Mountain Snowpack as of April 1, 2016

Percent of 1981-2010 Median (US)
Percent of 1981-2010 Average (Canada)

Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov
Created: 6 Apr 2016 14:20

Spring and Summer Streamflow Forecasts as of April 1, 2016

Percent of 1981-2010 Average

50% exceedance probability forecasts shown. For forecasts at other exceedance probabilities, see individual state reports.

Prepared by:
USDA Natural Resources Conservation Service
National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov
Created: 7 Apr 2016 09:30
Snow Water Equivalent Delta
March 31, 2016 minus March 1, 2016, end of day

- ≥ 20 in.
- 15 in.
- 10 in.
- 5 in.
- 0 in.
- -5 in.
- -10 in.
- -15 in.
- -20 in.

Change Color Set

NRCS Natural Resources Conservation Service
Created 4-12-2016, 07:50 AM MST
April 1 -10 Precipitation & Temperatures

Total Precipitation Anomaly: 01 April 2016 - 10 April 2016
Period ending 7 AM EST 10 Apr 2016
Base period: 1981-2010
(Map created 11 Apr 2016)

Daily Mean Temperature Anomaly: 01 April 2016 - 10 April 2016
Period ending 7 AM EST 10 Apr 2016
Base period: 1981-2010
(Map created 11 Apr 2016)
Jackson Peak and other west central sites are melting 0.5 to 1.0 inches / day since April 9.

For 5 days, April 21-26, 2013:
- melt rate was 0.8 to 1.2”/day,
- normal melt rate is 0.3”/day
SNOTEL Yesterday's Average Temperature Records

Apr 12, 2016

NOTE: record calculations are based on data through water year 2012; water years 2013, 2014, and 2015 are not analyzed.

**Yesterday's Average Temperature Records**
- New High
- Near High
- Near Record
- Non Record
- New Low
- Near Low

Analysis includes sites with at least 15 years of historical data. "Near" record means that one other year of the period of record is more extreme. Temperature is measured from midnight to midnight.

Provisional Data Subject to Revision

Prepared by USDA-NRCS National Water and Climate Center
Portland, Oregon
http://www.wcc.nrcs.usda.gov
Spokane Basin 2016 Snowpack Comparison Graph (9 sites)
Based on Provisional SNOTEL data as of Apr 10, 2016

Current as Pct of Normal: 78%
Current as Pct of 2015: 197%
Current as Pct of Peak: 77%
Normal as Pct of Peak: 99%
Pct of Normal Needed to Reach Peak: Current
Date is At or Past Peak Date
Normal Peak Date: Apr 03

Salmon Basin 2016 Snowpack Comparison Graph (22 sites)
Based on Provisional SNOTEL data as of Apr 10, 2016

Current as Pct of Normal: 97%
Current as Pct of 2015: 149%
Current as Pct of Peak: 97%
Normal as Pct of Peak: 100%
Pct of Normal Needed to Reach Peak: Current
Date is At or Past Peak Date
Normal Peak Date: Apr 09

2016 is a strong El Nino, as were 1992 & 1998.
2015 was a weak El Nino.
<table>
<thead>
<tr>
<th>BASIN or REGION</th>
<th>SWSI Value</th>
<th>Most Recent Year With Similar SWSI Value</th>
<th>Agricultural Water Supply Shortage May Occur When SWSI is Less Than</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spokane</td>
<td>-0.1</td>
<td>1981</td>
<td>NA</td>
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<tr>
<td>Clearwater</td>
<td>1.7</td>
<td>2009</td>
<td>NA</td>
</tr>
<tr>
<td>Salmon</td>
<td>0.3</td>
<td>2010</td>
<td>NA</td>
</tr>
<tr>
<td>Weiser</td>
<td>1.3</td>
<td>2010</td>
<td>NA</td>
</tr>
<tr>
<td>Payette</td>
<td>1.0</td>
<td>2008</td>
<td>NA</td>
</tr>
<tr>
<td>Boise</td>
<td>1.3</td>
<td>2012</td>
<td>-2.1</td>
</tr>
<tr>
<td>Big Wood</td>
<td>0.8</td>
<td>1985</td>
<td>0.2</td>
</tr>
<tr>
<td>Little Wood</td>
<td>1.0</td>
<td>2009</td>
<td>-1.2</td>
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<tr>
<td>Big Lost</td>
<td>0.8</td>
<td>2009</td>
<td>0.7</td>
</tr>
<tr>
<td>Little Lost</td>
<td>0.8</td>
<td>2012</td>
<td>1.4</td>
</tr>
<tr>
<td>Teton</td>
<td>0.1</td>
<td>2010</td>
<td>-3.9</td>
</tr>
<tr>
<td>Henrys Fork</td>
<td>-0.3</td>
<td>2000</td>
<td>-3.7</td>
</tr>
<tr>
<td>Snake (Heise)</td>
<td>0.8</td>
<td>2012</td>
<td>-1.6</td>
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<tr>
<td>Oakley</td>
<td>1.5</td>
<td>2007</td>
<td>0.0</td>
</tr>
<tr>
<td>Salmon Falls</td>
<td>1.7</td>
<td>1995/1996</td>
<td>-0.7</td>
</tr>
<tr>
<td>Bruneau</td>
<td>2.0</td>
<td>1997</td>
<td>NA</td>
</tr>
<tr>
<td>Owyhee</td>
<td>0.6</td>
<td>2005</td>
<td>-3.0</td>
</tr>
<tr>
<td>Bear River</td>
<td>-0.6</td>
<td>2015</td>
<td>-3.9</td>
</tr>
</tbody>
</table>
Boise Basin 2016 Snowpack Comparison Graph (10 sites)

Based on Provisional SNOTEL data as of Apr 11, 2016

- Normal
- WY1992
- WY1998
- WY2015
- WY2016

Current as Pct of Normal: 97%
Current as Pct of 2015: 158%
Current as Pct of Peak: 96%
Normal as Pct of Peak: 99%
Pct of Normal Needed to Reach Peak: Current
Date is At or Past Peak Date
Normal Peak Date: Apr 03

2016 is a strong El Nino, as were 1992 & 1998.
2015 was a weak El Nino.
April 11, 2016
Atlanta Summit SNOTEL, measured 36.0” of water with an average density of 48%!
Apr 1 Historic and Forecasted Surface Water Supply
Boise River Basin

Surplus Supply Above 1,830 to 1,930 KAF

Border line years

Outlier years

MARCH 1, 2016 SWSI Stacked Graph

Water Supply (1,000 Acre-Feet)

Years

Adequate Irrigation Supply Above 1,500 KAF
Surplus Above 2,200 KAF

Apr 1 Historic and Forecasted Surface Water Supply
Boise River Basin

Surplus Above 2,200 KAF

Adequate Irrigation Supply Above 1,500 KAF
Boise Basin:

**Determination of the 2,200 KAF Surplus Level:** The surplus threshold of 2200 KAF for the Boise Basin was determined based on the following analysis for years 1982-2014. The Boise River at Glenwood Bridge gage was installed in 1982.

SWSI volumes greater than 2,200 KAF, which is the summation of the Mar 31 combined reservoir storage plus Apr-Sep runoff volume, was sorted high to low.

Peak flows at the Glenwood gage were determined along with the number of days above 6000 cfs. There seems to be a distinct cutoff in the maximum flow at Glenwood. *Only one year, 1995, had a maximum discharge between 3330 to 6000 cfs.*

Natural inflow peaks were used as a guide but the amount released from the reservoir is primarily a function of the storage in the reservoir system. The total volume is then compared to the Glenwood maximum flow and duration of high flows.

**A volume greater than 2,200 KAF with a flow greater 6,000 cfs passing through the Boise River at Glenwood gage for generally more than 25 days meets the surplus threshold.**

### Boise Basin: Based on Glenwood Gauge Data 1982 - 2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Apr-Sep Volume [KAF]</th>
<th>March 31 Res Storage [KAF]</th>
<th>Sum Volume + Storage [KAF]</th>
<th>Max Q at Glenwood [cfs]</th>
<th>Days &gt; 6000 cfs @ Glenwood</th>
<th>Max Q Unreg @ LUC [cfs]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>2494.7</td>
<td>655.5</td>
<td>3150.2</td>
<td>9560</td>
<td>95</td>
<td>24255</td>
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<td>1982</td>
<td>2460.5</td>
<td>515.9</td>
<td>2976.4</td>
<td>7410</td>
<td>75</td>
<td>19020</td>
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<tr>
<td>1984</td>
<td>2490.6</td>
<td>346.5</td>
<td>2837.1</td>
<td>7160</td>
<td>117</td>
<td>24052</td>
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<tr>
<td>1987</td>
<td>2160.6</td>
<td>630.0</td>
<td>2790.6</td>
<td>6900</td>
<td>42</td>
<td>22541</td>
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<tr>
<td>1991</td>
<td>2105.8</td>
<td>574.1</td>
<td>2639.5</td>
<td>6690</td>
<td>67</td>
<td>20570</td>
</tr>
<tr>
<td>2006</td>
<td>2162.4</td>
<td>403.7</td>
<td>2566.1</td>
<td>7050</td>
<td>39</td>
<td>22066</td>
</tr>
<tr>
<td>1998</td>
<td>1793.0</td>
<td>837.0</td>
<td>2373.6</td>
<td>8350</td>
<td>28</td>
<td>14186</td>
</tr>
<tr>
<td>1995</td>
<td>1887.1</td>
<td>535.8</td>
<td>2422.9</td>
<td>4970</td>
<td>0</td>
<td>13350</td>
</tr>
<tr>
<td>2012</td>
<td>1610.9</td>
<td>801.3</td>
<td>2412.1</td>
<td>8050</td>
<td>45</td>
<td>22787</td>
</tr>
<tr>
<td>1999</td>
<td>1838.1</td>
<td>537.5</td>
<td>2375.6</td>
<td>6770</td>
<td>36</td>
<td>16445</td>
</tr>
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</table>

**Surplus above 2200 KAF**

<table>
<thead>
<tr>
<th>Year</th>
<th>Apr-Sep Volume</th>
<th>March 31 Res Storage</th>
<th>Sum Volume + Storage</th>
<th>Max Q at Glenwood</th>
<th>Days &gt; 6000 cfs</th>
<th>Max Q Unreg @ LUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>1656.5</td>
<td>421.7</td>
<td>2078.2</td>
<td>6560</td>
<td>5</td>
<td>16339</td>
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<td>2009</td>
<td>1323.0</td>
<td>666.6</td>
<td>1989.6</td>
<td>6040</td>
<td>1</td>
<td>10979</td>
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<td>2008</td>
<td>1382.1</td>
<td>577.9</td>
<td>1960.0</td>
<td>6860</td>
<td>5</td>
<td>17201</td>
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<tr>
<td>2000</td>
<td>1154.6</td>
<td>801.5</td>
<td>1956.1</td>
<td>6330</td>
<td>0</td>
<td>8867</td>
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<tr>
<td>2010</td>
<td>1223.8</td>
<td>697.0</td>
<td>1920.8</td>
<td>6000</td>
<td>0</td>
<td>17686</td>
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<tr>
<td>1989</td>
<td>1324.2</td>
<td>507.5</td>
<td>1831.7</td>
<td>6130</td>
<td>5</td>
<td>13151</td>
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<tr>
<td>1985</td>
<td>1165.6</td>
<td>664.0</td>
<td>1829.6</td>
<td>2360</td>
<td>0</td>
<td>9842</td>
</tr>
<tr>
<td>2014</td>
<td>1178.3</td>
<td>645.1</td>
<td>1823.4</td>
<td>1880</td>
<td>0</td>
<td>9776</td>
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<tr>
<td>2003</td>
<td>1218.6</td>
<td>538.4</td>
<td>1757.0</td>
<td>1480</td>
<td>0</td>
<td>16023</td>
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<tr>
<td>2002</td>
<td>1178.4</td>
<td>471.8</td>
<td>1650.2</td>
<td>1340</td>
<td>0</td>
<td>14216</td>
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<tr>
<td>2004</td>
<td>973.5</td>
<td>647.1</td>
<td>1620.6</td>
<td>1320</td>
<td>0</td>
<td>7247</td>
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<tr>
<td>2007</td>
<td>736.4</td>
<td>859.9</td>
<td>1596.3</td>
<td>1480</td>
<td>0</td>
<td>6441</td>
</tr>
</tbody>
</table>

**Shortages below 1500 KAF**

<table>
<thead>
<tr>
<th>Year</th>
<th>Apr-Sep Volume</th>
<th>March 31 Res Storage</th>
<th>Sum Volume + Storage</th>
<th>Max Q at Glenwood</th>
<th>Days &gt; 6000 cfs</th>
<th>Max Q Unreg @ LUC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>931.1</td>
<td>517.2</td>
<td>1448.3</td>
<td>1230</td>
<td>0</td>
<td>13233</td>
</tr>
<tr>
<td>1990</td>
<td>840.6</td>
<td>579.3</td>
<td>1419.9</td>
<td>875</td>
<td>0</td>
<td>7882</td>
</tr>
<tr>
<td>1993</td>
<td>703.8</td>
<td>681.6</td>
<td>1385.3</td>
<td>1440</td>
<td>0</td>
<td>7517</td>
</tr>
<tr>
<td>1987</td>
<td>561.8</td>
<td>784.6</td>
<td>1346.4</td>
<td>1470</td>
<td>0</td>
<td>5625</td>
</tr>
<tr>
<td>1994</td>
<td>588.4</td>
<td>677.9</td>
<td>1266.3</td>
<td>1280</td>
<td>0</td>
<td>5573</td>
</tr>
<tr>
<td>1991</td>
<td>734.4</td>
<td>477.5</td>
<td>1211.9</td>
<td>968</td>
<td>0</td>
<td>6308</td>
</tr>
<tr>
<td>1988</td>
<td>745.6</td>
<td>451.3</td>
<td>1196.9</td>
<td>939</td>
<td>0</td>
<td>6234</td>
</tr>
<tr>
<td>2001</td>
<td>544.9</td>
<td>619.5</td>
<td>1164.4</td>
<td>947</td>
<td>0</td>
<td>6209</td>
</tr>
<tr>
<td>1992</td>
<td>470.8</td>
<td>412.3</td>
<td>883.1</td>
<td>830</td>
<td>0</td>
<td>4317</td>
</tr>
</tbody>
</table>
Apr 1 Historic and Forecasted Surface Water Supply
Boise River Basin

Border line years
Outlier years
Surplus Above 2,200 KAF

Adequate Irrigation Supply
Above 1,500 KAF

StreamFlow Apr-Sep
Reservoir 31-Mar
The years with days above 6000 cfs on the Boise River at Glenwood Bridge are plotted. In the table, the years are in bold. The years in blue are surplus, and the years in green are borderline (defined above). The red years correspond to years of water supply shortage.
Big Lost Basin 2016 Snowpack Comparison Graph (5 sites)
Based on Provisional SNOTEL data as of Apr 11, 2016

Current as Pct of Normal: 86%
Current as Pct of 2015: 207%
Current as Pct of Peak: 86%
Normal as Pct of Peak: 99%
Pct of Normal Needed to Reach Peak: Current
Date is At or Past Peak Date
Normal Peak Date: Apr 09

2016 is a strong El Nino, as were 1992 & 1998. 2015 was a weak El Nino.

Apr 1 Historic and Forecasted Surface Water Supply
Big Lost River Basin

Adequate Irrigation Supply Above 180 KAF
Little Lost and Birch Basins 2016 Snowpack Comparison Graph (4 sites)
Based on Provisional SNOTEL data as of Apr 11, 2016

Current as Pct of Normal: 90%
Current as Pct of 2015: 149%
Current as Pct of Peak: 89%
Normal as Pct of Peak: 99%
Pct of Normal Needed to Reach Peak: Current
Date is At or Past Peak Date
Normal Peak Date: Apr 09

2016 is a strong El Nino,
as were 1992 & 1998.
2015 was a weak El Nino.

Apr 1 Historic and Forecasted Surface Water Supply
Little Lost River Basin
Snake Basin abv Palisades 2016 Snowpack Comparison Graph (18 sites)
Based on Provisional SNOTEL data as of Apr 11, 2016

Current as Pct of Normal: 87%
Current as Pct of 2015: 110%
Current as Pct of Peak: 87%
Normal as Pct of Peak: 100%
Pct of Normal Needed to Reach Peak: Current Date is At or Past Peak Date
Normal Peak Date: Apr 10

2016 is a strong El Nino, as were 1992 & 1998. 2015 was a weak El Nino.

Apr 1 Historic and Forecasted Surface Water Supply
Snake River Near Hise
Salmon Fall Creek usually peaks or has an increase when Magic Mtn SNOTEL is about 65% melted.
SF Boise River near Featherville, on average, peaks or has another increase 3 days after half melt at Vienna Mine