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United States Department of Agriculture
Natural Resources Conservation Service

National Water & Climate Center

SnowNews

June 2013

Volume 2, Issue 4

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- Estimating rain frequency/intensity
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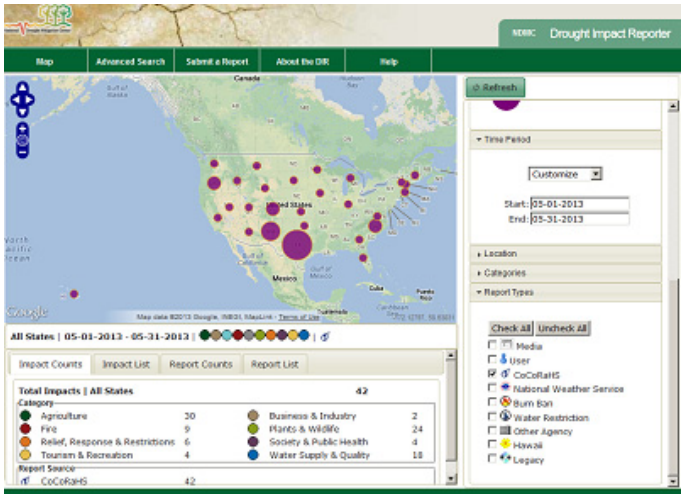
NDMC provides monitoring, impact assessments & planning

Kelly Smith
NDMC **Communications and Planning Specialist**

The National Drought Mitigation Center (NDMC) was established in 1995 at the University of Nebraska-Lincoln to reduce societal vulnerability to drought. Variations in annual precipitation are inevitable, but people may be able to escape some of the worst consequences of drought by planning ahead. Monitoring, impact assessments and planning are all key to reducing vulnerability to drought.

One of the first steps is figuring out how you'll recognize a drought, because it creeps up slowly, one nice day at a time. In 1999, the NDMC and Federal partners (the National Oceanic and Atmospheric Administration and the U.S. Department of Agriculture) launched the U.S. Drought Monitor, a weekly map characterizing drought in the U.S. and Puerto Rico. Each week, U.S. Drought Monitor authors work with a network of local observers across the country to synthesize many drought indicators such as precipitation, temperature, hydrologic conditions and observed impacts into a single map characterizing drought. In addition to providing a focal point for national discussion on drought for media and policymakers, the U.S. Drought Monitor is now one of the main triggers for distributing drought relief funds to agricultural producers.



This view of the Drought Impact Reporter (DIR) shows the distribution of CoCoRaHS reports received in May 2013. Larger circles mean more reports from that state. DIR users can click to drill down into the circles and see what observers said.

A good way to know how to plan for drought is to see how it has affected you in the past. In 2005, the NDMC launched the Drought Impact Reporter, a comprehensive archive of drought impacts, accessible via an online map. In 2011, the NDMC rolled out an updated version of the tool. Impacts come from user reports, and from media and various agency reports entered by NDMC staff. Anyone can submit a user report describing how drought is affecting his or her locale. The NDMC also has an active partnership with the Community Collaborative Rain, Hail and Snow Network (CoCoRaHS) that allows CoCoRaHS volunteers to include drought impact reports with their observations. They have been a particularly active group of citizen scientists.

City dwellers are usually insulated from the worst effects of drought because their water supplies are professionally managed. People in smaller, rural, agriculture-based communities may be more aware of drought's effects, as many individuals' livelihoods are affected, and smaller water supplies that depend on a single well may be more vulnerable to drought.

continued page 2

National Drought Mitigation Center (from page 1)

"Monitoring, impact assessments and planning are all key to reducing vulnerability to drought."

Laurie Abbott, New Mexico State University associate professor of Animal and Range Sciences, talks to Chad McNutt, National Integrated Drought Information System (NIDIS) program officer, at a workshop May 29 in Socorro, New Mexico, to help ranchers manage drought risk. The NDMC worked with the New Mexico Society for Range Management and NIDIS to organize the workshop.

The NDMC emphasizes that people at all decision-making levels, including communities, can and should plan ahead for drought. In 2010 the NDMC and partners released Drought-Ready Communities.

We are now working with the Extension Disaster Education Network to further spread awareness of community-based drought-planning. See http://eden.lsu.edu/Topics/Hazards/Drought/Pages/default.aspx

We are also working with the American Planning Association on a Planning Advisory Service Report to identify and disseminate best practices for integrating drought planning into other widely used planning processes. http://www.planning.org/research/drought/

One group that has been hit particularly hard by recent drought is ranchers, in part because they don't have the same insurance options that producers of row crops have. The NDMC worked with Extension forage specialists and others to produce an extensive, web-based guide for ranchers:

Managing Drought Risk on the Ranch,

The NDMC works closely with NOAA on the National Integrated Drought Information System (NIDIS).

For more information, please visit http://drought.unl.edu. Look for our weekly updates on U.S. Drought Monitor status, our new monthly drought impact summary and our quarterly newsletter, DroughtScape.

What are "snow needles?"

Several of the winning photos in this year's **SSWSF Photo Contest** (see pages 13-17) were by Hydrologist Jeff Anderson, Idaho Data Collection Office. The photos, taken at the Cool Creek SNOTEL site in Idaho's Clearwater Mountains during a helicopter snow survey, featured "snow needles."

According to Jeff, "As we approached, the summit was draped in clouds, and we nearly were not able to land. But, as we circled, the clouds lifted, just enough for us to set down near the site. Snow needles were on practically every surface, including tree branches, sensors, even the smallest string, like strands of lichen."

The conditions overnight and into the morning were perfect to create snow needles, a form of "soft rime" ice. Temperatures had hovered between -3°C and -5°C allowing the fog's liquid water droplets to become super-cooled.

Jeff continued, "A gentle wind must have moved the fog through the forest and SNOTEL site, allowing the water droplets to freeze on contact to the windward side of objects. The needles grew outward from those surfaces, into the wind, as more and more ice crystals were deposited on the windward surface. This explains why the needles were not equally distributed on all side of branches. Many needles were a couple inches or more in length. Beautiful!"

To learn more about snow needles and soft rime ice, here are some references:

http://en.wikipedia.org/wiki/Soft_rime

http://cathybell.org/2013/01/02/hoar-frost-and-rime-ice-whats-the-difference/

http://www.its.caltech.edu/~atomic/snowcrystals/frost/frost.htm

Successful tower climbing and rescue training

The annual **Tower Climbing and Rescue Training** occurred May 21-23 at the Boise Master Station.

This year, eight participants from the Natural Resources Conservation Service (NRCS) learned techniques for properly ascending, descending and working on meteorological and transmit/receive towers.

Tony Tolsdorf, National Water and Climate Center (NWCC), has been an OSHA-certified safety and rescue instructor since 2005. **Rashawn Tama**, NWCC, has assisted Tony for most of those years and was certified in 2011.

The 3-day training consisted of lectures, demonstrations and field exercises. After passing a written examination, participants were able to practice their skills during the field exercises.

The 40-foot receive towers at the Boise Master Station provided an ideal training ground, by allowing ample height for rescuers to descend their awaiting patients.

The simulated rescue was performed at a height of about 20 feet – the same height as most SNOTEL tower installations.

Second training session considered

For those unable to attend this training session, a second class is under consideration, and tentatively scheduled for late June, 2013. Contact Tony Tolsdorf (503-414-3006) if you're interested in learning more about this training.

Rashawn Tama rescues Butch Horner, while training participants observe.

*2013 Tower Climbing and Rescue participants. **Front row:** Tony Tolsdorf, Butch Horner. **Back row:** Amy Burke, Kent Sutcliffe, Melissa Webb, Lucas Zukiewicz, Phil Morrisey, Jordan Clayton, Rashawn Tama, Alexander Rebentisch*

ICI-RAFT estimates rain event frequency/intensity

The U.S. Army Corps of Engineers Institute for Water Resources (IWR) International Center for Integrated Water Resources has developed a software tool named the ***ICI Regional Analysis of Frequency Tool***, or ICI-RAFT.

The tool estimates the frequency and intensity of a rainfall event of a particular duration using rainfall observations on the ground.

ICI-RAFT helps answer questions like:

* What is the probability that the current drought will end in *X* months?
* How long a drought should we prepare for?
* What is the frequency of maximum drought intensity observed?

One problem that can occur when performing this type of analysis is a lack of sufficient rainfall data to make accurate estimates of rainfall intensity at a specific location. This is especially true in arid and semi-arid regions where rain gauge sites are minimal and where the measurements taken at those sites may contain numerous periods of missing data.

ICI-RAFT alleviates this problem using a method where several sites with similar characteristics (e.g., elevation, longitude, latitude) are grouped into a "region." All data from all sites within a particular region, regardless of missing data and varying record lengths, are used to make estimates of rainfall intensity and frequency at a specific location within that region.

Click here to learn more about ICI-RAFT, or to download the software and supporting documentation.

Example of an ICI-RAFT frequency distribution

125th Anniversary:
Geological Society of America annual meeting

The Geological Society of America's 125th annual meeting is scheduled for October 27-30, 2013.

The meeting's theme is "Celebrating Advances in Geoscience," and will be held at the Colorado Convention Center in Denver, Colorado.

If you'd like to submit an abstract for the conference, the deadline is August 6.

The deadline for meeting registration is September 23.

For more information, check out the GSA website.

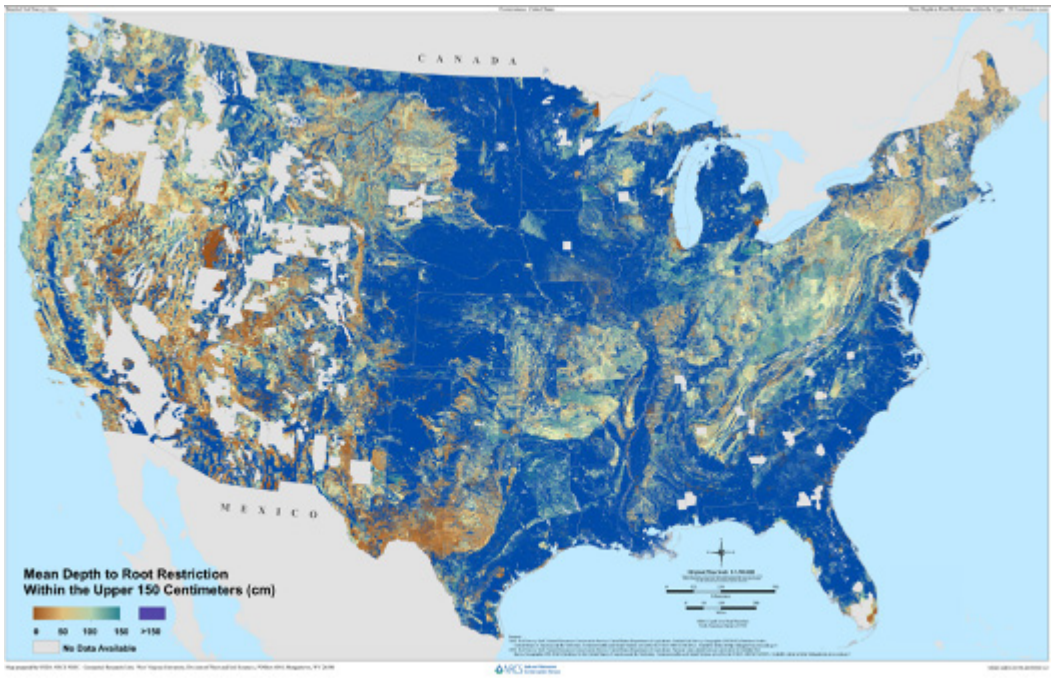
Gridded Soil Survey Geographic map product

The new Gridded Soil Survey Geographic (gSSURGO) product provides access to soils information for large land areas. gSSURGO provides detailed soil survey mapping in raster format with “ready to map” attributes in statewide tiles for desktop GIS.

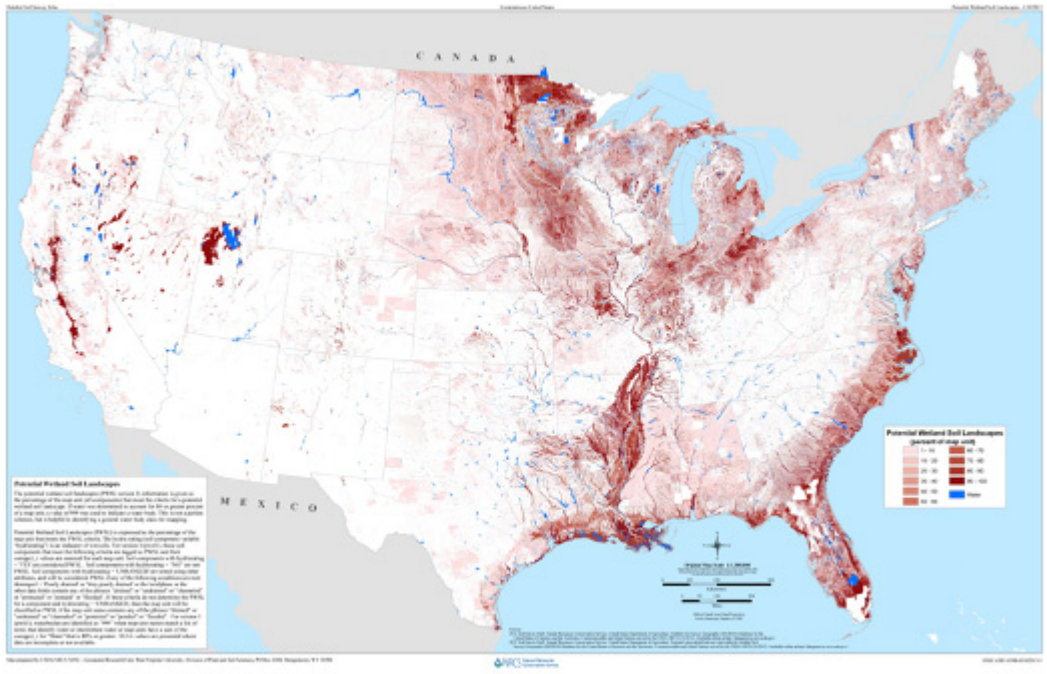
The gSSURGO dataset is for use in national, regional and statewide resource planning and analysis of soils data.

The new soil 10m raster map layer data offers rapid display of soil themes over large land areas and is easy to combine with other raster data sources (land cover, terrain data, climate, etc.).

Ready-to-map attributes include soil organic carbon, available water storage and productivity indices. gSSURGO is a product of the National Cooperative Soil Survey (NCSS) partnership.



gSSURGO map: Root zone depth for commodity crops



gSSURGO map: Potential wetlands soil landscapes

81st Western Snow Conference held in Jackson, WY

Jolyne Lea
NWCC Hydrologist

Several members of the Snow Survey and Water Supply Forecasting (SSWSF) Program attended the Western Snow Conference, held the week of April 15 in Jackson, Wyoming.

First held in 1932, the conference is an annual meeting of snow scientists from the western U.S. and Canada. It is an international forum for individuals and organizations to share scientific research on snow, water supply forecasting and snowmelt runoff processes to advance snow and hydrological sciences.

This year's conference theme was "Wild Weather in the Wild West," and focused on new research and technology in multi-year climate forecasts, snow data and modeling, changes in snowmelt runoff and the effect of changing snow regimes on wildlife.

"First held in 1932, the conference is an annual meeting of snow scientists from the western U.S. and Canada."

NRCS personnel in attendance included Mike Strobel (NWCC), Jan Curtis (NWCC), Jolyne Lea (NWCC), Scott Pattee (WA), Ron Abramovich (ID), Randy Julander (UT) and Lee Hackleman (WY). NRCS snow survey retirees included Phil Farnes (MT) and Peter Palmer (ID).

Grizzly bear mother and three 1-year old cubs foraging for food in the snow, Jackson, WY

The week started off with a short course titled "New Strategies and Techniques in Long Range Weather and Streamflow Forecasting." This session had a panel of experts, including **Ron Abramovich**, who gave the background information on how most agencies, utilities and irrigators use long-range forecasts for hydropower planning, reservoir operation and agricultural decisions.

Ron shared information on when these decisions need to be made, and what weather and hydrologic tools have been recently developed to provide more accurate forecasts of future weather and water supply.

Panel members included **Howard Neibling**, Extension Water Management Engineer (University of Idaho); **Jeremy Giovando**, Hydraulic Engineer (USACE, Walla Walla, WA); **Mel Kundel**, Hydrometeorologist (Idaho Power), **Klaus Wolter**, Meteorologist (University of Colorado-CIRES Climate Diagnostics Center NOAA-ESRL Physical Science Division), and **Jan Curtis**, Meteorologist (NRCS National Water and Climate Center).

The panel provided the latest information and tools on long range weather and water forecasting, water and irrigation decision-making timelines and critical needs.

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Jackson Lake, Wyoming, provides irrigation water for farmers in the Snake River Basin.

Western Snow Conference (from page 6)

Iconic barn view of the Grand Tetons, Wyoming

The last day of the conference was a "Wildlife and Snow Hydrology" technical tour. The tour provided detailed information on the effect of snow on wildlife lifecycles and movement in the Teton and Yellowstone National Parks. Wildlife seen on this tour included antelope, elk, moose, bighorn sheep, bison, coyote, swans, pelicans and a grizzly bear with three cubs.

Participants also stopped at Jackson Lake Dam to discuss the history and importance of the lake to supply water and power to the upper Snake River area.

The 2014 Western Snow Conference will be held in Durango, Colorado. Contact Randy Julander for more information.

The lunch speaker was **Tony Willardson**, Executive Director (Western States Water Council). Tony discussed the support role his organization plays as a liaison to Federal agencies and their support of agency water management by projects and tools such as WADE (Water Agency Data Exchange) and providing strong political support to identify threats to water in the West.

The technical program kicked off with a welcoming address from Wyoming State Conservationist, **Astrid Martinez,** followed by the keynote address by **Astor Boozer,** West Regional Conservationist.

Oral papers were broken into Current and Future Snow, Modeling Snow-Water Equivalent (SWE), Airborne Observations, Observations of Snow, Modeling Snow and Melt and the Environment. Oral papers were recorded and will be available on the WSC website soon.

The poster session presented a variety of snow-related research. We were especially pleased to welcome many students to the conference.

Bison foraging in the valley near the Grand Tetons, Jackson, Wyoming

WestWide Drought Tracker

The Western U.S. consists of complex terrain, where precipitation and temperature can vary dramatically across short distances. This, in turn, can impact local drought conditions.

The Western Region Climate Center's WestWide Drought Tracker (WWDT) is a tool that provides access to fine-scale drought monitoring and climate products. The climate data sets, drought indices, and maps on WWDT use monthly data which are updated with new values at the beginning of each month.

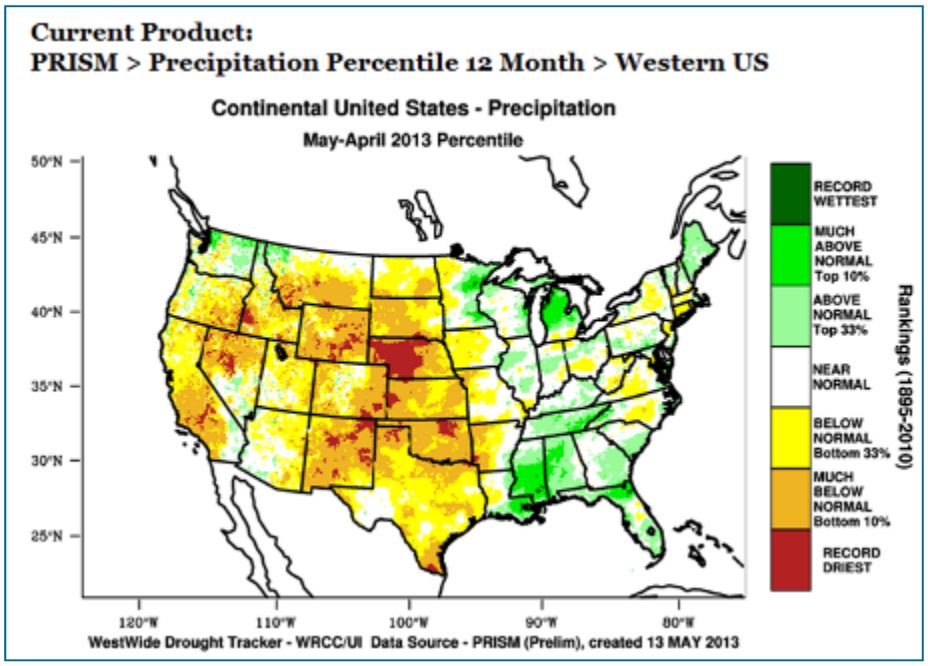
Data sources include the Parameter-elevation Regressions on Independent Slopes Model (PRISM) Climate Mapping System and the North American Land Data Assimilation System Phase 2 (NALDAS-2).

Drought indices used include the Palmer Drought Indices, the Standardized Precipitation Index and the Standardized Precipitation Evapotranspiration Index.

For days 1-10 of each month NLDAS-2 data are used to provide an initial view of the spatial patterns before the PRISM data are available.

The 1/8th degree (approximately 12 km) NALDAS-2 temperature and precipitation data are bilinearly interpolated to the PRISM grid and bias corrected by accounting for monthly differences in climatology of NLDAS and PRISM over a common time period from 1979-2011.

The PRISM data are then assimilated back into WWDT once it is made available (after day 10 of each month).



PRISM precipitation percentile rankings for the 12 month period

Upcoming events

Events of interest in the coming months.

What: Geological Society of America 2013 Annual Meeting

When: October 27-30, 2013

Where: Colorado Convention Center; Denver

How: Meeting Information

What: American Geophysical Union Science Policy Conference

When: June 24-26, 2013

Where: Washington, DC

How: Meeting information

What: American Meteorological Society 15th Conference on Mesoscale Processes

When: August 6-9, 2013

Where: Portland, OR

How: Meeting information

What: American Geophysical Union 46th Fall Meeting

When: December 9-13, 2013

Where: San Francisco, CA

How: Meeting information

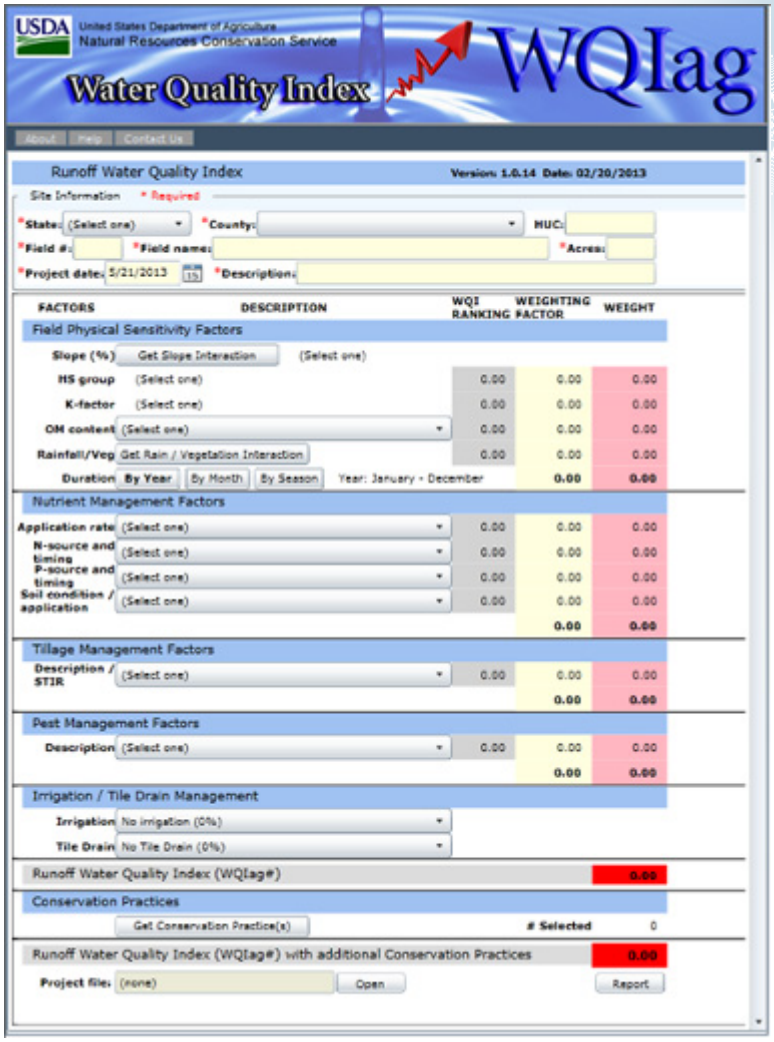
Water Quality Index for Agricultural Runoff released

Scientists from the NRCS National Water Quality and Quantity team recently introduced a web-based tool that helps producers easily understand the quality of water flowing off their fields – the **Water Quality Index for Agricultural Runoff** (WQIag).

On the WQIag website, producers provide information about their field, such as slope, soil characteristics, nutrient and pest management, tillage practices and conservation practices. WQIag calculates these variables into a single rating on a 10-point scale: 0 being very poor; 10 being excellent.

Though some variables – such as slope and soil type – won't change, producers can adjust other factors for a quick estimate of how conservation impacts water quality. A few clicks calculate the value of less tillage, less fertilizer and other conservation practices, making it versatile to use.

Here's a recent press release with more information about WQIag. The web-based tool is available here.



Water Quality Index for Agricultural Runoff web page

More stress management tips

Sequestration...
Continuing Resolutions...
Travel Restrictions...
Cutbacks...

The reality of today's budget situation can be stressful for some. Here are a few stress management ideas that may help you weather this storm.

Straighten Up
When people are under stress, they slump over as if they have the weight of the world on their shoulders. Slumping restricts breathing and reduces blood and oxygen flow to the brain, adding to muscle tension and magnifying feelings of panic and helplessness. Straightening your spine has just the opposite effect. It promotes circulation, increases oxygen levels in your blood and helps lessen muscle tension, all of which promote relaxation.

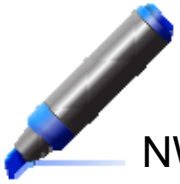
Do Some Math
Using a scale of one to 10, with one being the equivalent of a minor hassle and 10 being a true catastrophe, assign a number to whatever it is that's making you feel anxious. You'll find that most problems we encounter rate somewhere in the two to five range—in other words, they're really not such a big deal.

From: ***Reader's Digest*** 37 Stress Management Tips.

Resource Locator

Here's a handy reference for finding resources in the Snow Survey and Water Supply Forecasting Program.

Where	What	Who How
Alaska	Forecast Hydrologist	Jolyne Lea 503-414-3040 jolyne.lea@por.usda.gov
	Data Collection Office Supervisor (acting)	
		Daniel Fisher 907-271-2424 daniel.fisher@ak.usda.gov
Arizona	Forecast Hydrologist	Gus Goodbody 503-414-3033 angus.goodbody@por.usda.gov
	Water Supply Specialist	Dino De Simone 602-280-8786 dino.desimone@az.usda.gov
California	Forecast Hydrologist	Jolyne Lea 503-414-3040 jolyne.lea@por.usda.gov
	Water Supply Specialist	Greg Norris 530-792-5609 greg.norris@ca.usda.gov
Colorado	Forecast Hydrologist	Cara McCarthy 503-414-3088 cara.s.mccarthy@por.usda.gov
	Data Collection Office Supervisor (acting)	
		BJ Shoup 720-544-2850 william.shoup@co.usda.gov
Idaho	Data Collection Officer	Phil Morrisey 208-685-6983 phil.morrisey@id.usda.gov
	Forecast Hydrologist	Rashawn Tama 503-414-3010 rashawn.tama@por.usda.gov
	Water Supply Specialist	Ron Abramovich 208-378-5741 ron.abramovich@id.usda.gov
Montana	Data Collection Office Supervisor	Scott Oviatt 406-587-6844 scott.oviatt@mt.usda.gov
	Forecast Hydrologist	Cara McCarthy 503-414-3088 cara.s.mccarthy@por.usda.gov
	Water Supply Specialist	Brian Domonkos 406-587-6991 brian.domonkos@mt.usda.gov
Nevada	Forecast Hydrologist	Jolyne Lea 503-414-3040 jolyne.lea@por.usda.gov
	Water Supply Specialist	Dan Greenlee 775-857-8500 dan.greenlee@nv.usda.gov
New Mexico	Forecast Hydrologist	Gus Goodbody 503-414-3033 angus.goodbody@por.usda.gov
	Water Supply Specialist	Wayne Sleep 505-761-4431 wayne.sleep@nm.usda.gov
Oregon	Forecast Hydrologist	Rashawn Tama 503-414-3010 rashawn.tama@por.usda.gov
	Data Collection Officer Supervisor (acting)	Thor Thorson 503-414-3003 thor.thorson@or.usda.gov
Utah	Forecast Hydrologist	Gus Goodbody 503-414-3033 angus.goodbody@por.usda.gov
	Snow Survey Supervisor	Randy Julander 801-524-5213 randy.julander@ut.usda.gov
Washington	Forecast Hydrologist	Rashawn Tama 503-414-3010 rashawn.tama@por.usda.gov
	Water Supply Specialist	Scott Pattee 360-428-7684 scott.pattee@wa.usda.gov
Wyoming	Forecast Hydrologist	Cara McCarthy 503-414-3088 cara.s.mccarthy@por.usda.gov
	Water Supply Specialist	Lee Hackleman 307-233-6744 lee.hackleman@wy.usda.gov
All States	Center Director/Program Manager	Mike Strobel 503-414-3055 michael.strobel@por.usda.gov
	Database Manager	Del Gist 503-414-3007 del.gist@por.usda.gov
	Database Manager	Maggie Dunklee 503-414-3049 maggie.dunklee@por.usda.gov
	Information Systems Team Lead	Laurel Grimsted 503-414-3053 l aurel.grimsted@por.usda.gov
	Meteorologist	Jan Curtis 503-414-3017 jan.curtis@por.usda.gov
	Modeling Hydrologist	David Garen 503-414-3021 david.garen@por.usda.gov
	Operations Specialist (SNOTEL/SCAN)	Rose Loehr 503-414-3042 rose.loehr@por.usda.gov
	Resource Conservationist	Jim Marron 503-414-3047 jim.marron@por.usda.gov
	Statistical Assistant/SCAN QC	Denice Schilling 406-727-7580 denice.schilling@mt.usda.gov
	Water & Climate Monitoring Team Lead (acting)	Tony Tolsdorf 503-414-3006 tony.tolsdorf@por.usda.gov
	Water & Climate Services Team Lead	Tom Perkins 503-414-3059 tom.perkins@por.usda.gov

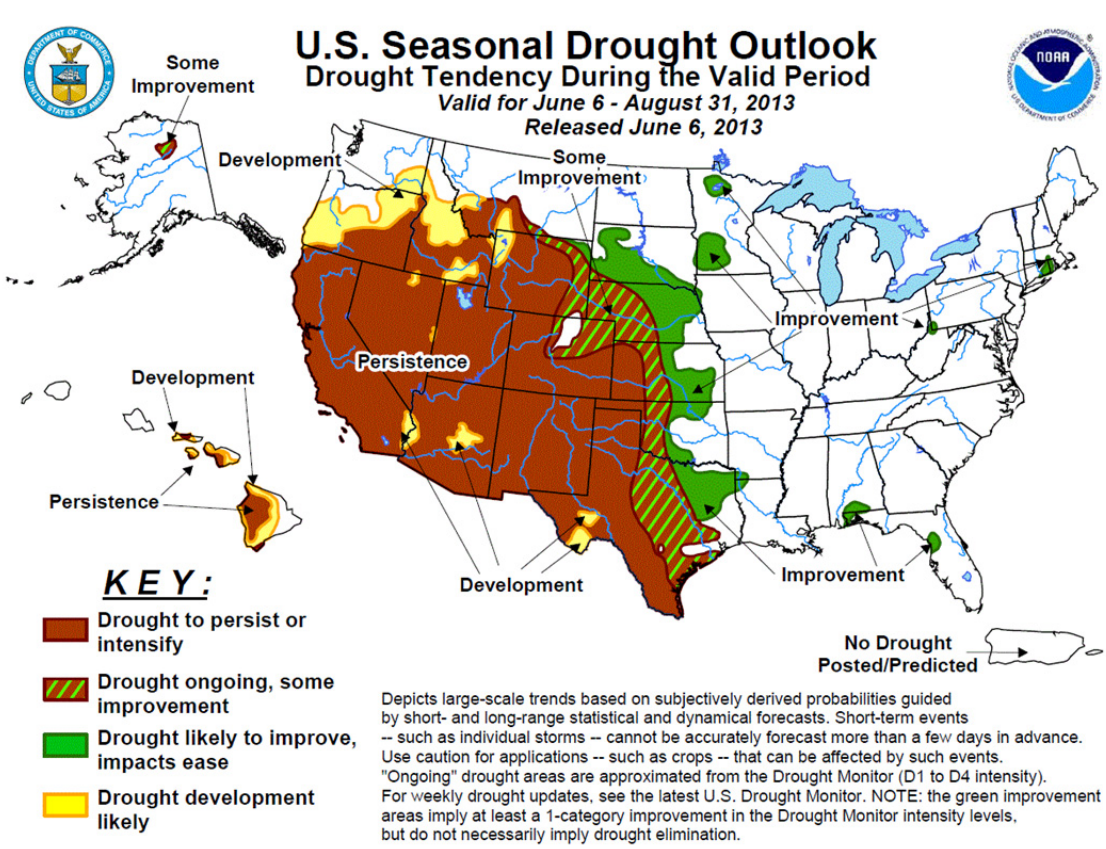


NWCC highlights

Team Vistronix contractor **Travis Hoffman** joined the NWCC in May. Travis is a software developer, concentrating on new products. A recent transplant from Arizona, Travis is enjoying the Northwest experience.

Curt Charles and **Dipesh Patel**, Team Vistronix, recently participated in an "Innovation Spike" sponsored by Vistronix. According to Robert Hoch, Vistronix Program Manager, an Innovation Spike is "a small, experimental solution to explore / investigate solving difficult problems with benefits for NRCS and supports the NRCS CIO IT Strategic Plan."

Curt and Dipesh proposed the development of two mobile applications. One application would support SSWSF Program field data collection activities, the second application would allow the Report Generator application to run on a mobile device. Their idea placed second in the competition.



Products and resources on the web

Federal Support Toolbox

The U.S. Army Corps of Engineers recently introduced an online water data resource called the **Federal Support Toolbox**.

The Federal Support Toolbox is a dynamic, evolving and comprehensive "one-stop-shop" water resource data portal with direct links to databases, innovative programs and initiatives, and state-of-the-art models and tools.

The website also serves as a leading-edge resource for sharing ideas on water-related issues, best management practices, and collaborations and partnerships within the water resources community.

As a centralized data portal, the Federal Support Toolbox (available at www.watertoolbox.us) allows Federal agencies, states, interstate organizations, Tribes, non-governmental agencies and international entities to access and share water resource information for their planning and management.

For additional information on the Federal Support Toolbox, contact Ada Benavides at Ada.benavides@usace.army.mil.

Online converters and calculators

Here's an interesting web resource. This site features a variety of online math and science calculators and converters. No more searching for that fraction-to-decimal converter or velocity calculation. Bookmark this site and you're done.

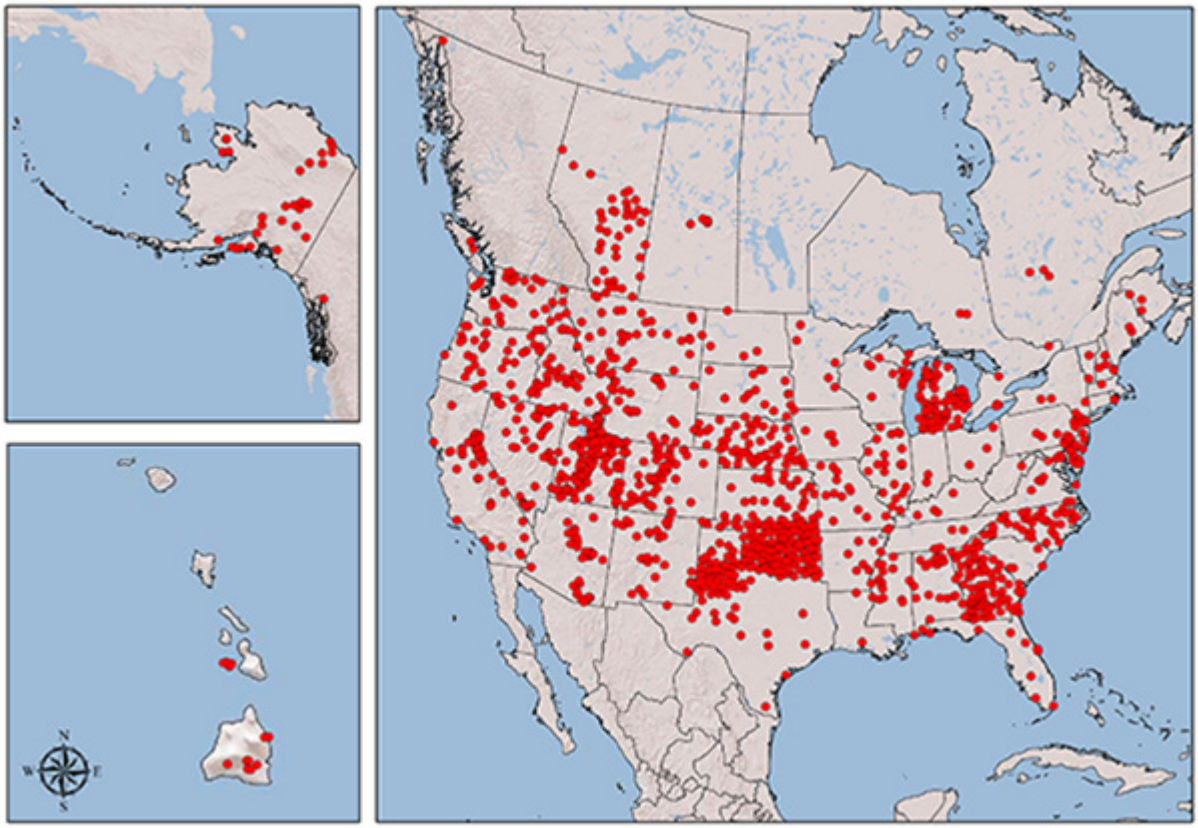
North American Soil Moisture Database

The North American Soil Moisture Database (NASMD), developed by the Texas A&M University Department of Geography's Climate Science Lab, is a quality-controlled soil moisture dataset.

The dataset aids in investigating land-atmosphere interactions, validating accuracy of soil moisture simulations in global land surface models, and describing how soil moisture influences climate.

The NASMD provides soil moisture data and metadata, free of charge, to anyone needing historical, accurate in-situ soil moisture observations over the United States, Canada and Mexico.

The data available cover a wide range of soil texture, land cover, elevation and climate regimes.



NWCC Director presents at drought conference

Improving Drought Prediction at Seasonal to Inter-Annual Timescales - San Diego, CA April 29 - May 1, 2013

Mike Strobel gave a talk on "Soil Moisture Monitoring Needs" at this 3-day conference. The presentation covered different Federal, state and local in-situ networks, aerial/satellite coverages, and models that simulate spatial soil moisture conditions. One critical point of the presentation, which was followed by extensive discussion by a workgroup consisting of representatives from various agencies and private organizations, was the need for a universal in-situ network of soil moisture/temperature monitoring that follows set standards for sensor types, measurement depths and data format. It was felt that the network could be made up of numerous local mesonets, that could be funded and maintained by their respective agency or organization, but which complied to a set of minimum standards and sensors. Because NRCS already serves data for a national network, it could be the clearinghouse for this network. Much more needs to be discussed and decided in regards to a national network, but this is a good first step and hopefully the ball is rolling to make this a reality down the road.

2013 Photo Contest Winners!

Click here to view the winning photos at full resolution

Category: Equipment

1st Place:
Jeff Anderson

Snow needles on depth sensor. Clearwater Basin, Idaho. February 2013

2nd Place:
Daniel Fisher

Moraine SNOTEL site above Eklutna Reservoir, Alaska. October 2012

3rd Place:
Bob Nault

Campbell weather station, High Atlas Mountains, Morocco

2013 Photo Contest Winners

Category:
Field Work

1st Place:
Tom Perkins

Julie Koeberle and Melissa Webb measure snow water content at the Mt. Hood Test SNOTEL site in Oregon. April 2013

2nd Place (tie): Julie Koeberle

Melissa Webb carefully removes a soil plug from the snow tube. Tom Perkins assists. Mt. Hood, Oregon. April 2013

2nd Place (tie):
Daniel Fisher

Brant Dallas calculates numbers at the Sheep Creek snow course in Alaska. February 2013

Click here to view the winning photos at full resolution

2013 Photo Contest Winners

Category: People

1st Place:
Jeff Anderson

Phil Morrisey at the Cool Creek SNOTEL site in Idaho's Clearwater Mountains. February 2013

2nd Place:
Randy Julander

Troy Brosten, Jordan Clayton and Amy Burke at Black Forks Commissary, a ghost town in northern Utah. January 2013.

Click here to view the winning photos at full resolution

3rd Place:
Tom Perkins

Melissa Webb is encouraged by Julie Koeberle. Mt. Hood Test SNOTEL site. April 2013

2013 Photo Contest Winners

Click here to view the winning photos at full resolution

Category: Scenery

1st Place: Daniel Fisher

Historic church at the Yukon-Charlie NPS headquarters at Eagle, Alaska. In May 2009 the Yukon River breakup came up to the church steps and destroyed a nearby SNOTEL site. April 2012

2nd Place: Randy Julander

Wasatch Plateau looking over Philadelphia Flats to Haystack Mountain with Mt Nebo in the far background. March 2013.

3rd Place: Jeff Anderson

Snow needles at the Cool Creek SNOTEL site, Idaho. February 2013

2013 Photo Contest Winners

Category:
Transportation

1st Place: Daniel Fisher

Hydro-tech Dan Kenney heads back to a Cessna 206 after measuring the Congahbuna Lake, snow course in Alaska. February 2013

Click here to view the winning photos at full resolution

2nd Place: Daniel Fisher

Tolsona snow course measurements on 2/26/2013: 18" depth, 2.8" SWE. NRCS Civil Engineering Tech, Brant Dallas measuring the Tolsona snow course. February 2013

3rd Place: Mike Strobel

Chad Gipson at the USFS Fox Park Patrol Cabin in Bridger-Teton National Forest on the border with Yellowstone National Park. En route to Two Ocean Plateau SNOTEL site. September 2012

National Water & Climate Center
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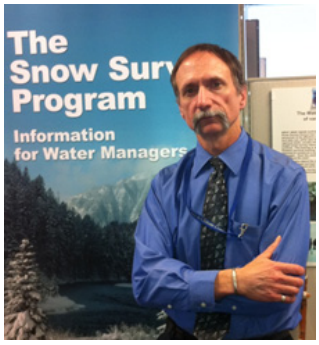
From the Director's desk



In changing times, adaptation is key.

Times are changing. That could be said both about the climate and about Federal budgets. From a climate perspective, we've seen warming conditions, loss of sea ice, increases in atmospheric CO_2, and many other changes. One can't deny the data (I guess one could, but from that perspective, denying that you have an illness doesn't make it go away).

What we do about change is a two-fold issue. There is mitigation, which requires changing how we live and requires political and personal determination. This is not an easy hurdle to get over.

The other is adaptation to live in a changing world. This requires evolution in our thinking, habits and expectations. Changes in temperatures, precipitation, storms and timing of snowmelt may require adapting our agriculture, where we live, and the activities we pursue. However, the ability to adapt is why we have persisted through ice ages and droughts. Humans are especially skilled at adapting to changing environments.

It's a similar scenario for our current Federal budget. There are things we can control and things that we just need to deal with the cards we're dealt. I am hopeful that there will be mitigation in the budget outlook soon. It is my job to vocalize our program concerns and needs to our leadership in D.C. But we, as a staff, also need to adapt. It is wrong to say that that we just can't work with smaller budgets and less staff. I'm confident that we can, if we adapt. We need to focus on what we can accomplish, with the understanding that we won't be able to do everything we did in the past.

This evolution in our thinking and our planning is critical. The question about the budget is, "Is this a temporary situation, or is it a true shift in the climate?" If this is short-term, then we try to keep things running until relief comes. If this is a true paradigm shift, then we must change with it. That is the most difficult aspect to forecast, but time will tell.

Last week, I was running in some marathons back east. One of the runners had only one leg, ending at about his knee. He had a running prosthetic made of metal. I talked with him many times during the week. Never did he tell me how fast he used to be or how difficult it is to run with a prosthetic. Funny, but his leg never came up at all. Yet he ran 5 marathons in 5 days. He had moved on and evolved with this new reality of his life. He accepted and adapted.

Like him, we have a lot of change to handle. Some will want to give up and drop out. The strong will find a way and succeed. Our program will move forward and we will continue to accomplish great things, just not everything we do now. Let's keep on running

Mike