



Natural Resources Conservation Service
P.O. Box 2890
Washington, D.C. 20013

Weekly Report - Snowpack / Drought Monitor Update **Date: 25 September, 2008**

SNOTEL SNOWPACK AND PRECIPITATION SUMMARY

Temperature: SNOTEL and ACIS-day station average temperature anomalies were highest (positive departures) over the Northern Rockies and lowest (negative departures) over the Sierra (Fig. 1). Specifically, the greatest positive temperature departures occurred over eastern Montana (>+6F) and greatest negative departures occurred over Northern California (<-4F) (Fig. 1a).

Precipitation: Preliminary precipitation totals for the 7-day period ending 24 September shows areas of heavy precipitation over portions of Idaho and eastern Washington-Oregon while dry conditions prevail over much of California, Nevada, and the 4-Corners States (Fig. 2).

Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2008 Water Year that began on October 1, 2007 shows above normal totals over northeastern Wyoming, parts of the Snake and Columbia River Basins in Washington, Oregon, and Idaho, and over parts of Arizona, New Mexico and Colorado. Parts of Nevada and Idaho are experiencing significant shortfalls. For precipitation totals, departures, and percent of normal for several time periods see: <http://water.weather.gov/>.

WESTERN DROUGHT STATUS

The West: Beneficial rains in recent weeks have given much of Montana positive precipitation departures at many time scales, from month-to-date for September back to 6 months. Soil moisture anomalies and the Vegetation Drought Response Index were normal to wet across most of the state, with dry areas remaining mainly in the corners. D1 was pulled back in northeast Montana and D0 was broken up into several sections. D0 remained in the southwest, northwest, and north central regions. Growing agricultural concerns resulted in the change of the H impacts designator to AH in the northeast Montana D3-D0 area. Some farmers in Sheridan County in extreme northeast Montana had only 4 bushels of wheat per acre, which was not enough to harvest.

Elsewhere in the West, D2 was removed from southwest Wyoming where the precipitation deficits and other indicators no longer supported a drought designation of that severity. Beneficial 1-inch-plus rains eliminated precipitation deficits back to 90 days, so D1 was shaved back along central parts of the Oregon-Idaho border. Continued dryness prompted the slight expansion of D1 into northeast Nevada to bring the depiction more in line with the Standardized Precipitation Index, soil moisture, and other indicators. D2 expanded in southern California and an A impacts designator was added over San Diego county to reflect growing agricultural impacts. The county has received only 15% of normal rainfall between March-June 2008 with over 47% loss of native pasture.

A sliver of D3 was added to northern California to reflect worsening conditions for some economic sectors. Statewide, 90% of California's pasture and range land was in poor to very poor condition. In northern California, farmers and ranchers were experiencing grazing conditions that were extremely impaired from the lack of moisture in March and April, stock

Weekly Snowpack and Drought Monitor Update Report

ponds were all almost empty, springs were drying up at a fast pace, and ranchers were hauling water. Dire conditions were evident in many indicators, including the Standardized Precipitation Index, streamflow, soil moisture, and the Vegetation Drought Response Index. An August 22 state Department of Water Resources report noted that several northern California reservoirs were around 50% of average, or about 33% of capacity, and the state was projecting that by September 30 Lake Oroville would reach its lowest carryover storage since the drought of 1977, and perhaps reach a new record low by the end of the year. But, drought impacts in California vary significantly with sector: some sectors such as ranchers and farmers were suffering significantly, while other sectors were not as severely impacted, with some crops reporting record harvests. The USDA National Agricultural Statistics Service (NASS) reported that irrigated crops (such as field, fruit, nut, and vegetable crops) were still being harvested and no problems were reported, and irrigated pastures were in good condition, but dryland pasture and rangeland forage continued to decline with poor to very poor conditions reported in most areas, lower-elevation water sources continued to dry out, and herd reduction continued in some areas due to the poor feed and water conditions. The low reservoir levels were the result of below-normal precipitation as well as water management practices. On the one hand, some drawn down has occurred for regulatory issues dealing with mandated releases for fisheries concerns. On the other hand, the last 2 years have had below average precipitation (about 70% of average) in the northern Sierra, according to an 8-station index. But, regardless of the reason for the low reservoir levels, the fact that they are so low and are projected to reach record or near-record levels is significant. The D3 that was added to northern California around the region of the Folsom, Oroville, and Shasta reservoirs reflects these hydrologic concerns as well as the major impacts to the non-irrigated economic sectors. Author: Richard Heim, National Climatic Data Center, NOAA.

A comprehensive narrative describing drought conditions for the nation can be found at the end of this document.

DROUGHT IMPACTS DEFINITIONS (<http://drought.unl.edu/dm/classify.htm>)

The possible impacts associated with **D4 (H, A)** drought include widespread crop/pasture losses and shortages of water in reservoirs, streams, and wells creating water emergencies. The possible impacts associated with **D3 (H, A)** drought include major crop/pasture losses and widespread water shortages or restrictions. Possible impacts from **D2 (H, A)** drought are focused on water shortages common and water restrictions imposed and crop or pasture losses likely. The possible impacts associated with **D1 (H, A)** drought are focused on water shortages developing in streams, reservoirs, or wells, and some damage to crops and pastures (Figs. 3, 3a, and 3b).

SOIL MOISTURE

Soil moisture (Figs. 4a and 4b), is simulated by the [VIC macroscale hydrologic model](#). The detailed, physically-based VIC model is driven by observed daily precipitation and temperature maxima and minima from approximately 2130 stations, selected for reporting reliably in real-time and for having records of longer than 45 years (and various other criteria).

OBSERVED FIRE DANGER CLASS

The National Interagency Coordination Center provides a variety of products that describe the current wildfire status for the U.S. - http://activefiremaps.fs.fed.us/lq_fire2.php. The latest Observed Fire Danger Class is shown in Figs. 5 shows the current active wildfires across the West - <http://geomac.usgs.gov/>.

U.S. HISTORICAL STREAMFLOW

This map, (Fig. 6) shows the 7-day average streamflow conditions in hydrologic units of the United States and Puerto Rico for the day of year. The colors represent 7-day average

Weekly Snowpack and Drought Monitor Update Report

streamflow percentiles based on historical streamflow for the day of the year. Thus, the map shows conditions adjusted for this time of the year. Only stations having at least 30 years of record are used. Sub-regions shaded gray indicate that insufficient data were available to compute a reliable 7-day average streamflow value. During winter months, this situation frequently arises due to ice effects. The data used to produce this map are provisional and have not been reviewed or edited. They may be subject to significant change.

http://water.usgs.gov/cgi-bin/waterwatch?state=us&map_type=dryw&web_type=map.

STATE ACTIVITIES

State government drought activities can be tracked at the following URL:

<http://drought.unl.edu/mitigate/mitigate.htm>. NRCS SS/WSF State Office personnel are participating in state drought committee meetings and providing the committees and media with appropriate SS/WSF information - <http://www.wcc.nrcs.usda.gov/cgibin/bor.pl>. Additional information describing the products available from the Drought Monitor can be found at the following URL: <http://drought.unl.edu/dm/>

FOR MORE INFORMATION

The National Water and Climate Center Homepage provide the latest available snowpack and water supply information. Please visit us at <http://www.wcc.nrcs.usda.gov>. This document is available from the following location on the NWCC homepage -

<http://www.wcc.nrcs.usda.gov/water/drought/wdr.pl>

This report uses data and products provided by the Interagency Drought Monitor Consortium members and the National Interagency Fire Center.

/s/ NOLLER HERBERT
Director, Conservation Engineering Division

Weekly Snowpack and Drought Monitor Update Report

SNOTEL (solid) and ACIS (dot-filled) Networks 7-Day Average Temperature Anomaly (Degrees F)

Sep 24, 2008

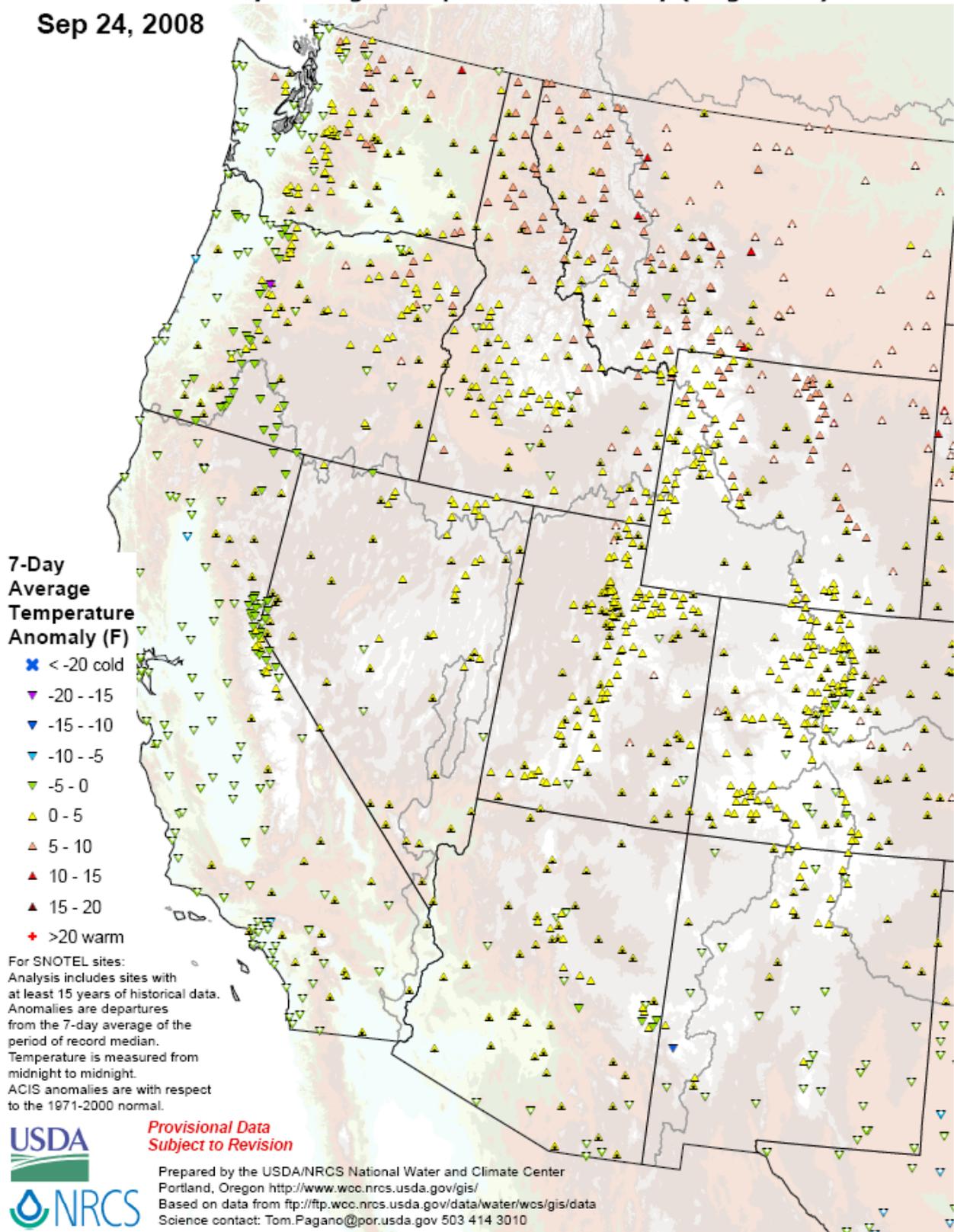
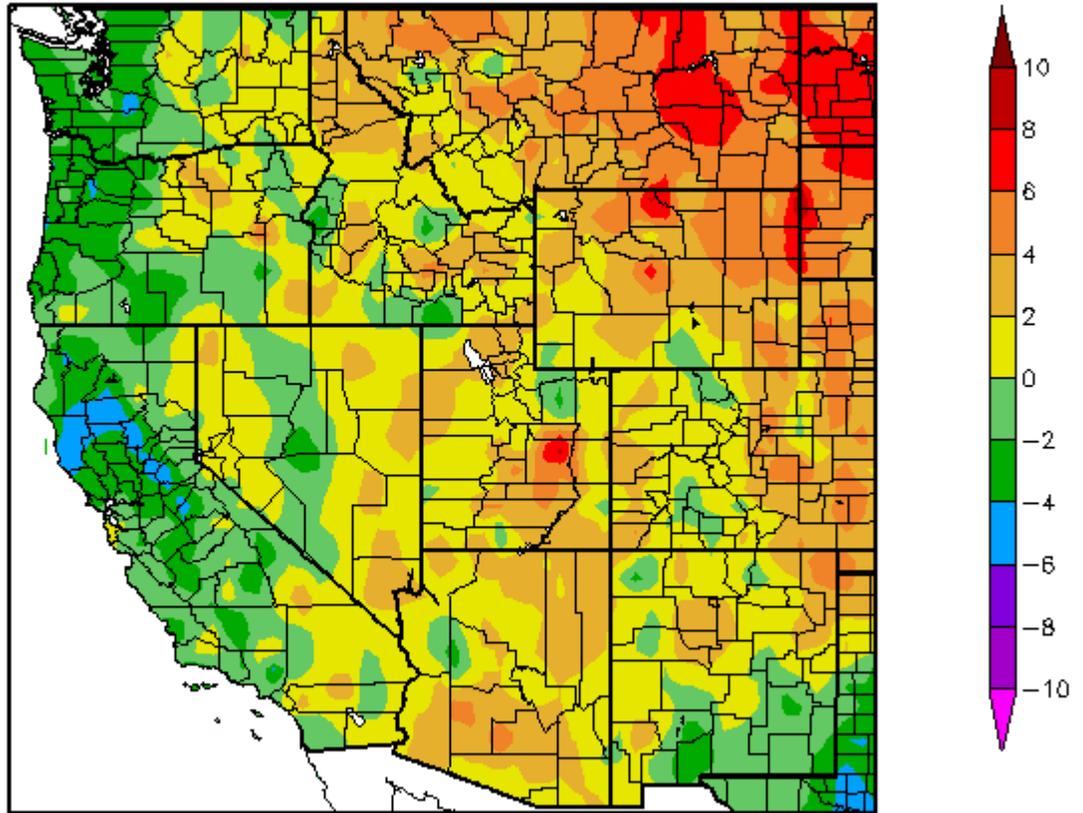


Fig. 1. SNOTEL and ACIS-day station average temperature anomalies were highest (positive departures) over the Northern Rockies and lowest (negative departures) over the Sierra.

Ref: <ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/WestwideTavg7dAnomalyAcis.pdf>

Departure from Normal Temperature (F)
9/18/2008 – 9/24/2008



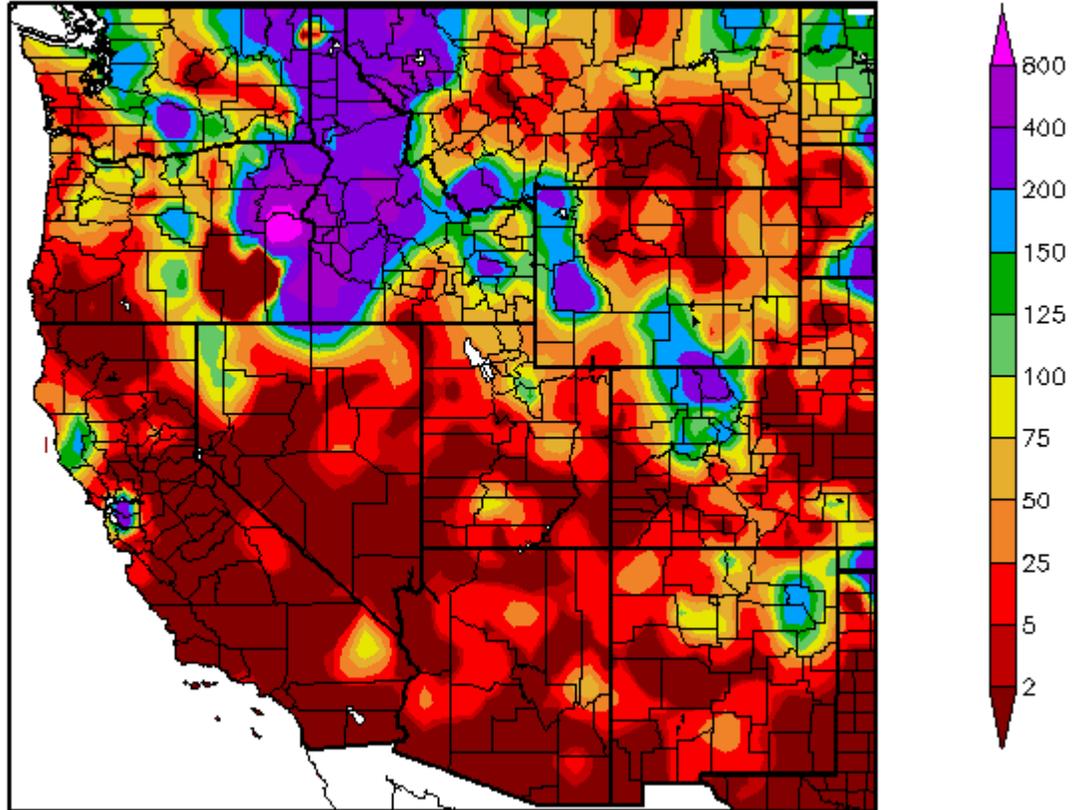
Generated 9/25/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 1a. ACIS 7-day average temperature anomalies: Greatest positive temperature departures occurred over eastern Montana (>+6F) and greatest negative departures occurred over Northern California (<-4F).

Ref: http://www.hprcc.unl.edu/maps/current/index.php?action=update_product&product=TDept

Percent of Normal Precipitation (%)
9/18/2008 – 9/24/2008



Generated 9/25/2008 at HPRCC using provisional data.

NOAA Regional Climate Centers

Fig. 2. ACIS 7-day average precipitation anomaly: Preliminary precipitation totals for the 7-day period ending 24 September shows areas of heavy precipitation over portions of Idaho and eastern Washington-Oregon while dry conditions prevail over much of California, Nevada, and the 4-Corners States.

Ref: http://www.hprcc.unl.edu/maps/index.php?action=update_product&product=PNorm

Weekly Snowpack and Drought Monitor Update Report

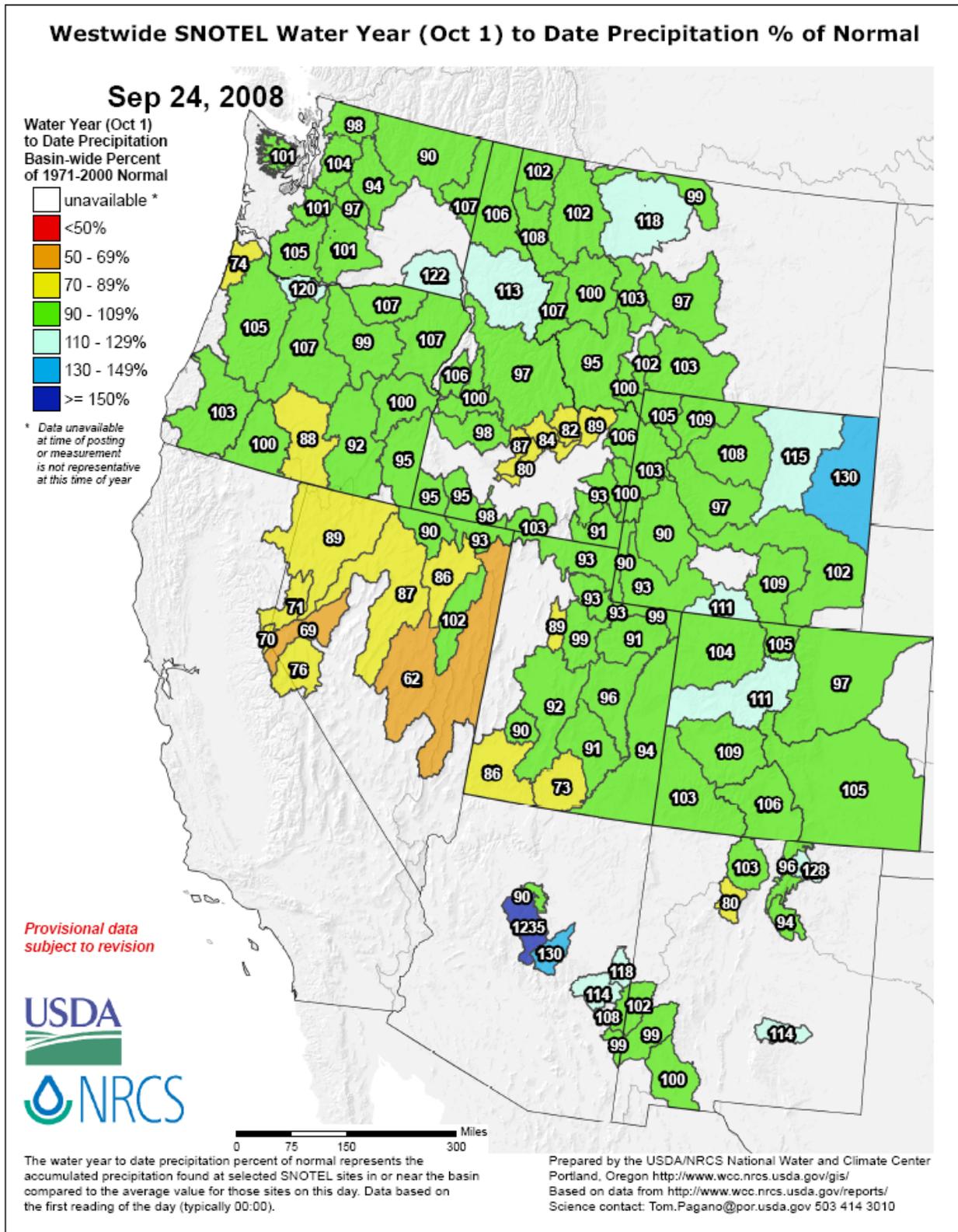
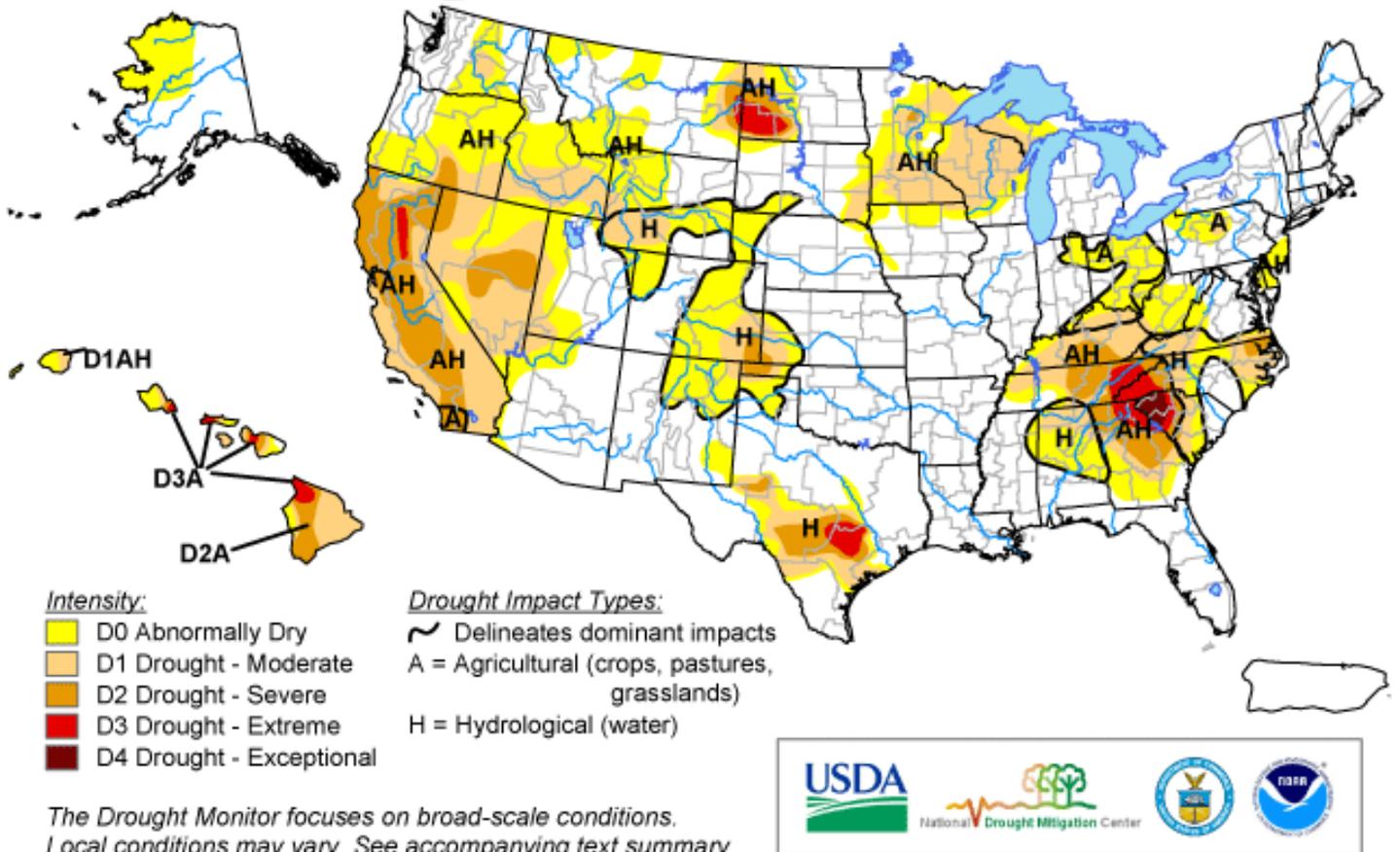


Fig 2a. Seasonal precipitation (rain & snow water equivalent) as a percent of normal for the 2008 Water Year that began on October 1, 2007 shows above normal totals over northeastern Wyoming, parts of the Snake and Columbia River Basins in Washington, Oregon, and Idaho, and over parts of Arizona, New Mexico and Colorado. Parts of Nevada and Idaho are experiencing significant shortfalls.

Ref: ftp://ftp.wcc.nrcs.usda.gov/data/water/wcs/gis/maps/west_wytdprecpcnormal_update.pdf

U.S. Drought Monitor

September 23, 2008
Valid 8 a.m. EDT



<http://drought.unl.edu/dm>

Released Thursday, September 25, 2008

Authors: Richard Heim/Liz Love-Brotak, NOAA/NESDIS/NCDC

Fig. 3. Current Drought Monitor weekly summary.

Ref: National Drought Mitigation Center (NDMC) - <http://www.drought.unl.edu/dm/monitor.html>

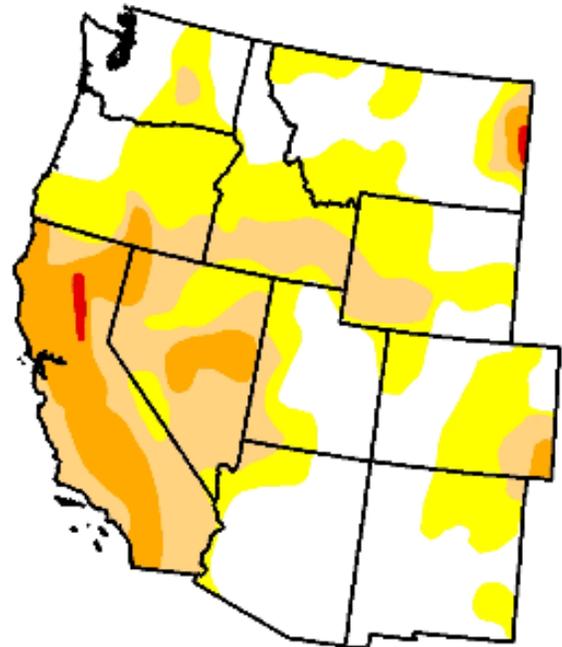
U.S. Drought Monitor

West

September 23, 2008
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	40.5	59.5	29.2	10.4	0.4	0.0
Last Week (09/16/2008 map)	34.2	65.8	29.7	10.1	0.1	0.0
3 Months Ago (07/01/2008 map)	40.6	59.4	35.2	9.2	1.7	0.0
Start of Calendar Year (01/01/2008 map)	26.3	73.7	54.7	33.1	2.7	0.0
Start of Water Year (10/02/2007 map)	22.0	78.0	62.3	44.7	12.4	0.0
One Year Ago (09/25/2007 map)	20.3	79.7	63.0	45.4	12.4	0.0



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

<http://drought.unl.edu/dm>



Released Thursday, September 25, 2008
Author: R. Heim/L. Love-Brotak, NOAA/NESDIS/NCDC

Fig. 3a. Drought Monitor for the Western States with statistics over various time periods. Note some deterioration to D3 over northern California since last week.

Ref: http://www.drought.unl.edu/dm/DM_west.htm

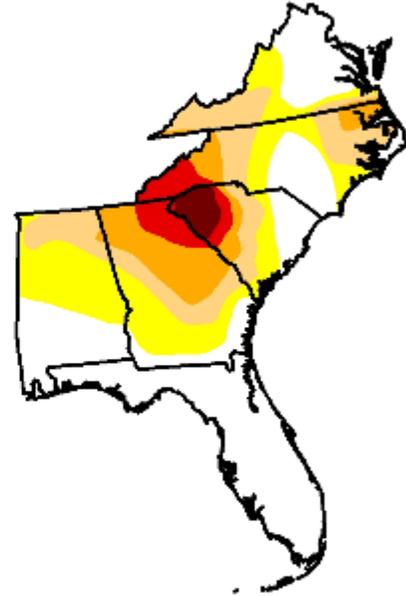
U.S. Drought Monitor

Southeast

September 23, 2008
Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	44.3	55.7	34.0	16.8	6.8	1.9
Last Week (09/16/2008 map)	43.3	56.7	35.1	17.0	6.9	1.5
3 Months Ago (07/01/2008 map)	14.3	85.7	58.6	35.0	12.3	2.8
Start of Calendar Year (01/01/2008 map)	9.6	90.4	74.3	58.5	41.0	22.0
Start of Water Year (10/02/2007 map)	10.1	89.9	77.9	63.8	45.2	24.0
One Year Ago (09/25/2007 map)	10.4	89.6	76.7	59.0	41.0	15.5



Intensity:

- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements

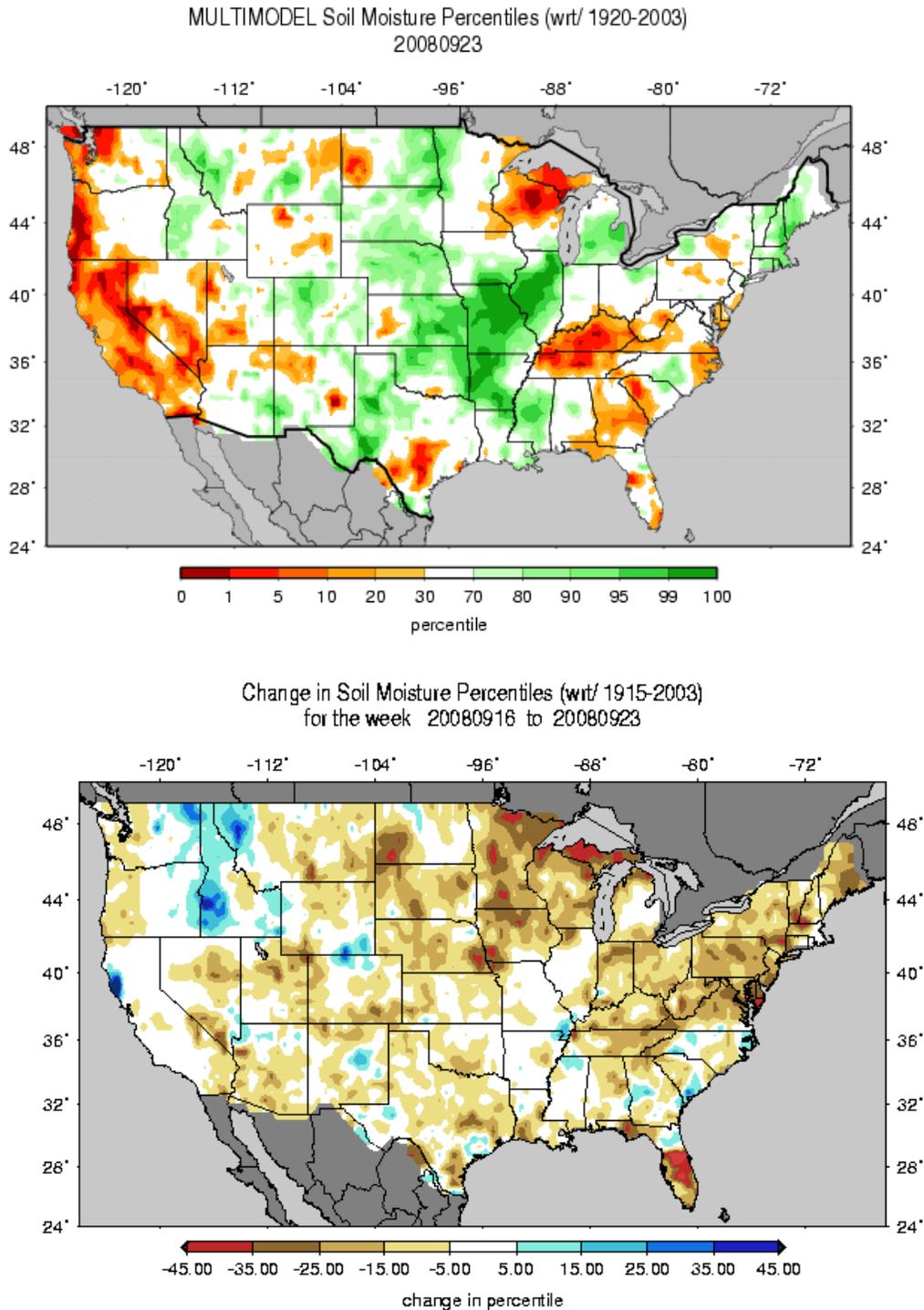
<http://drought.unl.edu/dm>



Released Thursday, September 25, 2008
Author: R. Heim/L. Love-Brotak, NOAA/NESDIS/NCDC

Fig. 3b: Drought Monitor for the Southeastern shows no significant change since last week. A small area of D4 continues over NW South Carolina. Ref: http://www.drought.unl.edu/dm/DM_southeast.htm

Weekly Snowpack and Drought Monitor Update Report



Figs. 4a & 4b: Soil Moisture Ranking and change in percentile based on 1915-2003 climatology for this past week. The driest conditions persist over California and part of Oregon, Washington, Nevada, Wisconsin, and Kentucky while the wettest in soil moisture is occurring over the middle Mississippi River Valley (Fig. 5). Last week saw a significant decrease in moisture over Minnesota and Upper Michigan while increases are noted over Idaho and the Montana Rockies (Fig 4b).

Ref: http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.multimodel.sm_qnt.gif
http://www.hydro.washington.edu/forecast/monitor/curr/CONUS.vic.sm_qnt.1wk.gif

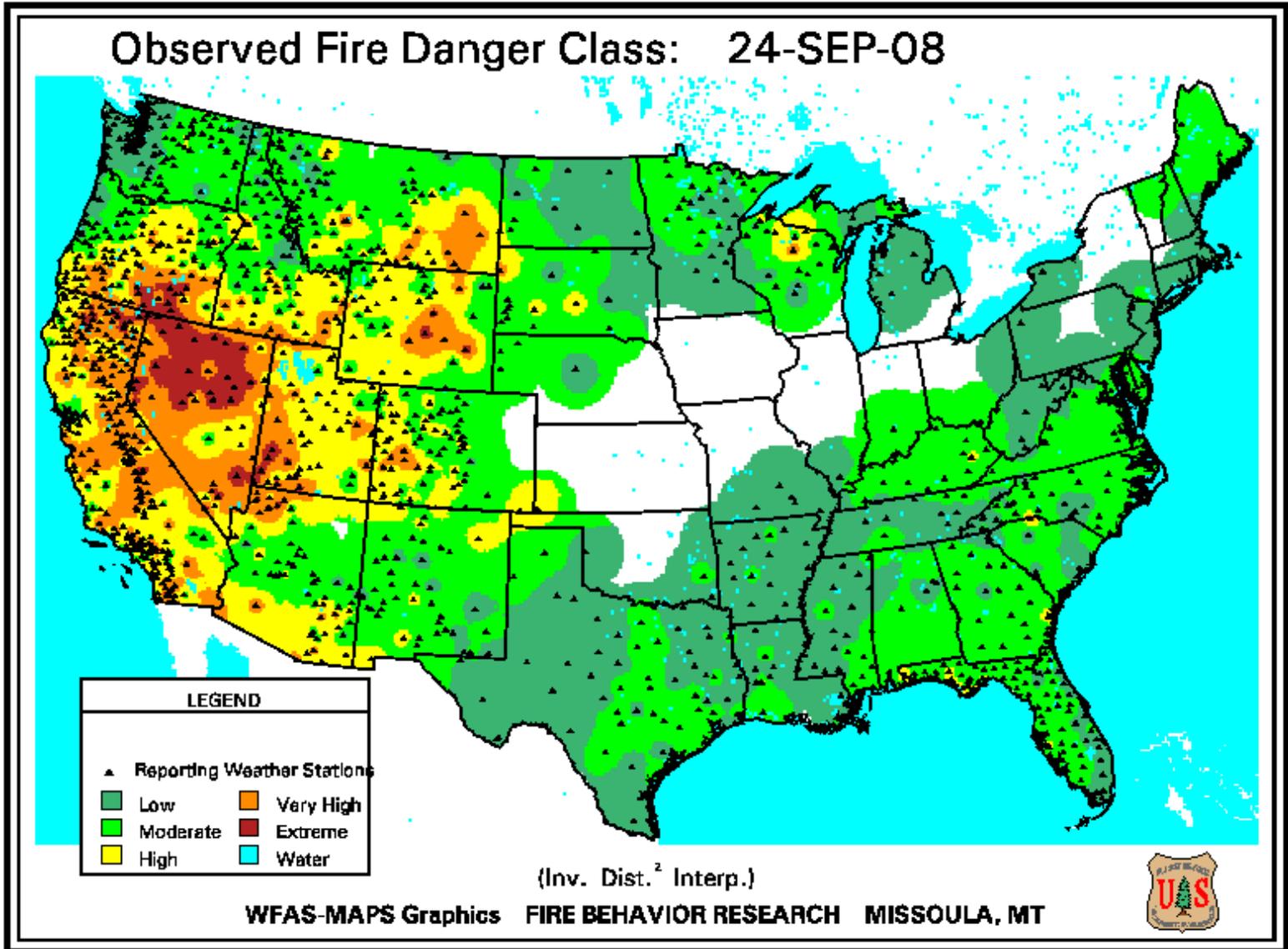
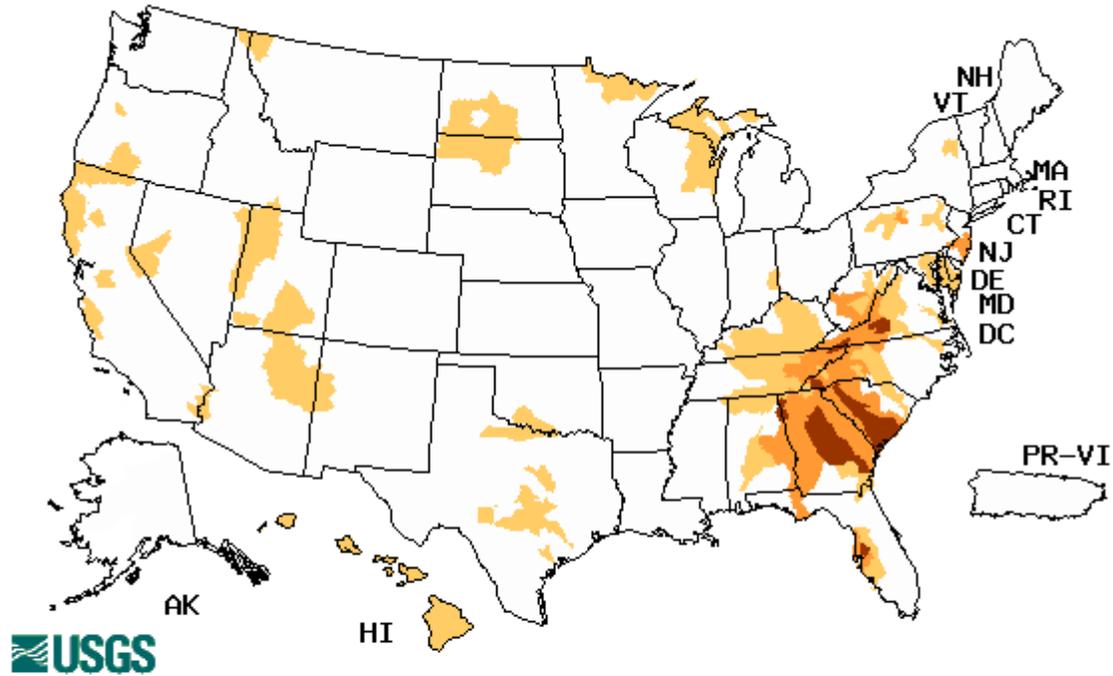


Fig. 5. Observed Fire Danger Class. Note worsening in fire threat over portion Nevada since last week.
Source: Forest Service Fire Behavior Research – Missoula, MT.
Ref: http://www.fs.fed.us/land/wfas/fd_class.gif

Weekly Snowpack and Drought Monitor Update Report

Wednesday, September 24, 2008



Explanation - Percentile classes				
Low	≤5	6-9	10-24	Insufficient data for a hydrologic region
Extreme hydrologic drought	Severe hydrologic drought	Moderate hydrologic drought	Below normal	

Fig. 6. Map of below normal 7-day average streamflow compared to historical streamflow for the day of year. Note persistent low flows over the Southeast.

Ref: <http://water.usgs.gov/waterwatch/?m=dryw&w=map&r=us>

Weekly Snowpack and Drought Monitor Update Report

National Drought Summary -- September 23, 2008

The discussion in the Looking Ahead section is simply a description of what the official national guidance from the National Weather Service (NWS) National Centers for Environmental Prediction is depicting for current areas of dryness and drought. The NWS forecast products utilized include the HPC 5-day QPF and 5-day Mean Temperature progs, the 6-10 Day Outlooks of Temperature and Precipitation Probability, and the 8-14 Day Outlooks of Temperature and Precipitation Probability, valid as of late Wednesday afternoon of the USDM release week. The NWS forecast web page used for this section is:
<http://www.cpc.ncep.noaa.gov/products/forecasts/>.

Dry high pressure dominated the Lower 48 States during this U.S. Drought Monitor (USDM) week. A couple weak cold fronts brought scattered areas of rain to parts of the West, northern Plains, Lower Mississippi Valley, and coastal Southeast, while a tropical disturbance dumped flooding rains on Puerto Rico.

The Great Lakes and Upper Midwest: Another week of dryness across the Tennessee and Ohio Valleys and into the central Appalachians resulted in continued deterioration of soil moisture and pasture and rangeland conditions, with low streamflows evident especially in Kentucky. The dryness extended back to 90 days across much of the area, and back to 6 months across parts of Kentucky and Tennessee. According to September 21 USDA reports, 63% of Kentucky's and 50% of Pennsylvania's pasture and rangeland were in poor to very poor condition. D0 was expanded in northwest Pennsylvania and into the central Appalachians in West Virginia and adjoining Ohio. D1 and D2 were expanded in Kentucky.

Precipitation has been persistently below normal across much of the Upper Mississippi Valley to the western Great Lakes from the last 7 days to 6 months ago. September 21 USDA reports indicated that 38% of Wisconsin's and 33% of Minnesota's pasture and rangeland were in poor to very poor condition, soils were dry and streams were low. D0 and D1 were expanded southward in Wisconsin, D1 expanded across most of southern Minnesota and into northeast Iowa, and D0 expanded in northern Iowa. With rainfall deficits now extending into the long-term time scales and hydrologic impacts (low streamflows) appearing, the A impacts designator for this region was changed to AH.

The Southeast: Half an inch to over an inch of rain fell over coastal South Carolina and central North Carolina this USDM week, and groundwater levels in central North Carolina were finally reflecting the recharge from rains of the last 30 days. This resulted in a pullback of D0 and D1 in the North Carolina piedmont, D2 and D3 in the York-Cherokee-Chester county area of South Carolina, and D1 in southern coastal South Carolina. But dryness persisted across other parts of the Southeast. D0 was expanded to the coast in southern South Carolina, an area which missed the recent rains. D4 expanded to fill more of Upstate South Carolina. The impacts designation was adjusted to reflect AH impacts across Georgia, Upstate South Carolina, western North Carolina, and eastern Tennessee. In addition to the low streams, reservoirs, groundwater, and topsoil moisture, USDA/NASS reports indicated some crops were beginning to be stressed in these areas. Ranchers in Upstate South Carolina were selling off their herds due to the lack of hay.

The Great Plains: One inch or more of rain fell across parts of the northern Plains, mostly in non-drought areas, but generally the week was dry. The only areas seeing improvement from rains this week was northeast Nebraska, where the D0 was reduced and cut into two parts, and southwest South Dakota, where the D0 was shaved back slightly. Improvement was also made

Weekly Snowpack and Drought Monitor Update Report

in the Trans Pecos/Edwards Plateau area of Texas due to rains from earlier weeks. The D0 and D1 east of the Pecos River were pulled back under the greatest rainfall departures at the 2-week to 90-day to 6-month time scales.

Degradation of drought conditions occurred in south central Texas, where D3/D2/D1/D0 boundaries were expanded southeastward toward the coast at Refugio-Calhoun-Matagorda counties. This area missed the tropical cyclone precipitation from Dolly, Edouard, and Ike. Bay City and Palacios, both in Matagorda county, were having their driest February 1-September 22 period on record since 1975 and 1956, respectively. D0 was also expanded to the Rio Grande River at Del Rio, and D2 was extended southward just east of that area. September rainfall so far has ranged from near zero to half an inch where normals are nearly 2 inches. The Edwards Plateau-South Central-Southern regions of Texas still have significant indications of drought on the long-term precipitation departure, streamflow, soil moisture, and Vegetation Drought Response Index maps.

Cimarron County in the Oklahoma panhandle where precipitation deficits remained large, ponds continued low, and the Vegetation Drought Response Index showed continued dryness. Precipitation in this area amounted to less than 20% of normal for the last 30 days. The H impacts designation over North Dakota was changed to AH to reflect growing concerns over agricultural impacts.

The West: Beneficial rains in recent weeks have given much of Montana positive precipitation departures at many time scales, from month-to-date for September back to 6 months. Soil moisture anomalies and the Vegetation Drought Response Index were normal to wet across most of the state, with dry areas remaining mainly in the corners. D1 was pulled back in northeast Montana and D0 was broken up into several sections. D0 remained in the southwest, northwest, and north central regions. Growing agricultural concerns resulted in the change of the H impacts designator to AH in the northeast Montana D3-D0 area. Some farmers in Sheridan County in extreme northeast Montana had only 4 bushels of wheat per acre, which was not enough to harvest.

Elsewhere in the West, D2 was removed from southwest Wyoming where the precipitation deficits and other indicators no longer supported a drought designation of that severity. Beneficial 1-inch-plus rains eliminated precipitation deficits back to 90 days, so D1 was shaved back along central parts of the Oregon-Idaho border. Continued dryness prompted the slight expansion of D1 into northeast Nevada to bring the depiction more in line with the Standardized Precipitation Index, soil moisture, and other indicators. D2 expanded in southern California and an A impacts designator was added over San Diego county to reflect growing agricultural impacts. The county has received only 15% of normal rainfall between March-June 2008 with over 47% loss of native pasture.

A sliver of D3 was added to northern California to reflect worsening conditions for some economic sectors. Statewide, 90% of California's pasture and range land was in poor to very poor condition. In northern California, farmers and ranchers were experiencing grazing conditions that were extremely impaired from the lack of moisture in March and April, stock ponds were all almost empty, springs were drying up at a fast pace, and ranchers were hauling water. Dire conditions were evident in many indicators, including the Standardized Precipitation Index, streamflow, soil moisture, and the Vegetation Drought Response Index. An August 22 state Department of Water Resources report noted that several northern California reservoirs were around 50% of average, or about 33% of capacity, and the state was projecting that by September 30 Lake Oroville would reach its lowest carryover storage since the drought of 1977, and perhaps reach a new record low by the end of the year. But, drought impacts in California vary significantly with sector: some sectors such as ranchers and farmers were suffering

Weekly Snowpack and Drought Monitor Update Report

significantly, while other sectors were not as severely impacted, with some crops reporting record harvests. The USDA National Agricultural Statistics Service (NASS) reported that irrigated crops (such as field, fruit, nut, and vegetable crops) were still being harvested and no problems were reported, and irrigated pastures were in good condition, but dryland pasture and rangeland forage continued to decline with poor to very poor conditions reported in most areas, lower-elevation water sources continued to dry out, and herd reduction continued in some areas due to the poor feed and water conditions. The low reservoir levels were the result of below-normal precipitation as well as water management practices. On the one hand, some drawn down has occurred for regulatory issues dealing with mandated releases for fisheries concerns. On the other hand, the last 2 years have had below average precipitation (about 70% of average) in the northern Sierra, according to an 8-station index. But, regardless of the reason for the low reservoir levels, the fact that they are so low and are projected to reach record or near-record levels is significant. The D3 that was added to northern California around the region of the Folsom, Oroville, and Shasta reservoirs reflects these hydrologic concerns as well as the major impacts to the non-irrigated economic sectors.

Alaska, Hawaii, and Puerto Rico: D0 in northwest Alaska was expanded southward to the vicinity of Norton Sound to reflect continued below normal precipitation at many stations. The dryness was evident at time scales from 60 to 90 days, but also out to 12 months. Dry weather continued this week across most of Hawaii. D1 expanded into southeast Kauai due to deteriorating pasture conditions. A tropical disturbance dumped heavy rains across much of Puerto Rico, with amounts ranging from 6 inches at interior stations to nearly 30 inches along the southern coastal upslope areas. The D0 in Puerto Rico was eliminated due to the heavy rains and flooding.

Looking Ahead: During the next 5 days, a strong low pressure system will move up the east coast, bringing beneficial rain to parts of the Southeast and mid-Appalachian drought areas, while another in a series of weak cold fronts will move across the Lower 48 States. An inch or more of rain is forecast for the Carolinas to New England, with several inches along the coast. An inch or more of rain is expected over southern Florida, half an inch or more across parts of the northern Plains and Upper Mississippi Valley, and lesser amounts over extreme southern Texas and parts of the Pacific Northwest. Otherwise, September 25-30 will be generally dry, with warmer than normal temperatures. For September 30-October 8, temperatures are progged to be warmer than normal in the western and central U.S. and cooler than normal in the east. The precipitation outlook is for dry weather in the central U.S. and most of Alaska, with wet weather in the coastal Pacific Northwest and the East Coast. **Author:** [Richard Heim, National Climatic Data Center, NOAA](#)

Dryness Categories

D0 ... Abnormally Dry ... used for areas showing dryness but not yet in drought, or for areas recovering from drought.

Drought Intensity Categories

D1 ... Moderate Drought

D2 ... Severe Drought

D3 ... Extreme Drought

D4 ... Exceptional Drought

Drought or Dryness Types

A ... Agricultural

H ... Hydrological

Updated September 24, 2008