



## NWT Snow Survey Bulletin & Spring Water Levels Outlook 2020

This is an outlook for anticipated spring water levels in the Northwest Territories (NWT) with information compiled from several sources, including the NWT Snow Survey Bulletin (attached). Each year, the Department of Environment and Natural Resources (ENR) conducts snow surveys which measure the amount of snow water equivalent (SWE) on the ground. The amount of SWE is the amount of water obtained from a given area if all of the snow is melted. SWE varies based on the depth of snow and its density.

### North Slave Region

The ENR snow surveys show that the snowpack in the Yellowknife and Snare River basins are at approximately average amounts at 104 per cent and 96 per cent of normal, respectively, as of late March 2020.

Water levels at monitoring sites on the lakes and rivers in the North Slave region range from below average (e.g. Cameron River below Reid Lake) to well above average (e.g. Indin River above Chalco Lake). Many of the water levels have bounced back from the dry conditions in previous years (2013-15) (e.g. Camsell River above Clut Lake, Beaulieu River near the mouth). Most streams have not yet shown evidence of rising water levels due to this spring's continuing cool temperatures. Based on the values in the North Slave region snow surveys, it is anticipated that many of the river systems in the region will experience average water levels through freshet; however, a rapid onset of warm temperatures and/or spring rain events could produce a considerable amount of water runoff to streams in a short period. Much depends on the rate of melt and rain received through late spring and summer.

### Hay River Basin

For the Hay River basin, the spring runoff outlook from Alberta Environment and Parks anticipates below average to average runoff as of March 1, 2020. Unfortunately, the Alberta outlook for April 1, 2020, indicates there are no data available for much of the provincial portion of the Hay River basin. The usual snow survey data from Assumption, AB, is not available this year due to current Government of Alberta travel restrictions. Snow surveys in the area near Swede Creek completed by ENR indicate snowpack was about average at 98 per cent of normal as of mid-March. Water levels on the Hay River near Hay River ranged from average to slightly above average over the winter months. Due to the slow onset of warmer weather in 2020, water levels have not yet begun to rise and the water level is currently considered below average for this time of year. There are currently few

signs of the beginning of break-up in the upper reaches of the Hay River basin. The Hay River Director of Protective Services reported that they have set up most of their water level gauges and cameras along the river in order to keep a close watch on conditions (Town of Hay River website: <https://hayriver.com/break-web-cam-images-temperature-graphs/>).

### **Peace and Athabasca River Basins**

Alberta Environment and Parks' spring runoff outlook as of April 1, 2020, for the Peace and Athabasca river basins ranged from "well above normal" (150-200 per cent) to "extremely above normal" (>200 per cent) in the majority of the Alberta portions of the basins. The percentage of precipitation between Nov 1, 2019 and April 1, 2020 ranged from above average (115-150 per cent of average) in the southern portion of the basins, to well below average (25-40 per cent of average) in the northernmost portion of the province. The British Columbia (BC) River Forecast Centre indicates that as of April 1, 2020, the BC portion of the Peace River basin was 121 per cent of normal basin snow water index. South Slave region snow surveys completed by ENR indicate a snowpack that was slightly above average values as of late March (107 per cent). Data for the snow survey site in Fort Chipewyan were not available from the Government of Alberta.

### **Slave River**

The water level on the Slave River has been well above average since January 2020, and while it has dropped since then, it remains above average at this time. It is normal, however, for levels to be extremely variable over freshet. Great Slave Lake water level has climbed to above average over the winter from average (in November) and continues to increase.

### **Liard River Basin**

For the Liard River basin, snowpack in the Yukon is well above average as of April 1, 2020, according to Environment Yukon, with values ranging from about normal at Watson Lake airport to 195 per cent at Hyland meteorological station. A basin-wide value of 157 per cent of normal (Yukon Snow Survey April 2020) has been estimated. The estimated flow volume for the Liard River upstream of Upper Liard (Yukon) is currently close to average. Coupled with the high volume of snow, the Yukon Government is anticipating very high water levels for the Yukon portion of the Liard basin (Yukon Snow Survey). Snow accumulation in the BC portion of the Liard basin is average (overall, 102 per cent of normal) (BC River Forecast Centre).

## **Dehcho and Sahtú Regions**

ENR snow surveys in the Dehcho region completed in March 2020 indicate that snowpack in the region was about average (96 per cent of normal). The water level on the Liard River at Fort Liard has been well below average over most of the winter. Water levels on the Mackenzie River have been about average at Fort Simpson since December 2019 and slightly above average at Norman Wells. There is little sign of seasonal water level increases as of the date of this publication.

## **Peel River Basin and Beaufort Delta Region**

According to Yukon Snow Survey (2020), the basin-averaged SWE in the Peel River basin is estimated at 144 per cent of normal as of April 1, 2020, which is the highest value on record. As of the end of February, the estimated flow volume on the Peel River above Canyon Creek (Yukon) was slightly above the historical average. This flow volume, combined with the record high snowpack in the watershed, increases the probability of significant May and June peak flows in the upper portion of the Peel basin (Yukon Government). Water Survey of Canada data indicate that water levels on the Peel River above Fort McPherson have been about average over most of the winter. Gauges show that the Mackenzie River water levels above Aklavik (Peel Channel) and at Inuvik (East Channel) are both well above average for this time of year. ENR snow surveys in Inuvik region indicate snowpack is about average (105 per cent).

The potential occurrence and severity of spring freshet flooding depend in large part on the weather over the next few weeks and how this interacts with existing water levels and snowpack amounts. Extremely warm temperatures, extreme rain or rain on snow events greatly increase the likelihood of flooding.

### **Special Note for 2020:**

*Water level data are part of the NWT Hydrometric Monitoring Network, funded by Environment and Climate Change Canada and the Government of the Northwest Territories (GNWT), and operated by the Water Survey of Canada. Data can be seen and/or downloaded at [https://wateroffice.ec.gc.ca/search/searchRealTime\\_e.html](https://wateroffice.ec.gc.ca/search/searchRealTime_e.html).*

*Due to travel restrictions and other special considerations, all Hydrometric Monitoring gauges that are part of the National Hydrometric Network may have limited site visits by field staff, particularly in remote regions. Please be reminded that real time data should be considered provisional.*

**ENR Spring Snow Surveys - Northwest Territories**  
**Snow Water Equivalent - 2020**

	Long	Lat	Elevation	Length of Record (years)	Historical Mean (Full period of record) SWE (mm)	Current Mean Value Mar-Apr 2020 surveys		% of Normal (using Historical Mean) 2020 (%)	1988-2008 Mean SWE (mm)	% of Normal (using 1988-2008 mean) 2020 (%)	Yrs of record between 1988-2008 (years)
						Depth (cm)	SWE (mm)				
<b>Yellowknife River Basin</b>											
Tibbitt Lake (Ingraham Tr Km 64 NW)	-113.38	62.50	244	38	84.1	50.4	85.0	101.1	88.8	95.6	20
Bluefish Hydro	-114.25	62.68	168	25	80.8	49.3	80.5	99.6	84.7	95.0	13
Allan Lake	-113.05	62.95	297	32	86.3	49.4	79.0	91.5	94.1	84.0	20
Denis Lake	-112.62	63.37	411	33	108.8	60.2	109.5	100.6	119.4	91.7	21
Little Latham Lake	-113.63	63.20	305	33	98.0	59.7	108.0	110.2	104.0	103.8	21
Nardin Lake	-113.85	63.51	366	33	105.7	68.1	117.5	111.2	115.6	101.6	21
Sharples Lake East	-112.82	63.90	369	33	108.0	68.1	124.5	115.3	118.6	104.9	21
Jolly Lake	-112.21	64.12		8	135.5	50.1	115.0		84.9		
<b>MEANS</b>					<b>100.9</b>	<b>56.9</b>	<b>102.4</b>	<b>104%</b>			
<b>Snare River Basin</b>											
Big Spruce Lake	-116.00	63.50	225	42	102.9	58.9	96.5	93.8	111.4	86.7	21
Ghost Lake	-115.07	63.88	290	43	104.8	69.6	110.5	105.4	110.6	100.0	21
Indin Lake	-115.03	64.38	290	42	109.8	68.0	115.0	104.7	119.7	96.1	21
Snare Lake	-114.04	64.20	360	42	111.8	61.2	119.5	106.9	114.2	104.6	20
Winter Lake	-113.03	64.50	365	42	81.9	49.8	90.5	110.5	78.4	115.4	21
Mattberry Lake	-115.96	64.09	255	43	98.0	62.5	112.0	114.3	99.3	112.8	21
Castor Lake	-115.99	64.52	295	43	114.1	59.9	108.0	94.7	118.8	90.9	21
Mesa Lake	-115.14	64.85	385	43	125.2	48.4	88.5	70.7	136.5	64.9	21
Big Lake	-112.55	64.48		23	122.3	55.4	122.5	100.2	119.7	102.3	12
White Wolf Lake	-114.60	65.00		25	132.6	40.9	113.0	85.2	133.8	84.5	13
Christison Lake	-114.90	64.38		26	112.4	34.6	74.5	66.3	120.6	61.8	14
<b>MEANS</b>					<b>110.5</b>	<b>55.4</b>	<b>104.6</b>	<b>96%</b>			
<b>North Slave Region</b>											
Mosquito Creek	-116.16	62.7		21	102.1		98.5	96.5	106.6	92.4	10
<b>South Slave Region</b>											
Boundary Lake	-115.55	59.48	820	27	155.6		n/a	n/a			
Fort Resolution, Forestry	-113.73	61.02		3	115.0		(discontinued 2017)				
Fort Smith	-111.86	60.00	205	37	89.4	63.3	98.0	109.6	89.8	109.1	20
Hook Lake	-112.78	60.67	159	30	95.7	60.9	106.0	110.8	97.4	108.9	20
Little Buffalo Tower	-113.79	61.00	170	38	119.1	70.1	125.0	105.0	116.7	107.1	21
Nyarling River	-114.17	60.33	245	37	104.6	65.1	113.0	108.0	101.5	111.4	20
Pine Point A	-114.36	60.82	175	38	136.6	75.2	146.5	107.2	132.7	110.4	21
Thubun Lake	-111.75	61.50	168	35	91.0	56.3	91.0	100.0	98.8	92.1	20
<b>MEANS</b>					<b>113.4</b>	<b>65.2</b>	<b>113.3</b>	<b>107%</b>			
<b>Taltson River Basin</b>											
Piers Lake	-111.17	60.32	260	36	103.5	67.1	115.0	111.1	108.5	106.0	21
Tortuous Lake	-111.70	60.75	230	50	84.8	55.8	97.0	114.4	95.9	101.2	20
Dunvegan Lake	-107.28	62.33	490	52	113.0	72.4	142.0	125.7	125.1	113.5	21
Whirlwind Lake	-108.68	60.25	430	49	98.3	71.2	125.5	127.7	106.7	117.6	20
Alcantara Lake	-108.28	60.90	425	50	102.1	65.1	109.5	107.2	114.5	95.7	21
Hill Island Lake	-109.90	60.50	325	51	95.9	63.9	109.5	114.2	107.4	102.0	21
Thekulthili Lake	-110.23	60.97	320	50	88.4	65.7	114.5	129.5	100.4	114.0	20
Nonacho Lake	-109.67	61.72	320	51	104.7	56.7	93.0	88.8	124.2	74.9	21
Halliday Lake	-109.03	61.38	350	52	101.8	74.1	127.0	124.8	121.3	104.7	21
Gray Lake	-108.30	61.80	324	53	106.7	60.7	116.0	108.7	125.4	92.5	21
Dymond Lake	-106.28	61.38	395	50	118.1	77.3	138.5	117.3	140.2	98.8	21
Powder Lake (Forestry)	-109.41	61.04		6	105.8	78.1	125.0	118.1			
<b>MEANS</b>					<b>101.9</b>	<b>67.3</b>	<b>117.7</b>	<b>115%</b>			
<b>Dehcho Region</b>											
Blackstone River	-122.90	61.05	198	15	95.6		(discontinued 2015)				
Caen Tower, Forestry	-117.16	61.67		3	84.5		(discontinued 2017)				
Checkpoint (previously JMC)	-121.25	61.45		20	102.9	53.1	90.0	87.5	100.2	89.9	12
Crown Fire site, Forestry	-117.15	61.58		3	85.0	46.8	78.0	91.8			
Enterprise, Forestry	-116.15	60.56		3	103.7	64.7	112.0	108.0			
Fort Providence, Forestry	-117.46	61.26		6	93.9	54.1	82.5	87.9			
Fort Simpson	-121.33	61.80	155	25	96.6	49.2	85.0	88.0	93.4	91.0	13
Fort Liard	-123.47	60.23	335	17	127.6		(discontinued 2015)				
Fort Liard, Forestry	-123.40	60.23		6	79.3	45.5	86.0	108.4			
Hay River	-115.83	60.78	170	35	98.3		(discontinued 2016)				
Hay River (Forestry)	-115.84	60.77		4	109.5	76.2	109.0	99.5			
Jean Marie River (Forestry)	-120.65	61.52		6	89.7	49.4	90.0	100.3			
Kakisa River	-117.27	61.00	205	39	105.6	51.5	82.5	78.1	102.1	80.8	21
Kimble Tower, Forestry	-117.73	61.14		6	108.6	64.8	96.0	88.4			
Nahanni Butte Rd, Forestry	-123.11	61.95		6	104.2	52.3	110.0	105.6			
Ndulee Lookout, Forestry	-122.53	62.15		6	85.8	50.9	84.0	97.9			
Shale Creek	-122.2	62.07	168	17	112.0		(discontinued 2018)				
Swede Creek	-116.57	60.27	290	38	91.8	58.6	90.0	98.1	88.1	102.2	21
Swede Creek, Forestry	-116.56	60.27		3	108.3		(discontinued 2017)				
Trout Lake, Forestry	-119.81	61.14		6	85.0	47.6	91.0	107.1			
Wrigley, Forestry	-123.41	63.20		6	77.1	36.5	69.0	89.5			
<b>MEANS</b>					<b>97.4</b>	<b>53.4</b>	<b>90.3</b>	<b>96%</b>			
<b>Sahtu Region</b>											
Colville Lake	-126.06	67.02		5	85.2	59.9	81.0	95.1			
Déline	-123.43	65.19		4	102.0	69.4	109.0	106.9			
Fort Good Hope	-128.61	66.27		4	100.8	68.6	119.0	118.1			
Norman Wells	-126.76	65.28		5	98.2	78.2	127.0	129.3			
Tullit'a	-125.53	64.90		4	99.6	70.2	106.0	106.4			
<b>MEANS</b>					<b>97.2</b>	<b>69.3</b>	<b>108.4</b>	<b>111%</b>			
<b>Inuvik/Gwich'in Regions</b>											
Rengleng River	-133.83	67.63	84	35	127.6	46.3	127.0	99.5	139.8	90.9	18
Caribou Creek	-133.48	68.05	76	35	121.2	52.8	121.0	99.8	131.2	92.2	18
Fort McPherson	-134.74	67.47		5	110.9	54.5	124.5	112.3			
Midway Lake	-135.44	67.23		5	142.3	63.4	169.5	119.1			
James Creek	-136.00	67.14		4	67.4	28.9	62.5	92.7			
<b>MEANS</b>					<b>113.9</b>	<b>49.2</b>	<b>120.9</b>	<b>105%</b>			

n/a - not available

Number of Stations Sampled in 2020 = 63