Fall 2011

DroughtScape- Fall 2011

Kelly Smith

National Drought Mitigation Center

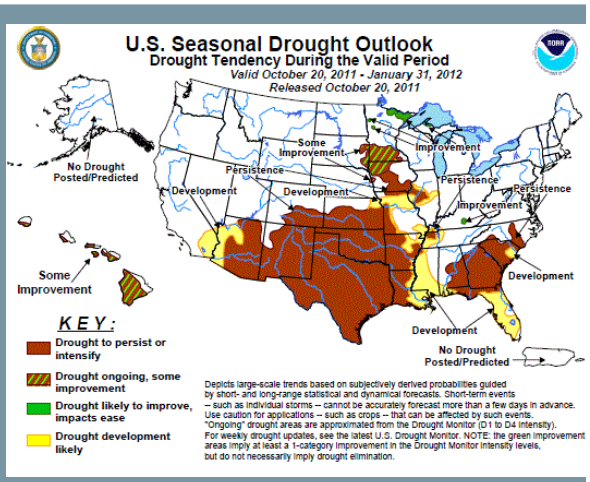
DroughtScape

The Newsletter of the National Drought Mitigation Center

Fall 2011

Drought Likely to Persist, Intensify Across South

The developing La Niña weather pattern means it is likely that drought will persist across the Soutwest, the southern Plains, and parts of the Southeast. Drought is also likely to emerge in south Florida, in the southern Mississippi River Basin, and west from Arizona into California.



Outlook and Climate Summary on page 2

Impacts: Ag Losses, Fire, Water Restrictions

The south-central United States suffered substantial losses from drought this summer, with reports highlighting impacts to agriculture, damage from wildfire, water restrictions, habitat loss, and damage to water mains from shifting soil.

Impacts Summary on page 4

Drought Preparedness Community Options

You too can be part of the ongoing discussion on how we can be as ready as possible for future droughts. Options include webinars – pencil Dec. 13 on your calendar – and online discussion and document sharing forums.

Read more on page 11

Database Will Help Planners Find Options

The NDMC is beginning work on a database of drought mitigation strategies. This two-year project is sponsored by NOAA's Climate Program Office.

Read more on page 9

NDMC Welcomes International Visitors

The NDMC is pleased to open its doors this fall to a steady stream of visiting scientists from around the world, from senior scientists to graduate students.

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New Drought Impact Reporter Online

The NDMC rolled out an updated Drought Impact Reporter in early October, enhancing the nation's most comprehensive database of drought impacts.

Read more on page 7

About *DroughtScape*

DroughtScape is the quarterly electronic newsletter of the National Drought Mitigation Center. We welcome your contributions. Editor's email: ksmith2@unl.edu.

Sim-Drought, Available Now at Select Agencies

The NDMC has long advocated that agencies and organizations responsible for drought planning conduct drought exercises, just as planners do for other hazards. It's starting to happen in Canada, and the Interstate Commission on the Potomac River Basin recently held its long-standing annual simulated drought.

Read more on page 10

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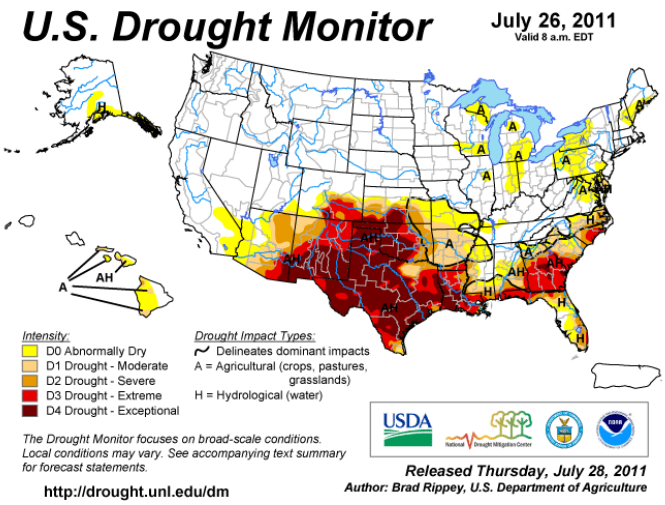
Fall 2011 Outlook and July to September Summary

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://droughtmonitor.unl.edu/classify.htm. Details on the extent and severity of drought are online at http://droughtmonitor.unl.edu/archive.html. 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: As we progress into another La Niña autumn and winter, forecasters don't anticipate significant improvement to the drought in the southern United States. Temperatures are likely to remain above normal and precipitation below normal, which makes improvement unlikely, even during the fall months of lower water demand.



July: Hot and predominately dry conditions did not bring any relief to drought-stricken areas in July. It remained very dry over the southern plains, where much of Texas, Oklahoma, and Kansas recorded less than 25 percent of normal precipitation during the month. Dry conditions over the Midwest prompted the introduction of abnormally dry and moderate drought status. Portions of Iowa, Illinois, Indiana, Ohio and Michigan received less than 50 percent of normal rainfall. Temperatures during July were well above normal over almost the entire United States, except for the West Coast. Portions of Kansas, Oklahoma, and Texas were 8-10 degrees Fahrenheit above normal, while most of the country was 2-6 degrees Fahrenheit above normal. In the first week of July, 24.5 percent of the United States was experiencing drought compared to 27.1 percent at the end of the month. Last year at this time, only 7.6 percent of the country was in drought and the only extreme and exceptional drought conditions were found in Hawaii and Louisiana, and only 2.7 percent of Texas was in drought with no extreme or exceptional drought, and just two counties in severe drought. At the end of July 2011, 99.5 percent of Texas was in drought with 91.7 percent in extreme to exceptional drought.

August: Above-normal temperatures continued in August. Almost the entire country was hotter than normal for the month, ending one of the warmest summers on record. The southern plains again led the way as the hottest region for August, with temperatures 8-10 degrees Fahrenheit above normal for much of Texas and Oklahoma. The preliminary data for the summer showed that Texas, Oklahoma, New Mexico and Louisiana recorded the warmest summers on record, surpassing records set in the 1930's. Continued dry conditions over the southern plains also strengthened the grip that drought held on the region. Dry conditions over portions

July to September Summary, continued

of the Midwest continued, with drought expanding and intensifying through the region. August ended with 27.5 percent of the United States in drought, which was virtually unchanged for the month. The area in extreme and exceptional drought also remained unchanged, with the areas in drought suffering from very intense drought. The United States saw a rapid change, from being virtually drought-free at the end of August 2010 to the conditions this year. In Texas, 99.9 percent of the state was in drought, compared to 11.5 percent a year ago, and 81.1 percent of Texas was in D4 drought compared to none last year. In Oklahoma, August ended with 100 percent of the state in drought compared to 36.2 percent a year ago, and 69.2 percent in exceptional drought compared to none a year ago.

September: Above-normal rainfall over the eastern United States along with some monsoonal precipitation in the southwest improved the overall drought status for the country during the month. Tropical Storm Lee and Hurricane Irene brought significant moisture to portions of the Gulf Coast and East Coast in September. September started off with 27.5 percent of the country in drought and ended with 24.4 percent in drought. The plains and the west were dry. The areas in extreme and exceptional drought did not get any relief, while the areas in the southwest that missed out on the monsoonal precipitation showed degradation. Temperatures were cool over much of the central plains and Midwest, 2-4 degrees Fahrenheit below normal. Wildfires in Texas displaced thousands of people and added to the hardship in the state that was already reeling from ongoing drought impacts.

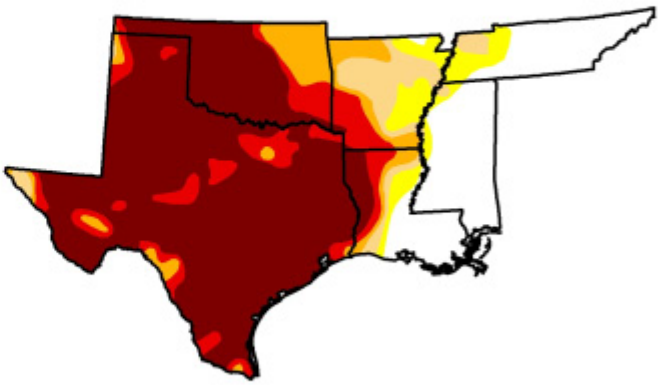
U.S. Drought Monitor

September 27, 2011
Valid 7 a.m. EST

South

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	18.34	81.66	76.26	70.61	63.67	53.77
Last Week (09/20/2011 map)	18.41	81.59	76.35	69.79	64.54	53.61
3 Months Ago (06/28/2011 map)	25.52	74.48	59.82	53.42	47.27	47.27
Start of Calendar Year (12/28/2010 map)	8.86	91.14	67.65	35.21	10.17	0.00
Start of Water Year (09/28/2010 map)	54.23	45.77	20.04	6.79	0.83	0.00
One Year Ago (09/21/2010 map)	58.00	42.00	12.70	5.13	0.83	0.00



Intensity:

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

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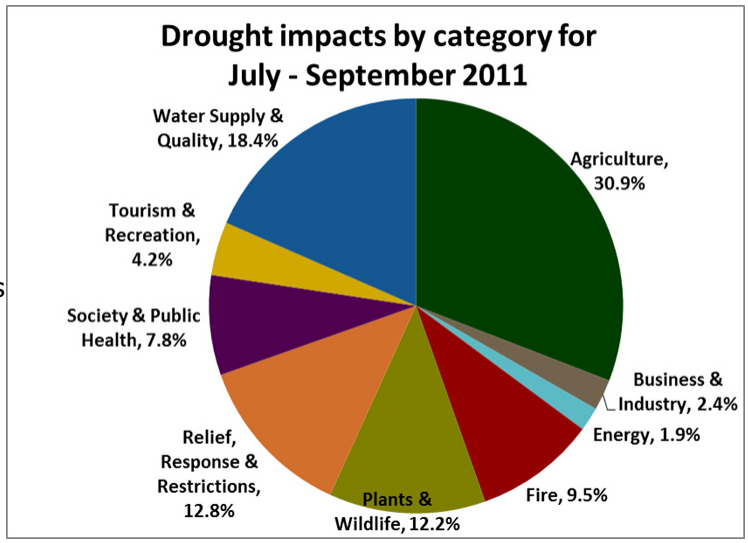
July to September Impacts: Drought Scorches Texas and Nearby States

By Denise Gutzmer, Drought Impact Specialist

Drought blistered the southern U.S. during the summer of 2011, decimating crops and forcing ranchers to sell livestock. Agricultural losses in Texas had reached $5.2 billion as of August 1 and continued to climb. Of the $5.2 billion, $2.1 billion were attributed to losses to the livestock sector, while the remaining $3.1 billion came from crop losses. High agricultural losses plagued Oklahoma as well with estimates at $2 billion toward the end of August, including damage to livestock and grain production, but excluding the cost of feed stocks. The value of lost cotton in Oklahoma was $144 million. Kansas also bore drought losses amounting to $1.7 billion by mid-September, with wheat, corn, sorghum and soybean yields all reduced.

Cattle sales soared to two to three times the usual rate through the summer in Texas, Oklahoma, New Mexico and Kansas as pastures and water supplies were depleted, leading to a decrease in the size of the national cattle herd and anticipation of rising beef prices at the grocery store. Short hay supplies led many ranchers to sell herds rather than purchase expensive hay to feed cattle through the winter. Drought put a dent in crop yields in sections of the Midwest and the East. Agricultural impacts accounted for 30.9 percent of the impacts in the Drought Impact Reporter from July through September.



The new Drought Impact Reporter uses more categories for impacts than the former version did. Water/Energy is now two separate categories, Water Supply & Quality, and Energy. The category formerly known as "Other" was divided into Business & Industry; Relief, Response & Restrictions; and Tourism & Recreation. Plants & Wildlife and Society & Public Health were renamed. Descriptions of the categories are on the Drought Impact Reporter help page at http://sucho.unl.edu/droughtimpactreporterpublic/help/.

Fire ravaged parts of the South this summer as heat combined with the dry conditions to create prime wildfire conditions. In Texas, 3.6 million acres burned from the start of its fire season in November 2010 through early September. Bastrop County, Texas, experienced a wind-driven fire that started on Labor Day weekend and consumed more than 34,000 acres, took two lives and destroyed 1,600 homes. Residents and business owners in Bastrop County filed 1,500 insurance claims for estimated property losses of $250 million, according to the Insurance Council of Texas. Much of the South was on the defensive combating wildfires over the summer. Nationwide firefighting resources were stretched thin, including experts to provide oversight and aircraft.

Depleted rivers and lakes across the South spurred many water districts to ratchet up the water restrictions, limiting outdoor watering, crop irrigation and overall water use. Major cities

July to September Impacts Summary, continued

in Texas, including Dallas, Austin and Houston, and many smaller communities, adopted water restrictions to stretch their supplies. Contracting soil caused water main breaks in many cities, particularly Houston. Some northwestern Louisiana communities also opted for water restrictions as groundwater levels fell, leaving county and municipal wells dry. Lake Okeechobee in southern Florida remained low with water restrictions still in effect, despite average rainfall over the summer, unable to recover from last year's drought. Parts of South Carolina also adopted water restrictions.

Representative impacts from the Drought Impact Reporter are listed below. For more information, please visit the new Drought Impact Reporter at the same URL as before:
http://droughtreporter.unl.edu/

Texas
Ranchers in Texas, Oklahoma and Kansas spent an average of $170 per ton of hay, compared to $112 per ton in July 2010, according to the U.S. Department of Agriculture. Shipping costs increased the price substantially. *Odessa American* (Texas), Aug. 29, 2011

Roughly two dozen athletic fields in Dallas have been closed because deep cracks have made them unsafe for use. KTRK-TV ABC 13 Houston (Texas), Sept. 16, 2011

Wildlife biologists rescued more than 3,000 smalleye shiners and sharpnose shiners from the upper reaches of the Brazos River near Sagerton to prevent the species, only found in this river, from becoming extinct. *Austin-American Statesman* (Texas), Sept. 16, 2011

The city of Houston lost 9,330 trees to drought, according to the parks and recreation department. The director of the department stated that there could be thousands of additional trees killed by drought. The executive director of Trees for Houston has a more dire view of the ongoing drought's impact on trees and estimated that up to 10 percent or 66 million of the 660 million trees in Harris County could die from lack of water in two years' time. Air quality will likely suffer if so many trees die since they produce oxygen. The cost of removing the dead trees is exorbitant, too, at $2 million to $3 million. Only 1,000 dead trees have been removed. KHOU-TV CBS 11 Houston, Sept. 21, 2011

Oklahoma
The governor of Oklahoma issued an executive proclamation on August 3 which extended the burn ban to all of the 77 counties in the state. KOTV-TV CBS 6 Tulsa (Okla.), Aug. 3, 2011

A researcher with the Oklahoma Biological Survey passed along a report from Honobia in far southeastern Oklahoma: VERY hot out there, lots of dry riverbeds and dead mussels and fish. Worst I have ever seen from 20 years of working in that system. Aug. 11, 2011

Local hay growers received hundreds of telephone calls daily from desperate ranchers looking for hay since supplies become depleted, stated the Garfield County extension agent. *Ag Journal.com*, Aug. 13, 2011

July to September Impacts Summary, continued

Kansas
A number of producers have had to shut off irrigation pumps to meet minimum desirable streamflow on the Little Ark River. Irrigated corn is burning up and pasture hay is hard to find. Very hot and dry. General public user submission, Aug. 9, 2011

State officials opened up the use of state lakes as an emergency supply of water. Kansas Weekly Drought Update, August 15, 2011

More acreage than usual was available for planting winter wheat in Kansas because drought caused many acres of corn and crops planted in the spring to fail, according to an extension wheat specialist at Kansas State University. *Salina Journal*, Sept. 13, 2011

New Mexico
New Mexico water managers said: Along the Pecos River in eastern New Mexico, the Interstate Stream Commission is for the first time pumping groundwater to augment the river's flow to meet a settlement with farmers in the Carlsbad Irrigation District. *Farmington Daily Times*, July 8, 2011

Many bears challenged by drought and wildfire have been feeding from trash and getting into grills in Taos County, prompting the New Mexico Game and Fish Department to caution residents. *Taos News*, July 16, 2011

A chile grower in Santa Fe lost nearly a quarter of his crop to drought and heat, which made the blossoms fall off the plants. *Santa Fe New Mexican*, Aug. 3, 2011

Fifty percent of the wetlands at Bitter Lake Wildlife Refuge were dry. The refuge does not have access to enough water to refill the wetlands, which will force migrating birds, such as sandhill cranes, to fly further south before finding water. *Santa Fe New Mexican*, Aug. 28, 2011

Missouri
Livestock producers in southwestern Missouri were purchasing higher than normal amounts of supplements for their livestock as stock tanks and water supplies decline, according to an employee at SoMo Agri Supply. Area farmers were beginning to feed hay to their livestock as the grass supplies run out. KYTV-TV NBC 3, Springfield, July 18, 2011

The governor of Missouri requested that the Farm Service Agency begin damage assessments for the entire state because heat and drought have hurt crop yields and stressed livestock. *Memphis Democrat*, Aug. 11, 2011

Another month with very little rain. We picked up roughly 1 and 1/2 inches of rain. The field grass is dead. We are feeding the cows hay meant for winter. Our spring is just a trickle. Pumping well water to the cows. CoCoRaHS Report from Station #Clever 4.0 ENE on Sept. 3, 2011, Christian County

National Drought Mitigation Center

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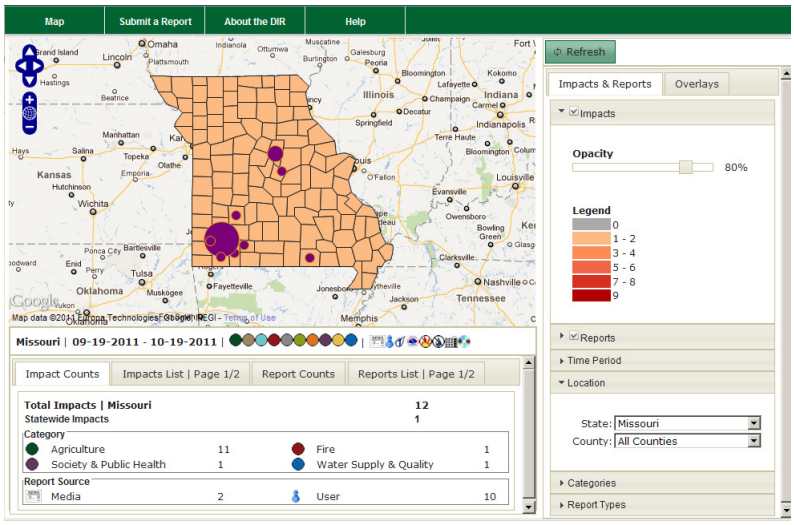
Updated Drought Impact Reporter Released

The National Drought Mitigation Center rolled out an updated Drought Impact Reporter on Monday, Oct. 3, enhancing the nation's most comprehensive database of drought impacts.

Besides an updated look and feel, the new Drought Impact Reporter provides more background and context on individual impacts, and distinguishes between impacts and reports, allowing a much greater range of information to be incorporated and extracted.

All information enters the Drought Impact Reporter as a report, and moderators decide whether it meets the tool's definition of an impact: An observable loss or change that occurred at a specific place and time because of drought.

Reports come from media, users (i.e., anyone), CoCoRaHS observers, National Weather Service Drought Information Statements, state-aggregated burn bans, state-aggregated water restrictions, and other summary reports compiled by agencies or organizations. The new system includes slight differences in how user-submitted reports are handled. Please contact the NDMC and / or refer to the Help page on the Drought Impact Reporter for more information.



This screen capture of the Drought Impact Reporter shows that in the 30 days before October 19, 2011, there were 12 impacts in Missouri, with two based on information from media and 10 based on information from users. The size of the circles indicates the number of reports from a given area. In this case the large circle represents seven reports coming from Mt. Vernon, Missouri, the seat of Lawrence County.

Reports and impacts are mapped separately. The default view of reports is to map them by point of origin – circles placed on the city or the county centroid – and the default view of impacts is to map them by affected area – shading – down to county level. This enables people to see whether drought-affected rural areas have local representation in the reporting process, or whether they are represented by media or agencies in urban areas.

More features soon to be added to the new Drought Impact Reporter are:

- A text-based Advanced Search, which will enable more reliable quantifiable measures of drought impacts.
- Photos.
- Searching by river basin, drought status, and other boundaries.

The Drought Impact Reporter is a companion tool to the U.S. Drought Monitor, which is an integral part of decision making for providing relief to drought-stressed agricultural producers. Drought Monitor authors often consult the Drought Impact Reporter in assessing whether

Updated Drought Impact Reporter, continued

drought conditions are depicted accurately or need to show more or less intensity.

The Drought Impact Reporter was developed with funding from the National Oceanic and Atmospheric Administration and from the U.S. Department of Agriculture's Risk Management Agency.

Many NDMC staff members and others have contributed to this version of the Drought Impact Reporter. NDMC staff greatly appreciate the efforts of Scott Owen, a programmer with Concentric Corporation, an Omaha-based IT consulting and staffing company; Qingfeng "Gene" Guan, assistant professor of Geography and Geographic Information Science with the Center for Advanced Land Management Information Technologies (CALMIT) at the School of Natural Resources at the University of Nebraska-Lincoln; Ruopu Li, a Ph.D. candidate in Natural Resource Sciences associated with CALMIT, and Jinfu Leng, a master's student in Geography and GIScience. Concentric built the database, web service and moderator interface, and Guan and his team developed the mapping tool and spatial analysis capabilities.

Drought Impact Reporter
http://droughtreporter.unl.edu

Submit a User Report
http://sucho.unl.edu/droughtimpactreporterpublic/submitreport/

Contact the National Drought Mitigation Center

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NDMC Building Drought Management Database

The National Drought Mitigation Center is beginning work on a database that will allow decision-makers to search for and compare drought mitigation and response strategies. Cody Knutson, leader of the NDMC's Social Science and Planning program area, is the principal investigator. Funding for the two-year project is from the Climate Program Office, Climate and Societal Interactions – Transitions program, of the National Oceanic and Atmospheric Administration. The database will be accessible via the U.S. Drought Portal (http://drought.gov) and on the National Drought Mitigation Center's website (http://drought.unl.edu). Knutson and other NDMC researchers will work with stakeholders to identify preferred options for categorizing, reporting and accessing case studies, news stories and other information.

NDMC Welcomes Visiting Scientists from China, India, Africa and Europe

April 4-June 28, Jaroslav Vido from Zvolen Technical University in the Slovak Republic worked at the NDMC on his Ph.D. research on drought impacts on selected ecosystems.

On Aug. 2, the NDMC welcomed visiting scholar Getachew Berhan Demisse, a graduate student from Addis Abbaba University in Ethiopia, who is working with Tsegaye Tadesse, NDMC climatologist. Getachew's research focuses on applications of satellite imagery to drought.

On Aug. 22, Meixiu Yu began a year as a visiting scientist at the NDMC. She is working on a Ph.D. in Hydrology and Water Resources at Hohai University in China, and is particularly interested in drought monitoring and indices.

The NDMC hosted two visitors from the Czech Republic Aug. 6-13, Peter Hlavinka and Daniela Semeradova, both from the Mendel University of Agriculture and Forestry, Institute of Landscape Ecology.

In September, the NDMC hosted two scientists from the Indian Agricultural Research Institute, Manoj Khanna, senior scientist at the Water Technology Centre, and Rabi N. Sahoo, senior scientist in the Division of Agricultural Physics.

The NDMC will host Dr. Hu Yuankun from China, who will visit on Oct. 20 as part of his Eisenhower Fellowship travels in the United States. He is deputy director general of the Department of Crop Production, Ministry of Agriculture. His visit is in part a follow-up to the recent visit of Mike Hayes, director of the NDMC, to China.

The week of Nov. 14, the NDMC will host three visitors from the Czech Republic and one from Austria: Mirek Trnka, from the Institute of Agriculture Systems and Bioclimatology, Mendel University in Brno, and the Global Change Research Centre, Academy of Sciences of the Czech Republic; Martin Mozny, Agrometeorology Observatory, Doksany, Czech Hydrometeorological Institute, Czech Republic; Jan Balek, Institute of Agrosystems and Bioclimatology, Mendel University, Brno, Czech Republic; and Andreas Schaumberger, Federal Research and Education Center for Agriculture, Raumberg-Gumpenstein, Austria.

For more, please see http://drought.unl.edu/NewsOutreach/UpcomingEvents.aspx

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Drought Simulations Help Organizations and Agencies Prepare

Drought exercises are underway. The National Drought Mitigation Center has long promoted drought simulations to help planners be better prepared, but actual examples have been relatively rare.

The Interstate Commission on the Potomac River Basin conducted its annual drought exercise for the Washington metropolitan area Sept. 15-21, including stakeholders from Maryland, Virginia and the District of Columbia. The goal of this year's exercise was to familiarize staff and utilities with the probabilistic modeling system OASIS (Operational Analysis and Simulation of Integrated Systems), a product of HydroLogics, Inc., which is used to forecast drought operations. According to the organization, the exercise used stream flows based on the 2002 low-flow period and projected 2015 demands and reservoir sedimentation rates. It was also a chance to practice communications between ICPRB, water utilities, reservoir operators and other stakeholders.

The NDMC was invited to observe the Sept. 15 kickoff meeting remotely. Mike Hayes and Crystal Bergman participated in a follow-up conference call with the ICPRB to discuss the process of the drought exercise, and to reiterate the NDMC's support of the ICPRB's drought planning activities.

"The ICPRB is a superb example of an organization that has successfully executed drought mitigation and planning activities for a trans-boundary river basin," Bergman said. "Many of the stakeholders in this basin have realized that they cannot address drought issues in the Potomac Basin separately, but must work together as a unit." The ICPRB has found that both state and local government representatives from each of the districts in the Potomac Basin must be at the table, and that the annual drought exercises help educate stakeholders on how the Potomac River system operates, which is an important piece of knowledge to have for planning purposes.

For more information about the ICPRB's drought exercises, please see http://potomacriver.org/cms/index.php?option=com_content&view=article&id=97&catid=47

Canadian drought planners at Agriculture and Agri-Food Canada (AAFC) are working on next year's Invitational Drought Tournament (IDT). The first-ever IDT was held this past Feb. 15-16 in Calgary, Alberta. Richard Rieger and Harvey Hill from the Agri-Environment Services Branch at AAFC report:

- The developers of the IDT are exploring how they can work with provinces to use the tool to refine drought regulation development, water allocation policy, and planning.
- The Partners for the Saskatchewan River Basin will feature the drought tournament at its November 2011 conference, "Planning for Extremes:"
  http://www.saskriverbasin.ca/confarence.php?id=13
- In March 2012, classes at the University of Alberta in Edmonton and the University of Regina will compete against one another, helping to showcase the educational utility of the IDT, and to test a dynamic water balance model in development at the University of Alberta.

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Connecting Drought Practitioners

Mark Your Calendar: Webinar, Dec. 13

The next webinar by the Engaging Preparedness Communities Working Group of the National Integrated Drought Information System (NIDIS) is tentatively scheduled for Dec. 13 at noon Central time. Potential topics include:

1. NIDIS Program Office updates
2. An overview of the report from the June 2011 workshop, Building a Sustainable Network of Drought Communities
3. How to get involved by using the Engaging Preparedness community on the NIDIS portal, drought.gov
4. Update on the Southern Climate Impacts Planning Program (SCIPP) drought webinars
5. Leadership and next steps for the Engaging Preparedness Communities Working Group

Please contact Nicole Wall (nwall2@unl.edu or 402-472-6776) at the NDMC if you have questions and to RSVP.

Join the Online Discussion

How to access the Engaging Preparedness Communities discussion and documents on drought.gov:

1. Navigate to the NIDIS Portal (www.drought.gov).
2. Click on **Log In** in the upper right.
3. Enter your username and password assigned from the NIDIS portal administrator.
   a. If you don't have this information, then contact Nicole Wall (nwall2@unl.edu).
   b. Request access to the Engaging Preparedness Communities portal community.
4. Once you have logged in, select **Engaging Preparedness Communities** from the **My Communities** menu.

To see the latest updates, find the **Community Projects** module and click on **Engaging Preparedness**. You will be able to see recent announcements, messages, and posted documents. Currently, the NIDIS EPC community has an array of presentations and archived webinar recordings in the **Community Documents Area** from the June 2011 workshop, Building a Sustainable Network of Drought Communities, that took place in Chicago. Users can also contribute to discussion boards. Currently there are two questions related to recent drought in the U.S. and to how this group can share best practices in drought planning. There is also the ability to post news announcements either through the announcements or email feature. To receive these notifications automatically, users will need to adjust their own preference settings. These steps are outlined on pages 20 and 21 in ***Instructions for Using Collaboration Areas in the US Drought Portal.pdf*** in the ***Community Documents Area***. Users will find this manual very helpful in navigating the EPC virtual community.