



VOLUME  
**X**  
ISSUE 3, SUMMER 2017

# Sage Winds

NATIONAL WEATHER SERVICE BOISE

## AUTUMN Spotter Checklist

### When should you call us?

**SNOWFALL:** 1" or greater.

**HAIL:** Pea size or larger.

**REDUCED VISIBILITY:** from fog, blowing dust, rain, snow.

**WIND:** 40 mph+ or damage.

**HEAVY RAIN:** ½" or greater.

**FLOODING:** Any water where it shouldn't be, or overflowing river/creek.

**TORNADO or FUNNEL CLOUD.**

**TRAVEL PROBLEMS** due to severe or hazardous weather.

**ANY WEATHER RELATED DAMAGE, DEATH, OR INJURY.**

### How to contact us:

1-800-882-1428

@NWSBoise

/NWSBoise

boise.weather@noaa.gov

## Season in Review

Joel Tannenholz

Temperatures averaged much above normal across the region. Some areas endured record heat, particularly in southeast Oregon and the central Idaho mountains. A very warm upper-level high pressure ridge played a leading role, as it became a persistent feature over the Intermountain Region in July and August.

Precipitation was near or above normal across southern Harney and Malheur Counties, Owyhee County, and the Treasure Valley, and below normal elsewhere. It was a particularly dry summer in the Burns area.

Smoke from wildfires became increasingly prevalent across the entire region.

June was unsettled and stormy, with alternating cool and hot periods more characteristic of spring than summer. Overall, it was a warmer than normal.

Precipitation was near or below normal in most areas. A band of above normal rainfall extended from west central Montana across the Central Idaho Mountains to southern Malheur and western Owyhee Counties.

On the 4th, thunderstorms associated with a cold front generated strong damaging winds across much of southwest Idaho in Canyon, Owyhee, Ada, Elmore, and Camas Counties. Gusts exceeding 60 mph were common. Damage included broken tree limbs and uprooted trees, a metal building blown over at the Nampa Sugar Factory, and a capsized boat on Lake Lowell.

On the 9th, a cold upper level low pressure area from the Gulf of Alaska began to invade the Pacific Northwest. By the 12th it was centered over the Idaho-Nevada border. The well-developed and extensive counterclockwise circulation pulled in copious amounts of Gulf of Mexico moisture which crossed the Rockies from eastern Montana. This resulted in moderate to heavy rainfall, mainly overnight from the 11th to the 12th in the above-mentioned band. The Magic Valley got most of their rain on the 13th as the storm moved east.

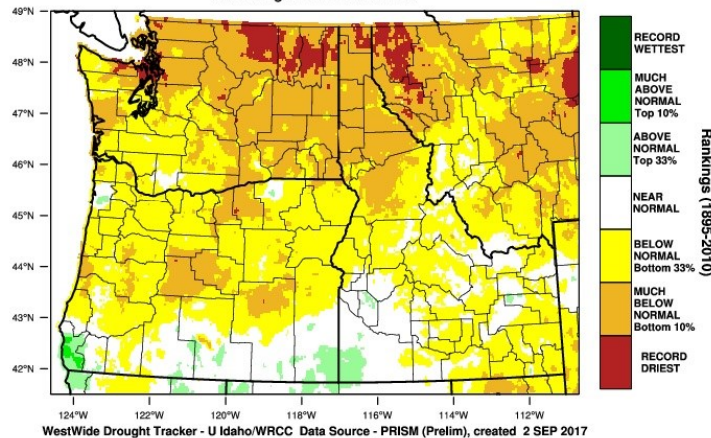
Despite the subtropical origin of this moisture, cold North Pacific air kept temperatures well below normal.

On the 11th, this weather system triggered a thunderstorm with damaging winds in Twin Falls County. Trees were uprooted, resulting in a downed power line near Buhl and damage to a parked vehicle at Filer.

On the evening of the 26th and the early morning of the 27th, a Pacific cold front initiated thunderstorms with strong winds which affected most of eastern Oregon and southwest Idaho. Gusts from 45 to 65 mph were reported from numerous locations. Part of a hotel roof was ripped off near Ontario, a barn collapsed and power poles were knocked down near Jerome, and several trees and power lines were downed near Gooding.

July was one of the warmest on record at many locations.

Pacific Northwest - Precipitation  
June-August 2017 Percentile



WestWide Drought Tracker - U Idaho/WRCC Data Source - PRISM (Prelim), created 2 SEP 2017

Rankings (1895-2010)

Temperatures averaged much above normal across the region.

July is normally one of the driest months of the year, but this year it was even drier. Precipitation was below normal across much of the region. An exception was southern Twin Falls County, where monsoon thunderstorms drifted just far enough north to provide above normal rainfall.

Thunderstorms were mainly dry elsewhere, as most of their rain evaporated in the hot dry air before reaching the ground. But thunderstorms of this variety often produce strong outflow winds.

Thunderstorms on the 9th broke large branches and downed trees in Malheur and Canyon Counties.

On the 15th Twin Falls and Jerome Counties were hit by thunderstorm winds. A 64 mph gust was measured near Jerome. Near Twin Falls, a large section of sheet metal roofing was peeled from a three story motel. Also near Twin Falls, four large pine trees were blown over.

August was another hot month, with temperatures averaging much above normal across eastern Oregon and much of southwest Idaho, with record heat in some areas.

It wasn't quite as dry as July, as more than half of the region received near normal or above normal rainfall, thanks to monsoon thunderstorms. But it was dry compared to precipitation averages for the cooler months.

A temporary respite from the heat arrived on the 13th, when an upper level low pressure trough from the Gulf of Alaska brought much cooler air, lowering highs by 15 to 20 degrees. There was even light

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# National Weather Service Boise Staff

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## Meteorologist Interns

Aviva Braun

Jessica Caubre

rain in some areas. The 14th and 15th were a preview of early fall, with lows on the 15th of 40°F at Baker City and 39°F at McCall.

A second Gulf of Alaska trough pushed inland over western Canada on the 18th and 19th. Cooler air drifting south of the Canadian border kept temperatures relatively cool from the 19th through the 21st. Burns recorded lows of 38°F on the 18th and 20th.

The ridge began to rebuild over the western U.S. on the 22nd and it intensified on the 26th. Summer heat returned, but with it came monsoon moisture and a couple of stormy evenings.

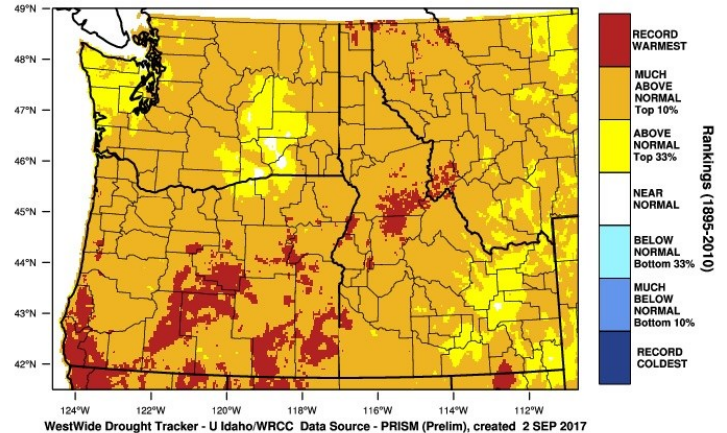
On the 24th, heavy rain fell near Boise, with .35 inch in less than 20 minutes and a total of .42 inch. A wind gust of 58 mph was measured at the Boise Airport.

On the 30th, ahead of a Pacific cold front, damaging thunderstorm winds were reported in Baker, Payette, and Ada Counties.

In Payette County a 74 mph gust was measured at the I-84 and US-95 interchange. At least 6 power poles were down near New Plymouth.

In Boise a gust of 58 mph was measured at the airport. Damage was hit-and-miss around Boise, with large branches broken and trees downed at a few locations, and no damage elsewhere.

Pacific Northwest - Mean Temperature June-August 2017 Percentile



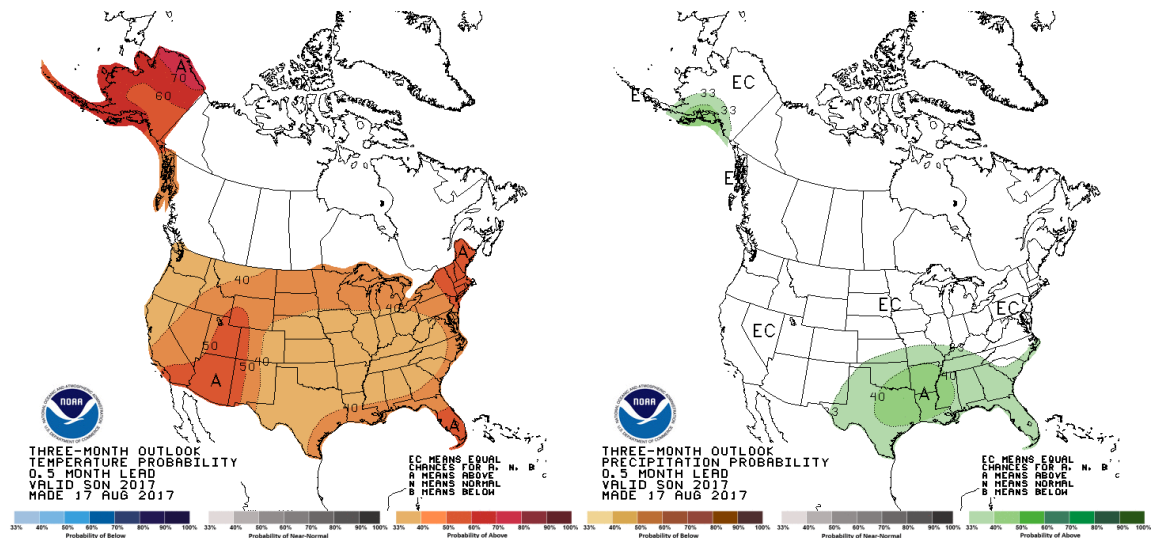
WestWide Drought Tracker - U Idaho/WRCR Data Source - PRISM (Prelim), created 2 SEP 2017

## Fall 2017 Outlook

Stephen Parker

One of the strongest impacts on global weather is whether or not we are in El Niño or La Niña conditions. At the present time, we are in what is called "neutral" conditions, which means that neither one is present. There is a greater than 50% chance of neutral conditions continuing during the fall and winter of 2017-2018. If this occurs, there will be no helpful predictive component from El Niño or La Niña. That will leave forecasters relying on other techniques, and typically this results in lower-confidence forecasts.

The following graphics show the official three-month outlook for the fall of 2017 (Sep-Oct-Nov). The country's temperature outlook is for a better chance of above-normal temperatures, especially in the Four-Corners region, Alaska, southern Florida, and New England.



The country's precipitation outlook is for equal chances of above- and below-normal in most areas, with an area of better chances for above-normal amounts from Texas into the Southeast, and southern Alaska.

For southeast Oregon and southwest Idaho, these charts indicate an approximately 40% better chance of above-normal temperatures and an equal chance of both below-normal and above-normal precipitation.

**Want to help NOAA weather scientists with research?**

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## Meet & Greet

Aviva Braun

We at the National Weather Service (NWS) work hard to not only forecast the weather accurately and get the word out in a timely fashion, but we work hard to facilitate the collection accurate weather data as well. You may wonder what we use this data for and why we always ask our readers to volunteer to make their homes new CoCoRaHS (Community Collaborative Rain, Hail, and Snow Network) sites. To address these questions and speak to the importance of the multiple data collection programs we facilitate, we sat down with our Observation Program Leader (OPL), Dave Decker.

**NWS:** You've been working as NWS Boise's OPL for quite some time. What exactly does this position entail?

**Dave:** My role is to oversee the collection of weather data through a variety of programs, guarantee its quality, and ensure that all data is ingested into our super-computers for usage in a timely manner.

**NWS:** Tell me about the different ways NWS collects data.

**Dave:** Well, there is the upper-air program in which we collect atmospheric data 2 times a day; there's the ASOS network in which we have 7 sites located at airports across the region; there's the COOP program in which we collect temperature and precipitation data at climatologically unique sites across the area; and finally there is the CoCoRaHS program. This is a program that the NWS collaborates with Colorado State University on to collect precipitation data across the nation. I specifically oversee the COOP and CoCoRaHS programs.

**NWS:** The OPL program is pretty hands-on and requires a lot of travel. What are some of the more interesting trips you've taken?

**Dave:** Well, up to about 3 years ago, we used to fly into Middle Fork Lodge, which is a famous lodge on the middle fork of the Salmon River. Many celebrities have stayed there, including President Carter. We no longer have that site though due to its expense, but it was really fun to go there and quite beautiful to see! It was wonderful to fly through the Sawtooths and land on the rocky runways. I love going to the other COOP sites in the mountains, for the scenery, but I also enjoy going to our valley sites and seeing all of the agriculture taking place – it reminds me of Indiana, where I'm from.

**NWS:** Can you tell me about the COOP program? When did it begin and what is its purpose?

**Dave:** The COOP (Cooperative Weather) program began in 1890 with the passage of the Organic Act in which the Weather Bureau was created, before it was called the National Weather Service. There are approximately 8,700 to 8,800 observers across the US Territories, including Guam, Puerto Rico and the Virgin Islands. Each site is located in a unique climatological location so that we can keep records of and better understand the climate of each area. The data collected helps with assessing the needs of each region, and how commerce is affected by the climate, including agriculture. The data collected from these sites also aid in engineering and environmental impact studies, energy and utility planning, and also litigation needs for insurance purposes. All data is sent to and stored at the National Centers for Environmental Information and can be retrieved at any point by any citizen. The first data available from Idaho goes back all of the way to 1910, but there are places along the east coast that go back about 200 years.

There are 55 COOP sites around the region in southwest Idaho and southeast Oregon. We used to have 87 sites, but through the years and due to lack of interest, we have lost a few stations, unfortunately.

**NWS:** We at the Weather Service have many stellar COOP participants, both

individuals and institutions. I know that we are handing out a few awards this upcoming month; would you mind sharing who is set to receive awards this season?

**Dave:** Yeah! We love to highlight those who have worked with us over the years. We are giving out 3 awards this season. The first is Dick Hagermeier Award that will go to Earl Ourada for 45 years of COOP weather observer participation; he's located in the Boise foothills, specifically, site Boise 7N. The second award being given out this season is to the Northside Canal Company in Jerome County for their 100 years of service. Lastly, the Bureau of Reclamation in Cascade, ID is receiving an awards for 75 years of service. We've been lucky enough to be able to award many COOP participants with awards over the years! Last year we awarded the McCall Smoke Jumpers' facility with a 100 years of service award, as well as the New Meadows Ranger Station with a 75 years of service award. These awards just keep coming up and we love recognizing our participants for their dedication to our programs and their service.

**NWS:** You've recently acquired the CoCoRaHS program. Can you describe it for us?

**Dave:** This program is actually quite unique and exciting! While the program is run out of the Colorado State University, we work in collaboration with them to collect precipitation data nation-wide. The most exciting aspect of the program is that all program participants use the same data collection standards that we in the Weather Service use! That way we receive data using the same methodology we use, for example at our COOP sites, therefore ensuring the quality of the observations.

**NWS:** What does it entail to be a CoCoRaHS observer?

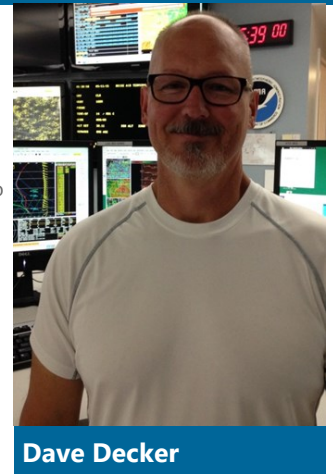
**Dave:** It's so easy to become a CoCoRaHS observer and set up a CoCoRaHS site! All you need is a 4" diameter rain gauge and a snow board (in some cases)! All observers keep track of is rain, snow or hail and input your daily readings online first thing in the morning. If our readers are interested, all program information can be found online at [www.cocorahs.org](http://www.cocorahs.org), or interested parties may contact me at [david.decker@noaa.gov](mailto:david.decker@noaa.gov)!

**NWS:** How do the COOP and CoCoRaHS programs differ?

**Dave:** Anyone interested can become a CoCoRaHS observer. All you need is passion, a rain gauge, a computer, and maybe a snow board. As for the COOP program, this is a bit more intricate. We have to find sites that are geographically and climatologically unique, that do not have COOP sites nearby, and then we need to go out to survey the area and install the equipment. COOP sites collect temperature and precipitation information.

**NWS:** Where could we use more CoCoRaHS sites?

**Dave:** We would love to have more volunteers in southeast Oregon and in Idaho's mountains! It is a great thing to be able to formalize people's weather observations and ingest their data into our computer systems; their data can help our forecasters see what is happening as it occurs.



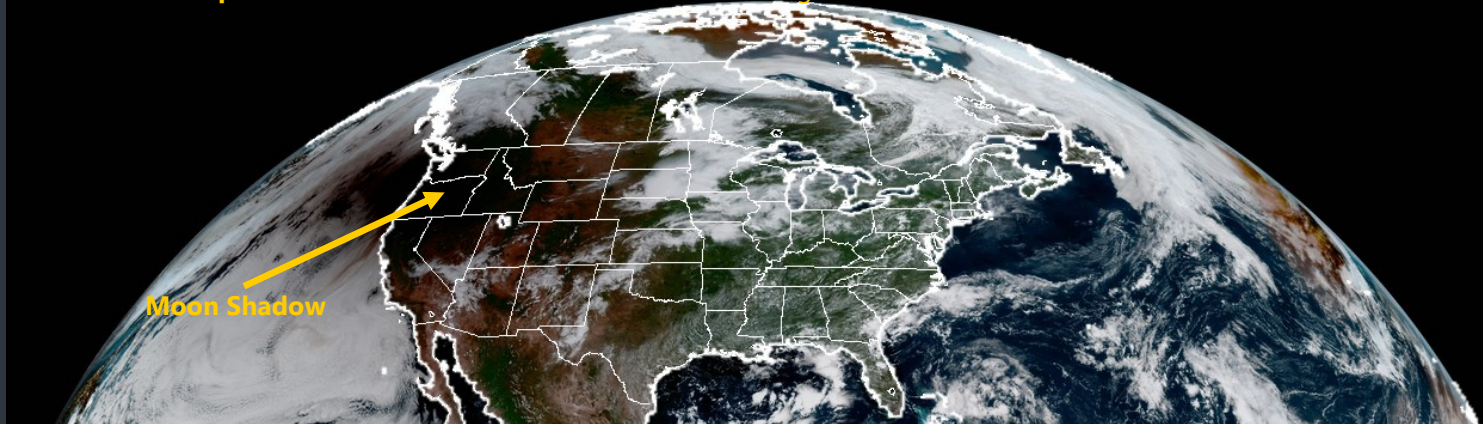
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**NWS:** Can you sum up these programs to entice our readership to become NWS volunteers?

**Dave:** What is so beautiful about these programs is a citizen's ability to help and participate with the National Weather Service with the mutual goal of building a robust and reliable database of the region's weather and climate. With this database available, we can see trends in how our weather may be changing over time. This allows Idaho's citizens to adapt and change with time as necessary, for example with how we address our agricultural needs, or how or where we build our structures. Our resiliency is dependent on our passionate citizens who donate their time to helping us build our national weather database.

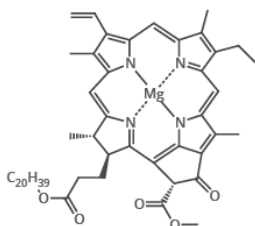
## Total Solar Eclipse as seen from the new GOES 16 Satellite August 21 11:15am MT



# THE CHEMISTRY OF THE COLOURS OF AUTUMN LEAVES



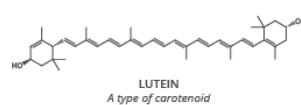
### CHLOROPHYLL



**CHLOROPHYLL A**  
A type of chlorin

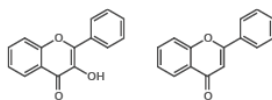
Chlorophyll is the chemical that gives plant leaves their green colour. Plants require warm temperatures and sunlight to produce chlorophyll - in autumn, the amount produced begins to decrease, and the existing chlorophyll is slowly broken down, diminishing the green colour of the leaves.

### CAROTENOIDS & FLAVONOIDS

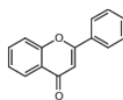


**LUTEIN**  
A type of carotenoid

Carotenoids and flavonoid pigments are always present in leaves, but as chlorophyll is broken down in the autumn their colours come to the fore. Xanthophylls, a subclass of carotenoids, are responsible for the yellows of autumn leaves. One of the major xanthophylls, lutein, is also the compound that contributes towards the yellow colour of egg yolks.

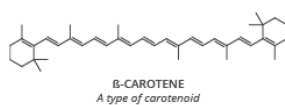


**FLAVONOL**  
(general structure)



**FLAVONE**  
(general structure)

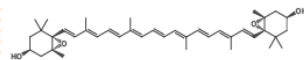
### CAROTENOIDS



**B-CAROTENE**  
A type of carotenoid

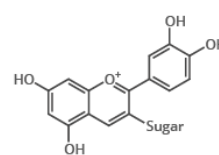
Carotenoids can also contribute orange colours. Beta-carotene is one of the most common carotenoids in plants, and absorbs green and blue light strongly, reflecting red and yellow light and causing its orange appearance. It is also responsible for the orange colouration of carrots.

Carotenoids in leaves start degrading at the same time as chlorophyll, but they do so at a much slower rate; beta-carotene is amongst the most stable, and some fallen leaves can still contain measurable amounts.



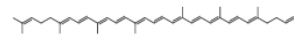
**VIOLAXANTHIN**  
A type of carotenoid

### ANTHOCYANINS & CAROTENOIDS



**ANTHOCYANINS**  
(general structure)

Unlike the carotenoids, anthocyanin synthesis is kick-started by the onset of autumn - as sugar concentration in the leaves increases, sunlight initiates anthocyanin production. The purpose they serve isn't clear, but it's been suggested that they help protect the leaves from excess light, prolonging the amount of time before they fall.



**LYCOPENE**  
A type of carotenoid



## CoCoRAHS observers needed!

Calling all weather enthusiasts in southeastern Oregon and southern Idaho! We need more weather observers interested in taking daily measurements of precipitation or snowfall.

If you would like to participate in CoCoRaHS, please contact us at: [boise.weather@noaa.gov](mailto:boise.weather@noaa.gov) or visit <http://www.cocorahs.org/>

It's hard to believe, but it's time to brush off the snow board and snow stick. Snow measurement time is right around the corner!

## BE PREPARED! Fall Safety Tips

Make sure you and your family are prepared for an emergency, whether it be flash flooding, wildfires, floods, winds, winter storms or power outages. Here is a simple list of what you can do to prepare for an emergency:

- Prepare a **Disaster Supply Kit** with a week's worth of food and water.
- Create a **Family Emergency Plan**, so you know how to communicate to others.
- Obtain a **NOAA Weather Radio**.
- Check [weather.gov](http://weather.gov) every morning before you leave home to make sure you are prepared for what the weather might bring.
- Inspire others to **take action** by showing your friends and family how you are prepared. You can tell them over the phone or in person, or tweet, or post about it.

Visit [www.ready.gov](http://www.ready.gov) for more information.

**Questions? Comments?  
Suggestions?**

Email:  
[boi.spotter@noaa.gov](mailto:boi.spotter@noaa.gov)

## The National Weather Service: Partners for a Weather Ready Nation

Michael Cantin

One of the amazing parts of working for the National Weather Service is the many folks we get to partner with each and every day. As an agency our goal is to build a Weather-Ready Nation, one that is prepared, informed, and able to respond to and recover from weather related hazards. In order to do this we here at the Boise forecast office forge strong bonds with like-minded agencies across southeast Oregon and southwest Idaho.

As we partner with other agencies who share the common mission of protecting lives and property, we are able to combine our resources and expertise to increase awareness and preparedness. This coordination happens throughout the year, not just when hazardous weather arrives.

During the year we routinely meet with partners to collaborate on communication, messaging, and how best deliver weather information when it's needed the most.

Recently, we held a meeting with a variety of our partners, including those from the education, aviation, media, emergency management, and transportation sectors. The group discussed our recent winter and spring season and how we could improve. Earlier in the year we partnered with Idaho's Governor, Butch Otter, and officials from emergency management and the US Corps of Engineers to forecast potential flooding and impacts for the Boise area. It's through these partnerships and strong relationships that we can best serve you and everyone calling southeast Oregon and southwest Idaho home.

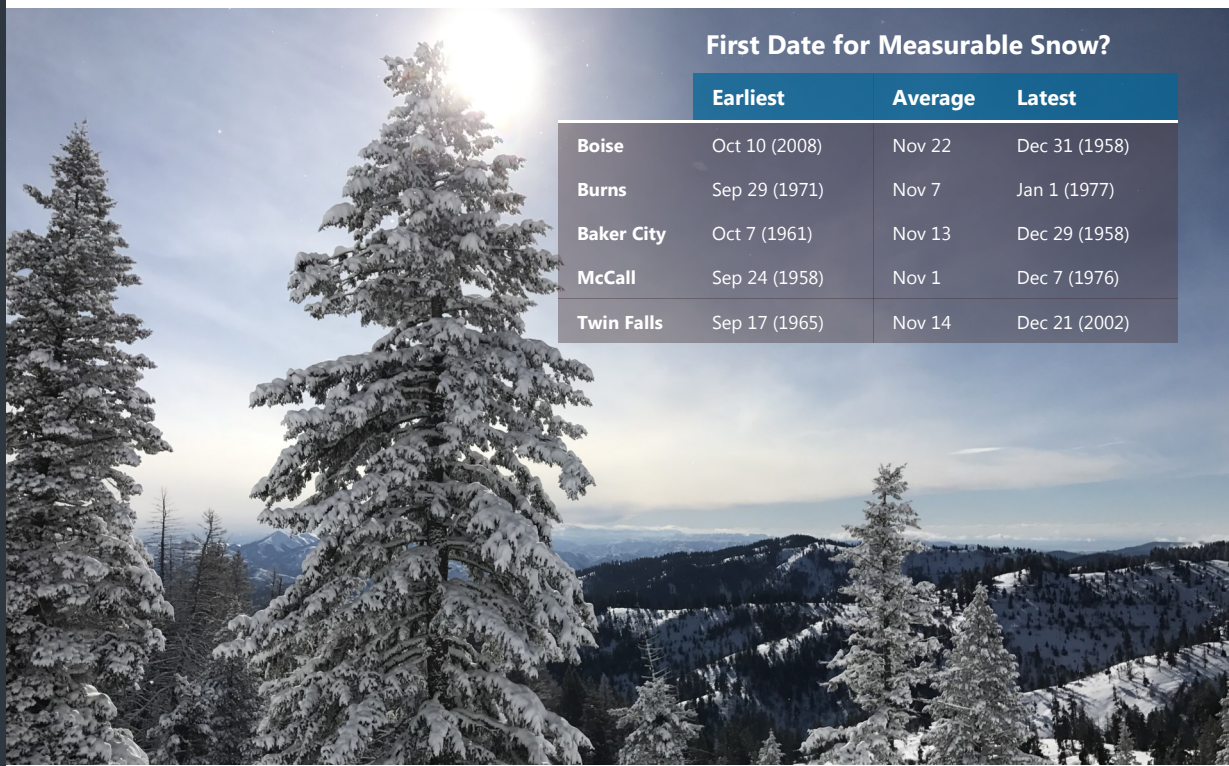


**NWS Boise Warning Coordination Meteorologist addresses the media and Governor Otter about the flood threat for the Boise area in early 2017.**

## Did you Know?

Elizabeth Padian

The earliest winter season measurable snowfall for Boise was October 10, 2008, with 1.7 inches.



### First Date for Measurable Snow?

	Earliest	Average	Latest
<b>Boise</b>	Oct 10 (2008)	Nov 22	Dec 31 (1958)
<b>Burns</b>	Sep 29 (1971)	Nov 7	Jan 1 (1977)
<b>Baker City</b>	Oct 7 (1961)	Nov 13	Dec 29 (1958)
<b>McCall</b>	Sep 24 (1958)	Nov 1	Dec 7 (1976)
<b>Twin Falls</b>	Sep 17 (1965)	Nov 14	Dec 21 (2002)