Summer 2011

DroughtScape- Summer 2011

Kelly Smith

National Drought Mitigation Center

DroughtScape

The Newsletter of the National Drought Mitigation Center

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New NDMC Website

The NDMC has revamped its website. **Drought.unl.edu** includes all the previous content, and much, much more, as well as dynamically generated pages of resources for and about state and local drought monitoring and planning. See, for example, Planning > Planning Info by State.

URLs to Update

U.S. Drought Monitor
http://droughtmonitor.unl.edu/

Vegetation Drought Response Index (VegDRI)
http://vegdri.unl.edu/

International Activities

Serving Data to Order

The NDMC and other researchers at the University of Nebraska-Lincoln's School of Natural Resources are collaborating with nine other institutions on a project led by Purdue to develop decision-support tools to help corn and soybean farmers adapt to a changing climate.

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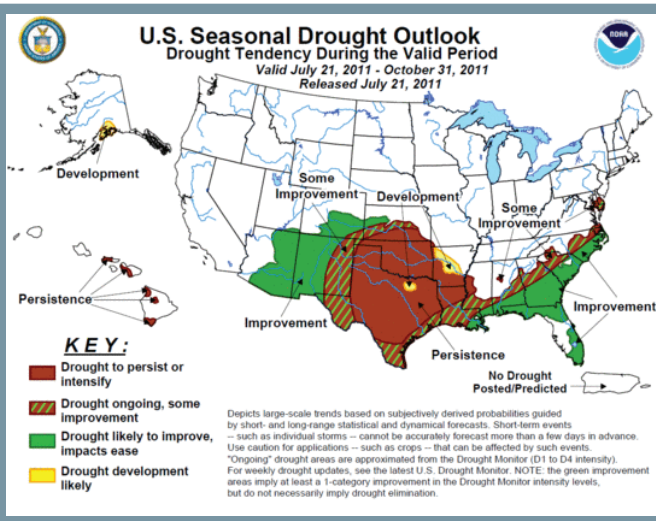
Drought May Improve in Southeast and Southwest



Forecasters anticipate that drought across the southern United States could improve in the southeast and southwest, while remaining intense over Texas and Oklahoma.

Record-breaking drought covered more of the United States in June with D3, extreme drought, and D4, exceptional drought, since the U.S. Drought Monitor was established in 1999.

page 2

Impacts Summary: Fire, Crop Loss and More

Drought across the southern United States led to record-breaking wildfires, widespread crop loss, and many other impacts in the second quarter of 2011.

page 4

NDMC Launches Ranch Planning Tool

The NDMC and collaborators launched a major new web-based tool, Managing Drought Risk on the Ranch:

http://drought.unl.edu/ranchplan

page 7

Workshop Builds Drought Planning Community

Drought planners from around the country gathered in Chicago in June to build connections between federal, state, local and tribal drought planning efforts.

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Summer 2011 Outlook and April to June Summary

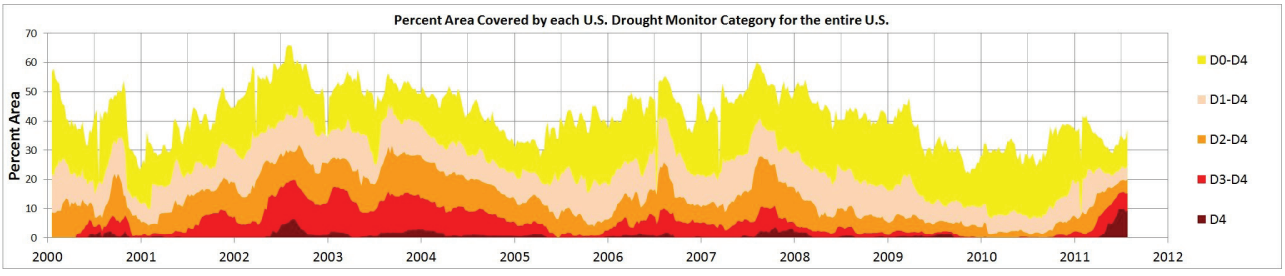
By Brian Fuchs, Climatologist, National Drought Mitigation Center

Drought classifications are based on the U.S. Drought Monitor. For a detailed explanation, please visit http://droughtmonitor.unl.edu/classify.htm. Details on the extent and severity of drought are on-line 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: NOAA's official Seasonal Drought Outlook anticipates the record-breaking drought in Texas and Oklahoma will persist through October. In addition, the current drought-free areas of Texas and central Arkansas are expected to see drought develop over the next three months. Some improvements to the overall intensity of drought are possible over the southwest and southeast, especially along the coastal regions of the southeast. These improvements may be slight, as drought is not expected to diminish completely, but the intensity may improve. The historic drought over Texas and into Oklahoma will continue, as very little improvement at all is being shown in the long-range forecast models.

April: Even as the La Niña conditions in the central Pacific slowly weakened, the months of dryness over the southern United States resulted in both expansion and intensification of drought. April was the first month since November 2009 for exceptional (D4) drought conditions to appear in the contiguous United States. At the end of April, 22.29 percent of the United States was in drought and just over 9 percent was in extreme (D3) and exceptional drought. Last April, 10.7 percent of the United States was in drought and there was no extreme drought on the map. By the end of this April, most of Texas and New Mexico were experiencing extreme or exceptional drought while extreme drought was spreading over south Florida and the Gulf Coast. Much of the southern plains had well below-normal rain, with many areas of New Mexico and Texas recording less than 2 percent of normal precipitation. Temperatures were above normal over much of the United States outside of the Pacific Northwest and northern Plains. The warmest temperatures were observed over Texas and New Mexico, with averages 6-8 degrees Fahrenheit above normal.

May: Dryness was evident all along the southern tier of the United States, with New Mexico and west Texas recording less than 2 percent of normal precipitation and much of the southern United States recording less than 50 percent of normal. Much of the eastern and southern United States recorded temperatures 2-4 degrees Fahrenheit above normal. Drought continued to intensify during the month, with 21.4 percent of the country in drought and 12.3 percent in extreme or exceptional drought. This compares to 9.3 percent in drought and 0.2 percent



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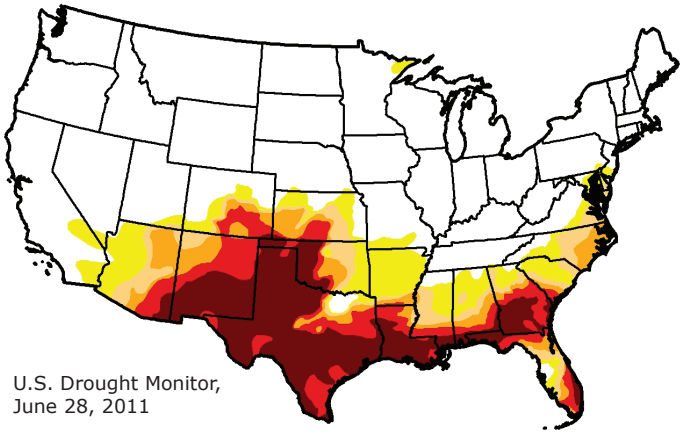
April to June Summary, continued

in extreme or exceptional drought a year ago. Conditions in Texas continued to worsen as the drought intensified to near historical levels. By the end of May, 81.1 percent of Texas was in extreme or exceptional drought and 51 percent was in exceptional drought.

June: Although the spatial extent of the drought did not change much in June, it intensified dramatically. By the end of June, 23.5 percent of the country was in drought compared to 21.4 percent at the beginning of the month, and 15.35 percent of the country was in extreme or exceptional drought, with 10 percent in exceptional drought. This is the most area in exceptional drought ever depicted on the U.S. Drought Monitor, and the most extreme or exceptional drought shown since November 2003. Even in 2003, intense drought areas were scattered throughout the western United States and into the Plains, whereas this year, the area of the country in extreme or exceptional drought was concentrated in the southern United States. June remained wet over the northern Plains and Midwest, while staying dry over much of the south. Temperatures were well above normal over much of the eastern and central United States, where temperatures were 2-4 degrees Fahrenheit above normal. Over portions of Texas, New Mexico and Oklahoma, temperatures were 6-10 degrees Fahrenheit above normal, which, coupled with the dryness, turned the drought situation into a historical event. Texas remained the "epicenter" of the drought, with 72.3 percent of the state in exceptional drought conditions at the end of June and 90.6 percent in either extreme or exceptional drought.



U.S. Drought Monitor, June 28, 2011

Values from the June 28, 2011, U.S. Drought Monitor

State	Percent of Area in D3 or D4	Percent of Area in D4
Texas	90.6	72.3
Louisiana	90.1	63.5
New Mexico	79.3	49.1
Georgia	68.9	41.2
Florida	47.6	20.7
Oklahoma	41.2	32.6

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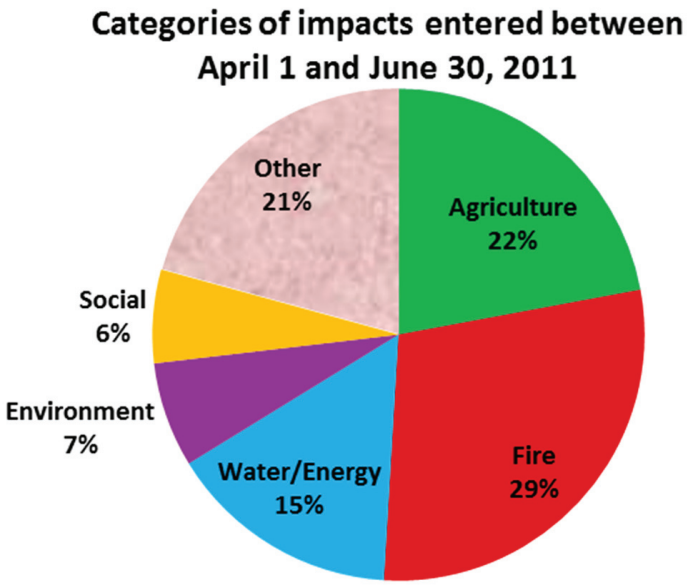
Southern U.S. Reeling From Drought Impacts

By Denise Gutzmer, Drought Impact Specialist

The impact count rose through the spring months as drought steadily intensified across the southern U.S., delivering a sharp blow to agriculture and contributing to the early start of a particularly intense wildfire season in several states. Impacts related to fire and agriculture represented 29 and 22 percent of the entries made in the Drought Impact Reporter during the second quarter of the year. Winter wheat from southeast Colorado and western Kansas through Texas was devastated by drought. Drought stalled planting in these same areas and prevented plants from germinating. Burn bans were common from Arizona through Florida, as was the tension and debate over whether or not to allow private citizens to use fireworks.

Texas experienced huge agricultural losses as the winter wheat crop was hit hard and cotton planting was delayed. Ranchers had little to feed their livestock because pastures were dry and water supplies became dangerously low in many places. Loss estimates through May 1 were $1.5 billion. Wildfires since November 2010, the official start of fire season, destroyed forage and incinerated more than 3,900 miles of fence, according to the Texas Department of Agriculture. Many communities were encouraging or mandating water conservation.



Wildfires also ravaged **New Mexico**, destroying forage and fences, leading to the evacuation of towns. The state Division of Forestry banned outdoor burning due to drought and strong winds in all counties except a few in the northwestern corner. By mid-May, more than 420,000 acres had burned. A number of communities in the state enacted water restrictions as river and spring flow lessened. Many parched communities tallied the days since rain had last fallen.

Wildfires flared in **Florida** as drought increased the fire risk. The Florida Division of Forestry reported that 3,723 fires burned 183,741 acres in the first six months of 2011. Many counties and fire districts reported above average fire activity. Lake Okeechobee in South Florida reached dangerously lows levels, requiring pumps to pull water from the lake, and harmed endangered species, such as the Everglade snail kite. Chicks in many nests were abandoned because the adult birds could not find food. Fortunately, the return of the rainy season began to raise the lake level by late June.

Eastern **Colorado** also suffered in drought this spring. Dry pastures forced ranchers to feed their cattle or sell them while winter wheat struggled to grow. Disaster declarations for southeastern counties made farmers eligible for assistance for crop and grazing losses.

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Southern U.S. Reeling From Drought Impacts, continued

Drought strengthened its hold on western **Oklahoma** over the last few months, dashing hopes for the wheat crop. Since it failed in many areas, agriculture officials in early May urged farmers to hold off on plowing their fields to reduce wind erosion. Wildfires were problematic, too, leading many counties to adopt burn bans.

Arizona experienced its worst wildfire on record, the Wallow Fire. The fire began on May 29, likely started by human activity, and burned more than 538,049 acres in Arizona and crept into New Mexico to char another 15,407 acres as of July 4, according to InciWeb. The fire was 100 percent contained on July 8.

Representative impacts from the Drought Impact Reporter are listed below, including reports submitted by CoCoRaHS observers and members of the general public.

Texas

The Electric Reliability Council of Texas recommended cleaning of all equipment to avoid more power outages like those that affected refineries in Texas City and on Galveston Island. Normally, rain washes salt, dust and other residue off power lines. Without regular rain, residue has created short-circuits and power outages. *Houston Chronicle*, April 29, 2011, and *The New York Times*, July 11, 2011

There were 175 water suppliers with voluntary or mandatory water restrictions in effect in Texas, with many of them concentrated in the San Antonio area. *Bryan-College Station Eagle*, June 5, 2011

Early estimates put agricultural losses in Texas due to drought from November 2010 through May 1, 2011 at $1.5 billion, according to the Texas AgriLife Extension Service. The estimate includes damage to livestock, wheat, corn and sorghum. The livestock sector alone has borne $1.2 billion in costs related to transporting water and supplemental feed. *El Paso Times*, May 18, 2011

Farms plant crops and pray only to see their crops burn in the 103 degree heat. Crops and pastures are drying up, water is scarce. Hay that was harvested last year was enough to last 3 winters, all of it has been exhausted because there is poor grazing land conditions for

Ron McQueen of the National Weather Service in Lubbock, Texas, submitted these photos of the Palo Duro Canyon State Park, mostly in Armstrong County, in the Panhandle. The top photo is from this year, when the area is in exceptional drought. The bottom photo is from 2010, which was a wet year. McQueen noted the striking differences in vegetation, with grasses and other low-lying ground cover non-existent during drought, exposing soils and probably contributing to a heat wave.

Southern U.S. Reeling From Drought Impacts, continued

the cattle to graze on due to lack of moisture and/or fire. Report from a member of the general public for Hale County, Texas, submitted in June.

The U.S. Department of Agriculture declared 213 Texas counties to be natural disaster areas due to ongoing drought, heat, strong winds and wildfires since January 1, 2011. *The New York Times*, July 12, 2011

New Mexico

All of New Mexico, with the exception of four and a half counties, was under a burn ban issued by the state Forestry Division. *Clovis News Journal*, April 17, 2011

Farmers in Dona Ana County were to receive just six acre-inches of water for irrigation this season, rather than three acre-feet, because little snow fell in the northern part of the state and southern Colorado. El Paso Inc., April 26, 2011

Entering our fourth month with no significant precipitation. My family has now spent 4 weeks working every day on wildfire fuel mitigation. We have so far sent 8,000 lbs of tree limbs to our dump and 1,000 pounds of cut grass. These amounts represent dealing with about 80% of the fuel in a 200 foot radius from our house. Our county fire dept. says this is the year to expect a catastrophic wildfire in this area. Report from CoCoRaHS Observer at Santa Fe 7.7 WNW, submitted 4/3/2011.

The New Mexico Game and Fish Department informed the Santa Fe Raptor Center that its rehabilitated raptors could not be released into the wild, due to the drought. *Santa Fe New Mexican*, June 10, 2011

Florida

The low level of Lake Okeechobee led to the abandonment of 17 snail kite nests on the lake, while other nests were threatened by the receding water. *Palm Beach Post*, May 27, 2011

The drought keeps going. We need something with a name ... just no lightning. Columbia and Suwannee Counties are under many fire weather warnings. Very low relative humidities. ... Untold losses right now. Water levels are going down, plants dying even with hand watering, water restrictions already in place. Temps are unseasonably high and have been. Wildfires in area but not as bad as in past. However, smoke and ash in the air makes driving and breathing difficult. Energy bills for cooling are going sky-high. I have seen no signs of tourism. People's tempers are short. This is more June going into July weather, but it appears 'normal weather cycles' are changing. ... CoCoRaHS report fromLive Oak 0.4 NE on 5/24/2011.

Q: Can I submit photos along with my drought impact reports?

A: Yes, as long as you are the photographer or have the photographer's permission. We can't use photos from newspapers without their permission. Just go to **http://droughtreporter.unl.edu** and click on Add A Drought Impact. It lets you submit photos.

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New Website Walks Ranchers Through Drought Planning

Managing Drought Risk on the Ranch is a new website developed by the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln (UNL) to help livestock producers develop drought plans.

The NDMC developed the site in collaboration with University of Nebraska-Lincoln Extension researchers Pat Reece (now owner of Prairie and Montane Enterprises), Jerry Volesky, and Matt Stockton. The NDMC also consulted with ranchers, federal grazing experts, and other researchers from UNL, South Dakota State University, and Texas A&M University The entire effort was possible thanks to sponsorship from the U.S. Department of Agriculture's Risk Management Agency.

"There's a lot of information out there for livestock and forage producers on how to mitigate and respond to drought," said Cody Knutson, the NDMC researcher who led the project. "This brings it all together in one spot so ranchers can learn what to do before, during and after a drought."

"A lot of people will say ranchers should have a plan for drought, without a framework of what that should be," said Tonya Haigh, an NDMC researcher who helped assemble the site. "Now we're giving them a framework. The website also conveys how and why the different pieces of the plan are so important, and how planning during non-drought years can lead to fewer impacts during drought years."

The website is designed to walk users through the steps of developing a ranch drought plan: assembling a planning team, identifying goals and objectives, inventorying resources, setting critical dates, developing a monitoring system, identifying strategies for preparing for and managing through drought, and implementing and evaluating the plan. Each step includes links to resources, tools, and worksheets.

The "Inventory and Monitor," "Before Drought," "During Drought," and "After Drought" sections provide in-depth information and resources that will aid users in developing a drought plan. In addition, the site includes a "Drought Basics" section, which provides in-depth information on climate and historical drought occurrence; the effects drought has on livestock, grasses, and grazing management; geographic variability in precipitation and forage growth; and drought-related financial considerations.

In the "Overview" section, users can also find quick links to tools and current drought and weather conditions, and resources for use in presentations and other outreach. Featured on the main page are descriptions of drought plans by rangeland managers from across the Great Plains.

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Knutson Helps With Startup of Africa-Asia Drought Network

Cody Knutson traveled to Bangkok, Thailand, to help the United Nations Development Programme Drylands Development Centre assess its Africa-Asia Drought Risk Management Peer Assistance Project, June 14-15.

Since 2005, the United Nations Development Programme (UNDP) Drylands Development Centre (DDC) in Nairobi, Kenya, has cosponsored an African Drought Risk and Development Network, along with the UNDP Bureau for Crisis Prevention and Recovery and the UN International Strategy for Disaster Reduction. The African network is a regional mechanism for advocacy, capacity building and peer learning on drought risk reduction.

Resources became available from the Government of Japan to extend the network to Asia in 2010. The workshop in June kicked off the collaborative portion of the three-year project, and focused on bringing together stakeholders from Africa and Asia to take stock of existing drought monitoring and planning in the regions, and how drought planners on the two continents can learn from one another.

A consultant's initial survey of professionals involved in managing Asian and African drought efforts found that although many concerns were similar, respondents felt that the degree drought effects malnutrition and loss of life was more of a concern in Africa. However, despite such differences, workshop participants felt there were many risk reduction activities that could be shared between researchers and practitioners from the two continents, which were elaborated on during a panel session chaired by Knutson.

Besides providing updates on current drought risk activities throughout the region, discussion also focused on options for addressing drought and integrating it into other development platforms such as desertification, natural hazards, and climate change. "While the group spent some time debating whether it's best to have a stand-alone drought plan, or to integrate drought planning into other kinds of planning, there is probably no single right answer," Knutson said. "There are benefits and trade-offs to both approaches. All of these activities should be integrated to some degree. The key is to ensure that drought risk reduction is adequately addressed in the planning activities undertaken."

On the whole, he said, "The workshop was a tremendous networking opportunity to meet and learn from a wide variety of drought researchers and practitioners from across Africa and Asia. It was an instrumental first step in expanding the African network to Asia, and will undoubtedly lead to more collaborative efforts down the road." In addition to annual workshops, it is anticipated that the project will provide a host of other opportunities for continued engagement among the network participants.

For more information, please refer to:

Africa-Asia Drought Risk Management Peer Assistance Project
http://www.undp.org/drylands/aadp.html

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FAO Sponsors Training Workshop on Drought Monitoring in Turkey

Anticipating the effects of a warmer world, decision makers, scientists and other stakeholders from Turkey spent an intensive two days in April learning about state-of-the-art drought monitoring and planning. National Drought Mitigation Center (NDMC) program area leaders led an educational workshop in Ankara, April 27-28, for Turkey's Ministry of Agriculture and Rural Affairs, sponsored by the United Nations Food and Agriculture Organization (FAO).

Mark Svoboda, NDMC Monitoring program area leader, praised Turkey's proactive approach to drought planning. "They've done their homework. I'm optimistic that there will be some follow-on activities," he said. "All the future climate models show the Mediterranean lit up like a Christmas tree. They're concerned about water security and food security. They're talking about it before they're at a crisis point."

Eren Atak, in charge of organizing the workshop for the FAO, discussed future steps, including an MOU with the University of Nebraska-Lincoln, the School of Natural Resources, and the National Drought Mitigation Center.

A Memorandum of Understanding (MOU) is in the works between the FAO, Turkey's Ministry of Agriculture and Rural Affairs and the University of Nebraska-Lincoln, School of Natural Resources, and the NDMC, to allow the drought center to conduct a formal evaluation of Turkey's drought plan.

The 40 or 50 at the workshop were from the Ministry of Agriculture and related ministries.

Svoboda's presentations to the group focused on state-of-the-art drought monitoring and early warning systems, reviewing drought indices and indicators in use around the world, and the need to monitor socio-economic impacts.

Brian Wardlow, Remote Sensing and GIScience program area leader, provided an introduction to how satellite remote sensing can be used to monitor drought, along with data and observations collected at ground level. "They're very interested in remote sensing," Wardlow said. "It plays a role in helping them address data gaps or monitoring gaps."

Many of the attendees sought Wardlow's input on how remote sensing could be best used to further a project to characterize rangeland. They were also interested in how the Vegetation Drought Response Index (VegDRI) could be implemented in Turkey. VegDRI combines satellite-derived data, historic climate data and other variables into a map showing drought's effects on vegetation.

Cody Knutson, Planning and Social Science program area leader, led sessions on best practices in drought risk management and planning. "Their drought plan has all the appropriate components we would expect," Knutson said, namely, monitoring, understanding impacts, and identi-

FAO Sponsors Training Workshop on Drought Monitoring in Turkey, continued

fying actions to reduce risk ahead of time. In fact, the plan contained so many good ideas that Svoboda and Knutson recommended that decision makers prioritize them and add realistic completion dates.

Among the many risk-reduction actions identified in Turkey's drought plan are infrastructure enhancement, such as completing reservoirs, drilling wells and expanding the use of modern pressurized irrigation systems; administrative options such as creating a drought task force with the structure necessary to link monitoring, stakeholders and decision makers; and programs to help farmers implement new practices, such as financial incentives and training.

"A lot of times people are focused on the technical solutions like infrastructure," Knutson said. "We remind them that they need policy and social or community actions, too."

Researchers Help Develop Climate Decision Support Tools

The National Drought Mitigation Center (NDMC) and others at the School of Natural Resources (SNR) at the University of Nebraska-Lincoln are collaborating with a research team led by Purdue University to develop decision-support tools to help corn and soybean growers adapt their practices to a changing climate.

Linda Prokopy, an associate professor of forestry and natural resources, will lead researchers affiliated with the Purdue Climate Change Research Center in the $5 million, five-year project. The research is funded by the Agriculture and Food Research Initiative, part of the U.S. Department of Agriculture's National Institute of Food and Agriculture.

Cody Knutson and Tonya Haigh from the NDMC are part of the social science team that will use surveys and focus groups to learn more about what information farmers and extension educators need, and how they need it presented.

Martha Shulski, director of the High Plains Regional Climate Center at SNR, will work with the group to provide climatological data and devise decision-support tools, based on the findings of the social science research. Tapan Pathak, a climate extension educator at SNR, will help showcase the tools and gather feedback.

Other collaborating institutions are Michigan State University, the University of Illinois, the University of Minnesota, the University of Wisconsin, Iowa State University, the University of Missouri, the University of Michigan and South Dakota State University.

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Hayes Finds China Focused on Drought Monitoring

Mike Hayes, director of the NDMC, reported that he was treated royally during an early June trip to China, reflecting the high value that the Chinese researchers and officials he met place on drought planning.

Hayes took part in a variety of meetings in Beijing at the Department of Water Hazard Research at the China Institute of Water Resources and Hydropower Research, the Academy of Disaster Reduction and Emergency Management at Beijing Normal University, the Chinese Academy of Meteorological Sciences, and the Chinese Academy of Agricultural Sciences.

He was accompanied by Zhenghong Tang, a faculty member in the Community and Regional Planning Department at the University of Nebraska-Lincoln (UNL), and by Steve Hu, a climatologist at UNL's School of Natural Resources. Gene Guan, an SNR faculty member specializing in GIScience, also helped organize one of the meetings, although he could not attend.

Hayes detected a shift in thinking since his last trip to China in 2005. "Before, it felt like they didn't think they needed a composite index like the Drought Monitor," he said. "They were looking for the right indices or indicators. Now they've found that an index is just an index and it doesn't work in all cases, and they find the concept of a drought monitor is extremely valuable."

Hayes received an honorary professorship at Beijing Normal University, and was impressed with a new scholarly journal they are publishing in English, the *International Journal of Disaster Risk Science*. He also returned with a copy of the *Atlas of Disaster Risk in China*, assembled by Beijing Normal University.

Above: Mike Hayes, center, and Zhenghong Tang, to his right, at a workshop held with the Academy of Disaster Reduction and Emergency Management at Beijing Normal University in Beijing.

Left: A graduate student asks Mike Hayes for more details about drought risk management during his seminar at Beijing Normal University.

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Workshop Pulls Drought Planners Together

The National Drought Mitigation Center and the National Integrated Drought Information System's Engaging Preparedness Communities working group held a workshop, "Building a Sustainable Network of Drought Communities," in Chicago, June 8-9, 2011. The primary goal of this workshop was to facilitate the development of a cooperative network of drought and planning practitioners. This workshop brought together 38 participants involved in federal, tribal, state, and local planning efforts and research to share knowledge and lessons learned on topics including integrating local and state planning efforts, incorporating drought into multi-hazard planning, planning under uncertainty, and leveraging resources for risk management. Participants also provided insight for the creation of a virtual community on the U.S. Drought Portal (http://www.drought.gov) for drought and planning professionals. Members of this community will be able to share knowledge through online discussions, collaborate on documents and projects, view archives of past workshops and activities, and find the latest NIDIS updates. For information on how to join this community please contact Deborah Bathke at nidis-epc@unl.edu.

At left, Missy Stults, ICLEI (Local Governments for Sustainability), and Kingste Mo, NOAA, enjoy discussion.

Below and left, Roger Pulwarty, NIDIS program office, participates in discussion, and Deborah Bathke, NDMC climatologist and Engaging Preparedness Communities working group co-chair, responds.

Below, Mark Shafer, Oklahoma Climatological Survey, at left, connects with Jim Schwab, manager of the American Planning Association's Hazards Planning Research Center.