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The RCC Report

NEWSLETTER OF THE NOAA REGIONAL CLIMATE CENTERS

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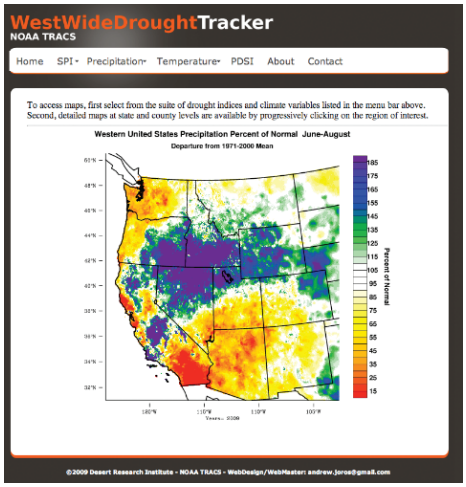
Data Visualization Tool Helps Track Drought in the Western U.S.

A data visualization tool in development at the Western Regional Climate Center (WRCC) is being used to monitor drought conditions in the contiguous western U.S. The WestWide Drought Tracker (WWDT) utilizes an array of data sets to allow scientists, citizens, and decision makers to monitor changing climate conditions in the region.

The WWDT uses temperature and precipitation data from PRISM (Parameter-elevation Regressions on Independent Slopes Model), produced at Oregon State University, as well as data from the Variable Infiltration Capacity (VIC) Macroscale Hydrologic Model, a gridded data set that is used for a multitude of hydrological applications. These data sets will be combined with traditional weather and hydrologic station data to provide the most complete picture of hydroclimate and drought conditions in the region. Drought indices, such as the Palmer Drought Severity Index and the Standardized Precipitation Index, are derived from both the gridded and station data.

This combination of data has not been presented in this style before, providing opportunities for users of the Web site to view climate and hydrology data alongside drought indices. Information can currently be viewed by state or as the entire Western U.S. region. Capabilities will soon be expanded to view data by counties, hydrological units, and climate divisions. Users will also be able to select both color maps and time series of data, with some basic statistics for comparison to historical drought periods. The initial WWDT tool was well received at a recent U.S. Drought Monitor Forum, and will be incorporated into the National Integrated Drought Information System (NIDIS) portal.

The development of the WestWide Drought Tracker is funded through a grant from the National Oceanic and Atmospheric Administration's Transition of Research Applications to Climate Services (TRACS) program.



The opening screen of the WestWide Drought Tracker

RESEARCH

Climate and Health Links Assessed

The Southeast Regional Climate Center (SERCC) is working with public health professionals to identify the range of efforts and information needed to strengthen ties between climate and health studies. Links between climate and health have long been known, but most are poorly understood.

The best known and longest established link involves heat stress, and the National Weather Service now has a warning system in place to alert the public to the dangers associated with heat waves. Concern about climate change is generating interest in the possibility of providing forecasts of future conditions and impacts on human health.

SERCC staff have initiated efforts to work with health professionals to understand the information needs within the health community. This past September the SERCC, in co-operation with the National Climatic Data Center, the Centers for Disease Control, the U.S. Environmental Protection Agency, and the National Institute of Environmental Health Sciences, brought together a group of experts to examine these needs. The result of this workshop was a pilot project to foster communication through joint efforts to use new high spatial resolution databases to enhance understanding of both short- and long-term impacts of heat waves, an area in which communication and understanding are already reasonably strong.

In addition, exploration of the atmospheric information required to help understand influenza outbreaks has begun. The goal is to bridge the gap between laboratory-scale knowledge of the biological and physical processes involved in influenza outbreaks and the statistical links between flu outbreaks and continental-scale atmospheric circulation.

More than 20 health and climate experts attended a workshop in September sponsored by the SERCC.

Martha Shulski Named New HPRCC Director

Dr. Martha Shulski became the new director of the High Plains Regional Climate Center (HPRCC) at the University of Nebraska-Lincoln (UNL) on August 1. In addition, she is an assistant professor of Applied Climate Science in the UNL School of Natural Resources.

Dr. Martha Shulski

She is no stranger to Lincoln, having obtained her M.S. degree in agricultural meteorology from UNL in 1998 and working as a research technician at HPRCC in 1999. She obtained her Ph.D. in soil science and climatology from the University of Minnesota in 2002, and worked for seven years as a service and research climatologist for the Alaska Climate Research Center at the University of Alaska Fairbanks.

While in Fairbanks, she was lead author on a book, "The Climate of Alaska," and taught weather and climate courses in the geography program. Because of her efforts, the Alaska Climate Research Center was recognized by the American Association of State Climatologists as the State Climate Office for the state of Alaska.

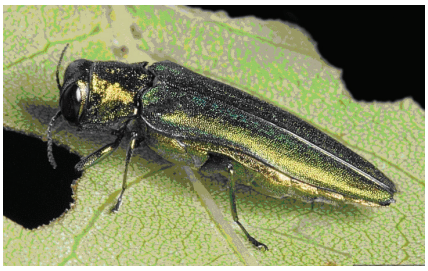
Dr. Ken Hubbard is now the regional research climatologist after serving as director of HPRCC since 1987. Ken's leadership of HPRCC led to the establishment of the Automated Weather Data Network, which now has more than 200 stations throughout the High Plains region. His work on climatological data quality control has produced numerous peer-reviewed publications and has set national standards in this area.

He continues to maintain an active research program, bringing in external funding, advising students, and teaching courses at UNL.

NRCC Aids New York in Monitoring for Emerald Ash Borer

In July, the emerald ash borer (EAB) was reported in western New York. The EAB is a green beetle native to Asia, and is an invasive species that is highly destructive to ash trees once infested. The EAB was discovered in southeastern Michigan near Detroit in the summer of 2002. The damage inflicted by the larval stage of the insect has already killed tens of millions of ash trees, and it's estimated that damages could rival that of earlier chestnut blight and Dutch elm disease outbreaks.

The New York State Department of Environmental Conservation (NYDEC) enlisted the assistance of the Northeast Regional Climate Center (NRCC) to set up a system to provide maps of season-to-date growing degree day (GDD) accumulations based on a high-resolution temperature data set. These maps, at county, state, and regional scales, were used to estimate the development of the EAB to determine the percentage of the population in the area that had emerged, and therefore could be trapped. The maps were e-mailed each day to the NYDEC response team and were used to determine the areas in which to deploy traps and the type of trapping techniques to use.



An adult emerald ash borer

The NYDEC was also interested in monitoring the Upper Peninsula of Michigan, the expected source region for the infestation. The NRCC coordinated with the Midwestern Regional Climate Center, which provided daily GDD maps of the Midwest region. The ash borer has now been found in 11 states and in the province of Ontario, Canada. The infestation has resulted in costs in the tens of millions of

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MRCC Responds to Need for Fall Freeze Information

Late-planted crops due to a cool, wet spring and a cool growing season had corn and soybean producers in the central U.S. speculating the possibility of an early freeze this year. In some areas of the Midwest, the corn crop was four weeks behind schedule in maturity, and the soybean crop was one to two weeks behind at the end of September. An early freeze (or in the case of this year, a normal freeze) would likely result in significant yield losses in corn that was planted around June 1.

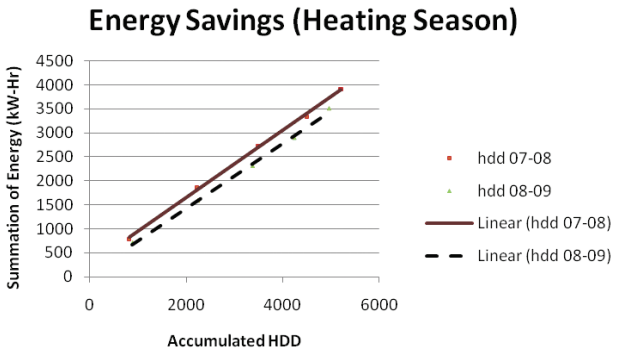
A National Weather Service office requested a product to indicate where a freeze had occurred in the Midwest to determine where freeze advisories and warnings may be needed.

In response to this request, the Midwest Regional Climate Center (MRCC) created a First Fall Freeze map for the Midwest Climate Watch page on the MRCC Web site. This map shows the locations where 32°F and 28°F temperatures have been recorded in the central United States so far in the season. The map is automatically updated each day.

The site has been extremely popular, receiving more than 2,500 views a day the first week of October and more than 2,000 views a day through the first three weeks of the month. The map is also featured on a number of National Weather Service Web sites. It is available on the Midwest Climate Watch page at http://mrcc.isws.illinois.edu.

Use of Degree Days Demonstrates Energy Savings

For years climatologists have provided Cooling Degree Days (CDD) and Heating Degree Days (HDD) to the energy industry and others involved in the delivery or end use of energy. The CDD and HDD are calculated with respect to a reference temperature, usually 65°F. If the average daily outdoor temperature (maximum+minimum)/2) is below 65°F, it is assumed that heat will be needed, and if the temperature is above 65°F, it is assumed that air conditioning will be needed.



This graph shows the difference in energy use between 2007-2008 (solid line) and 2008-2009 (dashed line) compared to the number of heating degree days accumulated.

Of course, different homeowners and businesses will use different practices with respect to setting their thermostats and using appliances. If these practices are more or less constant over time, the relationship of CDD and HDD to energy use can be determined on a home-by-home basis. Even more useful, home energy use before and after implementing certain improvements (e.g., more efficient furnace, additional insulation) can be calculated.

One example of the use of degree days was developed by the High Plains Regional Climate Center for a home in Nebraska. The home had a new furnace and new windows installed in spring of 2008. Energy use during the heating and cooling seasons was obtained from the local utilities company. The corresponding degree days (CDD and HDD) were obtained from the Applied Climate Information System (ACIS).

Energy used for cooling in the summer of 2008 was reduced nearly 12 percent from the summer of 2007. This is based on what would be saved in a normal year, and is independent of whether 2007 or 2008 was the hotter summer. Likewise, the energy savings for heating was determined to be nearly 8 percent per year.

This demonstrates a decrease in energy use, resulting in savings to the homeowner and a reduction in the "energy footprint" of the home.

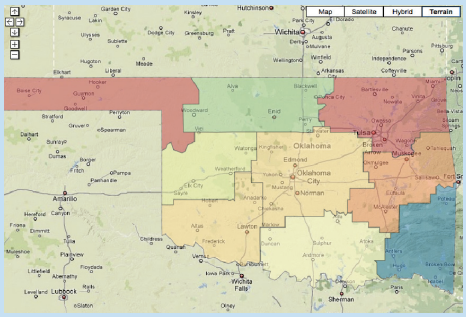
PARTNERSHIPS & COLLABORATIONS

New Drought Evaluation Tool Results from SRCC Partnership

A new tool for drought planning and evaluation in support of Southern Climate Impacts Planning Program (SCIPP) initiatives is being developed by the Southern Regional Climate Center (SRCC), and will soon be ready for pre-evaluation and testing.

This new tool incorporates multiple time-period analyses of daily climate observations to display geographic trends and anomalies of regional precipitation patterns. The product analyzes thousands of individual observation sites to produce hundreds of aggregated climate division precipitation totals, including standard precipitation index values, percentage of normal, and deviation from normal precipitation conditions. Results are tabulated and displayed geographically using a Google Map interface. Users will be able to select a climate division to examine the analysis results for each observation site and examine time series data graphs from these stations.

A unique feature of this product was developed by researchers at the Oklahoma Climate Survey, a SCIPP research partner. It is an analysis that examines previous time periods to derive scores that determine which years are most similar to current conditions. These analogue years are included to trigger local memory of previous conditions to frame impacts of anomalous conditions that may impact water management decisions. This product is intended for use by National Drought Monitor climatologists and private and public managers of systems reliant on water supplies. The product should be available on SRCC and SCIPP Web sites in January 2010, and will be updated daily.



A Google map interface provides climate division aggregations of individual station statistics for various time intervals.

New ACIS Interface Available for State Climatologists

The Northeast Regional Climate Center unveiled the latest in the line of interfaces to the ACIS database at the July 2009 meeting of the American Association of State Climatologists. This interface, called "SC ACIS," is aimed primarily at meeting the data access needs of State Climatologists, but includes a host of new features that will translate to other applications in the future.

SC ACIS provides a number of new methods to identify weather stations to be used in products. Users can select stations by station identifier (e.g., WBAN, COOP, ThreadEx id) or by address or zip code. The nearest weather stations will be displayed on a Google map. Users can also obtain products for all weather stations within a state, county, climate division, NWS County Warning Area, or user-defined latitude/longitude box. In each case, Google maps are employed to assist users in defining their area of interest.

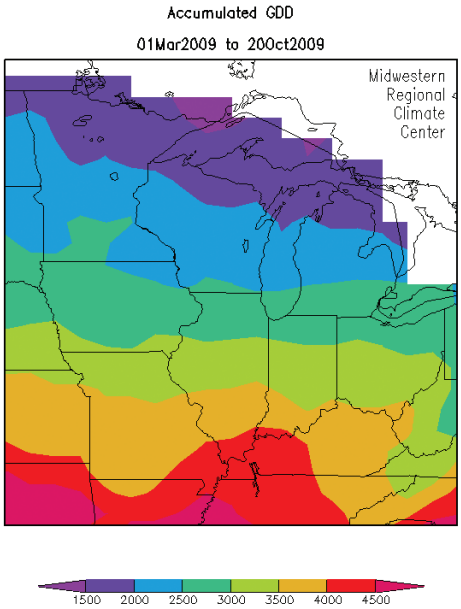
Powered by ACIS
NOAA Regional Climate Centers

The SC ACIS interface is written entirely in JavaScript. Therefore most of the user interaction occurs within the user's browser. When calls are made to the ACIS server, only a minimal amount of encoded data is transferred back and forth, resulting in a noticeable improvement in system responsiveness.

SC ACIS is also the first interface to use the new ACIS Web services calls to query the database. These calls are designed to perform all calculations on the server, resulting in improved response time. The new ACIS Web services should help speed development of future ACIS applications.

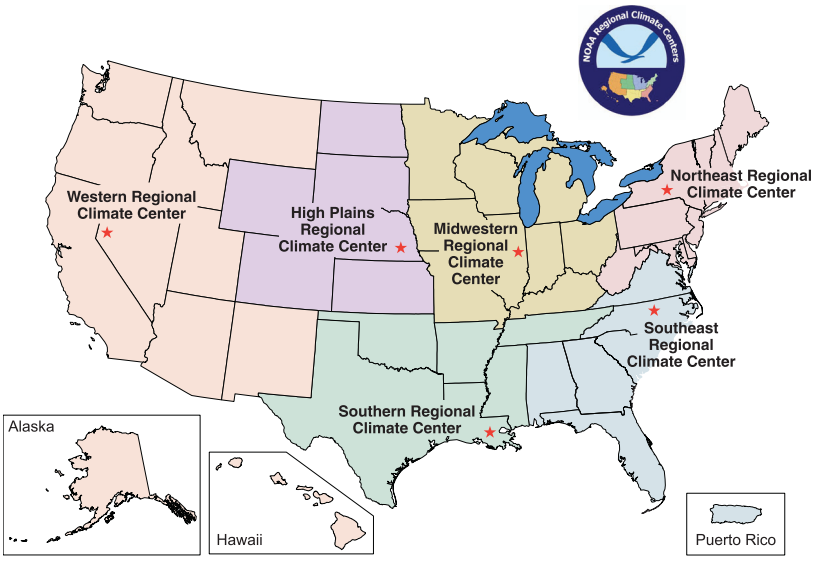
NRCC Aids New York continued from page 2

dollars for municipalities, property owners, nursery operators, and the forest products industry. For more on the EAB problem, visit www.emeraldashborer.info.



This is an example of the degree day map provided by the MRCC to the New York Department of Environmental Conservation.

For more than twenty years NOAA's Regional Climate Center Program has been recognized by Congress as vital to the efficient, coordinated delivery of NOAA climate services from national to local levels. The mission of the six centers is to provide quality data stewardship, improve the use and dissemination of climate data and information for the economic and societal good of the U.S., and conduct applied climate research in support of improved use of climate information.



BY THE NUMBERS

July 1-September 30, 2009

Total Web hits:	13,186,414
Data Requests/contacts:	2,275
Media requests:	102

High Plains RCC University of Nebraska, Lincoln, NE	**(402) 472-6706**
Midwestern RCC University of Illinois, Champaign, IL	**(217) 244-8226**
Northeast RCC Cornell University, Ithaca, NY	**(607) 255-1751**
Southeast RCC University of North Carolina, Chapel Hill, NC	**(919) 843-9721**
Southern RCC Louisiana State University, Baton Rouge, LA	**(225) 578-5021**
Western RCC Desert Research Institute, Reno, NV	**(775) 674-7010**