YUKON SNOW SURVEY BULLETIN & WATER SUPPLY FORECAST

May 1, 2023

Prepared and issued by:
Water Resources Branch
Department of Environment

Yukon

PREFACE

The Department of Environment's Water Resources Branch issues the *Yukon Snow Survey Bulletin and Water Supply Forecast* three times annually – early March, April and May. The bulletin provides a summary of winter meteorological and streamflow conditions for the Yukon, as well as current snow depth and snow water equivalent observations for 57 locations. This information is used to evaluate the potential for spring flooding caused by both breakup ice jams and large spring snowmelt (freshet) flows. It is important to note that other processes such as summer rain and glacier melt can significantly influence maximum annual water levels in specific Yukon basins.

April weather conditions for the Yukon are presented in two maps, one showing temperature anomalies (deviation from climate normals), and another showing precipitation anomalies. Territory-wide snowpack data are presented in a third map showing snow water equivalent (SWE) as a percent of historical median for each station, as well as the basin-averaged estimated SWE for 11 watersheds (or river basins). Complementary meteorological and hydrological data are presented for each basin through a series of five graphs, depending on data availability:

- **Figure A**: Daily Snow Water Equivalent (SWE) data starting in September at one specific location in the watershed, showing an overview of winter snowpack evolution.
- **Figure B**: Current, basin-averaged, estimated Snow Water Equivalent (SWE) from snow survey data, compared with historical data, serving as an indicator of potential runoff volumes in the spring (acknowledging that snow sublimation, evapotranspiration, rain and glacier melt also significantly affect runoff).
- **Figure C**: Monthly winter precipitation (rain and/or snow) compared with historical data (1980-2022 period of record), complementing the information presented in Figure B.
- **Figure D**: Cumulated degree-days of freezing (CDDF, sum of negative daily temperatures) compared with historical data, functioning as an indicator of winter coldness and overall river ice thickness; variables that influence river ice breakup scenarios in the spring.
- **Figure E**: Current, estimated daily discharge or measured water level, compared with historical data, representing an overview of the watershed hydrological conditions.

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ACKNOWLEDGMENTS

The Yukon Snow Survey Bulletin forms part of the Yukon Snow Survey Program administered by the Water Resources Branch, Department of Environment, Government of Yukon. The Water Resources Branch (WRB) strives for water stewardship in the Yukon and is committed to responsible and collaborative monitoring to inform the management and protection of waters.

We are grateful to monitor snow and water across the territories of all fourteen Yukon First Nations and to work in partnership with many First Nations in different aspects of our work. Though the findings expressed in this report are based primarily on field observations and relevant scientific data, we acknowledge the deep and longstanding connection to, and knowledge of snow and water held by, Yukon First Nations.

Gathering snow measurements and data from across our vast territory requires working together with a number of partners. We'd like to recognize the following agencies/individuals for their significant contributions to the snow survey bulletin:

- *Data Collection Officer, Natural Resources Conservation Service, United States Department of Agriculture*
- *Meteorologist, Wildland Fire Management, Yukon Department of Community Services, Whitehorse*
- *Officer in Charge, Water Survey of Canada, Whitehorse*
- *Water Management Engineer, Yukon Energy Corporation*
- *Research Technologists, McMaster University*

Agencies cooperating with Environment Yukon in the Snow Survey Program are:

- *B.C. Ministry of Environment, Water Stewardship Division*
- *Parks Canada, Kluane National Park and Reserve*
- *Parks Canada, Western Arctic Field Unit*
- *Yukon Department of Highways and Public Works*
- *Yukon Department of Energy Mines and Resources, Compliance Monitoring and Inspections Branch*
- *Yukon Department of Environment, Information Management and Technology Branch*
- *Vuntut Gwitchin First Nation*

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YUKON TERRITORY WEATHER AND SNOWPACK CONDITIONS

Fall 2022 was marked by a very wet and warm October, especially in the Klondike, Southern Lakes and Alsek River Basins, with a record rain event affecting most of the western half of the territory. When precipitation turned to snow, Dawson stood out with very high precipitation in December and January while Whitehorse recorded very low precipitation in January; the third driest on record. November to April precipitation totals were above normal in the west, falling to below normal in the east. On the whole, monthly average temperatures were warmer than normal in November, January and February, but December and March temperatures were colder than normal, while April temperatures in the North and West remained colder than normal as well. Notably, Old Crow experienced the warmest January on record with an average monthly temperature 8.5 °C warmer than normal[1].

October

October was marked by a very abrupt shift in temperature with mean daily temperatures remaining above freezing across most of the territory until late in the month, when cooler arctic air moved its way south and pushed temperatures well into the negatives. While mean monthly temperatures remained 2°C-3°C warmer than climate normals for the month, the most notable weather story was heavy rain and snowfall mid-month in the southwest Yukon, bringing up to 200 mm of mixed rain and snow in just 24 hours. The warmer temperatures and this single event pushed most stations, except those in the southeast, to 150%-200% of normal October precipitation.

November

In contrast to October, November experienced typical weather for late fall, with daily mean temperatures dropping below freezing and remaining there save for a few brief warm spells. Precipitation was likewise unremarkable, if slightly dry, when compared to climate normals for the month.

December

The start of December brought the first, albeit short-lived, arctic outbreak of winter 2022-23 as overnight lows dropped to the -30 °C range. After a brief respite, temperatures plunged even further over the holiday season with several official reports of -50 °C. The calendar year closed with mean monthly temperatures several degrees colder than normal and most of the territory slightly drier than normal with the exception of the central Yukon which ranged from 150%-200% of normal.

January

The first month of the new year was characterized by well-above-normal temperatures, in most cases by 5°C-10°C. A split jet stream resulted in the near absence of organized weather over the Yukon until the final week of January. Despite this, a persistent moist flow into western Yukon brought two to three times the normal monthly precipitation to Burwash, Dawson and surrounding areas.

February

The final month of the meteorological winter was varied, with mostly short-lived storms and temperatures that skirted both sides of seasonal normals. Despite some arctic air in the final week of the month, mean temperatures across the territory were almost uniformly within 1 °C of climate normals, while precipitation was slightly above normal (150%-200%) except in Old Crow where it was near 50% of normal.

[1] Historical temperature, precipitation, snow water equivalent and discharge or water level records are not always long enough to establish a state-of-the-art “normal”, which implies 30 years of data. Therefore, this document refers to historical average, or more simply, average. Historical records considered in this bulletin are always long enough to be representative of recent hydrometeorological conditions.

March

Mean monthly temperatures were slightly below climate normals in Central and Southern Yukon, despite a sustained warm period in the last half of the month. Snowmelt on southern aspects and at lower elevations occurred as a result of daytime highs around 7 °C in most communities, from Watson Lake to Dawson City. In the Klondike and Northern Yukon, mean monthly temperatures were above climate normals. Precipitation patterns varied substantially across the territory. Stations in the North recorded near-normal snowfall (Old Crow, Dawson, and Mayo). In Carmacks and the Kluane Region, precipitation was three to four times the normal amount. Snowfall in the Southern Lakes region was slightly above normal, while the Southeast (Teslin to Watson Lake) experienced drier-than-normal conditions.

April

A jet stream that remained stubbornly south of the territory resulted in another month with cooler-than-normal temperatures across much of the Yukon, most notably near Beaver Creek and Burwash. Overnight lows dropped to the minus 20s in Old Crow, which is nearly 10 °C cooler than normal for April. Precipitation at most locations was two to four times normal April totals and fell mostly as snow, stretching the "winter wonderland" feel for a few extra weeks and slowing the sun's progress in melting snow on exposed slopes. Watson Lake was the exception here, with slightly lower than normal precipitation. April is normally a very dry month and while precipitation totals were not particularly notable, the fact that snowfall extended throughout the Yukon to the end of the month was unusual.

Snowpack

The May 1 snow survey revealed a significant late-season increase in snowpack in many parts of the Yukon. When paired with the late onset of snowmelt, the result is a higher than average relative snowpack throughout the territory. This was particularly evident at many snow survey courses where there is often no snow remaining on May 1. The Peel River Basin has equaled its May 1 record while the White River Basin has exceeded its record for May 1 snowpack set in 2009.

Basin-averaged snowpack estimates range from a low of 113% of median in the Stewart River Basin to 422% in the White River Basin. The Upper Yukon Basin (Southern Lakes) (146%), Teslin River Basin (136%), Stewart River Basin (113%), Pelly River Basin (121%) and Liard River Basin (140%) are all above normal. The Central Yukon Basin (334%), White River Basin (422%), Lower Yukon Basin (195%), Porcupine Basin (174%), Peel River Basin (169%) and Alsek River Basin (251%) are all well above normal for this time of year.

YUKON TERRITORY FLOW CONDITIONS AND OUTLOOK

Winter discharge (or baseflow) is estimated based on a combination of periodic winter measurements as well as historic data and regional trends. While most sites have been measured recently, it should be noted that discharge estimates are provisional at all stations.

Estimated discharge and water levels, presented in the hydrographs below, range from near average to above historical maximums. Yukon Government also monitors groundwater levels across the territory. In 2022 many observation wells recorded their highest annual maximum groundwater levels within their periods of record. It should be noted that the records are relatively short, three to four years in most cases. However, observed winter baseflows support the suggestion that groundwater levels are much higher than normal.

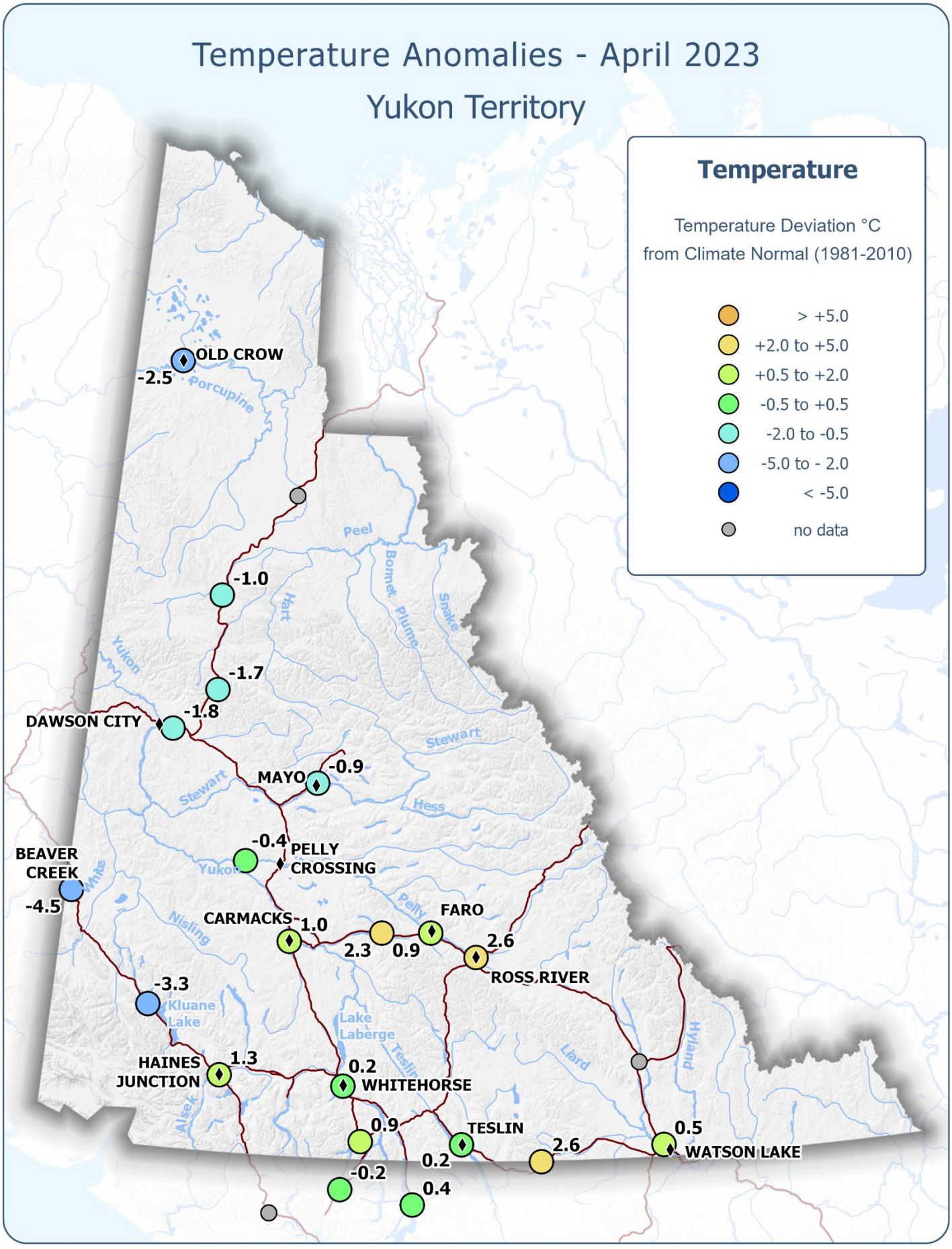
Following a drier autumn in southeastern Yukon, the Liard River had average winter flows and Teslin Lake had an average winter lake level. The Liard River is showing a slightly early snowmelt response. The Peel and Porcupine Basins also have close to average baseflow conditions. Most other basins continue to experience winter flows near or exceeding historical maximums including the Alsek River Basin, White River Basin, Lower Yukon River Basin, Central Yukon River Basin, Stewart River Basin, Pelly River Basin and the Upper Yukon River Basin. Lake Laberge is included in the bulletin as a more accurate representation of baseflow conditions in the Upper Yukon River basin given the regulation of Marsh Lake. Over the next couple of months, lakes and rivers will continue to rise from snowmelt inputs.

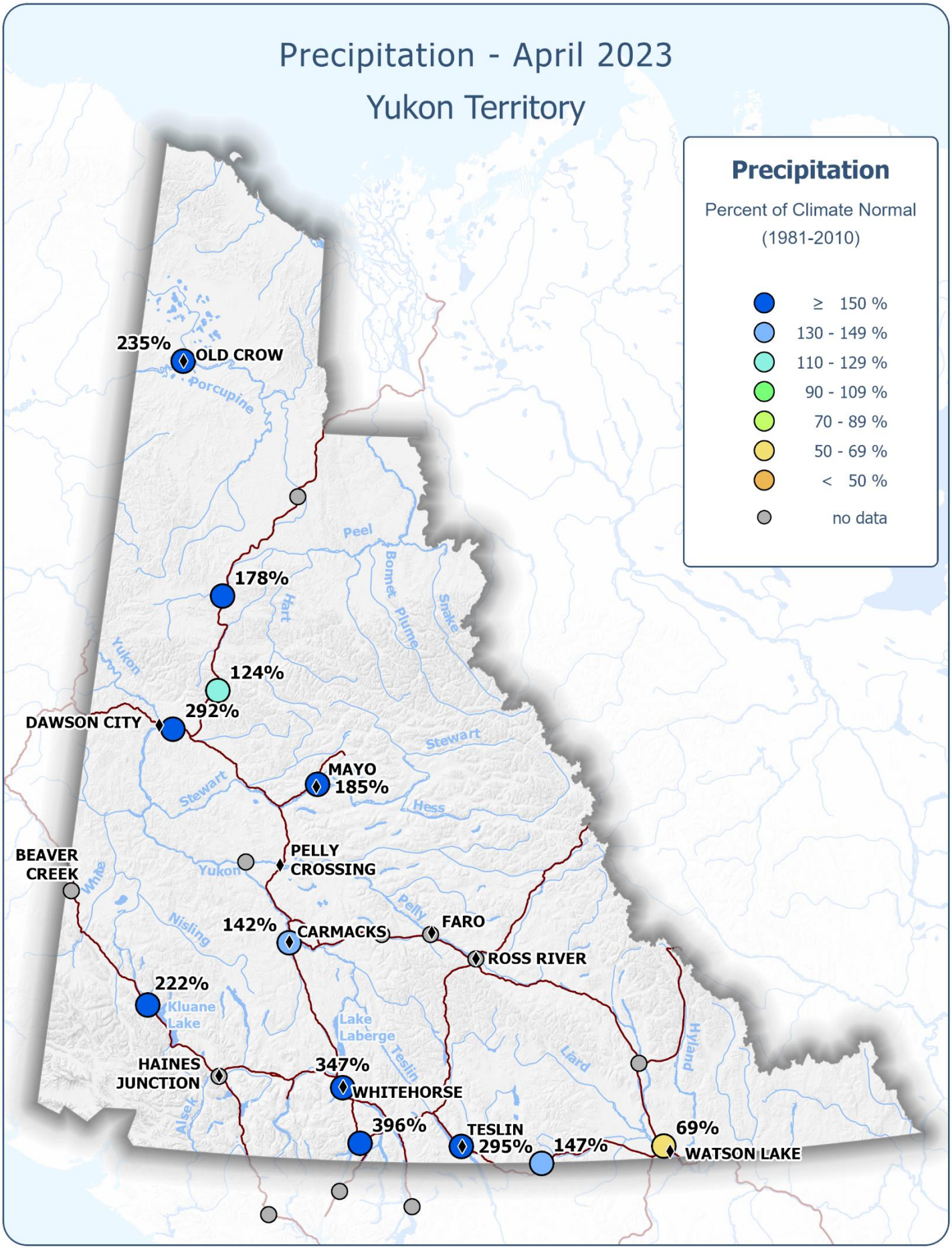
The combination of high groundwater levels and close to average to above average snowpack suggests spring snowmelt runoff in creeks and streams will range from slightly above average to above average in most of the Yukon River Basin and its main tributaries. Assuming average weather conditions, this also suggests slightly above average peak water levels in the Southern Lakes as well as other lakes in the Yukon Basin, with Teslin Lake being a likely exception. Teslin Lake is expected to have close to average water levels this summer.

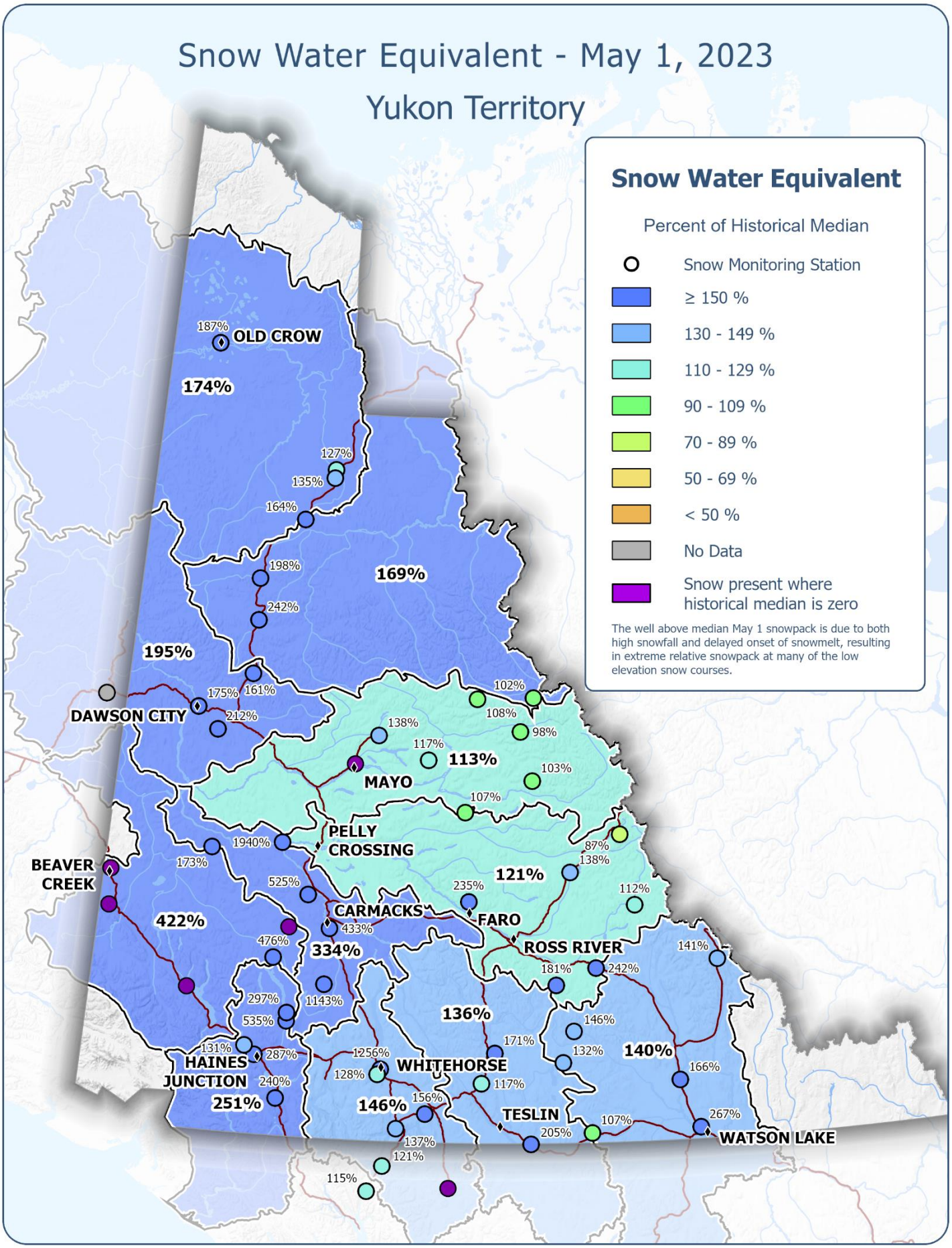
Current conditions in the Central and Lower Yukon River Basins as well as the White, Peel, and Porcupine River Basins suggest above average spring freshet flows in those regions. This is likely to be more pronounced in the smaller to medium-sized catchments in these regions.

Breakup induced ice jamming is caused by several local factors, such as ice thickness and freeze-up levels. Ice thickness, influenced by cumulative degree-days of freezing (CDDF), plays an important role in determining the *severity* of ice jams. With a late freeze-up and generally warmer than average winter, ice is likely thinner than usual in most areas, as confirmed by observations taken throughout the territory. However, ice may have formed at a higher elevation in some locations, which could lead to a higher risk of ice jamming. A sudden and sustained rise in temperature could lead to significant ice jam levels in some locations; however, the overall risk of ice jam flooding to communities where ice jam flooding is a risk is assessed to range from low to moderate. Currently, ice jam risk is above average on the lower Yukon and Porcupine Rivers.

Peak spring freshet flows will ultimately depend on spring weather patterns, while weather conditions over the spring and summer will influence peak flows and lake levels in watersheds influenced by glacial melt.

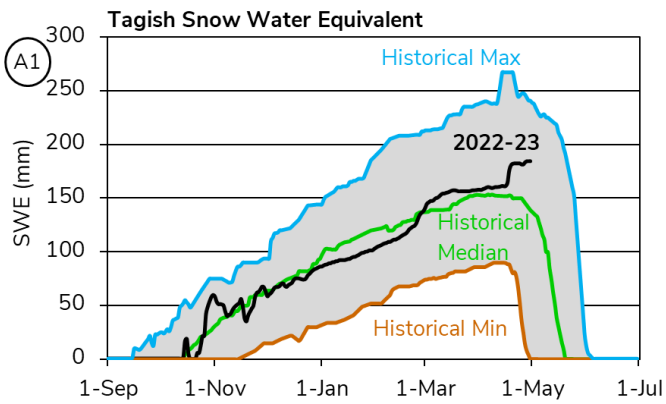

Temperature Anomalies - April 2023
Yukon Territory
Temperature
Temperature Deviation °C
from Climate Normal (1981-2010)
> +5.0
+2.0 to +5.0
+0.5 to +2.0
-0.5 to +0.5
-2.0 to -0.5
-5.0 to - 2.0
< -5.0
no data
OLD CROW
-2.5
Porcupine
-1.0
Hart
Peel
Bonnet Plume
Snake
Yukon
-1.7
-1.8
DAWSON CITY
Stewart
MAYO
-0.9
Stewart
Hess
-0.4
PELLY CROSSING
Yukon
BEAVER CREEK
White
-4.5
Nisling
CARMACKS
1.0
Pelly
FARO
2.3
0.9
2.6
ROSS RIVER
-3.3
Kluane Lake
Lake Laberge
Teslin
Liard
Hyland
HAINES JUNCTION
1.3
0.2
WHITEHORSE
Alsek
0.9
TESLIN
2.6
0.5
WATSON LAKE
0.2
-0.2
0.4

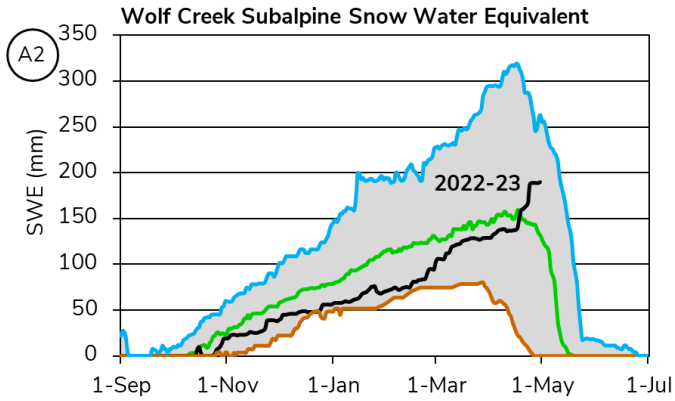

Precipitation - April 2023
Yukon Territory
Precipitation
Percent of Climate Normal
(1981-2010)
≥ 150 %
130 - 149 %
110 - 129 %
90 - 109 %
70 - 89 %
50 - 69 %
< 50 %
no data
235%
OLD CROW
178%
124%
292%
DAWSON CITY
MAYO
185%
PELLY
CROSSING
BEAVER
CREEK
142%
CARMACKS
FARO
ROSS RIVER
222%
Kluane
Lake
HAINES
JUNCTION
347%
WHITEHORSE
396%
TESLIN
295%
147%
69%
WATSON LAKE
Porcupine
Peel
Bonnet
Plume
Snake
Hart
Yukon
Stewart
Hess
White
Nisling
Pelly
Lake
Laberge
Teslin
Laird
Hyland
Alsek

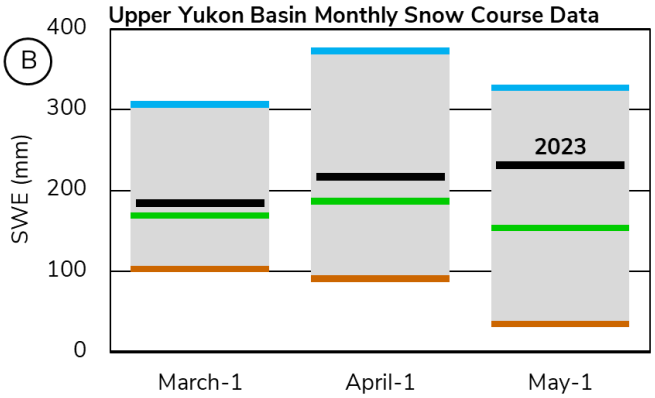

Snow Water Equivalent - May 1, 2023
Yukon Territory
Snow Water Equivalent
Percent of Historical Median
Snow Monitoring Station
≥ 150 %
130 - 149 %
110 - 129 %
90 - 109 %
70 - 89 %
50 - 69 %
< 50 %
No Data
Snow present where historical median is zero
The well above median May 1 snowpack is due to both high snowfall and delayed onset of snowmelt, resulting in extreme relative snowpack at many of the low elevation snow courses.
OLD CROW
187%
174%
127%
135%
164%
198%
242%
169%
195%
DAWSON CITY
175%
161%
212%
102%
108%
98%
138%
117%
113%
MAYO
103%
107%
PELLY CROSSING
1940%
173%
87%
138%
121%
BEAVER CREEK
525%
235%
112%
CARMACKS
433%
FARO
422%
476%
334%
ROSS RIVER
141%
181%
242%
297%
1143%
535%
136%
146%
171%
132%
140%
131%
287%
1256%
HAINES JUNCTION
240%
128%
WHITEHORSE
166%
117%
251%
156%
146%
TESLIN
107%
267%
205%
137%
WATSON LAKE
121%
115%

UPPER YUKON RIVER BASIN (SOUTHERN LAKES / WHITEHORSE)

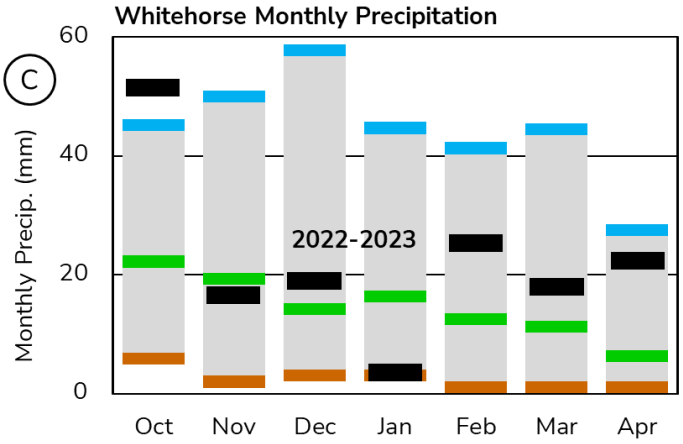
The Upper Yukon River Basin snowpack is **above average**. At Tagish Meteorological Station, Snow Water Equivalent (SWE) is estimated to be **132% of the historical median** (Figure A1), while at Wolf Creek Subalpine Meteorological Station, SWE is estimated to be **144% of the historical median** (Figure A2). The Upper Yukon basin-averaged SWE is estimated to be **146% of the historical median,** with **231 mm** as of May 1 (Figure B).

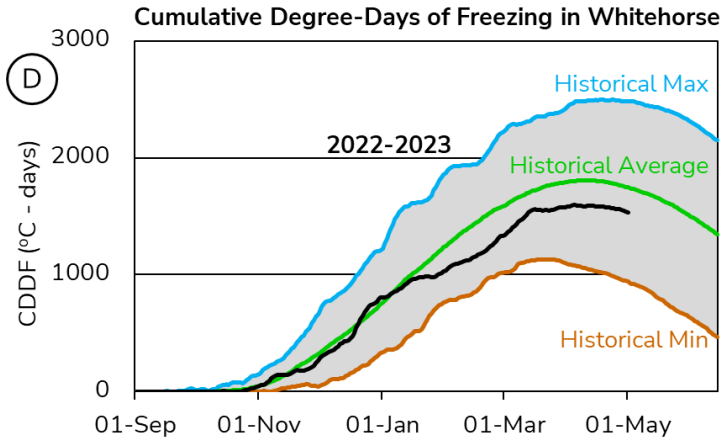




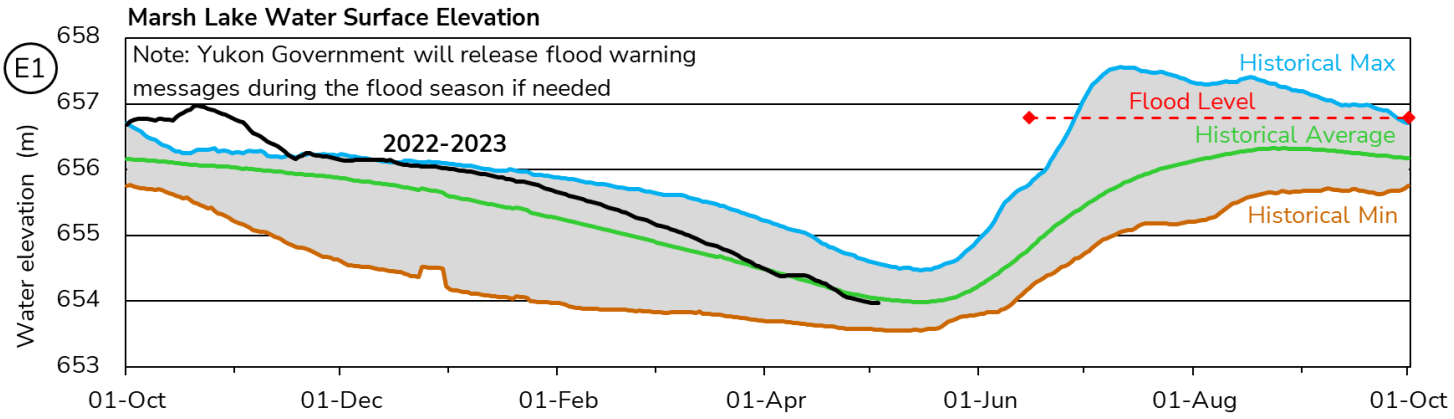


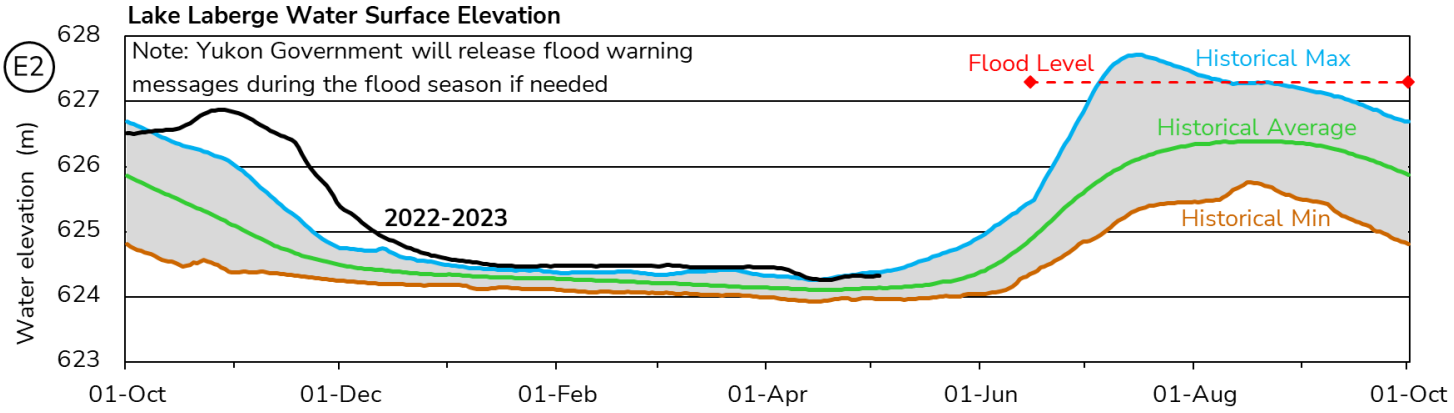
October was the **wettest** on record at Whitehorse Airport (Figure C) and was followed by **near median** monthly precipitation in November and December, a **very dry** January and **above median** snowfall in February, March and April. Cumulative winter precipitation is **47% above median** on May 1. Cumulative degree-days of freezing (CDDF) are **12% below average**, with 1532°C-Days on May 1 (Figure D), which suggests that the thickness of the ice cover on rivers and lakes of the region is likely **thinner than normal**.





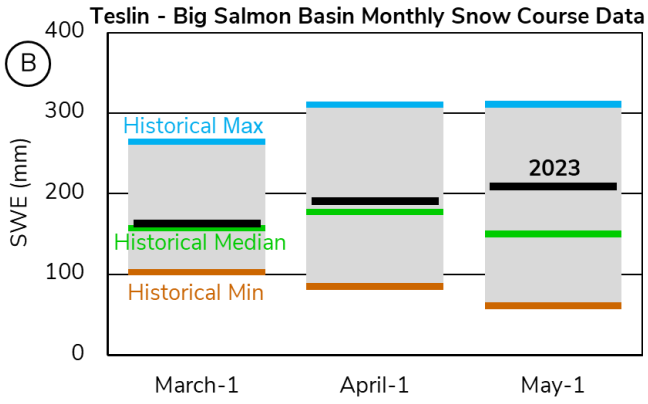
The measured water surface elevation (relative to sea level) in Marsh Lake is currently **average** (Figure E1). The current snow and groundwater conditions suggest that water levels will be **slightly above average** this summer. However, weather conditions over the spring and summer will determine the peak water level in Marsh Lake, which typically occurs in late summer in response to peak glacial runoff and large precipitation events. Lake Laberge also exhibited record levels in late 2022 in response to the warm, wet fall and is currently **near the historic maximum** for this time of year (Figure E2). Lake Laberge follows a similar summer pattern to the upper Southern Lakes and is expected to experience **above average water levels** this summer.



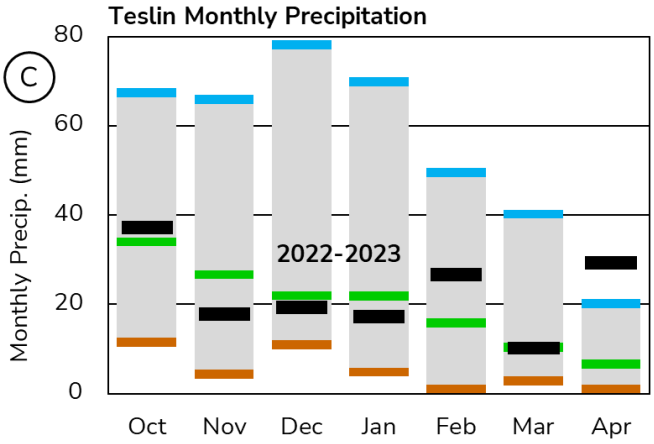


TESLIN RIVER BASIN

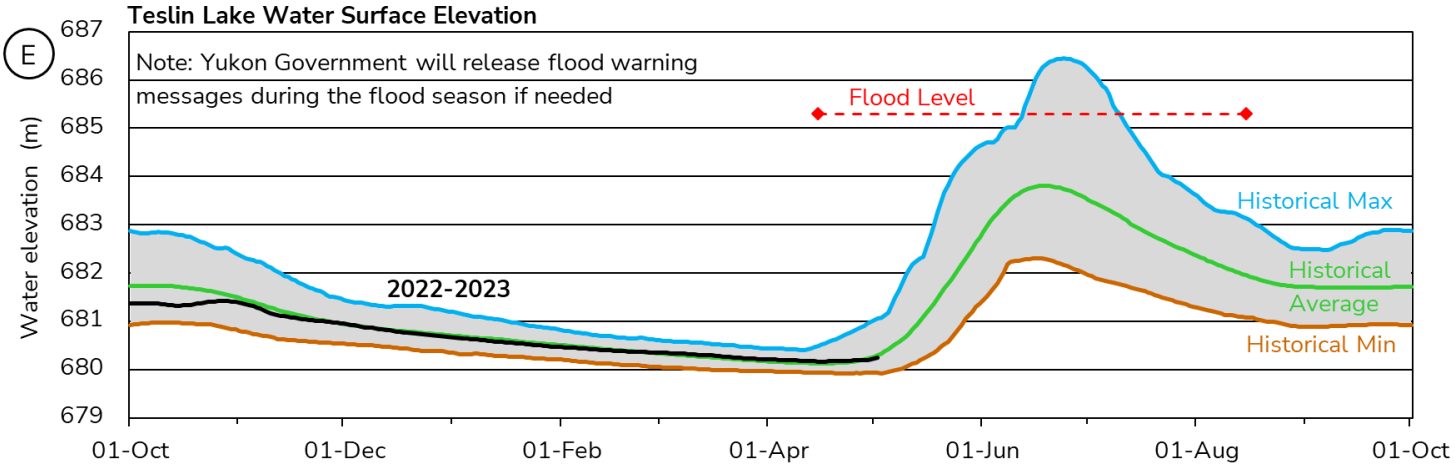
The Teslin River Basin snowpack is **above average**. The basin-averaged SWE is estimated at **136% of the historical median**, with **210 mm** as of May 1 (Figure B).



Teslin monthly precipitation has been **near median** from October to March (Figure C), and the **highest on record** in April. Cumulative precipitation was **11% above median** on May 1.

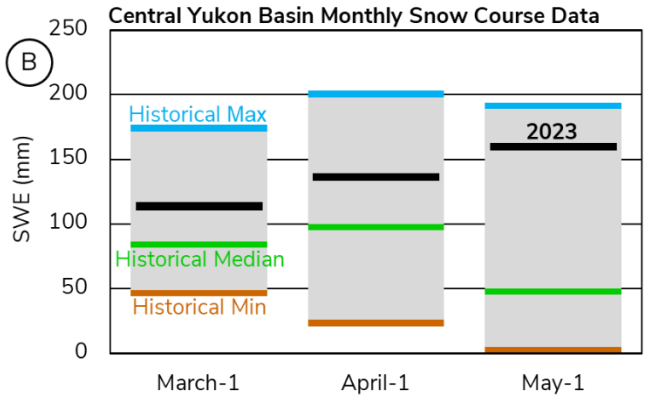


The measured water surface elevation (relative to sea level) in Teslin Lake is currently **near average** (Figure E). Teslin Lake typically peaks in late June and is predominantly snowmelt driven. The **above average** snowpack and **average** water level suggest that summer water levels will be **slightly above average**. Peak water levels will depend on weather over the next two months. Warm and/or wet weather will generate **high runoff rates and water levels**, including in rivers and streams crossing the Alaska Highway and the South Canol Road.

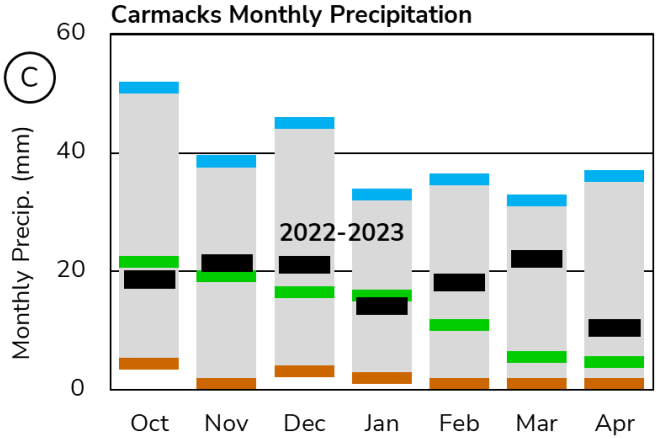


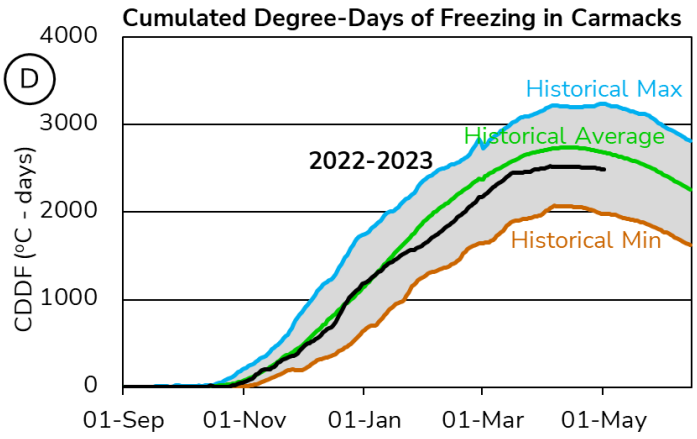
CENTRAL YUKON RIVER BASIN (CARMACKS AREA)

The Central Yukon River Basin snowpack is **well above average**. The basin-averaged SWE is estimated to be **334% of the historical median**, with **160 mm** as of May 1 (Figure B). However, the current snowpack is **154%** of median historical peak snowpack.

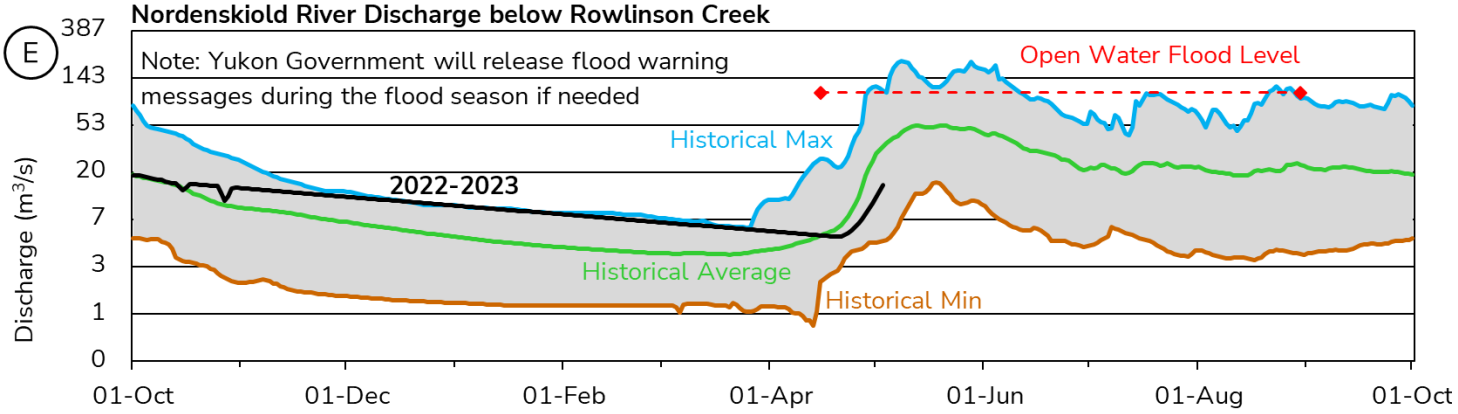


Carmacks monthly precipitation has been **near or above median** since October (Figure C), with cumulative precipitation being **28% above median** on April 1. Cumulated degree-days of freezing (CDDF) are **7% below average**, with 2487°C-Days on May 1 (Figure D).



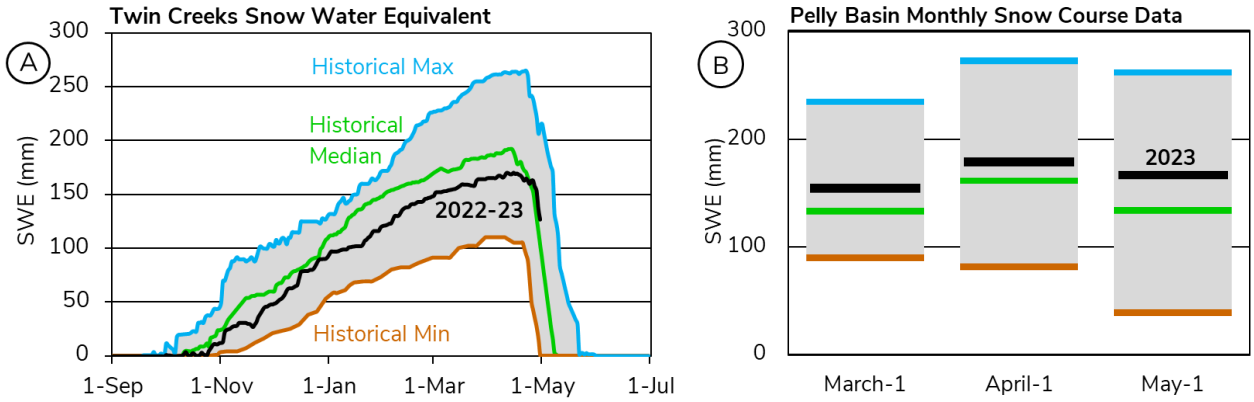


The estimated Nordenskiold River discharge is **near average** on May 3, following **above average** winter flow (Figure E). The **above average** snowpack combined with **high** winter flows in the watershed suggests **spring freshet flow volumes** will be **above average** with a potential for **higher-than-normal** **spring freshet water levels** on smaller and medium sized creeks and rivers. Breakup has passed on both the Nordenskiold and Yukon River at Carmacks. Weather patterns over the next two months will play a role in determining the **peak water levels** on the Nordenskiold River and Yukon River at Carmacks.

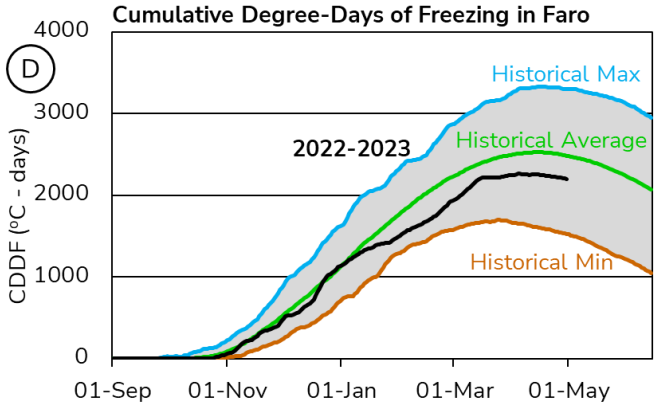


PELLY RIVER BASIN

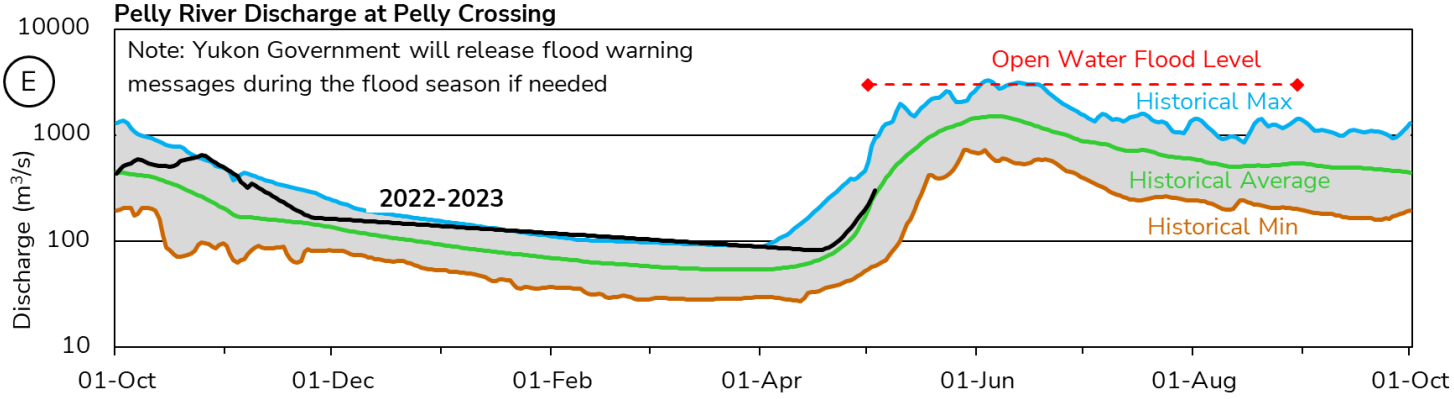
The Pelly River Basin snowpack is **above average** for May 1. At Twin Creeks Meteorological Station, Snow Water Equivalent (SWE) is estimated to be **124% of the historical median** (Figure A). As the result of a delayed spring melt, the Pelly River basin-averaged SWE is estimated to be **121% of the historical median**, with **166 mm** as of May 1 (Figure B).



Precipitation at Faro has not been recorded, but snowpack observations indicate values are **slightly above** the **climate normals**. Cumulated degree-days of freezing (CDDF) at Faro are **12% below average** at 2184°C-Days on May 1 (Figure D), which suggests that the thickness of the ice cover on rivers and lakes of the region is likely **thinner than normal**.

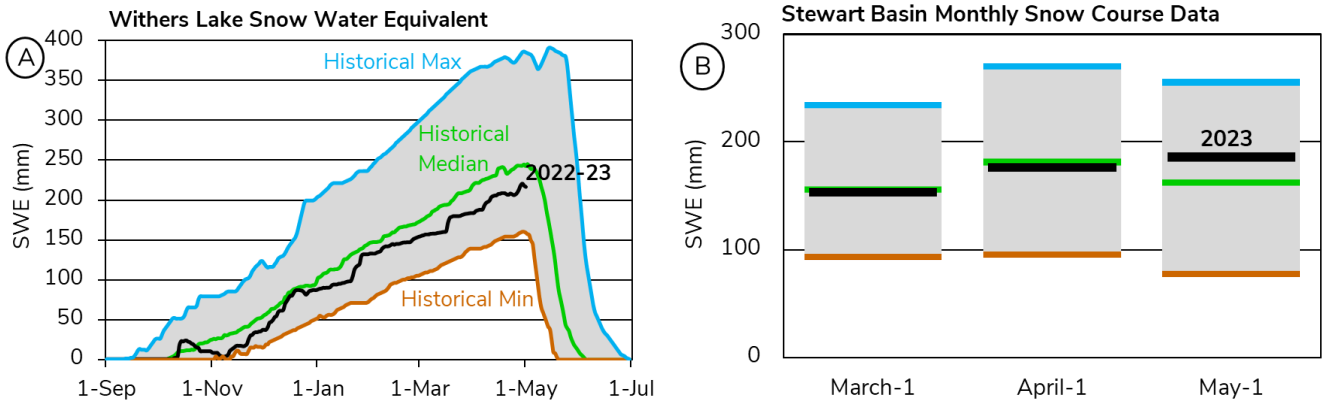


The estimated Pelly River discharge at Pelly Crossing is **near average** for this time of year (Figure E). Combined with the **slightly above average** snowpack and delayed melt, this suggests a potential for **slightly above average spring freshet flows.** A combination of local conditions such as ice thickness, freeze-up levels, and current flow volumes suggest an **average** ice jam risk. Weather over the next few weeks will play a crucial role in determining **peak water levels**. Ice cover degradation was delayed by the late onset of melt, but is now well underway.

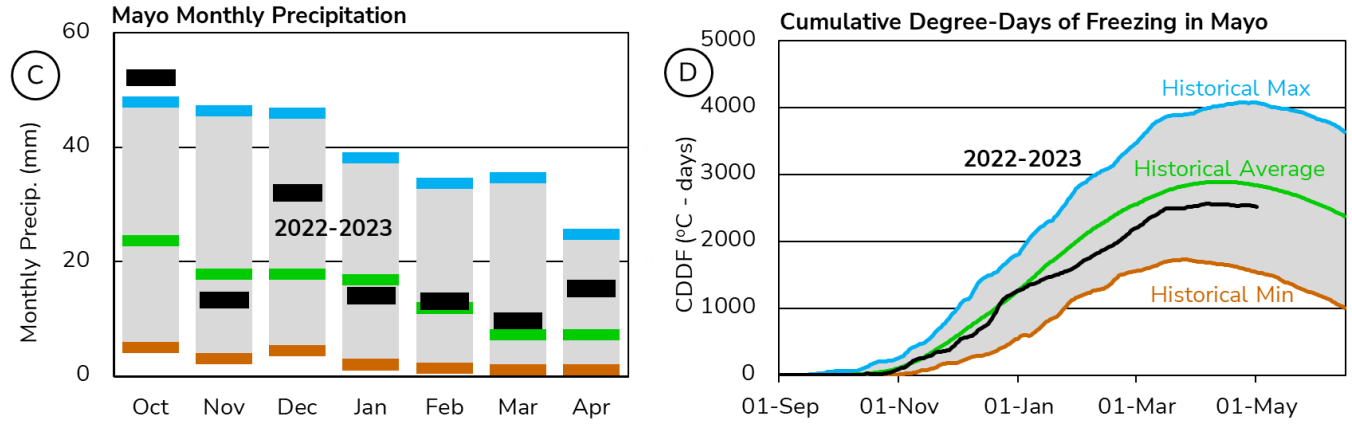


STEWART RIVER BASIN

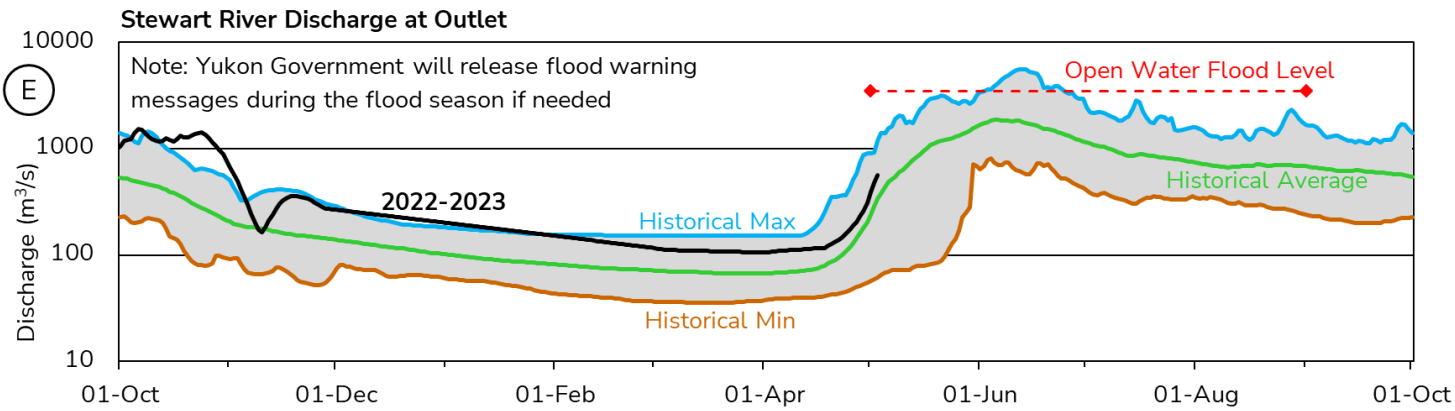
The Stewart River Basin snowpack is **close to average**. At Withers Lake Meteorological Station, Snow Water Equivalent (SWE) is estimated to be **89% of the historical median** (Figure A). The Stewart River basin-averaged SWE is estimated to be **113% of historical median**, with **186 mm** as of May 1 (Figure B).



October was the **wettest** of the past four decades at Mayo Airport. December and April had **above median** precipitation as well. While November, January and February saw precipitation **slightly below median**, cumulative winter precipitation is **40% above median** on May 1 (Figure C). Cumulated degree-days of freezing (CDDF) are **11% below average**, with 2517°C-Days on May 1 (Figure D), which suggests that the thickness of the ice cover on rivers and lakes of the region is likely **thinner than normal**.

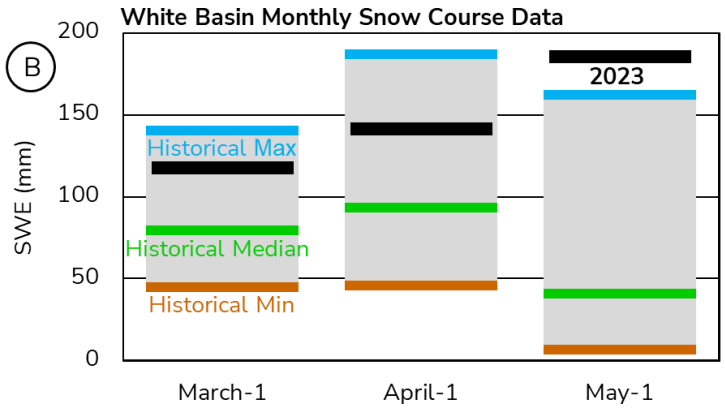


The estimated Stewart River discharge at the outlet is **slightly above average** on May 3 (Figure E). The **slightly above average** snowpack, delayed snowmelt and high winter flows in the watershed suggest a potential for **above average spring freshet flows.** Ice cover degradation was delayed by the late onset of melt, but is now well underway. Ice jam risk is currently **above average** on the Stewart River but historically has not presented a significant flood risk to Mayo or Stewart Crossing.

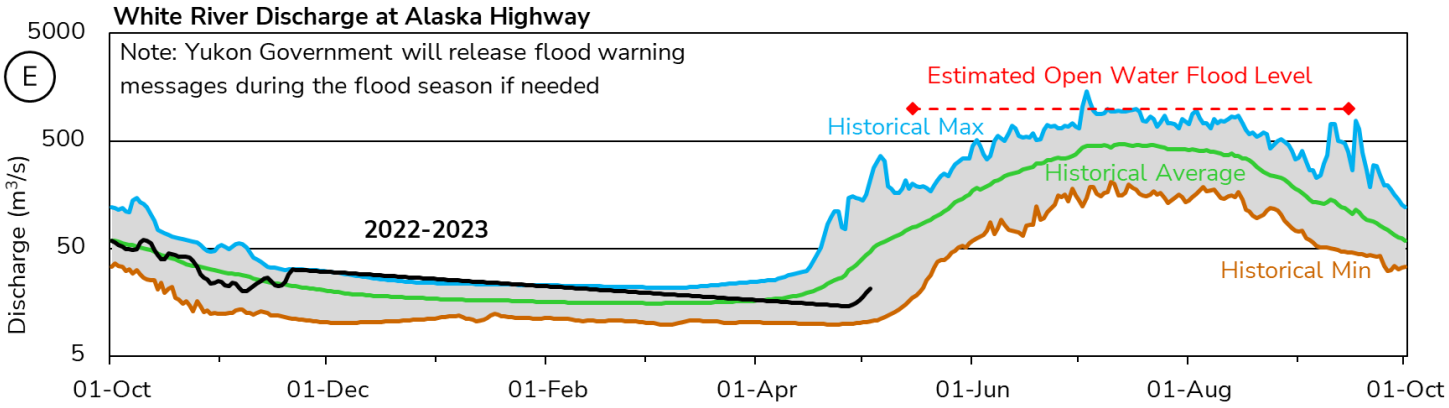


WHITE RIVER BASIN

The White River Basin snowpack is **well above average**. The basin-averaged SWE is estimated to be **422% of the historical median**, with **186 mm** as of May 1 (Figure B). This is considered a **significant snowpack** for this region.). However, the current snowpack is **185%** of median historical peak snowpack.

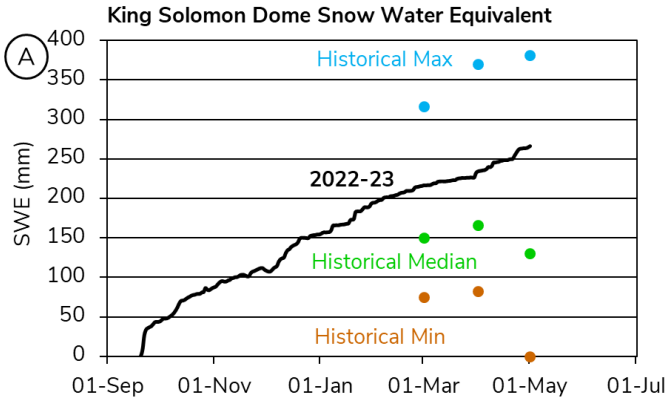


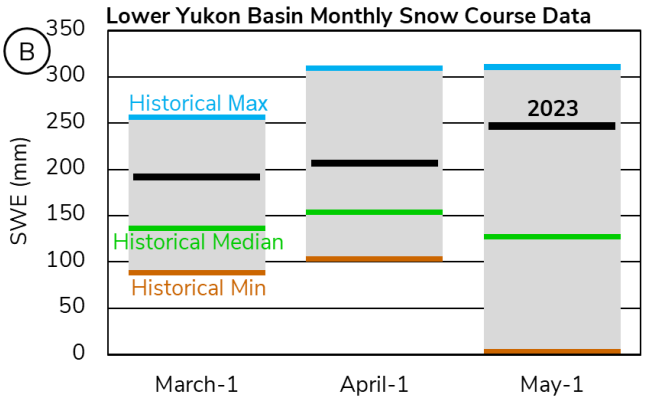
The estimated White River discharge at the Alaska Highway is **below average** (Figure E), due in part to the cold month of April and late onset of snowmelt. In this watershed, high flows are dominated by mountain snowmelt and glacial melt that are largely influenced by summer temperatures and precipitation. The **record high** snowpack combined with **above average** winter flows suggests **spring freshet flow volumes and water levels** will be **well above average.** Warm and/or wet weather anomalies in May, June, July will likely generate **high peak flows**, including in rivers and streams crossing the Alaska Highway in the Kluane region.



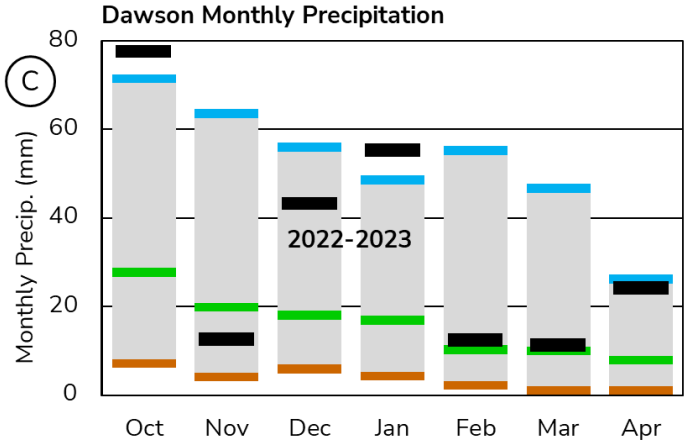
LOWER YUKON RIVER BASIN (DAWSON AREA)

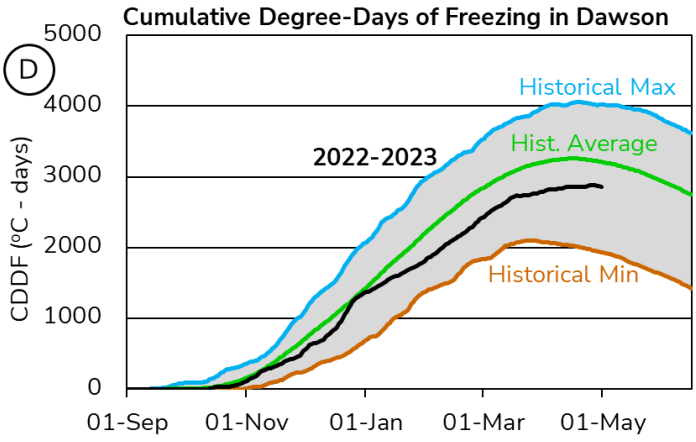
The Lower Yukon River Basin snowpack is **well above average**. Established in 2022, the King Solomon Dome Meteorological Station registered Snow Water Equivalent (SWE) at **204% of the historical median** when compared with the manual snow survey record for that site (Figure A). The Lower Yukon basin-averaged SWE is estimated to be **195% of the historical median**, with **247 mm** as of May 1 (Figure B).



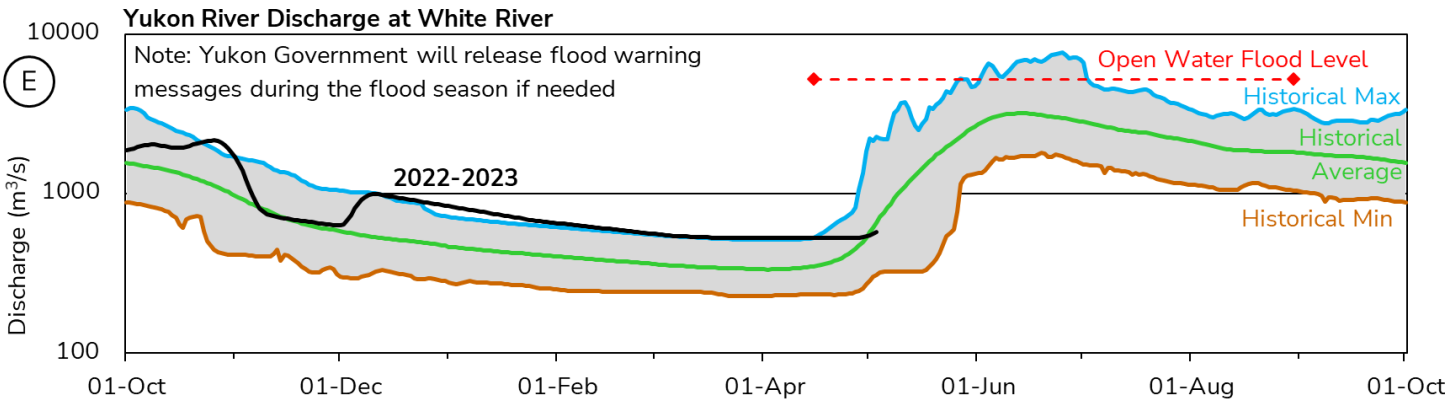


Monthly precipitation at Dawson Airport set **new record highs** for October and January, and snowfall was also **well above median** in December and April (Figure C), resulting in cumulative precipitation **105% above median** on May 1. Cumulated degree-days of freezing (CDDF) are **11% below average**, with 2858°C-Days on May 1 (Figure D), which suggests that the thickness of the ice cover on rivers and lakes of the region is likely **thinner than normal**.



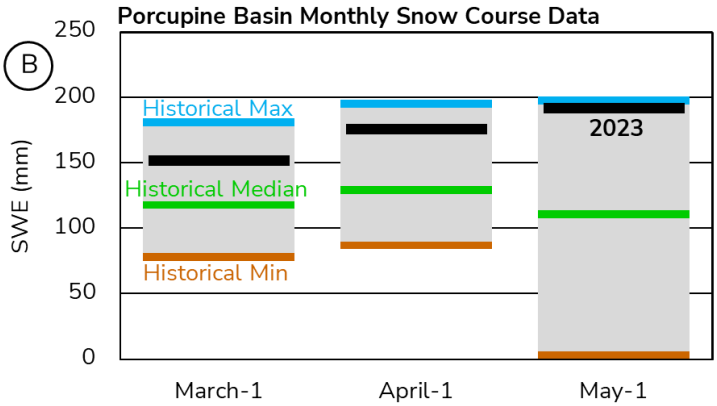


Following **above historical maximum** winter flows, the estimated Yukon River discharge at the White River is **near average** due to the onset of snowmelt (Figure E). The **above average** snowpack combined with **well above average** winter flows suggests **spring freshet flow volumes** will be **above average** with a potential for **higher than normal** **May and June water levels,** including the Klondike River and other rivers and streams crossing the Klondike, Dempster and Top of the World Highways. A combination of local conditions such as current weather, ice thickness, freeze-up levels, and anticipated flow volumes in the coming days suggest an **above average** ice jam risk on the Lower Yukon River. While breakup on the Klondike is currently well underway, ice degradation on the Yukon River is delayed and flood risk is considered high for areas not protected by mitigations (namely the dike in Dawson). Weather over the coming weeks will play a critical role in determining **peak freshet water levels**.

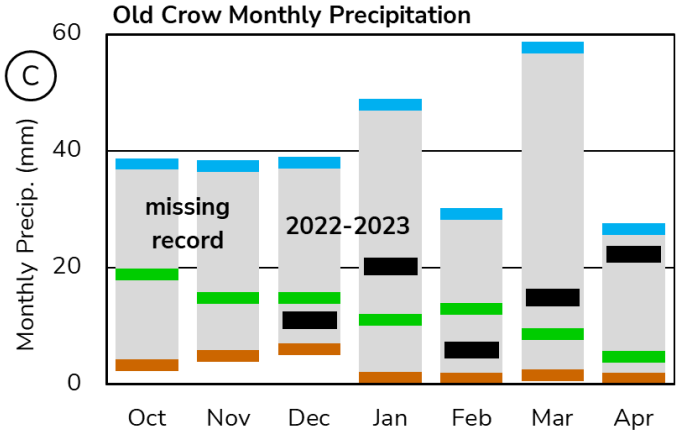


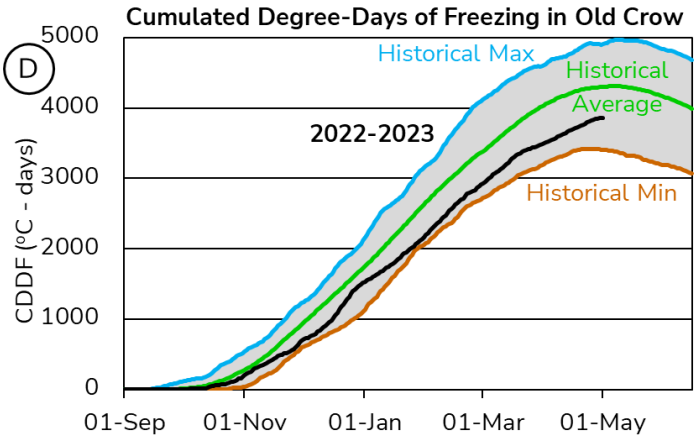
PORCUPINE RIVER BASIN

The Porcupine River Basin snowpack is **well above average**. The basin-averaged SWE is estimated to be **174% of the historical median**, with **192 mm** as of May 1 (Figure B). This is considered a **significant snowpack** for this region.

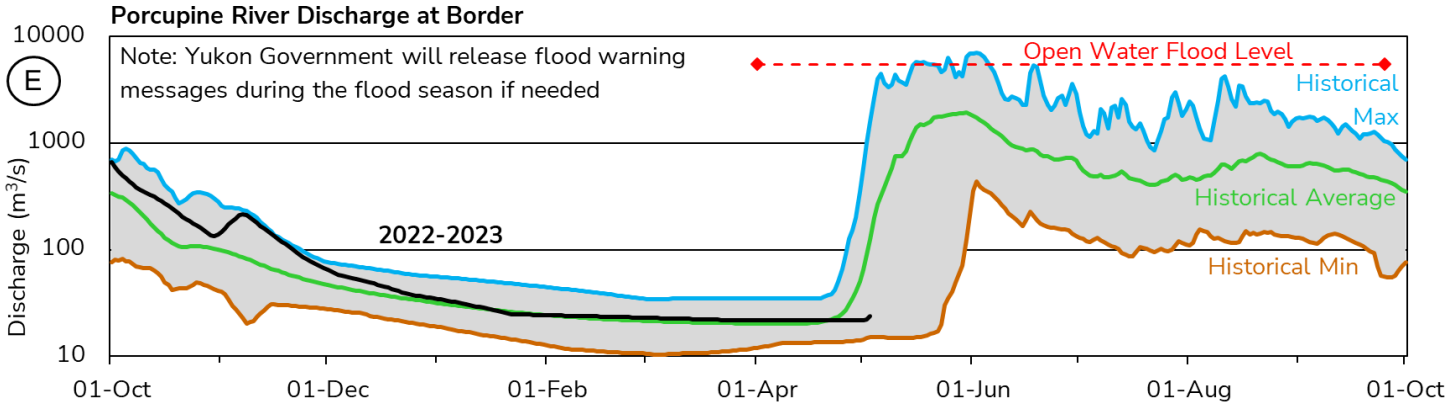


January, March and April snowfall at Old Crow Airport were **above median**, while December and February precipitation totals were **below median** (Figure C). Cumulated degree-days of freezing (CDDF) are **10% below average**, with 3862°C-Days as of May 1 (Figure D), which suggests a **thinner than average** ice cover thickness on lakes and rivers in the region.



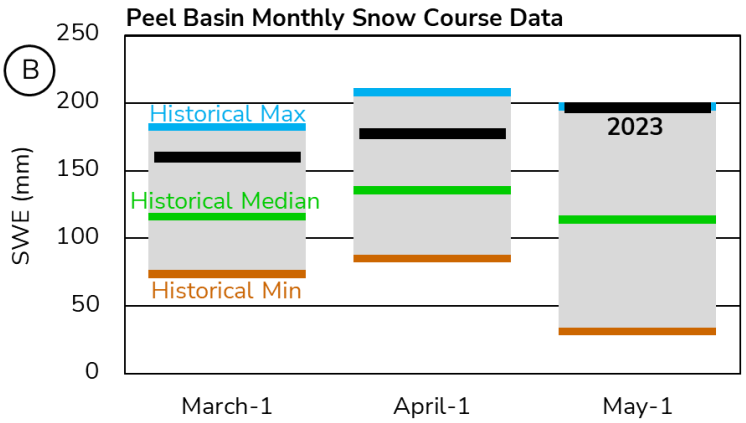


The estimated Porcupine River discharge is **below average** due to the late onset of snowmelt (Figure E). The **well above median** snowpack in the watershed suggests **spring freshet flow volumes** will be **above average** with a potential for **higher than normal** **spring freshet water levels**. Prior to that, a sudden sustained rise in air temperature could be **conducive to severe ice jamming**. Ice jam flood risk for Old Crow is currently considered moderate owing to the delayed onset of snowmelt and **above average** snowpack.

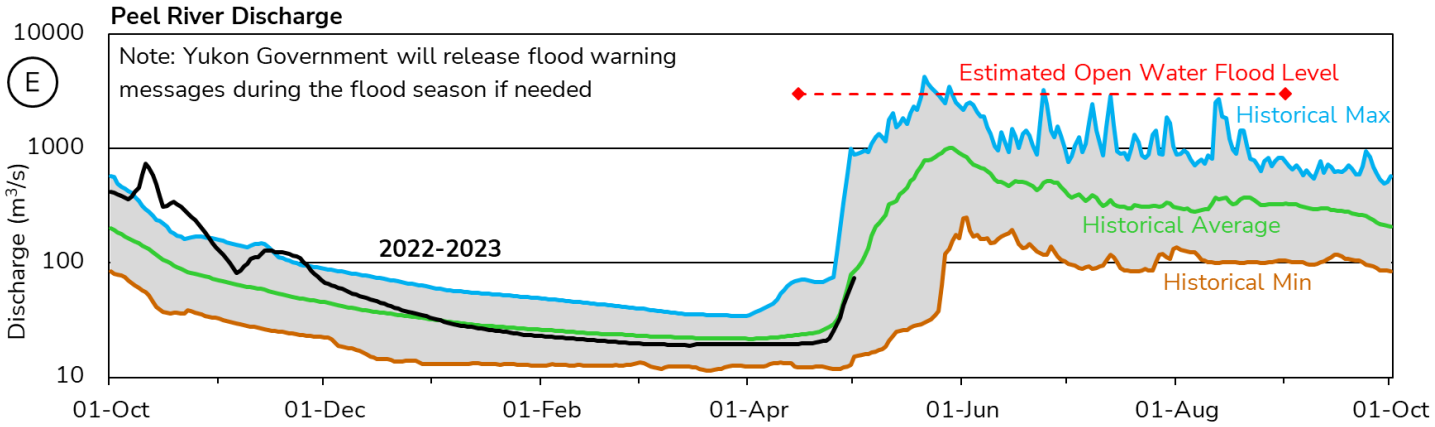


PEEL RIVER BASIN

The Peel River Basin snowpack is **well above average**. The basin-averaged SWE is estimated to be **169% of the historical median**, with **197 mm** as of May 1 (Figure B). This is considered a **significant snowpack** for this region.

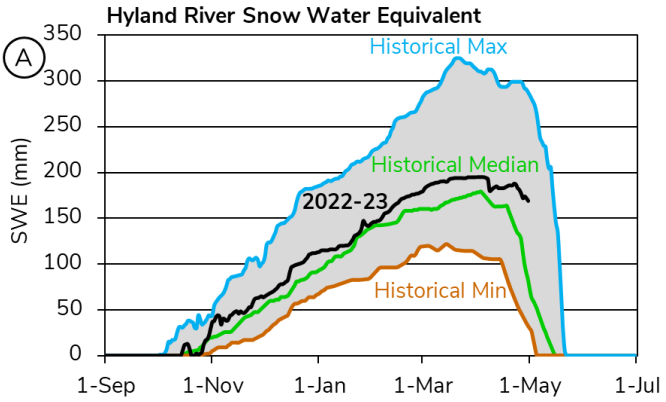


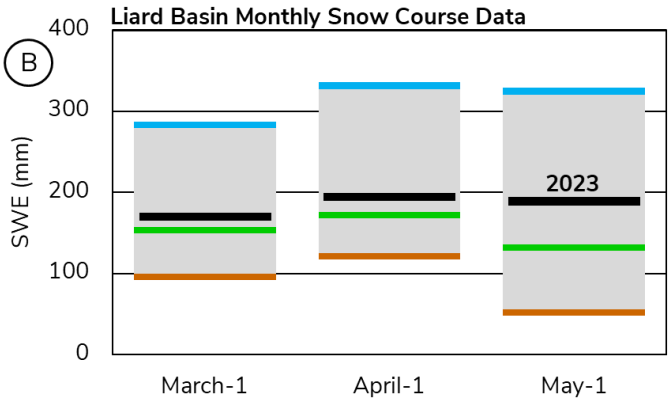
The estimated Peel River discharge is **near average** (Figure E). The **above average** snowpack and delayed onset of snowmelt suggests **spring freshet flow volumes and water levels** will be **above average**, including rivers and streams crossing the Dempster Highway.



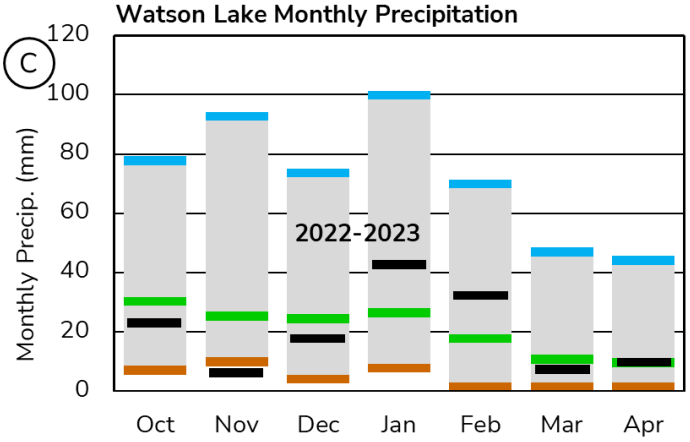
LIARD RIVER BASIN

The Liard River Basin snowpack is **above average** for May 1. At the Hyland Meteorological Station, Snow Water Equivalent (SWE) is estimated to be **202% of the historical median** (Figure A). On account of a delayed melt, the Liard River basin-averaged SWE is estimated to be **140% of the historical median**, with **189 mm** as of May 1 (Figure B).

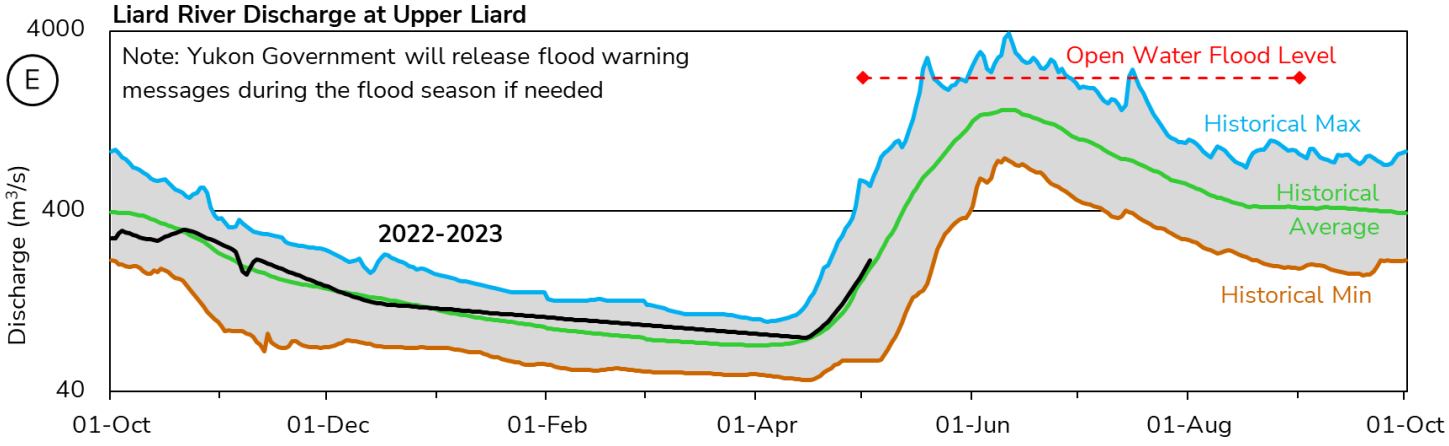




October to December and March precipitation at Watson Lake Airport was **below median**, including a **record dry** November. While January to February had **above median** snowfall, cumulative precipitation on May 1 was **9% below median** (Figure C).

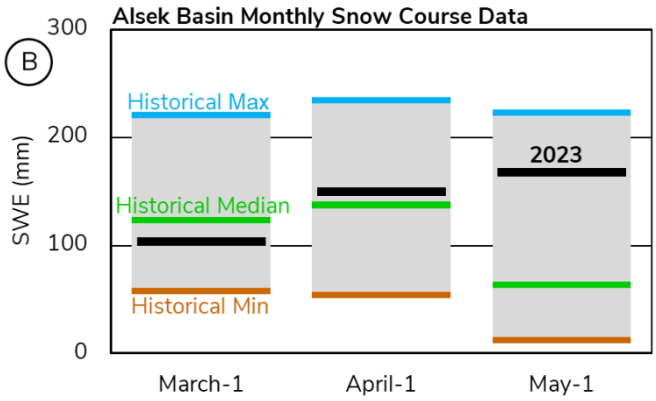


The estimated Liard River discharge at Upper Liard is **near average** (Figure E). The **above average** snowpack and delayed snowmelt combined with **close to average** winter flows suggests **spring freshet flows and levels** will be **above average**. Warm and/or wet weather anomalies have the potential to generate **significant freshet flows** in watercourses crossing the Alaska and Robert Campbell highways

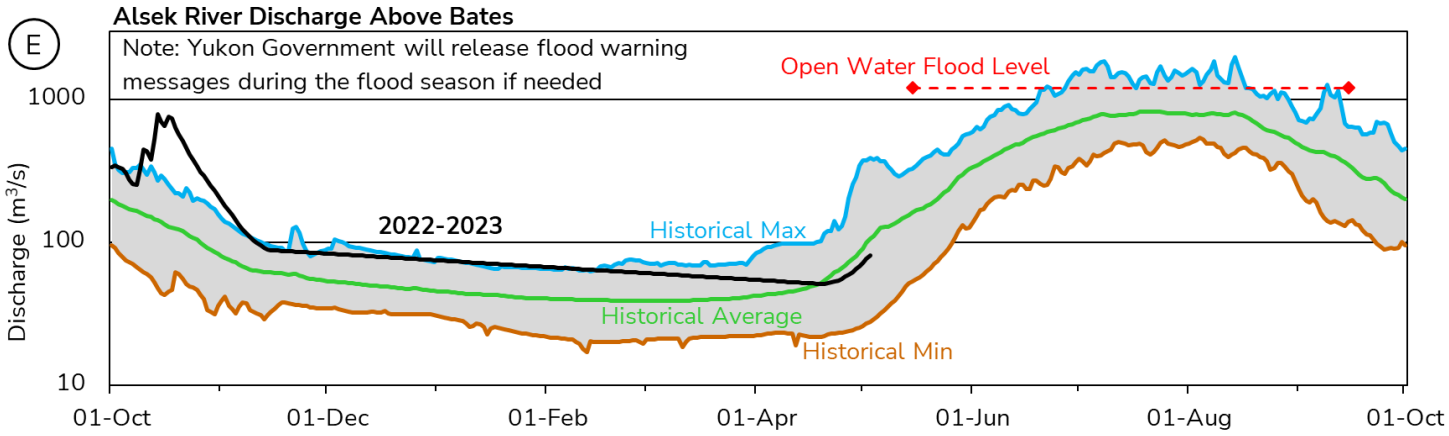


ALSEK RIVER BASIN

The Alsek River Basin snowpack is **well above average** for May 1. The basin-averaged SWE is estimated to be **251% of the historical median**, with **168 mm** as of May 1 (Figure B).



The estimated Alsek River discharge is **near average** following **above average** winter flow as a result of the delayed onset of snowmelt (Figure E). High flows in this watershed are dominated by mountain snowmelt and glacial melt that are largely influenced by summer temperatures and precipitation. The snowpack in the St. Elias Range is likely to generate **above average freshet volumes**. Warm and/or wet weather anomalies in May, June, July will determine peak flows.



DRAINAGE BASIN AND SNOW COURSE

For Sample Date: 2023-05-01

Name	Number	Elevation (m)	Date of survey	This year snow depth (cm)	Water content (SWE) (mm)	Last year (mm)	Median Historical SWE (mm)	Years of record
Alsek River Basin								
Canyon Lake	08AA-SC01	1160	2023-05-01	67	198 R	168	37	45
Alder Creek	08AA-SC02	768	2023-04-26	66	161	209	67	41
Aishihik Lake	08AA-SC03	945	2023-05-01	44	104	146	35	29
Haines Junction Farm	08AA-SC04	610	2023-04-28	34	89	102	31	22
Summit	08AB-SC03	1000	2023-04-28	107	276	311	211	41
Yukon River Basin								
Tagish	09AA-SC01	1080	2023-04-25	75	182	200	117	47
Montana Mountain	09AA-SC02	1020	2023-04-26	66	164	197	120	46
Log Cabin (B.C.)	09AA-SC03	884	2023-04-24	121	435 B	481	359	62
Atlin (B.C)	09AA-SC04	730	2023-04-24	30	80 B	114	0	55
Mt McIntyre B	09AB-SC01B	1097	2023-05-01	76	184	270	144	47
Whitehorse Airport	09AB-SC02	700	2023-04-25	36	113	178	9	56
Meadow Creek	09AD-SC01	1235	2023-04-25	121	332	500	283	47
Jordan Lake	09AD-SC02	930	2023-04-27	61	162	193	95	34
Morley Lake	09AE-SC01	824	2023-04-27	50	160	264	78	35
Mount Berdoe	09AH-SC01	1035	2023-04-25	95	221	232	51	47
Satasha Lake	09AH-SC03	1106	2023-04-25	81	160	128	14	33
Williams Creek	09AH-SC04	914	2023-04-25	79	176	202	34	26
Twin Creeks B	09BA-SC02B	900	2023-04-26	65	169	265	123	46
Hoole River	09BA-SC03	1036	2023-04-27	67	164	215	91	46
Burns Lake	09BA-SC04	1112	2023-04-27	95	253	377	226	37
Finlayson Airstrip	09BA-SC05	988	2023-04-27	48	128	192	53	36
Fuller Lake	09BB-SC03	1126	2023-04-26	83	187	274	216	37
Russell Lake	09BB-SC04	1060	2023-04-26	96	241	404	225	36
Rose Creek	09BC-SC01	1080	2023-04-25	41	107	217	46	28
Mount Nansen	09CA-SC01	1021	2023-04-25	69	145	177	0	46
MacIntosh	09CA-SC02	1160	2023-04-25	85	195	194	41	45
Burwash Airstrip	09CA-SC03	810	2023-04-25	42	90	0	0	42
Beaver Creek	09CB-SC01	655	2023-04-25	81	231 R	142	0	46
Chair Mountain	09CB-SC02	1067	2023-04-25	73	208 R	191	0	15
Casino Creek	09CD-SC01	1065	2023-04-25	99	214	287	124	45
Pelly Farm	09CD-SC03	472	2023-04-28	32	97	113	5	37
Plata Airstrip	09DA-SC01	830	2023-04-26	55	154	285	150	44
Withers Lake	09DB-SC01	975	2023-04-26	85	217	280	222	37
Rackla Lake	09DB-SC02	1040	2023-04-26	103	220	224	204	36

Code "E" – Estimate; Code "B" - Survey date is outside of valid sampling range; “N.S.” – No survey; “R” – New record

DRAINAGE BASIN AND SNOW COURSE

For Sample Date: 2023-05-01

Name	Number	Elevation (m)	Date of survey	This year snow depth (cm)	Water content (SWE) (mm)	Last year (mm)	Median Historical SWE (mm)	Years of record
Yukon River Basin								
Mayo Airport A	09DC-SC01A	540	2023-04-26	36	98	124	0	52
Mayo Airport B	09DC-SC01B	540	2023-04-26	42	94	100	0	35
Edwards Lake	09DC-SC02	830	2023-04-26	73	178	240	152	36
Calumet	09DD-SC01	1310	2023-04-27	110	250	280	181	42
King Solomon Dome	09EA-SC01	1070	2023-04-26	107	276	381	130	47
Grizzly Creek	09EA-SC02	975	2023-04-25	87	220	199	137	47
Midnight Dome	09EB-SC01	855	2023-04-26	109	248	327	142	48
Boundary (Alaska)	09EC-SC02	1005	N.S.	-	-	-	-	-
Porcupine River Basin								
Riff's Ridge	09FA-SC01	650	2023-04-25	100	225	194	137	35
Eagle Plains	09FB-SC01	710	2023-04-25	90	198	227	147	37
Eagle River	09FB-SC02	340	2023-04-25	69	137	154	108	37
Old Crow	09FD-SC01	299	2023-04-25	91	191	151	102	37
Liard River Basin								
Watson Lake Airport	10AA-SC01	685	2023-04-25	29	72	275	27	58
Tintina Airstrip	10AA-SC02	1067	2023-04-27	102	284	358	195	46
Pine Lake Airstrip	10AA-SC03	995	2023-04-27	74	212	412	199	47
Ford Lake	10AA-SC04	1110	2023-04-27	87	228	318	173	35
Frances River	10AB-SC01	730	2023-04-26	48	141	273	85	47
Hyland River B	10AD-SC01B	880	2023-04-26	61	183	325	130	47
Peel River Basin								
Blackstone River	10MA-SC01	920	2023-04-25	84	180	181	75	46
Ogilvie River	10MA-SC02	595	2023-04-25	85	170	184	86	45
Bonnet Plume Lake	10MB-SC01	1120	2023-04-26	83	195	220	191	37
Alaska Snow Courses								
Eaglecrest	08AK-SC01	305	2023-04-28	124	442	714	414	37
Moore Creek Bridge	08AK-SC02	700	2023-05-01	155	605	686	527	26

Code "E" – Estimate; Code "B" - Survey date is outside of valid sampling range; “N.S.” – No survey; “R” – New record


Location of Water Resources Snow Courses
Snow Survey Site
Snow Water Equivalent Basins
0 50 100 200 Kilometers
09FD-SC01
OLD CROW
Porcupine
09FB-SC02
09FB-SC01
09FA-SC01
10MA-SC02
Peel
Bonnet Plume
Hart
Snake
10MA-SC01
09DD-SC01
09DC-SC01B
09DC-SC01A
09DB-SC02
09EA-SC02
Yukon
09EC-SC02
09EB-SC01
09EA-SC01
DAWSON CITY
10MB-SC01
Stewart
09DB-SC01
09DC-SC02
MAYO
09DA-SC01
09CD-SC03
09CD-SC01
09CB-SC01
Hess
09BB-SC04
09BB-SC03
PELLY CROSSING
09BA-SC02B
09BA-SC02A
BEAVER CREEK
White
09BC-SC01
09AH-SC04
09CB-SC02
09CA-SC01
09AH-SC01
09CA-SC02
09AH-SC03
09CA-SC03
08AA-SC03
08AA-SC01
08AB-SC03
08AA-SC04
Nisling
CARMACKS
Pelly
FARO
09BA-SC04
ROSS RIVER
09BA-SC05
09BA-SC03
10AD-SC01B
10AD-SC01
Kluane Lake
Lake Laberge
Teslin
Hyland
Liard
10AA-SC02
09AD-SC02
10AA-SC04
10AB-SC01
HAINES JUNCTION
WHITEHORSE
Alsek
TESLIN
10AA-SC01
WATSON LAKE
08AA-SC02
09AB-SC02
09AB-SC01B
09AA-SC02
09AA-SC03
08AK-SC02
09AA-SC01
09AA-SC04
09AD-SC01
10AA-SC03
09AE-SC01
08AK-SC01