Western Governors’ Drought Forum

JAN. 28-29, 2015

The Inn at Loretto • Santa Fe, New Mexico

Drought Impacts and Solutions in the Recreation and Tourism Sectors

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WGA Thanks Our ...

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The Western Governors’ Drought Forum initiative is being conducted in partnership with NOAA’s National Integrated Drought Information System
Drought in New Mexico

Sam Fernald

Western Governors’ Drought Forum; Santa Fe, NM; 28-29 Jan. 2015
Ongoing Drought in New Mexico and the West

Intensity:
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author(s):
Matthew Rosencrans
CPC/NCEP/NWS/NOAA

http://droughtmonitor.gov

U.S. Seasonal Drought Outlook
Drought Tendency During the Valid Period
Valid for January 15 - April 30, 2015
Released January 15, 2015
Surface supplies are diminished with drought
Groundwater drops with less surface water

Depth to Groundwater in the Las Cruces - 2B Well (100-105' depth)

--- Provisional Data Subject to Revision ---
Surface water and groundwater balance threatened by drought
Fossil water aquifers face consistent declines.

Dynamic Statewide Water Budget

- Synthesize water supply and demand information
- Easy access to data at a variety of spatial scales
- Produce a holistic view of water resources and user-defined future scenarios
- Support local, regional, and statewide planning
Statewide Water Assessment

to reduce the negative impacts of water scarcity

Remotely Sensed Evapotranspiration and Precipitation Assessment
• Better quantify the largest inflows and outflows of water in New Mexico
• Inform management decisions regarding riverine ecosystems

Groundwater Level and Storage Changes
• Better manage withdrawals of groundwater and ensure groundwater supplies into the future

Groundwater Recharge Assessment
• Determine known areas of groundwater recharge
• Forest thinning in these areas to further enhance groundwater recharge

Surface Water Flow Statistics
• Characterize river stretches as gaining or losing to enhance management decisions

Brackish Water Assessment
• Find brackish aquifers suitable for desalinization to create future new water supplies
Statewide collaboration of multiple agency lead components

- Remotely Sensed Evapotranspiration and Precipitation Assessment
- Groundwater Recharge Assessment
- Groundwater Level and Storage Changes
- Oil and Gas Produced Water Assessment
- Surface Water Flow Statistics
- Water Use Reporting
- Water Budget
- Statewide Systems Dynamics
- Collaboration Efforts
Include *stakeholders* to address drought impacts.
U.S. Seasonal Drought Outlook
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KEY:
- Brown: Drought persists or intensifies
- Light Brown: Drought remains but improves
- Green: Drought removal likely
- Yellow: Drought development likely

Author: David Miskus, Climate Prediction Center, NOAA

Depicts large-scale trends based on subjectively derived probabilities guided by 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. Use caution for applications — such as crops — that can be affected by such events. "Ongoing" drought areas are approximated from the Drought Monitor (D1 to D4 intensity). For weekly drought updates, see the latest U.S. Drought Monitor.

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).
MINED vs CONJUNCTIVE AQUIFERS

RIO GRANDE AQUIFER SYSTEM
>> Connected surface water - groundwater

HIGH PLAINS AQUIFER
>> Mined groundwater
Figure 1. (a) Simulated average groundwater recharge by PCR-GLOBWB, (b) total groundwater abstraction for the year 2000 and (c) groundwater depletion for the year 2000 (all in mm a\(^{-1}\)). (Wada et al., 2010)
New Mexico Ground Water Association Meeting

State Engineer Tom Blaine, P.E.

Jan 2015

Oasis Well, Roswell NM-- Courtesy Photo from HSSENM archives
2011-2014 was *hottest and driest* period in NM recorded history, worse than the driest dust bowls summers.
NM Drought
2013

Jan 2013

April 2013

May 2013

June 2013

July 2013

Aug 2013

Sept 2013

DEC 2013
Current Drought Status
January 2014

U.S. Drought Monitor
New Mexico

January 6, 2015
(Released Thursday, Jan. 8, 2015)
Valid 7 a.m. EST

Drought Conditions (Percent Area)

<table>
<thead>
<tr>
<th>Period</th>
<th>EH4</th>
<th>D1-D4</th>
<th>D2-D4</th>
<th>D3-D4</th>
<th>D4</th>
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<tbody>
<tr>
<td>Current</td>
<td>12.01</td>
<td>97.99</td>
<td>04.53</td>
<td>28.10</td>
<td>3.70</td>
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<tr>
<td>Last Week</td>
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<td>97.93</td>
<td>05.33</td>
<td>28.10</td>
<td>3.70</td>
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<tr>
<td>3 Months Ago</td>
<td>16.70</td>
<td>03.30</td>
<td>62.64</td>
<td>30.04</td>
<td>8.08</td>
</tr>
<tr>
<td>Start of Calendar Year</td>
<td>12.01</td>
<td>97.99</td>
<td>05.33</td>
<td>28.10</td>
<td>3.70</td>
</tr>
<tr>
<td>Start of Water Year</td>
<td>16.70</td>
<td>03.30</td>
<td>62.57</td>
<td>30.04</td>
<td>8.00</td>
</tr>
<tr>
<td>One Year Ago</td>
<td>0.39</td>
<td>99.61</td>
<td>78.58</td>
<td>52.68</td>
<td>3.86</td>
</tr>
</tbody>
</table>

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Author:
Brod Rippey
U.S. Department of Agriculture

http://droughtmonitor.unl.edu/
Photos taken one month apart

Rio Grande
San Antonio, NM

Aug 18, 2013

Sept 16, 2013
Drought is now over, *right?*
We need to break the nexus between drought and declining water supply.
New Mexico’s Water Resources

Are Not Sustainable

Dry Irrigation Ditch 2012, **agricultural water supply for Las Cruces, NM**
How much water to produce 1 loaf of bread?

150 gallons
Water Use Categories in New Mexico

- **Irrigated Agriculture:** 78.62%
- **Public Water Supply:** 8.32%
- **Evaporation:** 6.87%
- **Self Supplied Domestic:** 0.76%
- **Livestock:** 1.05%
- **Commercial:** 1.43%
- **Industrial:** 0.33%
- **Mining:** 1.09%
- **Power:** 1.53%
Total NM Withdrawals:
3,815,945 AF/Y

Surface water: 2,041,844 (53%)
Ground water: 1,774,101 (46%)
How much water to produce 1 pair of blue jeans?

1,800 gallons
What are the options for dealing with declining water supplies?
1. Water Conservation
2. Water Reuse
3. Water Desalination
4. Water Importation

Drinking Water Project for Eastern New Mexico, Construction of Intake Structure. 2014
There is always one last option....
5. Stop growth
Managing Water and Interstate Compact Obligations During Drought

Governor’s Drought Forum,
January 28, 2015
Amy I. Haas
Acting Director and General Counsel
New Mexico Interstate Stream Commission
Compact Map of NM
Severe to Extreme Drought in New Mexico: 2012-2013
Projected Future Colorado River Basin Water Supply and Demand

• Average supply-demand imbalances by 2060 are approximately 3.2 million acre-feet
• This imbalance may be more or less depending on the nature of the particular supply and demand scenario
• Imbalances have occurred in the past and deliveries have been met due to reservoir storage
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