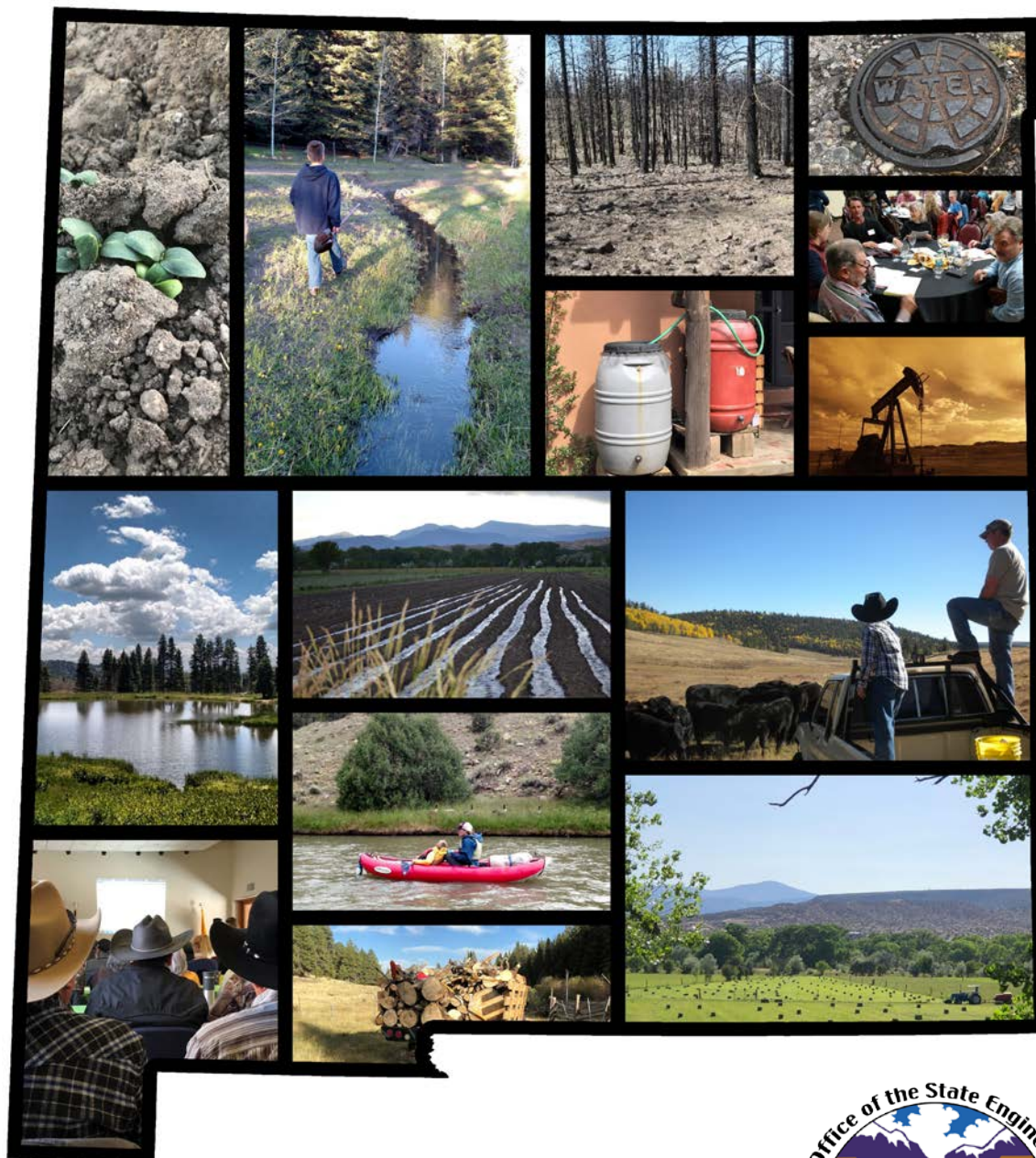


NEW MEXICO STATE WATER PLAN

PART I: POLICIES

Gaining a Statewide Perspective through Analysis and Integration of Water Planning Activities, Including New Mexico's 16 Regional Water Plans



*Adopted by the New Mexico Interstate Stream Commission
December 6, 2018*



New Mexico State Water Plan Part I: Policies

Prepared by the New Mexico Interstate Stream Commission



Published 2018

The 2018 New Mexico State Water Plan is presented in three parts:

Part I: Policies presents a concise, big-picture view of the highest priority water issues in New Mexico and the policies, goals, and strategies needed to address them, as well as information about the agencies and resources available to assist with these issues.

Part II: Technical Report integrates water resource information from the Regional Water Plans completed in 2016-2017, including estimated water supply and demand, projections of population, and strategies proposed by stakeholders to address key water issues.

Part III: Legal Landmarks provides information about historical New Mexico water law decisions, events, and circumstances that shaped New Mexico's legal structures for water resource administration.

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List of Acronyms and Abbreviations

AWRM	Active Water Resources Management
BIA	United States Bureau of Indian Affairs
CDC	Center for Disease Control, United States
DHSEM	Department of Homeland Security and Emergency Management
FEMA	Federal Emergency Management Agency
GIS	geographic information system
gpcd	gallons per capita per day
ISC	New Mexico Interstate Stream Commission
NGO	non-governmental organization
NASS	National Agriculture Statistics Service
NEPA	National Environmental Policy Act
NMBGMR	New Mexico Bureau of Geology and Mineral Resources
NMDFA	New Mexico Department of Finance and Administration
NMAC	New Mexico Administrative Code
NMDA	New Mexico Department of Agriculture
NMDGF	New Mexico Department of Game & Fish
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environment Department
NMEMNRD	New Mexico Energy, Minerals, and Natural Resources Department
NMFA	New Mexico Finance Authority
NMSU	New Mexico State University
NIDIS	National Integrated Drought Information System
NMWQCC	New Mexico Water Quality Control Commission
NRCS	Natural Resources Conservation Service
NOAA	National Oceanic and Atmospheric Administration
NWIS	National Water Information System
NWS	National Weather Service
NMWRRS	New Mexico Office of the State Engineer Water Rights Reporting System
ONRT	Office of the Natural Resources Trustee
OSE	New Mexico Office of the State Engineer
PPP	Projects, Programs, and Policies
PWS	public water system <i>or</i> public water supplier
SLO	New Mexico State Land Office
SNOTEL	Snow Telemetry
STORET	USEPA Water Quality Database (STORage and RETrieval)
SWCD	Soil and Water Conservation Districts
URGWOM	Upper Rio Grande Water Operations Model
USBOR	United States Bureau of Reclamation
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service
USFSA	United States Farm Service Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
USIBWC	International Boundary and Water Commission
USR	Underground Storage and Recovery
WIPP	Waste Isolation Pilot Plant
WRRI	New Mexico Water Resources Research Institute
WWTP	Wastewater Treatment Plant

Introduction

New Mexicans are actively restoring and protecting water resources, as well as planning for future water demand and climatic conditions. Supporting the culture and ecosystems within the state, protecting existing supplies, meeting future water demands, and enhancing water system and watershed resilience in light of changing conditions are goals to guide management of the state's water resources.

The actions required to achieve these goals are vast, complex, ambitious, and infinitely worthwhile. Many of the strategies for meeting the goals for managing our water resources are already in place, while other strategies need much more work to be realized.

Purpose of the 2018 New Mexico State Water Plan Part I: Policies

This *2018 New Mexico State Water Plan Part I: Policies* presents a concise, big-picture view of the highest priority water issues in New Mexico, along with the policies, goals, and strategies needed to address them, as well as information about the agencies and resources available to assist with these issues. These policies reflect the water resource issues and proposed strategies that were identified in the regional water planning process and in the 2017 State Water Plan Town Hall.

The 2016-2017 Regional Water Plan updates, representing the 16 water planning regions of New Mexico, provided information regarding key water issues, recommendations to the state, and over 2,600 regional suggestions for projects, programs, and policies (PPPs); in addition, the 2017 State Water Plan Town Hall identified 33 recommendations. The greatest concerns and proposed actions for each policy topic have been synthesized from these sources. Identified issues and strategies were compiled and organized by their objectives to identify the common priorities that arose from these public outreach and regional planning efforts.

Policies were selected for the eight topics that repeatedly appeared in stakeholder meetings, regional water planning, and the town hall event. This document can be used by decision-makers and individuals seeking to better understand rules and regulations and government agencies tasked with managing and protecting New Mexico's water resources. It is also designed to be helpful in identifying resources for specific water issues and for pursuing funding opportunities.

While the 2003 plan was organized by each statement in the State Water Plan Act, the 2018 plan is organized by objectives that arose from the regional water plans and the 2017 Town Hall. The objectives and strategies presented in the 2003 plan remain valid and are consistent with the policies included in this 2018 plan. Accordingly, the eight policy topics presented in the 2018 plan are complementary to, and not intended to replace, policies from the 2003 plan.

Overview of Policies

The highest priorities for the state are presented here, organized into eight policy topics, along with a brief summary of the key findings.

1. Water Infrastructure Policy

The state of New Mexico has significant water infrastructure repair and improvement needs for both the agricultural and public water use categories. These needs should be conveyed at the federal level to maximize federal matching funds while efficiently utilizing available state and local funding.

2. Data Collection, Accessibility and Monitoring Policy

The state of New Mexico needs to continue its steady improvement in measurement and estimation of water diversions, depletions, and return flows. In addition, the state should develop or expand the existing databases and create a centralized platform for managing measured or metered water diversions. The state of New Mexico also needs to continue to coordinate with multiple agencies to determine data gaps in monitoring networks, update surface water and

groundwater models, and consider other needs for centralizing water resources data. The process of developing the 2018 New Mexico State Water Plan was helpful in strengthening this interagency coordination.

3. Drought

The state of New Mexico needs to continue to monitor and assess drought conditions, as well as promote and incentivize the development of drought mitigation and response plans by local, state, and tribal agencies in the state.

4. Watershed Management

The state of New Mexico and tribal, federal, and private land managers should intensify efforts to manage forests, rangeland, urban, and riparian areas in order to improve resilience to drought, fire, and severe storm events. Funding entities such as the New Mexico Legislature should prioritize funding for planning and implementing forest treatments, particularly in watersheds that impact streams which supply or deliver surface water to public water systems.

5. Water Supply and Demand

While each public water system, irrigation district, acequia, and other self-supplied water user in the state is tasked independently with managing its own supply as well as forecasting and meeting future demands, the state of New Mexico must manage the resource to protect senior water right holders and to comply with interstate water compacts. The most glaring extreme water supply shortfall is occurring in eastern New Mexico, where some communities are projected to have fewer than five years of water supply remaining at current depletion rates. State and federal agencies should support water supply projects, especially diversions such as from Ute Reservoir, due to the severe dewatering of the High Plains aquifer.

6. Water Conservation

Mechanisms to promote and incentivize water conservation should be explored and implemented by all state, federal, tribal and local governments, public and private water systems, and individual water users. In the agricultural water use category, which is by far the largest water consumer in the state, conservation incentives need to be developed to prevent increased depletions. Water conservation in the agricultural category should be implemented in locations where the hydrologic setting does not result in unintended consequences of reducing the return flow required by downstream users.

7. Water Quality

The agencies and programs in place to protect water quality for humans and the ecosystem should continue to be supported. A funding source should be identified to address lingering contamination in groundwater not covered by the Corrective Action Fund.

8. Water Planning

The New Mexico Interstate Stream Commission (ISC) should continue to conduct water planning through collaboration with state, tribal, and federal agencies, non-governmental organizations (NGOs), and other stakeholders to help move the state forward and improve the outlook for New Mexico's economy, environment, and cultural heritage.

The goals and strategies for each of the policies are numbered primarily for ease of discussion; they are not listed in order of importance or with any intention to connect certain goals to strategies. The strategies discussed here are not an all-inclusive set of solutions to the many water challenges facing New Mexico. Rather, the strategies are recommendations expressed by various stakeholders around the state to address each goal.

Each policy topic also includes an accompanying figure to illustrate some of the statutes, rules, and regulations associated with that water policy topic; as well as the agencies, institutions, and organizations currently working to

implement those rules and regulations. Also, for each policy topic, a table of information is provided about the critical organizations providing regulation, guidance, and/or resources related to the policy topic, including hyperlinks to each agency's website and specific programs or resources, and is intended to serve as a directory.

As part of the dynamic nature of the State Water Plan, the ISC expects further conversation about those priorities and about how they will be applied in concrete situations. This document attempts to capture the existing local, tribal, state, and federal agencies tasked with reaching the goals and implementing the strategies associated with the policy topics.

Each strategy on its own could be worthy of a separate plan, and this document only provides a very brief overview and a road map to finding important information. Going forward, the ISC will convene stakeholders to discuss the policy topics, goals, and strategies and work together to determine how to actively engage in implementing strategies.

[Appendix 1A](#) presents feedback received from reviewers on the type of meetings that would be most helpful in moving forward.

1. Water Infrastructure Policy

Water infrastructure is the backbone for storing and delivering water to New Mexicans and providing protection from floods. The State Water Plan Act at NMSA §72-14-3.1 (C)(13) states that the plan shall “identify water-related infrastructure and management investment needs and opportunities to leverage federal and other funding.”

This infrastructure includes but is not limited to large reservoirs that store water for later use (such as the Navajo and Elephant Butte reservoirs); dams for flood control; river diversion structures, canals, and drains for irrigating agricultural lands; levees that protect homes and land; groundwater wells, pumps, storage tanks, and pipelines for delivering water to cities; sewer lines and systems for treating water from homes and cities, stormwater infrastructure; and much more. This infrastructure is a multi-billion-dollar investment in New Mexico that must be maintained and improved over time.



PHOTO 1. ELEPHANT BUTTE DAM.
PHOTO CREDIT: CHRIS STAGEMAN

Existing infrastructure requires continued repairs, maintenance, and expansion for the storage, conveyance, and delivery of water to the end user. Wastewater effluent must be collected and treated to protect not only downstream communities and groundwater, but also the health of the river systems. Levees, dam safety measures, and stormwater infrastructure are also essential to public safety and welfare.

Infrastructure needs for existing and new public water and wastewater systems, agricultural water systems, reservoir management, levees, and stormwater comprised more than half of the PPPs detailed in the 2016-2017 Regional Water Plan updates (ISC, 2016-2017). Estimated costs for 61% of the projects were provided. Those estimated costs totaled \$4.3 billion. Costs estimated for public water and wastewater systems alone was estimated for 83% of the state's total water infrastructure projects at \$3.1 billion (see [Part II: Technical Report, Section 6.6](#)).

Much of the water infrastructure on New Mexico's major rivers, which many New Mexicans rely on for all or a part of their water supply, was constructed and is operated and maintained by the federal government. Some costs and risks are also borne by the state of New Mexico and its water users.

New Mexico, largely through the ISC and New Mexico Department of Game and Fish (NMDGF), participates in forums and programs with the federal government, designed to aid the federal agencies in their operation of infrastructure projects to meet Endangered Species Act (ESA) and National Environmental Policy Act (NEPA) compliance activities, while reducing the potential impact on water users. These efforts, conducted primarily on the San Juan, middle Rio Grande, and Pecos rivers, require the State to share costs and resources for the system to be maintained.

The numerous organizations involved in designing, building, maintaining, and funding infrastructure projects are shown on [Figure 1](#), along with the legal authorities related to programs that support infrastructure. [Table 1](#) is a directory of critical government agencies which provide funding and/or are responsible for permitting infrastructure projects.

Water Infrastructure Goals

1. Maintain and operate properly functioning water systems.
2. Maintain and operate properly functioning wastewater systems.
3. Develop water and wastewater systems of sufficient capacity.
4. Replace use of potable water for non-potable use with alternative sources, such as treated effluent or desalination of brackish water, when possible and economically feasible.
5. Protect communities from floods.
6. Protect water quality.
7. Protect human health.
8. Reduce costs of infrastructure management.
9. Improve system efficiency, including reducing energy costs to pump water, or treat wastewater, or other actions which reduce costs and improve the delivery systems.
10. Promote equitable investment in water infrastructure.

Water Infrastructure Strategies

1. Promote water efficiency for new water infrastructure projects.
2. Provide funding for water treatment systems.
3. Provide funding for water conveyance systems and storage systems, such as diversion structures for agricultural systems, tanks, and lift stations for public water systems, and/or Underground Storage and Recovery (USR).
4. Support funding for infrastructure to support reuse of wastewater where appropriate.
5. Provide funding for wastewater treatment systems.
6. Provide funding for the Ute Reservoir Pipeline Project, which is critical to providing supply to alleviate the projected deficit for public water systems (PWSs) serving Clovis, Cannon Air Force Base, Portales, Elida, Melrose, Grady, Tucumcari, and Logan (see [Part II: Technical Report](#), Section 3.3).
7. Provide support for regionalized or expanded water systems where appropriate and consistent with the desires and customs of local communities to combine small water systems or domestic wells.
8. Support agricultural infrastructure that reduces water loss where seepage is not the source of supply for downstream users.
9. Provide funding to support dam repairs and maintenance, particularly for the dams identified in [Part II: Technical Report](#), Section 6.6, with high or significant hazard potential in poor condition.
10. Provide necessary funding and staff for state, federal, and tribal inspections of dams.
11. Provide funding for planning and design to improve resilience of stormwater systems.
12. Assist communities and irrigation districts in developing appropriate rate structures or other funding mechanisms to fund infrastructure projects and operations and maintenance.
13. Seek state or local matching dollars to capitalize on federal funding for water infrastructure projects that require a match.
14. Work with water users to develop strategies to manage earlier runoff.
15. Develop priorities for funding infrastructure that considers, at a minimum, life-cycle costs, equity, and ecosystem impacts, and provides sufficient funding to complete projects.

The state of New Mexico has significant water infrastructure repair and improvement needs. Communities in eastern New Mexico need to build the Ute Pipeline to reduce dependence on the declining High Plains aquifer and to supplement concurrent strategies for sustaining this aquifer.

These infrastructure needs should be conveyed at the federal level to maximize federal matching funds while efficiently utilizing limited available local funding. Funding agencies will need to continue to develop priorities for funding infrastructure in ways which consider life-cycle costs and appropriateness, while providing sufficient funding to complete projects.

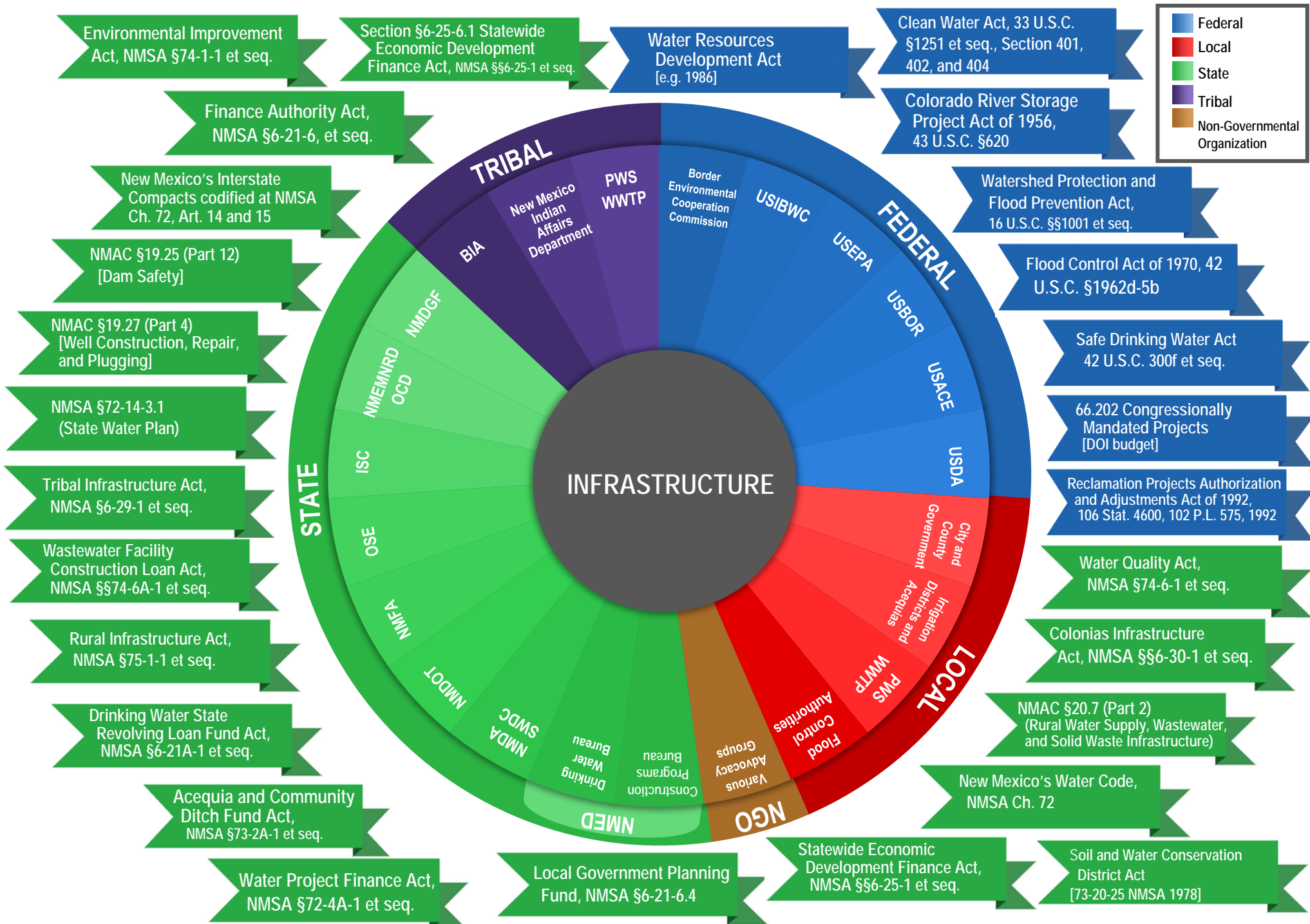


Figure 1. Statutes and Organizations Related to Infrastructure

Table 1. Directory of Organizations Crucial to Providing Support and Oversight of Infrastructure

Infrastructure Type	Funding	Support, Construction, and/or Regulatory Oversight
Public Water Systems	US Bureau of Reclamation WaterSMART Programs <ul style="list-style-type: none"> Title XI Water Reclamation and Reuse Program Water and Energy Efficiency Grants Water Marketing Strategy Grants 	US Bureau of Reclamation <ul style="list-style-type: none"> Manages, develops, and protects water projects and facilities
	NM Environment Department Construction Programs Bureau <ul style="list-style-type: none"> Rural Infrastructure Revolving Fund (mutual domestics and small communities or counties) 	NM Environment Department Construction Programs Bureau <ul style="list-style-type: none"> Administers capital outlay of public water system projects funded by legislature NM Office of the State Engineer <ul style="list-style-type: none"> Water Rights Division (well permitting) Underground Storage and Recovery NM Rural Water Association
	NM Environment Department Drinking Water Bureau <ul style="list-style-type: none"> Drinking Water State Revolving Loan Fund (co-managed with New Mexico Finance Authority) 	NM Environment Department Drinking Water Bureau <ul style="list-style-type: none"> Samples public water systems to ensure safety of water quality Provides board and operator training Conducts water and sewer rate surveys Regulatory oversight of public water systems Technical, managerial, and financial assistance for public water systems NM Environment Department Surface Water Quality Bureau <ul style="list-style-type: none"> Supports US Environmental Protection Agency in Point Source Regulation (wastewater discharge to surface water) (New Mexico does not have primacy for National Pollution Discharge Elimination System permitting)
	NM Finance Authority <ul style="list-style-type: none"> Drinking Water State Revolving Loan Fund (co-managed with NM Drinking Water Bureau) Colonias Infrastructure Project Fund Public Project Revolving Fund Local Government Planning Fund Water Trust Board Water Project Fund 	US Environmental Protection Agency NM Interstate Stream Commission <ul style="list-style-type: none"> Arizona Water Settlement Act for non-NM Unit projects NM Water Infrastructure Team Colonias Infrastructure Board Legislative Oversight Committee Water Trust Board NM Finance Authority Board
	US Army Corps of Engineers <ul style="list-style-type: none"> Water Infrastructure Finance and Innovation Act provides incentives through low-cost federal loans 	US Army Corps of Engineers <ul style="list-style-type: none"> Builds and maintains infrastructure for civil works (water supply, regulatory) Contingency operations (critical infrastructure)
	US Department of Agriculture Rural Development <ul style="list-style-type: none"> Water and Waste Disposal Loan and Grant Program 	US Department of Agriculture Rural Development
	NM Rural Community Assistance Corporation <ul style="list-style-type: none"> Environmental Infrastructure Loan Program 	Rural Community Assistance Corporation <ul style="list-style-type: none"> Training and technical assistance to water and wastewater systems
	Border Environment Cooperation Commission Project Development Assistance Program (water and wastewater)	Border Environment Cooperation Commission <ul style="list-style-type: none"> Administers Border 2020 Program (improve access to clean and safe water and waste management)

Table 1. Directory of Organizations Crucial to Providing Support and Oversight of Infrastructure (Continued)

Infrastructure Type	Funding	Support, Construction, and/or Regulatory Oversight
Public Wastewater Systems	NM Environment Department Construction Programs Bureau <ul style="list-style-type: none"> Clean Water State Revolving Fund (wastewater, stormwater, and non-point source) Rural Infrastructure Revolving Fund (mutual domestics and small communities or counties) 	NM Environment Department Ground Water Quality Bureau <ul style="list-style-type: none"> Groundwater Discharge Plans (wastewater discharge to groundwater)
		NM Environment Department Construction Programs Bureau <ul style="list-style-type: none"> Administer capital outlay of public wastewater system projects funded by legislature
		NM Environment Department Surface Water Quality Bureau <ul style="list-style-type: none"> Supports US Environmental Protection Agency in point source regulation (wastewater discharge to surface water) (New Mexico does not have primacy for NPDES permitting)
	NM Finance Authority <ul style="list-style-type: none"> Colonias Infrastructure Project Fund Public Project Revolving Fund Local Government Planning Fund Water Trust Board funds 	Colonias Infrastructure Board
		NM Finance Authority Board
		Legislative Oversight Committee
	US Environmental Protection Agency <ul style="list-style-type: none"> Funding of State programs 	US Environmental Protection Agency <ul style="list-style-type: none"> Point source regulation (wastewater discharge to surface water)
US Department of Agriculture Rural Development <ul style="list-style-type: none"> Water and Waste Disposal Loan guarantees 	US Department of Agriculture Rural Development	
Border Environment Cooperation Commission <ul style="list-style-type: none"> Project Development Assistance Program (water and wastewater) 	Border Environment Cooperation Commission <ul style="list-style-type: none"> Administers Border 2020 Program (improve access to clean and safe water, waste management) 	
Rural Community Assistance Corporation <ul style="list-style-type: none"> Environmental Infrastructure Loan Program 	Rural Community Assistance Corporation <ul style="list-style-type: none"> Training and technical assistance to water and wastewater systems 	
Tribal Water Systems	NM Indian Affairs Department <ul style="list-style-type: none"> Tribal Infrastructure Fund 	NM Indian Affairs Department
	Bureau of Indian Affairs <ul style="list-style-type: none"> 638 Contracts 	Bureau of Indian Affairs
		US Army Corps of Engineers <ul style="list-style-type: none"> Tribal Nations Program (consults with tribes that may be affected by US Army Corps of Engineers projects/ policies, partner with tribes on water resources)
		US Bureau of Reclamation <ul style="list-style-type: none"> Regional-scale water supply projects

Table 1. Directory of Organizations Crucial to Providing Support and Oversight of Infrastructure (Continued)

Infrastructure Type	Funding	Support, Construction, and/or Regulatory Oversight
Tribal Wastewater Systems	US Environmental Protection Agency <ul style="list-style-type: none"> ▪ Funding of tribal programs 	US Environmental Protection Agency <ul style="list-style-type: none"> ▪ National Pollution Discharge Elimination System permits
	Bureau of Indian Affairs <ul style="list-style-type: none"> ▪ 638 Contracts 	Bureau of Indian Affairs
	NM Indian Affairs Department <ul style="list-style-type: none"> ▪ Tribal Infrastructure Fund 	NM Indian Affairs Department
Agricultural Water Systems	NM Department of Agriculture <ul style="list-style-type: none"> ▪ Agricultural Programs and Resources ▪ Water Quality and Conservation Grant ▪ Regional Conservation Partnership Program 	NM Department of Agriculture
	NM Finance Authority <ul style="list-style-type: none"> ▪ Public Project Revolving Fund ▪ Local Government Planning Fund ▪ Water Trust Board Water Project Fund 	NM Finance Authority Legislative Oversight Committee NM Finance Authority Board
		Water Trust Board
	US Bureau of Reclamation <ul style="list-style-type: none"> ▪ Irrigation projects 	US Bureau of Reclamation
	US Army Corps of Engineers	US Army Corps of Engineers
	US Department of Agriculture Natural Resources Conservation Service <ul style="list-style-type: none"> ▪ Agricultural Management Assistance ▪ Conservation Stewardship Program ▪ Environmental Quality Incentives Program ▪ The Water Bank Program ▪ New Mexico Department of Agriculture Soil and Water Conservation Districts 	United States Department of Agriculture Natural Resources Conservation Service <ul style="list-style-type: none"> ▪ Technical Assistance ▪ Regional Conservation Partnership Program ▪ Conservation Reserve Program
	NM Interstate Stream Commission <ul style="list-style-type: none"> ▪ Acequias Rehabilitation Grant Program-administer Capital Outlay and Irrigation Works Construction Fund ▪ Arizona Water Settlement Act-NM Unit and Non-Unit Irrigation Projects 	NM Interstate Stream Commission Acequia Program <ul style="list-style-type: none"> ▪ New Mexico Acequia Association ▪ New Mexico Association of Conservation Districts
Tribal Irrigation Systems	Bureau of Indian Affairs Office of Trust Services <ul style="list-style-type: none"> ▪ Indian Irrigation Projects 	Bureau of Indian Affairs <ul style="list-style-type: none"> ▪ Office of Trust Services ▪ Water Resources Offices
		US Army Corps of Engineers <ul style="list-style-type: none"> ▪ Tribal Nations Program (consult with tribes that may be affected by US Army Corps of Engineers projects/ policies, partner with tribes on water resources)
	US Bureau of Reclamation <ul style="list-style-type: none"> ▪ Irrigation Projects 	US Bureau of Reclamation

Table 1. Directory of Organizations Crucial to Providing Support and Oversight of Infrastructure (Continued)

Infrastructure Type	Funding	Support, Construction, and/or Regulatory Oversight
Stormwater Infrastructure	<p>NM Environment Department Surface Water Quality Bureau</p> <ul style="list-style-type: none"> ▪ Nonpoint Source Management Program ▪ River Stewardship program <p>NM Environment Department Construction Programs Bureau</p> <ul style="list-style-type: none"> ▪ Clean Water State Revolving Fund (stormwater and non-point source) 	<p>NM Environment Department Surface Water Quality Bureau</p> <p>US Environmental Protection Agency</p> <ul style="list-style-type: none"> ▪ Issues Municipal Separate Storm Sewer Systems (MS4) Permits <p>Flood Control Authorities and Commissions</p> <ul style="list-style-type: none"> ▪ Albuquerque Metropolitan Arroyo Flood Control Authority ▪ Southern Sandoval County Flood Control Authority ▪ Eastern Sandoval County Arroyo Flood Control Authority ▪ Dona Ana County Flood Commission <p>NM Department of Transportation</p> <ul style="list-style-type: none"> ▪ Manages non-point source discharges from roads ▪ Manages stormwater discharges from roads
	<p>US Army Corps of Engineers</p> <ul style="list-style-type: none"> ▪ Federal Energy and Water Development Appropriations Act Funds (dependent on federal budget) 	<p>US Army Corps of Engineers</p> <ul style="list-style-type: none"> ▪ Builds and maintain infrastructure for civil works (flood control, disaster response, regulatory) ▪ Develops contingency operations (disaster response and recovery, life-cycle flood risk management, critical infrastructure) <p>International Boundary and Water Commission</p> <ul style="list-style-type: none"> ▪ Builds and maintains infrastructure for flood control on the Rio Grande downstream of Percha diversion dam (the Rio Grande Canalization Project)
Reservoirs	<p>NM Finance Authority</p> <ul style="list-style-type: none"> ▪ Public Project Revolving Fund ▪ Local Government Planning Fund ▪ Water Trust Board funds 	<p>NM Office of the State Engineer</p> <ul style="list-style-type: none"> ▪ Manages water rights ▪ Reviews and approves construction of new dams, modifications to existing dams, and conducts inspections of existing dams to ensure safety
	<p>NM Office of the State Engineer</p> <ul style="list-style-type: none"> ▪ Administer Capital outlay funding 	<p>NM Department of Game & Fish</p> <ul style="list-style-type: none"> ▪ Operates and maintains dams ▪ Operates and maintains irrigation infrastructure
	<p>US Bureau of Reclamation</p> <ul style="list-style-type: none"> ▪ Water and Energy Efficiency grants 	<p>US Bureau of Reclamation</p> <ul style="list-style-type: none"> ▪ Manages, develops, and protects water projects and facilities, including owning and operating several dams
	<p>US Department of Agriculture Natural Resources Conservation Service</p> <ul style="list-style-type: none"> ▪ Farm Bill ▪ New Mexico Department of Agriculture ▪ Soil and Water Conservation Districts 	<p>US Department of Agriculture Natural Resources Conservation Service</p> <ul style="list-style-type: none"> ▪ Rehabilitation of dams ▪ Emergency action plans <p>NM Interstate Stream Commission</p> <ul style="list-style-type: none"> ▪ Conducts responsibilities related to compact compliance ▪ Manages reservoirs
	<p>US Army Corps of Engineers</p> <ul style="list-style-type: none"> ▪ Civil Works Program Budget 	<p>US Army Corps of Engineers</p> <ul style="list-style-type: none"> ▪ Builds and maintains infrastructure of civil works (flood control, water supply, regulatory)

2. Data Collection, Accessibility, and Monitoring Policy

Data collection, accessibility, and monitoring rose to the top in many of the 2016-2017 Regional Water Plan lists of PPPs and recommendations to the state; as well as in lists generated during the 2017 New Mexico State Water Plan Town Hall event (NMF, 2018).

Steering committee members raised concerns about the need for more information on water resources, the need to standardize data collection and storage (in databases), and the need to share data among stakeholders. Additionally, the state would benefit from improved coordination with water management agencies and stakeholders to better understand the state's water resources.

Data collection, accessibility, and monitoring is clearly spelled out in the State Water Plan Act (NMSA §72-14-3.1 (C)(2)) and the *2003 New Mexico State Water Plan*, which states that “the state water plan shall establish a clear vision and policy direction for active management of the state's waters.”



PHOTO 2. REPLOTTLE FLUME.
PHOTO CREDIT: AMY C. LEWIS

The *2003 New Mexico State Water Plan* includes a policy statement in response to this directive that “the State shall accurately measure its water users and inventory the quantity and quality of its water supply.” One of the strategies for this policy statement is to use tools for “real-time measuring and metering of all water use...” The next section, NMSA §72-14-3.1 (C)(3), also addresses data collection: “include an inventory of the quantity and quality of the state's water resources,” as well as NMSA §72-14-3.1 (C)(4): “include water budgets for the state and for all major river basins and aquifer systems in the state.” NMSA §72-14-3.1 (D)(2) calls for the “creation and completion of a comprehensive database and an electronically accessible information system on the state's water resources and water rights, including file abstraction and imaging of paper files as well as information on pending adjudications” ; NMSA §72-14-3.1 (D)(3) describes “measuring of surface and ground water uses in the state as necessary for management of the state's water resources.” Each of these policy statements recommended measuring, metering, and monitoring our water supply.

Data collection of basic information for analysis of water supply, such as snowpack and precipitation, water diversions (including fresh, brackish, and saline water), return flow, irrigated acreage, aquifer thickness, extent and capacity, water levels, and water quality, are fundamental to managing New Mexico water resources. The recommendation from the regional water plans and other stakeholders is not only to develop a central clearing house for data access, but also to fill in the gaps where monitoring, water use metering, and hydrogeologic information are lacking (see [Part II: Technical Report](#), Section 6.4).

[Table 2](#) provides information about some of the critical government agencies responsible for statewide or national data collection and the types of data collected. Any strategy to collect, compile, and provide access to data must be mindful of sensitive issues with regard to sovereign tribes and pueblos.

This list does not include the many cities, counties, tribes, industries, and non-governmental organizations (NGOs) that also collect valuable water supply and water quality data. Some data collection is historic and ongoing, such as stream flow or water level monitoring at specific sites and lends itself to consolidation in a central database. Other types of data collection are more challenging to incorporate into a centralized form. For example, project-specific data (such as a geophysical investigation or photographic documentation of changes in bank erosion before and after riparian restoration efforts) will not conform to a database containing specific measurements.

Some data are in hard copy form, such as metered use of treated effluent that is submitted pursuant to a groundwater discharge permit. Other data are contained in reports, spreadsheets, and databases on individual government computers. Some data are accessible via the internet, such as the United States Geological Survey (USGS) National Water Information System (NWIS); or the National Oceanic and Atmospheric Administration (NOAA) Climate page, which contains monitoring data; the United States Environmental Protection Agency (USEPA) STorage and RETrieval (STORET) database for water quality data, or the New Mexico Office of the State Engineer (OSE) Water Rights Reporting System (NMWRRS, also referred to as the OSE WATERS Database), which contains water diversion and water rights information. As part of Active Water Resources Management (AWRM) the OSE/ISC website includes real-time water measurement information for surface water diversions and includes all the data required for each interstate compact (OSE, 2018).

The end goals for this data collection policy are ambitious. Coordinating among agencies to not only maximize and share resources, but also identify the purposes for which data is collected, sources of funding, data collection needs for the planning regions and the state, the gaps in data collection, and to explore methods to create a clearing house for data is a significant undertaking and would require leadership and staff resources that may not be currently available. However, many agencies are collecting and making data more accessible at the rate possible.

As [Figure 2](#) and [Table 2](#) show, many agencies are providing information, cooperation, and access to data in free and open-source formats. Encouraging this style of data sharing will only benefit future water planning efforts but note that future efforts will be made easier if data collection protocols and database formats are standardized.

Data Collection, Accessibility, and Monitoring Goals

1. Improve management of water resources and protect senior water-right holders.
2. Identify new sources of supply, including brackish and saline water resources and produced water.
3. Continually improve groundwater and surface water models to better estimate impacts on streams and aquifers from groundwater pumping, water rights, compact deliveries, lifetime of aquifers, and water quality.
4. Protect human health and natural resources.
5. Promote accessibility to data.

Data Collection, Accessibility, and Monitoring Strategies

1. Develop means for coordination between agencies and productive data-sharing methods.
2. Require metering of water use in the state, which will require legislative support and collaboration with the State Engineer and water users. This endeavor will require particular care in working with the agricultural water use category to meter diversions and irrigation return flows.
3. Expand the capacity of NMWRRS database or other database systems as needed to store water right and water use information throughout the state.
4. Create a statewide water right owner interface for entering meter data.
5. Expand aquifer mapping to better identify the extent of all water resources (including brackish and saline water) and better define aquifer boundaries for improved groundwater-surface water modeling.
6. Identify areas that require increased groundwater level monitoring, stream flow measurements, and water quality assessment, and seek funding to expand these networks.

2. Data Collection, Accessibility, and Monitoring Policy

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7. Support continued enhanced estimates of agricultural surface water use by OSE through stream flow monitoring, geographic information system (GIS) techniques, evaporation and evapotranspiration studies, and other methods.
8. Update Federal Emergency Management Agency (FEMA) flood plain maps based on forecast climate conditions, and identify areas, bridges, and culverts that require more protection from projected increases in intensity of precipitation.
9. Support further research for quantifying the impact of vegetation management and wildfire on water resources.
10. Identify gaps of standardized data collection protocols and procedures for New Mexico related to water and prioritize efforts to address these gaps.
11. Develop a process or agency to be responsible for integrating numerous existing data sources where applicable.
12. Improve collection and communication of data for changes of water use to oil and gas purposes
13. Collect data on reusable water (municipal wastewater, produced water, industrial wastewater), to evaluate effect on savings for fresh water.
14. Collect data on production costs and unit prices of produced water in addition to information on quality and quantity.
15. Increase forest mapping, such as forest density, to help prioritize watershed management projects
16. Explore possibility of appointing a watermaster in each declared surface water basin.
17. Support the expanded collection of habitat data as needed to protect threatened and endangered species.

In summary, the state of New Mexico's data collection, accessibility, and monitoring priorities are vast and complex and will require coordination with local, tribal, state, and federal agencies and stakeholders to define data needs (i.e. precipitation, stream flow, groundwater level, and water quality monitoring) and improve measurement and estimates of water diversions, depletions, and return flows, and revise groundwater-surface models. Support is needed for OSE to expand the existing database for tracking water right and water use data and create a centralized platform for managing measured or metered water diversions.

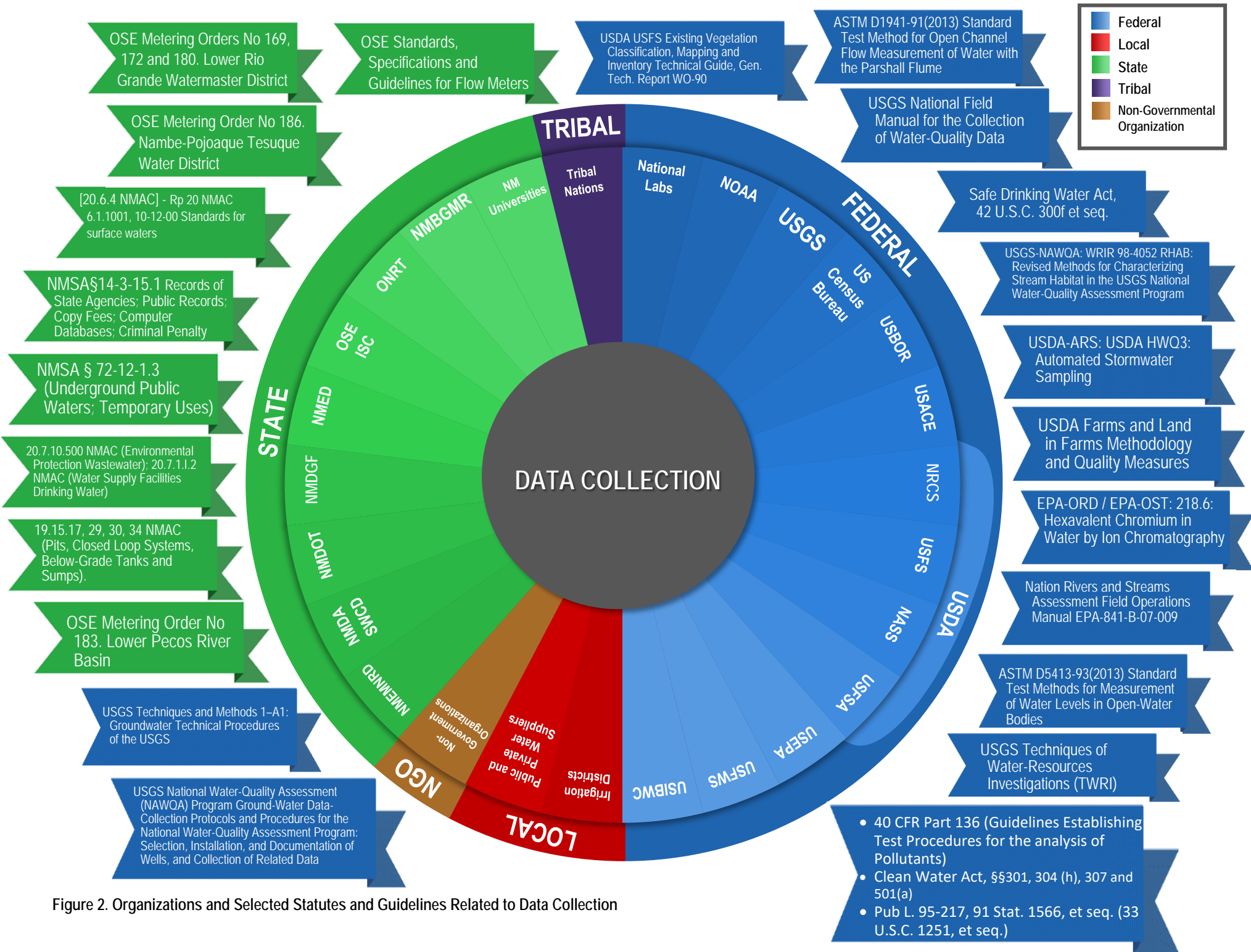


Figure 2. Organizations and Selected Statutes and Guidelines Related to Data Collection

Table 2. Directory of Major Organizations Involved in Water Data Collection

	Precipitation (including snowpack)	Stream Flow	Soil Moisture	Water Levels	Water Quality	Aquifer Parameters	Evaporation/Evapotranspiration	Biological Parameters	Groundwater Modeling	Surface Water Modeling	Aquifer Mapping	Geologic Information	Population	Water Diversions	Water Rights Information	Agricultural (Acreage/Crop & Livestock Inventories)	Reservoir Levels	Dam Condition	Fuel Moisture	Fire Intensity/Extent	Vegetation Surveys	Landscape Treatments	Contaminant Sources	Wastewater Volume Reused	Treated Wastewater Quality	Volume of Produced Water
Federal Agencies																										
US Geological Survey	X	X	X	X	X	X	X	X	X	X	X	X		X			X	X								
US Army Corps of Engineers	X	X	X	X	X			X		X							X	X								
US Bureau of Reclamation		X								X							X	X								
US Environmental Protection Agency					X																					
US Census Bureau													X													
NOAA National Climatic Data Center	X		X																							
US Fish and Wildlife								X																		
International Boundary and Water Commission		X																								
US Department of Agriculture																										
National Agricultural Statistics Service (NASS) and USFSA																X										
Natural Resources Conservation Service (NRCS)	X		X																		X	X				
Forest Service (USFS)	X	X	X	X	X			X									X		X	X	X					
National Labs																										
Sandia National Laboratories				X	X				X																	
Los Alamos National Laboratories				X	X				X																	
Waste Isolation Pilot Plant (WIPP)				X	X				X																	
State Agencies																										
NM Department of Health Scientific Laboratory Division					X																					
NM Bureau of Geology and Mineral Resources	X	X	X	X	X	X	X		X	X	X	X									X					
NM Department of Agriculture and Soil and Water Conservation Districts (SWCDs)				X												X		X			X	X				
NM Department of Game & Fish				X	X			X							X		X	X			X	X	X			
New Mexico Environment Department																										
Ground Water Quality Bureau				X	X	X																	X	X		
Surface Water Quality Bureau		X			X			X															X	X	X	
Drinking Water Bureau					X																		X			
Solid Waste Bureau				X	X																		X			
Petroleum Storage Tank Bureau				X	X	X																	X			
Hazardous Waste Bureau				X	X	X																	X			
Department of Energy Oversight Bureau	X	X	X	X	X	X		X	X	X	X												X			

Table 2. Directory of Major Organizations Involved in Water Data Collection (Continued)

	Precipitation	Stream Flow	Soil Moisture	Water Levels	Water Quality	Aquifer Parameters	Evaporation/Evapotranspiration	Biological Parameters	Groundwater Modeling	Surface Water Modeling	Aquifer Mapping	Geologic Information	Population	Water Diversions	Water Rights Information	Agricultural Acreage/Crop and Livestock Inventories	Reservoir Levels	Dam Condition	Fuel Moisture	Fire Intensity/Extent	Vegetation Surveys	Landscape Treatments	Contaminant Sources	Wastewater Volume Reused	Treated Wastewater Quality	Volume of Produced Water	
NM Office of the State Engineer																											
Dam Safety Bureau																		X									
Hydrographic Survey Bureau														X	X	X											
Water Use and Conservation Bureau							X							X		X											
Water Rights Bureau												X		X	X												
Hydrology Bureau				X		X	X		X	X	X	X															
District Offices		X												X													
Water Masters		X												X													
NM Interstate Stream Commission		X		X	X	X	X	X	X	X	X			X			X										
NM Energy and Minerals Natural Resources Department																											
Oil Conservation Division					X																		X			X	
Mining and Minerals Division	X			X	X																X		X				
State Forestry Division																				X	X	X					
State Universities																											
University of NM																											
Bureau of Business & Economic Research													X														
Department of Earth and Planetary Sciences											X	X															
New Mexico Institute of Mining and Technology																											
Earth and Environmental Sciences					X	X	X		X	X	X	X															
Petroleum Recovery Resource Center																										X	
NM State																											
Water Resources Research Institute					X		X		X					X		X											
NM Climate Center	X																										
NM Highlands University																											
Forest and Watershed Restoration Institute																				X		X					

3. Drought Policy

The State Water Plan Act at NMSA §72-14-3.1 (C)(6) states that the plan should “include a drought management plan designed to address drought emergencies, promote strategies for prevention of drought-related emergencies in the future and coordinate drought planning statewide.” The State of New Mexico Drought Task Force is dedicated to preparing and updating the state’s drought plan.

Drought is challenging to define because it is not a distinct event with a beginning and end and is only recognizable after a period of time. Drought and water supply are intertwined but not always directly related. For example, a meteorological drought in one location may not result in a water supply shortage to all water users in that location, depending on where the source of supply is located.

Drought challenges the reliability of water supplies and increases the likelihood of water shortages for many users. The wide-ranging characteristics of drought affects both water quantity and quality, such as reduced stream flow, groundwater recharge, reductions in grass or hay for rangeland animals, and exceedances of temperatures for cold-water fisheries. The shortages of surface water for farmers, public water systems, and ecosystems were the subject of the key water issues for most planning regions (described in [Part II: Technical Report](#), Section 6.2) and the subject of key collaborative strategies and PPPs ([Part II: Technical Report](#), Section 7).

Some of the fundamental components of managing for drought include monitoring, assessing risk based on numerous indicators of drought, mitigating, and responding to drought. Preparation for drought to minimize harm to the state’s economy, environment, and residents is an essential component of water planning, along with collaboration and adaptive management.

Many of the strategies in the Water Conservation Policy can be applied during drought, depending on the degree of “demand hardening” that has occurred within a water system. Demand hardening refers to the reduced flexibility of a water system to achieve increasingly greater reductions in per capita water use in response to additional conservation measures. Droughts are episodic, widespread events, and as a result, most of the 2016-2017 Regional Water Plan updates identified drought mitigation as a key water issue. [Figure 3](#) presents agencies and institutions involved in monitoring drought information, assessing risk, preparing for, and/or responding to drought. [Table 3](#) is a directory of the numerous federal, state, and local resources which support drought information tracking, planning, and response in New Mexico.

Drought Policy Goals

1. Continue to update the New Mexico Drought Plan in response to changing conditions.
2. Continue to support the New Mexico Governor’s Drought Task Force to continue to assess current conditions, create short- and long-term strategies, and provide information.
3. Forecast drought conditions.



PHOTO 3. CORN SHOWING EFFECTS OF DROUGHT.
PHOTO CREDIT: BOB NICHOLS, USDA. PUBLIC DOMAIN

4. Ensure sufficient water to meet basic needs for human health.
5. Protect sensitive species and habitat during drought.
6. Protect the economy during drought.

Drought Strategies

1. Support and expand drought mitigation and response planning efforts at the local, regional, basin, state, and federal level. Data collection, accessibility and monitoring suggested under Policy 2 will be necessary to help develop the predictive models for preparing for future climate conditions. Conservation strategies in Policy 6 should be included in a drought response, but communities must be aware of “demand hardening,” which reduces the flexibility of public waters systems to adapt to drought.
2. Communities need to prepare for drought by developing a conjunctive use portfolio, such as those developed by the cities of Albuquerque and Santa Fe, whereby surface water is relied on during wet years and groundwater is reserved for drought periods.
3. Alternative water supplies should also be explored, such as treated effluent reuse, desalination of brine or saline resources that are not hydrologically connected to fresh water resources.
4. Monitor drought conditions and support the US Drought Monitor, Natural Resource Conservation Service (NRCS) Snow Telemetry (SNOTEL) Sites, USGS stream flow, various agencies’ groundwater level monitoring; and other data collection, such as the New Mexico Energy, Minerals, and Natural Resources Department (NMEMNRD) Oil Conservation District (OCD) collection of produced water and dissemination efforts.
5. Support and encourage shortage sharing agreements. Provide technical and institutional support, such as facilitation, for water sharing with data and tools that can be used by stakeholders, such as acequias, tribal governments, and local governments, to develop and implement shortage sharing agreements.
6. Prepare for earlier snowmelt runoff; each region should assess the impact on availability of surface water supplies, particularly where storage of surface water is not an option.
7. Assess threats to the water supply, endangered species, and the economy caused by drought and create and implement mitigation strategies.
8. Support effective coordination among local, state, tribal, and federal agencies responsible for managing water supply, water quality, fisheries, and drought and water forecasting.
9. Support the development of drought triggers or other indicators to create drought response.
10. Support the National Guard, Department of Homeland Security and Emergency Management (DHSEM), and other entities in providing emergency response during drought.
11. Promote the use of water banks to provide flexibility for managing water use and allocation, particularly during drought.
12. Collaborate with the United States Forest Service (USFS) to better understand what can and should be done to protect water storage and delivery from National Forest Service lands under changing climatic conditions.

In summary, the state of New Mexico's needs to continue to monitor and assess drought conditions and promote the development of drought mitigation through a coordinated drought response by local, state and tribal agencies in the state. Key strategies for drought plans should include mechanisms to reduce demand, the development of conjunctive-use water supply portfolios (where possible), shortage sharing agreements to reduce conflict during periods of drought and explore alternatives such as desalination to meet future needs during periods of drought where other options may not be available.

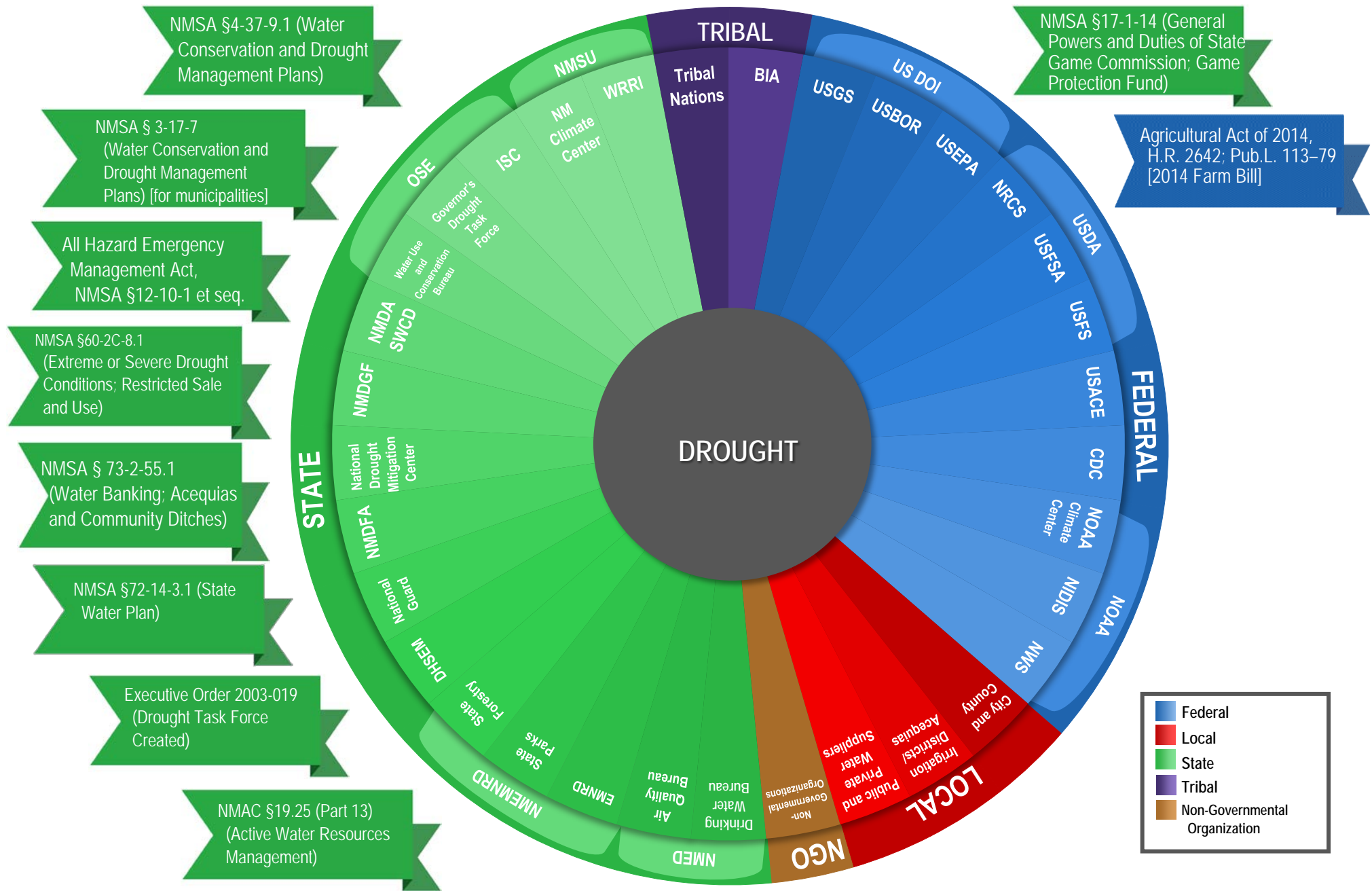


Figure 3. Acts and Organizations Related to Drought Planning and Response

Table 3. Directory of Organizations Related to Drought Planning and Response

Type of Organization	Organizations
Federal	<p><u>US Department of the Interior</u> <u>United States Geological Survey</u></p> <ul style="list-style-type: none"> ▪ <u>Water Watch Program, drought data, and maps</u> ▪ <u>Southwest Geographic Science Team: drought impact monitoring</u> <p><u>US Bureau of Reclamation</u></p> <ul style="list-style-type: none"> ▪ <u>WaterSMART</u> ▪ <u>Drought Response Program</u> ▪ <u>Drought Contingency Planning Program</u> ▪ <u>Drought Resiliency Program</u> ▪ <u>Emergency response programs</u> ▪ <u>Basin studies</u> <p><u>US Environmental Protection Agency</u></p> <ul style="list-style-type: none"> ▪ <u>Drought resilience and water conservation</u> ▪ <u>Drought and WaterSense</u>
	<p><u>National Drought Mitigation Center</u></p> <ul style="list-style-type: none"> ▪ <u>Conduct drought research</u> ▪ <u>Drought monitoring resources</u> ▪ <u>Drought impact reporter</u> ▪ <u>Drought planning information</u> ▪ <u>Drought forecasting</u> ▪ <u>NM State drought planning</u>
	<p><u>US Center for Disease Control</u></p> <ul style="list-style-type: none"> ▪ <u>Drought and health</u>
	<p><u>United States Army Corps of Engineers</u></p> <ul style="list-style-type: none"> ▪ <u>Temporary emergency water assistance for human consumption</u> ▪ <u>Supplements state and local efforts</u>
	<p><u>US Department of Agriculture Natural Resources Conservation Service and Soil and Water Conservation Districts</u></p> <ul style="list-style-type: none"> ▪ <u>National Water and Climate Center</u> ▪ <u>Disaster Recovery Assistance</u> ▪ <u>Emergency Watershed Protection</u> ▪ <u>Defending Against Drought</u>
	<p><u>US Department of Agriculture Farm Service Agency, New Mexico</u> <u>National Agricultural Statistics Service</u></p> <ul style="list-style-type: none"> ▪ <u>Annual Statistical Bulletin</u> ▪ <u>Crop progress and condition</u> ▪ <u>Emergency conservation programs</u>
	<p><u>US Department of Agriculture Forest Service</u></p> <ul style="list-style-type: none"> ▪ <u>Climate Change Resource Center</u> ▪ <u>Manage wildland fire on National Forests and Grasslands</u> ▪ <u>National Forests and Grasslands implement drought guideline for grazing permit administration</u> ▪ <u>Pacific Southwest Research Station</u> ▪ <u>Rocky Mountain Research Station</u>

Table 3. Directory of Organizations Related to Drought Planning and Response (Continued)

Type of Organization	Organizations
Federal	<p>National Oceanic and Atmospheric Administration</p> <p>Climate Center for Environmental Information</p> <ul style="list-style-type: none"> ▪ State of Climate reports ▪ Historical Palmer Drought Indices ▪ Temperature, precipitation, and drought data <p>National Integrated Drought Information System</p> <ul style="list-style-type: none"> ▪ US Drought Portal: includes US Drought Monitor, US Seasonal Drought Outlook, Drought Impacts Report, Wildfire Risk, and Snow Drought <p>National Weather Service</p> <ul style="list-style-type: none"> ▪ Red flag warnings ▪ Forecasting
State	<p>New Mexico Fire Restrictions on Federal, State and Tribal Land</p> <ul style="list-style-type: none"> ▪ Fire restrictions and forest closures <p>NM Office of the State Engineer Water Use and Conservation Bureau</p> <ul style="list-style-type: none"> ▪ Drought information ▪ NM Water Conservation Planning Guide for Public Water Suppliers <p>New Mexico Bureau of Geology and Mineral Resources</p> <ul style="list-style-type: none"> ▪ Groundwater monitoring and aquifer mapping <p>New Mexico Governor's Drought Task Force</p> <ul style="list-style-type: none"> ▪ New Mexico Drought Plan 2006 <p>NM Interstate Stream Commission</p> <ul style="list-style-type: none"> ▪ Interstate compact activities ▪ Support development of shortage sharing agreements ▪ Regional and state water planning ▪ Endangered Species Act compliance <p>NM Department of Homeland Security and Emergency Management</p> <ul style="list-style-type: none"> ▪ Information about preparing for and responding to emergencies <p>New Mexico National Guard</p> <ul style="list-style-type: none"> ▪ Temporary water source in emergencies <p>NM Environment Department</p> <p>Drinking Water Bureau</p> <ul style="list-style-type: none"> ▪ Community and technical assistance related to drought planning ▪ Emergency Response Plan ▪ Drinking Water Watch Database ▪ Source Water Protection Program ▪ Drought information <p>Air Quality Bureau</p> <ul style="list-style-type: none"> ▪ Air quality and monitoring data ▪ Smoke Management Program <p>Construction Programs Bureau</p> <ul style="list-style-type: none"> ▪ Grant and loan programs for water planning and infrastructure

Table 3. Directory of Organizations Related to Drought Planning and Response (Continued)

Type of Organization	Organizations
State	New Mexico Energy, Minerals and Natural Resources Department <ul style="list-style-type: none"> ▪ New Mexico State Parks, fire restrictions New Mexico State Forestry <ul style="list-style-type: none"> ▪ Fire restrictions ▪ Forest Health Conditions Report
	New Mexico Department of Game & Fish <ul style="list-style-type: none"> ▪ Wildlife and Sportfish Management ▪ Emergency Hunting Prohibition
	NM State University, New Mexico Water Resources Research Institute <ul style="list-style-type: none"> ▪ Statewide Water Assessment ▪ Climate center
	New Mexico Department of Agriculture <ul style="list-style-type: none"> ▪ Soil and Water Conservation Districts
	New Mexico Department of Finance and Administration <ul style="list-style-type: none"> ▪ Community Development Bureau: Water and Drought Information ▪ Guidebook for Small Water Systems
	New Mexico State Fire Marshall's Office <ul style="list-style-type: none"> ▪ Allow municipalities to restrict sale and use during drought
	New Mexico Fire Information <ul style="list-style-type: none"> ▪ Fire and fire restriction updates
Tribal	Bureau of Indian Affairs <ul style="list-style-type: none"> ▪ Planning and management of water resources
Non-Government Organizations	New Mexico Rural Community Assistance Corporation <ul style="list-style-type: none"> ▪ Drought resources ▪ Tribal source water protection
	New Mexico Rural Water Association <ul style="list-style-type: none"> ▪ NM Water/ Wastewater Response Network ▪ Source Water Protection Program

4. Watershed Management Policy

Watershed management includes activities such as restoration of degraded uplands to increase soil health, thinning dense forests to reduce the threat of catastrophic wildfire and subsequent debris flows, and improving the resilience of riparian areas to reduce erosion, store water, and improve habitat. Watershed management also involves management of wildlife and livestock and urban stormwater management.

The State Water Plan Act at NMSA §72-14-3.1 (C)(8) states that the plan shall “promote river riparian and watershed restoration that focuses on protecting the water supply, improving water quality and complying with federal Endangered Species Act of 1973 [16 U.S.C. § 1531 et seq.] mandates.”

Watershed management is of paramount concern, particularly for communities dependent on surface water (see [Part II: Technical Report](#), Section 6.3). The 2016-2017 Regional Water Plan updates (ISC, 2016-2017) included recommendations for multiple projects to address riparian and forest restoration ([Part II: Technical Report](#), Section 7); and the 2017 New Mexico State Water Plan Town Hall event also produced many recommendations for watershed management (NMF, 2018).

New Mexico’s Soil and Water Conservation Districts were formed, in part, for the purpose of controlling and preventing soil erosion, preventing floodwater and sediment damage, and ultimately conserving and developing the natural resources of the state; thus, Soil and Water Conservation Districts have authority to implement watershed restoration. The Southwest Forest Health and Wildfire Prevention Act of 2004 (Public Law 108–317 108th Congress), which was established to reduce the risk of wildfires and restore the health of fire-adapted forests and woodland ecosystems in the interior American West, further demonstrates the importance of this policy topic.

The USFS developed a Watershed Condition Framework (USFS, 2011) that can serve as a template for moving the state forward in characterizing the condition of watersheds and prioritizing the restoration activities. In 2005, NMSA 1978 § 72-14-3.3 gave the ISC the authority to establish the strategic water reserve to purchase or lease water or water rights to comply with interstate stream compacts and court decrees, and also to assist the state and water users in water management efforts for the benefit of threatened or endangered species. To date, a total of 2,748 acre-feet (ac-ft) of water rights have been acquired by ISC on the Middle Rio Grande and Pecos River and placed into the reserve.

Figure 4 shows various organizations involved in watershed management throughout the state, as well as the supporting statutes and rules. Over 30% of New Mexico’s land and more than 50% of New Mexico’s perennial stream miles are managed by the USFS and the United States Bureau of Land Management (USBLM). For this reason, these agencies play an essential role in watershed management (NMED, 2018). **Table 4** is a directory of the critical government agencies that fund and support forest restoration, riparian restoration, and stormwater management.



PHOTO 4. TRAMPAS LAKE
PHOTO CREDIT: STEVE CARY

Watershed Management Goals

1. Reduce the risk of catastrophic wildfire.
2. Reduce intensity of runoff from flood flows.
3. Reduce erosion and stream incision; protect adjacent groundwater.
4. Restore or maintain hydrology to enhance floodplain connection and dissipation of flood energy associated with overbank flows and improve ecosystem benefits such as instream flows.
5. Restore or maintain riparian areas and wetlands to more effectively filter pollutants and provide water during dry seasons and prolonged drought.
6. Enhance the economic benefits of healthy river systems, such as fishing and recreational boating.
7. Protect wildlife habitat.
8. Protect or improve endangered species habitat and ecosystem health.
9. Protect human health and natural resources.
10. Protect or improve water quality.

Watershed Management Strategies

1. Using best management practices, modify the structure of forests to allow the natural process of ground fires to maintain a more resilient forest.
2. Increase ground cover, such as grasses and permeable pavement, bioretention basins, rain gardens, vegetated swales, and depressions and infiltration trenches, as appropriate to impede the intensity of runoff and promote infiltration.
3. Increase a mosaic of native vegetation and habitat types along riparian corridors to improve habitat for wildlife and aquatic species and stabilize river banks with vegetation.
4. Improve rangeland health and resilience through practices that increase soil organic matter, reduce erosion, and increase the resilience of the landscape during drought and flood events.
5. Restore, enhance, and expand wetlands to improve water storage, water quality, and flood attenuation, particularly in areas vulnerable to catastrophic wildfires, while minimizing increases in water consumption.
6. Support community watershed organizations.
7. Support habitat for threatened and endangered species.
8. Support monitoring and mapping of restoration efforts currently pursued by New Mexico Forest and Watershed Restoration Institute.
9. Support the collaboration between federal and state agencies, including New Mexico Environment Department (NMED), NMDGF, USFS, USBLM, NRCS, SWCD, and the State Forestry Division in terrestrial and aquatic watershed restoration efforts.
10. Update flood plain maps based on forecast climate conditions and identify areas that require more careful management of floodplain development.
11. Develop methods to prioritize restoration efforts to achieve the greatest impact.
12. Support research to quantify the impact of vegetation management on water resources.
13. Support the creation of watershed management funds, such as the Rio Grande Water Fund, to develop innovative financing mechanisms for watershed management.
14. Support the development of source water protection plans for every water supplier in the state.
15. Support the development of stormwater management plans, particularly in urban areas.
16. Support and fund the Strategic Water Reserve to meet interstate stream compact obligations and court decrees as well as protect endangered species.
17. Support research on the effects of changing climatic conditions on watersheds and water supplies and support efforts to disseminate this information to water/natural resource managers and the public.

In summary, the state of New Mexico and tribal, federal, and private land managers should manage forests, rangeland, urban, and riparian areas to improve resilience to drought, fire, and severe storm events. They should prioritize funding for planning and implementing forest treatments in watersheds that impact streams which supply or deliver surface water to public water systems.

Communities downstream of forested watershed need to develop and implement strategies to prepare for post-fire debris flows that often occur following high-intensity forest fires. Collaboration and periodic convening of stakeholders would facilitate the sharing of information and develop best management practices for forest and riparian restoration techniques.

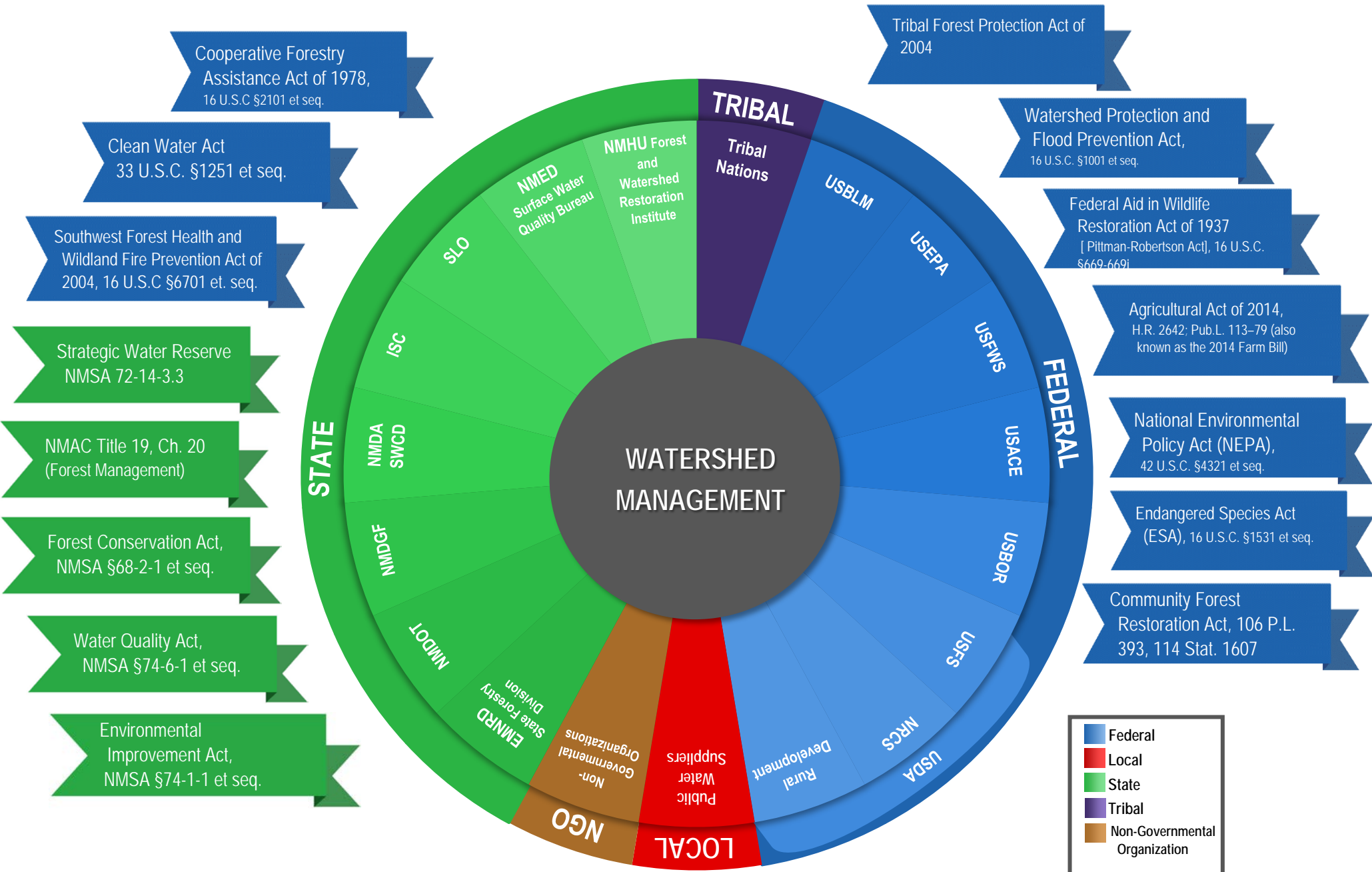


Figure 4. Statutes and Organizations Related to Watershed Management

Table 4. Directory of Primary Organizations Related to Watershed Management

Activity	Government Agencies
Forest Restoration	<p><u>NM Energy Minerals and Natural Resources Department State Forestry Division</u></p> <ul style="list-style-type: none"> ▪ <u>Manages the Forest and Watershed Health Program</u> ▪ <u>Supports watershed restoration projects</u> ▪ <u>Develops forest action plans</u>
	<p><u>NM Energy Minerals and Natural Resources Department State Parks Division</u></p>
	<p><u>US Bureau of Reclamation WaterSMART Programs</u></p> <ul style="list-style-type: none"> ▪ <u>Conducts vegetation management</u> ▪ <u>Cooperative Watershed Management Programs</u>
	<p><u>NM Highlands University Forest and Watershed Restoration Institute</u></p> <ul style="list-style-type: none"> ▪ <u>Provides information about forest and watershed restoration</u> ▪ <u>Collaborates with stakeholders</u> ▪ <u>Promotes ecological restoration</u>
	<p><u>US Department of Agriculture Forest Service</u></p> <ul style="list-style-type: none"> ▪ <u>Conducts forest management</u> ▪ <u>Collaborative Forest Restoration Program (New Mexico)</u> ▪ <u>Collaborative Forest Landscape Restoration Program (National)</u> ▪ <u>Watershed Restoration Program</u> ▪ <u>Watershed Condition Framework Initiative</u> ▪ <u>Rocky Mountain Research Station</u>
	<p><u>US Department of Agriculture Natural Resources Conservation Service</u></p> <ul style="list-style-type: none"> ▪ <u>Emergency Watershed Protection</u> ▪ <u>Watershed Surveys and Planning</u>
	<p><u>NM Department of Agriculture</u></p> <ul style="list-style-type: none"> ▪ <u>Soil and Water Conservation Districts</u>
	<p><u>NM State Land Office</u></p> <ul style="list-style-type: none"> ▪ <u>Targets Wildland and Urban Interface areas for forest treatment</u>
	<p><u>NM Department of Game & Fish</u></p> <ul style="list-style-type: none"> ▪ <u>Consultation of proposed project to protect wildlife and habitat</u> ▪ <u>Forest restoration</u>
	<p><u>US Bureau of Land Management</u></p> <ul style="list-style-type: none"> ▪ <u>Forest and rangeland treatments</u>
	<p><u>NM Environment Department Surface Water Quality Bureau</u></p> <ul style="list-style-type: none"> ▪ <u>Monitoring, assessment, and standards</u> ▪ <u>Watershed protection</u> ▪ <u>NM River Stewardship Program</u> ▪ <u>Wetlands Program</u>
	<p><u>US Bureau of Indian Affairs</u></p> <ul style="list-style-type: none"> ▪ <u>Reserved Treaty Rights Lands Plan</u>

Table 4. Directory of Primary Organizations Related to Watershed Management (Continued)

Activity	Government Agencies
Riparian Restoration & Protection	US Environmental Protection Agency <ul style="list-style-type: none"> Funding of state and tribal Programs for Water Quality Standards
	US Department of Agriculture Forest Service <ul style="list-style-type: none"> Riparian and aquatic ecosystem restoration
	US Fish and Wildlife Service <ul style="list-style-type: none"> Endangered Species Consultation National Wildlife Refuge System Habitat Conservation Plans
	US Bureau of Reclamation WaterSMART Programs <ul style="list-style-type: none"> River restoration Vegetation management Endangered Species Act compliance
	Tribal Nations <ul style="list-style-type: none"> Water Quality Standards Riparian Restoration
	US Army Corps of Engineers <ul style="list-style-type: none"> Section 404 Permits Environmental Resources Section Ecosystem restoration
	NM Bureau of Land Management <ul style="list-style-type: none"> Restore New Mexico Initiative
	NM Department of Transportation <ul style="list-style-type: none"> Wetland and riparian mitigation and enhancement Natural channel design for flood attenuation and habitat enhancement Endangered species mitigation
	NM Department of Game & Fish <ul style="list-style-type: none"> Fish hatcheries and management Manage protected wildlife species identified in NM §17-2-3 Map, monitor, and restore riparian habitat
	NM Interstate Stream Commission <ul style="list-style-type: none"> Strategic Water Reserve implementation Monitor and address salinity Geomorphology, sediment yields Vegetation management and habitat restoration in specific areas
	NM Environment Department Surface Water Quality Bureau <ul style="list-style-type: none"> Monitoring, assessment, and standards Point source regulation Watershed protection NM River Stewardship Program Wetlands Program
	NM Department of Agriculture <ul style="list-style-type: none"> Soil and Water Conservation Districts
	US Department of Agriculture Natural Resources Conservation Service <ul style="list-style-type: none"> Emergency watershed protection Watershed surveys and planning Farm Bill

Table 4. Directory of Primary Organizations Related to Watershed Management (Continued)

Activity	Government Agencies
Stormwater Management	US Department of Agriculture Rural Development <ul style="list-style-type: none"> ▪ Water and Waste Disposal Loan Guarantees
	US Department of Agriculture Natural Resources Conservation Service <ul style="list-style-type: none"> ▪ Agricultural conservation ▪ Emergency Watershed Protection ▪ Watershed and Flood Prevention Operations ▪ Watershed surveys and planning ▪ Watershed rehabilitation
	NM Environment Department Surface Water Quality Bureau <ul style="list-style-type: none"> ▪ Monitoring, assessment, and standards ▪ Watershed protection ▪ NM River Stewardship Program ▪ Point Source Regulation (certification of federal stormwater permits)
	NM Department of Transportation <ul style="list-style-type: none"> ▪ Non-point source
	NM Department of Agriculture <ul style="list-style-type: none"> ▪ Soil and Water Conservation Districts
	US Army Corps of Engineers <ul style="list-style-type: none"> ▪ Environmental Resources Section ▪ Flood Risk Management Program
	US Environmental Protection Agency <ul style="list-style-type: none"> ▪ Funding of state and tribal programs for stormwater management ▪ Issuance of discharge permits under Clean Water Act Section 402

5. Water Supply and Demand Policy

Balancing water supply and demand is a constant function of water management throughout the state. Ensuring adequate supply to meet beneficial uses and future demand is a key issue voiced in many arenas, such as in most of the steering committees in the 2016-2017 Regional Water Plan updates, city and local water plans, the 2017 New Mexico State Water Plan Town Hall event, and other forums for water-related input and concerns.

The State Water Plan Act at NMSA §72-14-3.1 (C)(3) states that the plan shall “include an inventory of the quantity and quality of the state’s water resources, population projections and other water resource demands under a range of conditions.” *Part II: Technical Report*, Sections 3 through 5 describes the supply, demand, and future projections for an “average” and “drought” scenario for the state.



PHOTO 5. SANCHEZ RANCH.
PHOTO CREDIT: LUCIA F. SANCHEZ

Balancing supply with demand can be difficult, given the limited and highly variable annual precipitation, snowpack, and stream flow in the state. While New Mexico has significant groundwater resources in many areas, it is relatively limited when it comes to surface water, and in many cases, use of groundwater affects our streams and stream flow.

Further, for each major stream that flows through New Mexico into another state, New Mexico is required to provide certain, specific amounts of water to the downstream state. That makes it harder to meet future demands because, in most cases, it means some existing water use needs to cease for the new use to commence.

Each public water system, irrigation district, or other self-supplied system is responsible for obtaining water rights and managing their water demand within limits of those rights. Demand management tools, such as the many components of water conservation plans, irrigation district seasonal allocations, shortage sharing agreements and drought plans, will continue to be a key aspect to New Mexico’s ongoing struggle to stretch supplies in an equitable manner. The OSE plays a critical role in managing the cumulative impacts on stream flow and protecting senior water rights from new uses or transfers of water rights.

Figure 5 illustrates the statutes, rules, and government institutions involved in managing water supply and demand. **Table 5** lists critical government agencies that manage water rights, are tasked with meeting compact obligations and compliance with the Endangered Species Act, manage reservoirs, and evaluate the ability of supply to meet demand.

As with many policy topics, there is overlap in scope and duties. As water supply and demand issues rely so heavily on reliable data, many of these agencies are also listed in Section 2, Data Collection, Accessibility, and Monitoring Policy.

Overall, supply and demand issues encompass many water policy goals and strategies. Many agencies assist with supply and demand data tracking, as well as improving implementation of supply and demand strategies. Some initiatives are in place and continue to improve, such as water rate structures that encourage conservation, incentives for identifying new supplies, and avenues for exploring safe and viable water reuse options.

Water Supply and Demand Goals

1. Manage water resources to meet current and future water demands.
2. Meet interstate stream compact obligations.
3. Reduce water demand through conservation, technology, and reuse.
4. Explore new water supply options.

Water Supply and Demand Strategies

1. Through collaboration with local, state, tribal, and federal water resource managers, develop a format for quantifying water supply and demand for water planning; future estimates of water supply should incorporate forecast diminished surface water supplies due to increased temperatures, increased evapotranspiration, and diminished snowpack.
2. Support the investigation of opportunities where storage permits could be enhanced to support existing water supplies, while protecting existing water rights and meeting compact obligations.
3. Support the economical use of brackish, municipal wastewater, or produced water in energy development or other uses while protecting senior water rights.
4. Support efforts and collaboration toward the advancement of water source technologies, such as desalination.
5. Support the development and permitting of Underground Storage and Recovery (USR) projects.
6. Expand monitoring networks to identify potential new sources of water and improve the management of existing water supplies.
7. Develop advanced hydrological modeling to manage surface and groundwater.
8. Explore new sources of water supply by supporting groundwater investigations.
9. Support funding for new infrastructure for water supply projects.
10. Process water right applications in a timely manner.
11. Promote water efficiency and conservation to reduce demand (see also Water Conservation Strategies).
12. Support conjunctive use strategies that rely on renewable supplies when available and preserve aquifers for drought periods.
13. Monitor any gap between supply and demand.
14. Support the development of water shortage sharing agreements.
15. Explore legal mechanisms to appropriate flood flows during times when such flows are physically and legally available and environmentally sound.
16. Create an efficient, user-friendly water market system, with low transaction costs, to benefit the environmental and economic sectors that require water.
17. Meter all water use.
18. Support and fund the Strategic Water Reserve to meet interstate stream compact obligations and court decrees as well as protect endangered species.
19. Encourage county officials to consider the opinions of the OSE regarding the availability of water and whether the subdivision proposal meets the requirements of the New Mexico Subdivision Act and County Subdivision regulations.

While each public water system, irrigation district, acequia, and other self-supplied water user in the state is tasked independently with managing its own supply as well as forecasting and meeting future demands, the state of New Mexico must manage resources to protect senior water right holders and comply with interstate compacts.

The state of New Mexico needs to continue to assess the amount of water diverted (and returned) to the hydrologic system, improve the hydrologic models that are utilized in making water resource management decisions and help communities understand their water supply future.

The most glaring water supply shortfall is occurring in eastern New Mexico where some communities have less than five years of water supply remaining. State and federal agencies should support water supply projects, especially diversions from Ute Reservoir, due to the severe dewatering of the High Plains aquifer in the Northeast New Mexico planning region (see [Part II: Technical Report](#), Section 3.3.2 Declining Groundwater Supplies). The Ute Reservoir Pipeline Project is critical to providing supply to alleviate the projected deficit for PWSs serving Clovis, Cannon Air Force Base, Portales, Elida, Melrose, Grady, Tucumcari, and Logan.

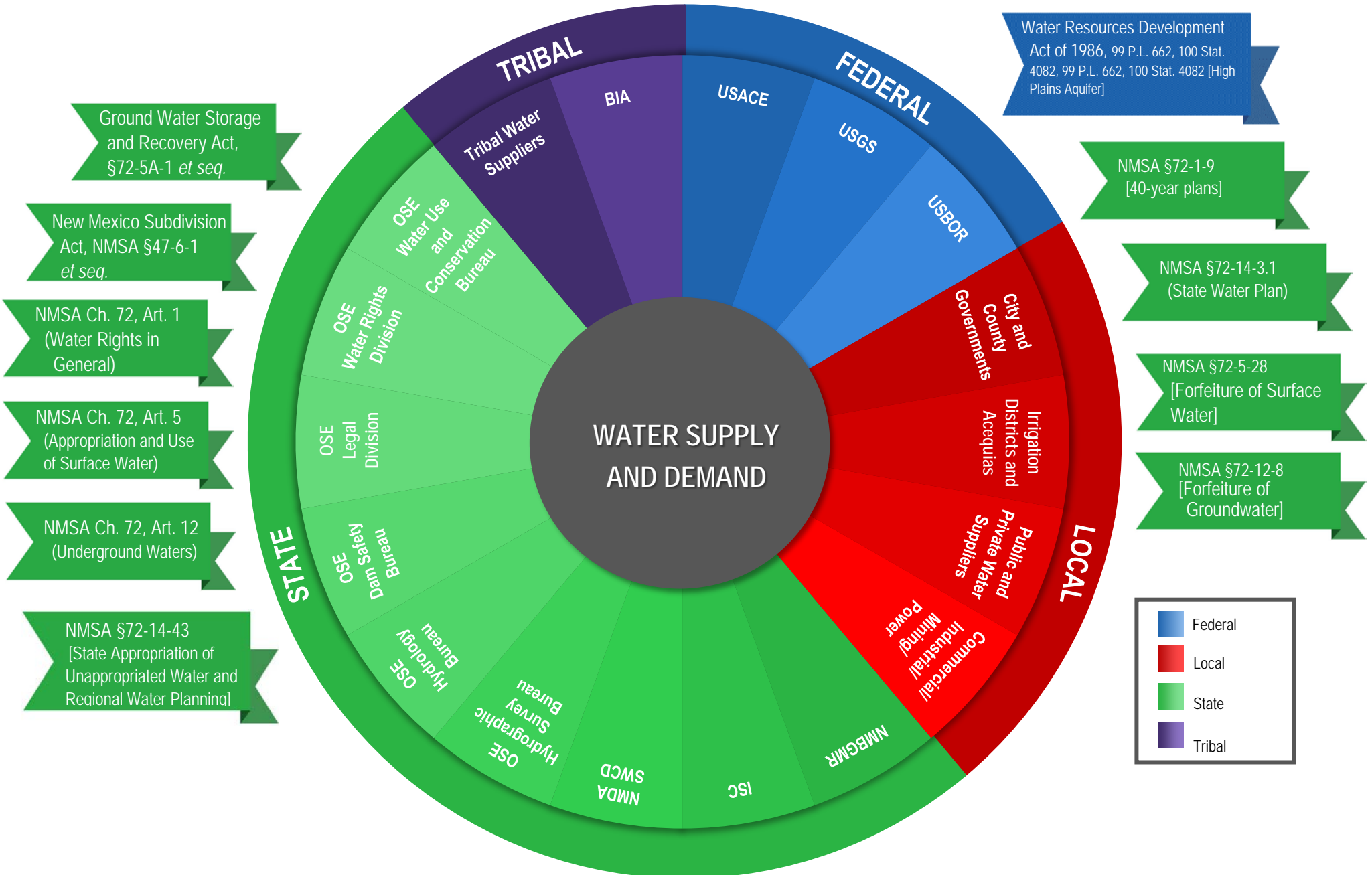


Figure 5. Statutes and Organizations Related to Water Supply and Demand

Table 5. Directory of Organizations Related to Water Supply and Demand

Activity	Government Agencies	
Water Rights	<p><u>NM Office of the State Engineer</u> <u>Litigation and Adjudication Program</u></p> <ul style="list-style-type: none"> ▪ Oversees water rights adjudications ▪ Participates in Indian Water Rights settlements <p><u>Hydrographic Survey Bureau</u></p> <ul style="list-style-type: none"> ▪ Performs hydrographic surveys ▪ Establishes priority dates ▪ Establishes acres irrigated <p><u>Water Rights Division</u></p> <ul style="list-style-type: none"> ▪ Processes water rights applications ▪ Implements priority calls ▪ Collects metered water diversion data ▪ Administers Active Water Resource Management ▪ Manages Underground Storage and Recovery rules and regulations <p><u>Water Masters</u></p> <ul style="list-style-type: none"> ▪ Manages and enforces water rights ▪ Manages approved sharing agreements <p><u>Hydrology Bureau</u></p> <ul style="list-style-type: none"> ▪ Evaluates hydrologic effects of proposed water right transfers ▪ Conducts and reviews hydrogeologic investigations ▪ Develops guidelines for Critical Management Areas <p><u>Water Use and Conservation</u></p> <ul style="list-style-type: none"> ▪ Calculations for irrigation water requirements ▪ Conditions of approval for water right permits 	
	<p><u>State Engineer Hearing Unit</u></p> <ul style="list-style-type: none"> ▪ Conducts administrative hearings for water rights applications 	
	<p><u>NM Interstate Stream Commission Acequia Program</u></p> <ul style="list-style-type: none"> ▪ Supports acequia bylaws and sharing agreements 	
	<p><u>US Department of the Interior, Indian Affairs, Branch of Water Resources</u></p> <ul style="list-style-type: none"> ▪ Advocates for tribes in water right negotiations ▪ Manages irrigation projects and dam operations 	
	Interstate Compacts	<p><u>NM Interstate Stream Commission</u></p> <ul style="list-style-type: none"> ▪ Performs duties related to Interstate Compact compliance
		<p><u>US Bureau of Reclamation</u></p> <ul style="list-style-type: none"> ▪ Manages reservoir operations and federal projects on the San Juan, Rio Grande, and Pecos rivers in accordance with compact provisions and compact commission directives
		<p><u>US Army Corps of Engineers URGWOM (Upper Rio Grande Water Operations Model)</u></p> <ul style="list-style-type: none"> ▪ Operates its reservoirs in accordance with federal statutes and interstate compacts. Conducts and refines the computational model used to complete simulations for operations of all the facilities in the Rio Grande Basin and provides the complex accounting to track water specifically allocated for different water users. ▪ Operates its reservoirs in accordance with federal statutes and interstate compacts ▪ Operates and revises the computer model used to simulate operations of all the facilities in the Rio Grande Basin and uses complex accounting to track water specifically allocated for different water users

Table 5. Directory of Organizations Related to Water Supply and Demand (Continued)

Activity	Government Agencies
Endangered Species Act Compliance	<p><u>United States Bureau of Reclamation</u></p> <ul style="list-style-type: none"> ▪ Performs baseline water assessments ▪ Operates its reservoirs under various National Environmental Policy Act Record of Decisions and Section 7 Consultations ▪ Engaged in recovery and collaborative programs
	<p><u>NM Interstate Stream Commission</u></p> <ul style="list-style-type: none"> ▪ Administers the Strategic Water Reserve ▪ Partner to the 2016 Biological Opinion for Middle Rio Grande Water Operations on the Rio Grande upstream of Elephant Butte Reservoir ▪ Coordinates with Reclamation on Pecos River Endangered Species Act activities ▪ Member of the San Juan Recovery Implementation Program
	<p><u>US Fish and Wildlife Service</u></p> <ul style="list-style-type: none"> ▪ Conducts Endangered Species Act consultations
Manage Reservoirs	<p><u>NM Office of the State Engineer Dam Safety Bureau</u></p> <ul style="list-style-type: none"> ▪ Inspects and regulates dams under state jurisdiction
	<p><u>US Army Corps of Engineers</u></p> <ul style="list-style-type: none"> ▪ Operates and maintains dams
	<p><u>NM Interstate Stream Commission</u></p> <ul style="list-style-type: none"> ▪ Estimates reservoir evaporation losses ▪ Manages Ute Reservoir ▪ Manages Eagle Nest Reservoir
	<p><u>US Bureau of Reclamation</u></p> <ul style="list-style-type: none"> ▪ Manages reservoir operations
Assess Supply Ability to Meet Demand	<p><u>NM Office of the State Engineer</u></p> <ul style="list-style-type: none"> ▪ Reviews water development plans ▪ Reviews hydrology studies and water demand analysis for proposed subdivisions ▪ Produces Water Use by Categories Report
	<p><u>NM Office of the State Engineer</u></p> <ul style="list-style-type: none"> ▪ Utilizes Active Water Resource Management to manage the state's limited water resources as an alternative to making a priority call
	<p><u>NM Interstate Stream Commission</u></p> <ul style="list-style-type: none"> ▪ Prepares engineer advisor reports ▪ Supports regional water planning and conducts state water planning
	<p><u>New Mexico Bureau of Geology and Mineral Resources</u></p> <ul style="list-style-type: none"> ▪ Groundwater investigations and assessment of new and existing resources

6. Water Conservation Policy

Water conservation is crucial for New Mexicans, as the state is located in the high desert of the Southwest, where water is limited. Water conservation that reduces the use of water or prevents waste of water is an important demand management strategy. Many water conservation measures also save energy costs and reduce the overall environmental impacts associated with water use.

Water conservation is at the center of many strategies identified in the 2016-2017 Regional Water Plan updates to reduce demand and mitigate drought (See [Part II: Technical Report](#), Section 7) and all water users need to be educated about water conservation. The State Water Plan Act at NMSA §72-14-3.1 (C)(5) states that the plan shall “develop water conservation strategies and policies; to maximize beneficial use, including reuse and recycling by conjunctive management of water resources and by doing so to promote nonforfeiture of water rights.



PHOTO 6. NEW MEXICO RAIN.
PHOTO CREDIT: AMY C. LEWIS

Furthermore, state water law requires that applications for a permit to divert water from a well or stream be evaluated by the State Engineer to determine not only if the water is available for appropriation and if the proposed purpose and place of use will impair existing rights, but also whether the proposed use is contrary to the conservation of water or is detrimental to public welfare. New Mexico’s semi-arid climate, the likelihood of extended and severe drought, population growth, and water shortages all contribute to a need to conserve water resources to sustain New Mexico’s communities, ecosystems, and economy. Many communities have taken great strides to reduce their per capita water consumption, and the potential for greater reductions is examined in [Part II: Technical Report, Appendix 2C](#).

[Figure 6](#) is a chart of many institutions involved in assisting communities with water conservation and education about water use, as well as statutes and rules that support water conservation. The directory shown in [Table 6](#) lists organizations that may provide conservation resources related to public water systems, agricultural water systems, and wastewater reuse.

Water Conservation Goals

1. Promote water conservation and the efficient use of water in all categories of water use.
2. Reduce water demand.
3. Reduce water consumption.
4. Eliminate water waste.

Water Conservation Strategies

1. Require metering or measuring of water diversions and return flows to improve accuracy of water use data.
2. Support the use of recycled water or alternative sources of water in place of potable water when economically feasible.

3. Engage public water suppliers in water conservation planning and encourage small water systems to take advantage of capacity building or other assistance offered through state programs.
4. Encourage agricultural water conservation methods that do not increase consumptive use and advance soil health.
5. Encourage water conservation measures to be developed in local and regional water plans and in building codes.
6. Provide water conservation education and raise awareness about water conservation strategies statewide.
7. Encourage the use of incentives and enforcement strategies to promote water conservation; at a minimum, and as an example, water bills should be based on the amount of water used by each customer, incentivizing reduced use.
8. Coordinate efforts to promote conservation among local, state, federal, and tribal governments.
9. Assist agricultural organizations, public water systems, and other agencies with creating and presenting informational programs for innovative water conservation strategies.

In summary, various mechanisms to promote and incentivize water conservation should be explored and implemented by all state, federal, tribal, and local governments, public and private water systems, and individual water users. Water conservation in the agricultural water use category should be implemented in locations where the hydrologic setting does not result in unintended consequences of reducing the return flow required by downstream users.

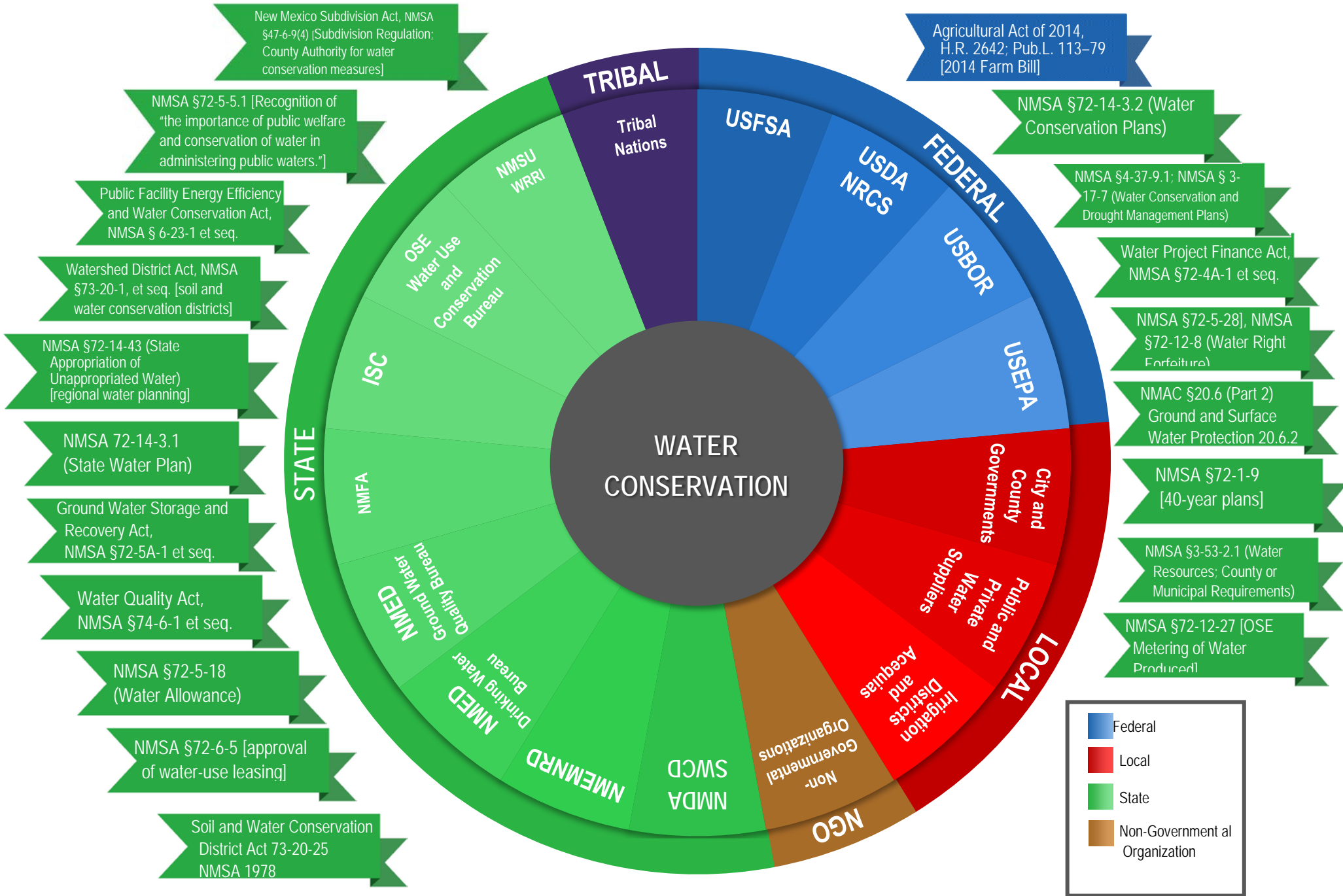


Figure 6. Statutes and Organizations Related to Water Conservation

Table 6. Directory of Organizations Related to Water Conservation

Type of Water System	Government Agencies
Public Water Systems	<p><u>US Bureau of Reclamation</u></p> <ul style="list-style-type: none"> Provides funding and support through the programs: <u>WaterSMART</u>, <u>Water and Energy Efficiency Grants</u>, <u>Small-Scale Efficiency Projects</u>, and <u>Water Conservation Field Services Program</u>
	<p><u>US Environmental Protection Agency</u></p> <ul style="list-style-type: none"> Provides support and educational materials through the <u>Drought Resilience and Water Conservation Program</u>, <u>WaterSense Program</u>, <u>Fix a Leak Week</u> and <u>Water Conservation Plan Guidelines</u>
	<p><u>NM Environment Department Drinking Water Bureau</u></p> <ul style="list-style-type: none"> Provides funding and support through the <u>Source Water Protection Program</u> and the <u>Drinking Water State Revolving Loan Fund</u>, water conservation projects may be eligible
	<p><u>NM Finance Authority</u></p> <ul style="list-style-type: none"> Administers the <u>Water Trust Board and Water Project Fund</u> Water Conservation projects may be eligible for funding through the <u>Water Project Fund</u>
	<p><u>NM Interstate Stream Commission</u></p> <ul style="list-style-type: none"> Conducts regional and state water planning programs
	<p><u>NM Office of the State Engineer Water Use and Conservation Bureau</u></p> <ul style="list-style-type: none"> Provides educational materials and other resources Developed the <u>NM Water Conservation Planning Guide for Public Water Suppliers</u> Reviews water conservation plans for public water suppliers Developed the <u>Office of the State Engineer Gallons Per Capita Per Day Calculator</u>
	<p><u>New Mexico State University</u></p> <ul style="list-style-type: none"> <u>New Mexico Water Resources Research Institute</u>
Agricultural Water Systems	<p><u>US Department of Agriculture Natural Resources Conservation Service</u></p> <ul style="list-style-type: none"> <u>Farm Bill</u> <u>Conservation Stewardship Program</u> <u>Environmental Quality Incentives Program</u> <u>Agricultural Conservation Easement Program</u> <u>Financial assistance programs</u> <u>Technical assistance programs</u>
	<p><u>US Department of Agriculture Farm Service Agency</u></p> <ul style="list-style-type: none"> <u>Emergency Conservation Program</u> <u>Source Water Protection Program</u>
	<p><u>NM Department of Agriculture</u></p> <ul style="list-style-type: none"> <u>Agricultural programs and resources</u> <u>Acequia and Community Ditch Fund</u> <u>New Mexico Soil and Water Conservation Districts</u>
	<p><u>NM Interstate Stream Commission</u></p> <ul style="list-style-type: none"> <u>Regional and state water planning programs</u> <u>Acequia Program</u>

Table 6. Directory of Organizations Related to Water Conservation (Continued)

Type of Water System	Government Agencies
Wastewater Reuse Systems	<p><u>NM Environment Department Ground Water Quality Bureau</u></p> <ul style="list-style-type: none"> ▪ <u>Provides guidelines for treatment standards for wastewater and regulates reuse through discharge permits for reclaimed wastewater use</u>
	<p><u>NM Energy, Minerals, and Natural Resources Department</u></p> <ul style="list-style-type: none"> ▪ <u>Energy Conservation and Management Division</u> ▪ <u>Wastewater Efficiency Program, Waste Not</u> ▪ <u>Oil Conservation District: permits for produced water reuse</u>
	<p><u>NM Interstate Stream Commission</u></p> <ul style="list-style-type: none"> ▪ <u>Regional and state water planning programs</u>
	<p><u>US Bureau of Reclamation</u></p> <ul style="list-style-type: none"> ▪ <u>Title XVI Water Reclamation and Reuse</u>
	<p><u>NM Finance Authority</u></p> <ul style="list-style-type: none"> ▪ <u>Administers the Water Trust Board and Water Project Fund</u> ▪ <u>Water Conservation projects may be eligible for funding through the Water Project Fund</u>

7. Water Quality Policy

The state of New Mexico, nations, tribes, and pueblos, USEPA, and United States Army Corps of Engineers (USACE) implement numerous programs to protect water quality, which include regulating the discharge of contaminants to surface and groundwater, monitoring and protecting drinking water, protecting aquatic and terrestrial species and public health.

The State Water Plan Act at NMSA §72-14-3.1 (B)(4) states that the State Water Plan shall be a tool for “protecting both the water supply and water quality” and NMSA §72-14-3.1 (C)(3) states that the plan shall “include an inventory of the quality of the state’s water resources...”

Surface and groundwater quality information is included in each of the 2016-2017 Regional Water Plan updates, including detailed maps of impaired reaches. A summary of the water quality issues identified in the 2016-2017 Regional Water Plan updates is provided in [Part II: Technical Report](#), Section 6.5). These issues range from naturally occurring arsenic and uranium to contamination of groundwater from mining and industry to the impacts of septic tanks on surface water and groundwater.



PHOTO 7. VISTA NEAR VELARDE.
PHOTO CREDIT: B.J. BUMGARNER ON FLICKR

[Approved Tribal Water Quality Standards:](#)

Navajo Nation
Pueblo of Acoma
Pueblo of Isleta
Pueblo of Laguna
Pueblo of Nambé
Pueblo of Ohkay Owingeh
Pueblo of Picuris
Pueblo of Pojoaque
Pueblo of Sandia
Pueblo of Santa Ana
Pueblo of Santa Clara
Pueblo of Taos
Pueblo of Tesuque

Water quality that meets the standards necessary to protect human health and agricultural uses while supporting aquatic life and wildlife habitat is inextricably linked to providing sufficient water quantity. Statutes and agencies important to water quality protection are illustrated in [Figure 7](#). Further information is provided in the legal section of each of the Regional Water Plan updates (ISC, 2016-2017). [Table 7](#) provides a list of the agencies with regulatory oversight associated with the various activities that may contaminate water quality.

New Mexico passed the State Water Quality Act in 1977 (§§ 74-6-1 et seq., NMSA 1978), which established the New Mexico Water Quality Control Commission (NMWQCC), as well as the first significant groundwater protection program in the country. The NMWQCC comprises state, tribal, and local representatives.

The Environmental Improvement Act imposes a water conservation fee for public water supply systems to fund tests of public water supplies for contaminants as required by the Safe Drinking Water Act; perform vulnerability assessments; and to provide training for water supply operators. Responsibility for protection of New Mexico’s water quality is shared among these governmental entities. Today, we enjoy clean water from our taps and healthy habitat for our flora and fauna because of the network of government agencies tasked with water quality protection.

Protection of water quality involves establishment of scientifically based chemical, physical, and biological standards necessary to support designated uses identified in the State Water Quality Standards (NMAC 20.6.4) and individually promulgated Tribal Water Quality Standards. Each lake, river, and stream in New Mexico has designated uses, which may include domestic water supply, public water supply, irrigation, livestock watering, primary or secondary contact, wildlife habitat, and/or one of several aquatic life uses (e.g., high-quality cold-water aquatic life) (Franklin, 2018). Surface water discharge permits typically include effluent limits set to ensure that water quality standards are met at a critical low flow. Water management policy that maintains flow above the critical low flows help ensure that streams support their designated uses.

Water Quality Goals

1. Provide safe drinking water for public water systems and domestic wells.
2. Provide water suitable for irrigation.
3. Protect aquatic life.
4. Protect wildlife habitat, livestock watering, and recreational opportunities.
5. Protect human health and natural resources.
6. Protect water for cultural uses.
7. Ensure that public and elected officials understand the value of protecting water quality.

Water Quality Strategies

1. Continue to support the federal, tribal, and state programs that protect water quality; including the Federal Clean Water Act, New Mexico Water Quality Act, New Mexico Wildlife Conservation Act, and the Endangered Species Act (see [Figure 7](#)).
2. Continue to support the water quality protection programs within state agencies, such as the NMED, NMDGF, and the NMEMNRD.
3. Continue to review and update Water Quality Standards for the state of New Mexico and continue to assist nations, tribes, and pueblos with their Water Quality Standards and water quality protection.
4. Support monitoring and assessment of water quality from groundwater and surface water.
5. Continue to support watershed management, including uplands, forest, wetland, and riparian restoration and urban stormwater management to improve downstream water quality.
6. Support educational outreach efforts on behalf of state, tribal, and federal agencies.
7. Provide funding opportunities for water quality protection and remediation of contamination.
8. Consider forming Flood Control Districts or proposing planning and zoning standards to help municipalities and counties protect drainages, streams, and rivers, and incorporate stormwater management into site plan designs.
9. Increase funding for groundwater orphan sites to assess and potentially clean up contaminated sites that are not covered by the Corrective Action Fund (which is now only for petroleum contamination cleanup).

In summary, the agencies and programs in place to protect water quality for humans and the ecosystem should continue to be supported. A funding source should be identified to address lingering contamination in groundwater that is not covered by the Corrective Action Fund.

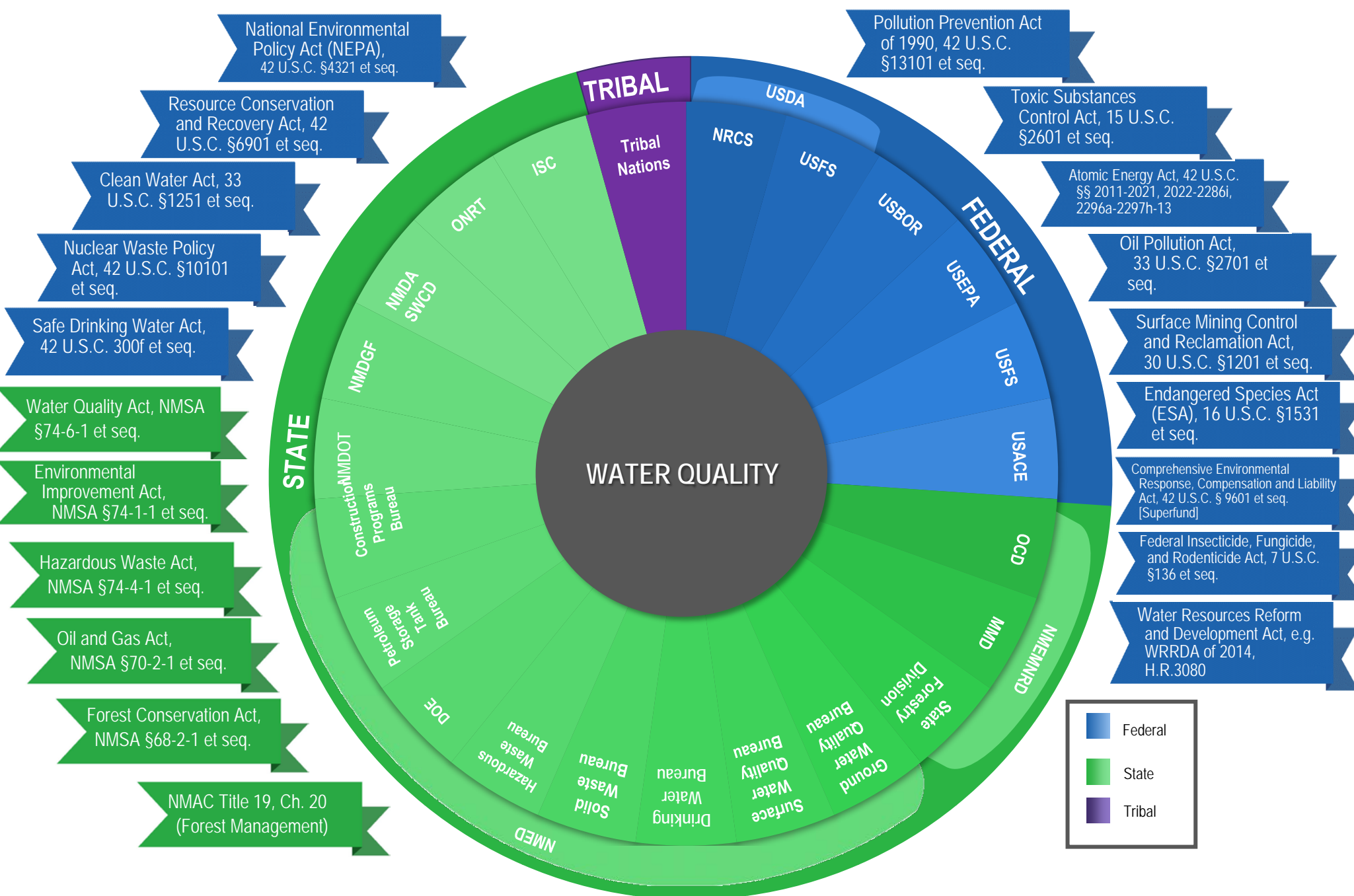


Figure 7. Statutes and Organizations Related to Water Quality Protection

Table 7. Directory of Essential Organizations Related to Water Quality Protection

Activity	Government Agencies
Discharging Pollutants to Groundwater	NM Environment Department Ground Water Quality Bureau <ul style="list-style-type: none"> ▪ Pollution prevention ▪ Agricultural compliance Tribal Environmental Departments
Discharging Pollutants to Surface water	US Environmental Protection Agency NM Environment Department Surface Water Quality Bureau Tribal Environmental Departments US Department of Agriculture Natural Resource Conservation Service NM Department of Agriculture
Drinking Water Oversight	NM Environment Department Drinking Water Bureau NM Environment Department Construction Programs Bureau
Storing Petroleum Products in Tanks	NM Environment Department Petroleum Storage Tank Bureau
Handling Hazardous Waste	NM Environment Department Hazardous Waste Bureau NM Environment Department of Energy Oversight Bureau
Disposing Solid Waste to Landfill	NM Environment Department Solid Waste Bureau
Extracting Mineral Resources	NM Energy Minerals and Natural Resources Department Mining and Minerals Division NM Environment Department Ground Water Quality Bureau <ul style="list-style-type: none"> ▪ Mining environmental compliance
Producing Petroleum Products	NM Energy Minerals and Natural Resources Department Oil Conservation Division

Table 7. Directory of Essential Organizations Related to Water Quality Protection (Continued)

Activity	Government Agencies
Reclamation of Polluted Sites	<u>US Army Corps of Engineers</u> <ul style="list-style-type: none"> ▪ <u>Restoration of Defense Sites</u> ▪ <u>Restoration of Abandoned Mine Sites</u>
	<u>NM Environment Department Ground Water Quality Bureau</u> <ul style="list-style-type: none"> ▪ <u>Remediation Oversight</u> ▪ <u>Superfund Oversight</u>
	<u>Office of the Natural Resources Trustee</u>
	<u>Energy, Minerals and Natural Resources Department</u> <u>New Mexico Mining and Minerals Division</u> <ul style="list-style-type: none"> ▪ <u>Abandoned Mines Land Program</u>
Managing Ecosystem Health <i>ESA Flows</i> <i>Forest Conditions</i> <i>Riparian Conditions</i> <i>Stormwater</i>	<u>NM Interstate Stream Commission</u>
	<u>NM Department of Agriculture</u> <ul style="list-style-type: none"> ▪ <u>Soil and Water Conservation Districts</u>
	<u>NM Department of Game & Fish</u> <ul style="list-style-type: none"> ▪ <u>Riparian, wetland, and forest restoration</u> ▪ <u>State Wildlife Action Plan</u>
	<u>US Bureau of Reclamation</u>
	<u>US Fish and Wildlife Service</u>
	<u>US Department of Agriculture US Forest Service</u>
	<u>US Army Corps of Engineers Section 404</u>
	<u>US Department of Agriculture Natural Resource Conservation Service</u>
	<u>NM Department of Transportation</u>
	<u>US Environmental Protection Agency</u> <u>NM Environment Department Surface Water Quality Bureau</u>

8. Water Planning Policy

Water planning ranges in scale; from the small mutual domestic water system that must consider its rate structure to pay for operation and maintenance costs, to the large municipality that forecasts population growth to determine the ability of water supply to meet future demands, to the state as a whole for compliance with interstate compacts.

Water planning is also vital to determining infrastructure needs and to demonstrating that New Mexico has future plans for all of the water within the state. Thus, water plans have multiple purposes from providing information to potential users so that they can make their own planning choices, to providing suggestions so that regional and local goals can be achieved to educating decision-makers and highlighting the need for programs and continued or expanded funding.

Including this policy goal for water planning within the State Water Plan is for the purpose of reinforcing the need for continued planning at all levels; to illustrate the multiple agencies and organizations that support local, regional and state water planning; and to acknowledge the need for coordination and public participation in the planning process.

The State Water Plan Act at NMSA §72-14-3.1 (F) outlines the need for public participation throughout the planning process. Public outreach and stakeholder involvement were identified as a key collaborative strategy in [Part II: Technical Report](#), Section 7.1, along with continued water planning.

Communities at all levels must continually evaluate their water supply system's ability to meet current needs, future demands, and peak daily demands in all seasons. Water-level declines in aquifers and vulnerability of surface supplies during drought are forefront in these evaluations.

The New Mexico legislature created the Water Planning Program in 1987 and designated the ISC to oversee the program. The original Water Planning Program was directed to lead water planning and management at the regional level. Regional planning provides an opportunity for input from all area stakeholders and for collaborative effort to address local concerns.

[Figure 8](#) shows the rules, regulations, acts, and stakeholders involved in water planning. [Table 8](#) identifies the critical government and non-government organizations that provide regulation, guidance, or resources related to this water planning policy.



PHOTO 8. ACEQUIA DE ALCALDE LIMPIA, 2018.
PHOTO CREDIT: LUCIA F. SANCHEZ

Water Planning Goals

1. Develop a comprehensive, coordinated State Water Plan.
2. Continue to improve and update the State Water Plan every five years.
3. Support continued regional water planning efforts.
4. Integrate regional water plans as they are updated into the State Water Plan.

5. Develop water plans to address water supply, demand, and changing conditions; and create goals that will have a positive impact on the public welfare of the state.
6. Ensure that the planning process is inclusive, open to the public, and transparent; and ensure the process uses best available science and data.
7. Manage water resources to maximize beneficial use.
8. Use water availability information, such as the opinions issued by the OSE during the subdivision review process, to make informed land use decisions.
9. Protect water supply and water quality.
10. Protect the customs, culture, environment, and economic health and stability of the state's diverse communities.
11. Coordinate among all levels of government and maintain effective government-to-government relationships with nations, tribes, and pueblos in decision-making processes regarding water.
12. Complete water rights adjudications.

Water Planning Strategies

1. Organize meetings or workshops to convene stakeholders to address specific water planning issues, such as watershed management and other policy topics.
2. Develop a recommended format for water planning by PWSs that allows for assimilation into regional and state water plans.
3. Allow each region of the state to plan for its water future.
4. Incorporate local water plans (such as Water Development Plans) and strategies into regional plans.
5. Support regional water planning efforts identified in regional water plans.
6. Promote ongoing regular communication and information sharing among the regional steering committees and the ISC Water Planning Program, including updating PPP lists.
7. Use the best data available to inform regional and state water plans.
8. Use water plans to provide clear information to inform water management decisions.
9. Engage in public outreach about water planning issues and support water education in elementary, middle, and high school.
10. Support implementation of water plans at various scales.
11. Make the planning process, as well as strategies included in water plans, flexible and adaptable.
12. Collaborate with the OSE and with other government agencies as appropriate.
13. Collect data about the quantity and quality of the state's water resources, population projections, and other water resource demands under a range of conditions.
14. Collaborate with the state's national laboratories and research institutions to address important water issues on demonstration projects in desalination, conservation, watershed restoration, weather modification, and other technological approaches to enhancing water supply, management, and technology.
15. Develop statewide and regional drought management plans.
16. Identify water-related infrastructure and management investment needs and opportunities to leverage federal, state, and other funding sources.
17. Provide staff and resources to support the completion of water rights adjudications.
18. Support water rights transfer policies that provide for timely and efficient transfers of water between uses to meet both short-term shortages and long-term economic development needs.
19. Conduct government-to-government consultation with nations, tribes, and pueblos for water planning efforts, as well as water rights adjudications and settlements with Indian nations, tribes, and pueblos located wholly or partially within New Mexico.
20. Provide an opportunity for public review and comment on the State Water Plan.

21. Present the State Water Plan to the interim legislative committee that studies water and natural resources.
22. Work collaboratively across state and national borders to strive for agreements and avoid litigation.

In summary, the ISC should continue to conduct water planning through collaboration with state, tribal, federal, non-governmental organizations, and stakeholders to help move the state forward and improve the outlook for New Mexico's economy, environment, and cultural heritage.

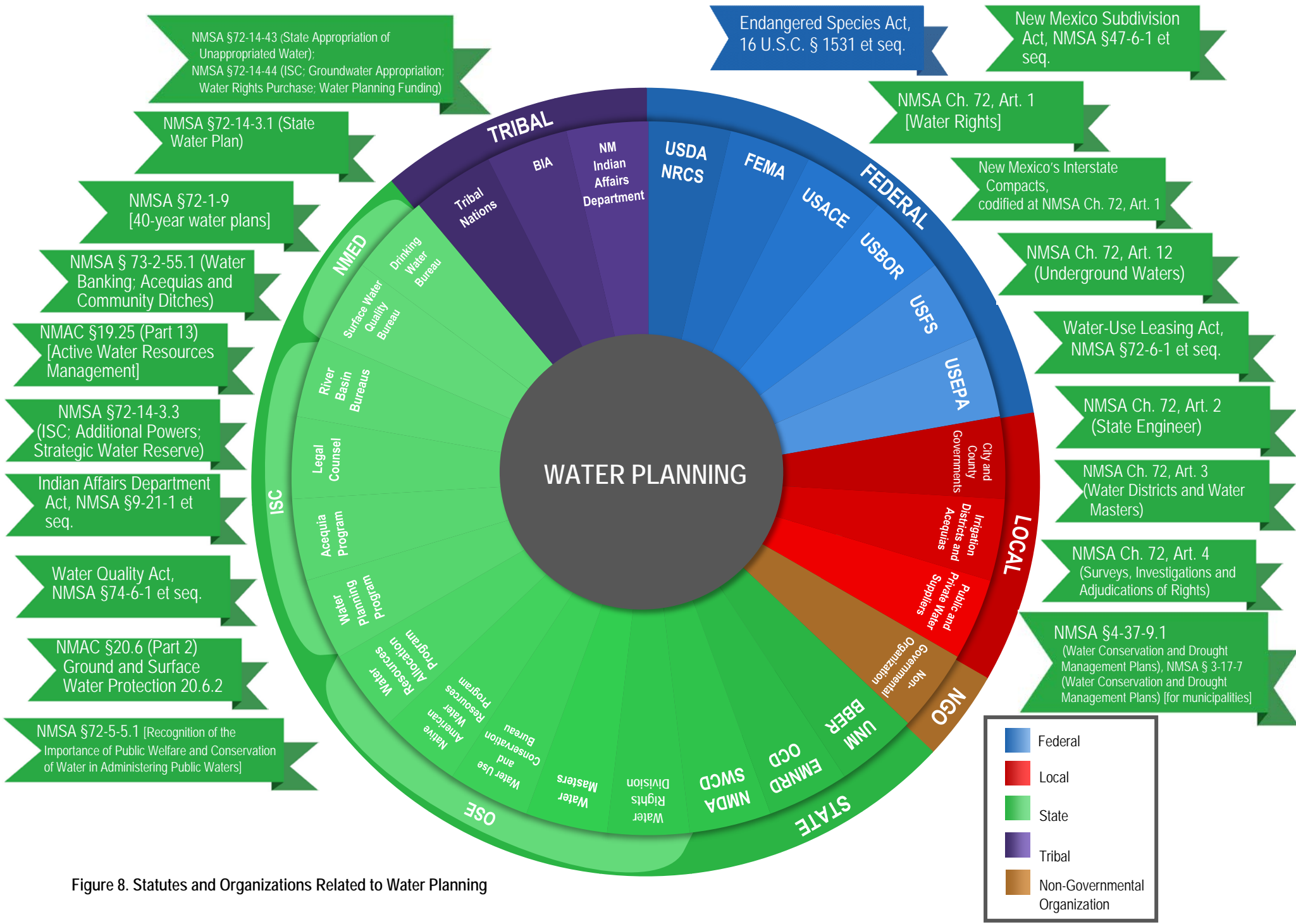


Figure 8. Statutes and Organizations Related to Water Planning

Table 8. Directory of Organizations Related to Water Planning

Activity	Government Agencies
Water Planning	<p><u>NM Interstate Stream Commission</u> <u>Water Planning Program</u></p> <ul style="list-style-type: none"> ▪ Oversees regional and state water planning program River Basin Bureaus ▪ Forecasts compliance with Interstate Stream Compacts and Settlement Agreements ▪ Collaborates with federal and state agencies and irrigation districts to meet compact obligations, settlement agreements and address Endangered Species Act issues ▪ Manages the Strategic Water Reserve <p><u>Acequia Program</u></p> <ul style="list-style-type: none"> ▪ Supports acequias by developing sharing agreements
	<p><u>NM Office of the State Engineer</u> <u>Water Rights Division</u></p> <ul style="list-style-type: none"> ▪ Manages WATERS Database (NMWRRS) ▪ Implements priority calls <p><u>Water Use and Conservation</u></p> <ul style="list-style-type: none"> ▪ Reviews subdivision proposals ▪ Reviews water development Plans ▪ Prepares Water Use by Category Report every five years <p><u>Native American Water Resources Program</u></p> <ul style="list-style-type: none"> ▪ Conducts government-to-government coordination and communication related to solving water issues <p><u>Water Masters</u></p> <ul style="list-style-type: none"> ▪ Calculates allowable diversions
	<p><u>US Bureau of Reclamation</u></p> <ul style="list-style-type: none"> ▪ Performs WaterSMART basin studies ▪ Manages and protects water resources through many programs
	<p><u>US Army Corps of Engineers</u></p> <ul style="list-style-type: none"> ▪ Forecasts compact compliance on the Rio Grande using Upper Rio Grande Water Operations Model (URGWOM)
	<p><u>US Environmental Protection Agency</u></p> <ul style="list-style-type: none"> ▪ Supports stormwater management planning through the Nonpoint Source Pollution Program
	<p><u>NM Environment Department Surface Water Quality Bureau</u></p> <ul style="list-style-type: none"> ▪ Provides funding and support for watershed planning through the Watershed Protection Section ▪ Conducts monitoring, assessment, and standards
	<p><u>UNM Bureau of Business and Economic Research</u></p> <ul style="list-style-type: none"> ▪ Provides information on historic population and forecasts population changes in New Mexico
	<p><u>NM Department of Agriculture</u></p> <ul style="list-style-type: none"> ▪ Soil and Water Conservation Districts
	<p><u>New Mexico Water Dialogue</u></p> <ul style="list-style-type: none"> ▪ Hosts annual statewide meeting ▪ Tracks policy-making activities in the Office of the State Engineer, the New Mexico Interstate Stream Commission, and the New Mexico Legislature
	<p><u>US Department of Agriculture Natural Resource Conservation Service</u></p> <ul style="list-style-type: none"> ▪ Prepares State Water Supply Outlook reports that forecasts runoff in river basins based on available snow pack

Table 8. Directory of Organizations Related to Water Planning (Continued)

Activity	Government Agencies
Infrastructure Planning	<p><u>US Bureau of Reclamation</u></p> <ul style="list-style-type: none"> Manages reservoir operations
	<p><u>US Army Corps of Engineers</u></p> <ul style="list-style-type: none"> Forecasts flood stage, plan, and design for flood control, dams, and canals and conducts feasibility studies
	<p><u>US Forest Service</u></p> <ul style="list-style-type: none"> Forecasts potential fire risk and impacts to water supply reservoirs
	<p><u>Federal Emergency Management Agency</u></p> <ul style="list-style-type: none"> Develops 100-year flood inundation maps
Tribal Planning	<p><u>US Department of the Interior Indian Affairs, Branch of Water Resources</u></p> <ul style="list-style-type: none"> Provides policy, oversight, and technical support functions through the Central Office Water Program Provides technical assistance to tribes; supports water rights negotiation, litigation, water management, planning, and pre-development through the regional office and Local Agency Water Program
	<p><u>New Mexico Indian Affairs Department</u></p> <ul style="list-style-type: none"> Develops state-tribal consultation policies

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Appendix 1A

Public Survey on Potential Workshops

Contents

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1. Survey Background

To move forward with implementation of policies, the New Mexico Interstate Stream Commission proposes hosting a series of public engagement events in 2019 and beyond. Reviewers of the *Draft 2018 New Mexico State Water Plan* were provided an opportunity to respond to a series of questions to help prioritize and locate the events. The following is a summary of the feedback from those questions. **Figure 1A-1** shows the categories of responders out of a total of 84 submissions.

As part of the public comment on the *Draft 2018 New Mexico State Water Plan*, a survey was conducted to capture the interests in future water planning events. This appendix includes feedback from a series of questions. In summary, interest in these events is high, with more than 50% of respondents interested in five out of the eight topics presented.

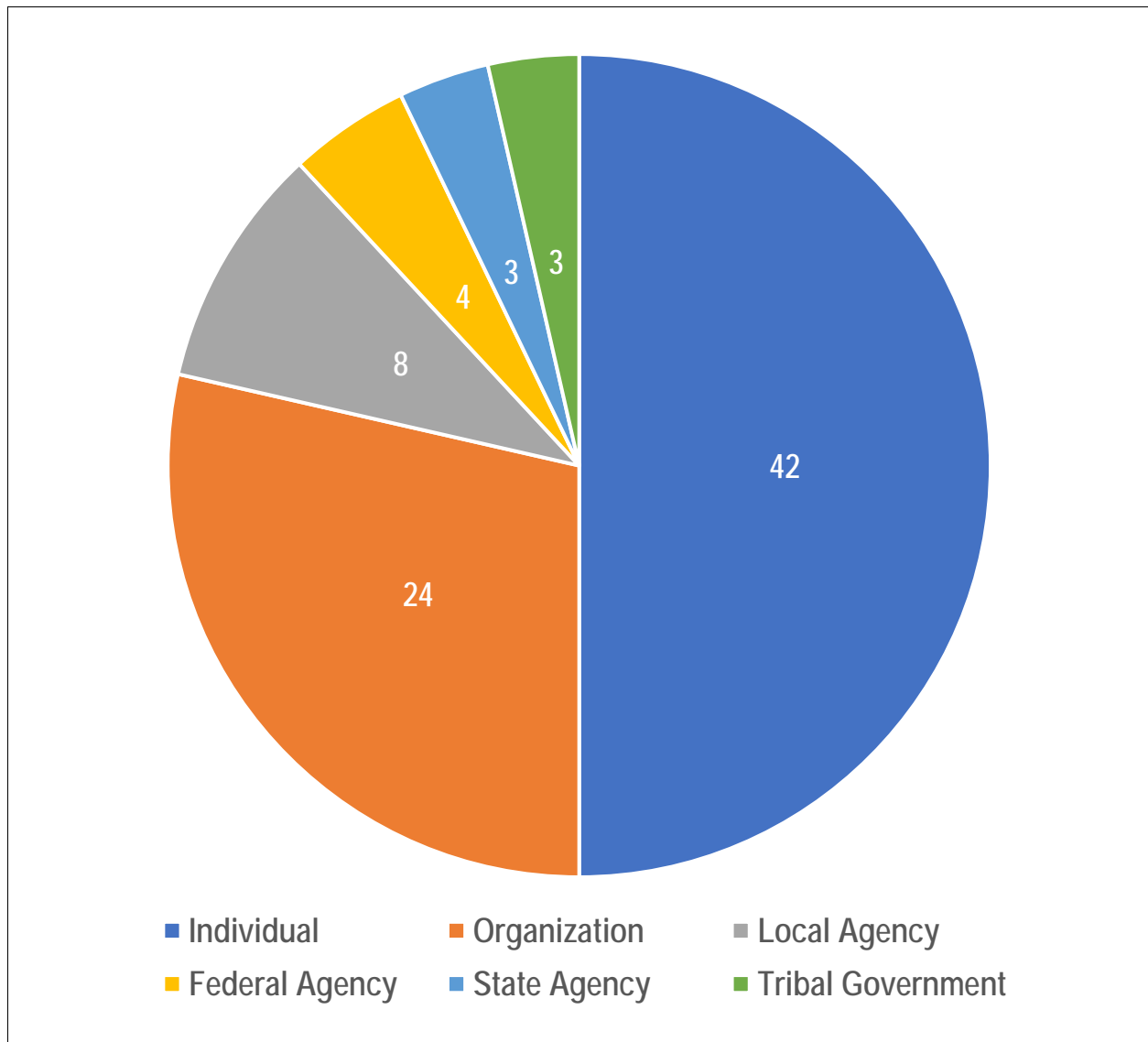


Figure 1A-1. Affiliation of Survey Responders.

Figure 1A-2 shows the geographic distribution of the various responders.

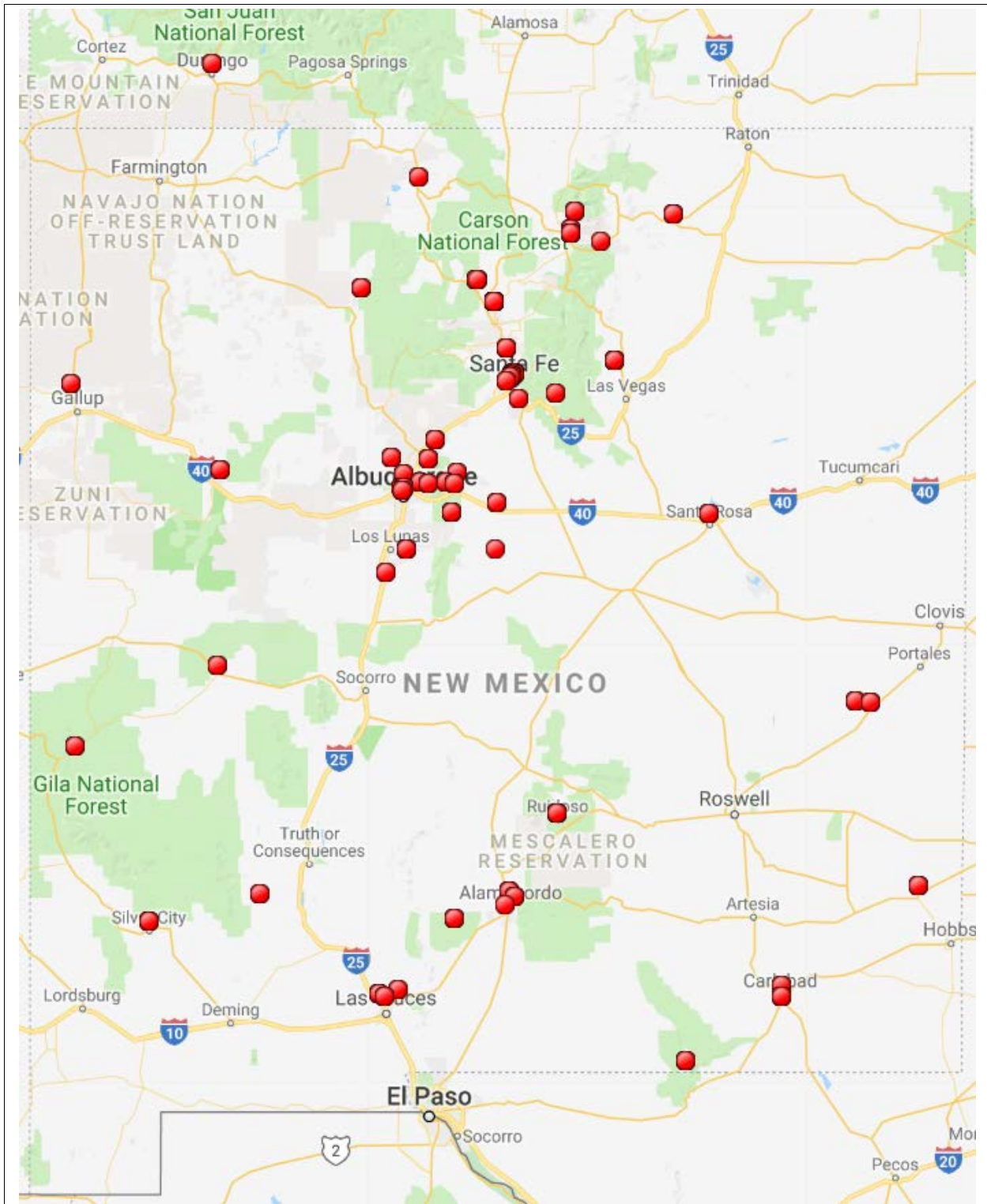
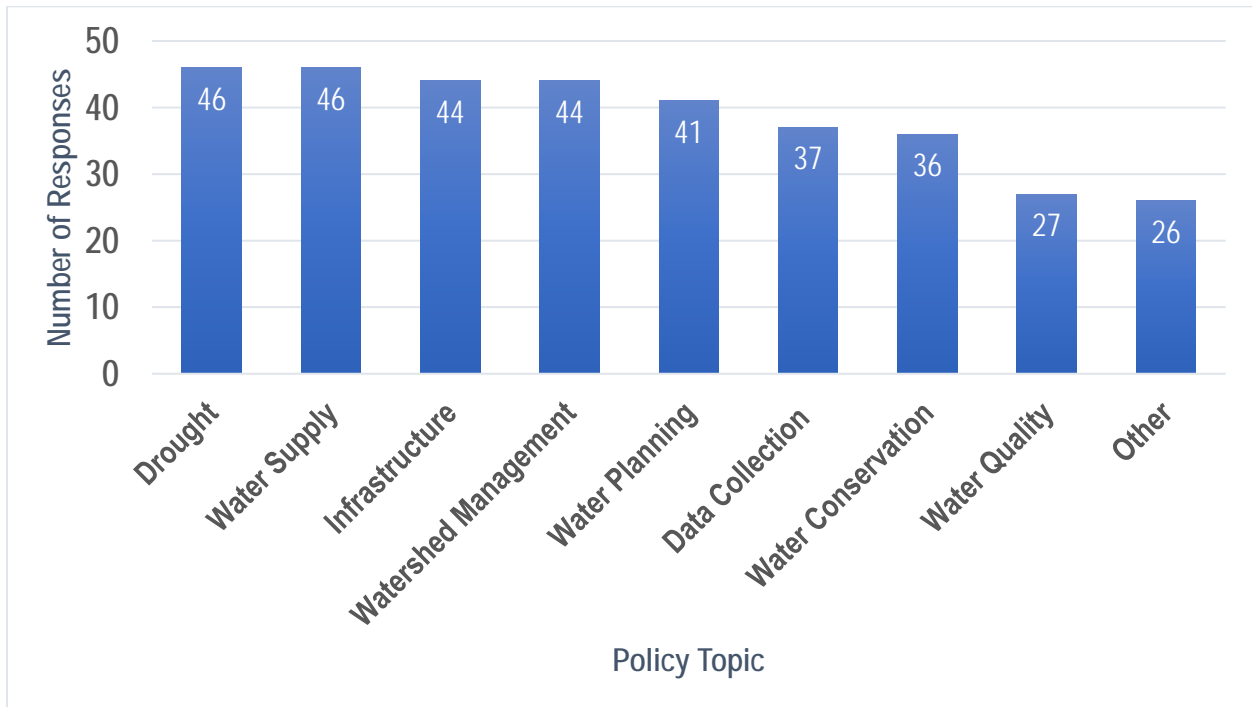


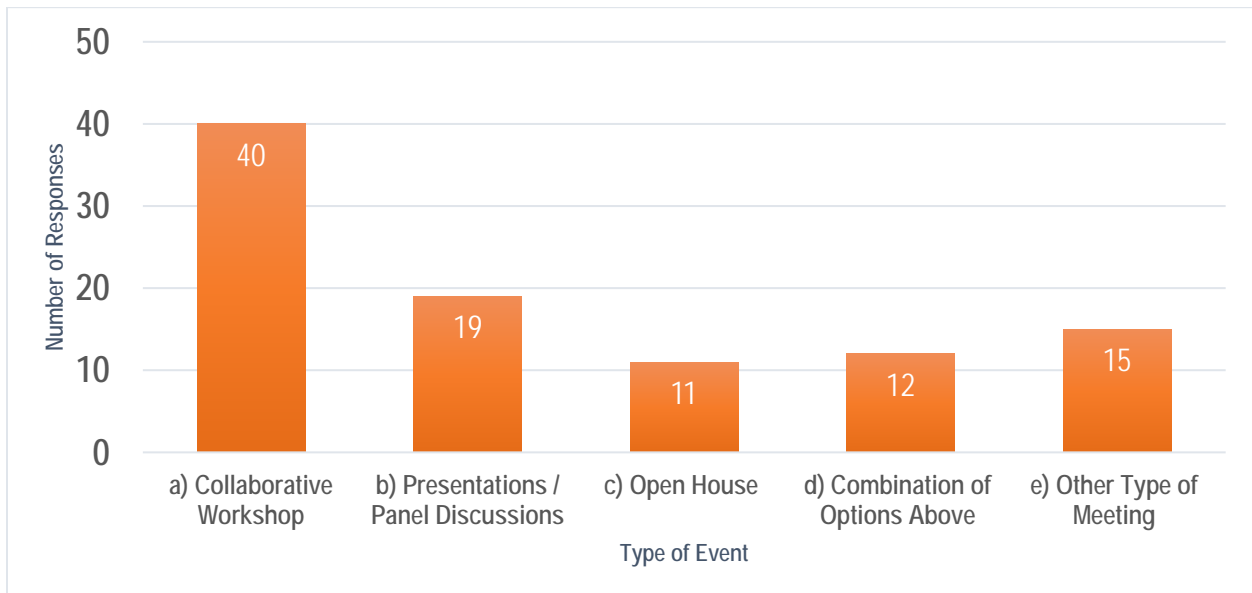
Figure 1A-2. Geographic Distribution of Responders.

2. Questions and Responses

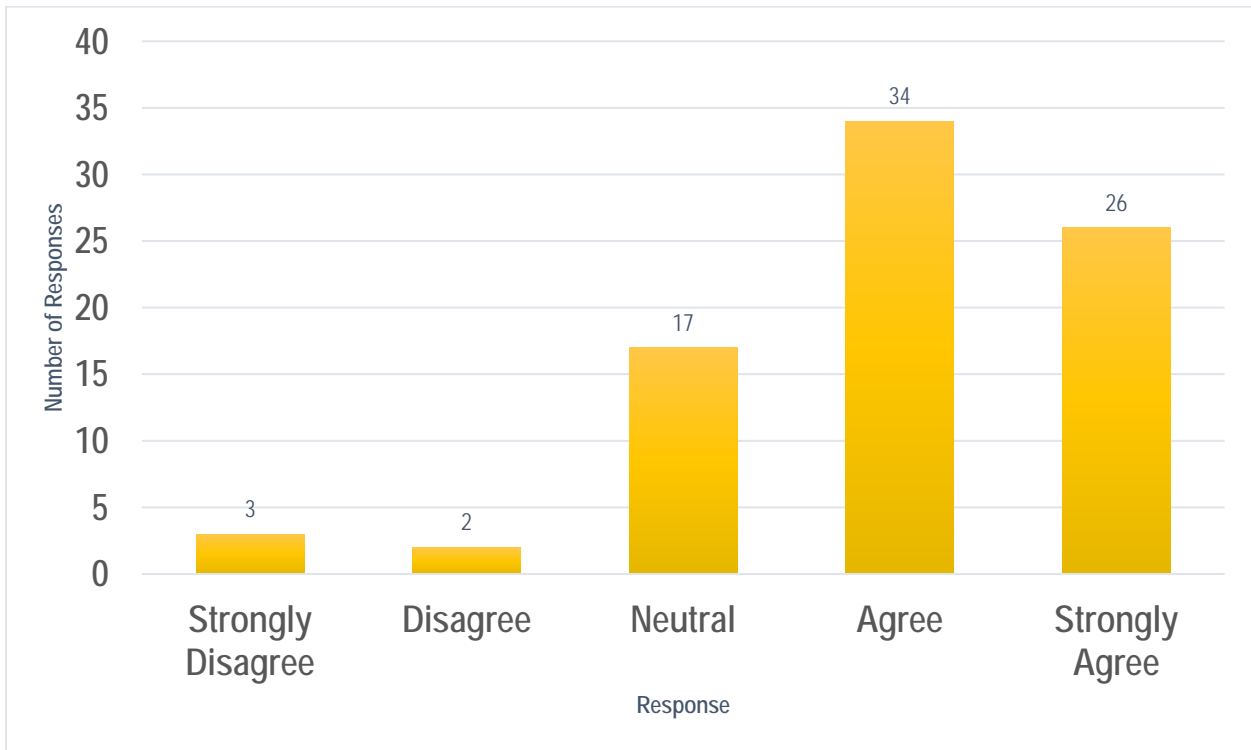
As we work to advance the State toward achieving policy goals identified in the State Water Plan, the ISC is considering organizing and hosting some public events. Would you be interested in participating in an event related to which of the following policy topics?



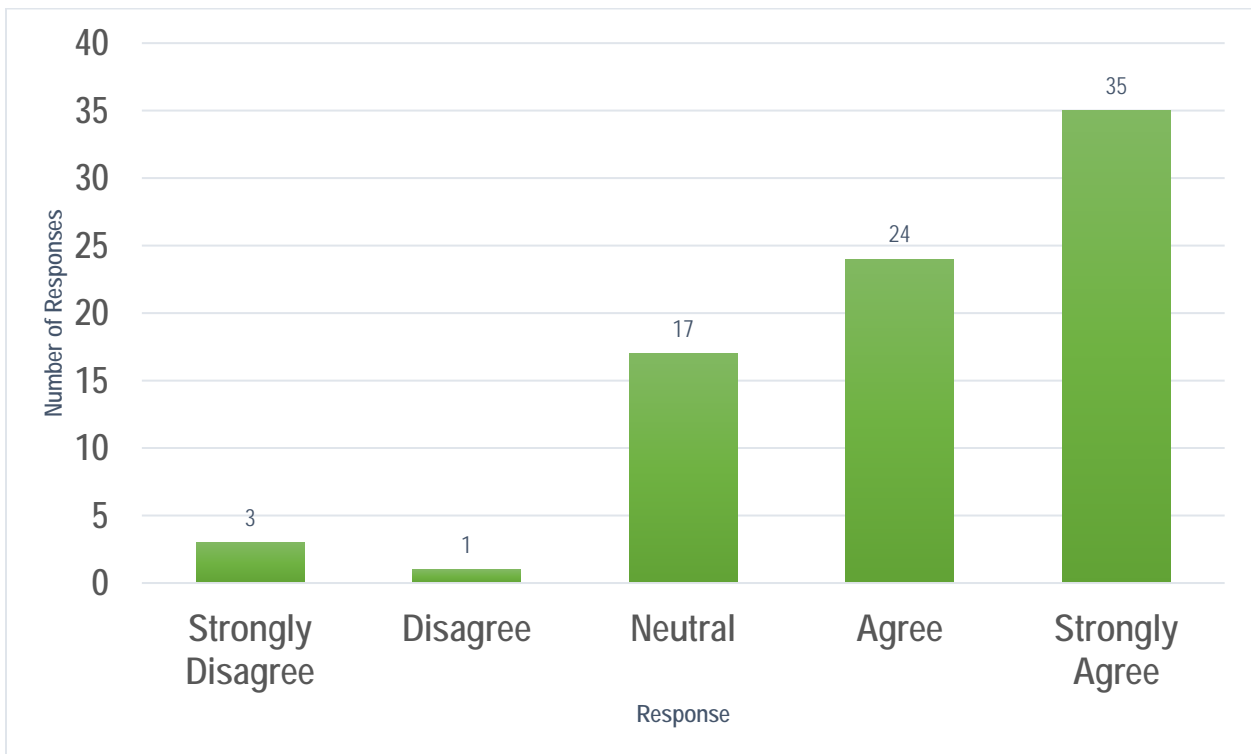
What type of event would be most useful?



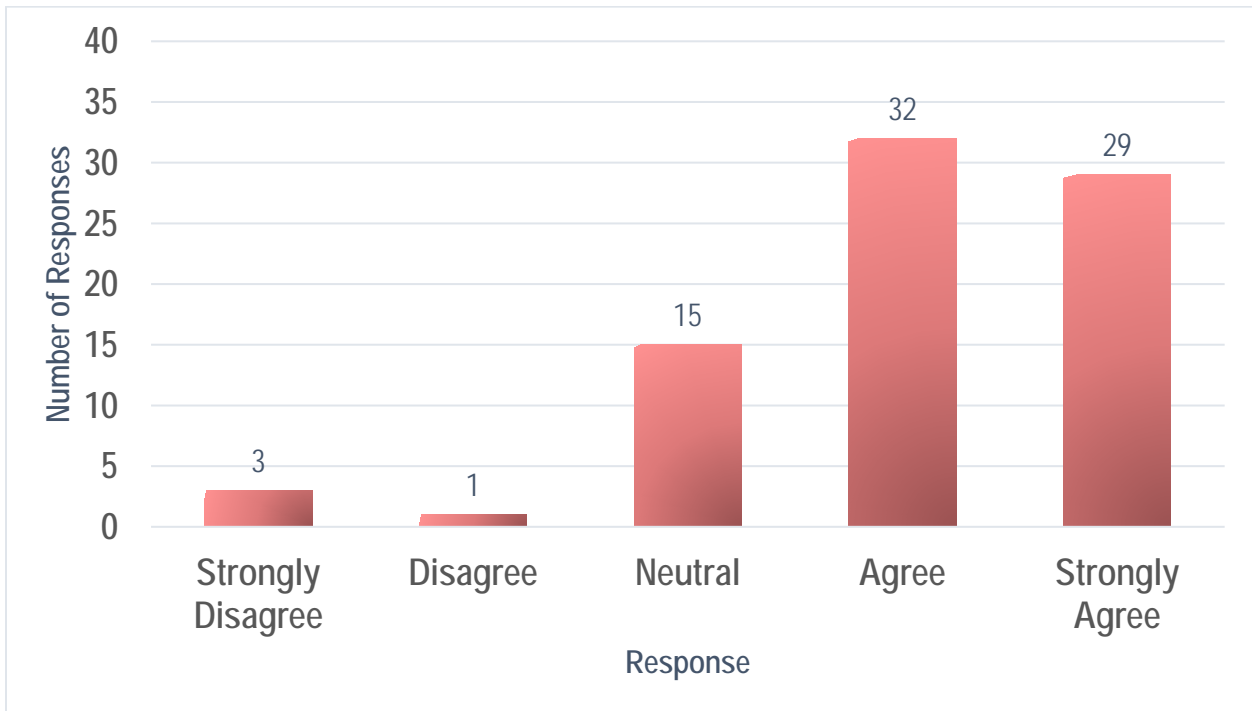
An important benefit of attending an event is to increase knowledge and understanding of scientific research.



An important benefit of attending an event is collaborative problem solving.



An important benefit of attending an event is the opportunity to speak with and listen to practitioners or professionals.



An important benefit of attending an event is to gain practical information related to daily operations.

