

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Droughtscape, Quarterly Newsletter of NDMC,
2007-

Drought -- National Drought Mitigation Center

Summer 2009

DroughtScape- Summer 2009

Kelly Smith

Follow this and additional works at: <https://digitalcommons.unl.edu/droughtscape>



Part of the [Atmospheric Sciences Commons](#), [Climate Commons](#), [Environmental Indicators and Impact Assessment Commons](#), [Environmental Monitoring Commons](#), [Fresh Water Studies Commons](#), [Hydrology Commons](#), [Meteorology Commons](#), [Natural Resources and Conservation Commons](#), [Natural Resources Management and Policy Commons](#), [Other Earth Sciences Commons](#), [Other Environmental Sciences Commons](#), [Sustainability Commons](#), and the [Water Resource Management Commons](#)

This Article is brought to you for free and open access by the Drought -- National Drought Mitigation Center at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Droughtscape, Quarterly Newsletter of NDMC, 2007- by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Summer 2009

U.S. Drought Monitor Forum, 2009

**October 7-9
Austin, TX**

Details and registration link on page 10

Around the World

NDMC founding director Don Wilhite and climatologist Mark Svoboda were separately in Chile, the Netherlands and Switzerland, helping with various international efforts to prepare for drought.

Read more on page 11

NDMC water scientist Cody Knutson co-presented a workshop in Israel as part of the official U.S. Middle East Peace Process.

Read more on page 12

Predictable Patterns in Missouri River Basin?

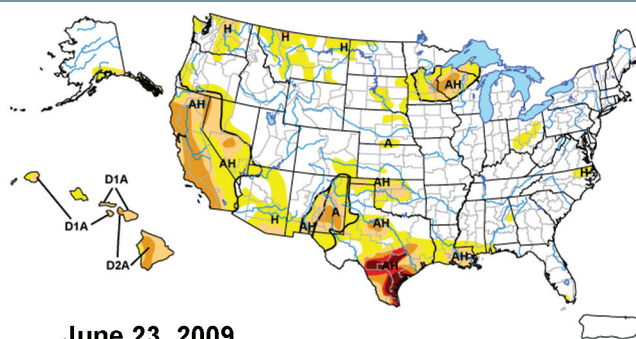
The NDMC helped the Center for Research on the Changing Earth System with stakeholder workshops in Kansas City, Missouri, and in Helena, Montana.

Read more on page 10

DroughtScape is the quarterly electronic newsletter of the National Drought Mitigation Center. We welcome articles from outside contributors. Please contact the editor by emailing droughtscape@unl.edu.

El Niño Could Bring Wet Winter After Hot Summer

A possible El Niño in the fall could mean a cooler, wetter winter for the southern tier, which would bring much-needed relief to Texas. Meanwhile, forecasters anticipate a chance of above-normal temperatures over the West, south Florida, and interior Alaska. In May, torrential rains erased drought from Florida. Read more on pages 2-3.



Agriculture Hit Hard in California, Texas

The second quarter of the year saw farmers and ranchers in California and Texas continuing to suffer. Urban water suppliers were also taking measures to reduce consumption.

Read more on pages 4-5

Seeking Low-Flow Effects in Colorado, Southeast

The NDMC is helping the National Weather Service anticipate the effects of low flows for 50 sites in the Alabama, Coosa, and Tallapoosa and Appalachicola, Chattahoochee, and Flint River Basins and for 164 sites in the Upper Colorado River Basin.

Read more on pages 6-7

VegDRI Began Coast-to-Coast Coverage in May

The Vegetation Drought Response Index (VegDRI) marked a milestone in May when its coverage expanded to include the eastern United States. We are now seeking evaluators from eastern states. At right, VegDRI PI Brian Wardlow and RMA sponsor Bob Smith field questions at a workshop.

Read more on pages 8-9



Summer 2009

Summer 2009 Outlook and April to June Summary

By Brian Fuchs, Climatologist, National Drought Mitigation Center

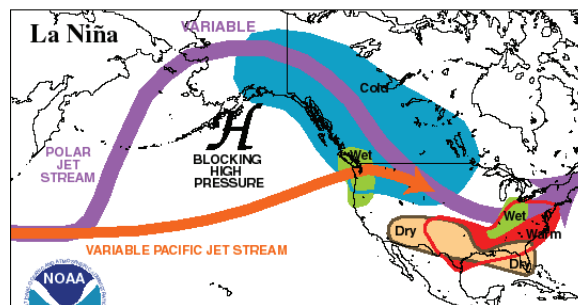
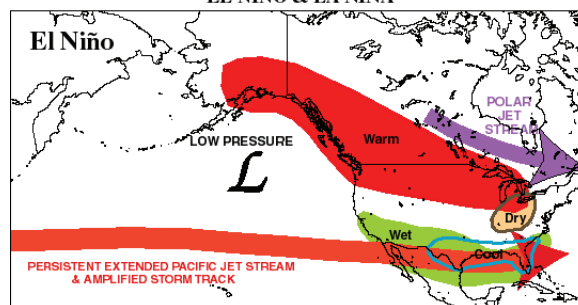
Drought classifications are based on the U.S. Drought Monitor. For a detailed explanation, please visit <http://drought.unl.edu/dm/classify.htm>. The outlook integrates existing conditions with forecasts from the National Oceanic and Atmospheric Administration's Climate Prediction Center: <http://www.cpc.ncep.noaa.gov/>

Outlook: After seeing the influence of La Niña over the last several months, forecasters anticipate neutral ENSO conditions through the summer. As we go into the fall and winter months, some models are showing a jump to El Niño conditions, so this will bear following over the next several months. With El Niño influence, the southern tier of the United States typically experiences cooler and wetter than normal conditions which would bring welcome relief to the current drought in Texas. Forecasters anticipate a likelihood for above-normal temperatures during the next three months over the western United States, south Florida and the interior of Alaska. Chances for above normal precipitation are greatest over Florida, New England, the southern Rocky Mountains and into the desert southwest. These rains would bring about improvements to the drought status in Arizona, New Mexico and Texas. Drought will persist over California, Hawaii, Oklahoma and south Texas.

April: April showers brought reductions in drought status for much of the United States during the month. At the end of the month, 61 percent of the United States was free from any dryness or drought, compared to 57.7 percent at the beginning of the month. As D0-D1 conditions improved, there was actually an increase in the spatial extent of D2-D4 drought as drought intensified in Florida, California and south-central Texas. A very dry March and April warranted the introduction of D0 conditions into Nebraska and Kansas. Conditions in the Southeast and up the East Coast of the United States improved as rains returned to the region, just in time for the start of the traditional agricultural season. Late season rains and snows allowed for improvements along the foothills of the Rocky Mountains in Colorado and into western Kansas. Spring thunderstorms brought some relief to portions of Texas and Oklahoma, allowing for the removal of D1-D2 conditions in both panhandles.

May: At the end of May, 30.1 percent of the United States was classified as abnormally dry or in drought, of which 12.33 percent was experiencing D1-D4 conditions, according to the U.S. Drought Monitor. This compares to 34 percent and 14.5 percent at the beginning of May, respectively.

TYPICAL JANUARY-MARCH WEATHER ANOMALIES AND ATMOSPHERIC CIRCULATION DURING MODERATE TO STRONG EL NIÑO & LA NIÑA



Climate Prediction Center/NCEP/NWS

Summer 2009

April to June Summary, continued

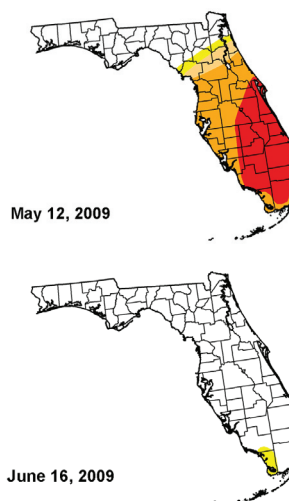
The month of May in Florida is a great example of how quickly drought situations can change for a region. For much of the winter and spring, Florida was very dry. Even into the first two weeks of May, D2 and D3 drought dominated much of the Florida peninsula. Once the rains returned, almost all the drought was eliminated by the end of the month, with several locations recording record rainfall for the month of May. The majority of this precipitation occurred during the last two weeks of the month. Many locations throughout the southeastern United States recorded 200-400 percent of normal precipitation for May, while locations up the East Coast received 125-150 percent of normal precipitation. The Burneyville, Oklahoma, Mesonet site reported an incredible 24-hour total of 12.89 inches in early May, the fourth highest in the state's history, bringing the week's total to more than 15 inches.

Areas of Texas that did not receive beneficial rains saw drought conditions worsen. The worst of the D4 area was centered over Aransas County, Texas, where the Aransas County airport reported 14 percent of normal precipitation over the past nine months (3.43 inches versus 25.07 inches normally). Since March 26, 2009, the airport only measured 0.03 inches of rain, or 0.7 percent of normal. Since October 1, 2007, a total of 19 months, not counting this May, Aransas County airport has reported only four months with at least 50 percent of normal precipitation.

According to NCDC, this was the 22nd wettest May in the 1895-2009 record. Both Florida and Arkansas had their wettest May on record. For the month of May, Daytona Beach, Florida, recorded 22.33 inches (685 percent of normal); Sanford, Florida, 17 inches; Ponce Inlet, Florida, 17.74 inches; and Kissimmee, Florida, 17.09 inches. Planting delays were a concern for producers across the central Midwest as a wet April and May have delayed planting of both corn and soybeans.

June: After a cool start to the month for most of the United States, the summer heat kicked in towards the end of the month. With the heat, dry areas in the Plains that had been holding on with the cooler temperatures started showing impacts related to both drought and heat. Portions of south Texas started implementing water restrictions and burn bans. Rains in the central and northern Plains helped to diminish the abnormally dry conditions there, but the areas that did not see the rain are abnormally dry, on the brink of drought. After six-plus months of precipitation below normal, abnormally dry conditions (D0) were introduced into much of southern Louisiana, Mississippi and into east Texas and southern Alabama. Good rains returned to west Texas and allowed for the removal of all D2 status and a reduction of the D1. After a good spring for most of Oklahoma, moderate drought spread into more of the state in June as the heat and depletion of soil moisture started to take effect. Improvements in Oregon and Idaho took place in June, as D0-D2 conditions were improved.

Florida, as shown on the U.S. Drought Monitor, before and after drought-busting rains



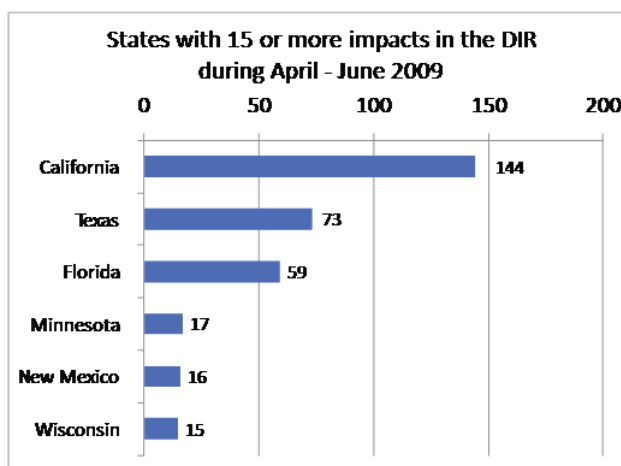
Summer 2009

Impacts Summary, April-June 2009: CA, TX, FL Hardest Hit

By Denise Gutzmer, Drought Impacts Specialist

This information is summarized from the Drought Impact Reporter, online since July 2005 at <http://droughtreporter.unl.edu>.

California, Texas, and Florida had the greatest number of drought impacts between April 1 and June 30, followed by Minnesota, New Mexico, and Wisconsin, where drought was developing. We added more than 400 impacts to the Drought Impact Reporter in the second quarter of the year, based on scanning thousands of reports from media, government, and individuals. In Florida, fire and the diminished water supply ranked as the main concerns, while in Minnesota, low water levels affected recreational opportunities, and in New Mexico and Wisconsin, wildfires posed problems.



California

California's water and agricultural woes continue with many farmers not receiving their usual allotment from water agencies, although allocations were revised upward. Restricted pumping from the San Joaquin Delta and environmental issues are contributing to the current water shortage. Social impacts for unemployed farm workers persist as fallowed fields offer little hope of work and paychecks in the near future. Southern California is preparing for a summer of reduced water supplies and resulting water restrictions.

A sample of the impacts experienced in California from April to June 2009:

April

- Residents in Sonoma and Mendocino counties were ordered to cut their water use in half through September 2009.
- Environmental activists sued the state's Department of Water Resources, Natural Resources Agency, and the governor of California over the Drought Water Bank.
- Thousands of farm workers marched from Mendota to the San Luis Reservoir to raise awareness of unemployment and social difficulties arising from the lack of irrigation water.
- The Metropolitan Water District announced plans to cut water deliveries to Southern California by 10 percent effective July 1.

May

- Kern and Tehama counties were seeking federal disaster declarations.
- Small towns on the west side of California's Central Valley were struggling with social issues and store closings.



Summer 2009

Impacts Summary, April-June 2009, continued

June

- Tehama County ranchers lost more than \$5.7 million in rangeland production since July 2008.
- Wells in Butte County are losing productivity.
- More stringent water restrictions are being enacted in Southern California.
- Marysville had a population explosion of toads because there were no fish in drought-shrunken ponds to consume the toad eggs.

Texas

Agricultural impacts remain at the forefront in Texas, with crop losses reported in various parts of the state. Ranchers are struggling to feed and maintain their livestock in such dry conditions. Wind-driven wildfires raged across the state, consuming land and taking lives. Dry conditions are leading many counties to consider fire restrictions on open burning and firework use as the Fourth of July holiday nears.

April

- About 1,500 cattle in Williamson County died from lack of food and water, becoming mired in drying ponds.
- Travis County lost 97 percent of its wheat and oat crops to drought.
- A spate of wildfires in Texas driven by winds and dry conditions burned more than 100,000 acres.

May

- Dust on power lines is increasingly leading to arcing and pole fires when mist or fog moisten the dust.
- Reports of crop failure and low yields are keeping custom harvesters away from Texas this year.

June

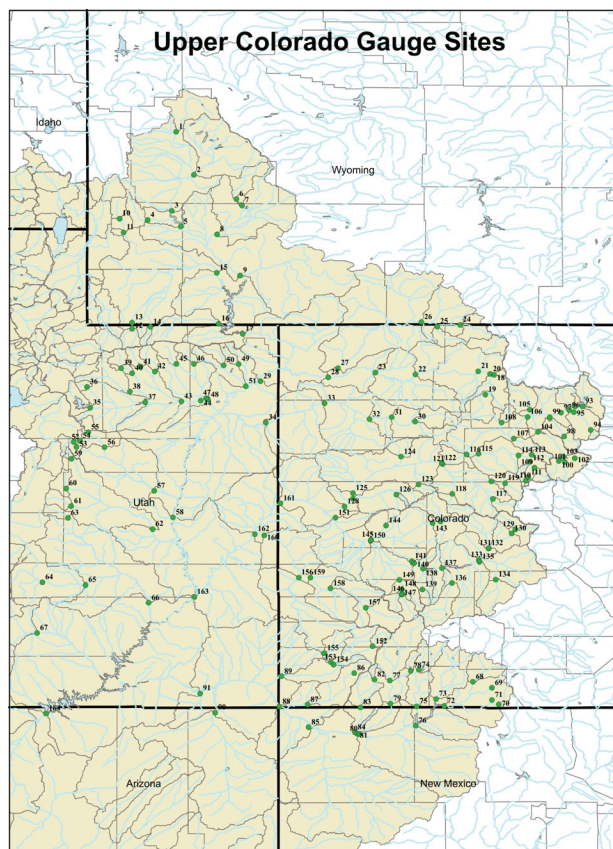
- In the Lower Rio Grande Valley, 75 percent of cotton, 87 percent of corn, and 44 percent of grain sorghum failed.
- About half of the wheat, corn, grain sorghum, and cotton in the Coastal Bend died in drought. Farmers were very discouraged.

Summer 2009

Low-Flow Studies Help Planners Anticipate Drought Impacts

What happens when there is very little water at a certain spot in a creek, river, pond or reservoir? How low do water levels have to be to trigger these impacts? Are they more likely to happen at some times of the year than at others? NDMC researchers conducting “low-flow” studies are asking these questions for 50 sites in the Alabama, Coosa, and Tallapoosa (ACT) and Appalachian, Chattahoochee, and Flint (ACF) River Basins and for 164 sites in the Upper Colorado River Basin. At each site a gauge monitors water flow or level.

The Advanced Hydrologic Prediction Service (AHPS) of the National Weather Service (NWS) will use the findings for warnings that accompany low-flow forecasts. The AHPS already predicts floods and helps people anticipate flow impacts. There is a growing awareness that “low flows can also have harmful effects,” said Dr. Donna Woudenberg, the NDMC researcher who is leading the efforts.



The current low-flow studies are connected with pilot projects for the National Integrated Drought Information System (NIDIS), which was established by law in 2006. One of the main goals of NIDIS is to create a better early warning system for drought, which can be fine-tuned based on a detailed understanding of impacts.

What does she anticipate finding? “Increased population is putting stress on the system” in both Colorado and in the Southeast, Woudenberg said.

The task is huge, partly because awareness of drought impacts is not widespread. The process combines education and inquiry, Woudenberg said. At presentations in April to water-oriented groups in Georgia and in Colorado, Woudenberg outlined drought impacts for the groups, highlighting a few of the major economic, environmental and social effects of drought.

The current studies also involve more observation points than previous studies: the Upper Mississippi River Basin in Minnesota (2004) had 21 forecast points; the North Platte River (2005) had 17; the Upper Missouri River Basin (2006) had 45; the Upper Trinity River Basin in Texas (2007) had 29; and the Red River of the

North (2007) had 35. For some of the sites associated with managed reservoirs or rivers, researchers have a good idea who to call for observations on impacts. In other cases, researchers work their way down from state or regional officials to local water suppliers or others who may have an idea about the effects of low flows in particular spots.

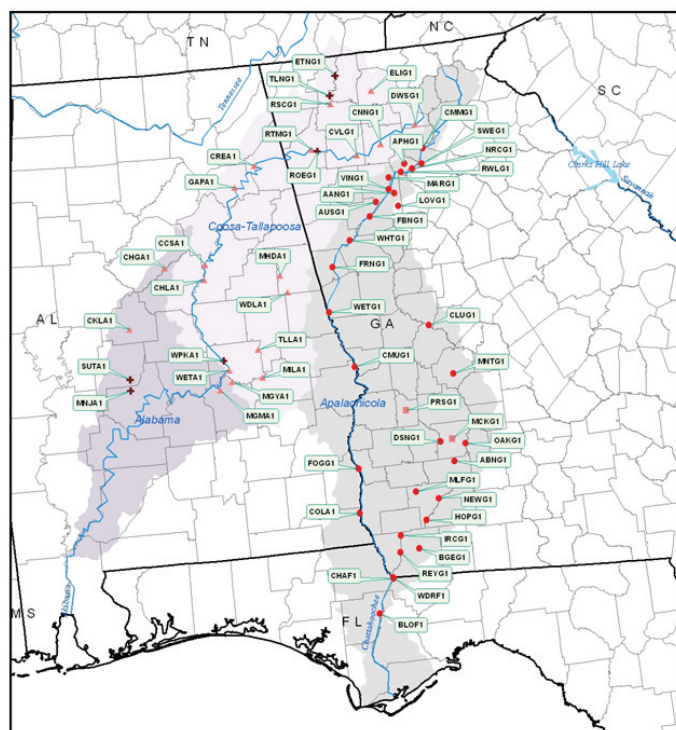
Summer 2009

Low Flow, Continued

"It takes a lot of talking and asking questions to find somebody who understands what's going on at the local level," Woudenberg said. "Different entities handle water management in different states, so I have to work to figure out where the buck stops – who's large and in charge."

The low-flow studies have provided Woudenberg with a new appreciation for how different water management issues are from place to place. "In agricultural areas, irrigation is major," she said. "In urban areas, it's highly managed, to the point where flows are consistently maintained through treated wastewater."

If you have information to contribute about what happens when flows are reduced at one or more of the gauge sites, please contact Donna Woudenberg, 402-472-8287, dwoudenberg2@unl.edu. If you know someone who may have information to contribute, please forward this along to them.



Basin

- ▲ Alabama-Coosa-Tallapoosa Basin (ACT)
- Apalachicola-Chattahoochee-Flint Basin (ACF)
- Optional River Collection Points – ACF Basin
- ✦ Optional River Collection Points – ACT Basin

Low-flow / Drought Impacts

Economic

- Costs and losses to agricultural and livestock producers
- Loss from timber production
- Loss from fishery production
- Loss to recreation and tourism
- Energy-related effects
- Water Suppliers
- River navigation
- Decline in food production

Environmental

- Damage to animal species
- Hydrological effects
- Damage to plant communities
- Increased number and severity of fires
- Wind and water erosion of soils, reduced soil quality
- Air quality effects (e.g., dust, pollutants)
- Visual and landscape quality (e.g., dust, vegetative cover, etc.)

Social

- Health
- Increased conflicts
- Reduced quality of life, changes in lifestyle
- Disruption of cultural beliefs
- Reevaluation of social values
- Public dissatisfaction with government drought response
- Perceptions of inequity in relief,
- Loss of cultural sites
- Increased data/information needs, coordination of dissemination activities
- Recognition of institutional restraints on water use

Summer 2009

VegDRI Expands to 48-State Area

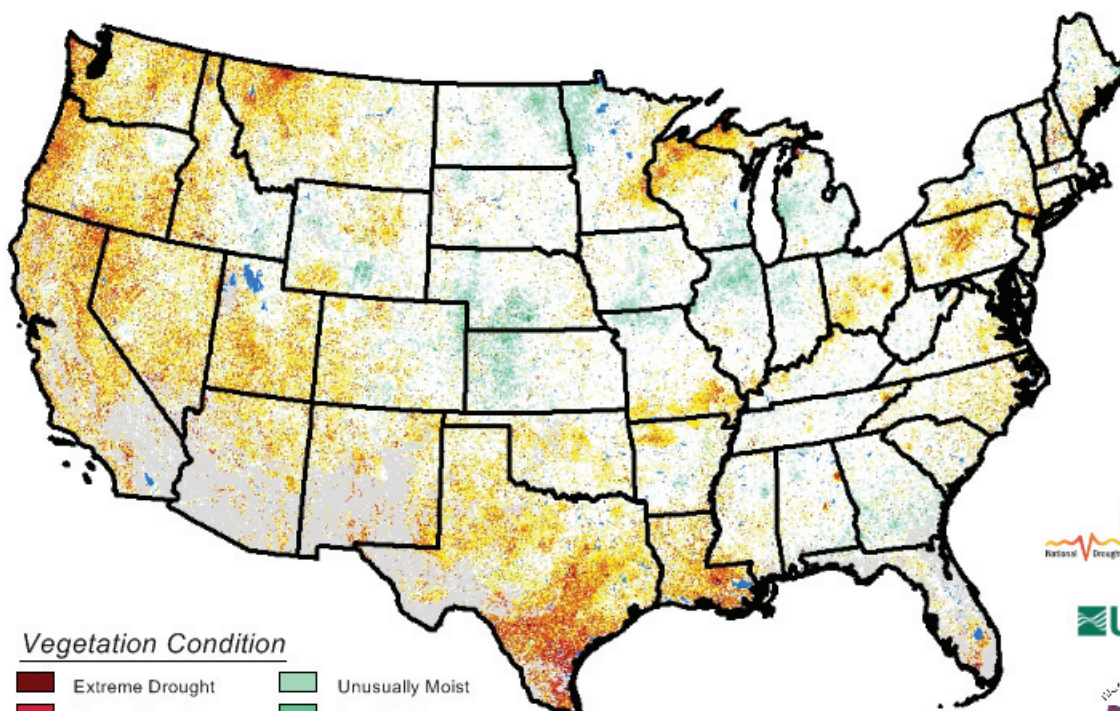
A seven-year research effort achieved a milestone on May 4, 2009, when the Vegetation Drought Response Index (VegDRI) expanded across the 48 states of the continental U.S. VegDRI maps, produced every two weeks, combine satellite-based observations of vegetation conditions with climate and biophysical information to map drought's effect on vegetation at a one-kilometer resolution.

"VegDRI provides a regional overview of how rangeland and crops are doing," said Dr. Brian Wardlow, the GIScience program area leader at the National Drought Mitigation Center (NDMC). "For anyone monitoring agricultural conditions, particularly ranching, or with interests in natural resource management, this is an invaluable addition to their tool set."











Wardlow and Dr. Tsegaye Tadesse, NDMC climatologist, are working closely with Jesslyn Brown and staff at the U.S. Geological Survey's (USGS) Center for Earth Resources Observation and Science (EROS), with sponsorship from the U.S. Department of Agriculture's (USDA) Risk Management Agency (RMA), to fine-tune VegDRI.

Vegetation Drought Response Index Complete

June 15, 2009



Vegetation Condition

 Extreme Drought	 Unusually Moist
 Severe Drought	 Very Moist
 Moderate Drought	 Extremely Moist
 Pre-Drought	 Out of Season
 Near Normal	 Water





Summer 2009

VegDRI Expands to 48-State Area, continued

A USGS/EROS historical 20-year satellite database provides critical input for VegDRI. "This project represents a very successful partnership between the USGS and the University of Nebraska–Lincoln's National Drought Mitigation Center," Brown said. "It shows how far we have come in recent years utilizing satellite remote sensing in combination with climate and other environmental data for operational monitoring."

In 2002, Brown and Tadesse received funding for a pilot study from the USGS to develop the concept into a drought monitoring tool for the U.S. that would complement other tools such as the U.S. Drought Monitor (USDM). In 2006, with additional RMA resources, the team began transitioning VegDRI from a research activity to producing biweekly VegDRI maps for a seven-state region centered on the northern Great Plains. VegDRI's coverage has expanded each year, culminating in coast-to-coast coverage this month.

Even though VegDRI now spans the U.S. coast-to-coast, the team's work is far from over. One of the current major tasks is to see how accurately the VegDRI maps depict actual drought conditions. Work has been ongoing over 22 central and western states, for which operational maps have been produced since 2008, but this is the first year VegDRI will be produced and tested over the 26 midwestern and eastern states. The researchers are currently recruiting people to join the VegDRI evaluator network. Evaluators in the past have included ranchers, farmers, climatologists, extension agents, resource management agency employees, and others in the general public. "We're really looking for input from anyone who can compare what they see on the map with what they see on the ground for their local area," Tadesse said.

VegDRI is undergoing fine-tuning, as better and more data are incorporated. For example, Wardlow said, VegDRI maps are now based on 20 years of historic climate and satellite information, providing a sounder basis for comparison with a longer historical normal.

Additional features to be added to the VegDRI website in the near future include animations, change maps showing the difference between maps for the two-week interval, and an enhanced archive.

For VegDRI maps and related information please visit http://drought.unl.edu/vegdiri/VegDRI_Main.htm

To volunteer as a VegDRI evaluator, please contact Karin Callahan of the NDMC, kcallahan2@unl.edu, 402-472-7556.

Summer 2009

U.S. Drought Monitor Forum, Austin, Texas, October 7-9, 2009

The 2009 U.S. Drought Monitor Forum will be at the Lower Colorado River Authority (LCRA) offices in Austin, Texas, October 7-9, sponsored by the National Drought Mitigation Center.

Each year the Drought Monitor forum alternates focus between the U.S. and North American monitors. The forum provides a chance for Drought Monitor authors and users to talk about ways to improve the product. Emerging issues this year are likely to center on drought impacts and on tools that can provide input at finer resolution in space or in time.

It's a chance for Drought Monitor authors, users, and drought researchers to meet with one another to refine the state of the art of drought monitoring. The forum is free and open to the public.

Check the NDMC's website for an agenda and updates in the months and weeks before the Forum.

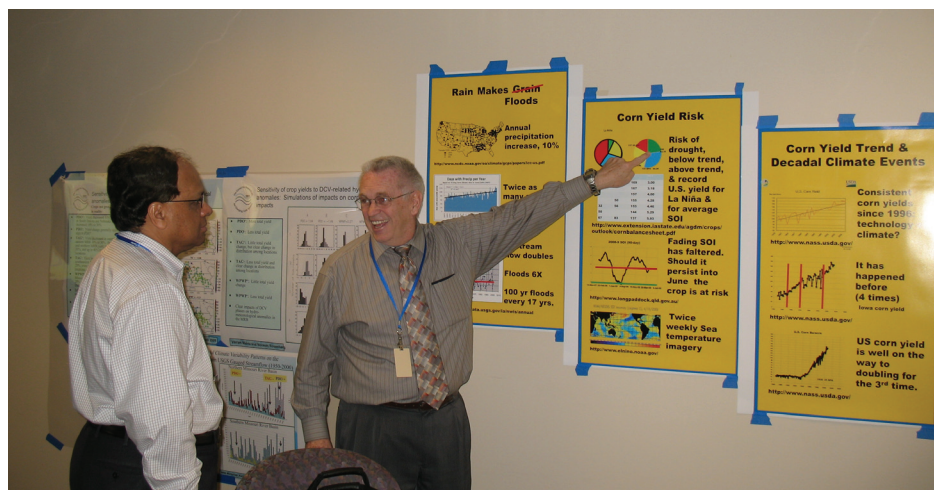
Register on-line at:

<http://drought.unl.edu/registration/DMF-TX2009/usdmregistration2009-step1.asp>.

Because there is no hotel at the LCRA office complex, participants are free to select accommodations from the many possibilities that Austin offers.

Questions? Please contact Ann Fiedler, NDMC administrative assistant, at 402-472-6707, or afiedler2@unl.edu

Decadal Variability Workshops Span the Missouri River Basin



Vikram Mehta, CRCES, discussed prospects for long-term drought forecasts with Elwynn Taylor of Iowa State University at a workshop in Kansas City in April.

For more information please contact Nicole Wall, nwall2@unl.edu, 402-472-6776.

The NDMC, the Center for Research on the Changing Earth System (CRCES), and the U.S. Army Corps of Engineers hosted a second listening session in Helena, Montana, June 24-25, to gather input from stakeholders about the need for decadal climate information. This is part of a project sponsored by the National Oceanic and Atmospheric Administration's Sectoral Applications Research Program.

Summer 2009

NDMC Helps Grow Global Drought Preparedness Network



The Xerochore workshop, "Drought and the Natural System," brought together drought planners from across the European Union and North Africa in June 2009 in the Netherlands. According to its website, Xerochore is a Support Action aimed at assisting in the development of a European Drought Policy in accordance with the EU-Water Framework Directive. Read more online at <http://www.feem-project.net/xerochore/index.php>.

The National Drought Mitigation Center (NDMC) is working with the World Meteorological Organization (WMO) and countries around the world to move toward a global drought preparedness network.

Mark Svoboda, NDMC climatologist and U.S. Drought Monitor author, traveled to Chile in May and to the Netherlands in June for continent-scale discussions on drought monitoring and early warning.

Also in June, Don Wilhite, NDMC founder and current director of the School of Natural Resources at the University of Nebraska–Lincoln, chaired a meeting of the WMO's Forum on the Social and Economic Benefits of Weather, Water, and Climate Services in Geneva, Switzerland. During his time at WMO, the School and the NDMC agreed to host a United Nations Inter-regional Workshop on Indices and Early Warning Systems for Drought. Other co-sponsors for the meeting are the U.N. Convention to Combat Desertification, the National Oceanic and Atmospheric Administration, and the U.S. Department of Agriculture. The workshop will be held in Lincoln, December 8-11, 2009.

Don also explored opportunities for NDMC scientists to offer a training course on drought monitoring for the Mali Meteorological Services with support from WMO. This training course will likely be in mid-September.



NDMC climatologist Mark Svoboda attended a drought monitoring and early warning conference in La Sevena, Chile, in May 2009. Conference organizers included the United Nations Educational, Scientific, and Cultural Organization, and CAZALAC, the Centro del Agua para Zonas Áridas y Semiáridas de América Latina y el Caribe.



World Meteorological Organization
Working together in weather, climate and water

Summer 2009

NDMC Contributes to Middle East Peace Process

Dr. Cody Knutson, NDMC water resources scientist, was one of three U.S. scientists who presented "Hydrology in a Changing Environment" to water, agriculture and climate managers from Israel, Jordan, and the Palestinian Territories. The workshop in Israel the week of June 8 was sponsored by the Multi-Lateral Working Group on Water Resources, part of the official U.S. Middle East Peace Process.



Knutson

The atmosphere was a little strained, initially. "But by the second day, it was more relaxed," Knutson said. "They got to know each other a little bit. They were finding out they faced similar technical and managerial issues."

Knutson's co-presenters were Dr. Dennis Todey, the South Dakota State Climatologist, and Dr. Mike O'Neill, the national program leader for water resources with the U.S. Department of Agriculture's Cooperative State Research, Education and Extension Service (CSREES).

The 18 participants, six from each region, heard about global climate change, including its causes and projected effects, particularly related to water and agriculture. Other sessions focused on what's been tried in different parts of the world to counter some of the anticipated effects, and on risk management. Some sessions included small group work that prompted additional dialog.

In addition to learning the latest research on climate change and impacts, the participants became familiar with their counterparts across borders. Or, as Knutson said, in the terms of the Middle East Peace Process, "The participants laid the groundwork for future collaboration."

Contact the National Drought Mitigation Center

P.O. Box 830988
Lincoln, NE 68583-0988
USA
ndmc@unl.edu
phone: (402) 472-6707
fax: (402) 472-2946

819 Hardin Hall
3310 Holdrege St.
School of Natural Resources
University of Nebraska-Lincoln
East Campus

National Drought Mitigation Center
<http://drought.unl.edu/>
DroughtScape
<http://drought.unl.edu/droughtscape/droughtscapecurrent.htm>
What's New
<http://drought.unl.edu/new.htm>