El Agua No Se Vende, el Agua Se Defiende:
Water Rights Transfers and Community Irrigation in New Mexico's Acequias

By

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ABSTRACT

Small farmers across New Mexico irrigate with acequias, a system of cooperative, gravity-fed ditches introduced in Spanish colonial times that remains well adapted to managing scarce water in a dry climate. While the acequia system has proven to be a self-sustaining means of managing common pool resources, it exists in tension with dominant legal doctrines that treat water as subject to tradable property rights. In recent decades, the growth of the state’s urban areas has increased pressure on farmers to sell their water rights to urban developers. But because acequias are a cooperative system, transfers of their water rights threaten their ability to flexibly provide water for irrigation.

Since 2003, state law has allowed acequias to rule on applications to transfer water out of the acequia and also to create “water banks” that protect individual water rights from loss to findings of non-use. To do so, however, an acequia must adopt changes to its bylaws and follow new procedures that can be complicated and unfamiliar. In the face of increasing pressure on rural water users to sell their rights and the varying governance practices of acequias, this thesis asks: how have New Mexico’s laws equipped acequias to persist despite growing demand for their water rights? And to what extent are acequias taking the necessary steps to take advantage of their legal rights?

I find that, when properly implemented, the powers granted by current law effectively empower acequias to resist the pressure of water markets, but that further efforts are needed to increase implementation of the measures. Through outreach, education, and the spread of innovative practices, acequias and their advocates can realize a powerful opportunity to restore community autonomy over water allocation.

Thesis supervisor: Judith A. Layzer, Associate Professor of Environmental Policy
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Starting my thesis, I knew little about New Mexico and how deeply humanity’s relationship to water has shaped the state’s culture and history. I feel fortunate to have had the opportunity to hear the unique story of the acequia system and humbled to have the chance to relate the story to others. Nine months and one research trip later, I have a sense of why New Mexico is known as the Land of Enchantment.

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I dedicate this thesis to Marjorie, the first person to show me the city.
In the middle of June 2002, farmers along the Rio Embudo gathered to divide the water that flows to their small farms. Farmers in the valley irrigate with acequias, community-managed irrigation ditches used in New Mexico for centuries to divert water from the rivers that run down from the high peaks of the Southern Rockies. The Rio Embudo supports ten acequias, eight that depend on runoff from melting snow and two further downstream, beyond where springs recharge the river (Templeton 2004). At the June meeting, the acequias were represented by their commissioners—three irrigators elected by their fellow farmers to manage its operation—and their mayordomo, a farmer elected to ensure the ditch can consistently deliver water. In that dry summer, delivering water would require more than just the typical tightening of belts.

Because of their close proximity and hydraulic connection, the acequias along a single stream often must work together during dry spells. In a typical dry year, the Rio Embudo dries up just past the headgates of the Acequia del Bosque, leaving the four lower acequias without enough water (Templeton 2004). When the lower acequias receive insufficient water, they can request that the community initiate the repartimiento, a water sharing agreement that restricts the four upstream acequias to irrigating Thursday through Sunday. For the remaining days of the week, the upstream acequias must keep their headgates closed, allowing the water to stay in the Rio Embudo to reach the lower acequias. The lowest two acequias, recharged by springs, remain functional even during

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drought and do not take part in the repartimiento. The Embudo Valley acequias have implemented the repartimiento in many dry years, an inconvenient but tolerated complication of farming in the arid mountain valley.

The situation in 2002, however, was more dire than usual. Even in northern New Mexico, an area accustomed to dry summers and years of scarce water, that summer presented extraordinary conditions. A typical dry year requires water sharing to begin in late June, but in 2002 the acequias began sharing on April 28, six weeks earlier than usual (Templeton 2004). For the twelve months beginning in October of 2001, the northern mountain region of New Mexico received only 65 percent of its normal precipitation, and much of that came during a rainy September and so did nothing to save the crops from the early summer heat (NM Drought Task Force 2002). Even with the repartimiento, the lower acequias could not deliver water by the middle of May and risked going completely dry unless the eight upstream acequias adapted their water sharing arrangement (Templeton 2004). Estevan Arellano, a lifelong member of the Acequia Junta y Cienaga, was mayordomo in 2001. “That was the only the time that I can remember....,” Arellano recalls, “that the repartimiento started since May, right since the beginning of the irrigation season, and lasted all the year because it was so damn dry” (Arellano 2013).

Faced with severe shortages, the commissioners developed an unprecedented new water sharing arrangement. The plan involved physically joining multiple ditches to one another and creating an eleven- to twelve-day sharing cycle, reducing each farmer's irrigation time to as little as thirty minutes per cycle (Templeton 2004; Arellano 2013). Over the course of a difficult summer, the Embudo Valley acequias adjusted problematic
aspects of their repartimiento to reassure each acequia that its neighbors would not steal water out of turn, and to address the unforeseen hydrologic problems of the many ditches they had newly stitched together. But throughout the dry summer, they adhered to its basic framework and the principle that, even in crippling drought, the community must work together to ensure that every farmer gets some amount of water. If there was not enough water to support farming, the repartimiento at least helped to keep the plants alive until the late but welcome onset of the North American monsoon in early September.

The acequias on the Rio Embudo are among the many that operate in the high, arid landscape of northern New Mexico, where little rain falls yet farms are plenty. Small farmers across the state continue to irrigate with acequias, a system of water delivery introduced in Spanish colonial times that remains well adapted to managing scarce water in a dry climate. Acequias are cooperatives that manage water as a common resource to be shared according to need even in times of extreme scarcity; even during the crippling drought of 2002, the Embudo Valley acequias committed to providing water to everyone while, as is the custom, leaving a trickle in the river to provide “water for the chickens” (Crawford 1993, 155). Traditionally, the term acequia refers not only to the physical system of ditches, dams, and gates, but also to the social arrangement of cooperative management; an acequia is both a canal and a community. The members of the acequia are known as parciantes; they receive water to irrigate land abutting the ditch in exchange for an annual fee and manual labor for ditch maintenance.

While the acequia system has proven to be a self-sustaining means of managing agricultural water, it exists in tension with dominant legal doctrines that treat water as a
private property right. As is common in western states, each water right in New Mexico pertains to a specific quantity of water that can be bought, sold, or traded separately from the land to which the water flows. The law treats water as a resource for which individuals compete through exclusive rights, rather than as a resource to be cooperatively managed. Irrigators in an acequia, by contrast, traditionally have a right to use the water that flows to their fields but hold no right to a set quantity. Instead, they have given elected members of the community the discretion to allocate water fairly according to need and supply. Over the last 150 years, New Mexico has adopted a patchwork of laws to reconcile the two legal frameworks and allow acequias to continue to function.

In recent decades, the growth of the state's urban areas has increased pressure on rural farmers to sell their water rights to urban water users. State law requires new developments to account for their projected water needs. To provide sufficient water rights for new uses, developers offer sizable payments to farmers in exchange for water rights long used for irrigation. But because acequias are a cooperative system, transfers of their water rights can have community-wide impacts. By reducing the overall amount of water in the ditch, every water transfer out of an acequia threatens its ability to adequately and flexibly provide water for irrigation. Every parciante who sells his or her right also represents a lost source of labor and fees. But as urban and suburban development continue to raise the market value of water rights, more and more parciantes are exploring the possibility of transfers (Brown and Rivera 2000).

The possibility of water rights being transferred out of acequias poses a significant threat to the long-term future of the acequia system. Two main mechanisms illustrate how
the tension between acequias' communitarian tradition and New Mexico's libertarian water rights regime threatens to undermine the acequia system: water rights markets and findings of abandonment. Water rights markets allow rights holders to transfer their water rights voluntarily, with the purchasing power of urban development creating a lucrative opportunity for farmers to trade a valuable asset. A finding of abandonment similarly allows the transfer of water rights out of acequias. Rather than a sale, however, a finding of abandonment follows from a court's ruling that a water right has fallen into non-use, giving the state the right to retake it.

The statewide acequia community has successfully organized to gain special protections from the state that enable them to restore community autonomy over their water rights. Since 2003, state law has allowed acequias to veto water transfer applications that threaten their viability and also to create "water banks" that protect individual water rights from loss to abandonment. To do so, however, an acequia must adopt changes to its bylaws and follow new procedures that can be complicated and unfamiliar. Given the varying levels of knowledge and organization among acequias, the extent to which they are making the required changes to their governance and management varies, leaving some poorly protected.

In the face of increasing pressure on rural water users to sell their rights and the varying governance practices of acequias, this thesis asks: how have New Mexico's laws equipped acequias to persist despite growing demand for their water rights? And to what extent are acequias taking the necessary steps to take advantage of their legal rights? To answer these questions, I investigate the response of acequias in the Rio Grande Valley to
developments in water markets and state law. In the Middle Rio Grande region, some acequias have found ways to persist even within urbanized regions such as Santa Fe. In the rural Upper Rio Grande north of Santa Fe, which includes the Embudo Valley, acequias remain a common and vital element of local economies. Both regions face the pressure of water rights transfers and the possibility of rights being lost through state legal processes. I interviewed people from four different categories: 1) staff of acequia advocacy groups; 2) commissioners and mayordomos of individual acequias; 3) staff of public agencies; and 4) water rights brokers.

I find that while many acequias have adopted the required bylaws, they are more likely to implement their powers to rule on water transfers than to operate a water bank. Numerous examples show that current laws have empowered commissions to protect their acequias’ water rights, but the complexity of water banking has hindered widespread implementation. Outreach by acequia advocates has led to wide adoption of the bylaw changes required by the 2003 laws, but potentially hundreds of acequias have yet to make the changes. Further education efforts can increase adoption of the bylaws and help train acequias on how to properly implement their legal powers. The abilities to rule on water transfers and to operate water banks are unfamiliar practices derived from New Mexico’s rights-based water law, but are also a powerful opportunity to restore traditional methods for community autonomy over water allocation. Correctly implemented, the powers allow acequias to effectively maintain their age-old system and protect themselves from the growing pressure for water rights transfers.
In the long run, water markets are only one of many threats to acequias; economic and demographic trends have made small-scale, rural agriculture increasingly tenuous and climate change promises to diminish New Mexico's already strained water resources. Yet acequias have been dealing with systemic shocks and cultural shifts for hundreds of years and in that time have always found a way to adapt. New Mexico's community irrigation ditches are charming relics of a bygone era, but they are not only that. Acequias are one of the few systems that has empirically demonstrated an ability to sustainably manage scarce water in an arid and unpredictable climate. Acequias cannot singlehandedly solve New Mexico's water crisis, but they may be able to solve their own. As New Mexico continues to pursue statewide solutions to water shortages, it must work to ensure that it does not damage the resilience of effective institutions at the community scale (Adger 2005). Preserving acequias' ability to adaptively and sustainably deliver water is an important and worthwhile goal for the state.

The future of water rights and the acequia system arouses passion, anger, and wariness among New Mexicans. The topic evokes memories of historic injustices and disputes about freedom and rights; many see the future of a cherished lifestyle hanging in the balance. Advocates speak reluctantly about the effectiveness of legal protections, fearing that publicizing gaps in the rights framework may lead to brokers exploiting vulnerable parciantes. Mindful of the vulnerability of their water rights, parciantes themselves can be guarded in discussing ditch practices and land use. The commissioners I spoke with were willing to talk about the status of the acequia system and how they have sought to implement statutory protections, but the topic remains fraught with implications
for their region’s future. Water brokers and public officials spoke with me about the state of water markets and their effect on development. As has anyone who has considered water management in New Mexico, they have also thought extensively about the future of the state and its traditions. While the 2003 acequia statutes are a relatively new frontier in water law, how a land with so little water can support agriculture, industry, and human settlements has been New Mexico’s existential question since its earliest years.

**EL AGUA ES LA VIDA: ACEQUIAS AS A SUSTAINABLE RESOURCE SYSTEM**

While local conditions and advances in technology have led to some evolution, the essence of acequia infrastructure and management has remained remarkably unchanged since the Spanish introduced it to New Mexico in the late 1500s. At the *presa* (headgate), the acequia diverts water into a main ditch called the *acequia madre*. The system is gravity-powered, with the diverted water flowing downhill past gates that open to lateral ditches leading to parciantes’ fields. In the absence of pumps, the pressure of water entering the headgate provides the momentum that carries water to each farm’s lateral. In times of plenty, parciantes can freely open the gate to flood their fields; in times of scarcity, the mayordomo limits how often they may irrigate. At the end of the acequia madre, any remaining water flows back to the river.

Acequias can be described by their infrastructure, but it is their distinctive culture of water management that truly defines the institution. Parciantes share not only the flow

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2 “Water Is Life,” a common refrain in the acequia community and the title of the statewide *Congreso de las Acequias*’ 2006 declaration of principles.

3 The need to abut an acequia directly to receive water for farming drove rural New Mexico’s characteristic form of long, narrow farms with short frontages along the length of an acequia.
of water, but also the responsibilities of labor and funding that maintain the ditch. Each season, before irrigation begins, the mayordomo supervises the limpia, a day or more of clearing brush and repairing ditch banks that have been eroded by dry winds or compromised by invasive plants and burrowing muskrats. Traditionally, each parciante participated in the limpia or sent a laborer in his or her place; in modern times, acequias often hire laborers to assist the cleaning, but it remains a valorized example of the acequia culture of sharing and community.4

As seen in the repartimiento, the distribution of water in an acequia is based on principles of equity, a value that becomes more pronounced and problematic as the rivers dry out in the summer sun. During the early months of the irrigation season, from March or April into early summer, the rivers often flow strongly enough to provide all irrigators with sufficient water with little need for coordinated management. “In times when there is bountiful supply, nobody complains and everybody has more than enough water,” says Estevan Arellano (2013). As water grows scarce, the mayordomo begins controlling the allocation of water through a variety of methods. The mayordomo sometimes simply requires that parciantes ask permission before irrigating; at other times, the mayordomo imposes a rigid schedule of who may draw from the ditch at specific times to ensure that, at least part of the time, the acequia maintains enough pressure to reach the laterals of the farms furthest downstream (Crawford 1993; Templeton 2004). In unusually dry periods, coordination between neighboring acequias may be necessary. The arrangement is often

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4 Stanley Crawford’s Mayordomo, a memoir of his time in that position on an Embudo Valley acequia, provides an engaging narrative about the tasks and difficulties of managing an acequia.
only an oral agreement, flexible enough that it can be adapted to the unique needs of each season, even to the severe level of drought seen in 2002.

According to recent scholarship, in addition to their primary benefit of managing scarce water, acequias yield significant economic, ecological, and cultural benefits. Studies show that acequias regulate stream flow, recharge groundwater, and nurture riparian systems (Fernald et al. 2007; Brown and Rivera 2000). One study estimates that, by promoting local agricultural markets and providing ecosystem services, the acequia system in one northern New Mexico bioregion annually produces $350 million in value (Peña 2003). Acequias also hold an esteemed place in New Mexico’s cultural imagination, providing a connection to the region’s Hispano heritage (Rivera 1998; Ackerly 1996; Crawford 1993).

Water resource systems present a classic example of the problem economists term the “tragedy of the commons.” In a system where many users share easy access to a valuable good or resource (a “common pool resource”), each user faces the temptation to overuse it. Overdrawing provides individual benefits, but if all users do so, they will collectively deplete the resource. Identifying the phenomenon in the collapse of fisheries and the pollution of clean air, ecologist Garrett Hardin theorized that only regulation of individual behavior by a strong firm or the state could prevent the tragedy of the commons (Hardin 1968). The history of western water management reveals a faith in the state’s ability to manage water. The Reclamation Era, lasting from the 1890s to the 1970s,
approached water allocation by putting the weight of government behind interstate river compacts and centralized agencies that regulated private water use (Tarlock 2001).5

But political scientist Elinor Ostrom rejected Hardin’s claims. She describes an alternative model for sustainably managing common resources that emerges from cooperation at the local scale. Citing examples in fisheries, forest management, and small-scale irrigation systems, Ostrom shows that under certain conditions, local groups self-organize to sustainably manage common resources (Ostrom 1990). Acequias conform to the design principles Ostrom identifies as necessary components of sustainable, common pool resource (“CPR”) institutions: they have clearly defined local boundaries, appropriators participate in decision-making, and there are provisions for monitoring and for sanctioning violations (Ostrom 1990; Cox 2008). Many of the distinctive qualities of acequias fit the model: membership follows the clear boundaries of the ditch, all parciantes receive voting rights to elect officers from among themselves, and providing monitoring by scrutinizing their neighbors’ irrigation practices for violations. Consistent with Ostrom’s model, for hundreds of years, spanning droughts, floods, wars, industrialization, and migrations, acequias have sustained themselves and their water resource with astonishingly little change.

The leadership of the commissioners and mayordomo provides an authority that maintains the acequia and enforces rules, while ensuring accountability within the community. The mayordomo and commissioners are themselves irrigators on the ditch; parciantes must answer to them, but they ultimately must answer to the parciantes. “The

5 The Reclamation Era was also marked by a defiant attitude toward the limits of the commons. Massive federal investments in dams and water diversion reflected a belief that with enough engineering, the federal government could bring water from where it naturally runs to where society desires it.
mayordomo is kind of like the CEO of the acequia, in charge of the day-to-day operations," says Arellano, himself a mayordomo for five years. Besides dividing the water and running the limpia, the mayordomo must prepare the acequia for storm events that could wash silt into the ditch and must be constantly vigilant for any parciantes stealing of water out of turn (Arellano 2013). The commissioners—a president, treasurer, and secretary—collect fees and manage the overall operations of the acequia. Like the mayordomo, they enjoy discretion, often working out special arrangements with elderly and poor parciantes who have difficulty paying their fees (Arellano 2013).

By placing the authority for water management at the most local level possible, acequias take advantage of irrigators’ knowledge of the resource and its users. An acequia officer can know the particulars of how the water flows as well as the personalities of the parciantes, both of which affect water delivery. “The vernacular knowledge of the way water flows and is used is something that we all acquire from living in a place for decades, and that’s hard to transfer or convey or formalize," says Stan Crawford, longtime commissioner and mayordomo on the Acequia del Bosque in Dixon. “There isn’t any central mind, as it were, that’s going to help us figure out some of the puzzles...” (Crawford 2013).

Besides incorporating local knowledge, acequias give irrigators confidence that those managing the water supply will adhere to a shared set of values. An overarching concern that many of Ostrom’s design principles address is the establishment of behavioral norms shared by appropriators, which can increase confidence that others will follow the rules. Ostrom highlights the need for “mutual monitoring” in CPR institutions
and points to an effective example in Valencia, Spain. There, farmers monitor one another, the commission monitors the farmers, and the farmers monitor the commission; the commission can sanction members who break rules and is accountable to the community of members (Ostrom 1990). The acequia system uses a similar setup to provide effective mutual monitoring and sanctions that hold irrigators accountable. Acequias depend heavily on “eyes on the ditch,” as all community members have a sufficient stake in shared good behavior that they police their neighbors’ actions. “You have to be on the lookout that your neighbors don’t steal it from you,” says Arellano. “That’s what happens when there’s very little water. You’re watering at two o’clock in the morning and all the sudden the water stops running” (Arellano 2013).

The fact that common pool resource institutions can be sustainable does not mean they lack conflict and drama. The reason for their creation is the likelihood that members face a temptation to cheat. Managing an acequia can, not surprisingly, get messy. “You get to choose your friends in town, but you don’t get to choose your parciantes,” says Robert Templeton. “They are the people who own the land around you. It’s difficult at times, but it’s also very interesting.” Crawford recounted the difficulty of balancing the needs of several acequias and the personalities of numerous officials during the 2002 repartimiento, and their ultimate success:

What was interesting was that the commissioners from all the ditches and the mayordomos met every Sunday. And the first meetings lasted for two hours. That was at the beginning of the season. By the end of the season, after they had worked everything out and kicked a very difficult commissioner out of the group, the meetings lasted 10 minutes (Crawford 2013).

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6 The Valencia example Ostrom cites is especially similar, as it derives from the same successful Moorish irrigation systems that inspired Spanish colonists to create New Mexico’s acequias.
The discretion that New Mexico has afforded to acequias to manage the majority of their internal affairs has given them the flexibility to deal with the conflicts that emerge from too many fields seeking too little water.

Sustainable CPR institutions require recognition and accommodation by higher levels of government to function properly (Ostrom 1990). Even the smallest water systems in the western United States exist alongside highly influential regional and national compacts, districts, and policy frameworks (Clark 1987; Reisner 1993). While they were once a feature of isolated frontier communities, acequias have been incorporated over the centuries into the New Mexico water system. Their continued use as a water management system has been enabled by deliberate efforts by the state of New Mexico to preserve their role through formal legal recognition of their authority to allocate water, collect fees, and settle disputes.

The continued viability of acequias requires similar state recognition of a role in resisting water transfers. CPR institutions cannot function if members do not trust that other members will consistently follow the rules; the motivation to adhere to a quota disappears once a member sees neighbors overdrawing with impunity. Water transfer agreements pose a similar threat to acequias. If parciales fear that other members are not committed to the institution, they are more likely to break rules to protect themselves. The loss of rural population and increasing number of arrivals from other parts of the country threatens solidarity for acequias, as people place less value on local food economies and move away from family farms (Crawford 1993; Perramond 2012). If parciales lose faith
that cultural tradition ensures their neighbors’ dedication to the acequia, formal legal protections can help restore their confidence.

New Mexico’s recognition of acequias’ legitimacy preserved the foundation for cooperative management. While it has taken decades to clarify the legal status of acequias, the current legal environment offers opportunities to protect the integrity of their irrigation community even in an environment of increasingly market-oriented water rights (Hicks 2010; NMAA 2010; Perramond 2012). If properly implemented and widely adopted, acequias’ abilities to create water banks and rule on water transfers exemplify how recognition by the state can facilitate CPR institutions.

ACEQUIAS AND WATER RIGHTS IN NEW MEXICO LAW

The need for special legal protections for acequias results from a long history of tension between the principles of traditional water systems and New Mexico’s legal doctrine that water rights are private property. Waves of settlement and conquest have brought to New Mexico a unique succession of cultural and legal understandings of society’s relationship with water, creating an uneasy balance in the state’s laws and institutions. Overall, the effect of New Mexico’s legal treatment has been to preserve a formal role for acequias, but also to transform them into regulated subdivisions of state government. In practice, acequias maintain their traditional ability to share water as they see fit and to control their resource locally. Legally, however, water in New Mexico belongs to the public via the state and acequias’ right to self-government derives from a statutory grant of authority from the legislature.
The current legal status of acequias is a considerable departure from their roots as a communitarian system of water management in the Upper Rio Grande. Acequia infrastructure and culture date to the earliest Spanish settlements in northern New Mexico. In 1598, colonists dug the first acequia in what is now New Mexico, constructing a canal off the Rio Chama in the village of Yunque, 30 miles northwest of present-day Santa Fe (Ackerly 1996). The river valleys of the Sangre de Cristo Mountains in northern New Mexico, where settlers usually built acequias before even the church or government buildings, remain home to the largest number of the state’s acequias (Brown and Rivera 2000).

Spanish irrigation systems were well adapted to dry climates, informed by Moorish innovations in Valencia that spread throughout Spain (Clark 1987). Under the Spanish
system, communities allocated water based on need and equity, not who diverted water first, a principle that persists in acequia practice and the repartimiento (Hicks 2010).

Following the end of the Mexican-American War in 1848, New Mexico became a territory of the United States. When it acquired the territory in the Treaty of Guadalupe Hidalgo, the United States promised to recognize existing rights in formerly Spanish and Mexican lands, including water claims. The treaty obligation remains a major reason New Mexico has accommodated acequias in its laws (Utton Center 2013). In the centuries since New Mexico's acquisition, its English-speaking population has grown and it has adopted Anglo-American laws and institutions, culminating in statehood in 1912. As its institutions became increasingly Anglo-American, New Mexico adopted the more property-based water laws typical in the American west. Today, water in New Mexico is subject to the treaty, interstate compacts, U.S. federal law, and state laws that reflect its unusual mix of water societies. Further complicating the matter, the water systems of New Mexico's Pueblo communities, which predate European settlement, are protected by the federal government and insulated from state regulation (Perramond 2012; Clark 1987).

Acequias and the Prior Appropriation Doctrine

As the United States settled the West and developed its resources, the federal government remained mostly silent on water policy, leaving it to state and territorial legislatures to develop a legal system for its management (Perramond 2012). In the early years of the

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7 The Rio Grande Compact remains highly influential on New Mexico water policy. Signed by New Mexico, Colorado, Texas in 1938, the compact obligates Colorado to deliver water to New Mexico based on river flows in Colorado. New Mexico may allocate a certain amount and must deliver the remainder to Texas. During dry years, New Mexico struggles to meet its obligation to Texas, forcing usage restrictions within New Mexico.
New Mexico territory, the territorial legislature attempted to accommodate local practices and institutions, but over the course of the 19th century moved toward incorporating acequias into a more centralized system of water management (Hicks 2010). Beginning in 1891, New Mexico legally adopted the system of rights by then widespread in the American West: the Colorado Doctrine, also known as “prior appropriation.”

Under prior appropriation, all waters are public property, and a water right consists of the right to use a certain amount of water on the basis of “first in time, first in right.” Essentially, whoever began using water first has priority, gaining the right to continue to draw that amount of water as long as it is put to “beneficial use.” That is, the first person to begin taking water has a legal right to do so, but only in the amount he or she continually uses for irrigating crops, mining, manufacturing, or domestic supply. When drought or overuse leaves too little water to satisfy all claimed beneficial uses, the users with more senior rights are entitled to their full use. Significantly, under this system water rights can be detached from property and traded.

Following its adoption in Colorado, the prior appropriation doctrine spread throughout the West as a way to manage scarce water. The doctrine exemplifies the state-centered approach to averting the tragedy of the commons, relying on government to enforce restrictions on water use in times of shortage. From a legal perspective, what a

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8 The question of whether water use for environmental protection can be treated as a beneficial use has been fiercely debated in the West, but has gained legal approval in recent years. New Mexico has weakly endorsed leaving water in a river to maintain instream flow as a beneficial use. In 1998, the New Mexico Attorney General issued an opinion stating that current laws allow the Office of the State Engineer to treat instream flow as a beneficial use if the flow is carefully metered. Since that date, releases of water to maintain instream flow to comply with the Endangered Species Act have successfully earned permits. Despite recent administrative support for instream flow, no legislative statute or judicial opinions have codified the practice (Utton Center 2013).
water user owns is not water itself, but a right to use water that is owned by the public (Perramond 2012). In traditional acequias, irrigators respond to scarcity by imposing restrictions on all users, sharing what little water remains. Even in a drought as severe as that of 2001-2002, the Embudo Valley acequias distribute the hardship to all parciantes, ensuring everyone receives water even when it amounts only to a “piddling little flow” (Crawford 2013).

Prior appropriation asks no such shared sacrifice, instead using seniority to exclude certain users from drawing water. Senior users suffering from insufficient water supply can make a “priority call” to the Office of the State Engineer (OSE), which then institutes priority administration in that river basin, delivering water in order of seniority. The OSE is reluctant to administer water based on priority and suggests to citizens that priority calls “should be a measure of last resort” (Utton Center 2013; OSE 2013). Priority calls could provoke political controversy, potentially forcing regulators to guarantee water to small farms ahead of newer urban development. Water rights attorney David Benavides relates a common belief among acequia communities. “Acequia people will tell you that even...this fundamental principle of respect for senior rights and preference for senior rights in times of shortage...is not enforced in New Mexico and [point to] many examples of juniors, if they are powerful enough, not being curtailed at the expense of senior acequias or senior pueblos” (Benavides 2013).
Legal Accommodation and the Changing Nature of Acequia Rights

Despite the overall embrace of Anglo-American water law, the New Mexico statutes include a series of laws accommodating acequias. As a territory and later as a state, New Mexico maintained recognition of pre-1907 water rights as required by the Treaty of Guadalupe Hidalgo and formally recognized the position of mayordomo and acequias’ rights to easements along their courses. The 1907 Water Code remains the primary basis for New Mexico’s water policies, establishing the Office of the Territorial (now State) Engineer as a central authority and formalizing the framework of prior appropriation and beneficial use (N.M.S.A. 1978, Chapter 72). The 1912 New Mexico Constitution ensured that the same principles would continue to shape water law for the new State of New Mexico (New Mexico Constitution, Article XVI).

As part of the territorial Water Code, the New Mexico Legislature passed the 1907 Acequia Act, which formalized the status of acequias while restricting elements of their autonomy (N.M.S.A. 1978 Chapter 73, Articles 2 and 3). The Act designated acequias as political subdivisions of the state, akin to towns, counties, or irrigation districts. The designation carried new authority to levy fees and enforce labor requirements, backed by the ability to bring enforcement from civil courts. As political subdivisions, acequias also gained legal standing to act on behalf of their parciantes. With new recognition, however, came standardized requirements for acequia governance, such as the timing and term of elections, which traditionally varied according to local practice.

Incorporation into a centralized system based in prior appropriation also changed the nature of acequia water rights. Under current New Mexico laws, water rights belong to
the users themselves and the acequia is a system of management. The law recognizes the validity of acequias as an administrative scheme into which parciantes voluntarily enter, but the underlying water rights belong to each landowner according to when they began putting a certain amount of water to beneficial use and can be bought, sold, and leased separately from land (Hicks 2010). Under current law, the acequia itself holds no right to water.

The shift from community ownership of water to community management of individual rights marked a true change in parciantes’ rights, but the day-to-day experience of providing water to farms remained mostly unchanged. Acequia commissioners and mayordomos agree that the adoption of new bylaws related to water transfers and water banking, for example, have had little effect on their management practices (Arellano 2013; Crawford 2013; Templeton 2013). For the most part, the bylaws reflect widely used practices in ditch governance. Moreover, the state has generally been content to allow acequias to self-govern, asserting more control only when state funding for capital improvements is involved.

The Adjudication Process

A major occasion for conflict between acequia traditions and prior appropriation is the state adjudication process. New Mexico has spent decades attempting to fully catalog all claims to ground- and surface water in the state through the process of adjudication. The OSE manages adjudication, a legal process that seeks to establish the priority, use, and quantity of every water right in each stream system. The process starts from the
assumption that all surface water in the state has been allocated and that water planning and administration require a complete index of who owns rights to what water and in what order of seniority. Besides aiding priority administration, adjudication can bolster water rights markets by providing potential buyers and sellers with full information, creating a more economically efficient transfer market (Perramond 2012). The process is fraught with conflict, however, as water rights holders seek to justify their water use as beneficial and establish the priority of their claim over others in the watershed.

Eventually, New Mexico hopes to complete the adjudication process for the entire state. Cost and complexity present a huge challenge, however, and one source estimates that less than 25 percent of the state’s area has been adjudicated (Perramond 2012). While the state has yet to begin the daunting, expensive task of adjudicating the Middle Rio Grande, which includes Albuquerque and Rio Rancho, the state remains officially committed to fully adjudicating its waters (Ridgley 2010).9

For acequias, the possibility of adjudication is both promising and threatening. If irrigators along an acequia can prove they have continually been putting water to beneficial use for hundreds of years, adjudication can result in validation of their very senior rights, protecting them from any future priority calls. Recent adjudications have also explored innovative protections; the Aamodt adjudication in northern New Mexico incorporated ditch-wide priority dates for acequias rather than individual priority dates for

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9 In response to the reality that full adjudication is many decades away, in 2003 the legislature ordered the OSE to develop regulations for expedited water marketing, leasing, and priority administration. The result, Active Water Resource Management, allows the OSE to make temporary decisions about priority and drought management of unadjudicated districts at the administrative level, through specially appointed Water Masters. The enabling legislation protected acequias, but the long-term implications of the still new law remain highly uncertain (Pease 2010; Perramond 2012; Utton Center 2013).
each parciante (Perramond 2012). Yet as a complex, lengthy legal process, adjudication can impose a significant financial burden on parties. Moreover, many acequia advocates view the lengthy and divisive adjudication process as a threat to cooperation among acequias, Indian Pueblos, and other users (Rodriguez 2006).

Adjudication also carries the possibility that parciantes could lose water rights to a finding of non-use; if the OSE demonstrates to the court that a rights holder intentionally abandoned his water rights or failed to use his full water right for four consecutive years, the water right reverts to state control. In parts of the state, farmers have let land go fallow or built residences on former cropland. In unadjudicated acequias, water rights that go unused due to land use changes could be used by the rest of the acequia. If these water rights revert to state control, however, the acequia could lose the right to divert water in amounts sufficient to keep the ditch operational for parciantes who still wish to irrigate.

Between facilitating water rights markets and providing a venue for findings of non-use, adjudication demonstrates how New Mexico’s water policies enable the movement of water rights out of acequias. Adjudication stands out as a process that threatens acequias, but it is just one policy that follows from prior appropriation and separable water rights. The difficult marriage between acequias and the overarching system of water laws has become even more evident in recent decades, as urban and suburban growth has revealed how the law enables the displacement of water rights and threatens acequias.
THE FLOW OF WATER RIGHTS TO CITIES

*Crescit Eundo*, touts the New Mexico state motto: “it grows as it goes.” And so it has; the original population of the New Mexico Territory upon its acquisition was about 61,000, but grew to over 300,000 by the time of statehood in 1912. Since then, the population has grown to over 2 million residents. New Mexico has grown mostly in its metropolitan areas along the Rio Grande. Albuquerque, its largest city, housed only 35,000 in 1940; it now boasts a population of over 550,000. Nearby Rio Rancho has become the state’s third largest city, growing from under 10,000 in 1980 to 90,000 today. New Mexico’s rapid growth is a function of land that is cheap and plentiful. Water, on the other hand, is increasingly difficult to find.

New Mexico has provided water for its growing cities by transferring rights from agricultural uses. Tradable water rights reallocate water from agriculture and industry to cities, using market incentives to encourage farmers and ranchers to facilitate urban growth (Tarlock 2001). The idea of a water transfer market derives from the belief that all water rights in the state are currently fully allocated. New Mexico officials believe that water users already use all possible sources of water in state, so any new development must account for how it will meet its projected water needs. One way developers can satisfy this requirement is to purchase water rights from rural users such as farms that plan to cease operating.\(^{10}\) To date, most transfers to cities have originated with farms in the Middle Rio Grande Valley; Santa Fe, for example, has transferred water mostly from the

\(^{10}\text{Not every new water user requires a transfer of water rights. A new home in a city, for example, typically can connect for a fee to the municipal water system, which owns rights to a large quantity of water. The number of new connections a municipal system can support is finite, of course, and if the utility needs to increase its total amount of water rights, it would require transfers.}
Socorro area 70 miles south of Albuquerque (Borchert 2013). The OSE sees water rights transfers as part of the future of New Mexico’s development and has incorporated water markets into its statewide water plans (Utton Center 2013).

**Running Dry: The Threat of Water Transfers Out of Acequias**

Overall, New Mexico has been pursuing policies that push water rights further towards a tradable market. By pursuing adjudication of water rights throughout the state, the government has attempted to create a more efficient market. As demand increases and markets become more efficient, the water transfer market may become a bigger and bigger threat to acequias, regardless of legal protections. Advocates, commissioners, and parciantes see the possibility of water transfers as a major threat to the future of the acequia system (Ortiz 2013; Crawford 2013; Crawford 1993).

While transferring water rights out of irrigation and into cities clearly poses a challenge to agriculture in general, it presents a particular threat to acequia communities. In a farm with its own private irrigation system, a transfer would theoretically affect only the involved parties. The farmer would cease diverting water, leaving it in the stream to be used further downriver by the new user. On an acequia, even a relatively small number of rights transfers could threaten the hydraulic viability of the ditch. If several parciantes transfer their water rights, the acequia will have the right to divert less water from the river, and pressure may not be sufficient for water to reach farms at the lower end of the ditch (Brown and Rivera 2000).
Water delivery depends just as strongly on an involved community to manage the institution. If parciantes opt out of water delivery, they will also likely opt out of participation in acequia affairs. Having fewer active participants will exacerbate the difficulty of finding officers and a mayordomo; even today some acequias operate with fewer than three commissioners because of a lack of participation (Arellano 2013). While the days of each parciante attending the limpia to prepare the ditch for the season are waning, acequias still depend on collecting fees from their parciantes to maintain infrastructure and hire labor for the cleaning. “If you lose landowners you lose revenue, and you can’t hire ditch crews and you can’t pay the mayordomo,” says Crawford. “You need money to run an acequia. And so transferring water out of your acequia is transferring your tax base” (Crawford 2013).

The interdependence of acequias makes them especially vulnerable to the impact of water rights transfers, but their age makes them highly desirable to water markets. The more older, or more “senior,” a water right, the more valuable it will be, as it will have priority over newer uses during shortages. Most acequias contain highly senior water rights that predate the 1907 territorial water law and thus attract high bids from developers and increase the temptation for parciantes to enter the market. Junior rights, established since 1907, are known as “paper rights” because they do not guarantee water supply in times of drought. Conservatively planning for the possibility of priority administration, the city of Santa Fe will buy only pre-1907 water rights (Borchert 2013).
The Water Transfer Market

New Mexico lacks specialized institutions for managing water transfers, but has nonetheless seen the emergence of a strong water market. Legislative efforts to create a statewide water rights clearinghouse or bank have failed, leaving the state to manage transfers through an ad hoc process administered by the OSE (Brown and Rivera 2000). While the OSE evaluates the merits and impacts of potential transfers, the process of finding water rights for sale, matching sellers and buyers, and negotiating contracts has fallen to private water brokers.

Water broker Bill Turner is one of the more controversial figures in New Mexico water circles. When it comes to water in New Mexico, Turner says, “I know all the actors, I know their agendas, and I know where the bodies are” (Turner 2013). He has been a PhD geologist, a state cabinet secretary, an elected official, and a thorn in every side he can find; acequia advocates frequently quote him as comparing water rights to antiques because they go on the market when people die (McAlindin 2007; Varela 2013). Following his election to the board of the Middle Rio Grande Conservancy District, which manages water in the Albuquerque metropolitan area, the district tried and failed to have him removed from its board, citing his brokering activities as a conflict of interest. In Turner’s telling, the district simply objected to his efforts to “clean house” on voters’ behalf (Paskus 2007).

The typical transfer, Turner explains, begins with a farmer who no longer wishes to farm and would like to maximize the value of his key asset, his water right. Once a broker has found two parties interested in a trade, he or she submits it to the OSE, which
evaluates the validity of the water right and the merits of the transfer. Newer water rights have been closely monitored through state permits, making determining the history of continuous beneficial use straightforward. For senior rights, a broker establishes validity through a combination of maps, tax records, analysis of land use in aerial photographs, and genealogical research (Turner 2013). The applicants must prove to the OSE that the transfer will not 1) impair existing rights, 2) harm water conservation efforts, or 3) be detrimental to "public welfare." The OSE process requires public notice, after which members of the public may file comments or protest a transfer. Since the 1985 introduction of the public welfare standard, acequias have been legally empowered to file protests, but their success in opposing transfers has been mixed (Utton Center 2013). Since 2003, applicants seeking to transfer water out of acequias must also submit to the OSE an affidavit from the acequia commission stating that the commission has approved the transfer. Parties may appeal the OSE’s transfer ruling or water rights validation to the state district court.

Water transfers are much easier and cheaper in adjudicated basins where the courts have already validated water rights. While an unadjudicated senior water user must pay a consultant to validate his right, the adjudication process catalogs all such information for that basin. In recently adjudicated areas, no validation is required, so applicants do not need to pay a broker to provide that research and more readily gain OSE approval (Turner 2013). Even in unadjudicated basins, however, water rights are subject to

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11 The public welfare clause, adopted in the 1980s, affords the OSE broad discretion to deny transfers. While acequia advocates initially hoped to develop case law that established harm to acequias as contrary to public welfare, they found that the OSE shied away from judgments about welfare and were too inconsistent to offer protection (Benavides 2012, Benavides 2013).
transfer, and acequias remain vulnerable to the detrimental effects of water leaving the system.

Despite New Mexico's ad hoc process for regulating transfers, a lucrative market in water rights has developed. Today, water in the Middle Rio Grande sells for between $12,000 and $15,000 per acre-foot, a decline after several decades of high prices (Borchert 2013; Turner 2013). At the height of the housing boom, senior rights could earn $18,000 per acre-foot, spiking as high as $35,000 per acre-foot in the early 2000s, when the city of Rio Rancho was acquiring large amounts of water rights for an Intel plant (Turner 2013; Utton Center 2013). The market price reflects both the demand of developers and the influence of policy. A 2005 Santa Fe ordinance requires that any development needing more than ten acre-feet of water bring sufficient rights to the city water system; the ordinance had the effect of pushing developers in Santa Fe into the market and increasing demand for transfers in the Middle Rio Grande (Borchert 2013; Varela 2013). For farmers along acequias that may hold rights to three to five acre-feet for each acre under cultivation, a water transfer can offer a persuasive amount of money.

Abandonment

Market-driven transfers threaten to divert water rights from acequias, but involuntary transfers pose a challenge as well. Because individuals possess only a right to use water rather than ownership of the water itself, their right can revert to the state's control through one of two findings: forfeiture or abandonment. Forfeiture stems from four consecutive years of non-use of a water right, after which the OSE issues the user a notice. Following
notice, the user has one year to resume use and stave off forfeiture. The OSE rarely pursues forfeiture claims.

Abandonment occurs when a rights holder intentionally ceases putting all or some of his or her water right to its original beneficial use. It is the most common way an acequia loses water rights through the adjudication process (Varela 2013). Like forfeiture, abandonment requires a judicial determination, but it does not require a year’s notice from the OSE. Courts often find abandonment when they see construction on what was previously cropland; if a new house or driveway takes up a portion of a field, the court interprets it as evidence of purposeful abandonment of that percentage of the water right (NMAA 2010). An acequia that loses water rights to non-use faces the same challenges as does an acequia that loses them to voluntary transfers: a loss of water, and a loss of community engagement in the management of what scarce water remains for the fields.

EMPOWERING ACEQUIAS TO RETAIN WATER RIGHTS: THE 2003 STATUTES

As the market for senior water rights gained momentum in the 1990s and 2000s, advocates realized the need to protect acequias from the possibility of high prices driving parciantes to sell their rights out of the system. With adjudication proceeding across many of the state’s watersheds, the loss of rights to abandonment posed a looming threat as well. The New Mexico Acequia Association was founded in 1990 to advocate for funding and legal protections in response to these threats and the need to preserve acequia culture. Their successful lobbying for passage of the 2003 water transfer and water banking
statutes gave acequias unprecedented power. While the provisions have been widely adopted into acequias' bylaws, however, their use in practice has varied.

**Water Transfer Protections**

The statute addressing water transfers provides acequias the opportunity to require that any applications to transfer water into or out of the ditch come before the commission before being submitted to the state for approval. Current state law states that the OSE may only approve a transfer that involves an acequia if the acequia commission has first approved it or if the applicant shows that the acequia lacks a bylaw requiring their approval of transfers (N.M.S.A. 1978 §72-5-24.1).

To gain the authority to rule on water transfers, acequias must take certain steps spelled out in the statute. The acequia must adopt into its bylaws an amendment establishing a process for ruling on transfers. The commission must rule on transfers within 120 days of receiving an application and must issue a written decision based on its judgment of whether the transfer would be "detrimental to the acequia or community ditch or its members" (N.M.S.A. 1978 §§73-2-21(E), 73-3-4.1). If the acequia approves the transfer, the application moves on to the typical OSE process. If the acequia denies it, the OSE cannot approve the transfer and the applicant can appeal to county district court. Commissions can also approve transfers with conditions attached.

The NMAA focuses a great deal of its community organizing efforts on advising acequias about the importance of adopting a proper bylaw. The law empowers acequias to not merely advise the OSE, but to make a ruling the OSE must follow. The NMAA
estimates that they have worked with more than 300 acequias to add the protection to their bylaws (Ortiz 2013). New Mexico Legal Aid (NMLA), which runs a Land and Water Project to assist rural residents in defending their rights, has participated in the outreach alongside the NMAA (Benavides 2013). The NMAA has written a sample bylaw that many acequias have adopted. It includes a standardized application form and provision for a public meeting within 90 days of application and a written ruling within 30 days of the meeting. It spells out procedures for the meeting, allows applicants’ attorneys to be present, and clearly states that the commission will base its decision on the possibility of detriment (NMAA 2010).

Advocates laud the statute for allowing acequias to retain control over what they believe are community rights. Even appeals to state courts maintain deference to the acequia; the court can overturn an arbitrary or capricious ruling that violates due process, but cannot conduct a de novo review of the evidence. New Mexico courts have upheld the law, finding a rational basis for deferring to local bodies of government that have intimate knowledge of their own water system and needs (Pena Blanca Partnership v. San Jose de Hernandez Comm. Ditch, 2009 NMCA 16, 145 N.M. 555). Active members of acequias in the Embudo Valley called the law “common sense” and “a very positive thing” despite seeing no imminent threat of water transfers out of their acequias (Crawford 2013; Templeton 2013). All ten of the Embudo Valley acequias have adopted the bylaw (Arellano 2013).

David Benavides, Director of NMLA’s Land and Water Project, says that his office becomes aware of five to ten applications to transfer water out of acequias each year, and
that of those, “the vast majority are denied. Some are approved with conditions...and the smallest percentage would be those that are approved outright.” Of those that are denied, he estimates maybe 10 percent are appealed to district court. And of those, only one has been overturned, and no appeal has overturned the validity of the statute and its deference to acequia commissions (Benavides 2013). It is, however, still early in the lifetime of the statute, and it remains to be seen whether the protection remains as robust if demand for transfers increases.

The statute does not forbid the sale of water rights out of acequias, however; if a commission approves the sale, it can go forward. Rather than taking acequia water rights out of the marketplace completely, the law allows those with the most local understanding of the interrelated water rights on a ditch to evaluate whether the spillover effects of losing particular rights will harm the community. In practice, sentiment in many acequia communities runs so strongly against transferring water that few commissions would approve transfers, and those who did would likely lose their next election. Bill Turner has brokered acequia water rights both before and after the 2003 passage of the water transfer statute, and he generally tries to stay out of what is a difficult market where every transfer attracts numerous protests. “Usually, it’s impossible,” he says. “We generally don’t like to deal with water rights north of Santa Fe. It’s extremely contentious” (Turner 2013). The law does, however, allow acequias that have collectively agreed to sell their rights to do so. “The acequias that we’ve brokered transfers from have been acequias where there are only very few members and they’re all out to make money from their water rights,” he adds (Turner 2013).
While state law grants acequias considerable power to stop transfers, commissions must take care to rule on a case-by-case basis and speak prudently about water transfers. The statute and subsequent case law have stressed the importance of ruling on the merits of a particular application and findings of impairment, informed by evidence provided by parciantes (Varela 2013). Acequia commissioners sometimes talk openly about being opposed to water transfers, which can be a problem on appeal. Courts have overturned commission rulings when an appellant can show evidence of bias based on past statements against water transfers in general (Varela 2013). The NMAA and NMLA have advised acequia commissions on the importance of following procedure and being mindful of due process, fearing the possibility of overzealous commissions (Varela 2013).

The law’s requirement that acequias opt in to their statutory power creates another hurdle to community regulation of water transfers. Some acequias do not realize that they need to adopt the changes prior to receiving applications. The NMAA has attempted to reach out to as many acequias as it can to communicate the importance of adopting the bylaw, and has found most to be receptive to their guidance (Varela 2013). Like many of the legislature’s attempts to fold acequias into Anglo-American water law, the 2003 statutes represent another trade-off between increased recognition of acequia authority and increased formal governance requirements. Commissioners do not, however, see the changes to the bylaws as having any noticeable impact on how their acequias govern themselves (Arellano 2013; Crawford 2013; Templeton 2013).

One threat that remains is the possibility that a commission with ulterior motives or an eye for short-term gain can make a decision that harms the acequia. “I think the
vulnerable part is that it's the commission that decides to allow the water transfers,” says Crawford. “So if you have a commission that is not heeding its membership, you could have a real mess there” (Crawford 2013). The system highlights the continuing importance of mutual monitoring and accountability in CPR institutions. Elections for acequia commissions now take on added importance, as the commissioners are entrusted with the power to keep enough water rights to maintain a viable system. “It’s very important that people elect people to the commission who will protect the water rights,” says Arellano, “instead of somebody that might be more in tune with the politicians of businesses that say ‘let’s sell the water rights. We’re not using it, so let’s sell it or let’s lease it.’” (Arellano 2013).

Given the importance of water rights to New Mexico’s urban development and the existing market, acequias’ powers over water transfers have generated controversy. “All they’re doing is perpetuating poverty in the northern part of the state and preserving it as a living museum,” says Turner, who sees the law as an unconstitutional taking of farmers’ property rights. “Those farmers...are no longer going to farm and are trying to better their lives and the lives of their children. If that can help them move into a retirement home, give them a good quality of life, why shouldn’t they be able to sell their assets?” (Turner 2013). The attitude that a water right is akin to other forms of personal property demonstrates the forces that drive the tragedy of the commons. The reason acequias do not allow parciantes to sell their rights freely is that doing so affects the rest of the community, perhaps depriving them or their own right to water. If everyone in an acequia sought to sell his or her personal assets, the system would cease to function.
In January 2007, more than 200 people, mostly parciantes of the Acequia de la Cañada Ancha, filled the gymnasium of Chimayo Elementary School to vote on adopting the water transfer bylaw (McAlindin 2007). The acequia serves farms along the Rio Santa Cruz in Chimayo, a small village a few miles east of Española. The attendance was remarkably high for a 21st century acequia meeting. “Some of these acequias have 70 or 100 parciantes,” says Arellano. “You’re lucky if you get ten people to show up” (Arellano 2013). But for this meeting, people arrived in droves, having received a flier with an alarming warning: “Your water rights are in danger!” Jerry Powers and Belinda Bowling circulated the fliers, claiming the acequia commission was seeking to sneak the bylaws through because parciantes would oppose them if they knew their impact. At the time, water rights in the Chimayo area could sell for up to $50,000 per acre-foot, according to Powers, who appealed to the belief that individuals should be able to determine whether to sell their rights without acequia control (McAlindin 2007). The pair succeeded in publicizing the decision but not in defeating it. At least along the Acequia de la Cañada Ancha, the communitarian argument won out; the bylaw passed 107-14 (McAlindin 2007). “When we explained what it was,” says NMAA community organizer Janice Varela, “everybody from the acequia in that room voted for the bylaw” (Varela 2013).

Opposition to the acequia protection laws derives mostly from concern about individual rights rather than their impact on water rights markets. While acequias control a large amount of water in certain parts of the state, brokers and developers have been able to find sufficient water rights for transfer by looking to other sources. Despite his vociferous opposition to the laws, Bill Turner sees little impact on his ability to do
business as a water broker. Acequia rights are a “very small, almost non-existent” part of market. “It’s not going to really affect it very much” (Turner 2013). Fervent criticism of the statutes reflects ideological positions, as protecting acequia water rights projects to have minimal impact on the larger system of water transfers.

**Water Banking Protections**

The second 2003 statute allows acequias to create water banks. In an acequia that has made the requisite changes to its bylaws, individual water users who are not drawing the full quantity of their claim can deposit unused water rights in the bank; the mayordomo can reallocate their water to other users along the ditch without having to go through a transfer process with the OSE (N.M.S.A 1978 §73-2-55.1). The sum of the acequia’s water rights remain in beneficial use, but in a more efficient distribution that is not subject to forfeiture or abandonment while they are enrolled in the water bank.

As with the water transfer provisions, the water banking law requires that acequias adopt changes to their bylaws to qualify for the power. Also as with water transfers, the NMAA has pushed acequias to make the changes and has authored a widely used model bylaw. Their bylaw sets up a system for managing the water bank and keeping records, and a procedure for making deposits. The model bylaw sets a renewable term of one year for deposits. It grants authority to the mayordomo for reallocating the banked rights within the acequia at his or her discretion, but also allows the acequia to transfer the banked rights out of the acequia temporarily, subject to approval by the commission and OSE (NMAA 2010).
Many acequias have adopted the bylaw changes that enable water banks, but fewer have taken the step of opening and operating a water bank. While the water transfer bylaw creates an opportunity for an acequia to protect itself as needed, the water banking provision requires the ongoing operation of a new program, straining the already limited capacity of acequia commissions. In the Embudo Valley, for example, all ten acequias have adopted the change to their bylaws, but none have actually started a water bank (Arellano 2013). Explanations for the relative underutilization of water banking range from its confusing terminology to the difficulty of keeping the necessary records.

Although the need to preserve water rights is widely understood, many believe that the mechanism of a water bank confuses acequias. For one, the term has often been associated with stimulating water markets and moving water rights (Varela 2013). Bill Turner’s brokerage is called WaterBank and the New Mexico legislature has repeatedly debated creating a statewide “water bank” that would function as a clearinghouse for water rights. The association with rights markets may scare off acequias that are habitually wary of them. The term also suggests to parciantes that what they deposit will be available to them when they need it, when in reality the water bank requires a deposit that will be there long enough that it can be reallocated. Parciantes might decide to bank water early in the season when the rivers are bountiful, thinking they can retake it in the drier months. But parciantes deposit a water right, not water itself; nothing is physically impounded for use during dry periods later in the season. And unlike a financial bank, a water bank requires a commitment of a set term, discouraging involvement (Arellano 2013).
Managing a water bank also simply creates extra work for acequias that already struggle just to find commissioners and mayordomos. Robert Templeton said that his acequia has adopted the language enabling water banks into its bylaws and recognized the opportunity it offers, but “no one has had the time and energy to make it happen” due to the other responsibilities of keeping the ditch running (Templeton 2013). NMAA staff acknowledges that the practical hurdles of operating water banks have limited the statute’s impact. “Practicing it has actually turned out to be quite a challenge,” said Quita Ortiz, a project specialist at NMAA. “It’s really a lot of paperwork for acequias” (Ortiz 2013).

If acequias can find a way to boost implementation of water banking, the statute offers an opportunity to promote water conservation while protecting water rights. After over a century of laws that reframed acequia water rights as individual property under a joint management scheme, the banking law presents something of a return to the more traditional framework in which water rights appertain to the ditch rather than to individual property. “The water banking statute and the transfer statute of 2003 are two excellent examples of not turning back the clock, but correcting the distortion” created by imposing Anglo law on the Spanish system (Benavides 2013). The kind of internal reallocation enabled by the water banking statute is a more formal version of traditional acequia management. With a water bank, an acequia distributes water available to its community according to the discretion of the mayordomo, but does so with the confidence that parciantes’ water rights are protected.

One of the more pernicious effects of the prior appropriation framework is that, despite its prevalence in arid climates, it discourages water conservation. Because the
system allows irrigators to retain water rights based on continuous use, it creates an incentive to use as much as possible, regardless of need. The push to "use it or lose it" can drive farmers to flood fields for no reason other than legal protection from the possibility of abandonment or forfeiture. The NMAA advises parciantes to draw to their full right, but sees water banking as a potential alternative. "The best thing to do," says Varela, "is break the cycle of non-use and irrigate, always. And then absent of that, they should place them in the water bank to protect them from loss for non-use through forfeiture and abandonment" (Varela 2013).

Perhaps nowhere is the perverse incentive of prior appropriation more evident than in the debate over introducing drip irrigation in acequia communities. Drip irrigation requires less pressure to reach lower fields, and reduces the amount of water a farmer needs to divert from the acequia and, ultimately, the river. Yet it has been slow to catch on in acequia communities, partly because it carries the risk of losing the rights to however much water one conserves. Stan Crawford and Robert Templeton have been using drip irrigation for years and tout the environmental benefits as well as the opportunity it offers to be free from constantly monitoring irrigation, but acknowledge that the message to farmers has often discouraged conservation (Crawford 2013; Templeton 2013).

Acequias that operate a water bank can protect the water rights that conservation and drip irrigation might otherwise risk forfeiting. Increasing conservation along acequias would be especially beneficial because of how they operate. The acequia diverts the full amount of its parciantes' combined water rights from the river, and anything conserved
becomes a return flow to the river. In reality, concern over lost water rights is not the main barrier to drip irrigation; technological, financial, and cultural factors have led to slow adoption (Crawford 2013). Templeton described a chilly reception for drip irrigation:

This year we had a situation where we had a mayordomo who was relieved of his duties and another mayordomo came on. And both of them were very upset, and one of them was quoted as saying he just wanted to rip out the pipes that were in the acequia because that’s never traditionally been allowed, to have a two-inch pipe [for drip irrigation] installed in the acequia (Templeton 2013).

Despite some resistance, however, the appeal of drip as a way to save water and reduce the necessity of monitoring irrigation has led to its introduction on six properties along the *Acequia del Bosque* (Templeton 2013).

Santa Fe’s *Acequia del Llano* is an example of an acequia with an especially high risk of non-use, but also one whose innovations, if broadly adopted, could boost the use of water banking. The history of Santa Fe acequias reveals the dangers that urban development poses for community irrigation; as the city spread and farms turned to residences and subdivisions, most of Santa Fe’s acequias lost their water rights to abandonment (Crawford 2013). The 30-member *Acequia del Llano* runs for three miles in the eastern part of Santa Fe, where farming has mostly given way to “hobby orchards” (Ellenberg 2013). Around 2005, commissioner Richard Ellenberg became concerned that the city might try to get unused water rights on the acequia forfeited. “We set up a water bank with the intention of getting people who weren’t using their water rights to put their rights in the bank to protect them and the acequia, which is dependent on everybody using the water, or having the water rights. We couldn’t lose half of them and still operate” (Ellenberg 2013). To deposit rights in the bank, parciantes fill out a form that they
submit to Ellenberg, committing to leaving the rights in the bank for one year, after which they may renew the arrangement or withdraw their water rights. Five parciantes currently have deposits (Ellenberg 2013).

Two elements of the *Acequia del Llano*’s approach have helped make their water bank an active program. For one, they included the possibility that internal reallocation of banked rights can save money for depositors. On other acequias, parciantes who inquire about water banks often seek relief from fees, which the NMAA’s model bylaw does not offer. Estevan Arellano explains that many parciantes approach him about banking rights looking to avoid annual fees, only to be disappointed. “‘If I still have to pay, what’s the use of banking my water?’ That’s about the end of the conversation” (Arellano 2013). On the *Acequia del Llano*, Ellenberg seeks to find new users for banked rights, and uses their lease to offset the fees of the depositor (Ellenberg 2013).

The other innovation the *Acequia del Llano* is pursuing is the leasing of the banked water rights to a user outside the acequia. When the acequia adopted the water banking bylaw, the parciantes were receptive to creating a provision to temporarily transfer water rights to the city for instream flow in the Santa Fe River. While the lease has not yet occurred, the sides are exploring the possibility and trying to determine how the acequia would need to manage its water delivery differently. To date, the commission has reallocated banked rights only to other parciantes on the acequia, who seek additional water or a more flexible watering schedule (Ellenberg 2013).

The *Acequia del Llano* water bank has used financial incentives to boost participation in its water bank, offering some gain to depositors while not compromising
the long-term viability of the ditch. The chance for a parciante who is not using his or her water right anyway to also avoid paying dues can motivate participation where other acequias have struggled to generate interest. The threat of forfeiture or abandonment remains the more powerful driver, and Ellenberg speculates that if parciantes received the one-year notice of possible forfeiture from the OSE, that they would quickly move to join the water bank (Ellenberg 2013).

The financial incentives of the water bank do make it into something of a water rights market in miniature, but keeps the arrangement under the supervision of commissioners and mayordomos with knowledge of the acequia. Most importantly, it has kept the water in the acequia and under the control of the community. There is more of a paper trail and a more formal arrangement than in traditional acequias, but the banking system in many ways returns the basis of water allocation to one based on the needs of individual irrigators and the wisdom of accountable community members.

By moving rights out of the acequia, the possible transfer to Santa Fe represents a bigger departure from tradition. The nature of the rights being transferred and the temporary duration of the lease, however, seem to offer adequate protection for the acequia. The rights being transferred were not being used, so there should be no additional loss of community participation if those parciantes deposit them in the bank. The lease to the city should also cover any loss of fees and dues for maintenance. The temporary nature of the deposits and the lease will allow the commission to make adjustments to the arrangement as necessary to keep the acequia functioning. Parciantes
will be able to withdraw their water rights if they choose; the ultimate control over the water rights remains within the acequia, under supervision of the community.

THE PROSPECTS FOR ACEQUIAS

The framework of water law in New Mexico does, at present, offer considerable protections for acequia water rights. Moreover, the early history of acequias' ability to rule on water transfers offers encouraging signs that devolving authority to commissions will withstand scrutiny from courts. Continued outreach and training remains necessary, but advocates and commissioners appear confident that they can protect the viability of their ditches.

Fulfilling the promise of water banks remains more elusive. Many of those acequias that are aware of the statute have adopted the power into their bylaws, but the bylaw itself does nothing to protect rights from loss by non-use. Overall, both laws offer the potential to empower acequias by putting their senior water rights under the control of accountable bodies that draw on local knowledge. It is up to the acequia whether it wants to use the powers to insulate their water rights from the market, or use them as leverage to benefit the community in ways that maintain irrigation viability.

Recommendations

Of the two powers granted by the legislature in 2003, the ability to rule on water transfers has most effectively allowed acequias to protect their water rights. However, its success depends on how many acequias, often scattered in rural areas otherwise outside the orbit
of Santa Fe, are aware of the law’s requirements and sophisticated enough to take advantage of its protections. Once in place, the bylaw offers commissions sufficient authority to rule on water transfers provided they adhere to their own rules. Again, however, the principles of due process may be unfamiliar to commissioners who have not been involved in legal proceedings before, and procedural guidance from the NMAA and NMLA will help acequias more effectively protect themselves from transfers.

The NMAA has achieved impressive penetration with its outreach efforts, but is hampered in part by New Mexico’s lack of information on its own water system. Estimates for the total number of acequias across the state range from 700 to 1300; the NMAA believes there are about 800 (Utton Center 2013; Varela 2013). They estimate that they have directly aided between 300 and 400 acequias in adopting the requisite bylaw changes, and that more may have added the language on their own (Ortiz 2013). Adoption of the bylaw is either/or, however, and every remaining acequia that has not empowered itself to rule on transfers runs the risk of crippling water transfers occurring before they can enact the change. Even by a conservative estimate of the total number, the NMAA has been able to reach only half so far. The organization hopes to compile a database of every acequia in the state, beginning with Rio Arriba County, to aid its governance and community organizing programs (Ortiz 2013).

Advocates play a key role in spreading the benefits of the 2003 statutes to geographically remote acequias that are less attentive to Santa Fe policymaking. The Embudo Valley, where all ten acequias have adopted the bylaw changes, benefits from having acequia leadership that is unusually well connected to advocates and well versed
in the threats presented by state legal processes. While typical in their physical structure and adherence to beloved traditions, the Embudo Valley acequias feature commissioners who have extensively researched and written about the acequia culture and its future. The large number of recent Anglo arrivals in the area correlates with a receptiveness to innovations such as drip irrigation that break from traditional methods. In acequias far from Santa Fe the Rio Grande Valley, commissioners may be unaware of available legal protections and wary of change.

Outreach from a non-governmental organization such as NMAA or NMLA is especially important given the historically strained relationship between rural Hispano populations, especially in northern New Mexico, and the New Mexico government. Stan Crawford sees the legacy of centuries of disputes reflected in his region’s disposition toward Santa Fe and desire to be left alone to manage their affairs:

This area’s always been a marginal area. It’s always been a headache, anarchistic. It never has really fit in. And people know that and are proud of it in a way. Maybe a diminishing number. It gets more pronounced as you go higher up into the mountains. You know the land grant issues are still alive for some people.\textsuperscript{12} So against more and more regulation…the reality is the resistance to that would be considerable (Crawford 2013).

Commissioners and advocates find a general reluctance among parciantes to suggestions or requirements from the legislature. “There’s a resistance in the culture to government because of historic things that have happened,” says Varela. “But our organization is trusted and known throughout the state, so people feel like they trust us rather than the

\textsuperscript{12} Many cite the legacy of land grant disputes as a lingering source of resentment in northern New Mexico (Crawford 2013; Templeton 2013; Perramond 2012). In Spanish custom, a community land grant allowed private development along an acequia but preserved the land around its headwaters to be managed collectively. Despite the Treaty of Guadalupe Hidalgo’s guarantees of Mexican property rights, more than 8 million acres of community land-grant land had been enclosed as private or public property by the early 1900s (Peña 2003).
state engineer” (Varela 2013). The NMAA has helped many acequias update their practices to comply with the Open Meetings Act, which acequias must follow as political subdivisions of New Mexico, despite the initial reluctance of commissioners to formalize their meetings (Mullen 2013; Varela 2013; Templeton 2013). Because of their ties to the community and established record as advocates, the NMAA can help connect acequias to the benefits that can come from taking advantage of a well-intentioned law.

Beyond reaching out to commissions about their statutory powers, advocates should also focus on educating parciantes about the process. Many have identified the statute’s reliance on the judgment and motives of commissioners as a potential vulnerability. Accountability between commissioners and the rest of the parciantes is a strength of acequia culture, but if parciantes are unaware of the possibility of vetoing water transfers, they cannot encourage their commissions to do so. Estevan Arellano believes that “hardly anybody pays attention” to state laws about acequias (Arellano 2013). Besides the possibility that a commission might enable transfers for financial reasons, there is a risk that acequias might fail to adopt the bylaws out of a belief that none of their parciantes would seek a transfer (Varela 2013). Most commissions comprise parciantes who are dedicated the tradition and rights of their community, and will act to take every available opportunity to preserve them. But when that is not the case, the more members of the community become aware of the acequia’s rights, the more likely that they will organize to secure them.

With the constitutional basis for transfer authority seemingly secure, perhaps the most important role for advocates is figuring out how acequias can use their powers to
create mutual gains. NMLA attorney David Benavides believes that the water transfer statute, which to this point has largely been celebrated for giving acequias the option to deny transfers outright, creates the potential to spread benefits of transfers throughout the community while minimizing downsides. Transfers traditionally created community conflict by pitting a one-time windfall beneficiary (the seller of the water right) against the other parciantes, who saw no benefits but only the loss of water, fees, labor, and control. With the process created in 2003, acequias can approve or deny a transfer, but also can approve it with conditions. Those conditions could be methods to distribute benefits within the community by encouraging water leases, which not only are not permanent but also create a recurring rather than one-time benefit. Acequias could also explore rotating leases, so that no single farm trades its water for money, but rather all do so in a rotation that brings benefits communitywide (Benavides 2013). It is not hard to imagine other conditions that could be used to build value for the community, such as requiring the buyer or seller to invest in the acequia’s infrastructure to lessen the overall hydrologic impact of the transfer.

Of course, a transfer is still a transfer, and can harm the acequia, both in terms of water and community. The power and promise of the law is that it allows that determination to be made by the acequia itself. The commissioners and mayordomo know the hydrology and community of each ditch better than does a centralized state agency, and the statute entrusts them with the ability to judge the impact of each transfer. If acequias begin to explore the occasional use of conditional approvals, they can not only
For New Mexico’s acequia water banking statute to become more effective, changes will have to occur that drive more acequias to actually operate banks. Groups such as the NMAA and NMLA can help spread implementation of the power by continuing to conduct outreach and hold workshops. They should also continue pursuing general capacity building for acequias; while having three good commissioners and a mayordomo may not be sufficient to drive adoption of water banking, it does seem to be an important first step. Any additional sophistication and expertise that acequias can develop should help them take on new responsibilities such as managing deposits and reallocating banked rights. Further implementation of the types of financial incentives the *Acequia del Llano* is using in Santa Fe could also boost the adoption of water banks.

 Commissioners on several acequias noted that requiring parciantes to opt in to a water bank by actively making a deposit limits the reach of the statute. The efficacy of a water bank depends on the activities of non-users, yet individuals who are not putting their water right to beneficial use may not be the most engaged with their acequia’s bylaws and practices. Unless they complete the deposit process, they risk not only forfeiting the water right for themselves, but also harming the entire acequia. Richard Ellenberg believes that “the current law appears to be designed so basically if you’re not paying enough attention you could lose the rights. And since they’re individual rights but the administration of [them] affects everybody, it’s sort of a difficult place to be” (Ellenberg 2013). In an area that has seen a significant decline in irrigation, there may be enough
unprotected water rights subject to loss for non-use that the water bank cannot guarantee the acequia’s viability with only volunteer depositors. “What they don’t let us do,” Ellenberg notes, “is protect somebody’s water rights who just isn’t paying attention” (Ellenberg 2013).

Some acequias are establishing water banks that more aggressively protect water rights from loss by non-use. The NMAA has yet to endorse the bylaw, which is relatively new and untested, but sees the potential to better protect a larger amount of water rights while reducing the administrative burden on commissions. At least two acequias have adopted bylaws that automatically place parciantes’ water rights in a water bank if they are not irrigating (Ortiz 2013). Water banking based on opting out rather than opting in could better protect acequias by making water rights exempt from loss to non-use by default, while reducing administrative hassles. It takes a more aggressive approach than do most existing water banks, and the NMAA has not incorporated it into their model bylaw amendment. The validity of “opt-out” water banks has yet to come before New Mexico courts.

*Sin Agua? The Uncertain Future of Acequias*¹³

In the long run, protecting water rights may not be enough to save acequias. The threat of loss of water rights to transfers and non-use are symptoms of decline, not its cause. Lifestyles are changing, communities are evolving, and traditional ways are ebbing for many reasons. That acequias have persisted into the 21st century shows their resilience

¹³ “Without water.” The phrase begins two sayings common in New Mexico: “*sin agua, la tierra no vale nada*” (without water the land is worthless) and “*sin agua, no hay vida*” (without water, there is no life).
and the tenacity of their members, but in no way guarantees that they can persist for many more generations. Today’s middle-aged parciantes, says Templeton, “worked the acequias with their fathers or grandfathers and they have a sense of the importance, the sacredness, the essence of it being a community thing in which the water should not be separated” (Templeton 2013). He sees now as the time to ensure those cultural values are passed on. “There’s a 20 year window with a solid number of Hispanics that are still in touch with the culture [and] a solid number of Anglos that have acquired the culture and value the culture deeply” (Templeton 2013). The NMAA has created several programs to encourage youth participation and pass on traditions to the younger generation. The Mayordomo Project is a community-based effort to record the oral history and practical knowledge of current mayordomos for posterity. Without such efforts, as rivers dry, snowfall lessens, and communities dwindle, even legally empowered acequias may find themselves without parciantes to clear cottonwoods, mayordomos to ride the ditch, or fields to irrigate.

Additionally, climate change may deplete water supplies to the point that acequias cannot provide enough water to their parciantes. While acequias are more resilient – or at least more equitably resilient – than is priority administration, they are limited in their ability to adapt. Like most water planning schemes, they are designed to allocate the amount of water they currently see or have seen in the past. When drought only occasionally besets an irrigation community, acequias can successfully cope. But in an environment where shortages are commonplace, there may be too little water to divide. Recalling the difficult summer of 2002, Stan Crawford expresses admiration for the repartimiento but doubt about its future. “You can do that for a year or two, maybe three,
but after that, forget it. You know, it isn’t worth it, in terms of the water” (Crawford 2013). If drought becomes the default condition of an acequia, shared water may not be enough to keep the farms viable.

Already straining to meet current demands, the state will almost certainly have to contend with a diminishing supply of water as it overdraws its aquifers and finds its mountain streams’ and rivers’ flows diminishing. Establishing greater legal protections for acequias will not solve New Mexico’s water problems. But neither will New Mexico solve its water crises by plundering water from these long-functioning, sustainable systems. The combined water claims of acequias amount to a small fraction of the state’s total water usage, and offer benefits that few uses of similar scale can boast. It may be that even left completely alone, acequias will find that water shortages and declining interest in rural lifestyles leave them derelict, but it serves no state interest to hasten that process. In the most optimistic telling, acequias represent one of the few forms of sustainable water use in an arid climate. As they have for hundreds of years, they will continue to provide water as long as New Mexico invests in their infrastructure and preserves their rights. “No matter what comes down,” says Templeton, “no matter what we may be facing in a long emergency if that’s what in our future...then the gravity-irrigated systems of New Mexico are an incredible investment in infrastructure toward sustainability.”
References


Arellano, Juan Estevan. 2013. Parciante, commissioner, and former mayordomo, Acequia Junta y Cienaga. Interviewed by Brian Daly, January 17.


Benavides, David. 2013. Director of Land and Water Project, New Mexico Legal Aid. Interviewed by Brian Daly, January 18.

Borchert, Claudia. 2013. Water Resources Coordinator, City of Santa Fe. Interviewed by Brian Daly, March 7.


Crawford, Stanley. 2013. Parciante, former commissioner, and former mayordomo, Acequia del Bosque. Interviewed by Brian Daly, January 17.


Mullen, Julia. 2013. Associate Director, New Mexico Acequia Association. Interviewed by Brian Daly, January 16.


Ortiz, Quita. 2013. Communications and Project Specialist, New Mexico Acequia Association. Interviewed by Brian Daly, January 16.


Varela, Janice. 2013. Community Organizer, New Mexico Acequia Association. Interviewed by Brian Daly, January 16.

Works Consulted


