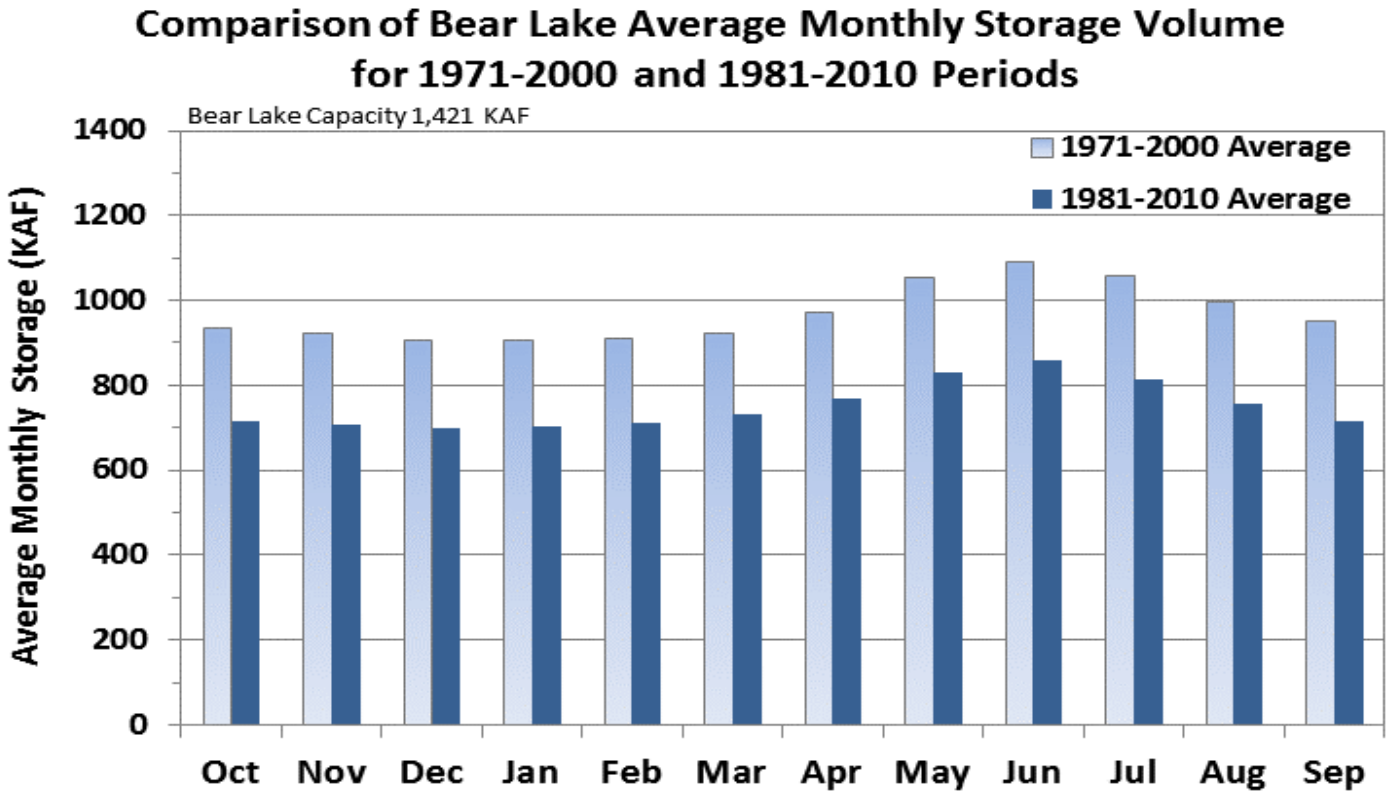
United States Department of Agriculture
Natural Resources Conservation Service

Idaho Water Supply Outlook Report
April 1, 2013



This month we examine how average reservoir storage changed as result of the 30-year comparison periods shifting from 1971-2000 to 1981-2010. Previous reports this year demonstrated the result of dropping the wet 1970s and adding the dry 2000s made the new "normal" snow and streamflow amounts decline. Unlike the snowpack and natural streamflow, people manage reservoirs to prevent flooding and store as much water as possible for various uses. Due to management, reservoir storage averages were not affected the same as these other variables. Management adjusts each year to maximize storage, however managers are limited by the storage capacity of each reservoir. Reservoirs that store more than one season's water allocation saw the biggest change in averages because storage levels continued to decline for multiple years during the dry 2000s. Examples include Bear Lake, Lake Owyhee, Salmon Falls and Oakley reservoirs, where monthly averages decreased about 20% from the 1971-2000 averages to the 1981-2010 averages. For Bear Lake, above, the new monthly averages are about 200,000 acre-feet less than before. For other reservoirs where capacity more closely matches annual water use, modest changes of less than 5% were common. As a result, the percent of average amounts for reservoirs tend to be more inflated for reservoirs with a multi-year capacity and less inflated for the others. Knowing where your water comes from will help you decide how to interpret the new percentages in a meaningful way.

Basin Outlook Reports
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How forecasts are made

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when the snow melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to produce runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences.

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertainty is in the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. (Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount.) By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

IDAHO WATER SUPPLY OUTLOOK REPORT
APRIL 1, 2013

SUMMARY

The totals are in and another dry month added little to Idaho's snowpack. Instead of maintaining snow levels from month to month if near normal precipitation amounts would have fallen, snow percentages decreased again. Luckily last fall, we got off to a great start by getting some moisture in the ground and snow in the highest elevations; otherwise, our water supply would be in even worse shape. Now with three straight months of below normal precipitation, the questions to answer are: what happened to winter? where do we stand? and, is there hope for spring precipitation?

The winter in the West suffered from a split flow in the jet stream as a result of high pressure situated off the coast of Washington for a good portion of the winter. Storms were diverted well north and south of the US although the northern branch dipped far enough south to enhance precipitation over Washington and northern Idaho. The Polar Vortex was also another factor that helped the Arctic Oscillation and North Atlantic Oscillation indexes to remain more negative, which in turn disrupted the jet stream over western half of the states. Now as we look to the spring for the final pieces of the water supply puzzle, the best forecast is still "persistence". What you have been seeing is what you should continue to expect; or as they say at sea, "Steady as she goes". The water supply shouldn't change much now that we are near the seasonal snow water peaks for the year. However, if there are lessons to be learned from the poor runoff in the Owyhee basin last month, water users may choose to use a smaller exceedance forecast, especially if the dry spell continues into April.

SNOWPACK

The lowest snowpacks in the state are in the Owyhee at 39% of the new median, 53% in the Weiser and 58% in the Boise basin. The lack of a mid-elevation snowpack in these central Idaho basins has been pulling the percentages down all winter. The few sites below 6,000 feet are melted out and others like Mores Creek Summit and Bogus Basin have the 3rd lowest April 1 snow water content since records start in the early 1940s. Snowpacks increase to 70-75% of median in the Payette, Big Wood, Bear River and lower elevations in eastern Idaho. Elsewhere, snowpacks are 80-90% of the new April 1 median with the exception of the Northern Panhandle Region which continues to hang on to a near normal snowpack. In contrast to the low elevation snowpack, the high elevation snowpack in the Big Lost mountains is still near normal after its good start from early season snow in November and December. Hopefully, this higher elevation zone which is above most measuring sites will produce enough runoff to keep base flows a little higher in these central Idaho streams.

PRECIPITATION

March precipitation was a meager 34% of average in the Little Wood, 40% in the Owyhee, 42% in the Weiser and Big Lost, and 47% in the Little Lost and Mud Lake area. Basins that received 50-65% of average include: Bear, Bruneau, Salmon Falls, Goose, Big Wood, Boise and Salmon. The highest amounts were 80-89% of average in the Snake headwaters in Wyoming, Henrys Fork, Clearwater, Spokane, and Northern Panhandle Region. The bad news is the combined impacts of three months of below normal precipitation. January, February and March combined precipitation this year was record low for 16 SNOTEL sites from the Payette basin to Little Lost basin, another 24 stations across the state were 2nd or 3rd lowest. Most daily SNOTEL data precipitation records start in the early 1980s. Luckily, good precipitation amounts in November and December have kept the water year to date totals looking respectable and ranging from 110% of average in the Northern Panhandle Region to 80% in the Bear River. Similar analog years to this year are still 2002, 1968 and 1963; however, if you are looking

for relief from the dry spell, April and May 2002 precipitation was nothing to brag about with below to near average amounts across the state.

RESERVOIRS

Reservoirs are like banks and luckily there is some water already deposited. Some are in better shape than others depending upon carryover from last year and amount of snow in the mountains. Here is summary from north to south:

- **Coeur d'Alene, Pend Oreille and Priest lakes** are about 57% full and waiting for the best snowpack in the state to start melting.
- **Dworshak Reservoir** is 81% full, which is above average and should fill with an inflow streamflow forecast of 86% of average.
- **The Payette system** is 77% full thanks to runoff from fall rains and should fill from the snowmelt.
- **The Boise system** is 67% full, and may not re-fill completely, but should provide an adequate water supply for the users; however, carryover amounts will be low for next year.
- **Magic Reservoir** is only 41,049 acre-feet, 21% full, will not fill and may only provide an irrigation season of about 45 days.
- **Little Wood reservoir** is 83% full, should fill and provide an adequate irrigation supply.
- Mackay Reservoir is 83% full, shortages are possible, but, hopefully the elevated baseflows from the previous year's moisture will help sustain flows through the summer months as they did last year.
- **Jackson Lake** is 74% full while **Palisades Reservoir** is only half full; the system may not fill as result of last year's water use and timing of this year's irrigation demand with snowmelt.
- **American Falls** is 93% full and should be close to full in early April.
- **Oakley Reservoir** is only 34% full, with 26,000 acre-feet and inflow forecast of 20,000 will not be enough to meet the normal irrigation demand of 50,000 acre-feet for the season.
- **Salmon Fall Reservoir** has 38,000 acre-feet, and with an inflow forecast of only 48,000 acre-feet, 65% of average, shortages are likely.
- **Owyhee Reservoir** is just over half full at 376,000 acre-feet, and is nearing its peak storage for the year, unless it rains, as the snowmelt peak flow has already occurred. The inflow forecast of 200,000 acre-feet should be enough to satisfy the irrigation demand this year; however the reservoir will be low by summer's end.
- **Bear Lake** is two-thirds full, but with the Bear River forecast at only 6% of average, you know the natural streamflow water users will have shortages and should be planning for a summer similar to last year. On the bright side, Bear Lake water users will have enough water for this year and hopefully, some water in the bank for the 2014 season.

As illustrated on this month's cover, additional information about the new reservoir and streamflow normals along with April 1 snow percentage comparison of the old and new normals are available at: http://www.id.nrcs.usda.gov/snow/data/averages.html

STREAMFLOW

This month's streamflow forecasts across Idaho illustrate the diverse climate, snow accumulation and storm tracks in Idaho. The highest forecasts call for 100% of average runoff in Idaho's Northern Panhandle region while the Bear River, in southeast Idaho, is forecast at only 6%. From north to south: streamflow forecasts then drop to 80% of average in the Spokane basin and increase to near average in the Selway and Lochsa basins because of the steady track of storms this winter in the Clearwater basin. The Salmon River headwater streams are forecast just above 80% of average because of the better higher elevation snowpack and decrease to 77% for the Salmon River at White Bird. Across the rest of the state, forecasts are as low as 40% of average in the lower elevation streams such as Mores, Owyhee, Camas, and parts of the upper Bear River and increase to 80% of average in the Big Lost River basin. The Upper Snake streams reflect this similar elevation pattern with the headwater streams for the Snake River above Jackson Lake at 90% of average and decreasing to the mid-80s as you move down stream and to 67% for the Salt River which originates along the Bear River divide. The Snake River near Heise is forecast at 74% of average while the Henrys Fork is a little better at 82%. Minimal water will pass Milner Dam this season with the exception of fish augmentation or other predetermined releases. Because of limited inflows this season, reservoirs will be drafted to near minimum levels by summer's end, which means carryover storage will be low for next year across most of the state, and a good snow year in 2014 is critical.

Note: The volumes referenced in these narratives are the 50% Chance of Exceeding Forecast, unless otherwise noted. Users may wish to use a different forecast to reduce their risk of having too much or too little water. Forecasts published in this report are produced by the NRCS with the exception of the NWS main-stem Snake River forecasts.

RECREATION

With the onset of warm temperatures in early April, the rivers are now rising across the state. Winter's colder than normal temperatures kept the meager mid-elevation snowpack in place but it is now melting to produce the early April flow increase. The Owyhee River had its snowmelt peak flow of 3,000 cfs for several days last month. It will rise again, but only with additional rains. The Bruneau basin has a little more snow than last year, but don't expect a much longer season unless it rains. Last year the Bruneau River near Hot Springs was only above 800 cfs a handful of days. The MF Salmon River is already at 3 feet, 2,100 cfs and will have a moderate season with moderate peaks, provided it doesn't rain. With the Salmon River at White Bird forecast at 77% of average, the main Salmon will still have a good season without the potential for extended high flows. With the snow at 90% of median in the Locsha and Selway basins, expect ideal river running opportunities as the streams are also predicted at near average. The Payette snowpack and reservoirs will provide ideal flow levels through the summer on the Payette. Additional snowmelt-streamflow relationship information is available on the Idaho Peak Streamflow Resources internet page. Know your boating skill limits, and be sure to watch the changing spring weather for more climatic variability extremes that may affect the melt rates during the snowmelt season and produce sudden increases in flows.

WESTERN SNOW CONFERENCE – APRIL 15-18, 2013

The Western Snow Conference is coming to Jackson, Wyoming April 15-18. Monday's Short Course kicks off with a panel discussion on New Strategies & Techniques in Long Range Weather and Streamflow Forecasting. Snow and hydrology papers will be presented the next two days followed by a hydrologic technical tour of the area on Thursday. See WSC page for registration to attend all or part of conference http://www.westernsnowconference.org.

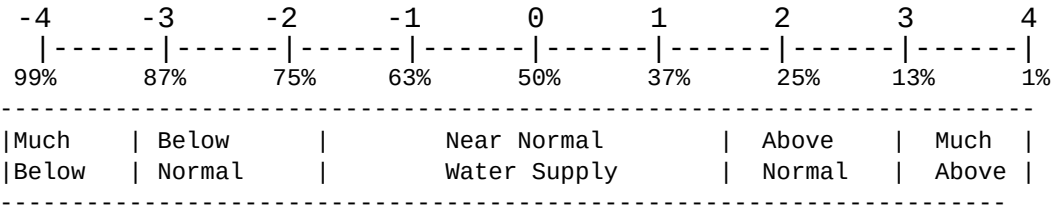
IDAHO SURFACE WATER SUPPLY INDEX (SWSI) April 1, 2013

The Surface Water Supply Index (SWSI) is a predictive indicator of surface water availability within a watershed for the spring and summer water use season. The index is calculated by combining pre-runoff reservoir storage (carryover) with forecasts of spring and summer streamflow. SWSI values are scaled from +4.0 (abundant supply) to -4.0 (extremely dry), with a value of zero indicating a median water supply as compared to historical occurrences. The SWSI analysis period is from 1981 to present.

SWSI values provide a more comprehensive outlook of water availability by combining streamflow forecasts and reservoir storage where appropriate. The SWSI index allows comparison of water availability between basins for drought or flood severity analysis. Threshold SWSI values have been determined for some basins to indicate the potential for agricultural irrigation water shortages.

BASIN or REGION	***SWSI Value***	***Most Recent Year With Similar SWSI Value***	***Agricultural Water Supply Shortage May Occur When SWSI is Less Than***
Northern Panhandle	-0.3	2000	NA
Spokane	-1.5	2007	NA
Clearwater	-0.3	2004	NA
Salmon	-1.5	2004	NA
Weiser	-1.8	2004	NA
Payette	-1.8	2002	NA
Boise	-2.0	2007	-2.1
Big Wood	-1.3	2007	-0.1
Little Wood	-0.5	2010	-1.6
Big Lost	-0.5	2005	0.4
Little Lost	-1.5	2000	1.1
Teton	-2.0	2000	-3.9
Henrys Fork	-1.0	2004	-3.2
Snake (Heise)	-1.8	2007	-1.6
Oakley	-0.5	2010	-0.4
Salmon Falls	-1.8	2008	-1.1
Bruneau	-0.5	2008	NA
Owyhee	-3.0	2001	-3.4
Bear River	0.2	2001	-3.4

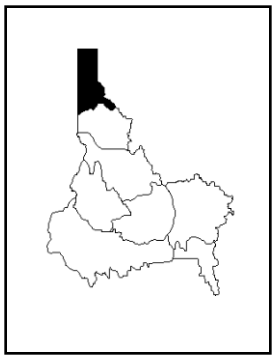
SWSI SCALE, PERCENT CHANCE OF EXCEEDANCE, AND INTERPRETATION

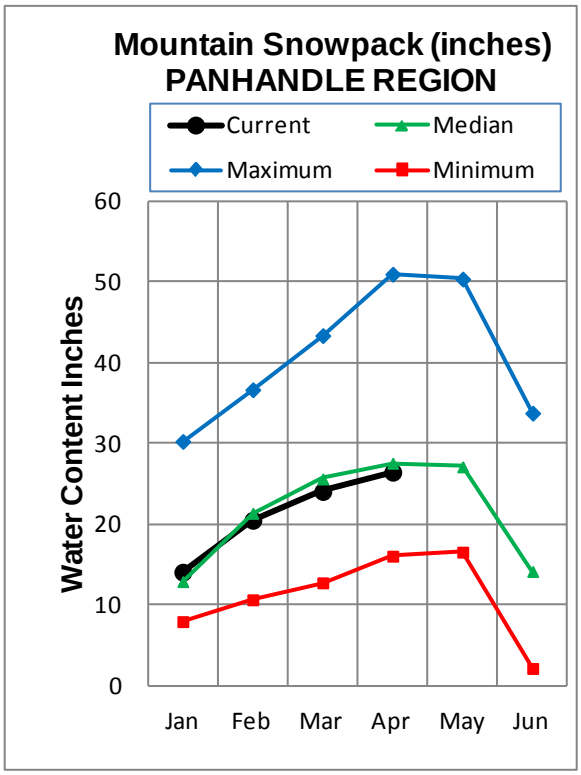


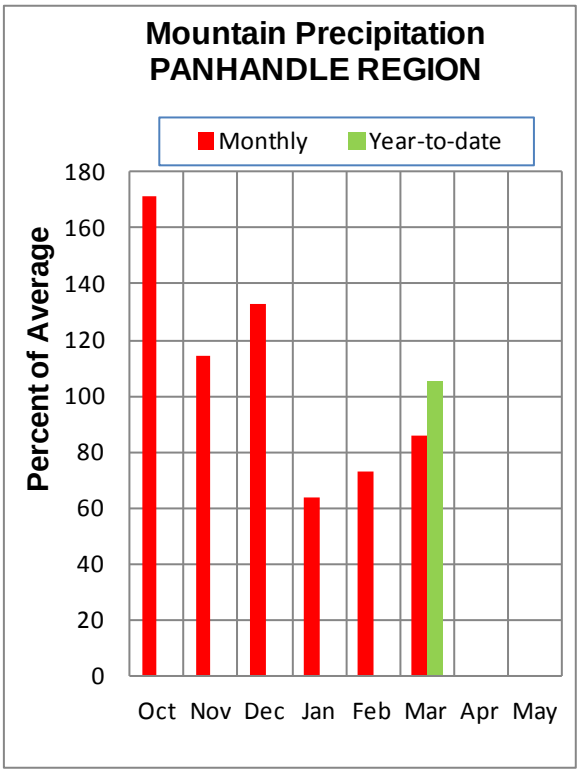
NA=Not Available / Not Applicable; Note: The Percent Chance of Exceedance is an indicator of how often a range of SWSI values might be expected to occur. Each SWSI unit represents about 12% of the historical occurrences. As an example of interpreting the above scale, the SWSI can be expected to be greater than -3.0, 87% of the time and less than -3.0, 13% of the time. Half the time, the SWSI will be below and half the time above a value of zero. The interval between -1.5 and +1.5 described as "Near Normal Water Supply," represents three SWSI units and would be expected to occur about one-third (36%) of the time.

PANHANDLE REGION

APRIL 1, 2013







WATER SUPPLY OUTLOOK

The Panhandle Region had the best precipitation in Idaho in March. The region received 87% of its average amount for the month, leaving water year to date precipitation at 105%. Not all sites recorded near average amounts. Three SNOTEL sites close to the Washington state line received only 33-65% of March's normal amount; these include Moscow Mountain, Quartz Peak and Ragged Mountain SNOTELs. With winter snow accumulation ending, the April 1 snowpack is near average for basins in the Panhandle, while snow is 90% of average in the Spokane basin. Soil profiles are still wet from soaking rains last fall and streams are responding to mid-elevation snowmelt observed at SNOTEL sites during the last week of March. Water storage in this region is 115% of average in Lake Pend Oreille, 93% of average in Priest Lake, and 83% of average in Lake Coeur d'Alene. Streamflow forecasts are similar to last month – lower to the south and higher to the north. Looking at the major rivers the St. Joe River is forecast at 83% of normal, Spokane River near Post Falls at 80%, Pend Oreille inflow at 98%, and Moyie River at 97%. Overall, water supplies this year continue to be very good thanks to a near average snowpack. The current outlook for April, May and June calls for below normal temperatures, which would be ideal for a well-behaved spring runoff. However, as stated last month, depending on storm patterns later this spring and melting of the lower elevation snowpack northern Idaho is always a potential for rapid runoff if heavy pacific storms roll in at a critical time when the snow is actively melting.

PANHANDLE REGION
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Kootenai R at Leonia (1,2)	APR-JUL	5590	6320	6660	101	7000	7730	6600
	APR-SEP	6550	7300	7640	101	7980	8730	7590
Moyie R at Eastport	APR-JUL	280	330	365	97	400	450	375
	APR-SEP	285	340	375	97	410	465	385
Boundary Ck nr Porthill	APR-JUL	89	102	111	95	120	133	117
	APR-SEP	92	106	115	94	124	138	123
Clark Fork at Whitehorse Rpds (1,2)	APR-JUL	8250	9660	10300	98	10900	12400	10500
	APR-SEP	8970	10600	11300	98	12000	13600	11500
Pend Oreille Lake Inflow (2)	APR-JUL	9860	10900	11600	98	12300	13300	11800
	APR-SEP	10600	11800	12600	98	13400	14600	12800
Priest R nr Priest River (1,2)	APR-JUL	605	680	730	94	780	855	780
	APR-SEP	635	720	775	93	830	915	830
NF Coeur d'Alene R at Enaville	APR-JUL	375	485	560	80	635	745	700
	APR-SEP	405	520	595	80	670	785	740
St. Joe R at Calder	APR-JUL	685	800	875	83	950	1060	1050
	APR-SEP	740	855	935	84	1010	1130	1120
Spokane R nr Post Falls (2)	APR-JUL	1340	1670	1900	80	2130	2460	2390
	APR-SEP	1400	1750	1980	80	2210	2560	2480
Spokane R at Long Lake (2)	APR-JUL	1460	1820	2070	79	2320	2680	2620
	APR-SEP	1660	2040	2300	81	2560	2940	2850

PANHANDLE REGION
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
HUNGRY HORSE	3451.0	2896.0	2734.0	2081.0
FLATHEAD LAKE	1791.0	643.3	705.0	762.6
NOXON RAPIDS	335.0	317.5	308.3	309.9
Pend Oreille	1561.3	888.0	711.4	773.0
Coeur d'Alene	238.5	138.1	302.7	165.5
Priest Lake	119.3	62.7	69.1	67.6

PANHANDLE REGION
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
Kootenai ab Bonners Ferry	21	72	101
Moyie River	8	71	92
Priest River	5	69	106
Pend Oreille River	84	74	93
Rathdrum Creek	2	58	103
Coeur d'Alene River	10	65	92
St. Joe River	6	69	87
Spokane River	16	66	90
Palouse River	2	51	84

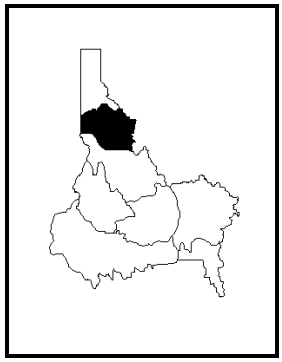
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

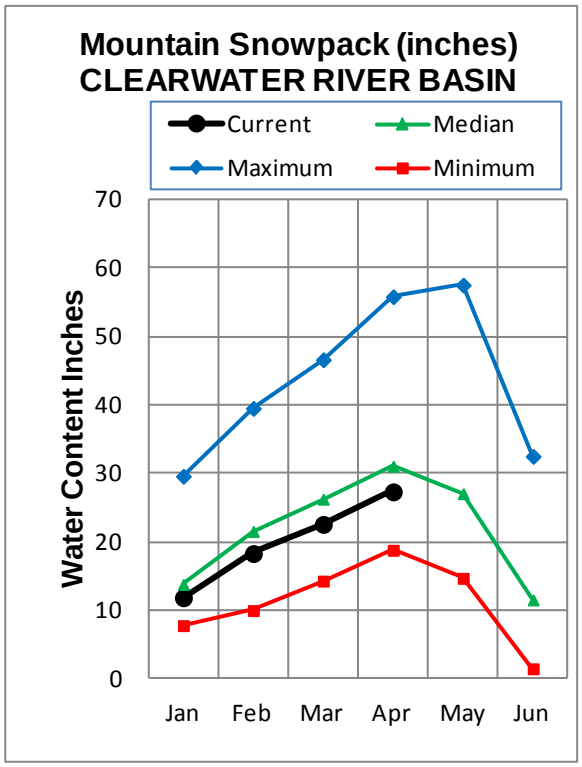
The average is computed for the 1981-2010 base period.

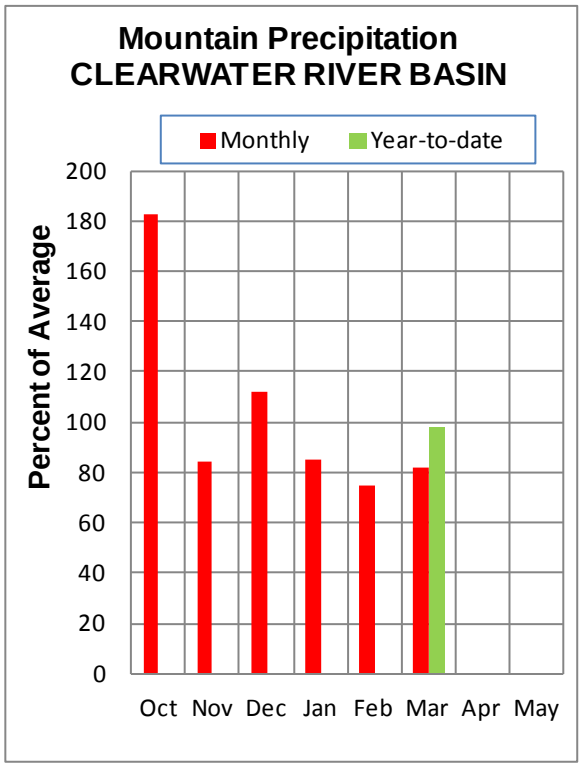
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

CLEARWATER RIVER BASIN

APRIL 1, 2013







WATER SUPPLY OUTLOOK

The high elevation SNOTEL sites in the Clearwater basin have about 10 feet of snow on the ground, but that is less than normal. March was the third consecutive month with drier than normal conditions. Monthly precipitation in March was 82% of average, which was similar to the January and February percentages. Water year to date precipitation since October 1 is 99% of average. The Clearwater's snowpack is 89% of the 1981-2010 median. The last week of March our staff made ground truth measurements at a number of the basin's highest sites. These measurements revealed that soils are still frozen, which means the moisture that fell last fall is still locked in the soil profile. In the coming weeks, as the snowpack and soil profile warms and snowmelt begins, immediate runoff can be expected since the soil profile is already full of water. This may help make up for a below normal snowpack in the high country. Snow percentages are 80% of median or less at most mid-elevation stations in the 3,000 to 4,500 foot zone. Sherwin SNOTEL, at 3,200 feet, has only 56% of its normal snow. Last week, as we flew to SNOTEL sites making ground truth measurements, we were surprised to see southern aspects in this mid-elevation zone that had spotty snow and bare patches when typically continuous snow cover would be expected. Reservoir storage is in good shape for below normal runoff with Dworshak Reservoir storing 116% of its average amount, which is 81% full. Dworshak inflow is forecast at 86% of average. The Selway and Lochsa rivers are forecast at near normal volumes and should provide ideal river running opportunities to enjoy.

CLEARWATER RIVER BASIN
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Selway R nr Lowell	APR-JUL	1590	1760	1880	98	2000	2170	1920
	APR-SEP	1670	1850	1980	98	2110	2290	2020
Lochsa R nr Lowell	APR-JUL	1150	1270	1360	97	1450	1570	1410
	APR-SEP	1210	1340	1430	97	1520	1650	1480
Dworshak Res Inflow	APR-JUL	1460	1890	2080	86	2270	2700	2410
	APR-SEP	1580	2030	2230	87	2430	2880	2570
Clearwater R at Orofino (1)	APR-JUL	3160	3880	4210	98	4540	5260	4310
	APR-SEP	3340	4100	4450	98	4800	5560	4540
Clearwater R at Spalding (1,2)	APR-JUL	4780	5940	6460	94	6980	8140	6890
	APR-SEP	5080	6300	6850	94	7400	8620	7270

CLEARWATER RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Dworshak	3468.0	2807.5	2305.0	2417.0

CLEARWATER RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
North Fork Clearwater	9	72	88
Lochsa River	3	72	91
Selway River	5	71	91
Clearwater Basin Total	17	71	89

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
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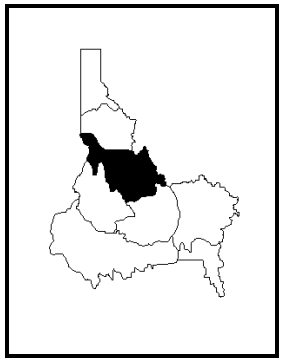
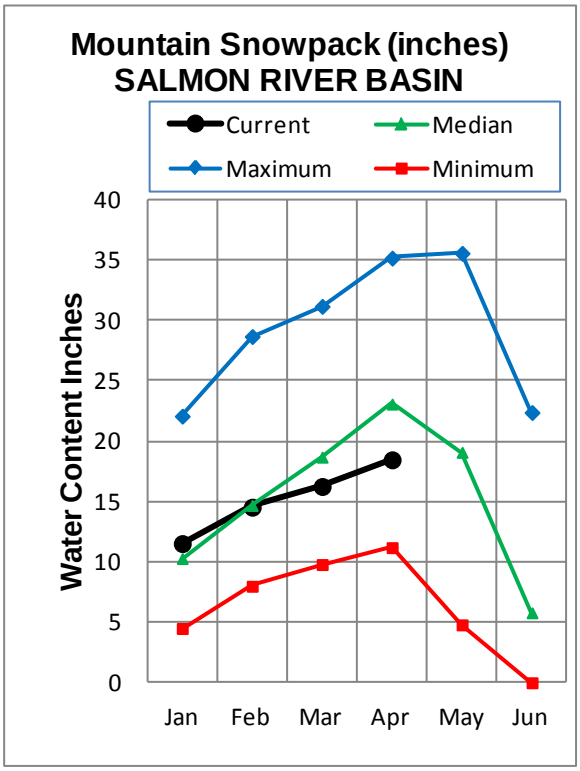
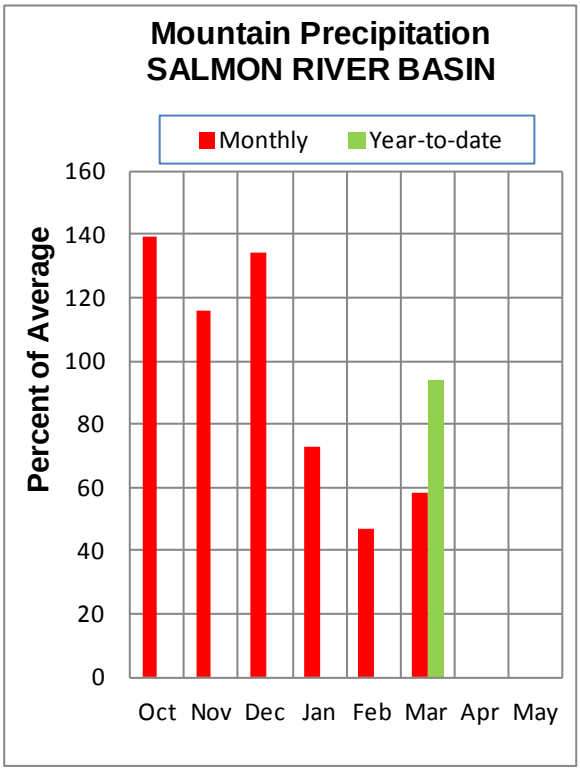
SALMON RIVER BASIN

APRIL 1, 2013







WATER SUPPLY OUTLOOK

Dryness since January is starting to outweigh the wet start to the water year from October through December. October, November and December started off the water year with abundant moisture, by New Years the Salmon basin water year to date precipitation was 128% of average. Now after three months of below normal precipitation water year precipitation is less than normal at 94% of average. Basin wide March precipitation was 58% of average. This year's January–March period ranks as second driest at Deadwood Summit and Banner Summit and third driest at Vienna Mine, Mill Creek and Morgan Creek sites since SNOTEL records begin in the early 1980s. It's a wonder that snowpack percentages are still 84% of median as of April 1, but keep in mind the shift to the 1981-2010 medians is inflating the percentage. This year's snow would be 73% of average based on the 1971-2000 averages. To help put this year's snow in perspective with recent history a snow index is very useful. A snow index sums the snow water inches at a group of stations to compare years. The snow index for the Middle Fork Salmon, which combines snow water at Banner Summit, Deadwood and Morgan Creek SNOTELs indicates that this April's snowpack is less than last year, but better than other recent low years like 2010, 2007, 2005 and 2004. Years with slightly better snow were 2009 and 2002. Since snowpack correlates with streamflow this is a good way to judge runoff. Streamflow forecasts range from 77% of average for the Salmon at White Bird to 83% of average for the MF Salmon. Remember you can expect the MF Salmon River's snowmelt peak to occur when Banner Summit is half melted. Banner Summit only has 20 inches of snow water and could still accumulate a little more snow. Keep watching this site's snow water to determine this year's half-melt value. It will provide a clue as to when the snowmelt driven peak flow is past.

SALMON RIVER BASIN
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Salmon R at Salmon (1)	APR-JUL	390	550	620	80	690	850	775
	APR-SEP	455	640	725	81	810	995	900
Lemhi R nr Lemhi	APR-JUL	29	38	45	61	53	65	74
	APR-SEP	36	47	55	61	64	78	90
MF Salmon R at MF Lodge	APR-JUL	390	500	575	83	650	760	690
	APR-SEP	440	565	650	84	735	860	770
SF Salmon R nr Krassel RS	APR-JUL	167	199	220	82	240	275	270
	APR-SEP	185	210	230	79	250	275	290
Johnson Ck at Yellow Pine	APR-JUL	101	127	145	76	163	189	191
	APR-SEP	108	133	150	73	167	192	205
Salmon R at White Bird (1)	APR-JUL	2750	3700	4130	77	4560	5510	5370
	APR-SEP	3050	4120	4600	77	5080	6150	5940

SALMON RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg

SALMON RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
Salmon River ab Salmon	9	68	82
Lemhi River	9	87	95
Middle Fork Salmon River	3	76	90
South Fork Salmon River	3	72	85
Little Salmon River	4	61	68
Salmon Basin Total	28	72	84

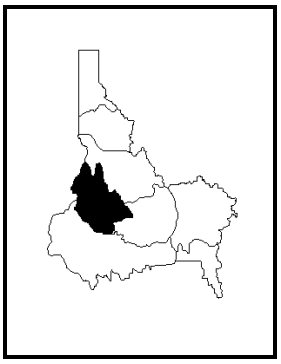
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

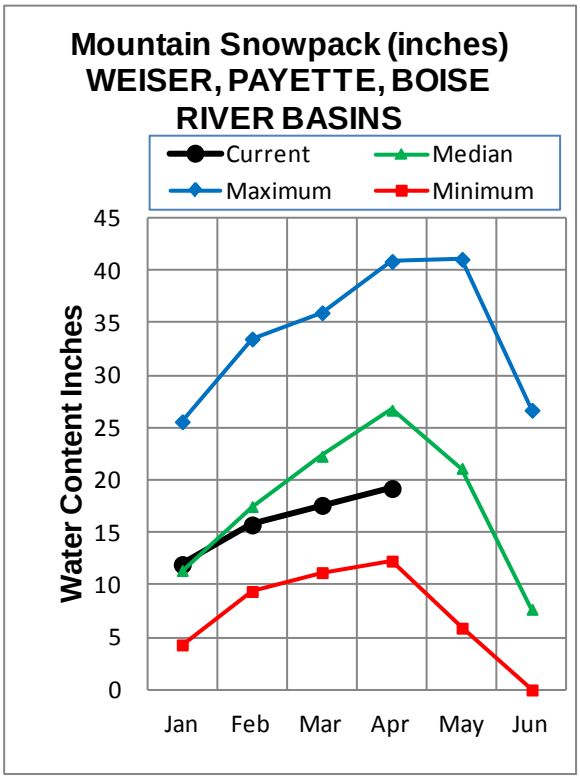
The average is computed for the 1981-2010 base period.

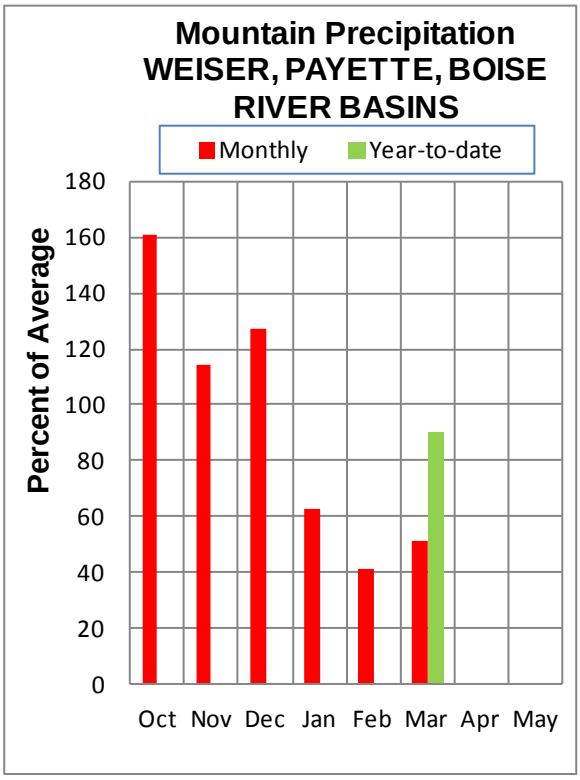
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

WEISER, PAYETTE, BOISE RIVER BASINS

APRIL 1, 2013







WATER SUPPLY OUTLOOK

Three consecutive dry months have produced new record conditions in the west central mountains. March precipitation was similar to January and February, only half the normal amount fell. This resulted in new minimum January to March precipitation totals at Dollarhide Summit, along the Boise and Big Wood divide; it only received 4.8 inches during this period, 36% of average. Normal is 13.5 inches. 2001 was another very dry year, but it received a full inch more moisture. Other sites received their second lowest amount for the January to March period since daily precipitation data starts in the early 1980s; including Banner Summit, Jackson Peak, and Trinity Mountain, while Vienna Mine, Mores Creek Summit and Graham Guard Station were the 3rd lowest. Water year to date precipitation is now below normal in all three basins, with the Boise Basin at 83% of average being the worst. Snowpack percentages took a large hit this month, dropping to 53% of median in the Weiser, 58% in the Boise and 69% in the Payette. This is the lowest snow since 2001 in the Weiser and since 2005 in the Boise. Conditions are worse below 6,500 feet. April 1 measurements at Mores Creek Summit, Bogus Basin and West Branch (Weiser basin) were the third lowest since records start in 1945. Fortunately, reservoir storage is above average with the Boise system at 113% of average, 67% full, and the Payette system at 119% of average, 77% full. Unlike the last couple of springs, flood control releases are not needed and managers are encouraging water conservation. Streamflow forecasts call for 64% of average for the Boise River, 73% for the Weiser and 74% for the Payette River. Adding the Boise River's 50% exceedance forecast to March 31 reservoir storage shows the total surface water supply is 1,572,000 acre-feet. Boise water users need at least 1,500,000 acre-feet for an adequate surface water supply, so current conditions should be marginally adequate and any spring precipitation will help to stretch this year's water supplies.

WEISER, PAYETTE, BOISE RIVER BASINS
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Weiser R nr Weiser (1)	APR-JUL	134	220	270	73	320	455	370
	APR-SEP	148	240	290	73	345	480	400
SF Payette R at Lowman	APR-JUL	210	240	260	65	280	315	400
	APR-SEP	240	275	300	66	325	365	455
Deadwood Resv Inflow (1,2)	APR-JUL	59	78	87	71	96	115	123
	APR-SEP	62	84	94	72	104	126	131
Lake Fork Payette R nr McCall	APR-JUL	56	64	69	86	74	83	80
	APR-SEP	58	65	71	86	77	86	83
NF Payette R at Cascade (1,2)	APR-JUL	255	345	385	79	425	515	485
	APR-SEP	250	345	390	79	435	530	495
NF Payette R nr Banks (2)	APR-JUL	365	440	490	78	540	615	625
	APR-SEP	355	440	495	77	550	635	640
Payette R nr Horseshoe Bend (1,2)	APR-JUL	785	995	1090	74	1180	1390	1480
	APR-SEP	790	1040	1160	71	1280	1530	1630
Boise R nr Twin Springs (1)	APR-JUL	255	345	390	67	435	525	585
	APR-SEP	285	385	430	68	475	575	635
SF Boise R at Anderson Ranch Dam (1,	APR-JUL	205	285	320	67	355	435	475
	APR-SEP	220	305	345	68	385	470	510
Mores Ck nr Arrowrock Dam	APR-JUL	29	42	52	45	63	82	115
	APR-SEP	30	43	54	45	66	85	119
Boise R nr Boise (1,2)	APR-JUN	560	675	725	64	775	890	1140
	APR-JUL	510	715	805	64	895	1100	1260
	APR-SEP	595	800	890	65	980	1190	1360

WEISER, PAYETTE, BOISE RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Mann Creek	11.1	8.2	9.4	8.7
Cascade	693.2	556.0	552.6	462.1
Deadwood	161.9	101.1	103.4	90.6
Anderson Ranch	450.2	283.4	374.3	245.3
Arrowrock	272.2	213.8	242.1	190.4
Lucky Peak	293.2	184.3	184.8	167.5
Lake Lowell (Deer Flat)	165.2	121.7	117.7	113.0

WEISER, PAYETTE, BOISE RIVER BASINS
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
Mann Creek	1	58	66
Weiser River	8	55	53
North Fork Payette	9	68	72
South Fork Payette	5	63	74
Payette Basin Total	16	65	69
Middle & North Fork Boise	5	55	62
South Fork Boise River	9	61	69
Mores Creek	6	50	47
Boise Basin Total	17	55	58
Canyon Creek	2	17	15

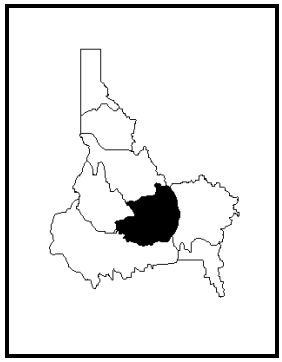
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

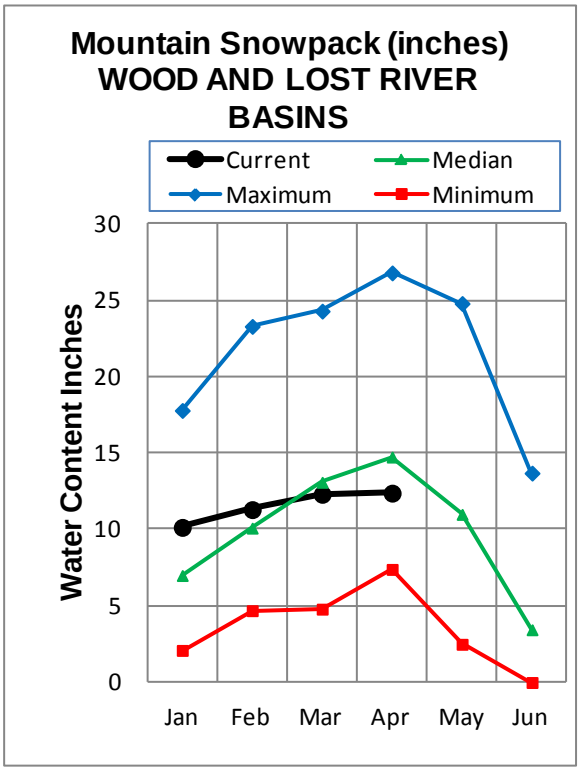
The average is computed for the 1981-2010 base period.

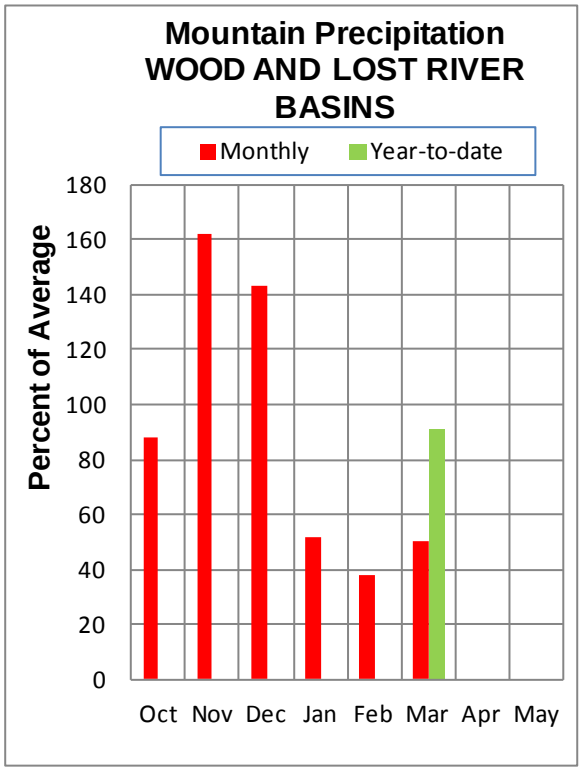
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

WOOD and LOST RIVER BASINS

APRIL 1, 2013







WATER SUPPLY OUTLOOK

Near record high to record low precipitation sums up this water year in the Wood and Lost basins. October through December precipitation was the second wettest in the last 30 years at Hyndman, Moonshine, and Bear Canyon SNOTELs; making it one of the best starts on record. On January 1 water year to date precipitation across these basins was 136% of average, and much of that precipitation had fallen as snow in these high mountains. January 1 snowpacks were 133-163% of normal. Unfortunately, the spigot turned off and this year's January – March period has set new records for mid-winter dryness at eleven SNOTEL sites, another four SNOTEL sites just had their second driest mid-winter period on record. SNOTEL precipitation records extend back to the early 1980s for most sites. March precipitation was 50% of average across the region dropping water year to date precipitation to 91% of average. Occasional mid-winter storms added snow in the mountains and amazingly, April 1 snowpacks are still near normal in the Big Lost and Little Lost basins. Snow in the Big Wood and Little Wood basins is not as good at 74% of normal. Reservoir storage is 126% of average in Little Wood and 119% in Mackay. Magic's storage at 41,049 acre-feet is 46% of average, 21% full. The April–September 50% exceedance forecast for the Big Wood River above Magic is for 167,000 acre-feet, 63% of average. Combining Magic's storage and the forecast equals 208,000 acre-feet which is short of the 275,000 acre-feet needed for an adequate surface water supply. Only the 10% of exceedance forecast provides enough water to meet the adequate threshold. Shortages are also possible for Little Lost water users, where streamflow forecasts call for 79% of average flow, 27,000 acre-feet, but typically near average runoff is needed for an adequate supply. With the Big Lost River below Mackay forecast at 83% of average and even with reservoir storage above average, water supplies are short based on the 50% forecast. Little Wood water users appear to be in good shape thanks to excellent reservoir storage. Hopefully spring rains and good base flows from previous years will help to extend water supplies.

WOOD AND LOST RIVER BASINS
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Big Wood R at Hailey (1)	APR-JUL	105	154	176	75	198	245	235
	APR-SEP	104	169	199	75	230	295	265
Big Wood R ab Magic Res	APR-JUL	30	75	105	62	135	180	170
	APR-SEP	59	89	113	62	142	192	182
Camas Ck nr Blaine	APR-JUL	0.8	10.2	31	38	52	82	82
	APR-SEP	12.7	23	31	37	41	57	83
Big Wood R bl Magic Dam (2)	APR-JUL	59	117	157	63	197	255	250
	APR-SEP	77	131	167	63	205	255	265
Little Wood R ab High Five Ck	APR-JUL	25	41	52	75	63	79	69
	APR-SEP	33	46	56	75	67	85	75
Little Wood R near Carey (2)	APR-JUL	26	43	55	71	67	84	77
	APR-SEP	37	50	59	71	68	81	83
Big Lost R at Howell Ranch	APR-JUL	91	118	136	86	154	181	159
	APR-SEP	103	133	154	86	175	205	180
Big Lost R Below Mackay Res	APR-JUL	52	81	100	81	119	148	123
	APR-SEP	68	102	125	83	148	182	150
Little Lost R nr Howe	APR-JUL	14.2	18.7	22	79	26	31	28
	APR-SEP	17.3	23	27	79	32	39	34
Camas Ck at Camas	APR-JUL	3.8	13.3	19.8	71	26	36	28

WOOD AND LOST RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Magic	191.5	41.0	184.9	89.3
Little Wood	30.0	24.9	26.4	19.8
Mackay	44.4	37.0	42.8	31.2

WOOD AND LOST RIVER BASINS
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
Big Wood ab Hailey	8	79	89
Camas Creek	5	30	28
Big Wood Basin Total	13	68	74
Fish Creek	3	83	71
Little Wood River	7	79	74
Big Lost River	6	87	96
Little Lost River	4	85	93
Birch-Medicine Lodge Cree	4	97	88
Camas-Beaver Creeks	4	117	78

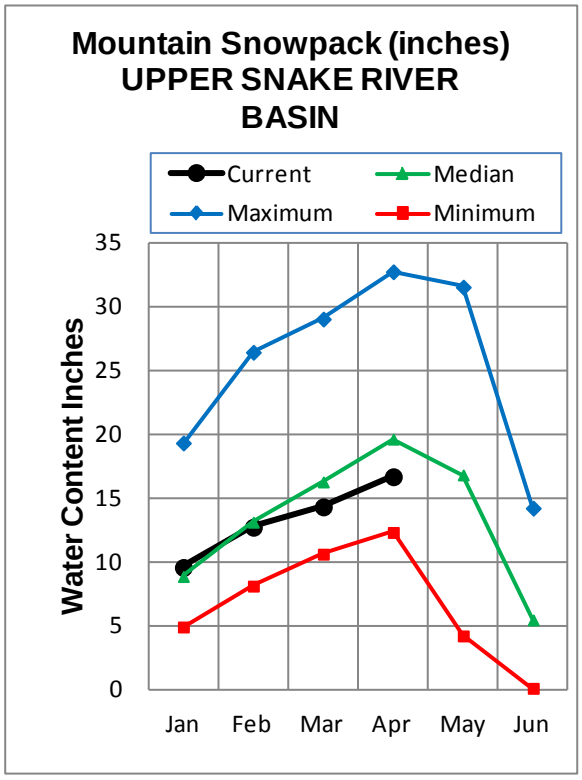
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

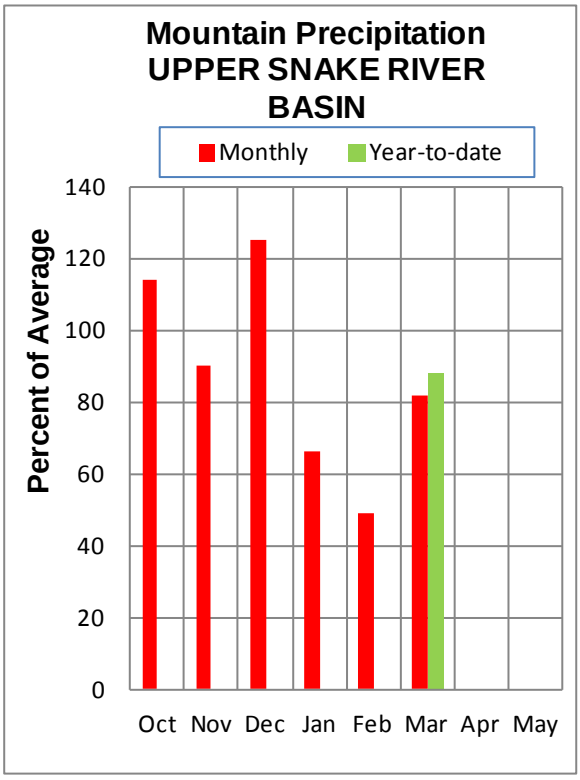
The average is computed for the 1981-2010 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

UPPER SNAKE BASIN

APRIL 1, 2013





WATER SUPPLY OUTLOOK

Shortages are possible for those who depend on the Upper Snake basin for their water supply. March precipitation in the Upper Snake was 82% of normal for the month, much better than the rest of southern Idaho, but not enough to ensure adequate water for summer. Since October 1 precipitation has been only 87% of average. Snow is best in the northern sub-basins with 94% of the median above Jackson Lake and 90% of median in the Henrys Fork. Basins to the south including the Hoback, Greys, Salt, Willow, and Blackfoot are 76-83% of normal. The least snow is in the Portneuf basin at 65% of median. Reservoir storage on the Henrys Fork, which includes Henrys Lake, Grassy Lake and Island Park reservoirs, is currently 104% of average, 88% of capacity. Combined storage in Jackson Lake and Palisades is 1,327,000 acre-feet making that system 59% full, which is normal for this time of year. Percentage wise the majority of the storage is in Jackson Lake which 74% full, 146% of average. Streamflow forecasts are best for the Snake River at Flagg Ranch at 90% of average, and decrease to 74% of average at the Heise gage due to low snow in the southern basins where forecasts call for 75% of normal for the Greys River and 67% for the Salt River. The Teton River near Driggs is forecast at 68% of average, while the Henrys Fork near Rexburg forecast is 82%. Adding Heise's 50% exceedance forecast to the March 31 reservoir storage levels in Jackson Lake and Palisades provides a total available surface water supply of 4,137,000 acre-feet. Water users need 4,400,000 acre-feet for an adequate surface water supply. Current conditions continue to point towards less than adequate supplies. Spring precipitation and summer temperatures will be the critical wildcards to determine onset of irrigation and summer demand levels.

UPPER SNAKE RIVER BASIN
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Henrys Fork nr Ashton (2)	APR-JUL	345	400	440	83	480	545	530
	APR-SEP	465	530	580	82	630	710	710
Henrys Fork nr Rexburg (2)	APR-JUL	920	1060	1150	82	1240	1380	1400
	APR-SEP	1210	1360	1470	82	1580	1730	1790
Falls R nr Ashton (2)	APR-JUL	230	265	290	80	315	355	365
	APR-SEP	275	315	345	79	375	425	435
Teton R nr Driggs	APR-JUL	71	91	105	68	120	145	154
	APR-SEP	88	112	131	68	151	183	193
Teton R nr St. Anthony	APR-JUL	191	230	260	71	290	340	365
	APR-SEP	230	275	310	71	345	405	435
Snake R at Flagg Ranch	APR-JUL	355	395	420	90	445	485	465
	APR-SEP	385	425	455	89	485	525	510
Snake R nr Moran (1,2)	APR-JUL	505	600	645	84	690	785	765
	APR-SEP	545	660	710	84	760	875	845
Pacific Ck At Moran	APR-JUL	97	121	138	84	155	179	164
	APR-SEP	103	128	145	84	162	187	173
Buffalo Fork ab Lava nr Moran	APR-JUL	195	225	245	88	265	295	280
	APR-SEP	215	250	275	86	300	335	320
Snake R nr Alpine (1,2)	APR-JUL	1310	1530	1630	75	1730	1950	2170
	APR-SEP	1470	1750	1880	75	2010	2290	2500
Greys R Nr Alpine	APR-JUL	182	210	230	75	250	280	305
	APR-SEP	210	245	270	75	295	330	360
Salt R Nr Etna	APR-JUL	98	159	200	67	240	300	300
	APR-SEP	115	192	245	66	300	375	370
Snake R nr Irwin (1,2)	APR-JUL	1770	2090	2240	74	2390	2710	3010
	APR-SEP	2070	2440	2610	75	2780	3150	3500
Snake R nr Heise (2)	**APR-JUL**	**1976**	**2227**	**2390**	**74**	**2553**	**2804**	**3240**
	APR-SEP	**2340**	**2620**	**2810**	**74**	**3000**	**3280**	**3780**
Willow Ck nr Ririe (2)	APR-JUL	2.4	16.0	32	53	48	72	61
Blackfoot R ab Res nr Henry	APR-JUN	16.1	26	35	58	45	61	60
Snake R nr Blackfoot (1,2)	APR-JUL	2240	2760	3000	70	3240	3760	4260
	APR-SEP	2720	3360	3650	70	3940	4580	5220
Portneuf R at Topaz	APR-JUL	29	36	42	66	48	57	64
	APR-SEP	38	47	53	65	60	70	81
Snake R at Neeley (1,2)	APR-JUL	685	1420	1750	66	2080	2820	2650
	APR-SEP	695	1490	1850	66	2210	3000	2810

UPPER SNAKE RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Henrys Lake	90.4	90.6	90.4	81.3
Island Park	135.2	109.2	116.3	111.8
Grassy Lake	15.2	13.0	12.5	12.3
Jackson Lake	847.0	628.9	647.2	430.7
Palisades	1400.0	698.4	1132.7	902.8
Ririe	80.5	50.6	58.6	44.8
Blackfoot	348.7	235.8	295.6	186.4
American Falls	1672.6	1549.8	1537.4	1497.0

UPPER SNAKE RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
Henrys Fork-Falls River	9	87	90
Teton River	8	87	84
Henrys Fork above Rexburg	17	87	87
Snake above Jackson Lake	9	86	94
Pacific Creek	3	81	98
Gros Ventre River	4	92	83
Hoback River	5	87	78
Greys River	4	88	83
Salt River	5	99	81
Snake above Palisades	28	88	88
Willow Creek	7	114	77
Blackfoot River	5	107	76
Portneuf River	6	104	65
Snake abv American Falls	46	92	85

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

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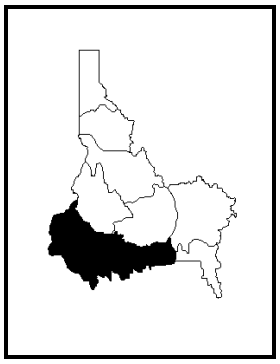
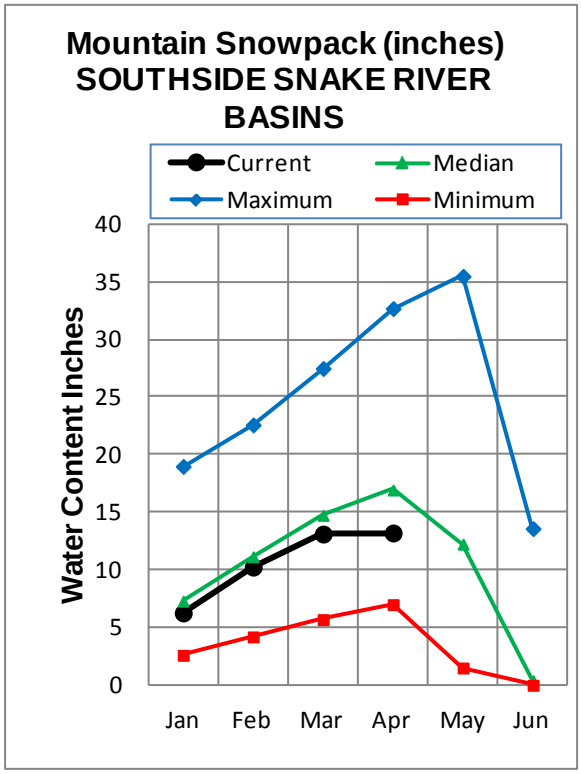
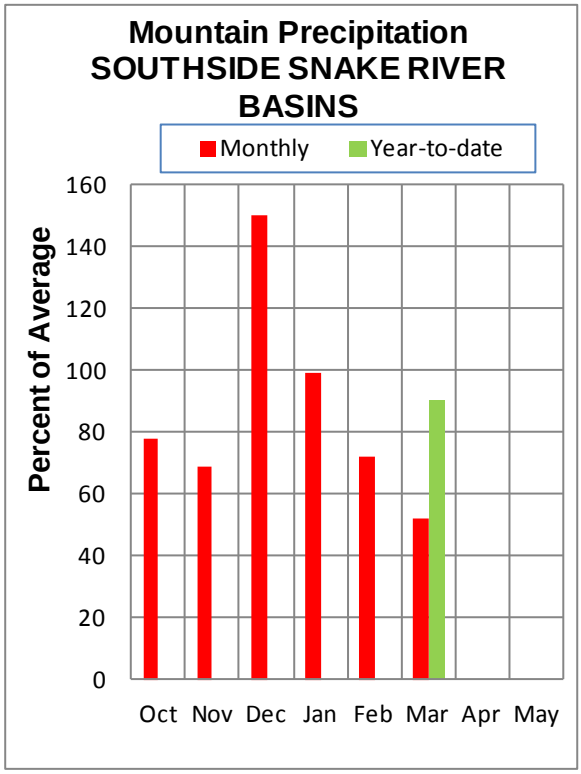
SOUTHSIDE SNAKE RIVER BASINS

APRIL 1, 2013







WATER SUPPLY OUTLOOK

Water shortages are likely for Salmon Falls and Oakley water users after the fourth month this water year with less than normal precipitation. March precipitation was 68% of average in the Goose-Trapper drainages, less than 60% in Salmon Falls and Bruneau and just 40% for the Owyhee. Reynolds Creek and Taylor Canyon SNOTELs, both in the Owyhee basin, received only 0.4 and 0.3 inches of precipitation in March. These totals are normal in August, but are only 17% and 27% of average in March. Water year to date precipitation since October 1 is still about 95% of average for Goose, Trapper, Salmon Falls, and Bruneau basins, and 85% for Owyhee. April 1 snowpacks are 85% of median in Salmon Falls, 80% in Goose and Trapper Creeks, 72% in Bruneau and 39% in the Owyhee. The Owyhee basin aerial marker survey was not accomplished this month; based on last month's survey it is likely that the basin's snow percentage would be even lower if those sites were measured. Reservoir storage in Oakley, Salmon Falls, Wildhorse and Owyhee is 68-88% of average. The Owyhee basin reservoirs are the most full with Owyhee Reservoir 53% of its capacity and Wildhorse 40% full. Oakley reservoir is 34% full and Salmon Falls is only 21% full. The Owyhee River had its snowmelt peak flow in mid-March. Streamflow forecasts range from poor to fair with the Owyhee River below the dam forecast at 47% of average, Salmon Falls Creek at 64%, the Bruneau River at 71% and Oakley inflow at 77%. The Surface Water Supply Index (SWSI) which combines streamflow forecasts and reservoir storage helps determine if water shortages are likely. Owyhee water users should be fine. Oakley's water users will be short by 4,000 acre-feet based on the 50% forecast. Combining the 50% forecast and current storage Salmon Falls tract users have 86,000 acre-feet, far short of the 110,000 acre-feet needed for an adequate supply; only the 10% chance of exceedance forecast will meet the adequate threshold. Spring precipitation is needed to delay the start of the irrigation demand and preserve the water for the drier summer months.

SOUTHSIDE SNAKE RIVER BASINS
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Goose Ck ab Trapper Ck nr Oakley	APR-JUL	4.3	10.2	14.3	77	18.4	24	18.7
	APR-SEP	4.5	10.9	15.2	76	19.5	26	20
Trapper Ck nr Oakley	APR-JUL	2.8	3.7	4.2	84	4.7	5.6	5.0
	APR-SEP	3.8	4.7	5.3	87	5.9	6.8	6.1
Oakley Res Inflow (2)	APR-JUL	7.1	13.9	18.5	77	23	30	24
	APR-SEP	7.8	15.1	20	77	25	32	26
Salmon Falls Ck nr San Jacinto	APR-JUN	24	34	42	64	51	65	66
	APR-JUL	25	36	45	64	55	71	70
	APR-SEP	27	39	48	65	58	75	74
Bruneau R nr Hot Springs	APR-JUL	70	103	129	71	158	205	183
	APR-SEP	73	108	135	70	166	215	192
Reynolds Ck at Tollgate	APR-JUL	0.5	2.2	3.3	43	4.4	6.1	7.6
Owyhee R nr Rome	APR-JUL	6.0	95	156	45	215	305	345
Owyhee R bl Owyhee Dam (2)	APR-JUL	94	140	176	47	217	284	375
	APR-SEP	114	162	200	49	242	311	405
Snake R at King Hill (1,2)	APR-JUL	735	1390	1690	65	1990	2640	2620
Snake R nr Murphy (1,2)	APR-JUL	925	1610	1920	74	2230	2920	2610
Snake R at Weiser (1,2)	APR-JUL	3120	3150	3170	63	3190	3220	5010
Snake R at Hells Canyon Dam (1,2)	APR-JUL	3210	3380	3460	60	3540	3710	5760
Snake R bl Lower Granite Dam (1,2)	APR-JUL	10400	13800	15300	77	16800	20200	19850

SOUTHSIDE SNAKE RIVER BASINS
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Oakley	75.6	25.9	41.6	29.6
Salmon Falls	182.6	37.8	99.3	56.0
WILDHORSE RESERVOIR	71.5	28.6	54.9	39.2
OWYHEE	715.0	376.1	624.4	495.8
Brownlee	1420.0	1147.1	1002.1	1102.0

SOUTHSIDE SNAKE RIVER BASINS
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
Raft River	1	87	87
Goose-Trapper Creeks	3	84	80
Salmon Falls Creek	8	122	85
Bruneau River	8	136	72
Reynolds Creek	6	45	46
Owyhee Basin Total	10	87	39
Owyhee Basin SNOTEL	8	87	46

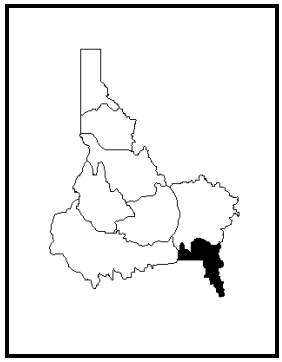
* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

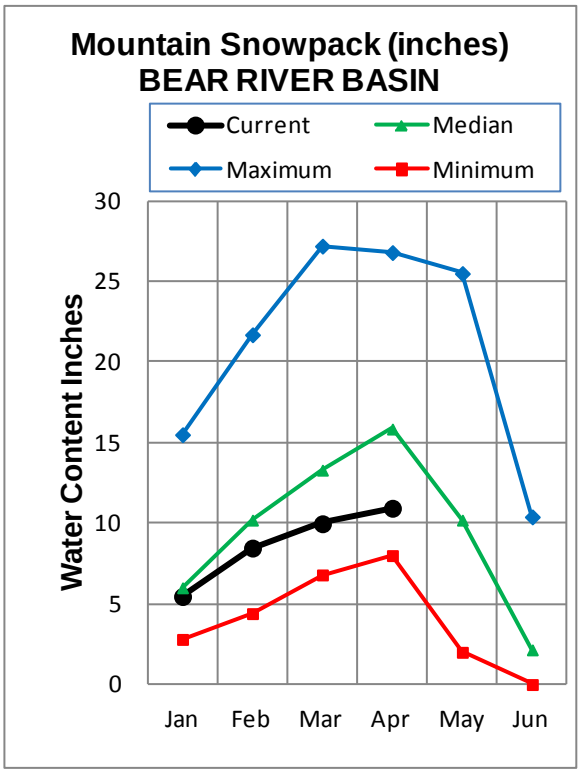
The average is computed for the 1981-2010 base period.

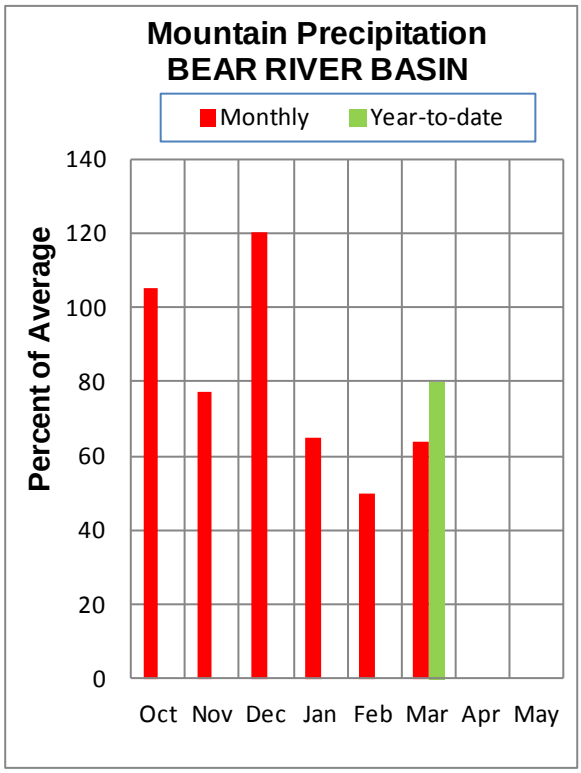
(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

BEAR RIVER BASIN

APRIL 1, 2013







WATER SUPPLY OUTLOOK

Bear Lake water users are ok, but natural streamflow conditions continue to deteriorate across the basin. The Bear Basin has seen three consecutive months of below normal precipitation. Monthly precipitation for March was 64% of average. Taken together this year's January–March period was the third lowest on record at Emigrant Summit and Franklin Basin SNOTELs and fourth driest at Giveout and Oxford Spring SNOTELs based on about 30 years of data. Since October 1, the Bear basin has been the driest part of the state, receiving just 80% of its average amount. The April 1 snowpack is 72% of the 1981-2010 median. If we substitute the 1971-2000 averages, this year's snowpack comes in at 59%. This year's snowpack won't last long once snowmelt begins. Most sites below 8,000 feet elevation are measuring less than 12 inches of snow water. Typical melt rates of 0.5 to 1.0 inch per day are common once melt begins, so it will only take two to three weeks to melt this year's snow. During the first couple days of April the snow at Emigrant Summit SNOTEL, elevation 7,390 feet, has already been melting at the rate of about a half inch a day. Expect streams to peak soon and then begin to recede to low summer base flows after two poor winters. The best forecasts are for the Smiths Fork and the Bear River near the Utah-Wyoming state line, each at half of normal. Most other forecasts are 25-45% of average, except the Bear River below Stewart Dam forecast at just 8% of average. Bear Lake is 126% of the 1981-2010 average, 65% full, which is plenty of water for Bear Lake water users for this year and should provide the best carryover in the state for next year. Water users dependent on natural streamflow should be prepared for another dry summer.

BEAR RIVER BASIN
Streamflow Forecasts - April 1, 2013

Forecast Point	Forecast Period	<<====== Drier ====== Future Conditions ======= Wetter =====>> Chance Of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
Bear R nr UT-WY State Line	APR-JUL	27	44	56	50	68	85	112
	APR-SEP	29	48	61	50	74	93	123
Bear R ab Res nr Woodruff	APR-JUL	1.0	10.0	45	37	39	64	121
	APR-SEP	1.0	14.0	50	39	36	62	128
Big Ck nr Randolph	APR-JUL	0.0	0.5	1.3	35	1.2	2.1	3.8
Smiths Fk nr Border	APR-JUL	23	36	45	51	53	66	89
	APR-SEP	30	45	55	53	65	80	104
Bear R bl Stewart Dam	APR-JUL	2.0	4.0	14.0	8	40	106	183
	APR-SEP	2.0	4.0	12.0	6	20	77	205
Little Bear R at Paradise	APR-JUL	0.4	3.3	9.8	24	13.6	25	41
Logan R nr Logan	APR-JUL	10.0	27	38	34	50	67	111
Blacksmith Fork nr Hyrum	APR-JUL	1.3	8.0	18.6	43	29	45	43

BEAR RIVER BASIN
Reservoir Storage (1000 AF) - End of March

Reservoir	Usable Capacity	*** Usable Storage *** This Year	Last Year	Avg
Bear Lake	1421.0	922.0	1149.6	730.9
Montpelier Creek	4.0	1.7	3.7	1.9

BEAR RIVER BASIN
Watershed Snowpack Analysis - April 1, 2013

Watershed	Number of Data Sites	This Year as % of Last Yr	Median
Smiths & Thomas Forks	4	90	81
Bear River ab WY-ID line	4	90	81
Montpelier Creek	2	109	73
Mink Creek	4	101	69
Cub River	2	99	63
Bear River ab ID-UT line	17	98	73
Malad River	1	106	46

* 90%, 70%, 50%, 30%, and 10% chances of exceeding are the probabilities that the actual volume will exceed the volumes in the table.

The average is computed for the 1981-2010 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural volume - actual volume may be affected by upstream water management.

Streamflow Adjustment List for All Forecasts Published in Idaho Water Supply Outlook Report: Streamflow forecasts are projections of runoff volumes that would occur without influences from upstream reservoirs or diversions. These values are referred to as natural, unregulated or adjusted flows. To make these adjustments, changes in reservoir storage, diversions, and inter-basin transfers are added or subtracted from the observed (actual) streamflow volumes. The following list documents the adjustments made for each forecast point**. (Revised Dec 2011).**

Panhandle River Basins

Kootenai R at Leonia, MT
+ Lake Koocanusa storage change

Moyie R at Eastport – no corrections

Smith Creek nr Porthill – no corrections

Boundary Ck nr Porthill – no corrections

Clark Fork R at Whitehorse Rapids
+ Hungry Horse storage change
+ Flathead Lake storage change
+ Noxon Rapids Res storage change

Pend Oreille Lake Inflow
+ Pend Oreille R at Newport, WA
+ Hungry Horse storage change
+ Flathead Lake storage change
+ Noxon Rapids storage change
+ Pend Oreille Lake storage change
+ Priest Lake storage change

Priest R nr Priest R
+ Priest Lake storage change

NF Coeur d'Alene R at Enaville - no corrections

St. Joe R at Calder- no corrections

Spokane R nr Post Falls
+ Coeur d'Alene Lake storage change

Spokane R at Long Lake, WA
+ Coeur d'Alene Lake storage change
+ Long Lake, WA storage change

Clearwater River Basin

Selway R nr Lowell - no corrections

Lochsa R nr Lowell - no corrections

Dworshak Res Inflow
+ Clearwater R nr Peck
- Clearwater R at Orofino
+ Dworshak Res storage change

Clearwater R at Orofino - no corrections

Clearwater R at Spalding
+ Dworshak Res storage change

Salmon River Basin

Salmon R at Salmon - no corrections

Lemhi R nr Lemhi – no corrections

MF Salmon R at MF Lodge – no corrections

SF Salmon R nr Krassel Ranger Station – no corrections

Johnson Creek at Yellow pine – no corrections

Salmon R at White Bird - no corrections

Weiser, Payette, Boise River Basins

Weiser R nr Weiser - no corrections

SF Payette R at Lowman - no corrections

Deadwood Res Inflow
+ Deadwood R bl Deadwood Res nr Lowman
+ Deadwood Res storage change

Lake Fork Payette R nr McCall – no corrections

NF Payette R at Cascade
+ Cascade Res storage change
+ Payette Lake storage change

NF Payette R nr Banks
+ Cascade Res storage change
+ Payette Lake storage change

Payette R nr Horseshoe Bend
+ Cascade Res storage change
+ Deadwood Res storage change
+ Payette Lake storage change

Boise R nr Twin Springs - no corrections

SF Boise R at Anderson Ranch Dam
+ Anderson Ranch Res storage change

Mores Ck nr Arrowrock Dam – no corrections

Boise R nr Boise
+ Anderson Ranch Res storage change
+ Arrowrock Res storage change
+ Lucky Peak Res storage change

Wood and Lost River Basins

Big Wood R at Hailey - no corrections

Big Wood R ab Magic Res
+ Big Wood R at Stanton Crossing nr Bellevue
+ Willow Ck

Camas Ck nr Blaine – no corrections

Big Wood R bl Magic Dam nr Richfield
+ Magic Res storage change

Little Wood R ab High Five Ck – no corrections

Little Wood R nr Carey
+ Little Wood Res storage change

Big Lost R at Howell Ranch - no corrections

Big Lost R bl Mackay Res nr Mackay
+ Mackay Res storage change

Little Lost R bl Wet Ck nr Howe - no corrections

Upper Snake River Basin

Henrys Fork nr Ashton
+ Henrys Lake storage change
+ Island Park Res storage change

Falls R nr Ashton
+ Grassy Lake storage change
+ Diversions from Falls R ab nr Ashton

Teton R nr Driggs - no corrections

Teton R nr St. Anthony
- Cross Cut Canal into Teton R
+ Sum of Diversions for Teton R ab St. Anthony
+ Teton Dam for water year 1976 only

Henrys Fork nr Rexburg
+ Henrys Lake storage change
+ Island Park Res storage change
+ Grassy Lake storage change
+ 7 Diversions from Henrys Fk btw Ashton to St. Anthony
+ 21 Diversions from Henrys Fk btw St. Anthony to Rexburg
+ 3 Diversions from Falls R ab Ashton
+ 6 Diversions from Falls R nr Ashton to Chester
Snake R nr Flagg Ranch, WY – no corrections
Snake R nr Moran, WY
+ Jackson Lake storage change
Pacific Ck at Moran, WY - no corrections
Buffalo Fork ab Lava nr Moran, WY - no corrections
Gros Ventre R at Kelly, WY - no corrections
Snake R ab Res nr Alpine, WY
+ Jackson Lake storage change
Greys R nr Alpine, WY - no corrections
Salt R R nr Etna, WY - no corrections
Snake R nr Irwin
+ Jackson Lake storage change
+ Palisades Res storage change
Snake R nr Heise
+ Jackson Lake storage change
+ Palisades Res storage change
Willow Ck nr Ririe
+ Ririe Res storage change
The forecasted natural volume for Willow Creek nr Ririe does not include an adjustment for Grays Lake water diverted from Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Blackfoot R ab Res nr Henry
+ Blackfoot Res storage change
The forecasted Blackfoot Reservoir Inflow includes Grays Lake water diverted from the Willow Creek drainage through the Clarks Cut diversion and into Blackfoot Reservoir.
Portneuf R at Topaz - no corrections
Snake R at Neeley
+ Jackson Lake storage change
+ Palisades Res storage change
+ American Falls storage change
+ Teton Dam for water year 1976 only

Southside Snake River Basins
Goose Ck nr Oakley - no adjustments
Trapper Ck nr Oakley - no adjustments
Oakley Res Inflow - *flow does not include Birch Creek*
+ Goose Ck
+ Trapper Ck
Salmon Falls Ck nr San Jacinto, NV - no corrections
Bruneau R nr Hot Springs - no corrections
Reynolds Ck at Tollgate - no corrections
Owyhee R nr Gold Ck, NV
+ Wildhorse Res storage change
Owyhee R nr Rome, OR – no Corrections
Owyhee R bl Owyhee Dam, OR
+ Owyhee Res storage change
+ Diversions to North and South Canals

Bear River Basin
Bear R nr UT-WY Stateline, UT- no corrections
Bear R abv Res nr Woodruff, UT- no corrections
Big Ck nr Randolph, UT - no corrections
Smiths Fork nr Border, WY - no corrections
Bear R bl Stewart Dam nr Montpelier
+ Bear R bl Stewart Dam
+ Rainbow Inlet Canal
Little Bear R at Paradise, UT - no corrections
Logan R nr Logan, UT - no corrections
Blacksmith Fk nr Hyrum, UT - no corrections

Reservoir Capacity Definitions (Units in 1,000 Acre-Feet, KAF)
Different agencies use various definitions when reporting reservoir capacity and contents. Reservoir storage terms include dead, inactive, active, and surcharge storage. This table lists these volumes for each reservoir, and defines the storage volumes NRCS uses when reporting capacity and current reservoir storage. In most cases, NRCS reports usable storage, which includes active and inactive storage. **(Revised Dec 2011)**

Basin/ Reservoir	Dead Storage	Inactive Storage	Active Storage	Surcharge Storage	NRCS Capacity	NRCS Capacity Includes
Panhandle Region						
Hungry Horse	39.73	---	3451.00	---	3451.0	Active
Flathead Lake	Unknown	---	1791.00	---	1791.0	Active
Noxon Rapids	Unknown	---	335.00	---	335.0	Active
Pend Oreille	406.20	112.40	1042.70	---	1561.3	Dead + Inactive + Active
Coeur d'Alene	Unknown	13.50	225.00	---	238.5	Inactive + Active
Priest Lake	20.00	28.00	71.30	---	119.3	Dead + Inactive + Active
Clearwater Basin						
Dworshak	Unknown	1452.00	2016.00	---	3468.0	Inactive + Active
Weiser/Boise/Payette Basins						
Mann Creek	1.61	0.24	11.10	---	11.1	Active
Cascade	Unknown	46.70	646.50	---	693.2	Inactive + Active
Deadwood	Unknown	---	161.90	---	161.9	Active
Anderson Ranch	24.90	37.00	413.10	---	450.1	Inactive + Active
Arrowrock	Unknown	---	272.20	---	272.2	Active
Lucky Peak	Unknown	28.80	264.40	13.80	293.2	Inactive + Active
Lake Lowell	7.90	5.80	159.40	---	165.2	Inactive + Active
Wood/Lost Basins						
Magic	Unknown	---	191.50	---	191.5	Active
Little Wood	Unknown	---	30.00	---	30.0	Active
Mackay	0.13	---	44.37	---	44.4	Active
Upper Snake Basin						
Henrys Lake	Unknown	---	90.40	---	90.4	Active
Island Park	0.40	---	127.30	7.90	135.2	Active + Surcharge
Grassy Lake	Unknown	---	15.18	---	15.2	Active
Jackson Lake	Unknown	---	847.00	---	847.0	Active
Palisades	44.10	155.50	1200.00	---	1400.0	Dead + Inactive+Active
Ririe	4.00	6.00	80.54	10.00	80.5	Active
Blackfoot	Unknown	---	348.73	---	348.7	Active
American Falls	Unknown	---	1672.60	---	1672.6	Active
Southside Snake Basins						
Oakley	0.00	---	75.60	---	75.6	Active
Salmon Falls	48.00	5.00	182.65	---	182.6	Active + Inactive
Wildhorse	Unknown	---	71.50	---	71.5	Active
Owyhee	406.83	---	715.00	---	715.0	Active
Brownlee	0.45	444.70	975.30	---	1420.0	Inactive + Active
Bear River Basin						
Bear Lake	5000.00	119.00	1302.00	---	1421.0 includes 119	Active + Inactive: that can be released
Montpelier Creek	0.21	---	3.84	---	4.0	Dead + Active

Interpreting Water Supply Forecasts

Introduction
Each month, five forecasts are issued for each forecast point and each forecast period. Unless otherwise specified, all streamflow forecasts are for streamflow volumes that would occur naturally without any upstream influences. Water users need to know what the different forecasts represent if they are to use the information correctly when making operational decisions. The following is an explanation of each of the forecasts.

90 Percent Chance of Exceedance Forecast. There is a 90 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 10 percent chance that the actual streamflow volume will be less than this forecast value.

70 Percent Chance of Exceedance Forecast. There is a 70 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 30 percent chance that the actual streamflow volume will be less than this forecast value.

50 Percent Chance of Exceedance Forecast. There is a 50 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 50 percent chance that the actual streamflow volume will be less than this forecast value. Generally, this forecast is the middle of the range of possible streamflow volumes that can be produced given current conditions.

30 Percent Chance of Exceedance Forecast. There is a 30 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 70 percent chance that the actual streamflow volume will be less than this forecast value.

10 Percent Chance of Exceedance Forecast. There is a 10 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 90 percent chance that the actual streamflow volume will be less than this forecast value.

*Note: There is still a 20 percent chance that actual streamflow volumes will fall either below the 90 percent exceedance forecast or above the 10 percent exceedance forecast.

These forecasts represent the uncertainty inherent in making streamflow predictions. This uncertainty may include sources such as: unknown future weather conditions, uncertainties associated with the various prediction methodologies, and the spatial coverage of the data network in a given basin.

30-Year Average. The 30-year average streamflow for each forecast period is provided for comparison. The average is based on data from 1971-2000. The % AVG. column compares the 50% chance of exceedance forecast to the 30-year average streamflow; values above 100% denote when the 50% chance of exceedance forecast would be greater than the 30-year average streamflow.

AF - Acre-feet, forecasted volume of water are typically in thousands of acre-feet.

These forecasts are given to users to help make risk-based decisions. Users can select the forecast corresponding to the level of risk they are willing to accept in order to minimize the negative impacts of having more or less water than planned for.

To Decrease the Chance of Having Less Water than Planned for
A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive less than this amount). To reduce the risk of .having less water than planned for, users can base their operational decisions on one of the forecasts with a greater chance of being exceeded such as the 90 or 70 percent exceedance forecasts.

To Decrease the Chance of Having More Water than Planned for
A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive more than this amount). To reduce the risk of having more water than planned for, users can base their operational decisions on one of the forecasts with a lesser chance of being exceeded such as the 30 or 10 percent exceedance forecasts.

Using the forecasts - an Example
Using the 50 Percent Exceedance Forecast. Using the example forecasts shown below, there is a 50% chance that actual streamflow volume at the Boise River near Twin Springs will be less than 685 KAF between April 1 and July 31. There is also a 50% chance that actual streamflow volume will be greater than 685 KAF.

Using the 90 and 70 Percent Exceedance Forecasts. If an unexpected shortage of water could cause problems (such as irrigated agriculture), users might want to plan on receiving 610 KAF (from the 70 percent exceedance forecast). There is a 30% chance of receiving *less* than 610 KAF.

Alternatively, if users determine the risk of using the 70 percent exceedance forecast is too great, then they might plan on receiving 443 KAF (from the **90** percent exceedance forecast). There is 10% chance of receiving less than 443 KAF.

Using the 30 or 10 Percent Exceedance Forecasts. If an unexpected excess of water could cause problems (such as operating a flood control reservoir), users might plan on receiving 760 KAF (from the 30 percent exceedance forecast). There is a 30% chance of receiving *more* than 760 KAF.

Alternatively, if users determine the risk of using the 30 percent exceedance forecast is too great, then they might plan on receiving 927 KAF (from the 10 percent exceedance forecast). There is a 10% chance of receiving more than 927 KAF.

Users could also choose a volume in between any of these values to reflect their desired risk level.

Weiser, Payette, Boise River Basins
Streamflow Forecasts – January 2006

Forecast Point	Forecast Period	Chance of Exceeding * 90% (1000AF)	70% (1000AF)	50% (1000 AF)	50% (% AVG.)	30% (1000AF)	10% (1000AF)	30-Yr Avg. (1000AF)
SF PAYETTE RIVER at Lowman	APR-JUL	329	414	471	109	528	613	432
	APR-SEP	369	459	521	107	583	673	488
BOISE RIVER near Twin Springs (1)	APR-JUL	443	610	685	109	760	927	631
	APR-SEP	495	670	750	109	830	1005	690

*90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table

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Numerous other groups and agencies provide funding and/or cooperative support for the collection, operation and maintenance of the Cooperative Idaho Snow Survey Program. Their cooperation is greatly appreciated.