Spring Breakup Outlook for Alaska
Valid May 3, 2024
Alaska-Pacific River Forecast Center
Next Product Issuance: May 10, 2024
www.weather.gov/aprfc

EXPERIMENTAL PRODUCT

Spring Breakup and Flood Potential Outlook

Current Conditions

- Upper Yukon River- The main breakup front is upstream of Eagle, between Dawson and the Fortymile River. The ice continues to slowly degrade between the Fortymile and Eagle, and the strongest ice is at Eagle Bluffs, downstream of the Seventy Mile River. Of note, ***the ice appears to gain strength between Eagle and Circle***,
- Middle and Lower Yukon - No changes yet, anticipate timing to be close to normal.
- Tanana - Breakup front is downstream of Manley Hot Springs. The Tanana at Nenana broke up on 4/27, 3 days ahead of median. The Chena is mostly open. ***Post breakup, water levels are increasing due to snowmelt along the Tanana.***
- Kuskokwim - Breakup front is at Kalskag, where minor flooding is occurring on 5/3/2024. Ice is largely in-place downstream of Kalskag and ice free upstream.
- Southcentral - Breakup is progressing, with many of the lower elevation streams ice free. ***Snowmelt flooding is occurring in Glennallen.***

Forecast Conditions

- Yukon - Eagle will be breaking up soon. Because the ice gains strength between Eagle and Circle, hydrologists will be watching the ice front carefully for flood potential in Circle. Satellite imagery of the Porcupine indicates that it is still white ice and has not yet begun melting. Water levels in Galena are coming up slowly, but no signs of breakup yet.
- Tanana - hydrologists will be watching the pulse of snowmelt for the coming days. Temperatures in Fairbanks are expected to stay above freezing, even at night.
- Kuskokwim - Cooler temperatures will modulate the speed of breakup, however the ice seems generally weak so a complete stall is unlikely.
- Southcentral - Snowmelt flooding is expected to continue in Glennallen as snowpack is still present.

The 2024 spring breakup is trending more towards a **thermal*** breakup across the Eastern Interior due to warmed late April temperatures, 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. The one exception to the thermal trend is the community of Circle, which still appears to have strong ice

in place. Across the western part of the state, including the middle/lower Yukon River, breakup is still trending towards a **dynamic*** breakup with a robust snowpack and intact river ice persisting early May. The Kuskokwim appears to be experiencing a largely thermal breakup. Despite cooler April temperatures, the ice on the upper river was weak, with breakup between Stony River and Kalskag occurring between May 1st and 3rd.

*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 is well underway this week. The Tanana is mostly ice-free, the upper and middle Kuskokwim broke up this week, breakup is imminent at Eagle, and many of the low elevation streams and rivers in Southcentral are mostly open. The Yukon is still frozen above Circle, and it is still winter in the Brooks Range and the Arctic. Forecast breakup dates in the table below have been adjusted per recent model analysis, but are largely near normal.

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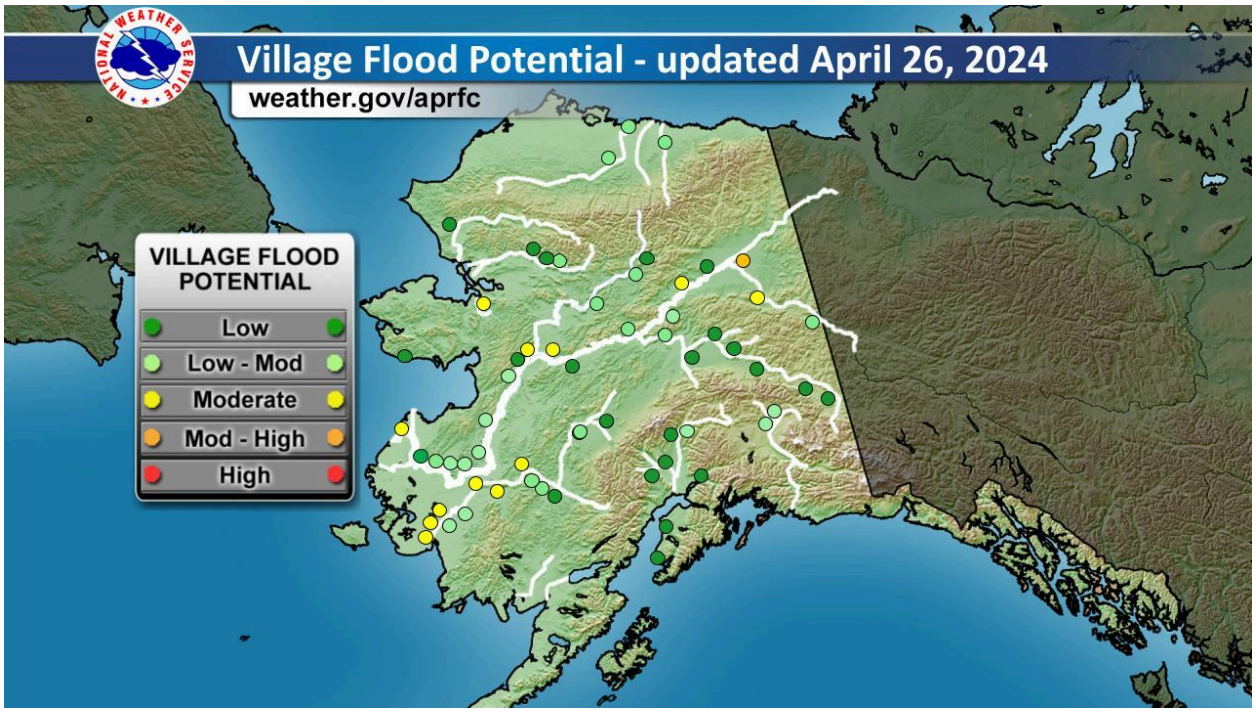
Spring Breakup Village Flood Potential along major rivers in Alaska

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

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River Ice Observations

Late March through mid-April measurements indicate that ice thicknesses were near normal across the state. The ice condition status as of 5/3:

APRFC Breakup Map - 3 May 2024 2:35:30 PM AKDT


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**********************************************************************
* EVEN THOUGH A PARTICULAR RIVER OR REACH MAY BE DESCRIBED AS MOSTLY  *
* OPEN OR OPEN... IT IS STILL POSSIBLE FOR RUNS OF ICE AND DEBRIS TO  *
* MOVE THROUGH AS HEADWATERS UPSTREAM BREAKUP.  PLEASE USE CAUTION AT *
* ALL TIMES WHEN ATTEMPTING TO NAVIGATE RIVERS.                       *
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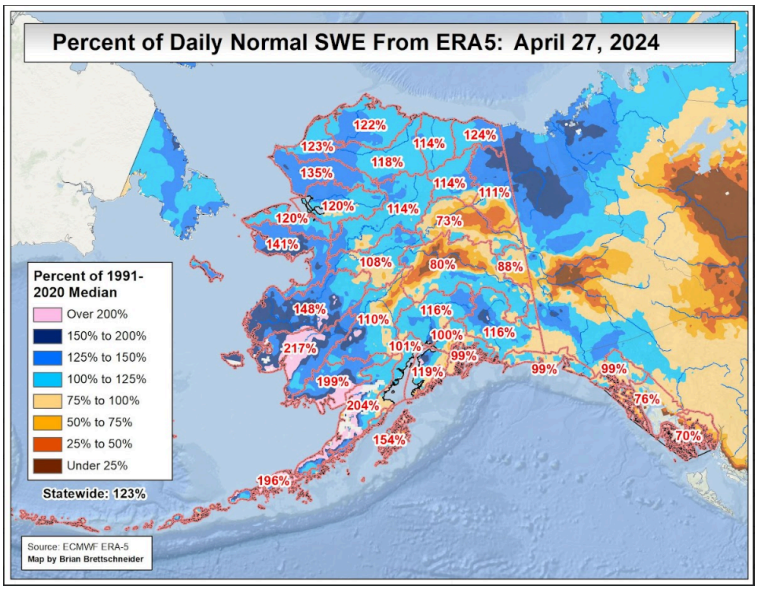
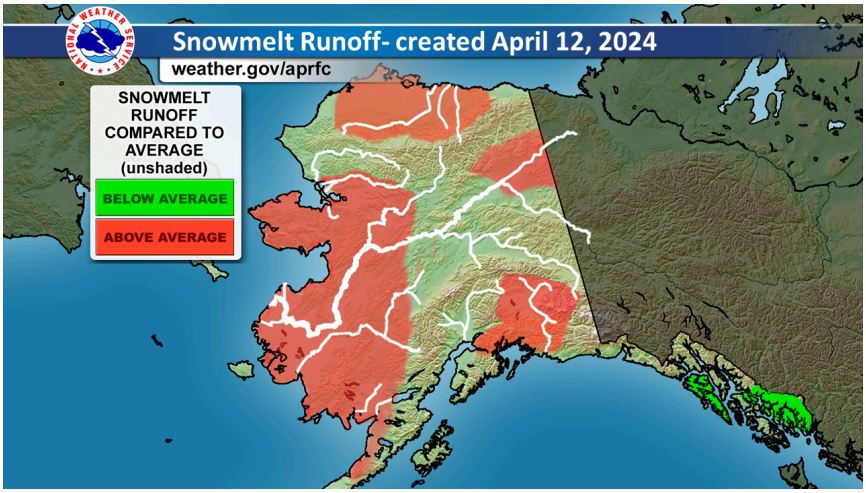
Link to current breakup map

Snowpack



The modeled snow water equivalent map for April 27th, above, shows that melt is well underway in the central interior, but there is still snow to melt in western Alaska, southcentral, and the northern Yukon Territory.

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

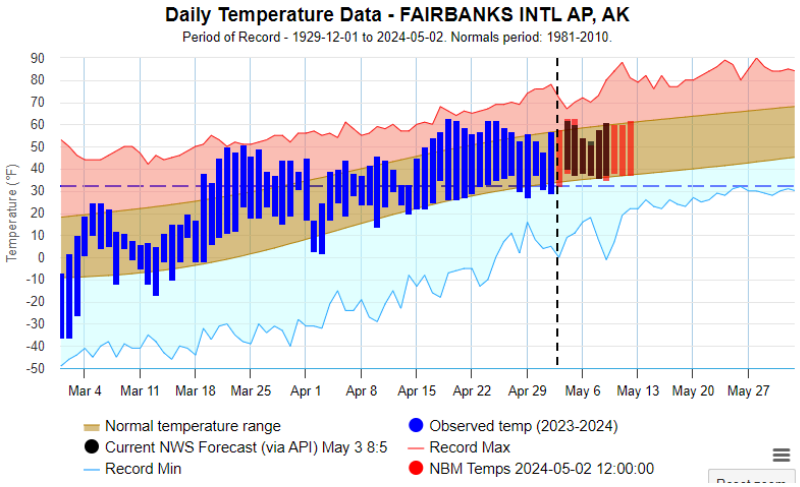


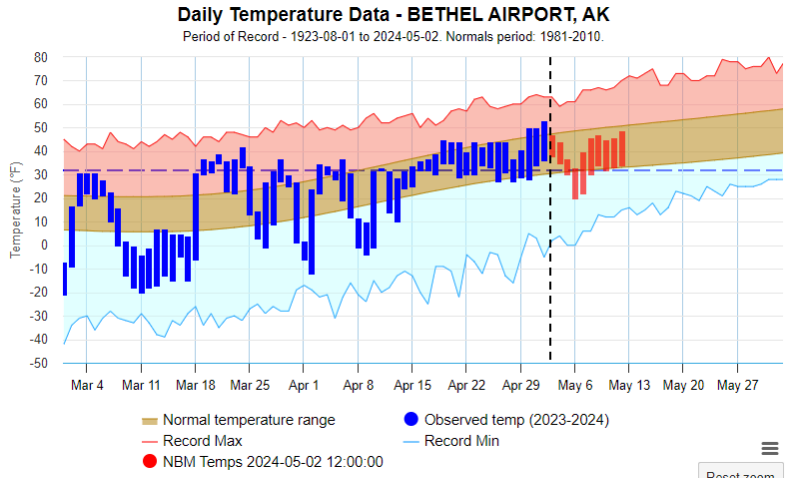
Snowmelt Runoff Potential Compared to Average

Climate Outlook

The most important factor determining the severity of ice jam breakup remains weather immediately prior to and during breakup. Dynamic breakups, with the high potential for ice jam flooding typically require an abrupt warm up in temperature.

In the near term, temperatures in the interior are close to climate normals, with highs in the 50s and lows in the 30s. In Bethel, highs will be in the 40s, and lows in the 30s. The relatively normal temperatures and slow warm up are good indicators of trending towards a thermal breakup.





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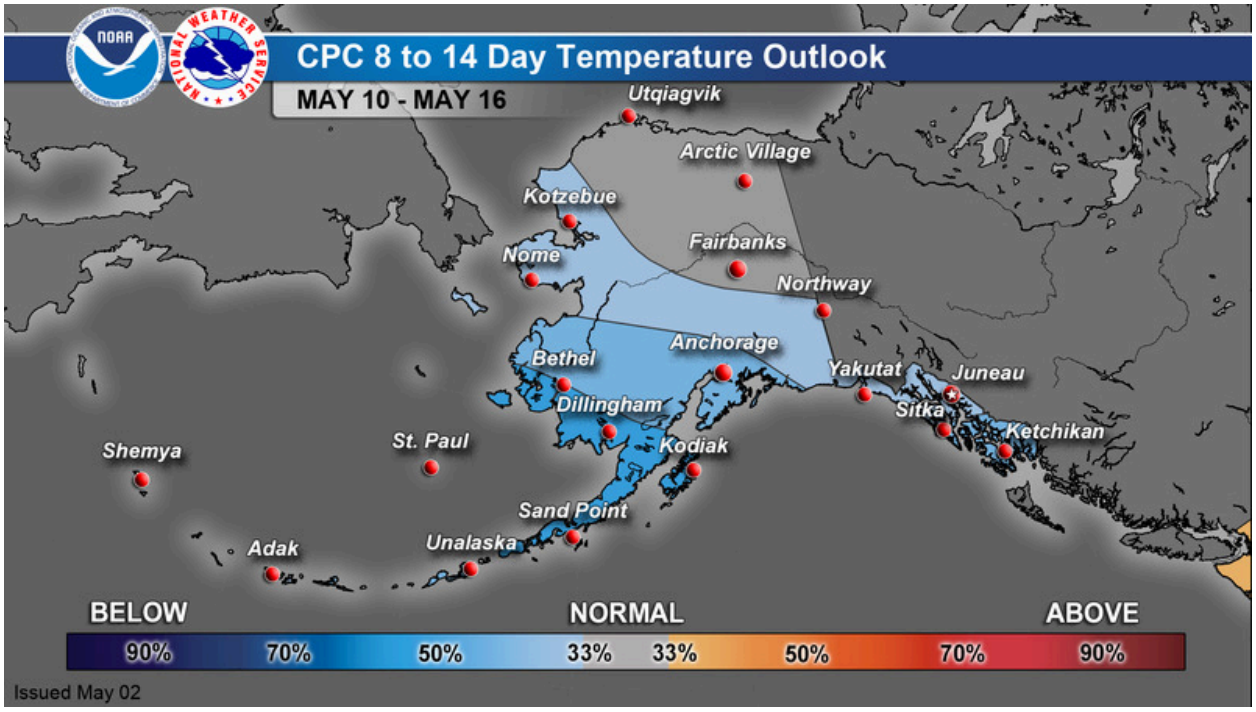

The Climate Prediction Center temperature outlook for mid May indicates an increased chance of cooler than normal temperatures for southwest Alaska and normal temperatures for the eastern interior and north slope. Cooler temperatures in mid May have the greatest impact on the Lower Yukon River; the key will be where the ice jam front comes into contact with stronger downstream ice.

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	4/25**
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	4/27**
	Manley HS		Low	5/3	32	5/1**

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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	5/5	44	5/1**
	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	5/6-5/12
	Ruby		Low	5/9	38	5/7-5/13
	Galena		Moderate	5/11	43	5/9-5/15
	Koyukuk		Moderate	5/9	17	5/7-5/13
	Nulato		Low	5/12	26	5/10-5/16
	Kaltag		Low-Moderate	5/12	38	5/10-5/16
	Anvik		Low-Moderate	5/14	35	5/12-5/18
Yukon River (Lower)		Above				
	Holy Cross		Low-Moderate	5/14	37	5/11-5/17
	Russian Mission		Low-Moderate	5/15	37	5/12-5/18
	Marshall		Low-Moderate	5/15	32	5/12-5/18
	Pilot Station		Low-Moderate	5/13	27	5/11-5/17
	Mountain Village		Low	5/14	37	5/12-5/18
	Alakanuk/Emmonak		Moderate	5/20	38	5/18-5/24
Koyukuk River		Above				

	Bettles		Low	5/10	42	5/5-5/11
	Allakaket		Low-Moderate	5/11	37	5/6-5/12
	Hughes		Low-Moderate	5/11	37	5/6-5/12

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	5/5	44	5/1**
	Stony River		Low	5/2	36	5/2**
	Sleetmute		Low	5/1	35	5/2**
	Red Devil		Low	5/4	38	5/1**
	Crooked Creek		Low	5/4	38	5/1**
	Aniak		Low	5/6	41	5/2**
	Kalskag		Moderate	5/5	35	5/3**
	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		Average	Low			
Susitna River		Average				
	Gold Creek		Low	5/2	9	4/30**
	Sunshine		Low	5/2	35	5/1**
Talkeetna		Average				
	Talkeetna		Low	4/28	5	4/26**
Yentna River		Average				
	Lake Creek		Low	5/2	32	4/28**
Skwentna		Average				
	Skwentna		Low	4/30	29	4/24**
Copper River		Above				
	Gakona		Low	4/30	35	5/2**
	Gulkana		Low-Moderate	5/1	34	5/2**

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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	5/21-5/27
	Colville at Colville Village		Low-Moderate	6/3	22	5/31-6/6
Sagavanirktok River		Above				
	Dalton Highway		Low-Moderate			5/24-5/30

The next Spring Breakup Outlook will be published May 10, 2024.

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

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