Idaho Snowpack and Water Supply Outlook

February 13, 2019

NRCS - Idaho Snow Survey

Danny Tappa & Ron Abramovich
Lost River Basins

Snow Water Equivalent in Big Lost Basin Total

Current as of 02/12/2019:
- % of Median - 97%
- % Median Peak - 65%
- Days Until Median Peak - 51
- Percentile - 53

Station List
- Median Peak SWE
  - Max
  - Median (POR)
  - Median ('81-'10)
  - Min
- Stats. Shading
  - 2019 (5 sites)
  - 2018 (5 sites)
  - 2017 (5 sites)
  - 2016 (5 sites)
  - 2015 (5 sites)
  - 2014 (5 sites)
  - 2013 (5 sites)
  - 2012 (5 sites)
  - 2011 (5 sites)
  - 2010 (5 sites)
  - 2009 (5 sites)
  - 2008 (5 sites)
  - 2007 (5 sites)

Snow Water Equivalent in Little Lost River

Current as of 02/12/2019:
- % of Median - 97%
- % Median Peak - 71%
- Days Until Median Peak - 54
- Percentile - 49

Station List
- Median Peak SWE
  - Max
  - Median (POR)
  - Median ('81-'10)
  - Min
- Stats. Shading
  - 2019 (3 sites)
  - 2018 (3 sites)
  - 2017 (3 sites)
  - 2016 (3 sites)
  - 2015 (3 sites)
  - 2014 (3 sites)
  - 2013 (3 sites)
  - 2012 (3 sites)
  - 2011 (3 sites)
  - 2010 (3 sites)
  - 2009 (3 sites)
  - 2008 (3 sites)
  - 2007 (3 sites)
Wood River Basins

Snow Water Equivalent in Big Wood Basin Total

Current as of 02/12/2019:
- % of Median - 109%
- % Median Peak - 89%
- Days Until Median Peak - 46
- Percentile - 61

Station List

- Median Peak SWE
- Max
- Median (POR)
- Median ('81-'10)
- Min
- Stats. Shading
- 2019 (8 sites)
- 2018 (8 sites)
- 2017 (8 sites)
- 2016 (8 sites)
- 2015 (8 sites)
- 2014 (8 sites)
- 2013 (8 sites)
- 2012 (8 sites)
- 2011 (8 sites)
- 2010 (8 sites)
- 2009 (8 sites)
- 2008 (8 sites)
- 2007 (8 sites)

Snow Water Equivalent in Little Wood River

Current as of 02/12/2019:
- % of Median - 109%
- % Median Peak - 83%
- Days Until Median Peak - 49
- Percentile - 71

Station List

- Median Peak SWE
- Max
- Median (POR)
- Median ('81-'10)
- Min
- Stats. Shading
- 2019 (3 sites)
- 2018 (3 sites)
- 2017 (3 sites)
- 2016 (3 sites)
- 2015 (3 sites)
- 2014 (3 sites)
- 2013 (3 sites)
- 2012 (3 sites)
- 2011 (3 sites)
- 2010 (3 sites)
- 2009 (3 sites)
- 2008 (3 sites)
- 2007 (3 sites)

Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.
Boise & Payette

Access to interactive comparison graphs..

Snow Water Equivalent in Boise Basin Total

Station List

- Median Peak SWE
- Max
- Median (POR)
- Median ('81-'10)
- Min
- Stats. Shading

- 2019 (9 sites)
- 2018 (9 sites)
- 2017 (9 sites)
- 2016 (9 sites)
- 2015 (9 sites)
- 2014 (9 sites)
- 2013 (9 sites)
- 2012 (9 sites)
- 2011 (9 sites)
- 2010 (9 sites)
- 2009 (9 sites)
- 2008 (9 sites)
- 2007 (9 sites)

Snow Water Equivalent in Payette Basin Total

Station List

- Median Peak SWE
- Max
- Median (POR)
- Median ('81-'10)
- Min
- Stats. Shading

- 2019 (11 sites)
- 2018 (11 sites)
- 2017 (11 sites)
- 2016 (11 sites)
- 2015 (11 sites)
- 2014 (11 sites)
- 2013 (11 sites)
- 2012 (11 sites)
- 2011 (11 sites)
- 2010 (11 sites)
- 2009 (11 sites)
- 2008 (11 sites)
- 2007 (11 sites)

Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles.
Feb 2 vs Feb 12: Snow depth change
Current snowpack density records
How many were surprised to see this much snow in February so far?

- Raise your right hand

Cat Skiing Brundage Sunday February 10, 2019
## SNOTEL Snowpack & Precipitation Summary

**as of February 12, 2019**

<table>
<thead>
<tr>
<th>Region or Basin</th>
<th>February 12, 2019</th>
<th>February 1-12 Precipitation as % of Monthly Total Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>SWE as % of Median</td>
<td>Percent of Seasonal Peak</td>
<td></td>
</tr>
<tr>
<td>Northern Panhandle Region</td>
<td>87</td>
<td>64</td>
</tr>
<tr>
<td>Spokane Basin</td>
<td>85</td>
<td>66</td>
</tr>
<tr>
<td>Clearwater Basin</td>
<td>93</td>
<td>68</td>
</tr>
<tr>
<td>Salmon Basin</td>
<td>97</td>
<td>68</td>
</tr>
<tr>
<td>Weiser Basin</td>
<td>122</td>
<td>91</td>
</tr>
<tr>
<td>Payette Basin</td>
<td>102</td>
<td>71</td>
</tr>
<tr>
<td>Boise Basin</td>
<td>91</td>
<td>65</td>
</tr>
<tr>
<td>Big Wood Basin</td>
<td>98</td>
<td>70</td>
</tr>
<tr>
<td>Little Wood Basin</td>
<td>104</td>
<td>70</td>
</tr>
<tr>
<td>Big Lost Basin</td>
<td>97</td>
<td>65</td>
</tr>
<tr>
<td>Little Lost, Birch Basins</td>
<td>97</td>
<td>65</td>
</tr>
<tr>
<td>Medicine Lodge, Beaver, Camas</td>
<td>98</td>
<td>65</td>
</tr>
<tr>
<td>Henry's Fork, Teton Basins</td>
<td>99</td>
<td>67</td>
</tr>
<tr>
<td>Snake Basin Above Palisades</td>
<td>91</td>
<td>62</td>
</tr>
<tr>
<td>Willow, Blackfoot, Portneuf</td>
<td>111</td>
<td>79</td>
</tr>
<tr>
<td>Snake Basin Above American</td>
<td>97</td>
<td>66</td>
</tr>
<tr>
<td>Oakley Basin</td>
<td>96</td>
<td>69</td>
</tr>
<tr>
<td>Salmon Falls Basin</td>
<td>99</td>
<td>70</td>
</tr>
<tr>
<td>Bruneau Basin</td>
<td>104</td>
<td>74</td>
</tr>
<tr>
<td>Owyhee Basin</td>
<td>104</td>
<td>77</td>
</tr>
<tr>
<td>Bear River Basin</td>
<td>104</td>
<td>69</td>
</tr>
</tbody>
</table>

**SWE = Snow Water Equivalent**
## Observed Reservoir Storage for End of January 2019 & Projected Spring Storage

**As of November 6, 2018**

Projected change in reservoir storage from Oct 31, 2018 to start of runoff season in Spring 2019.

<table>
<thead>
<tr>
<th></th>
<th>Sep 30 storage KAF</th>
<th>Oct 31 storage KAF</th>
<th>Observed Nov 30 storage KAF</th>
<th>Observed Dec 31 storage KAF</th>
<th>Projected Feb 28 storage KAF</th>
<th>Projected Mar 31 storage KAF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boise Reservoir System</strong></td>
<td>446.4</td>
<td>437.5</td>
<td>465.4</td>
<td>494.9</td>
<td>529.3</td>
<td>630</td>
</tr>
<tr>
<td>Magic Reservoir</td>
<td>61.1</td>
<td>69.0</td>
<td>76.7</td>
<td>79.9</td>
<td>83.8</td>
<td>120</td>
</tr>
<tr>
<td>Little Wood Reservoir</td>
<td>11.1</td>
<td>12.9</td>
<td>15.6</td>
<td>18.3</td>
<td>21.1</td>
<td>23</td>
</tr>
<tr>
<td>Mackay Reservoir</td>
<td>24.8</td>
<td>24.8</td>
<td>26.8</td>
<td>29.7</td>
<td>30.9</td>
<td>40</td>
</tr>
<tr>
<td>Jackson &amp; Palisades Reservoir System</td>
<td>1476.7</td>
<td>1462.5</td>
<td>1582.4</td>
<td>1684.7</td>
<td>1781.8</td>
<td>1800</td>
</tr>
<tr>
<td>Oakley Reservoir</td>
<td>12.1</td>
<td>13.5</td>
<td>14.4</td>
<td>17.3</td>
<td>18.9</td>
<td>23</td>
</tr>
<tr>
<td>Salmon Falls Reservoir</td>
<td>31.9</td>
<td>33.1</td>
<td>34.8</td>
<td>36.0</td>
<td>39.1</td>
<td>41</td>
</tr>
<tr>
<td>Lake Owyhee</td>
<td>220.5</td>
<td>222.7</td>
<td>237.0</td>
<td>254.0</td>
<td>273.8 / 280</td>
<td></td>
</tr>
<tr>
<td>Bear Lake</td>
<td>802.3</td>
<td>798.2</td>
<td>769.8</td>
<td>809.8</td>
<td>850</td>
<td></td>
</tr>
</tbody>
</table>

Other basins, Spokane, Clearwater, Salmon, Weiser, Payette and Bruneau basins, the surface agricultural irrigation demand is not known or relevant.
Fall reservoir carryover storage is used to project spring reservoir storage levels based on current conditions and current flow trends. Then, by knowing the adequate irrigation water supply needed in your basin, the projected spring reservoir volumes are subtracted from the adequate irrigation supply to determine the volume of streamflow to marginally meet adequate surface irrigation supplies in 2018.

<table>
<thead>
<tr>
<th>Column 2</th>
<th>Column 3 = Column 4</th>
<th>Col4/Col6 X 100 = Col5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basin</td>
<td>Amount needed</td>
<td>Projected end of month reservoir volume</td>
</tr>
<tr>
<td></td>
<td>for adequate irrigation water supply (Jan, Feb or Mar) KAF</td>
<td>2019 streamflow volume for adequate water supply KAF</td>
</tr>
<tr>
<td>Boise</td>
<td>1500</td>
<td>630</td>
</tr>
<tr>
<td>Big Wood above Hailey</td>
<td>135</td>
<td>---</td>
</tr>
<tr>
<td>Big Wood</td>
<td>275</td>
<td>120</td>
</tr>
<tr>
<td>Little Wood</td>
<td>60</td>
<td>23</td>
</tr>
<tr>
<td>Big Lost</td>
<td>180</td>
<td>40</td>
</tr>
<tr>
<td>Little Lost</td>
<td>40</td>
<td>---</td>
</tr>
<tr>
<td>Teton</td>
<td>85</td>
<td>---</td>
</tr>
<tr>
<td>Snake (Heise)</td>
<td>4,400</td>
<td>1800</td>
</tr>
<tr>
<td>Oakley</td>
<td>50</td>
<td>23</td>
</tr>
<tr>
<td>Salmon Falls</td>
<td>110</td>
<td>41</td>
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<td>Teton</td>
<td>85</td>
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</tr>
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</table>

* Based on Bear River reservoir allocation: only 245 KAF in storage can be used in 2019, remaining 35 KAF to meet adequate irrigation supply is from runoff.
Water Supply Forecast
February 1, 2019

Forecasted April-July Flow as a Percentage of the 1981 to 2010 Average

Above Average

- 180%
- 150 - 179%
- 130 - 149%
- 110 - 129%
- 90 - 109%
- 70 - 89%
- 50 - 69%
- 25 - 49%
- 0 - 24%
- No Data

Below Average

- Provisional Data - Subject to Revision

This map is prepared by the USDA-NRCS Idaho Snow Survey Office.

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Feb 1 Historic and Forecasted Surface Water Supply
Big Wood above Hailey

Water Supply (1000 Acre-Feet)

Years

Adequate Irrigation Supply Above 135 KAF
Big Wood Basin 7 Station Snow Index & Big Wood River at Hailey
Apr-Sep Streamflow as % of 1981-2010 Normals, 1961–2018

Wood River Snow Index
2019 SWE based on Feb 12 and
compared to April 1 Index &
Apr-Sep Flow as % of Average

Based on current Feb 12 SWE,
estimated Apr-Sep volume in
the 60-100% of average.
2019 Big Wood River at Hailey: Apr-Jul Volume
NRCS Monthly Forecasts are Squares

Updated February 12, 2019

2018 April–July Volume 97% of Normal 227 KAF

2019 – 51% of the average Apr-Sep runoff (135 KAF) is needed for marginally adequate surface irrigation supply

SNOTEL Sites used: Hyndman, Lost Wood Divide, Chocolate Gulch, Dollarhide Summit, Galena, Galena

Changes in gray: 10, 25, 75, and 90th percentiles for historical period of record

2018 April–July Volume 97% of Normal 227 KAF
2019 Little Wood River near Carey: Apr - Jul Volume Updated

February 12, 2019

Daily Guidance Forecast
Monthly Forecasts
2018 Runoff in %
Skill (r²)

2018 Apr-Jul Volume 87% of Normal 67 KAF

2019 -- based on irrigation demand of 60 KAF and Mar 31 reservoir storage projection of 23 KAF
37 KAF or ~40% of Apr-Sep Volume is needed for marginally adequate surface irrigation supply

1-Oct 1-Nov 1-Dec 1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug 1-Sep

SNOTEL Sites used: Swede Peak, Garfield RS, Hyndman, Lost-Wood Divide, Bear Canyon

2019 Little Wood River near Carey: Apr - Jul Volume
NRCS Monthly Forecasts are Squares

2018 Apr-Jul Volume 87% of Normal 67 KAF

Changes in gray: 10, 30, 70, and 90th percentiles for historical period of record

Updated February 12, 2019

1-Oct 1-Nov 1-Dec 1-Jan 1-Feb 1-Mar 1-Apr 1-May 1-Jun 1-Jul 1-Aug 1-Sep

2019 Cumulative KAF to date for period

2018 Apr-Jul Volume 87% of Normal 67 KAF
70 KAF was determined as the surplus volume based on the reservoir capacity of 30.0 KAF and potential to fill the reservoir.
2019 Big Lost River below Mackay Resv: Apr-Jul Percent of Normal
NRCS Monthly Forecasts are Squares

2018 April - July Runoff
147% of Normal 180 KAF

Updated
February 12, 2019

2019-- based on irrigation demand of 180 KAF and Mar 31 reservoir storage projection of 40 KAF
93% of the average Apr-Sep runoff (160 KAF) is needed for marginally adequate surface irrigation supply

SNOTEL Sites used: Bear Canyon, Garfield RS, Swede Peak, Hyndman, Lost-Wood Divide and Stickney Mill
2019 Snake River near Heise: Apr-Jul Percent of Normal
NRCS Monthly Forecasts are Squares

Updated
February 12, 2019

2018 Apr - Jul Runoff
132% of Normal 4,250 KAF

2019 -- based on irrigation demand of 4,400 KAF and Mar 31 projected storage for Jackson & Palisades of 1,800 KAF
69% of normal runoff (2,600 KAF for Apr-Sep period) is needed for marginally adequate surface irrigation supply

SNOTELs used: Base Camp, Blind Bull, Cottonwood Ck, Lewis Lake, Snake River Station, Slug Ck, Thumb Div, Willow Ck
Surplus Estimate based upon CFS flow >25,000 @ Blackfoot and volume > 6,300-6,800 KAF.
2019 Salmon Falls Creek: Mar - Jul Volume
NRCS Monthly are Yellow Squares

Updated February 12, 2019

2018 Mar - Jul Runoff 44% of Normal 36 KAF

2019 -- based on irrigation demand of 110 KAF and projected Feb 28 reservoir storage of 41 KAF
81% of average runoff (69 KAF for Mar-Sep) is needed for marginally adequate surface irrigation supply

2018 Streamflow % of Normal
Skill (r²)

2019 Oakley Reservoir Inflow: Mar - Jul Volume
NRCS Monthly Forecasts are Squares

Updated February 12, 2019

2018 Mar - Jul Volume 44% of Normal 12.5 KAF

2019 -- based on irrigation demand of 50 KAF and Feb 28 reservoir storage of 23 KAF
87% of average (27 KAF for Mar-Sep) runoff is needed for marginally adequate surface irrigation supply

SNOTEL Sites used: Bear Creek, Seventy-Six Creek, Pole Creek, Wilson Creek and Draw Creek.
2019 Bear River below Stewart Dam: Apr - Jul Volume
NRCS Monthly Forecasts are Yellow Squares

Updated
February 12, 2019

2018 Apr-Jul Volume, % of Normal
47% of Normal 87 KAF

Based on Bear River allocation, 17% of average (35 KAF) runoff is needed for adequate surface irrigation supply for Bear Lake water users.

SNOTEL Sites used: Giveout, Kelley RS, Chalk Creek #1, Monte Cristo, Trial Lake and Bug Lake
Snow Water Equivalent in Little Wood River

Current as of 02/12/2019:

- % of Median: 110%
- % Median Peak: 82%
- Days Until Median Peak: 49
- Percentile: 71

Snow Water Equivalent (in.)

Station List:
- 2002 (3 sites)
- 2001 (3 sites)
- 2000 (3 sites)
- 1999 (3 sites)
- 1998 (3 sites)
- 1997 (3 sites)
- 1996 (3 sites)
- 1995 (3 sites)
- 1994 (3 sites)
- 1993 (3 sites)
- 1992 (3 sites)
- 1991 (3 sites)
- 1990 (3 sites)
- 1989 (3 sites)
- 1988 (3 sites)
- 1987 (3 sites)
- 1986 (3 sites)
- 1985 (3 sites)
- 1984 (3 sites)

2017 (3 sites)
(Apr 15, 19.8)

1986 (3 sites)
(Apr 15, 14.8)

2014 (3 sites)
(Apr 15, 4.9)
Snow Water Equivalent in Big Wood Basin Total

Current as of 02/12/2019:
% of Median - 98%
% Median Peak - 75%
Days Until Median Peak - 46
Percentile - 49

Station List
- Median Peak SWE
- Max
- Median (POR)
- Median ('81-'10)
- Min
- Stats. Shading
- 2019 (8 sites)
- 2018 (8 sites)
- 2017 (8 sites)
- 2016 (8 sites)
- 2015 (8 sites)
- 2014 (8 sites)
- 2013 (8 sites)
- 2012 (8 sites)
- 2011 (8 sites)
- 2010 (8 sites)
- 2009 (8 sites)
- 2008 (8 sites)
- 2007 (8 sites)

Snow Water Equivalent (in.)

May 1, 26.3 (1986, 5 sites)
May 1, 23.1 (2017, 8 sites)
May 1, 10.8 (2014, 8 sites)
A volume greater than 350 KAF with a maximum flow greater than 1,500 cfs passing through Magic Dam gage meets the surplus threshold. The agricultural shortage threshold is 275 KAF.
2019 Big Wood River at Hailey: Apr-Jul Volume
NRCS Monthly Forecasts are Squares

Updated February 5 2019

60-100% of average range = 160 to 265 KAF
Apr-Sep Runoff

2018 April-July Volume
97% of Normal 227 KAF

SNOTEL Sites used: Hyndman, Lost Wood Divide, Chocolate Gulch, Dollarhide Summit, Galena, Galena Summit