sup> The lesser of two evils, in the tribes' view, was to let stand the state decision, which applied in Wyoming alone.

This series of decisions has left the tribes with considerable paper rights that still have not been put into action, some 15 years after the first award of 1868-date water. It has been a victory for the non-Indian irrigators, but a defeat for greater prosperity in the Wind River valley. The tribes have not been able to put a major asset to work to improve social conditions on the reservation. What they might be able to do with investment and creative use of water resources is demonstrated by the capacity they have built in water quality and quantity administration within the tribal government. Tribal members, who have gone away to earn scientific and engineering degrees, now have a chance of finding professional jobs on the reservation in the tribes' water offices. Racial tensions in the valley, never absent, were exacerbated by the decisions and the exaggerated "threat" of tribal water rights portrayed in the public discussion accompanying the state lawsuits.

The state water law and management system failed dismally in this instance. Irrigators with state water rights were protected effectively, but no accommodation of the goals of the tribal government was achieved. Litigation was seized upon early on as the only course. Serious negotiation of a settlement that would work on the ground, because designed by people on the ground, was attempted only after it was clear how big a defeat the state case faced. After the decree, when the tribes sought to put their values for water to work via

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<sup>122</sup> Ibid. at 276

<sup>123</sup> Ibid. at 278-79. The court went on to point out that the tribes' plan could not meet the requirements of the state in-stream flow law since it provides that only the state can hold an in-stream flow water right. Id. at 279 (citing Wyoming Statute § 41-3-1002(e) (1977)).

<sup>124</sup> Echohawk, *supra* note 111.

an in-stream flow right, there appears to have been no effort to help make that initiative work. For other tribes across the country, the Wyoming cases made it clear that negotiation of settlements was the way to go, and the federal government for more than a decade proved itself willing to provide cash to sweeten such settlements.<sup>125</sup> Meanwhile, the precedent set with Buffalo Bill's old permit persisted, allowing decades of extensions for the non-Indian water project on the Wind River.<sup>126</sup> A ballooning number of irrigators and their water demands came in under the old date and took more and more water for irrigation as the extensions multiplied. Permit extensions on the Wind River, however, had much more serious effect than on the Shoshone since the Wind had no big reservoir that provided plenty of water to all regardless of priority. Rather, the old permit with its ballooning right put increasing pressure on later-date irrigators, who in turn then reacted with even more anger to the courts' awards to the tribes.

Wyoming's water law and management system has faced other challenges in recent years and met them with more creative and successful responses. A few examples follow.

On the North Platte River, construction of a series of federal (and a few private) big diversions and reservoirs starting at the headwaters in Wyoming and Colorado has over time completely changed the nature of the river downstream in Nebraska--to the point of nearly destroying habitat for migratory birds protected by the Endangered Species Act.<sup>127</sup> Under that act, the U.S. Fish & Wildlife Service has contemplated proposed major changes in the way the reservoirs operate, as well as a moratorium on most new development.<sup>128</sup> Since the mid-1990s, the states of Wyoming, Colorado, and Nebraska and the U.S. Department of Interior have attempted to forestall the proposed changes by coming up with a more acceptable solution they will design to rebuild the bird habitat through a

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<sup>125</sup> Echohawk, *supra* note 111. Echohawk notes the government's attitude was due partly to executive and Congressional consciousness of the long betrayal of federal treaty obligations to the tribes, made worse by the federal Reclamation program's enthusiastic efforts to attract non-Indian settlers to move in and use rivers in which the tribes had latent rights. See also, Tom Jensen, Remarks, October, 2005 (speech delivered to Buffalo Bill symposium, October, 2005, manuscript on file with WYO. L. REV.

<sup>126</sup> Interview with Nancy McCann, *supra*, note 89.

<sup>127</sup> Western Water Policy Review Commission, *Water in the West: Challenge for the Next Century: Platte River Basin Report*, at 8-9 (June 1998).

<sup>128</sup> *Ibid.*

variety of experimental approaches, including changes in irrigator and reservoir practices upstream.<sup>129</sup>

Their new proposal (calling for such things as groundwater management, adjustments to reservoir size and operations, etc.) comes before the state legislatures in 2006. Wyoming's part of the plan calls for increasing the size of Pathfinder Reservoir to provide water for birds as well as for Wyoming towns.<sup>130</sup> Planners say it will cut back irrigators' water primarily downstream of the dam, and state money aiding those irrigators has helped win their support of the overall Platte plan. Irrigators upstream believe they face more losses than the state expects, and a number of them oppose it. What the negotiators are trying to craft is a way to prompt all users along the Platte to adjust their water use patterns to meet the birds' needs while still reasonably accommodating their own. It is no wonder it takes some elaborate negotiation. As one participant noted at the Buffalo Bill symposium, it is like writing a new constitution for that region.<sup>131</sup> Many interests must weigh in the balance. Wyoming's two most recent State Engineers, along with the two most recent directors of the Wyoming Water Development Commission, have led the effort to convince Wyoming irrigators that this arrangement is in the "public interests" the engineer is required to protect and is, in fact, in the irrigators' interests.

Many other challenges, on a smaller scale, have also come before the regional and statewide water officials in recent years. Second-home owners in Jackson just want a babbling brook running through their land for the sake of the way it looks and sounds. Can they get a water right for that? How about Pinedale, where the town council wants to keep water in Pine Creek, which runs through the town, so tourists will stop and fish there? What about coal-bed methane, which brings a lot of money to the state in taxes while producing a lot of extra water? Can the gas company treat that water as waste, simply for disposal? What about changes in water use, such as moving from ditch irrigation to sprinklers, or to other uses entirely? Should the State Engineer consider the effect of the old flood irrigation runoff patterns on riparian areas which support wildlife?

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<sup>129</sup> Cooperative Agreement for Platte River Research and Other Efforts Relating to Endangered Species Habitats Along the Central Platte River, Nebraska, July 1997, available at [www.platteriver.org](http://www.platteriver.org).

<sup>130</sup> Session Laws, Wyoming, 2006, Ch. 105: enacting W. S. 99-3-1105 (b). Available at <http://legisweb.state.wy.us/2006/Enroll/SF0094.pdf>.

<sup>131</sup> D. Luecke, *The Platte River and the Endangered Species Act: The Law Creates the Conflicts. The Culture of Water*, Buffalo Bill Historical Center, Cody WY, (2005) (scheduled for publication Spring 2006).

Some of these issues have made their way to the Board of Control and the State Engineer. In the case of the “aesthetic” streams and ponds for second homes in Jackson, the board and the engineer frequently find they can recognize beneficial use and therefore a water right (with certain limits).<sup>132</sup> Pinedale, however, has not been able to protect releases of the water it stores in Fremont Lake, to keep the releases safe from irrigators’ diversions, so as to keep a steady flow in Pine Creek through the town.<sup>133</sup> State Engineer permits allow CBM gas producers to produce as much water as they want to get the gas out.<sup>134</sup> Riparian areas supported by flood irrigation survive largely by grace of an economic calculus of an irrigator or a second-home owner, while no support for riparian values is provided by the water law and management under the water rights system.

In 1986, political feeling statewide culminated in a legislative, top-down change in water law to recognize leaving water in a stream for fish as a beneficial use.<sup>135</sup> The strength of the popular push for in-stream-flow protection, which built throughout the 1970s and 80s, clearly indicated that many Wyoming people, few of them irrigating much more than their lawns, place a high value on water that is left in streams for fish. More than forty in-stream flow rights are now on the State Engineer’s records.<sup>136</sup> However, strong divisions of feeling are still aroused by discussions of in-stream flow and perhaps resulted in the only statutory pronouncement defining a particular beneficial use.<sup>137</sup> Consequently, the State Engineer in recent years has been wary of taking a more familiar, evolutionary path that might slowly recognize an in-stream flow right that does not specifically fit the statutory criteria. Accordingly, Pinedale still does not have the right to flow its stored water down Pine Creek for fish, although the state engineer has approved in Pine Creek much smaller

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<sup>132</sup> See, e.g., State Engineer’s Office permits #U.W. 125157 and 139426, Teton County, and other groundwater permit proofs from that county submitted to the Board of Control, May, 2003.

<sup>133</sup> See Record of Decision, Wyoming State Engineer Pat Tyrrell, Surface Water Permit # 33 IF. In the course of approving this permit for releasing stored water owned by the Wyoming Game and Fish Department, the engineer denied the portion of the permit request that involved stored water owned by the town of Pinedale and transferred to the game and fish department by lease.

<sup>134</sup> The volume amounts in CBM well permits are amounts inserted by CBM producers, not scrutinized and set by the State Engineer’s Office. See discussion in Anne MacKinnon and Kate Fox, *Demanding Beneficial Use*, WYO. L. REV. vol. 6 at ???.(ie June issue coming out, same issue as this article)

<sup>135</sup> Wyo. Stat. Ann §§ 41-3-1001-1014.

<sup>136</sup> Wyoming Instream Flow Applications, Wyoming State Engineer’s Water Right Database (Jan. 10, 2006).

<sup>137</sup> See *supra*, note 104 and accompanying text.



Game & Fish Department in-stream flow rights, which match the restrictive statutory definition.<sup>138</sup>

On some issues, like tribal rights and in-stream flow, Wyoming's water law and management system have lost flexibility; on others, like the proposals to deal with endangered birds on the North Platte, there have been creative solutions. The economy and the society of the state, as well as its role in the nation, continue to change. The need to accommodate different views on the best use of water is bound to increase, not disappear. The Wyoming water system has its own value, as a very locally-grown institution that has in the past done well meeting the needs of people in the state. What is needed now are more ways to help that institution adapt and remain resilient.

#### 4.5 Next Steps in Evolution

In the language of the founders of Wyoming's water law and management system, that system may now no longer serve the entire community it is designed to sustain. It seems to serve, instead, only its "constituents" – water rights holders, yes, but not everyone in the community who depends upon water. The solution, in that original language, should be to make changes that allow and encourage the system to recognize and serve the broader community.

What is needed is change that will work as it has in the past for this system – from the bottom up. There are two ways to approach this. One very valuable way is the traditional process of proposals by individual water rights holders, followed with review and action by the board and the engineer. It is also worth considering new ways to give people on the ground - the wide variety of people who depend upon water and may or may not hold water rights - ways to come together to create water proposals and submit them to the other levels of water management.

There are a number of initiatives potentially worthy of further research and action – by individual water-right holders, by the State Engineer's Office officials, and by other Wyoming entities also associated with water issues. A partial list of such initiatives follows:

- *Individuals can work with neighbors to change the pattern of use* so as to provide more water for desired uses at desired times – for stock, irrigation, recreation, fish, wildlife, riparian habitat, etc. This can be done by making new

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<sup>138</sup> See infra note 131. Surface Water Permits #33 IF and #34 IF grant the Game and Fish in-stream flow rights for both direct flow and stored water releases.

agreements among everyone on the creek, including, of course, plans for what will happen in drought.

- *Individuals could seek to change their water rights to include uses not previously recognized* by the Board of Control, such as maintenance of riparian areas. Formal recognition of water used for new purposes could complement the current Wyoming Water Development (WWDC) study of the value of water in the Green River Basin.<sup>139</sup>
- Individuals and local advocacy groups could seek to have the Board of Control consider the impact of proposed water rights changes on other resources besides irrigated neighboring lands. The board could be asked to consider the effect on fish, wildlife, and riparian areas whenever proposals to change water rights come before the board for review.
- *Existing local water-related institutions could be encouraged to take on a variety of new initiatives.* Such institutions include irrigation districts, watershed improvement districts, conservation districts, or other watershed groups authorized by the Legislature. The Legislature could approve financial incentives for local organizations which met certain criteria to take on new initiatives through agencies like the WWDC. New initiatives might be:
  - researching the needs of and the threats to the environmental health of their watersheds.
  - increasing the value of water in their districts, either protecting or changing uses (through appropriate action by water rights holders at the Board of Control) as desired
  - providing for local exchanges of water use information or temporary trades of water rights (through appropriate action by water rights holders at the Board of Control)
  - proposing potential changes in water statutes
- Informal river basin advisory groups already created by the WWDC could be formalized, required to be representative of all water interests, and given authority to propose water-related investments that must receive priority consideration by the development agency and the Legislature.
- A joint management agency with authority over the construction and operation of reservoirs, diversions and all water uses on the Wind River could be considered.

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<sup>139</sup> ECONorthwest, *The Economic Value of Water in Wyoming's Green River Basin*, Wyo. Water Dev. Comm'n, (final report due June 2006), *supra*, note 116.

Creation of such an agency would require state, tribal and federal approval, but its constitution could be proposed by a fully representative river basin advisory group (see above). Creation of such an agency may be far in the future, after state and tribal water managers become accustomed to working with each other over the years on day-to-day, smaller issues. Such an agency would have a unique capacity, nowhere now present on the river, to propose and implement management of the river as a whole to serve the complex Wind River community. It could access federal and state funds now available only for projects that both state and tribes agree upon. It could integrate water management for both quality and quantity. Such an agency would have to be composed of locally knowledgeable individuals, but it could continue to rely on multiple levels of state and tribal water administrators, without replacing those entities.

Such options may not be the best available; others concerned with Wyoming water management should suggest alternatives. Working with the traditions of the Wyoming water law system, it should be possible to explore further the new efforts Wyoming can make to meet new challenges in water. In the end, such efforts will help Wyoming's water law and management system to better serve its historic goal of supporting the state's communities.

## 5. MAKING THEIR OWN WAY: RECOGNIZING THE COMMONS IN WATER MANAGEMENT, WYOMING 1900-1925<sup>140</sup>

**Abstract:** *In an era of population growth and climate change, when water management is increasingly important worldwide, it can be useful to re-examine how water management schemes have been crafted, and how they have changed, in the past. In the U.S., where management through private property or central government control are the most familiar approaches to natural resources, it is worth considering an example of a different approach. This article takes up an instance of Americans who changed an institution of centralized state management into an institution with strong attributes of common property management. Such was the case in the years 1900–1925 in Wyoming with management of water, which is scarce and sought-after in that state. Historical evidence, from court cases, state records and correspondence, details how and why, in response to their physical and economic environment, Wyoming water administrators and water users together made institutional change. They moved away from their centralized management system, once lauded as a model for the nation, to create a system far more complex—with aspects recognizable to students of common property.*

### 5.1 Introduction

Whether fresh water supplies can continue to support people and ecosystems is an increasingly pressing issue worldwide. Water supplies are threatened with drastic change due to both climate change and increasing demand, fueled by economic and population growth. Finding ways to manage water effectively in the face of change is crucial for many societies. Water history can help, by examining the origins, growth and outcomes of water management institutions.

This paper examines the system of property rights in water that has been used for a little over a century to manage water in an isolated piece of the Rocky Mountains in the U.S. – the state of Wyoming. The U.S. of course is known for its faith in private property. If an alternative appears necessary – for certain limited types of resources – government ownership is typically the only alternative recognized. Nonetheless, a study of the Wyoming water rights system suggest that even in the U.S. there has sometimes been persistent if unheralded use of a third approach to property rights – common property. Studies of other resources have similarly revealed instances of common property approaches to natural resources in the U.S. (McCay, 1998). In the state of Wyoming, people using water

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<sup>140</sup> MacKinnon, A. 2011. Making Their Own Way: Recognizing the commons in water management. Wyoming 1900-1925. 3 Water History 3, 187-212. The citation style of the article reflects the requirements of the journal to which it was submitted.

initially adopted a carefully-crafted system of government ownership of water. This paper shows, however, that over time, Wyoming people changed that system – not to one of private property, but to a system much more complex, with features familiar to students of common property.

A crucial factor in this development was the difficulty of enforcing the state ownership system over a vast and varied topography. Douglass North has noted that such a situation creates the kind of entrepreneurial opportunity for experiment with new systems that is often key to change in human institutions (North 1990, 83-89). That is very clearly what happened in Wyoming. In the absence of effective enforcement of the initial state-ownership system, people facing new circumstances went to work to change the Wyoming water rights system into something more like a common property system.

Common property systems, as a way to manage what economists call “common-pool” resources, have been explored and documented extensively over the last 30 years. Common-pool resources are resources that are hard to sequester from use, but easy to use up. They include ocean fisheries and fresh water, and in fact the management of fresh water for agriculture was among the classic examples cited by Elinor Ostrom in her seminal 1990 study, *Governing the Commons*. In that book she teased out the common characteristics of a variety of successful common-pool resource management institutions that had been the subject of detailed case studies by colleagues worldwide. Irrigation systems known as *zanjeras*, in the Philippines, were one example she cited. *Zanjeras* are associations of farmers who have banded together to irrigate and cultivate lands. They allocate land and water so that all share in the advantages and disadvantages of varied locations; the land is held privately, the water is not. The farmers’ association maintains and guards the diversion dams and canal systems, sets its own rules requiring each irrigator to do free maintenance work on the system, and chooses among members the officials who will implement and enforce the rules. Such systems had shown up in recorded history in the Philippines since the 1600s, and over 600 of them existed there in the 1970s (Ostrom, 1990, 82-88). *Zanjeras* displayed a number of what Ostrom identified as the “design principles” important for long-enduring institutions managing common-pool resources. Such institutions can be classified as creating “common property” in natural resources, rather than either public (government) or private property. In short form, the principles for the design of such institutions that Ostrom found are: clearly defined boundaries of the resource; rules meeting local conditions; users participating in making, monitoring and enforcing rules; low-cost dispute resolution and appropriate sanctions; and larger-

government recognition of the right of the users to organize their own institution (Ostrom 1990, 90-91).

Wyoming's property rights system in water has all these features, but they are combined to look very different from a classic common property institution like a *zanjera*. In the era described in this paper, Wyoming's population dealing with water management emphatically rejected the idea that individuals or groups could hold the capstone property right that, under the analysis outlined by Schlager and Ostrom (Schlager and Ostrom 1992, 254), could make those individuals or groups the private owners of a resource. Wyoming people dealing with water chose not to recognize for anyone a right to sell or lease water in order to transfer water easily to new uses or places. They did recognize in water, however, other types of rights that can be associated with a resource. Those include rights to decide who could use water, rights to manage when and where water would be used, rights to access and use water, for instance (Schlager and Ostrom 1992, 251-54). Wyoming people distributed those rights between a small state agency and the water users. Water users could be individuals, or entities, like irrigation districts or municipalities; the state governor chose top agency officials, who in turn appointed top assistants from among people living in each major river basin.

The later history of the Wyoming system shows that over time, which property rights in water were held by the agency and which were held by users has varied in response to changing circumstances. However, in the era examined here, the key characteristics of the Wyoming system of property rights in water were established. Together the agency and the users work in symbiosis. They act as a community. The water rights system covers a large territory but a relatively small number of users, with a general group of rules that apply to all and local rules based on the stream in use. The agency is the gate-keeper and record-keeper. It is the sole grantor of rights to use water. The users, with the agency, make the rules for water use, and help determine what enforcement occurs. Users call upon the agency as needed to enforce rules, or to decide whether to authorize changes in water use. The authority of the users and the agency to make and enforce water rules, and to resolve conflict cheaply, is recognized and respected by the larger state government.

Wyoming's water rights system is thus not a private property system nor a state property system. Neither is it a classic common property system. Rather, it is a member of a family of locally rooted institutions for the management of common pool resources, institutions that include common property systems. Carol Rose, a leading scholar in U.S. property law, calls this family of institutions "community-based management regimes."

She notes they can have social weaknesses – closed ranks, inequity, hierarchy – along with ecosystem conservation strengths - rules attuned to local circumstances and long-term livelihoods. The test of whether these community-based management regimes can be useful to meet modern challenges will be whether they can liberalize their social practices while retaining their conservation strengths (Rose 2002). Wyoming’s “community-based management regime” for water is a just such a mixed bag. It could be labeled a familiar case of unpalatable “agency capture” by an exclusive club of water users (Wilkinson 1992a) – or a fruitful symbiosis between water users and agency to produce community that endures in an unforgiving landscape. Which label sticks will probably depend, as Rose suggests, on whether the Wyoming water rights system can recognize and empower new water users and new interests to work in concert with the Wyoming landscape.

The standard image of water management in the Western U.S. is one of huge government-funded dams and privately-owned green fields in the midst of near-desert - the embodiment of central-government controls working on and with private property rights to use water (Reisner 1986). Yet, closer examination reveals something else going on as well, in many locations. First, take the image of well-engineered central government controls. Some of Ostrom’s colleagues have demonstrated that the unorganized “chaos” of local, sometimes competing, groups underlies water management success. They point to the small local-basin management groups that have made possible the long-term use of groundwater in the megalopolis of Los Angeles (Blomquist 1992). They call for “embracing watershed politics,” and thereby recognizing and welcoming the role of competing centers of authority in managing water in the American West, which have helped shape the agreements that coordinate water supplies, including the water from the big projects, and make them serve changing needs (Schlager and Blomquist 2008; Blomquist, Schlager and Heikkila 2004). Next, take the paradigm that private property rights in water are the foundation of water use in the Western U.S. The developments documented in this paper challenge that model.

Lawyers pursuing clients’ private claims have long held that water rights in the region are private property rights - subject to state regulation (Tarlock 1988; Anderson 1975; Wilkinson 1992a, b). Reformers concerned about lack of attention to ecosystem or social equity demands often call for more regulation of private water rights (Tarlock 1988; Wilkinson 1992a; Squillace 1989; Kenney 2001). This article counters that view by revealing the community management aspects of water rights in Wyoming. The article’s approach is to look beyond the strictly legal analysis of statutes and court cases, to examine how

the Wyoming water rights system worked as an institution in a formative period. The “prior appropriation” system common to most Western U.S. states makes this possible. The system gives highest-priority rights to earliest-date water use. Accordingly, state vaults hoard nearly every scrap of paper affecting a water right. Documentation of the water system’s history is crucial to its modern operation, and handy to the historian.

What this article documents should be of interest for several reasons. First, even historians uninterested in water history per se will find it aids their understanding of the U.S. in the early 20<sup>th</sup> century. The Wyoming story is the story of what happened to the brainchild of Elwood Mead, a nationally and internationally famous figure of his time. Mead, as a young and idealistic engineer, launched the plan for state ownership of water in Wyoming, and then went on to influence water management in Australia, California, and the Depression-era U.S., when he shepherded such mega-engineering projects as the Hoover and Grand Coulee dams (Kluger 1992). Mead’s design of a centralized state control system of water management in Wyoming brought him early fame and launched his career. Tracing the fate of his signature system after he left moved on adds a new dimension to the understanding of the impact Mead and other Progressive Era “social engineers” had on their country.

Further, the case of water rights in Wyoming should prompt similar examination of the water rights systems of other U.S. Rocky Mountain states. In other Rocky Mountain states, just as in Wyoming, the water rights systems may not always be a matter of regulated private rights. There may be latent attributes of community management, rather than private property, and with that, unexplored capabilities and avenues for dealing with changing needs. The existence of user power to change rules, as in Wyoming, could for instance point to new ways to effect change in water management. Working to expand local people’s understanding of who is a user, and what are users’ interests, could perhaps be more effective than lobbying for new state regulation.

Finally, Wyoming and the development of its water rights system should be of interest outside the U.S. There are many places where, despite fascination with the idea of managing water via mega-engineering projects working upon private water rights, what actually happens on the streams and ditches demands attention as a more complex system, with aspects of community management (Trottier 1999; Gerbrandy and Hoogendam 1998; Boelens et al 2007). These more complex systems, in turn, could be just what are needed now to handle and survive looming crises in water supply. A significant group of scholars have pointed to such failures in mega-management as the collapse of the North Atlantic cod



fishery in the 1990s to suggest that linear cause-and-effect science or engineering, pursued by centralized agencies that inevitably dismiss local knowledge and concerns as annoying “politics,” will continue to lead to ecological disasters. They recommend, instead, joining “adaptive management” trial-and-error science with local community-based management – a partnership which, if protected by larger governments, could lead to long-term management that meets and adapts to coming crises (Wilson 2002; Holling, Berkes and Folke 1998; Berkes and Folke 1998; Folke, Berkes and Colding 1998). In water management, that means it can be worth locating, building upon, or building new versions of community-based management. This paper may help point the way to finding and fostering such systems, even in the most unlikely places.

## **5.2 Background to the Case Study**

Water in Wyoming offers a particularly compelling study in how people find their own way to managing a common pool resource through a locally-crafted institution. Early on, Wyoming provided textbook tales in other natural resource management options: the “tragedy of the commons” (Hardin 1968) – enacted in the creation and then near-destruction of its grasslands cattle industry in just 10 years; and state ownership and control – seen in the adoption of a Progressive-era scientific state water management agency in just 2 years. That system was hailed as a model for other Western states (Dunbar 1983).

Subsequently, in the development that is examined here, Wyoming people transformed that model centralized water management system. They made it into something quite different – a form of community management.

Wyoming in the late 19th century was haunted by disasters that had struck the open range industry. This industry, using a common pool resource of grasslands, nearly self-destructed in the late 1880s because, while nominally owned by the federal government, the grasslands were actually left as open access (Larson 1978, 163-94). In reaction, the men who had overstocked the range took very consciously different steps to manage water, a scarce resource. Wyoming is essentially a high, cold desert – a strange new terrain and climate for all these newcomers. Stockmen began to experiment with irrigation – to grow hay as winter fodder for their herds, and to attract new farmer-settlers. (Territorial Engineer 1889, 2, 22-23; State Engineer 1891-2, 10-11).

Who got to use how much water was, however, a matter of great confusion. Unlike a cow, water couldn't carry a brand. Also, its scarcity meant that people often wanted to transport it, to put it where it could be useful. The practice was to nail to a nearby tree (if

there was one) a paper stating that you had claimed that water for your ditch, by diverting water from the creek channel and over to some lands that might support hay (Mead 1903, 69-71, 248-9; Session Laws of Wyoming 1886, ch. 61; Wyoming Revised Statutes 1887, sec. 1340; *Smith v. Devoe*, 1889). This might not be a very secure claim on which to stake the future.

When grassland productivity crashed after a drought-plus-bad-winter in 1886-87, the larger ranchers, who dominated the territorial legislature, approved public funds to hire someone to get present and future claims to water straightened out. They managed to hire a bright young engineer for the job – a 28-year-old who grew up in moist and verdant southern Indiana but had spent a few years in dry-land Colorado getting an education from water battles there (Kluger 1992; Dunbar 1983).

In Wyoming, that young man had the pleasure of dealing with an essentially blank slate on which to draw whatever he might see as the perfect water management system for the arid West. He was a young, early Progressive thinker, imbued with the idea that proper management of the valuable water resource in the arid lands of the West could be the foundation of stable communities. The young man, named Elwood Mead, read avidly all he could find about irrigation present and past. Lessons from older civilizations dependent on irrigation, he wrote, showed that proper management of water could lead to “security and content” among the people, while ill-considered systems lead to “disastrous controversies, misery and wrong.” (*State Engineer* 1895-6, 57). The national capitol was too far away, and too ignorant of Western conditions, to set up a proper water management system for a place like Wyoming. At the state level, the young engineer believed, there should be scientific expertise to assess and allocate the water resource. That required centralized, state control.

Mead proposed a system of state ownership and control of water resources in an approach that late-20th century advisers might have recommended for a developing country.<sup>141</sup> The young engineer persuaded the territory’s political leaders to proclaim the concept of state ownership of water in the official constitution of the new state of Wyoming that they wrote in 1889 (Wyoming Constitution, art. 8, sec. 1). While other Western state constitutions also

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<sup>141</sup> Ostrom, in dissecting and discrediting Garrett Hardin’s famous dismissal of common property regimes in natural resources as “horrible,” leading to a “tragedy of the commons,” notes that Hardin eventually proposed centralized state control to manage and protect natural resources (Ostrom 1990, 9; Hardin 1968; Hardin 1978, 314). Mead initially recommended state control of both land and water, with state surveys determining proper location of ditches and irrigated lands and irrigators required to locate according to state surveys. He noted, however, that such a system was impossible without federal lands being ceded to the states – which did not occur (*Territorial Engineer* 1889, 12-13, 47-48, 60-61). The state could, however, control water independent of controlling land, and that is what Mead proposed.

mention state or public ownership, Mead pumped life into those words by providing that only the new state government, via a new water agency, could allocate water use rights. No longer could someone claim water by simply taking the water out of the stream and posting or filing a notice. The water governance agency (the “State Engineer’s Office”) held the crucial right of excluding users from this important resource. A few years later, State Engineer Mead explained (drawing on European examples) that the relation thus created between state and individual water user was essentially that of landlord and tenant – the user rents the water for a set time, and pays a rental fee for it. Though Wyoming people hadn’t yet actually accepted the rental fee idea, he believed they would do so, eventually (State Engineer 1895-96, 59-60). Meanwhile the fundamental provision was that would-be users had to apply to the state for the right to take water. The state’s trained engineers would examine the water project plans, large or small, for probable success – considering everything from engineering details to the applicant’s finances. They would return applications for modification as necessary (Territorial Engineer 1889, 96-98; State Engineer 1893-4, 49-58; State Engineer 1895-6, 9; Mead 1903, 266-68). The state engineer could also, however, deny an application for water use – if, as the new constitution put it, the “public interests” so demanded (Wyoming Constitution, art. 8, sec. 3; Session Laws of Wyoming 1890-91, ch.8, sec. 34). Here was the Progressive ideal of expert civil servants helping the settler and the society, saving both from costly mistakes (Hays 1969). Public ownership would be maintained, but economic development would be achieved by putting that water in the hands of private users. The supervision by the expert state engineer staff would ensure a continuing balance between the stability that fostered investment and the flexibility that welcomed innovation.

If an applicant received a permit, he or she received with it a “priority,” as against later users. The priority was based on the date of the permit application. Mead thereby accepted the “prior appropriation” concept of “first in time, first in right” that had been the water-use custom in scattered Western communities for nearly 50 years before 1890 (Dunbar 1983). But under Mead’s new system, whether a person could acquire that priority right was up to the state engineer’s agency. The state alone decided whether to issue a permit – or, in the case of older water uses, whether to confirm a right claimed with that notice on a tree from territorial days. The state and its expert engineers were in control.

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Congress, through a succession of general legislation, from 1866 through the Reclamation Act of 1902, had explicitly deferred to the states in the matter of water. (Dunbar 1983, 51, 77-78.)

The state's high court upheld this new system in 1900, 10 years after it was put in effect (Farm Investment 1900). Nationally, the Wyoming system was heralded as the model for Western water administration (Dunbar 1983). The fame of the system propelled its young creator Mead into a career in irrigation and rural development on a national and international level, ending up as head of the U.S. Bureau of Reclamation, where he died in office in the 1930s (Kluger 1992).

During the first ten years in Wyoming of the new system, most of the effort involved in implementation went into establishing the state's authority as gate-keeper, empowered to admit or exclude individuals from water use. Across the state, major stream-wide "adjudications" examined existing users' water claims compared to their actual water use. The state office then issued a "certificate of appropriation" that awarded rights based on actual documented use (and sometimes cutting paper claims by 50 percent) (State Engineer 1895-1896, 150-151; Mead 1903, 257-9). New state permits, too, were to be followed by adjudication and a certificate awarding rights, after an examination showing how the water had actually been put to use (Session Laws 1890-91, 8:36).

The next phase in putting the new system to work began with the new century. Once adjudications were underway and new permits were being issued, around 1900 a new set of questions emerged. What did a user get when he or she got a water right? Could he sell it off to someone else to use somewhere else? Could she hold off for years before really putting all the water involved to use? In sum, what did the state's permission for use really require of a user, and what choices could that user make in using the water?

Arriving at the answers to those questions turned out to involve considerable debate, and in the end caused considerable change in the water management system. In the years 1900-1925, Wyoming water administrators and users made decisions that moved the entire water management system away from simple state ownership and control. The result was not, however, private ownership of water, but something approaching a common property system of ownership and control of water. The state constitution was not changed (though statutes were), but the people of Wyoming essentially made a fundamental, what can be rightly called a "constitutional" (Ostrom 2005), change in how water was managed.

Two separate controversies in the years 1900-1925 illuminate the changes that took place, and are the focus of this article.

### **5.3 Challenges and Change, 1900-1925**

#### **5.3.1 Question #1: Can I sell the water?**

In 1904, a major controversy came to a head over whether a user with state-confirmed water rights could sell off the water, for use on other lands.

By 1904, the State Engineer's Office, staffed with just a few energetic and dedicated people, found itself dealing with inadequate funding to deal with a rapidly growing workload as more and more lands were settled. The agency had four "superintendents" who lived in the state's four major hydrologic basins, but they were falling behind in their inspections and adjudications of territorial claims and state permits – and they sometimes paid meeting expenses out of their own pockets (State Engineer 1901-02, 54-8, 66-70). Nonetheless, the new agency provided something of a network reaching out to on-ground water users, who had as yet few organizations of their own. The four superintendents based around the state, and their part-time staff, pursued their own livelihoods as ranchers or surveyors as well, and communicated regularly with water users. They in turn hired other ranchers part-time as water "commissioners" to monitor and regulate according to priority rights the use of certain streams where water supply routinely fell below demand. The superintendents and the State Engineer met twice a year as the "Board of Control" to confirm adjudications and rule on proposals from users to change a water use or argue that a neighbor had forfeited a water right (Session Laws 1890-91, 8:25-26, 34; State Engineer 1895-96, 37-45; State Engineer 1903-04, 19-20). This made conflict resolution low-cost for users (who did not have to attend) (Mead 1903, 247). For the five board members, however, even getting together was expensive: it took days to cross the state by horseback, wagon or coach, on rough roads, while train service reached only a few places (State Engineer 1897-98, 72; State Engineer 1903-04, 30-35). Centralized state administration looked elegant on paper, but it was patchy in action. That provided opportunities for users to change how the system worked.

In 1891, the superintendent of Division I, covering south-east Wyoming (the most heavily populated portion of the new state) took evidence for his first adjudication of water claims – on Little Horse Creek, just outside the capitol and largest town, Cheyenne. The creek hosted water users who had been there from territorial times, and after the evidence was taken all four superintendents and the state engineer (meeting as the Board of Control) issued an adjudication sorting out the water rights (and commenting on the difficulty of the task) (State Engineer 1891-92, 73-74). Under the adjudication, the holder of some of

the earliest and best rights on the creek was the Springvale Ditch Company, formed by a small rancher. Neighbors immediately challenged the board order and took Springvale to court; as the court case dragged on, the Springvale rancher eventually found himself in financial trouble, and had to sell the place. In the meantime, he made a deal to sell a “half-interest” in one of his key water rights to one of the neighbors who had taken him to court. The neighbor was a company called Little Horse Creek Irrigating Company, headed by a very wealthy man who liked buying ranches and had briefly been territorial governor in the 1880s. The sales contract said Little Horse Irrigating would get to use Springvale’s water right, with its early priority, every other week – when Springvale would not use it (Johnston v. Little Horse Creek civil case file 1891-95).

There were a lot of other users on Little Horse Creek – some 67, in fact, and they jostled with each other to get enough water to support their crops (State Engineer 1895-96, 46). One was the Johnston family, perhaps a family of small farmers, whose lands on the creek were in between the lands of the Springvale and the Little Horse Irrigating companies. Their water rights, too, were in between those two companies in priority (Johnston v. Little Horse Creek 1904, 223).

The Springvale-Little Horse Creek Irrigating contract settled the court fight as far as Little Horse Irrigating was concerned, but it left the Johnstons out. The Johnstons expected, by virtue of their priority position, to get water when Springvale didn’t use it. In the Johnstons’ view, Little Horse Creek Irrigating shouldn’t be able to take and use that water when Springvale didn’t use it just by paying off Springvale under a sales contract (Johnston v. Little Horse Creek civil case file 1891-95).

The State Engineer’s Office agreed emphatically with the Johnston family. The water commissioner at work on Little Horse Creek refused to honor the Springvale-Little Horse contract (State Engineer 1895-96, 45-46, 52-53). The Johnstons meanwhile asked the courts – still reviewing the board’s adjudication of the creek – to defeat the water sale contract.

The state’s top court, however, in 1904 supported the sales contract. The court stated flatly that water users who had water rights could sell those rights to others, to use the water on other lands (Johnston v. Little Horse Creek 1904, 233-35). The legislature responded promptly, putting the court’s ruling into a statute allowing water transfers (Session Laws 1905, ch. 97).

That decision was a bombshell for the State Engineer’s Office. Superintendents of the water basins protested in public reports and in 1905 the State Engineer succeeded in

convincing the state legislature to appoint a special commission on water law (with himself as a member) (State Engineer 1905-06, 81-99).

That special commission on water law took the unusual move of sending out written surveys to water users statewide. The commission found that users opposed water sales (State Engineer 1905-06, 84). The commission convinced the legislature to enact a new law, which took the users' view and overturned the court decision. The new law forbade the sale of water rights to use on other lands, on pain of loss of priority (Wyoming Compiled Statutes 1910, 724).

The rule thus clearly stated, and accepted for some decades afterwards, clearly limited the choices available to users. It specifically provided that the actual characteristics of water use – on what lands, in what season, taken from what point on a stream and through what ditches - defined a water right. Accordingly, land and water rights could be sold together, but water rights could not be sold away from their setting, the land. The state engineer who had pushed for the new law saw it as a fundamental step in the definition of a water right, writing a triumphant section entitled “What is a Water Right?” in his 1910 public report after the struggle was over (State Engineer 1909-1910, 17-30).

Here we see a struggle of ten years or more in which men with investment capital and political influence pushed for establishment of a straightforward rule allowing water transfers. They wanted anyone with a water right to be able to sell the water involved, off the land, to anyone else who could find a use for it, wherever that might be. But these men could not get that rule adopted. Instead, the rule adopted imposed even more explicit limits on how users could manage water. What were the factors behind this result?

One was the strong policy concern in the state water agency that water sales away from the original use were inherently pernicious. Mead believed such sales would allow speculation in water. Little Horse Irrigating's stance, he said, was based on the idea that individual users held an “an absolute property right in water:” a concept that might be current in other Western states, but, Mead declared, had no validity in Wyoming. Private property and speculation in water would undercut the establishment of the settled, prosperous communities that he felt could, in an arid territory, only be grounded in orderly water use (State Engineer 1893-94. 34-46).

By the time of the early 1900s debate over property rights and sales of water in the Little Horse Creek case in Wyoming's high court, Mead had moved on to his national and international career, but took vigorous part by mail. His successors, meanwhile, were men he had trained and so imbued with his beliefs that they can fairly be called his disciples.

They argued determinedly to outlaw the kind of water sales that Little Horse Irrigating and the state's high court supported.

Other factors may have been equally important, however. The dispute arose in the most settled part of the state. Irrigators had been using water from Little Horse Creek for over 20 years before the court decision of 1904 and the subsequent 1909 reversal and defeat of water sales. Meanwhile the creek itself was small, unsuited to investment to enhance the supply (such as major dam construction). There were also a lot of users, and a water commissioner regularly on hand to monitor their use. These water users, accordingly, had better knowledge of each other and the ecosystem in which they worked than did many other water users in Wyoming at the time. There were also reasonably good ways of sharing information about the issue at hand in the Little Horse Irrigating dispute: the facts would have been well-known on the creek itself and in the nearby capitol city, and also would have been somewhat familiar to other water users in the state.

The majority of those users were relatively small ranchers and farmers, carefully reading the biennial public reports of the engineer's office, which were written for that audience. In those reports, successive state engineers assertively followed every development in the Little Horse Creek situation from the 1890s through the first decade of the 1900s. The superintendents around the state, whom many water users knew personally, also cared deeply about the case, as evidenced by their individual comments within the public State Engineer's Reports. The time that elapsed between the original sales contract in the 1890s and the commission survey of 1906 gave ample time for mulling over the issue involved.

The superintendent in northeast Wyoming, for instance, repeatedly stated his opposition to allowing water sales such as that sanctioned by the high court on Little Horse Creek: "It gives the individual a right with public property whereby the State will suffer in the end" (State Engineer 1905-06, 70). The personal relationship superintendents had with water users was significant, and shaped policy:

*The people are coming every day for advice and information that they can get in no other place. In this respect, it is one of the most important positions in the State. It deals more directly with the people, knows their needs and conditions better than any other place, and is of the greatest help to them, all of which they fully appreciate. In connection herewith I want to express my appreciation of the help and good will extended to me by the people. They have given me every encouragement in the performance of my duties and without their hearty co-operation the administration of the work of this office would be extremely difficult. They have always been consulted before any great change has been made and their advice has always been good, founded as it is, upon actual experience and observation." (Report of Lou Blakesley, superintendent of Water Division III, Wind-Big Horn basin, Northwest Wyoming, State Engineer 1909-1910, 56).*



Good communication channels, and several years to talk it all out, allowed the State Engineer's Office, the protesting ranch family on Little Horse Creek, and water users statewide to unite around what had become, as they tried to use Wyoming water, a common understanding and concern: water users working with a limited water resource were interdependent in a way peculiar to people living in arid regions. In such a place, a dry year meant, as one superintendent put it, "Intense feeling, theory and pet laws for the government of water are cast aside. The condition is an angry farmer, the half matured crops on his land, which gave promise of an abundant harvest, are rapidly burning up." Any irrigator sharing a creek had to be stopped from simply moving water wherever he wanted: "No other determination would long be tolerated by his neighbors" (Report of Superintendent, Water Division II (northeast Wyoming), State Engineer 1895-96, 150-151).

So the state engineer and the water users determined to limit the choices of water users—much to the irritation of not only Little Horse Irrigating Co. and its cohorts, but also of later economists and lawyers advocating free markets in water (MacDonnell 1990, 34-36, 64-70; Squillace 1989).

The rule the engineers and the users endorsed ensured that users had no significant power to transfer away their right to use water.

The rule that the users and the state engineer chose was, as Mead had insisted, useful to the settled communities that both the water users and the state agency officials aspired to build. Since the nature of water tends to make interdependent the different uses on the same stream system, once uses are established users typically need to be able to rely on a regular pattern of use. In Wyoming, Mead and his colleagues believed, that pattern needed protection. It would be disrupted by free alienation of a water right, shifting water resources to other lands and other uses. Mead had noted that the history of traditional irrigation societies proved that recognition of private property in water was damaging (he cited the case of the Lombardy region of Italy) (State Engineer 1895-6, pp. 60-61). Through the 19th and 20th centuries other Western U.S. systems typically have come to adopt some version of a rule allowing water transfers unless they "injure" other water rights (Trelease 1984, 209-10). Wyoming's water users and administrators, however, had declared themselves plainly in favor of a view that simply did not include the power of alienation as a right water users could hold.

This decision on the part of Wyoming water users and administrators meant they had drawn distinctions between exactly what rights over water went to irrigators (who could use the water but not sell it away) and what to the state representing the public (which

could determine who got a right to use). They had launched, by 1909, upon a detailed delineation of property rights that Barzel points out is peculiarly appropriate for scarce and valuable resources (Barzel 1991, 118-120). They had, however, also firmly rejected applying to water the more familiar approach of relatively simple concept of private property ownership, as used by land law. Land law, of course, freely allowed owners of land to alienate that land. The Wyoming Supreme Court had taken the private property ownership approach to water in 1904 when it upheld the Little Horse water sale: to disallow the sale, the court said, would be “to deny the element of property in the water right itself” – and that, the court refused to do (Johnston v. Little Horse Creek 1904, 229, 232-3). When the users and the engineer, followed by the legislature, decided to repudiate the court’s view, they demonstrated a commitment to experiment with new rules, in order to deal with a resource that the users clearly understood to be different from land.

Property rights outline the relations between people – privileges and obligations – over a resource (Meinzen-Dick and Nkonya, 14). Political scientists, economists and lawyers all agree there is no single “property right.” Property owners hold a “bundle” of rights, and bundles can differ. Ostrom and Schlager have usefully identified basic rights to look for in classifying the property relations that different people may have in connection with a resource. They identified: the right to access a resource; the right to withdraw portions of it; the right to manage how and when it is used; the right to exclude others from it; and the right to “alienate” or transfer a resource by sale or lease to another’s control. Schlager and Ostrom proposed that someone who holds all five of those rights, including alienation, is an “owner,” while those holding less than all five are not owners but (when holding from the first two up to all four of the rights other than alienation) could be called, successively, an authorized user, a claimant, or a proprietor (Schlager and Ostrom 1992 251-54). Some 90 years before these social science studies of property rights, Wyoming water users and the engineer’s office had understood that there were a variety of possible property rights, and that rights appropriate to water might not be the rights appropriate to land. They had decided that, for water, the right of alienation should not be put into private hands. While in Wyoming, Mead had spent much of his time writing essays on such topics in his reports to water users. The average settler, Mead told those settlers in 1894, “has usually regarded an appropriation of water in much the same light as he regards acquiring title to land, and looks on nothing less than absolute ownership as adequate and proper. We have never been able to accept that view” (State Engineer 1893-94, 39-40). Eighty pages later he returned to that theme: “The difficulty is to draw the line between

adequate protection to the appropriator and preservation of the rights of the public. To do this involves to many a new conception of property rights, few being able to conceive of any interest in water short of absolute ownership, which the Board is not disposed to sanction” (State Engineer 1893-4, 124). After he had left Wyoming, Mead bemoaned the fact that in most places, the users and the engineers, who understood how water rights should work, had to watch lawyers and courts continue to favor a land-law view supporting private ownership in water rights: “The speculative value of the personal ownership of running water is so great that every argument which the ingenuity and intellect of the best legal talent of the West can produce has been presented to the courts in its favor. Organized selfishness is more potent than unorganized consideration for the public interests”(Mead 1902, 12).

### **5.3.2 Question # 2: Must I use the water?**

The second key question to come up in the early 1900s was what was required of someone who got a permit for a new use. Was the permit itself enough to confer a right to use water, with a priority position? Could a would-be user, once a permit was in hand, do nothing further and still be protected against later comers?

The State Engineer’s Office believed the answer was clear: “No.” There was much more for a would-be user to do. Obtaining a permit was merely the first step towards obtaining a secure water right. To get a secure right to use water, the next requirement was to make a permitted water use become an actual water use.

Under the water laws of 1890 that Mead wrote for Wyoming, state water permits had requirements written into them, clear deadlines for the start and finish of water facility construction, and for getting water actually into use (typically, into irrigation) (Session Laws 1890-91, 8:34). After water had actually reached farm fields, and proof of the water use and permit compliance presented to the Board of Control, the board would issue a certificate of appropriation, recognizing a water right for the amount of water actually used (Session Laws 1890-91, 8:34, 36).

By the early 1900s, the state engineer stated that a permit once issued should be regarded only as a contract with the state. The contract simply allowed a would-be user his opportunity to put water to use - under certain conditions including deadline compliance. Only compliance with all the contract conditions, including deadlines, would result in someone obtaining an actual right to water (State Engineer 1903-04, 1907-08). There was a penalty for failing to comply on time: the permit and the opportunity for a water right

with priority position would be cancelled. “If the applicant does not sufficiently appreciate the value of the water right sought to comply with terms of the permit,” the state engineer wrote in 1904, “it should be cancelled in order that others who have shown proper diligence may be protected” (State Engineer 1903-04, 12-13).

The policy concern was fundamentally the same as in the water-sales question. To allow applicants to proclaim themselves “users” by obtaining a state water use permit, but doing nothing more, was to allow speculators to obtain Wyoming water rights and thereby hamper the growth of self-supporting settlements. Further, the growth of prosperous communities demanded that unsuccessful ideas make way for new, more promising proposals. That again meant that no one should be able to obtain a state permit, fail to use the water, but keep the permit and a claim to the water. If one could do that, she could create for herself the ability to bide her time, and pre-empt others who could put the water to use right away.

Mead noted early in implementing the state water system that sometimes he would issue a second permit to irrigate lands already covered by an earlier permit – if it appeared that the holders of the first permit simply weren’t progressing with their project. As he wrote to one laggard permit holder: “The fact that you have had a year of unrestricted opportunity with no visible result, as I am informed” meant it was more important to the state of Wyoming to issue a new permit to someone with new plans, than “that development should be retarded in order to protect your prospective profits” (State Engineer 1895-96, 63-66). Similarly, Mead had adopted into the state water law the territorial rule (customary in a number of Western states) that a water right could be challenged and lost as “abandoned” if it could be proved that the water involved had not been used for a few years. Water rights had to be in the hands of people who proved successful, in order to put Wyoming water to use quickly, and keep it in use (State Engineer 1895-96, 63-66).

Putting Wyoming water to use *if possible*, however, turned out to be the more practical goal. In 1902, a puzzling question arose which highlighted the distressing realities of what was really possible. Those realities, in turn, undermined the state engineer’s rule on what a state water permit meant.

This question came up in a place that reeked of impossibility - a very different part of the state from the Little Horse Creek area in the southeast, near the capitol city. The place was the Big Horn Basin of northwestern Wyoming, just adjacent to Yellowstone National Park. Yellowstone’s wild landscape had been consecrated as the first national park thirty years earlier, and attracted well-heeled Eastern visitors and the construction of ambitious

hotels. Nonetheless the Big Horn Basin, east of the park's boundaries, remained frontier country in 1902. Isolated by physical barriers from more settled parts of the state, the region had the harshest terrain, sparsest population (less than 5,000), least economic activity, and least social stability in Wyoming (Davis 1993; Davis 2005).

The Big Horn Basin also had in spades what any newcomer who tried irrigation had found everywhere in Wyoming. Whether armed with cash, or with only a mule and shovel, everyone - including the state engineer and his staff - met surprises trying to put ideas for water into practice. They were all profoundly ignorant of the ecosystem in which they were working. No one really understood what would be required in finances and engineering to irrigate the terrain, or to grow crops in the climate. There was a steep and painful learning curve, which killed many private irrigation ventures. (Bonner 2007).

Mead described the Basin in 1898 as:

*...an immense bowl entirely surrounded by lofty mountains. It has not, however, the appearance of a valley as that term is ordinarily used. The greater part of the surface is hilly and broken. Some of the bad-land ridges rise almost to the dignity of mountains and present a picture of aridity and desolation which disappoints and discourages many of those who visit this section for the first time. None of the broken country can be reclaimed. The limits of irrigation are restricted to the bottoms and table-lands which border the water courses. Outside of this the country is neither adapted to the construction of ditches nor fit for cultivation even if water could be carried to it." (State Engineer 1897-98, 93).*

Nonetheless, there seemed no end to big ideas for testing the "limits of irrigation" in the Big Horn Basin. Among those who dreamed of molding garden spots were some who brought money, some who brought know-how, and some who brought neither. One with money was Solon Wiley, a successful public utilities engineer from Omaha. Starting in 1895 he formed a company and obtained water permits (including the purchase of some permits for projects that had gone nowhere) for a plan to build an irrigation colony on flat bench land above the sizeable Gray Bull (now the Greybull) River. Following an act of Congress offering aid to irrigation projects in the West (an 1894 precursor to the 1902 Reclamation Act), Wiley was able to get public lands set aside for his project. Though Wiley was not an absentee entrepreneur but a very hands-on one - personally supervising construction of his canal while his wife cooked for the laboring crews - progress was very slow (Lindsay 1930; Cook 1990). It looked like Wiley might well not meet his permit construction deadline - set for the last day of 1902.

As his canals began to reach some of the land, however, in 1901-1902, Wiley wanted water for the few farmers he had convinced to settle there. He got in an argument with downstream neighbors, the Farmer's Canal - a group of experienced Mormon irrigators,

who had farms and a state water certificate for water. Their priority date was 1894; Wiley, who got a state water permit for his venture in 1896, nonetheless claimed an 1893 date because he had bought up permits dated 1893 that contemplated putting water on the lands now beginning to be reached by his canals (Lindsay, 1930; State Engineer 1901-02, 47-53).

It was Elwood Mead who, in accord with his policy, had issued Wiley a new permit in 1896 for irrigating the same lands that the 1893 permits had covered, since no one had acted on the 1893 permits. Now, in 1902, as Wiley argued with the Farmers' Canal and claimed the earliest date, Mead's successor had to decide what to do with Wiley's claim. Despite the looming unmet deadline in Wiley's permit, he appreciated Wiley's construction difficulties, and he had some sympathy for getting water to the eager farmers who were living in sod huts at Wiley's colony. He was totally unwilling, however, to give Wiley's project any priority over the Farmers' Canal, where the farmers had been successful in getting water to land and "proving up on" their water right (Attorney General 1901-02, 8-5-1901; Mead-Van Orsdel Correspondence, 11-14-1902, 12-2-1902).

The state engineer asked for advice – twice – from the state attorney general. The attorney general, appointed by the governor, responded that Wiley should indeed get water via the priority position he sought, ahead of the Mormon colony. Further, the attorney general said, an unmet construction deadline on Wiley's project would not affect his permit or his priority right to water, whenever he did get everything built (Attorney General 1901-02, 8-5-1901, 6-30-1902.)

To reach that conclusion, the attorney general, Josiah Van Orsdel, outlined a sweeping new view of state water permits and of federally-supported water projects. Van Orsdel declared that state water permits should be regarded as documents that conveyed a germ of a property right (an "*inchoate*" right, the attorney general called it). The permit holder had to nurture that right, by putting the water to use. The state engineer's office, however, also had a duty – to protect that right at the earliest stages, which meant delivering water before construction was complete, if necessary (Attorney General 1901-02, 8-5-1901). The germ of a property right also gave a permit holder the right to change plans for reaching the same lands. So if someone like Wiley, with a new plan, bought up an older permit, he was merely changing old plans and could claim the old permit's priority date (Attorney General 1901-02, 6-30-1902).

The attorney general also declared that state water permits for projects like Wiley's, which had federal lands set aside for them, were a special case. In their case, he wrote,

failure to meet water permit construction deadlines carried no penalty. The germ of a water right conveyed by a permit could not be lost. Since such projects had land set aside for them, it was only logical they should have their water set aside for them too, for as long as it took to get the project built (Attorney General 1901-02, 6-30-1902).

The attorney general's conclusions caused an uproar along the Gray Bull River, in the state engineer's office in the capitol, and beyond (Mead-Van Orsdel Correspondence, 8-19-1902, 11-14-1902). Van Orsdel wrote to Mead about it. Mead, now heading up "Irrigation Investigations" for the federal Department of Agriculture in Washington, D.C., recalled the sequence of permits involved in the Wiley project and the Farmers' Canal very well. He told Van Orsdel flatly that he was wrong, and that Van Orsdel's view "would cause unending confusion, would be unjust to other appropriators on the stream," and violated the Wyoming constitutional language on water that Mead had spearheaded (Mead-Van Orsdel Correspondence, 11-14-1902). Van Orsdel, who had worked closely with Mead in Wyoming years before, responded doggedly, "I am aware that I have departed from some of the principles upon which we were always agreed, in my opinion, but I still believe that my opinion to a large extent, will be upheld" (Mead-Van Orsdel Correspondence, 11-24-1902).

Van Orsdel's prediction was both right and wrong. The state engineer's office had little choice but to implement the attorney general's ruling and give Wiley water. The Farmers' Canal immediately filed suit. The state district court ruled for Farmers' Canal, and against Wiley – overruling Van Orsdel's opinion (Farmer's Canal 1902-1904). That court, located in the Big Horn Basin, said Wiley could get water he needed – but only *after* the Farmers' Canal got the water it needed. The court ruling stuck: both projects on the Gray Bull were successfully irrigated under that priority order for some decades after.

All this was, however, only an initial wrangle over just what water use was required for a permit holder to obtain a protected Wyoming water right, with a priority position. There was more to come – and Van Orsdel's opinion in the Wiley case did, in the long run, manage to prevail where it mattered, in policy statewide.

Next up to bat was the U.S. government. Westerners, after watching so many private irrigation ventures flounder even with the gift of public lands, had begged Congress to authorize the federal government to take on irrigation of the West (seen as "reclamation" of a desert) (Lilley and Gould 1966). The new U.S. Reclamation Service of 1902 started one of its first projects in Wyoming's Big Horn Basin, on the Shoshone River just north of the Gray Bull. The federal agency acquired an unused permit from 1899. The 1899 project was a

venture of showman Buffalo Bill Cody, who could never pull the funds together to successfully divert part of the Shoshone up to the benches above it. His 1899 permit, however, had considerable value vis-à-vis the many irrigators who had moved on to the Shoshone soon after 1899 (Bonner 2007). So the federal government acquired the permit – and then met with its own difficulties. The plan was to build a dam for storage, and diversions. The Shoshone River was big, and neither damming its steep canyon nor diverting it was easy. By 1910, the government’s Shoshone project was far from complete. By 1915, the state engineer’s office said the valuable 1899 permit for diverting direct flow of the Shoshone was void due to failure to meet construction deadlines. The federal government protested – and pointed to the Wyoming Attorney General’s opinion of 1902 on the Wiley Project. Van Orsdel had said that that project’s permit was unaffected by missed construction deadlines, and the Reclamation Service demanded the same treatment. Van Orsdel’s old opinion had a life of its own, and still cast a shadow, despite the district court decision that had effectively overruled it on the Gray Bull. Shown the 1902 opinion by the current Wyoming attorney general, the state engineer reluctantly allowed the federal project to keep its 1899 priority date (Wyoming State Engineer Correspondence 1915, 12-17-1915, 12-27-1915). Though the federal project grew only slowly, and later state engineers kept raising the issue of permit expiration, the big federal dam built on the Shoshone eventually supplied so much water to everyone on that river that it drowned out neighbors’ initial protests (State Engineer 1921-22, 51-58; Burritt 1935). After years of growing and using more water, the project did not prove up on the old permit to get a state certificate until some 90 years later, as a manager in the state engineer’s office confirmed in 2006.

The state engineer’s office was concerned about water users missing deadlines statewide, however. With water superintendents short of time and money to get all new water uses adjudicated, some water users ended up content to take water from Wyoming streams as convenient based on their state permits alone (State Engineer 1903-04, 20; State Engineer 1915-16, 86-87). Inevitably, some users naturally believed, as one state engineer had warned that they would, that their permits alone had conveyed a “water right of perpetual value,” with the priority of the permit application date (State Engineer, 1903-04, 11). In 1916 the state engineer demanded a strict new statement of the original rule, and the legislature enacted it (State Engineer 1915-16, 86-87). Water permit deadlines were to be met, on pain of forfeiture of the permit and the priority position involved. Water users had to seek appropriation certificates, requiring superintendent examination and proof of use,



within two years of getting water onto land (or, for long pending permits, by 1919) (Session Laws of Wyoming 1917, 119).

Yet this apparent victory quickly dissolved into another defeat. In 1920, the state engineer declared that the statutory requirements had to be relaxed. Many water users had not complied and superintendents couldn't get around to inspect all the water rights that should have been adjudicated (State Engineer 1919-20, 62-63).

The "contract" view of a water permit had lost out – and with its defeat, users' property rights in water had gained ground. The rule about how someone got to be a Wyoming water user had become less clear. There was no penalty attached to a failure to meet permit deadlines. A would-be water user had only to get an agency permit, and with that would get a toe-hold on a priority position in the water use system. A Wyoming water permit came to be regarded, increasingly, as Van Orsdel had regarded it in 1902. It conveyed the roots of a property right to use water, with a certain priority position – a right that must be protected by the state engineer's office.

Consequently, the state agency had less gate-keeping power. There were admittedly still limits on who could get into the world of secure Wyoming water users. A state permit remained, and has remained to this day, an absolute requirement: in Wyoming claims to water rights based on long usage without state permit are rarely made; any such claims are uniformly thrown out (Trelease 1984, 203-205; *Lewis v State Board of Control* 1985). In the early 20th century, while few water permits were denied (State Engineer 1909-1910, 10), many were issued only after promoters revised their projects to make them more practical, in the view of the engineer's office. And in fact, many water users did use their permitted water, prove their use, and receive certificates of appropriation. But the aura of private property – the idea that water rights were like private property rights in land - clung to the rights obtained, whether via permit or certificate, in the minds of some users.

By 1920, water users had taken on more authority than Mead had envisioned for them when he designed the state-ownership water system in 1890. Users could determine for themselves what water use would actually be allowed to take place. Distances were long, and superintendents and their staff lacked time and money to get everywhere. Those were the factors that made it impossible for superintendents to inspect and adjudicate all the outstanding water rights, and they were the factors that gave users more and more authority over what actually happened with Wyoming water. In 1920, when users faced a drought year on top of a depressed agricultural market, juries in the Big Horn Basin refused to convict on charges of water theft, even when unchallenged facts showed illegal use of water.

On some creeks, the superintendent in the Basin reported, neighbors decided to turn a blind eye to water rights sitting unused, and no one brought charges that the rights had been “abandoned” and should be stricken from the records (State Engineer 1919-1920, 81-82).

Neighborhood monitoring of water use appears likely to have become the norm by the 1920s, judging by the evidence of legal cases that emerged in later decades. Water users took over some of the supervision and enforcement role that the state engineer’s office had once expected to perform. Neighbors might watch to see if water diverted under a permit went to the lands that were originally planned (*Green River Development v. FMC* 1983). Neighbors might not draw attention to water rights left unused for years – but they would be the first to know and could be ready to object if that water right were suddenly revived and the water diverted from the stream (*Lonesome Fox Corp.* 1981, Wyoming State Board of Control Order Record Book 27, 19). The local economy and the current value of water could make a difference in what water use or disuse neighbors tolerated. A good deal also depended on personalities and the interpersonal relations on a creek – whether the local norm was accommodation or intimidation, for instance. Now, and no doubt then, successful intimidation can change the priorities to use water on a given stream, for instance – and even a superintendent who knows what is going on might not enforce the official priorities unless someone braves the bully on the creek and complains, as one superintendent explained in 2000.

So by the 1920s, the state engineer’s original policy on what a water permit required, and what were the roles of users and of the engineer’s office, was defeated. Yet in 1909, on the issue of selling water, the state engineer’s original policy prevailed. What brought on these different results? Clearly, on the issue of permit requirements, a user with considerable power and lobbying influence - the U.S. government - played a major role. So too, however, did the ordinary users of all kinds, insignificant except in their numbers, and the division superintendents, who together could not manage to comply with the strict requirements the state engineer sought.

The most telling factor in the final defeat of the state engineer’s view of water permits may well have been the location where this question arose, and its symbolic significance. The Big Horn Basin, and the Shoshone River itself, embodied the hopes for new communities, the huge tasks involved, the difficult terrain and the constant irrigation disappointments common to all of Wyoming. Would-be water users statewide, no matter what their size or their finances, all identified with the problems of getting ditches built and water onto land on time. The state engineer’s files from the time are full of hand- written

letters explaining why permit deadlines couldn't be met. In cases of small water users, the state engineers often canceled water rights for failure to meet deadlines, despite good excuses. "I was sick all summer and was not able to work. I wish you would give me a little more time to finish this ditch," one would-be irrigator pleaded with the state engineer in 1918. The engineer (the same man who was compelled by federal government pressure to extend the Shoshone Dam permit in 1915) replied firmly to this small irrigator that his permit was expired, gone and off the books Wyoming State Engineer Correspondence, James True-Ron Nebeker, 9-30-1918).

It was, of course, the federal government and its Reclamation program that pushed the outer limits of a Wyoming water permit so far that it was hardly recognizable as the contract once envisioned by the state engineer's office. But the federal program embodied the kind of settlement policy and investment yearned for not only in the Big Horn Basin but also in most of the rest of Wyoming, where starting in 1911 state funds were invested in a program to recruit farmers and capitulate to the state (Larson 1978, 363-4). Ultimately, perhaps, what won the day for extending permits and leaving much water use unadjudicated was the ordinary water user's painful experience with just how hard it was to turn Wyoming prairies and benches into irrigated farms.

The state's water managers had watched the users' troubles with increasing concern. By the 1920s, irrigation growth in downstream states contrasted sharply with agricultural depression in Wyoming. The engineer's office, by the 1920s, had become eager to be flexible, ready to stretch the rules to keep permits alive - in order to help get water onto Wyoming land. Otherwise they feared that, under newly emerging court decisions on interstate water rights, neighboring states could establish use and rights to all the water of a river. In 1922 the state engineer, after raising anew the question about whether the federal permit on the Shoshone should be considered void, pointed out that the public interest governing his duties cut two ways. It was important to protect individual appropriators who managed to put water to use on deadline, and had obtained water rights. But it was equally important, the engineer said, to support the development of water in Wyoming as far as possible, so as to compete with growth in water use in other states. That very year of 1922, the state engineer signed the first interstate compact - on the Colorado River - setting precedent for how to keep water available in Wyoming for later use, despite slow growth in the present. He also upheld the federal government's claim to an early priority date for the Shoshone Dam, despite missed deadlines - so as to support that prospect for Wyoming water development (State Engineer 1921-22, 54-55; Tyler 2003, 15-

20, 218). Four years later, Wyoming voters rewarded this state engineer by electing him governor (Larson 1978, 460-62).

So by the 1920s, on the question of what water use was required to get a water right, the initial idea held by the state engineer's office gave way to a reality recognized by both users and administrators. Putting water to use in Wyoming was a tough job, and sometimes the best that could be done fell short of the best that was once envisioned.

The rule that settled into place as a result allowed water rights to be rooted in a permit alone, leading water users to take on more property rights in water. That, in turn, inevitably gave to water management a tinge of land management thinking. Wyoming water users and the engineer's office originally demonstrated an understanding of key differences between land and water, with emphasis on the inevitable interdependence inevitable to users of water. That understanding was reflected in the way both users and the engineer's office adamantly opposed water right sales, denying private ownership of water, in the Little Horse Creek controversy. Land management thinking, with its focus on private ownership, was a powerful model. Into the 1920s, Wyoming people made active use of the federal land policy that gave individuals ownership of land if they followed up on an initial "homestead" land permit with "good faith" efforts to settle the land (Spaulding 1884, secs. 76, 80, 103, 106; Larson 1978, 173-78, 362, 414-416). Attorney General Van Orsdel, who opined in the Big Horn Basin cases that a Wyoming water permit contains a valuable germ of a private property right in water, later made himself into a nationally recognized jurist expounding the law governing agency action (Morris 2001, 68, 73-77). In 1902 he may well have seen the state engineer's office as simply a water-oriented version of the U.S. General Land Office – with the simple mission of churning a public resource into private property. That had not been Mead's view, but as Wyoming water users and the engineer's office experienced the troubles of trying to put water to use, both water users and administrators began to adopt some of Van Orsdel's way of thinking. In their actions 1910-1925 on what actions a water permit required, eagerness to get Wyoming water into use no matter how long it took led users and agency alike to sidestep the distinction they had seen between water and land. That meant that users wound up, in the 1920s, with more property rights in water, associated with increased authority over water use.

#### **5.4 Conclusion: What they Wrought**

Twenty-five years of implementation of water management in Wyoming in the early 20th century significantly changed the system. The original state-run system put water into the

hands of private water users, but maintained considerable public control. There would be inspection of the uses those private parties achieved, and continued supervision. The supervision would ensure that successful water use remained attached to the lands originally intended, and that unsuccessful ventures were replaced by better ideas. When the words of first State Engineer Mead are read along with Schlager and Ostrom's (1992) classification of property rights, it becomes apparent that Mead expected the state agency to act as the resource owner, exercising the right to exclude users and to determine how and when they would use the water; and also holding the right, though forbearing ever to use it, to sell or lease away the water.<sup>142</sup> The water users in his view were to be merely authorized users of the resource, with the right to access the water and to withdraw it (within limits set by the agency).

Mead declared in the 1890s,

*There is no question but what absolute ownership would be more valuable to the individual securing control of the stream than the right to use water for beneficial purposes, but we have never believed that the purpose of the State in assuming control of the water supply and protecting appropriators in its use was for the purpose of conferring a valuable property right on individuals to the exclusion of the rights of the public. (State Engineer 1893-94, 39-40)*

Mead also made assumptions, based on his own experience, about how this arrangement might change, should change ever be needed. Mead expected that change would come from the two key players who had set up the original system in 1890: The state administrative agency (headed by Mead) and the legislature (with whom he worked to establish the water statutes).

Issues emerged that the initial system and its statutes did not address, however - areas of uncertainty highlighted in the Little Horse Creek and Big Horn Basin controversies.

By the 1920s, after working through those issues, the public via the state remained the owner of the water, but state administrators had more limited power to determine who could use water and how. The agency had sole say over who got a permit to use water, and for what purpose, and it could find that the public interest forbade permits for a

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<sup>142</sup> Mead wrote that the state of Wyoming, as owner, retained in theory the right to alienate or transfer Wyoming water entirely out of its hands (State Engineer 1895-96, 41). Schlager and Ostrom (1992) point out that the right of alienation is the final, key attribute of ownership. Mead described the Wyoming rationale for not acting on that power as follows: "It is admitted that if the State, the unquestioned owner, were to sell a stream to the highest bidder and authorize the purchaser to exact tribute from users the transactions would outrage public sentiment and seriously menace our prosperity and development. Our laws, therefore, make no provision for the sale by the State of water rights. Only those prepared to beneficially use water and those who have so used it can obtain rights in our streams by appropriation." Mead wrote this in the context of the Little Horse Creek situation, and went on to ask: How then could it be proper to allow such a user subsequently to claim ownership of the water and the right to sell it to anyone else? (State Engineer 1895-96, 41)

certain project. The agency could not always, however, preclude individuals from the user group, if those individuals once obtained a water permit. The agency could not supervise all water use as planned. It could not always know whether permit-holders were using water as they had stated; and it could not always require that deadlines for getting water into use were met. It had often to rely on users to monitor each other's water use, thus developing what use patterns they saw fit.

Water users thus had more management powers over water than under the original system. Though any variation in use from what was set forth in their permit or certificate had to be accepted, at the least by their neighbors, still they could make management decisions. They reached the status of what could be called quasi claimants, using the classification of Schlager and Ostrom (1992). They were not, however, able to treat their water as they did their land. They were not "proprietors," who could decide who else could be a user of water. And finally, they could not sell their water off to someone else. The holder of a water right still was not the "owner" of water. She was not free to dispose of water, as she might "own" and dispose of land.

Most important is how these changes were made: by user participation. Water users had become major players in defining the relationship between themselves and the state agency. Together they and the agency – not the legislature and the agency – made the rules. They jointly arrived at an arrangement on who had what powers over water. In the course of 30 years of change the legislature, which had established the original system of centralized state control, ended up playing only the minor role of codifying the new principles arrived at by the agency, the water users, or both, moving away from centralized state control. What the written *Constitution of the State of Wyoming* had to say about water did not change (and has not changed, since 1890), but the underlying constitution of the state's water management system did change – a new constitutional choice was made, in Ostrom's terms (2005) - with this change in who set the rules governing the daily choices available to water users.

A system of neither centralized state control nor private ownership, the working arrangement of water management in Wyoming relied on complex interaction between the state engineer's office and the water users. Together, they became a community of their own. The state engineer's agency and the users together set the rules; the state agency kept the records and articulated the rules; in many locations the users monitored and enforced the rules; the state engineer, in turn, became the monitor and enforcer when the users exhausted what they could do locally. Situations described in state engineers'

reports or court records show that the response to violations of the rules ranged from enforcement of a set pattern of water use, to monetary fines, to loss of the right to use the water (Nichols v. Hufford 1913; State Engineer, 1919-1920, 72, 80-81). Disputes over water use went to the local water commissioner, then to the superintendent, then to the state engineer, and then to the superintendents and the engineer sitting as a review board, and rarely to the state judicial system. The process was low-cost and user-friendly, with no need for a lawyer except in the last resort of state court – Mead was particularly proud of this feature, and of the fact that few Wyoming water disputes went so far as to reach the courts (Mead 1903, 247, 256-259). The state agency, dealing with a small population in a large area, became less the locus of centralized control and more the chosen agent of the users. The rest of Wyoming society paid considerable respect to the autonomy of the managers-users community: on water matters, the legislature acted at their request, not on its own initiative.

Lawyers attempting to work with and analyze this system have found it rather murky – involving a property right that could not be sold, its use governed by rules that could change depending on location and situation, but might not be stated in statutes or court decisions. To the users and the state engineer's agency, however, the system seemed rather straightforward and practical. They worked together and, though sometimes at odds, they didn't have to call on lawyers too much; the rules they put together were stable enough that people could and did invest in land, ditches and reservoirs.

For an outsider working with the system, it can be most useful to think of Wyoming water management as a system that, with considerable user involvement, distributes varied rights to a scarce common pool resource between an administrative agency and users, who together can be viewed as the community that manages the resource. The institution so viewed demonstrates what Ostrom found to be characteristic principles of common property ownership systems that endure: Clearly defined boundaries of the resource; rules meeting local conditions; users participating in making, monitoring and enforcing rules; low-cost dispute resolution and appropriate sanctions; and larger- government recognition of the right of the users to organize their own institution (Ostrom 1990, 90-91). Wyoming people dealing with water found that this arrangement, with its attributes of a common property system rather than a centralized state system or a private property system, was the practical way to manage water in the physical and social circumstances in which they found themselves. Much of this decision had to do with simply the size, topography and climate in the area the Wyoming water system attempted to cover, and the era when it began, with technology

and transportation remaining rudimentary. It demonstrates a fundamental adjustment of a human institution to meet the social and environmental circumstances surrounding it.

As Mead put it when a young engineer:

*“..a climate so different from that of the East as to profoundly modify the structure of plants and the colors and habits of animals required a corresponding modification of laws and institutions to bring human settlement into harmony with its environment.”*  
(Mead 1902, 3)

As it turned out, the physical and social environment also required modification of Mead’s own ideal of a centralized system, the system once hailed as a model for other Western states.

How the Wyoming system changed over subsequent years, and whether it can meet today’s changing economic and social conditions is a topic for another day. What the history examined here does suggest, however, is that water in the American West may be usefully seen as being under a form of community management rather than a regulated private property scheme.

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## 6. LOSS VS. TRANSFER OF WATER RIGHTS: A LOCAL HISTORY OF TWO INTERLOCKING DOCTRINES AND WHAT IT SAYS ABOUT WATER LAW<sup>143</sup>

**Abstract:** *Rules on the loss and the transfer of water rights are key doctrines in Western water law. Loss via abandonment has generally been restricted by the courts, while transfer of water rights to new purposes or places has been liberalized – both suggesting that water rights increasingly should be construed as private property rights. Yet transfer procedures often are reminiscent of abandonment cases: recent use is minutely examined as the transferable amount of water is considerably pared down. How has abandonment managed to rear its head again in transfers, and what does that mean? Examination of the history of these two doctrines in Wyoming, where change has been slow and the parties are few, suggests that interdependence among water users, a result of hydrology, is the driving factor behind transfer restrictions and the welcome they offer to abandonment-style review. Fear of speculation in water rights, the original source of transfer restrictions, has been joined by fear of disruption of local economies and cultures, and together those concerns continue to prompt transfer restrictions. The source of concern is, at root, interdependence among water users. Interdependence shaped by hydrology is a fundamental feature of human use of water resources, and it not only accounts for the shape of water law doctrines, but suggests that ultimately it is not helpful to construe water rights as private property rights. Rather, to take interdependence into account, they are necessarily property rights distributed between private actors and the public as represented by administrative agencies (with distribution patterns that vary by state). That basic understanding should be borne in mind by anyone proposing ways for Western water law to adapt to whatever social, economic, or climatic changes lie ahead.*

### 6.1 Introduction

In one of the most sparsely populated and arid regions of the United States, the state of Wyoming, water management has developed in isolation and produced its own peculiar versions of principles common to water law in the Western U.S.

In this secluded laboratory, where industrial and urban growth have been slow and small, central policies in water law and management have evolved gradually, and the implications are easy to track. Two key questions – whether and how rights to use water can be lost and whether and how they can be transferred elsewhere – have been the subject of long and carefully recorded discussion. The conclusions reached thus far reveal an interlock

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<sup>143</sup> MacKinnon, A. (publication pending). Loss vs. transfer of water rights: A local history of two interlocking doctrines and what it says about water law. Submitted April 2012 to Natural Resources Journal (see <http://lawschool.unm.edu/nrj/> ) The citation style of the article reflects the requirements of the journal to which it is submitted.

between the rules of loss and transfer: A water right in Wyoming is difficult to lose...until you try to transfer it, and then you may lose a lot. An apparently odd result, this is nonetheless only the extremely conservative and cautious version of similar conclusions reached elsewhere in the water-short Western U.S.

As Dan Tarlock has pointed out, water rights through the course of the 20<sup>th</sup> century were increasingly regarded as private property rights – subject like any other private property to state regulation, sometimes with a nod to the peculiar physical characteristics of water, but a private property right all the same. It has been, of course, in the interest of lawyers, working for private clients, to portray water rights this way; the courts have typically absorbed this view.<sup>144</sup> Whether it was accurate or not has not mattered much in the big scheme of Western water development, with water management increasingly a matter of federal-state deals, and lately of multi-stakeholder negotiations. In that context, the prior appropriation system of water rights boils down to a risk-allocation scheme, a default rule that only makes more urgent the need to negotiate new deals.<sup>145</sup>

Yet as the West faces the overwhelming challenge of climate change on top of population growth and an increasing variety of demands, it is worth revisiting the characterization of water rights as private property rights. Tarlock, David Getches, Charles Wilkinson, Joseph Sax and others have described over the past quarter-century the many limitations inherent in water rights, from the doctrine of beneficial use to the public trust doctrine. Their work suggests how, if water rights are considered a property right, new rules affecting water use

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<sup>144</sup> A. Dan Tarlock, A. D., New commons in Western waters. In DAVID GETCHES, ed., *WATER AND THE AMERICAN WEST: ESSAYS IN HONOR OF RAPHAEL J. MOSES*. Boulder, CO: Natural Resources Law Center, University of Colorado School of Law. (1988); A. Dan Tarlock, The future of prior appropriation in the New West. *Natural Resources Law Journal* 41: 4. (2001); Lasky, M. From Prior Appropriation to Economic Distribution of Water by the State – Via Irrigation Administration. 1 *Rocky Mtn. Law Rev.* 161 (1929); Meyers, C.J. In Defense of Private Rights in Water: A Response. Outline for a conference talk, *Water as a Public Resource: Emerging Rights and Obligations*, Natural Resources Law Center, U. Colorado, Boulder, CO. (1987) Available at: [http://www.rlch.org/WWPP/archives/publications/1987/87\\_CFD\\_Meyers.PDF](http://www.rlch.org/WWPP/archives/publications/1987/87_CFD_Meyers.PDF); SAX, J.L. *THE CONSTITUTION, PROPERTY RIGHTS, AND THE FUTURE OF WATER LAW*. Western Water Policy Project Discussion Series Paper, No. 2., Natural Resources Law Center, Univ. of Colo. School of Law. (1990) Accessible at [http://www.rlch.org/WWPP/archives/publications/1990/90\\_RR\\_Sax%\(constitution\).pdf](http://www.rlch.org/WWPP/archives/publications/1990/90_RR_Sax%(constitution).pdf); Wilkinson, C.F. In Memoriam: Prior Appropriation, 1848-1991. 21 *Environmental Law* XXIX 199 (1991).

<sup>145</sup> Tarlock 2001; Getches, D. The Nineties: Major Developments in Western Water Law. Conference paper, *Strategies in Western Water Law and Policy: Courts, Coercion and Collaboration*, Natural Resources Law Center, Univ. of Colorado School of Law, Boulder, CO. (1999) Accessible at: [http://www.rlch.org/WWPP/archives/publications/1999/99\\_CFD\\_Getches.pdf](http://www.rlch.org/WWPP/archives/publications/1999/99_CFD_Getches.pdf)

(perhaps rules adopted to deal with climate change) might fare if challenged as a “taking” of property without compensation.<sup>146</sup>

This paper steps back to take another look at the nature of water rights, in order to better understand how Western U.S. water management might adjust to crises like climate change. The paper re-examines water rights by drawing on the historical development of the transfer and loss doctrines in their Wyoming laboratory. Taking a cue from Moses Lasky’s seminal paper of 80 years ago,<sup>147</sup> this inquiry seeks to determine how water rights actually function, independent of their legal definition. The paper argues that the stark rules on loss and transfer of water rights that persists in Wyoming reveal characteristics of water rights too often overlooked. The loss and transfer rules show that water rights may have aspects of private property rights – yet still not quite be private property. In this analysis, concepts from institutional economics are helpful. Institutional economics directs the focus onto who holds what rights to a resource, and what governance of that resource results. Review of loss and transfer rules for water in Wyoming show that water users can hold property rights in water – including the right to use or not use water for years – but not all the rights. The public, via the state water administration, can hold other property rights in water, including the right to keep water use from shifting to new places or purposes. Users need not hold rights merely at the whim of the state; and the state need not be a mere regulator of private owners. Rather, property rights in water can be distributed between users and the state. The relative distribution of those rights can vary over time and place, but shared rights means shared water governance. The users and the state, through its water administrators, can form a joint operation that manages its scarce water supply together, for better or for worse.

This paper suggests, based on the Wyoming history of two important water law doctrines, that the natural characteristics of water – the peculiarities of local hydrology that set the stage for water use - make it susceptible to such a joint management system. And, for anyone working with such a system, it is important to recognize the sources of authority in

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<sup>146</sup> See footnotes 1 and 2, above, and: Wilkinson, C.F. *Water as a Public Resource: The Legal Basis*. Outline for conference talk, *Water as a Public Resource: Emerging Rights and Obligations*, Natural Resources law Center, U. Colo. School of Law, Boulder, CO. (1987) Accessible at: [http://www.rlch.org/WWPP/archives/publications/1987/87\\_CFD\\_Wilkinson.PDF](http://www.rlch.org/WWPP/archives/publications/1987/87_CFD_Wilkinson.PDF); and Wilkinson, C.F. *Allocation of the Nation’s Waters: The Constitutional Framework*. Conference paper, *Boundaries and Water: Allocation and Use of a Shared Resource*, Natural Resources Law Center, U.Colo. School of Law, Boulder, CO. (1989). Accessible at: [http://www.rlch.org/WWPP/archives/publications/1989/89\\_CFD\\_Wilkinson.PDF](http://www.rlch.org/WWPP/archives/publications/1989/89_CFD_Wilkinson.PDF)

<sup>147</sup> Lasky, 1929.



the system as it deals with new challenges. This analysis helps explain the shift in recent years to multi-stakeholder negotiations, and may help set groundwork for further efforts to meet new conditions. Change and accommodation to change in this kind of system may come not from new state regulation, nor from private market choices, but from collective decisions reached by both groups that hold rights in water – the water users and the public via the state water administrators.

## 6.2 The Interlock: Loss and Transfer Rules

Water rights in Wyoming are based on the system of prior appropriation typical of the Western U.S.: the earliest-date right has a priority right to water in times of shortage. Prior appropriation states typically impose a rule of abandonment – water rights that are not used for a set period of years are lost.<sup>148</sup> Prior appropriation states also typically recognize, to varying degrees, a need for water rights to be transferred to new uses. Mindful of interdependency of water users drawing from the same stream, a number of states allow transfers if they do not injure the rights of other appropriators.<sup>149</sup>

Wyoming's version of abandonment rules has made it increasingly difficult for a water right to be lost due to a declaration of abandonment. Wyoming Supreme Court decisions require a showing that a water user has voluntarily left a water right unused through a five-year abandonment period. A generous interpretation of water put to use, and skepticism about the water interests of anyone bringing an abandonment charge, tend to narrow the chances of a finding of abandonment. Accordingly, abandonment contests that succeed in forcing the loss of water rights are few.<sup>150</sup>

In tandem with that development, Wyoming has formally recognized an individual's right to let a water allocation sit unused for long years, and then bring it back into active use - to surprise and potentially to disrupt his neighbors and their use of water from the same stream. The revival can be stopped only by an abandonment charge, typically launched by other water users - but only if that charge is filed before any use of water under the revived

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<sup>148</sup> FRANK J. TRELEASE, *CASES AND MATERIALS ON WATER LAW* (3rd Edition) (1979)

<sup>149</sup> Lawrence J. Macdonnell, The water transfer process as a management option for meeting changing water demands, Usgs Grant 14-08-0001-g1538, Draft Report (April 1990), I, 39-44. Available at: [http://www.rlch.org/WWPP/archives/publications/1990/90\\_RR\\_MacDonnell%20\(water%20vol%20I\).pdf](http://www.rlch.org/WWPP/archives/publications/1990/90_RR_MacDonnell%20(water%20vol%20I).pdf)

<sup>150</sup> *Scott v. McTiernan*, 974 p.2d 966 (Wyo. 1999); *Van Tassel v. Cheyenne*, 906 54 2d 906 (Wyo. 1936); *Simmons v. Ramsbottom*, 68 P.2d 153 (Wyo. 1937); *Ramsey v. Gottsche*, 69 P.2d 535 (Wyo. 1937).

right occurs, and only if the charge survives the many legal obstacles raised against a finding of abandonment.

There is, however, a catch to reviving an unused water right. Revival can only resuscitate the old pattern and purpose of water use associated with the right. If, instead, the idea is to use the water in some new way - putting it to new uses or on new locations - the game changes.

If new purpose or use is proposed, the rules on transfer of water rights come into play. In the effort to be certain of no injury to others' water rights, the water right proposed for transfer comes under microscopic scrutiny – a scrutiny much stricter than has evolved in abandonment cases. Under that scrutiny, any part of the water allocation found to be unused in recent years won't get a new future. Instead, that part of the allocation is gone. Often, the used portion is itself further cut back, possibly by half or more, in order to ensure that water that would have returned to the stream unconsumed remains in the stream.

Thus, it turns out that in Wyoming old unused water rights can become useful in a new era – but not too quickly. The only way to put old unused rights to new uses in Wyoming is to put the rights to work in their old uses first, for several years, and only then try to put them to a new use.

So stand the doctrines of abandonment and of transfer of water rights in Wyoming. With these two doctrines in place, water in Wyoming is thus a resource in which people can secure private property rights of great value, rights that can lie unused like a buried treasure. But they are rights that might shrink or even vanish if put too quickly to a new use - not a secure private property right at all.

An abandonment doctrine that encourages old rights to lie unused but on the books, capable of revival at any time, is problematic. It is a major hindrance to effective water regulation, and it potentially makes a mockery of water records. A transfers doctrine that uses a screening process so elaborate that it discourages the shift of old water rights to new uses - or requires investment in old ditches before moving water to a new power plant - can make for poor economic use of water. It is not surprising that water law in Wyoming, with both doctrines at work, has been criticized for making water regulation difficult, and keeping water use uneconomic.<sup>151</sup>

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<sup>151</sup> Milliman, J. W., *Water Law and Private Decision-Making: A Critique*, 2 JOURNAL OF LAW AND ECONOMICS 41, 51-52 (1959); Michael V. McIntire, *The Disparity between State Water Rights Records and Actual Water Use Patterns*, 5 Land & Water L.R. 23 (1970); Mark Squillace, *A critical look at Wyoming water law*, 24 LAND AND WATER LAW REVIEW 307, 338-341(1989)

Other states have similar doctrines – allowing revivals, yet scrutinizing any attempt to move water to new uses.<sup>152</sup> And water rights do manage to move to new uses in such states, including Wyoming.<sup>153</sup>

This combination of policies – which allows rights to be revived but not immediately revived into new uses - seems to satisfy water users and administrators. Certainly that is the case in Wyoming. Neither users nor administrators have taken major steps to change the rules. Whatever benefits either more efficient regulation or active water markets might provide, it seems, people working with water in Wyoming will either forego or try to achieve by other means. To them, the two doctrines work together well. To them, the rules of loss and transfer are not anomalous relicts of legal history, which have to be memorized because they cannot be understood. Rather, to Wyoming people in water, these two doctrines reflect quite clearly their understanding of water and of water rights: however much they might wish it otherwise, they realize they are not at bottom dealing with private property in water. This paper, by diving into the evolution of the Wyoming doctrines, finds concerns there that are particular to users of water rather than land, and universal to users of water in the West. Wyoming has its peculiarities; but this paper suggests that the conclusion that water rights are not a matter of private property might well apply to other states.

### **6.3 An Analysis Tool, Borrowed from Economists**

In comparing rights to water and rights to land, an analysis much in use by economists and social scientists can be helpful. A leading line of thought in those fields is that when rights to resources are examined closely, they can be classed into five types – rights to access, to use, and to manage the resource, plus rights to exclude others, and to alienate those last two rights to others. This analysis echoes the legal tradition that property consists of a “bundle of rights,” but it is more helpful because it is more precise. It helps identify exactly which powers are held by whom in a given scheme of property rights. In this analysis, put forward by Schlager and Ostrom in the 1990s and elaborated upon by many

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<sup>152</sup> Colorado’s practice in this area is cited in MACDONNELL (1990) , Vol II, ch 3, pp 3-5.

<sup>153</sup> Transfers of water rights are distinguished from short-term transfers of water, within water districts or via water banks, which are much more common, in a number of states. MACDONNELL (1990); Howe, Charles W. Innovative Approaches to Water Allocation: The Potential for Water Markets, outline for conference talk, Western Water: Expanding Uses/Finite Supplies, Natural Resources Law Center, U. Colo. School of Law, Boulder, CO. (1986). Available at: [http://www.rlch.org/WWPP/archives/publications/1986/86\\_CFD\\_Howe.PDF](http://www.rlch.org/WWPP/archives/publications/1986/86_CFD_Howe.PDF)

colleagues, the last three rights listed - management, exclusion, and alienation - are the most powerful, because holders of those rights have the authority to set the rules for how a resource will be used.<sup>154</sup>

Private property in land, in the American law context familiar to the Wyoming courts and the water users, typically means the right-holder in fee simple has all five of those rights – in both economic and lay terms, she is the “owner” of the land.<sup>155</sup> She may encumber her rights and the government may regulate her actions, but owner she is.

Rights in water are arguably not so clearly all in the hands of the water user. Water rights holders clearly have rights to access and to use water. It is another question, however, how much they have a right to manage use, to exclude others and to alienate rights of management and exclusion. The results of this investigation will vary by state, but the point of this paper is that the question is worth examining in every state.

In the West, the prior appropriation system has a good deal to say about management—how much water is used where and when – and therefore administrators do too, when supplies are short. Permit-system states may combine management with exclusion – the power to approve or deny individuals’ proposals to use what water, where, and when – and put that authority in the hands of administrators. Wyoming, initially the leading permit-system state, clearly does so. The power to exclude encompasses the power to say not only who is allowed what water use, but also what uses are not allowed to what people. Accordingly, the issue of loss of water rights also involves exclusion issues. The long Wyoming debate over abandonment, and the outcome of the debate, discussed below, demonstrates that. Administrators in Wyoming can deny a permit, or limit what is covered by an adjudicated right. Despite what the abandonment doctrine appears to say on its face, however, since the early 20<sup>th</sup> century Wyoming water administrators have not easily been able to exclude use of water in a certain time or place because that water has not been steadily in use. Once admitted to the circle of water users, a landowner, a town or an industrial facility is not easy to eject. Users (and their successors) hold on to their water allocations and can in effect choose over the years when and whether to put the water to use, as it suits them – hampered only by the extent to which their neighbors are willing to

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<sup>154</sup> Edella Schlager and Elinor Ostrom, Property-rights regimes and natural resources: A conceptual analysis, 68 *LAND ECONOMICS* 3 (1992).

<sup>155</sup> Thomas W. Merrill and Henry E. Smith, Optimal Standardization in the Law of Property: The Numerus Clausus Principle, 110 *YALE LAW JOURNAL* 1 (2000); Schlager and Ostrom.

challenge them. That means that users have won management power and administrators have lost exclusion power.

Alienation, the transfer of a water right, is the final subject for investigation. As noted below, in the water context alienation means authorizing a water right to be used for another purpose or in another place, not just putting the right in the name of a new owner. Restrictions on alienation in this sense often occur in water rights, to the frustration of economists seeking more vibrant water markets as the way to move water to new needs. Users can find it is beyond their power truly to alienate their rights, depending on their physical location and the plan for alienation.

Thus this article will argue that water users do not have all the rights that would make them owners. There is much contested ground in the history of water rights in the West, and the struggles have particularly centered on management and exclusion. Long debates, and occasional battles, have ensued over who has those rights - users, or water administrators (or other representatives of the public - be it the courts or the legislature). But a true right of alienation has eluded the users, and in fact the typical rules on alienation withhold some exclusion powers, as well, from users. The reason for this, this paper suggests, is fundamental to the nature of the water resource, and the fact that the resource is shaped by hydrology.<sup>156</sup> Accordingly, water rights are never likely to be properly considered a private property right.

#### **6.4 Loss of Water Rights**

Rules on abandonment are essentially answers to the question of whether and how a water user can lose a right to use water.

The question lends itself to drama and to dramatic language: “Abandon” and “forfeit” are the words used in law and in everyday language to condemn a man or woman to lose the right to use water in the arid West. In Wyoming, legal traditions and difficult everyday experience in a cold high desert landscape have combined to help people manage to avoid that kind of drama wherever possible.

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<sup>156</sup> Terry Anderson and Peter Hill argue that restraints on alienation and obstacles to abandonment stem from a goal of protecting “cultural homogeneity that can reduce transaction costs” for groups of water users. (ANDERSON, TERRY L. AND PETER J. HILL, *PROPERTY RIGHTS: COOPERATION, CONFLICT, AND LAW* 137 (2003.)) The persistence of both features of water laws far beyond a period when cultural homogeneity might be found on Western streams (even in Wyoming), however, indicates that analysis is not helpful.

As a practical matter, in the early years of every state in the Western U.S., customs developing around water called for users to lose their right to water if they didn't use the water for some years. Failing to use water was called "abandonment" of a water right.<sup>157</sup> "Use it or lose it," along with "first in time, first in right," remains many people's short version of the common law system of prior appropriation.

In Wyoming Territory, first created in 1868, settlers adopted the prior appropriation concept. To put it into practice, the custom developed to allow people to claim a first-in-time right to take water out of a stream by posting a notice - on a tree, for instance, if there was one available. Eventually territorial legislation required the notice to be filed in a county courthouse (often hundreds of miles away).<sup>158</sup> As in other states, this approach to water use created some chaos and conflict. Wyoming Territory developed slowly enough, however, that when statehood came in 1890, it was still possible to replace the customs wholesale with a new, orderly statutory system. A young engineer hired in the last years of the territory undertook to do just that.<sup>159</sup>

The engineer, Elwood Mead, wrote up a new system written into the new state constitution. The system envisioned state control of the resource, with no individual access to water except under rights granted by the state through a strict adjudication and permit system. That system accepted the popular idea of prior rights based on the earliest documented use (or, for new rights, the earliest permit date) - "first in time, first in right." The new state system required, however, that the right to water be limited to just the amount of water that could be and was actually and effectively used.<sup>160</sup> In addition, construction deadlines and inspection requirements were designed to make sure that those who tried but failed to get water put to use were quickly replaced by more successful

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<sup>157</sup> *Utt v. Frey*, 39 P 807 (CA. 1895); *CF&I Steel Corp. v. Purgatoire River Water Conservancy Dist.*, 515 P.2d 456 (Colo. 1973).

<sup>158</sup> ELWOOD MEAD, *IRRIGATION INSTITUTIONS*, 69-71, 248-49 (reprint Arno Press, 1972) (1903); 1886 Wyo.Sess.Laws §10.

<sup>159</sup> Elwood Mead, *Recollections of Irrigation Legislation in Wyoming*, An enclosure in a letter to Grace Raymond Hebard, March 27, 1930. Mead Collection, American Heritage Center, University of Wyoming, reprinted in ANNE MACKINNON AND JOHN SHIELDS; *SELECTED WRITINGS OF ELWOOD MEAD ON WATER ADMINISTRATION IN WYOMING AND THE WEST* 8 (2000); available at <http://seo.state.wy.us/PDF/FinalMeadBooklet.pdf>; for details on water law development in this period, see Anne MacKinnon, *Historic and Future Challenges in Western Water Law: The Case of Wyoming*, 6 *WYOMING LAW REVIEW* 2, 299-300 (2006).

<sup>160</sup> *WYOMING STATE ENGINEER BIENNIAL REPORT 1891-92*, 58-62, 68 (hereinafter *STATE ENGINEER*); *STATE ENGINEER 1893-94*, 33-35; *STATE ENGINEER 1895-96*, 40; for details, see MacKinnon, *Historic and Future Challenges*, 302-303.

water users.<sup>161</sup> In accordance with that idea, Mead adopted the other familiar precept from the common law of prior appropriation – abandonment: “Use it or lose it.”

Wyoming water users had to be very alert to the warning to “use it.” Common law in the U.S. West has typically required a water right to lie unused for several years, often five, before it could be considered abandoned. The Wyoming Territorial Legislature of 1888, however, declared the fatal period of non-use to be only 2 years.<sup>162</sup> Legislators were, perhaps, impatient to see people keep water regularly in use or get out of the way to let someone else try. Mead, living nearby in Colorado in 1888, and in touch with Wyoming legislative leaders, may have influenced this legislation.<sup>163</sup> At any rate, the two-year abandonment rule was one of several in the territorial water laws that Mead adopted into state law and that remained in force after statehood.<sup>164</sup>

The decade of the 1890s, marking the first ten years of water management in the new state of Wyoming, were spent simply in establishing the state’s fundamental authority – its right to include or exclude people from the water rights system. The state engineer (who was Mead himself, for most of the decade) and his staff insisted that all users bring their territorial claims to be tested in stream-wide adjudications, and that the only new uses allowed were those that got permits from the state engineer’s office. In 1900, the state’s new high court upheld that authority against a vigorous constitutional challenge.<sup>165</sup>

The next 25 years were spent on more difficult questions: what did a water right from the state mean: Could the holder sell it to someone else to use elsewhere? Could she hold on to the right and only slowly put all the water involved to use? The answers to those questions were arrived at through a long process that made clear that it was the administrators and the users, not the legislature, who would make the law and policy in water management. By 1925, the administrators and users had arrived at a system

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<sup>161</sup> STATE ENGINEER 1895-96, 64-66; STATE ENGINEER 1903-04, 12-13; for details on the construction deadlines and inspection requirements and the policy involved, see Anne MacKinnon, *Making their own way: recognizing the commons in water management. Wyoming 1900-1925*. 3 WATER HISTORY 3, 198-99 (2011)

<sup>162</sup> 1888 Wyo. Sess. Laws 55, § 1.

<sup>163</sup> J.R.KLUGER, *TURNING ON WATER WITH A SHOVEL: THE CAREER OF ELWOOD MEAD*, 12-15. (1992)

<sup>164</sup> 1893-94 BIENNIAL REPORT OF THE STATE ENGINEER, 26.

<sup>165</sup> *Farm Inv. Co. v Carpenter*, 61 P. 258 (Wyo. 1900); for details on the setting and arguments in the case, see MacKinnon, *Historic and Future Challenges*, 304-306.

distributing rights to water between their two groups: administrators had the right to establish who had a water right, and water users could not sell the water into use elsewhere; but users could hold on to their right and only slowly put it to use as, conditions allowed.<sup>166</sup>

The difficulty in putting water to use, and keeping it there, in Wyoming's topography and climate, helped shape that result. Difficult reality also played a part in determining the further development of abandonment policy.

Topography and climate (economic as well as natural) seems very quickly to have led Wyoming's water users to see their strict statutory two-year period for abandonment as far too short. In 1905, in response to the water users (some of whom were legislators) and despite the opposition of the water administrators, the state legislature changed the abandonment period from two years to the five years more common in other states. There it has stayed ever since.<sup>167</sup>

Administrators continued to see abandonment as one important tool to put failed or sleeping water users out of the Wyoming water rights system and replace them with successful, active users. But that view began to face serious challenge. When water issues came before lawyers, rather than administrators, the legal minds tended to see a water right as a property right, not to be easily lost. In addition, the rapidly growing number of water rights on state records, representing water use proposals scattered across thousands of acres, meant it was harder and harder for administrators to track who was using water and who wasn't.

What kind of right *is* a water right? That was a question that caught the attention of the state's leading legal thinkers as implementation of the new state system proceeded. In 1904 the state supreme court declared that, contrary to the engineer's views, a water right could be likened to a property right in land – and so could be sold, with the water to be used elsewhere.<sup>168</sup> That decision stood for just five years, until overturned by the joint effort of the engineers and water users, through legislation in 1909. That legislation

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<sup>166</sup> For details on how this system emerged in the period 1900-1925, see MacKinnon, *Making their own way*, 206-209.

<sup>167</sup> 1905 Wyo. Sess. Laws 39; Wyo.Rev. Stats, 41-3-401; 1905-06 BIENNIAL REPORT OF THE STATE ENGINEER 95-96.

<sup>168</sup> *Johnston v. Little Horse Creek Irrigating Co.*, 79 P. 22 (Wyo.1904)



instituted a broad ban on transfers, with a limited list of exceptions, as discussed in Sec. IV.<sup>169</sup>

Despite that public rebuke, official legal opinion in Wyoming continued to see a right to water as much like a right to land. Fundamental property law approaches kept being raised in regard to water. “The law abhors a forfeiture” is a standard tenet of the law of property in land,<sup>170</sup> and it seeped steadily through official legal opinion into judicial decisions in Wyoming on water, to the point where “the law abhors abandonment” could sometimes be said of Wyoming water law today.

A key pronouncement on abandonment came, also in 1904, from the state’s attorney general. It was terse, and thereby the more emphatic. A former lawyer for both water promoters and water administrators in Wyoming, and a future federal appellate judge in the District of Columbia, the attorney general had elsewhere made it clear that he considered water rights very much akin to property rights.<sup>171</sup> In 1904 he answered a question from the water administrators on abandonment by saying flatly that administrators had “no authority whatever” to declare a forfeiture of a water right due to failure to use water. Unless the statutes were changed, he wrote, “this is a matter entirely for the courts.”<sup>172</sup>

It was just a few months later that the Legislature changed the fatal time period for abandonment from two years to five.<sup>173</sup> But, just as had been the case since territorial times, the Legislature put nothing in the new law about a procedure for abandonment, or who had authority to declare that a user had forfeited a water right. So the attorney general’s ruling - that the engineer’s office did not have that authority - held.

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<sup>169</sup> Report of Commission to Revise, Codify and Simplify the Laws of Wyoming Relating to Water Rights, STATE ENGINEER 1905-06, 17-29; 1909 Wyo. Sess. Laws 68, §1; MacKinnon, *Making their own way*, 195.

<sup>170</sup> WIEL, SAMUEL C. *WATER RIGHTS IN THE WESTERN STATES*, sec. 567, 3rd ed. San Francisco: Bancroft-Whitney 1911; WEST’S *ENCYCLOPEDIA OF AMERICAN LAW*, 1998, <http://www.answers.com/topic/forfeiture>.

<sup>171</sup> ATTORNEY GENERAL OF WYOMING BIENNIAL REPORT 1901-02: 8-5-1901, 6-30-1902; J MORRIS, *CALMLY TO POISE THE SCALES OF JUSTICE: A HISTORY OF THE COURTS OF THE DISTRICT OF COLUMBIA*, 68, 73-77; for details of the context for the attorney general’s related opinions on water rights, see MacKinnon, *Making their own way*, 200-205.

<sup>172</sup> OFFICE OF THE WYOMING ATTORNEY GENERAL, *OPINIONS OF THE ATTORNEYS GENERAL OF THE STATE OF WYOMING 1888-1922*, opinion of 12-12-1904 (electronic resource reformatted from the original)

<sup>173</sup> 1905 Wyo.Sess.Laws 39, enacted Feb. 15, 1905.

After a few more years went by, however, non-use of old rights became a more common problem. In 1912 and 1913 the water administrators requested and the legislature enacted a clear procedure for review of abandonment situations.<sup>174</sup> That procedure envisioned a neighbor, interested in making water available for his use, bringing a written complaint against someone who had a water right but hadn't used it. In that situation, the new statute said, the facts would be reviewed by the administrators (the "Board of Control" – the state engineer and the four superintendents of the four major water basins, in charge of establishment and change in water rights). As a board, they would declare the water right abandoned or not. Appeals could be taken to the courts.<sup>175</sup>

When the state courts reviewed these appeals, however, they persisted in imposing limits on abandonment. One key district court, in fact, soon refused the administrators the right to use abandonment themselves as a policing tool, to keep water rights in the hands of active users and out of the hands of sleepers. The court insisted that abandonment could only be declared in response to a complaint formally brought by a neighbor – and that rule held for a long time.

The circumstances of this decision are worth a closer look. It took place in 1918. In that year, the courts intervened to stop a massive administrative effort to clean up sleeping rights. The courts thereby allowed a large, impractical, and apparently unused right to stay on the books and available to its owners for over half a century. Eventually, technology made it possible for that old unused right to become useful – to be revived, and create continued strife in its neighborhood more than 100 years after that big water right was first staked out.

The right involved was on Horse Creek, a stream near the capitol city in gently rolling country that in the 1880s had won the attention of moneyed men from the capitol, from nearby Nebraska, and from distant railroad headquarters, for its potential as ranch or even farm lands.

Horse Creek is fed largely by occasional small storms, as it has no high mountains at its headwaters. In the area in question, the stream is however enhanced by geology. A succession of three large ditches with water rights from the mid-1880s can dry up the creek below each ditch head-gate. Yet the next one of these ditches gets water too. The

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<sup>174</sup> STATE ENGINEER 1911-12, 25, 33-34; 1913 Wyo.Sess. Laws 106.

<sup>175</sup> 1913 Wyo.Sess. Laws 106.

stream comes back to life in the stretch down to the next head-gate, fed partly by flows coming off irrigated fields, but largely by groundwater. A productive small aquifer, very local to the area where the oldest ranches and their ditches were established, is created there by a wide sand-silt-and-gravel alluvium bed along the stream, up to 100 feet thick, which is underlain by fractured siltstone. Those two features (and by now, 120 years of irrigation) work together to allow the groundwater to rebuild stream-flow steadily.<sup>176</sup>

Even the large 1880s ditches can and do divert in winter as well as summer – whenever the stream flows a little water and lack of ice make it possible to divert some water and build up soil moisture for spring planting.<sup>177</sup> By the 1900s, the idea of reservoirs just off the stream and near irrigable lands caught hold as a way to store whatever winter water the stream carried, for use in the summer growing season. In May 1908, a group of locals in a new “development company” got a state water right permit to build a reservoir to irrigate thousands of acres for settlers; later that same year, in October, a railroad land company with big holdings in eastern Wyoming, including an old ranch on Horse Creek, got a state water right permit to build a small reservoir at a spot where water stored in winter would seep out to build soil moisture in the surrounding pasture.<sup>178</sup> The local development group and the railroad land company knew of each other’s plans and negotiated exchanges of money and water to serve their different ventures.<sup>179</sup>

The old ranch that the railroad owned had a big old water right from 1884 - it was one of the ditches that if put to use could dry up the creek below its head-gate. It was an ambitious right, claiming to water 4,500 acres. It was typical of water rights claimed all over Wyoming in those days before the territory became a state – water rights that could best be called imaginative. A territorial judge – knowing little about the terrain and nothing about

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<sup>176</sup> HINCKLEY CONSULTING AND AMEC, HORSE CREEK GROUNDWATER/SURFACE WATER CONNECTION INVESTIGATION, GOSHEN AND LARAMIE COUNTIES, WYOMING. Oct., 2011. Available at: <http://seo.state.wy.us/GW/PDFs/HorseCreekReport2011.pdf>. The report draws on older reports as well as making new compilations of data, and notes that those results correspond to local memories of stream behavior.

<sup>177</sup> Hinckley and AMEC.

<sup>178</sup> Hinckley and AMEC, Fig. 2-14.

<sup>179</sup> TABULATION OF ADJUDICATED WATER RIGHTS OF THE STATE OF WYOMING WATER DIVISION I, 33 (1996); Memoranda of agreements between Lincoln Land Co. and Hawk Springs Development Co., May 24, 1912 and Sept. 1, 1921 (enclosures in letter, Kara Brighton to Randy Tullis, Supt. of Water Div. I, 5-15-2007.); for Lincoln Land as major landholder in area, see Frank J. Trelease, Priority and Progress – Case Studies of the Transfer of Water Rights, 1 LAND & WATER L. REV. 1, 52 (1966)

irrigation, as the state engineer soon pointed out – had officially affirmed that claim as a legal water right, along with some other expansive rights claimed on Horse Creek and its neighbor streams.<sup>180</sup>

The old ranch had built a ditch in the 1880s to divert some water. Later testimony showed the ditch had been washed out and repaired a couple of times, rather fruitlessly. By the early 1900s, that ditch was “grewed up with grass,” said rancher Nelson Sherard, who as a boy had accompanied his father in the 1880s to dig the ditch. As a grown man, in 1917 Sherard complained to the state engineer that the railroad company ranch was claiming to use a water right it had abandoned in the long years that grass grew up in the ditch. Others in the neighborhood saw it the same way. A man who had as a boy ridden horseback to town for school (then held from summer through fall), the rural mail carrier, and a man who had driven freight teams back and forth to Nebraska - all said they had had no trouble crossing that one-time ditch. It was full of dirt and grass, never of water. It was dry, until about 1909, when the railroad company started running water through one stretch of it to get water to its new pasture reservoir. The freighter, who grew up in the east and had never seen an irrigation ditch, remembered asking people in 1909, “It didn’t rain, how did that water get there?”<sup>181</sup> His wagon and team had gotten stuck in mud and water where he’d always driven over dry ground.

The water running to fill the pasture reservoir was “1908 water,” the local water commissioner working for the state later testified. It was water the railroad company’s ranch had a right to because of its October 1908 water permit for the reservoir. The original line of the ditch stemmed from the 1880s, but it was just a conduit for that 1908 water to get to the new reservoir. That, at least, is what the neighbors and the water commissioner said.<sup>182</sup>

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<sup>180</sup> District Court, First Judicial District, Decree of June 12, 1889, In the matter of an application for an adjudication of the priorities of rights to use water for beneficial purposes, in water district number one on Horse Creek, Archives of the Wyoming State Board of Control; TABULATION, DIVISION I, 30 (1996); MEAD, IRRIGATION INSTITUTIONS, 5-9.

<sup>181</sup> Horse Creek Dist. v. Lincoln Land Co., 54 Wyo. 320, 92 P. 2d 572 (Wyo., 1939), docket 2093, case file: Abstract of Record on Appeal, Appellant (Lincoln Land. Co.), July 8, 1938, Wyoming State Archives: 9, Testimony of Nelson H. Sherard (for respondent Horse Creek); 18-19, Testimony of Hugh Stemler (for respondent Horse Creek); 15, Testimony of Earl L. Chamberlain (for respondent Horse Creek); 21-22, Testimony of Otis N. Lovercheck (for respondent Horse Creek)

<sup>182</sup> Horse Creek v. Lincoln Land case file, Abstract of Record on Appeal: 25-33, Charles C. Donahue, water commissioner, Dist 1 & 2, Div 1; 33-34, L.C. Bishop, former Superintendent, Div. I; Horse Creek v. Lincoln Land case file: Brief of Respondent Horse Creek Conservation Dist., Sept. 20, 1938, 13-15.

Of course the railroad land company and its lessees, ranchers who used the place, saw it all differently. They said they were using the 1880s ditch for the water right that dated from the 1880s.<sup>183</sup>

It was a crucial distinction – the 1880s right was big enough to take, all winter long, water that otherwise would go to the development company’s reservoir. The pasture reservoir that the ranch was filling with that water was some three miles away from the creek.<sup>184</sup> Water stored in the pasture reservoir, though it seeped out, probably wouldn’t make it to the stream till summer. And the settler company’s May 1908 right was far too late a date to ever take any water in summer. It would, however, get water in winter if it could show that the railroad’s ranch had only a right to water from its 1908 right - its *October* 1908 right.

All this was laid out in hearings held first in 1917-18 and again in 1933-38. The first round of hearings was in the World War I years, when farming had become profitable from the big demand to feed the armies and the people in Europe. Sherard complained to the State Engineer’s Office in Cheyenne that the railroad company’s ranch was claiming water through the ditch under its 1884 right, which it had abandoned long ago. That complaint led the head of the state water management agency, the state engineer, to look at the bigger picture. He realized how little use there seemed to be of big portions of many of the large old water rights confirmed by the territorial court nearly 30 years before on Horse Creek and its neighbor streams. The engineer got the state legislature to appropriate \$4,000 - \$60,000 in today’s dollars – for an investigation and “readjustment” of rights on those creeks.<sup>185</sup>

The money funded a survey to determine what lands in all of Horse Creek, and neighboring drainages, were not irrigated. With the survey in hand, the state engineer launched a wholesale abandonment action against portions of nearly 50 water rights on Horse Creek and other key creeks near the capitol. In most cases, the state engineer proposed that water rights be cut by well over 50 percent. His proposals would essentially make the

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<sup>183</sup> Horse Creek v. Lincoln Land, Abstract of Record on Appeal: 40-42, Testimony of B.F. “Frank” Yoder, lessee of Lincoln Land (for appellee Lincoln Land); 43-45, Testimony of Frank Jones, lessee (for appellee Lincoln Land); Horse Creek v. Lincoln Land Co. case file: Brief of Appellant Lincoln Land Co., Aug. 26, 1938, 11, 34-38.

<sup>184</sup> Hinckley and AMEC, Fig. 2-14

<sup>185</sup> Horse Creek Readjustment of Rights, Petitions Granted Files, Wyoming State Board of Control: Letter of Frank Kittle, Supt. Div I, Oct. 4, 1917; Board order Jan. 7, 1918; 1917 Wyo. Sess. Laws. 125, §27.

legal water right conform to what was actually being irrigated on the ground. (A look at the topography even today makes it clear that what he proposed covered essentially all it was practical to irrigate in the area.)<sup>186</sup> The Board of Control approved the engineer's recommendation and declared major parts of the big old claims, including the railroad land company's claims, officially abandoned.<sup>187</sup>

That declaration did not last long. Owners of lands on the creeks involved – including ex-governors and sitting U.S. Senators – had the most influential lawyers in the state, including one firm whose founder was by that time a sitting U.S. Supreme Court justice. These lawyers did not argue the facts of the cases. Instead, they said the abandonment declaration was void on procedural and jurisdictional grounds. The state engineer, heading the state's administrative agency for water, they said, did not have the power to bring an abandonment charge, as the user's complaint had prompted him to do. Only a water right holder, not a state agency, could bring an abandonment charge, they said. The attorney general countered that "unless the state has the power to secure the legal declaration of abandonment of a water right, it cannot supervise and control the appropriation, diversion and distribution of the public waters" as the state constitution empowered the Board of Control to do.

The state district court in Cheyenne ruled for the landowners (issuing an order but no explanatory opinion). The attorney general appealed to the Wyoming Supreme Court, but later withdrew the case. Perhaps that was because the new governor he served managed extensive family ranches including on Horse Creek, and possibly sympathized with influential neighbors who did not want to see their water rights abandoned.<sup>188</sup>

The state engineer who had commandeered the Horse Creek investigation and abandonment resigned soon after the district court defeat, citing personal reasons. Some 15 years later, however, in the early 1930s, he was briefly Wyoming State Engineer

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<sup>186</sup> Tour of Horse Creek area by author with an hydrographer-commissioner staff member of the Board of Control, November 2011.

<sup>187</sup> Horse Creek Readjustment, Board of Control: List of recipients of Kittle letter Oct. 4, 1917; Elmer K. Nelson, Report on the survey of Crow and Horse Creeks and their tributaries, submitted to James B. True, Wyoming State Engineer, 11-24-1917; Board order Jan. 7, 1918.

<sup>188</sup> Horse Creek Readjustment, Board of Control: Transcript of Board of Control hearing, Nov. 26, 1917, 14, 37, comments of attorney J.W. Lacey; draft brief to court, Wyoming Attorney General, n.d., 2,5,7; In the matter of Horse Creek Readjustment of Rights, Laramie County District Court, Order, May 27, 1918, Laramie County District Court case file 11-478, Wyoming State Archives; WY CONST. art VIII, §2; Wyoming Supreme Court docket file 3-972, 973, Wyoming State Archives; Judge Lacey, Teapot Dome Lawyer, Dies, LARAMIE REPUBLICAN BOOMERANG Feb. 11, 1936, J.W. Lacey vertical file, American Heritage Center, University of Wyoming; WYOMING BLUE BOOK, II, at 466 (V.C. Trenholm, ed., 1974).

again. He may have been pleased to see a new abandonment case, raising the same facts found 15 years earlier, brought against the railroad land company and its 1884 right on Horse Creek. This time the case was brought by a water right holder, as the Cheyenne lawyers and the district court had said it must be. Facing the new, “severe” drought that accompanied the Great Depression in the U.S., the settler group, now formed into the Horse Creek Conservation District, brought an abandonment claim against the railroad land company. Nelson Sherard, who had complained to the state engineer in 1917, testified again in 1934; the former schoolboy, the rural mail carrier and the freighter testified as well. The water commissioner said the water he allowed down the ditch of the railroad ranch had always been 1908 water destined for the pasture reservoir, apparently then irrigating perhaps 175 acres (not 4,500). It was only in 1932, the water commissioner said, that the ranch manager requested that water with a priority of 1884 go into that ditch.<sup>189</sup>

The Board of Control found that all of the 1880s right had been abandoned.<sup>190</sup> The district court once again reversed the board’s decision, and the dispute went again to the Wyoming Supreme Court, which ruled this time. The high court ruled in favor of the railroad land company, and against abandonment.<sup>191</sup>

The district court findings, the briefs to the supreme court and the supreme court opinion made it appear that the only basis for an abandonment charge was a claim that the company’s ranch hadn’t used its 1880s water long ago - in the early years of the century before 1909. In 1909, of course, everyone – like the mystified freighter – agreed that water started running through that ditch. The justices thought that settled the matter. The justices never saw, or at least lost sight of, the difference so important to water

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<sup>189</sup> Horse Creek v. Lincoln Land case file, Abstract of Record on Appeal: 9, Testimony of Nelson H. Sherard (for respondent Horse Creek); 18-19, Testimony of Hugh Stemler (for respondent Horse Creek); 15, Testimony of Earl L. Chamberlain (for respondent Horse Creek); 21-22, Testimony of Otis N. Lovercheck (for respondent Horse Creek); 27, Testimony of Charles C. Donahue, water commissioner, Dist 1 & 2, Div 1. The year 1933 was prime time for abandonment claims: the Wyoming Supreme Court itself took note of the weather, in a different abandonment case, recording that “(c)ommencing with about 1930 or 1931, a period of drouth (sic) settled over southeastern Wyoming, which became more and more severe from time to time, reaching its height in 1933 and lasting at least through a part of 1934.” (Van Tassel v. Cheyenne, 54 P.2d 906 (1936).

<sup>190</sup> Board of Control order, April 20, 1934, 7 Order Record Book 695.

<sup>191</sup> Horse Creek v. Lincoln Land, 54 Wyo. 320, 334-337, 92 P.2d 572 (Wyo. 1939)

administrators – that the water going down the old ditch after 1909 was “1908 water” not “1884 water.”<sup>192</sup>

What the Wyoming Supreme Court saw, therefore, was a situation of 1884 water being used regularly since 1909, and then facing an abandonment charge in 1932. The court declared, on those facts, that an abandonment case to be successful had to show non-use of water in the five year period immediately preceding the filing of the abandonment charge. Abandonment could not be declared based on non-use of a water right – for five years or for many more – long earlier, when the water right had been put back to use again before the abandonment charge was brought.<sup>193</sup> As the company’s lawyers had pointed out, to declare an abandonment years after an unused water right had been put back to use would be in itself a major disruption of the water use pattern that had settled on the stream.<sup>194</sup>

The 1884 water right to irrigate 4,500 acres out of Horse Creek survived successfully until 1979 (the land and the water right by then had passed out of railroad hands and into local ownership). In 1979 farmers on the old settler company lands were finally successful in showing abandonment of the old right – but only partially successful. The abandonment case they brought managed only to cut the right in half. The 1884 water right still provides a right to water for 2,140 acres – not the couple of hundred acres witnesses testified was all that was irrigated after 1909 with the 1908 right. This time, the Board of Control decided the case, cutting the right by more than half, and the board ruling stood, with no Supreme Court review because the new owner of the property did not appeal.<sup>195</sup>

That 1979 ruling was once again only part of an ongoing wrangle between the farmers dependent on their big 1908 reservoir, and the local owners of the old railroad company ranch. In their disputes, the hydrology of the area has played an increasingly important role. The farmers in the 1960s and 1970s put in wells just outside their big reservoir to pump groundwater into the reservoir; the ranch owner used the pasture reservoir for

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<sup>192</sup> Horse Creek v. Lincoln Land case file, Abstract of Record on Appeal: 49-52, summary of Findings of Fact, Conclusions of Law and Decree, Laramie County District Court, April 22, 1938; Horse Creek v. Lincoln Land case file, Brief of Appellant Lincoln Land; Horse Creek v. Lincoln Land, at 334-337.

<sup>193</sup> Horse Creek District v. Lincoln Land, 92 P.2d 572 (Wyo. 1939) .

<sup>194</sup> Horse Creek v. Lincoln Land case file: Brief of Appellant Lincoln Land.

<sup>195</sup> Horse Creek Conservation District, I-78-210 (1979), Petitions Granted Files, Wyoming State Board of Control; Board of Control 28 Order Record Book 359-369.



groundwater recharge more than for irrigation. The state engineer and the board restricted both practices.<sup>196</sup> The ranch owner has drilled his own wells to tap into the ground watertable in summer. Both sides continue to argue over who gets the groundwater and who gets the surface water, when, in what order – and to whose detriment. In 2011, the irrigation district and the present owner of the old railroad company ranch – now a state senator – were tied up in a bitter fight over the senator's use in mid-winter of the old right to take stream water to soak his ground and recharge the groundwater while the irrigation district's big reservoir, relying on its 1908 right to collect winter flows, couldn't fill. In mid-summer the senator's wells could pump up the groundwater to irrigate big pivot-irrigation circles of crops, while the district farmers close by were short of water.<sup>197</sup>

These ongoing battles, of course, would not have happened if the abandonment evidence the engineer's office had amassed in 1917 had been allowed by the courts to cut back the old right.

The impact of the ultimate 1939 Wyoming Supreme Court decision overturning abandonment of the railroad company's old water right reached much farther than Horse Creek, however. The court, with its description of the Horse Creek facts, had joined other Western courts and set precedent for allowing a water right, however long left unused, to be revived and come roaring back to life.<sup>198</sup>

Once revived, an old long-unused water right could completely disrupt the pattern of water use which neighbors had built up over the intervening years. The burden was on the neighbors who wanted to protect their water uses to file a timely abandonment complaint. They had to choose to spotlight an abandoned water right (and they would carry the burden of proof on many issues, in a hearing before the board or in court).<sup>199</sup> In the absence of that kind of initiative among their neighbors, landowners with unused water

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<sup>196</sup> Hinckley and AMEC, 3-14 to 3-15.

<sup>197</sup> Hinckley and AMEC: the report states it was generated in response to farmer complaints; in late 2011 the State Engineer's office held a public meeting to review report results in hopes that better information would help both sides reach an accommodation: Oct. 19, 2011 press release announcing Nov. 1, 2011 public meeting, accessible at: <http://seo.state.wy.us/>

<sup>198</sup> Hall v. Lincoln, 50 Pac. 1047 (Colo. 1897); Platte Valley Irr. Co. v. Central Trust Co., 75 Pac. 391 (Colo.); Carrington v. Crandall, 147 P.2d 1009 (Idaho.)

<sup>199</sup> Ramsay v. Gottsche, 51 Wyo. 516, 69 P.2d, 535 (Wyo. 1937); Hall v. Lincoln; burden of proving unavailability of water, as a defense, is however on the one charged with non-use, In the Matter of Johnson Ranches, 605 P.2d 367 (Wyo. 1980).

rights could rest easy and not put water to work until they had money, time, inclination, or new technology.

The catch to this rule, as the court may well have known, was that few abandonment claims are likely to be filed under such conditions. In the small world of Wyoming irrigation (where the slim profit margins did not tend to attract many newcomers), neighbors expected to work lifelong alongside each other and each other's children and grandchildren. It was, and is, therefore a major decision to make an enemy of such neighbors, via an abandonment claim and its bitter contest of opposing witnesses. It is also a major expense, involving lawyers, engineers, hearings, and sworn testimony.

Better to let sleeping water rights lie, as long as they stay asleep, and unused. If it becomes clear that someone – perhaps a new owner – is planning to start using water covered by a dormant right, then it can be worth going to the state with a complaint of abandonment. But, as the court has interpreted its 1939 ruling in the years since then, that complaint has to be filed in a very specific time period: before the old water right actually gets into use. There are clear examples in later decades of a race between the backhoe laying new pipe for an old water right, and the neighbors rushing to the engineer's office with a written abandonment petition charging decades of non-use.<sup>200</sup>

Once again, the tradition in American law that “the law abhors a forfeiture” played a role in the thinking of the state's high court that led to this abandonment rule. In its 1939 decision approving Lincoln Land's revival of old rights, the Wyoming Supreme Court cited that maxim – and quoted the high court of a neighboring state citing it when that court too allowed revival of an old water right.<sup>201</sup> In a water right abandonment case two years earlier, the Wyoming court also specifically cited legal commentators on water who

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<sup>200</sup> A variety of cases fleshed out how revival could work in Wyoming – and its limits: *Sturgeon v. Brooks*, 281 P.2d 675 (Wyo. 1955) held that a right to fill a reservoir with a damaged dam that has not held water for years can be revived by dam repair, and use of the water – so that abandonment petition filed 2 years after water use began again would fail; *Ward v. Yoder*, 355 P.2d (Wyo. 1960), held that a landowner purchaser of land with an old unused right who started to try cleaning out its grassed-in ditch could be stopped by an abandonment claim filed before the cleaning was accomplished or water put to use; *Wheatland Irr. Dist. v. Pioneer Canal Co.*, 464 P.2d 533 (Wyo. 1970) held that the Board of Control could not give the owner of a damaged reservoir a grace period to get the dam repaired in order to avoid an abandonment ruling. Craig Cooper, former Wyo. Supt. Water Division III, Talk at Wyoming Game and Fish Commission, Fishery and Wildlife Managers, Educational Seminar (Jan. 29, 2003) (tapes on file with author) describes how neighbors noticing truckloads of pipes being delivered could successfully derail a city's plans to revive an old right and put it to municipal use.

<sup>201</sup> *Horse Creek District v. Lincoln Land*, 54 Wyo. 320, 92 P.2d 572 (Wyo. 1939), at 335-6, citing *Zezi v. Lightfoot*, 68 P.2d 50 (Idaho 1937).

discussed the general rule that “forfeitures are not favored in law,” in the water context.<sup>202</sup> The leading treatise in Western water law turned to in the 1930s went on to note that as a result of that rule, abandonment was not easy to find even in the customary 19th century water law in the West. Once the abandonment concept was put into statute, the treatise noted, those statutes that specifically used the term “forfeit” (as Wyoming’s had since 1888)<sup>203</sup> were essentially a legislative response to courts’ reluctance to order forfeiture. Legislatures were attempting to overcome that reluctance, to impose a strict standard requiring forfeiture.<sup>204</sup>

The Wyoming high court, then, responding in turn to the legislature, sought to mute the effect of that harsh word, “forfeit,” by putting up barriers to abandonment – as in its endorsement of water right revivals in 1939. Property law scholar Carol Rose has noted that courts and legislatures, in a never-ending attempt to reach a balance between clarity and equity, often do engage in moving the law back and forth between “crystalline” rules and “mud” (or muddy) rules affecting property, particularly when the issue is forfeiture.<sup>205</sup> But in the Wyoming courts, the significance of where that back-and-forth ended up in 1939 was that it made use of a time-tested approach to issues of private property, typical of rights to *land*, and applied it to issues involving rights to *water*.

Through their efforts to clean up water rights through abandonment orders, the water administrators had made it clear that though “the law abhors a forfeiture,” engineers do not.<sup>206</sup> Rather, engineers saw forfeiture as a key tool in water management. If one plan for using water failed, let a new one take its place – with a new water right. That had been their policy in permitting,<sup>207</sup> and they had tried to make it their policy on abandonment.<sup>208</sup>

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<sup>202</sup> Ramsay v. Gottsche, 51 Wyo. 516, 69 P.2d, at 529 (1937). For the general policy against forfeitures, see West’s Encyclopedia of American Law, 1998, accessed at <http://www.answers.com/topic/forfeiture>, 2-23-11).

<sup>203</sup> 1888 Wyo. Sess. Laws 55 §14.

<sup>204</sup> CLESSON KINNEY, TREATISE ON IRRIGATION AND WATER RIGHTS (2d edition), 2011, §1118 (1912), cited in Ramsay v. Gottsche, 529 (1937).

<sup>205</sup> CAROL M. ROSE, PROPERTY AND PERSUASION: ESSAYS ON THE HISTORY, THEORY, AND RHETORIC OF OWNERSHIP, 199-225 (1994)

<sup>206</sup> Lasky, in 1929, described the more general issue of the growth of private property thinking in water law with the same dichotomy between lawyers and “the layman,” arguing that “legalistic thought obscured the layman’s natural inclination” and insisted on a private property content to water rights. (Lasky, 168).

<sup>207</sup> For details on the original permitting policy, see MacKinnon, Making their own way, 206-209.

It was not that the engineers were averse to abandonment – it was simply that it was a tool that had to be available. (The Board of Control in the 1920s, for instance, showed itself perfectly willing to consider each case on its merits, finding abandonment in some situations but not in others.)<sup>209</sup>

The court decisions leading up to *Lincoln Land* both exemplified and imposed the lawyers' view, in place of the engineers' view. It was based on a fundamental concept that property rights in water shared significant features, perhaps all the significant features, with property rights in land. Providing substantial protection against forfeiture to private rights in water echoed the even stronger protections afforded to rights in land.

In the 1930s and the years that followed, the barriers the Wyoming Supreme Court threw up against abandonment of water rights only increased. The court called for close scrutiny in abandonment cases, saving water rights from abandonment for a variety of reasons: the water had been used somehow, through a stream or another ditch;<sup>210</sup> there was no water available;<sup>211</sup> some "fault or neglect" on the part of a water right owner needs to be shown, for abandonment (whether this means the owner had to "intend" to abandon has been hotly debated)<sup>212</sup>; intent is not necessarily required, but the abandonment must be voluntary, not forced by circumstances;<sup>213</sup> those claiming abandonment had to be clearly affected by the fate of the contested water right, or they had no standing to bring

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<sup>208</sup> A 1920s case illustrates the Board of Control policy to encourage not revival of old rights but the opposite: Gottlieb Fluckiger, Wyoming State Board of Control, 6 Order Record Book 157, 5 Minute Record Book 413 (1922). In that case the water right holder officially abandoned a water right for 40 acres, for lack of use, and applied for new 1922 water right for the same acreage, to start a new use.

<sup>209</sup> STATE ENGINEER, 1919-20, Report of the Secretary of the Board of Control, 72; STATE ENGINEER, 1925-26, Report of the Secretary of the Board of Control, 36.

<sup>210</sup> Van Tassel v. Cheyenne, 906 54 2d 906 (Wyo. 1936)

<sup>211</sup> Simmons v. Ramsbottom, 68 P.2d 153 (Wyo. 1937)

<sup>212</sup> Ramsey v. Gottsche, 1937: the new owner of a water right would not lose it through abandonment, since he showed no "fault or neglect" in not using the water, when after years of damaging floods he started diversion repairs in a reasonable time. The court in Ward v. Yoder (1960) (water right with grassed-in ditch, abandonment charge succeeds when filed after owner starts to clean ditch but before water is used again) declared no "intent" was necessary to find abandonment. Administrators, however, have read the court's decisions differently (CRAIG COOPER, HISTORY OF WYOMING WATER LAW AND DEVELOPMENT, 78 (2004) (Cooper is a former member of the Board of Control, as former superintendent of Water Division III) ).

<sup>213</sup> Scott v. McTiernan, 974 p.2d 966 (Wyo. 1999).

an abandonment case.<sup>214</sup> The pronouncement that abandonment must be “voluntary,” in particular, seems to require an inquiry into the state of mind of the water user who failed to use water.<sup>215</sup> Further, the rule of abandonment in Wyoming, as in other states, meant simply that water had to be used only *at some point* in the required period of years. One good wetting of a field amidst five years of otherwise lack of use can be enough to defeat an abandonment charge.<sup>216</sup>

One court pronouncement in the 1980s – possibly trying to find a “crystalline” clear rule on abandonment - only served to highlight the general trend towards mud that frustrated the engineers. In a case finding potential abandonment where the board found none, the former Chief Justice of the court wrote an opinion declaring that, where the Board had cited precedent that forfeitures are not favored in the law:

*...(W)e can only say that this proposition is hardly applicable here. Our concern in this appeal necessarily focuses upon a statutory interpretation question--not whether the court abhors forfeiture. We cannot call up the abhorrence-of-forfeiture rule in order to rescue Laramie Rivers from an abandonment of a water right in lieu of requiring that the applicable statute pertaining to abandonment be applied and given its plain English-language meaning. We are not the legislature. Indeed, we do abhor forfeitures, but it is the legislature that has established this rule for forfeiting water rights--not the court!*<sup>217</sup>

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<sup>214</sup> Hagie v. Lincoln Land Co. 18 F.Supp. 637 (D.Wyo. 1937); cited with approval by the Wyoming Supreme Court in: Platte Co. Grazing Assoc. v. Board of Control 675 p.2d 1279 (Wyo. 1984) ; Cremer v. State Bd. Of Control, 675 p.2d 250 (Wyo. 1984).

<sup>215</sup> In McTiernan (1999) irrigated lands once held by the same owner had been split up. One owner of a resulting part filled in the ditch that took water to lands now owned by a neighbor, making that water unavailable for five years – while reassuring the neighbor that he would open the ditch back up again. Then this deceptive land owner brought an abandonment charge against the neighbor after the requisite five years had passed. The board found that the neighbor’s failure to take the recourse available in civil law to get the ditch opened back up was sufficient “fault or neglect” (under earlier Wyoming Supreme Court cases) to justify a declaration of abandonment. The Wyoming Supreme Court disagreed. The court’s more abstract sense of equity contrasted with the board’s practical sense of how water use and water users actually work on the ground. The court’s result suggested the board weigh the attitude of water users, which to a practical mind means examining their intent.

<sup>216</sup> JAMES J. JACOBS, PATRICK T. TYRELL, DONALD BROSZ, WYOMING WATER LAW: A SUMMARY, 11, UNIVERSITY OF WYOMING AGRICULTURAL EXPERIMENT STATION, PAMPHELT B-849-R (2003). Accessible at: <http://seo.state.wy.us/PDF/b849r.pdf>.

<sup>217</sup> Wheatland Irrigation Dist. v. Laramie Rivers Co., 659 P2d 561 (Wyo 1983), 565-66. The court held that an irrigation company that had spent years to get state financial aid and had finally gotten the funds and put repairs underway on its reservoir nonetheless could lose its water right to abandonment when the abandonment claim was filed before the repairs could be completed and water put to use. The case complemented the holding of Sturgeon v. Brooks, 1955, that successful repair of a reservoir and putting its water to use could defeat an abandonment claim filed two years after the water use recommenced. The state’s major investment of funds in the Laramie Rivers dam repair may, however, have persuaded the board that in this case the company had made enough of a revival effort to defeat abandonment.

That breathless pronouncement turned out to be only the exception that proved the rule. The message that water administrators have gotten from decades of abandonment decisions by the Wyoming Supreme Court is quite the opposite: the idea of forfeiting a property right makes Wyoming judges cautious, highly skeptical, and likely to deny abandonment of a water right. The court has repeatedly overturned board abandonment orders – both the board’s declarations of abandonment and its denials of abandonment. In the course of that, the court draws lines that are hard to follow as a practical matter – looking into the state of mind of someone who has not used water seems to equate pretty closely to looking for intent. Water administrators watch successive court decisions with both exasperation and consternation.<sup>218</sup> The court’s hesitations over abandonment reveal, to the engineers’ minds, a profound misunderstanding of water and water management principles.

“*No one* intends to abandon a water right,” comments Floyd Bishop, a former State Engineer who was also the son of a State Engineer.<sup>219</sup> But, he would argue, people do leave water allocations unused for years, and the state board has to be able to declare abandonments, in order that others can put water in use to meet changing needs. (On the other hand he recognizes and adopts as law the court’s doctrine that old unused rights can be revived and put back to old uses. He knows how handy that can be for some users. In fact, when he was in private practice as an engineer, Bishop acknowledges, he helped that happen for some old, slumbering rights.)<sup>220</sup>

Bishop, who came into office in 1963, argued for 10 years as state engineer that his office should be able to initiate abandonment actions. Since the 1917 effort on Horse Creek, that authority had been denied by the courts. From that time on, administrators trying to manage real use amidst the clutter of abandoned paper rights had continued to call for state abandonment authority, since “the people evidently are not interested in the matter” and did not bring abandonment cases themselves, as the superintendent in northwest Wyoming wrote in 1920.<sup>221</sup> Finally in 1973 Bishop did succeed, after considerable public debate and opposition, in getting state engineer-initiated abandonment actions officially sanctioned by

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<sup>218</sup> COOPER, 89-90.

<sup>219</sup> Interview with Floyd Bishop (Dec. 13, 2010)

<sup>220</sup> Ibid.

<sup>221</sup> STATE ENGINEER 1919-20, 83, Report of Lou Blakesley, Superintendent, Water Div. No. 3.

statute.<sup>222</sup> His successor pursued one such action. But, as the assistant attorney general who represented the state engineer's office in that case remembers, water users deeply resented seeing a Wyoming water rights administrator trying to prove that a user had abandoned a water right. No state engineer has tried to use that tool again.<sup>223</sup> The statute lies on the books unused.

So, through the combination of court resistance and user reluctance, final declarations of abandonment in a contested case have become very hard to find. The evidence lies not only in the few cases that come before the administrators and the courts, but in the many unused water rights littering state water records.

Those unused water rights could be regarded as time bombs waiting to go off. All that is needed is a water right holder starting up water use under an old right that would disrupt the water uses of neighbors. In the 1960s State Engineer Bishop, emphasizing the need for both water users and state strategists to have a "true picture" of water use, declared "there are many thousands of acres of water rights on the records in Wyoming which have not been utilized over a long period of years, and in some instances have never been used."<sup>224</sup> Those paper rights "constitute a cloud on the rights of all later appropriations," but Wyoming's abandonment process under its court rulings was "so cumbersome and expensive for anyone wishing to force an abandonment that it is seldom utilized," Bishop wrote.<sup>225</sup>

What is happening today on Horse Creek between the senator and the farmers is a classic example of just what a time bomb revival of an old right can be. The recent development, with 1884 surface water recharging groundwater in winter for pump and pivot irrigation in summer, is only the latest explosion in the ongoing struggles on Horse Creek that were encouraged instead of settled by the district court when it overruled the board in 1917. That decision may well have cost the area a chance at greater prosperity, since it left water claims uncertain and in conflict. New technology, in the form of wells

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<sup>222</sup> 1973 Wyo. Sess. Laws 176.

<sup>223</sup> Interview with Lawrence Wolfe, Feb. 2010, on file with author.

<sup>224</sup> STATE ENGINEER 1962-64, 24; STATE ENGINEER 1965-66, 37.

<sup>225</sup> STATE ENGINEER 1962-64, 24; Michael V. McIntire, *The Disparity between State Water Rights Records and Actual Water Use Patterns*, 5 *Land & Water L.R.* 23 (1970): the research for McIntire's article was requested by State Engineer Bishop, STATE ENGINEER 1965-66, 37.

and pivot irrigation, may in this situation only have helped fuel the conflict and disruption rather than add to general local wealth.

Unused water rights and their shadow of uncertainty are still plentiful on state records today, forty years after Bishop highlighted the issue. Cases involving unused water rights come regularly before 21<sup>st</sup> century water administrators. Often, a superintendent of one of the state's four water divisions will seek to clean up the record books so it will be easier to know that the right amount of water is getting into the right ditches, especially in dry years when water demands compete for low supplies. After a good deal of talk, a superintendent can sometimes manage to convince water users formally to give up some old unused water rights.<sup>226</sup> Or in other examples, new owners of land with water rights attached decide to put in a residential subdivision, or sometimes a pivot irrigation system, and they may give up some old water rights that simply don't fit the new picture.<sup>227</sup> What the administrators term "voluntary abandonment" – abandonment sought and acknowledged by the water user, in order to accomplish some other goal - has therefore become far more prevalent than traditional "abandonment." Yet the administrators agonize, too – not over the user's loss of a private property right, but over the water tied to priority rights that has been left unused, in the face of the ever-present specter of downstream states more successful than Wyoming in putting water to use. Those states might gain advantage on some streams if upstream Wyoming rights disappear.<sup>228</sup> The cases that come before the Board of Control indicate how much is now required in the way of determined persuasion, economic change, or extraordinary circumstances before disuse of a water right is acknowledged and the unused right purged from state records.

As a practical matter that all amounts to just what the "anti-forfeiture" language in the abandonment cases would suggest: that rights in water are significantly like rights in land. That is, the court cases imply, water rights award rights to use and manage the water as an owner – and to act as an owner of land might act. Clearly, in the initial years of the Wyoming system, water administrators held a different view. In 1917, for instance, when the state engineer proceeded to declare a whole raft of abandonments, he did not

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<sup>226</sup> Gaspar Wright, Wyoming State Board of Control, I-U-2007-1-4 and I-U-2006-2-8 through -14.

<sup>227</sup> Austin, Michael and Teresa, Wyo. State Board of Control, IV-2007-2-4 (subdivision); Double L Ranch #4, Board of Control, IV-2009-3-9 (subdivision); Mark Lyman Revocable Trust, Board of Control, III-2011-1-11/12 (pivot).

<sup>228</sup> Crandall, Board of Control, IV-2002-4-2



think that water rights holders like landowners required protection against forfeiture. In the years of court decisions that ensued, water users got much more of that protection.

How this happened was the combination of a number of factors. One was the socio-economic situation on the ground. A snapshot of Horse Creek in 1917 demonstrates the forces at play. To the engineers, the situation on Horse Creek cried out for a clean-up of unused water rights. To an orderly mind, water rights on Horse Creek and its neighboring streams were a mess. The rights had been confirmed by a territorial court little versed in stream flows or water use, nearly 30 years earlier. Since then, energetic land and water development had led to confusion and contradiction in water rights (statewide, as well as on Horse Creek). From the early years on, water superintendents across the state reported instances of irrigators using more water than they were ever entitled to, tacking their old priority date onto the additional water in an “expansion” of their original water rights. Irrigators thought that was innocuous; administrators thought it illegal and pernicious. Superintendents themselves meantime had also fallen prey to the temptation not to inspect in person every water right they had to adjudicate, because they had simply too many to review.<sup>229</sup> That meant certificates to water rights had issued which were likely to overstate, based on irrigator testimony, how much water that irrigator had actually succeeded in using. So in the Horse Creek case, the proliferation of unused rights the engineer sought to cut back were of all kinds - rights his own office had approved, as well as rights confirmed in territorial court.<sup>230</sup>

Notably, the legislature backed up the engineer, with an allocation of funds in 1917 that was significant. (The amount of money matched what went that year to the heartfelt goal of central Wyoming, an investigation of the potential for more big dams in that area.<sup>231</sup>) But Horse Creek, while a natural for clean-up in an engineer’s eye, had proved itself a dangerous target. Horse Creek and its neighboring streams were perfect territory for investment and development enterprises, indulged in by a number of major, wealthy individuals and companies who had considerable influence in state and national politics. The engineer’s attempts to cut back their ambitious water rights claims led to an uproar. Landowners,

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<sup>229</sup> STATE ENGINEER 1899-1900, 76-79 Report of William Gilcrest, Superintendent of Water Div. No.1 (Southeast Wyoming, including Horse Creek); STATE ENGINEER 1903-04, 20; STATE ENGINEER 1911-12, 32, Report of C.E. Howell, Superintendent, Water Division No. 4 (Southwest Wyoming); STATE ENGINEER 1915-16, 86-87; STATE ENGINEER 1919-20, 62-63.

<sup>230</sup> Horse Creek Readjustment, Board of Control: Board Order, Jan 7, 1918.

<sup>231</sup> 1917 Wyo. Sess. Laws. 125, §26

lawyers and onlookers turned out for the hearings in crowds so huge that in both 1917 and 1935, the Board of Control had to relocate its abandonment hearing to the House chambers in the state capitol building. The murmurs of those crowds, and their eagerness to hold onto what they saw as property rights, found an echo in the court decisions.<sup>232</sup>

So the moneyed investors, who might well have had speculation in mind, supported the courts' "abhorrence" of forfeiture, and the land law thinking that came with it. But the majority of Wyoming water users, not so well-heeled, also played a role in this process. They acquiesced in, even welcomed, the court rulings. Before and after World War I the newcomers to Wyoming – and even the old-timers were really newcomers – found that Wyoming's climate and terrain made it very difficult to make the place into the blooming Eden that every arrival had hoped for. Then, starting in the early 1920s, for the two decades before World War II most of Wyoming was subject to recurrent drought and continuing economic depression.<sup>233</sup> Those conditions no doubt encouraged users to share the courts' distaste for abandonment. Though drought was an incentive to watch neighbors' water use with an eye to eliminating their rights, drought also meant mutual understanding of the difficulty of irrigating and raising a crop. Continued economic depression, meanwhile, was an incentive to put off repairing a damaged reservoir or ditch head-gate, for years at a time.

What the state engineer called "cumbersome" – the courts' abandonment procedure, and the resulting the difficulty of proving abandonment – was to the advantage of most users. They were glad to have their water rights become effectively more and more like a private property right in land. And, eventually, they had hopes of reaping some value from it. The 1970s saw changes in Wyoming's economy: national clean-air policy gave coal-burning utilities in the Midwest an interest in low-polluting Wyoming coal, prompting unheard-of industrial development and (after the governor endorsed a severance tax) an enormous boost to state revenues.<sup>234</sup> Ranchers and farmers, dominating the state legislature, managed

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<sup>232</sup> Horse Creek Readjustment, Board of Control files: Surveyor's notes on owners of original rights; Hearing Transcript, 11-16-1917, 7, 14; Order of the Board of Control, Jan 7, 1918; Tabulation of Adjudicated Water Rights, Division I, 1996, 29 (priorities #8, #9), 52, territorial rights #3, #6, #8. Prominent landholdings affected included those of former territorial governor and sitting U.S. Senator F.E. Warren, and former territorial governor George Baxter. Former U.S. Senator and governor Joseph M. Carey had lands in the area but the surveyor found his ditches "in good condition."

<sup>233</sup> J. CURTIS AND K. GRIMES, *WYOMING CLIMATE ATLAS* (2004); T.A. LARSON, *HISTORY OF WYOMING*, 2d. ed. (1978).

<sup>234</sup> LARSON.

to have a percentage of those tax revenues formally dedicated to a new agency for building and repairing water infrastructure. A political battle for the governor's office in 1980 was decided in favor of minority Democrats in part because their candidate campaigned for that dam-building.<sup>235</sup> Irrigators therefore, rather than being challenged by the new economy, were literally fortified by it. And they stuck to their anti-abandonment, pro-private property view of water. They have voiced their view in their active, resentful questioning of the idea of administrators independently bringing abandonment cases against water users – to the point that no administrator has used the statutory power to bring abandonments in the four decades since it was enacted in 1973.

Thus the conditions on the ground in Wyoming – socio-economics, terrain, and climate, and even mineral geology – combined to make its water users welcome the concept of property in natural resources that prevailed in the surrounding, larger national society. No matter that, as the hydrology on Horse Creek demonstrated, water can be the product of complex inter-relations of geology, and the source of complex inter-relations among people. The decisions in *Lincoln Land* and in the decades beyond made it clear that revival of water rights was always possible and abandonment always difficult. As that happened, the concepts of abandonment and loss of unused water rights played a smaller and smaller role in actual water management in Wyoming. Wyoming water users acquired more rights in water and administrators in turn lost rights. In terms of economic analysis of property rights, the users won management power, and the administrators lost exclusion power. Users held more rights, and looked a little more like owners. In lay and legal terms, the idea that rights to water should be viewed as a matter of private property like rights to land took increasing hold.

## 6.5 Transfer of Water Rights

Discussion of water transfers can be confusing. At issue in water transfer laws is not the question of whether a user can sell his water right to another person, who will use the water in his stead. Water rights can be sold along with the irrigated fields or power plants they serve – and irrigation water rights are often considered to be sold along with the land even if the deed fails to mention them.<sup>236</sup> What has caused struggles over water transfers is

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<sup>235</sup> Dave Freudenthal (former aide to Gov. Ed Herschler), speech (n.d.) on file with author; Wyo.Sess.Laws 1979, Ch. 59, sec. 1.

<sup>236</sup> Frank v. Hicks, 35 P. 475 (Wyo. 1892)

not the sale to another person, but the sale (or transformation without sale) to another kind of use, or another place of use – the transfer of water away from the original purpose for which the right to the water was established.

Free alienation of property is often regarded as a key attribute of private property. In legal and economic analyses, the power of alienation makes a right holder an owner. When traditional market economists critique Western U.S. water law, they are concerned about whether the water resource can reach its highest and best use. Markets and free alienation of rights are a tool for achieving that goal. Property law typically shares that goal, and resists enforcing restraints on alienation. The alienation at stake for water, however, is the kind of alienation that “water transfers” involve - alienation to a new purpose or place, not simple change of the name of the owner. Western water law can pose obstacles to free alienation of water rights in that sense, and market economists have accordingly seen those obstacles as problems that need to be cured.<sup>237</sup>

Wyoming water users have never had the right of free alienation, i.e. free transfers, of water rights. To alienate the water separate from the land, or separate from whatever use to which the water had been dedicated, cannot be done without state permission. Administrators have held a firm grip on their power to decide whether and under what conditions water can be transferred to a new place or a new purpose. Their idea of the restrictions necessary has ruled for all but a brief five-year period in the early 20<sup>th</sup> century. Wyoming believes in restraint on alienation when it comes to water rights, and the state is rather notorious among water economists and lawyers for that reason.<sup>238</sup>

The restraint stems from the very origins of Wyoming water management. Wyoming was one of the late-settled regions in the American West, becoming a state (with just barely enough population to qualify) only in 1890. In what was still very much a frontier area, speculation in land was of course a driving factor in the economy, just as it was nationwide.<sup>239</sup> One of the major concerns of the drafters of the new state’s water management system was the fear of speculation infecting water as well as land. Speculators

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<sup>237</sup> Terry Anderson and Peter J. Hill, *The Evolution of Property Rights*, in TERRY ANDERSON AND PETER J. HILL, *PROPERTY RIGHTS: COOPERATION, CONFLICT AND LAW* 137-38 (2003); Mark Squillace, *A Critical Look at Wyoming Water Law*, 24 *Land and Water L.R.* 307, 338, 340-41 (1989).

<sup>238</sup> George A. Gould, *Water Rights Transfers and Third Party Effects*, 23 *Land and Water L.R.* 1, 35-36 (1988); Squillace (1989), 338, 340-41; Mark Squillace, *Water Marketing and the Law*, 6-9, conference paper, *Moving the West’s Water to New Uses: Winners and Losers*, Natural Resources Law Center, U. Colo. School of Law, Boulder, CO (1990).

<sup>239</sup> LAWRENCE FRIEDMAN, *A HISTORY OF AMERICAN LAW*, 2d ed., 235 (1985).

might take up water rights on paper, only to sell them off at a profit, possibly for use somewhere else. That potential was viewed as a threat to genuine efforts to put water to use, and thereby as a threat to the building of stable communities.<sup>240</sup>

Most other Western states, more comfortable with individual property rights that included the right of alienation, allowed transfers of water rights as long as the transfer created “no injury” to another’s water right.<sup>241</sup> Typically “no injury” has meant preservation of flow conditions that other users relied on in taking out their water rights.<sup>242</sup> The Wyoming Supreme Court in 1904 joined the courts of neighboring states, and declared that, unless another’s rights were injured, Wyoming water rights could be transferred. Water administrators and users alike were appalled, and they persuaded the legislature to reverse that rule just five years later.<sup>243</sup>

So, starting in 1909, Wyoming statutes said very clearly that water rights could not be transferred to a new purpose or place, except in special circumstances. Any other attempted transfer would result in the loss of the water right’s most valuable feature – the priority date giving it a place in the order of water use in time of shortage.<sup>244</sup> As a practical matter, an attempted transfer that didn’t fit the exceptions meant the loss of the water right.

The few legislated exceptions to the no-transfer rule in Wyoming only reinforced the rule. The exceptions allowed such changes as transfers to domestic or municipal use, or to steam railways.<sup>245</sup> Transfers to the uses on the exceptions list (called “preferred” uses) could be done only with the approval of state water administrators. For over 60 years after 1909, administrators weighed their concerns about the potential impact of transfers of Wyoming water rights to new places or purposes, and imposed conditions as they saw fit if they chose to approve a transfer.

Administrator concern about speculation remained paramount. To allow unfettered transfers of rights to use the water flowing in the streams “would make a speculative

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<sup>240</sup> STATE ENGINEER 1891-92, 58-59.

<sup>241</sup> Frank J. Trelease, *Priority and Progress – Case Studies of the Transfer of Water Rights*, 1 LAND & WATER L.R. 1, 21-22 (1966).

<sup>242</sup> MACDONNELL, *WATER TRANSFER PROCESS*, II, 3-3.

<sup>243</sup> Report of Commission, STATE ENGINEER 1905-06, 17-29; 1909 Wyo. Sess. Laws 68, §1; for details from 1905-1909, see MacKinnon, *Making their own way*, 195

<sup>244</sup> 1909 Wyo. Sess. Laws 68, §1.

<sup>245</sup> 1909 Wyo. Sess. Laws 68 §2.

commodity of the water of the State. The equilibrium of conditions on our streams would be continually changed... rights acquired under certain conditions might be found worthless by changes afterwards allowed other rights,” wrote the state engineer in 1920.<sup>246</sup> The Wyoming of that year still displayed frontier conditions: more public land was claimed in Wyoming under the homestead laws in the 1920s than in any other decade (many of those claims were also lost, in the poor economy and frequent dry years that persisted in Wyoming from the early 1920s through the Great Depression).<sup>247</sup>

As the state engineer expressed it in 1920, allowing an early priority date water right to move up or down a stream system via a transfer to some other user would completely destroy the pattern of water uses on a stream – “the equilibrium.” Here the engineer spoke to the qualities of flowing water that make water different from land. They are qualities that include what economists and political scientists call its “subtractability.” Depending on hydrology, less volume of flowing water may be available after others use it.<sup>248</sup> Every stream has its own hydrology, affecting everyone who takes water from it. Few streams have had their hydrology documented, as on Horse Creek, but irrigators will regularly refer to the unique hydrology they deal with – deep gravel or lack of it, for instance, determining just how they’d like their neighbors to use water, and whether they’ll call in state administrators to enforce priority.<sup>249</sup> Flowing water is also, of course, hard to keep away from others (which economists call its low “excludability”) – that’s why regulators, from state agencies to ditch riders, can be called on to enforce the rules, on occasion. Subtractability, low excludability, and the hydrology particular to each stream means that water use creates a certain pattern of water availability on a stream. That pattern is what users depend upon, and what makes users interdependent. Wyoming water users recognized that interdependence early on, when they rejected in 1909 their court’s initial decision allowing transfers of water rights.<sup>250</sup>

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<sup>246</sup> STATE ENGINEER 1919-20, 50.

<sup>247</sup> T.A. LARSON, HISTORY OF WYOMING 414-16 (2d ed.) (1978)

<sup>248</sup> ELINOR OSTROM, UNDERSTANDING INSTITUTIONAL DIVERSITY 24-5 (2005)

<sup>249</sup> Interviews with irrigators on Bates Creek, Natrona County, Wyoming, and East Fork of New Fork River, Sublette County, Wyoming, Dec. 2011-Jan. 2012. In author’s files.

<sup>250</sup> See MacKinnon, Making their own way, 196, for a discussion of the facts behind the 1904 Wyoming Supreme Court case and the subsequent debate over transfers.

Wyoming has since then surpassed most other Western states in erecting roadblocks to transfers of rights to use flowing water. Administrators and users take a long and cautious route before reaching any decision endorsing a transfer of water rights to new locations or new uses, because of the original fear of speculation rooted in the long experience with frontier conditions. (Stored water is a different matter. Considered a “tangible thing” created by investment in construction of a reservoir, stored water can be transferred freely, as Wyoming’s state engineer noted in 1920.)<sup>251</sup>

Implementing the 1909 prohibition on transfers that they and the water users had sought, Wyoming water administrators in subsequent decades created a variety of tools to protect patterns in the use of flowing water as they approved the few transfers that were allowed under the exception list. A right to divert a certain amount of water for agriculture could be transferred to a municipality, or to a steam railway, sometimes in its entirety, or sometimes in a reduced volume, apparently depending on the locations and the stream involved.<sup>252</sup> Concurrent with a perennial interest in how water rights could best be measured and delivered,<sup>253</sup> the administrators thought through the question of interdependence, and when confronted with a transfer proposal began to investigate the details of what it means to avoid injury to a water right. They sought on occasion to ensure that water diverted for irrigation but not consumed by crops, and therefore ultimately returned to the river, would still be there, after the transfer, for the other water users who had relied on that “return flow.”

After World War II, new industry began to eye Wyoming – steel, aluminum, and coal-fired steam power plants – all with a demand for water, and usually seeking the most-secure water supply offered by early-date rights. The state legislature of the 1950s, ever hoping for new industrial development in what had remained a rather poor state, responded by adding more industries to the list of exceptions, admitting industrial and steam power uses to the company of the lucky few who could receive transferred water rights.<sup>254</sup> The

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<sup>251</sup> STATE ENGINEER 1919-20, 50.

<sup>252</sup> Town of Lander, Board of Control 7 Order Rec. Book 593 (1933); Town of Greybull, Board of Control 10 Order Rec. Book 223-35 (1940); Union Pacific Railroad, Board of Control 11 Order Rec. Book 56 (1943.)

<sup>253</sup> STATE ENGINEER 1915-16, 89:

<sup>254</sup> 1955 Wyo. Sess. Laws 227, § 1; 1957 Wyo. Sess. Laws 116, § 1; Trelease, *Priority and Progress*, 62-64.

water administrators in their turn then made their own rules, in their own process of trial-and-error, on how to condition those transfers as they dealt with each proposal that arose.

The key period for understanding the Wyoming rule on transfers – after the dramatic 1909 repudiation of the general “no injury” rule followed in other states – begins in the 1950s. The Pacific Power and Light Co., proposing to operate a new coal-fired power plant on the North Platte River, in those years brought to administrators a succession of proposed transfers – and administrators responded with a succession of conditions designed to protect other North Platte users. In 1956 the administrators approved the transfer to the company of the entire amount of an old agricultural diversion from the Platte, and allowed that diversion to go on year-round, though the original agricultural diversion did not do so.<sup>255</sup> By the 1960s, however, concern about the impact of that transfer on others using the river led to an unwritten agreement between administrators and company that the company could take only about two-thirds of the original amount of water diverted – in part to make up for the year-round nature of power plant water use.<sup>256</sup> In 1972 the power company wanted another water transfer, to secure more water in order to meet the new environmental regulations of the 1970s that required the plant to cool down the water it discharged. This new transfer proposal met with stricter requirements from water rights administrators. The administrators sought to protect the stream flow pattern relied on by other water users – specifically, to keep in the stream the amount of water that had once returned to it when the water was used for irrigation. Accordingly, the administrators allowed the power company to divert only in summer, and to take only about half the original amount of water once diverted for irrigation.<sup>257</sup>

Meanwhile hopes for increased prosperity in agriculture, as well as in new industry, created added pressure for transfers of water rights. In southeast Wyoming, there was a large irrigation project that was started as a for-profit venture in the 1880s and had never had enough water rights to serve the acreage involved, despite lots of early water diversions, tunnels and reservoir construction.<sup>258</sup> In the 1950s, during the most serious drought yet seen

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<sup>255</sup> Board of Control 7 Minute Rec. Book 118 (1956).

<sup>256</sup> John Barnes, Pacific Power and Light Company and Water Transfers in Wyoming, Plan B thesis, Public Administration, 6 (1993), (on file with author).

<sup>257</sup> Barnes, Pacific Power and Light Co., 7-9; interview with Randy Tullis, Superintendent, Water Div. 1 (Jan. 11, 1999)

<sup>258</sup> Trelease, Priority & Progress, 40-43.



that century, the project, now owned by the farmers on its lands, once again sought more water supplies. Originally looking for unallocated water to store and use, the project managers came upon a large ranch of mountain hayfields, some 60 miles from the project's irrigated lands, a ranch that had early water rights and was for sale.<sup>259</sup>

Could the irrigation district buy the ranch and transfer its water rights from the hay meadows to irrigated fields in plains miles away? The transfer of agricultural water for agricultural use in a different place was the very thing the Wyoming's transfer prohibition was written to stop. Nonetheless, with the backing of the governor, the Wheatland Irrigation District obtained a loan of state funds in order to buy the distant ranch for its water.<sup>260</sup> The trick was that the ranch water rights considerably pre-dated Wyoming's 1909 prohibition on transfers. The attorney general advised that the ranch rights therefore could be transferred under only the general rule recognized by other Western states and by the 1904 Wyoming court – a transfer would be allowed if it did not injure others' water rights.<sup>261</sup>

Wyoming's water administrators accepted the attorney general's view. But they assumed they had authority to review and condition, permit or deny this transfer, just as they had done for decades with other transfers excepted from the no-transfer statute. They proceeded to apply to Wheatland's agricultural water transfer plan the standards they had developed to review transfers that were on the exception list. They required the farmers to submit detailed analyses to show what had been the historic patterns of diversion and use, the actual consumption by the ranch hay crops, and the return flows from the hay fields when the ranch had used its pre-1909 rights.<sup>262</sup> In the end the administrators allowed a transfer of some of the pre-1909 rights on the ranch in their entirety, while they cut other pre-1909 rights on the ranch by one-quarter to one-half their original amount of water, as a condition of the transfer.<sup>263</sup>

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<sup>259</sup> Trelease, *Priority & Progress*, 43-44.

<sup>260</sup> *Ibid.*, 58-59.

<sup>261</sup> 1957-60 Opinions of the Office of the Attorney General of the State of Wyoming, #24, 55-56 (April 1957)

<sup>262</sup> Wheatland Irrigation Dist., Board of Control 16 Order Rec. Book 1-26 (1964); Trelease, *Priority & Progress* 44-45.

<sup>263</sup> Wheatland Irrigation Dist., Board of Control 16 Order Rec. Book 1-26 (1964); Trelease, *Priority & Progress*, pp. 43-46.

Wheatland had tried and failed, a few years earlier, to get the legislature to soften the no-transfers statute. Legislators, though they rejected the district's proposed language, were interested in the problem of making more water transfers possible. In the late 1950s - at Wheatland's request - legislators asked an influential Wyoming law professor to advise them on the pros and cons of legislation allowing agricultural water rights to be transferred to new agricultural lands under certain circumstances (if, for instance, the original lands had become unirrigable.) Prof. Frank Trelease, recognized nationwide as a water law expert, responded with a report covering a much broader issue - looking at the history of all water right transfers in Wyoming, and making recommendations for change.<sup>264</sup> Then, a year after the water administrators had decided the case of the ranch rights-transfer to Wheatland, Trelease went further. In a seminal law review article, he called for overhaul of the Wyoming water rights transfer rules to allow transfer of all Wyoming water rights, subject to administrative review and approval.<sup>265</sup>

The need to make Wyoming's water rules clear to the new users and the new proposals entering the state may have pushed the legislature to take on the prickly task of writing new law on water, even though the early statutes were regarded by many users as a matter of almost religious faith.<sup>266</sup> Already in the mid-1960s the legislature had started to codify some of water administrators' practices, at the administrators' request.<sup>267</sup> Ultimately in 1973, the legislature did enact a new transfer statute.<sup>268</sup> It too essentially put into statutes the procedure that administrators had been using for years. It codified the process and the considerations in water transfers that the water administrators had worked out for users and themselves over the past half-century. The 1973 law provided that no amount of water could be transferred that exceeded the amount or the timing of historic diversions, or that increased the amount consumed historically, or that resulted in reduced return flows, or that

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<sup>264</sup> Frank J. Trelease, *Severance of Water Rights from Wyoming Lands*, 1 (1960) (on file in Trelease collection, University of Wyoming Law School)

<sup>265</sup> Trelease, *Priority & Progress*, 70-73.

<sup>266</sup> Henry E. Smith has made it clear just how prominent the question of "information cost" in broadcasting rules to an audience drives property law towards standardization, and codification of longstanding practice, as the audience grows wider and wider. Merrill and Smith. (2000); Henry E. Smith, *Community and Custom in Property*. *THEORETICAL INQUIRIES IN LAW* 10:1 (2008).

<sup>267</sup> See, for instance, codification of the administrators' long-time practice of requiring water users to seek administrative approval of changes in point of diversion and/or means of conveyance of water: 1963-64 *STATE ENGINEER* 21-22; 1965 *Wyo. Sess. Laws* 138.

<sup>268</sup> 1973 *Wyo. Sess. Laws*. 170 §1; 1974 *Wyo. Sess. Laws* 23 §1.

in any way injured the rights of other water users (the traditional, general rule elsewhere). The next year one more consideration was added to that list in the statute – administrators should consider the impact on the economy of the county from which the right was being transferred.<sup>269</sup> This had been an argument raised by water users who initially opposed the transfer of the ranch water to Wheatland.<sup>270</sup>

Significantly, Board of Control practice has included an additional restriction at least since the 1970s. The board's examination of historic consumptive use looks for consistent consumptive use over a period of years before the transfer, ideally at least five years – with current technology, that can involve close scrutiny of infrared photographs, etc.<sup>271</sup> This is in sharp contrast to the amount of use required to defeat abandonment, which can be simply one successful use in the most recent five-year period. Other features of the inquiry initiated with the board by the transfer process, such as the consumptive use calculations which are elaborately detailed and often sent back for further work by petitioners, are equally detailed. It becomes apparent that a water right proposed for transfer in Wyoming is subject to what could be called “strict scrutiny” (with apologies to the very different original context of the U.S. Supreme Court test of that name).<sup>272</sup> It contrasts with the examination conferred on a water right charged with abandonment.

So as the appropriate scope of the power to transfer Wyoming water rights was debated and then resolved through the 1960s and 1970s, Wyoming water users ended up with a right to transfer water rights - but a right subject to the considerable restrictions that could be imposed by water administrators when the water right was transferred.

Wyoming water users, water administrators, and politicians responded to a number of forces throughout this period. Insistent agricultural water demand spawned by the severe drought of the 1950s, plus the proposals of new water-using industry, were joined by fear of future outside restraints on Wyoming water use. One worry had been familiar since the first

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<sup>269</sup> 1974 Wyo. Sess. Laws 170 §1

<sup>270</sup> Trelease, *Priority & Progress*, 44.

<sup>271</sup> This practice was recorded by 1989 in the board's written version of its rules of operation, Squillace 340, citing State Engineer Office Regulations and Instructions, Part IV, Board of Control, Ch. 5, sec.15(f).

<sup>272</sup> *Regents of the University of California at Davis v. Bakke*, 438 U.S. 265 (1978) articulated what is known as the “strict scrutiny” test in a case involving challenge to an affirmative action program for university admissions that included race as a consideration for admissions. The court ruled that when a program touches upon “an individual's race or ethnic background, he is entitled to a judicial determination that the burden he is asked to bear . . . is precisely tailored to serve a compelling government interest.” (Ibid at 299)

years of the century – the growth of downstream state population and industry, steadily increasing their water use, while Wyoming’s economy and water use grew slowly by comparison. The fear in Wyoming was that those downstream uses might ultimately demand a bigger share of the rivers that headed up in Wyoming, to the detriment of some hoped-for future Wyoming development. Interstate compacts, like the Colorado River Compact of the 1920s, were supposed to protect a share in the river for each state to use in its own good time. In the 1960s and 1970s the prospect of downstream demand grew ever more alarming for Wyoming, however: massive population increases and urban development post-World War II in Arizona and California only intensified, and began to reach Nevada, Utah and Colorado as well. Federal investments in the Colorado River put in service in the 1960s more massive dams and reservoirs to provide water and power for agriculture and cities fed by the river in the southwest. Wyoming and neighboring states supported those projects, since they were designed to provide to the southwest its share of the river while ensuring that upper river states like Wyoming could someday still draw on their own shares of the river, whenever their own development might take place.<sup>273</sup> The new infrastructure only encouraged more growth in the southwest, however, inviting the downriver states to thirst for more than their share. Meanwhile Wyoming couldn’t generate new demand for even a small part of its apportioned share of the river. The poor economics for agriculture in the high desert meant that even a small new federal reservoir built in the 1960s on Wyoming’s headwaters of the Colorado River couldn’t generate the new irrigated agriculture it had been designed to create. None of the hoped-for industrial users have ever tapped the reservoir water.<sup>274</sup> Increasingly, the state engineer’s office feared, those whom State Engineer Floyd Bishop wrote of as “economists and federal-type planners” were likely to give priority to the investment and thirst for water of downstream, low-elevation states with more attractive climates.<sup>275</sup>

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<sup>273</sup> U.S. Bureau of Reclamation, Upper Colorado Region, Colorado River Storage Project History, <http://www.usbr.gov/uc/rm/crsp/history.html>, accessed 3-16-11.

<sup>274</sup> U.S. Bureau of Reclamation, Seedskadee Project History, [http://www.usbr.gov/projects/Project.jsp?proj\\_Name=Seedskadee%20Project&pageType=ProjectHistoryPage#Group336765](http://www.usbr.gov/projects/Project.jsp?proj_Name=Seedskadee%20Project&pageType=ProjectHistoryPage#Group336765), accessed 3-16-11; Wyoming Water Development Office, Technical Memorandum: Use of Wyoming’s Contract Storage Water in Fontenelle Reservoir, Feb. 2011, <http://waterplan.state.wy.us/plan/green/2010/finalrept/fontenelle.html>, p. 2, accessed 3-16-11 (Fontenelle is the reservoir built for the Seedskadee project)

<sup>275</sup> 1965-66 STATE ENGINEER 20-21.

Through the 1960s, Wyoming seemed wrapped in a cocoon of isolation and subsistence agriculture. It was not at all clear that its water users wanted to change that. Bishop warned about past decades of somnolence in Wyoming water administration. He feared that persistence in the traditional underfunding and understaffing of water administration in Wyoming could invite increased activity from the federal government to the detriment of Wyoming's style of water management. The federal government was starting to show interest in issues like water pollution and endangered species – issues that could bring federal intervention as they cut across state lines.<sup>276</sup>

Since before World War II, Bishop wrote,

*Too little emphasis has been placed on the administration of water in Wyoming for many years, and if this trend continues the ultimate result can only be federal control of our water, which has historically been a state responsibility. This would be a tragic thing in the eyes of most Wyoming water users.*<sup>277</sup>

Users, however, were suspicious of change, fearful that it might mean water would be shifted away from them to benefit new uses in Wyoming. The water superintendent of the Powder River Basin, for instance, expected change to take the form of industrial demand for large volumes of water as coal production in that basin appeared likely to grow to be the largest in the U.S. He noted with dismay however that

*Almost without exception whenever I have discussed the potential use of water for industrial purposes with local water users, I have observed a negative attitude on the part of most irrigation water users, which would appear to be the results of a lack of knowledge relative to laws and procedures which must be complied with before an irrigation right can be changed to an industrial use.*<sup>278</sup>

Already Wyoming water users had sought to shut the door against newcomers in general, convincing the Legislature by 1945 to grant them a legal right to “surplus” water if their stream flowed more water than their original rights could use – and letting them take that water before anyone with a right dated after mid-1945 got any water at all.<sup>279</sup>

Law professor Trelease urged adoption of the new transfers statute of 1973 in order to eliminate hobbles that he believed the longstanding transfers ban had put on Wyoming water users. The ban had created inequities among water users, Trelease argued. Some could sell

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<sup>276</sup> 1965-66 STATE ENGINEER 6-7.

<sup>277</sup> 1963-64 STATE ENGINEER 9-10.

<sup>278</sup> 1965-1966 STATE ENGINEER 48.

<sup>279</sup> 1945 Wyo. Sess. Laws. 153, now codified as Wyo. Stat. §41-4-318 through -324.

their rights and others couldn't, due not to the merits of their investment in their rights, but to the chance of who the buyer was: sale to a city or a railroad could happen, sale to another ranch or farm could not.<sup>280</sup> That last meant, Trelease argued further, that agricultural innovation was stifled in Wyoming. A priority system linked with a transfers-ban meant that "the mortmain grip of the pioneer" held the Wyoming landscape in its grasp, freezing it to a pioneer pattern of agriculture suited to outdated technology, Trelease wrote.<sup>281</sup> And the dead hand of the pioneer left successive generations of water right holders with what Trelease called an "heirloom attitude" that became a feature of the state's poor economy – a fear of letting water rights move or of taking on any change. The Wyoming water user, Trelease wrote:

*...feels that water is his most precious asset, his heritage, his birthright. To sell it would be sinful. Laws against sin are much in favor. In part this attitude may come from a misunderstanding, a fear that stability of water rights is at stake, that water will be "taken" from irrigators without compensation, as may be done in some eastern states. In part it seems to stem from desires to preserve the status quo of rural Wyoming, to prevent neighbors from selling out, to prevent the loss of tax revenues for counties and school districts in areas subconsciously feared to be marginal.*

Overall, the law professor argued in his frank, initial report to the Legislature in 1960, "In general there is no essential difference between the property aspects of land and water." Water rights in Wyoming were in his view fundamentally a private property right – and a very valuable one - and the transfers ban deprived water users of a crucial aspect of resource putting resources to the best economic use.<sup>282</sup>

Yet it became clear in the years after the 1973 statute was enacted that Wyoming water administrators and users did not see water as entirely a matter for private ownership, or for marketing, whatever some might say of the economic promise of those concepts. Commentators reviewing the potential for water markets in the Western U.S. have critiqued Wyoming's 1973 statute (unchanged since then) for the limits it still imposes on water marketing in Wyoming.<sup>283</sup>

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<sup>280</sup> Trelease, Severance of Water Rights 37-38; Trelease, Priority & Progress 71.

<sup>281</sup> Trelease, Priority & Progress 70.

<sup>282</sup> Trelease, Severance of Water Rights, 1, 39-40. For economic arguments in favor of water markets and transfers, Trelease cited J.W.Milliman, Water Law and Private Decision making: A Critique, 2 J. L. & Econ, 41, 54 (1959).

<sup>283</sup> Gould (1988), 35-36; Squillace (1989), 338, 340-41, Squillace (1990), 6, 9.

The 1973 statute allows water transfers, but it does not provide the right of free alienation more typical of private rights in land. It does not even provide the right of alienation subject to general “no injury” considerations that most other Western states allowed. The new statute essentially put into formal written rule only what Wyoming water administrators had crafted over time – a set of considerations and potential restrictions designed to protect water use patterns. Those considerations - questions on historic diversions, consumption, return flow of water, expanding upon the traditional question of other injury to others’ water rights<sup>284</sup> - could now be applied to all water transfers, not just those on the old exceptions list.

The considerations listed in board practice, and in the statute, were restrictions very peculiar to water. Unlike Trelease, water administrators saw a fundamental difference between water and land. They had put together a set of considerations they had found to be key for water – not for land. In their view, it was crucial that water users not have the power simply to alienate the right to use water. The water administrators had to retain the power to supervise, condition, and if necessary disallow any such transfers. They had to retain the power of alienation, and not cede it to users.

The new statute might have been designed to dampen water users’ fears of change in water use. The law encapsulated the administrators’ authority and their process and recorded it in black and white so as to reassure cautious users that there were protections in place to handle water transfers. But many water users who have never been exposed to the transfer process still insist that in Wyoming, water cannot be moved from the land it irrigates. They consider that one of the best features of Wyoming water law. They are not jealous of the administrators’ exclusive power to control the right of alienation.

Since the 1970s, Wyoming’s state government has gained healthy funding, and put away surpluses, based on energy development in coal, oil, gas and uranium. The industry

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<sup>284</sup> *Basin Electric Power Coop. v. State Board of Control*, 578 P. 2d 557 (Wyo.1978). In this case, a power company proposed moving for its use a water right on a ranch where some of the water had been used in a “closed basin” that had no outlet, and no other users, for the water or its return flow. The transfer came up under the 1973 statute. That statute included “no reduction in return flows” as one of the test factors in determining what water right could be transferred. The company argued that in the unusual physical situation of the closed basin, it should be able to move all of the ranch water rights pertaining to that basin, without deducting for maintenance of return flows, since there was no one who received the return flows, and so no pattern of water use for the statute to protect. Both the Board of Control and the Wyoming Supreme Court found that the new law, when it formalized the board’s longstanding practice, did not provide its list of test factors, including no reduction in return flows, as examples of the “no injury” rule prevalent in other states. Rather, those factors were to be considered in addition to “no injury.” (*Basin Electric* at 566-67.) This construction of the statute may have left the board with less discretion in transfer cases than it had been able to exercise before 1973, but both the board and the court read the statute that way.

gave wealth to some and solid jobs to others, and is now recognized as the premier economic driver in the state. Legislators have in turn put over \$2 billion in mineral revenues into development of water infrastructure for cities and for irrigation, through the water facilities agency created as Wyoming's energy development began.<sup>285</sup> And, very significantly, the Board of Control has approved water rights transfers, to ranchers and farmers as well as to cities and industry – and to non-consumptive uses, as a taste for those uses has developed.<sup>286</sup> But there has been no loosening of the rules in the name of a more smoothly functioning water market.

The restrictions remaining in the transfer rules have in fact served as another way of imposing the abandonment doctrine on water users – when the situation allows. If a water user proposes a new purpose or place for water covered by an existing water right, the scrutiny his water right undergoes is even greater than what would be applied to it under an abandonment charge.<sup>287</sup>

A dramatic case from the early years of Wyoming's energy development seared into everyone's consciousness at the time the reason why this is true. In the 1970s, a plan came up to supply water for a coal-fired power plant on the Wyoming headwaters of the Colorado River –the Green River. The proposal wound its way through the Board of Control and the courts in the late 1970s and early 1980s. Those were years of dramatic increases in oil prices nationwide – the “energy crisis” as it was called - and accompanying intense pressure for energy development in Wyoming. The state engineer who succeeded Floyd Bishop, and had worked for him for years, was the focal point of pressure for new uses for water for energy development.

In 1977, an old irrigation venture that had largely failed, holding water right permits dating from as early as 1908 that had never been put to use, made a deal with Pacific Power and Light Co. to sell some of its completely unused permits to the power company for a coal-fired power plant. The plan called for changing the original permits so the water could be used 134 miles downstream from the originally planned location, and used for

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<sup>285</sup> Wyoming Water Development Commission Legislative Reports, 1982-2012.

<sup>286</sup> Wagonhound, Board of Control, I-2007-4-3; Hagie's Haven LLC & Wyoming Game and Fish Commission, Board of Control, IV-2010-1-5, IV-2010-3-17, IV-2011-2-2, IV-2011-2-4.

<sup>287</sup> The Wyoming Supreme Court in the Basin Electric case of 1978, its first review of implementation of the new transfer statute, explicitly noted that abandonment principles must arise in transfers: “the issues of nonuse and misuse are inextricably interwoven with the issues of change of use and change in the place of use. This is true even without the formal initiation of abandonment proceedings under the statutes.” Basin Electric, 564.



industry rather than irrigation. The irrigation company, known as Green River Development Co., asked for the State Engineer's blessing. Four years later, the State Engineer approved the plan.

Ranchers and mining companies all along the river were outraged and came to the Board of Control to protest the ghost of an old, large, and unused water permit suddenly coming to life with priority dates that would predate and disrupt some of their long-established water uses. The case led to a painful division between the State Engineer and his superintendents, who voted to overturn his decision allowing such a move. The Wyoming Supreme Court upheld the board and the Green River Development plan died.<sup>288</sup> The water involved was covered by permits, and had never been used.<sup>289</sup> It was not a case of water that had been used, then unused, and was now to be revived rather than abandoned. Still the facts of the case – which clearly alarmed the Board, and shocked the Supreme Court, as its opinion made plain – showed what could have happened in Wyoming if the court-sanctioned power of users to revive old unused rights had not been restrained by the longstanding Wyoming suspicion of water transfers.

The rules made evident to all by the 1973 transfers statute make it clear that minute inspection will take place if an existing water right is proposed for transfer. The inspection will include examination of how much water was historically diverted under the existing use, how fast the rate of diversion was, how much water has been consumptively used, and how much water has come back to the stream in return flow.<sup>290</sup>

Several of those considerations will not come up in an abandonment proceeding, which looks for use of water, but not necessarily questions of exactly how much was consumed by vegetation, compared to how much was diverted. Further, Wyoming water administrators have made clear, abandonment imposes an easier test to beat because of how it views the time span involved in evaluating existing use. One use in five years can defeat an abandonment charge, but proving a water right is substantial enough to transfer means

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<sup>288</sup> *Green River Development Co. v. FMC*, 660 P.2d 339 (Wyo.1983)

<sup>289</sup> The permits were still considered valid, and could still have allowed the water to be put to use decades later on the original fields where the use had once been planned. The decades that had gone by had, however, proved the impracticality of the old plans. So, until the 1970s, so others who had successfully put water to use had not been threatened by these old permits. The permits were still considered valid because of developments in 1900-1925 which had given water users who didn't have certificates of water rights, but did have permits, a right to put off use of the water, thus increasing the management rights that users had in Wyoming water. For details on the 1900-1925 developments related to permits, see MacKinnon, *Making their own way*.

<sup>290</sup> Wyo.Stats. 41-3-104.

showing steady use, over a span of years. Wyoming administrators often advise water users of the stark difference between the two.<sup>291</sup>

Other states can also see a transfer proposal as the appropriate moment to examine what a water user really does have in the way of a water right.<sup>292</sup> And other states have even come around to seeing some merit in Wyoming-style restrictions aimed at protecting local water use patterns and explicitly the local economy of the area that is home to the water right proposed to be transferred. After considerable unpleasant experience with long-distance transfers of agricultural rights to urban areas, for instance, Colorado joined other states in looking for ways to offer some protection to the “basin of origin” when transfers are proposed.<sup>293</sup>

Water administrators in Wyoming, and water courts or other representatives of state administration in other states, have been very clear about retaining the right of alienation to themselves, and not ceding it to water users. They have even clawed back some of the right of exclusion, to wield in the transfer process. Water users have whatever rights they’ve gained in management, and some rights of exclusion, but they don’t have the right to alienate. (And in Wyoming, at least, the majority of users seem to like it that way.)

## 6.6 Conclusion

Overall, the arguments against the abandonment doctrine are still in force in Wyoming. Water rights are hard to lose, revivals can occur, and local patterns of interdependent water use are disrupted. The long history of Horse Creek illustrates that. Water rights in Wyoming as in all the West have long been under pressure to become private property rights.

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<sup>291</sup> Brad Reese, Board of Control, I-2011-4-3.

<sup>292</sup> MACDONNELL, vol II, ch 3, pp 3-5

<sup>293</sup> Steven Shupe, Issues and Trends in Western Water Marketing, conference paper for Natural Resources Law Center, U.Colo. School of Law, Boulder, CO (1988), accessible at: [http://www.rlch.org/WWPP/archives/publications/1988/88\\_RR\\_Shupe%20\(Issues\).pdf](http://www.rlch.org/WWPP/archives/publications/1988/88_RR_Shupe%20(Issues).pdf); Bonnie Colby et al., Transferring Water Rights in the Western States – A Comparison of Policies and Procedures (Feb.1989), on file with Natural Resources Law Center, U.Colo. School of Law, Boulder, CO. Accessible at: [http://www.rlch.org/WWPP/archives/publications/1989/89\\_RR\\_Colby%20\(transferring%20water%20rights\).pdf](http://www.rlch.org/WWPP/archives/publications/1989/89_RR_Colby%20(transferring%20water%20rights).pdf); Charles W. Howe and Jeffrey K. Lazo, Econ on file with Natural Resources Law Center, U.Colo. School of Law, Boulder, CO. Accessible at: [http://www.rlch.org/WWPP/archives/publications/1990/90\\_CFD\\_Howe-Lazo.PDF](http://www.rlch.org/WWPP/archives/publications/1990/90_CFD_Howe-Lazo.PDF); TERESA RICE AND LAWRENCE J. MACDONNELL, AGRICULTURAL TO URBAN WATER TRANSFERS IN COLORADO: AN ASSESSMENT OF THE ISSUES AND OPTIONS. Natural Resources Law Center Research Report Series.1993. Available at: [http://www.rlch.org/WWPP/archives/publications/1993/93\\_RR-Rice\(agricultural%20to%20urban\).pdf](http://www.rlch.org/WWPP/archives/publications/1993/93_RR-Rice(agricultural%20to%20urban).pdf)

Still, water law in all the West recognizes that water is not land. The role of hydrology in water means water users will be interdependent. Water rights are therefore not entirely like rights in land. Water cannot be entirely made into private property.

That is evident in the rules on transfer of water rights in Wyoming. The concern behind the transfer statutes are at bottom concerns about protecting water users who are interdependent and therefore vulnerable. They use a resource that flows through streams to one ditch, is sent off to soak a certain soil, filters through gravel and stone to groundwater or back to the stream, and is taken up again by another ditch or a well to head for another field. It is not an easy thing to extract one water right from that picture, and move it elsewhere. It can be done – but it can't be a matter of “free alienation,” a choice made solely by the owner of a “private property.” Some rights have to be retained by the larger society, represented by the state government.

Every Western state has made a different distribution of rights in water. Wyoming's distribution pattern is no doubt peculiar to itself. But the opportunity that the Wyoming example provides to examine the doctrines of both loss and transfer of water rights offers a chance to look at those doctrines close-up, over many decades, without too many distractions. It offers a conclusion that is handy to remember when working in water in any Western state. Rights to water are not private property rights. They are property rights divvied up, in various ways in the various states, between water users and the state government that represents the public.

## **PART THREE: CONCLUSION**

## 7. FINDINGS

### 7.1 Property Rights Regimes in Water

This section of the Findings offers a sketch of the sequence of different regimes of property rights in water that emerged in Wyoming from 1890-1985.

When Wyoming became a state in 1890, its constitution and its initial legislation placed special emphasis on water issues, largely because of its settlers' recent experience with the unpredictable and often water-short streams cutting through many square hectares of unwatered plains, which they had largely been using for grazing. The new constitution specifically declared that "the water of all natural streams, springs..." (etc) within state boundaries were "the property of the state" (Wyoming Constitution, Art. 8, Sec. 1). The constitution and new water laws set up how the State would allow citizens to use water (MacKinnon, 2006; Wyoming Constitution, Art 8 and Art. 1, Sec. 31; 1890-91 Session Laws of Wyoming, Ch.8).<sup>294</sup>

The State of Wyoming as owner of the water was clearly understood – as the Wyoming Supreme Court explained ten years later – to be the people, the entire community, of Wyoming.<sup>295</sup> The Constitution itself set up an administrative agency to represent the state, in turn, in water matters: that agency was and is known as the state engineer's

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<sup>294</sup> Wyoming Const. Art. 8 and Art. 1, Sec. 31, reads: "Water being essential to industrial prosperity, limited in amount, and easy of diversion from its natural channels, its control must be in the state, which, in providing for its use, shall equally guard all the various interests involved."

<sup>295</sup> The Wyoming Supreme Court rejected a major legal challenge to the new water language in the state's constitution and statutes in *Farm Investment v. Carpenter* (1900), specifically upholding and explaining the constitutional declaration that the state owns the water. The court said that over some 20 years before Wyoming became a state, settlers had invested time, labor and money in putting water to work, and "the welfare of the entire people became deeply concerned in a wise, economical and orderly regulation of the use of the waters of the public streams" (124). Noting that water users in Wyoming and elsewhere in the West had followed a "doctrine of prior appropriation" (according the best right to first users), the court commented: "Under the doctrine of prior appropriation, it would seem essential that the property in waters affected by that doctrine should reside in the public, rather than constitute an incident to the ownership of adjacent lands... (A)n expression by constitution or statute that the waters subject to appropriation are public, or the property of the public, would seem rather to declare and confirm a principle already existing, than to announce a new one" (136-37). Later, the court noted: "There is to be observed no appreciable distinction, under the doctrine of prior appropriation, between a declaration that the water is the property of the public, and that it is the property of the State (T)he State, as representative of the public or the people, is vested with jurisdiction and control in its sovereign capacity. The title of the appropriator fastens not upon the water while flowing along its natural channel, but to the use of a limited amount thereof for beneficial purposes in pursuance of an appropriation lawfully made and continued. The appropriation is made, in the first place, upon the basis of public ownership of the water, and is protected instead of impaired by the constitutional declaration [of ownership by the state]" (138-39). (For more detail, see Chapter 4).

office. The arrangements that the state as owner made via the state engineer's office to provide for individual water use rights were of course not simple, and they changed over time. This section outlines the regimes of property rights to water in Wyoming at three significant points in the state's history: 1890, 1920, 1970. To facilitate discussion of historical trends, it also notes key features of the regime in 2010.

The analysis below takes account of both officially enforced (*de jure*) property rights and unofficial, in-practice (*de facto*) rights in water in Wyoming. For simplicity's sake, the people of Wyoming represented by the Wyoming state administrators will be called "the state" in this section.

The analytical tools and theory in property rights used here are that of Schlager and Ostrom (1992), laid out in detail in the 1990s (see also Ostrom and Schlager, 1996), and discussed in Chapter 3 (section 3.1.1).

Wyoming water rights are most easily analyzed by first classifying three types of water resources based on key attributes: *flowing surface waters* (locally called "*direct flow*" waters), which can have problems of predictability and excludability; *stored surface waters*, which can be more predictable and excludable; and *ground water*, which can have problems of predictability and excludability. Most of this study focuses on direct flow surface water because of its importance to irrigated agriculture, the primary use for water in Wyoming; in this section however the regimes for stored surface waters and groundwater will be briefly touched upon.

### 7.1.1 Direct flow water

The most complex property rights to analyze are rights to direct flow water. The state over 140 years has retained its *de jure* rights of alienation over the water. Even at the establishment of the water rights system in 1890, however, the state was not an "owner" in the Schlager and Ostrom (1992) sense. The state never held *de jure* access and use rights. Starting in 1890, and for perhaps 15 years afterwards, the state did however hold all three crucial collective choice rights (management, exclusion, and alienation).

As might be expected in such a large geographic area, with its few inhabitants scattered across it, and difficult access in the early decades, users quickly *de facto* held many more rights than they held *de jure*. They held *de facto* at least some features of all the operational and collective choice rights *except* alienation, starting with the 1890 establishment of the system and at every point in time examined since.

Thus the Wyoming regimes of property rights in water are best described as regimes distributing rights between the state and the users. As between the two, the most interesting fluctuations have been, as Schlager and Ostrom would predict, in the areas of management rights and exclusion rights. Both state and water user positions in those two rights, powerful because they give authority in collective choice of rules, have waxed and waned and sometimes waxed again over the decades since 1890. That has been true even *de facto*, not only *de jure*. The following outlines the variations in user positions in those two kinds of rights over the years considered. (Alienation rights have remained in the hands of the state.)

- In **1890**, as property rights in water were first defined, individual users were clearly *de facto* claimants but, *de jure*, only authorized users. Users were *de facto* claimants (with management rights as well as access and use) on most streams except for possibly a few near the capitol. Users were *de facto* claimants not only on small streams or isolated streams (where state staff were rarely at hand), but also especially on abundant-supply streams (where state staff did not need to exercise any controls in order for everyone to get the water their rights covered – and often even more water). In those conditions, users could work out management among themselves, and rarely invoke the statewide agency management rules. (Users who organized themselves into an irrigation system of some type<sup>296</sup> – a phenomenon that increased in the 20<sup>th</sup> century – became *de facto* proprietors, with both management and (some) exclusion rights). The prior appropriation system itself, by providing for possible exclusion of late-date right holders (depending on water supply) also gave some water users minimal *de facto* and *de jure* exclusion rights, but users did not hold significant exclusion rights even *de facto* until about 1920).
- By **1920**, individual users even outside of organized irrigation systems became *de facto* quasi-proprietors (holding some exclusion rights that the state lost) and also *de jure* quasi-claimants.

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<sup>296</sup> Types of irrigation systems prevalent at the time included: “colonies” – private ventures run by an outside investment group; “projects” – publicly-funded irrigation works with special rules for user acquisition of lands to be irrigated; and “districts” – self-organized irrigator groups. Barzel notes that the restrictions on the rights of users typical of water rights systems in the arid Western U.S. are part of the “thorough delineation” and complexity of property rights in water in that area – rights carefully delineated because water is so valuable there. Barzel also notes the exceptions typically made for irrigation districts (and “ditch companies”), allowing them management discretion, as long as that does not disturb the larger pattern of water use on a stream protected by the state’s management rules as applied to individuals not part of irrigation organizations (Barzel, 1997, 118-121).

- By 1970, individual users remained *de facto* quasi-proprietors, and increased their *de jure* power to become *de jure* quasi-proprietors as well.
- By 2010, however, the picture had changed again. Water users are *de facto* only quasi-claimants and quasi-proprietors, holding more limited management rights and only some exclusion rights). *De jure*, users are only quasi-claimants and quasi-proprietors as well, having also seen more *de jure* limits imposed on their management rights, and no expansion to the kind of exclusion rights they hold.

Another interesting factor is that a new kind of user – users who don’t withdraw or consume water – has some collective choice rights by 2010. While at all previous points such users were only authorized entrants, holding only the right of access, by 2010 (starting in 1986 *de jure*) they held both *de facto* and *de jure* management rights. Such users are not claimants in Schlager and Ostrom’s (1992) sense, since they have access rights, and management rights, but not withdrawal rights, and claimants are said to hold all three. So they hold some operational rights and some collective choice rights, but they are not claimants. This arrangement is perhaps not surprising, since these users participate in an institution that tends to distribute property rights, rather than encourage cumulative right holdings.

Examination of user and state rights over time in Wyoming shows that a pair of rules on exclusion and management have been key in structuring the property rights regimes. Changes in these rules resulted in changes in the regimes. Accordingly this pair of rules requires special attention.

The key exclusion rule runs: A person can become a user of direct flow water in Wyoming by obtaining a permit from the statewide water agency and using the water.<sup>297</sup> The rule also has management implications: Meeting those requirements gives the user a “priority date” (the date of permit application) crucially relevant to govern use in times of shortage. In times of water shortage, those holding use rights with the earliest priority date have the right to use all the water covered by their use permit before someone holding a use right with a later priority date can use any water (Wyoming Constitution; 1890-91 Session Laws, Ch. 8, Sec. 34).

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<sup>297</sup> Initially in 1890, a procedure for adjusting existing water claims for inclusion in the new statewide system was also set up, alongside the permit system: people with existing claims had to come forward in an “adjudication” procedure covering an entire stream, and by affidavit, testimony and inspection the statewide agency officials would determine the date and extent to which water had been used before 1890 (1890-91 Session Laws of Wyoming, Ch. 8, secs. 20-33).



A significant subset of that exclusion rule initially stated: The water for which a permit is obtained must be actually put to use by a certain date, for the user to hold that right (Constitution and 1890-91 Session Laws, *op cit*); and if at any time (including decades later) the water is not used for a short, consecutive period of years, the right to use the water can be determined to be “abandoned” and thereby extinguished (Wyo. Statutes Annotated, Title 41, Ch. 3, Art. 4).<sup>298</sup>

The basic permit-and-priority exclusion rule has remained in force over 120 years, but changes in the subset have affected the rights of users. Between 1890 and 1920, due to user action, the deadline for initial, actual use of the water became meaningless (see Chapter 5). Then, between 1920 and 2010, due to user and court action, the potential for abandonment of a water right became almost meaningless as well (see Chapter 6).<sup>299</sup> Both of these changes, but particularly the second, gave individual users more management authority, with less risk of being expelled from the user group if they chose for some years not to use the full amount of water described in their permit (thus giving them a kind of *de facto* and *de jure* exclusion right, in the form of protection from exclusion).

Another set of developments gave individuals a further *de jure* exclusion right. In 1945, and again in 1985, direct flow water users convinced the legislature to enact rules providing that once all water users with rights *pre-dating* the new rule received the amount of water allowed by their rights, any additional water in the stream would be a “surplus” or “excess” (Wyo. Statutes 41-4-318 through 324, and 41-4-329 through 331; 1945 Wyo. Sess. Laws, Ch. 153; 1985 Wyo. Sess. Laws, Ch. 176). The rule then provided that all those pre-rule right-holders could take that surplus or excess water (in addition to the water they had already taken under their priority date) before anyone with a water right *post-dating* the rule could take any water at all. This rule, twice enacted into statute, creating two tiers of privileged water right holders, was a successful rent-seeking effort by existing water users that gave them increased exclusionary powers.

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<sup>298</sup> Abandonment benefits other users with later-date rights, who then can use water in times of shortage sooner and with more expectation of adequate supply than if the extinguished right with its earlier date were still in operation. Accordingly, this subset of the rule was designed to provide users with incentive to monitor each other’s uses and focus attention on non-use to eliminate unused rights. The virtual elimination of the abandonment rule by 2010 due to user challenges and resulting court decisions meant a weakened monitoring system.

<sup>299</sup> The 1890-1920 changes came about through a shift in governance structure for the property rights regime in water, in which users became actors at the constitutional level and thereby swung the collective choice decision to eviscerate the deadline for “initial use” to obtain a water right (see Chapter 5). The 1920-2010 changes in abandonment came about largely through state court decisions sparked by user challenges (see Chapter 6).

Moving on to the system's management rules: the key management rule provided that the actual characteristics of water use define the extent of the right to use the water. The right was to use water on particular lands, in certain seasons, withdrawing the water at specific points on a stream and through identified ditches. In a corollary rule, the interlocking individual uses, so defined, were considered a pattern of water use and flows, on which all users could rely – and which the community via the state agency would protect against disruption. This rule seems to provide an example of Barzel's (1997: 90) observation that more detailed delineation of rights will accompany increased appreciation of the value of the resource – such as scarce water in an arid region.

This key rule was explicitly declared only in 1909 after considerable struggle. The basic rule has remained in force. But it has been refined in implementation, in ways that affect user rights. In 1909, as part of the declaration of the rule, transfers of water rights away from their original lands were prohibited (see Chapter 5). Soon after 1970, transfers of water rights away from the original lands remained suspect, but were possible. Changes in individual uses (whether transfers away from original lands, or changes in withdrawal points or ditches used) could be made if the statewide agency determined that the change would not significantly disrupt the water use and flow pattern.<sup>300</sup> There was a significant anomaly, however: Users by 1970, and more so by 2010, faced the risk that an unused water right held by a neighbor might be successfully revived to make use of an early priority date, seriously disrupting the water use pattern without statewide agency approval. That was made possible because users hardly risked abandonment when they left water unused for years and then resumed use (see Chapter 6).<sup>301</sup>

Changes in these exclusion and management rules explain much of the variation in the property rights regimes for direct flow water to 1970. But in the final years, 1970-2010, changes in the entire setting affecting water use in Wyoming dramatically affected the property rights regime. In terms of the Institutions of Sustainability framework, the action arena – the arena for decision-making - essentially broadened to admit new actors (Hagedorn et al 2002). Those actors included people who valued non-consumptive uses of water (recreationists and environmentalists) and two Native American tribes long resident in Wyoming, who valued non-consumptive uses of water and had other goals as well.

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<sup>300</sup> Trelease (1966) notes some of these changes. For more detail, see Chapter 6.

<sup>301</sup> Wyo. Statutes Annotated, Title 41, Ch. 3, Art. 4. The annotated version of the statutes cited includes pages of references to Wyoming Supreme Court decisions interpreting and ultimately weakening the abandonment rule.

The interest in non-consumptive uses of water represented what North (1990) would call the growth of a new taste or preference. Recreationists and environmentalists expressing this preference were successful in winning recognition for their preference from the institution. After a decade of political action and legal challenges, they were able in the 1980s to change the property regimes in water so that (as noted above) they joined the ranks of “users” at the collective choice level, for choosing water use rules and ensuring that room can be made for their uses.

The impact was far-reaching. The state and the water users had shared goals for water from 1890 through 1970, focusing on consumption (first for commercial agriculture, then for subsistence farming and stock raising, with an increasing emphasis on municipalities and industry). After 1970, state goals slowly shifted to include non-consumptive uses for water quality, recreation and aesthetic-spiritual uses. Users changed to include not only non-consumptive users of all kinds but also wealthy new consumptive users with non-agricultural income (“hobby ranchers”). From 1890-1970, the transactions between users and the water resource were diversion, transportation and distribution of water on fields.

The drying up of streams – a transformation of their hydrology - was an accepted and sometimes explicit goal. Costs to users related to those transactions, including knowledge of streams and users as well as construction of infrastructure, were initially high but declined over time. After 1970, however, a new transaction was added: leaving water in-stream. Acquisition of knowledge plus conflict negotiation, to support this full new array of transactions, was costly.

Meanwhile, the non-consumptive user group also had influence at the national level. Among the environmental protection legislation initiated in the 1960s and 1970s (which set up a “time-out” to consider ecosystem impacts before a federal agency took an action) were major statutes to protect water quality and endangered species (all of which, in some way, were of course dependent on water). As these federal statutes were implemented, and litigated, over time, it became apparent that they often “trumped” (as if overpowering a lesser card in a card game) state schemes of property rights in water (Tarlock 2001: 772). Wyoming water users turned to the state to represent them in this new contest. As it has played out between 1970 and 2010 (sometimes over the course of litigation costing tens of millions of dollars and lasting more than a decade), the long-drawn out dispute has put the state, willy-nilly, in the position of imposing new restrictions on some users on major Wyoming rivers, including detailed management mandates whose implementation is monitored minutely with computerized measurements and infrared photographs – costly

management tools in which the state had never before considered it worthwhile to invest (U.S. Department of Interior 1997; U.S. Supreme Court 2001). The result has placed unprecedented *de facto* and *de jure* management rights – not all, but some - in the hands of the state.

Implementation of the new non-consumptive water use goals by the state – under both in-state and national pressure - was contentious but effective enough that consumptive users by 2010 were *de facto* and *de jure* only quasi-proprietors, and even only quasi-claimants. They were empowered to access and withdraw water, but there were situations in which they could not set the management rules they followed. The new non-consumptive users were typically only quasi-claimants (only the state, for instance, could actually hold a non-consumptive right). Non-consumptive users were, however, able to join consumptive users in the governance structure of the new property rights regime, becoming actors in collective decision-making on the management rules affecting all users.<sup>302</sup>

The tribes entering the action arena in the 1970s, however, did not fare as well.<sup>303</sup> They had interests which went beyond valuing of non-consumptive uses and sought recognition of their rights to self-determination in water use. Essentially, they sought recognition of a new tribal water management institution, with its own action arena encompassing tribal water administrators and tribal water users, an institution which might then have polycentric relations with the Wyoming water management institution. This effort failed, and the

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<sup>302</sup> Changes in the action arenas involved in water use in Wyoming were affected by socio-economic changes on both the external national and internal state level favoring non-consumptive uses of water. Nationally, increased economic growth, wealth, and attention to civil rights led to passage of the U.S. Clean Water Act and Endangered Species Act and increased legal recognition of Native American demands. In-state, those legal trends plus the explosion of a new minerals industry with workers interested in non-consumptive water use led to the following: the 1986 Wyoming In-stream Flow Statute; 1988 Wyoming Supreme Court confirmation of Native American water rights in Wyoming; and negotiations on reservoir operations across the state to protect water quality and endangered species (In Re: The General Adjudication (1988); Department of Interior (1997).

<sup>303</sup> Two Native American tribes, Eastern Shoshone and Northern Arapaho, were forced to settle on a “reservation” of land within Wyoming by U.S. armies in 1868. Federal law governing the tribes has required them to work together in one governance institution, which is why “the tribes” are described as one actor in this description. They occupied land in central Wyoming and used water there from 1868 on, and from 1890 on had property rights in water issued and approved by the Wyoming water administrators. Those rights were like those of other Wyoming water users, and were often individually held. Thus from 1890 to the 1970s they can be considered as among the set of water users described in this paper. In the 1970s, the tribes asserted, under the original 1868 treaty with the U.S. government, control of far greater amounts of water than had been allocated to their members as rights to water under the Wyoming water management institution. This assertion of control made them a new player in the action arena for that institution, starting in the 1970s, and accordingly they are so described here. For a detailed description of the tribes’ water situation and the litigation that resulted from their assertion of control, see O’Gara (2000).

implications of that failure are discussed in section 7.2 of this chapter, in the resilience analysis of the Wyoming water management institution.

### 7.1.2 Stored water and ground water

Property rights regimes in stored water and in groundwater also changed over this 120- year period, but in ways that can be described more briefly:

- For stored water, the user groups who built the storage facilities had from the outset in 1890 the rights of quasi-owners, while the state had by 1920, and through 1970, such limited rights of ownership as to be relegated almost to the status of a regulator (protecting public safety, etc). Goals and users were the same as those for direct flow through this period (consumptive uses in agriculture, municipalities or industry); initial transaction costs were high, but paid off in predictability and excludability. After 1970, the widened decision-making arena described above (section 7.1.1) produced a new demand for more water to be left in-stream below dams. That reduced the authority of the reservoir holders and increased that of the state to the point that both essentially shared ownership. The new non-consumptive users became quasi-claimants, via their influence on reservoir management. Transaction costs for construction and management of reservoirs increased.
- For ground water, users were explicitly considered owners of waters under their lands until the late 1940s. At that point state permits began to be required for groundwater wells, and from about 1970 on, largely in response to increasing groundwater use and resulting conflicts, the state asserted authority as owner while groundwater users became nearly mere authorized claimants (1947, Groundwater, Wyoming Statutes Annotated; 1957 et seq; Wyoming State Engineer Guidance, no date). Goals and users were the same as those for direct flow in that period, but transaction costs to users (resource knowledge and withdrawal technology) were very high in the period 1890-1950s. After the 1950s, new technology led transaction costs to users to decline until the post-1970 era, when costs of resource knowledge and conflict negotiation increased in response to increased groundwater use.

### 7.1.3 Conclusion

The changes in these property rights regimes resulted in changing investment incentives. Direct-flow users, although never achieving the status of owner *de facto* or *de jure*, nonetheless appeared to have moderate investment incentive, probably due to the stability of

the state's basic rules of exclusion and management, and their own increased *de facto* and *de jure* management and even exclusion powers, allowing them to affect the collective choice of rules. The exclusion influence of the priority system also had the effect of insulating them from competition from new users. Their risks changed, however, with the withering of the abandonment rule 1920-2010 – it gave them more management power in some situations, but less capacity to protect themselves against disruptive revival of old rights. The withering of the abandonment rule also allowed increased uncertainty in rights records, since unused rights could still appear to be valid on paper. That and the post-1970 changes, allowing new non-consumptive users to join in governance – in collective choice on rules - appears likely to have reduced consumptive users' investment incentives somewhat.

Users of stored water, as quasi-owners, clearly had high incentives to invest from 1890 – 1970, with reduced incentives due to arena changes post-1970. Groundwater users, with potentially high incentive initially as owners, were affected primarily by transaction cost declines described above, so that their investment incentive reached a high in 1970; assertion of state ownership rights post-1970 appears to have slowly decreased users' investment incentive.

Interestingly enough, however, the change-intensive era of 1970-2010 also brought forth another new influence on investment incentives. The consumptive user group, retaining political dominance in the legislature, created a statewide water facility construction fund (using new post-1970 statewide minerals revenues). This fund provided outright grants and low-interest loans to irrigators and municipalities, offsetting the reduced investment incentives for irrigation system facilities, reservoirs, and municipal ground water wells.<sup>304</sup>

Overall, analysis of the regimes of property rights in water that developed over 120 years in Wyoming reveals some intriguing patterns. These patterns encourage a close look at the varying physical attributes of the resource and the users, the user-resource transactions and costs, and the governance structures for each regime of water property rights, in order to understand the course of institutional change in water management in Wyoming. It appears that from 1890-1970, the institution achieved a kind of equilibrium. After 1970, however, socio-economic changes that admitted new actors to decision-making affected the property rights regime in all water resources. These changes perhaps amounted

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<sup>304</sup> The Wyoming Water Development Commission, created in 1979 and fully funded in the early 1980s, had allocated, with legislative approval, about \$1 billion in mineral tax revenue on water projects by 2007. 1979 et seq., Planning and Development, Wyoming Statutes Annotated. Figures provided by WWDC staff, 2007.

to the kind of “shock” discussed in the literature on institutional resilience. Examination of the impact of those socio-economic changes and the institutional reactions to them should aid analysis of whether and how this area’s water management institution can be considered resilient.

## **7.2 Characterization and Resilience Analysis of the Institution**

### **7.2.1 Characterization of the institution**

The institution in Wyoming which manages water via the property rights regimes described above can best be envisioned as a net which lies over the varied landscape of the state, from plains through mountain valleys. There are two kinds of material woven into this net: a strand of water users, and the strand of water administrators. They are the primary actors in the action arena, where decisions on water management are made.

The points where the strands are tied together, to form the net, are the points of interlink between water users and the water administrators (the representatives of the state water governance agency). In some locations the net is much more tightly woven than in others – the spaces between the ties are small, and the net is made in a tight weave. Empirical interviews done at the end of the research confirm this picture and are cited through the rest of this section.

A tight weave is found where the water administrators are almost always present, physically or virtually, by telephone or digital communication (Ross 2011, Espenscheid 2011). That does not mean that the water administrators are the only actors to make decisions: as seen in section 7.1 above, the property rights schemes in water used by this institution (whether *de facto* or *de jure*) never give all three types of collective choice rights to water administrators. Water users always have in this institution a role to play as actors, part of the decision-making process.

A tight weave does, however, mean that the *de jure* scheme of property rights in water will be the one in play, always referred to by both sets of actors, always enforced by one or the other. It is the scheme whose rules the actors will follow in making decisions on the ground.

By contrast, a loose weave is found where the water administrators are rarely or never present (B. Bousman 2011; J. Bousman 2011). That does not mean that the water users are the only actors to make decisions: again as seen in section 7.1 above, the property rights schemes in water used by this institution (whether *de facto* or *de jure*) never give all three

types of collective choice rights to water users. The administrators in every era hold some kind of a collective choice right. They retain a role as actors, the rules involving their rights speaking for them and followed even when they themselves are not present, in every decision made.

A loose weave does mean that the *de facto* scheme of property rights in water will be the one in play – again, always referred to by both sets of actors and enforced by one set or the other. It is notable that administrators always keep some collective choice rights even in *de facto* schemes.

The tight weave tends to occur in places with complex hydrology, scarce water, high numbers of users, or proximity to the state capitol – or any combination of those factors (Scott, 2012; Ross, 2011). (The portion of Horse Creek, in southeastern Wyoming, described in Chapter 6, has all four, and a very tight weave. Almost the entire North Platte River, following interstate litigation and federal-interstate environmental negotiations that resulted in the 21st century in the kind of elaborate technological surveillance described in section 1 above, has a tight weave and almost all factors - proximity to the capitol varies with the course of the river).

The loose weave tends to occur (just as it did in the late 19th century) in places with simple hydrology, abundant water, few users, well-elaborated user organizations, or physical isolation (the latter is harder and harder to achieve in the 21st century). And again, loose weave can also occur where there is any combination of those factors. (Large swaths of irrigated lands along the Shoshone River in northwest Wyoming, served by one of the first federal reservoirs built in the U.S., has the first four plus traces of its once dramatic physical isolation. Tributaries on the east side of the Green River Basin, Wyoming's headwaters of the Colorado River, have the first three plus physical isolation – which, however, is rapidly disappearing.)

The institution – this net spread across the landscape – is essentially flat and single-scale. It is not polycentric with different, often overlapping centers of power. It does of course have different levels within itself – a constitutional level, a collective choice level, and an operational level. The two prime sets of actors, the water users and the water administrators, are present and make decisions at both the constitutional and the collective choice level. Only the users work at the operational level.

There is one additional player who does appear at the collective choice level: the courts. They are a different representation of the state, which is ordinarily and primarily represented by the water administrators. The courts perform the function of arbitrating



disputes between water users and water administrators, and among water users themselves. The results of those arbitrations, however, play a role in forming rules.

The state legislature has not appeared as an actor in this institution. It has enacted statutes, but always at the behest of the water administrators, or more rarely at the direct request of water users.

The courts, however, are an actor in collective choice, and they have had an interesting effect on the property rights schemes in water. This is because the judges in courts draw upon a history and tradition of their own, in law, and their tradition partakes more of a national than a local understanding of issues and possibilities. The courts act based not only on principles of equity but also on their own understanding of whatever rules were chosen collectively in the past. Notably, of course, they are the least expert in water matters, particularly hydrology, within the action arena – dramatically inexperienced, compared to the two prime players.

The understanding of the judges is affected not by their knowledge of water but by their own concepts of what property rights schemes are possible. Those concepts are dominated by a view that draws on national trends in property law, and even in water law. That in turn tends to blind them to the actual distributed-rights property rights scheme in the institution where they are called upon to arbitrate disputes. Due to national traditions in property law, and the most standard legal view of water law in the Western U.S. discussed in Chapter 3 above, the Wyoming courts expect that any scheme that puts some property rights in the hands of anyone who is not the state must be a private property scheme. They therefore erroneously equate property with ownership, as has often been the case in the most simplistic view of water law taken in other Western states.

It is worth noting that the original drafter of Wyoming's institution for managing water through a property rights scheme consciously tried to keep courts and lawyers out of water decision-making as much as possible. He sought to and succeeded in providing a process in which administrators (as individuals or as the Board of Control panel) and users would make decisions by themselves without need of assistance of lawyers. That process can still be seen, functioning without lawyers, today. The original drafter of the institution cited that process with pride as a reason for low numbers of court cases over water in Wyoming compared to other Western states (Mead 1902). Water cases were few in the Wyoming courts in 1902, and they are still few today. Accordingly, though courts have played a significant role in affecting rules and therefore property rights schemes in Wyoming

water, they have not actually changed the institution itself. (For influence of the courts on rules, see especially Chapter 6).

In the end this institution for water management can be characterized as one that is flat, with two key sets of players and one occasional set of players. The institution works via a series of interlinks between the two key sets of players, with the number of interlinks varying according to the physical and social terrain. It manages water through a scheme of property rights in water. That scheme distributes rights between the two key sets of players. The distribution has varied over time, but the principle of keeping rights distributed has persisted.

The empirical survey done at the end of the research period indicated that this description is accurate. Both administrators and water users identified their two groups as the key sets of players involved in rule making (even administrators barely mentioned the courts, and no one referred to the legislature as a rule-maker). In the locations where administrators are constantly present (described as “tight weave” locations above), water users interviewed were less conscious of their own role as rule makers (Espenscheid 2011, Pope 2012). This appeared to be due to the application of *de jure* rules in those situations. Even so, most water users in those locations acknowledged they had some role in rule-making. In locations where administrators are rarely present, water users were much more articulate about their role in rule-making, particularly their role in making the *de facto* rules which apply in those situations.

### **7.2.2 Robustness of the institution**

The robustness analysis for institutions of natural resource management used in this research draws on resilience theory. It looks initially to three characteristics of an institution – its capacity for self-organization, its capacity for learning and adaptation, and the extent to which it can undergo internal change and external disturbances and still retain controls on structure and processes (Brand and Jax 2007, Carpenter et al. 2001, Gatzweiler, Hagedorn et al. 2002). Next and most importantly, it looks to see whether experience is transferred and responded to between levels of fast and slow variables within the institution (Holling, Gunderson and Peterson 2002).

In applying this assessment approach to the Wyoming case, the discussion below draws upon the research detailed in this work, and is assisted by the empirical survey done at the end of the research period, which both confirmed and elaborated upon the author’s conclusions from observation. The citations to individual names refer to those interviews.

At the first level of analysis, it appears that the Wyoming water management institution has the key characteristics that can create robustness or resilience. The management institution is a prominent example of institutional self-organization in the United States. The provisions regarding water in the Wyoming constitution are unique among Western states. While much of the rest of the constitution adopted in 1889 in preparation for statehood contains standard language found in (and possibly copied from) most state constitutions of the era, the water language is not standard (Dunbar 1983: 99-112). It was clearly the product of local experience and the thinking of individuals involved in crafting it. Records of the constitutional debates over the water language clearly reflect that (Wyoming Constitutional Convention 1889).

Since that time, self-organization has remained a feature of the institution. Irrigators organize into small “ditch companies” and “reservoir companies” or into large irrigation districts (which if they meet certain guidelines can obtain legal authority to levy assessments, etc.) (WWDC Irrigation system survey, 2010). These user organizations interact with water administrators as subsets of the set of water users, and in essentially the same manner. People on a shared ditch, whether or not they have formed a “ditch company,” may hire a “ditch rider” to help make sure allocations of water reach individual users along a shared ditch; representatives of several ditches may meet in mid-winter to discuss plans for the irrigation season, if they share a water source like a reservoir or a major river (MacKinnon 2011). (Groundwater irrigators in heavy-use areas sometimes organize into a “control area,” which if it follows certain state guidelines will provide its members with specific additional avenues for regular consultation with water administrators on questions of exclusion and management of water in the area (Wyo. Stats. 41-3-912/915)).

Less formally, water users organize into associations and meeting groups – to discuss concerns about dramatic growth in downstream demands on the Colorado River, for instance; or to discuss a variety of issues (especially water facility funding) statewide (Fassett 2012; Wyoming Water Association website). Water administrators are expected to and do participate in these meetings. Users and administrators in different basins also regularly set up public meetings to discuss likely water flows and possible administrative needs in the coming growing season.

The water administrators, meeting as the Board of Control, have also over time in conjunction with irrigators created rules for the property rights schemes in water. Some of these rules have been discussed in detail in this paper. They were expressed in board decisions, in statute, and in occasional court decisions. Meanwhile, much of the

implementation practice for these rules went unwritten for a long time. The agency was created long before the maturing in the U.S. of the concept of administrative law, with a formal process for review and promulgation of written documentation of agency practice. The water administrators did however organize to create their own written handbook of agency practice, for the assistance of their own staff and of water users – and recently they have been engaged in some debate with the legislature over whether and how their handbooks go through the same review and promulgation rules required for standard state agencies (few of which are as old, or as explicitly enshrined in the state constitution, as the water administrators' office) (Tyrrell 2011).

Wyoming's water management institution also gets high marks for its capacity for learning and adaptation in the ways necessary for a natural resource management institution. The action arena which involves primarily administrators and users provides almost constant opportunities for the users with local knowledge and the administrators with scientific expertise to communicate and learn from each other. Administrators live in the major river basins, not in the capitol. (The exception is groundwater administration, and administrators note that the communication necessary for learning and adaptation in groundwater suffers as a result (Henderson 2011, Smith 2011)). Water users regularly visit administrators' offices in the major river basins, as noted in decades of biennial reports of administrators (see Chapters 5 and 6) and in administrator discussions at modern quarterly meetings. Users draw upon their knowledge of exactly how their stream, soils, alluvium and geology respond to the use they and their neighbors make of the stream; the administrators draw upon their knowledge of the wider basin and user practices and experiences statewide, as well as their scientific training – and both benefit from the detailed maps, documents, and computer access to technical data that are available at the administrators' offices (Henderson 2011, Smith 2011, Tullis 2011, Whitaker 2011, Gibson 2011).

The institution also makes it relatively easy for people to experiment, discover, and implement adaptation in rules. The “loose weave” locations, where *de facto* property rights regimes most often govern, provide an important opportunity for this experimentation, discovery, and implementation in adaptation of rules. Administrators serve as a conduit for word of these experiments to reach other locations in the same basin and statewide – locations that may not have the creative advantage of working largely with *de facto* rather than *de jure* rules. At their quarterly meetings, administrators discuss with each other the practices and rules that have arisen locally, and sometimes after further testing and

discussion those rules are adopted *de jure*. (Rules regarding how rights to use water may be relocated in case of a construction of a reservoir or even a subdivision that obliterates once-irrigated fields developed in this way, for instance (Wyo.Stats. 41-3-107).) Administrators also find that *de jure* exceptions to basic rules can provide them and their users room to experiment with processes that later – sometimes decades later – may be adopted *de jure* for all cases, not just the exceptions. (See discussions of the rules regarding transfer of water rights, in Chapter 6 and in section 7.2.3 of this chapter, below).

There are some limits to the opportunities the institution provides for experiment, discovery and implementation of adaptation in rules, however, because there have been situations where a rule gathers the aura of a taboo, making experimentation and discovery difficult. This has occurred primarily where Wyoming courts have entered the action arena as players, brought in by users dissatisfied with a final administrative decision applying rules in a specific situation. In that situation, the courts with their own traditions and knowledge *not* rooted with experience with water in Wyoming have sometimes interpreted a Wyoming rule of property rights in water in a way that appears (especially when repeated) to forbid experimentation. (See discussions of the rules regarding loss of water rights, in Chapter 6 and in section 7.2.3 of this chapter, below). This has not occurred regarding most key rules affecting property rights regimes, however.

The question of how much internal change and external shocks and disturbances an institution can undergo and still retain the same controls on structure and processes is always complex. In the case of the Wyoming water management institution, key external shocks are very much ongoing (and possibly intensifying) and the institution's response to them has yet to unfold completely. Thus the period for analysis of the response to these shocks may not yet have arrived. That is probably true however in analysis of most institutions, since as North (1990) and Knight (1992) point out, most undergo only incremental change. Nonetheless, analyses are needed. Fortunately, the long time period (120 years) in institutional history that is the basis for the analysis of this case should allow drawing some conclusions.

Until the 1970s, the institution dealt largely with internal change: initially, the growing understanding of the difficulty of creating irrigation systems and growing cultivating crops in Wyoming's topography and climate; with experience, the growing understanding of the hydrology affecting user transactions with water for irrigation; and slow urbanization. This change was dealt with quite successfully: rules were eliminated or modified in response to changing understandings of the physical situation of users and the resource, and special

exceptions were made to allow rights to water supplies to be acquired to accommodate steady growth of towns and cities (see Chapters 5 & 6).

The external shocks and disturbances received in the 1970s and every decade since, noted in section 7.1 of this chapter, have been far more serious and are far more important to assessing the resilience of the institution. The first serious shock was the opportunity provided by outside markets for new opportunity in energy production. This shock had multiple effects, including: opportunities for much increased individual and state government revenues; entry of new population and new land uses, with considerable growth in both arenas; development of new opportunities for profit from transfer of water rights; and development of new preferences for non-consumptive uses within the resident Wyoming population. What Smith (2008) would call a widening of the audience for Wyoming's property rights regimes occurred. Part of that widening resulted in the encounters between national schemes for consideration and control of environmental impacts (described in section 7.1 of this chapter), expressing, in part, new national preferences for non-consumptive uses of water.

The Wyoming water management institution dealt with all of these effects in a relatively adept way. New rules for transfer of water rights were adopted (Chapter 6), and the new preference for non-consumptive use resulted in *de jure* recognition of non-consumption as an appropriate use for Wyoming water. (Actual implementation of that recognition has been successful though slow – the very first transfer of an irrigation right to become a non-consumptive right that leaves water flowing in a stream occurred in 2011, 25 years after adoption of the statute that recognized non-consumptive use (MacKinnon 2011)). The outside pressure for more consideration of ecosystem needs, including non-consumptive uses, was accommodated (sometimes after considerable time) by negotiated agreements on two major Wyoming rivers to provide water needed to flow in-stream (for endangered birds and endangered fish). Despite individual criticisms of various features of the Wyoming system, all the administrator and water-user interviewees in the empirical survey cited each of these developments with pride, as examples of what they consider flexibility within the continuity of the Wyoming system.

This first significant shock, from energy production, did however result in developments that, while not yet affecting the controls and processes of the institution, might yet do so.

First, the new energy money coming into the state was directed, as has been noted, in part to a new agency investing public funds in new and rehabilitated facilities for water use. While many of these facilities were built for municipal rather than irrigation use, the securing

of these funds strengthened the economic prospects of the irrigation sector and may have made irrigators slower than they otherwise would have been to seek opportunities for gain by transferring their rights to use water to new uses and new locations. That in turn served as a kind of brake on the process for accommodation of change that the institution adopted in its new transfer rules.

Second, accommodation of the pressures internally and externally to meet new needs and increased population (in-state and downstream out-of-state) has led to an increased presence of administrators in many locations, and to increased use of technology by those administrators (as noted in section 7.2.1 of this chapter, in discussion of locations where the institution has “tight weave” features). The former means that there will be fewer opportunities for experimentation and discovery of new rules, as the number of “loose weave” locations diminishes and with them the number of places where *de facto* rights can govern. The latter means that the communication between administrators and users, the source of much of the past successful learning in the institution, will be jeopardized. The problem reveals itself sometimes in increased formalization within the water administration agency. One administrator expressed this concern with considerable anxiety. Increased technology, and the need to supervise the staff that uses it, he said, is leading to elaborate in-agency personnel rules. Those rules already interfere directly with the time and attention he can personally give to water users or to learning from other superintendents about what is done on water issues in other basins (Anonymous superintendent 2011).

A second shock to the Wyoming water institution, concurrent with the appearance of new energy markets, occurred in the claims made by a group of people who had traditionally been water users in Wyoming but whose articulation of goals for water had long been forcibly repressed. The two Native American tribes living on reserved land in the center of Wyoming asserted in the 1970s that they have rights to control an overwhelming majority of the water in one of the state’s major rivers, in whose basin their reservation is located.

Litigation over the tribes’ assertion finally ended for the most part in the 1990s, with a series of court decrees. The repercussions, however, are not yet fully developed. Key results of the litigation were that the tribes do hold rights to the majority of the water in the river (though not to as much as they had asserted), and that they have independent authority over that water which would support creation of their own management institution (which they have drafted and implemented). The use of the water is however restricted to agricultural use on reservation lands (Big Horn I 1988). In particular, the water cannot

be used to support flows left in-stream for non-consumptive uses, without approval from the Wyoming water management institution (Big Horn III 1992).

Thus while the tribes have succeeded in winning recognition for what is an independent management institution in name, they have not won the right for self-determination of what the rules of that institution will be. Hence their management institution is not actually separate and independent of the Wyoming water management institution. It is more akin to an organization of water users within the Wyoming management institution. That is not what the tribes seek.

A key tribal water administrator interviewed described this result as a failure of the Wyoming water management institution. He described the institution as “rigid,” having allowed itself to be imbued for too long with the goals of irrigators, with agriculturalist dislike of water uses and accompanying water rules that could accommodate goals different from those traditionally espoused by agriculturalists (Anonymous administrator 2011).

His assessment points to another dimension of the weakness in the Wyoming system noted above: the brake on accommodation of change that derives from the continued strong role of agricultural water users and their views within the system (a role arguably artificially shored up by the diversion of energy development revenues to that water use sector).

Interestingly enough, a former Wyoming water administrator who was intensely involved in the years of litigation, and post-litigation discussion, with the tribes, agreed that the result of state-tribal water management encounters thus far is a failure of the institution and a problem that needs resolution. He offered two insights. One was that this shock had been the most difficult for the system to handle because it potentially involved major reallocation of water and rights to water that would affect stream flows and land uses *in the midst of* Wyoming. This is in sharp contrast to the reallocations done in order to affect stream flows and land uses *out of state*, in downstream states that shared Wyoming rivers, as had happened to be the case with the negotiated accommodations made on two major rivers, to help downstream endangered birds and fish (Anonymous administrator 2012). Second, he suggested that if the tribes’ goal of self-determination of water use were addressed incrementally, instead of wholesale (as was the case in the 1970s-1990s litigation), that the result might be a series of small recognitions of tribal uses and goals different from those the Wyoming institution would permit – a series that ultimately would build into something much larger (Anonymous administrator 2012). The suggestion for incremental change, of



course, makes sense in terms of institutional change generally (North 1990, Knight 1992) and the history of the Wyoming water management institution in particular.

A review of the preceding suggests two key weaknesses in the Wyoming water management institution which – if left unaddressed – may yet make its resilience problematic. One is the growth of sophisticated surveillance technology in management, and the other is the artificially long life of agricultural goals for the system.

The first is a danger that is likely to grow due to two unrelenting trends in the region encompassing Wyoming: population growth and climate change. Both will call for increasingly sophisticated accounting and management water use. However, the very angst with which this prospect is greeted by Wyoming water administrators, who have not only respect but also affection for their institution, makes it likely that they will find a way to limit the impact of sophisticated technology on the key processes of their institution, which have been successfully based on involving both administrators and users in collective action decisions on rules.

The second danger, the artificially long life of agricultural goals for the system, appears to pose a greater threat to the system's ability to maintain its identity. The agricultural use focus may reach an end on its own, as more non-agricultural goals are expressed even among agricultural users. Some of those users see opportunity, for instance, in hosting and selling access to streams across their land that are abundant in water and fish. They see an opportunity to serve a population, from inside and outside the state, which seeks recreation dependent on water flows that support boating, fishing, and wildlife viewing and hunting.

The artificially long life of agricultural goals for Wyoming water management is in part exemplified in the system's rejection of the tribes' goal of an independent management institution. The tribes proposed protecting volumes of water to be left in-stream, based on their 1868 treaty rights, to be approved by their management institution, with no need for state approval; Wyoming water managers successfully opposed that in court. They argued for restraints on in-stream flow protections, restraints which have largely been demanded by agricultural water users wary of new non-consumptive uses (Big Horn III 1992).

Here too, the danger posed by the long life of agricultural goals for water may dissipate over time. The recognition by an influential past Wyoming water administrator of the inadequacy of current state-tribal relations over water, and the potential for incremental change, suggests that possibility. And Wyoming water administrators have gained experience in managing rivers jointly with other independent water management

institutions, in the course of negotiating agreements on interstate rivers to accommodate endangered species in recent decades. That experience may allow Wyoming water administrators to accept working with a different independent water management institution - an independent tribal water management institution. There could conceivably be joint state-tribal administration of Wyoming's Wind River. Such joint management has developed on rivers in other states. Wyoming's water management institution could increasingly accept a role for itself in a world of water management that has been described as one of polycentricity (Schlager and Blomquist 2008). That would mean implicitly recognizing the legitimacy and importance of non-agricultural goals in water management.

Such changes can be a long time coming, however – a time too long and too painful, for Wyoming water users who currently seek a more significant role for non-agricultural water uses. The Wyoming water management system's persistent under-weighting of non-agricultural goals suggests a resilience problem. It points to a partial failure in the transfer of and response to experience between levels of an institution. Scholars have argued, as noted in Chapter 3, that such a failure can mean lack of the appropriate resilience that is crucial to long-term operation of a healthy social-ecological system.

Three levels for analysis of a water management institution can be set out (in the terminology of Holling, Gunderson and Peterson (2002)): "fast variables," "slower variables," and "slowest variables." Arguably, in water, the fast variables are the use of human resources; the slower variables are land use; and the slowest variables are water use (which changes slowly due to the physical infrastructure required for water use and due to the interdependence of water uses). Ultimately in a healthy system, the experience and changes undergone among the fast variables should find some reflection in the ranks of the slow variables and the rules affecting them (Holling, Gunderson and Peterson (2002)). Under such an analysis, it appears that the Wyoming water management institution has seen the slow variables in water use respond appropriately to changes in the variables in use of human resources – but only to one portion of those human use variables.

People valuing water for agriculture have seen their experience, experimentation and adaptation in dealing with new economic challenge transfer effectively from their level into the "slow" level of water use and water use rules, as this work has detailed. But other people – those who value water for non-consumptive uses – have not seen their experience, experimentation or adaptation in dealing with new economic challenge transfer nearly as readily. The wide swath of water users and would-be water users whom the Wyoming water management system started out to serve in the late 19<sup>th</sup> century has narrowed over time, so

that the system serves – and responds to – primarily only the agricultural water users now. The changes in rules on alienation of water rights after 1970, detailed in Chapter 6, suggest creativity, and resilience, to meet the needs of that group. Rule changes have however been constrained, as that chapter also shows, by the agricultural viewpoint – focusing on the difficulty of putting water to use, and engaging in rent-seeking by working to secure their own position as the pre-eminent right-holders. Loss of water rights became more and more difficult over time because of the action of the courts, but also because of the water users supporting the results of those court decisions. Disturbance - via loss of rights, and replacement of a failed would-be water user with another more creative one - was resisted and made less and less possible, rather than accepted and adapted to, as users and administrators over time changed the rules on exclusion and loss, as shown in Chapters 5 and 6. Further embellishment of users' exclusion rights, via the rules allowing existing (largely agricultural) water users to take extra water before new users could take any (see section 7.1.1 above) only exacerbated the tendency of system rules to support existing water users. The energy-revenue-fueled investments in agricultural water use did the same.

This analysis suggests that Wyoming's water management system has resilience regarding only one sector of water users. For the sake of this set of users, the system could have so much resilience, responding to just one set of users, that it could move past the point of being adaptive or creative, perhaps making it unable to adapt to change, having entered a "rigidity trap," as Holling, Gunderson and Peterson (2002, 96) would put it. "Rigid" is, of course, also the term that one water administrator for the tribes used to describe the Wyoming water management system, because of its focus on agricultural water use. It is a telling coincidence. A fair assessment of the Wyoming system seems to be that the system is resilient only in reference to one sector of the people who need to use water in Wyoming – the agricultural sector. For the system to be part of a healthy and lasting social-ecological system, the system needs to change and become resilient regarding all sectors.

### **7.2.3 Contributions of the case to theories of institutional change**

This study of the history of Wyoming's water management institution demonstrates both path-dependency and path-breaking, phenomena of interest to a variety of theories of institutional change. The actors in this institution undertook, at various places and times, one major transaction: withdrawing water from streams for agriculture under harsh conditions that included isolation from other regions. The empirical data presented in Chapters 4-6 demonstrate the extent to which the actors' experience was determined by the nature of

that transaction. Those chapters describe their experience, noting statements made by actors, where available, about their resulting mental constructs. Those chapters document the impact of the actors' experience on their choice of rules over time.

This final section of the study discusses how that data illuminates what creates path dependencies, and what does and does not spark path-breaking. Following North's (1995) suggestion, it attempts to trace how the physical transaction related to nature, the resulting experience of the actors, and the mental models produced by that experience, both constrained choices of rules along a certain path, and in certain situation allowed collective choice of rules that break from the past.

The discussion is organized into a set of three examples. The examples involve the most powerful rights in a property rights regime – the collective choice rights, which give their holders the authority to participate in making rules. Those rights are management, exclusion, and alienation (Schlager and Ostrom 1992). The examples chosen illumine rules regarding those three types of rights. Because of the particular way that Wyoming rules regarding those rights intertwine, the examples are easier to understand if discussed in reverse order. The examples examined here are: alienation rules (whether rights to use water can be transferred to a new place or purpose of use); exclusion rules (whether rights to use water can be lost); and management rules (whether there can be rights to use water for non-extractive, non-consumptive purposes).

The history of all three types of rules illustrate path-breaking – completed, in the case of alienation rules and in exclusion rules, and perhaps underway presently in management rules. The exclusion rules also illustrate a case of an initially broken path succeeded by strong dependency on a new path that remains unbroken. The examples of these three types of rules, taken together, yield the following conclusion regarding creation and breaking of path dependency:

*Harsh local physical conditions can dominate institutional choices. That is particularly true if the harsh physical conditions are combined with a population lacking in local knowledge and facing outside competition for resources. That combination of factors can mean that purely local experience will disregard rational argument in setting a path favoring or disfavoring entrepreneurial methods or safe-havens used elsewhere. Exposure to the external world can break such a path – as, via major new opportunity for gain provided by external markets. The speed with which the path is broken, however, is determined in part by whether local physical conditions have led to barriers against experimentation in the direction of the new path.*

What follows is a short discussion of each example, summing up the detailed discussion presented in the articles.

### **7.2.3.1 Alienation: The rule on whether rights to use water can be transferred to a new place or purpose of use**

Chapter 5 describes how Wyoming people prohibited use of a major entrepreneurial method in the exploitation of water. They rejected the idea of investment in water rights for future use or sale, instead requiring that water covered by a water right be used, in the place and for the purpose for which the right was initially intended and approved. Investment in water rights not for immediate use but for future use or sale was pejoratively termed “speculation” in Wyoming, and rejected wholesale, in the “anti-transfer” statute of 1909. This was despite the fact that speculation in natural resources (land, minerals, or water) was a classic feature of the booming growth of the 19<sup>th</sup> century United States and its expansion westward through territories like Wyoming – and most of Wyoming’s population had prior experience in those areas and that economy. Settlement over the mere 13 years before the creation of the water management institution had featured only a few watering-holes serving railroads, ranches, forts or a mine. A longer-term basis for economic and social development had considerable appeal. At the same time, the difficulty of economic and social development made the yearning for stable, non-speculative enterprise, all the more passionate. That difficulty was caused by harsh and arid terrain and climate, and the complete unfamiliarity with both, on the part of all the population engaged in institution-building (the original inhabitants, Native American tribes, were excluded from any role in choice of rules). The result of these factors led to the staunch refusal to allow investment in water rights for future use or sale.

Significantly, this embrace of this rule went counter to the interests of the small and powerful group of large livestock owners who had originally helped establish the water administration system. As Chapter 4 details, they had literally imported a bright young-rule drafter in an effort to secure their hold on water resources in the face of daunting physical conditions plus a wave of settlement by new, small-scale farmers and ranchers. Only two years later a few of those same large-scale livestock owners tried to fight that inexorable wave of settlement with guns; they clearly had disproportionate gains for themselves in mind. Chapter 5 shows that some of their number were later among those interested in selling water for gain. Nonetheless, the rules of property rights for water that emerged over the course of the next 15 years and ultimately rejected speculative investment in water reflected the growing bargaining power of the new settlers. As Chapter 4 describes, the young designer of the water management institution asserted his independence with an

eloquent articulation of the yearning for stability, and of the contrasting evils of “speculation,” which gave immediate expression to the experience of the population in a rule against transfer. Chapter 5 shows how in the end, and after the young designer was gone, it was the experience itself that dominated and fixed a broad anti-transfer rule in place.

Chapter 6 describes how this path, adhered to for eight decades, was ultimately broken in the 1970s. What allowed the shift to a new path, allowing water to be transferred to new places and purposes, was a combination of major new economic opportunity offered from the outside, and years of internal experimentation with transfers in the one arena that had by necessity been exempted from the original wholesale ban. In the 1950s and 1960s, water extraction technology and better national and regional transportation to markets made it possible for agricultural users of water to aspire to move beyond a livelihood of subsistence or low-level profits. New industry responding primarily to growing national demand for electric power also brought new actors interested in extracting Wyoming water to combine with its coal to generate power in coal-fired plants. Both these external economic developments put considerable pressure on water users and administrators to find ways to make use of the new opportunities, by transferring water to new places or uses suitable for meeting the new demands. Interests that had vested on the old path began to see advantages to shifting to a new one. The transition to a new path was eased by the fact that even at the moment that the original ban on transfers was made emphatic in the rules governing water rights, contemporary conditions in the early 20<sup>th</sup> century had required recognition of some exceptions: home and garden use, use for growing towns, and use for steam railroads (whose routes determined the economic fate of whole regions at the time) were considered and designated as such “preferred” uses that transfer of other rights to those uses had to be allowed. In the eight decades that followed, the administrators of the water management institution had ample time, and many places, to experiment with transfers of water rights in those situations, and by trial and error develop new rules allowing those transfers with the imposition of appropriate conditions. Increasing understanding by administrators and water users of how hydrology unique to each stream creates interdependence among users was an important consideration that shaped the new rules arrived at by experimentation.

Those rules became the rules for all transfers when the institution finally broke from the no-transfers path in the 1970s. The administrators’ rules were essentially imported as-is into statute. The experimental experience of the administrators, and the accumulation of user trust in the administrators in the course of the institution’s history combined to make the break relatively non- controversial. Outside commentators considered the conditions

imposed on transfers to be unnecessarily conservative (and clearly influenced by the earlier no-transfers path), but over time the new Wyoming path has facilitated transfers while protecting potentially- affected social, economic and ecological interests in a way that outsiders have come to value and insiders rely upon.

Irrigators in structured interviews reported how much they valued the detailed considerations required in transfer cases. Some discussed their intense awareness of the coherence costs involved in irrigation transactions (perhaps even presaging a new cycle of institutional change ahead). One irrigator noted that because of the gravel layer over bedrock that underlies the creek basin where he lives, if even one farmer above him on the stream stops irrigating, he won't have the water table he needs on his lands below to make his allocation of stream water sufficient to grow a crop. Irrigation on that creek means that "if we don't all do it, none can do it," he said (B. Bousman, 2011).

#### **7.2.3.2 Exclusion: The rule on whether rights to use water can be lost.**

Chapters 5 and 6 further document how a safe-haven for entrepreneurs commonly provided elsewhere for other resources was adopted for water by Wyoming people as well, despite rational arguments against it. The concern about speculation described above meant that Wyoming water rules required that to have a water right, the water involved must be used in the place and for the purpose for which the right was originally intended and approved. But used how soon, and how often - as long as no change was made in place or purpose - became a question for rulemaking. Attempting to make water use a reality in Wyoming's harsh physical environment proved unexpectedly difficult. Extracting the water, transporting it, and making use of it to yield a useful crop involved technological challenges, financial investment, and a steep learning curve. There were many transactional failures, and those who succeeded required time, more than anything.

Chapter 5 examines the strict requirements to get water into use under time deadlines, another rule promoted by the articulate young designer of the water management institutions. That rule dropped away in the face of the difficulties of water use. In its place arose a safe-haven rule, granting water users time for continued and repeated attempts at their water transactions (as long as they stuck to the place and purpose originally intended). The rule choice was prompted by the results reached by enterprising users who took advantage of the fact that the vast and difficult terrain made enforcement of the time-deadline rules nearly impossible. It was also aided by the imperative need for major infrastructure investment for big dams and reservoirs, on big rivers with inaccessible

canyons, to store and redistribute snow-melt as water when needed for irrigation. Wyoming's leading political entrepreneur of the early 20th century, one of the large livestock owner elite, had sponsored the creation of the national dam-building agency (Reclamation Act 1902). That agency's construction work in Wyoming both consolidated support for the politician's more than 35 years in the U.S. Senate, and pressured Wyoming water administrators not to enforce their time-deadlines.

In turn, Chapter 5 shows, the final rule choice for a safe-haven nullifying those deadlines was aided by legal thinkers whose experience with the rules of land rights in the westward expansion of the United States and in Wyoming led them to pronounce that people who made a good faith attempt to use a resource should be protected in their claim to rights in the resource. Behind that pronouncement lay a broader rule, that when individuals hold property rights in resources, those rights require special protection. That protection derived from the idea, specifically enshrined in the U.S. Constitution as well as in statute and common law nationwide, that private ownership of property requires special protection. Contemporary (early-to-mid 20<sup>th</sup> century) thinking about resources, and specifically land, posited that there were exactly two ways to categorize resource rights: as either public ownership or private ownership. Accordingly the existence of private rights in resources meant private ownership of resources, and once this thinking was applied to water, private rights in water meant private ownership of water. For investors in land, private ownership had meant a safe-haven rule, protecting them from losing their land unless equity clearly demanded it.

Chapter 6 shows how that rule began to be articulated and applied to water. The choice of a safe-haven rule for water users triumphed over the arguments of the young institutional designer. He had endorsed loss of water rights on the simple basis of two years of unjustified non-use (known as an "abandonment rule" in Western U.S. water language.) He saw such a rule as a crucial mechanism for encouraging new transactional attempts and dissolving failed ones. But the unforgiving physical conditions in which Wyoming water users worked, as well as the strength of the interests that quickly vested around the first traces of a safe-haven rule, meant that his argument lost out. The rule choice was reinforced to become a settled path with the decisions of the local judiciary who made certain that loss of water rights in Wyoming for failure to use them were rare. The same pattern, in which the safe-haven rule has overwhelmed anything to the contrary, has prevailed region-wide, in a tribute to the strength of the U.S.-wide rule on the sanctity of private property rights.



In the course of their decisions making water rights forfeitures rare, the Wyoming judges – following colleagues region-wide - declared water rights a private property.

This path has not been broken in Wyoming despite the external economic opportunity, which arguably highlighted the need for new kinds of transactions with water and the casting aside of old attempts that have failed. Chapter 6 notes the continued strength of the safe-haven path. Interests that vested on the safe-haven path have of course resisted any change. If anything, the new opportunity for gain meant that existing water-rights holders wanted even more assurance that they could not lose their rights for lack of use – so that, moving along the new path that allowed transfers, they could sell those rights to new uses for a profit.

In addition, however, the lack of opportunity for administrators to experiment with water-right loss rules over previous years was significant. Unlike the no-transfers rule, the safe-haven rule against losses was never emphatically stated by putting it into statute– and there were similarly no articulated exceptions leaving room for administrative experiment. In fact, the formal rule applied by administrators, and remaining enshrined in statute, made it appear that there was no safe haven and therefore that water rights loss for non-use was a real risk. But the implementation of the formal rule was put, by the action of users who appealed administrator decisions, in the hands of the local judiciary. The judiciary imposed the safe-haven rule that resists loss of water rights. They relied on a nationwide safe-haven rule applied to all private property, and land in particular, and in doing so reiterated the view that water rights are private property. The decision by water users to appeal to the judgment of the courts was motivated by the significance of the sunk investment involved when loss or maintenance of water rights was at stake. By contrast, unrealized opportunity for gain was not enough to justify the costs of a court appeal once the anti-transfers rule had been emphatically stated – particularly when there were arenas, however small, in which the rule did allow some transfers.

In water-rights loss situations, the administrators did for decades apply their own far-stricter understanding of when water rights should be lost – based on their practical understanding of the importance of making room for new transactions by clearing out the failures of the past. But the repeated reversals, amounting to a reprimand, from the courts - whose authority was supported by users seeking to protect their sunk costs – led to slow but steady adoption of the safe-haven rule for water rights holders. Administrators still on occasion apply their own view of water rights loss contrary to that rule, reflecting their firm belief in their superior practical expertise; but, other than in the case of a few spectacular

exceptions, if the users appeal to the courts the safe-haven rule is applied. The constitutional rules for all institutions in Wyoming, including the water management institution, mean that controversies that reached the courts had moved beyond the arena where the administrators have the final word.

Meanwhile, an additional twist has helped cement the safe-haven path. In the early 1980s the legislature, dominated by farm and ranch family interests, directed revenues from the new economic opportunity that reached Wyoming (via coal mining and coal-fired power plants to serve outside markets) to serve the water interest of the agricultural sector. This was as might be expected from a sector whose members had the power of acknowledged rights in water, plus a limited exit opportunity from farming and ranching – which accordingly gave them a strong political voice favoring protection of their status and assets. The legislative move supporting agricultural water interests was also facilitated by a political entrepreneur, a governor who was successfully re-elected on the basis of campaign promises to use mineral revenues to fund water development projects. The propriety of the long-followed safe-haven path against loss, for water rights blessed with such support, was thereby underscored.

### **7.2.3.3 Management: The rule on whether there can be rights to use water for non-extractive, non-consumptive purposes**

The era in which the water management institution was created and the difficulties of making a living in the landscape of Wyoming meant that extraction-and-consumption of water was the prime use considered in the initial rules. Though Wyoming flood waters were also used for moving lumber out of mountain forests, early on, and initial administrator reports warned users to be careful not to strand fish that enter irrigation ditches, the main concern was water for human, animal, plant and railroad consumption. Eight decades later, however, when the new economic demands from outside began to offer opportunity for new gain, some parts of Wyoming society demonstrated a change in preference – an interest in keeping water in streams for non-consumptive use (everything from recreation to aesthetics), rather than extracting it. As Chapter 4 notes, however, this preference has met only very limited accommodation in Wyoming's water rights institution. The path of consumptive-use-only has been difficult to break, though it may now be in the process of being broken. Administrators and existing (and so by definition, consumptive) users have been uneasy with expressions of a new preference. Administrators showed themselves hesitant to proceed when in the 1960s some would-be users sought rights to keep water in a

major river and protect it from being extracted. Administrators suspected the result would be benefits to consumptive users in downstream states, competing for agricultural markets. Meanwhile the prospect of a society that valued non-consumptive uses – a society that had already raised its head in more urban areas of the U.S. – perhaps even at the expense of consumptive uses, was felt as a threat by agricultural communities who had not yet gained anything from new economic opportunities.

These factors together amounted to something of a taboo on experimentation in non-extractive rights. In the late 1960s, the water administrator rejected the application for non-consumptive water rights and recommended that the idea become a subject of legislative study. Twenty years of divisive debate ensued, and resulted in recognition of a water right for non-consumptive uses in only one narrow set of circumstances (to provide the minimum amount of water necessary to support a fish population.) Another external force explicitly challenging the scope of the water rights institution (via the assertion of jurisdiction over local water by the Native American tribes living on federally-reserved land in Wyoming) also carried the banner of rights for non-extractive use, and thereby hardened the limits set on such a right. In the same time period, water administrators did experiment, without controversy, in recognizing rights for *extractive* non-consumptive uses (diverting a stream to make a pretty pond or a chattering brook on an expensive second-home estate) – highlighting the power of the extractive-use path. Cooperative efforts to help the agricultural sector reap economic gain from non-extractive uses are presently underway and may or may not ultimately result in breaking that path.

This last example also provides an example of an agricultural sector, still dominated by the integrative institution of the family and thus slow to embrace new economic opportunity, that is able to stop or at least slow the breaking of a path that favored agricultural assets. The discussion of the exclusion rule above has already demonstrated that, if the agricultural sector has political strength at the moment that gains from first steps towards the new economic model flow into the society – strength enough to direct to its own sector some of those gains, which otherwise agriculturalists would not see – the agricultural sector may be able to prevent the immediate breaking of a path that has supported rules that protect that sector's assets. The prevention of path-breaking is of course important to the survival of the agricultural sector if it is a majority user of the resource managed by the institution whose rules have followed the path in question. The prevention of path-breaking is also aided by that majority-user status, as the agricultural users then have the strongest relationships with administrators, and the greatest knowledge of the institution. Success in

maintaining a protective rule within the institution at the crucial point of the entry of new economic gains into the society may mean that the agricultural sector can ultimately command payment for its assets some time later when the new economic opportunity has transformed the society and its preferences. Then, the time for path-breaking has finally arrived.

## Annexe

### Structured Interview Questions

For administrator, user, user/administrator and tribal water administrator individuals:

- 1) Role of water users in creating rules for water use:
  - a. Informal rules (example: rotation among users during dry periods)
    - i. Heard/not heard
    - ii. Respected/not
    - iii. Ignored
    - iv. Rules changed in response to users
  - b. Formal rules (example: enlarging exceptions to ban on transfers)
    - i. Heard/not heard
    - ii. Respected/not
    - iii. Ignored
    - iv. Rules changed in response to users
- 2) How has Wyoming water system accommodated change?
  - a. In the past (example: increased urbanization, growth of towns)
  - b. More recently:
    - i. Change in physical conditions (change in stream course; drought)
    - ii. Water quality/quantity demands (needs for fish, wildlife, biota)
    - iii. New ideas of beneficial use (tribes' uses, fish ponds, instream flow, aesthetics)
- 3) How do you believe the system will accommodate change in the future?
- 4) Would you prefer a different system for allocating water?
  - a. Allocate by need, efficiency, type of crop, type of other use
    - i. Decision every year or every five years
  - b. Receive water by amount willing to pay (not by priority date)

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