

Natural Resources Conservation Service

Idaho Water Supply Outlook Report

March 1, 2017





Dry Fork Snow Course, February 28, 2017. Photo courtesy of Chris Merrill (NRCS-Arco)



During February, the mountains of Idaho received 150% to 500% of normal monthly precipitation! At the Dry Fork snow course in the southern Pioneer Mountains (pictured above), surveyors measured 23.4" of water and 80" of snow depth. This is 213% of normal and the highest March 1 measurement since 1969. As a whole, the Big Lost River basin has the most snow since 1997. The nearby Big Wood basin has the most snow on record, dating back to 1961. The red line on the chart above illustrates the incredible amount of snow received in these basins during February.

Wood River Water Collaborative Meeting Wednesday, March 15, 2017 at 1:00 p.m.

The Nature Conservancy

2017 Water Projection

- Current Year and how we got here... ٠
- The SNOTEL network and current conditions ٠
- Water supply outlook SWSI ٠
- Past work modeling work and information learned •
- **GIS** analysis from last fall about analysis of sites ٠
- **Q&A** during the discussion ٠

Ron will discussion 2017 water supply, shortages, surpluses and how the department (and users) works with stream gauge data, reservoir fill and snowpack peak to predict water supply.

The department is using the WR basin as a system optimization model to look at data gaps and where future SNOTEL sites might be needed for refining data. Opportunities with NRCS for financial partnering on more SNOTEL sites in our area.

Ron Abramovich

Water Supply Specialist **Snow Survey Boise**, Idaho













| | | | | Stre | eamflow as | % of 1981-2 | 010 Averag | e |
|-------------|------|-----------|------------|---------------------|--------------------------|------------------------------------|----------------------------|---------------------|
| | | ENSO | PDO | Feb-Sep | Apr-Sep | Apr-Sep | Apr-Sep | Apr-Sep |
| | Vear | SE Strong | nos or nog | Owyhee River blw | Salmon Falls Creek | Big Wood River blw Magic Dam | Snake River nr Heise | Spokane River nr |
| | 1994 | SE | nos | 23 | 36 | Magic Dam | 61 | 51 |
| Analysis of | 1988 | SE | nos | 30 | 65 | 24 | 70 | 71 |
| Streemflow | 1941 | SE | pos | 83 | 53 | 69 | 73 | 45 |
| Streamnow | 1966 | SE | neg | 28 | 39 | 51 | 78 | 90 |
| in Strong | 1973 | SE | pos / neg | 61 | 114 | 51 | 79 | 45 |
| motiong | 1942 | SE | pos | 122 | 173 | 117 | 86 | 77 |
| El Nino | 1947 | SE | pos / neg | 44 | 50 | 59 | 108 | 90 |
| 1952 | SE | neg | 246 | 178 | 263 | 116 | 123 | |
| Years (SE) | 1995 | SE | pos | 124 | 135 | 195 | 118 | 70 |
| | 1998 | SE | pos | 135 | 138 | 161 | 119 | 82 |
| like 2010 | 1983 | SE | pos | 221 | 157 | 282 | 132 | 91 |
| | 1978 | SE | pos | 110 | 112 | 140 | 133 | 99 |
| | 2016 | SE | pos | 82 | 122 | 70 | 80 | 66 |
| | | | | | | | sorted | |
| | | | | | <60 | | | |
| | | | | | | 60-90 | | |
| | | | | | | 90-110 | | |
| | | | | | | ~111-130 | | |
| | | | | | | >130 | | |

Analysis of Streamflow for a year like **2017 that** follows a **Strong El Nino Year**

| | | | | | Stre | eamflow as | s % of 1981-2 | 010 Avera | ge |
|---|----------|---------|----------|---------|-----------|------------|---------------|-----------|------------|
| | | ENSO | | ENSO | Feb-Sep | Apr-Sep | Apr-Sep | Apr-Sep | Apr-Sep |
| | | | Year | | | | | | |
| | | SE | Folowing | | Owyhee | Salmon | Big Wood | Snake | Spokane |
| | | Strong | a Strong | | River blw | Falls | River blw | River nr | River nr |
| l | Year | El Nino | El Nino | | Dam | Creek | Magic Dam | Heise | Post Falls |
| | 1941 | SE | 1942 | SE | 122 | 173 | 117 | 86 | 77 |
| | 1978 | SE | 1979 | N | 97 | 116 | 34 | 90 | 105 |
| | 1952 | SE | 1953 | N | 56 | 76 | 92 | 92 | 108 |
| | 1947 | SE | 1948 | LN | 58 | 86 | 66 | 97 | 176 |
| | 1988 | SE | 1989 | SL | 145 | 100 | 75 | 102 | 116 |
| | 1966 | SE | 1967 | N | 69 | 88 | 151 | 109 | 113 |
| | 1994 | SE | 1995 | SE | 124 | 135 | 195 | 118 | 70 |
| | 1998 | SE | 1999 | SL | 100 | 108 | 158 | 131 | 129 |
| | 1983 | SE | 1984 | N | 363 | 369 | 206 | 133 | 112 |
| | 1942 | SE | 1943 | N | 137 | 150 | 259 | 144 | 150 |
| | 1973 | SE | 1974 | SL | 120 | 111 | 184 | 147 | 193 |
| | 1995 | SE | 1996 | N | 124 | 115 | 132 | 148 | 116 |
| | | | | | | | | | |
| | 2016 | SE | 2017 | N or LN | ? | ? | ? | ? | ? |
| | | | | | | | | | |
| | 12 years | 5 | | | | | | sorted | |
| | | | | | | | <60 | | |
| | | | | | | | 60-90 | | |
| | | | | | | | 90-110 | | |
| | | | | | | | ~111-130 | | |
| | | | | | | | >130 | | |
| | | I | I I | | 1 | | | | |

Siberia Is Being Clobbered With Snow Already, and That Could Mean a Harsher U.S. Winter Ahead

By Jonathan Belles Published Nov 4 2016 02:43 PM EDT weather.com

Russia Could Have Huge Impact on U.S. Winter

A look at how snow in Siberia affects the U.S. and why it's looking like the eastern and central United States will have a cold, snowy winter.

Siberia is known to be one of the coldest places on the planet, but exactly how cold and snowy it gets each year has big ramifications elsewhere on the globe.

In North America, a more snow-covered Russia means that colder air will have an easier time harvesting in Siberia and departing for our continent's heartland. Early in the calendar year, the air coming from Siberia can be cold enough to bring snow to even more southern reaches of the United States if the pattern sets up correctly.



The Extent of Snow Cover

Snow is covering the ground across most of Russia, including all of Siberia - likely the greatest extent of snow cover since 1998. Below is the current snow cover in northern Asia as of Oct. 31.

Some locations, including Sakha in east-central Russia, are seeing their snowiest winter on record, with most of the snow season yet to come. Nearly 10 feet of snow fell in some places in Siberia in just three days, according to the Government of Sakha.

https://weather.com/news/weather/news/ snow-siberia-russia-united-states-cold





SNOTEL October Precipitation

78 SNOTEL sites in Idaho

118 in Idaho Data Collection Office (DCO) monitoring area: Spokane to **Pinedale to Jarbidge**



November Precipitation





≊USGS

— Discharge

USGS 13139510 BIG WOOD RIVER AT HAILEY ID TOTAL FLOW



₭ Measured discharge

Land & Ocean Temperature Departure from Average Jan 2017 (with respect to a 1981–2010 base period) Data Source: GHCN–M version 3.3.0 & ERSST version 4.0.0





February Precipitation Record High

Scale is >500%

This changed the water supply outlook for this year



February Snow Water Equivalent (SWE) Change



End of February Snow Water Content

at over 800 SNOTEL sites & about 100 manually measured snow courses

Dollarhide Summit SNOTEL Site Before & After the Fire



Data

Dry Fork Snow Course, Summer.

Dry Fork Snow Course, February 28, 2017. *Photo courtesy of Chris Merrill (NRCS-Arco)*

Big Lost Basin 2 station mid-elevation snow index

Copper Basin & Dry Fork snow course index is the 3rd highest for 1961-2017 period

Manual Snow Course Measurements

Veee CIA/E

| Date | rear | SVVE- | Percent |
|---------------------------|-------------------|-------------------|-------------------|
| | | Sum | |
| Mar 1st Half | 1969 | 43.8 | 245% |
| Mar 1st Half | 1965 | 39.5 | 221% |
| <mark>Mar 1st Half</mark> | <mark>2017</mark> | <mark>36.9</mark> | <mark>206%</mark> |
| Mar 1st Half | 1983 | 33.8 | 189% |
| Mar 1st Half | 1967 | 33.3 | 186% |
| Mar 1st Half | 1999 | 33.0 | 184% |
| Mar 1st Half | 1997 | 32.5 | 182% |
| Mar 1st Half | 1986 | 30.9 | 173% |
| Mar 1st Half | 1971 | 30.1 | 168% |
| Mar 1st Half | 1978 | 26.9 | 150% |
| Mar 1st Half | 1993 | 26.0 | 145% |
| Mar 1st Half | 1972 | 25.5 | 142% |
| Mar 1st Half | 1974 | 24.2 | 135% |





Water Supply Forecasts







March 1, 2017 Snowpack

Includes SNOTEL & Snow Courses

Monthly comprehensive analysis done each month

March 1 Idaho Snow Index Summary

| | Idaho Snow Index Summary | | | | | | | | | |
|---------------------------------|------------------------------------|---|---|--|--|--|--|--|--|--|
| | As of March 1, 2017 | | | | | | | | | |
| Number of SNOTEL Sites | Region or Basin | Snow Water Equivalent % of Median | Rank Since Complete Record Starts in 1961 | | | | | | | |
| | | | | | | | | | | |
| 7 | Boise | 153 | 9th highest | | | | | | | |
| | | | | | | | | | | |
| 7 | Big Wood | 181 | Highest in front of 1965, 1997, 1969 | | | | | | | |
| 4 | Big Lost | 180 | 4th highest behind 1965, 1969, 1997 | | | | | | | |
| | | | | | | | | | | |
| 5 | Snake above Jackson | 140 | 11th highest | | | | | | | |
| 17 | Snake above Palisades Reservoir | 201 | 8th highest | | | | | | | |
| 3 | Oakley | 137 | 9th highest | | | | | | | |
| 15 | Bear River | 173 | 3rd highest behind 1986, 1997 Record starts 1975 | | | | | | | |



March Big Wood Basin above Hailey 7 Station Snow Index for Years 1961 - 2017 Chocolate Gulch, Dollarhide, Galena, Galena Summit, Hyndman, Lost-Wood Divide, Vienna Mine March 1 Snow WaterApril 1 Snow Water





Wood & Lost River Basin

March 1, 2017



WATER SUPPLY OUTLOOK

Precipitation and Snowpack

Monthly precipitation in the Wood & Lost River basins, and ranged from 250 to 500% of average, with the highest amounts observed in the Big Lost basin (458%). Every SNOTEL site in the Wood & Lost River Mountains reported record monthly precipitation for February, and most of these sites were installed in 1980. Drainages farthest to the east received the least precipitation, but still



Big Wood Basin 2017 Snow Water with Non-Exceedence Projections (9 sites)

Based on Provisional SNOTEL data as of Mar 13, 2017



Idaho SNOTEL Precipitation Summary Report as of Mar 14, 2017

| Basin or Region | Mar 1 to 14 Precipitation as % of Monthly Total | Oct 1 to Mar 14 as % of Annual Total |
|----------------------------------|--|--|
| NORTHERN PANHANDLE | 73 | 85 |
| SPOKANE | 89 | 81 |
| CLEARWATER | 101 | 74 |
| SALMON | 82 | 74 |
| WEISER | 99 | 81 |
| PAYETTE | 105 | 89 |
| BOISE | 97 | 103 |
| BIG WOOD | 61 | 114 |
| LITTLE WOOD | 44 | 106 |
| BIG LOST | 41 | 103 |
| LITTLE LOST, BIRCH | 28 | 76 |
| MEDICINE LODGE, BEAVER, CAMAS | 24 | 66 |
| HENRYS FORK, TETON | 84 | 94 |
| SNAKE BASIN ABOVE PALISADES | 91 | 98 |
| WILLOW, BLACKFOOT, PORTNEUF | 44 | 92 |
| SNAKE BASIN ABOVE AMERICAN FALLS | 76 | 95 |
| GOOSE CREEK | 29 | 78 |
| SALMON FALLS | 21 | 74 |
| BRUNEAU | 22 | 78 |
| OWYHEE | 33 | 78 |
| BEAR RIVER | 48 | 93 |

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





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







306-ATLANTA SUMMIT

| | Forecast Exceedance Probabilities for Risk Assessment | | | | | | | |
|--------------------------------|---|---|-------|----------|----------|-------|--------|----------|
| | | <drie< td=""><td>r</td><td>Projecte</td><td>d Volume</td><td>W</td><td>etter></td><td>1 </td></drie<> | r | Projecte | d Volume | W | etter> | 1 |
| Forecast Point | Forecast | 90% | 70% | 50% | | 30% | 10% | 30yr Avg |
| Forecast Fornt | Period | (KAF) | (KAF) | (KAF) | % Avg | (KAF) | (KAF) | (KAF) |
| Camas Ck at Camas | APR-JUL | 36 | 48 | 56 | 200% | 64 | 76 | 28 |
| Little Lost R nr Howe | APR-JUL | 32 | 39 | 43 | 154% | 48 | 54 | 28 |
| | APR-SEP | 39 | 48 | 54 | 159% | 59 | 68 | 34 |
| Big Lost R at Howell Ranch | APR-JUL | 245 | 285 | 310 | 195% | 335 | 375 | 159 |
| | APR-SEP | 275 | 320 | 350 | 194% | 380 | 425 | 180 |
| Big Lost R bl Mackay Reservoir | APR-JUL | 205 | 240 | 265 | 215% | 295 | 330 | 123 |
| | APR-SEP | 240 | 285 | 315 | 210% | 345 | 385 | 150 |
| Little Wood R ab High Five Ck | MAR-JUL | 149 | 174 | 191 | 248% | 210 | 235 | 77 |
| | MAR-SEP | 159 | 186 | 205 | 250% | 225 | 250 | 82 |
| | APR-JUL | 134 | 159 | 176 | 255% | 193 | 220 | 69 |
| Little Wood R nr Carey 2 | MAR-JUL | 165 | 193 | 210 | 244% | 230 | 260 | 86 |
| | MAR-SEP | 176 | 205 | 225 | 245% | 245 | 275 | 92 |
| | | 4.47 | 474 | 402 | 2540/ | 240 | 240 | 77 |
| Big Wood R at Hailey | APR-JUL | 425 | 475 | 515 | 219% | 550 | 600 | 235 |
| | APR-SEP | 470 | 530 | 570 | 215% | 610 | 670 | 265 |
| Big Wood R ab Magic Reservoir | APR-JUL | 375 | 435 | 470 | 276% | 510 | 570 | 170 |
| | APR-SEP | 395 | 455 | 495 | 272% | 540 | 600 | 182 |
| Camas Ck nr Blaine | APR-JUL | 188 | 245 | 285 | 348% | 330 | 405 | 82 |
| | APR-SEP | 189 | 245 | 285 | 343% | 335 | 405 | 83 |
| Big Wood R bl Magic Dam 2 | APR-JUL | 545 | 630 | 685 | 274% | 745 | 830 | 250 |
| | APR-SEP | 565 | 650 | 715 | 270% | 775 | 865 | 265 |

Wood and Lost Basins Streamflow Forecasts - March 1, 2017

Normals based on 1981-2010 relefence period, streamlow, precipitation, & reservoir normals are averages, SWE normals are medians.

1) 90% and 10% exceedance probabilities are actually 95% and 5%

2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions

| Reservoir Storage | Watershed Snowpack Analysis: | March 1 | , 2017 | | | | | |
|-----------------------|------------------------------|---------|---------|----------|-----------------------------|---------------|--------|--------|
| Reservoir Name | Current | Last YR | Average | Capacity | Basin Name | # of Sites | % of N | ledian |
| | (1001.) | | | (1001) | | Ones | 2017 | 2010 |
| Mackay Reservoir | 35.5 | 31.3 | 29.3 | 44.4 | Camas-Beaver Creeks | 4 | 117% | 90% |
| Little Wood Reservoir | 11.5 | 14.1 | 17.4 | 30.0 | Birch-Medicine Lodge Creeks | 4 | 143% | 107% |
| Magic Reservoir | 98.9 | 35.8 | 72.5 | 191.5 | Little Lost River | 4 | 168% | 97% |
| | | | | | Big Lost River ab Mackay | 6 | 197% | 88% |
| | | | | | Big Lost Basin Total | 7 | 192% | 88% |
| | | | | | Fish Creek | 3 | 197% | 85% |
| | | | | | Little Wood River | 4 | 199% | 89% |
| | | | | | Big Wood River ab Hailey | 7 | 184% | 103% |
| | | | | | Camas Creek | 5 | 158% | 114% |
| | | | | | Big Wood Basin Total | 12 | 175% | 107% |



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





| Idaho Su | Irface Water Supply In | dex Ag Shortage & Surplus Thresholds |
|--------------|----------------------------|--|
| Basin | Ag Shortage Threshold | Surplus Threshold |
| Big Wood | 275 KAF | 350 KAF with 1,500 cfs release from the dam. |
| Boise Basin | 1,500 KAF | 2,200 KAF with a flow > 6,000 cfs passing the Glenwood gage for more than 5 days and approaching 25 days is considered the surplus threshold. |
| Little Wood | 50-60 KAF | 70 KAF was determined as the surplus volume based on the reservoir capacity of 30.0 KAF and potential to fill the reservoir. |
| Owyhee | 575 KAF (updated value) | 950 KAF with a flow greater than 1,800 cfs for 8 or more days meets the surplus threshold. |
| Oakley | 50 KAF | 60 KAF was determined as the surplus volume based primarily on the reservoir capacity of 76.6 KAF and the ability to rent water when volumes are above 60 KAF. |
| Salmon Falls | 110 KAF | 180 KAF was determined as the surplus volume based primarily on reservoir capacity of 182.65 KAF and potential to fill the reservoir. |
| Payette | Shortages not common | 1,400 KAF based primarily on 2015 total water supply. |

Not completed: Snake at Heise, Teton, Big Lost, Little Lost, Bear



| Station ID | Station Name | | | Period | Data Type | Years | # of Years | |
|----------------------|--------------------------------|--------------|-----------------------|-------------|------------|-------------|---------------|------------|
| 13142500 Big Wood R | blw Magic Reservoir | | / | Apr-Sep s | trm | 1981-2016 | 36 L | Jnits KAF |
| 13142000 Magic Reser | voir | | | 28-Feb r | esv | 1981-2016 | 36 L | Jnits KAF |
| ENSO Classif | fication | | | | | | | |
| SE Strong El | Nino - EN Mild El Nino - N Neu | utral - LN N | 1ild La Nina - SL Str | ong La Nina | | | | |
| | | | | | | | | |
| | | | | | | New | | |
| | | | Stuarus Flaur | Decembria | December + | Ivon- | | |
| Pank | Voor | Enco | Apr Son | 28 Eab | Reservoir | Brobability | S/4/SI | |
| | Tear | Enso | Apr-Sep | 20-FED | Sum | Probability | 30031 | |
| 2017 10% Cr | ance Exceedance Forcast | LA | 203 | 99 | 964 | 98% | 4.0 | |
| 1 2017 20% CF | 1965 | | 747 | 100 | 900 | 97% | 2.0 | |
| 2017 50% CF | ance Exceedance Forcast | | 715 | 99 | 814 | 96% | 3.9 | |
| 2017 30% CF | ance Exceedance Forcast | | 650 | 99 | 749 | 95% | 3.7 | |
| 2017 7070 CI | 2006 | N | 636 | 62 | 699 | 95% | 3.7 | |
| 3 | 1982 | N | 622 | 74 | 696 | 92% | 3.5 | |
| 4 | 1997 | N | 605 | 78 | 683 | 89% | 3.3 | |
| 2017 90% Cł | nance Exceedance Forcast | LA | 565 | 99 | 664 | 88% | 3.2 | |
| 5 | 1984 | N | 545 | 119 | 664 | 86% | 3.0 | |
| 6 | 1998 | SE | 427 | 163 | 590 | 84% | 2.8 | |
| 7 | 1986 | N | 432 | 131 | 563 | 81% | 2.6 | |
| 8 | 1999 | SL | 420 | 120 | 540 | 78% | 2.4 | |
| 9 | 1995 | SE | 518 | 16 | 534 | 76% | 2.1 | |
| 10 | 1996 | Ν | 351 | 127 | 478 | 73% | 1.9 | C |
| 11 | 2011 | SL | 322 | 91 | 412 | 70% | 1.7 | 5 U |
| 12 | 1985 | N | 242 | 149 | 391 | 68% | 1.5 | ab |
| 13 | 1993 | EN | 355 | 14 | 369 | 65% | 1.2 | 25 |
| 14 | 2012 | LN | 238 | 128 | 365 | 62% | 1.0 | |
| 15 | 1981 | N | 153 | 126 | 279 | 59% | 0.8 | |
| 16 | 2000 | N | 165 | 111 | 277 | 57% | 0.6 | |
| 17 | 2010 | EN | 167 | 83 | 250 | 54% | 0.3 | |





Magic Reservoir Monday March 13, March 15, 2017 level 102,541 inflow 661 cubic feet per second outflow 577 cubic feet per second





≊USGS

USGS 13142500 BIG WOOD RIVER BL MAGIC DAM NR RICHFIELD ID



△ Median daily statistic (104 years) ★ Measured discharge



Snow Survey Data, Products, and Reports



Snow & Precipitation

- Current Water Year
- > Historic Data
- > 30-Year Normals
- Snow Load Info



Water Supply

- > Water Supply Outlook Reports
- Surface Water Supply Index (SWSI)
- Streamflow Forecasts
- Reservoir Storage
- > Peak Streamflow Information
- > Water Supply Presentations by Year

Wood and Lost River Basins

Big Wood River | Camas Creek | Big Lost River | Little Lost River
Snow-Stream Comparison: Big Lost River and Lost Wood Divide SNOTEL
Big Wood River at Hailey Snowmelt Streamflow Peak Forecast - updated 1-2 times/week
Little Lost River Enhanced Snowmelt Runoff Model (SRM) - this ated

2011 Daily Guidance Streamflow Forecast Results



Big Wood Basin 2006 Snowpack Graph (9 Sites)



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



□ StreamFlow Apr-Sep

2006 Big Wood River at Hailey Streamflow



SNowmelt Operational Spreadsheet Hydrograph Using SNOTEL (SNOSHUS) June 29 Update --- Final run based on provisional snow, precipitation and streamflow data.



June 29 Update --- Final run based on provisional snow, precipitation and streamflow data.



Hydrograph Trend and Cumulative Precipitation June 29 Update --- Final run based on provisional snow, precipitation and streamflow data. **Big Wood Basin Key Indicators**

Dollarhide Summit - Key Site represents high snow on north facing slopes.

Point data that represents 160 square miles of the 640m2 in Big Wood basin / model.

Dollarhide Summit SNOTEL 8420 feet



Key Snow Precipitation Indicators

Dollarhide Summit --- If you have snow on the pillow, you can still have another streamflow increase.

Galena Summit SNOTEL Site --- No Snow No Flood

Big Wood River has never been at flood stage, 4100 cfs, after Galena Summit melts out.

Key Precipitation Relationships:

Big Wood Basin: need 3/4 inch to prime soils & 1/3 inch the next day to produce runoff

Partnerships between NRCS & BSU



1. <u>Estimating timing of snowmelt peak streamflow using</u> <u>snowmelt relationships at SNOTEL sites</u>

(Kara Ferguson & Dr. Jim McNamara)

2. Estimating critical flow magnitudes using SNOTEL data

(Becca Garst & Dr. Jim McNamara)

Day of Allocation Prediction for the Boise, Payette & Upper Snake



Snow to Flow Relationships that should be in Operational Use in 2017

- Moyie River at Eastport ID
- Lochsa River nr Lowell ID
- Selway River nr Lowell ID
- MF Salmon River at MF Lodge ID
- Boise River nr Twin Springs ID
- SF Boise River nr Featherville ID
- Big Lost River at Howell Ranch ID
- Bruneau River nr Hot Springs ID
- Owyhee River nr Rome ID
- Salmon Falls Creek nr San Jacinto
- Teton River nr Driggs ID
- Snake River at Flagg Ranch WY

SLOPE



BIG WOOD BAGIS TEST #1 PRECIPITATION ZONES



NRCS Partnership with Idaho Water Resource Board

Primary Goal:

GIS watershed analysis to assist in determining data collection needs, data voids and need for mid-elevation snow measuring stations with the hope to improve streamflow forecasts.

Agreement Signed.

Will work with IASCD to complete analysis.

Partnerships!



BIG WOOD BAGIS TEST #1

PRECIPITATION ZONES



SNOTEL ELEVATION ZONES



Area-Elevation, Precipitation and Site Distribution



Big Wood Basin

The 7,000-8,000 foot elevation band is the largest precipitation zone accounting for over 8% of total precipitation.

Notes: existing sites generally capture zone of highest precipitation. Mid-elevation zone could be added to characterize early melt contribution and rain/snow border; high elevation zone could be characterized through integration of remote sensing.

Big Wood Basin

Area-Elevation and SNOTEL Distribution, Median April 1 SWE inches (1981-2010) and Aspect



Note: chart not automated; SWE/aspect info overlays BAGIS elevation curve. Recommend separating SWE/elevation in a separate chart.

Camas Creek above Magic Reservoir

Elevation

Snow Course

▲ SNOTEL

——— Precipitation

Area-Elevation, Precipitation and Site Distribution



5,250 – 5,750 feet elevation band is the largest precipitation zone with 35 - 45% of total precipitation falling in this zone 1) The Big Wood is a well instrumented basin.

2) Forecast skill is already very high. For example, for the April forecast of April-July volume, the jackknife R2 is about 0.8 (R about 0.9).

3) Additional SNOTEL sites in this basin cannot be expected to give any appreciable improvement of forecast skill.

4) Forecast error is driven primarily by future weather. If you look at the SNOTEL precipitation data, you will see that there are several years with large amounts in April, May, and June. This is mostly what limits forecast skill, not an insufficient characterization of the snowpack.

5) There are other needs / use for SNOTEL sites in these basins besides water supply forecasting such as to improve spatial or elevational distribution of sites for simulation modeling, soil moisture monitoring, etc.

Information Learned in Camas Creek:

Camas Creek

- 1) Investigate need for March July forecast rather than typical April-July forecast as March can have substantial snowmelt/runoff.
- 2) There is less skill in Camas Creek compared to the Big Wood forecast. Camas Creek has jackknife R2 of about 0.7. This is to be expected, given the lower elevation of Camas Creek and its large flat area, which adds variability to the snowpack.
- 3) Forecast accuracy may never be as good as more mountainous areas like the Big Wood basin.
- 4) Automation of Chimney Creek snow course as a SNOTEL site may be of benefit in this basin.
- 5) Investigate need for automated weather station / SCAN site in the lower portion of Camas Creek basin or Big Wood basin to represent the lower part of the watershed above Magic Reservoir. The nearest AgriMet site is in Silver Creek area.

85th Annual Western Snow Conference April 17-20, 2017 Boise, Idaho A Joint Meeting with the Weather Modification Association



Western Snow Conference Web Site: www.westernsnowconference.org

General Chair Scott Pattee scott.pattee@wa.usda.gov

General Chair-Elect Ron Abramovich ron.abramovich@id.usda.gov

Secretary/Treasurer/ Documents Manager

Jon Lea P.O. Box 485 Brush Prairie, WA 98606 Phone: (503) 414-3267 westernsnowconference@gmail. com October 25, 2016

First Call for Papers Joint Meeting of the Western Snow Conference and the Weather Modification Association

Members and Friends of the Western Snow Conference:

Please join us on April 17 – 20, 2017 for a joint meeting of the 85th Annual Western Snow Conference and the Weather Modification Association in Boise, Idaho. The conference venue offers the opportunity to interact with other professionals while enjoying one of the most vibrant cities in the Intermountain West.

You are invited to submit an abstract of 150 – 300 words for either oral or poster presentation by January 31, 2017. Submit abstracts by filling out the online submission form at:



Idaho NRCS **Snow Survey Staffing Status** Jan 25, 2017

Snow Survey

Program Manager and Staff Supervisor

| Name | Position | Phone | Email |
|-------------|----------------------|--------------|-------------|
| Shawn Nield | State Soil Scientist | 208-378-5728 | Shawn Nield |

Office Staff

| | Office Sta | | | |
|----------------|-------------------------|--------------|----------------|-------------------------------------|
| Name | Position | Phone | Email | |
| Ron Abramovich | Water Supply Specialist | 208-378-5741 | Ron Abramovich | |
| Vacant | Hydrologist | | | Announcement closed Jan 24, on hold |
| Phil Morrisey | Data Collection Officer | 208-685-6983 | [| Vacant - retired Dec 31 |
| Daniel Tappa | Hydrologist | 208-378-5740 | Daniel Tappa | |

| | Field St | aff | | |
|--------------|------------------------|---------------|--------------|-------------------------------------|
| Name | Position | Phone | Email | |
| John Wilford | Electronics Technician | 208-685-6943w | John Wilford | |
| Vacant | Hydrologist | 208-685-6942w | | Announcement closed Jan 24, on hold |
| Vacant | Hydrologic Technician | 208-685-6942w | | Start Date Feb 21, on hold |

Boulder Mountains, looking SE from Highway South of Galena Lodge after <u>Major Snow,</u> <u>Rain & Wind Event</u> January 11-14, 2014 Keep in mind, when the snow melts this year..... The high elevation snow is the opposite of last year which had good early season snowfall above 8,000 feet. January's winds scoured the peaks with gusts close to 100 mph.



Photo taken by Ray Gadd March 11, 2015 looking east over Ketchum in Big Wood River valley illustrating lack of snow on south facing slopes.

