Surface Water Forecasting Above Magic March 2018 Report

A subcommittee of the Wood River Water Collaborative has been working to understand surface water delivery above Magic to improve water management and inform crop planning. The subcommittee consists of Kevin Lakey, Chris Johnson, Ron Abromavich, Pat Purdy, Justin Stevenson, and Keri York.

Surface Water Demand

Looking at surface water delivery from diversions in 2017, NRCS evapotranspiration rates and irrigated land, and a 2015 water demand analysis, surface water demand above Magic is estimated at 135,000-154,000 acre-feet.

NRCS Snow Water Equivalent and Snow Index

According to the March 1, 2018 report, the current snow water equivalent (SWE) is at 91.7 inches of water. This is approximate to the recent years of 2008, 2014, and 2015. 2008 had a wet spring, and 2014 and 2015 had drier springs.

https://www.wcc.nrcs.usda.gov/ftpref/states/id/webftp/snow-indexes/BigWood_snow_data.pdf

Based on March 1 reports, the NRCS mentions that the 30 day for forecasts are for the wet and cool weather pattern to continue through March 12, 2018:

- 1 to 7 Day NWS Precipitation Forecast 🗗 <u>http://www.wpc.ncep.noaa.gov/qpf/day1-7.shtml</u>
- 6-10 Day to 3 Month Outlooks from NWS Climate Prediction Center <u>http://www.cpc.ncep.noaa.gov/</u>

NRCS Surface Water Supply Index

Using the demand estimates of 135,000 – 155,000 acre-feet, the SWSI indicates a 70% chance of exceedance of this amount for delivery; in other words, there is a 70% chance that the demand of 135,000 - 155,000 acre-feet will be met. This is illustrated in this SWSI table and graph:

https://www.wcc.nrcs.usda.gov/ftpref/states/id/webftp/swsi/tables/Mar/Big_Wood_above_Hailey_Ma r.pdf

https://www.wcc.nrcs.usda.gov/ftpref/states/id/webftp/swsi/graphs/Mar/Big_Wood_above_Hailey_M ar_Last30Years.gif

Looking at the similar year of 2015 (with a drier spring), there is approximately a 50% chance that the surface flows will be 162,000 acre-feet.

Surface Water Delivery and Forecasted Shut-Off Dates

Kevin put together a spreadsheet with dates when 1886 and 1883 priority dates shut off and corresponding flows at Hailey gauge (table below). If we look at similar years according to SWE or demand, we can estimate shutoff dates and flow at Hailey gauge. The similar years of 2008, 2014, and

2015 had 1886 shutoff dates between 7/6 and 7/14. 1883 shutoff dates were 7/21 for drier years and 8/6 for the wetter year of 2008.

In general during drier years, 1883 water rights were cut off closer to 1886 rights; in decent water years all 1886 rights were cut off from the 3rd week of June to 1st week of July. Once peak flow hits the Hailey gauge, we can use the flow data in Kevin's spreadsheet to further narrow down the window of expected shutoff dates for 1886 and 1883 water rights. Until we know how melting occurs, it is difficult to be precise because snowpack melt affects surface water supplies later in the summer and shutoff dates

						Date on	
	Ac Ft x			Flow @ Big	Date on	which first	Flow @ Big
	1000	Date on which	Date on which	Wood Hailey	which Big	1883	Wood Hailey
	April -	Big Wood Hailey	first 1886	when 1886	Wood Hailey	priorities	when 1883
Year	Sept	hit 650 cfs	priorities cut	water cut	hit 350 cfs	were cut	water cut
1981	237	7/7/1981	7/20/1981	346	7/17/1981	8/26/1981	170
2016	236	6/26/2016	7/12/2016	398	7/15/2016	7/26/2016	231
2010	221	7/14/2010	7/28/2010	366	7/30/2010	8/16/2010	236
2003	221	7/2/2003	7/9/2003	427	7/14/2003	8/7/2003	189
1985	205	6/21/1985	7/8/1985	351	7/15/1985	8/7/1985	241
2008	199	7/7/2008	7/14/2008	427	7/19/2008	8/6/2008	187
1989	198	6/23/1989	7/13/1989	398	7/15/1989	8/3/1989	195
2000	190	6/21/2000	7/5/2000	362	7/6/2000	7/26/2000	210
2014	162	6/16/2014	7/10/2014	363	7/11/2014	7/21/2014	220
2015	159	6/20/2015	7/6/2015	307	7/2/2015	7/21/2015	207
2013	154	6/19/2013	7/8/2013	345	7/8/2013	7/11/2013	296
1991	153	6/30/1991	7/17/1991	324	7/17/1991	8/2/1991	194
2002	153	6/27/2002	7/3/2002	413	7/6/2002	7/12/2002	266
1990	147	7/2/1990	7/14/1990	352	7/14/1990	7/30/1990	212
2004	136	6/12/2004	7/7/2004	371	7/8/2004	7/31/2004	177
1987	134	6/12/1987	6/26/1987	331	6/26/1987	8/18/1987	160
1988	130	6/20/1988	7/4/1988	304	7/2/1988	7/19/1988	190
2007	117	6/5/2007	6/25/2007	321	6/24/2007	7/10/2007	168
2001	104	5/31/2001	6/19/2001	334	6/15/2001	7/30/2001	131
1992	103	5/11/1992	5/14/1992	533	6/8/1992	7/6/1992	248
1994	91	6/6/1994	6/16/1994	368	6/17/1994	6/28/1994	228

Groundwater Supply

There is an interest in seeing if we can understand annual groundwater supply levels, to add to this surface water predictions. There may be a way to correlate long-term well data with flow at the Hailey gauge or one of the SNOTEL sites.

Updated NRCS Snowpack Charts as of March 9, 2018

And links:

https://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/basin_proj/id/big_wood_swe_proj.gif https://www.wcc.nrcs.usda.gov/ftpref/data/water/wcs/basinsweplots/id/big_wood_swe_d.gif

