STATEMENT OF BRUCE I. KNIGHT, CHIEF
NATURAL RESOURCES CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE
BEFORE THE U.S. SENATE
COMMITTEE ON ENERGY AND NATURAL RESOURCES

April 19, 2006

Mr. Chairman and Members of the Committee:

Thank you for the opportunity to appear before the Committee to discuss the current status of drought in New Mexico and neighboring States. Drought as a natural disaster is not easily recognized in its early stages. However, the longer it lasts the more detrimental its effects to natural resources and human communities. In my remarks today, I will report on the state of drought, current and future snowpack conditions, the water supply forecast, soil moisture content, reservoir storage, and NRCS activities to improve drought preparedness and monitoring for farmers and communities across the West.

The Natural Resources Conservation Service (NRCS) is responsible for the Snow Survey and Water Supply Forecasting Program, which provides agricultural water users and other water management groups in the 11 Western States and Alaska with water supply forecasts to enable them to plan for efficient water management. The program also provides the public and the scientific community with data that can be used to accurately determine the extent of the snow accumulations and ultimately the surface water resource. Up to 80 percent of the stream flow in the Western United States is derived from melting snow pack, so accurate measurement is critical to those that depend upon water resources.

In order to provide these services, the NRCS maintains a network of high elevation snow measurements throughout the Western U.S. Snow surveys across the West take place once a month from January through June and involve travel to specific remote locations (snow courses) and manually measuring the snow. In the past 30 years, the NRCS has automated 715 of the 1,600 sites in the West. Measurements from these automated sites, called SNOTEL (SNOw TELemetry) stations now report daily and hourly snow, precipitation, and temperature data. NRCS also operates three Soil Climate Analysis Network (SCAN) sites in New Mexico that monitor real-time soil moisture and temperatures.

Current State of Drought in New Mexico

Most parts of New Mexico have experienced some category of drought since 1999 when the United States Department of Agriculture (USDA) partnered with other Federal agencies to initiate a weekly drought assessment called the U.S. Drought Monitor. The current drought has recently intensified as a result of an exceptionally dry fall and winter.

The U.S. Drought Monitor dated March 28, 2006, shows New Mexico is experiencing "severe" drought conditions in 70 percent of the State and "extreme" drought in 23 percent of the

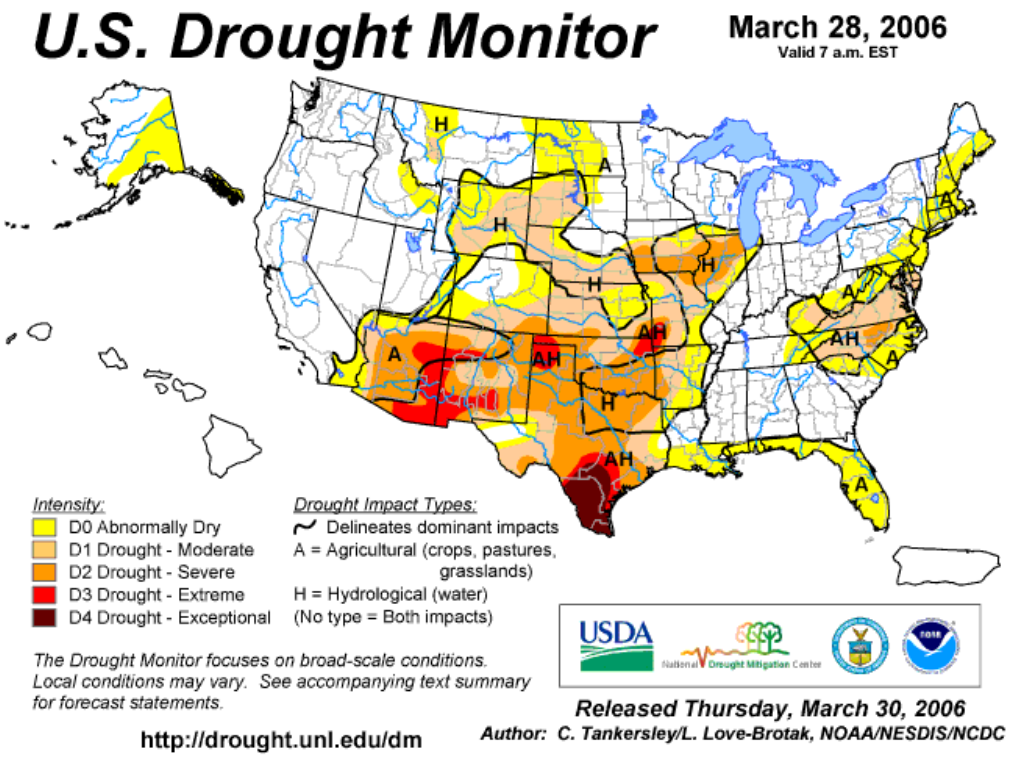


Figure 1. U.S. Drought Monitor (USDA, NDMC, NOAA)

State (Fig. 1). The most extreme conditions are reported in the southwestern part of the State. Recent storms have brought limited relief; however, drought conditions are expected to persist through June 2006, well beyond the snowmelt and runoff season (Fig. 2).

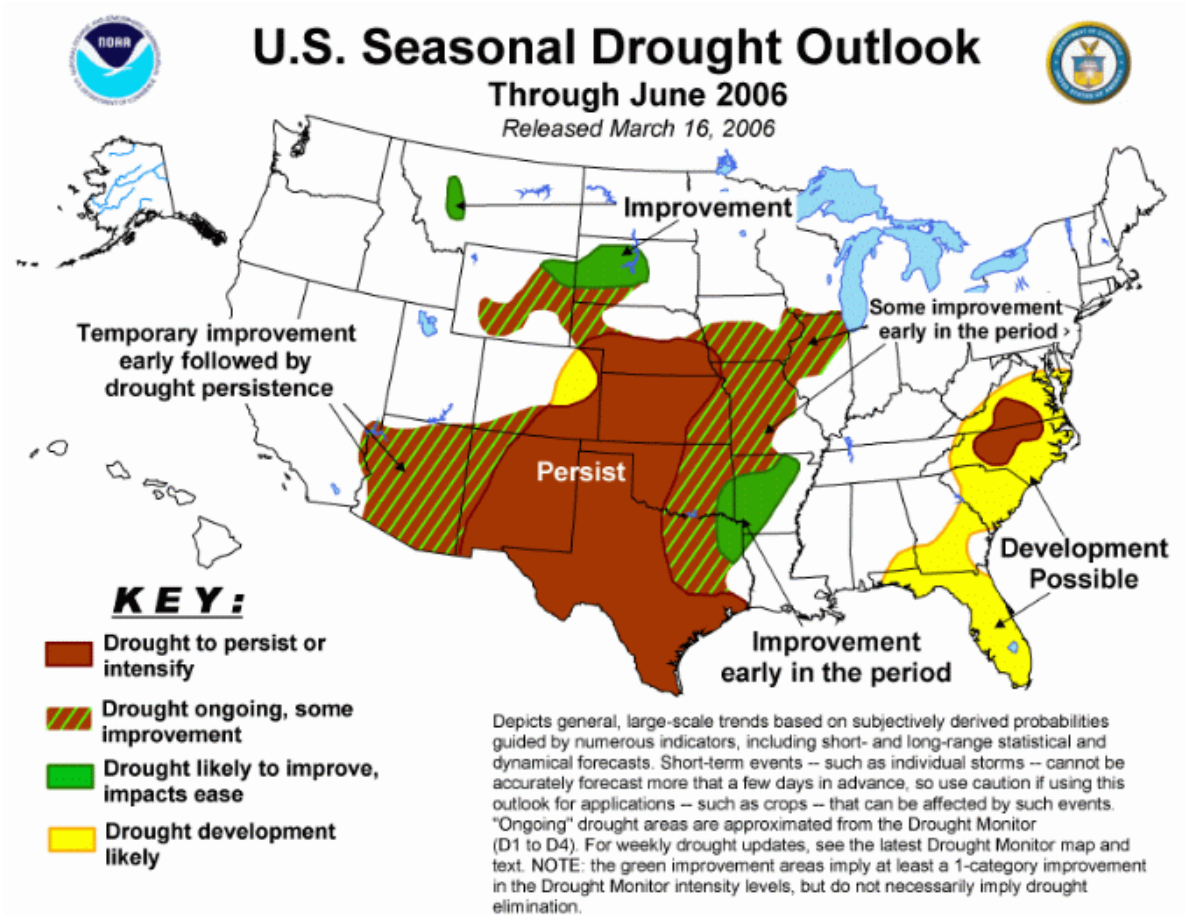


Figure 2. U.S. Seasonal Drought Outlook (NOAA)

Current and Historic Snowpack Conditions – New Mexico

Over half of New Mexico's annual water supplies come from streams that are fed by snowmelt coming from the mountains. Therefore when gauging water supplies, it is critical to measure snow. The NRCS New Mexico Snow Survey network began in 1937 in the mountains above Taos, and expanded to a network of 28 manual and 20 automated sites today. Across the entire State, many sites that were snow-free on March 1, 2006, remain exceptionally low in spite of recent storms.

On April 1, 2006, nearly all New Mexico basins reported snowpacks of less than 50 percent of average with several basins reporting less than 25 percent of average (Fig. 3). Almost half of the New Mexico's long-term measurement sites are at record lows for this time of year and a full one third of the sites have no measurable snowpack.

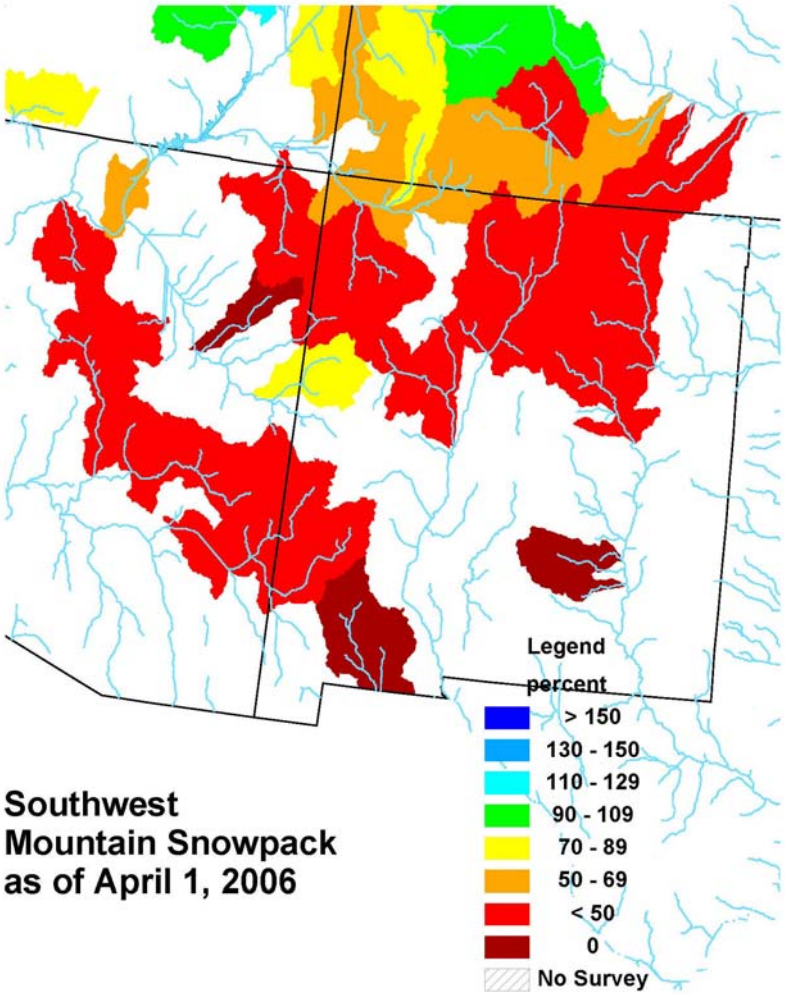


Figure 3. Southwestern snowpacks as of April 1, 2006 (USDA, NRCS)

Statewide, the snowpack is the 5th lowest in the last 55 years at 29 percent of normal (Fig. 4). Since 1999, the average April 1 snowpack has been 64 percent of normal. If it were not for the brief respite in 2005, this 8-year stretch would be the longest drought in modern records.

The latest snow survey shows that what are typically the wettest parts of the State have simply fallen too far behind to contribute meaningfully to water supplies this year. This late in the season, there are not many opportunities for recovery, although a significant spring event could still influence the course of the season.

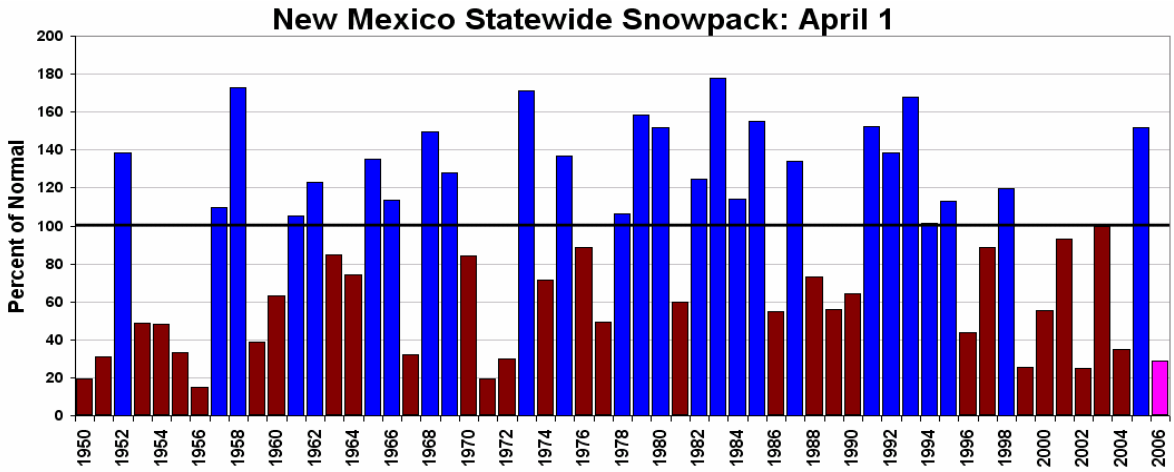


Figure 4. New Mexico April 1 Historical Snowpacks

Streamflow Outlook

Due to exceptionally poor snowpack conditions, anticipated streamflows are expected to be very low. The highest flows are projected to reach only two-thirds of normal for the rivers that flow into New Mexico from Colorado. Within New Mexico, no stream is forecasted to produce more than 50 percent of normal runoff.

For the period April-July, the inflow of the Rio Grande into Elephant Butte reservoir is expected to be 11 percent of normal. The flow of the Pecos river at Pecos has been forecasted by the NRCS since 1947 and this month's forecast, 21 percent of normal, is the all-time lowest ever issued.

In the northwest part of the State, many of the streambeds are already dry and it is likely that no more than 2-3 percent of normal runoff will be experienced.

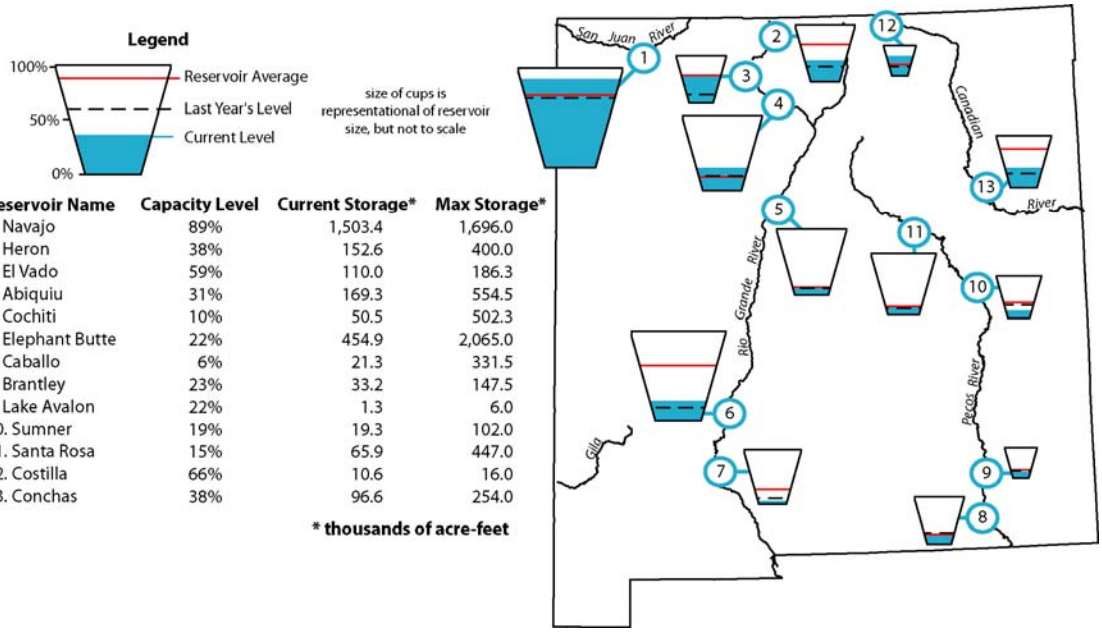
Soil Moisture Content

An analysis of soil moisture values through the NRCS Soil Climate Analysis Network (SCAN) has documented the drying trend in Arizona, New Mexico and west Texas. In October 2005, measurements taken at the 8-inch depth showed soil moisture values that approached vegetation wilting point. By January 2006, the 20-inch deep sensors reported wilting point conditions. This shows the rapid drying of the soil profile.

The Joint Agricultural Weather Facility (a cooperative effort of National Oceanic and Atmospheric Administration and the USDA, including NRCS) reports on April 4, 2006, that topsoil moisture in New Mexico is 55 percent very short, 36 percent short and only 9 percent adequate.

Reservoir Storage

Current reservoir storage is generally fair to poor depending on location within the State (Fig. 5, Courtesy CLIMAS, University of Arizona). The Navajo Reservoir in northwest New Mexico benefited from above-average runoff last year and is currently at 89 percent of capacity while Elephant Butte reports 22 percent of capacity. With the expected lack of spring runoff, the State will rely on available stored water. For example, using the latest available projections, Elephant Butte will fall from 22 percent of capacity today to 3 percent by Labor Day.



Reservoir Name	Capacity Level	Current Storage*	Max Storage*
1. Navajo	89%	1,503.4	1,696.0
2. Heron	38%	152.6	400.0
3. El Vado	59%	110.0	186.3
4. Abiquiu	31%	169.3	554.5
5. Cochiti	10%	50.5	502.3
6. Elephant Butte	22%	454.9	2,065.0
7. Caballo	6%	21.3	331.5
8. Brantley	23%	33.2	147.5
9. Lake Avalon	22%	1.3	6.0
10. Sumner	19%	19.3	102.0
11. Santa Rosa	15%	65.9	447.0
12. Costilla	66%	10.6	16.0
13. Conchas	38%	96.6	254.0

* thousands of acre-feet

Figure 5. New Mexico reservoir levels for March 2006 as a percent of capacity. The map also depicts the average level and last year's storage for each reservoir, while the table also lists current and maximum storage levels. (CLIMAS, University of Arizona)

State Preparedness Activities

The NRCS is working closely with landowners on practices and projects aimed to increase irrigation efficiency, and achieve net reductions in water use. Through the Ground and Surface Water Conservation (GSWC) component of the Environmental Quality Incentives Program, NRCS has provided more than $150 million in financial and technical assistance through GSWC.

Activities under the GSWC program include improving irrigation systems, enhancing irrigation efficiencies, converting to the production of less water intensive agricultural commodities, converting to dryland farming, improving the storage of water through such measures as water banking and groundwater recharge, and mitigating the effects of drought. Projects must result in a net savings of groundwater or surface water resources in the agricultural operation of the producer.

Since GSWC began in 2002, NRCS has entered into over 5,000 contracts, enrolled

more than 1.5 million acres into the program to help producers conserve ground and surface water resources. An additional $51 million in GSWC funding is currently available to producers nationwide.

While funding to support water conservation practices is important, NRCS recognizes that dollars aren't the only solution. Education of producers about water consumption, and the on-farm economic benefits of improved efficiency is a critical tool. For that reason, NRCS is currently developing an irrigation water energy estimator on the NRCS website. The purpose of this tool will be to provide farmers the ability to explore future management scenarios, including changes in irrigation equipment and practices. From the options that the producer provides, the estimator will provide potential energy savings estimates that would result from the change in practices. We believe that this additional knowledge will assist producers in making better farm management decisions for the future.

Paleoclimate Drought Record

How unusual is the current drought in a historical context? It does not appear to be as severe as the 1950s drought, which is generally believed to be New Mexico's worst of the 20th century (Fig. 6). However, looking back further in history, using records from tree rings, even the 1950s drought seems typical over the past 300 years. Viewing back more than 2,000 years, history presents many cycles of droughts that are almost incomprehensible by modern standards.

It is impossible to predict whether the pattern of wet conditions over the last 50 years will continue or if the region is due for a return to normal. What has changed however is the significant population growth of the West during this period; this growth has put additional pressures on scarce water resources and made the need for real-time data even more critical.

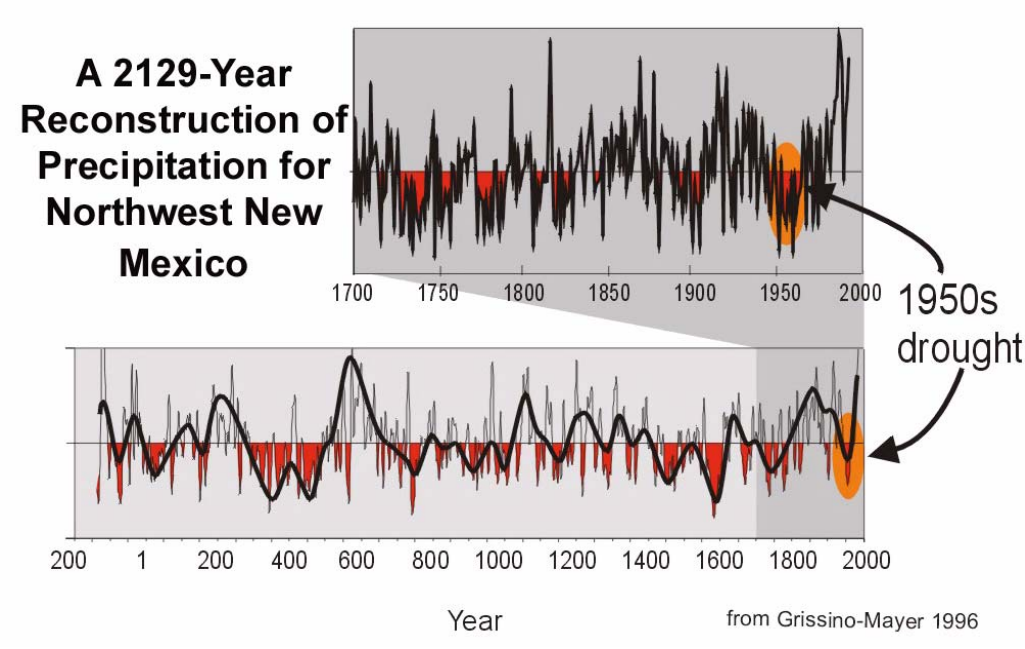


Figure 6. Tree ring record of New Mexico precipitation. Grissino-Mayer, H. D. 1996

Conclusion

In conclusion Mr. Chairman, the Natural Resources Conservation Service will continue to provide high quality, timely data, drought monitoring and water supply decision support information so that users and managers of water resources in the West can make scientifically based decisions. We will accomplish this by continuing to collect snowpack and soil moisture data through the SNOTEL and SCAN information systems and providing forecasts of spring and summer streamflow that are used by thousands of natural resource managers in the West. NRCS staffs will continue to support the weekly U.S. Drought Monitor and NRCS products used by each state to determine drought mitigation strategies and actions. The National Water and Climate Center homepage (www.wcc.nrcs.usda.gov) is the operational link to this information and is available to citizens nationwide.

In addition to our ongoing monitoring and forecasting of current conditions, the NRCS is implementing improvements in resource data monitoring and assessment capabilities by:

- Further automating of manual snow courses to SNOTEL sites where real-time information is needed to provide water supply forecasts.
- Expansion of SCAN to provide governments, water managers, agricultural producers, businesses and researchers improved information about soil moisture conditions and potential droughts.
- Improving models and computational capacity to provide more frequent and accurate water supply forecasts and assessments of soil moisture.

Thank you for opportunity to describe the work of NRCS on this issue. This concludes my statement. I will be glad to answer any questions that Members of the Committee might have.