

Snow Survey and Water Supply Bulletin April 1st, 2014

The April 1st snow survey is now complete. Data from 155 snow courses and 51 snow pillows around the province and climate data from Environment Canada form the basis for the following report¹.

Weather

For most of March warm, moist air masses affected much of the south and west parts of the province, and cold arctic air was prevalent over northern and interior areas. Temperatures through March were below average across the North and Interior (1-4 °C below normal), and variable, but near normal through the South Interior, Kootenay and Columbia. Minimum temperatures were above normal through the South Coast, Vancouver Island, and areas of the Okanagan (0.5-2 °C above normal).

Precipitation patterns in March were variable across the province. The south half of the province saw above normal precipitation, with well above normal precipitation observed in the eastern Fraser Valley, southern Vancouver Island, and in the Rockies. Below normal precipitation was experienced in the Peace, Liard and Skeena regions.

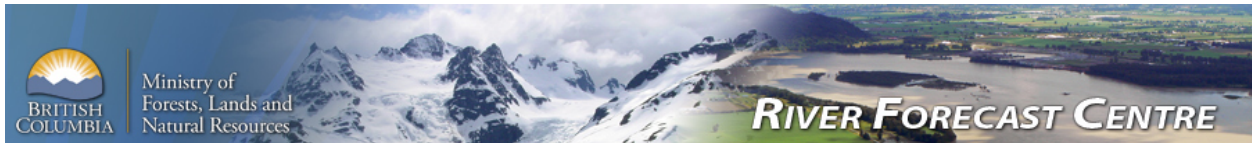
Snowpack

Snow basin indices across the province range from a low of 60% of normal on Vancouver Island, to a high of 136% in the Upper Fraser (Table 1). Wetter weather patterns in the south of the province led to increases in snow basin index values in the South Coast, Lower Fraser and Vancouver Island. Despite increases in snow pack, snow basin index values remain moderately low on the South Coast (75%) and low on Vancouver Island (60%). Higher than normal snow packs (>120%) are present in the Upper Fraser, Liard, Similkameen and Skagit basins. Other regions of the province have near normal (80-120%) snowpack.

Table 1 - BC Snow Basin Indices – April 1, 2014

Basin	% of Normal	Basin	% of Normal
Upper Fraser	136	Okanagan-Kettle	97
Nechako	80	Similkameen	124
Middle Fraser	96	South Coast	75
Lower Fraser	83	Vancouver Island	60
North Thompson	97	Central Coast	99
South Thompson	105	Skagit	143
Upper Columbia	98	Peace	96
Lower Columbia	99	Skeena-Nass	85
East Kootenay	118	Stikine	82
West Kootenay	118	Northeast-Liard	124
Northwest	110		

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Outlook

Typically the peak of the snow accumulation season in BC occurs in the middle of April with a transition from accumulation to snow melt at higher elevations. Therefore the April 1st snow survey data is a good reflection of the overall seasonal snow pack that is available for melt during freshet.

Snow packs in the Upper Fraser, Liard, and Similkameen are elevated (>120% of normal) indicating elevated seasonal flood risk. In the Upper Fraser basin, snow packs are below levels observed in 2012, and while some individual survey locations are at or above historic levels (e.g. 1A05 Longworth-Upper), the 2013 basin index is the 6th highest snow pack in 62 years of record. In the Liard basin, snow packs exceed conditions observed in 2012. In the Skagit basin, the elevated snow basin index (143%) reflects higher than normal snow pack at mid-elevations. Due to limited elements at risk on the Skagit floodplain, and that peak flows on the river typically occur during fall-winter rainstorm events, higher than normal snow packs in the watershed pose limited risk for freshet flooding.

In other areas of the province, near-normal snow pack levels indicate a normal seasonal flood risk. In the Fraser basin, high snow pack levels in the upper headwaters are moderated by near-normal and below normal snow packs in other major tributaries. The overall Fraser River basin index for April 1st is 99% of normal. The forecasted peak flow (i.e. a 50% chance of a peak flow below this value, and a 50% chance of flows exceeding this estimate) for the Fraser River at Hope is 8600 m³/s, or approximately the 2-year flow or mean annual peak.

Seasonal weather during the snow melt season is a critical factor in determining whether or not flooding will occur. Adverse weather, including extreme heat or extreme precipitation, can cause flooding in years with normal, or even below normal snow packs.

In the south-west (Vancouver Island and South Coast, and Lower Fraser) the low snow packs (60-75%) indicate that we can expect below normal seasonal runoff during the spring melt. While lower than normal spring runoff can be expected, spring and summer weather conditions will be the key factor in determining whether or not drought and low flows will occur this summer.

Seasonal volume runoff forecasts (in Appendix below) indicate higher than normal runoff forecasted in the Upper Fraser and Similkameen basins, near normal or slightly below normal runoff (90-105%) forecasted in the Middle Fraser, Thompson, Okanagan, Skeena and Cowichan basins, and below normal runoff (<90%) forecasted in the Nicola and Bulkley basins. Actual seasonal volume runoff can vary greatly depending on spring and summer weather conditions.

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The winter 2013-2014 has been characterized by neutral ENSO conditions. The Climate Prediction Centre at the U.S. National Weather Service/NOAA is currently forecasting approximately a 50% chance of the emergence of El Niño conditions into the summer. El Niño years typically have increased winter temperatures and decreased winter precipitation, and while this may not play a role in terms of 2014 summer weather, it may become a factor for the 2014-15 snow season.

Seasonal forecasts from Environment Canada indicate an increased chance of above normal temperatures for the April to June 2014 period through most of British Columbia, with the highest likelihood of above normal temperatures on Vancouver Island and south-west BC. Forecasts for seasonal precipitation do not indicate an increased likelihood of any particular precipitation trend through the spring.

Current medium-range forecasts from the North American Ensemble Forecast System indicate a high likelihood of above normal temperatures through the April 15-22 period. This extended forecast suggests that the seasonal transition to snow pack melt will likely occur over the next couple of weeks.

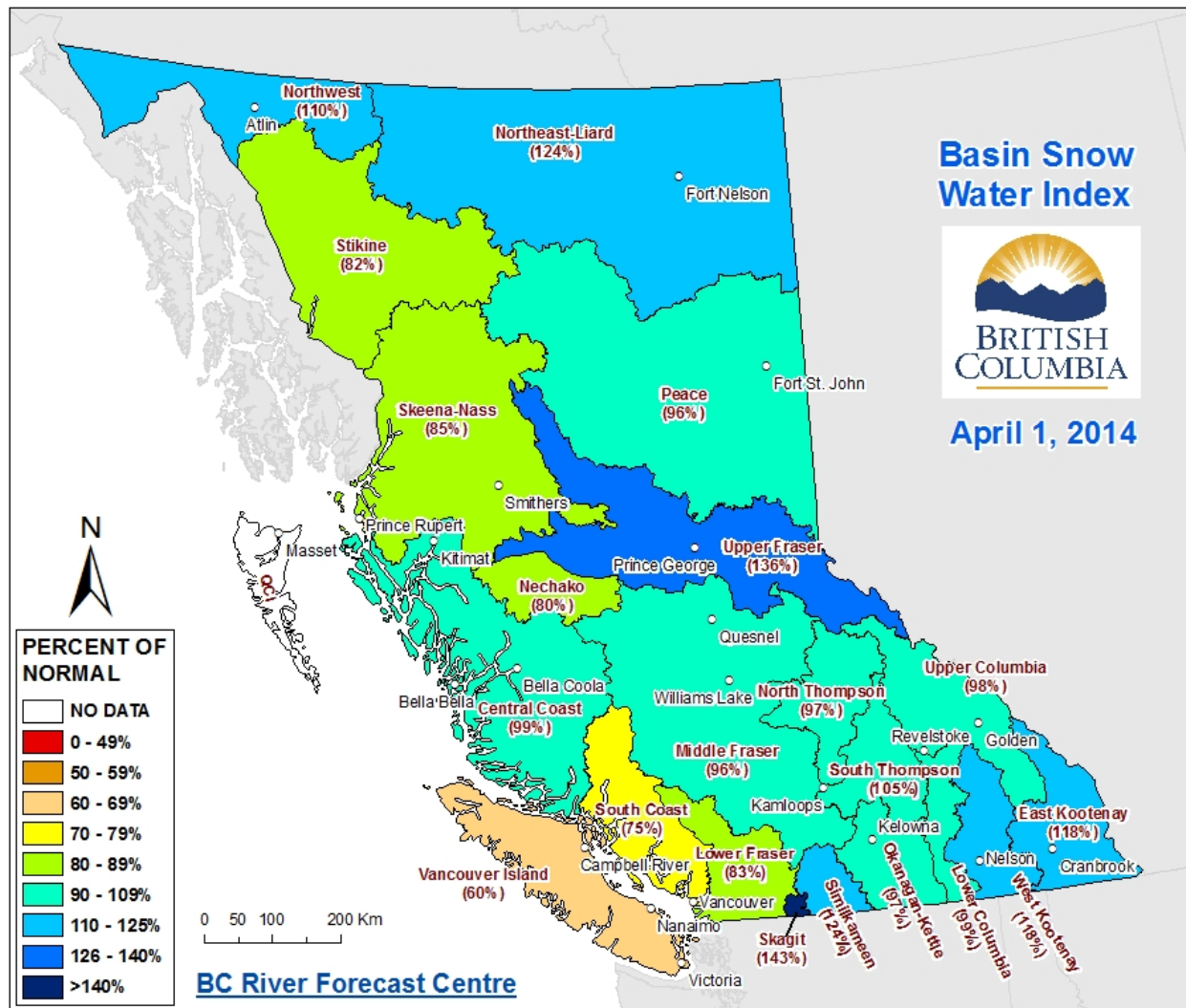
The River Forecast Centre will continue to monitor snow pack conditions and will provide an updated seasonal water supply and flood risk assessment in the May 2014 Snow Bulletin, scheduled for release on May 8, 2014.

Produced by: BC River Forecast Centre
April 8, 2014



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Figure 1: Basin Snow Water Index – April 1st, 2014



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