

Attachment #1

Snow Survey & Water Supply Bulletin February 1, 2022

Snow Survey and Water Supply Bulletin – February 1st, 2022

The February 1st snow survey is now complete. Data from 97 manual snow courses and 87 automated snow weather stations around the province (collected by the Ministry of Environment and Climate Change Strategy's 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 report¹.

Weather

The provincial weather pattern shifted in January, switching from very cold and relatively dry conditions in late December to wetter conditions for the first half of the month. Predominantly drier weather persisted throughout much of B.C for the latter half of the month. Temperatures in January ranged from 0.0 to +3.0°C above normal. The warmest anomalies were centred in the Northwest and the South Interior. Above normal precipitation was measured on southern Vancouver Island, the South Coast, the South Interior, the North Coast and the Northwest, whereas other regions in the province were near normal.

Several storm systems have already affected B.C. since the start of February. Most notably, the Skeena-Nass and Upper Fraser East regions have measured considerable additional snow. Upcoming weather forecasts display another storm expected for the northern regions of the province, whereas the southern areas are forecast to be dry over an extended period.

Snowpack

Snow basin indices for February 1st, 2022 range from a low of 88% of normal in the Boundary to a high of 143% in the Liard (Table 1 and Figure 2, 3). Generally, the province has above normal snow pack for February 1st, with the average of all snow measurements across the province at 109%. The Boundary and Okanagan are the only regions slightly below normal (80-89%) for February 1st. Normal snow packs (90-110%) were measured for the Nechako, Lower Fraser, South Thompson, Okanagan, Similkameen, South Coast, Vancouver Island, Peace, Skeena-Nass and Stikine. Slightly above normal snow packs (110-120%) exists in the Upper Fraser West, Upper Fraser East, Middle Fraser, North Thompson, West Kootenay and East Kootenay. Snow basin indices that are above normal (120-130%) include the Upper Columbia, Central Coast and Skagit. Well above normal (>130%) snow pack was measured in the Liard. The overall snow basin index for the entire Fraser River basin (e.g., upstream of the Lower Mainland) is 108%.

As the Middle Fraser encompasses a large and geographically diverse area, it can be divided into sub-basins to display snow conditions and potential flood risks in localised areas. The Bridge region measures 117% of normal, the Quesnel area 109%, the Lower Thompson 86% and the Chilcotin sub-basin at 170%. Please review the full summary data tables at

1. Every effort is made to ensure that data reported on these pages are accurate. However, in order to update the graphs and indices as quickly as possible, some data may have been estimated. Please note that data provided on these pages are preliminary and subject to revision upon review.

Snow Survey and Water Supply Bulletin – February 1st, 2022

the end of this report for further interpretation.

Table 1 - BC Snow Basin Indices – February 1, 2022

Basin	% of Normal (Jan 1 st value)	Basin	% of Normal (Jan 1 st value)
Upper Fraser West	117 (94)	East Kootenay	117 (121)
Upper Fraser East	119 (122)	Okanagan	89 (84)
Nechako	97 (99)	Boundary	88 (103)
Middle Fraser	115 (126)	Similkameen	95 (104)
Lower Thompson*	86 (129)	South Coast	102 (106)
Bridge*	117 (140)	Vancouver Island	102 (100)
Chilcotin*	170 (N/A)	Central Coast	128 (135)
Quesnel*	109 (115)	Skagit	126 (95)
Lower Fraser	103 (103)	Peace	101 (99)
North Thompson	118 (115)	Skeena-Nass	108 (113)
South Thompson	102 (104)	Stikine	96 (100)
Upper Columbia	130 (140)	Liard	143 (N/A)
West Kootenay	116 (125)	Fraser	108 (110)
		British Columbia	109 (115)

* sub-basin of Middle Fraser

There are two snow stations with period of record highs for February 1st:

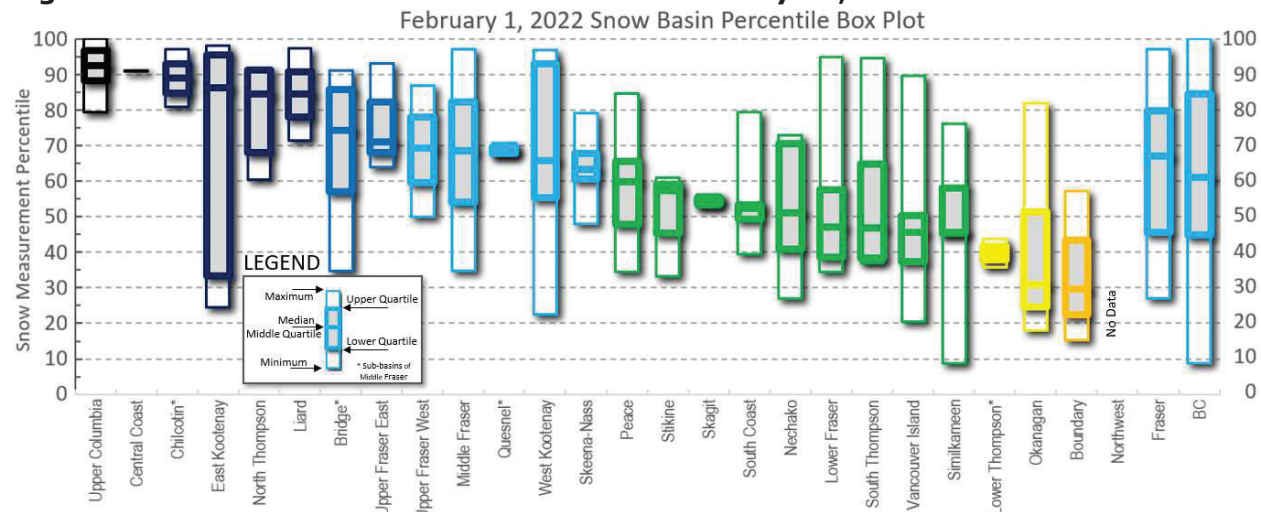
- 2A14 Mount Abbot: 1212 mm SWE (145% of normal) – period of record 63 years (UPPER COLUMBIA)
- 2A30P Colpitti Creek: 785 mm SWE – period of record 12 years (UPPER COLUMBIA)

The River Forecast Centre began including percentiles into the final data summary table in the 2020 bulletin in addition to using percent of normal to analyze snow pack. Percentiles offer a more accurate interpretation of variance, especially in regions when the percent of normal can be extremely high or low. The region with the highest average percentile is the Upper Columbia (92nd percentile); the region with lowest is the Boundary (34th). A box plot

Snow Survey and Water Supply Bulletin – February 1st, 2022

displaying the percentile variance ordered from highest to lowest median, including sub-basins, is provided below in Figure 1.

Figure 1. Snow Basin Percentile Box Plot – February 1st, 2022



Outlook

The Climate Prediction Center (CPC) shows that El Niño Southern Oscillation (ENSO) demonstrated La Niña conditions during the fall of 2021. This is the second La Niña in a row, with La Niña present during the fall-winter of 2020-21. La Niña occurs when oceanic temperature anomalies along the equatorial Pacific Ocean region are below normal for an extended period. Historically, La Niña conditions create cooler temperatures for British Columbia and wetter weather in the South Coast and Vancouver Island during the winter months. Conditions this year have so far followed this typical La Niña scenario.

Forecasts from the CPC indicate a likelihood (67% chance) of continued La Niña conditions (March-May 2022), with a potential transition to neutral conditions (51% likelihood) during spring 2022 (April-June). Historically, the April 1st snow pack is often above normal when winter La Niña conditions exist in British Columbia, particularly for the South Coast and Southern Interior. La Niña conditions that persist into the spring can lead to late-season snow accumulation and delayed snowmelt, which increases the risk for freshet flooding.

Seasonal weather forecasts from late January by Environment and Climate Change Canada indicate an increased likelihood of colder than normal temperatures from February through April for the entire province. There is an increased likelihood of greater than normal precipitation in the Northeast, Peace and Upper Fraser East for February to April, whereas there is a greater probability of below normal precipitation for Vancouver Island and the South Coast.

1. Every effort is made to ensure that data reported on these pages are accurate. However, in order to update the graphs and indices as quickly as possible, some data may have been estimated. Please note that data provided on these pages are preliminary and subject to revision upon review.

Snow Survey and Water Supply Bulletin – February 1st, 2022

Seasonal volume runoff forecasts (see below) are near-normal (90-110%) for the Thompson, Bulkley and Skeena. Slightly above normal (110-120%) are forecast for the Upper Fraser and Middle Fraser. The Similkameen is forecast to be well above normal (>140%) and likely a reflection of extremely high antecedent flow conditions caused by extreme rainfall last November. In 2021, an updated model was developed for Nicola Lake, Nicola River, Okanagan Lake and Kalamalka-Wood Lake. Further details can be found in the February 1st 2021 Snow Bulletin. There is significant variability between the newer and older seasonal volume forecasts for Nicola Lake, Nicola River, Okanagan Lake and Kalamalka-Wood Lake. Several predictor variables were outside the historic range for which the modeling was developed, resulting in increased uncertainty for the upcoming forecast. Any interpretation of seasonal volume runoff forecasts must include this critical fact. Near normal snow pack on Vancouver Island and the South Coast indicates an average year of spring runoff for other watersheds within the regions.

By early February, nearly two-thirds of the annual B.C. snow pack has typically accumulated. Snow pack throughout the province ranges from 88 to 142% of normal. Several storm systems have already affected B.C. since the start of February. Most notably, the Skeena/Nass and Upper Fraser East regions measured considerable additional snow. Upcoming weather forecasts predict generally dry conditions to persist through most of B.C. for the upcoming week. The provincial average for all snow measurements across the province is 109% of normal and indicates a higher risk for snowmelt related flooding during the spring months (freshet), particularly for the Interior. With a few months left for snow accumulation, seasonal snow packs can still change significantly.

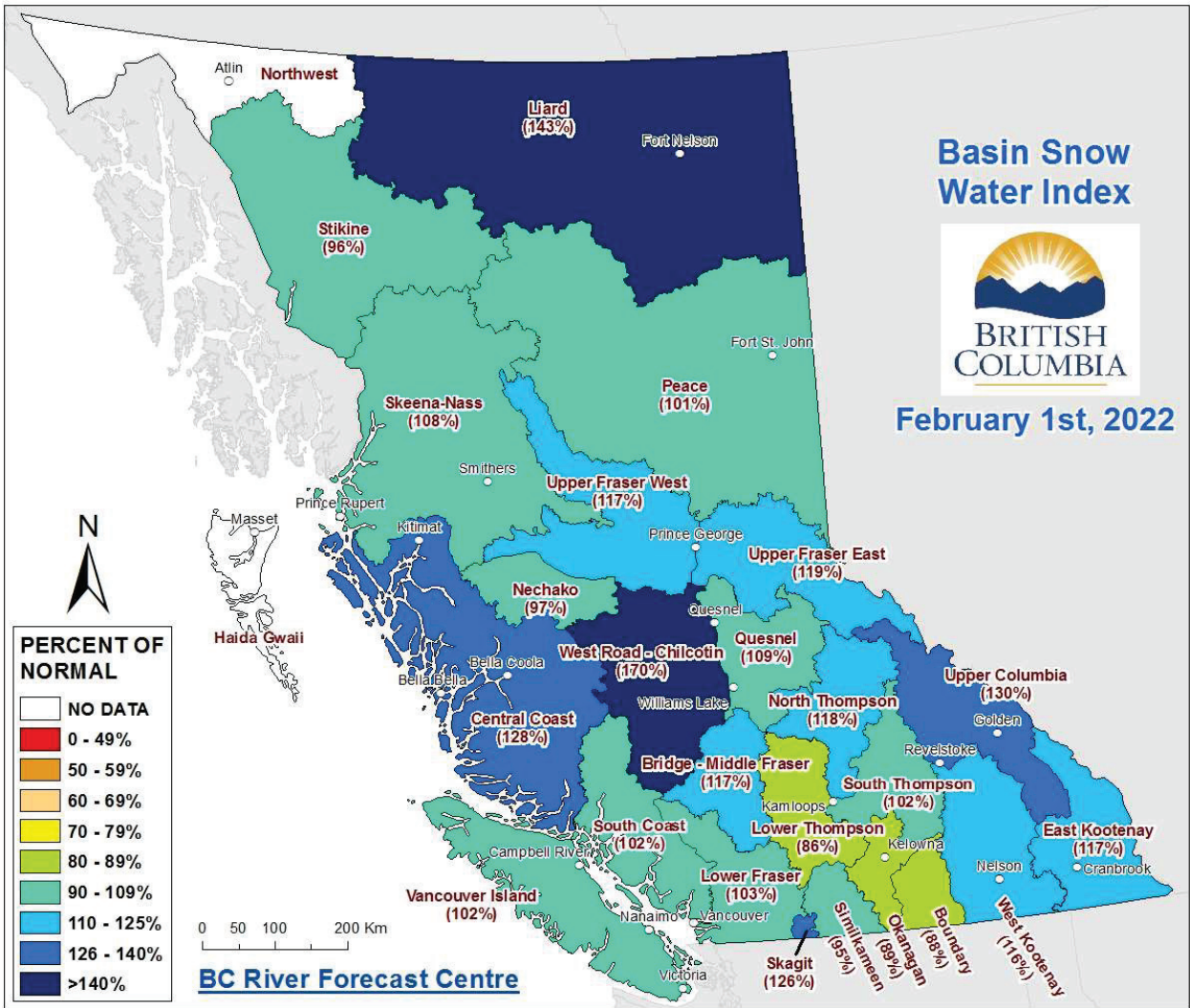
The River Forecast Centre will continue to monitor snow pack conditions and will provide an updated seasonal flood risk forecast in the March 1st, 2022 bulletin, which is scheduled for release on March 9th.

BC River Forecast Centre
February 8, 2022

**The February 1st Snow Survey and Water Supply Bulletin was revised on February 11, 2022. The previously reported record high snow measurement at 1C25 Lac Le Jeune in the Lower Thompson of the Middle Fraser was rejected due to sampling errors. Additional snow surveys were reported for 1C09A Highland Valley (Lower Thompson / Middle Fraser), 1F01A Aberdeen Lake (South Thompson), 2F01A Trout Creek West (Okanagan), 2F10 (Silver Star Mountain) after the original release of the bulletin on February 8. The updated data resulted in changes to the Snow Basin Indices for the Lower Thompson, Middle Fraser, South Thompson, Okanagan and all British Columbia. The updated snow surveys also slightly reduced seasonal volume forecasts for Nicola River, Nicola Lake and Okanagan Lake using the older volume runoff model.*

Snow Survey and Water Supply Bulletin – February 1st, 2022

Figure 2: Basin Snow Water Index – February 1st, 2022



1. Every effort is made to ensure that data reported on these pages are accurate. However, in order to update the graphs and indices as quickly as possible, some data may have been estimated. Please note that data provided on these pages are preliminary and subject to revision upon review.