Peak to Valley Weather

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El Niño? 2014-2015 Winter Outlook

Joe Ramey, General Meteorologist

The Climate Prediction Center (CPC) issued their winter outlook on October 16, 2014 but unfortunately, it's weak in terms of forecast confidence. In the CPC winter outlook charts, Figures 1 and 2, you can see a shift of probabilities towards wetter and cooler along the southern tier of states, and drier and warmer along the

Figure 1: Temperature Outlook for December-January-February

Figure 2: Precipitation Outlook for December-January-February

northern tier. However, eastern Utah and western Colorado are left in a broad swath of "Equal Chances." Basically the CPC illustrates no forecast skill for our winter. How does the CPC produce these forecasts? And is there any way we can gain further insight into our winter?

The Climate Prediction Center uses statistical and dynamical models for seasonal outlooks, but the most powerful seasonal outlook tool is found by looking to the Pacific (see Figure 3 on next page) for hints on winter storm track and intensity. El Niño Southern Oscillation (ENSO) describes the state of the equatorial eastern Pacific. This winter, the southeastern Pacific waters are forecasted to become warmer than normal, a condition that is called El Niño. One of the problems this season is that El Niño has been slow to emerge. Perhaps a weak El Niño will develop, or perhaps the warm equatorial waters will not quite make the El Niño category.

Looking back through the climate record for eastern Utah and western Colorado, El Niños show a shift towards a dry winter but a wet spring season. The most recent seasons similar to this upcoming winter occurred in 2006-2007 and 2003-2004. Both of these seasons were dry.

What does this mean? If we use ENSO and our recent climate history as a guide, the odds this winter present a very slight tilt towards drier than normal. As for temperatures, dry winters tend to be mild winters in the mountains of Colorado. Looking forward on Page 2, you will see illustrations of El Niño patterns and how they may affect Colorado and Utah for the upcoming season.

Continued on next page

El Niño? 2014-2015 Winter Outlook *(continued from front page)*

Joe Ramey, General Meteorologist

Additional winter outlook information is available from this video on the National Oceanic and Atmospheric Administration's (NOAA) climate site.

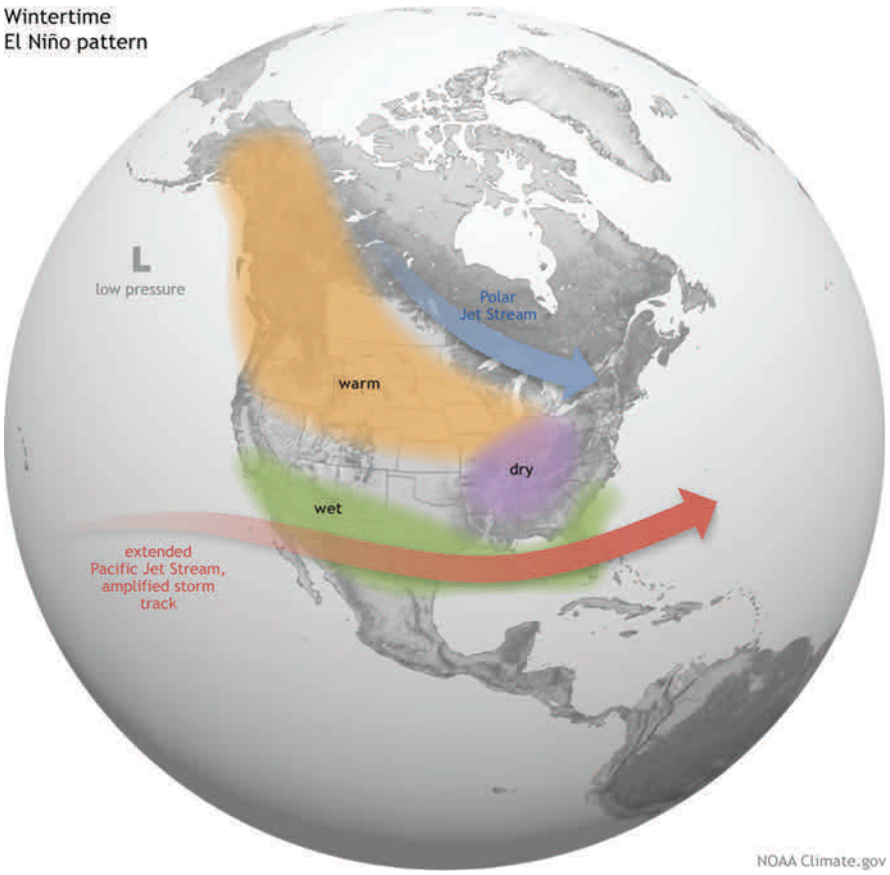


Figure 3: Utah and Colorado are sandwiched between the stronger signals during El Nino winters.

Can you see the similarities to the CPC forecasts in Figures 1 and 2 located on the Front Page?

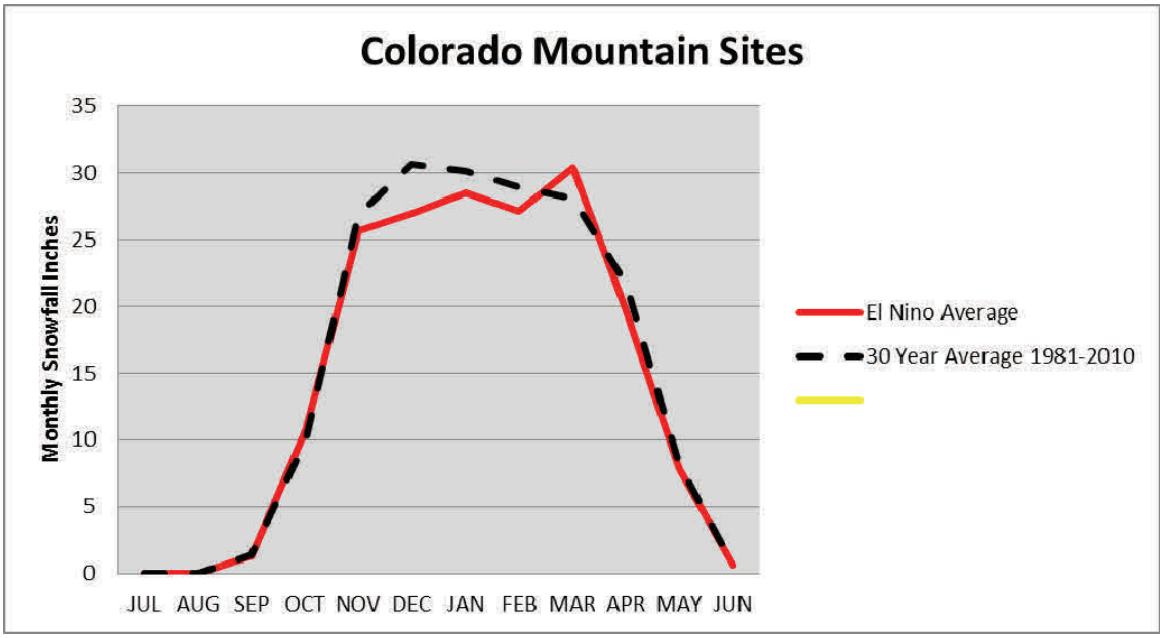


Figure 4: El Nino **winters**, plotted in **red**, tend to be d*rier than normal* in the Colorado Mountains.

Decision Support Services in Mesa County, Colorado

Aldis Strautins, Service Hydrologist and Jim Pringle, Warning Coordination Meteorologist

Shortly before 6 p.m. on the evening of May 25, 2014, 30 million cubic meters of rock and soil broke loose from the Grand Mesa, in western Colorado. The rock and soil traveled nearly three miles, from an elevation of about 10,000 feet down the West Salt Creek basin. The landslide deposited debris more than 100 feet deep along the slide path. Three people are believed to have been caught in the landslide and are still missing. This landslide occurred around the period of peak snowmelt in the mountains of western Colorado.

NWS Grand Junction was notified about the landslide later that evening and started providing support to the Mesa County Search and Rescue Control (SARC) team. Support actions included spot forecasts for the landslide area issued at least twice daily through the first 11 days after the event. **Service Hydrologist**, **Aldis Strautins,** began providing technical assistance to emergency management and other government officials at the site of the landslide early on the morning of May 26. Strautins and **Warning Coordination Meteorologist**, **Jim Pringle,** participated as information resource experts at the emergency operations center in Grand Junction. They provided weather forecast updates at morning and afternoon briefings. Additionally, they provided information regarding instrumentation placed near the landslide, including a portable Remote Automated Weather System (RAWS) station and stream gauges.

The landslide area is considered by geologists and other scientists to be unstable and it is unknown if, or when, another landslide could occur. To further complicate the situation, a small lake formed near the top of the slide behind a large landslide embankment dam and the water level behind the dam has continued to slowly rise.

Mesa County officials and National Weather Service staff continue to monitor instrumentation in the landslide area. They have also made preparations for warning notifications if there are indications of an imminent additional landslide. Warning notification resources for this possibility include All-Hazards NOAA Weather Radio and the Emergency Alert System (EAS).

50 Years of Weather Observations

John Kyle, Data Acquisition Program Manager

Cimarron, Colorado weather observer, ***Mr. William Newberry***, was presented with a 2014 *John Campanius Holm Award*. The prestigious *award* is granted annually to honor cooperative observers for outstanding accomplishments in the field of meteorological observations. Additionally, ***Mr. Newberry*** was the recipient of a *Stoll Award* signifying 50 years of volunteer weather observing.

John Campanius was the first person known to have taken systematic weather observations in the American Colonies and is considered by some to be the first weatherman in America. His record-keeping dates back to 1645 and were published in Sweden in 1702.

The awards were presented by John Kyle (not pictured), the Grand Junction Data Acquisition Program Manager. Accompanying Mr. Newberry is his lovely wife and son Jim.

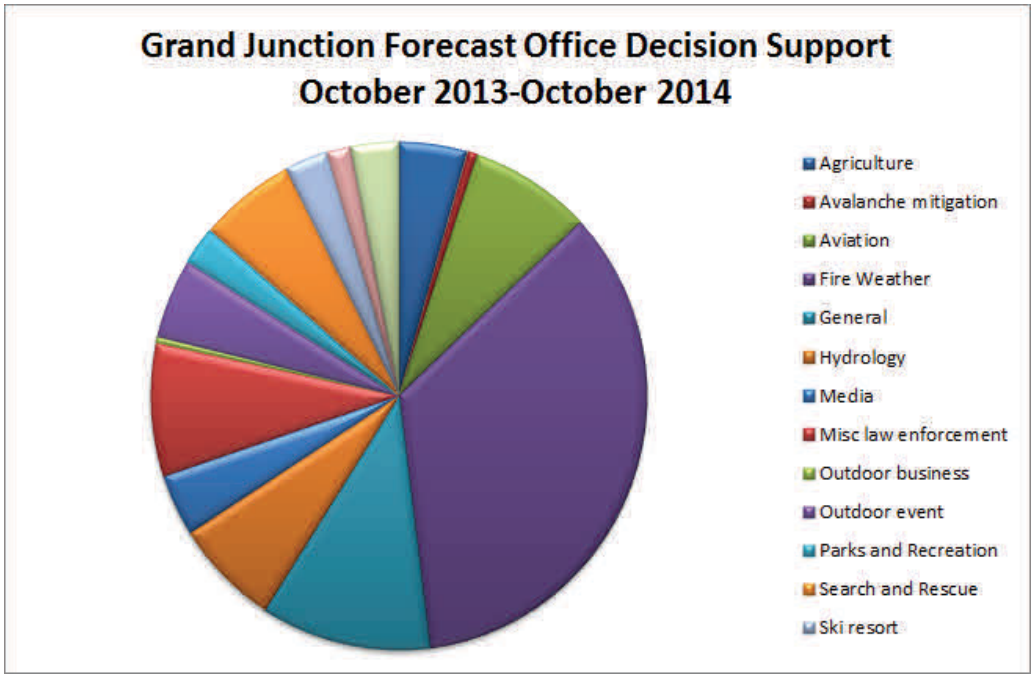
Photo: NWS

Decision Support Services from the Grand Junction Forecast Office

Julie Malingowski, General Meteorologist & Jim Pringle, Warning Coordination Meteorologist

Are you an outdoor event organizer? Do you have an outdoor business? Are you in charge of the safety of a large number people in the great outdoors? The National Weather Service Forecast Office in Grand Junction is available to help you with your weather safety planning for upcoming events. If we know about your event ahead of time, we can contact emergency services personnel (normally the County Sheriff's dispatch office) about severe weather conditions heading your way.

Shown is a graph of the types of Decision Support Service activities that the NWS in Grand Junction has provided over the past 12 months. As you can see from the graph, the greatest percentage of our Decision Support Services, just behind fire weather, is providing weather safety information for outdoor–related events and activities, including parks and recreation. Our goal is to reach out to as many people as possible to advance the National Weather Service's mission to protect life and property.



We are working 24/7 to constantly monitor the weather and update our database that goes out to the world. Did you know that the NWS updates the forecast at least every 3 hours? Did you know that the NWS creates hourly weather graphs and hourly tabular forecasts? You can access these by going to http://www.crh.noaa.gov/gjt/ and clicking on your local point. If you have any questions about this data, feel free to contact our office at 970-243-7007.

Calling All Weather Watchers!

Jim Pringle, Warning Coordination Meteorologist

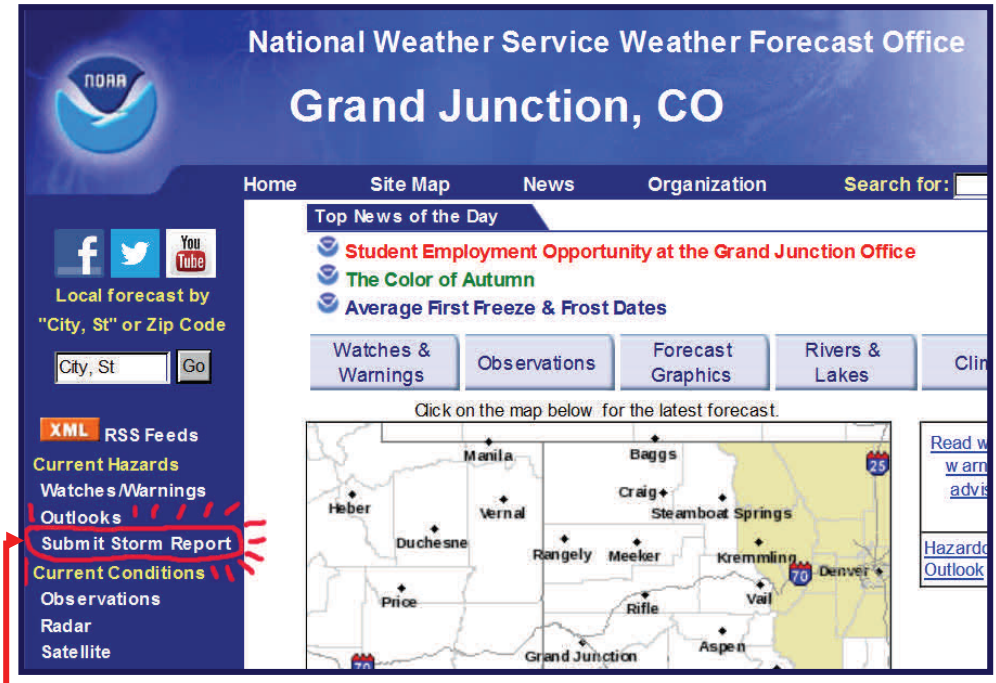
When it is snowing at your location, forecasters at the National Weather Service (NWS) need your reports of how much snow has fallen and the time period in which it has fallen.

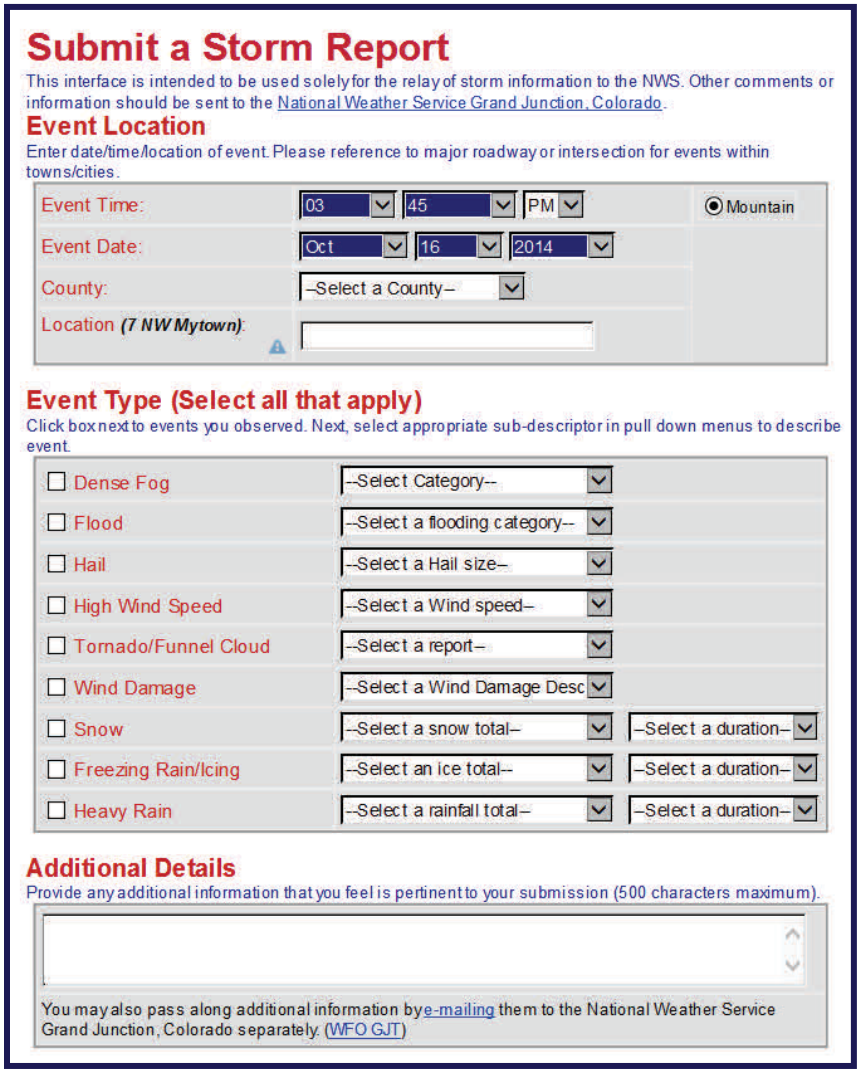
Timely reports of snowfall, strong winds, and reduced visibilities in fog or blowing snow help us in our warning decision making.

Our cooperative weather observers, trained storm spotters, emergency managers and law enforcement personnel are provided access to specialized NWS communications for reporting. However, for the general public there are other options.

How do you send us reports of significant weather?

The newest storm reporting resource available to the general public can be found on the homepage of our NWS websites. Look for the "**Submit Storm Report**" menu option. Clicking on "**Submit Storm Report**", opens a reporting form which allows you to quickly fill in and submit a report to our NWS forecasters. Another storm reporting option for the general public, such as sending storm photos, is our office e-mail address: **wxgjt@noaa.gov**. Any significant weather reports you send us will be greatly appreciated!

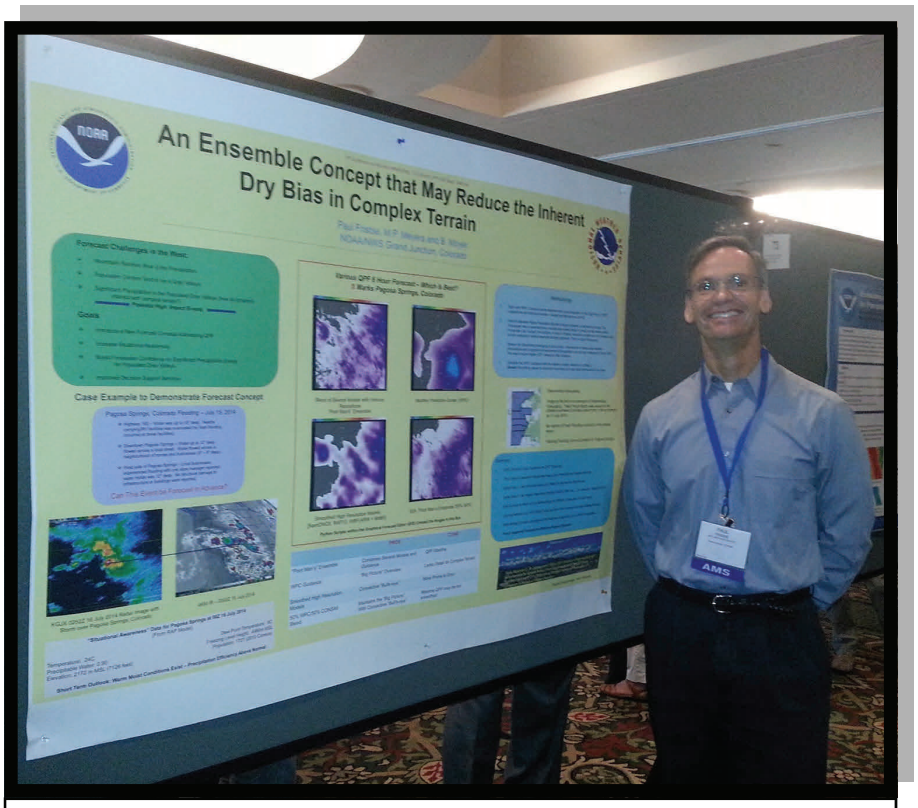




Grand Junction Represents at 2014 AMS Mountain Meteorology Conference

Jeff Colton, Lead Forecaster

This past summer, the Grand Junction National Weather Service (NWS) office was fortunate to participate in the 16th Annual American Meteorological Society (AMS) Mountain Meteorology Conference in San Diego, CA. The Grand Junction staff in attendance included **Science and Operations Officer, Dr. Michael P Meyers, Senior Forecasters Jeff Colton** and **Paul Frisbie,** and **Matthew Aleksa, Meteorological Intern**. They presented several studies along with a worldly consortium of meteorologists whom specialize in mountain meteorology. This conference is perfectly suited to the needs of our office and to our ability to share lessons learned. The exchange between academia and the meteorologists who forecast the daily weather allows computer modeling to be adjusted to fit the needs of the forecaster.



Mr. Paul Frisbie, Lead Forecaster, presents the poster related to his study. *Photo: Jeff Colton*

Dr. Meyers presented a study titled, *"The 2014 Water Year for Western Colorado and Eastern Utah: Impacts and Mitigation"*, **Mr. Colton** presented two studies, *"The Steamboat Springs Smoke-Out: The 15 April 2010 Case Study"* and *"The Steamboat Springs Smoke-Out: The Evolution of Impact-Based Decision Support"*. **Mr. Frisbie** focused on computer modeling adjustments with a study titled, *"An Ensemble Concept that May Reduce the Inherent Dry Bias in Complex Terrain"*. **Mr. Aleksa** focused on a winter storm titled, *"Intense Snowfall Rates over West-Central Colorado during a 2014 Winter Storm"*.

Mr. Matt Aleksa, Meteorological Intern, presents the poster related to his study. *Photo: Jeff Colton*

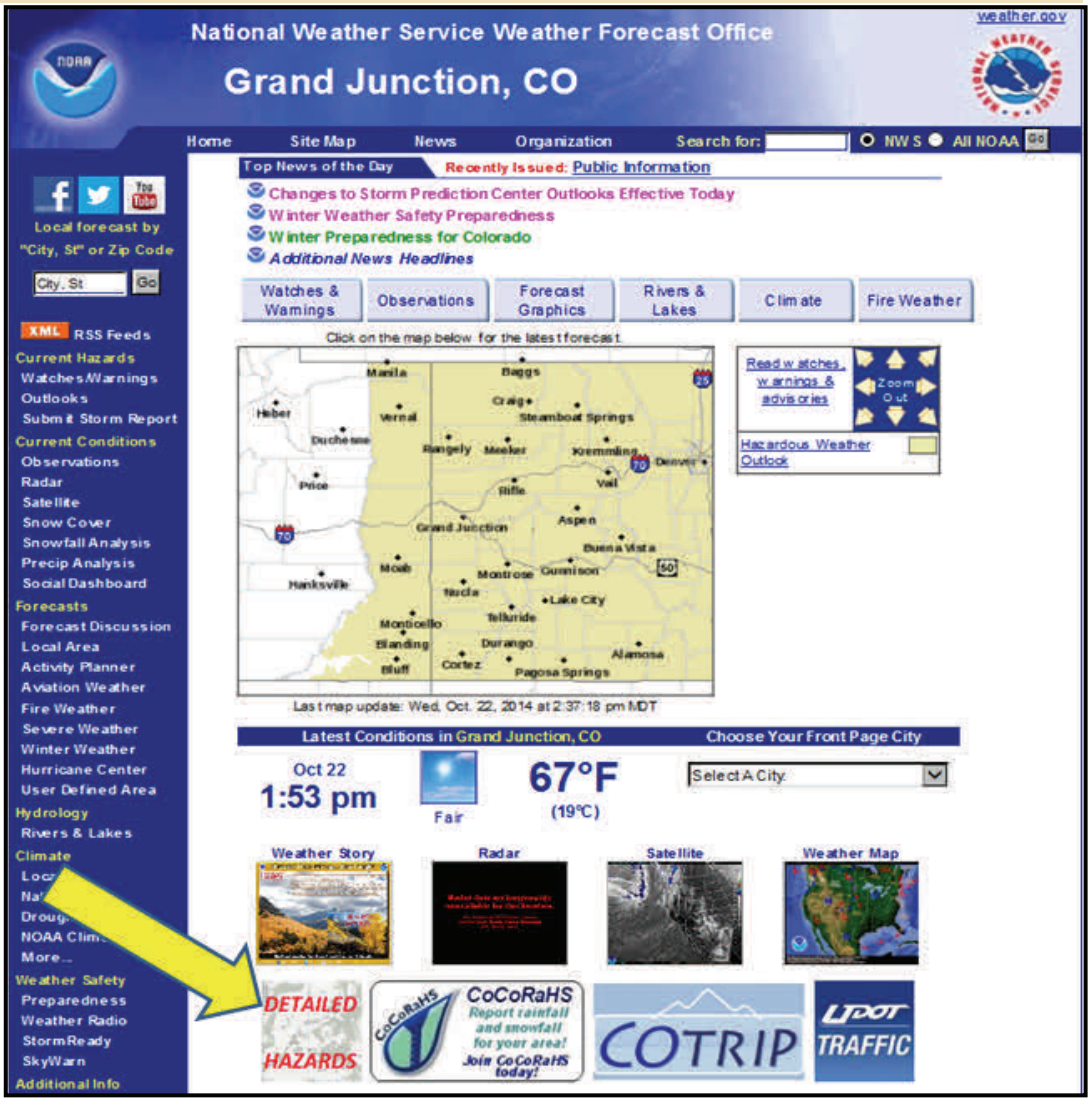
Scientific contributions provided from other members of the staff enhanced the presentation material, despite the fact they were unable to attend the conference.

Detailed Hazards - What is That?

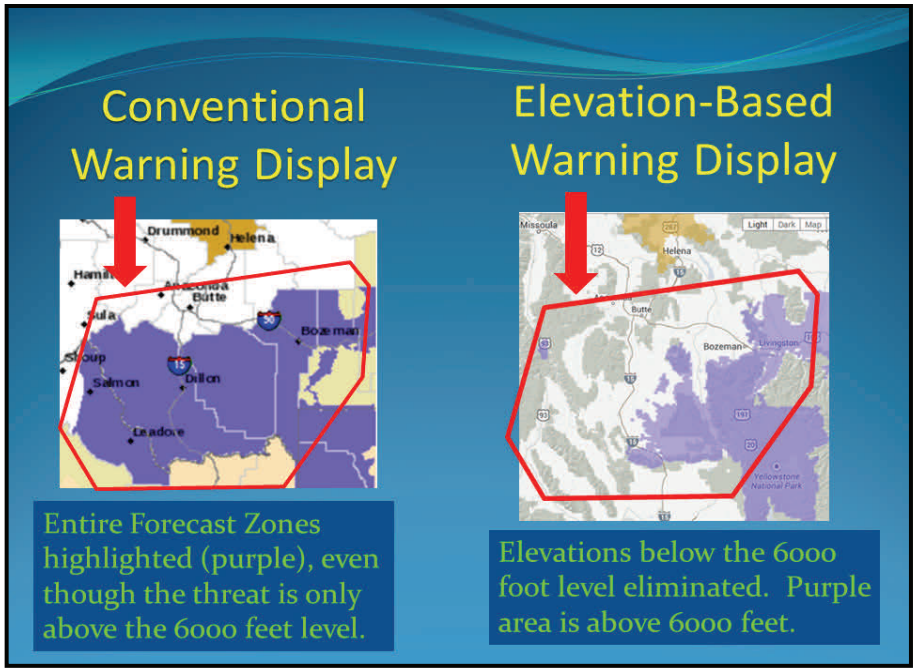
Jim Pringle, Warning Coordination Meteorologist

The **Detailed Hazards** program applies to long-fused watches, warnings, and advisories, such as Winter Storm Warnings, High Wind Warnings, and Red Flag Warnings. The Grand Junction NWS forecast office began participating in this experimental program in December of 2013.

This program allows the forecaster to be more specific about the expected impact areas of these warning program products. Presently, NWS graphics containing this greater detail are only available via the URL linked to the **Detailed Hazards** icon.



The graphic in the lower right corner is an example comparing the existing warning program display (left) with the experimental warning display (right) during an actual winter weather advisory event last winter. It is obvious that the conventional display indicates a large portion of the area outlined by the red polygon to be impacted by the advisory (purple-colored area), when in reality only the purple area shown on the elevation-based display is within the advisory.



Hopefully, the **Detailed Hazards** graphical resource will help you to better assess the area where impacts are expected from a particular watch, warning, or advisory.

Upper Colorado Network (UCN) Upgrade Successful

Ian Fox, Electronics Technician and Aldis Strautins, Service Hydrologist

In June of 1983, widespread flooding occurred throughout the Colorado River Basin, an area of 243,000 square miles spread over Arizona, California, Colorado, New Mexico, Nevada, Utah, Wyoming, and Mexico that drains into the Colorado River. The flooding resulted in 10 deaths, $75,829,000 worth of damage (adjusted for inflation), and ultimately led to the near collapse of the Glen Canyon Dam, which would have caused one of the largest floods in modern history. (http://www.assessment.ucar.edu/flood/flood_table.html)

In response to the flooding, Congress provided funding for the Upper Colorado Network (UCN), a group of approximately 85 sites in the Colorado River Basin, with more than half of the sites located in western Colorado. These sites provide dependable temperature and precipitation data during the spring runoff and summer monsoon seasons. The readings are also essential in river and water supply forecasts for the Upper Colorado River Basin and in the forecasting of flooding.

At the beginning of the UCN program, the majority of the sites were under the National Weather Service's (NWS) domain. Of the 85 sites, 22 supported a joint mission between the NWS and the United States Geological Survey (USGS) to include river gauge data, along with five of the sites measuring pool height data at reservoirs. In the late 1990s, the USGS took control of the river gauge sites to support a separate mission, followed by the United States Bureau of Reclamation (USBR) which took control of three of the five reservoir sites in the early 2000s.

Starting in the early 2000s, the transmission speed that was being used by the UCN system was becoming outdated and needed to be upgraded in order to continue providing crucial data. Existing satellite transmitters were obsolete and in order to support the newer speed, they needed to be replaced. These upgrades ensured the continued operation for a number of UCN sites.

The Grand Junction Weather Forecast Office (WFO) was given a group of speed compliant transmitters in 2013 which were previously purchased for a different program and had never been used at a WFO as a means of remote data transmission. Over the course of several months, Electronics Technicians (ETs) at the Grand Junction WFO learned to operate these transmitters and worked to repurpose them for use with the preexisting equipment at each UCN site. They programmed each unit, engineered a way of interfacing the new transmitter with the existing systems, and preformed diagnostic testing necessary to ensure reliable data collection.

A group of 29 critical sites were identified and technicians were sent throughout western Colorado to perform the installations. After four months, 25 sites were successfully upgraded with the newer satellite transmitters. Along with the upgrade of these sites, equipment for five other sites was assembled and provided to other Colorado River Basin WFOs. In addition to the 25 sites installed, the Grand Junction WFO expects to upgrade a second group in the coming year, along with expanding the capabilities of the newer transmitters.

The UCN program was able to save approximately $85,000 by utilizing preexisting transmitters from storage instead of purchasing new ones. Additional cost savings will come in the form of reduced travel for repairs because the newer transmitters have a higher uptime rate. The satellite transmitters can be programmed to facilitate future data requirements, extending their lifespan for years to come.

The success of the upgrade resulted in WFO ETs, **Bill Beagley, Ian Fox, and Michael Martinez**, receiving awards from NWS's Central Region for excellence in testing, configuration, and ingenuity which allows for the continual retrieval of data being delivered to the NWS and its partners.

Ian Fox, ET, maintains UCN equipment. (L & R)
Photo: Bill Beagley

Mike Martinez, ET, maintains UCN equipment.
Photo: Bill Beagley

Time to "Fall-ow" up on your Rain Gauges and Season Precip Reports

Jim Pringle, Warning Coordination Meteorologist

Wedge Rain Gauges

With the advent of autumn, it is time to make sure that wedge rain gauges are not left outside when temperatures are expected to drop below freezing. Wedge gauges will split at the bottom if water is allowed to freeze in them.

Four-inch Gauges

Those with the four-inch cylindrical rain gauges should remove the inner tube and funnel when freezing temperatures become likely. The nice thing about the four-inch gauge is that the primary four-inch tube is sufficiently sturdy to remain outside throughout the winter.

Photos: CoCoRaHS

Precipitation Reports

The Grand Junction forecasters need your rainfall and snowfall measurements. We very much appreciate the daily reports. However, during heavy snowfall, heavy rainfall, or hail events, **real-time reports** are particularly important to our warning operations. To find out how to join our volunteer storm spotter network, please contact our forecast office at 970-243-7007 or send your request to webmaster@noaa.gov.

Photo: Carl Marcus