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Subject: Snow Survey and Water Supply Bulletin – June 15th, 2020

Importance: High

The June 15th snow survey is now complete. Data from three manual snow courses and 81 automated snow weather stations around the province (collected by the Ministry of Environment Snow Survey Program, BC Hydro and partners), and climate data from Environment and Climate Change Canada and the provincial Climate Related Monitoring Program have been used to form the basis of the following report.

A complete version of this report, including full survey data, snow basin map, and comparison with previous years is available on the River Forecast Centre website at:

<https://www2.gov.bc.ca/gov/content/environment/air-land-water/water/drought-flooding-dikes-dams/river-forecast-centre/snow-survey-water-supply-bulletin>

Weather

The weather for the first two weeks of June has been dominated by cold upper low systems, which have delivered wet weather through most of British Columbia. Precipitation has been mostly normal to above normal for this time of year. Temperatures have been near normal through most areas.

Snowpack

Snow basin indices on June 15th, 2020 range from a low of 0% of normal for the Nechako to a high of 636% in the Okanagan (Table 1 and Figure 1). Most coastal snow basin indices are well below normal for this time of year, whereas many of the Interior basins are well above normal. The high snow basin indices relative to normal for June 15th in the Interior are indicative of a relative high winter season snowpack and delayed melt of higher elevation snow by several weeks. The overall average of province-wide measurements increased from 93% of normal on June 1st to 104% of normal on June 15th.

By June 15th, on average, approximately three-quarters of the accumulated seasonal snow pack has melted. Most sites have melted at seasonal rates this year. However, higher elevation snow pack in the Interior has experienced limited melt. Higher elevation Automated Snow Weather Stations in the Upper Fraser East have melted 40-60% of their seasonal peak. Elsewhere, the North and South Thompson sites have melted 30-60%, the Upper Columbia stations have melted 40-50%, the Okanagan/Boundary sites have melted 60-70% and the Kootenays have melted 25-60% of their respective higher elevation peak snow for the year.

Note that in the later part of the snow season, basin indices can be extremely low due to early melt or extremely high due to delayed melt. Comparison of the current snow pack

relative to a very low normal snow water equivalent can create seemingly extreme snow basin index values. Caution should be exercised when interpreting snow basin indices at this time of the year.

Table 1 - BC Snow Basin Indices – June 15, 2020

Basin	% of Normal (June 1 st values)	Basin	% of Normal (June 1 st values)
Upper Fraser West	N/A (N/A)	Boundary	332 (211)
Upper Fraser East	229 (142)	Similkameen	118 (106)
Nechako	0 (50)	South Coast	77 (73)
Middle Fraser	122 (69)	Vancouver Island	11 (22)
Lower Fraser	59 (73)	Central Coast	1 (78)
North Thompson	138 (110)	Skagit	N/A (N/A)
South Thompson	129 (111)	Peace	126 (97)
Upper Columbia	162 (133)	Skeena-Nass	27 (45)
West Kootenay	139 (128)	Stikine	633 (148)
East Kootenay	134 (104)	Liard	N/A (N/A)
Okanagan	636 (193)	Northwest	N/A (N/A)
Fraser River (All)	107 (90)	British Columbia	104 (93)

Streamflow

A significant warm period at the end of May, followed by heavy rain in the Interior on May 30th and 31st, led to Flood Watches and Flood Warnings in several regions including the Bonaparte, the Salmon, the Okanagan, the Similkameen, the Nicola, the Boundary, the West Kootenay and East Kootenay. Several of those rivers reached their highest flows for the year in early June.

Upper level lows distributed more precipitation across the province over the first two weeks of June and maintained flows at normal to well above normal for this time of year in the Interior. Other regions that were under advisory during the first half the month include the Upper Columbia, Upper Fraser, Cariboo, Nicola Lake, Peace and Liard.

Earlier seasonal melt and lower peak snow accumulation in areas of the province have seen some rivers trend towards an earlier freshet and below normal seasonal streamflow. This is most prominent in West-Central BC, Chilcotin, Central Coast, and South Coast.

Lake systems in the Interior, including Nicola Lake, Okanagan Lake, and Shuswap Lake, are relatively high for this time of year. These systems are susceptible if moderate to heavy precipitation persists for several more weeks.

The Fraser River in the Lower Fraser Valley has been high relative to normal for nearly two months. Fortunately, there were no extended periods of very hot weather, allowing the higher than normal snowpack to gradually melt. The cumulative flow for the Fraser River at Hope has been very high for the season, but favourable weather conditions prevented significant peaks and avoided major flooding.

Outlook

Seasonal weather forecasts from Environment and Climate Change Canada indicate an increased likelihood of warmer than normal June-July-August temperatures for the west side of B.C., while there is an increased likelihood of cooler temperatures in Northeast B.C. Short-term weather forecasts indicate slightly above seasonal temperatures and continued seasonal unsettled weather in some regions.

Seasonal flood risk is diminishing throughout the province as snow melts and weather conditions become more stable. However, flood risk remains in regions where flows or lake levels are high relative to normal for this time of year (Peace, Northeast, Upper Fraser East, Cariboo, Nicola, North Thompson, South Thompson, Southeast), and thus remain vulnerable to short-term heavy rainfall events. The Lower Fraser River remains at minor risk of flooding due to the combined effects of snowmelt and rainfall. Other Interior regions may still be at risk for flooding if heavy rainfall occurs; in recent years rain-driven flooding unrelated to snow conditions or snowmelt has occurred in the Chilcotin and in North-East BC in late-June and early-July

In recent years, hot and dry weather conditions in April & May have resulted in earlier than normal freshets. If cooler than normal or seasonal temperatures and wetter conditions continue throughout June, the freshet period can continue into mid-July. This season has seen a mix of snowmelt conditions, with early melt in low and mid-elevation areas and a delay in the melt of high elevation snowpack. In areas with early melt, including the Skeena-Nass, Nechako, Central Coast, South Coast, Lower Fraser tributaries, and higher elevation rivers on Vancouver Island, snowmelt influence on streamflow is expected to lead to an earlier low flow season and may increase risk of low flows later in the summer. Summer weather remains the critical factor for drought, and persistent dry and hot weather can lead to low summer streamflow in any region.

This is the final snow bulletin for the 2020 season; the first snow bulletin of the 2021 snow season will be released in early January 2021. Thank you to our partners for their contributions to these bulletins.

BC River Forecast Centre, June 19th, 2020