



# The Inland Northwest Informer

Information For Storm Spotters, Cooperative Observers And Everyone

A Publication Of WFO Pendleton, Oregon

Spring/Summer 2014 - Volume 14

## Record Snow Storm of February 2014

By Mary Wister, Science and Operations Officer

The winter season of 2013-2014 was very active throughout the United States. If you turned on the television to watch the news or searched the Internet, you were likely to see headlines about heavy snow somewhere in the nation. Snow was even reported as far south as Florida in late January. There may have been times when the Pacific Northwest appeared sheltered from the winter's grasp. However, this was not the case in eastern Washington and eastern Oregon in early February when heavy snow was observed in nearly every location of the NWS Pendleton's County Warning Area (CWA).

The prolonged snow event began on February 6, 2014 and continued through February 9, 2014. A moist westerly flow and a series of frontal systems brought widespread precipitation to the region. Due to a very deep cold air mass, precipitation fell as

Location	24-HR Snowfall	Previous Record
* Madras OR	18" on Feb. 8	10" on 2/12/1986
Pelton Dam OR	12" on Feb. 8	7" on 2/8/1975
Monument OR	12" on Feb. 10	8" on 2/4/1979
Condon OR	11.5" on Feb. 8	12" on 2/6/1938

*\*The cooperative observation station in Madras, OR measured an all-time record 24-hour snowfall. Previous record was 14" on January 11, 1998*

Figure 1. 24-hour cooperative observer snowfall reports

snow at all elevations. Several cooperative stations--Monument, Madras, and Pelton Dam--reported 24-hour record snowfall amounts for February (Figure 1, above). Condon, Oregon, also came very close to reaching their 24-hour snowfall record

for February.

The East Slopes of the Oregon Cascades were hit particularly hard by this storm. A moist westerly flow for several days provided significant orographic lift along the Oregon Cascades, thereby bringing steady snow to the east slopes

(Figure 2, below).

Approximately 125 storm reports were submitted during this event. Unfortunately, we will not be able to provide the full list of reports, but selected stations are listed. (Figure 3, page 2) ❖

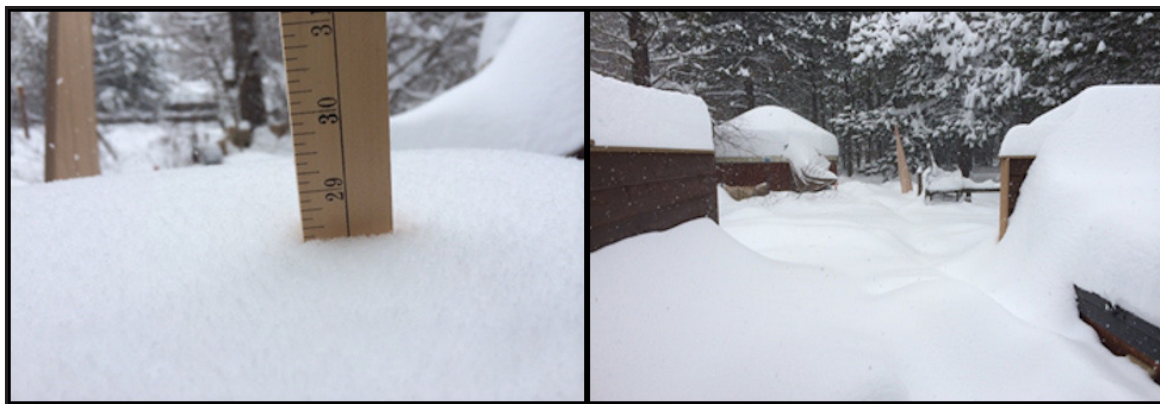


Figure 2. Jefferson County weather spotter Madeline Landis took these photographs at her home in Camp Sherman.

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- Banner Image by T.W. Earle

Figure 3. Storm total (Feb 6-9) snowfall reports from Oregon and Washington spotters, CoCoRaHS and Cooperative Observers.

Locations		Storm Total Snowfall (Inches)	Locations		Storm Total Snowfall (Inches)
Bend	OR	15.0	Pendleton Airport	OR	9.2
7 NE Bend	OR	29.7	2.6 ENE Prineville	OR	17.0
12.6 SSW Canyon City	OR	13.7	Sunriver	OR	23.1
Condon	OR	29.0	Wickiup Dam	OR	11.0
The Dalles	OR	13.0			
9.8N Elgin	OR	17.0	Bickleton	WA	6.1
Flora	OR	13.9	1 WSW Dayton	WA	5.0
Grizzly	OR	15.0	Ellensburg	WA	6.0
2 NW Hermiston	OR	9.0	Goldendale	WA	15.0
Heppner	OR	7.0	Kennewick	WA	6.9
John Day	OR	10.0	Mt. Adam Ranger Station	WA	6.0
2.4 ESE Lostine	OR	10.6	Priest Rapids Dam	WA	7.5
4 NW Meacham	OR	10.0	2 NE Selah	WA	10.0
2 N Madras	OR	16.0	Walla Walla	WA	12.3
Moro	OR	15.0	0.7 WNW White Salmon	WA	14.2
6 ESE Paulina	OR	9.1	Whitman Mission	WA	10.0
Pelton Dam	OR	18.0	Yakima Airport	WA	17.4



From our Facebook page, southwest Bend, Oregon on February 8. Received 23 inches of snow in 48 hours. Photo by Scott Brees.

# Winter 2014 Outlook

By Diana Hayden, Meteorologist

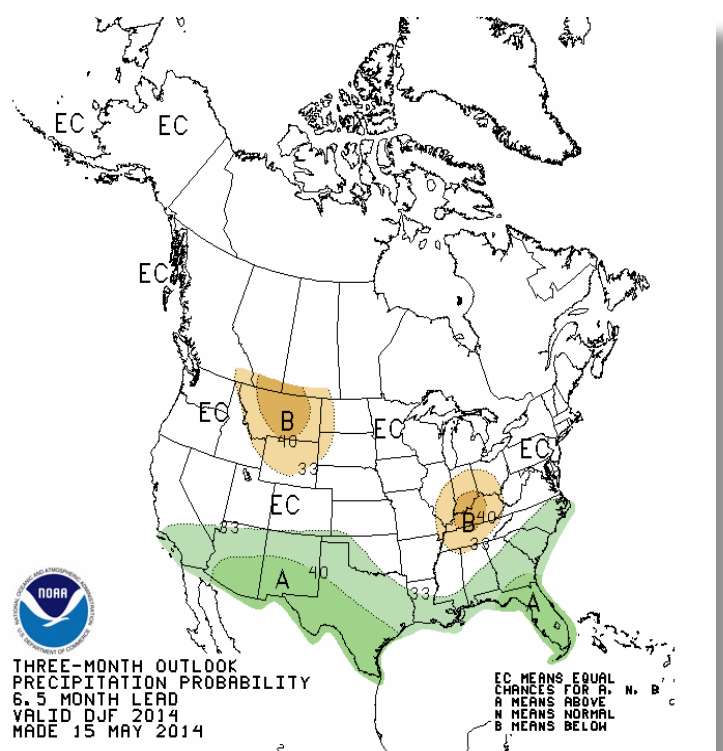
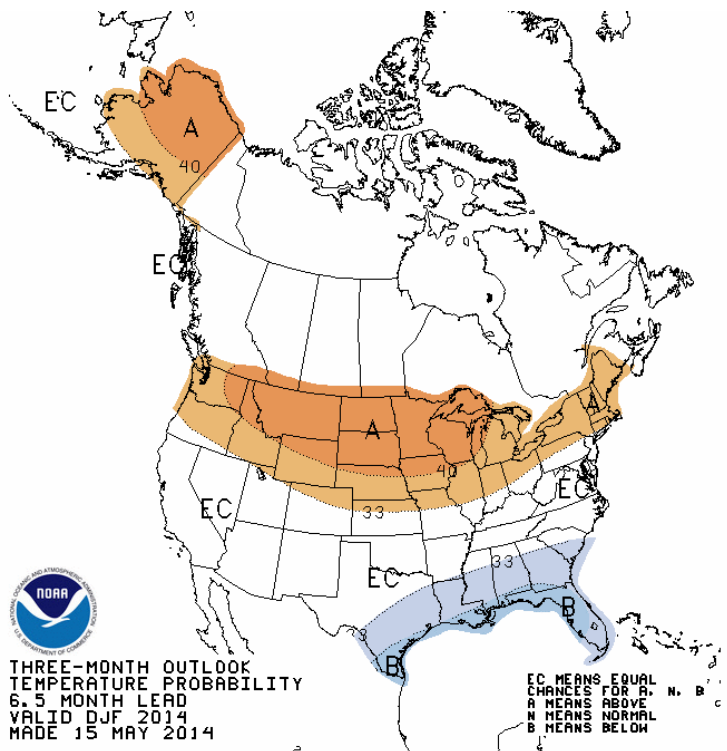
The Climate Prediction Center (CPC) issued an El Niño Watch for the winter of 2014-2015. An El Niño Watch is issued when conditions are favorable for the development of El Niño conditions within the next six months. The definition of "El Niño conditions" is when the one-month positive sea surface temperature anomaly is 0.5 degrees Celsius or greater in the Niño-3.4 region of the equatorial Pacific Ocean and that the 3-month average sea-surface temperature departure will exceed 0.5 degrees Celsius in the east-central equatorial Pacific. To be classified as an El Niño event, there must be 5 consecutive 3-month average sea-surface temperature departures exceeding 0.5 degrees Celsius in the east-central equatorial Pacific. In addition, the atmospheric response typically associated with El Niño must also be observed over the equatorial Pacific Ocean. The current ENSO forecast indicates that there is a greater than 65% chance of an El Niño developing by the winter of 2014-2015.

So what happens during a typical El Niño event? During El Niño, the easterly trade winds that blow across the tropical Pacific Ocean become weaker than usual and sea surface temperatures

in the central and eastern Pacific become warmer than usual. These warmer waters lead to an increase in thunderstorms in the eastern tropical Pacific, contributing at times to well above normal precipitation on the West coast. El Niño events also increase the odds of unusually wet and cold winter across the southern tier of the United States, while the Pacific Northwest tends to experience milder winter temperatures than usual.

Leading up to this winter, Climate.gov will be posting a new blog that will discuss the upcoming El Niño, including forecasts, interviews with scientists and other topics.

The current three-month outlook put out by the Climate Prediction Center for December through February indicates that most of the Pacific Northwest has a greater chance of above normal temperatures and an equal chance of above, near and below normal precipitation. These outlooks take into consideration a wide variety of climate variables, including the El Niño - Southern Oscillation. Please remember, that these are probabilities of averages and that the day-to-day weather can still vary throughout the winter. ❖



# Water Year Precipitation October 2013 - April 2014

By Marilyn Lohmann, Service Hydrologist

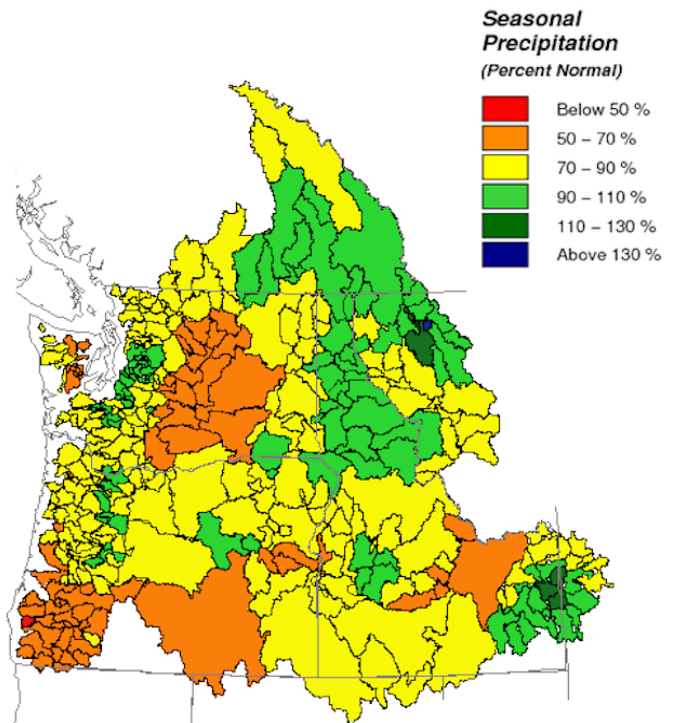
Location	Amount In Inches	Percent of Normal
Bend.....	5.86.....	70%
Condon.....	10.92.....	106%
Dufur.....	9.00.....	83%
Heppner.....	8.06.....	83%
John Day City.....	7.11.....	89%
La Grande.....	15.09.....	140%
Madras.....	6.12.....	82%
McNary.....	3.62.....	57%
Meacham.....	29.65.....	118%
Milton Freewater.....	7.98.....	68%
Mitchell.....	8.74.....	99%
Moro.....	7.51.....	86%
Pelton Dam.....	6.40.....	77%
Pendleton Airport.....	7.34.....	79%
Pilot Rock.....	9.96.....	105%
Prineville.....	5.65.....	77%
Redmond Airport.....	3.80.....	66%
The Dalles.....	10.63.....	85%
Wallowa.....	14.30.....	128%
Wickiup Dam.....	12.79.....	76%
Cle Elum.....	17.98.....	98%
Dayton.....	9.26.....	65%
Ellensburg.....	3.65.....	54%
Hanford.....	3.68.....	71%
Mill Creek Dam.....	11.98.....	87%
Mt Adams RS.....	40.53.....	99%
Sunnyside.....	3.96.....	72%
Whitman Mission.....	7.87.....	75%
Yakima Airport.....	3.62.....	58%

well below normal at the end of December. Amounts ranged from 25 to 50 percent of normal in the Oregon Cascades to 40 to 50 percent of normal in the Washington Cascades. The mountains of northeast Oregon fared better with snow water amounts 65 to 70 percent of normal. The dry conditions continued into January, but were better than the previous months. February was much wetter than normal with most locations seeing amounts 150 to 200 percent of normal. The above normal precipitation continued through March. This allowed the mountain snowpack to rise significantly with the Washington Cascades seeing amounts near normal and southeast Washington and northeast Oregon Mountains saw amounts 80 to 90 percent of normal. The Oregon Cascades saw improvement, but still were below normal with amounts 50 to 60 percent of normal. April saw continued above normal precipitation in the mountain areas, with drier conditions in the lower elevations. ❖

The water year began with very dry conditions in October, November and December. At the end of December, precipitation amounts for the preceding 3-month period were 35 to 75 percent of normal with only extreme northeast Oregon having amounts near normal. Mountain snowpack was also



## Seasonal Precipitation Oct 1, 2013 - Apr 30, 2014



Creation Time: Thursday, May 1, 2014 Northwest River Forecast Center

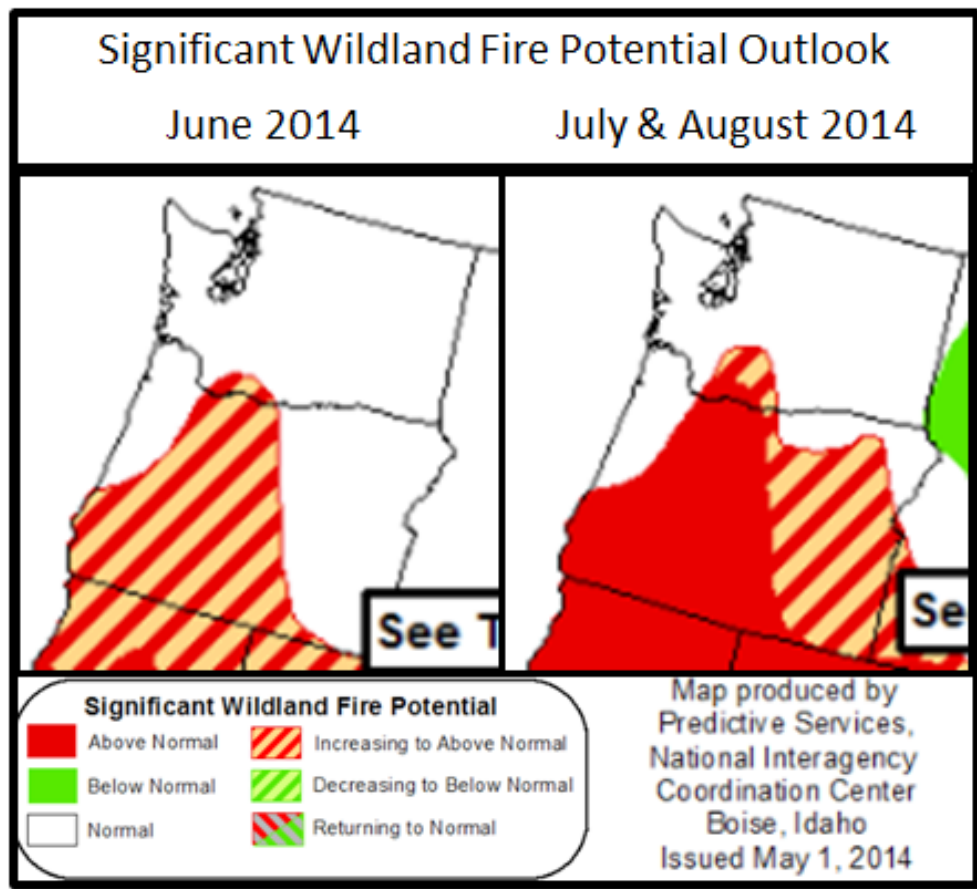


# 2014 Projected Fire Season

By Rachel Trimarco, Incident Meteorologist / Fire Weather Program Leader

The fire season is greatly influenced by weather conditions in the preceding winter and spring. Although temperatures have been near normal, the inland Northwest has had yet another dry winter. Some areas have received less than 50 percent of normal precipitation since the water year began on October 1st. The U.S. Drought Monitor has designated southeast Oregon in a D3 extreme drought, while the rest of Oregon and south-central Washington range from D0 abnormally dry to D2 severe drought. However, substantial rains in February and April have kept the area out of fire season through May. The Climate Prediction Center is calling for temperatures to be above normal in June, but the precipitation outlook is uncertain. If the dry trend continues, fire season could begin weeks earlier than usual with an

increasing risk of fires at higher elevations than usual due to deficient snowpack, especially in portions of southern Oregon. Then in July and August, typical summer heat and dryness coupled with earlier exposure of higher elevation fuels during July lightning events could lead to the remaining geographic area experiencing a greater than usual risk of large, costly wildfires due to drought and low fuel moisture. In summary, the 2014 fire season in the Pacific Northwest has the potential to be more active than previous seasons. For more information about fire weather and wildland fire management please visit the Northwest Interagency Coordination Center (NWCC) website at: [www.nwccweb.us](http://www.nwccweb.us) ❖



For information on ways to help protect your home, property or community from wildland fires, check out [www.firewise.org](http://www.firewise.org)

# SKYWARN Weather Spotter Training, Field Guide, and Additional Training Opportunities

By Alan Polan, Meteorologist, KE4TRR

## SKYWARN Weather Spotter Training

SKYWARN Weather Spotters are the eyes and ears of the National Weather Service. Spotters provide ground truth weather reports of severe or hazardous weather to our weather forecast operations center, thereby updating our forecasters regarding weather impacts to public safety and property. Spotter weather reports help forecasters with warning verification and provide a bench mark comparison with warnings and forecasts.

The map (below) shows where our SKYWARN Weathers Spotters are located in our County Warning Area. Where the green dots on the map are sparse or absent, those are areas where we would especially like to train and recruit new Weather Spotters.

We are always interested in recruiting new SKYWARN Weather Spotters. There are two ways to become a trained Weather Spotter. You may attend a training class or you may get equivalent training online over the Internet.

Most people become Weather Spotters by attending a free SKYWARN Weather Spotter Training Class taught by a NWS Meteorologist Forecaster. Weather Spotters who have previously taken the training class are encouraged to take the class again, as refresher training. NWS Pendleton provides training classes annually - in the spring - in our County Warning Area. As such our spring 2014 training classes will have already been provided by the time you read this article. Our schedule of training classes is available on our website at the following webpage by around mid-February of each year for those classes that we schedule to take place each spring:

[www.wrh.noaa.gov/pdt/weatherSafety/spotter/spotterTraining.php?wfo=pdt](http://www.wrh.noaa.gov/pdt/weatherSafety/spotter/spotterTraining.php?wfo=pdt)

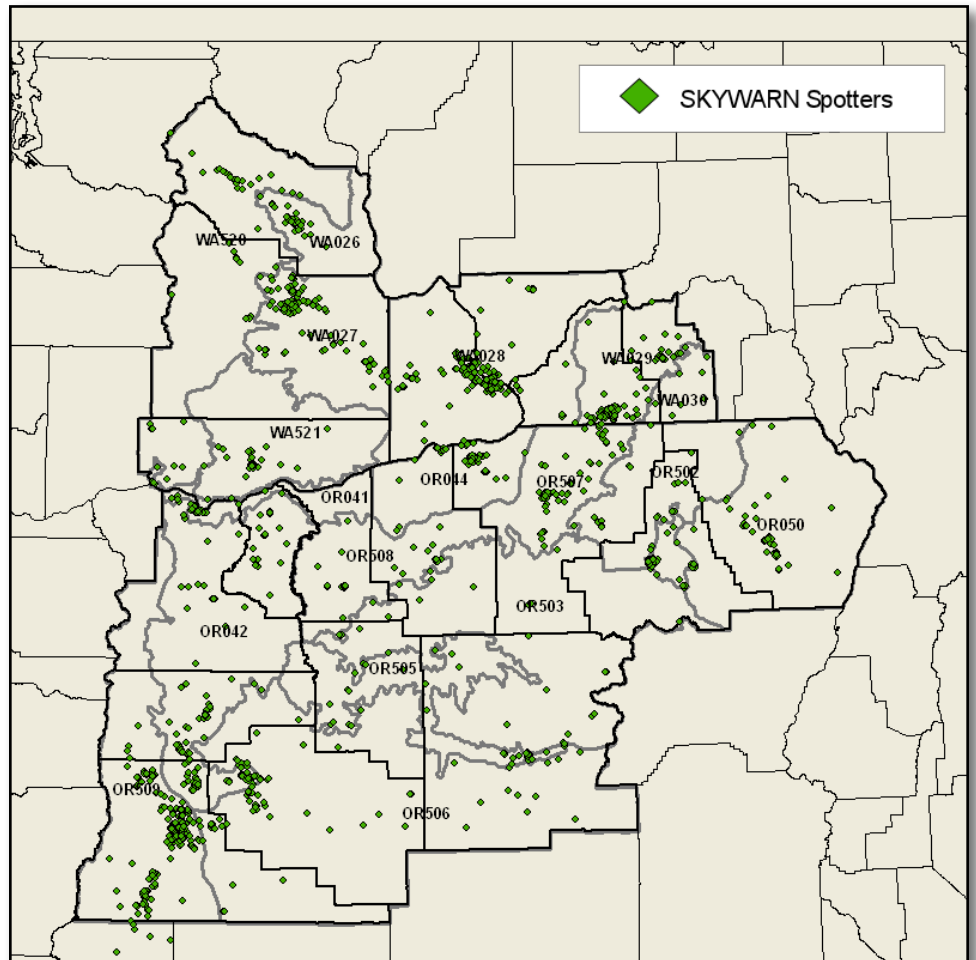
Some people become Weather Spotters by taking a free online Weather Spotter Training Course over the Internet. This is an option for people who

are unable to attend a training class in person. The online SKYWARN Weather Spotter Training Course is at this website: [https://www.meted.ucar.edu/training\\_course.php?id=23](https://www.meted.ucar.edu/training_course.php?id=23) This online training course consists of two modules: "Role of The SKYWARN Spotter" and "SKYWARN Spotter Convective Basics". Completion of both modules will qualify you to become a SKYWARN Weather Spotter.

If you are interested in taking the online SKYWARN Weather Spotter training, please send an email to [alan.polan@noaa.gov](mailto:alan.polan@noaa.gov) and I will send you information about how to get started with the online training.

Dennis Hull, our Warning Coordination Meteorologist, will be happy to answer any questions you may have about getting the training and being a Weather Spotter. You can reach him by email at [dennis.hull@noaa.gov](mailto:dennis.hull@noaa.gov) or call him at 541-276-7832, ext. 223.

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Being a SKYWARN Weather Spotter means that you want to support the NWS mission of protecting lives and property by providing reports of severe or hazardous weather. We may call you or you may call us on our unlisted toll-free phone number. Your involvement as a SKYWARN Weather Spotter is only to the extent you are able. Since severe weather occurs infrequently, your commitment to being a SKYWARN Weather Spotter is not time consuming and it does not require you to send in daily weather reports on a scheduled basis.

### **Weather Spotter's Field Guide**

A new field guide for weather spotters - entitled Weather Spotter's Field Guide: A Guide to Being a SKYWARN Spotter - is now available. Due to budgetary constraints, printed copies of the new field guide were not available as handouts at our Weather Spotter Training Classes taught this spring and in 2013. You may download the new field guide to your computer via the Internet. To access and download the new field guide (size 27 MB), which is in an online PDF file, go to:

<http://www.nws.noaa.gov/om/brochures/SGJune6-11.pdf>

### **Thunderstorms, Tornadoes, Lightning - A Preparedness Guide: (size 14 MB)**

<http://www.lightningsafety.noaa.gov/resources/ttl6-10.pdf>

### **Flood Safety Rules: (size 6.2 MB)**

[http://tadd.weather.gov/resources/TADD\\_6\\_Arial.pdf](http://tadd.weather.gov/resources/TADD_6_Arial.pdf)

### **Snow Measurement Guidelines for Weather Spotters**

NWS Pendleton issues Winter Storm Watches and Winter Storm Warnings for heavy snow. As such we would like our weather spotters to be familiar with simple procedures for accurate snow measurement. We appreciate weather spotter reports of snow accumulations when heavy snowfall is occurring or has occurred. You can go to the following website to download a PDF file (size 300 KB) that contains NWS snow measurement guidelines:

[http://www.nws.noaa.gov/om/coop/reference/Snow\\_Measurement\\_Guidelines.pdf](http://www.nws.noaa.gov/om/coop/reference/Snow_Measurement_Guidelines.pdf)

### **The Snow Booklet**

The Colorado Climate Center has a wonderful booklet that covers various aspects of snow in the United States. The booklet's title is The Snow Booklet - A Guide to the Science, Climatology, and Measurement of Snow in the United States. The Snow Booklet is available in an online PDF file via the Internet and is

free for downloading to your computer. The booklet explores the problems and challenges in measuring snow.

This website has a concise overview of The Snow Booklet with the Table of Contents: (size 25 MB)

<http://ccc.atmos.colostate.edu/snowbooklet.php>

Download the online PDF file that contains The Snow Booklet - A Guide to the Science, Climatology, and Measurement of Snow in the United States.

<http://ccc.atmos.colostate.edu/pdfs/snowbook.pdf>

### **Jetstream – An Online School for People Interested in the Weather**

Jetstream is a National Weather Service website designed to help teachers, emergency managers, or anyone else who is interested in learning more about weather and weather safety. Think of it as an online weather school where you may go to broaden your understanding of the processes that influence the weather and the impacts that weather has on our lives. All website content and articles are free for your perusal. Here's where to go to access the Jetstream online school:

<http://www.srh.noaa.gov/jetstream/>

### **Thunderstorm Basics**

The following webpage on the Jetstream website reinforces the training about the thunderstorm life cycle, the categories of thunderstorms, and the thunderstorm hazards that are covered in our live Weather Spotter Training Class:

[http://www.srh.noaa.gov/jetstream/tstorms/tstorms\\_intro.htm](http://www.srh.noaa.gov/jetstream/tstorms/tstorms_intro.htm)

To all of our weather spotters, Thank You! We greatly appreciate your support of NWS Pendleton's SKYWARN Weather Spotter Program! ❖



## Severe Weather Comes In Many Forms



*Dust storm west of Walla Walla WA, August 2005*



*Tornado damage southeast of Adams OR, May 2009*



*Downburst damage south of Interstate - 84, May 2006*



*Heppner OR flash flood, June 14, 1903*



*Hail in Finley WA, July 2012*



*Hail in Sunnyside WA, July 2012*



# Photo Album



*A flock of sheep graze along the banks of the Umatilla River in Pendleton OR. Photo by D. Coonfield.*

*Sulphur Lupine wildflowers and sunset over the Columbia Basin. Photo by T.W. Earle.*



*Spectacular sunset from Hermiston, Oregon. Photo by D. Hayden*



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