

NWS Form E-5 U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL WEATHER SERVICE MONTHLY REPORT OF HYDROLOGIC CONDITIONS	HYDROLOGIC SERVICE AREA: Pocatello, Idaho
	REPORT FOR: MONTH: March YEAR: 2016
TO: Hydrologic Operations Division, W/OH2 National Weather Service National Oceanic and Atmospheric Administration Silver Spring, Maryland 20910	SIGNATURE Corey Loveland Service Hydrologist
DATE: April 13, 2016	
When no flooding occurs, include miscellaneous river conditions, such as significant rises, record low stages, ice conditions, snow cover, droughts and hydrologic products issued (NWS Instruction 10-924).	



An X in this box indicates that no flooding has occurred for the month within this hydrologic service area.

Overview:

March was fairly wet and relatively warm across the Hydrologic Service Area (HSA). Overall, well above normal precipitation fell across the most of the Snake River Plain; and near normal amounts in the mountains. Generally, one-half to five inches of precipitation fell across our area during the past month with most of the precipitation falling in the mountainous regions of the Idaho-Wyoming border and the Bear River area. Temperature departures from normal for February show that across the HSA, we ranged mostly 1 to 3 degrees F above normal in the southern half of the HSA with it being a little bit warmer in the northern half, which was about 3 to 6 degrees F above normal. Mean average temperatures ranged from 23 to 43 degrees F across the HSA. The Oakley COOP had 6 days of average temperatures over 50 degrees F during March.

As far as the short-term 8 to 14 day Climate Prediction Center Outlook is concerned, the forecast is for a 60 to 70 percent chance of above normal temperatures across Idaho with a near normal to 33 percent chance of below normal precipitation. The one-month forecast graphics are found below. For the three-month outlook, the temperatures are forecast to be warmer than normal in eastern Idaho; mostly ranging from 40 to 50 percent chance of above normal temperatures within the HSA. As for precipitation, the outlook is for mostly above normal precipitation across eastern Idaho with a 33 percent chance of above normal precipitation.

Of the data available for the month, the stations within the HSA reaching the highest 24-hour temperature was the Burley Airport station reaching 70°F on the 20th. The station (non-SNOTEL and non-RAWS) with the lowest recorded temperature was the Stanley COOP station at -12°F on March 19th. The highest recorded 24-hr precipitation (non-SNOTEL) occurred at the Ketchum Ranger Station station where 1.05 inches fell on the 14th. The highest recorded precipitation total (non-SNOTEL) occurred at the Lava Hot Springs COOP where 4.44 total inches was recorded for the month. The Franklin Basin and Vienna Mine SNOTELs recorded 8.20 each of total precipitation for the month according to NRCS. The Raft River basin and the Portneuf basin received 175% and 169% of average precipitation respectively for March-based on SNOTEL data.

Reservoirs last month increased capacity overall by around 9% in the upper Snake River basin system (an increase of about 384 KAF occurred over the month and is currently sitting at 77% of capacity overall). Compared to last year at this time, it was about 87% of capacity. According to the Natural Resources Conservation Service and U.S. Bureau of Reclamation reservoir data, the most notable increase in storage capacity was the Magic and Milner Reservoirs increasing percent capacity by 28% each with Little Wood

Reservoir increasing by 27%. Magic is 100% of average and Little Wood is 112% of average. Mackay is currently at 110% of average with Ririe at 118% and Oakley at 76% of average. Overall, the upper Snake reservoirs are collectively at 106% of average where it was 88% at this time last year.

Current streamflow conditions in eastern Idaho are mostly near to below normal for monthly streamflows for the majority of the unregulated streams (see graphic below).

Drought conditions across eastern Idaho have progressively improved since last month's assessment. Currently, only about 8 percent of the state is in Abnormally Dry drought status with no areas in Moderate Drought. The latest U.S. Seasonal Drought Outlook shows a clear forecast of no drought conditions within the HSA.

According to the Idaho NRCS Snow Survey April 1st Idaho Surface Water Supply Index (SWSI); combining streamflow volume forecasts and reservoir storage (where appropriate), rates the greatest valued basin for water supply within the HSA as being the Oakley basin. This basin was given a SWSI rating of 1.5 (near to above normal). This rating reflects overall water availability in the basins and are mostly used for irrigational planning purposes. The three lowest ranked basins within the HSA are the Henrys Fork, Teton and Bear River basins, rated at -0.3, 0.1 and -0.6 respectively, which are still rated at near normal. Most basins within the HSA are near to above average for the NRCS Apr through Sept streamflow volume forecasts: Lost/Wood ranges from 86-106%, upper Snake 91-110%, Southside 128-145% and Bear about 82% of average for points within our HSA.

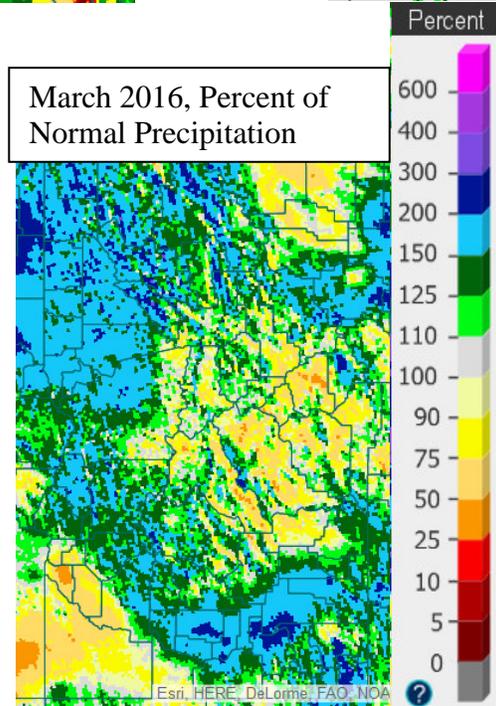
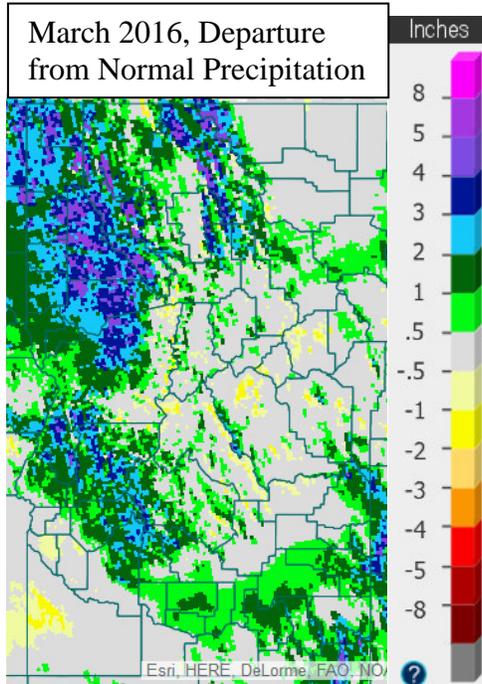
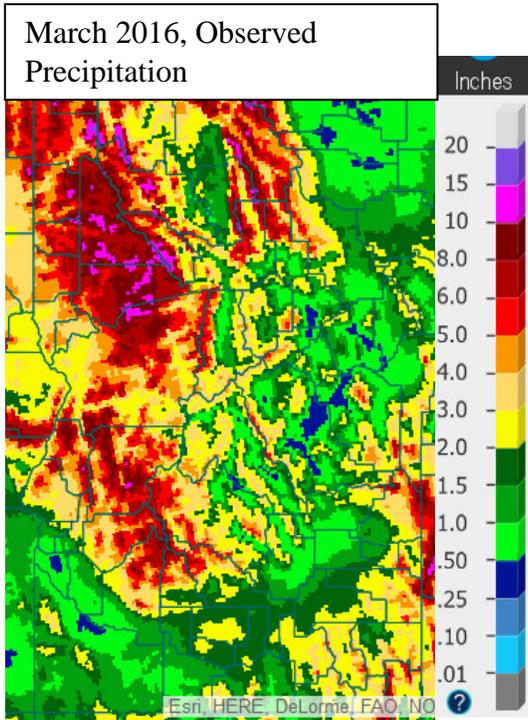
For more information on the Idaho Surface Water Supply Index (SWSI) April 1st Outlook please visit:
<http://www.wcc.nrcs.usda.gov/ftpref/states/id/webftp/swsi/tables/Apr/SWSI04.pdf>

For more information on the Idaho Water Supply April 1st Outlook please go to:
<http://www.wcc.nrcs.usda.gov/ftpref/states/id/webftp/wsor/2016/borid416.pdf>

For a table format of the current volume forecasts and current runoff for WFO PIH:
www.nwrfc.noaa.gov/water_supply/ws_report.cgi

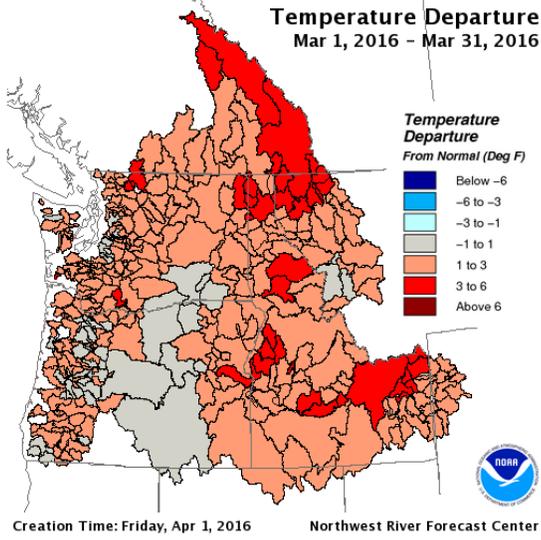
Please see the NWRFC (approximately daily computed ensembles), CBRFC, and NRCS Official April 1st streamflow volume forecasts and Bear Basin conditions below.

Precipitation:

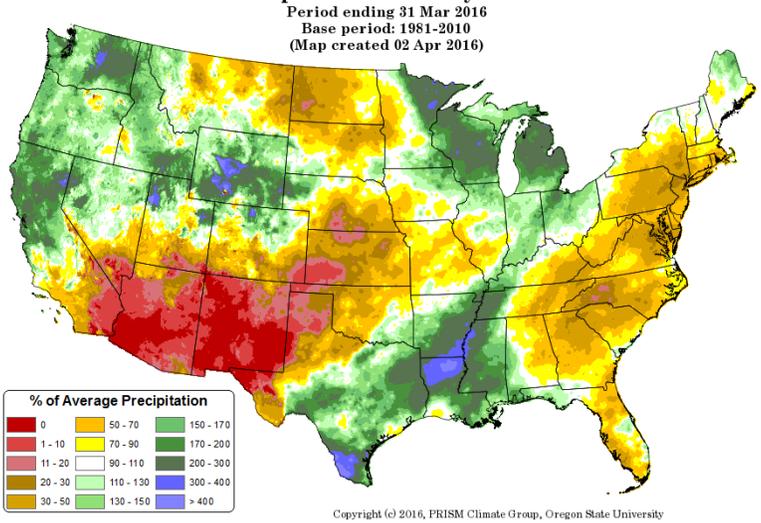


water.weather.gov/precip/#

Temperature Departure
Mar 1, 2016 - Mar 31, 2016



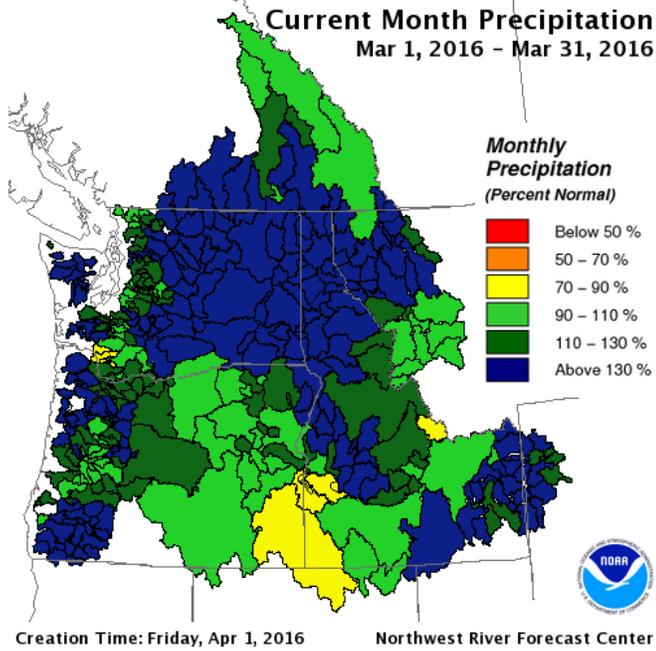
Total Precipitation Anomaly: March 2016



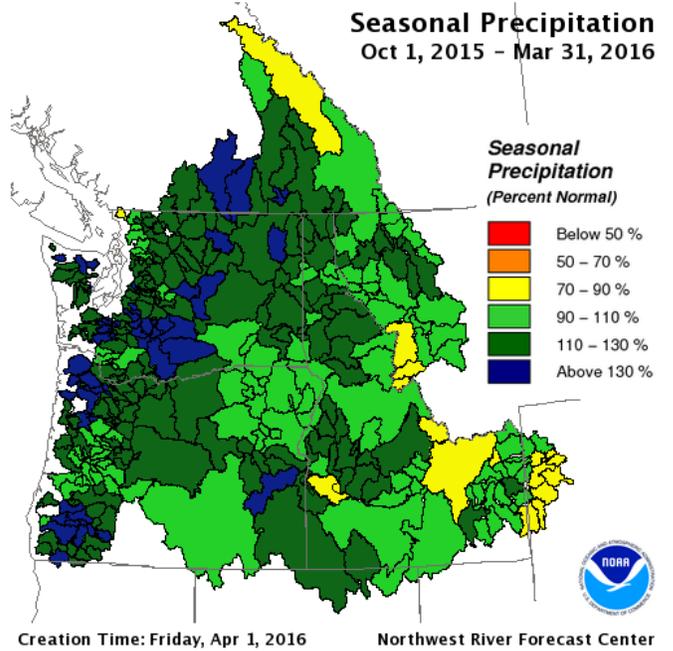
nwrfc.noaa.gov/WAT_RES_wy_summary/20160401/CurMonMAT_2016Mar31_2016040116.png

prism.oregonstate.edu/

Current Month Precipitation
Mar 1, 2016 - Mar 31, 2016



Seasonal Precipitation
Oct 1, 2015 - Mar 31, 2016



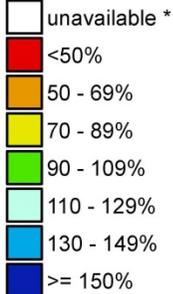
nwrfc.noaa.gov/WAT_RES_wy_summary/20160401/CurMonMAP_2016Mar31_2016040116.png

nwrfc.noaa.gov/WAT_RES_wy_summary/20160401/SeasonalMAP_2016Mar31_2016040116.png

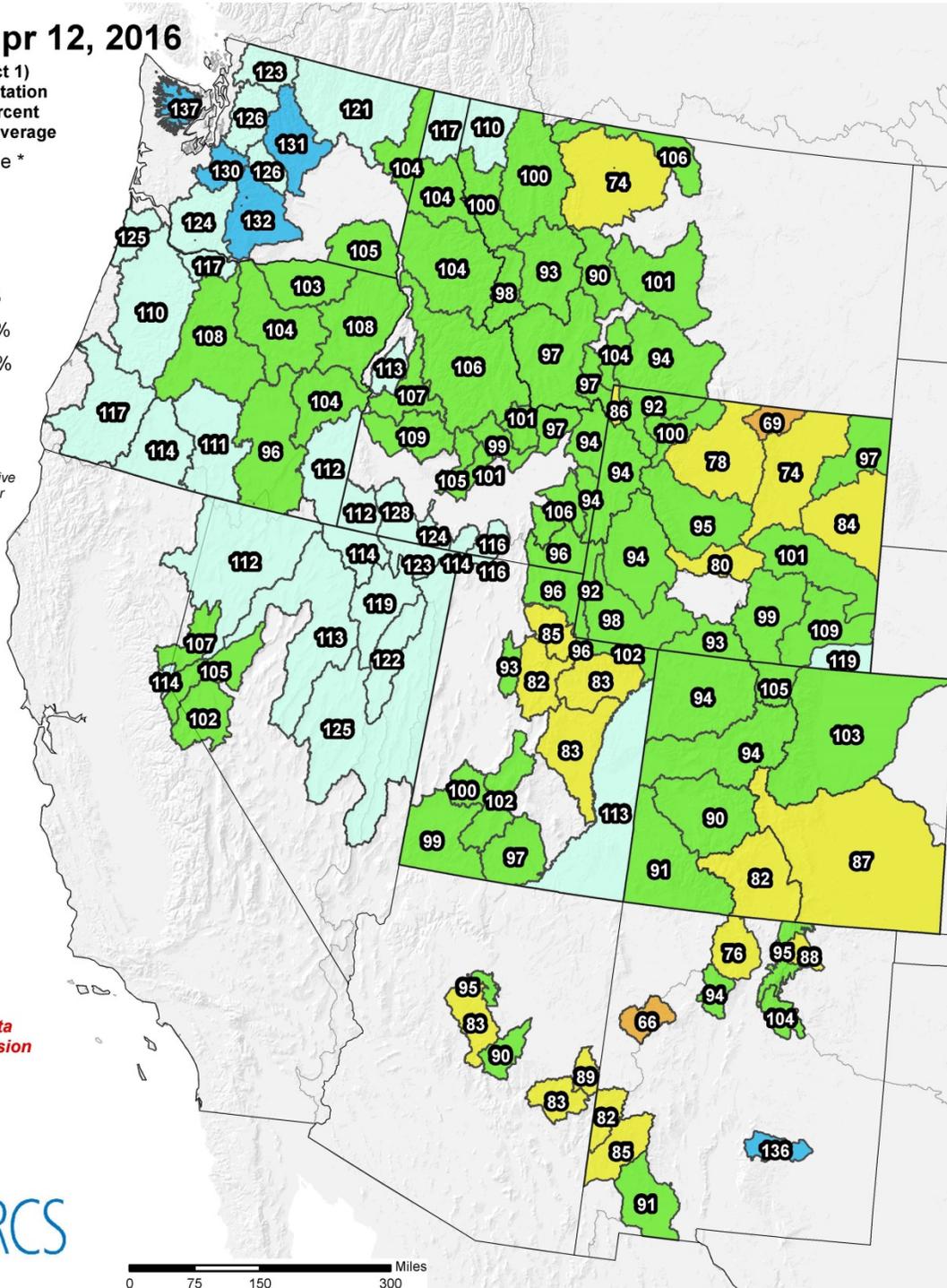
Westwide SNOTEL Water Year (Oct 1) to Date Precipitation % of Normal

Apr 12, 2016

Water Year (Oct 1) to Date Precipitation Basin-wide Percent of 1981-2010 Average



* Data unavailable at time of posting or measurement is not representative at this time of year



Provisional data subject to revision



The water year to date precipitation percent of normal represents the accumulated precipitation found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/west_wytdprecptnormal_update.pdf

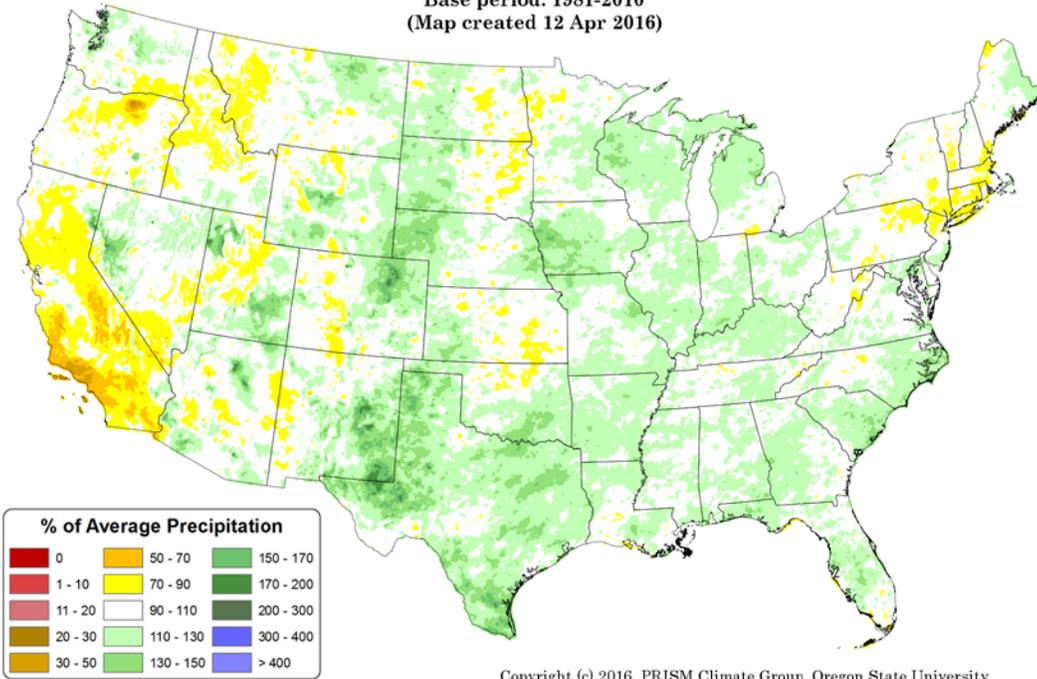
Past 2 Years of Precipitation % of Average:

Total Precipitation Anomaly: April 2014 - 11 April 2016

Period ending 7 AM EST 11 Apr 2016

Base period: 1981-2010

(Map created 12 Apr 2016)



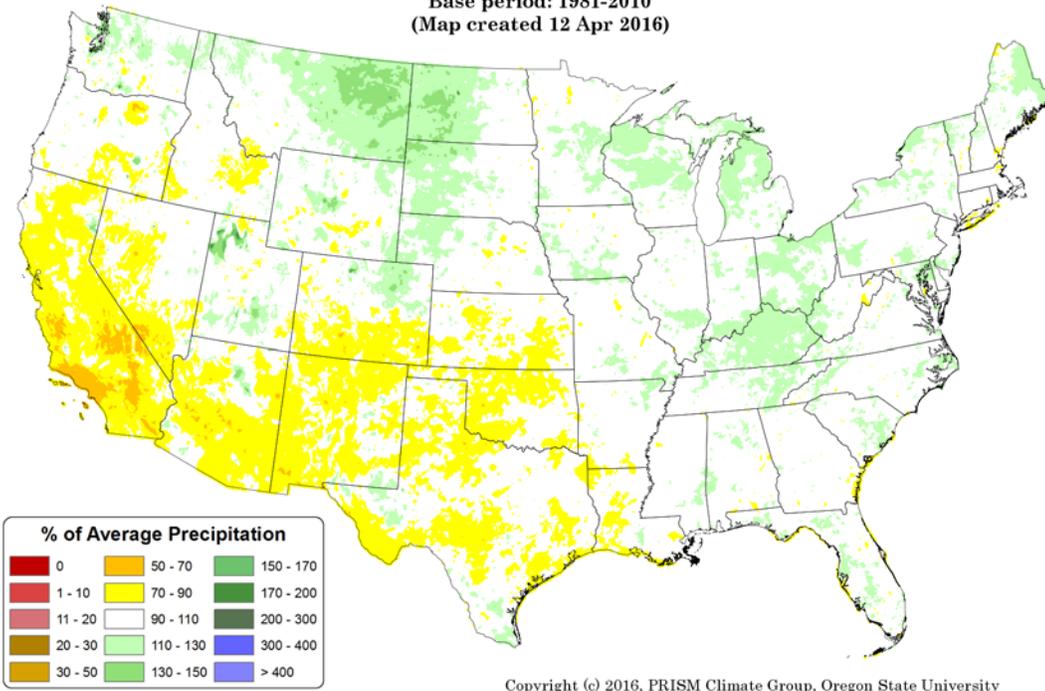
Past 6 Years of Precipitation % of Average:

Total Precipitation Anomaly: April 2010 - 11 April 2016

Period ending 7 AM EST 11 Apr 2016

Base period: 1981-2010

(Map created 12 Apr 2016)



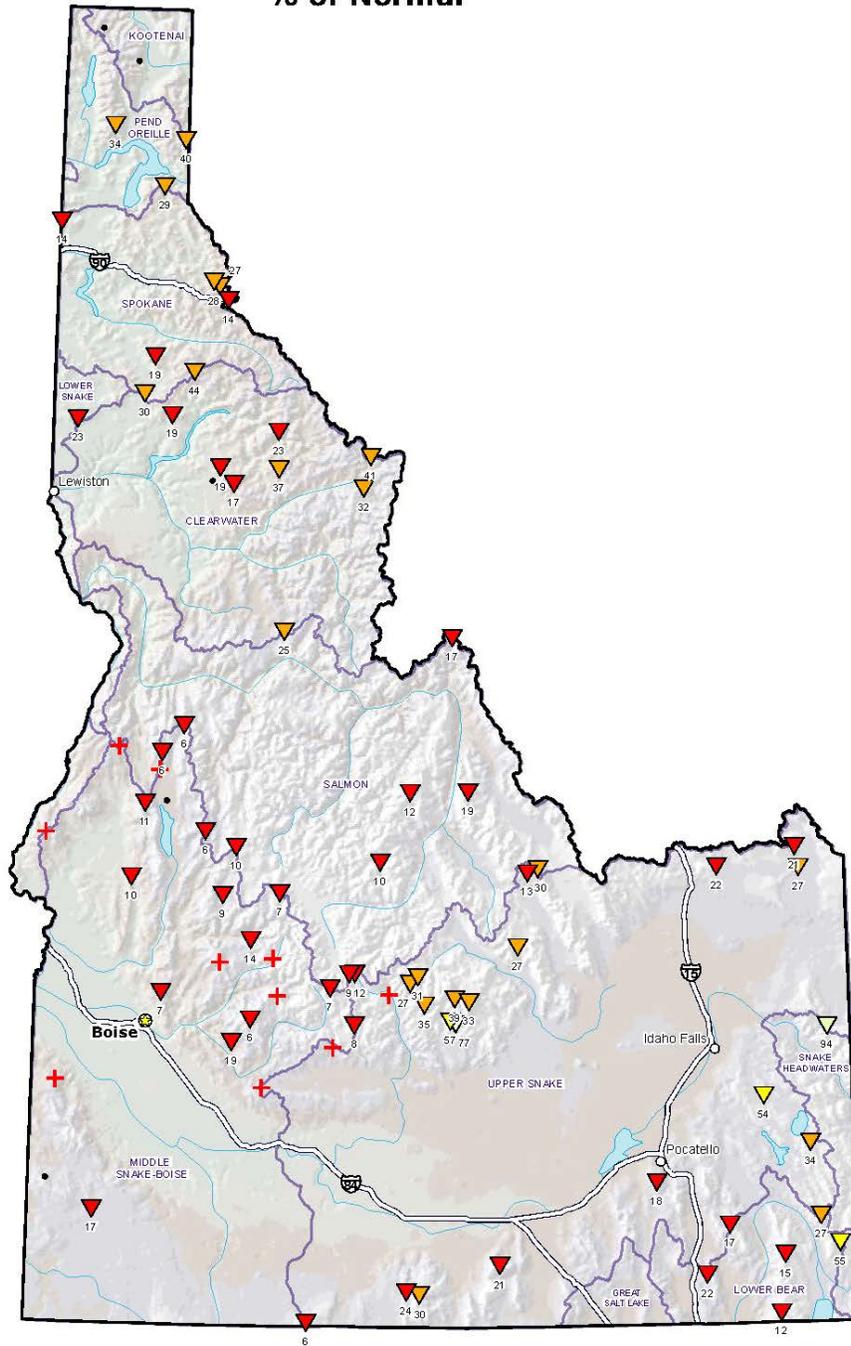
prism.oregonstate.edu/comparisons/drought.php

Idaho SNOTEL Month to Date (MTD) Precipitation % of Normal

Apr 12, 2016

- Current MTD
Precipitation
% of 1981-2010
Average**
- ▲ > 200%
 - ▲ 150-200%
 - ▲ 125-149%
 - ▲ 100-124%
 - ▼ 75-99%
 - ▼ 50-74%
 - ▼ 25-49%
 - ▼ 1-24%
 - +
 - Unavailable*

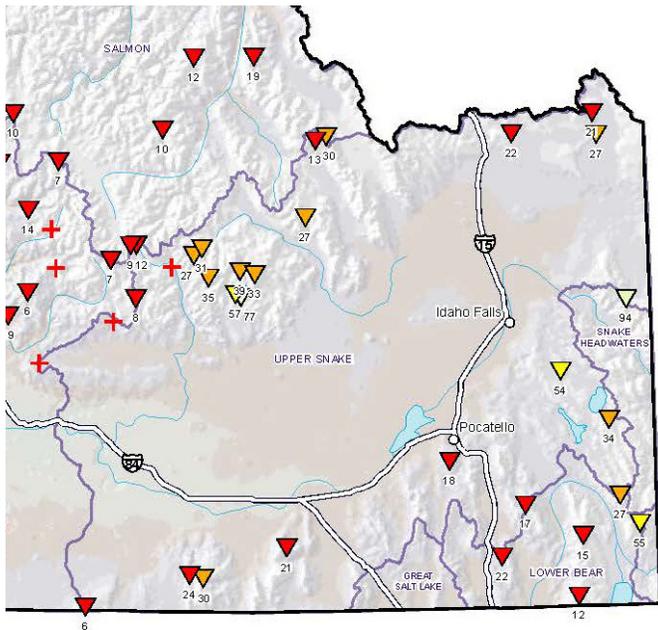
*Provisional Data
Subject to Revision*



Prepared by:
USDA/NRCS National Water and Climate Center
Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

** Data unavailable at time of posting or
unavailable long-term normal.*

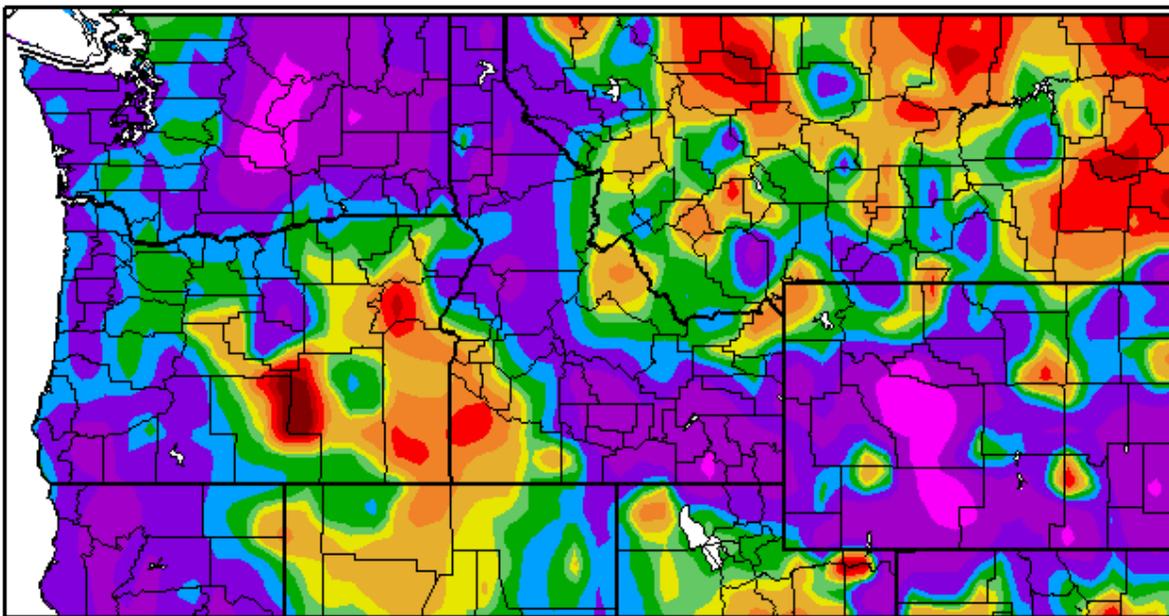
wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/id_mtdprecptnormal.pdf



**SNOTEL MTD % of Normal
Precipitation for end of March 2016**
(image is cropped from above image)

March was great precipitation wise across eastern Idaho with over 200% of normal falling across the area. The Henrys fork area was drier as was the area adjacent to the Continental Divide, but still in the near normal range. A portion of Oneida county received the greatest amount of precipitation; over 300% of normal. Regionally, it was wet last month, which is great news for water supply.

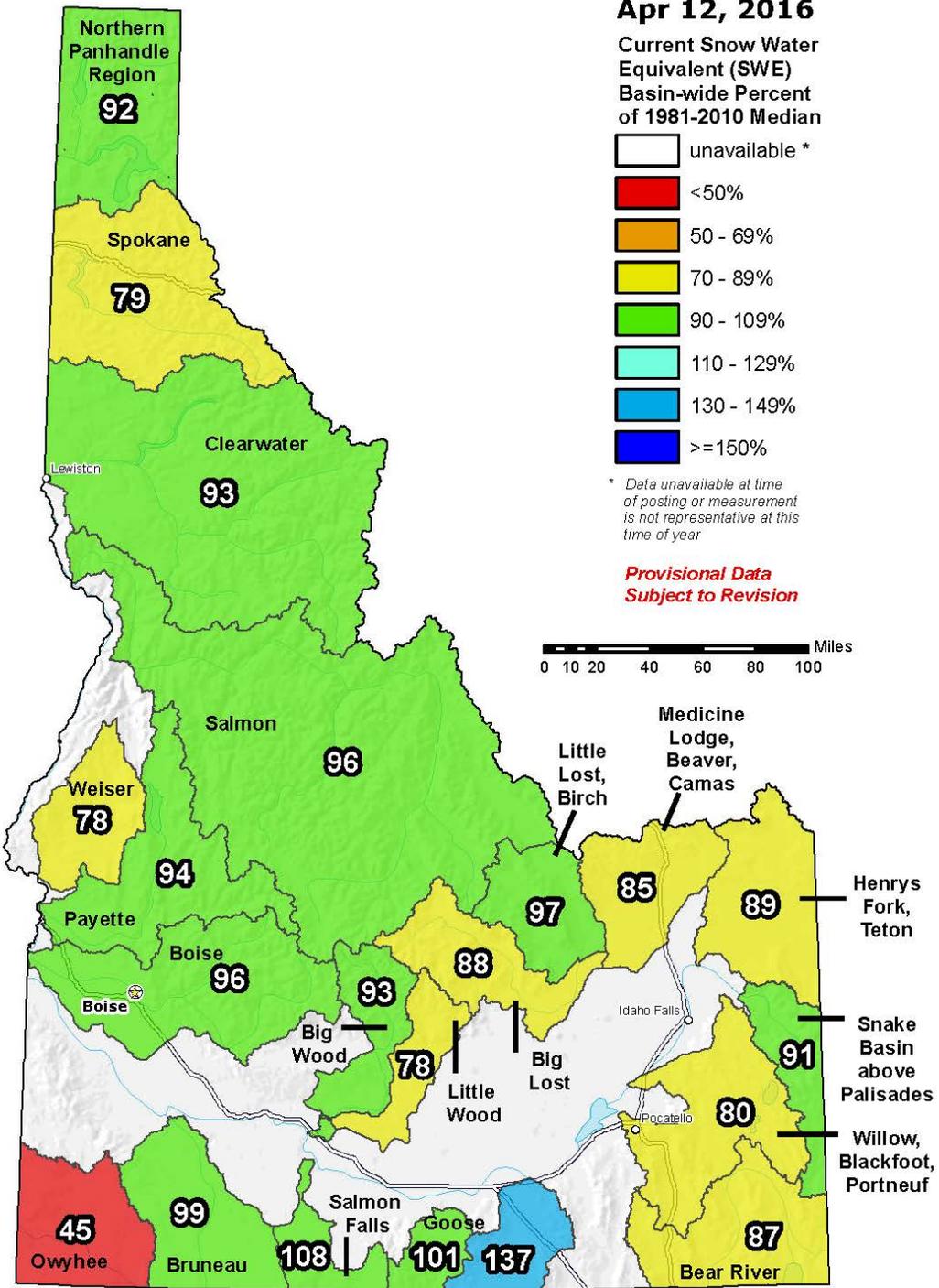
Percent of Normal Precipitation (%)
3/1/2016 – 3/31/2016



Generated 4/11/2016 at HPRCC using provisional data.

Regional Climate Centers

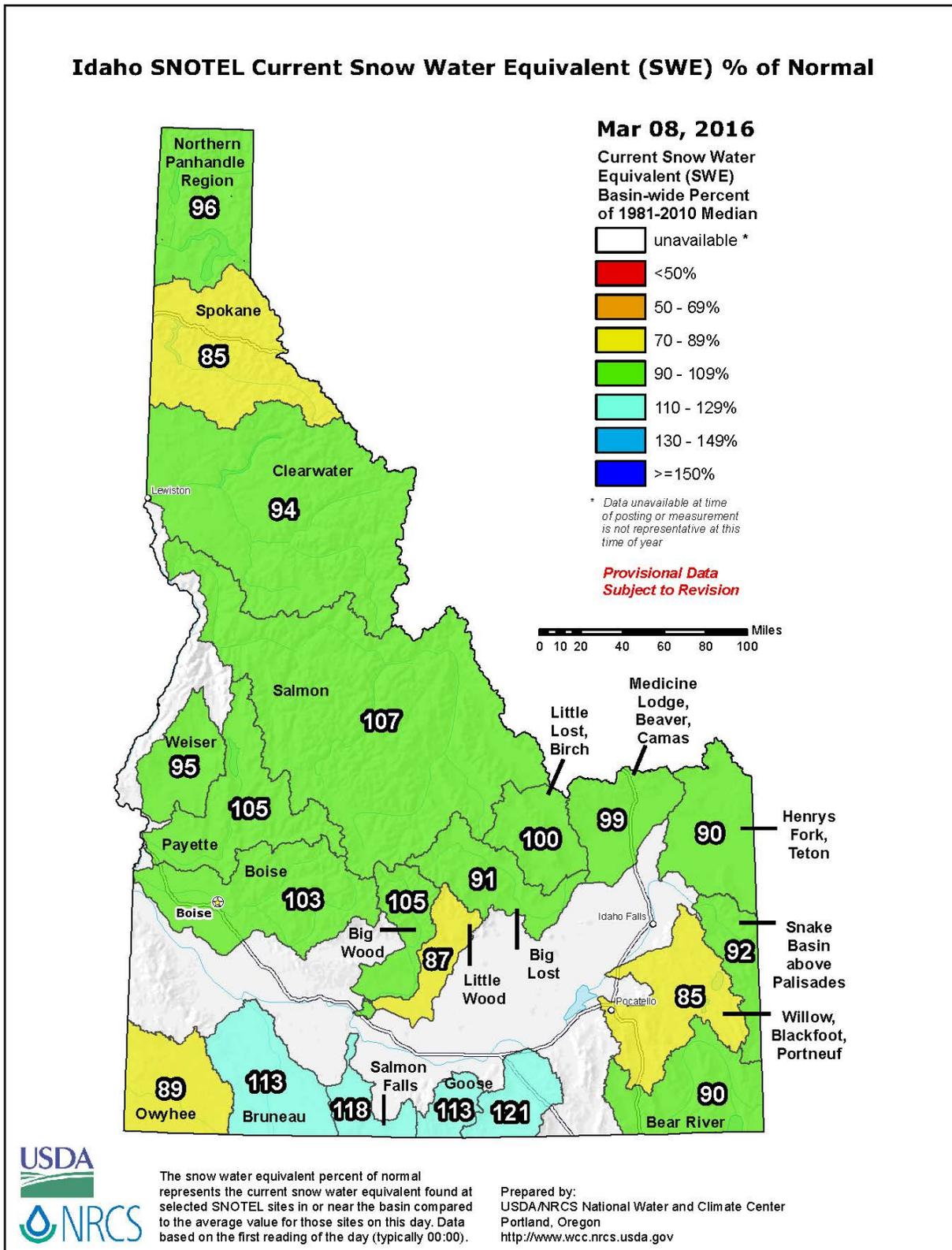
Idaho SNOTEL Current Snow Water Equivalent (SWE) % of Normal



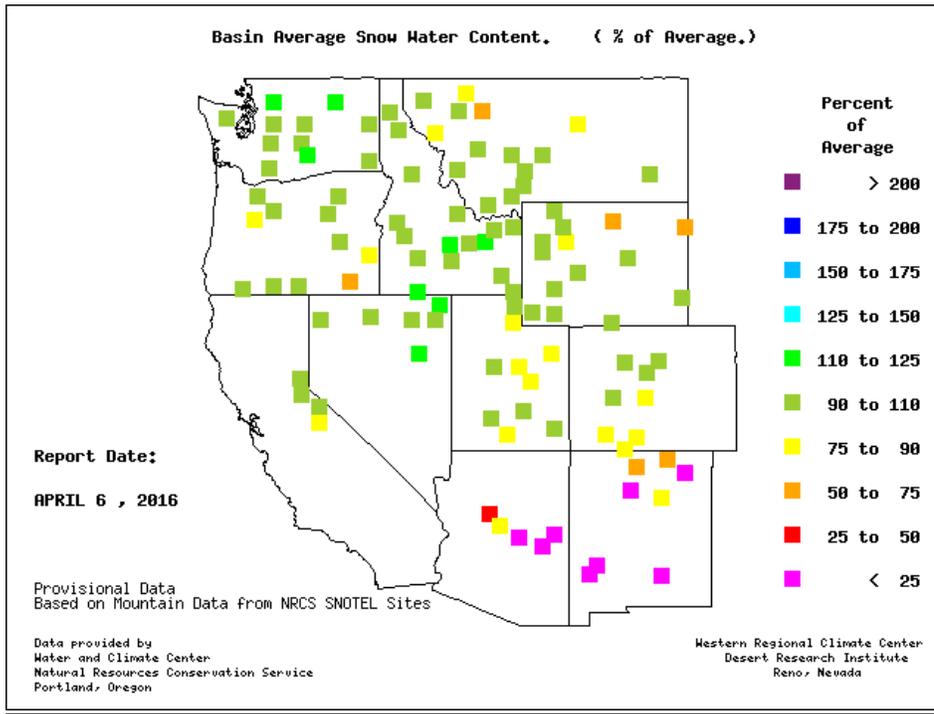
The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by:
 USDA/NRCS National Water and Climate Center
 Portland, Oregon
<http://www.wcc.nrcs.usda.gov>

Basinwide SWE compared to last month: A relatively wet march brought snowpack, but with no additional snowstorms, degradations across all the basins is now a reality. Most notable loss was the Raft River basin; losing 16% of normal compared to last month (see below):

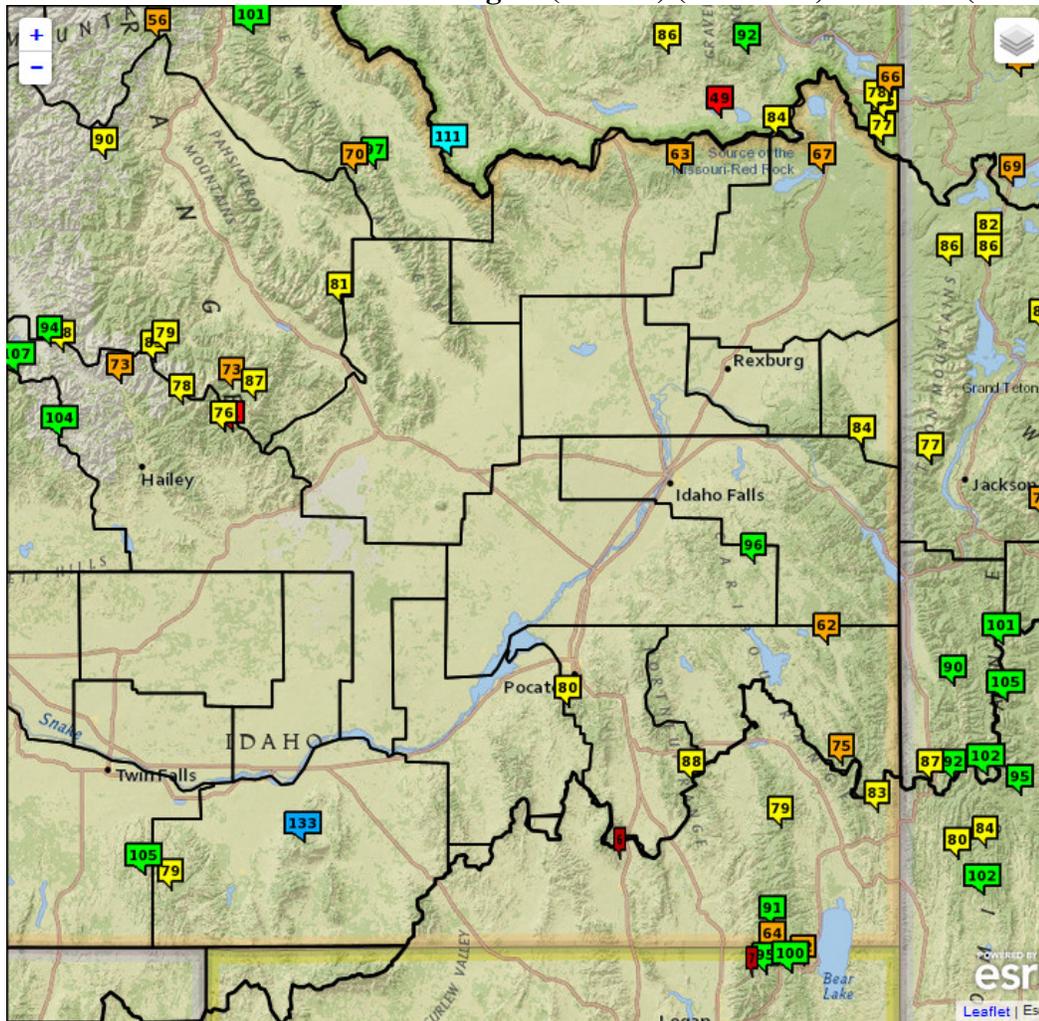


wcc.nrcs.usda.gov/ftpref/data/water/wcs/gis/maps/id_swepctnormal_update.pdf



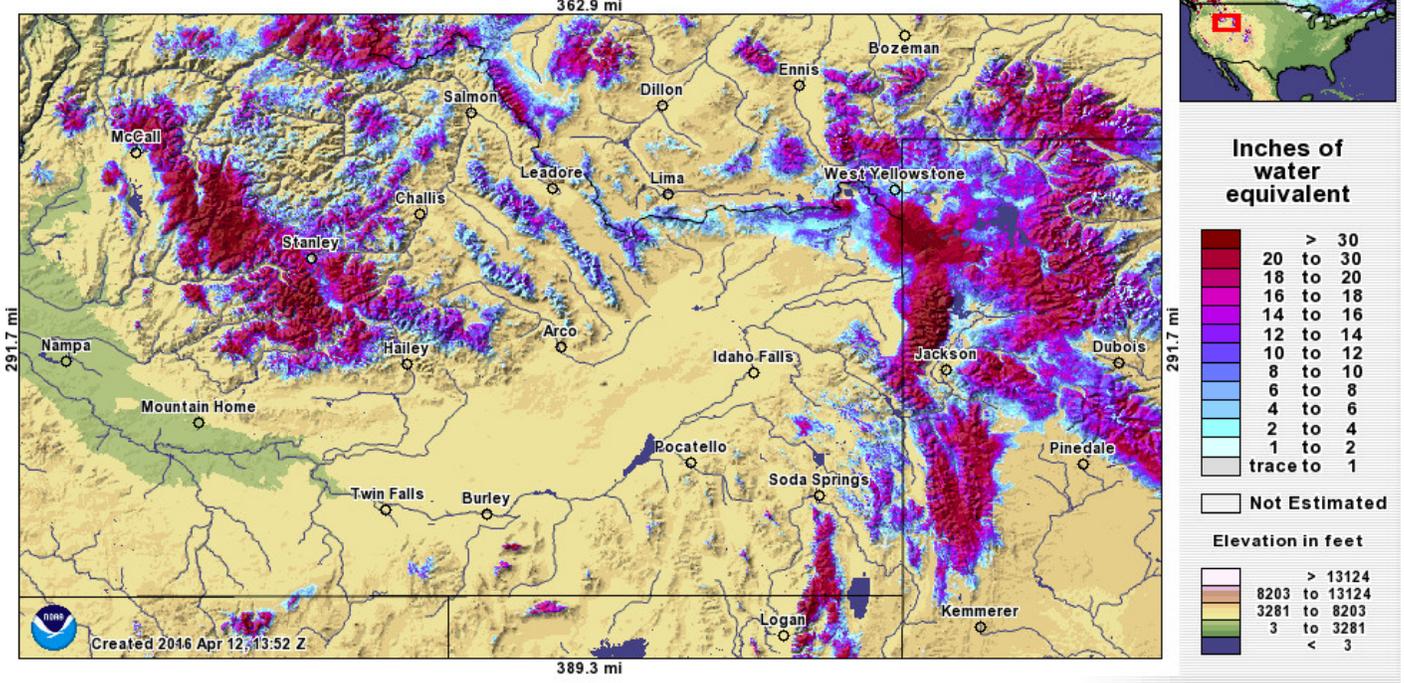
wrcc.dri.edu/snotelanom/basinswe.html

Current SWE Conditions: % of Avg (4/12/16) (SNOTEL): (NWRFC)



nwrfc.noaa.gov/snow

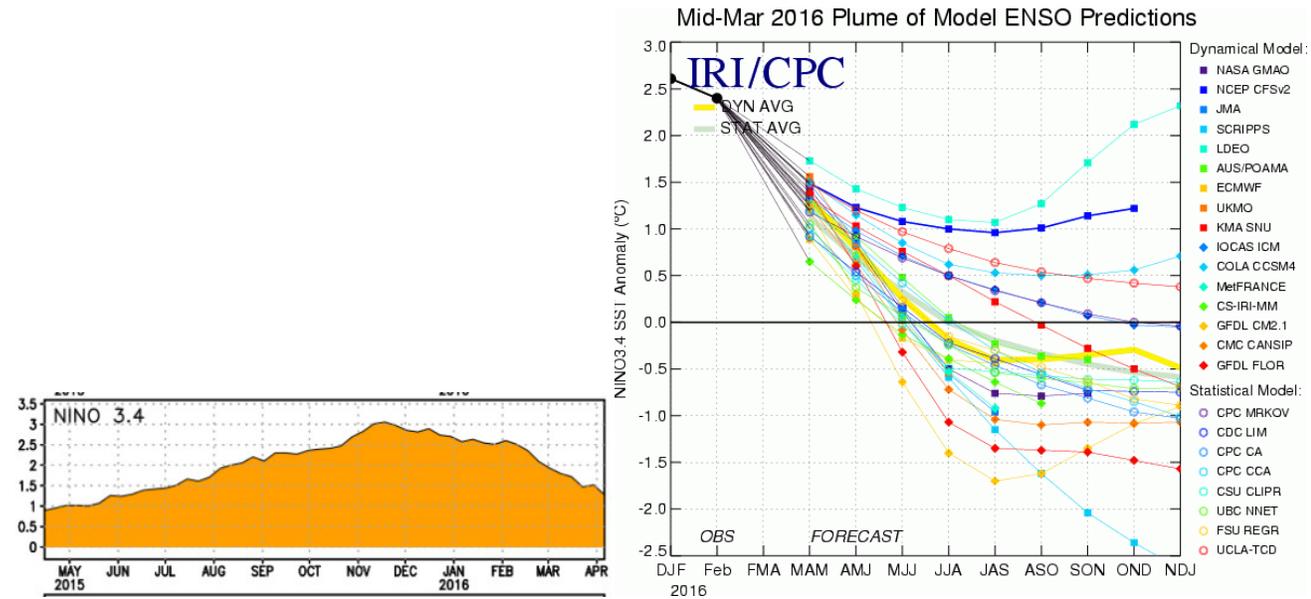
Modeled Snow Water Equivalent forecasted for 2016 April 12, 19:00 UTC



nohrc.noaa.gov/interactive/html/map.html

ENSO Update:

Latest Observed SST Departure: Niño 3.4 ~ 1.3 Deg C



cpc.ncep.noaa.gov, iri.columbia.edu/climate/ENSO and cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/ensodisc.pdf

CPC Synopsis: A strong El Niño is present and is weakening. El Niño expected to transition to ENSO-neutral late spring/early summer 2016 with a 50% chance for La Niña conditions developing in the Fall.

Note: Positive equatorial sea surface temperature (SSTs) anomalies continue across most of the Pacific Ocean. MJO has been active recently. The Pacific Decadal Oscillation (PDO) is currently positive.

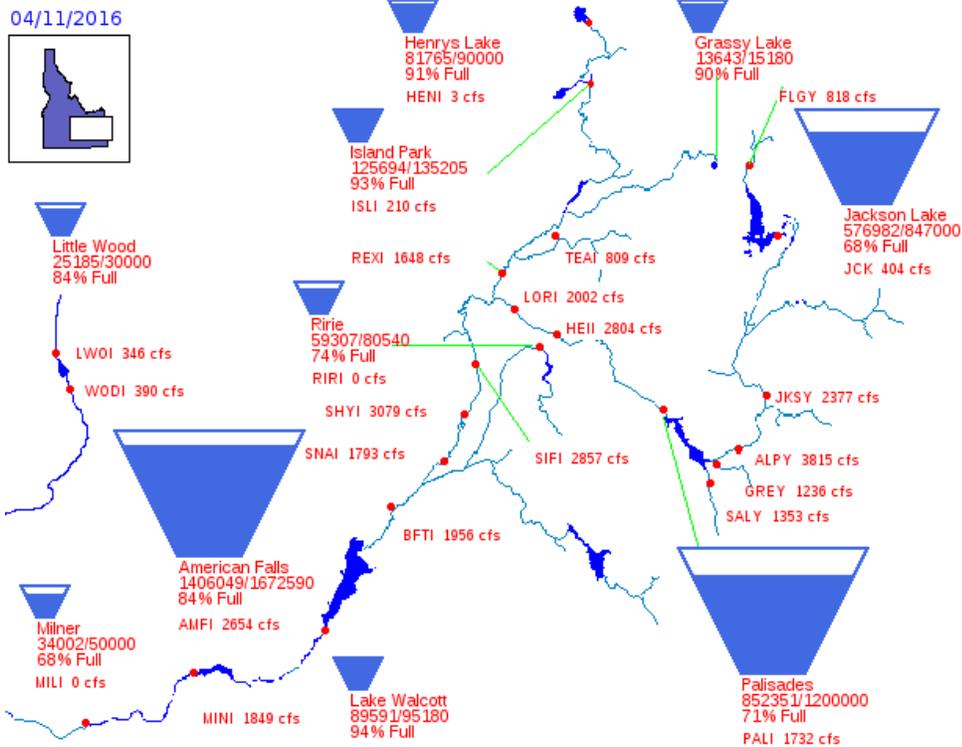
Reservoirs:

Reservoir	% Capacity February 29 ¹	% Capacity March 31 ²	Percent Change	% of Average ²	% of Average Last Year ²
Jackson Lake	67	67	0	133	150
Palisades	62	70	8	108	138
Henrys Lake	86	89	3	99	110
Island Park	80	89	9	108	113
Grassy Lake	87	89	2	110	107
Ririe	60	65	5	118	118
Blackfoot	53	58	5	104	95
American Falls	67	82	15	91	100
Mackay	70	77	7	110	110
Little Wood	47	74	27	112	112
Magic	19	47	28	100	91
Oakley	25	30	5	76	76
Bear Lake	38	41	3	87	95
Lake Walcott	91 ³	94 ⁴	3	n/a	n/a
Milner	40 ³	68 ⁴	28	n/a	n/a

Source: (1) NRCS February 29, 2016; (2) NRCS March 31, 2016.

(3) US Bureau of Reclamation (BOR) March 10, 2016 (4) BOR April 11, 2016

wcc.nrcs.usda.gov/ftpref/support/water/SummaryReports/ID/BRes_4_2016.pdf

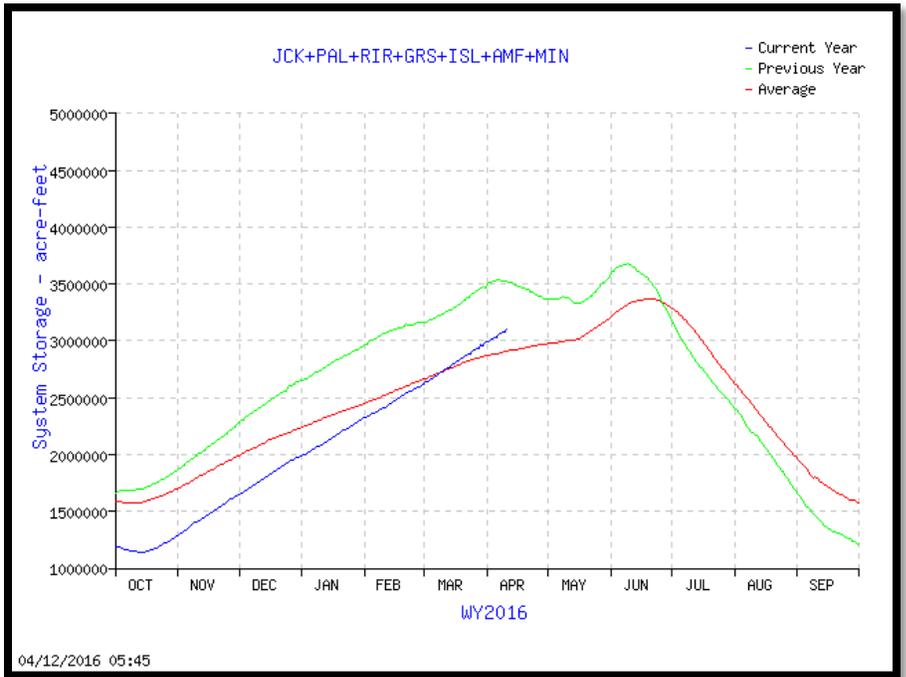


77% of Capacity in Upper Snake River System
 (Jackson Lake, Palisades, Grassy Lake, Island Park, Ririe, American Falls & Lake Walcott)

usbr.gov/pn/hydromet/burtea.html

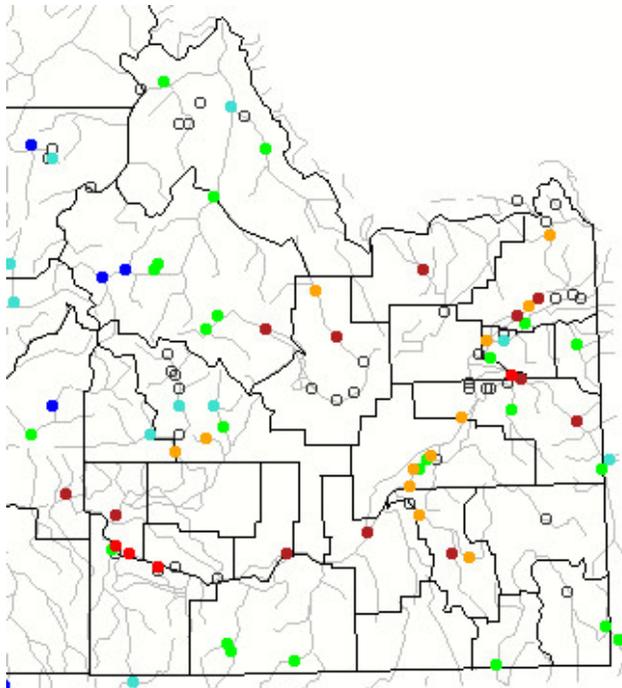
Upper Snake River:
 Total Space Available: 922,079 AF
 Total Storage Capacity: 4,045,695 AF

**Graph of Upper Snake River
Current Total System Reservoir
Storage**



usbr.gov/pn-bin/graphwy2.pl?snasys_af

Streamflow:



Monthly average streamflow compared to historical average streamflow for March 2016.



waterwatch.usgs.gov/?m=mv01d&r=id&w=map

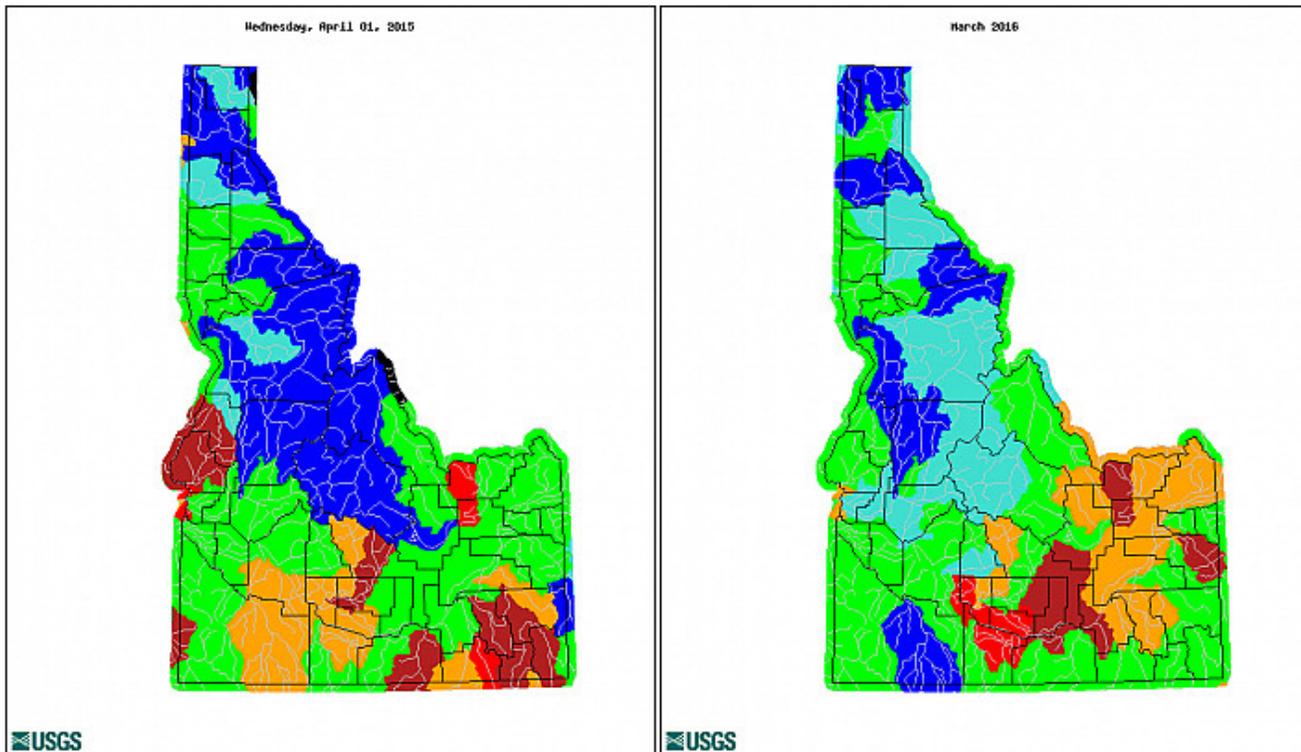
Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked

Comparison of Streamflow Maps

Geographic area: Water resource region:
 Map type: Sub type:

Date (YYYYMM):

Date (YYYYMM):



Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	No Data
	Much below normal	Below normal	Normal	Above normal	Much above normal		

waterwatch.usgs.gov/index.php

Drought:

**U.S. Drought Monitor
Idaho**

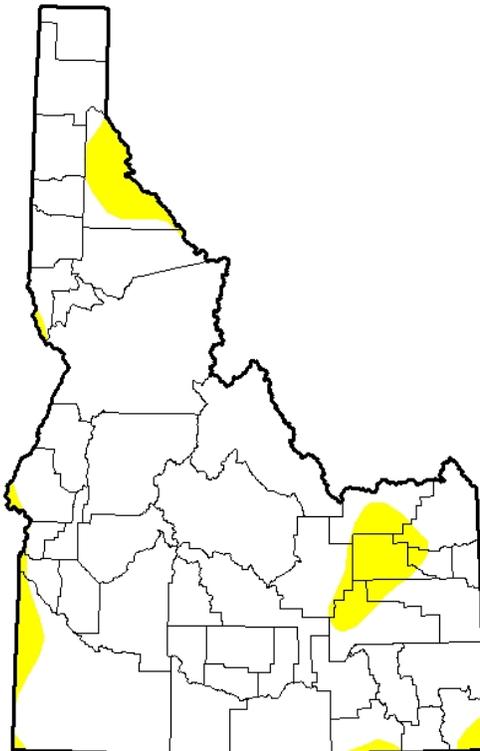
April 5, 2016

(Released Thursday, Apr. 7, 2016)

Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	91.97	8.03	0.00	0.00	0.00	0.00
Last Week <i>3/29/2016</i>	78.92	21.08	3.16	0.00	0.00	0.00
3 Months Ago <i>1/5/2016</i>	10.98	89.02	63.25	3.66	0.00	0.00
Start of Calendar Year <i>12/29/2015</i>	10.98	89.02	64.05	24.35	1.18	0.00
Start of Water Year <i>9/29/2015</i>	0.00	100.00	85.59	47.55	29.26	0.00
One Year Ago <i>4/7/2015</i>	30.47	69.53	39.05	17.55	2.41	0.00



Intensity:

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

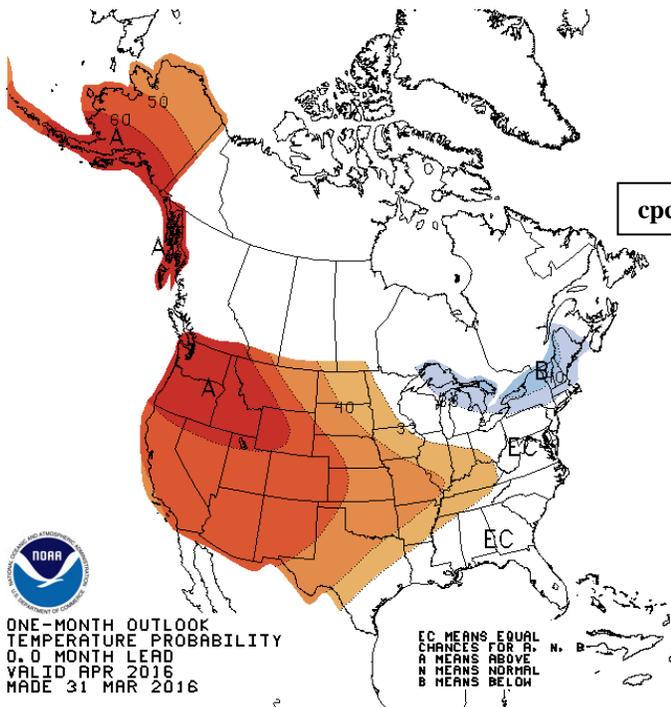
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Richard Tinker
CPC/NOAA/NWS/NCEP



<http://droughtmonitor.unl.edu/>



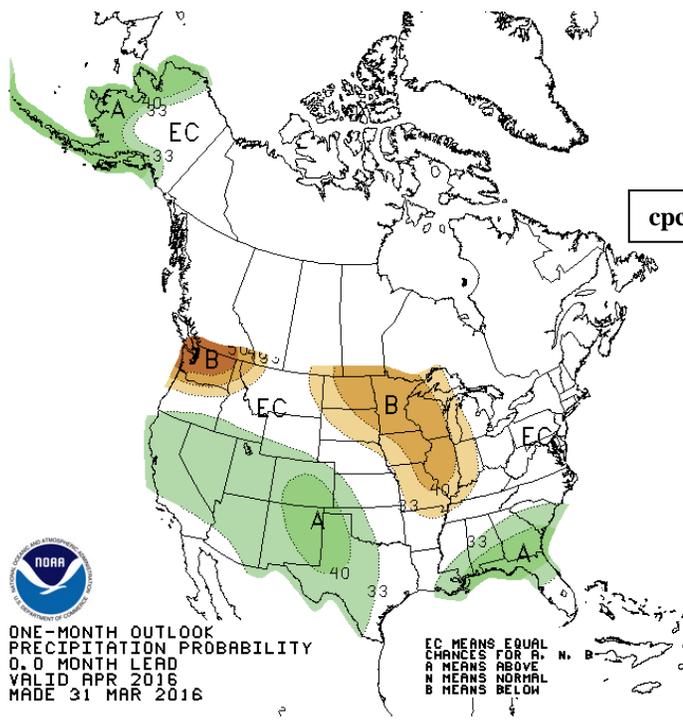
cpc.ncep.noaa.gov/products/predictions/30day/off15_temp.gif



ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0, 0 MONTH LEAD
VALID APR 2016
MADE 31 MAR 2016

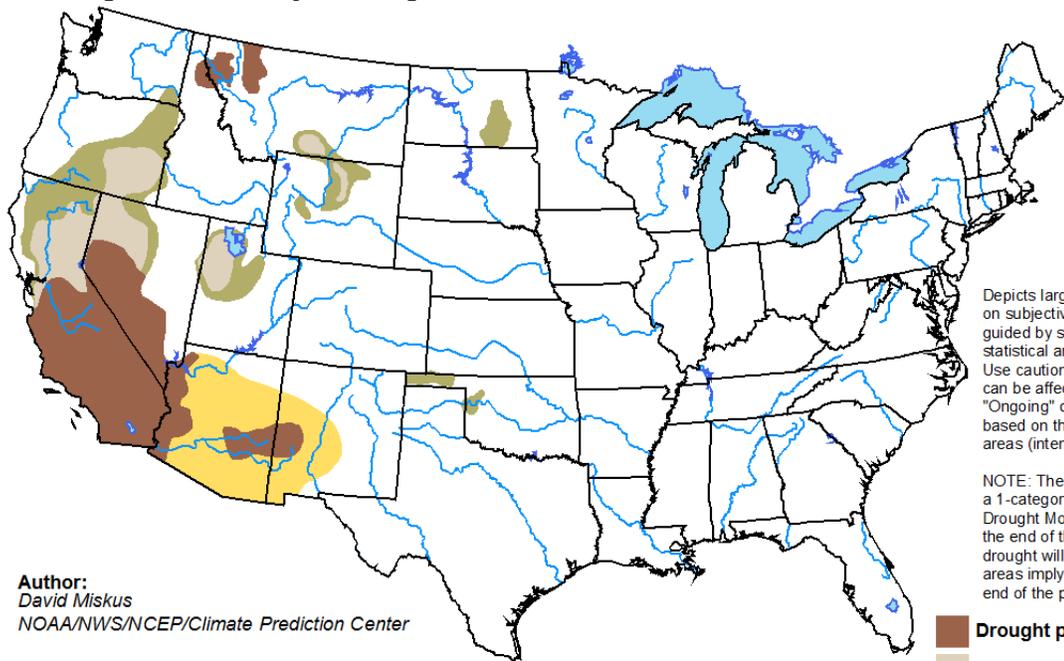
EC MEANS EQUAL
CHANCES FOR A, N, B
A MEANS ABOVE
N MEANS NORMAL
B MEANS BELOW

cpc.ncep.noaa.gov/products/predictions/30day/off15_prpc.gif



U.S. Seasonal Drought Outlook Drought Tendency During the Valid Period

Valid for March 17 - June 30, 2016
Released March 17, 2016



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

Author:
David Miskus
NOAA/NWS/NCEP/Climate Prediction Center

- Drought persists
- Drought remains but improves
- Drought removal likely
- Drought development likely

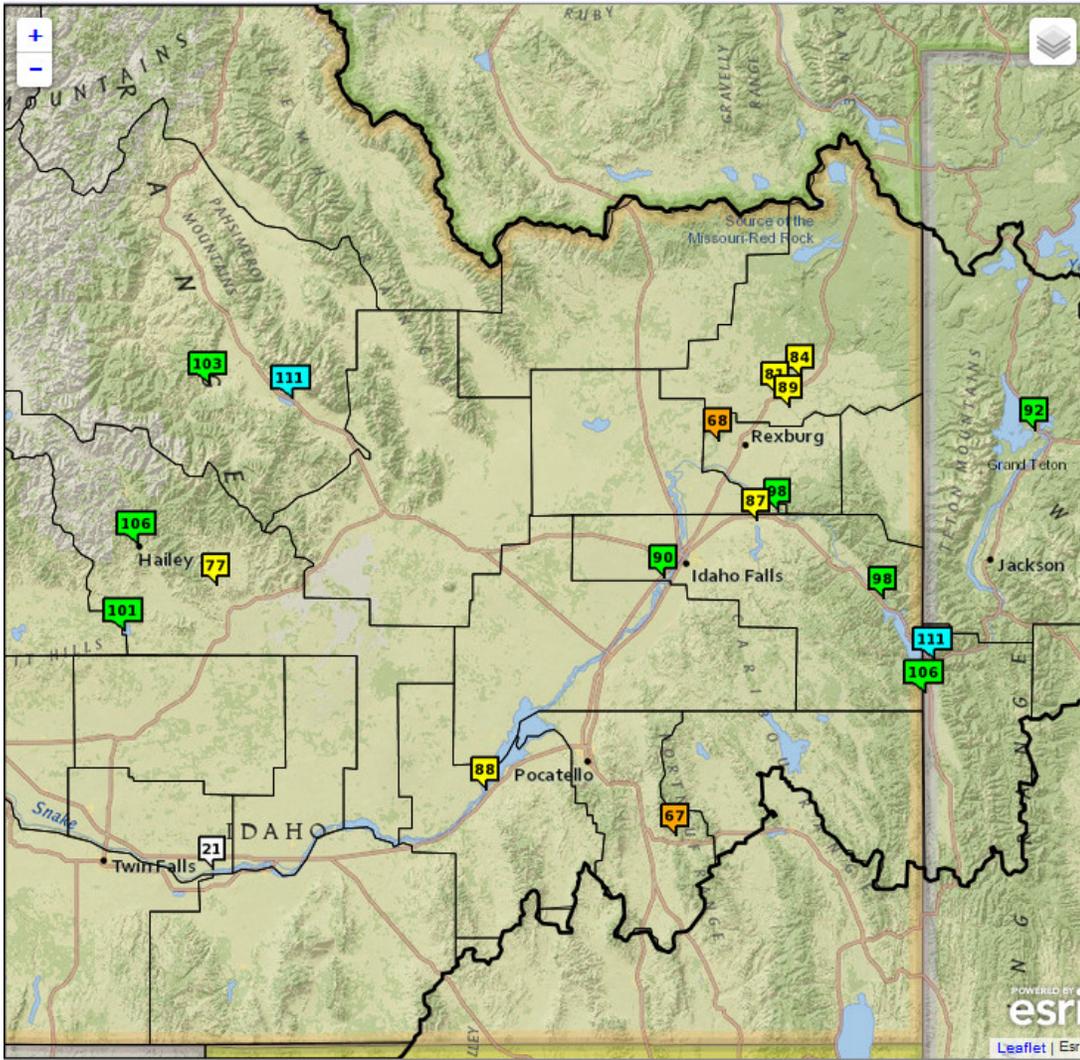


<http://go.usa.gov/3eZ73>

cpc.ncep.noaa.gov/products/expert_assessment/season_drought.png

Water Supply:

NWRFC Water Supply Volume Forecast Map (4/11/16):



nwrfc.noaa.gov/ws

NWRFC Water Supply Forecasts:

*For the current Forecast Period Table showing the 90% volume, 50% volume, Percent Normal (official forecast) and 10% volume Exceedence Forecast Ensemble Probabilities in conjunction with the current 30-Year Normal (1981 - 2010): (to select the locations within the Weather Forecast Office Pocatello, click on the column header “Servicing WFO” to sort to PIH)

www.nwrfc.noaa.gov/water_supply/ws_summary.cgi

*For a table format of the current Volume Forecasts and current Runoff statistics for various forecast periods for locations within the Weather Forecast Office Pocatello: (select type: WFO and Site: Pocatello)

www.nwrfc.noaa.gov/water_supply/ws_report.cgi

CBRFC Water Supply Forecast Report for Bear River basin (April 1 Forecast):

Water Supply Volume Percent Average/Median Condition
 ▲ <70 ▲ 70-90 ▲ 90-110 ▲ 110-130 ▲ >130 ▲ Regulated

Options (on/off): Plot
 Area: CBRFC Green Colorado San Juan Great Sevier Virgin Low Col WGRFC ABRFC

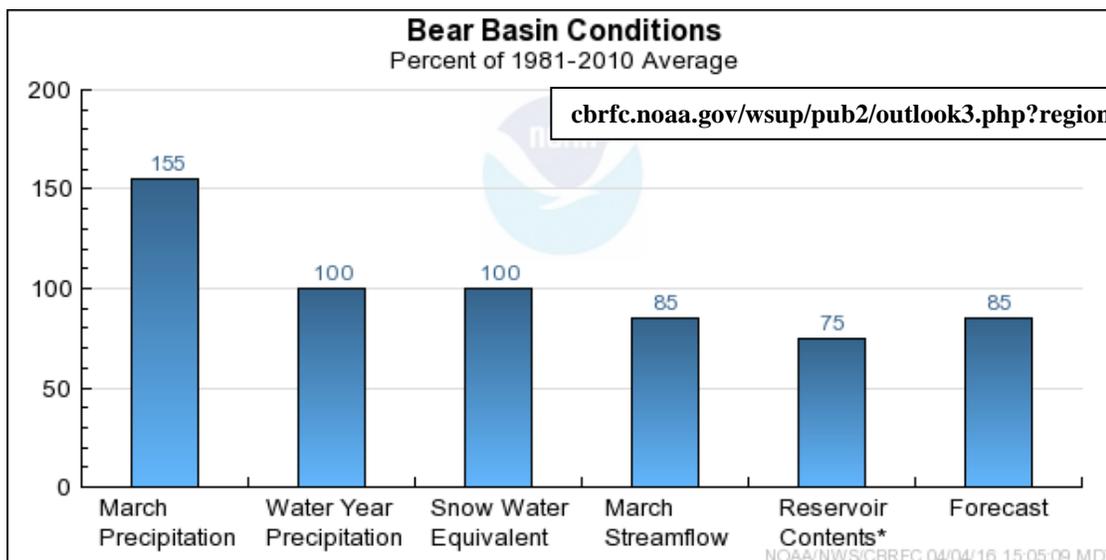
Columns (on/off): Area Sub Area NWS ID DS River Location Forecast Date Avg Cond Med Cond Forecast Period Min 90 P 70 MP 50 P 30 Max 10 Avg Med Pct Avg Pct Med

Click column heading to sort by that data. Click ID to view point info. Click Area, Sub Area, or Forecast Period to show only those points.

	Area	Sub Area	NWS ID	River	Location	Forecast Date	Avg Cond	Med Cond	Forecast Period	Min 90	P 70	MP 50	P 30	Max 10	Avg	Med	Pct Avg	Pct Med
1	Great	Bear	BERU1	Bear	Utah	2016-4-1	▲	▲	Apr 01-Jul 31	78	85	94	101	114	112	106	84	89
2	Great	Bear	BEAW4	Bear	Woodruff Narrows Rsvr	2016-4-1	▲	▲	Apr 01-Jul 31	65	75	83	92	117	121	110	69	75
3	Great	Bear	BORW4	Smiths Fork	Border	2016-4-1	▲	▲	Apr 01-Jul 31	64	70	79	85	92	89	80	89	99
4	Great	Bear	STDI1	Bear	Montpelier	2016-4-1	▲	▲	Apr 01-Jul 31	69	76	87	104	127	182	117	48	74
5	Great	Bear	LGNU1	Logan	Logan	2016-4-1	▲	▲	Apr 01-Jul 31	85	87	97	106	116	111	97	87	100
6	Great	Bear	HRMU1	Blacksmith Fork	Hyrum	2016-4-1	▲	▲	Apr 01-Jul 31	30	34	36	44	51	43	29	84	124
7	Great	Bear	PRZU1	Little Bear	Paradise	2016-4-1	▲	▲	Apr 01-Jul 31	25	30	33	41	44	47	51	70	65

cbrfc.noaa.gov/rmap/wsup/wsuplist.php

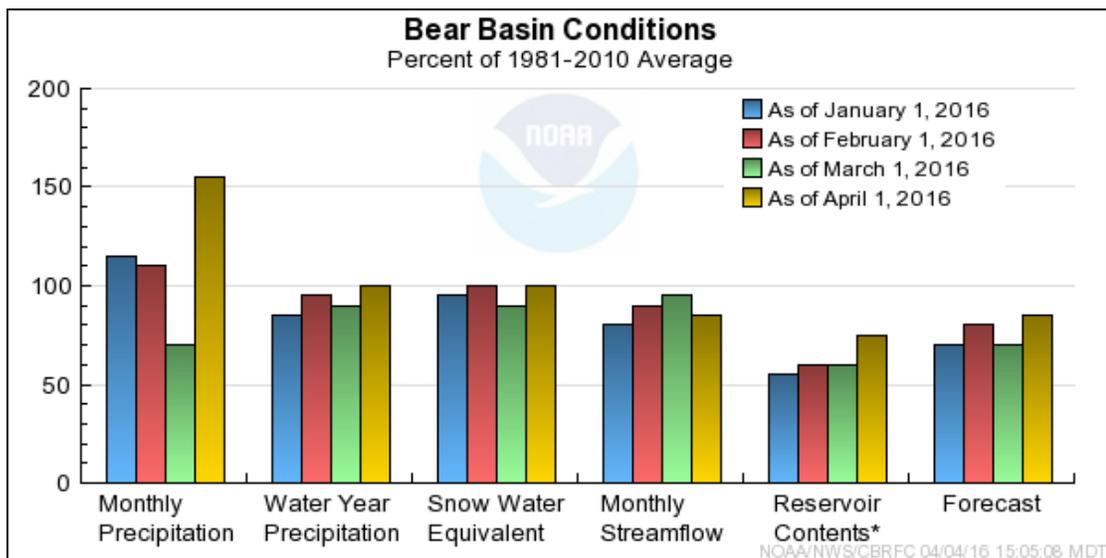
Bear River Basin Conditions:



cbrfc.noaa.gov/wsup/pub2/outlook3.php?region=sl&month=4&year=2016#br

Snow Water Equivalent in Percent of Median.

* Percent usable capacity, not percent average contents.



cbrfc.noaa.gov/wsup/pub2/graph/png/br.cond.2016.4.png

**NRCS-NWCC Water Supply Forecast Report for the upper Snake River and Bear River basins
(April 1 Forecast):**

*For a table format of the current Volume and Percent of Average Forecasts for both the upper Snake and Bear River basins which show various forecast periods for the 50% volume, percent of average (Official Forecast), max volume (10%), 30% volume, 70% volume, min volume (90%) and the 30-year 1981 - 2010 average, please visit:

www.wcc.nrcs.usda.gov/wsf/west_fcst.html
and click on appropriate first of month forecast and then either UPPER SNAKE or BEAR

cc:
Mike Schaffner, Western Region HCSD
Joe Intermill, Hydrologist-in-Charge, Northwest River Forecast Center
Steve King, Development and Operations Hydrologist, Northwest River Forecast Center
Michelle Stokes, Hydrologist-in-Charge, Colorado Basin River Forecast Center
Greg Smith, Acting Service Coordination Hydrologist, Colorado Basin River Forecast Center
John Lhotak, Development and Operations Hydrologist, Colorado Basin River Forecast Center
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Dean Hazen, Meteorologist-in-Charge, Pocatello, Idaho
Kurt Buffalo, Science and Operations Officer, Pocatello, Idaho
Vern Preston, Warning Coordination Meteorologist, Pocatello, Idaho
Troy Lindquist, Senior Service Hydrologist, Boise, Idaho
Brian McInerney, Senior Service Hydrologist, Salt Lake City, Utah
Kevin Berghoff, Senior Hydrologist, Northwest River Forecast Center
Taylor Dixon, Hydrologist, Northwest River Forecast Center
Brent Bernard, Hydrologist, Colorado Basin River Forecast Center
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End

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