

Climate Change & Water

Is New Mexico Vulnerable?



**A Background Report for
Public Forums on Water Policy**

Forums Sponsored by:

National Commission on Energy Policy and the
New Mexico Office of the State Engineer

Forums Convened by:

New Mexico First

Dates & Locations of 2007 Forums

Las Cruces: September 17

Roswell: September 18

Farmington: September 24

Albuquerque: September 25

Las Vegas: September 26

Forward

This issue guide was produced to support the September 2007 citizen discussions on water policy in New Mexico. These forums are sponsored by the National Commission on Energy Policy and the New Mexico Office of the State Engineer.

Event Sponsors

The **New Mexico Office of the State Engineer** is charged with administering the state's water resources. The State Engineer has authority over the supervision, measurement, appropriation, and distribution of all surface and groundwater in New Mexico, including streams and rivers that cross state boundaries. The State Engineer is also Secretary of the Interstate Stream Commission.

The **National Commission on Energy Policy** is a bipartisan group of 20 of the nation's leading energy experts – representing the highest ranks of industry, government, academia, labor, consumer and environmental protection. The commission has produced a consensus energy plan that aims to enhance American national security, strengthen the U.S. economy, and protect the global environment and public health. The commission identifies and addresses the political and analytical barriers that have obstructed previous efforts at energy policy reform. By taking a bipartisan approach, and seeking to connect the expertise and objectivity of scientific research with political realities, the commission seeks both to build on and distinguish itself from past energy policy efforts.

Event Convener

New Mexico First is a nonpartisan, nonprofit organization that engages citizens in public policy. Co-founded in 1986 by U.S. Senators Pete Domenici (R-NM) and Jeff Bingaman (D-NM), the organization brings people together for two- and three-day town hall meetings as well as one-day forums. These events use a unique consensus-building process that enables participants to learn about a topic in depth, develop concrete policy recommendations addressing that topic, and then work with fellow New Mexicans to help implement those recommendations with policymakers.

The Town Hall Process

New Mexico First forums are not typical conferences. There will be a few guest speakers to help set the context, but the bulk of the forum is comprised of small group discussions among citizens who care about the topic. Using **New Mexico First's** proven process, these forums will ask participants to share their best ideas for managing New Mexico's water resources.

To see what recommendations and ideas these forums provided, please see the final report, available through www.nmfirst.org after November 1st.

This Report

There are few right or wrong answers, and these problems are complex. As a result, no brief explanation of the situation – including this report – can hope to cover all the information and opinions available. Ultimately the people of New Mexico must decide what all the players should do or not do.

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Introduction: The Purpose of These Forums

Throughout the nation and around the world, people are increasingly concerned about climate change. New Mexico is an arid state that already faces significant challenges to our water resources due to our variable climate and growing population. Many New Mexicans are wondering just what all the talk about climate change means for our state.

To address these questions – and to discuss possible solutions – regional forums are being held throughout the state. These forums are not intended to be debates about the science of climate change, carbon reduction, or ways to reduce future global warming. Those matters are being discussed elsewhere. Instead, these local forums will provide a practical conversation about how New Mexico can respond to potential water shortages that may already be underway. This is a conversation about risk-management – about how best to plan for the future.

In this report, we are using the terms *climate change* and *global warming* interchangeably to describe changes in the global climate that have been noted in recent decades. *Global warming* is the term that the media often uses, but *climate change* is more accurate, given that not all parts of the world are experiencing warming and that many other climate factors show change as well.

Different people have different views about climate change. However, most New Mexicans agree that water is our most precious resource. Republicans and Democrats agree that it is prudent to discuss how we should adapt to potential water shortages. You and the other participants in the forums will help develop common sense recommendations to help better manage New Mexico's water resources, as well as to adapt to potential changes in New Mexico's climate.

This report will discuss what the scientific research indicates for New Mexico, including potential impacts on the business community, farmers and ranchers, and water users in general (whether they are residential, commercial, or industrial), as well as our rivers, forests, rangelands, and wildlife.

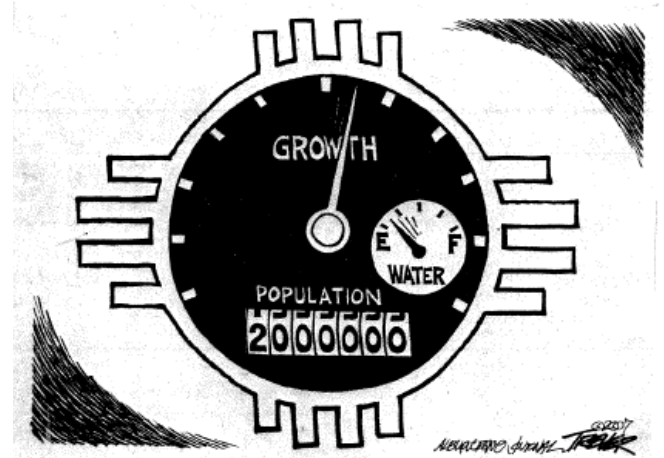
During the forum, participants will have the opportunity to talk about how these issues might affect their part of the state and to suggest possible action steps for addressing them. These suggestions will be given to the Office of the State Engineer for consideration as it reviews and revises

the State Water Plan, as well as to the Governor, the Legislature, and other policymakers working to create a sustainable water supply that insures New Mexico's quality of life and economic vitality.

New Mexico's Challenge: Limited Water

Water management is traditionally a larger challenge in New Mexico than in many other parts of the world. Within a single year, water is sometimes quite scarce and other times too abundant. Its availability varies dramatically between years. Add in rising temperatures and the remarkable population growth the state has seen in our urban areas, and the stress on our water resources rapidly worsens.

More water is being consumed in our region than is naturally available, which means we are depleting ground water resources¹. This is equivalent to overspending our checking account and starting to dig into savings.



2

New Mexico takes part in nine separate interstate agreements, regulating the distribution of water sources that cross state boundaries. The state's use of water from the Rio Grande, for example, is governed by the Rio Grande Compact. New Mexico is required by the compact to provide a certain amount of water to Texas every year; the exact amount that Texas gets depends on streamflow that passes the Otowi gauge near Los Alamos. During dryer years,

¹ U.S. Geological Survey, *Water Availability in the Western United States*, Circular 1261, Figure 21. Available at pubs.usgs.gov/circ/2005/circ1261/pdf/C1261.pdf

² Editorial Cartoon by Trever, published in the Albuquerque Journal, July 3, 2007.

New Mexico and Texas share the burden of the drought via the compact. In high flow years, the extra amount of water in the river all must be delivered to Texas.

While that division of water remains constant, much else has changed. The southwestern U.S. has seen a remarkable population boom in recent years, and Rio Rancho, NM is one of the fastest growing cities in the nation. The U.S. Census bureau estimates that New Mexico's population has grown almost 7.5% since 2000³ – with about 2 million people calling the state their home – and the growth trend shows no sign of slowing. According to the Bureau of Business and Economic Research, the state will have more than 500,000 new residents by 2030, bringing our total population to 2,626,000⁴. These new residents are contributing to the state's productivity and economic growth, while at the same time tapping our water resources.

What all this means is that water management is an issue that should be of interest to all New Mexicans, simply because it truly affects the way we go about our daily business and prepare for our future. New Mexico currently has relatively limited water available to meet the growing demand, and all predictions indicate that the supply of water resources will only decline in the future.

These limitations are fairly common knowledge throughout New Mexico. No one argues that water is not a challenge here. The state maintains water and drought task forces to deal with the recognized issues. 2007 was even declared "The Year of Water" by Governor Richardson. Still, though roughly 130 bills related to water went to the legislature in the most recent session, only a few became law. Most water related projects were funded at levels significantly below the budget requests⁵.

³Table 1: Annual Estimates of the Population for the United States and States, and for Puerto Rico: April 1, 2000 to July 1, 2006 (CSV). *2006 Population Estimates*. U.S. Census Bureau, Population Division (2006-12-22). Retrieved on 2007-01-08 from www.census.gov/popest/states/tables/NST-EST2006-01.csv.

⁴ Bureau of Business and Economic Research, University of New Mexico. Released April 2004. Accessible at www.unm.edu/~bber/demo/table1.htm

⁵ Paskus, Laura. "The Big Suck," Santa Fe Reporter, April 4, 2007. Retrieved from sfreporter.com/articles/publish/cover-040407-the-big-suck.php.

All of these water challenges exist now, even without climate changes. When a warmer climate is added to the mix, the picture becomes even more difficult to manage.

The Past and Present: How Does the Climate Already Affect New Mexico?

History's Lessons: Modern-Era Droughts

Even without definite impacts from global warming, New Mexicans are no strangers to changes in climate. Many local residents still remember the drought of the 1950s. This experience was actually fairly normal by historical averages⁶. Figure 1 uses tree-ring data to map the average precipitation for northern New Mexico over the last thousand years as a thick black line, and the jagged blue line maps how every decade's rainfall compares to that average. The table shows that New Mexico has experienced relatively wet years in recent decades. The tree ring record warns us that this wet spell is unusual and that we should anticipate a much drier future climate.

The jagged blue line, the precipitation for any given decade, dips down below 1950s levels several times, with several long droughts more severe or longer-lasting than the 1950s drought. Given these data, it seems reasonable to assume that similar conditions are likely to occur again at some point. Variations in precipitation are just a part of New Mexico's climate.

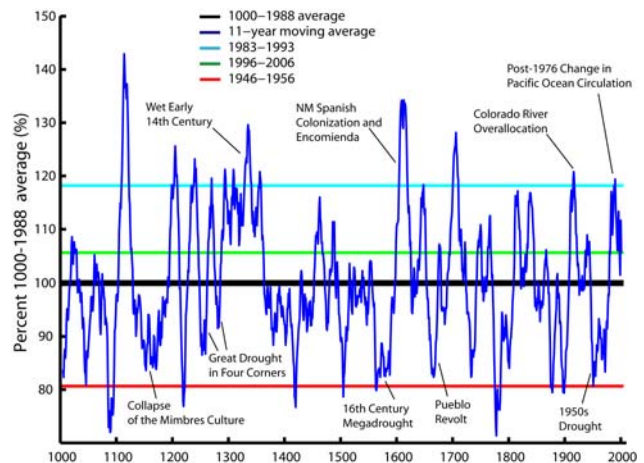


Figure 1: Precipitation in New Mexico over 1,000 years, showing that precipitation naturally varies dramatically.

⁶ Fleck, John. "Drought Reigns in NM History," *Albuquerque Journal*. Available at www.abqjournal.com/2000/1mill5-27.htm

Precipitation isn't the only part of our climate that has an impact on the state. The early years of the 20th century were a bit cooler than they had been, but a warming trend began around the time of the drought years of the 1950s. Up until the 1960s, summer temperatures were rising, while winters were staying cool; since then, temperatures have been rising year-round. New Mexico's climate is now warmer than at any time in the 20th century, a result of the warming trend that's been observed both in New Mexico and globally during the late 20th century and which continues today.

Recent Observations

Temperature

When long-time New Mexicans comment that the weather sure has changed over their lifetimes, they are right. Eleven of the last 12 years rank among the 12 hottest globally since record-keeping began in 1850. The hottest year on record was 2005, followed by 1998, 2002, 2003, and 2006⁷. Utility companies report that New Mexicans are heating their houses less in the winter, but cooling their homes significantly more during the summer, confirming what the thermometer tells us.

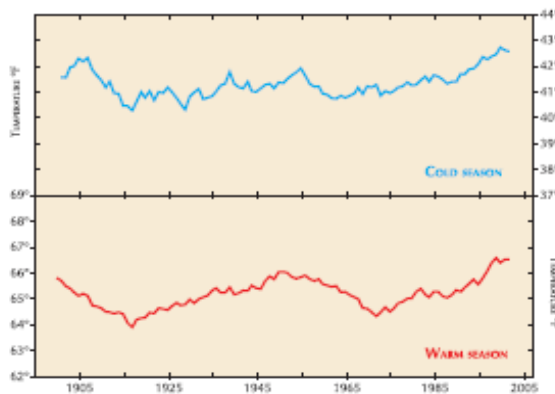


Figure 2: Average daily temperatures in New Mexico, 1900-2007. “Cold season” is October-March. “Warm season” is April-September.

It is worth mentioning that New Mexico's observed temperature change so far is about twice what the Earth as a whole has seen over the past century. In other words, New Mexico's temperature has risen

⁷ From National Climatic Data Center Climate of 2006 - Annual Report. Available at www.ncdc.noaa.gov/oa/climate/research/2006/ann/global.html

more than most other places on Earth. This makes sense, because big bodies of water tend to heat up more slowly than land areas, so inland New Mexico experiences more rapid warming than oceans and coastal regions do.

Drought

It is not just the temperature that has changed. The last 20 years have been roughly 23% wetter than the state's average over the past millennium. Recent years that have been commonly labeled as “droughts” are not particularly dry compared to the historical record; for example, 1989 was actually 20% wetter than the estimated 1,000-year average in the state⁸. But while it's been overall wetter, we're seeing more variability.

The mountain snowpack in 2006 was remarkably low, with 22 of 30 recording stations at record lows on March 1st. Three of these sites had no snow at all for the first time in their history⁹. And while dry years don't necessarily directly cause more wildfires, we tend to have more fires during prolonged droughts.

Extreme Weather

Across the country, other climate changes are being noted. The percentage of the continental U.S. that is experiencing extreme climate conditions – measuring temperature and precipitation – has been generally increasing since the 1970s¹⁰.

What Does It All Mean?

Here in New Mexico, we can use our own experience to see that climate has a huge impact on our lives. Changes in what we think of as the “normal” climate seem to demand changes in the way we live.

Knowing how variable our climate has been, and what impacts this has had on the availability of water for our homes, our farms, and our businesses, planning for the increased variability anticipated due to future climate change becomes a necessity.

⁸ Fleck, John. “Drought Reigns in NM History,” *Albuquerque Journal*. Available at www.abqjournal.com/2000/1mill5-27.htm

⁹ Data provided by the Natural Resources Conservation Service.

¹⁰ From NOAA's National Climatic Data Center. A graph of the most current Climate Extremes Index may be viewed at www.ncdc.noaa.gov/oa/climate/research/cei/cei.html.

The Future: What Is Projected For New Mexico's Climate?¹¹

Climatologists say that New Mexico's climate will probably continue to warm in coming decades, with corresponding impacts on water availability. The following table presents a simple overview of the potential changes in climate, potential impacts on our state and economy, and potential coping strategies. While a range of models have been produced showing slightly different outcomes, the likelihoods in this table are based on a fairly average model.

	Temperature	Precipitation/Snowpack	Extreme Events
Potential Changes	<ul style="list-style-type: none"> ▪ Significantly warmer, but with considerable uncertainty surrounding how much, and how fast, temperatures will increase. ▪ New Mexico may warm by approximately 5F in winter, and 8F in summer, by 2100¹². ▪ Models vary in terms of how quickly the temperature will rise and how effective mitigation measures might be. 	<ul style="list-style-type: none"> ▪ Greater range of extremes in summer precipitation possible – both severe droughts and intense floods. ▪ Increased probability that snowfall will melt earlier. ▪ Snowpack could exist in higher elevations only, with potentially no snowpack south of Santa Fe. 	<ul style="list-style-type: none"> ▪ Increased likelihood of forest fires, floods, and dust storms. ▪ The potential for a higher probability of outbreaks of diseases that are carried by insects or rodents (hantavirus, West Nile, plague, etc.)¹³.
Potential Impacts	<ul style="list-style-type: none"> ▪ Plant species will likely change, as those that can't stand the heat die off and those that like it thrive. ▪ Probably more insects, since winters may not be cold enough to kill them. ▪ Probable increase in evaporation of surface water, causing decreases in soil moisture. 	<ul style="list-style-type: none"> ▪ Soil is likely to be drier, due to higher temperatures and more evaporation. ▪ Likely reduction in water supply throughout the southwest, including New Mexico. ▪ The timing and amount of the water supply throughout the west will probably change, requiring water managers to change their tactics and strategies. ▪ Snow-fed rivers in New Mexico are projected to receive significantly less water from high-elevation sources in Colorado, but interstate stream compacts will retain the current legal requirements for downstream delivery. 	<ul style="list-style-type: none"> ▪ More soil erosion likely in forested areas, as wildfires remove vegetation. ▪ Increased risk to lives and property from extreme events.
Potential Adaptation Strategies	<ul style="list-style-type: none"> ▪ Gather more detailed data about water issues for use in planning ▪ Improve coordination of water management efforts ▪ Improve integrated regional water planning ▪ Improve our water management infrastructure ▪ Enforce the State Water Plan's provisions ▪ Increase and diversify water storage capacity ▪ More statewide water conservation programs ▪ Change planning processes to incorporate climate change ▪ Develop new sources of water (through desalinization, etc.) ▪ Increase flexibility of use (temporary transfers of water) ▪ Better joint use of groundwater and surface water (for storage, for buffering drought) 		

¹¹ Unless otherwise specifically noted, the predictions in this table come from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report, the most complete and quantitative assessment of climate change, written by 152 coordinating lead authors from over 30 countries and reviewed by over 600 experts.

¹² From Martin Hoerling of the NOAA Earth System Research Lab

¹³ *Potential Effects of Climate Change in New Mexico*, p. 32-35.

Potential Impacts by Sector

If predicted climate change impacts occur, New Mexico's economy and culture will be influenced in various ways. Changes may be abrupt, rather than continuous and gradual.

Agriculture

Impacts on agriculture are highly dependent on whether precipitation (especially snow) increases or decreases, meaning that the conditions under which farmers and ranchers work would be more likely to become unstable from year to year. This would make agriculture an even more risky industry, because so much of a farmer or rancher's success depends on successful management of weather events. Models show that the soil will likely become dryer. Also, higher temperatures can reduce livestock weight gain.

Higher temperatures would lengthen the frost-free growing season, but more summer high heat could damage crops. Severe drought combined with higher temperatures would adversely affect crop and rangeland production. Warmer conditions may also help some insects thrive, requiring new strategies for pest control.

Agriculture in New Mexico is a \$1.6 billion industry, two-thirds of which comes from livestock. One-half of the farmed acres in New Mexico are irrigated, and projected climate change could reduce wheat crop yields by 10-30% as temperatures rise to be more than the wheat can handle¹⁴. At least one study projects direct economic losses of up to \$100 million to New Mexico agriculture by 2080.¹⁵

Mining

The mining industry is very susceptible to flooding, and changes in precipitation may require them to implement more permanent flood-control measures, while reducing the water actually available to them for the production process. This would make mining more costly and less efficient. Mining operations also often store the water they use in open reservoirs,

which may experience significantly more evaporation¹⁶.

Energy

The capacity of power lines for energy transmission goes down as temperatures rise, meaning that on the hottest days when energy consumption is at a peak, the system is stressed¹⁷.

Energy industries may feel the impact of changes in public policy around climate change issues. Measures to limit the amount of carbon released into the air may make coal, oil, and natural gas more expensive, thus reducing demand¹⁸.

Tourism/Natural Ecosystems

Significant impacts are likely for New Mexico's forests, grasslands, deserts, lakes and streams, although specific predictions are difficult because of the complexity in natural systems. Lakes and rivers will likely shrink, and habitat for coldwater fish (such as trout) will decrease as temperatures rise¹⁹. On land, many species will likely move farther north or to higher elevations as temperatures rise, and some may face extinction²⁰.

Less snow-pack in the mountains (see Figure 3 for illustration) is likely to reduce the opportunities for winter sports such as skiing and snowboarding²¹. One model predicts that Taos Ski Valley will lose 89% of the snow-pack that it currently offers, essentially putting it out of business as a ski resort²². Ski areas that remain open may have to deal with a significantly shorter winter sport season.

¹⁴ *Potential Effects of Climate Change on New Mexico*, p. 15-16.

¹⁵ *Climate Change and Its Implications for New Mexico's Water Resources and Economic Opportunities*, July 2007, Hurd, Brian and Coonrod, Julie. Report to National Commission on Energy Policy.

¹⁶ *Preparing for a Changing Climate*, p. 37, available at www.ispe.arizona.edu/library/publications/reports/swassess/complete.pdf

¹⁷ *Preparing for a Changing Climate*, p. 49, available at www.ispe.arizona.edu/library/publications/reports/swassess/complete.pdf

¹⁸ *Preparing for a Changing Climate*, p. 50.

¹⁹ *Potential Effects of Climate Change on New Mexico*, p. 19.

²⁰ *Potential Effects of Climate Change on New Mexico*, p. 25.

²¹ U.S. Department of the Interior. *Water: The Potential Consequences of Climate Variability and Change for the Water Resources of the United States*. Available at www.gcrio.org/nationalassessment/water/water.pdf.

²² "2006 State of the Rockies Report Card" Colorado College. "2006 Colorado College State of the Rockies Report Card". Retrieved from www.coloradocollege.edu/stateoftherockies/06ReportCard.html.

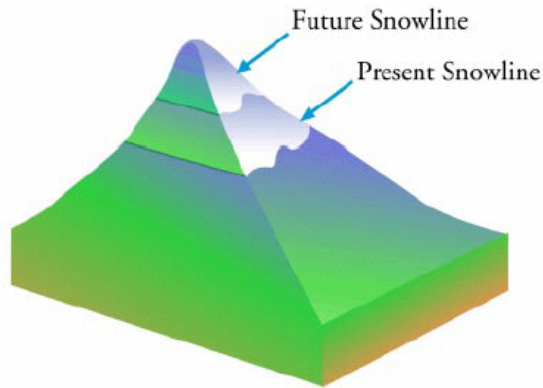


Figure 3: The snowline on mountains may retreat to a higher elevation.

Lower lake and river levels will hinder sports such as boating, fishing, and whitewater rafting. Increased periods of high forest fire danger may also restrict access for camping, hiking, hunting, and other outdoor activities. Air pollution could increase, damaging the attractiveness of our scenic vistas²³.

Almost 90,000 New Mexicans have jobs that are related to tourism, with \$984 million in tourism earnings by businesses in 2006²⁴, meaning that impacts to these activities would likely have a significant economic impact on the state.

Quality of Life Issues

Air pollution is likely to increase, as higher temperatures and more stagnant air increases smog levels, aggravating asthma and chronic lung diseases. New Mexico already has three areas that have nearly exceeded federal standards for air quality – Rio Rancho, Sunland Park (adjacent to El Paso), and San Juan County – and these areas may eventually be unable to meet federal standards for air quality. Wildfires and dust storms (associated with drought) are likely to increase particulates in the air, further worsening air quality²⁵ as well as increasing the number of road and highway closures due to blowing dust.

²³ Potential Effects of Climate Change on New Mexico, p. 29.

²⁴ State of New Mexico. Travel Economic Impact Model, 2006. Retrieved from www.newmexico.org/MEDIA/RESEARCH/economic-impacts/Economic%20Impact%20FY2006.pdf

²⁵ Potential Effects of Climate Change on New Mexico, p. 30.

Heat waves are projected to become more severe and much more frequent, resulting in more heat-related illnesses and deaths, particularly in urban areas. Average daily maximum temperatures that are now exceeded only on the hottest 18 days of the year are projected to be exceeded on 60-70 days per year²⁶.

New Mexico's population growth could be significantly limited by the amount of water available to municipalities. New Mexico's rivers are depleted by evaporation and withdrawals by people, both of which are anticipated to increase, at the same time that the snowpack feeding the river is expected to decrease.

Our Task: What to Do?

Key Definitions:

Adaptation:	Changes made by nature or people in response to climate change (such as water storage or conservation)
Conservation:	The management of human and natural resources to provide maximum benefits over a sustained period of time
Mitigation:	The reduction of heat-trapping greenhouse gas emissions into the atmosphere (such as increasing energy efficiency or adopting alternative energy sources such as wind or solar power)
Vulnerability:	The extent to which a natural or social system is susceptible to sustained damage from weather extremes and climate variability or change

While *mitigation* strategies would reduce the likelihood or severity of adverse conditions, *adaptation* strategies will also be needed to reduce the severity of potential impacts. Even with the most aggressive mitigation strategies, experts believe that some future change in climate is inevitable.

Our task in these forums is to consider potential adaptation strategies – what do New Mexicans need to do in order to be able to respond to potential changes in the environment?

Currently, a number of public water management projects are underway that could be affected by changes to what now seems “normal” on New Mexico's rivers. For example, the state has spent approximately \$9.6 million over the last four years maintaining the Rio Grande's river channel, which has

²⁶ Potential Effects of Climate Change on New Mexico, p. 31.

improved New Mexico's ability to meet its Rio Grande Compact delivery obligations to Texas. This river channel maintenance program was designed around the Rio Grande as it is today.

This program is just one of many water projects around the state. Between 2003 and 2007, New Mexico appropriated and spent nearly \$400 million on water projects, nearly all of which assume that the water management picture will remain fairly stable. However, if the climate changes, that picture is likely to change as well, which could jeopardize these investments of public funds.

Increased variability in stream flows may also lead to increased conflict and competition among water users. These conflicts are already underway. For example, the 1999 litigation that required the state to provide enough water to sustain the silvery minnow pitted environmentalists against farmers against municipalities is not yet finally resolved²⁷.

The New Mexico State Water Plan

There are a number of state, regional, and watershed-level management plans that provide an existing vehicle for looking at adaptation strategies.

In 2003, New Mexico created the State Water Plan, at the direction of the Governor and the Legislature. It provides a comprehensive list of policies and strategies to guide management of our water resources. When it was written, climate change was not addressed because it was just beginning to surface as a critical issue. The State Water Plan is nearly five years old and due for its required review and update.

Ten basic statewide fundamental priorities, goals, and objectives guide the Plan. This list is not presented in any particular order.

1. Ensuring that water is available for the continued and future economic vitality of the state;
2. Ensuring a safe and adequate drinking water supply for all New Mexicans;
3. Developing water resources to expand the available supply;
4. Promoting conservation and efficient use of water;
5. Promoting drought planning;

6. Protecting, maintaining, and enhancing the quality of the state's waters;
7. Providing for fish and wildlife habitat preservation and maintenance and for river restoration;
8. Maintaining and enforcing interstate stream compact compliance;
9. Preserving state administrative authority over the state's waters; and
10. Determining who has the rights to water and in what priority order.

Water Conservation Measures

While the State Water Plan discusses water management on a policy level, there is a wide range of ways that average citizens and business leaders can support water conservation.

Case Studies

New Mexicans are already beginning to adapt to the changes they've observed. Here are a few examples.

Factory Making Fuel From Manure

A new biogas plant is slated to be built in rural Clovis, NM, employing 250 people. The company plans to extract methane gas from cow manure, clean the gas, and produce 200,000 tons per year of alternative fuel to power generators, provide heat or produce soil amendments. The factory is expected to reduce methane gas emissions and improve the quality of groundwater, while re-using about 600,000 gallons of wastewater per day from the Southwest Cheese plant.

Development Harvesting Water

The developing Mesa Del Sol community in southeast Albuquerque designed into its master plan water retention, detention, and diversion systems to catch rainfall. The water is being collected from roofs and parking lots, and some of it is stored in underground cisterns and ponds. This water will be used to irrigate landscaping and public open space, including parks and trails.

What other potential strategies might be recommended? Here is a list of a few options that might start the conversation:

State and Local Government

- Know what we need:

²⁷ This information was provided by Estevan Lopez, Director, Interstate Stream Commission.

- Clarify ownership and priority rights to use water throughout the state.
- Support research to establish water needs for endangered and threatened species.
- Know what we have:
 - Conduct regular, thorough inventories of the quantity and quality of water supplies.
 - Coordinate efforts among all water-managing groups (acequias, state and local governments, utilities, and irrigation and conservancy districts).
- Expand our resources:
 - Develop desalinization and water treatment/reuse projects.
 - Restore watersheds to improve water quality and quantity, as well as wildlife habitat.
- Encourage and enforce sound water policies:
 - Support investments in community water harvesting projects that reclaim rainwater and “grey water” for irrigation, schools, golf courses and other public uses.
 - Provide tax incentives to businesses that initiate major conservation activities (such as xeriscaping or green design).
- Develop plans that protect New Mexicans in the wake of extreme events:
 - Maintain migration corridors for at-risk natural species, to allow them to travel to areas where they can find appropriate habitats.
 - Develop water banks and water markets to transfer water to parts of the state in need.
 - Require drought contingency plans for all water providers.

Individuals and Households

- Use rain barrels to collect water that drains from your roof to irrigate your lawn.
- Install water-efficient plumbing fixtures in your home (dual-flow toilets, low-flow showerheads, and water-efficient dishwashers and washing machines).
- Check your home or business for leaks in sinks, tubs, or toilets that may be wasting water.

The Business Community

- Encourage new construction to employ high-efficiency irrigation or use captured rain or recycled site water.
- Install water-efficient plumbing fixtures.

The Forums

Hopefully, this issue guide will have helped you to see how climate change may affect water shortages in New Mexico – and some concrete things we can do about it. Water policy is an enormously important issue for the state, and citizen voices must be heard when making important decisions. Through these forums, you will have your chance to have your views heard by state government as they make their plans.

Where can I learn more about climate change and its impacts?

New Mexico Office of the State Engineer's report on The Impact of Climate Change on NM's Water Supply and Ability to Manage Water Resources:

www.nmdrought.state.nm.us/ClimateChangeImpact/completeREPORTfinal.pdf

New Mexico Office of the State Engineer's report on The Potential Effects of Climate Change on NM:

www.nmenv.state.nm.us/aqb/cc/Potential_Effects_Climate_Change_NM.pdf

Intergovernmental Panel on Climate Change: www.ipcc.ch

NASA's Earth Observatory: Earthobservatory.nasa.gov

National Oceanic and Atmospheric Administration: waf.ncdc.noaa.gov/oa/climate/globalwarming.html

The National Space Science and Technology Center: www.nsstc.uah.edu

U.S. Chamber of Commerce: www.uschamber.com/issues/index/environment/climatechange.htm

U.S. Climate Change Science Program: www.climatechange.gov

Resources: Current Federal Administration

U.S. Department of Energy www.energy.gov/environment/climatechange.htm

U.S. Environmental Protection Agency www.epa.gov/climatechange

U.S. Geological Survey: www.usgs.gov



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