

TOWN HALL BACKGROUND REPORT



STATE WATER PLANNING TOWN HALL

Advancing New Mexico's Water Future

CONVENER

New Mexico Interstate Stream Commission

RESEARCHER

New Mexico First

- Town hall participants urged to read this report before the event.
- December 13-14, 2017
- Albuquerque Marriott Pyramid



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Executive Summary

This water background report summarizes information, challenges and opportunities potentially affecting the 2018 comprehensive update of the State Water Plan. The many topics in this report are grouped into six thematic chapters that address relevant issues surrounding:

- Water supply and demand
- Water quality and environmental health
- Water infrastructure and funding
- Legal issues
- Water planning, data and education
- Changing conditions, including climate, land use and economics

Participants at the December 2017 town hall will use this report as a *starting point* for discussion of ideas to be submitted to the New Mexico Interstate Stream Commission (ISC) for potential inclusion in the State Water Plan.

Chapter 1: Striking the Balance deals with New Mexico's current and potential water supply sources, as well as future water demands. Using water efficiently, through both policy and technology, to build a more resilient water supply is a key theme of this section. Additionally, discussion centers on potential tools and future goals to prepare for drought, as well as the demands of humans, industry and the environment on water.

Protecting water quality and ensuring adequate environmental protections are in place is the subject of *Chapter 2: Protecting Precious Resources*. Topics such as watershed management practices, water quality regulatory programs, environmental flows and erosion reduction are critical to assessing the future wellbeing of water. Ensuring our water stays clean and our ecosystems stay healthy for the long-term is this chapter's primary goal.

The ability to effectively move and use our water relies on both infrastructure and funding. *Chapter 3: Making Improvements* addresses construction and repair needs for dams, pipelines and other projects. Just as importantly, this chapter discusses the policies and processes that determine our infrastructure priorities and funding capabilities.

Legal programs and policies determine much of our water use and prerogatives. *Chapter 4: Gatekeeping* reviews the current major topics in water regulation: prior appropriation, adjudications, interstate compact obligations, and various options for moving and sharing water.

Chapter 5: Bridging Gaps explores how we collaborate and coordinate between water planning entities. This chapter addresses past water planning efforts and future opportunities to better engage all New Mexicans in the dialogue on water. The chapter also looks at how the state water data is managed and opportunities for improved public education about water.

Finally, population fluctuations, climate change and economic development will mean New Mexico must be prepared to adjust water practices and planning. *Chapter 6: Preparing for a Changing New Mexico* delves into potential actions that could impact our state's water future.

The broad scope of topics discussed in this report should enable strong policy conversations at the upcoming town hall. Town hall participants are highly encouraged to read this report, especially those chapters relevant to their small group assignments, before the event.

Foreword

Purpose of this Report

This background report informs New Mexicans' understanding of issues relevant to the updated State Water Plan, scheduled for release next year. Pursuant to the State Water Plan Act (NMSA 72-14-3.1), the New Mexico Interstate Stream Commission (ISC) will draft the updated plan in coordination with the New Mexico Office of the State Engineer (OSE), the Water Trust Board and other relevant agencies. In December 2017, people throughout the state will come together for a two-day deliberative town hall to discuss New Mexico's water future and offer suggestions for the plan. Public input for the plan was also collected via multiple regional water planning meetings held in 2013-2016. Additionally, in accordance with Section E of the State Water Plan Act, tribal consultations have been initiated by the OSE in coordination with the ISC for the 2018 State Water Plan, and will continue through the coming months. The plan will be released for public review in 2018 before being finalized later in the year.

The staff and board of New Mexico First believe that effective deliberations require a sound foundation in data, policy information and the challenges impacting water management. All our town halls are preceded by a nonpartisan background report that sets the context.

Note: There are few right or wrong answers to any public policy question, and the problems and opportunities around our state's water are complex. As a result, no brief explanation of the situation – including this report – can cover all information and opinions available. The people, policymakers and government experts of New Mexico will lend their knowledge and expertise to the town hall and State Water Plan.

About New Mexico First

A statewide public policy organization, **New Mexico First** engages people in critical issues facing their state and communities. The nonpartisan, nonprofit group produces comprehensive policy reports – primarily on natural resources, education, health and the economy. These analyses inform policy discussions, legislative options and often student learning as well. These documents also provide the foundation for New Mexico First's unique town halls and forums that convene people to develop proposals to improving the state. The reports are available at nmfirst.org. Our state's two U.S. Senators – Tom Udall and Martin Heinrich – serve as New Mexico First's honorary co-chairs. The organization was co-founded in 1986 by retired U.S. Senators Jeff Bingaman and Pete Domenici.

About the Interstate Stream Commission

The Interstate Stream Commission was created by statute in 1935. It holds broad powers to investigate, protect, conserve and develop New Mexico's waters, including both interstate and intrastate stream systems. Governed by a nine-member commission appointed by the governor, the ISC investigates and develops the water supplies of the state and institutes legal proceedings in the name of the state for planning, conservation, protection and development of public waters. The ISC is also authorized to lead the updating of the state's 16 Regional Water Plans and the State Water Plan.

Report Reviewers

This New Mexico First report was prepared by Heather W. Balas, Kelsey Rader and Sara Gerlitz, with editorial support from Bruce Thomson. The writing team was advised by the following committee members. Some offered input on the report as a whole while others focused only on specific sections. We are grateful for their commitment to New Mexico's future.

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WHERE DO WE GET OUR INFORMATION?

Throughout this document, we provide as many data sources as possible. We draw from published reports, newspaper and journal articles, first-hand interviews and online resources. All direct quotes are from interviews conducted for this report unless otherwise noted. We know that policymakers, researchers and students use our reports, so we provide the details you need to learn more – and answer your questions. Footnotes provide short references to complete citations in the detailed Works Cited.

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Introduction

In 2003 the State Water Plan Act was enacted to address long- and short-term water planning for New Mexico. While the original plan has been previously reviewed and revised, 2018 will mark the first comprehensive update of the plan. While key goals remain the same, this report highlights a number of water issues that have evolved over the last 15 years. The new plan will look different – reflecting the urgent water issues facing our state today – but it will retain its focus on the key policies reflected in the law.

The State Water Plan Act calls for the State Water Plan to be a strategic management tool for the purposes of:

- promoting stewardship of the state's water resources
- protecting and maintaining water rights and their priority status
- protecting the diverse customs, culture, environment and economic stability of the state
- protecting both water supply and water quality
- promoting cooperative strategies, based on concern for meeting the basic needs of all New Mexicans
- meeting the state's interstate compact obligations
- providing a basis for prioritizing infrastructure investment
- providing statewide continuity of policy and management relative to our water resources

Some of these objectives are concrete – like protecting water quality – while others remain more cross-cutting and span throughout all chapters in this report. We point out these over-arching principles in the hope that all discussions are framed from the perspectives of overall state needs and mutual respect.

Introduction
State Water Plan Town Hall Background Report

Chapter 1

Striking the Balance

Increasing Water Supply and Reducing Demand

New Mexico is at a water crossroads. The state faces challenges to water supply and demand from combined human, industrial and environmental needs. Long-term supply and demand scenarios of enduring drought predict significant water shortfalls in every region of New Mexico by 2060.¹ Even without long-term forecasts, New Mexicans need only to look at recent years' water shortages in Las Vegas, Carlsbad, Magdalena, Taos County or Clovis to know that real challenges exist today. Striking a balance between water supply and demand presents one of the state's greatest challenges, and is the subject of this chapter.

KEY CONSIDERATIONS

The semi-arid climate in which most New Mexicans live constantly reminds us how precious water resources are. However, few of us know the sources of our water, how much is available, and how much water we use. To what degree will current water sources meet future needs? What technology exists today – that perhaps did not a decade ago – to use water more efficiently? What laws or policies might we change to make the best use of water supplies or decrease demand? And how can we maximize water reuse, while ensuring compliance with existing laws? Fundamentally, how can we ensure a resilient water future for today's needs and tomorrow's residents?

Where We Get Our Water

New Mexico is a land-locked state. That means practically all our water comes from precipitation, much that fell thousands of years ago, and is now stored in underground aquifers. For example, the vast majority of groundwater at the depth levels serving Albuquerque is over 11,000 years old.² New Mexico averages a scant 14 inches of rain a year and receives additional river water that flows from Colorado.³ Of the water received each year, an estimated 97 percent evaporates or is transpired by plants.⁴ The remaining three percent is what we use to help meet human, economic, legal, environmental and groundwater recharge needs. We access our water from two sources: surface water (rivers, streams, lakes) and groundwater (underground aquifers).

SURFACE WATER

New Mexico surface water comes from rain, snow, downstream flow from other states, and inter-basin transfers. Much of that water flows into our major river basins: Rio Grande, Pecos, San Juan, Canadian and Gila. Considerable volumes travel to one of New Mexico's 15 major reservoirs (human-made lakes) that store and deliver water. New Mexico's economy and current way of life rely on this heavily regulated and engineered system.

For that reason, policymakers and water managers pay attention to water levels and evaporation losses in those reservoirs. In 2010 (the most recent year available), over 262,000 acre-feet of water evaporated from New Mexico reservoirs.⁵ Much of the evaporation occurred at Elephant Butte Reservoir due to its low elevation, desert setting and large surface area. Figure 1 illustrates summer reservoir levels across the state in this rainy 2017 compared with the drier 2013 (Figure 2). In either year, we see low storage levels in several important lakes.⁶ However, lake levels are only one indicator of water availability. Researchers also consider data from stream gauges in strategic locations.

¹ (N.M. Interstate Stream Commission, 2017)

² (U.S. Geological Survey, 2007-9)

³ (N.M. State University, n.d.)

⁴ (N.M. Bureau of Geology and Mineral Resources, n.d.)

⁵ (N.M. Office of State Engineer, 2010)

⁶ (CLIMAS, University of Arizona, 2013)

NEW MEXICO SUMMER RESERVOIR VOLUMES, 2017 AND 2013

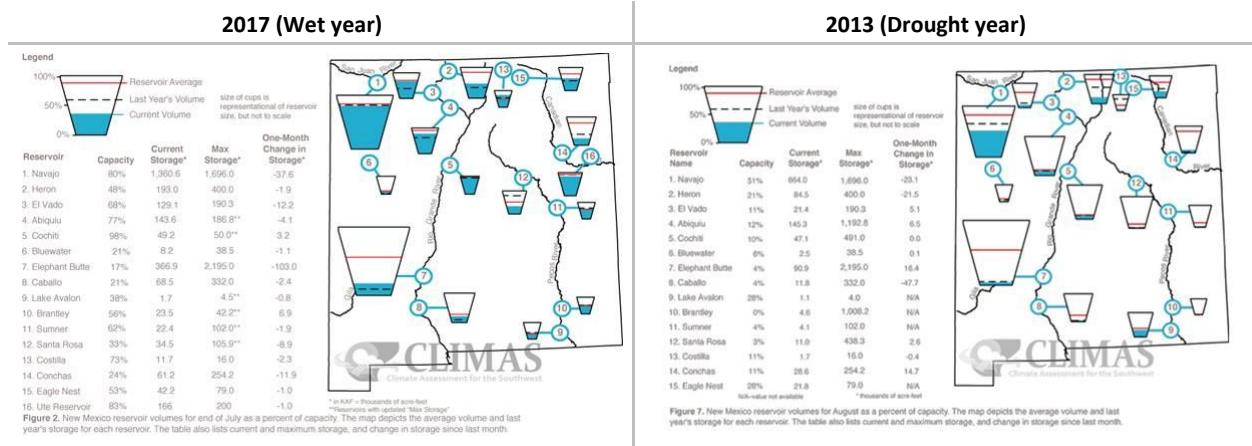


Figure 2. New Mexico reservoir volumes for end of July as a percent of capacity. The map depicts the average volume and last year's storage for each reservoir. The table also lists current and maximum storage, and change in storage since last month.

Figure 2: N.M. Reservoir Levels, 2013

GROUNDWATER

Underground aquifers are geological formations that hold and transmit water. They hold the single largest freshwater supply on the planet.⁷ New Mexico gets about half its fresh water from aquifers. The Regional Water Plans (regions illustrated on page 27) identified areas with declining water levels in mined basins that receive insufficient recharge such as:⁸

- The Ogallala/High Plains aquifer in the Northeast and Lea County regions
- The Animas, Playas, Mimbres and other closed basins in southwest New Mexico
- Portions of the Northwest Region (near Gallup), Estancia Basin Region, and Jornado del Muerto Basin in the Lower Rio Grande Region

Water level declines in stream-connected aquifers also present problems for water resource management. Declines have affected water supply in: the Maxwell area (Colfax Region), the Ojitos Frios area (Mora-San Miguel-Guadalupe Region), the Magdalena area (Socorro-Sierra Region), the Mesilla Bolson (Lower Rio Grande Region), the La Cienega areas (Jemez y Sangre Region), as well as the Santa Fe, Eldorado, and portions of the East Mountain areas (Middle Rio Grande Region). The cities of Albuquerque and Santa Fe have reduced their dependence on groundwater in the past decade, and water levels are now rising in the vicinity of these municipal well fields.

How Much Water Do We Use?

It is hard to know precisely how much water New Mexicans use since we tap many different sources. Additionally, not all water use is measured or reported. The OSE estimates overall water use every five years (based on 9 use categories, see footnote), and the most recent available data is from 2010.⁹ Based on those numbers, New Mexico withdraws about 3.8 million acre-feet of water a year for human needs. These withdrawals come from surface and groundwater sources, and averages to 3.4 trillion gallons per day. Long-term data indicates New Mexico is using less water, despite population and economic growth. Perhaps this productive shift reflects increased conservation, changes in business practices, technology improvements or other factors. Figure 4 compares our water use and population growth since 1995. Similarly, Figure 11 compares water use with the state's gross domestic product.

⁷ (U.S. Geological Survey-Groundwater, n.d.)

⁸ (N.M. Interstate Stream Commission, 2017)

⁹ The categories are Public Water Supply, Self-Supplied Domestic, Irrigated Agriculture, Self-Supplied Livestock, Self-Supplied Commercial, Self-Supplied Industrial, Self-Supplied Mining, Self-Supplied Power and Reservoir Evaporation.

WHAT'S THE DIFFERENCE BETWEEN WATER USE AND CONSUMPTION?

Water *use* describes water withdrawn from its source, which may or may not be returned to that source. Water *consumption* is the portion that is not returned. For example:

- The Intel plant in Rio Rancho uses thousands of gallons a day to manufacture microchips. It cleans and releases that water for re-use by downstream users. Companywide, an average of 80 percent of water returns to the environment, so 20 percent is consumed in the manufacturing process.
- Most water for showering or household washing is used, then cleaned as wastewater for re-use downstream.
- Irrigation is a mix. Water transpired by a crop or that evaporates from the field is consumed. But water that flows through an irrigation system back to a river is not.

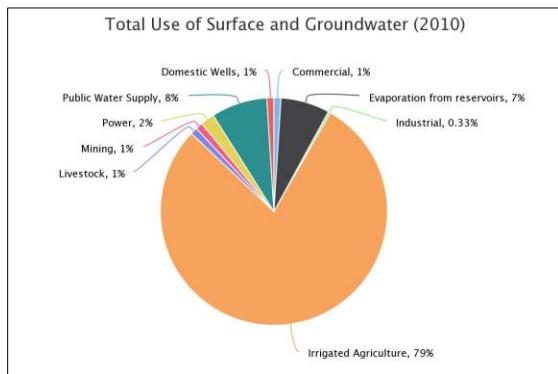


Figure 3: Water Use by Category, 2010

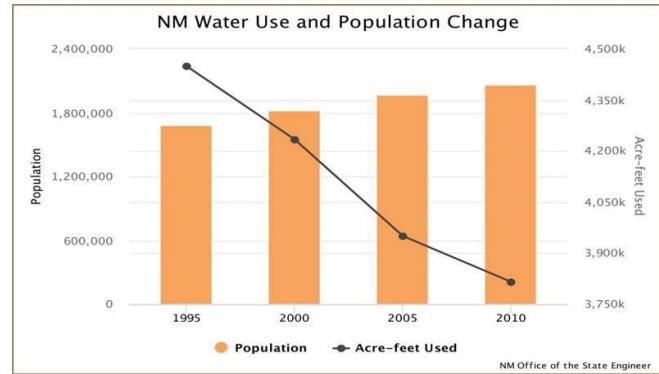


Figure 4: Water Use Compared with Population Size, 1996-2010

How Much Water Will We Need in the Future?

The 16 Regional Water Plans, accepted by the ISC, focus extensively on this question. Each region considered local water use by category, population and economic trends, projections of future population, water conservation, and projections of future water demand. This combination of data and on-the-ground community knowledge of local needs resulted in the most current available forecasts about New Mexico's future water needs.

The Regional Water Plans forecast water needs through 2060. Two scenarios were considered: one based on an average water supply, which presumed roughly average precipitation and climate conditions each decade until 2060; the other presumed drought conditions.¹⁰ Under the average scenario, one region (the San Juan) is forecasted to have enough water by 2060.¹¹ Also, under the average scenario, the northeast region is projected to face a serious supply gap while half the regions would have more than 90 percent of their water needs met.

However, when the regional planners considered drought scenarios occurring through 2060, a different picture emerged. No regions are predicted to have enough water, and 15 of the 16 regions face severe or critical shortfalls in water supply with less than 70 percent of the water needed to meet their demands. Of these, four regions would have less than 20 percent of the supply needed to meet demands.

¹⁰ The ISC used the Palmer Drought Severity Index and New Mexico stream gauge data to inform its methods.

¹¹ San Juan's regional plan incorporated new water supply from the Navajo-Gallup pipeline, which is under construction.

When considering these scenarios, readers will note that climate change is one main driver of long-term drought. Data indicates that a warming climate will diminish water supplies through decreased runoff and increased evaporation, among other factors.¹² (See Chapter 6 for additional information on climate variability.)

The gap analysis presented in the regional water plans is based on the amount of water public water systems diverted in 2010 and does not consider the additional water supply held by public water systems to meet growing demand. Public water systems are allowed to reserve water rights for 40 years, and so many communities are better prepared than the map would suggest. Further, some communities have planned for drought, including Albuquerque and Santa Fe, both of which are “resting the aquifers” and using surface water to the extent possible.

Even with these caveats, some people in water policy circles question the accuracy of the ISC’s supply/demand gap data. Some say the data is fine because it considers available physical supply and legal restrictions. Some believe it is too optimistic and fails to present a water future that is adequately dire. Others say the opposite, arguing that the prediction of increased future water need does not align with the historic trend of reduced water use illustrated in Figure 4. Still others question the scientific foundation upon which the regional supply/demand estimates are based. Many who use the data recognize that it is at least comprehensive, statewide data collected with an acceptable amount of consistency.

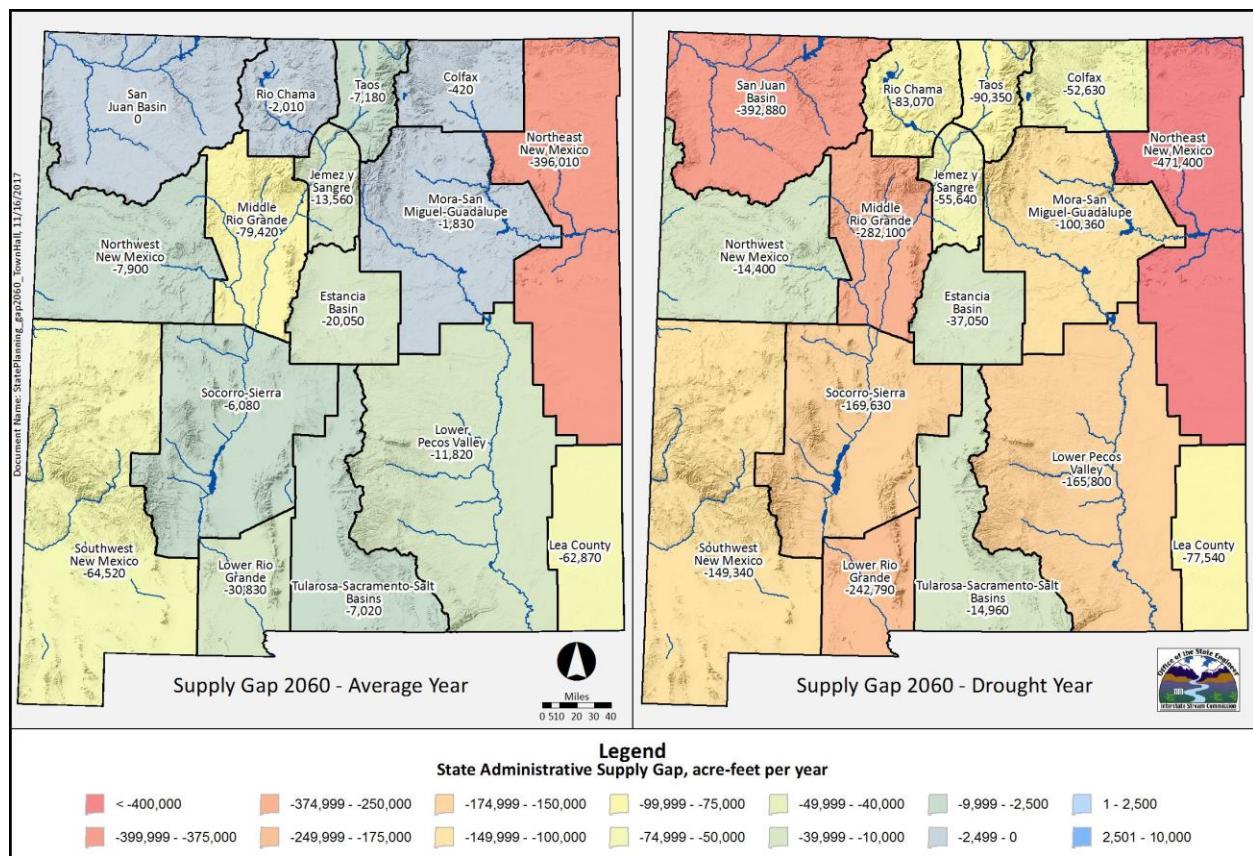


Figure 5: Maps Depicting Regional Water Supply by 2060, Based on Average and Drought Scenarios (ISC)

Improving Water Supply

Planning for water shortages is part of the state’s history and its future challenges. In the simplest terms, there are at least three obvious strategies for addressing shortages: use less water, acquire new water, or manage the water

¹² (U.S. Bureau of Reclamation, 2013)

we have differently (e.g., increasing re-use). New technologies can play a role in each of those approaches, as can creative planning strategies. The following strategies (listed alphabetically) provide some options for New Mexico to strike a better supply-demand balance. Many people already implement these strategies.

AGRICULTURAL CONSERVATION

Agriculture is an important element of New Mexico's heritage and economy, as well as the state's largest water user. Water-saving programs for agriculture were supported in 11 out of the 16 regions, with 34 specific projects identified. However, while these techniques may reduce the amount of water needed to raise a crop, the "saved" water is often applied to a second crop or other uses. Thus, some agricultural conservation practices do not always reduce the consumptive use of water and can increase soil salinity.

There are both farm-specific and irrigation system conservation techniques that can save water. Examples include:

- Lining irrigation ditches
- Using less water-intensive crops
- Utilizing alternative irrigation technologies
- Laser leveling fields

AQUIFER STORAGE AND RECOVERY

Aquifer Storage and Recovery (ASR) is a water supply management approach that replenishes water in an aquifer with excess surface water. The practice is used throughout the West to replenish depleted aquifers and provide water during shortages.¹³ Sources include surface water from streams and rivers, treated effluent from wastewater treatment plants and stormwater, or runoff from surfaces like parking lots or storm drains. A variety of engineering techniques are used for ASR including injection wells or unlined stream channels.

However, ASR is expensive, partly some say due to regulatory processes developed by the OSE and water quality monitoring required by NMED. Albuquerque's 100-year water plan includes a major focus on ASR. Currently, the Albuquerque Bernalillo County Water Utility Authority (ABCWUA) uses land application to infiltrate into the aquifer along the Bear Canyon Arroyo and just completed drilling both a vadose zone and injection well for injecting San Juan-Chama water into the aquifer at the Drinking Water Plant.¹⁴ New Mexico passed the Ground Water Storage and Recovery Act in 1999, providing for ASR projects and giving the OSE authority to permit and manage ASR projects. To date, there have been four permits issued in New Mexico for ASR projects.

CONSERVATION AND EFFICIENCY FOR PUBLIC SYSTEMS

Public water systems – generally owned by cities, counties or other government entities – use about eight percent of New Mexico's water withdrawals. These systems implement an array of conservation strategies, such as education (i.e., landscaping guidelines) or financial incentives (i.e., rebates or rate increases for high use).¹⁵ For example, the city of Santa Fe reduced per capita water demand almost by half between 1995 and 2015 by implementing water conservation measures.¹⁶ In addition, several cities – including Silver City and Santa Fe – are deploying smart meters to accurately measure customer water use. The Regional Water Planning groups identified 145 water conservation projects for reducing water demand. The projects included metering, water conservation programs, infrastructure and wastewater reuse.

DESALINATION

Desalination treats brackish water by removing salt and other dissolved constituents using distillation or reverse osmosis. There is an estimated 15 billion acre-feet of brackish groundwater in New Mexico. That resource presents intriguing opportunities, but the process is energy intensive, costly and generates large amounts of waste salts.

¹³ (American Ground Water Trust)

¹⁴ (Albuquerque Bernalillo County Water Authority, 2017)

¹⁵ (U.S. Environmental Protection Agency, 2017)

¹⁶ (U.S. Bureau of Reclamation, 2015)

Several pilot projects have been conducted in the state, but faced the challenges above.¹⁷ However, interest in developing brackish water to augment public supplies in New Mexico continues. The City of Alamogordo is around 20 percent complete on the construction of a desalination plant to provide the community an additional water source. Total costs are estimated at \$30 million, half from grants.¹⁸

EMERGENCY DROUGHT RESTRICTIONS

Proactive drought plans that provide for curtailed water use and redundancy in supply can allow communities to rebound quickly when faced with drought. Communities can restrict specific types of water use such as irrigating lawns or washing cars.¹⁹ This approach was heavily used during the most recent California drought cycle.

Developing a set of drought-response actions based on common criteria, which are publicly vetted before a crisis, could benefit New Mexico and can be achieved on a local level. Some New Mexico cities, including Santa Fe, Las Cruces and Albuquerque, have emergency drought restrictions.

LARGE SCALE INTER-BASIN WATER TRANSFERS

The importation of water from different river basins occurs throughout the western United States. The San Juan-Chama Project is probably the best-known example in New Mexico. Water from the Colorado River tributaries is transported in tunnels into the Rio Chama. It supplies water for several entities including Santa Fe, Albuquerque, Belen, Los Lunas, several Pueblos, the Middle Rio Grande Conservancy District and the Bureau of Reclamation (supporting endangered species compliance).

Additional large-scale projects are under development in New Mexico:

- The Navajo-Gallup Water Supply Project will convey municipal and industrial water from the San Juan River to the eastern section of the Navajo Nation, the southwestern portion of the Jicarilla Apache Nation, and the city of Gallup. Designed to deliver almost 38,000 acre-feet of water a year, the project is slated for completion in 2024. Construction began in 2011. The Bureau of Reclamation estimates the project's cost at \$995 million.
- The Eastern New Mexico Rural Water System Project (commonly known as the Ute pipeline project), is intended to withdraw over 16,000 acre-feet of water a year from Ute Lake and transport it Roosevelt, Curry and Quay counties. The project's initial phase was completed in 2016, but only a small portion of the funds required to complete it have been secured. The project is estimated to cost \$750 million by completion.²⁰

INFRASTRUCTURE

One way to optimize existing water supplies is to repair and replace old infrastructure. Every day in the United States over six billion gallons of pumped water fails to reach a billed customer, due in part to leaks.²¹ New Mexico has 650 public water systems, many of them with aging infrastructure, inadequate capacity, or limited ability to comply with drinking water laws.²² The OSE encourages communities to perform water audits to identify water losses from the distributions systems, and many large communities participate in this program. About half the states in the nation require annual water audits or reporting of water loss; New Mexico is not among them.²³

PRODUCED WATER

Produced water is a byproduct of oil and gas extraction. When oil or gas is extracted, significant amounts of brackish water come up too. Most wells generate far more produced water than they do oil. Unless the industry reuses the water, millions of barrels of the byproduct are reinjected thousands of feet underground. Some of this reinjection is essential to the pressure required for the extraction process, but not all. For this reason, multiple

¹⁷ (Feinburg & Bohannan, 2013)

¹⁸ (Melton, 2017)

¹⁹ (U.S. Environmental Protection Agency, 2016)

²⁰ (Bryan, 2017)

²¹ (American Society of Civil Engineers, 2012)

²² (N.M. Office of the State Engineer, 2013)

²³ (Master Meter, n.d.)

energy companies in New Mexico use technology to partly clean produced water and re-use it in the oil field (for the “completion” phase, washing equipment, etc.). This practice reduces the industry’s need for fresh water.

In addition, much state and national attention has been devoted to re-using produced water for other purposes, such as landscaping or agriculture. Nationally, this activity happens on a limited basis, including in California where treated produced water irrigates almonds and pistachios.²⁴ However, most states – like New Mexico – have thus far found the desalination and treatment of this very salty and mineral-laden water to be far too expensive. Re-use of produce water outside the oilfield would also be complicated by regulatory challenges.

TREATED WASTEWATER

Treated wastewater goes by many names including effluent, recycled or reclaimed water. Essentially, treated wastewater is sewage or industrial water cleaned to a certain degree of quality. It may be reused for agricultural or landscape irrigation, which is called non-potable reuse and occurs in many communities in New Mexico. Theoretically, highly purified wastewater can be used to augment a community’s water supply (which is called direct potable reuse). However, there is no direct potable reuse practice in the state and only a few projects in the entire country. The technical and administrative challenges of direct potable reuse include its impact on water rights and downstream flows, the technical complexity of treating water to very high quality, and public acceptance.²⁵ All 16 Regional Water Plans identified treated effluent projects as a strategy to increase supply.²⁶

UPSTREAM STORAGE

As noted previously, New Mexico maintains a highly engineered system of reservoirs. Storing more water in higher elevations, rather than in the hotter area of Elephant Butte, could curtail significant evaporative losses. However, there are significant legal and regulatory barriers to implementing this idea. The Rio Grande Compact contains rules restricting upstream storage if Elephant Butte levels are low. When these rules (Article VII) are in effect, the state has few options besides letting the water flow to southern New Mexico. It might be possible to store more water upstream when Article VII is *not* in effect. Since 2003, Article VII has been in effect more often than not. This matter of upstream water storage arises in many water policy discussions.

WATER HARVESTING

Water catchment, or rain harvesting, describes a landscaping strategy to capture rooftop precipitation for landscaping, reducing the need for supplemental potable water. This often occurs using barrels capturing rainwater from rooftops. According to the OSE, homeowners can legally capture rooftop runoff for use on their property. The collection of water harvested in this manner should not reduce the amount of runoff that would have occurred from the site in its natural, pre-development state. For larger-scale commercial projects, however, the issue is less clear since the OSE must examine on a case-by-case basis. Legislation to expand water catchment options has been introduced in recent years but failed.

Wrap-Up

In short, New Mexico faces serious water shortfalls, requiring statewide activity and leadership on many fronts to address the problem. However, there are several policy and programmatic options to explore to address water supply and demand challenges. This chapter presents almost a dozen concrete options, and town hall participants will likely offer more. The state must overcome all manner of hurdles – including legal, behavioral, financial and regulatory barriers. The town hall presents important opportunities for New Mexicans to reflect on these very real challenges and offer ideas to keep our state’s water foundation stable for the future.

²⁴ (Jerome, 2015)

²⁵ (Scruggs, 2017)

²⁶ (N.M. Interstate Stream Commission, 2017)

Chapter 2

Protecting Precious Resources Watersheds, Natural Environments and Water Quality

New Mexico's watersheds, natural environments and water quality all impact the surface and groundwater available to water users in the state. When upstream land use disturbances occur – such as fire, over-grazing, or large-scale erosion – downstream users can experience water quality and availability problems. Land and water protection problems can also negatively affect natural habitats and wildlife. Protection of land and water requires careful management and integrated policy choices. This chapter explores these issues, laying a foundation for robust discussions on water quality, watersheds and environments.

KEY CONSIDERATIONS

What is New Mexico already doing to protect its watersheds, natural environments and water quality? Are those actions sufficient? How are they coordinated among the water-managing agencies? How might our state prevent future contamination of groundwater and ensure proper cleanup of current contaminations? What actions are needed to create a systematic approach to watershed management – and how can we best leverage resources to get the work done? What about instream flow and river health?

Water Quality

Water quality is a variable measurement to gauge if water can be used for a particular purpose. For example, the quality standard for river water to support fish and other wildlife is different from the quality standard required for human consumption. Another set of standards guides groundwater regulation to prevent or clean up contamination of aquifers or water tables.²⁷ To determine water quality, scientists assess characteristics including temperature, dissolved mineral content and bacteria.

PROTECTION OF WATER QUALITY

In accord with national mandates and tribal governments, the New Mexico Environment Department (NMED) regulates water quality on the state level. Day-to-day local management is directed by city or county water entities. The NMED manages non-tribal surface water and groundwater through separate bureaus. Combined, these offices issue water-related permits, manage remediation programs, conduct investigations, oversee major environmental clean-ups (e.g., superfund sites), coordinate watershed programs, and direct a range of related activities. The department also provides oversight of most water infrastructure projects; see Chapter 3.

The authors of the original 2003 State Water Plan advocated that water *quality* issues retain equal standing with water *quantity*.²⁸ More recently, 14 of the 16 Regional Water Plans highlighted concerns in water quality including impairments.²⁹ Specific water quality concerns included:

- Contamination from septic tanks³⁰
- Potential contamination from mining, hydraulic fracturing or other industries
- Naturally occurring salinity and uranium in groundwater
- Needed restoration of riparian areas
- Mercury in fish or E. coli in waterways
- Storm water and associated permits

²⁷ Water tables are the surface of an aquifer. (USGS)

²⁸ Roughly three-fourths of New Mexicans receive their drinking water from groundwater, ensuring regulation of groundwater is a top priority. (N.M. Environment Department, 2017)

²⁹ (N.M. Office of the State Engineer, 2017) Note: Regional assessments were based on the NMED's 303(d) list of water quality impairments.

³⁰ Around 21 percent of U.S. households deploy on-site septic systems. (Congressional Research Service, 2017)

WATER QUALITY CONTAMINATION EXAMPLES

- **Municipal water:** Artesia, N.M. issued boil advisories in July and September of 2017 due to the detection of potentially fatal E.coli bacteria in the water supply. The New Mexico Health Department and NMED coordinated with the city to assess public safety and educate community members.
- **Surface water:** The 2015 Gold King Mine Spill poured 3 million gallons of contaminants into the Animas River in northern New Mexico. The accident was caused by Environmental Protection Agency (EPA) staffers trying to mitigate pollutants from the closed mine.
- **Groundwater:** Underground jet fuel leaks on Kirtland Air Force Base, starting before 1975, resulted in chemical contamination to groundwater and soil. Major inter-agency efforts to contain and clean the spill began in 2014. Public drinking wells near the spill are tested monthly.

Large industry is important to New Mexico's overall economy, and is generally a good steward of water quality. Starting in the 1970s, the Clean Water Act and Water Quality Control Commission regulations have helped guide protecting water resources and raise public awareness. Some industries, such as mines, oil and gas, and agriculture are carefully regulated either because of their byproducts or the volume of water they discharge.

MINES AND WATER QUALITY

Groundwater contamination from mines and industry was identified in three of the regions as a water quality issue. New Mexico's Energy, Minerals and Natural Resources Department (EMNRD) has permitted approximately 605 mining and exploration projects in the state.³¹ Throughout the West, over 160,000 abandoned mines exist. While most mining operations today maintain high standards, the legacy of old mines left their mark on New Mexico water quality. NMED conducts water-related permitting, spill response and abatement for mining facilities. The department currently manages over 55 active mining permits for exploration and operation, and reviews mining closeout plans.

OIL AND GAS AND WATER QUALITY

Worries about hydraulic fracturing were identified by five of the Regional Water Plans. Commonly called "fracking," the technique has been deployed in New Mexico for several decades. Hydraulic fracturing involves the injection of a fracturing fluid under pressure to create artificial fissures in oil and gas-bearing rocks. The fissures allow oil or natural gas to flow more freely from the rock formations to a well, enabling extraction of oil and gas in previously inaccessible areas.³² In the past, some oil and gas operations have caused water contamination, but there is no evidence that hydraulic fracturing has contaminated groundwater in New Mexico.³³

AGRICULTURE AND WATER QUALITY

Currently, NMED oversees 224 water quality permits for agricultural discharges from cheese production, processing plants, dairies and an assortment of other agricultural production facilities. Of these, dairies prompt the most water quality issues in New Mexico. New Mexico's dairies are concentrated near aquifers along the middle Rio Grande, lower Rio Grande and the Pecos River, as well as above the Ogallala aquifer.

For farmers and ranchers, the primary water quality concern is contamination from insecticides and other chemicals. However, the rising costs of chemicals, fuel, labor and transportation have led to different land management practices (e.g., more drought-resistant crops and less fertilizer, insecticide and pesticide use). These factors have led to a 30 percent decrease in application of commercial fertilizers and conditioners since 2007.³⁴ In addition, some farmers participate in federal conservation programs that address drinking water protection, soil

³¹ (N.M. Energy, Minerals and Natural Resources Department , 2016) The agency also regulates land restoration after mining operations cease.

³² (American Water Works Association, 2013)

³³ (Matlock, 2014)

³⁴ (USDA Census of Agriculture, National Agricultural Statistics Service, 2014)

erosion, habitat preservation and forest and wetland restoration.³⁵ Continuing these programs could further protect New Mexico's water quality going forward. (See Chapter 1 for agricultural water supply and use.)

Watershed Management

While the previous section presents concerns about *human impacts* on water quality, the most effective widespread water quality management occurs naturally through healthy ecosystems. Watershed management, river stewardship, and other preservation activities provide tools to maintain safe water for humans and wildlife.

A watershed is a large area of land that catches any type of water (rain, snow, runoff) that falls within its area. Water moves from the highest point of the watershed to the lowest; passing through communities, forests, grasslands, farmlands, wetlands and floodplains. Some water soaks into the soil, which often filters it before it is stored in underground aquifers. It may re-emerge at a spring or remain underground for years. A healthy watershed helps maintain good drinking water, reliable irrigation, ecological life and the recreational economy.³⁶

New Mexico's 84 watersheds (also called drainage basins) contain six river basins, six closed (no outlet) basins and 37 groundwater basins.³⁷ At least 27 active watershed groups exist statewide (i.e., regional alliances, soil and water conservation districts).³⁸ Watershed efforts can focus on forested area restoration (i.e., preventing catastrophic wildfire, increasing snowpack retention and protecting headwaters). Watershed work also addresses riparian areas (the "greenbelt" areas surrounding rivers, lakes and streams). Watershed management techniques include:

- Mechanical tree thinning
- Streambed management and flood control
- Prescribed burns and managed natural fires
- Erosion control
- Meeting needs of wildlife
- Perennial cover crops on agricultural lands not in production

15 of the 16 Regional Water Plans recommended watershed restoration actions such as:³⁹

- Dedicated funding for watershed-scale management
- Education for best management practices to protect watersheds
- Programs and policies that encourage small-diameter timber use and landscape-level forest restoration
- Best practices for grazing management

EROSION CONTROL

Western landscapes commonly face soil erosion issues, which can be caused by unmanaged grazing, mining, construction or other factors.⁴⁰ In addition, New Mexico's water supply can be particularly affected by erosion following wildfire and flooding events that deposit large amounts of soil and contaminants into streams, rivers or lakes. Even rainstorms can contribute substantial sediment into waterways. These challenges can affect public water supplies. For example, Albuquerque's water utility had to temporarily stop using Rio Grande water after the 2011 Los Conchas fire.⁴¹ These types of concerns led 11 of the 16 regions to identify sedimentation as an infrastructure issue.⁴² In addition, five regions identified reservoir infill (a result of sedimentation) as an issue.

³⁵ (USDA Farm Service Agency)

³⁶ (Global Development Research Center) (United States Geological Survey, 2016)

³⁷ (U.S. Environmental Protection Agency, 2012)

³⁸ (N.M. Environment Department, 2017)

³⁹ (N.M. Interstate Stream Commission, 2017)

⁴⁰ (Altar Valley Conservation Alliance, 2006)

⁴¹ (Fleck, 2 Agencies Curtail Rio Grande Draws, 2011)

⁴² (N.M. Interstate Stream Commission, 2017)

WATERSHED METRICS

Multiple deliberations in New Mexico have recommended a shared, uniform watershed metric to enable multiple entities engaged in this work to track progress. There are two ways of assessing watersheds: determining the need for restoration in the state (thus quantifying the *scope* of the problem) and measuring the progress of restoration in the state (thus quantifying *how much* of the work is completed). Presently, New Mexico does not have a common metric for answering either question.

In addition to the quantitative questions, there are also qualitative ones. Watersheds might be measured by their progress toward a particular outcome (i.e., resistance to forest fires). Main variables include:

- Landscape conditions and habitat
- Hydrology
- Water quality
- Biological conditions

The New Mexico Opportunity Mapping Project (under development) aims to address some of these data needs. Its goal is to assist policymakers and resource managers with watershed restoration decision-making and develop shared, up-to-date information about forest and watershed restoration across New Mexico.

COSTS

Long-term watershed restoration activities are relatively expensive. For example, thinning a forest costs about \$1,000 per acre; controlled burning costs about \$100 per acre.⁴³ One way to address these issues is through increased state funding. Another option is to shift federal funding from fighting fire to preventing fire. Nationally, wildfire fighting costs exceeded \$2 billion this year.⁴⁴ Currently, the U.S. House of Representatives is considering the Wildfire Disaster Funding Act, and the Senate added a similar fire-funding solution to another bill.⁴⁵

Environmental Flows

Environmental flows and instream flows are terms often used synonymously. They refer to the quality, quantity and timing of water flows required to maintain the functions and resilience of aquatic ecosystems.⁴⁶ More simply, instream flows are the waters flowing within a stream channel. The major policy issues surrounding these concepts include determining how much water should be in a stream bed to properly sustain that ecosystem, and how to legally transfer water for that purpose. Federal legislation or programs (including the Endangered Species Act, the Wild and Scenic Rivers System and the National Wildlife Refuges) may claim water for species protection or to meet needs for federally designated recreational or wildlife uses.

Four of the 16 regional water planning groups recommend instream flows as a statewide policy issue, and half the regions identified the topic as a water management issue. Transfers of water rights to the environment are governed by state laws and regulations, and they must be approved by the OSE. New Mexico is one of the few states with an instream flow statute. However, New Mexico lacks an application form for environmental changes of use, so the pathway to pursue such transfers is unclear.

In regards to private instream flow rights, the OSE and Attorney General acknowledged the state has the authority to issue water rights for environmental use.⁴⁷ However, some believe there are no specific policies enabling this authority. The OSE may also require instream flow applicants to show physical control via metering over water, a costly installation not required by other southwestern states.⁴⁸ Ultimately, New Mexico has yet to permit private instream flow rights.

⁴³ (New Mexico First, 2012)

⁴⁴ (U.S. Department of Agriculture, 2017)

⁴⁵ (Global Solutions, 2017)

⁴⁶ (Hirji, 2009)

⁴⁷ (New Mexico Attorney General, 1998)

⁴⁸ (Miller, 2017)

STRATEGIC WATER RESERVE

The Strategic Water Reserve was created by the New Mexico State Legislature in 2005, and allows the ISC to acquire water rights from owners who are willing to sell, lease or donate them. However, water rights cannot be acquired from an acequia or community water ditch association. These water rights can be used for two purposes: to comply with interstate stream compacts and court decrees, and to benefit threatened or endangered species. In the first three years, state appropriations totaling \$5.3 million supported the work, until state budget problems developed. No new appropriations have been made since 2007.⁴⁹ Seven projects deploying 2,700 acre-feet of water have been completed in the middle Rio Grande and Pecos River watersheds.⁵⁰

The Endangered Species Act in New Mexico

Enacted in 1973, the federal Endangered Species Act (ESA) is intended to prevent the rapid rate of species extinction. The law is administered by the U.S. Fish and Wildlife Service and protects listed species – ensuring that both private and public actions which may harm the species are prevented or mitigated. The federal ESA includes 33 endangered species and 20 threatened species located in New Mexico.⁵¹

The ESA helps plants and animals (and the ecosystems they inhabit) recover from potential extinction, often due to human activities. However, protections placed on listed species can inhibit water withdrawals from rivers, development or other land use activities on both private and public land.⁵² These limitations can frustrate land owners and industry groups in both New Mexico and throughout the country.⁵³

To overcome some of these challenges, some suggest incentivizing conservation activities by private landowners.⁵⁴ Also, increased collaboration to protect the health of ecosystems on the front end could help prevent more species from being listed. The U.S. Fish and Wildlife Service implements several voluntary programs for landowners and industries.⁵⁵ Possible policy questions for the town hall participants include how to best balance ESA implementation with local land and water needs.

MOUNTAIN MEADOWS – NOT JUST FOR PICNICS

Upland meadows store spring floodwaters, release cool flows in late summer, generate healthy soil and grass that filter out sediments and pollutants, and provide high-quality forage and habitat for rare and threatened wildlife species. In New Mexico, ranchers, foundations, grazing associations and others invest in meadow restoration. One of these projects is along the Comanche Creek Watershed in the upper Rio Grande.

Wrap-Up

There are many ways to protect New Mexico's precious water resources. Watershed management practices, vigilance on water quality and erosion reduction are but a few ways. Already many businesses, government agencies and nonprofits are working diligently in these spaces. The pros and cons of these protection mechanisms should be weighed carefully in the town hall. How can New Mexico support what is already underway and supplement what is not? Certainly, New Mexicans agree that catastrophic wildfires, pollutants in our rivers, or contaminants in our groundwater are unacceptable. New Mexico's State Water Plan will drive policy for the foreseeable future on these matters.

⁴⁹ (Uttom Center , 2014)

⁵⁰ (N.M. Office of the State Engineer)

⁵¹ (Ballotpedia, 2016)

⁵² (U.S. Environmental Protection Agency) A 2014 New Mexico First town hall proposed increased collaboration between industry, agriculture and environmental interests to work protect habitat voluntarily, thus preventing new species from being added to the list.

⁵³ (New Mexico First and New Mexico State University Cooperative Extension Service, 2017)

⁵⁴ (New Mexico First and New Mexico State University Cooperative Extension Service, 2017) (Moss, Feds vow to restore 500K acres to lesser prairie chicken, 2016)

⁵⁵ (U.S. Fish and Wildlife Service, 2009)

Chapter 3

Making Improvements Building and Maintaining Water Infrastructure

Water Infrastructure Needs

New Mexico faces significant water infrastructure challenges. From aging municipal water systems and hazardous dams to rural wastewater and watershed management, our needs are far greater than our budgets. Cost estimates are significant, such as drinking water needs, estimated at \$1.7 billion in the next five years; or wastewater infrastructure, costing another \$1 billion over the same period.⁵⁶ The list of dams in most need of rehabilitation identifies \$110 million in repairs.⁵⁷ Each year of delay in these investments escalates the cost and risks of aging infrastructure systems. Major types of water investments (some of which go beyond traditional infrastructure, but may still be funded through capital investment) include:

- Agricultural and acequia water requests, including canal lining
- Dams and levee safety
- Drinking water quality projects
- Endangered Species Act compliance and prevention of new listings
- Lake dredging and repair
- Pipelines (developing new and maintaining existing)
- Public water systems (urban, rural, tribal)
- River stewardship
- Storm water and drainage systems
- Surface water quality projects
- Wastewater systems
- Watershed management

There is also a need for asset management, which includes taking care of existing systems, addressing deferred maintenance, and planning for the future.⁵⁸ Generally speaking, it is considerably less expensive to train communities to upkeep existing systems than invest in new ones.

KEY CONSIDERATIONS

That's a long list. How can our state, which is small in economy but large geographically, address all these financial needs? How can we pay for human and environmental water demands without going into unmanageable debt? How can we advance transparency and public trust in funding decisions? Should we leverage more federal and private funds – rather than state dollars? And, regardless of how water projects are paid for, how do we ensure they are reliably maintained? These and other questions will be considered in this chapter.

Mix of Funding Streams

At the state level, New Mexico currently finances water needs through a combination of loans and grants. The funds come from a variety of federal and state sources, including proceeds from severance tax bonds that stem primarily from oil, gas and mineral extraction. A relatively small number of water projects also receive non-governmental funding through public-private partnerships. Locally, cities or counties may also finance improvements through consumer rate changes and wastewater service fees.

⁵⁶ (Legislative Finance Committee, 2016)

⁵⁷ (N.M. Office of the State Engineer, 2017)

⁵⁸ (N.M. Office of the State Engineer, 2013)

Some of these funding streams will be described in the following pages.⁵⁹ It is difficult to quantify all dollars and projects, but perhaps the best source is the state's Construction Program Bureau (CPB), housed in the New Mexico Environment Department (NMED). This office provides technical oversight for water projects funded by loans and grants authorized by the NMED, New Mexico Finance Authority (NMFA), Water Trust Board, Indian Affairs Department and the state's Capital Outlay program.

The following charts illustrate that the greatest number of CPB-managed water *projects* are funded through Capital Outlay (described below). However, most of the *dollars* come from loan funds and the Water Trust Board.

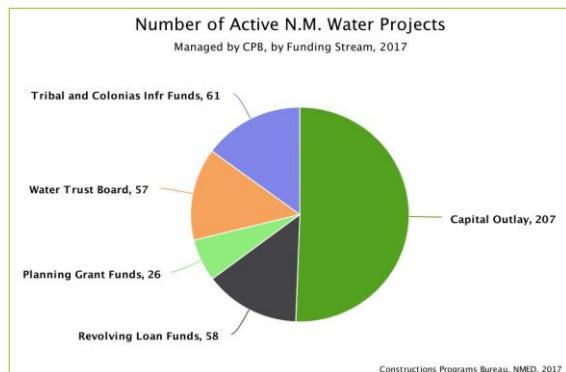


Figure 7: By Funding Stream, Number of Active CPB Water Projects, 2017

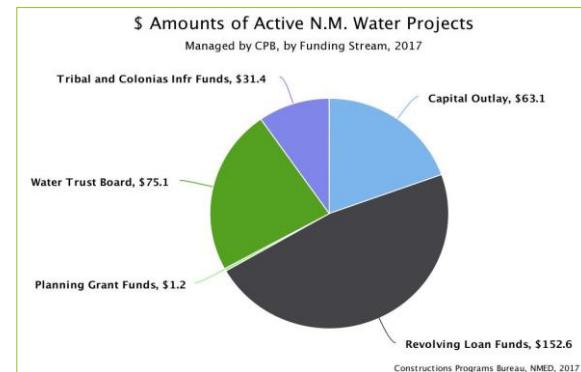


Figure 6: By Funding Stream, Amounts Allocated to Active CPB Water Projects, 2017

New Mexico's funding mix is not typical. We spend six times more state money on water project grants than our neighboring states combined.⁶⁰ Most states finance water projects from federal revolving loan programs. However, our local and county officials – contending with limited budgets – understandably prefer state grants to federal loans. To consider whether to adjust New Mexico's water spending approach, one must understand the current system. Our mix of funding essentially falls into two broad categories:

- Funding based on competitive applications
- Funding based on legislative earmarks (Capital Outlay)

Funding Based on Competitive Applications

Multiple funding streams in New Mexico (and throughout the nation) select projects based on designated criteria and scored applications. This approach applies to all the projects in the charts above except Capital Outlay.

REVOLVING LOAN FUNDS

A government revolving loan fund carries a low interest rate, long duration to repay (i.e., decades), and can be self-perpetuating because the interest returns to the fund. Three loan funds play a major role in New Mexico:

- The Clean Water State Revolving Loan Fund supports wastewater and stormwater projects. The NMED administers the program. The federal government finances 80 percent of the loan, with a 20 percent state match. Recent changes expand eligibility and offer a decreased interest rate ranging from zero to 2.4 percent.
- The Drinking Water State Revolving Loan Fund invests in safe, quality drinking water systems; it is administered and funded the same way as the clean water fund.
- The Rural Infrastructure Revolving Loan Program finances water and wastewater projects in small communities and is funded through state resources.

⁵⁹ Beyond the federal loan programs described in this chapter, some federal agencies invest in projects directly. Examples include the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, U.S. Forest Service, Indian Health Service, or the U.S. Forest Service.

⁶⁰ (Water Trust Board, 2013)

Each of these loans requires communities to submit detailed applications with project descriptions, engineering reports, clear budgets and disclosure of other committed or potential funding sources. Each community's application is reviewed and scored, using pre-published ranking systems. By the time an applicant receives a loan offer, the lender has reviewed the finances and rate structure of the community to ensure it can afford to repay the loan. In many cases, the offer includes a combination of a grant and low-interest loan.

SAMPLE RANKING SYSTEM

Applicants for clean water funds submit proposals with the following sections and maximum scores:⁶¹

- Water quality improvement, 150 points
- Permit compliance, 50 points
- Financial need and affordability, 100 points
- Sustainability, 75 points
- Readiness to proceed, 100 points
- Bonus points, 25 points

The "readiness to proceed" score particularly interests some policymakers and analysts, as it indicates whether the funds can be deployed right away – versus being tied up for months or years.

WATER TRUST BOARD

The Legislature created the Water Trust Board (WTB) and the Water Project Fund in 2001. The board, comprised of 16 members, recommends to the Legislature applications to be funded through the Water Project Fund. The board is also tasked to help prepare and implement the State Water Plan. The board and fund are administered by NMFA, while NMED provides technical oversight of projects once they get started. As of June 2016, the WTB has awarded approximately 349 projects in the amount of over \$366.5 million, with less than 50 incomplete projects.⁶²

Like the revolving loan applications, WTB reviewers score applications using established criteria. These guidelines were updated in 2015, following a two-year review of best practices.⁶³ Submissions ranked highly are invited to complete an additional "readiness application," addressing whether projects are shovel-ready. Based on the board's recommendations and the Legislature's approval, the Water Project Fund issues a combination of low-interest loans and grants each year.

However, analysts predict the Water Trust Fund will be depleted in less than 20 years.⁶⁴ This challenge exists because many applicant communities operate on limited budgets, so the board prefers to issue far more grants than loans. (The ratio is 86 percent grants to 14 percent loans.⁶⁵) Communities appreciate this practice, but it means the fund is not self-perpetuating. Additionally, the fund receives most of its money from proceeds of severance tax bonds, which vary with the ups and downs of the state's extractive industries.

ADDITIONAL COMPETITIVE FUNDING STREAMS

Beyond the major resources above, additional funding streams follow. More information on these and other funding sources appears in Appendix A: Funding Sources.

- Tribal Infrastructure Fund and Colonias Infrastructure Fund
- U.S. Department of Agriculture
- Acequias Construction Program and the N.M. Irrigation Works Construction Fund
- Improvement to the Rio Grande Income Fund

⁶¹ (N.M. Environment Department, 2014)

⁶² (N.M. Finance Authority, 2017)

⁶³ (N.M. Water Trust Board, 2016)

⁶⁴ (Legislative Finance Committee, 2016)

⁶⁵ (Legislative Finance Committee, 2016)

Funding from Capital Outlay

New Mexico operates a unique system of Capital Outlay, different from most models across the country. Capital Outlay is used to build, improve or equip physical property used by the public. In our state, the money comes primarily from bond proceeds on oil and gas severance taxes, and each year the Capital Outlay budget is generally divided into even thirds between the Governor, the N.M. Senate and the N.M. House.

In the House and Senate, the money is distributed to each lawmaker to allocate toward projects of her or his choosing. The amounts vary annually based mostly on oil and gas revenues. In 2015, each of the 42 senators received \$1 million to appropriate, and each representative received \$600,000.⁶⁶ These dollars might fund water treatment plants, senior centers, courthouse furniture, museum exhibits, dump trucks or any number of other local investments.⁶⁷ The current practice began in 1977 and has since been labeled the “Christmas Tree Bill” because it gives “presents” to lawmaker districts. Before 1977, New Mexico primarily used bonds for large-scale projects such as the Ute Dam and major roadways.⁶⁸

The program has its share of supporters and opponents. Supporters see Capital Outlay as a vehicle for moving money throughout the state and ensuring equal opportunity for rural communities to receive state grants that create jobs. Some recipients point to the fact that Capital Outlay dollars can be leveraged as a state match for federal grants. Communities often like that Capital Outlay projects can be funded quickly, without difficult application forms and engineering or environmental reports. Instead, applicants and their sponsoring legislator submit a simple two-page form. In the end, each lawmaker gets the projects she/he wants funded, without the hassle of public hearings or funding criteria.

However, opponents describe the system as potentially wasteful spending. They argue against the lack of transparency about project sponsors, the absence of objective criteria or public vetting, and the fact that projects do not need to be “shovel-ready” before being funded. These projects may, or may not, be part of the local infrastructure capital improvement plans or, for water, the Regional Water Plans.⁶⁹ Because of the diffused spending approach, dollars generally support multiple small projects rather than large-scale investments. This approach also means that some funded projects are not ready to start when funding is appropriated; this leaves the money unused – often for years.

Capital planning in other states takes various forms. Some create bipartisan committees to review and prioritize projects. The committees may include both executive and legislative branch representation, or just legislators. Other states create five or ten-year capital plans and invest toward their completion. Some states create funding criteria and accept proposals for capital funding (similar to New Mexico’s Water Trust Board model).⁷⁰

BENCHMARK 2014

Partly in response to concerns about unused funds, the Legislative Finance Committee (LFC) selected the year 2014 (“Year of Water”) to track long-term progress of one cohort of Capital Outlay grants.⁷¹ Those grants were intended to fund 191 water projects. The LFC presents regular report cards on the 2014 grants. To date, at least 152 projects have been completed.

2014 Capital Outlay Water Funding	Amount
Total appropriations	\$83.5 million
Total unspent as of September 2017	\$24 million
Combined amount of 2014 grants that have used no funding	\$4.7 million

⁶⁶ (Think New Mexico, 2015)

⁶⁷ All examples drawn from the 2017 Capital Outlay bill. (N.M. Legislative Council Service, 2017)

⁶⁸ (Think New Mexico, 2015)

⁶⁹ It is also noteworthy that the local Infrastructure Capital Improvement Plans are not necessarily aligned with the Regional Water Plans or other long-range plans.

⁷⁰ (Commission to Study Capital Budgeting)

⁷¹ (Legislative Finance Committee, 2016) Governor Martinez dubbed the 2014 session the “Year of Water.”

Of the funding above, five projects have spent 10 percent or less of their appropriation, and seven have spent none. There is a distinction between using part of a bond-funded grant, versus none of it. If the project never starts, the state never sells the bonds to finance the grant. The dollars are theoretically tied up – and thus not being used to finance other projects – but at least the state is not yet paying interest on outstanding bonds. By contrast, if the project begins but cannot finish, the state is paying on the full grant amount. In some cases, the state is also paying interest. New Mexico repays severance tax bonds over a ten-year period.

Stalled projects can create many challenges. For instance, if funds are tied up for a project that is not ready, those dollars cannot be used, and the planned jobs do not materialize. Jobs are one of the Capital Outlay program's primary justifications.

Additional Challenges and Solutions

COORDINATION BETWEEN FUNDERS

The state manages seven main programs that fund water projects, and coordination is a longstanding challenge. These efforts became more integrated in 2014 when the multi-agency Water Infrastructure Team began its work. Appendix B lists the members who, among other activities, established the water infrastructure needs survey. This tool invites communities to share water needs and receive guidance on programs for which they might qualify.⁷²

People in the water policy community value these efforts but recognize that coordination challenges remain. Both the LFC and 2014 New Mexico First town hall called for a uniform funding application, a request that NMED indicates is not possible given different deadlines, fund capitalization rates and criteria by funders. Advocates wonder, however, whether even incremental alignment between applications is possible, thus saving communities time and money. Additionally, since no single entity oversees all water projects, data is scattered among different agency's spreadsheets, internal databases, or outsourced technology platforms. Other states solve these problems through centralized data warehousing.⁷³ (See Appendix E: Data Sources for New Mexico Water.)

LEVERAGING OUTSIDE DOLLARS

New Mexico has access to millions of dollars in unused federal water infrastructure funds, particularly from the U.S. Department of Agriculture.⁷⁴ One reason the federal funds go unused (alluded to previously) is because communities favor grants over loans. The grants – whether from Water Trust Board or Capital Outlay – are funded by New Mexico severance tax dollars. By contrast, the source for most revolving loan dollars is federal programs.

Some communities offered financing through revolving loan funds turn the money down to instead pursue Capital Outlay or other grants. As a result, New Mexico underutilizes the loans. In 2016, \$22 million in approved loans were declined by communities because they indicated repayment would have presented hardship.⁷⁵ In most cases, the loans were coupled with a subsidy, meaning that part of the funds would not be required to be repaid.

IDEAS FOR IMPROVEMENT

A host of entities offer recommendations about the use of government dollars:⁷⁶

- Tap Capital Outlay funds only when competitive loan and grant programs cannot be used.
- Centralize the water-funding decision-making process, ensuring collaboration among all funding programs.
- Link up project priorities between the Regional Water Plans and the local infrastructure capital improvement plans – and use these documents to inform Capital Outlay investments.
- Establish a commission to prioritize infrastructure needs, and deploy Capital Outlay dollars accordingly.

⁷² (N.M. Environment Department, 2017)

⁷³ (Legislative Finance Committee, 2016)

⁷⁴ (NM Legislative Finance Committee, 2013), (U.S. General Accounting Office, 2017); USDA was unable to lend over \$10 million in available funds in New Mexico in 2016.

⁷⁵ (N.M. Environment Department, 2017)

⁷⁶ List includes ideas from the LFC, New Mexico First, Think New Mexico and public meetings.

- Require all Capital Outlay to be shovel-ready and set a minimum dollar amount, so the bond funds are not spent on a myriad of tiny projects.
- Require all water Capital Outlay applicants to, at a minimum, take the Water Infrastructure Team's survey and disclose the resulting funding options list.

Public-Private Partnerships

Most of this chapter focuses on government dollars. However, people increasingly point to public-private partnerships (P3s) as a possible strategy for providing New Mexico more financing opportunities. They say P3s can support infrastructure development, create efficiencies and spark innovation that can also lead to cost savings.⁷⁷ These agreements exist between public agencies (federal, state or local) and private sector companies that finance a public service or facility. The skills and assets of each sector (public and private) are shared, along with the risks.⁷⁸

Supporters of P3s argue that in addition to injecting financial resources, private sector involvement reduces costs, project delivery time and public risk, and may also improve project selection and quality.⁷⁹ While P3s provide private capital for public projects, they also contribute the ingenuity of the private partners.⁸⁰ On the other hand, opponents argue that P3 potential is limited, or that private funding will substitute for public resources with no net gain to the citizenry.⁸¹ Additional concerns include loss of public control, private sector profits at the public's expense, loss of future revenues, the risk of private sector bankruptcy, loss of accountability and transparency, environmental concerns, and specific contract terms.⁸²

Thirty-three states (along with the District of Columbia and Puerto Rico) enacted P3-enabling legislation, including Arizona, Colorado, Texas and Utah.⁸³ Increasingly, federal grants require a larger portion of state and local matching funds and require that P3 agreements be part of grant proposals.⁸⁴ New Mexico P3 enabling legislation was repeatedly introduced in recent years, but did not pass the Legislature.

IDEAL COMPONENTS OF P3 LAWS

The DC-based Bipartisan Policy Center researched best practices nationwide; a few components are listed below.⁸⁵

1. Enable P3s for a wide range of public projects.
2. Create a state office dedicated to providing P3 expertise, standardized procurement and assistance.
3. Standardize and promote best practices, including a P3 Guidelines Task Force with public meetings and members representing all tiers of government within the state as well as public and private stakeholders.
4. Protect the public interest through education and input on P3s plus life-cycle costs and benefits.

Wrap-Up

Decisions around water funding are admittedly complex, and it is difficult to understand what types of reforms would be most beneficial. Longstanding, unique traditions play a huge role in New Mexico's financial practices. At the same time, analysts predict that our water needs will grow while our water finances will deplete, thus requiring some sort of change. The ongoing debate between grants or loans – as well as the role of private dollars in water financing – also needs to be settled. And certainly, the challenges of tying up limited dollars for water projects that are not underway warrants attention. These matters and more will be considered during the statewide town hall and by the authors of New Mexico's next State Water Plan.

⁷⁷ (National Conference of State Legislatures, 2016)

⁷⁸ (Meyer, 2012)

⁷⁹ (Mallett, 2014)

⁸⁰ (Sandy Apgar, 2012)

⁸¹ (Mallett, 2014)

⁸² (National Conference of State Legislatures, 2016)

⁸³ (Association for the Improvement of American Infrastructure, 2015)

⁸⁴ (Mallett, 2014)

⁸⁵ (Bipartisan Policy Center, 2015)

Chapter 4

Gatekeeping

Water Rights and Legal Matters

New Mexico's Water Laws

New Mexico water law is based on two fundamental principles. The first is “prior appropriation,” which essentially means the earliest water rights are the best. The second principle is the requirement that water rights be used for “beneficial use” such as agricultural, municipal, industrial or wildlife purposes.

In New Mexico, our water laws are historically based. Pueblo Indians used water centuries before the arrival of Europeans. Later, Spanish settlers introduced the acequia system based on engineering, governance and customs common in 15th century Spain.⁸⁶ When New Mexico became a territory, treaties guaranteed that inhabitants’ existing property and water rights would be respected. In the years that followed, the policy of prior appropriation became a widespread practice that was passed into law after statehood.⁸⁷ Presently, New Mexico’s water laws seek to inform sound water-use decisions, satisfy interstate compact obligations, protect the environment, and ensure water is available in times of shortage.

KEY CONSIDERATIONS

While the town hall will not deal with any specific litigation, participants may discuss legal programs and policies. How can we ensure that legal programs are effective, efficient and clear, while also equitable for all water interests and users? What is the proper balance promoting environmental protection and ensuring economic advancement? What legal challenges stand in the way of promoting better policy?

New Mexico Water Rights

Under our state constitution, all water is owned by the state of New Mexico, and the ability to use it is granted in the form of water rights. A water right is the legal authority to use a specific quantity of water, at a specific place, and for a specific purpose.⁸⁸ Because water is a precious resource, it is subject to extensive regulation. This section outlines basic water law tenets, the processes to acquire water rights, and legal limitations on those rights.

PRIOR APPROPRIATION

As noted above, prior appropriation is the foundation of water law in the West. Under this system, water rights are afforded to those who can demonstrate an application of water to beneficial use.⁸⁹ Timing is key under prior appropriation. Each water right on a stream system is assigned a “priority,” which is determined by the chronological order in which the water was first put to beneficial use. The people (or entities) who came first are the “senior water rights holders” and get top priority. All who follow are “junior”; junior water rights holders theoretically must wait to access their water until the senior water rights are fulfilled.⁹⁰ This concept is commonly described as “first in time, first in right,” and it presents both benefits and challenges.

Under prior appropriation, senior water rights holders can reasonably rely on the water supply provided for in their right. Some users worry about the fact that this approach prioritizes individual water rights, rather than water access for the larger population or the environment. That said, the current system is firmly established in the state constitution. There is no path for undoing over 200 years of water law, nor for taking a legal property right from

⁸⁶ (Buynak, Basic Water Law Concepts, 2008)

⁸⁷ (Buynak, Basic Water Law Concepts, 2008)

⁸⁸ (N.M. Office of the State Engineer)

⁸⁹ N.M. law defines beneficial use as “the direct use or storage and use of water by man for a beneficial purpose including, but not limited to, agricultural, municipal, commercial, industrial, domestic, livestock, fish and wildlife and recreational uses.”

⁹⁰ In N.M., the more senior water rights are typically owned by Native Americans, acequias and farmers. Junior rights often apply to municipal, industrial, residential and recreational uses. (Buynak, Basic Water Law Concepts, 2008)

thousands of owners. Therefore, this report operates under the assumption that improvements in policy or practice would occur within the current water rights system.

LIMITATIONS ON WATER RIGHTS

Once you have a water right, it does not belong to you indefinitely. Prior appropriation requires water users to use their rights consistently. When all or part of the water allotted in a water right is not continuously used toward its ascribed purpose, that right (or portions of it) may be theoretically taken away.⁹¹ This principle is commonly referred to as “use it or lose it.”

Throughout the state, there are different understandings on the application of use it or lose it. Some people are under the impression they must use all their annual allocation of water right to avoid losing some or all of it.⁹² Some report that the New Mexico Office of the State Engineer (OSE) does not actively revoke rights because it wants people to conserve. Others report their rights being devalued at the point of sale (or other transaction) because of conservation or reduced water usage.⁹³

In 2007, the Legislature passed New Mexico Statute 72-5-18 in an effort to strike a balance between the need for water conservation and users’ financial interests. The law states that water rights owners who use improved irrigation or make changes in agricultural practices that result in water conservation will be protected from losing part or all of their water right.⁹⁴ However, confusion on this rule’s application remains, and many believe that clarity is needed on the law and its application.⁹⁵

PERMITTING PROCESS

The OSE is the state agency that administers the supervision, measurement, appropriation and distribution of all surface and groundwater in New Mexico. To receive a ground or surface water right, a person must apply for a water permit with the OSE. Permits are issued if the OSE determines that: water is available; the water sought will be applied to beneficial use; and the permitted right will not impair valid, existing rights, be detrimental to the public welfare, or be contrary to water conservation.⁹⁶

All water rights permits, transfers and leases are conditioned on the requirement that they do not impair other *existing water rights*. The courts have ruled that impairment is determined on a case-by-case basis, and this uncertainty leaves some water advocates concerned about how impairment applies to them.⁹⁷

TRANSFERS AND LEASES

Much of New Mexico’s waters are appropriated, which means that buying or leasing water rights is the main way water users access new water supplies.⁹⁸ The OSE regulates such transfers. Someone who wants to transfer a water right must prove that it is valid and that the transfer will not impair existing water rights, conservation of water or public welfare.⁹⁹

Some water users, particularly those in agricultural communities, express mixed feelings about water rights transfers. Because water rights are often economically valuable, selling these rights can provide a significant

⁹¹ Forfeiture and abandonment are two legal principles under prior appropriation that determine if a water right may be lost or reverted to the public domain. Forfeiture is regulated under statute 72-5-28, 72-12-8, NMSA 1978. Abandonment is determined under common law, and hinges on facts that help establish intent by the water user to abandon their right. (OSE and ISC)

⁹² The water right may undergo scrutiny by OSE and can be reduced during a process such as a water rights transfer or adjudication.

⁹³ For many users, the stakes are high if all or part of a water is found to be abandoned or forfeited. Water rights can translate directly to dollars as they can be sold, leased or transferred for large sums of money – at times costing up to tens of thousands of dollars. (Thomson, 2013)

⁹⁴ (Water Allowance)

⁹⁵ (New Mexico First and New Mexico State University Cooperative Extension Service, 2017)

⁹⁶ (Uton Transboundary Resource Center)

⁹⁷ New Mexico courts’ general rule is that impairment is determined on a case-by case basis, proven through scientific analysis and must be substantial and specific to existing water rights. (Bounds v. State ex. rel D’Antonio, 2013)

⁹⁸ It is important to note that water from tribes and pueblos can be leased, but not permanently transferred without permission from the U.S. Congress. (Indian Non-Intercourse Act, 25 USC 177)

⁹⁹ (NMAC 19.26.2.11)

source of income. However, farmland may then be rendered fallow or unusable for agricultural purposes if the water rights previously attached to the land are sold.¹⁰⁰ Additionally, environmental advocates argue that water transfers should be carefully regulated to consider the sustainability of ecosystems.¹⁰¹

An alternative to permanent transfers are water leases. These arrangements enable a water rights holder to temporarily lease their water right to another. Some farmers and environmentalists consider leases an essential water management tool and recommend their use in conjunction with a water bank system (see page 25). Many farms already lease their annual water allotments if they are not going to be used that year.¹⁰²

Adjudications

Adjudications are legal proceedings that determine the priority of water rights throughout New Mexico. They are required under law and upon their completion create a legally enforceable, formal inventory of water rights and their priority.¹⁰³ Unfortunately, large portions of New Mexico's water rights are not adjudicated. For the last decade, lawmakers and water advocates have said that full adjudication is a top priority.¹⁰⁴

Adjudications are a lengthy, complex process. Essentially, to assign a priority date to a water right, one must trace the history of continued water use – which can date back centuries. The phases of adjudication, in part because they provide opportunities for due process, are difficult to expedite. Additionally, the process takes time because of the sheer numbers and types of defendants. However, there has been progress in recent years, with the OSE surpassing its projected number of judicial determinations in 2017 (see table below).¹⁰⁵

The water rights of tribes and pueblos may be adjudicated in state or federal court, through litigation or settlement. Major Indian water rights have been adjudicated in New Mexico, including the settlement of the water rights of the Navajo Nation in the San Juan Basin and the water rights of Taos Pueblo in the Taos adjudication. Additionally, the Aamodt Settlement should end 50 years of water disputes involving four pueblos and thousands of non-pueblo residents. However, although the settlement was signed into law, current disputes and litigation may stall implementation.¹⁰⁶

Region	Total Acres	Adjudicated Acres	Percent of Acres Adjudicated	Subfile	# of Defendants	Combined OSE Staffing
Northern NM	118,112	79,082	62%	29,581	39,318	14
Southern NM	128,483	51,270	40%	14,137	18,513	13
Pecos	206,949	180,326	87%	6,222	15,053	4
TOTAL	463,544	310,678	67%	49,940	72,884	31

Source: OSE

How to balance expediency with fairness and accuracy is one of the core questions surrounding adjudications. On the one hand, some water rights holders are unsatisfied with the slow pace of adjudications. Many have called for expedited completion of adjudications, including setting target timelines and increases in efficiency and fairness.¹⁰⁷ On the other side, some water rights holders do not particularly care about adjudications. They would rather “keep the state out of our business.” Still others have stated they prefer fairness, accuracy and certainty over speed in

¹⁰⁰ Some stakeholders worry that continuously transferring water rights out of agriculture could inhibit our future ability to feed our country. (Balok, 2014) (Garcia, 2014)

¹⁰¹ The concern about permanent water transfers is also well known within acequia communities, which have the statutory authority to regulate water transfers out of their respective ditches. (NMSA 1978 73-2-55.1, 2013)

¹⁰² Leases in New Mexico are governed under the Water Use Leasing Act, NMSA 1978 72-6-1.

¹⁰³ (Utton Transboundary Resource Center, 2014)

¹⁰⁴ When the senior and junior water rights are settled for an entire stream system or groundwater basin, the system is “fully adjudicated.”

¹⁰⁵ No adjudication process has been undertaken for the middle Rio Grande, therefore the percentages below do not include that region.

¹⁰⁶ (Carillo, 2017)

¹⁰⁷ (New Mexico First and New Mexico State University Cooperative Extension Service, 2017) (New Mexico First, 2014)

adjudications.¹⁰⁸ Funding also remains a major concern; the ability of the courts and OSE to perform adjudications rests on their ability to have consistent staff and funding.¹⁰⁹

ACTIVE WATER RESOURCE MANAGEMENT

According to the Utton Center, the Active Water Resource Management (AWRM) initiative was enacted into law in 2004 as an alternative for conducting priority administration in areas that remain unadjudicated. The initiative was prompted because the lack of final adjudications in some water basins hindered the ability to make water allocation decisions in times of drought. Some people believed the OSE needed the ability to make tough decisions without waiting on the slow-moving adjudication process; thus AWRM was developed as a solution. Implementation of AWRM was delayed by legal challenges for several years.¹¹⁰

In 2012, general rules were adopted outlining a framework for AWRM implementation. Generally, these rules include use of hydrologic analysis and input from water rights owners to develop district-specific rules for priority administration.¹¹¹ Currently, the OSE is in the process of developing district-specific regulations and installing basin meters.¹¹² Other implementation activities are also planned for deployment.¹¹³

Options for Moving and Sharing Water

While priority administration is the legal solution guiding water use, some people refer to it as the “nuclear option.” Many stakeholders invest in other solutions that avoid cutting users off and share water more equitably.

SHORTAGE-SHARING AGREEMENTS

Voluntary shortage-sharing agreements enable water rights owners within a region to work together to meet the minimum needs of water users. Agreements can be developed between water rights owners whose rights have been fully adjudicated, or among those waiting for resolution. Fundamentally, shortage-sharing agreements provide an alternative to priority administration or to a permanent water right transfer.

Given the time and expense associated with court and legislative solutions, some tribal leaders are champions of shortage-sharing agreements. The same is true of some acequia stakeholders. Supporters note that this approach allows for more local decision-making, and such agreements guarantee at least some water for all participants. Some proponents call for more shortage-sharing incentives to make the practice more common.¹¹⁴ However, like any negotiation, the agreements take time, money and careful attention to the unique facts and circumstances in each situation. They may not be a perfect solution for those looking to make quick decisions in times of drought, or for those who do not have the resources required to negotiate such an agreement.

¹⁰⁸ (University of New Mexico Institute of Public Law, 2009) (presented to the Water and Natural Resources Legislative Interim Committee and the Courts, Corrections and Justice Legislative Interim Committee July 2009).

¹⁰⁹ (Ridgley, 2014)

¹¹⁰ (Utton Center, 2014)

¹¹¹ (Utton Center, 2014) (Carol Romero-Wirth, 2012) (NMAC 19.25.13.1 , 2004) AWRM will be implemented in seven priority basins including the lower Pecos River, lower Rio Grande, the San Juan River, the Upper Mimbres, the Rio Gallinas, the Nambe-Pojoaque-Tesuque Basin and the Rio Chama.

¹¹² (N.M. Legislative Council Service, 2015) (N.M. Office of the State Engineer and the Interstate Stream Commission, 2015) The first set of basin regulations were finalized in September 2017 for the Nambe-Pojoaque-Tesuque Water Master District. Next steps include development of district-specific rules and administrable lists of water rights and their priorities, beginning in the Lower Rio Grande Basin.

¹¹³ Planned implementation activities for AWRM include: designate basin managers and project teams, develop schedules for implementation of AWRM, develop district-specific regulations, establish a budget of metering costs and implementation of metering devices, develop a plan for communication with the public, hire and train water master for each area of critical concern, provide training for water masters and other personnel, develop water master manuals, abstract water rights files into WATERS database. (N.M. Office of the State Engineer)

¹¹⁴ (New Mexico First, 2014) Specific items from the New Mexico First 2014 town hall on water called for a template for shortage-sharing agreements and funding for metering to implement these agreements.

EXAMPLES OF NEW MEXICO SHORTAGE SHARING AGREEMENTS

Although shortage-sharing agreements can be complex, there are successful examples. These New Mexico agreements enabled water users to provide for agricultural, tribal, industrial and environmental interests:

- 1996 Rio Jemez shortage-sharing agreement
- 2003 San Juan shortage-sharing agreement
- 2013 Rio Chama shortage-sharing agreement
- 2013 Lower Rio Grande shortage-sharing agreement

WATER BANKING

Water banking is a voluntary market tool that facilitates water rights transactions between buyers, borrowers and sellers. Although water banks exist in most western states, they come in many forms and do not share a single definition.¹¹⁵ Water banking can occur on local, regional and interstate levels, and provides a system for water rights owners to temporarily lease their rights to others.

In New Mexico, the Middle Rio Grande Conservancy District (MRGCD) uses a water bank to provide irrigation water to landowners who have severed their water rights or acquired land that no longer retains water rights. The MRGCD water bank leases out conservancy rights to help ensure adequate supply, and that distribution of water supports aquifer recharge. Policy considerations for town hall participants include how to identify appropriate water bank models in New Mexico.¹¹⁶

Interstate Compacts

Water travels without regard to state lines or international borders. To equitably share these waters that cross state lines, interstate compacts were developed as legal agreements between states on how to allot water within specific river systems. New Mexico is a party to eight interstate stream compacts. Rules governing them vary, and they influence how much water we receive, how much we can use, where we store it, and when we can move it. The compacts cannot be changed without the consent of the affected state legislatures and U.S. Congress.

While all eight of the interstate agreements are important, the Upper Colorado and Rio Grande River compacts stand out because they guide the use of two large water sources. Under these compacts, the Colorado and Rio Grande river systems provide an average of about 700,000 acre-feet of water to New Mexico users. Legal challenges to New Mexico's compliance with the Rio Grande Compact go back to the 1950s. In 2013, Texas filed a lawsuit regarding the Rio Grande Compact. The case is pending.¹¹⁷

It is important to note that input from the public cannot change these legal compacts; however, the State Water Plan statute requires the subject be addressed. Town hall participants may consider education or government communication regarding compacts.

Wrap-Up

There are certain laws that clearly drive how water is used in the state. In discussions regarding the water plan, these laws must be kept in mind. Laws can be changed, but it is not an easy process. Town hall participants may consider what laws might warrant change, compared with which laws water users can work within and still make gains toward better management of water resources. Additionally, programs such as AWRM, shortage-sharing agreements, water banks and others show promise. How can we best administer these programs clearly and effectively? How can we better incentivize conservation practices within the current legal framework?

¹¹⁵ (Stavney, 2016) (State of Washington Department of Ecology)

¹¹⁶ (Middle Rio Grande Conservancy District) (Middle Rio Grande Conservancy District, 2009)

¹¹⁷ (Supreme Court of the United States Blog, 2017)

Chapter 5

Bridging Collaboration Gaps Planning, Data Sharing and Educating

Working Together

Fulfilling objectives of the State Water Plan is an ongoing process. Water planners may need to continually review their practices and consider more ways to collaborate with the goals of improvement and greater efficiency. Multiple water-related planning efforts exist in New Mexico, which are not always aligned with one another. Another important challenge for the water community is accessing and maintaining the most up-to-date data, particularly considering ever-tightening state budgets that fund the research. And, of course, education on water use, conservation, efficiency and other topics remains a priority for New Mexicans of all ages.

KEY CONSIDERATIONS

New Mexico will spend \$350,000 on water planning for fiscal year 2018. That is considerably less than our neighboring states, but still a notable sum. How can we ensure the state and regional water plans receive the attention they need and become true drivers of positive change? How can we improve these processes in future years? And how can we avoid duplication with other planning efforts? In what ways can we improve our data-sharing for water policy across the board – including information housed with different entities? Looking to the future, how can we prepare children, youth and adults to be smart water consumers? These questions and others will be considered by the town hall and the drafters of the 2018 State Water Plan.

Improving Collaboration in Regional Water Planning

The 16 Regional Water Plans were updated in 2016 and 2017 to create a common technical approach and prepare key information for the State Water Plan.¹¹⁸ The regional plans include:

- Descriptions of the planning regions, including boundaries, climate, surface and groundwater sources, demographics, economics and land use
- Water supply and water demand, supply gaps and strategies to meet future water demand
- Legal issues
- Public involvement

A wide array of stakeholders took part in the regional water planning process, including representatives from environmental, agriculture and industry interests, as well as tribes, state and local governments. The information compiled in the regional plans is invaluable, but can still be improved in many ways. The following concerns and ideas were collected by New Mexico First and the ISC during and after the regional planning process.

CLARIFY PURPOSES OF PLANS

Around the state, questions exist about the fundamental purposes of and connections between the regional and state plans. Some people wonder if the two efforts duplicate or if their respective goals are adequately clear. Fundamentally, the state plan is intended to focus on *broad policy direction* for New Mexico's overall water use and management. The regional plans are intended to provide more direction on *regional programs, policies and projects* (i.e., specific water infrastructure needs). However, some regional participants reported they felt uncomfortable ranking specific projects, or they believed they needed a more robust process and criteria for assigning rankings.¹¹⁹ Some participants believed their regional conversations were more fruitful when focused on water policy, rather than picking winner and losers among actual water projects. However, without a regional ranking of projects, it is difficult for the state to make funding decisions. As noted in Chapter 3, lawmakers face

¹¹⁸ (N.M. Interstate Stream Commission, 2017)

¹¹⁹ Focus groups were held in northern and southern New Mexico to capture feedback on the regional planning process.

multiple requests for limited dollars. Some people question the value of the regional water plans unless they provide tangible direction on specific water projects. And so here lies a key point of tension: the activity some regional participants prefer *not* to do (ranking the projects) is the very action lawmakers say they need the most.

EVALUATE GEOGRAPHICAL BOUNDARIES

The geographic boundaries of the 16 water planning regions are very different, ranging from 2,100 square miles to over 17,000. As Figure 8 illustrates, some regions like Taos contain one county. The northeast region, by contrast, contains five. Some regions align with county borders, while others like the San Juan Basin have four partial counties but no intact ones. Some contain large populations, like the middle Rio Grande's 863,000 people (compared to Rio Chama with under 7,000 residents). Geographic idiosyncrasies and governance challenges presented by the regional boundaries prompt some people to recommend they be modified before the next round of revisions. Others prefer to keep the existing boundaries for continuity.

Our regions are much more varied than our neighboring states, most of which divide into fewer regions that are more equivalent in size. *Appendix G: Regional Water Planning in Western States* illustrates that Texas – more than double New Mexico's size – is the only neighboring state with as many planning regions. Arizona and Colorado have seven and nine regions respectively.

Preliminary research by the ISC offered three possible maps for group discussion; all predicated on a combination of hydrologic unit code (HUC), watershed and aquifer boundaries.¹²⁰ All retain New Mexico's current granular approach, with between 16-18 regions. In the different maps, the boundaries move modestly, but foundationally, they appear similar to the current model. For comparison purposes, the figures below compare one of the ISC discussion maps with Arizona's seven planning regions. See *Appendix F: Regional Water Planning Boundaries Options and Examples* for all three versions of the ISC discussion maps plus maps from other western states.

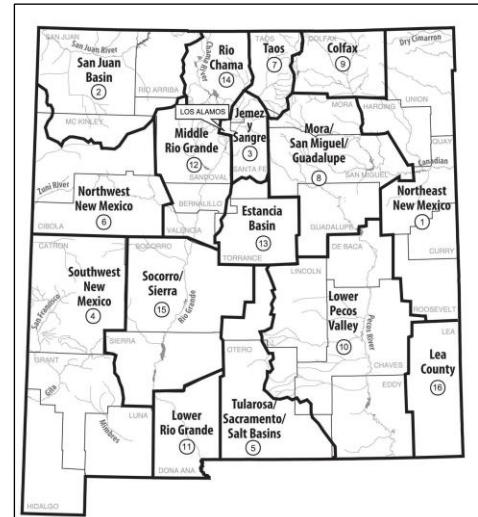


Figure 8: N.M. Water Planning Regions

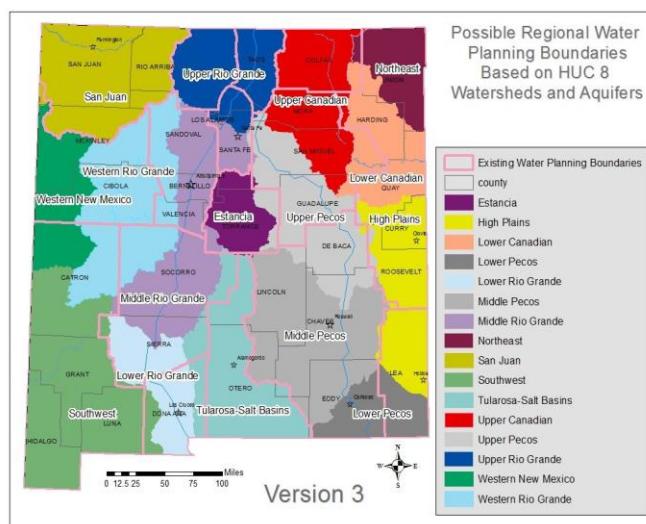


Figure 9: Possible Revised Borders to NM's 16 Regional Planning Regions (option 1 of 3); Arizona's Seven Planning Regions

¹²⁰ (N.M. Interstate Stream Commission, 2017)

IMPROVE WATER PLANNING

People engaged in water planning champion the notion that it needs to be an ongoing and adaptive process. Updating plans every decade – or even half-decade – may not lead to coordinated community problem-solving or integration with other planning efforts. Analysts with the ISC developed preliminary ideas on making water planning less of a “start and stop and start again” activity.¹²¹ The ISC has gathered information from many parties and increased the amount of communication among steering committees, but has not formally committed to any of these processes. Ideas for reform include:

1. For each region, establish steering committees that are consistent and maintained over time. Committee members would commit to a set of operating principles to be developed (i.e., term limits, bylaws, consistent and public meeting schedule, clear decision-making process).
2. Schedule regular (annual or bi-annual) phone calls, video conferencing or meetings between the ISC Planning Program and each steering committee to give updates, ask questions and share information.
3. Create ISC-managed resources to support the statewide effort, including an email listserv, newsletter, updated website or other tools to provide at least quarterly planning information to steering committees.
4. Form a group of representatives from each planning region to conduct and coordinate planning efforts.

CONTINUE TRIBAL CONSULTATION

As the state’s oldest water users, New Mexico’s 23 tribes and pueblos are important stakeholders in the water planning conversation. Programs such as the State Tribal Water Institute help to promote communication and coordination between state and tribal water interests. The ISC reports that it continues to take actions in its water planning activities that respect the sovereignty of tribes and pueblos, promote government-to-government relations and establish partnerships.

ADDRESS OTHER PLANNING CHALLENGES

In addition to possibly redrawing the boundaries and solidifying goals or structure, the last year’s interviews and meetings revealed other opportunities to strengthen future regional water planning. Across the board, people urge that robust and authentic public, tribal and other stakeholder involvement inform the work.

- **Increase the utility of planning documents:** People worry the reports will “sit on a shelf” and not inform future policy or funding. Participants and government employees alike agree that, given the work that goes into the plans, the documents must lead to concrete changes in programs, policies or funding.
- **Complete the water budgets:** The State Water Plan calls for area water budgets, but some regional water plans did not address this goal, due in part to limited resources and because their boundaries do not lend themselves to the task. Many watersheds overlap planning regions, and some communities obtain water from different watersheds and planning regions.¹²²
- **Coordinate with other planning efforts:** Many non-ISC water-related planning activities exist, and they do not necessarily align with regional or state water plans. These efforts range from local capital improvement plans, to watershed-based management plans, to local 40-year supply plans. (See Appendix D: Other Water Plans.)
- **Evaluate the technical approach:** A common technical approach was used to calculate projected supply and demand for each region. The system was strongly supported by some people – who valued the consistency it brought to the 16 plans – and disliked by others who questioned its accuracy. Some requested peer review of the data. Before regional plans are updated – in any format – an evaluation of this approach may be warranted.
- **Work toward conciseness:** The state and regional plans are currently lengthy documents, posted as printable PDFs on a large government website with many other types of water content. Users find the plans challenging to locate and even harder to search. The 16 plans, averaging 230 pages or more, provide over 3,600 pages of regional water planning documentation. While executive summaries exist for each plan, those summaries are

¹²¹ (Geery & Oglesby, 2017)

¹²² Researchers at the Water Resources Research Institute, Tetratech and the University of New Mexico recently developed a computerized water budget tool. (Roach, 2017)

- published as part of the larger PDFs. The sheer volume makes it difficult for these resources to inform policy or funding. (Note: Several other states convert their water plans to more succinct, online searchable resources on stand-alone planning websites, rather than PDFs posted to agency sites.)
- **Secure funds to make plans a reality:** Despite good plans, there are not always good resources to implement or fund the important projects they recommend. Consistent and steady funding for implementation after the plans are developed might ensure they do not sit on a shelf.

Promoting Sharing of Water Data

Another planning and coordination tool is data. New Mexico may want to improve its data-sharing practices or expand the type of water information it collects. Eleven out of the 16 water planning regions identified needs for additional data collection, monitoring, modeling and analyses to better inform water resource decisions and policies. Improved data collection and use was also a priority issue at the 2014 statewide water town hall.

Specific data needs identified in the regional water plans include:

- Research into alternative water sources to identify new supplies, perhaps through aquifer mapping and exploratory drilling
- Funding to continue data collection, aquifer mapping and water quality monitoring
- Metered pumping for improved water budget and groundwater modeling analyses
- Improved groundwater modeling
- Well driller reports on water levels
- Improved reservoir loss accounting
- Development of a database of geohydrology reports

Some of this data is already available, but it is not always easy to access. *Appendix E: Data Sources for New Mexico Water* compares seven separate data warehouses for New Mexico's water, each containing different information and housed in different online or physical locations.

Improving Public Education About Water

Water issues can be complex, and citizens of the West need a basic understanding of the topic. Participants in the regional planning process, as well as previous water deliberations, called for more public education and engagement of children, youth and adults. Ideas for students range from enhancing K-12 curriculum on water, tying water science to school science programs, or expanding the Youth Conservation Corps to do more water projects. For college students, New Mexicans have recommended water internships in state agencies and increased integration of university students in water research.

Unique water educational events and programs exist across the state, such as:

- Las Cruces holds an annual Children's Water Festival to provide hands-on education on how people, animals and plants use water in an arid environment. Last year, the festival included 850 students from five schools.¹²³
- High school students at Santa Fe Indian School learn about water use in agriculture through the "Agriscience" course. The program works with several Pueblo communities to engage students in farming through regular community visits, while food also grows in school gardens and a greenhouse. The curriculum is based on chemistry, biology, botany, ecology, math, economics and cultural studies.¹²⁴
- The Watershed Watch program at Albuquerque's Bosque School is a 7th-grade science curriculum focused on stream monitoring in the Rio Grande watershed. In collaboration with the New Mexico Department of Game

¹²³ (Michaels, 2016)

¹²⁴ (Santa Fe Indian School, n.d.)

- and Fish, students monitor water quantity and quality in two watersheds. They report on the data each school year.¹²⁵
- The Albuquerque Bernalillo County Water Utility Authority runs an outreach program to schools and invites students to water treatment plants for trips and tours. The utility also offers an education-based website with curriculum support for Albuquerque teachers.¹²⁶

EDUCATION FOR ADULTS

Students are not the only ones who can benefit from education on water. The 2014 statewide water town hall recommended education for business, industrial, agricultural, municipal and residential water users that promotes water conservation, ethical management of water resources, wastewater reuse and water quality protection. Additionally, the New Mexico Environment Department, in partnership with the Albuquerque's water utility authority, recently ran the "Value of Water" campaign to educate consumers about the true cost and worth of water and wastewater infrastructure.

Wrap-Up

This chapter is different from others in this report. It is less about the *policies* that drive our water future – like conservation, infrastructure or adjudication – and instead, focuses on the *processes* that inform them. It asks how New Mexico should organize its meetings or avoid government duplication. What consideration should be given to future changes to regional planning, improvements to tribal collaboration or integration with other governmental efforts? How might we improve sharing and development of water data? What types of water education will support our people and policymakers in making sound water decisions?

¹²⁵ (Bosque School, n.d.)

¹²⁶ (Albuquerque Bernalillo County Water Utility Authority, n.d.)

Chapter 6

Preparing for a Changing New Mexico: Land Use, Climate and Economics

Challenges and Opportunities to Come

Many changes are in store for New Mexico. We have more people, a warmer climate and a drive to bring new economic growth to our state. Determining how water fits in with these new trends takes advanced planning and educated discussions. Beginning to anticipate future changes now will mean we are ready to seize opportunities and address challenges as they come. When New Mexicans imagine our future, some may worry about long-term drought, changes in climate, or competing demands for land that create water shortages. Others may say we have enough water; we just need to be smarter about how we use it. Ultimately, making effective use of our existing land and natural resources, as well as utilizing science and ingenuity, will help us make smart decisions for New Mexico's future.

KEY CONSIDERATIONS

Understanding that our state's populations, economic growth and ecosystems are changing requires us to examine current practices and determine how to change with our new circumstances. This chapter looks at how land use planning impacts water supply. It also considers adaptation and mitigation strategies for climate change. Additionally, as one of the nation's poorest states, economic growth is key to New Mexico's future. This chapter explores how our economy can grow within the confines of our current and future water supply.

Land Use

Like many of its western neighbors, New Mexico has large swaths of rural landscape and concentrated populations in urban centers.¹²⁷ Growth of these urban centers is on the horizon. Reports project that by 2040, our state will grow by over 600,000 people. Metropolitan counties such as Sandoval, Bernalillo, Dona Ana, San Juan and Valencia county are all poised to experience over 25 percent growth by 2040.¹²⁸ Some estimates predict Albuquerque will almost double in population to 1.4 million within the next 25 years.¹²⁹ Some planners are collaborating with water managers to ensure water is a central element to land use, environmental and infrastructure decisions.¹³⁰

Most land use decisions take place at the local level. However, the ISC requested that land use be included in this report because the State Water Plan provides a policy guide for local leaders to draw on when making their own policy decisions. Additionally, improved collaboration between state and local governments, as well as private landowners, can only strengthen our water future.

MUNICIPAL LAND USE PLANNING AND WATER

Land use planning in urban areas presents challenges because new growth brings with it the potential for increased water demand. Studies have shown that low-density development with larger lots, commonly referred to as "sprawl," results in higher per-capita water use.¹³¹ National data shows cities are learning how to grow while actually reducing their water use. For example, the consumptive use of water in Albuquerque declined by roughly 25 percent since 1995, although the population grew by 40 percent.¹³²

¹²⁷ (McKinney, 2002)

¹²⁸ (N.M. Department of Workforce Solutions, 2015)

¹²⁹ (U.S. Department of Transportation, 2015)

¹³⁰ (American Planning Association, 2016)

¹³¹ (Western Resource Advocates , 2003)

¹³² (Albuquerque Bernalillo County Water Utility Authority , 2016)

Many cities use zoning as a means to promote water savings. Zoning ordinances control residential lot sizes, residential densities and types of landscaping for different types of development. Zoning strategies that reduce water use include:¹³³

- Reducing the size of single-family residential lots
- Moving from single-family to multi-family development
- Increasing multi-family residential density
- Passing and enforcing turf/irrigation restrictions

Planning strategies that encourage cluster development can reduce water use by allowing for smaller lot sizes in return for setting aside 50-70 percent of a subdivision tract as open space.¹³⁴ In addition, local governments may be able to incentivize water-smart development by providing density bonuses, streamlined approval processes, offering discounted tap fees, and extending utility rebate programs to homebuilders practicing water-saving development strategies.¹³⁵ There is some concern that these practices may be too restrictive or expensive and can impact development. Communities must therefore work with residents and developers to achieve a balanced land use planning process that is acceptable to all.¹³⁶

Other institutional means of ensuring water conserving practices in municipalities include updating and enforcing municipal codes and ordinances to require water-conserving plumbing systems and appliances, grey water reuse, household storm water capture and ordinances that reduce the volume of storm water runoff or improve its water quality. Federal agencies are also encouraging the construction of net-zero water buildings that minimize water consumption and wastewater discharge while maximizing alternative water sources.¹³⁷

Water utilities can develop programs that encourage efficient water use, such as implementing block-rate water pricing in which the price per gallon of water increases as the volume of water used increases, or utilization of time-of-day watering. In an extreme water shortage situation, most utilities can implement mandatory conservation measures such as restricting or eliminating outdoor water use.

NEW MEXICO SUBDIVISION ACT

The New Mexico Subdivision Act sets requirements for counties establishing subdivisions – land divided into two or more parcels for sale, building development, etc. Under this act, the OSE is required to submit opinions, at the request of the New Mexico Board of County Commissioners, that assess whether the developer can adequately furnish water to the proposed subdivision. It is at the discretion of the local board to determine whether to utilize the OSE's opinion when making their final decision.¹³⁸

AGRICULTURAL LAND USE AND WATER

Agriculture has a significant presence in rural areas of New Mexico as well as along the more populated “Rio Grande Corridor.” Regarding land use and water, many farmers and ranchers are concerned with losing water rights (and with it productive land for agriculture).¹³⁹ Prime rural land in New Mexico decreased 33 percent between 1982 and 2012, much of it converted to residential or industrial use.¹⁴⁰ To protect against the loss of agricultural land and accompanying water rights, the Mid-Region Council of Governments recommends.¹⁴¹

¹³³ (The Keystone Center, 2015)

¹³⁴ Cluster development has also been identified as a means of preserving agricultural land in proximity to urban areas. (Mid Region Council of Governments of New Mexico, 2017) (The Keystone Center, 2015)

¹³⁵ (Western Resource Advocates, 2009)

¹³⁶ (The Keystone Center, 2015)

¹³⁷ (U.S. Office of Energy Efficiency and Renewable Energy)

¹³⁸ New Mexico Subdivision Act, NMSA 1978 46-7-1

¹³⁹ (New Mexico First and New Mexico State University Cooperative Extension Service, 2016)

¹⁴⁰ (Farmland Information Center, 2015)

¹⁴¹ (Mid Region Council of Governments of New Mexico, 2017)

- Agricultural zoning and districts
- Conservation easements
- Preferential agricultural tax policies
- Bond funding
- Farm and ranch lands protection programs

Another challenge to maintaining prime agricultural land is the impact of erosion on water quality. Erosion can cause runoff and sediment deposits in surface water sources, damaging water quality.¹⁴² Erosion can occur because of wind, rain or drought, as well as land use practices including tillage and overgrazing. Significant work in past decades and into the present has been conducted by conservation districts and others to combat erosion. However, as illustrated in Figure 10, overall soil erosion on New Mexico cropland increased by 80 percent since 2002.¹⁴³

New Mexico stakeholders have identified several strategies for addressing soil health:¹⁴⁴

- Practices to improve soil health and the production quality of land (i.e., cover crops, low-till farming, green manure, development of organic matter)
- Integrated methods for land planning that fit the ecology of the area (i.e., proper grazing techniques, seasonal extension, density clustering, dryland farming)
- Continuing and extending efforts to eliminate invasive plants that deplete water supply
- Supporting research of best practices to support the land

When considering policy implications for agricultural land use planning and water, stakeholders will likely consider the reality that roughly 80 percent of the state's water is used by agriculture. People may consider how to make conservation practices enticing for farmers and ranchers. Another key consideration is how to balance growth from other industries and urban areas with the need to preserve agricultural lands and water rights.

Climate Impacts to Future Water Resources

Climate change has the potential to pose serious changes to communities throughout New Mexico. There is a consensus among climate scientists that global temperatures are warming, and impacts are already being experienced in New Mexico. Given these changes, it is important to understand the range of potential impacts on future water resources in New Mexico.

PREDICTED CLIMATE CHANGE EFFECTS FOR NEW MEXICO

Contrary to popular assumptions, climate change does not simply result in higher temperatures. In New Mexico, climate change may alter our water supply, ecosystem health and ability to manage conservation efforts. Findings show that average winter temperatures increased statewide by about 1.5° Fahrenheit since the 1950s, with a prediction for increases of 5° to 10°F by the end of the century.¹⁴⁵

Equally serious are implications for the state's snowpack, which is one of the major water sources in New Mexico and throughout the West. In New Mexico, snowpack results in a significant portion of our surface water and

¹⁴² (Ashraf, 2017)

¹⁴³ (USDA, 2015)

¹⁴⁴ (New Mexico First and New Mexico State University Cooperative Extension Service, 2016)

¹⁴⁵ (N.M. Interstate Stream Commission, 2017) (U.S. Department of the Interior, Bureau of Reclamation, 2013) (U.S. Bureau of Reclamation, 2011) (Hurd, 2008) (Christensen, 2004)

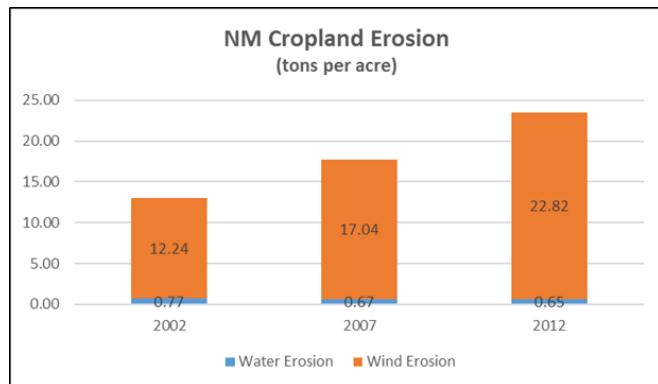


Figure 10: New Mexico Cropland Erosion. Source: USDA

aquifer recharge.¹⁴⁶ In southwest New Mexico, snowpack is expected to be lower, and snowmelt is expected to be earlier. The Upper Rio Grande Basin is expected to experience increasingly unpredictable snowpack runoff volume due to observed climate impacts.¹⁴⁷ Other potential impacts of climate change include:¹⁴⁸

- Soil, reservoir and other open-water evaporation are expected to increase.
- Precipitation may become more concentrated, leading to increased frequency and severity of flooding.
- Forest habitat vulnerability may increase from changes in precipitation and temperature. These stressors leave forests increasingly susceptible to insects, forest fires and tree die-offs.

As the following table illustrates, participants in New Mexico's Regional Water Plan process expressed concerns about these changes. Each of the 16 regional plans discussed and identified climate impacts to water resources.

Climate Vulnerability Issue Identified in Regional Plans	Number of Issues	Number of Regions
Drought	28	14
Increasing demand due to increasing temperatures	2	2
Earlier runoff (and lack of storage)	1	1
Greater risk for catastrophic fires	9	9
Flooding, storm water and/or sedimentation	12	11
Limitations on legal framework for water banking which could help address variability of climate	1	1

Planning for climate variability and its impacts to state water supplies is often contentious and difficult because of unknown impacts.

PREPARING FOR CLIMATE CHANGE

To achieve resiliency in the face of a changing climate, “adaptation” or “mitigation” methods exist. Adaptation methods seek to prepare for effects of climate change, while mitigation methods seek to reduce the emission of greenhouse gases. Throughout New Mexico measures are being taken to implement both these strategies.

In central New Mexico, at least two planning projects are in place considering adaptation and mitigation strategies for climate change:

- The Central New Mexico Climate Change Scenario Planning Project developed by the Mid-Region Council of Governments uses climate scenario planning to predict impacts to the central New Mexico region. The project develops strategies to address those impacts including land use and zoning.¹⁴⁹
- The Albuquerque ABC to Z Comprehensive Plan offers a blend of adaptation and mitigation strategies. The plan contains strategies to limit development that could exacerbate these issues (i.e. higher density development, reducing sprawl, etc.).¹⁵⁰

Across the board, long-term state planning may consider both adaptation and mitigation efforts, including their potential impacts on regulatory schemes and conservation efforts.

¹⁴⁶ (N.M. Office of the State Engineer, 2017)

¹⁴⁷ (Gutzler, 2017)

¹⁴⁸ (N.M. Office of the State Engineer, 2006)

¹⁴⁹ (U.S. Dept. of Transportation, 2015)

¹⁵⁰ (City of Albuquerque, 2017)

Economic Planning in an Arid State

Potential future water shortages may create significant challenges in using our lands productively and in ways that prevent erosion or unnecessary sprawl. At the same time, a fifth of our state lives in poverty, and unemployment hovers around seven percent.¹⁵¹ The majority of New Mexicans who have jobs work for low wages. Multiple public deliberations – on practically any subject – communicate the overriding need for New Mexico to grow a stronger, more vibrant economy that lifts up our people and quality of life.

However, there is far less agreement about the type of economic growth New Mexico should pursue. Water is critical to existing industries, including agriculture or oil and gas. Some new industries appear to make more sense than others in New Mexico. Some participants in the Regional Water Planning process recommend statewide economic development initiatives that encourage low-water industries, green infrastructure and low-impact development. Economic growth assets include our natural resources, outdoor and cultural amenities, as well as cutting-edge research and technologies generated by national laboratories and nationally recognized research universities. Economic planners indicate that New Mexico is or could become competitive in the following target areas.¹⁵²

Note: the following economic options are not necessarily directly about water. They reflect a wide array of growth opportunities our state may consider, given water limitations. What type of overall economy makes sense for New Mexico?

NATURAL RESOURCES: WATER, ENERGY, FORESTS

Water security, food security and energy are major issues confronting the world for the foreseeable future. New Mexico could lead the way in resource management, especially as it relates to water and energy. If our state could solve our water problems through technology, planning and policy initiatives, we could teach others to do the same. Similarly, expansion of renewable energy (wind, solar and geothermal), while retaining conventional production (oil and gas), could create more opportunities to lead and grow the economy. Expanding efforts in forest and watershed restoration presents another growth option. Doing so would help protect our forests from extreme fire, while also potentially creating rural jobs and reinvigorating New Mexico's timber industry.

FIX WHAT'S BROKEN: INFRASTRUCTURE

Chapter 3 illustrates economic benefits of investing in ourselves. For example, the New Mexico community of Las Vegas received \$10 million in 2014 for improvements to the Bradner Reservoir and other water needs in San Miguel Country. These types of projects generate hundreds of short-term construction jobs. They also hopefully lead to more long-term economic opportunities for the communities whose infrastructure can support more employers and residents.

TECHNOLOGY

New Mexico is recognized as a leading developer of new and advanced technologies, partly due to its research universities, two national laboratories and two Department of Defense research laboratories. Additionally, bio-

¹⁵¹ (U.S. Department of Labor, 2017)

¹⁵² Some ideas in this section were drawn from the 2016 New Mexico First statewide town hall on economic development. Other sources include: (Dekker, 2016) (Barela, 2014) (N.M. Economic Development Department, 2016; N.M. Economic Development Department, 2016)

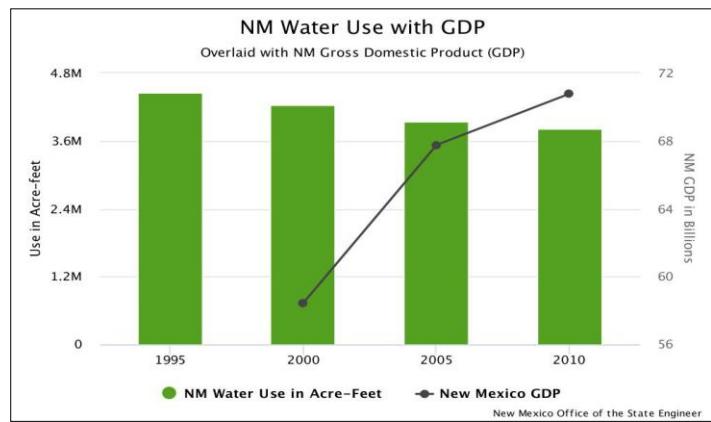


Figure 11: N.M. GDP and Water Use (1995-2010)

tech, bio-pharmaceuticals and new drugs are growing three times faster than traditional healthcare, and are examples of potential economic growth areas that do not require enormous investments of water.¹⁵³

TOURISM

New Mexico's trifecta of history, nature and culture makes us unique in the nation for tourism. In 2014, the state saw 2.3 million visits from people engaging in "quiet recreation," such as campers and hikers — bringing \$173 million to the state that year and employing more than 1,700 people.¹⁵⁴ In 2016, combined trips of all sorts in New Mexico totaled 34.4 million, of which out-of-state visitors made up 70 percent.¹⁵⁵ Increased tourism could bring immediate benefits for state and regional economies without major drains on water supplies. Marketing outreach could target travelers in the U.S. as well as Mexico's growing middle class.

BINATIONAL PLANNING AND GROWTH

New Mexico's border community with Mexico offers multiple economic and water planning opportunities, and some of these efforts are underway. A unique binational master-planned community is under consideration in the communities of Doña Ana County, Santa Teresa and San Jerónimo, which is in Ciudad Juárez. New Mexico's Water Resources Research Institute is involved in the work, which will address transportation, utility lines, residential areas and sustainable environmental practices.¹⁵⁶

BACK OFFICE AND TECHNICAL SUPPORT

New Mexico already has a strong "back office" sector comprised of customer service, technical support, order taking, claims processing, bilingual customer support, accounts payable and mail processing. These jobs may be appealing from a natural resources standpoint because they do not require much water. Strategies to grow this sector include training and credentialing a bilingual workforce, strong workforce development with education in "soft skills" including phone courtesy, and expansion/maintenance of reliable, high-speed broadband.

Wrap-Up

The examples above provide a few ideas for economic and land use directions the state can take. Regardless which interests New Mexico pursues, the foundational issue remains: what kind of growth makes sense for our people and our climate? What land use choices will further our state's future and conserve water? How can we best prepare for climate variability and mitigate its changes? What science is needed to be certain of our decisions and investments? How can we set common priorities and work toward them?

¹⁵³ (Dekker, 2016)

¹⁵⁴ (Moss, Study: 'Quiet recreation' brings in \$173 million, employs more than 1,700, 2016)

¹⁵⁵ (Hood, 2017)

¹⁵⁶ (Barela, 2014)

Conclusion

The 2018 State Water Plan presents the opportunity to craft a strong policy path for New Mexico's future. As encapsulated by this report, water touches and determines much about life and growth in our state. It seems almost nothing we do can be accomplished without water. Nevertheless, for as many challenges presented by water, there are just as many opportunities.

It is important to ensure all New Mexicans are a part of the water conversation. In these conversations, we see consistent trends. Uncertainty helps us recognize change is the only constant, and the way forward requires adaptability. All other hurdles – water quality, watershed needs, infrastructure, funding, legal challenges, economic planning and climate change – push us as New Mexicans to set a vision for our future.

Determining how we want to use our water is the end goal for the December town hall. This may seem impossible, given that water use can often feel like a high-stakes competition. However, New Mexicans often find they have more in common than not. Keeping eyes on the future and focusing on our common interests will help guide town hall participants to achieve clear and thoughtful input for our next State Water Plan.

Key considerations for participants relate to the following questions: What kind of growth makes the most sense for New Mexico? How should we prioritize and invest our limited resources? What information will we need to make the best choices? How do we best balance multiple water uses, especially when these uses compete with one another? What are best practices to ensure our regulatory programs are effective in supporting water users? These topics and more will focus discussions informing policies developed in the 2018 State Water Plan.

Appendix

Appendix A: Funding Sources

N.M. WATER INFRASTRUCTURE FUNDING PROGRAMS

Agency/Organization	Funding Sources/Programs
Border Environment Cooperation Commission and North American Development Bank	<ul style="list-style-type: none"> • 7 Infrastructure and Technical Assistance Funds/Programs funded from Congressional appropriations to the Environmental Protection Agency (EPA)
New Mexico Department of Finance and Administration	<ul style="list-style-type: none"> • Community Development Block Grant (CDBG) • CDBG -- Colonias Set-Aside • Emergency Water Supply Fund
New Mexico Department of Agriculture	<ul style="list-style-type: none"> • Acequia and Community Ditch Grant • Water Quality and Conservation Grant
New Mexico Environment Department	<ul style="list-style-type: none"> • 319 Nonpoint Source Management Program Watershed Protection and Restoration • Capital Outlay Appropriations • Clean Water State Revolving Fund • Drinking Water State Revolving Fund (Technical) • River Stewardship Program • Rural Infrastructure Program (RIP)
New Mexico Finance Authority	<ul style="list-style-type: none"> • Colonias Infrastructure Project Fund • Drinking Water State Revolving Loan Fund (Administrative and Financial) • Local Government Planning Fund • Public Project Revolving Fund • Water Project Fund • Acequia Project Fund • Wastewater and Water Project Grant Fund (currently unfunded)
New Mexico Energy, Minerals and Natural Resources Department	<ul style="list-style-type: none"> • Re-Leaf program • Watershed Restoration Initiative
New Mexico Indian Affairs Department	<ul style="list-style-type: none"> • Tribal Infrastructure Fund
Office of the State Engineer (OSE)	<ul style="list-style-type: none"> • Acequia Restoration and Rehabilitation Programs (90/10) • Acequia Legislative Appropriations • Capital Outlay Statewide – Dams • Corps Section 215/ 1113 Acequia Programs (Currently Unavailable) • Irrigation Works Construction Fund (IWCF)
Rural Community Assistance Corporation (RCAC)	<ul style="list-style-type: none"> • Environmental Infrastructure Loan Program (EIL) funded through Community Development Financial Institutions Fund
US Department of Agriculture (USDA)	<ul style="list-style-type: none"> • Rural Development - Water and Waste Disposal Loan and Grants • Rural Development - Water and Waste Disposal Loan Guarantees • Technical Assistance and Training Grants (TAT) • Wetland Reserve Program

Appendix B: Water Infrastructure Team

This team was established in 2013 and began significant work in 2014. Its aim is to address concerns about competition and lack of coordination between water funding mechanisms. The N.M. Environment Department coordinates the effort.

Major initiatives include:

- Compilation of capacity assistance resources
- Asset management guidelines
- Promotion of the Department of Finance and Administration's 400-plus-page local government funding guide
- Management of the annual water infrastructure needs survey
- Public awareness campaign on the value of water

GOVERNMENT AGENCIES

N.M. Department of Finance and Administration
N.M. Environment Department
N.M. Finance Authority
N.M. Indian Affairs Department
N.M. Legislative Council Service
N.M. Legislative Finance Authority
N.M. Office of the State Engineer
U.S. Department of Agriculture-Rural Development
U.S. Environmental Protection Agency

NON-GOVERNMENTAL ORGANIZATIONS

N.M. Association of Counties
N.M. Municipal League
N.M. Rural Water Association
Rural Community Assistance Corporation
University of New Mexico-Environmental Finance Center

Appendix C: State Government Entities in Water Policy and Programs

N.M. DEPARTMENT OF AGRICULTURE

The NMDA is a service and regulatory department responsible for various agriculture-related statutes. Divisions include agricultural and environmental services, agricultural programs and resources, dairy, marketing and development, standards and consumer services and veterinary diagnostic services.

N.M. ENVIRONMENT DEPARTMENT

The NMED is the primary agency responsible for implementing regulations and standards adopted by the Water Quality Control Commission (WQCC). The NMED also provides the principal source of technical expertise available to the WQCC in its rulemaking and other policy-setting activities. Key water-related bureaus include: Ground Water Quality Bureau, Surface Water Quality Bureau, Construction Programs Bureau, and the Drinking Water Bureau.

N.M. ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

The EMNRD oversees the energy and natural resources of New Mexico. Divisions of the department include Administration Services, Energy Conservation and Management, State Forestry, Mining and Minerals, Oil Conservation and State Parks. All these divisions directly or indirectly relate to water policy.

N.M. FINANCE AUTHORITY

The NMFA finances infrastructure projects for the state's counties and cities and certain departments of state government. Its objective is to provide low-cost financing to borrowers who might not otherwise be able to access the tax-exempt bond market on a cost-effective basis. The NMFA's primary programs include:

- The Public Project Revolving Fund
- The Drinking Water State Revolving Loan Fund
- Water Project Fund
- The Local Government Planning Fund
- New Markets Tax Credits

N.M. INTERSTATE STREAM COMMISSION

See foreword.

N.M. OFFICE OF THE STATE ENGINEER

See foreword.

N.M. RURAL WATER ASSOCIATION

The NMRWA is a nonprofit membership organization committed to helping communities provide safe drinking water and wastewater services through on-site technical assistance, specialized training and legislative support.

N.M. STATE LAND OFFICE

The SLO supports sound forest management to improve forest/watershed health, foster positive economic impact on communities, and reduce the risk of high-intensity wildfire near communities.

WATER QUALITY CONTROL COMMISSION

The WQCC is the water pollution control agency for N.M. and is responsible for developing specific water quality policy in WQCC adopts water quality standards and regulations

WATER TRUST BOARD

See page 17.

Appendix D: Other Water Plans

In addition to the state and regional water plans, multiple other water-related planning activities exist. In some cases, relevant documents were evaluated as part of the regional water planning process.

Planning Activity	Entity	Description
Watershed-Based Plans	N.M. Environment Department, Surface Water Quality Bureau	The Watershed-Based Plans are developed and implemented to address impaired waters in New Mexico. Where the WBP is designed to implement a Total Maximum Daily Load (TMDL), nine elements help provide reasonable assurance that the projects become successful over time.
State Water Quality Management Plan and Continuing Planning Process	N.M. Environment Department, Surface Water Quality Bureau	The statewide WQMP/CPP provides a consistent approach to protecting and improving water quality. Establishing such a plan ensures that the quality of water in the environment is periodically assessed, water quality standards are established to protect designated uses, and sources of pollution that may adversely impact water quality are controlled.
Focus 2050	Mid-Region Council of Governments of New Mexico	Developed in 2000 as a framework for planning in the multi-county MRCOG district. It provides a common vision and vocabulary for regional functional planning for transportation, economic development, water, open space, and housing.
New Mexico Forest and Watershed Health Plan	N.M. Department of Forestry	The Plan provides a framework for meeting ecological, socio-cultural and economic objectives through a collaborative, landscape-scale approach. It lays out actions designed to transform the way ecological restoration is accomplished in New Mexico and articulates guiding principles for how this work should be approached.
Infrastructure Capital Improvement Plan (ICIP)	N.M. Department of Finance and Administration	A local infrastructure capital improvement plan (ICIP) is a plan that establishes planning priorities for anticipated capital projects. The state-coordinated ICIP process encourages entities to plan for the development of capital improvements so that they do not find themselves in emergency situations, but can plan for, fund, and develop infrastructure at a pace that sustains their activities
40-Year Plans	Local entities	Municipalities, counties, school districts, state universities, member-owned community water systems, special water users' associations and public utilities supplying water to municipalities are allowed a 40-year water use planning period, and water rights for these entities are based upon a water development plan, which must be implemented within the 40-year period.
Wetland Action Plans	Surface Water Quality Boards	Wetland Action Plans (WAPs) are designed to specifically address wetlands and riparian resources within the boundary of a specific watershed. The Surface Water Quality Board facilitates watershed groups throughout the State to develop WAPs as an additional component of their Watershed-Based Plan.

Appendix E: Data Sources for New Mexico Water

This table reflects New Mexico data warehouses known to members of the research committee; additional sources may exist. It does not reflect the wide array of national data hubs such as National Weather Service or U.S. Drought Monitor.

Data Source	Managing Entity	Description
N.M. Water Rights Reporting System	N.M. Office of the State Engineer	Online access to OSE files including electronic images of water rights documents plus reports on wells, driller licenses, points of diversion and subdivisions.
Water Use and Data Technical Reports	N.M. Office of the State Engineer	Data by county from 1990-2010 and data by river basin from 1990-2010.
Enterprise Geographic Information System	N.M. Office of the State Engineer	Maps, geospatial data, and other information for public access.
Statewide Water Assessment	N.M. Water Resources Research Institute	Future resource to complement existing state agency water resource assessments, providing new, dynamic, spatially representative assessments of water budgets for the state.
Statewide Water Quality Data	N.M. Environment Department, Surface Water Quality Bureau	The Monitoring, Assessment and Standards Section is responsible for the continual collection, integration and assessment of water quality data for all lakes, streams and rivers in New Mexico in addition to the preparation of water quality standards and impairment reports.
Water Data for New Mexico	U.S. Geologic Survey	Real-time data for New Mexico streamflow and stream stages, lakes and reservoirs, precipitation, groundwater and water quality.
New Mexico Opportunity Mapping Project	Multi-sector planning team	Under development, aims to develop shared, up-to-date information about forest and watershed restoration across New Mexico.

Appendix F: Regional Water Planning Boundaries Options and Examples

The following maps illustrate three possible boundary options developed by ISC. While all three versions are roughly based on groupings of HUC 8 watersheds and aquifers, the major differences involve the Middle Rio Grande, Pecos and Southwest Regions. The options attempted to strike a balance between the hydrologic similarities, travel distance for participants to attend meetings and population and potential for leadership.

Based on surface water basins only, the Middle Rio Grande Region should start at the Otowi Gage and include much of Santa Fe and Los Alamos with Albuquerque, which would put much of the state's population into one region. Version 2 separates the Santa Fe and Los Alamos areas into the "Upper Middle Rio Grande" region. Version 3 includes the Rio Puerco in with the Western Rio Grande region rather than the Middle Rio Grande. The Upper and Middle Pecos Region are modified in Version 3 to reduce the size of the Middle Pecos. The Gila is separated from the Southwest Region in Version 2 based on the surface water basins and size of the region. The population of the proposed Gila Region would be very small compared to other regions.

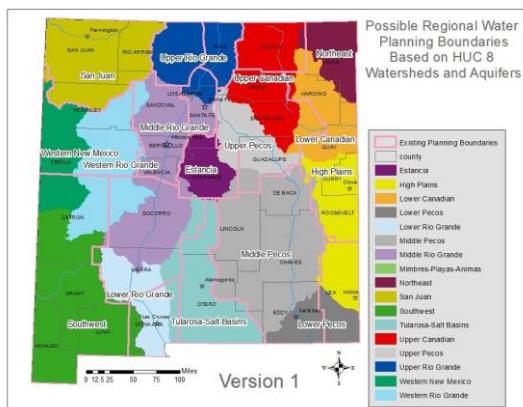


Figure 12: Possible Regional Water Plan Boundaries- Version 1

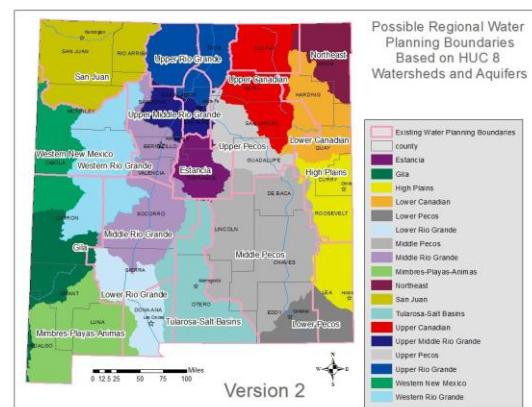


Figure 13: Possible Regional Water Plan Boundaries- Version 2

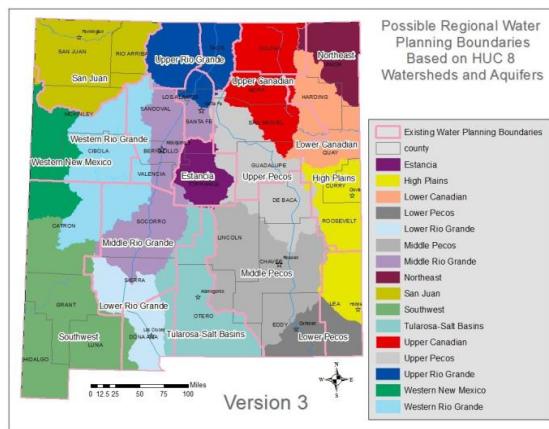


Figure 14: Possible Regional Water Plan Boundaries- Version 3.



Figure 15: Hydrologic unit code (HUC) boundaries

Works Cited
State Water Plan Town Hall Background Report

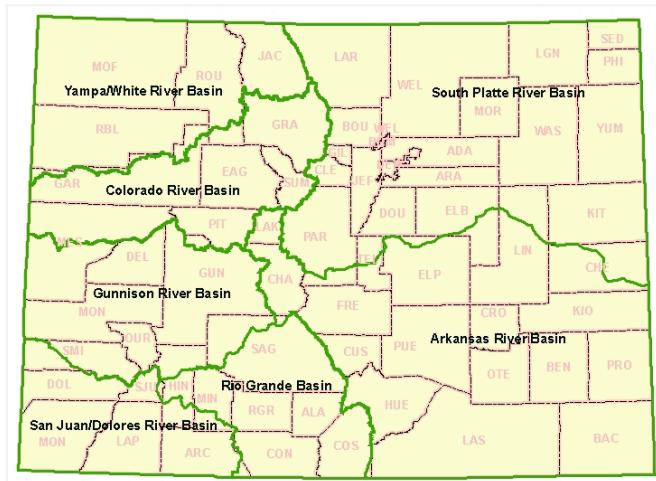


Figure 16: Colorado Planning Regions



Figure 17: Arizona Planning Regions

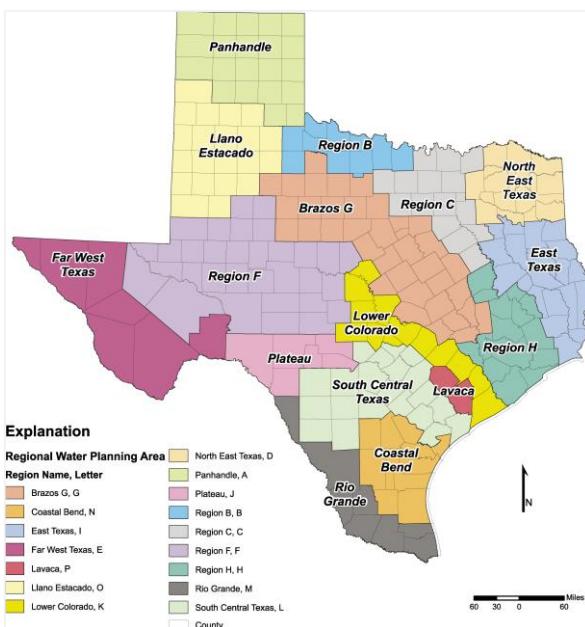


Figure 18: Texas Planning Regions

Appendix G: Regional Water Planning in Western States

State	# of Regions	State Size in Square Miles	Population	How Boundaries Drawn
Arizona	7	114,000	6.9 million	Most regions organized by basins, except the “Active Management Areas” that create one plan for major cities.
Colorado	9	104,000	5 million	Called “Basin Roundtables,” Colorado’s regional planning groups are organized around the state’s eight major river basins, with a separate region for the Denver metro area.
New Mexico	16	121,500	2 million	Regions were created by the combination of watersheds, county jurisdictions and political boundaries, with some counties split between regions.
Oklahoma	13	70,000	3.8 million	Boundaries are guided by watersheds but aligned to counties; each region has an ongoing advisory group.
Texas	16	269,000	26.4 million	Boundaries are guided by watersheds but aligned to county borders.
Utah	11	85,000	2.9 million	Regions are organized by 11 major hydrologic basins.
<i>Population-based on 2013 census. Square miles based on total area (not total land). Both rounded.</i>				

Appendix H: N.M. Region Maps, Defined by Groups Other Than Water Planners

Water planning is fundamentally connected with other state efforts including economic development, councils of government (COGs), public health, environment, transportation, broadband – not to mention water rights. All these entities divide the state into different regional boundaries. From as few as three regions to as many as seven, these maps demonstrate common approaches to dividing the state when not considering hydrologic boundaries.

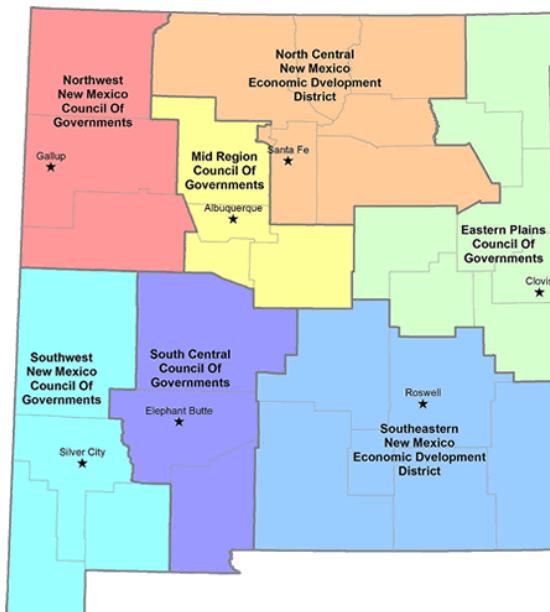


Figure 19: N.M. Council of Governments Districts

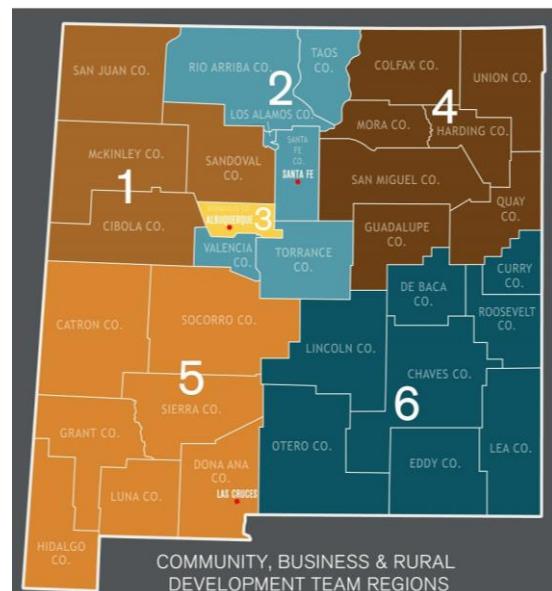


Figure 20: N.M. Economic Development Department Regions

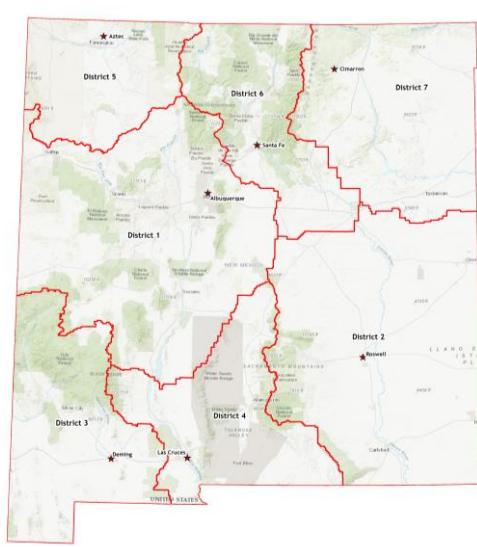


Figure 21: N.M. OSE Administrative Districts

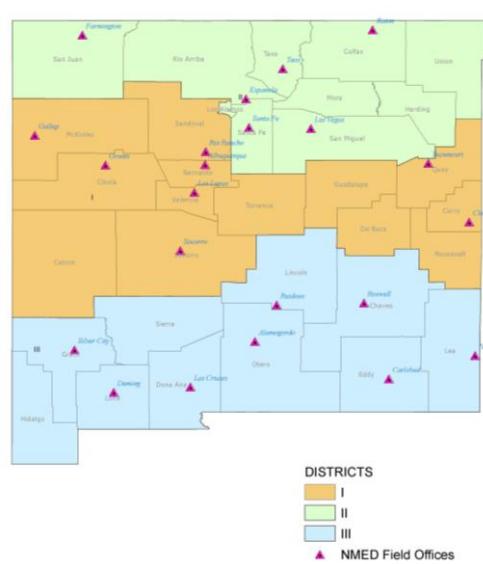


Figure 22: N.M. Environment Department Districts

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