



## **Spring Breakup Outlook for Alaska**

Valid April 12, 2024

[Alaska-Pacific River Forecast Center](https://www.weather.gov/aprfc)

Next Product Issuance: April 19, 2024

[www.weather.gov/aprfc](https://www.weather.gov/aprfc)

### **EXPERIMENTAL PRODUCT**

#### **Spring Breakup and Flood Potential Outlook for Alaska**

Across the state, this year's breakup is shaping up to be dynamic, with temperatures forecasted to remain below normal through the end of April, particularly for the western half of the state, with a robust snowpack present across the northeast and western parts of the state. However, while some areas anticipate a dynamic breakup, conditions aren't as favorable as they were during last year's historic breakup season, marked by numerous significant ice jams and snowmelt floods across the interior. If temperatures remain cold in the last half of April and into early May, it will increase chances for a dynamic breakup and flooding.

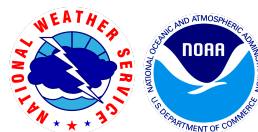
\*The two generalized types of river ice breakup are dynamic (mechanical) and thermal. A dynamic breakup moves from headwaters downstream in a somewhat linear fashion. Ice jam flooding occurs more often during a dynamic breakup. A thermal breakup occurs when the ice rots in place usually caused by a gradual warm up resulting in very few and only minor ice jams.

#### **Updates to the previous Spring Breakup Outlook**

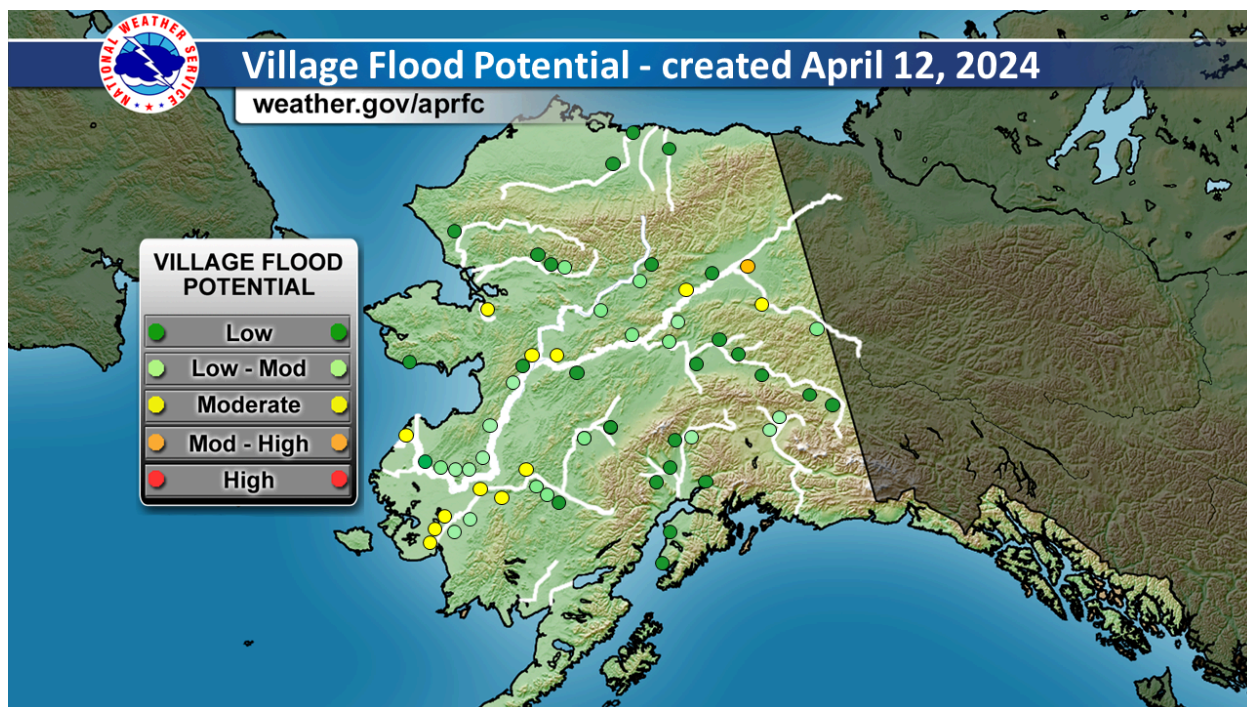
April 1 ice thickness data across the state continue to show near normal values. April 1 snowpack measurements continue to show well above normal snowpack for the North Slope, Porcupine River Basin, Copper River Basin, and the Lower Yukon and Kuskokwim River Basins. Recent aerial snowpack measurements show very high snow amounts in the Nushagak Hills and Holitna River Basin, south of the middle Kuskokwim River. Normal to slightly below normal snowpack is observed in the Upper Yukon and Tanana River Valleys. Climate outlooks are indicating temperatures to remain colder than normal across most of the state through the end of April, especially across the western half of the state. If temperatures remain cold in the last half of April and into early May, it will increase chances for a dynamic breakup and flooding.

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Spring breakup flood potential for villages along major rivers in Alaska:



[Link to the current Village Flood Potential and Snowmelt Runoff Maps](#)

### River Ice Observations

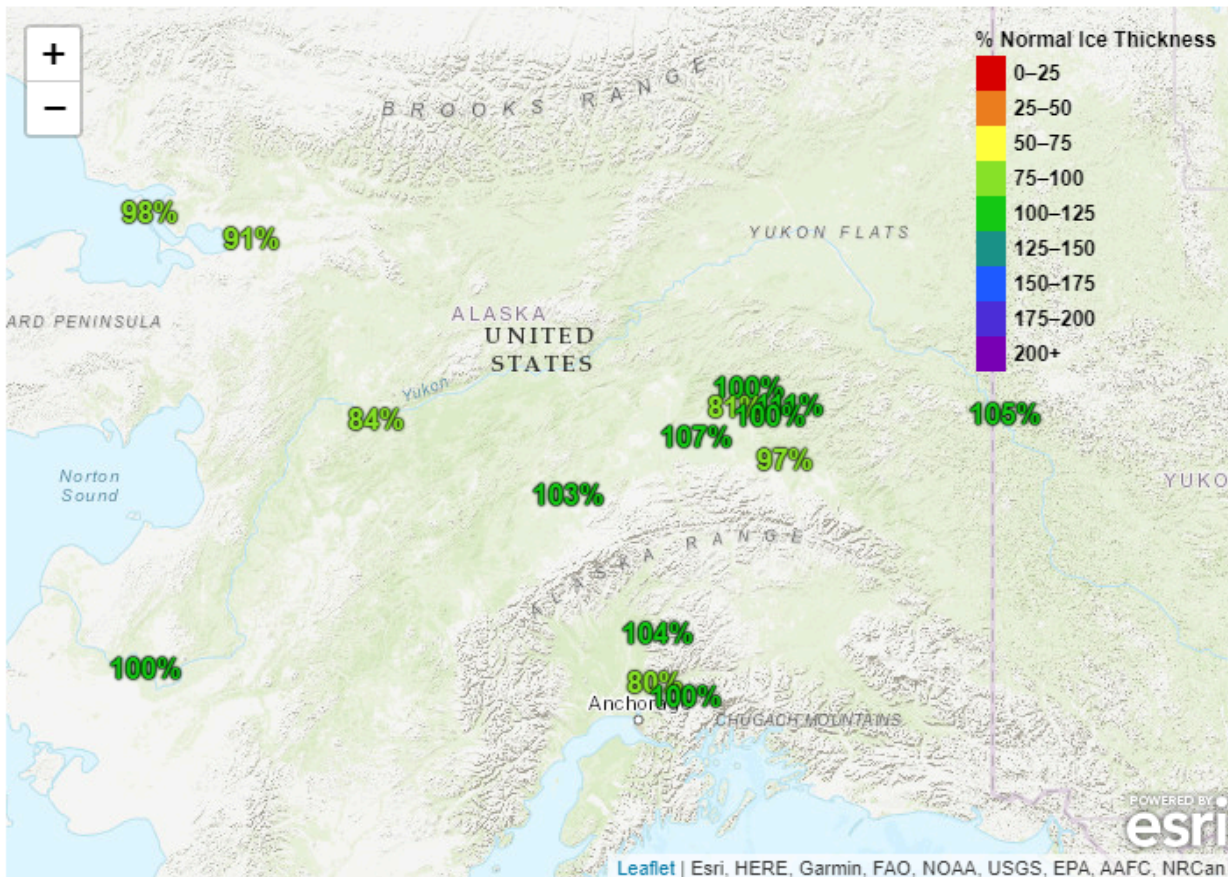
April 1st river ice observations are available for a limited number of observing sites in Alaska. Late March through mid April measurements indicate that ice thicknesses are near normal across the state. Observations across interior Alaska range from 81%-111% of normal. However, dense jumble ice has been observed on the middle Yukon River between Rampart and Tanana. Recent UAF Fresh Eyes On Ice team (FEOI) reconnaissance confirmed that ice this year (2024) along the middle Yukon and Tanana River was on average thicker than last year (2023). Yukon River ice thickness at Eagle appears to be thicker than the past two winters (2022-2023). Observers on the Kuskokwim River reported normal to slightly below normal ice thicknesses between Aniak and Bethel, with recent reports indicating that river ice has begun to deteriorate, and/or soften in some locations. Ice thicknesses along the Kuskokwim are, on average, 20% less than this time last year. No freeze-up jams or mid-winter breakups were reported across the Yukon and Kuskokwim River basins this winter.

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## % Average Ice Thickness Map



[Link to % Average ice thickness map](#)

### Freezing Degree Days

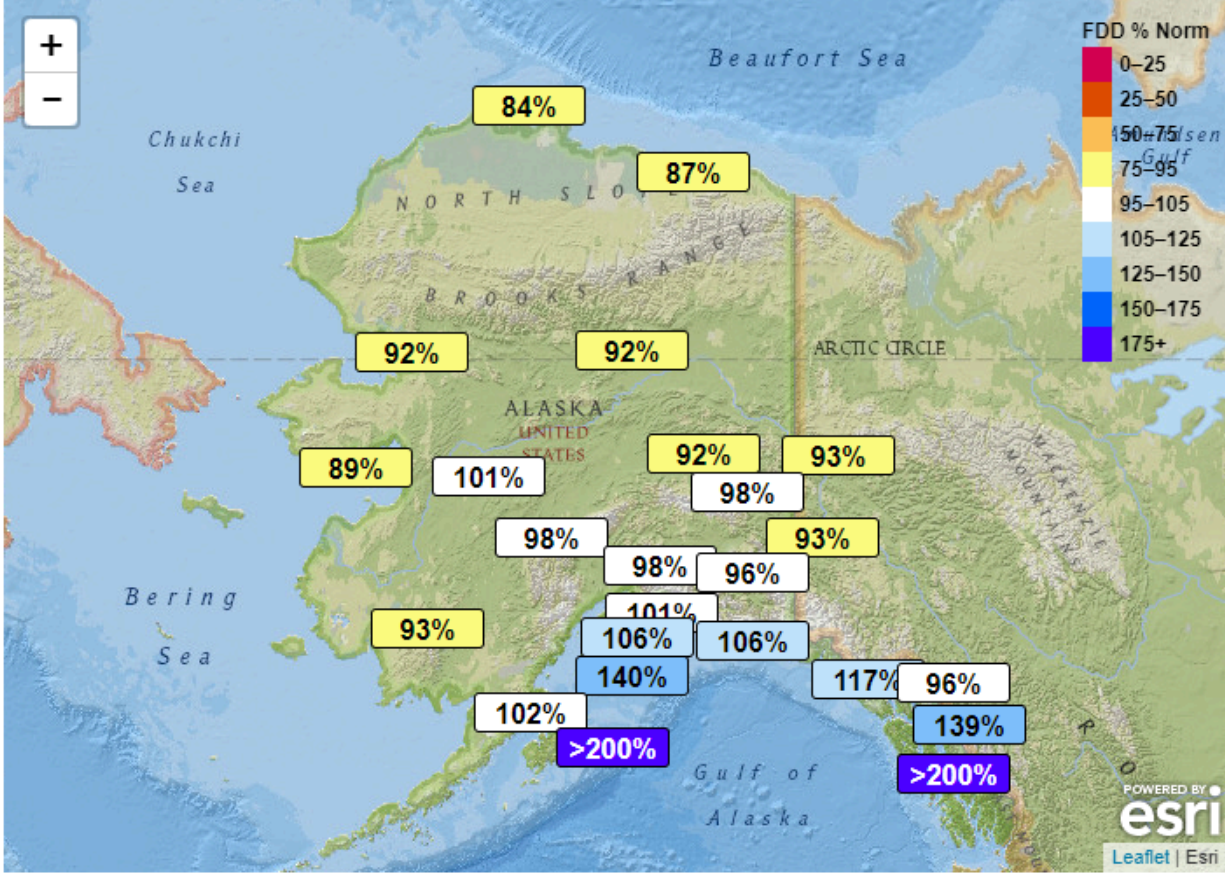
Cumulative freezing degree days (FDD), which can serve as a proxy for river ice thickness, are near normal across most of Alaska. Colder conditions were observed across coastal sites along the Gulf of Alaska (Homer to Sitka), where FDD was reported to be 110% to 200% of normal. Near normal FDD conditions have been observed across Southcentral and Copper River Valley. The West Coast, Interior, and North Slope observed near normal FDD, ranging from 89% to 100% of normal.

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## Freezing Degree Days - Percent of Normal



[Link to freezing degree day \(FDD\) map](#)

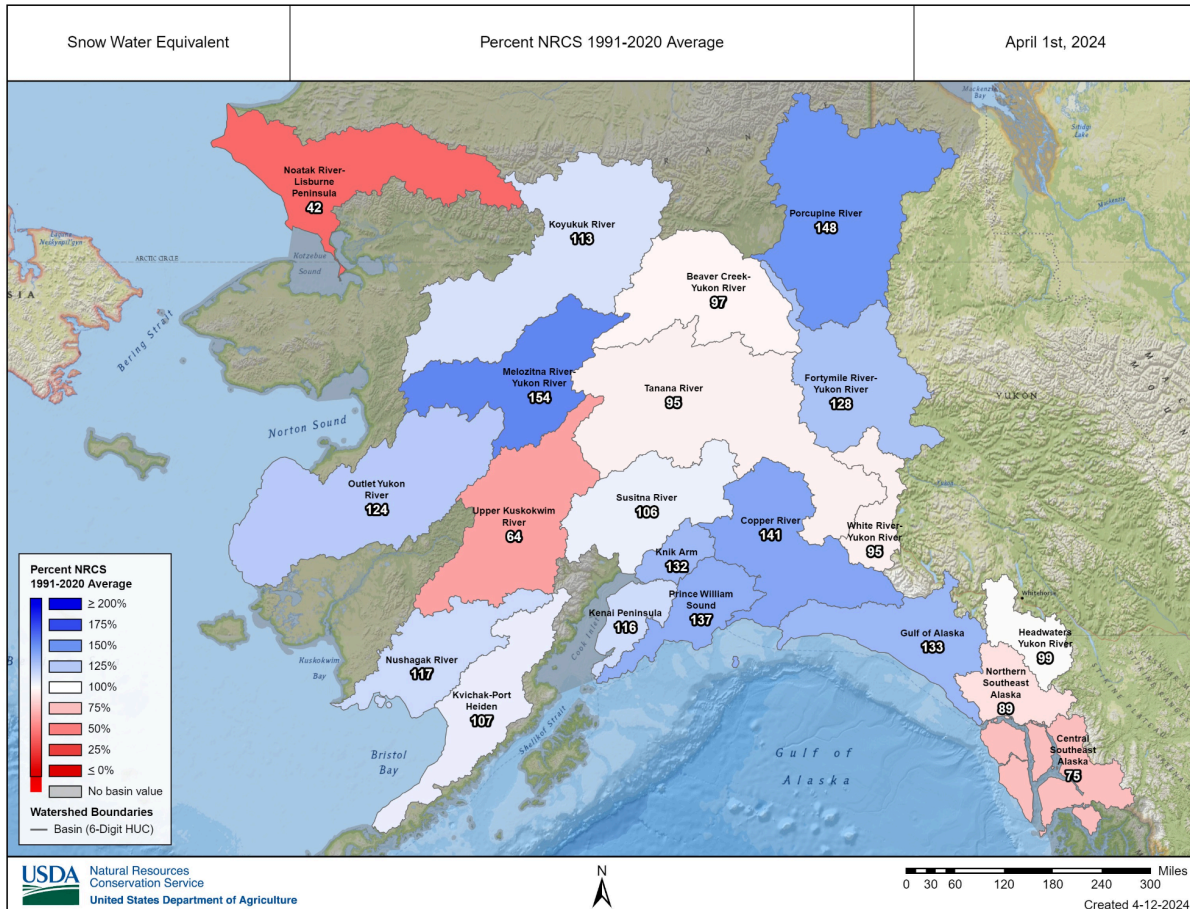
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## Snowpack

[April 1 Natural Resources Conservation Service \(NRCS\) snowpack analysis](#) indicates an above average snowpack for the majority of the state. The current NRCS snowpack map can be accessed [here](#).

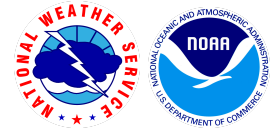


Along the North Slope, though snowpack observations are limited, winter time precipitation is well above average indicating likely above average snowpack north of the Brooks Range. In fact, year-to-date precipitation at Utqiagvik Airport and Prudhoe Bay are the highest on record. The record at Utqiagvik goes back eighty-nine years.

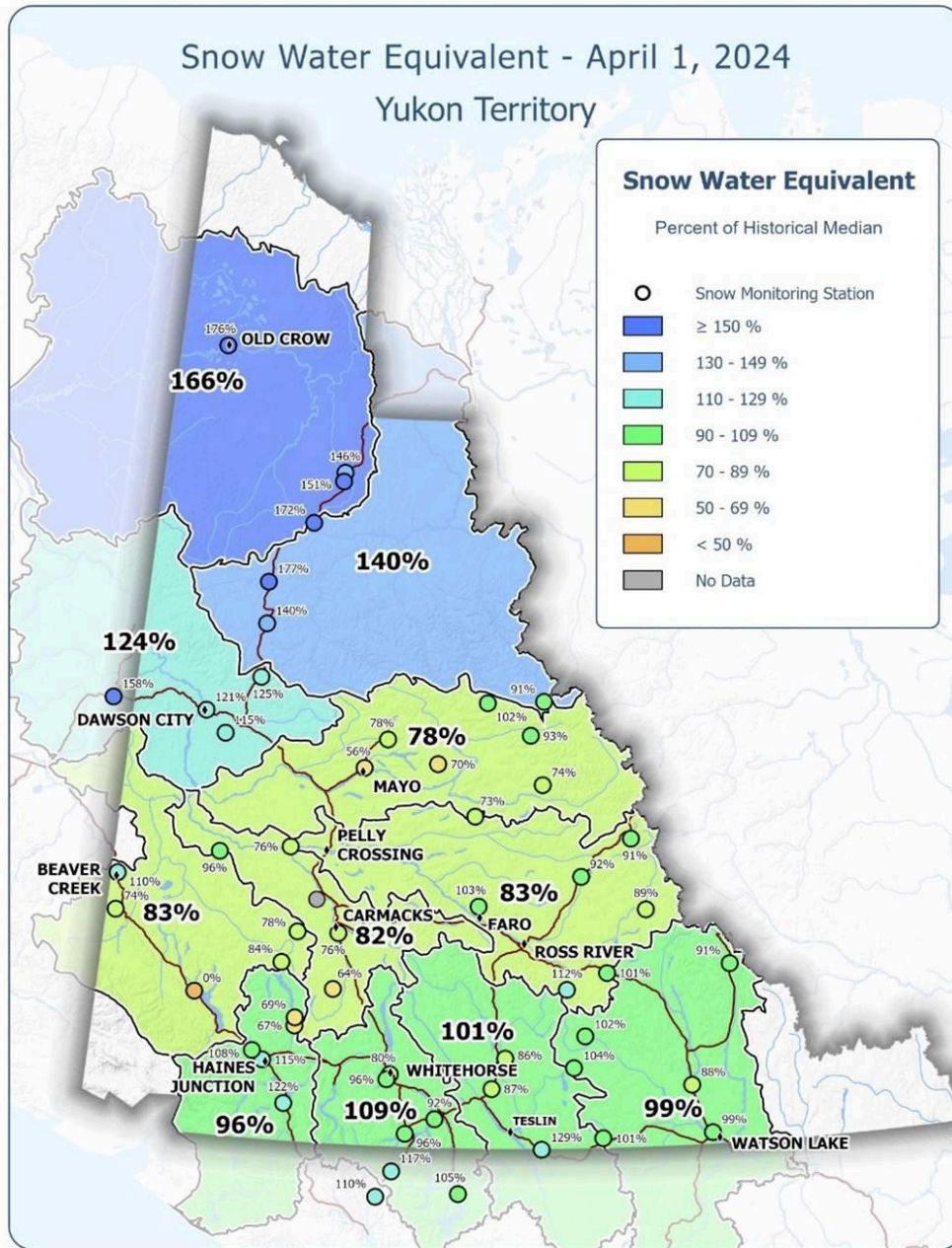
In the northeastern part of the state, the Porcupine Basin reports a snowpack well above average, with Old Crow village in the northern Yukon Territory recording its highest snowpack levels in over four decades of monitoring. However, as one moves towards the southern half of the Yukon Territory, snowpack conditions vary, with areas from Whitehorse to Mayo

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experiencing average to below-average levels. Meanwhile, the Upper Yukon basin spanning from Dawson to Fort Yukon, as well as the Fortymile basin, exhibit snowpack levels well above average, measuring around 130% of normal.

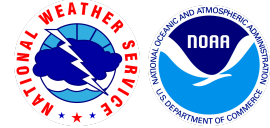


SWE Map published by the government of Yukon Territory, accessible here.

<https://yukon.ca/en/april-1-2024-yukon-snow-survey-bulletin-and-water-supply-forecast>

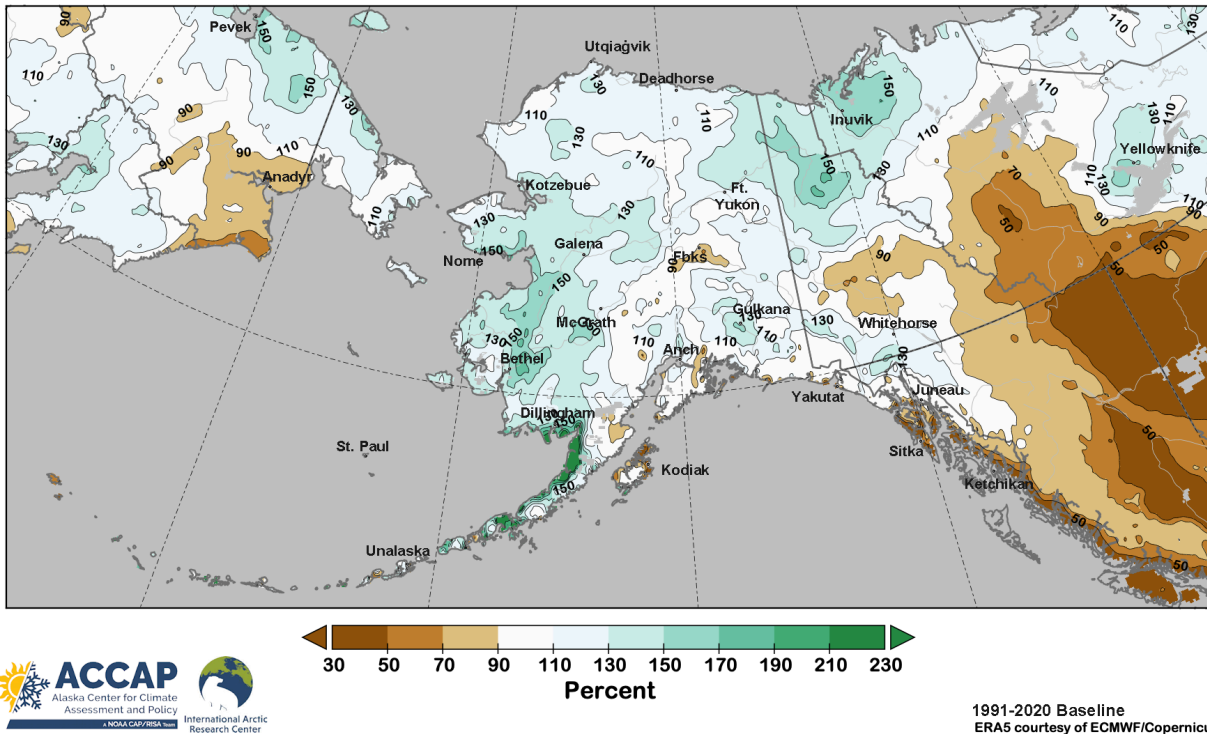
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Further down the Yukon Basin, snowpack levels remain near average until reaching the lower Yukon, where the snowpack is ~120-135% of normal. The Tanana River Basin and Upper Kuskokwim River Basin report snowpack levels ranging from average to slightly below average. However, in the middle to lower Kuskokwim River Valley, snowpack levels are significantly higher, reaching approximately 150-170% of the April 1 average, as indicated by ERA5 analysis. This assessment is corroborated by anecdotal reports and in-situ observations, notably in Bethel, which has recorded a record high snow depth for April, marking the highest measurement for the month in 100 years of records.

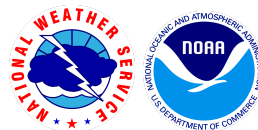
**Snowpack Snow Water Equivalent: Percent of Median**  
April 1, 2024



In Southcentral Alaska, the snowpack in the Copper Basin stands at around 140% of the April 1 average. Monitoring sites throughout the basin are consistently reporting higher-than-average snowpack. Notably, four sites within the basin rank within the top three of historical records for snowpack levels as of April 1. However, it's important to note that despite this above-average snowpack, the basin's snowpack remains lower than the levels observed in 2022 (180%) and 2023 (160%), both of which resulted in flooding in Glennallen.

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Across the rest of Southcentral Alaska, the Susitna Basin is reporting normal snowpack, while the Cook Inlet and Kenai Peninsula are experiencing above-average snowpack.

In summary, the state's snowpack is generally above average, with anomalies increasing from average in the east to above average in the west. Well above average snowpack is noted in the Porcupine Basin, Lower Kuskokwim and Yukon Basins, as well as the Copper Basin. Although above average this year, snowpack across most of the interior is notably less than the previous two years.

The next NRCS statewide snowpack summary is expected after the first week of May.

### Climate Outlook

The most important factor determining the severity of ice breakup remains the weather during April and May. Dynamic breakups, with a high potential for ice jam flooding, typically require cooler than normal temperatures in early April followed by an abrupt transition to warm, summer-like temperatures in late April to early May.

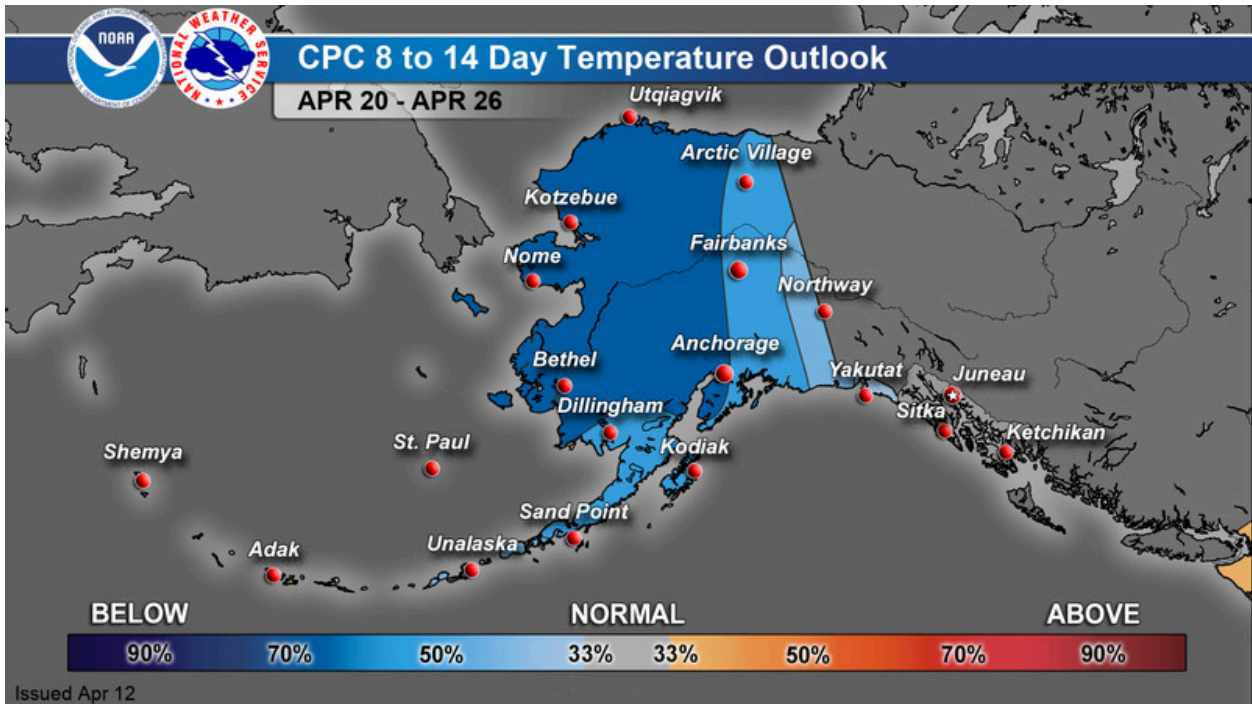
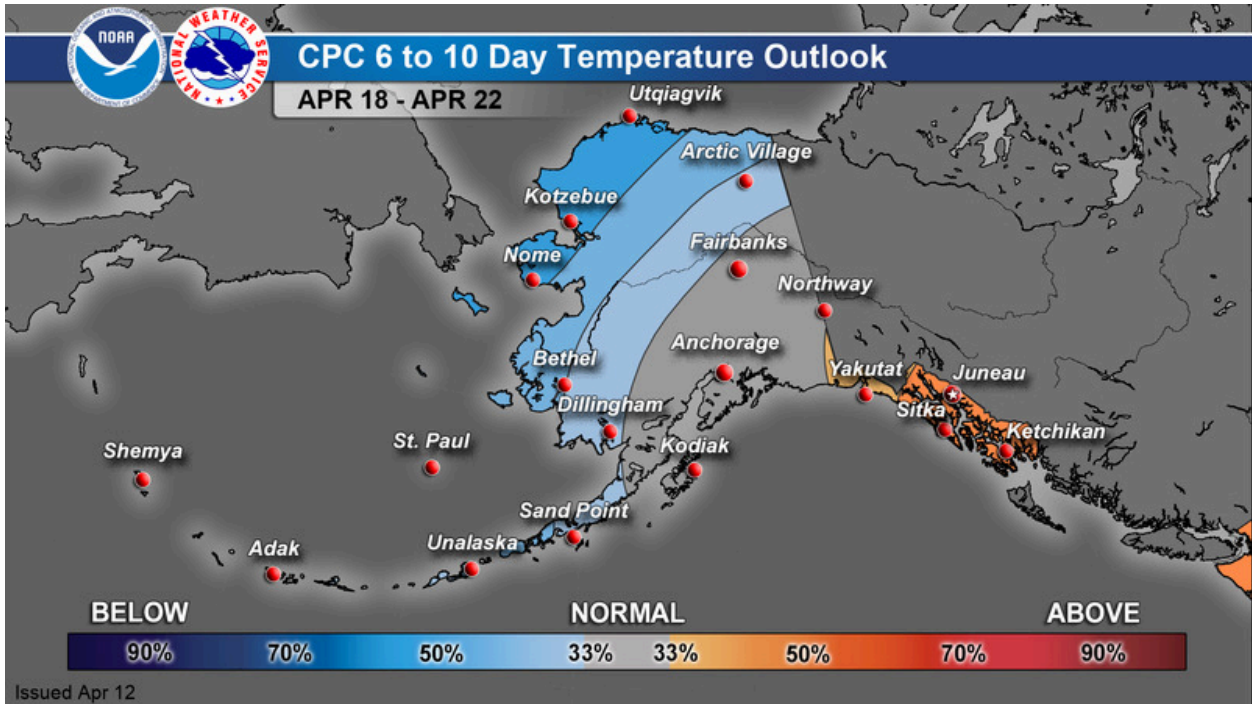
A brief warming trend is expected by the middle of next week for most of the mainland with daytime temperatures expected to warm into the 50s in the valleys across the eastern interior and the Canadian Yukon. However, NOAA's Climate Prediction Center (CPC) April 12th outlooks favor colder than normal temperatures for the northwestern third of the state with normal temps expected for the rest of mainland through the third week in April. By the 4th week in April, the CPC is favoring a strong chance of below average temperatures across nearly the entire mainland, especially over the western half of the state. By the beginning of May, the temperature outlook becomes less uncertain with the CPC favoring a slight chance of below normal temperatures across the southwest portion of the state with equal chances of above and below normal temperatures across the rest of the mainland.

Looking ahead into May and June, there's an elevated probability (40-60% chance) of above-normal temperatures across all of Alaska.



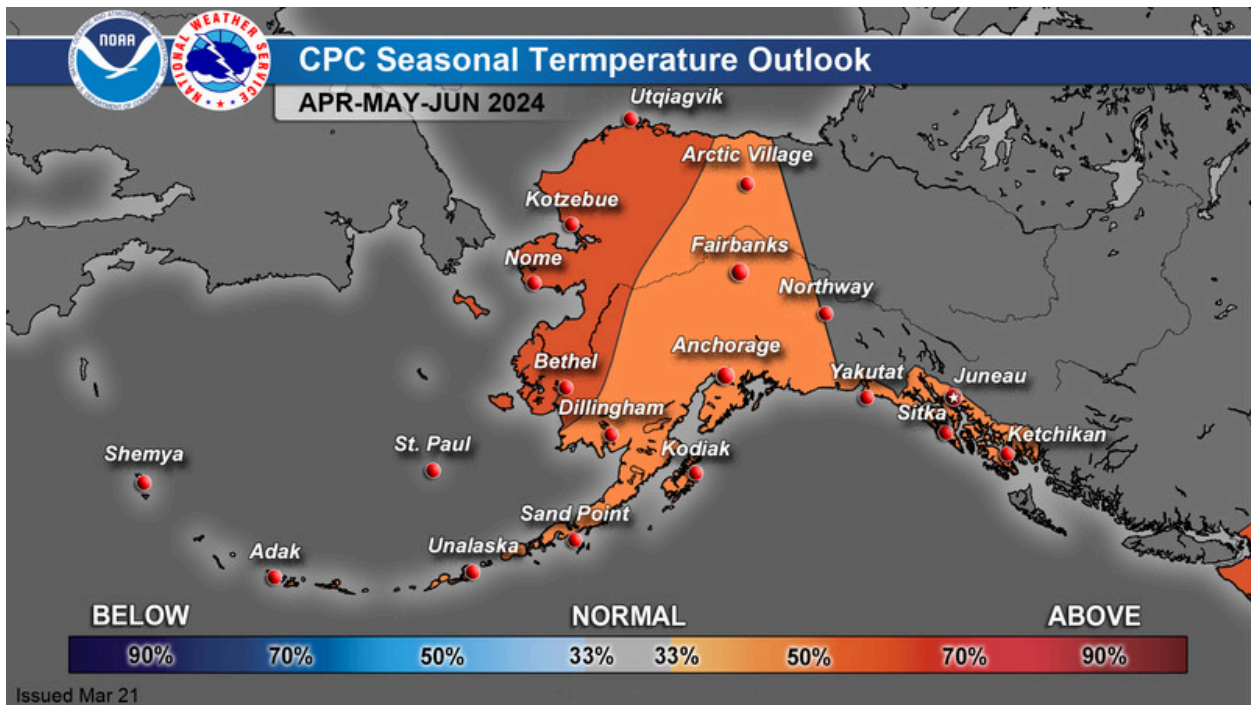
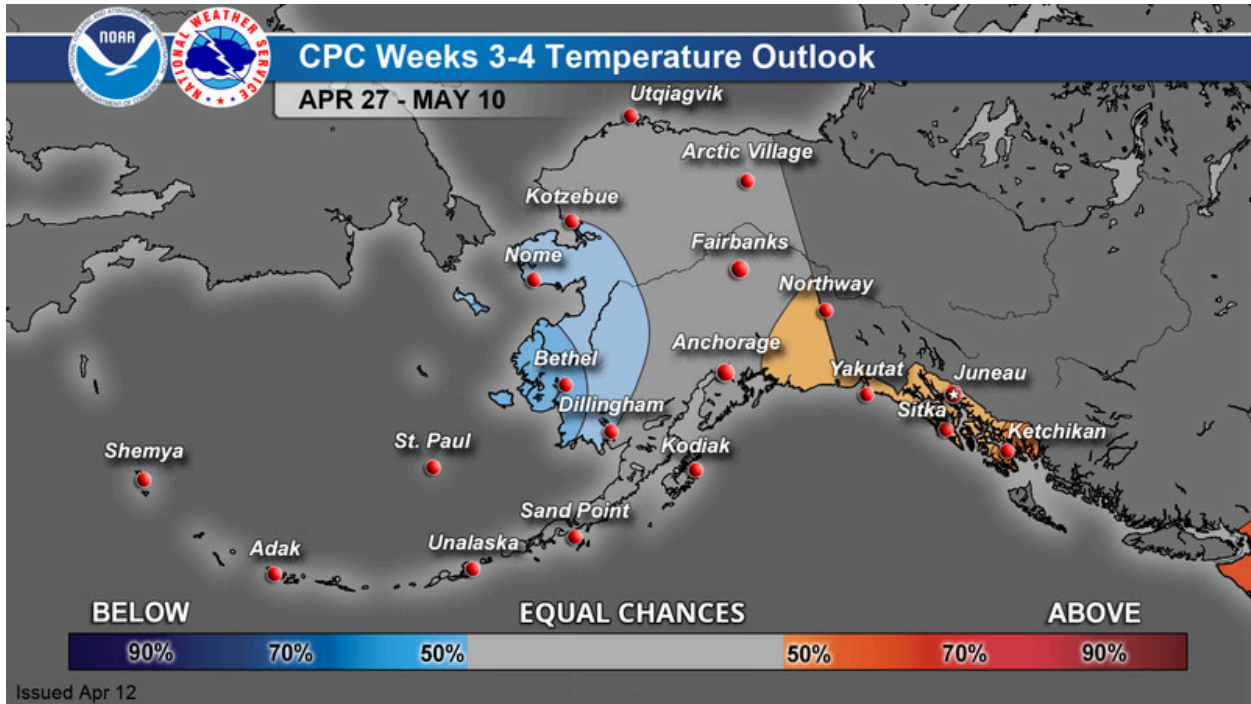
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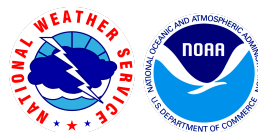
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## Timing of River Ice Breakup

Timing of breakup is expected to be 1-2 days late for the eastern half of the state and 2-5 days late for the western half of the state. The North Slope is expected to breakup near the median date.

## Flood Potential

The likelihood of flooding from snowmelt and/or ice jams is initially calculated based on the flood frequency for the current 2000 to 2021 historical record and adjusted to reflect current conditions.

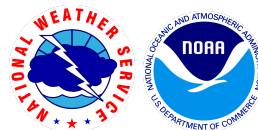
The following tables give an estimation of the flood potential for various locations around the state and basin runoff volumes.

### Tanana/Fairbanks

River-Reach	Location	Snowmelt Runoff Volume	Flood Potential	Median Breakup Date	Years of Record	Forecast Breakup Date Range
Chena River		Average				
	Chena Lakes		Low			
	Fairbanks		Low	4/26	31	4/24-4/30
Tanana River		Average				
	Northway		Low	4/26	31	4/24-4/30
	Salcha		Low	4/26	3	4/24-4/30
	Fairbanks		Low	4/26	31	4/24-4/30
	Nenana		Low	4/30	44	4/28-5/4
	Manley HS		Low-Moderate	5/3	32	5/1-5/7

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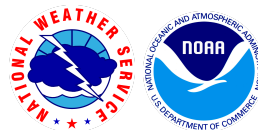


## Yukon

River-Reach	Location	Snowmelt Runoff Volume	Flood Potential	Median Breakup Date	Years of Record	Forecast Breakup Date Range
Yukon River (Upper)		Average				
	Dawson, YT		Low-Moderate	5/5	44	5/3-5/9
	Eagle		Low-Moderate	5/4	44	5/2-5/8
	Circle		Moderate	5/9	40	5/7-5/13
	Fort Yukon		Moderate-High	5/11	40	5/10-5/16
	Beaver		Low	5/10	27	5/9-5/15
	Stevens Village		Moderate	5/11	25	5/10-5/16
	Rampart		Low-Moderate	5/11	27	5/10-5/16
		Average				
	Tanana		Low-Moderate	5/8	39	5/8-5/14
	Ruby		Low	5/9	38	5/9-5/15
	Galena		Moderate	5/11	43	5/11-5/17
	Koyukuk		Moderate	5/9	17	5/9-5/15
	Nulato		Low	5/12	26	5/12-5/18
	Kaltag		Low-Moderate	5/12	38	5/12-5/18
	Anvik		Low-Moderate	5/14	35	5/14-5/20
Yukon River (Lower)		Above				
	Holy Cross		Low-Moderate	5/14	37	5/15-5/21
	Russian Mission		Low-Moderate	5/15	37	5/16-5/22
	Marshall		Low-Moderate	5/15	32	5/16-5/22
	Pilot Station		Low-Moderate	5/13	27	5/15-5/21
	Mountain Village		Low	5/14	37	5/16-5/22
	Alakanuk/Emmonak		Moderate	5/20	38	5/22-5/28

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## Kuskokwim

River-Reach	Location	Snowmelt Runoff Volume	Flood Potential	Median Breakup Date	Years of Record	Forecast Breakup Date Range
Kuskokwim River		Average				
	Nikolai		Low	4/23	38	4/22-4/28
	McGrath		Low-Moderate	5/5	44	5/4-5/10
	Stony River		Low	5/2	36	5/1-5/7
	Sleetmute		Low-Moderate	5/1	35	4/30-5/6
	Red Devil		Low-Moderate	5/4	38	5/3-5/9
	Crooked Creek		Moderate	5/4	38	5/3-5/9
	Aniak		Moderate	5/6	41	5/6-5/12
	Kalskag		Moderate	5/5	35	5/5-5/11
	Tuluksak		Low-Moderate	5/7	32	5/7-5/13
	Akiak		Low-Moderate	5/8	38	5/8-5/14
	Kwethluk		Moderate	5/5	12	5/5-5/11
	Bethel		Moderate	5/9	44	5/9-5/15
	Napakiak		Moderate	5/9	29	5/9-5/15

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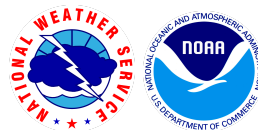


**Southeast/Southcentral**

River-Reach	Location	Snowmelt Runoff Volume	Flood Potential	Median Breakup Date	Years of Record	Forecast Breakup Date Range
Southeast		Average	Low			
Kenai River		Average	Low			
Anchor River		Average	Low	4/17	16	4/14-4/20
Matanuska River		Above	Low			
Susitna River		Average				
	Gold Creek		Low-Moderate	5/2	9	4/29-5/5
	Sunshine		Low	5/2	35	4/29-5/5
Talkeetna		Average				
	Talkeetna		Low	4/28	5	4/25-5/1
Yentna River		Average				
	Lake Creek		Low	5/2	32	5/13-5/6
Skwentna		Average				
	Skwentna		Low	4/30	29	4/28-5/4
Copper River		Above				
	Gakona		Low-Moderate	4/30	35	4/28-5/4
	Gulkana		Low-Moderate	5/1	34	4/29-5/5

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## North Slope/Northwest

River-Reach	Location	Snowmelt Runoff Volume	Flood Potential	Median Breakup Date	Years of Record	Forecast Breakup Date Range
Koyukuk River		Above				
	Bettles		Low	5/10	42	5/9-5/15
	Allakaket		Low-Moderate	5/11	37	5/10-5/16
	Hughes		Low-Moderate	5/11	37	5/10-5/16
Seward Peninsula		Above				
	Buckland		Moderate	5/18	34	5/19-5/25
Kobuk River		Above				
	Kobuk		Low-Moderate	5/14	40	5/15-5/21
	Shungnak		Low	5/16	32	5/17-5/23
	Ambler		Low	5/16	38	5/17-5/23
	Kiana		Low	5/18	13	5/19-5/25
Noatak River		Above				
	Noatak		Low	5/19	26	5/20-5/26
Brooks Range		Above				
	Colville at Umiat		Low-Moderate	5/24	21	5/21-5/27
	Colville at Colville Village		Low-Moderate	6/3	22	5/31-6/6
Sagavanirktok River		Above				
	Dalton Highway		Low-Moderate			

\* Median break dates are for the period 1980 through 2023 and are calculated for locations with at least 5 years of data.

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For more detail and to see the Flood Potential Map refer to the APRFC website at:  
<https://www.weather.gov/aprfc/floodpotential>

The next Spring Breakup Outlook will be published April 19, 2024.

This product is experimental. For more information and to submit comments, please contact:

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