



# SnowNews

October 2016

Volume 5, Issue 4

## Summer field work highlights diverse nature of Snow Survey Program

This month's issue of **SnowNews** focuses on the wide range of field activities needed to keep SNOTEL sites, SCAN sites, and snow courses in top working order.

Every summer and fall, teams of hydrologists, technicians, and seasonal employees travel to remote areas of the West, sometimes using all-terrain vehicles, helicopters, or even horse packs.

Typical annual maintenance activities include clearing vegetation, recharging precipitation gages, and ensuring sensors and other equipment are operational and within specification.

In other cases, work crews are deployed to rebuild or repair sites that have been damaged or destroyed by fire, avalanche, or wild animals (typically bears).

Sometimes, experimental sensors or new telemetry are installed.

Here's a recap of this summer's activities from several states and data collection offices.

### Alaska

*Daniel Fisher*

We installed one new site this summer in Alaska. Nick's Valley [Snolite](#) was installed in late August (photo on page 4). The installation had been weather-delayed once, but the clouds lifted high enough for us to heli-

copter in and install it in about five hours. In addition, we have completed a few evaluations for potential new site installs this year, mainly in southeast Alaska.

For comparison purposes, we installed a 2KR Systems SnowScale™ next to a snow pillow (which we replaced at the same time due to ursine vandalism). We have plans to install one more - if the snow doesn't fall first! Poor late season weather has stacked up our fall flight schedule to reach these remote areas.

### Montana

*Mage Hultstrand*

In Montana, we're nearing the finish of our maintenance season; our estimated finish date is

late September. As of September 1, we had only 17 SNOTEL sites left to visit. The work left includes six sites that are helicopter flights and one site that is a horse-pack trip.

We will also be installing a load cell snow pillow at the Black Bear SNOTEL, and soils sensors for our temperature study at the Twelvemile and Twin Lakes sites. We have not had to pull anything out due to fires and we're "knocking on wood" that we make it out of this season without anything burning. We've also completed half of the SCAN maintenance; the other sites will probably have to wait until October.

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*Dan Kenney performing annual maintenance at the Antiguan Pass SNOTEL site in Alaska. Photo by Daniel Fisher.*



First snow of the season, September 22, 2016; taken at the Snow Mountain SNOTEL site in central Oregon. Photo by Bill Overman.

This year we will have installed three of the Sommer load cell pillows for testing at the Lick Creek and Noisy Basin SNOTEL sites. We also installed a tan snow pillow at Lick Creek. That site now has three snow water equivalent (SWE) sensors: a black pillow, a tan pillow, and a load cell side-by-side.

As far as new telemetry is concerned, we will have five sites on cell modems: West Yellowstone, Madison Plateau, Lone Mountain, Brackett Creek, and Emery Creek. And, we installed our temperature study, which adds two YSI thermistors (for a total of three) with different configurations of the radiation shield and location on the tower, at 10 SNOTEL sites in the DCO.

### Nevada/California

Jeff Anderson/Greg Norris

Here in Nevada and California, we have been busy with normal summer maintenance work, such as recharging precipitation gages, adding fluid to snow pillows, patching shelters, cutting back overgrown vegetation, and swapping out sensors that failed. The Utah DCO staff were in California in August to renovate the Independence Camp SNOTEL. This involved replacing the original shelter with a new, rodent-proof one, as well as replacing

plumbing lines, wiring, and the antenna. We are also experimenting with three different types of fluidless snow water sensors which use electronic load cells to weigh the snow-pack instead of fluid-filled snow pillows.

This fall we hope to rebuild the Hole-in-Mountain SNOTEL near Wells, Nevada, which was destroyed by an avalanche last winter. In addition, we plan to install a new site on Fredonyer Peak near Susanville, California, for the Bureau of Land Management (BLM). Both of these projects are awaiting administrative approval.

### Oregon/Washington

Melissa Webb/Scott Pattee

As it relates to summer field work, Oregon and Washington have been concentrating on upgrading our SNOTEL telemetry this summer. In an effort to find the best telemetry to match the challenges of the Pacific Northwest weather, we have been upgrading aging 545B meteor burst radios to one of two newer technologies: the MRC 565 meteor burst radio and the RavenXT cellular modem.

We now have 14 SNOTEL sites with the MRC 565 radio and 8 SNOTEL sites with the RavenXT cellular modem. Our plan is to run these two groups of sites through the 2017 winter and work out any kinks before we continue to expand the scope of our conversion next field season.

In addition to telemetry upgrades, we have also been steadily improving our bear-proofing of snow pillows and plumbing as well as replacing and rehabbing precipitation storage gages that are older than 30

years.

We recently hired two, permanent full-time field hydrologists (Lauren Austin and Joshua Roach), so we no longer have any seasonal positions.

### Utah

Randy Julander

This summer we've performed regular maintenance at more than 230 SNOTEL sites and 40 SCAN sites in Utah and Nevada. The Mt. Baldy SNOTEL site was rebuilt, and three new sites are currently on the docket for installation after Special Use Permits are approved by the U.S. Forest Service (USFS) and BLM.

The Utah DCO also installed new, rodent-proof shelters at several locations. Ensuring all sites have good shelters is our main system upgrade over the next few years.

Our team installed some 2KR fluidless snow scales, co-located with fluid-filled pillows, for testing and comparison. We're waiting for approval to install the remainder at Iridium sites. In addition, we completed more soils classifications at various SNOTEL sites – and are on track to get them all done.

On the maintenance front, the team performed a few radio upgrades, did sensor replacements, and replaced snow pillows damaged by critters or humans.

For outreach, the Utah DCO participated in a videotaping session on the SNOTEL system and hydrologic forecasting with the Bureau of Reclamation (BOR) for the visitor center at Glen Canyon Dam. Also, we digitized and posted all Utah historic water supply outlook reports to our web page – 1925 to current.

# Electronics technicians receive hands-on training with new radios

**John Weeks**

**Electronics Maintenance Facility, Lead Technician**

In late July, 14 electronics technicians from the Oregon, Idaho, Utah, and Colorado Data Collection Offices (DCOs) attended training at the Electronics Maintenance Facility (EMF) in Portland.

The training was provided by Tom Donich from MaidenRock Communications (MRC).

With the recent hiring of technicians and the advanced technology in the new MaidenRock 565 Meteor Burst Radio Modems, we felt it was time for in-depth training on the features and operation of both the meteor burst radio and the XTerm application used to program it.

Training consisted not only of the features of the radio, but the different operating systems and how to change them.

The training went into depth about developing the script files to program the radios for use with the various dataloggers.

The implementation of "low power mode," which is meant to conserve battery power for those low-light applications where the solar panel struggles to keep the system charged, was also discussed.

The training covered many of the features of XTerm that apply to our operation, not only for programming the radio but for logging functions of the radio to aid in remotely

monitoring and troubleshooting issues that may arise.

During the training, each technician had use of their own radio and dataloggers for true hands-on operation.

Feedback from the participants was very positive and, based on the comments received, we will definitely hold this type of training more often, perhaps even making it an element of our annual Field Operations Workshop.

On a related note, earlier during the week of training, MRC delivered the Beta unit of the next generation Meteor Burst Master Station Remote Control and Monitor (RCAM) unit and test fixture to the EMF.

The system is still undergoing fine-tuning but should be ready for delivery later this fall.

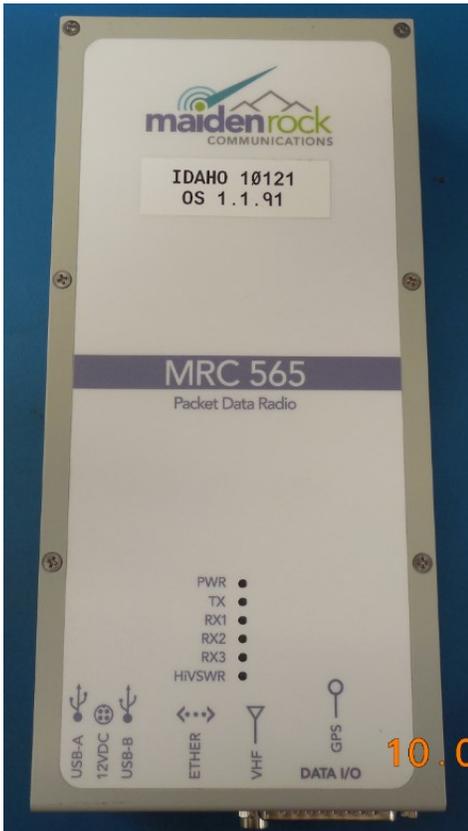
Watch for further updates on the RCAM in a future issue of **SnowNews**.

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## Svoboda named National Drought Mitigation Center Director

**Mark Svoboda**, climatologist and internationally known expert on drought monitoring and early warning, is the new director of the National Drought Mitigation Center (NDMC), University of Nebraska officials announced Oct. 4. Svoboda was one of the center's original employees at its founding in 1995. The NDMC is based at University of Nebraska Lincoln's School of Natural Resources. Congratulations, Mark!

[Full press release](#)



*New MRC 565 Packet Data Meteor Burst Radio Modem*





## Snow Survey Program retirees: Tony Tolsdorf and Denice Schilling

The Snow Survey and Water Supply Forecasting (SSWSF) Program and the National Water and Climate Center (NWCC) want to recognize the contributions of two recently-retired employees, **Tony Tolsdorf** and **Denice Schilling**.



Tony started his snow career while he was still in college working part-time at the Idaho Data Collection Office (DCO) for Jerry Beard (Austin Beard's father) in 1985 and 1986.

After graduation, he spent six years as a soil scientist in Idaho and as a geologist in California. He then returned to snow, working as an assistant hydrologist under Mike Gilles-

pie in Colorado. Tony worked in Colorado for about 11 years. In Tony's words, "It was so fun working at the DCO level!"

In 2004, Tony came to the NWCC and worked for Garry Schaefer until Garry retired in 2014. For the last 2.5 years, Tony has been the supervisory hydrologist for the Water and Climate Monitoring team.

After 32 years of service, Tony is looking forward to getting back to hiking and camping throughout the West.



Denice was the statistical assistant in the NWCC Water and Climate Monitoring team, where she ensured the quality of the Soil Climate Analysis Network (SCAN) data.

Denice began her career in government working for the Forest Service and then later for the Bureau of Land Management.

In 1979, she started work in the Soil Conservation Service as an area clerk under Snow Survey Supervisor, Don McAndrew. The following year Denice began working with Phil Farnes in the Montana Snow Survey office in Bozeman.

Denice worked in Bozeman for about nine years, when she and her family relocated to Portland for a new business opportunity. While in Portland, she worked at the West National Technical Support Center.

In 1990, after returning to Bozeman, Denice became one of the first employees to be assigned to the "new" SCAN project.

Since then, she has continued in the critical role of providing the highest quality SCAN data to our customers.

We all wish Tony and Denice the best as they leave government service and begin the next chapters of their lives.

*New site installation: Nick's Valley Snolite site in south-east Alaska.*

*A Snolite site is an aerial marker that has been outfitted with basic sensors, such as temperature and snow depth, and telemetered using the Iridium Satellite System.*

*Photo by Daniel Fisher.*



# Younts Peak SNOTEL Horse Pack Trip



[Mike Strobel](#)

NWCC Director

SSWSF Program Manager

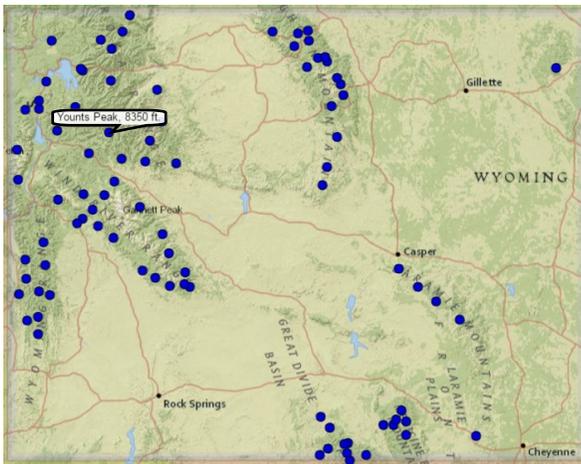
In August 2013, the Younts Peak SNOTEL site in northwest Wyoming was destroyed by wildfire. Since that time, we have worked with the Forest Service to rebuild the site.

For the past few years, I have had the opportunity to participate in different week-long horse pack trips into the protected wilderness areas near Yellowstone National Park to maintain sites, including Younts Peak and Two Ocean Plateau SNOTEL sites.

The trip to perform annual maintenance at Younts Peak involves a one-day journey on horseback to reach the site, followed by a one-day maintenance stint, and then a one-day trek back. Here are a few photos from this year's trip.



*Crossing the South Fork Shoshone River near the trailhead in Washakie National Forest.*



*New Younts Peak SNOTEL site surrounded by burnt forest and spectacular views. Chad Gipson, Montana DCO, is performing site maintenance.*



*Trail heading up Marston Creek basin on the route to Younts Peak SNOTEL site.*



## Forecast hydrologists assist with field activities

Each year, several National Water and Climate Center (NWCC) forecast hydrologists venture into the field to assist the state Data Collection Offices (DCOs) with their annual maintenance activities. This is a great opportunity for our hydrologists to assist their colleagues and increase their familiarity with the watersheds they forecast.

Here's a brief overview of some of this year's activities.

In July, **Rashawn Tama**, Forecast Hydrologist from the NWCC, joined the Snow Survey team out of Bozeman, Montana for a week of maintenance work and upgrades on SNOTEL sites across western Wyoming. The crew handled everything – from installing new high-tech electronics and sensitive environmental monitoring equipment to pouring concrete for new communica-

tions towers and running chainsaws to clear wind-fallen trees from monitoring sites.

After a successful week of working “in the woods,” Rashawn headed home on a drive back to Portland, OR. Before reaching his final destination, he ended up having to pull over for an emergency appendectomy.

Not deterred by the close call, in August, a recovered Rashawn went back in the field for another week to assist the Boise Snow Survey team with maintenance and sensor installations in Idaho.

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In late August, **Gus Goodbody** joined the Colorado DCO for the installation of the new Elkhead Divide SNOTEL site. Permits from the U.S. Forest Service were in place after nearly five years since

the original site selection was made.

The new site will help characterize snowpack in the Elkhead and Slater Creek basins in northwestern Colorado, primarily for improving water supply forecasts and management of Elkhead Reservoir.

The installation went smoothly, even with the introduction of a new skid steer into the building process.

The only complaints came from a hunter's camp nearby that was worried we might scare away the elk. They wondered if, in the future, we could avoid installing sites during elk season. Gus, in turn, wondered if they could avoid hunting during SNOTEL installation season.

“The only complaints came from a hunter's camp nearby that was worried we might scare away the elk.”

## Summer is busy time for SCAN maintenance

The Soil Climate Analysis Network (SCAN) is composed of over 200 sites in 40 states, including Alaska, Hawaii, Puerto Rico, and the U.S. Virgin Islands. That's a lot of territory to cover.

**Deb Harms**, acting team lead for the National Water and Climate Center (NWCC) Water and Climate Monitoring group, explained how SCAN sites are maintained.

“In the eastern U.S., we use teams of contractors who are trained on SCAN maintenance activities to work on sites. They are deployed to sites where known problems exist, or where equipment needs replacement. This year we

had three teams out in the field.”

As an example, earlier this year, contractor teams converted all the SCAN sites in the eastern U.S. from meteor burst to cellular modem telemetry.

Deb went on to explain that, in the western states, SCAN maintenance is often performed by that region's Data Collection Office (DCO) staff.

Typical SCAN field activities include:

- Clearing vegetation from sites.
- Recalibrating sensors.

- Replacing sensors and other equipment.

In addition to annual maintenance, the team also installed a new snow scale collocated with a snow pillow at the Hubbard Brook SCAN site in New Hampshire.

# Snow Survey and Water Supply Forecasting Program

## 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	<a href="mailto:jolyne.lea@por.usda.gov">jolyne.lea@por.usda.gov</a>
	Data Collection Office Supervisor	Daniel Fisher 907-671-7746	<a href="mailto:daniel.fisher@ak.usda.gov">daniel.fisher@ak.usda.gov</a>
Arizona	Forecast Hydrologist	Jolyne Lea 503-414-3040	<a href="mailto:jolyne.lea@por.usda.gov">jolyne.lea@por.usda.gov</a>
	Water Supply Specialist	Dino De Simone 602-280-8786	<a href="mailto:dino.desimone@az.usda.gov">dino.desimone@az.usda.gov</a>
California	Forecast Hydrologist	Jolyne Lea 503-414-3040	<a href="mailto:jolyne.lea@por.usda.gov">jolyne.lea@por.usda.gov</a>
	Water Supply Specialist	Greg Norris 530-792-5609	<a href="mailto:greg.norris@ca.usda.gov">greg.norris@ca.usda.gov</a>
Colorado	Forecast Hydrologist	Cara McCarthy 503-414-3088	<a href="mailto:cara.s.mccarthy@por.usda.gov">cara.s.mccarthy@por.usda.gov</a>
	Hydrologist	Karl Wetlaufer 720-544-2853	<a href="mailto:karl.wetlaufer@co.usda.gov">karl.wetlaufer@co.usda.gov</a>
	Data Collection Office Supervisor	Brian Domonkos 720-544-2852	<a href="mailto:brian.domonkos@co.usda.gov">brian.domonkos@co.usda.gov</a>
Idaho	Data Collection Officer	Phil Morrissey 208-685-6983	<a href="mailto:phil.morrissey@id.usda.gov">phil.morrissey@id.usda.gov</a>
	Forecast Hydrologist	Rashawn Tama 503-414-3010	<a href="mailto:rashawn.tama@por.usda.gov">rashawn.tama@por.usda.gov</a>
	Water Supply Specialist	Ron Abramovich 208-378-5741	<a href="mailto:ron.abramovich@id.usda.gov">ron.abramovich@id.usda.gov</a>
Montana	Data Collection Office Supervisor	Mage Hultstrand 406-587-6844	<a href="mailto:mage.hultstrand@mt.usda.gov">mage.hultstrand@mt.usda.gov</a>
	Forecast Hydrologist	Cara McCarthy 503-414-3088	<a href="mailto:cara.s.mccarthy@por.usda.gov">cara.s.mccarthy@por.usda.gov</a>
	Water Supply Specialist	Lucas Zukiewicz 406-587-6843	<a href="mailto:lucas.zukiewicz@mt.usda.gov">lucas.zukiewicz@mt.usda.gov</a>
Nevada	Forecast Hydrologist	Jolyne Lea 503-414-3040	<a href="mailto:jolyne.lea@por.usda.gov">jolyne.lea@por.usda.gov</a>
	Water Supply Specialist	Jeff Anderson 775-857-8500 x152	<a href="mailto:jeff.anderson@nv.usda.gov">jeff.anderson@nv.usda.gov</a>
New Mexico	Forecast Hydrologist	Gus Goodbody 503-414-3033	<a href="mailto:angus.goodbody@por.usda.gov">angus.goodbody@por.usda.gov</a>
	Water Supply Specialist	Chris Romero 520-292-2999 x107	<a href="mailto:chris.romero@nm.usda.gov">chris.romero@nm.usda.gov</a>
Oregon	Forecast Hydrologist	Rashawn Tama 503-414-3010	<a href="mailto:rashawn.tama@por.usda.gov">rashawn.tama@por.usda.gov</a>
	Hydrologist	Melissa Webb 503-414-3270	<a href="mailto:melissa.webb@or.usda.gov">melissa.webb@or.usda.gov</a>
	Data Collection Office Supervisor	Scott Oviatt 503-414-3271	<a href="mailto:scott.oviatt@or.usda.gov">scott.oviatt@or.usda.gov</a>
Utah	Forecast Hydrologist	Gus Goodbody 503-414-3033	<a href="mailto:angus.goodbody@por.usda.gov">angus.goodbody@por.usda.gov</a>
	Snow Survey Supervisor	Randy Julander 801-524-5213	<a href="mailto:randy.julander@ut.usda.gov">randy.julander@ut.usda.gov</a>
Washington	Forecast Hydrologist	Rashawn Tama 503-414-3010	<a href="mailto:rashawn.tama@por.usda.gov">rashawn.tama@por.usda.gov</a>
	Water Supply Specialist	Scott Pattee 360-428-7684	<a href="mailto:scott.pattee@wa.usda.gov">scott.pattee@wa.usda.gov</a>
Wyoming	Forecast Hydrologist	Cara McCarthy 503-414-3088	<a href="mailto:cara.s.mccarthy@por.usda.gov">cara.s.mccarthy@por.usda.gov</a>
	Water Supply Specialist	Lee Hackleman 307-233-6744	<a href="mailto:lee.hackleman@wy.usda.gov">lee.hackleman@wy.usda.gov</a>
All States	Center Director/Program Manager	Mike Strobel 503-414-3055	<a href="mailto:michael.strobel@por.usda.gov">michael.strobel@por.usda.gov</a>
	Information Systems Team Lead (acting)	Rashawn Tama 503-414-3010	<a href="mailto:rashawn.tama@por.usda.gov">rashawn.tama@por.usda.gov</a>
	Water & Climate Monitoring Team Lead (acting)	Deb Harms 503-414-3050	<a href="mailto:deb.harms@por.usda.gov">deb.harms@por.usda.gov</a>
	Water & Climate Services Team Lead	Cara McCarthy 503-414-3088	<a href="mailto:cara.s.mccarthy@por.usda.gov">cara.s.mccarthy@por.usda.gov</a>
	Database Manager	Maggie Dunklee 503-414-3049	<a href="mailto:maggie.dunklee@por.usda.gov">maggie.dunklee@por.usda.gov</a>
	Database Manager	Vacant	
	Hydrologist (Water & Climate Monitoring)	Deb Harms 503-414-3050	<a href="mailto:deb.harms@por.usda.gov">deb.harms@por.usda.gov</a>
	Modeling Hydrologist	David Garen 503-414-3021	<a href="mailto:david.garen@por.usda.gov">david.garen@por.usda.gov</a>
	Operations Specialist (SNOTEL/SCAN)	Vacant	
	Resource Conservationist	Vacant	
	Statistical Assistant/SCAN QC	Vacant	



**Contact Help Center**

There's an online tool to help locate resources within the Snow Survey and Water Supply Forecasting Program.

Click [here](#) to open the **Contact Help Center**. Don't forget to bookmark the url.

## Upcoming events

Events of interest in the coming months.



**What:** Conference of Parties (COP) 22: United Nations Framework Convention on Climate Change

**When:** November 7-18, 2016

**Where:** Marrakech, Morocco

**More information:**  
[Conference Overview](#)

**What:** Annual Snow Program Advisory Committee (SnowPAC) meeting

**When:** December 5-9, 2016

**Where:** Portland, OR

**More information:**  
[Mike Strobel](#), 503-414-3055

**What:** Westwide Snow Survey Training School

**When:** January 9-13, 2017

**Where:** Bend, OR

**More information:** [Deb Harms](#), 503-414-3050

**What:** Western Snow Conference

**When:** April 17-20, 2017

**Where:** Boise, ID

**More information:**  
[Conference Overview](#)



## Helping People Help the Land.

National Water & Climate Center  
Natural Resources Conservation Service  
US Department of Agriculture  
[www.wcc.nrcs.usda.gov](http://www.wcc.nrcs.usda.gov)

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[www.wcc.nrcs.usda.gov/SnowNews/SnowNews\\_landing.htm](http://www.wcc.nrcs.usda.gov/SnowNews/SnowNews_landing.htm)

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."*

## Director's Corner



I was recently asked by an acquaintance about my job, if I liked where I worked and what I did, and why? These are interesting questions, and ones we should all ask ourselves from time to time.

It has always been my opinion that we only get one shot at life and if we are doing anything that is less than a passion for us, if it is only about a paycheck, then maybe we need to consider what other options are out there.

I thought about the questions, and tried to answer honestly. Do I like where I work and what I do?

That answer can depend on the day, because all jobs have their parts that are frustrating, monot-

onous, and unpleasant. I guess the question is whether the good days outnumber the bad.

For me, I love our mission. I love that we do science in the most beautiful and remote parts of the country, that the data and forecasts are critical to people, and that our program carries such a high regard. There is nothing more satisfying to me than knowing that, at the end of the day, what we do matters and what we do helps people. It is icing on the cake to know that almost every one of my personal acquaintances is envious of the job I have, the places I go, the things I get to do.

What also adds to this is the respect our program holds with folks in the western U.S. I recently had a rancher in Wyoming ask me if our agency did other things besides snow surveys. I was shocked that he wasn't aware of all the other great programs NRCS offers, and maybe he was aware of them but didn't directly associate them with our agency. This did exemplify just how much regard our

snow survey has for many of the people we serve.

I was at a recent meeting in California where the entire discussion for two days was on snowpack and soil moisture. These topics are quite often the focus of discussions when looking at drought, water supplies and climate change, three critical topics for our agency, department, and the country. It is a good feeling in knowing that what we do matters, that people not only use our data, but depend on our data, and that our program is viewed as a goldmine of information that is important for decision makers considering policies, priorities and directions.

So, in response to the question about whether I like my job, this actually is quite easy to answer. Our work is critical to our country, it is fun, it offers many adventures and experiences, it is something I am proud to speak about and share with others, and it serves millions of people in a positive way. Yes, I love my job.

Mike



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