

SnowNews

September 2011

Volume 1, Issue 1

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SCAN station frequency conversions complete

Garry Schaefer
garry.schaefer@por.usda.gov

For many years, SCAN (Soil Climate Analysis Network) stations shared their radio frequency with the U.S. Coast Guard and Office of Homeland Security. Recently, however, Homeland Security advised NRCS that this shared frequency might be needed for national security use.

SCAN stations in the central and eastern U.S. have traditionally relied on Meteor Communications Company (MCC) to provide meteor burst coverage in these areas. When NRCS purchased the meteor burst assets from MCC in late 2009, the agency was given the responsibility to change its SCAN stations from the shared frequency to a unique, NRCS-assigned frequency.

SCAN consists of 183 stations nationwide. Out of this network, 90 sites required installation of new antennas and radios.

Equipment was transported to almost 30 states.

In addition, the three MCC-operated Master Stations, which are the central data receiving sites, were retrofitted with new computers, antennas, amplifiers, transmitters, servers and other hardware. Telephone lines at the three Master Stations were replaced with the new UTN (Universal Telecommunications Network) hardware.



John Weeks and Tony Tolsdorf upgrading a SCAN Master Station in Tipton, Missouri. Some days went better than others.

The effort took nearly six months and lots of travel by members of the NWCC Water Climate Monitoring team. Now the conversion is complete and all SCAN stations are operating at the new frequency. More on SCAN is at www.wcc.nrcs.usda.gov/scan

WCIS databases consolidated, failover capability enhanced

NWCC WCIS (Water and Climate Information System) is in the process of converting multiple, legacy databases to a single, relational database. The result is less ongoing maintenance, increased ease of management and enhanced data integrity.

NWCC Information Systems recently completed a project to move all its Master Stations

from a frame relay wide area network (WAN) to the Universal Telecommunications Network (UTN). UTN offers more reliability, flexibility, and perhaps most importantly, a failover capability in the event communication is disrupted at the Master Station.

On August 11, the Mt. Gilead, Ohio Master Station went online, marking the complete

transition of Master Stations to the new telecommunications backbone.

Rose Loehr and Maggie Dunklee (NWCC Information Systems) were instrumental to the success of the project.

To find out more about the database consolidation and transition to UTN, contact Laurel Grimsted, laurel.grimsted@por.usda.gov

Special points of interest:

- 2011 water year a record for precipitation and temperature
- NWCC partners with PRISM Climate Group for nearly two decades
- 30-year normal data now available for period 1981–2010.
- Basin Analysis (BAGIS) program identifies new SNOTEL sites
- Ogden Master Station decommissioned



Preliminary 2011 water supply forecast verification

Tom Perkins
tom.perkins@por.usda.gov

The 2011 water year will long be remembered by water managers all over the West. Most of the West received extensive runoff from abundant precipitation...primarily in the form of snow. However, a small portion of the West experienced severe drought conditions.

Some of the highest runoff on record occurred in California, the Oregon/Washington Cascades, eastern Oregon, Nevada, Utah, Montana, Wyoming and northwest Colorado.

Both Lake Powell and Lake Mead on the Colorado River recovered from many years of drought-like

conditions. A record runoff on the North Platte River strained the capacity of system reservoirs. There was so much runoff in the Missouri River that millions of acres of land were inundated and reservoir flood control space is still being evacuated.

On the flip side, people in Arizona, southern Colorado

and New Mexico experienced no relief from a long-term drought. These parched areas are seeing their crops wither and livestock sold off from lack of water that is so abundant to the north.

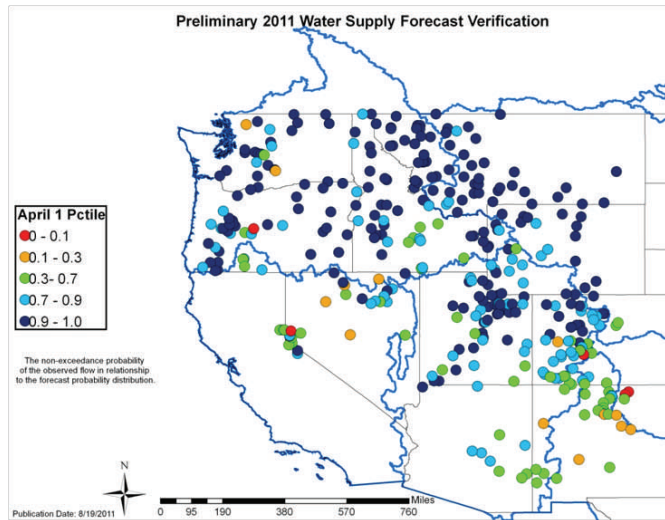
The map shows an example of the performance of the forecasts during this amazing year. Basically, forecasts

within normal statistical range are depicted by the orange, green and light blue circles. Forecasts that were too high are depicted by the red circles. Forecasts that were too low are depicted by the dark blue circles.

Almost every forecast point in the northern tier of the West, plus Utah and northern Colorado were under forecast by water supply hydrologists.

Continued on page 4...

“There was so much runoff in the Missouri River that millions of acres of land were inundated and reservoir flood control space is still being evacuated.”



April 1 water supply forecast performance. Orange, green and light blue are within normal range. Red means forecast was too high; dark blue means forecast was too low.

Montana DCOs train in Portland

Jolyne Lea
Jolyne.lea@por.usda.gov

Brian Domonkos and **Lucas Zukiewicz** from the Montana DCO (Data Collection Office) were at NWCC/Portland for training on hydrologist duties from August 23 to September 1.

The training focused on learning and developing statistical equa-

tions in the Viper tool, but also covered water supply forecast operations, databases, climate tools, hydrologic models, data products, and tools used and produced here at the center.



The pair was enthusiastic to participate in current projects happening here, such as the 30-Year Normals

testing and water year 2012 preparations.

Most of the center employees participated in some way with their training, and Brian and Lucas came away with an appreciation of the variety of work we do.

They also had a chance to enjoy some of the international restaurants and attractions in the Portland area.



Spotlight On... Chris Pacheco

What's on Chris Pacheco's mind these days? Lowering his handicap. But, more on that later.

Chris grew up in Las Vegas, New Mexico. While at New Mexico State University, he held several part-time jobs as a student trainee with the Soil Conservation Service in California. He worked throughout the state, gaining a broad range of experience in orchards, agricultural and rangeland settings.



Chris, with nephew, Max, and niece, Bella.

After graduating with a BS degree in Wildlife Science, Chris accepted his first position with NRCS. He left Las Cruces for an assignment at the Winnemucca, Nevada Service Center. As part of his duties, he did snowpack measurements and maintenance on seven snow courses, and maintained five SNOTEL sites.

In 1986, a job as Water Supply Specialist opened in Reno and Chris was named to the position. After about three years, another transfer opportunity presented itself. This time, Chris transferred to the West National Technical Center in Portland to concentrate on developing water-supply related products for the agency. He spent 15

years in Portland, before moving to Denver to assume the position of Assistant Snow Survey Supervisor with the Colorado Snow Survey group. In total, Chris' length of service to the agency is more than 33 years!

As noted, Chris has served in many roles within NRCS. When asked what he'll miss when he retires, he quickly responds, "The people. They're a really good group of people." On the other side of the coin, Chris said, "I won't miss the 4 x 4 x 4 concrete boxes (for the SNOTEL towers) or the bureaucracy."

Chris also had some advice to share. "Don't settle for the status quo. Pushing the envelope is the only way you'll make progress as a program."

Now, back to his handicap. After retiring, Chris plans to return to Las Vegas (the one in New Mexico) and work on his golf game. Maybe we'll see him on the Senior's Tour one day!



"Don't settle for the status quo. Pushing the envelope is the only way you'll make progress as a program."

NEH 622 gets long-awaited update

Tony Tolsdorf
tony.tolsdorf@por.usda.gov

Trivia question: What year was the movie *The Godfather* released?

[Answer on page 8](#)

It was the same year the *National Engineering Handbook (NEH)*, Section 22, *Snow Survey and Water Supply Forecasting* was last updated.

Since then, the NRCS directives system has been revamped and what was Section

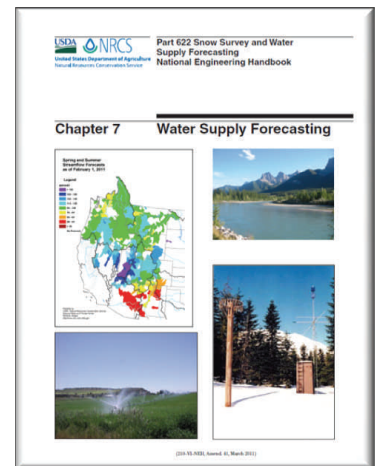
22 is now referred to as NEH Part 622.

Now, thanks to the efforts of folks across many agencies, the handbook is nearing its final review stage. This is an ongoing project that encompasses nearly 400 pages of material and, in the end, will take about two years to complete. It includes chapters on site selection, installation, maintenance, data management, water supply forecast-

ing, and standards and specifications.

Claudia Hoefft, national hydraulic engineer, is overseeing completion of the update. NWCC personnel, including **Dave Garen**, **Laurel Grimsted**, **Jim Marron** and many others, contributed to the project.

For more information, contact Tony Tolsdorf
tony.tolsdorf@por.usda.gov,
or Claudia Hoefft
claudia.hoefft@wdc.usda.gov.



A chapter from the soon-to-be-released NEH, Part 622



Forecast verification (continued from page 2)

Does this mean that the forecaster's models were "bad"? No, it means that the models were not equipped to handle the 2011 climate variability.

The maps below show the May 2011 precipitation and temperature anomalies. These

graphics, although only representing one month, show the high climate variability associated with the 2011 water year runoff.

Precipitation was heavy in California, northern Cascades, eastern Oregon, Utah, Montana, and portions of Colorado and Wyoming. Precipitation was very low over Arizona, New Mexico and southern Colorado.

Temperatures were below normal over much of the West, especially in the Missouri Basin. Conversely, warmer-than-normal temperatures in southern Colorado and New Mexico heightened the drought-like conditions.

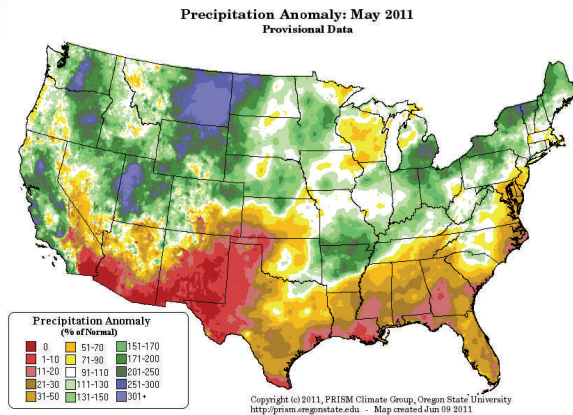
After the April 1 forecasts were prepared and disseminated to the Western water users, the weather over most of the West turned cool and wet, building snowpacks to unprecedented levels in some regions

and delaying the melt by three to four weeks. A delayed snowmelt compresses the melt out period, causing the entire snowpack to melt at a higher intensity. This phenomenon has a tendency to apply more water to the watershed than it can normally handle, with the result being abnormally high streamflow. That's what happened during the spring and early summer of 2011.

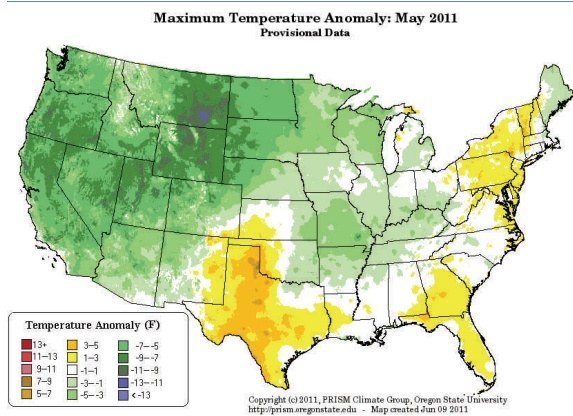
But it could have been much worse. The cooler temperatures late in the melt/runoff season softened the runoff blow that could have occurred had normal temperatures prevailed.

Because of the cool, wet weather over most of the West, the forecast models did not perform adequately. Conversely, the warm, dry weather over the Lower Colorado and Rio Grande basins caused a similar response from the models in the reverse.

What's the lesson to be learned from all this extreme weather? You can't always predict the weather, but you can learn from it. NWCC forecast hydrologists are already actively working this year's variability into next year's models.



May 2011 precipitation anomaly (% of normal)



May 2011 temperature anomaly (°F)

"30-Year Normals" 1981-2010 release update

Cara S. McCarthy
cara.s.mccarthy@por.usda.gov

After completion of internal testing, the latest 30-Year Normals software, addressing snow depth, precipitation and snow water equivalent for the period 1981-2010, was re-

cently deployed for testing to the data collection offices (DCOs). An updated version of the documentation also went out to the DCOs.

The next step will be to incorporate comments. The target is to release the final version

of the 30-Year Normals software the first week of October.

Check out the Winter issue of **SnowNews** for more on 30-Year Normals.

Basin Analysis (BAGIS) program evolves

Jim Marron
jim.marron@por.usda.gov

The NRCS Snow Survey and Water Supply Forecasting (SSWSF) Program is responsible for forecasting water supply for the western U.S. To forecast water supply, the Program measures snowpack by both manual and automated methods.

The Basin Analysis Geographic Information System (BAGIS) program analyzes the adequacy of snow measurements and assists in identifying the best locations for new data collection sites.

Background

In 2009, NWCC developed a method to identify potential new sites using ArcGIS, a suite of software tools designed by Environmental Systems Research Institute (www.esri.com).

The method used ArcGIS tools to determine the drainage area, aspect, elevation, slope, vegetation and other physiographic characteristics of each basin. Joining these characteristics in the GIS environment let NWCC identify potentially promising areas in the drainage, resulting in better snow measurement sites.

Problem definition

Unfortunately, this method was too time-consuming and at certain times provided too much variability. The NWCC analysts knew that, within the ArcGIS environment, there was a way to unify the process into one tool and to structure the analysis so that the results were more consistent and reliable. However, NWCC did not have the expertise to develop this tool.

Research

To solve the problem NWCC met with the Center for Spatial Analysis and Research (CSAR) at Portland State University. The problem was laid out to CSAR Assistant Professor Jiunn-Der Geoffrey Duh to develop a proposal for a tool to satisfy the Basin Analysis process.

CESU agreements

As an operational and research unit, NWCC works with many Universities and other Government agencies to develop tools. Basin Analysis was an opportunity for research and development through collaboration.

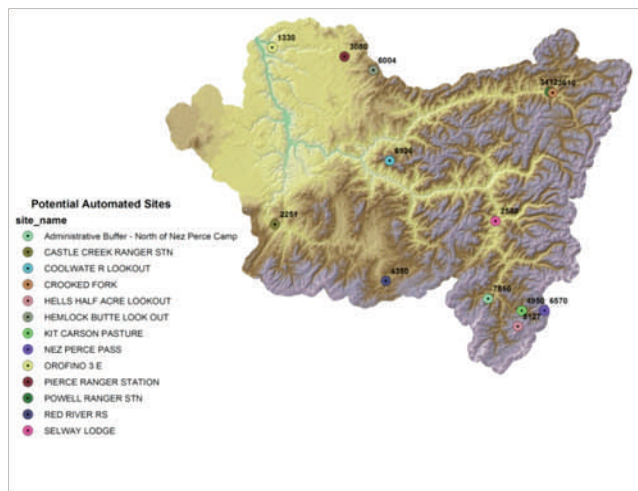
NWCC decided that using Cooperative Ecosystem Studies Unit (CESU) agreements was the best course of action. On October 1, 2009 the first agreement for development of the BAGIS software was entered into with Portland State University. Another agreement was entered on June 1, 2010 to develop the second tool in the Basin Analysis program. This tool provided a sub-basin analysis dividing the larger basins into sub-areas of hydrologic significance.

Results

In October 2010, the production version of BAGIS was released for use in site determinations and network analy-

ses. Since that time, several updates have been released to accommodate changes in software and transition to improved technologies.

BAGIS and its subsystems are now an integral part of the hydrologic analysis of basins, not only for measurement site selection but for hydrologic analysis and modeling.



Example basin map produced by BAGIS tools.



Pierce Ranger Station SNOTEL in north central Idaho, installed as a result of BAGIS analysis.





PRISM weather models. The gold standard.

Jan Curtis jan.curtis@por.usda.com

NWCC's partnership with the PRISM Climate Group at Oregon State University spans almost two decades. In that time, the PRISM team has developed a suite of climate products capable of modeling high-resolution spatial views of climate patterns.

PRISM stands for Parameter-elevation Regression on Independent Slopes Model. Quite a mouthful. In simpler terms, PRISM is a knowledge-based system that uses point measurements of precipitation, temperature and other factors to produce estimates of monthly, yearly and event-based climatic parameters. The output from PRISM is high-resolution maps and gridded data that can be imported into a GIS (Geographic Information System).

So, how does this benefit our efforts at USDA? In many ways... First, PRISM data are recognized worldwide as the highest-quality spatial climate data sets available. Many weather analyses and hydrological forecasts use PRISM's gridded climate datasets as a background for depicting de-

partures from long-term averages.

In addition, PRISM has the ability to fill in data gaps that occur between widely-separated weather stations. The NWCC Water and Climate Information System (WCIS) database incorporates PRISM data to ensure quality and consistency.

PRISM is also used in model development, climate change assessments, weather radar calibration and to help identify ecosystems. Many USDA agencies regularly use PRISM

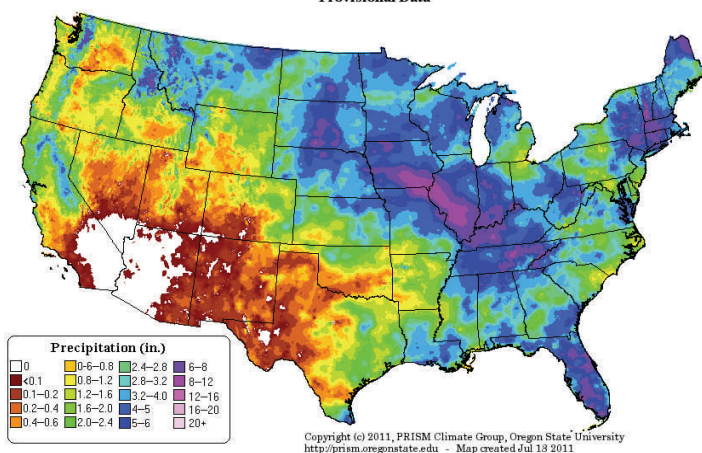
data in their analyses.

The PRISM Climate Group is currently working with USDA Risk Management Agency (RMA) to provide data sets for use in substantiating weather events and producer claims related to Federal crop insurance programs. A prototype, web-based spatial weather and climate portal is now online and in use by RMA personnel.

To learn more about the PRISM modeling tool, go to <http://www.wcc.nrcs.usda.gov/climate/prism.html>

“PRISM is the proven standard for spatial climate data and has been used in over 2,000* journal papers in the last decade.”

Precipitation: Jun 2011
Provisional Data



The model in the photo shows precipitation for the contiguous U.S. during June of this year.

End of “summer” BBQ feeds the team!

After enjoying Portland's annual week of summer, the NWCC team held a BBQ and potluck on September 16.

Employees and families gathered after work at the Electronics Maintenance Facility (EMF) to munch burgers and dogs, chips and all the fixins.

Thanks go out to Garry Schaeffer, John Weeks and Jo Huelshoff for hosting and organizing the festivities.

John Weeks manning the BBQ



* To see a large sample of papers utilizing PRISM, go to:

<ftp://ftp.wccnrcs.usda.gov/support/climate/prism/papers.doc>



NWCC forecast hydrologists in the field

Rashawn Tama
rashawn.tama@por.usda.gov

The week of July 18, Gus Goodbody traveled to Colorado to join Mike Gillespie and Mage Skorhdahl (Colorado DCO) to tour water supply forecast basins in western Colorado and discuss regional forecasting issues.

Visits were made to existing SNOTEL sites and forecast basins including the Yampa, White, Colorado Headwaters, Gunnison, Dolores and Animas basins, spanning the western slope of Colorado from north to south. Final site locations were determined for the new Elkhead Divide and

Black Mesa SNOTEL installations in the Yampa and Dolores watersheds.

During the week of July 25, Cara McCarthy and Rashawn Tama traveled to Ely, Nevada to assist the Utah DCO and Nevada water supply specialist with installation of three new SNOTEL sites, Bird Creek, Kalamazoo and Cave Mountain.

Two of these sites were upgrades of existing snow courses while the third, Cave Mountain, was selected from recommended locations as a result of the Basin Analysis process. (See related story on page 5.)

The week of August 15, Rashawn went to the Panhandle region of Idaho to assist the DCO with summer maintenance. As part of performing annual maintenance, the crews replaced multiple dead radios, repaired a snapped stinger, replaced a leaking pillow and installed two new towers.



Cara gets on-the-job training from Randy Julander at the new Cave Mountain SNOTEL site In Nevada.



Spotlight on... Mike Gillespie

Mike Gillespie has always loved the outdoors. He grew up in Colorado Springs with his two older sisters and later attended Colorado State University. While in school, Mike was drawn to work in the Forest Service. He held summer jobs on a fire crew and doing land use planning, before landing a temporary position with forest hydrologist, Dave Rosgan. Mike graduated from CSU with a degree in Forest Management.



In 1980 a job with the Snow Survey team in Casper, Wyo-

oming opened. Mike was selected for the position and his career with NRCS began.

He soon found himself trekking through remote areas of the Grand Tetons and Glacier

National Park to perform snow surveys. His memories of the spectacular scenery in both Wyoming and Colorado, and the challenges he often faced getting there, stay with him today.

When asked about his accomplishments, Mike says, "I'm proud of how we've been able to expand our snow survey network in Colorado. It's fulfilling to work with water users to provide vital forecast information and data. I'm always im-

pressed with how our organization finds a way around some of the barricades to help water users."

Throughout his service to the agency, Mike has always appreciated the "can-do" spirit and commitment of his co-workers. As he said, "We share the same goals and desire to help folks."

As Mike's role as Colorado Snow Survey Supervisor nears an end, we asked what's in store for the future. He's looking forward to getting back outdoors more, adding that extended bicycling tours with his wife, backpacking, canoeing and travel to places new and old were at the top of the to-do list.

We asked Mike if he'd like to leave us with some advice. He said, "As long as you do what you like, things will take care of themselves."

"I'm proud of how we've been able to expand our snow survey network in Colorado. It's fulfilling to work with water users to provide vital forecast information and data."



Removing the past: Ogden Master Station

As part of an ongoing effort to maintain current technology associated with the Meteor Burst Communications system that serves the Snow Survey and Water Supply Forecasting (SSWSF) program, the Master Station functions originally assigned to the Ogden Master Station were moved to the Dugway Master Station installed in 2009.

The Ogden Master Station was installed in 1975/1976 at the Little Mountain Air Force Facilities near Ogden, Utah. As a result of the transition to

the Dugway station, the Ogden Master Station was turned off in 2010.

Because the Ogden Master Station was decommissioned, SSWSF was required to remove the structures from the Little Mountain Facility. In addition, SSWSF had to submit the site to both onsite and aerial surveys.

Work to remove the Ogden Master Station facility from Little Mountain began August 30 and finished up on September 1.

The removal included eight receive antennas, one transmit antenna, air conditioning equipment, the instrument building, and all support structures and features.

Much of the removed components were processed through the local public landfill, construction material landfill, metal recycling and general recycling centers.

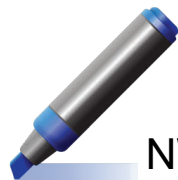
Questions? Contact Garry Schaefer, 503-414-3068, garry.schaefer@por.usda.gov



Ogden Master Station "Before"



Ogden Master Station "After"



NWCC highlights

Welcome to new employee

Mildred ("Del") Gist.

Del joined the Information Systems (IS) group on September 12, in the role of IT specialist. Before coming to



NRCS, Del worked for Indian Health Services at the capital of the Tohono O'odham reservation in Sells, Arizona. Del reports to Laurel Grimsted, IS team leader.

Best wishes to retiring employee **Chris Pacheco**. Thank you for your 33+ years' service to the agency.

It's a small world. Just ask **Mike Strobel**. While speaking at a workshop in Zacatecas, Mexico last month, only a few other Americans were in attendance. At dinner one evening, Mike discovered that the gentleman on his left (an American) had attended the same, small high school in Ohio that he had attended. Upon hearing that news, the gentleman on Mike's right (another American) said, "I went to that high school, too."



Colorado snow survey team members **Paul Gallegos**, **Mike Gillespie**, and **Chris Pacheco** maintaining the Chalender, Arizona SNOTEL site.

Who took the photo? That's **Dino DeSimone**, Arizona water supply specialist.

Related stories on pgs 3 and 5.

Products and resources on the web

NWCC offers several products and resources to aid our customers. Here are a few web-based tools you may not know about...

Start at home

www.wcc.nrcs.usda.gov

Our home page links you to many tools, reports, maps, and surveys. Get water supply, climate monitoring and climate interpretation data. View highlights and special reports. Download brochures.

Weekly snowpack and drought report

www.wcc.nrcs.usda.gov/cgibin/water/drought/wdr.pl

Released every Thursday morning, this report highlights in both narrative and map format, the changes to snowpack, drought, temperature and precipitation from long-term averages.

Climate reports

www.wcc.nrcs.usda.gov/cgibin/soil-nar.pl

This report provides, at the county level, a summary of average and extreme climate as well as tables of climate data (e.g., first and last freezing days).

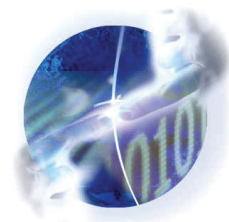
AgACIS

efotg.sc.egov.usda.gov/efotg_locator.aspx

AgACIS stands for Agriculture Applied Climate Information System. AgACIS is a cooperative effort between NRCS and the National Oceanic and Atmospheric Administration's Regional Climate Centers (RCC) to make climate data and applications available through the Internet.

You access AgACIS data via the electronic Field Office Technical Guide (eFOTG) county locator. Simply select the state and county you want to view data on.

Questions? Contact Jan Curtis, 503-414-3017, jan.curtis@por.usda.gov.



Climate Data for Jefferson County, Colorado				
1. Product	2. Location	3. Variable	4. Year	5. View
<input type="radio"/> Daily data for a month <input type="radio"/> Daily almanac <input checked="" type="radio"/> Monthly avgs/totals <input type="radio"/> Monthly occurrences <input type="radio"/> Monthly extremes <input type="radio"/> Daily extremes <input type="radio"/> Daily/monthly normals <input type="radio"/> Record extremes <input type="radio"/> Frost/freezing dates <input type="radio"/> TAPS <input type="radio"/> FROST <input type="radio"/> GROWTH <input type="radio"/> WETS	CHEESMAN EVERGREEN INTER CANYON KASSLER LAKEWOOD RALSTON RSVR WHEAT RIDGE 2	<input checked="" type="radio"/> Max Temperature <input type="radio"/> Min Temperature <input type="radio"/> Avg Temperature <input type="radio"/> Precipitation <input type="radio"/> Snowfall <input type="radio"/> Snow Depth <input type="radio"/> GDD (Base 50)	<input checked="" type="radio"/> Current year <input type="radio"/> Last year <input type="radio"/> 1971-2000 <input type="radio"/> Select year: 2011	<input type="button" value="Go"/>
Product Description: MONTHLY AVERAGES/TOTALS - calculates averages or totals, as appropriate, for the selected variable for each month of the year. This product is available for the current year, the previous year, or an average of the years 1971 through 2000, or any other year in the period of record. Additional stations are available from the Regional Climate			Questions, comments Powered by LACIS NOAA Regional Climate Centers	

AgACIS data for Jefferson County, Colorado



National Water & Climate Center
 Natural Resources Conservation Service
 US Department of Agriculture

1201 NE Lloyd Blvd.
 Suite 802
 Portland, OR 97232

Phone: 503-414-3038
 E-mail:

jacquie.workman@por.usda.gov

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www.wcc.nrcs.usda.gov/publications/

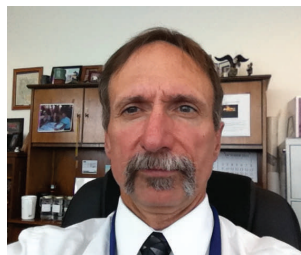
Helping People Help the Land.

Our mission is: *"To lead the development and transfer of water and climate information and technology which support natural resource conservation."*



With a vision of the future as:
"A globally-recognized source for a top quality spatial snow, water, climate, and hydrologic network of information and technology."

From the Director's desk



Welcome to the first issue of **SnowNews**, the quarterly newsletter from the National Water and Climate Center. We ran a competition to determine the newsletter name and Jim Marron provided the winning entry. The difficult part was that we wanted a title that reflected all aspects of our mission, but decided that **SnowNews** was catchy (SnowNews is good news).

Thanks to the ability and talents of our Technical Editor, Jacquie Workman, and the contributions from many on our staff, this inaugural issue provides a brief but

comprehensive sampling of the many activities at the NWCC and within the Snow Survey and Water Supply Forecasting (SSWSF) Program. We hope that each issue will continue to be as informative and interesting as this one.

As we approach the end of the fiscal year, we can reflect back on the many challenges, successes and changes we have experienced. Most of the year operated under a continuing resolution and we even had a potential government shutdown at one point. Travel was strongly cut back and many of our planned meetings reduced. Dollars for many other efforts were quite limited. Yet, we managed to complete the frequency change-over, upgrade our master stations, greatly advance our status on report generator, complete the 30-year Normals document, complete many

parts of the Standards and Specifications (NEH 622), and many other efforts. All this during a year of record snowpacks in the West, subsequent flooding in many areas, and drought in the South. It illustrates the amazing abilities, dedication and hard work of the people in the NWCC and SSWSF Program.

As we head into next year, it will be interesting to see what challenges we will face with budgets, changing personnel, snowpacks, floods, droughts and potential changes in our organization. But, I look forward to these with optimism and excitement, knowing that these challenges and changes provide opportunities to grow in new and better ways.

Mike



USDA NRCS is an equal opportunity employer and provider

Trivia answer: **The Godfather** was released in 1972.