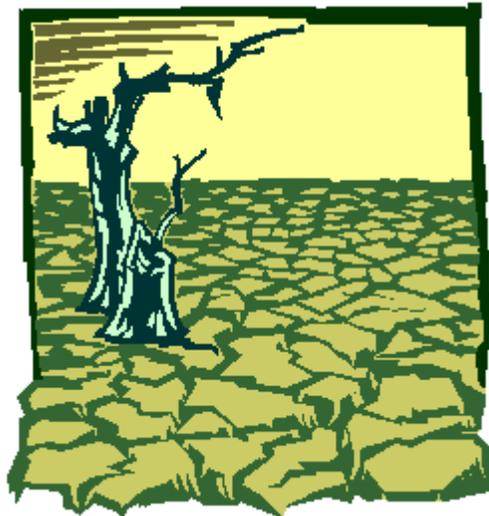


New Mexico Drought Task Force

New Mexico Drought Plan



Update: December 2006



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Introduction

The purpose of this report is to provide information on the status of drought in New Mexico and the activities of the Governor's Drought Task Force over the past year, outline the goals of the Task Force for the coming year, and provide an assessment of risk that drought presents to our state.

Governor Bill Richardson created the current New Mexico Drought Task Force by Executive Order 2003-019 in the spring of 2003 (Appendix A). The twelve-member Task Force is chaired by the State Engineer and includes Cabinet Secretaries from the Energy, Minerals and Natural Resources Department, Department of Environment, Department of Finance and Administration, Department of Agriculture, Department of Indian Affairs, Department of Tourism, and Economic Development Department; Executive Director of the New Mexico Finance Authority; Directors of the Interstate Stream Commission and the Office of Emergency Management of DPS; and the Director of Policy and Planning from the Office of the Governor (Appendix B).

The history of the Drought Task force goes back to 1996, when Governor Gary Johnson created the New Mexico Drought Task Force by Executive Order. The five-member Task Force was chaired by the Cabinet Secretary of Energy, Minerals and Natural Resources and consisted of three Cabinet Secretaries, the State Engineer, and a representative from the Office of the Governor. The New Mexico Drought Plan, Volumes I and II, were published in 2002 under Governor Johnson's leadership.

The year 2006 has been a year of very extreme climate regimes. The January-June period was the 2nd driest of 112 years while the July-August period was the Wettest in 112 years. Accordingly, the January-May (5 months) average precipitation was 39 percent of normal, while the July-October (4 month) average was 156 percent of normal.

The transition between the two extreme periods began in late June. June precipitation averaged 96 percent of normal. After the wet summer and early autumn, calendar year precipitation as of November averaged 120 percent of normal. The National Climatic Data Center (NCDC) determined that October 2006 was the 21st wettest October of the past 112 years in New Mexico.

Risk assessment is one of the chief components of drought management. In planning for drought, assessment is a major tool in the toolbox for drought-related hazards and the associated cost of drought impacts, which partly can be expressed in monetary terms in an economic assessment which assists in decision making. Other types of assessments are also relevant for decisions on pre-emptive measures or mitigation. These assessments are both environmental and social. Once a management strategy has been prepared, there will be a need to apply various policy tools to assist in implementation of that strategy. There will

be a need to address how to effectively catalyze social change, which regulatory instruments to apply, how land use planning can be brought into the picture, and how economic instruments can assist integrated drought management. These tools will help to identify and reduce New Mexico's vulnerabilities to drought.

The New Mexico Drought Task Force created six Work Groups to address specific sectors impacted by drought. The groups were convened in the summer of 2003 and worked for two years to determine each sector's vulnerabilities to drought, formulate plans and policy proposals for the Drought Task Force to mitigate drought impact, and take action to reduce the impact of drought on their sector. The Work Groups provided a means for representation and participation by a broad spectrum of stakeholders for each sector impacted by drought, with representatives from Federal, State, Tribal, local, advocacy groups and private citizens.

Having accomplished the tasks that the Work Groups were charged with by the Drought Task Force, four of the Work Groups were disbanded while the ongoing work of the Drinking Water Work Group has been taken over by the Water Infrastructure Technical Team (TT) which is a multi-agency staff team appointed to assist the Governor's Water Infrastructure Investment Team (WIIT). The Monitoring Work Group continues to meet regularly and report to the Drought Task Force on the current conditions of the drought throughout the State.

The increase in New Mexico's population over the past several decades has dramatically increased the state's vulnerability to drought. It is therefore critical to both inform and educate New Mexico residents about drought conditions and the threats posed to the environment, to our economy, and to our health. There is much that the general public can do to conserve water, ensure adequate quantity and quality drinking water and mitigate the local impacts of drought.

In 2005, Governor Richardson formed the Climate Change Action Council (CCAC) through Executive Order (05-033). The CCAC was formed by the Governor in the Climate Change and Greenhouse Gas Executive Order (see attached). The Governor designated the State Engineer and the Secretaries of Game and Fish, Economic Development, Energy and Minerals, General Services, Health, Indian Affairs and Transportation as members of the Council. The EO also established a Climate Change Advisory Group (Advisory Group) to investigate and report on regional and national initiatives, particularly in association with nearby states, which will help create meaningful policy to address climate change. The Advisory Group reports to and makes recommendations to the CCAC. The primary purpose of the Council is to review recommendations from the Advisory Group before they go to the Governor.

On December 1, 2006, the CCAC announced that New Mexico could reduce its greenhouse gas emissions by the equivalent of 267 million metric tons and create a projected \$2 billion net economic savings for New Mexico's economy over the next decade if the State adopts 69 policies they developed on climate change. The complete CCAC Report to the Governor can be accessed at: www.nmclimatechange.us.

Many DTF work group members were substantially involved with the work group established by the State Engineer and chaired by Anne Watkins to prepare the “analysis of the impact of climate change on the State’s water supply and ability to manage its water resources” called for by the Governor’s Executive Order. The report titled “The Impact Of Climate Change On New Mexico’s Water Supply And Ability To Manage Water Resources” was submitted to the Governor in July 2006. This report is available at:
www.ose.state.nm.us/ClimateChangeImpact/completeREPORTfinal.pdf

Extended drought is one of the anticipated impacts of climate change, and work group activities need to be closely coordinated with the Governor’s initiative. Researchers believe the massive die-off of piñon during 2002 and 2003 could be a harbinger of the effects of climate change. Tree deaths occurred in areas that were relatively unaffected by a drier drought during the 1950s, but this drought was warmer. Scientists have predicted that mountain snowpack would be reduced in a warming world. Recent research indicates that warming in much of the west during winter and spring has already produced declines in mountain snowpack (-11% averaged over the west) earlier snowmelt runoff and lower summer streamflow. It was with these issues in mind that the Work Groups directed much of their energies during 2006 to climate change initiatives. Accordingly, the DTF decided that the main theme of the Governor’s 2006 Drought Summit should be “Climate Change: What Does It Mean For New Mexico?”. (Appendix E)

Over 300 people registered for the 2006 Drought Summit. The major presentations made at the Summit as well as all other documents referenced in this report can be accessed on the Drought Task Force website at: www.nmdrought.state.nm.us.

Drought Conditions Update

CURRENT DROUGHT STATUS

The Monitoring Work Group of the Drought Task Force keeps track of drought conditions throughout the year. Their work is invaluable in overseeing the status of drought in New Mexico as well as forecasting future drought conditions. The following update is due largely to their work throughout the year.

Over most of the State, the wet period that began in late June had ameliorated the short-term drought that began in late October 2005. Some short-term drought still lingers over portions of the mountains in the north, and also in the far west in McKinley County. The long-term drought has also been diminished significantly, especially over the south. However, lingering impacts of the long-term drought over northern New Mexico will require significant winter precipitation followed by a significant spring snow melt runoff before they are ameliorated. Elephant Butte Reservoir provides a prime example of the effect of long-term drought. Storage at Elephant Butte was 132 percent of normal in early 2000 when the long-term drought was young. Storage dropped to 10 percent of normal during the peak drought periods from 2003 into 2006. After the recent wet period, Elephant Butte storage reached 34 percent of normal storage by the end of October 2006.

Month	Percent of Normal	Comment
January	28	10 th driest of 112 years
February	15	3 rd driest of 112 years
March	71	49 th driest of 112 years
April	47	25 th driest of 112 years
May	36	22 nd driest of 112 years
June	96	2 nd driest Jan-June of 112 years
July	139	27 th wettest of 112 years
August	184	Wettest of 112 years, wettest Jul-Aug of 112 years
September	131	25 th wettest of 112 years, 2 nd wettest Jul-Sep of 112 years
October	168	21 st wettest of 112 years, 3 rd wettest Jul-Oct of 112 years

One way to assess short and long-term drought is to look at the precipitation percentiles. In general, percentiles provide a good measure of how rare conditions are. Percentiles greater than 50 indicate the area has been wetter than average. Drought is associated with the lower percentiles. Percentiles less than the 11th are usually associated with “emergency” designations in New Mexico. Percentiles from 11th to 20th are consistent with drought “warning” designations. The 21st to 30th percentiles are associated with drought “alerts” and the 31st to 40th percentiles are consistent with “heads up” advisories.

Rangeland/Pasture conditions: According to the USDA, as of the end of October, 62 percent of the range and pasture land in New Mexico was in good to excellent condition.

This was up from only 3 percent in June. Meanwhile, 20 percent of the land was considered to be in poor or very poor condition in early October, which was down from 79 percent in early June.

Fire Danger Impacts: Drier weather since mid-October has allowed fire danger to return to moderate or high over most of New Mexico, especially in the lower elevations and the grasslands. This is fairly normal for the period of year between summer thunderstorms and winter snowfall.

Hydrologic Impacts: Summer and early autumn rainfall helped stream flow and storage, especially in the smaller systems. At the end of October, NRCS reported storage at normal or above-normal levels at Abiquiu (134 percent of normal), Navajo (112 percent), and Santa Rosa. Storage at Santa Rosa was 129 percent of normal, compared to 109 percent in September and only 48 percent in early August. Conchas Lake storage was 47 percent of normal, compared to 30 percent in early August. Heron was up slightly from 60 percent to 69 percent of normal, while El Vado was at 63 percent of normal. Heavy inflow into the Rio Grande basin occurred during August, September and early October, above and below the Caballo-Elephant Butte storage system. Elephant Butte was up to 34 percent of normal, which is considerably higher than it would be if the basin had experienced normal summer rainfall.

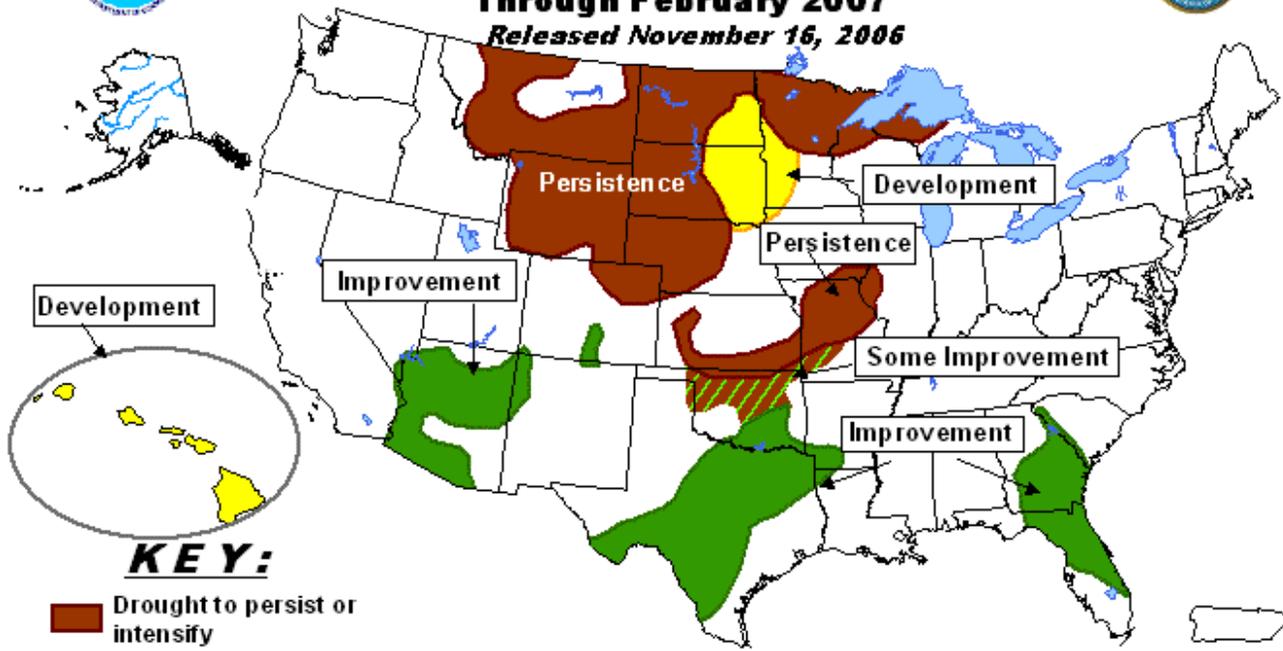
Long-range outlook: A weak El Nino has developed over the Pacific. El Nino is usually associated with above-normal precipitation in New Mexico during the cooler half of the year. Warmer than normal sea surface temperatures have also developed over the northern Pacific. This scenario doesn't occur very often, but it does reduce confidence in a wet winter to some degree. Best chances for above-normal winter and spring precipitation will be over southern and western New Mexico, especially for the period December through April. Temperatures are expected to be near or slightly above normal as El Nino reduces the frequency of extremely cold arctic air intrusions into New Mexico. In any case, the winter and spring of 2006-2007 is likely to be significantly wetter and colder than last winter and spring.



U.S. Seasonal Drought Outlook

Through February 2007

Released November 16, 2006



KEY:

-  Drought to persist or intensify
-  Drought ongoing, some improvement
-  Drought likely to improve, impacts ease
-  Drought development likely

Depicts general, large-scale trends based on subjectively derived probabilities guided by numerous indicators, including short- and long-range statistical and dynamical forecasts. Short-term events -- such as individual storms -- cannot be accurately forecast more than a few days in advance, so use caution if using this outlook for applications -- such as crops -- that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4). For weekly drought updates, see the latest Drought Monitor map and text. NOTE: the green improvement areas imply at least a 1-category improvement in the Drought Monitor intensity levels, but do not necessarily imply drought elimination.

Organizational Structure of Drought Planning

DROUGHT TASK FORCE

The New Mexico Drought Task Force (DTF) oversees the implementation of drought-preparedness activities in the State of New Mexico. This Task Force acts as a liaison between the Monitoring Work Groups, the Water Infrastructure Technical Team and the Office of the Governor. The Task Force also plays a major role in intergovernmental drought preparedness and response coordination and media information releases.

In March 2006, the Governor issued Drought Declaration in Executive Order 2006-012. This EO directed the Drought Task Force to prepare recommendations for the Governor's consideration as soon as possible concerning steps that the State may take to conserve water during this period of extreme drought.

In response to the Executive Order, on March 29, the Drought Task Force submitted to the Governor a report, which included ten specific recommendations for consideration. This report (Appendix F) also included a status report on the Current and Ongoing State Agency Drought Mitigation Activities. These two documents are available on the Drought Task Force website at: www.nmdrought.state.nm.us.

Monitoring Work Group (MWG)

The Monitoring Work Group includes water resource and climate professionals from all levels of government. The group is responsible for monitoring available climatological data, stream flow, reservoir storage levels, and other pertinent information necessary to analyze the current status of drought conditions in the State of New Mexico. The group also examines and reports on long-term forecasts to assist the DTF in preparedness and response actions. The MWG issues status reports on various stages of drought that trigger actions by the DTF.

Water Infrastructure Technical Team (TT)

The Water Infrastructure Technical Team is comprised of professionals knowledgeable in fields such as water resources and planning, conservation, water systems construction programs, and water financing. The group has a broad spectrum of responsibilities for mitigation and response, working to prevent community water systems from reaching emergency status through improved planning (including conservation and drought contingency plans) and through multi-system collaboration. The group also identifies methods for domestic, commercial, and industrial sectors to reduce water use, through the

use of techniques such as market-based incentives, changes in land-use regulations, and increased education and technical assistance, and makes recommendations to the DTF and the Water Infrastructure Investment Team for policy that may assist with water conservation in those sectors.

Drought Task Force Work Group Activities and Priorities

Many DTF work group members were substantially involved with the work group established by the State Engineer and chaired by Anne Watkins to prepare the “analysis of the impact of climate change on the State’s water supply and ability to manage its water resources” called for by the Governor’s Executive Order. The report titled “The Impact Of Climate Change On New Mexico’s Water Supply And Ability To Manage Water Resources” was submitted to the Governor in July 2006. This report is available at:

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

Monitoring Work Group

2006 Priorities

1. Continue to work with the Western Governors’ Association toward federal enactment of the National Integrated Drought Information System (NIDIS).
2. Continue to coordinate with the Arizona drought monitoring committee to provide more consistent monitoring between the states of New Mexico and Arizona.
3. Complete a comprehensive drought monitoring plan for the state and seek funding for additional monitoring equipment and better statistical tools to aid in gathering information that will allow more comprehensive monitoring of drought.

2006 Activities and Accomplishments

The Monitoring Work Group has continued to take the lead role in providing information on the drought in reporting the current situation and forecasting future conditions. They worked toward their priorities from last year through the following efforts:

- Proposal is in place to improve monitoring by upgrading manual snow course platforms owned and maintained by NRCS to SNOTELs, and to upgrade a number of state-owned weather stations maintained by the State Climate Office.
- Continues to support the efforts of the Western Governors’ Association to develop the National Integrated Drought Information System (WGA-NIDIS) proposal to congress.
- Coordinated with the Arizona drought monitoring committee to provide more consistent monitoring between the states of New Mexico and Arizona. The Drought Programs Manager for Arizona participates in the meetings of the Monitoring Work Group via telephone.

- Participated in a workshop on drought-related policy related issues with the NASA Earth Science Data group in Washington, D.C. Gave input on the states perspective on how NASA can help states deal with drought and drought data management.

2007 Priorities

1. Continue to work with the Western Governors' Association toward federal enactment of the National Integrated Drought Information System (NIDIS) and to designate New Mexico as a beta site.
2. Continue to research impact of different levels of drought on the state and build a list of impacts on a spatial scale.
3. Continue to seek funding for additional monitoring equipment and better statistical tools to aid in gathering information that will allow better monitoring of drought status; the proposal in Appendix H was adopted by the DTF and will be submitted to the Governor for consideration.
4. Continue to research the use of drought triggers that will help quantify when a drought is in effect and when a state of drought should be declared.
5. Continue to work with Arizona in two capacities: (a) coordinate with the Arizona drought monitoring committee to provide more consistent monitoring between the states of New Mexico and Arizona, and (b) work with the Arizona drought monitoring committee to develop better monitoring tools for the state of New Mexico.
6. Support or seek funding for a pilot survey with the USDA National Agricultural Statistics to allow for the gathering of drought information in New Mexico.

Water Infrastructure Technical Team (TT)

2006 Priorities

1. Continue development of a state policy to require hydrological and fiscal sustainability and Safe Drinking Water Act compliance for all water projects getting state funding. This would include such requirements as regional collaboration among geographically proximate water systems, strong drought management and conservation plans, interjurisdictional cooperation, realistic rates structures, and aggressive leak detection. Draft policies, regulations and statutory changes as may be required to implement the policy.
2. Continue review of existing state statutes that call for water planning, conservation plans, drought plans and source water protection and create a "Navigating the Waters" handbook to help water systems with planning as necessary.

3. Make recommendations to combine into one statute the requirements for public water system planning dealing with OSE plans and conservation issues.
4. Continue to investigate assured water supply and associated subdivisions and zoning proposals, including a provision requiring demonstrated availability of wet water for an appropriate time period, such as 100 years. After that is done, analyze how subdivision and zoning ordinances could assure adequate wet water, encourage water efficiency, discourage water pollution and discourage exacerbation of drought effects by new developments.
5. Continue to develop a plan to increase conservation by water users including commercial building managers, the building industry, homeowners and managers and occupants of public buildings, including educational strategies and funding needs.
6. Recommend and prepare model code/ordinance for cities and counties that will move toward xeric landscaping.
7. Prepare package for Source Water Protection requirement including statutes, regions and water systems sizes.

2006 Activities and Accomplishments

The Technical Team has been active in pursuing its priorities for 2006 with special emphasis on:

- Continued review of existing water and wastewater systems statutes to identify needs and gaps.
- Working with local government entities to encourage regionalization of water and wastewater systems throughout the State.
- Prepared response to HJM 86, passed by the 2006 Legislature, which called for a proposal on "Criteria for water system planning, performance, and conservation as a condition for state funding." The Executive Summary of that report is attached (Appendix G), and the full report is available at: www.nmdrought.state.nm.us

2007 Priorities

1. Assist the Water Infrastructure Investment Team (WIIT) with development of a "business model for sustainability" for water and wastewater systems based on the HJM 86 report.

2. Continue researching other states' statutory and institutional structures for organizing and funding water and wastewater systems in order to make recommendations for appropriate changes in New Mexico.
3. Continue to pursue assured water supply and associated subdivisions and zoning proposals.
4. Assist and encourage public water systems in adopting source water protection plans and other measures to ensure adequate quantity and quality drinking water for local communities.

Appendix A: Executive Order 2003-019

Bill Richardson, Governor
State of New Mexico
Office of the Governor

EXECUTIVE ORDER 2003-019

WHEREAS, portions of New Mexico have experienced mild drought conditions since 1996; and

WHEREAS, drought conditions intensified during the extremely dry winter of 2001-2002 and spring of 2003, with large portions of New Mexico experiencing severe to extreme drought conditions; and

WHEREAS, total statewide reservoir levels are at their lowest point since October 1978; and

WHEREAS, it may take several years of significantly higher than normal levels of precipitation and snow pack to allow for current reservoir storage to recover to levels that will satisfy all demands; and

WHEREAS, the National Weather Service and Natural Resource Conservation Service's coordinated May 1 snow pack runoff forecast projects below to well below normal runoff volumes at 600/0 of the forecast location in the state, including the Canadian, Rio Grande and San Juan river basins; and

WHEREAS, present composite snow pack levels for eight of the ten basins in the state are significantly lower than the thirty year averages for those areas; and

WHEREAS, the present combination of low reservoir levels and projected snowmelt runoff forecasts continues to match the lows for the state not seen since the drought of the mid-1970s; and

WHEREAS, runoff into some major streams is expected to be as low as 53% of normal; and

WHEREAS, stream flow during water year 2002 on the Pecos River was the lowest since 1950 and on the Rio Chama was the lowest since 1977; and

WHEREAS, five-year precipitation deficits of up to 18 inches have been recorded in two basins; and

WHEREAS, the National Weather Service believes that long-term trends indicate that the State may be entering a period of prolonged drought; and

WHEREAS, the El Niño Southern Oscillation trend forecast to bring an increased amount of winter precipitation has not fully developed this year; and

WHEREAS, there is a shortage of soil moisture in the rangelands and forests; and

WHEREAS, the National Oceanographic and Atmospheric Administration's (NOAA) Vegetation Health Index throughout 2002 showed a high level of stress on range and farm land throughout the State; and

WHEREAS, it may take a considerable amount of precipitation and snow melt runoff to return the soil moisture conditions and vegetation health to reasonable levels; and

WHEREAS, fire conditions are expected to reach a critical stage in many areas of the state this spring and summer; and

WHEREAS, compliance with Endangered Species Act may be compromised by the drought; and

WHEREAS, the New Mexico Drought Monitoring Work Group has recommended that warning or emergency conditions have been met in the majority of the state's eight climate divisions; and

WHEREAS, all indications are that drought conditions are not likely to abate in the near future and may worsen; and

WHEREAS, extraordinary measures are necessary to protect public health, ensure public safety and well being, and provide for the economic stability of the State.

NOW, THEREFORE I, Bill Richardson, Governor of the State of New Mexico, by virtue of the authority vested in me by the Constitution and Laws of the State of New Mexico, do hereby declare a state of emergency due to drought conditions statewide; and

I FURTHER DIRECT the establishment of the New Mexico Drought Task Force as follows:

1. The Task Force shall be composed of the following members:
 - a. The State Engineer, or designee, who shall serve as Chair.
 - b. The Secretary of the Environment Department, or designee, who shall serve as Vice Chair.

- c. The Executive Director of the New Mexico Finance Authority, or designee, who shall serve as Secretary and shall provide staff and administrative support to the Task Force.
- d. The Director of the Interstate Stream Commission, or designee.
- e. The Secretary of the Energy, Minerals and Natural Resources Department, or designee.
- f. The Secretary of the Department of Finance and Administration, or designee.
- g. The Secretary of the Department of Agriculture, or designee.
- h. The Director of the Office of Emergency Management of the Department of Public Safety, or designee.
- i. The Secretary of the Office of Indian Affairs, or designee.
- j. The Director of Policy and Planning in the Office of the Governor, or designee.
- k. The Secretary of the Department of Economic Development, or designee.
- l. The Secretary of the Tourism Department, or designee.

2. The purpose of the Task Force shall be to provide ongoing oversight and examination of statewide drought conditions.
3. The Task Force shall make recommendations to the Governor for intermediate actions and long-term strategies to mitigate drought conditions and impacts in the State.
4. The Task Force shall appoint such Working Groups as may be necessary and appropriate to examine and recommend solutions regarding the drought conditions to the Task Force,
5. The Task Force shall provide guidance and information to the Governor regarding drought conditions.
6. The Task Force shall invite local government officials, federal officials, and Indian tribes and pueblos to participate in the activities of the Task Force.
7. The Task Force shall meet at least once each quarter of the year and shall conduct all meetings and maintain written minutes of their proceedings in conformity with the provisions of the New Mexico Open Meetings Act.
8. The Task Force shall meet immediately upon execution of this Executive Order to establish its organizational structure and revise the New Mexico Drought Plan to conform to the provisions set forth herein. The Task Force, thereafter, shall prepare and submit, on or before November 1 of each year, an annual update of the New Mexico Drought Plan, which shall include recommendations to the Governor for drought mitigation actions.

9. For purposes of conducting business, a majority of the membership of the Task Force shall constitute a quorum.

I FURTHER ORDER the activation of the New Mexico Drought Plan upon its revision as set forth herein to assess conditions, evaluate impacts, and make recommendations as to appropriate response and mitigation actions to be taken; and

I FURHTER AUTHORIZE all executive branch agencies of state government to apply for and, if eligible and qualified, receive emergency funds as required to carry out the New Mexico Drought Plan and for such other disaster relief related to drought as set forth in this Executive Order, such funds to be released upon approval by the Office of the Governor based on the recommendation of the New Mexico State Drought Task Force, pursuant to and in accordance with Sections 6-7-1 through 6-7-3, NMSA 1978.

This Executive Order supersedes any other previous orders, proclamations or directives in conflict. This Executive Order shall take effect immediately and shall remain in effect until such time as it is rescinded by the Governor.

ATTEST:

REBECCA VIGIL-GIRON SECRETARY OF STATE
DONE AT THE EXECUTIVE OFFICE THIS 30th DAY OF MAY, 2003.

WITNESS MY HAND AND THE GREAT SEAL OF THE STATE OF NEW MEXICO.
GOVERNOR BILL RICHARDSON

Appendix B: Drought Task Force Members

DROUGHT TASK FORCE MEMBERS				
NAME	ADDRESS	TELEPHONE	FAX	E-MAIL
John D'Antonio CHAIR	NM State Engineer Office of the NM State Engineer PO Box 25102, Santa Fe, NM 87504	505-827-4193	505-827-3806	jdantonio@ose.state.nm.us
Ron Curry	Secretary Department of Environment 1190 St. Francis Drive, N4050, Santa Fe, NM 87503	505-827-2855	505-827-2836	ron.curry@nmenv.state.nm.us
I. Miley Gonzalez	Secretary Department of Agriculture MSC 3189, PO Box 30005, Las Cruces, NM 88003	505-646-5063	505-646-8120	nmagec@nmda.nmsu.edu
William Sisneros	Executive Director NM Finance Authority 409 St. Michael's Drive, Santa Fe, NM 87505	505-984-1454	505-984-0002	wcsisneros@nmfa.net
Rick Homans	Secretary Economic Development Department 1100 St. Francis Drive Santa Fe, NM 87505	505-827-0330	505-827-0328	rick.homans@edd.state.nm.us
William Hume	Director Policy and Planning Capitol, Santa Fe, NM 87505			william.hume@state.nm.us

DROUGHT TASK FORCE MEMBERS

NAME	ADDRESS	TELEPHONE	FAX	E-MAIL
Katherine Miller	Secretary Department of Finance and Administration Bataan Bldg., Room 180, Santa Fe, NM 87503	505-927-4985	505-827-4984	katherineb.miller@state.nm.us
Estevan Lopez	Director Interstate Stream Commission Bataan Bldg., Room 101, Santa Fe, NM 87501	505-827-6160	505-827-6188	elopez@ose.state.nm.us
Tim Manning	Acting Director Office of Emergency Management of DPS P.O.Box 1628, Santa Fe, NM 87504	505-476-9622	505-476-5922	tmanning@dps.state.nm.us
Mike Cerletti	Secretary Department of Tourism Lamy Building, Santa Fe, NM 87504	505-827-7469	505-827-7402	mcerletti@state.nm.us
Joanna Prukop	Secretary Energy Minerals & Natural Resources Department 1220 S. St. Francis Drive, Santa Fe, NM 87505	505-476-3227	505-476-3200	jprukop@state.nm.us
Benny Shendo	Secretary Indian Affairs Department 228 E. Palace Avenue, Santa Fe, NM 87501	505-476-1600	505-476-1601	benny.shendo@state.nm.us

Appendix C: Drought Task Force Monitoring Work Group Members

MONITORING WORK GROUP				
NAME	ADDRESS	TELEPHONE	FAX	E-MAIL
Deborah Bathke CHAIR	New Mexico State University Assistant State Climatologist New Mexico CoCoRaHS Coordinator	505-646-6327	505-646-6041	djbatkhe@nmsu.edu
Tim Darden	NM Dept of Agriculture P.O. 30005 Las Cruces, NM 88003-8005	505-646-2670	505-646-1540	tdarden@nmda.nmsu.edu
Bill Ewing	Dept. of Public Safety P.O. 1628 Santa Fe, NM 87504	505-476-9615	505-476-9695	bewing@dps.state.nm.us
Don Gallegos	US Army Corps of Engineers 4101 Jefferson Plaza, NE Albuquerque, NM 87109	505-342-3383	505-342-3195	Donald.J.Gallegos@Spa02.usace.army.mil
Charlie Liles	National Weather Service 2341 Clark Carr Loop, SE Albuquerque, NM	505-243-0702	505-244-9151	charlie.liles@noaa.gov
Ed Polasko	National Weather Service 2341 Clark Carr Loop, SE Albuquerque, NM	505-243-0702	505-244-9151	ed.polasko@noaa.gov
Richard Armijo	US Dept. of Agriculture Natural Resources Conservation Service 6200 Jefferson, NE Albuquerque, NM 87109	505-761-4428	505-761-4462	richard.armijo@nm.usda.gov

MONITORING WORK GROUP

NAME	ADDRESS	TELEPHONE	FAX	E-MAIL
Ted Sammis	NM State University Agriculture & Horticulture Department Box 30003-MFC3Q Las Cruces, NM 88003	505-646-2104	505-646-6041	tsammis@nmsu.edu
Roy Jemison	US Dept. of Agriculture Forest Service 333 Broadway SE Albuquerque, NM 87102	505-842-3255	505-842-3152	rjemison@fs.fed.us
Dave Mattern	US Dept. of Interior Bureau of Land Mgmt. 435 Montano, NE Albuquerque, NM 87107	505-761-8776	505-761-8911	dmattern@blm.gov
Scott Waltemeyer	US Geological Survey 5338 Montgomery NE Suite 400 Albuquerque, New Mexico 87109	505-830-7953	505.830.7998	sdw@usgs.gov
Gilbert Suazo Sr.	Taos Pueblo P.O. Box 1846 Taos, New Mexico 87571	505-758-8626 Ext. 103	505-758-8831	gil_suazo@yahoo.com
Dwight Slauch	U.S. Bureau of Reclamation 555 Broadway NE, Suite 100 Albuquerque, NM 87102	505-462-3630	505-462-3593	dslough@uc.usbr.gov

Appendix D: Water Infrastructure Technical Team Members (TT)

OSE: Anne Watkins (Lead)
Jim Sizemore

NMED Construction Programs Bureau: Richard Rose & Andy Edmundson

NMED Drinking Water Bureau: Chuck Thomas, Ana Marie Ortiz, Darren Padilla, Dennis McQuillan, Lourdes Monserrat & Rob Pine

NMED Surface Water Bureau: Marcy Leavitt

DFA: Rick Martinez

DFA Local Government: Robert Apodaca & Ken Hughes

NMFA: Tom McHugh & Angela Rodarte

EMNRD: Craig O'Hare

PRC: Tim Martinez, Phillis Stevens & Martin De La Garza

NM Rural Water Association: Matt Holmes & Rick Bela

NM Environmental Finance Center: Heather Himmelberger

RCAC: Blanca Surgeon, Ellen Drew & Olga Sanchez-Morales

USDA Rural Development Loan/Grant Program: Martha Torres

Appendix E: 2006 Drought Summit Agenda

N. M. GOVERNOR'S DROUGHT TASK FORCE

FOURTH ANNUAL DROUGHT SUMMIT—2006

CLIMATE CHANGE:

WHAT DOES IT MEAN FOR NEW MEXICO?

Wednesday October 18, 2006
UNM Continuing Education
1634 University Blvd NE
Albuquerque, New Mexico

AGENDA

7:00 Registration Begins

8:00 Welcome and Opening Comments

- Anne Watkins, Special Assistant to the State Engineer
- John D'Antonio, State Engineer and Chair of the Governor's Drought Task Force
- Sarah Cottrell, Energy and Environment Advisor to Governor Bill Richardson
- Governor Bill Richardson

- 8:30 **The Science of Climate Change**
Moderator: Sarah Cottrell, Energy and Environment Advisor to Governor *Bill Richardson*
 - Global and National Projections: Dr. Jonathan Overpeck, UA
 - Impacts on New Mexico and the Southwest: Dr. David Gutzler, UNM
- 10:15 **Break**
- 10:30 **Climate Change Solutions: New Mexico and Western States Emissions Reduction Strategies**
Moderator: Ron Curry, Secretary, NMED
 - Arizona’s Climate Change Initiatives: Kurt Maurer, AzDEQ
 - Governor Richardson’s Climate Change Initiative, The Western Regional Air Partnership and Climate Change Initiatives in Other Western States, Jim Norton, NMED
- 11:30 **Climate Change Initiatives at the Federal Level**
 - Michael Connor, Senator Jeff Bingaman’s Energy and Natural Resources Committee Staff*Moderator: Ron Curry, Secretary, NMED*
- 12:00 **Managing Risk in an Uncertain Climate**
 - Jacques E. Dubois, Swiss Re*Moderator: Lt. Gov. Diane Denish*
- 1:00 **Lunch**
- 2:00 **The Water/Energy Nexus**
 - Erik Webb, Office of Senator Pete Domenici*Moderator: Joanna Prukop, Secretary, EMNRD*

- 2:30 Climate Change Mitigation Projects: Case Studies
- Michael Walsh, Chicago Climate Exchange
- Moderator: Joanna Prukop, Secretary, EMNRD*
- 3:00 Challenges and Opportunities in Adapting to Climate Change
- Brian Hurd, NMSU
- Moderator: Anne Watkins, OSE*
- 3:30 Break
- 3:45 State Water Planning within the Uncertainty of Climate Change
- Ron Ott, California Bay-Delta Authority
- Moderator: Estevan Lopez, Director, NM ISC*
- 4:15 Agriculture's Role in Greenhouse Gas Mitigation
- Keith Paustian, Colorado State University
- Moderator: Dennis Alexander, USDA NRCS*
- 4:45 Statutory and Legal Challenges to Climate Change Adaptation
- Bennett Raley, Trout, Raley, Montano, Witwer & Freeman
- Moderator: Connie Rupp, US BOR*
- 5:15 Wrap-Up
- Moderator: John D'Antonio, State Engineer*

Appendix F: Recommendations From The DTF – March 29 2006

This document is available at: www.nmdrought.state.nm.us

Appendix G: Response to HJM 86 – Executive Summary

**CRITERIA FOR WATER SYSTEM PLANNING,
PERFORMANCE, AND CONSERVATION
as a
CONDITION FOR STATE FUNDING**

[Report to the New Mexico State Legislature in response to HJM 86](#)

Submitted by the Office of the State Engineer, November 3, 2005

In the summer of 2002, when the latest drought became most severe in New Mexico, over seventy (70) community water systems (CWS)* experienced emergency loss of drinking water. A “Strike Team” was organized by the New Mexico Finance Authority (NMFA) and the Water Trust Board (WTB) to help identify solutions to those emergencies. As the Strike Team investigated each situation, it became clear that almost all of these “emergencies” were in fact due to a chronic lack of adequate management, maintenance, and system planning, resulting in CWS that were not robust enough to handle the stress of drought conditions.

Consequently, the Drinking Water Work Group (DWWG) of the Governor’s Drought Task Force (DTF) began to discuss ways to prevent these kinds of emergencies in the future. Under the current administration, an informal Technical Team (TT— Attachment A) grew out of those discussions and began to meet regularly to investigate how other states were approaching the challenge of CWS sustainability and water quality protection through waste water treatment. The TT also provided advice and support to the Governor’s Finance Council (GFC) as it began to develop recommendations to insure that the State’s limited capital dollars are invested in infrastructure for the 21st century.

As a result of this activity, Governor Richardson, in April 2005, signed an Executive Order (Attachment B) that created a Water Infrastructure Investment Team (WIIT) to “provide recommendations and advice regarding a long range plan for secure and sustainable water and waste water infrastructure in New Mexico.” WIIT formalized the TT and asked that it provide recommendations for how to develop systems that could plan, construct and manage water and waste water infrastructure that would dependably and economically meet the State’s current and future needs.

Representative Joseph Cervantes’ **HJM 86** (Attachment C) requested that “the State Engineer collaborate with the Department of the Environment and other agencies to develop criteria for water system planning, performance, and conservation as a condition of funding.” Requiring a standard level of financial and operational planning and management capacity, as well as an accountable system for monitoring water use to encourage conservation and efficiency, is the best way to insure that the nearly \$100 million dollars in annual state funding for water and waste water systems is invested in the best and most cost effective engineering solution to meet an area’s drinking water needs and to protect the State’s water resources through adequate waste water treatment.

Because the TT included all of the agencies in the State that are involved in water and waste water system development, regulation, and funding, that group was asked by the State Engineer to help develop the criteria called for by HJM 86.

“Community water systems (CWS)” are public water supply systems which provide centralized service to at least 15 service connections used by year-round residents, or regularly serve 25 year-round residents, and includes distribution of water for municipal, domestic, industrial and commercial purposes.

GENERAL APPROACH:

- ** Set State standards for funding based on sound business practices, conservation and efficiency, with clear targets, templates and guidelines for how those standards should be met.
- ** Provide “free and easy” technical support to help water and waste water systems meet those standards.
- ** Enforce statutory and regulatory compliance.
- ** Create incentives to motivate water and waste water systems by prioritizing grants and zero-interest loans to those who meet the standards.

GOALS:

1. To protect the public health and economic vitality of New Mexico through strategic planning and investment in infrastructure for secure and dependable drinking water supplies, sufficient water for business and economic development, and waste water treatment for environmental and water quality protection.
2. To insure that New Mexico’s limited infrastructure dollars, including federal monies, are invested in water and waste water systems that will provide a stable and predictable supply of water for domestic, residential, commercial and industrial use throughout the 21st century.
3. To foster a coordinated, strategic, long-range approach to the development of water and wastewater infrastructure and “new” water supplies (through technologies such as desalination), thereby realizing economies of scale through regionalization and affording opportunities for public/private partnerships.
4. To protect New Mexico’s investment in water and waste water infrastructure by requiring management accountability to insure that assets achieve optimum efficiency and longevity, thereby decreasing the demand for state and federal funding.
5. To insure comprehensive financial planning and adequate funding for operation and maintenance, emergencies, and anticipated repair and replacement of water and waste water systems.

6. To promote conservation and highly efficient use of the State's limited water supplies.
7. To create water delivery systems that are hydrologically and fiscally sustainable and meet state and federal statutory and regulatory requirements.

RECOMMENDED CRITERIA: SUMMARY

The State of New Mexico plays an important role to insure that the state's residents and economy have safe and adequate water resources through the development of appropriate infrastructure for water delivery and waste water management. Because these delivery systems are local or regional in nature, the State needs to insure that the management entities for these systems have adequate financial, managerial, and technical capacity to reliably, consistently and economically supply sufficient quantities of water to meet regulatory standards, and that waste water treatment is sufficient to protect water quality and public health. The State can insure that systems have adequate capacity by adopting a "business model" approach to delivery of these services and requiring that funding recipients have the following in place:

1. A financial plan
2. A rate structure that covers expenses, builds necessary reserves, and encourages conservation
3. An asset management plan
4. A water accounting system with full metering
5. Full compliance with Office of the State Engineer regulatory requirements
6. Full compliance with the Safe Drinking Water Act (SDWA), the Clean Water Act (CWA), and all N.M. Environment Department regulatory requirements.
7. A governance structure adequate for proper direction and oversight, and which meets all applicable state laws.
8. Planning to support infrastructure project development and operation
9. Participation in regional efforts to collaborate on "long term" solutions with other CWS in an appropriate geographic region. [See definition of regionalization below.]
10. An energy efficiency strategy.

Many of the State's CWS do not now have these basic management tools in place, and many are not in compliance with state and federal laws and regulations. It will thus be important to provide technical assistance to help systems develop the necessary level of management expertise and to come into compliance within a reasonable "grace period." Preliminary approval of funding can be granted to systems that demonstrate both willingness and ability to comply with these requirements. However, final funding should be conditioned upon the system coming into compliance, and providing the funding agency with documentation of compliance within the designated time period.

For those CWS that are unable or unwilling to meet these requirements, the state should provide assistance for the system to merge with another or to participate in a regional solution. The state might also consider establishing a receivership program for such systems, and might want to consider establishing a role for counties to assume responsibility for unsustainable systems. While this may not be the most palatable solution for some water systems, it may be necessary to meet the goal of long term sustainability and security of drinking water supplies in New Mexico.

ADDITIONAL RECOMMENDATIONS:

1. Establish standards for all of the funding criteria.
2. Provide adequate training and technical assistance in the form of “free and easy” grants funded through annual (ideally recurring) appropriations.
3. Package infrastructure project funding as a combination of grants and loans to extend the benefits of grant dollars to more eligible CWS, expand the funding capacity of infrastructure dollars, and assure financial and management capacity through the loan qualification process.
4. Require that projects be fully planned prior to funding, with full funding then packaged from multiple available sources to allow completion in a timely manner.
5. Establish within State government an entity to coordinate and implement regional planning projects and to coordinate technical assistance activities.
6. Require metering of all water users in the state; make meters available under state purchasing; and provide a grant or revolving loan fund for systems to procure meters.
7. A septic management system should become part of the statutory authority and mandate for water systems where centralized wastewater treatment is not available or economical. Funding priority should be given to communities that address proliferation of septic tanks and septic tank maintenance through ordinances and public education.
8. Require that construction oversight always be included as part of a CWS project budget, and that it be included in funding and in contracts. Research oversight programs in other states to devise an appropriate one for N.M.
9. Fund the development/implementation through the state’s 17 community colleges of an on-campus and a “distance learning” program for water and waste water system management (financial planning and management, asset management, certified operators, etc.).

REGIONALIZATION DEFINED

Regionalization of small water systems is being encouraged by many states and by EPA, because small water systems are often unable to economically meet the requirements of the SDWA or to adequately manage their assets.

Regionalization can take many forms but can generally be defined as:

Collaboration among geographically proximate water systems (generally within a 30-mile radius but can vary with terrain and other factors) which share the same water resource and could:

- a. combine administrative, managerial and financing activities for improved management capacity and economic efficiencies;
- b. optimize treatment, conveyance and waste water disposal through comprehensive planning and funding
- c. increase efficiency and reliability, facilitate statutory and regulatory compliance, and decrease cost of service delivery through collaboration.

Regionalization can lead to system interconnection and/or merger of several systems into one larger governing entity, but may also be shared operations, administration, and management.

One attraction of larger regional water systems is that they are of adequate size to attract private sector investment, including design/build/operate/maintain as well as “new water” development projects requiring very large regional conveyance systems or expensive installations.

An additional attraction is that larger regional systems would have the capacity to more effectively deal with waste water management. Currently few systems operate either waste water treatment facilities or have septic management programs, resulting in a growing problem of groundwater pollution. **Statutory changes mandating treatment and/or septic management are an urgent need, in addition to more stringent septic permitting requirements.**

Appendix H: Enhanced Monitoring Capabilities Proposal

New Mexico Drought Monitoring Work Group Proposal for Enhanced Monitoring Capabilities

*Presented to the Governor's Drought Task Force
December 8, 2006*

Introduction

Drought is a pervasive natural hazard. According to a recent report of the Western Governor's Association (2004), severe or extreme drought has affected some part of the United States in every year since 1895. Similarly, a portion of New Mexico has been in severe to extreme drought in 57% of the years since 1895. Drought, especially prolonged multi-year drought, has tremendous societal and economic impacts. A 1995 report by the Federal Emergency Management Agency (1995) estimated that the cost of drought to the United States ranges from \$6-\$8 billion annually with major droughts costing substantially more (e.g., \$39B in 1988).

The Monitoring Work group of the Governor's Drought Task Force assesses drought severity across the state through the monitoring of precipitation, snowpack, stream flows, reservoir levels, and recognized drought indicators. Early identification of drought conditions and accurate characterization of the spatial extent and severity can help reduce drought vulnerability and mitigate its impacts in New Mexico. The Monitoring Work group strives to analyze and depict drought conditions at the local scale, which is crucial for water managers, decision makers, and other stakeholders who must plan for and react to continuously changing drought conditions to mitigate impacts in a and timely and cost effective manner. National drought products (i.e., the National Drought Monitor) provide drought analysis broad scales, which mask the effects of topography on precipitation and other climate controlling variables in the western U.S. Drought assessments made locally by the New Mexico Monitoring Work Group are at finer scales than are currently possible at the National scale, thus targeting problem areas more accurately and enhancing the efforts at the national level.

Problem Statement

The New Mexico Monitoring Work Group relies on meteorological and hydrologic data from a variety of networks (i.e., National Weather Service, United States Geological Survey, Natural Resources Conservation Service, New Mexico State University, USDA Forest Service, etc.) to produce their drought assessment products. However, their efforts are hindered by a lack of timely data, large gaps in the geographic areas covered by these networks, data quality issues, and incomplete monitoring stations. For example, data from approximately 200 National Weather Service Cooperative Observer Sites across New Mexico provide integral input into the Monitoring Work Group assessments. However, data from some of these sites is not available for weeks or months after the observations are taken.

Additionally, the most widely dispersed observational networks are located at lower elevations. In the western U.S. over 60 million people depend on mountain river basins for their water supply. However, our current capacity to observe water sources in these regions is inadequate. The USDA-Natural Resources Conservation Service (NRCS) SNOw TELemetry (SNOTEL) network provides the bulk of the available information on winter snow accumulation and spring snowmelt. Their network has a limited number of locations and needs to be extended in mountainous areas to provide more comprehensive information.

Data quality issues arise in all networks. However, they occur more frequently in networks with older equipment and those that with sector or season specific uses. For instance, the New Mexico State University (NMSU) Agricultural Meteorological Network consists of automated weather stations located in agricultural communities throughout the state. They provide meteorological information and input data for irrigation scheduling programs to growers and producers throughout the state. In several areas, these stations provide the only meteorological data available (e.g., Hatch). Many of these stations are nearly 20 years old and are in need of replacement and upgrades to provide more reliable and timely data. Alternatively, the Interagency Remote Automated Weather Stations (RAWS) provide weather data which is used primarily for monitoring fire danger are not equipped to monitor winter precipitation. These sites

New Mexico Drought Monitoring Needs

A state owned and operated automated weather station network (similar to the Oklahoma Mesonet) would be ideal and is necessary to provide adequate monitoring for New Mexico. This would require approximately 250 new monitoring stations. Fully equipped (temperature, precipitation, soil moisture, wind, etc.), these stations would provide one of the most comprehensive real-time monitoring networks in the country. At a cost of about \$25,000 each, approximately \$6.25 million would be needed to purchase and install the equipment alone. In addition annual funding would be needed to cover station repairs and replacements, plus additional employees to process and analyze the data and do the routine maintenance and repairs. Estimated costs are approximately \$3,000 per site per year (\$750,000 total) for maintenance plus an additional \$50,000 per new employee each year.

The alternative and most cost-effective solution in the absence of funding for a totally new network, the most cost-effective solution is to extend and upgrade existing networks. The NRCS, NMSU, and the USDA Forest Service (USDA/FS) all currently maintain and operate automated weather station networks across New Mexico. If the State purchases the equipment needed to upgrade these respective agency networks, these agencies have agreed to operate and provide annual maintenance for the stations. This would eliminate the need for annual funding for operations, maintenance, and data management.

A brief description of these networks, the equipment needs, and associated costs follow:

1. New Mexico State University Agricultural Meteorological Network

- **DESCRIPTION:** Network consists of 25 automated sites operated by the New Mexico Climate Center and NMSU researchers. These sites are located in agricultural regions throughout the state. NMSU sites monitor air temperature, relative humidity, wind speed, wind direction, precipitation, solar radiation, and soil temperature. Data is transmitted on a daily basis to NMSU where it is made available to end-users via the internet.

- **NEED:** Replace the New Mexico State University Agricultural Meteorological Network with new equipment, additional sensors, and add wireless communications to allow for more frequent data transmission.
- **COST: 25 sites @ \$8,500 each = \$212, 500**

2. NRCS SNOTEL and Snow Course Sites

- **DESCRIPTION:** The SNOTEL network consists of 20 automated sites in New Mexico with additional sites in southern Colorado used to forecast water supplies for New Mexico. Automated SNOTEL sites monitor precipitation, temperature, barometric pressure, relative humidity, soil moisture and temperature, wind speed and direction, snow depth, and snow water equivalent. Data is transmitted on an hourly basis to a central location where it is made available to end-users via the internet. An additional 23 manual Snow sites (3 to 4 readings per winter season) provide snow depth and snow water equivalent only.
- **NEED:** Upgrade the 23 manual sites to automated sites (as described above), providing continuous measurements across a wider range of the key variables which affect the water quantity in New Mexico's mountains.
- **COST: \$25,000 per site x 23 sites = \$575,000**

3. RAWS Network

- **DESCRIPTION:** The Interagency RAWS network consists of 70 interagency sites located across New Mexico that are used to monitor the weather and predict fire danger. Data provided include air temperature, dew point, relative humidity, wind speed, wind direction, precipitation, fuel temperature, and fuel moisture conditions, which are transmitted hourly to a central location and made available to end-users via the internet.
- **NEED:** Upgrade 17 RAWS stations located above 8,000-ft for year-round data collection and improved drought monitoring. This would include adding heated rain gauges with power sources, soil moisture sensors, and upgraded data control processors.
- **COST: 17 sites @ \$8,000 each = \$136, 000**

In addition, if the State purchases equipment to add sensors to existing USGS platforms, this agency has agreed to operate and provide maintenance for these sites for one year. At the end of that year, USGS will seek funding from other Federal, State, and local agencies to support the continued operation of this equipment.

4. USGS

- **DESCRIPTION:** the USGS network consists of approximately 112 real-time streamflow gaging stations located across New Mexico. Data are transmitted via GOES satellite every 1 to 4 hours where it is made available to end-users via the internet.
- **NEED:** Upgrade existing USGS stations located in remote areas with real-time precipitation and air temperature sensors.
- **COST: 25 sites @ \$7,200 each = \$180,000**

The total estimated cost to upgrade the 4 networks (NMSU, NRCS, RAWS, and USGS) is \$1,103,500.

Benefits to the State

Increasing the drought monitoring capabilities of the Monitoring Work Group offers the following benefits to the state of New Mexico:

- Enhanced monitoring for the early warning and prediction of drought could help reduce the State's vulnerability and mitigate the impacts of drought
- Increased spatial resolution of drought products to assist stakeholders, water planners, and other decision makers in planning for and reacting to evolving drought conditions.
- Improved/expanded observational data could be included into existing hydrologic forecast models and could aid in the development of numerical hydrologic and climate models as well as decision support and impact assessment tools.
- Investments into monitoring could better the State's chances for being selected as a beta site for the National Integrated Drought Information System (NIDIS).

Drought Monitoring Workgroup Membership

The New Mexico Drought Monitoring Workgroup is an interagency team with representatives from the following:

- New Mexico State University
- New Mexico Department of Public Safety
- USDA National Resource Conservation Service
- USDA Forest Service
- U.S. Bureau of Reclamation
- Taos Pueblo
- Office of the State Engineer
- NOAA National Weather Service
- U.S. Geological Survey
- U.S. Army Corp of Engineers
- Bureau of Land Management
- Navajo Nation