



## Spring Breakup Outlook for Alaska

Valid April 26, 2024

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

Next Product Issuance: May 3, 2024

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

### EXPERIMENTAL PRODUCT

#### Spring Breakup and Flood Potential Outlook

The 2024 spring breakup is trending more towards a **thermal\*** breakup across the Eastern Interior due to recent above average temperatures and strong solar input, which has helped to deplete low elevation snowpack and degrade river ice across the middle and upper Tanana River as well as portions of the Upper Yukon River. Across the western part of the state, including the middle/lower Yukon River as well as the Kuskokwim River, breakup is still trending towards a **dynamic\*** breakup with a robust snowpack and intact river ice persisting into late April.

However, while we anticipate a dynamic breakup in some areas this year, the conditions aren't as favorable as they were at the beginning of the 2023 historic breakup season, which was marked by numerous significant ice jams and snowmelt floods across the Interior. If air temperatures rapidly warm in early May, the chances **increase** for a dynamic breakup and localized flooding, especially across the western half of the state.

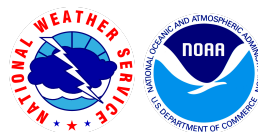
\*The two generalized types of river ice breakup are dynamic (or mechanical) and thermal. A dynamic breakup is characterized by cold early spring air temperatures followed by rapid warming, and can be compounded by above average headwater snowpack and river ice thicknesses, and generally moves the breakup ice front downstream in a somewhat linear fashion. Ice jam flooding occurs more often during a dynamic breakup. A thermal breakup occurs from gradually warming air temperatures, where the ice simply rots in place usually. Thermal breakups commonly result in fewer and less severe ice jams.

#### Updates to the previous Spring Breakup Outlook

Breakup has begun this week across portions of the state, including along the Tanana River down to Fairbanks, as well as most of the South Fork of the Kuskokwim River, including Nikolai. Breakup is trending **earlier** across the Upper Yukon and should begin by at least the middle of next week. Reports indicate that river ice has started to **degrade** around Eagle and river levels are relatively low. Breakup on the Kuskokwim is trending towards the median breakup date and is expected to begin upriver at Stony and Sleetmute by the middle/end of next week. Reports indicate that river ice is also beginning to degrade there, with some sloughs around Stony and Sleetmute already opening up, though ice in the main channel is still holding strong.

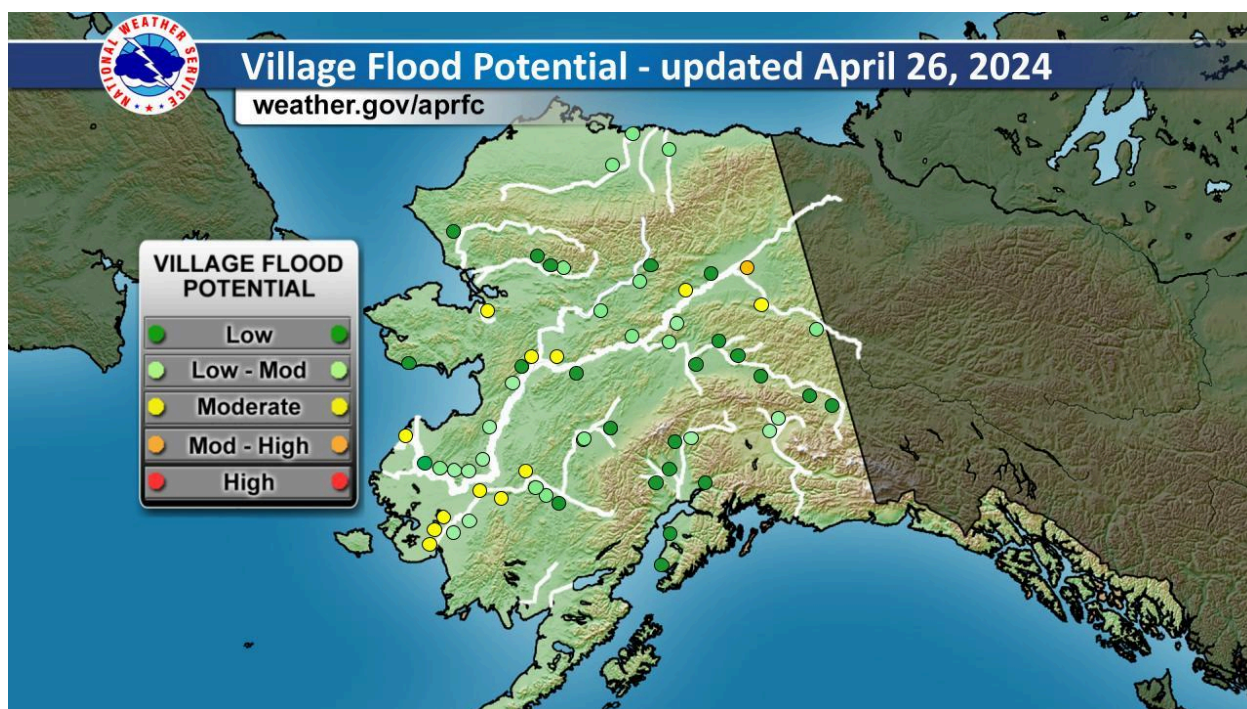
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### Spring Breakup Village Flood Potential along major rivers in Alaska

Spring breakup village flood potential considers the climate outlook, snowpack, ice thickness and condition, historical likelihood of flooding and flood severity, and community knowledge. Village flood potential is reassessed continually as outlooks change and breakup season progresses.



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

### River Ice Observations

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. As of late April, river ice has significantly **degraded** across the Eastern Interior including along the Tanana River and the upper Yukon River. Ice along the Kuskokwim River is also showing signs of degrading with water ponding on the surface and along the sides. Ice along the middle and lower Yukon River still appears **solid** and intact, with little signs of degradation yet.

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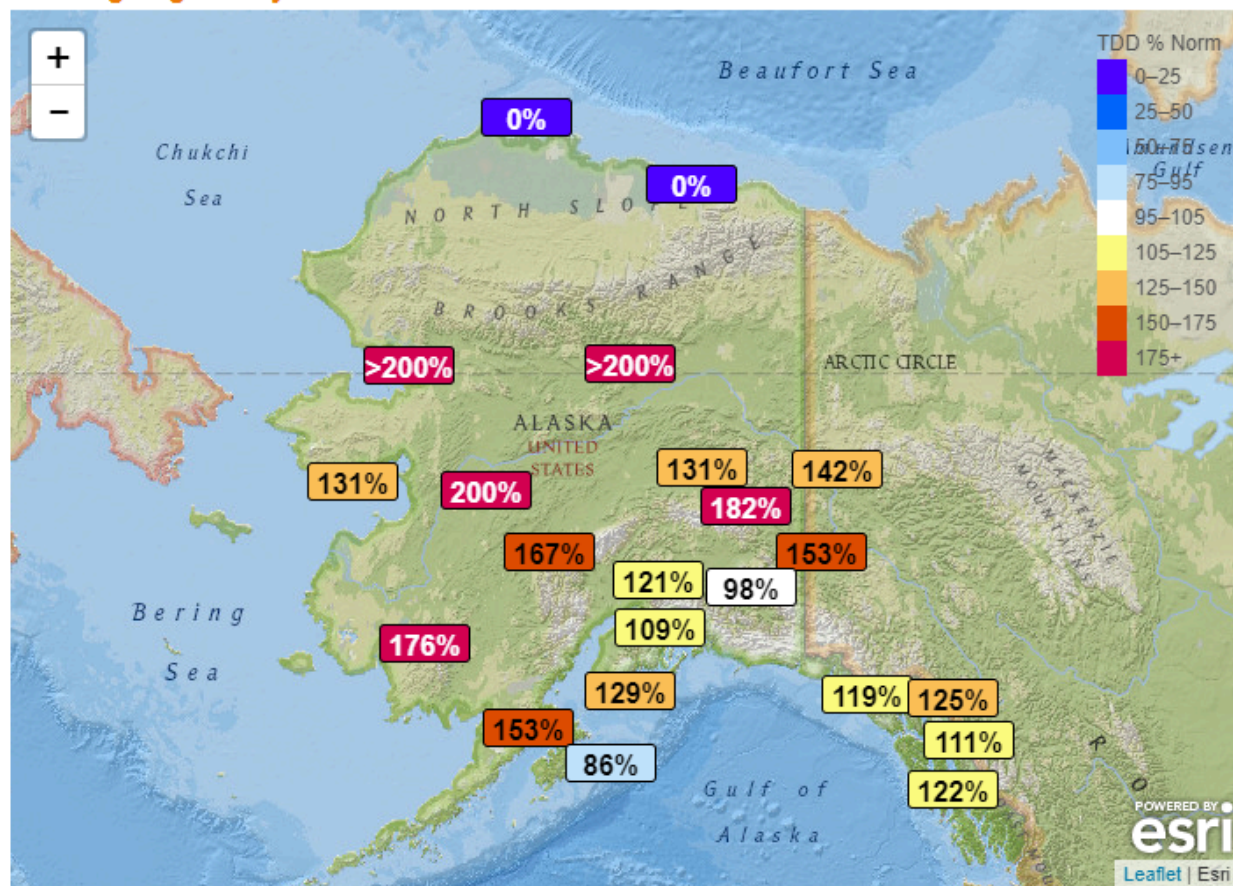
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## Thawing Degree Days

Cumulative thawing degree days (TDD), which are the cumulative number of degrees the average temperature is above freezing for a season and can serve as a way to track how the spring thaw is progressing, are well above average across most of Alaska. The interior has seen the most above average TDDs so far this spring, which has led to depletion of low elevation snowpack and river ice degradation in that area.

### Thawing Degree Days - Percent of Normal



[Link to Thawing Degree Day \(TDD\) map](#)

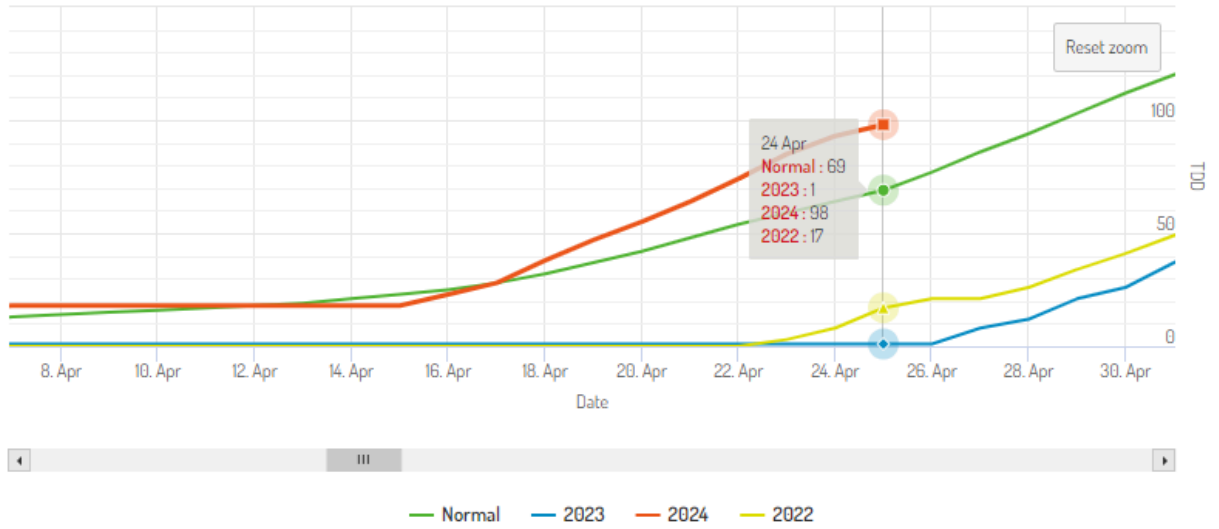
In fact, this year's spring thaw began approximately **2 weeks earlier** than in the preceding two years. For instance, Eagle has already accumulated 98 thawing degree days (TDDs), a stark contrast to the mere 17 and 1 TDDs recorded by this time in 2022 and 2023, respectively.

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### EAGLE AIRPORT THAWING DEGREE DAYS



*Accumulated thawing degree days at Eagle as of Apr 24th showing TDDs so far for 2024, 2023, 2022, and the average TDDs*



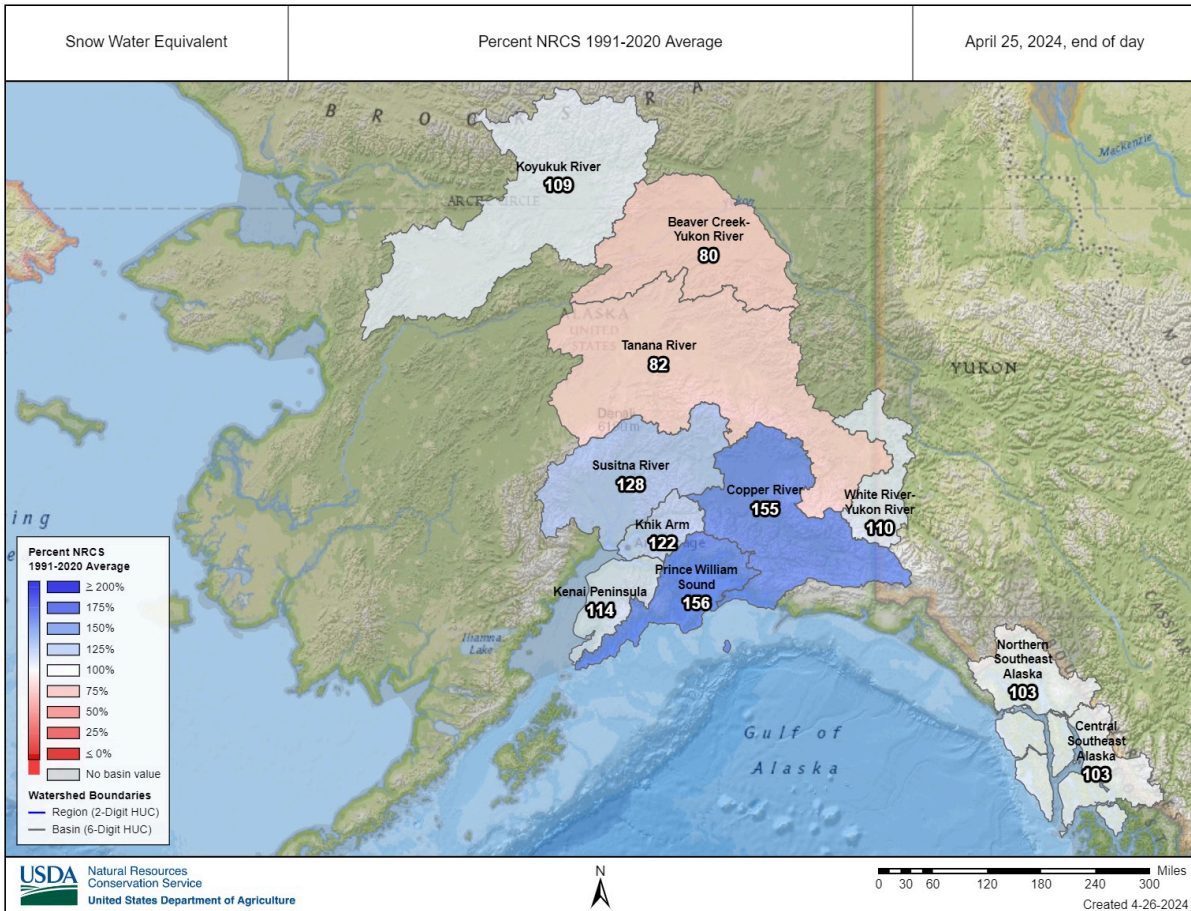
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## Snowpack

[April 25 Natural Resources Conservation Service \(NRCS\) snowpack analysis](#) indicates average to below average snowpack for the interior with still well above average snowpack for Southcentral, especially in the Copper River Basin

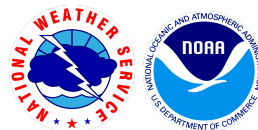


NRCS April 25 Statewide Snow Water Equivalent map

Low elevation snowpack across Southcentral and the eastern Interior has been significantly depleted over the past week or so due to recent warm and sunny conditions. Snow has mostly melted out across the low elevations of the Tanana River Valley as well as the Kuskokwim River valley from Aniak down. As of Friday the 26th, snow still remains in the upper Yukon River Valley, including at Eagle and Fort Yukon, but is melting quickly. There is still abundant snowpack in the upper Kuskokwim River Valley above Aniak, as well as the middle and lower Yukon River Valleys. The Porcupine Basin in the northeastern part of the state had a

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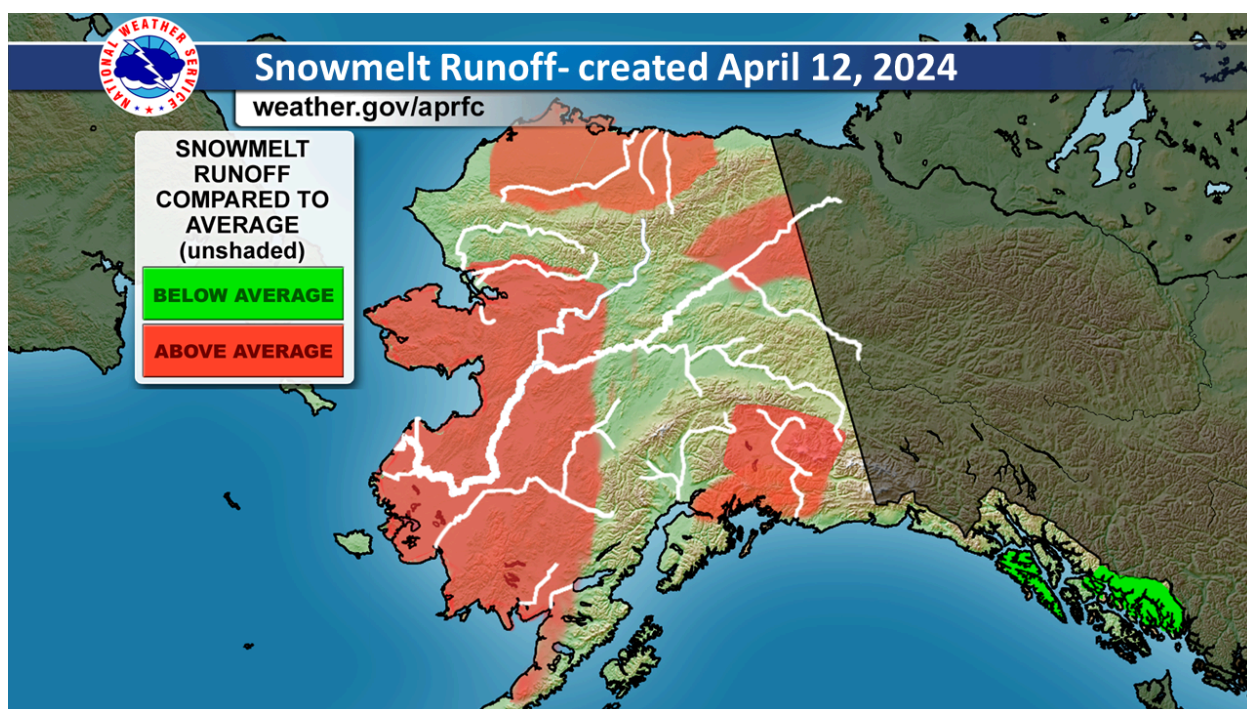
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well-above average snowpack on April 1, with Old Crow village in the northern Yukon Territory recording its highest snowpack levels in over four decades of monitoring. Current satellite imagery shows a robust snowpack up there with little signs of depletion. The snowpack at mid and upper elevations across the interior sits near its seasonal maximum, and signs of the seasonal melt are just beginning to show.

Although snowpack observations are limited, North Slope winter 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

Snowpack depth and extent is used to estimate the snowmelt runoff potential across Alaska.



[Snowmelt Runoff Potential Compared to Average](#)

In summary, the state's snowpack is nearly melted out across low elevations in the Eastern Interior and southcentral with still above average snowpack persisting in the Copper River, middle/lower Yukon, upper Kuskokwim, and Porcupine River Valleys.

The next NRCS Statewide Snowpack Summary is expected after the first week of May.

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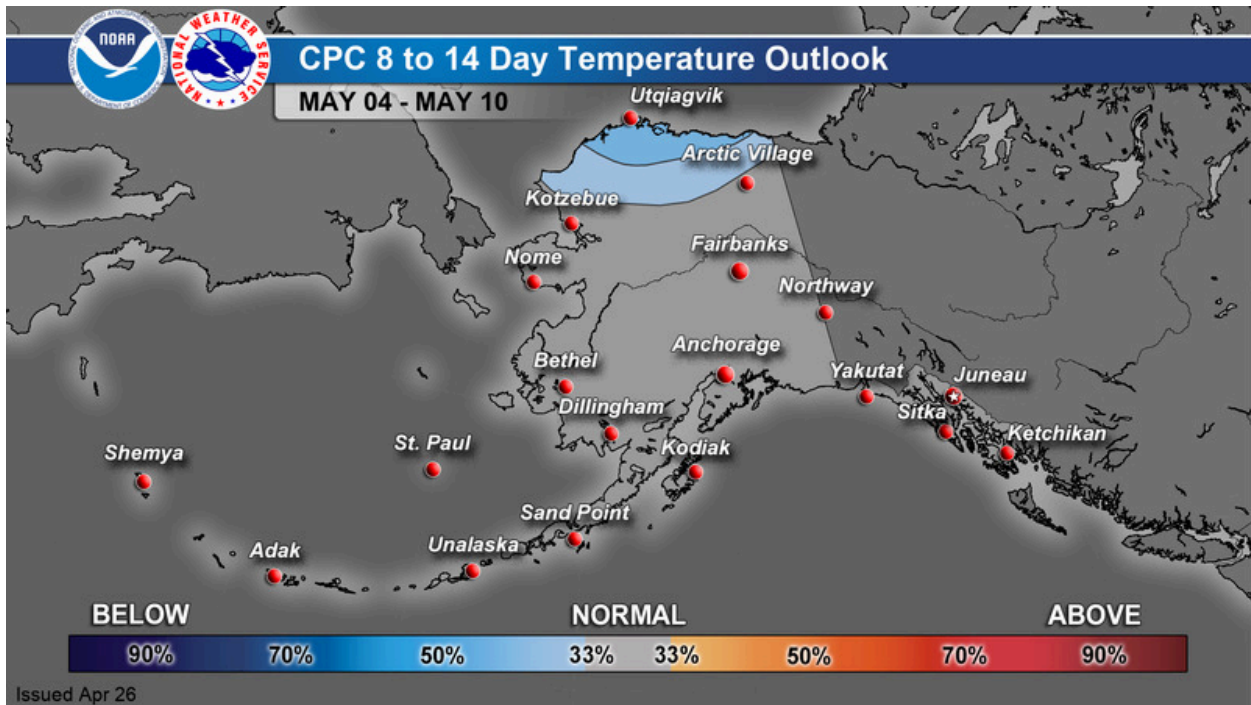
## Climate Outlook

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.

The amplified pattern across mainland Alaska is expected to quickly transition from ridging to troughing through the first week of May. Under this pattern, enhanced cloudiness is expected to moderate temperatures towards climatology for most of Alaska. The Climate Prediction Center's 8-14 day outlook favors normal temperatures across Alaska south of the Brook Range.

While uncertainty is always a factor in long term outlooks, the CPC guidance continues to favor above normal temperatures across central and eastern interior through the third week of May. Across western Alaska, the CPC outlook suggests an equal chance of above, below, or normal temperatures, with a slight tilt towards below normal temperatures across the southwest coast.

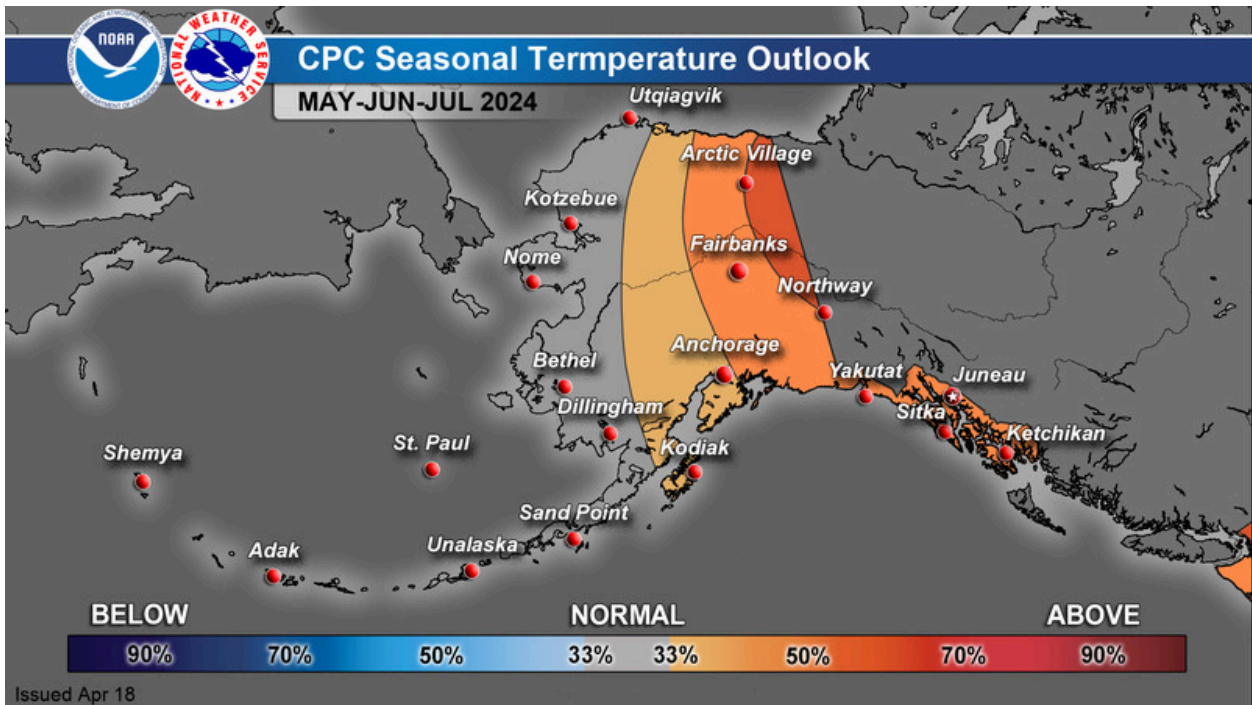
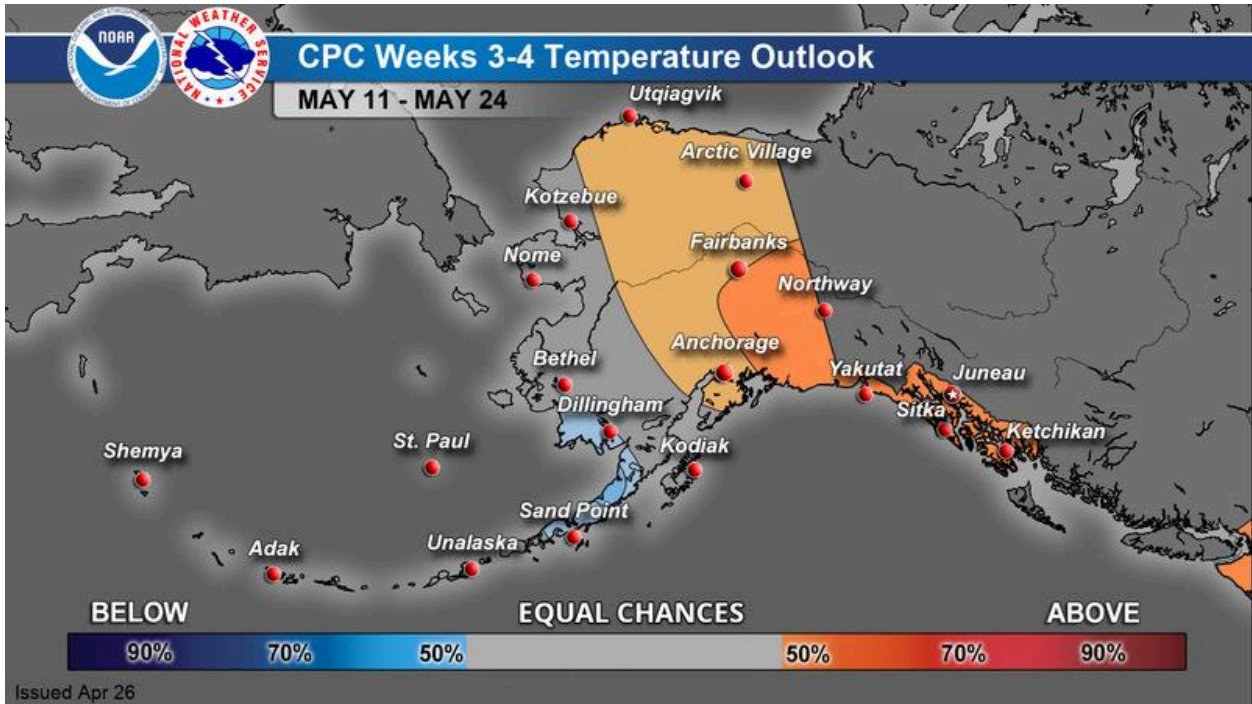
Looking ahead at the longer, 3-month outlook, which includes May, June, and July, there's an elevated probability (40-60% chance) of above-normal temperatures across the eastern two-thirds of Alaska.





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## 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 snowmelt runoff volume, flood potential, and forecast breakup date range for various locations across the state.

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

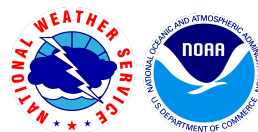
Forecast breakup timing is expressed as a range based on snowmelt runoff volume and flood potential. Locations where breakup has already occurred are identified with two asterisks following a single date; for example, Kuskokwim River at Nikolai breakup occurred on April 16, 2024 (4/16\*\*).

### 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	4/22**
Tanana River		Average				
	Northway		Low	4/26	31	4/24**
	Salcha		Low	4/26	3	4/24**
	Fairbanks		Low	4/26	31	4/24**
	Nenana		Low	4/30	44	4/26-5/2
	Manley HS		Low-Moderate	5/3	32	4/30-5/6

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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	5/1-5/7
	Eagle		Low-Moderate	5/4	44	4/30-5/6
	Circle		Moderate	5/9	40	5/6-5/12
	Fort Yukon		Moderate-High	5/11	40	5/8-5/14
	Beaver		Low	5/10	27	5/7-5/13
	Stevens Village		Moderate	5/11	25	5/9-5/15
	Rampart		Low-Moderate	5/11	27	5/9-5/15
		Average				
	Tanana		Low-Moderate	5/8	39	5/7-5/13
	Ruby		Low	5/9	38	5/8-5/14
	Galena		Moderate	5/11	43	5/10-5/16
	Koyukuk		Moderate	5/9	17	5/8-5/14
	Nulato		Low	5/12	26	5/11-5/17
	Kaltag		Low-Moderate	5/12	38	5/11-5/17
	Anvik		Low-Moderate	5/14	35	5/13-5/19
Yukon River (Lower)		Above				
	Holy Cross		Low-Moderate	5/14	37	5/13-5/19
	Russian Mission		Low-Moderate	5/15	37	5/14-5/20
	Marshall		Low-Moderate	5/15	32	5/14-5/20
	Pilot Station		Low-Moderate	5/13	27	5/12-5/18
	Mountain Village		Low	5/14	37	5/13-5/19
	Alakanuk/Em monak		Moderate	5/20	38	5/19-5/25



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Koyukuk River		Above				
	Bettles		Low	5/10	42	5/7-5/13
	Allakaket		Low-Moderate	5/11	37	5/8-5/14
	Hughes		Low-Moderate	5/11	37	5/8-5/14

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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	4/16**
	McGrath		Low-Moderate	5/5	44	5/2-5/8
	Stony River		Low	5/2	36	4/29-5/5
	Sleetmute		Low-Moderate	5/1	35	4/28-5/4
	Red Devil		Low-Moderate	5/4	38	5/1-5/7
	Crooked Creek		Moderate	5/4	38	5/1-5/7
	Aniak		Moderate	5/6	41	5/4-5/10
	Kalskag		Moderate	5/5	35	5/3-5/9
	Tuluksak		Low-Moderate	5/7	32	5/5-5/11
	Akiak		Low-Moderate	5/8	38	5/6-5/12
	Kwethluk		Moderate	5/5	12	5/3-5/9
	Bethel		Moderate	5/9	44	5/7-5/13
	Napakiak		Moderate	5/9	29	5/7-5/13

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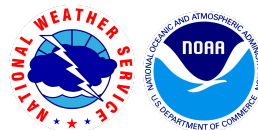
## Southeast/Southcentral

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			4/1**
Anchor River		Average	Low	4/17	16	4/17**
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	4/30-5/6
Skwentna		Average				
	Skwentna		Low	4/30	29	4/24**
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
Seward Peninsula		Above				
	Buckland		Moderate	5/18	34	5/16-5/22
Kobuk River		Above				
	Kobuk		Low-Moderate	5/14	40	5/12-5/18
	Shungnak		Low	5/16	32	5/14-5/20
	Ambler		Low	5/16	38	5/14-5/20
	Kiana		Low	5/18	13	5/16-5/22
Noatak River		Above				
	Noatak		Low	5/19	26	5/17-5/23
Brooks Range		Above				
	Colville at Umiat		Low-Moderate	5/24	21	5/20-5/26
	Colville at Colville Village		Low-Moderate	6/3	22	5/30-6/5
Sagavanirktok River		Above				
	Dalton Highway		Low-Moderate			5/24-5/30

The next Spring Breakup Outlook will be published May 3, 2024.

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

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