



Recap of the 2018 Breakup Along the Yukon and Kuskokwim Rivers

Alaska Pacific River Forecast Center

May 22nd 2018



Outline

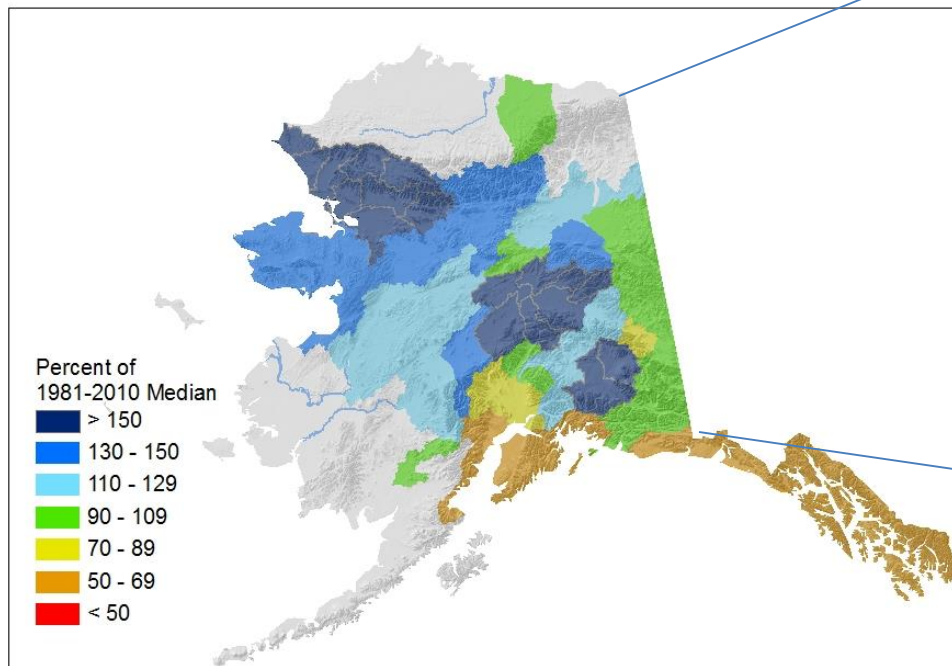


- Recap of Winter Conditions
- Mechanical vs. Thermal Breakup
- Review 2018 Breakup Outlook
- Riverwatch on the Yukon and Kuskokwim Rivers
- Breakup Up Dates
- Questions

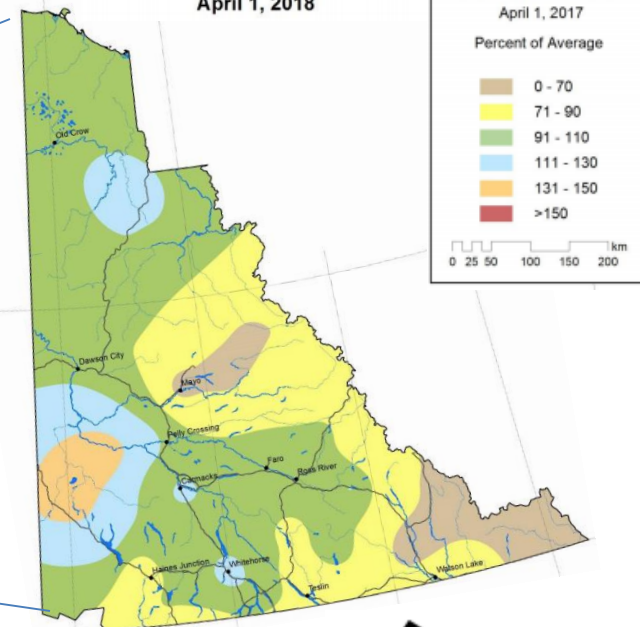
2018 Snow Conditions

Alaska Snowpack as of April 1, 2018

Based on Snow Course and SNOTEL site Snow Water Content



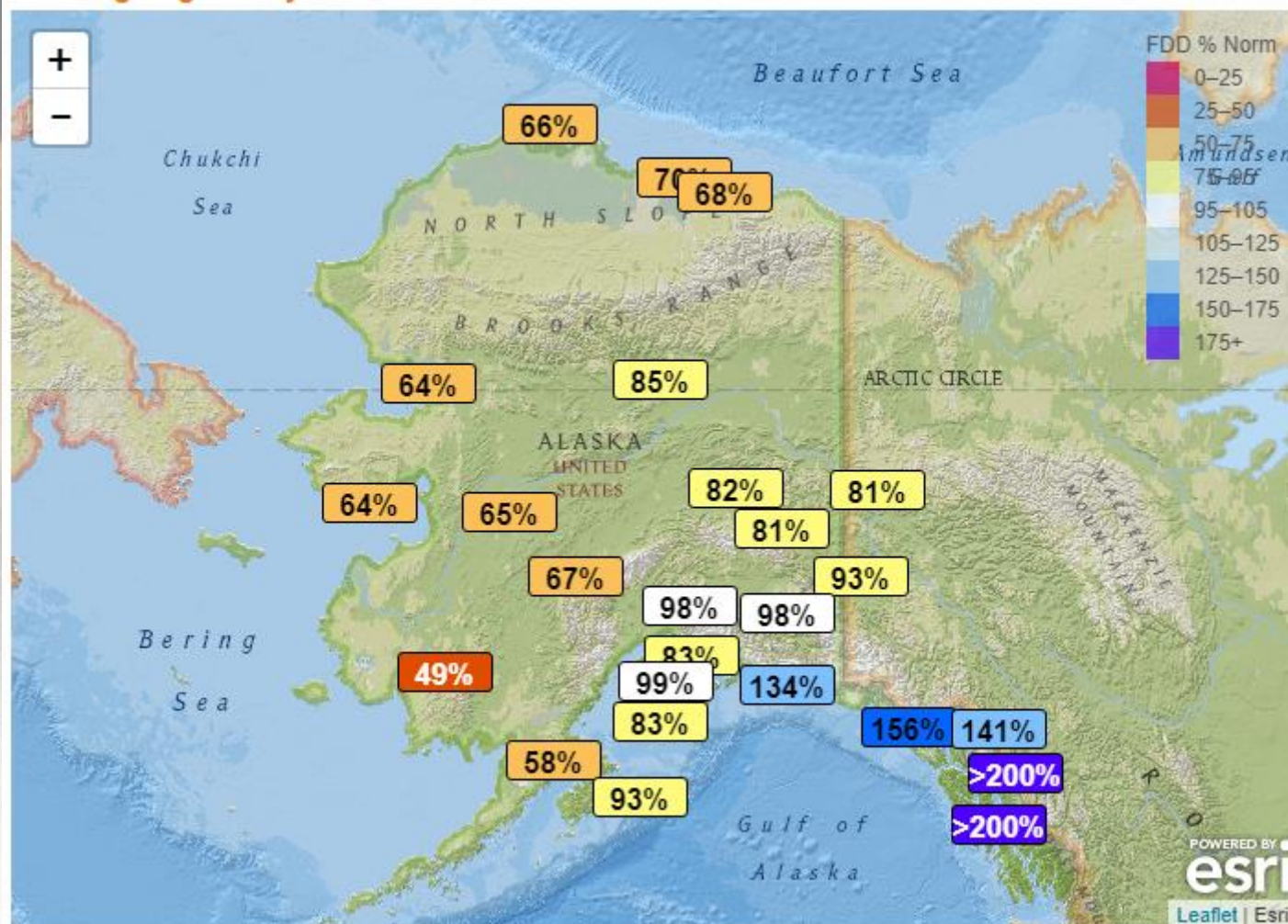
Snow Water Equivalent Percent of Normal April 1, 2018



Yukon
Environment

2018 Winter Temperatures

Freezing Degree Days - Percent of Normal

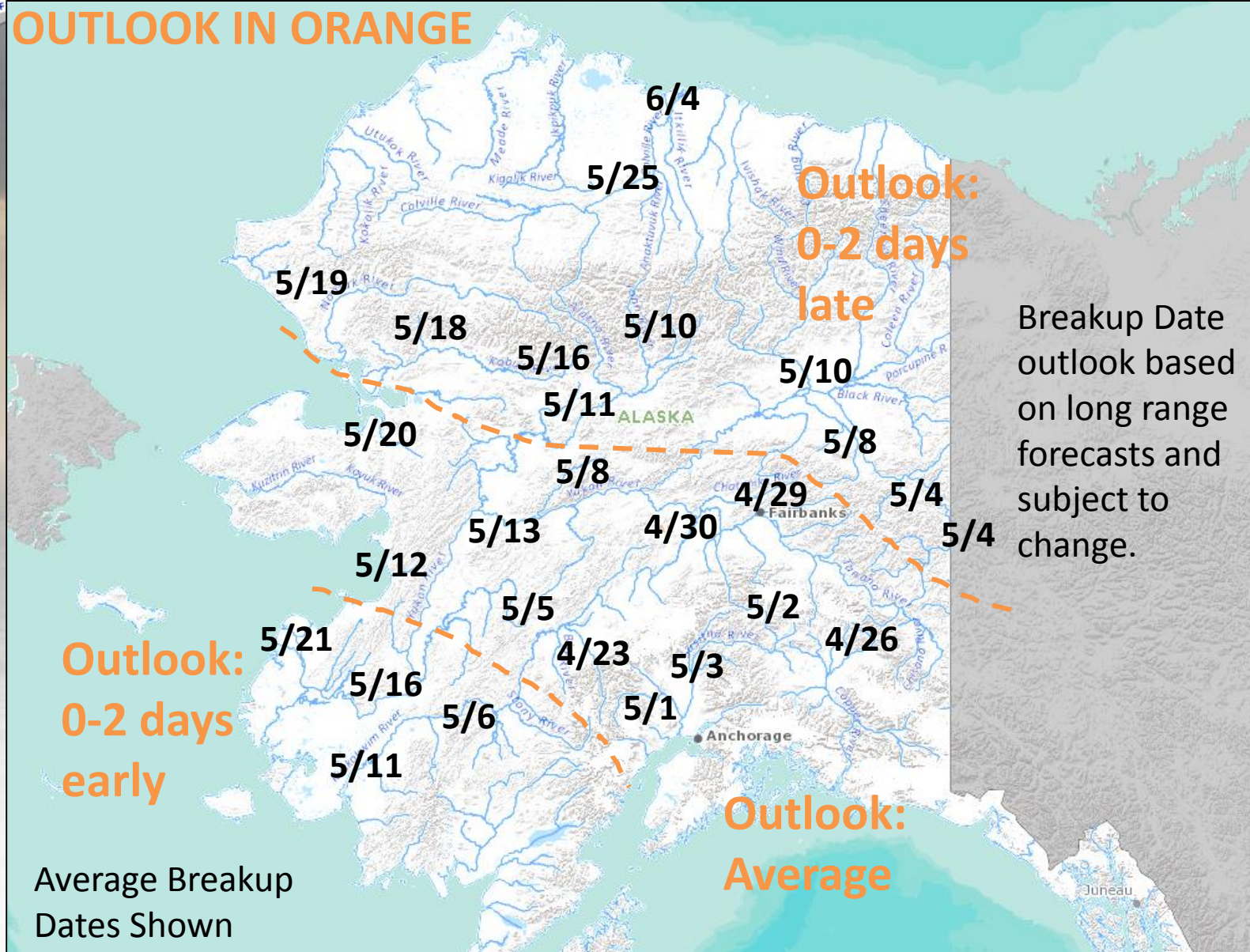


$$t_i = \alpha \sqrt{AFDD}$$

Ice thickness is related to Accumulated Freezing Degree Days

April Breakup Date Outlook

OUTLOOK IN ORANGE





Flood Outlook Potential



Spring Flood Potential created April 10, 2018

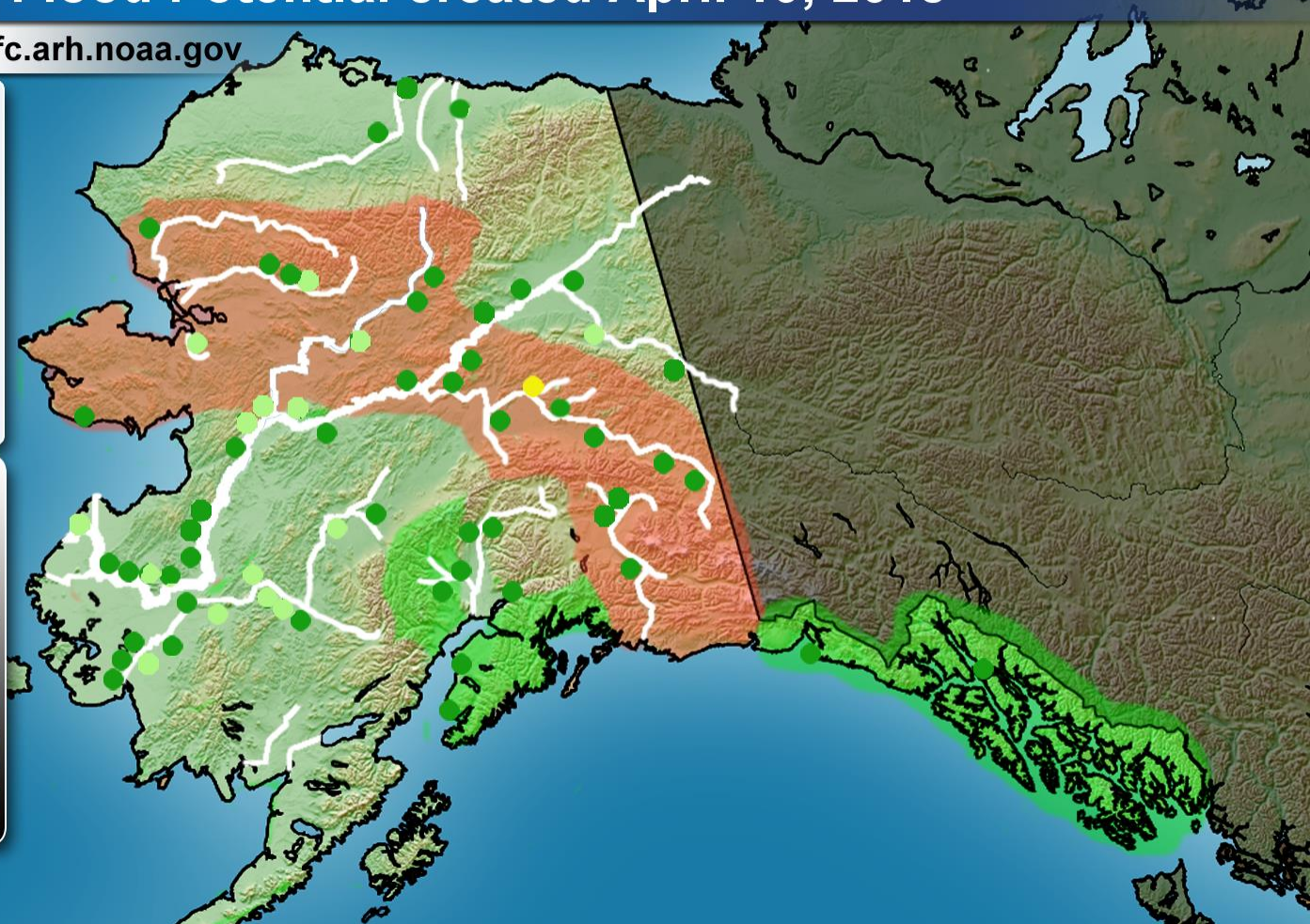
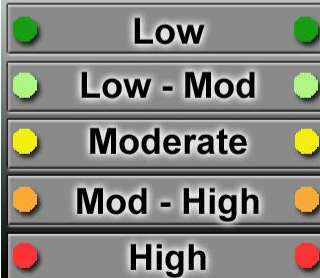
<http://aprfc.arh.noaa.gov>

SNOWMELT
RUNOFF
COMPARED TO
AVERAGE
(unshaded)

BELOW AVERAGE

ABOVE AVERAGE

VILLAGE FLOOD
POTENTIAL





What did we anticipate in April?

2018 Breakup Outlook (from April)

- We expected breakup to favor the mechanical process in the middle and upper Yukon and Kuskokwim Rivers and trend towards thermal breakup along the lower reaches.
- Spring breakup flood potential is currently rated as low to low-moderate statewide. However, Spring Breakup may be much closer to the normal this year than the past 4 years.
- Heavy snowpack for most of the state increases the chance of snowmelt flooding.

Breakup Overview

Breakup – the transition from an ice covered river to ice-free open water



Bethel 1973

Thermal Breakup



Photo: S. Beltaos

Mechanical Breakup

Dynamic or Mechanical transition from an ice covered river to ice-free open water



Galena Flooding May 28, 2013

Bishop Rock May 27, 2013



Mechanical Breakup

Dynamic or Mechanical transition from an ice covered river to ice-free open water



Aniak April 30th 2018

Mechanical Breakup

Dynamic or Mechanical transition from an ice covered river to ice-free open water



Aniak May 2nd 2018

Mechanical Breakup

Dynamic or Mechanical transition from an ice covered river to ice-free open water



Aniak May 2nd 2018

Mechanical Breakup

Dynamic or Mechanical transition from an ice covered river to ice-free open water



Aniak May 2nd 2018



River Monitoring 2018



River Watch

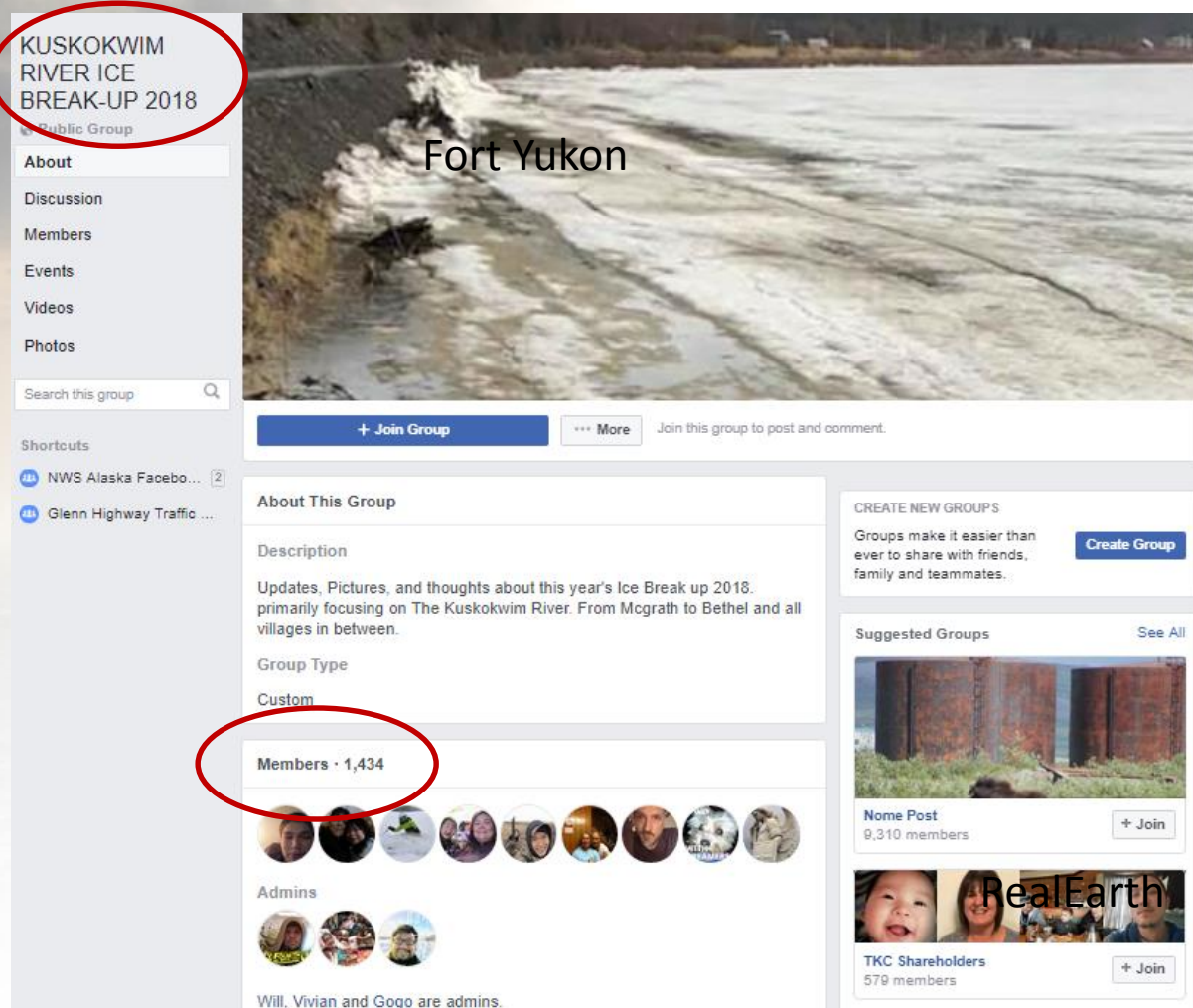




Tracking Social Media

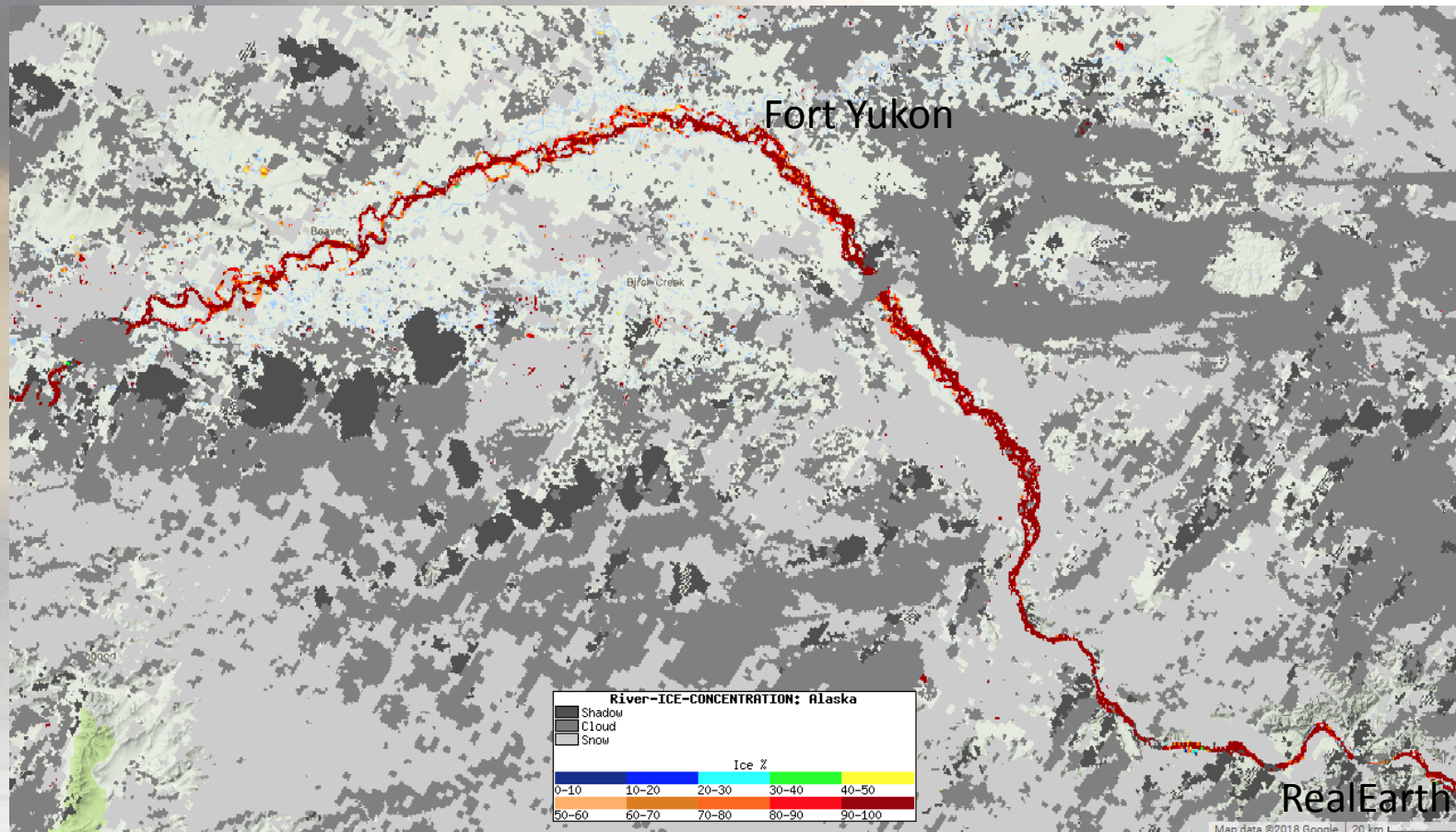
Local Group:

Updates, Pictures, and thoughts about this year's Ice Break up 2018. Primarily focusing on The Kuskokwim River from McGrath to Bethel and all villages in between.



1,400+ members in less than a month
24 Videos and 302 Photos Posted
Users responsive to questions from NWS staff

Satellite Imagery



Yukon from Circle to Beaver April 27, 2018



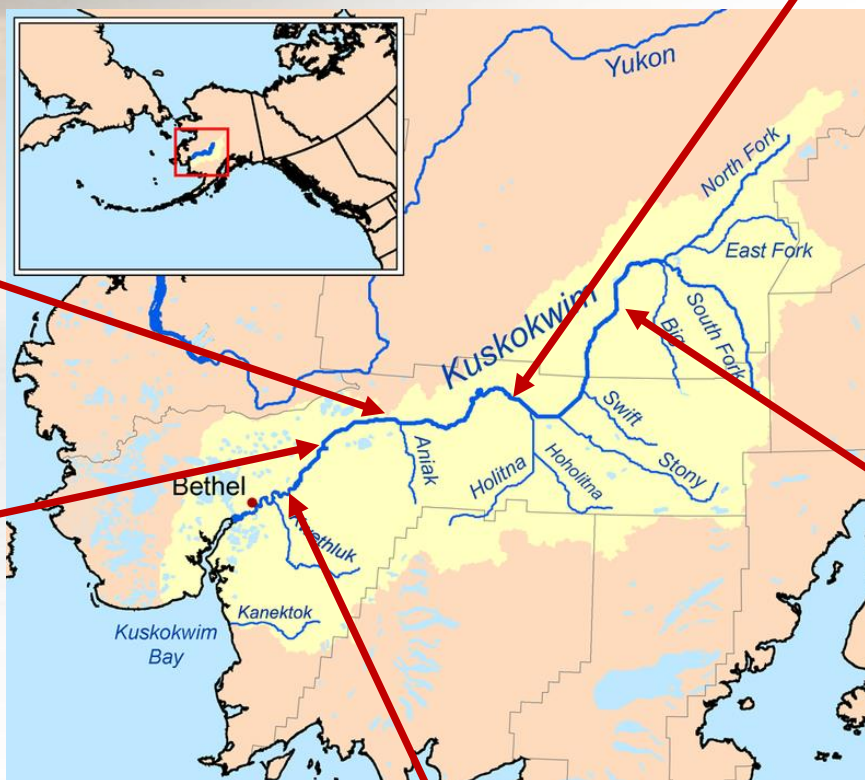
Kuskokwim River

April 30th

* Flood Advisory for... An Ice Jam in... The Kuskokwim River from Red Devil to Crooked Creek

May 1st

* Flood Advisory for... An Ice Jam in... Aniak along the Kuskokwim River



May 7th

* Flood Warning for... An Ice Jam in... The Kuskokwim River Downstream of Lower Kalskag at Coffee Bend

May 9th

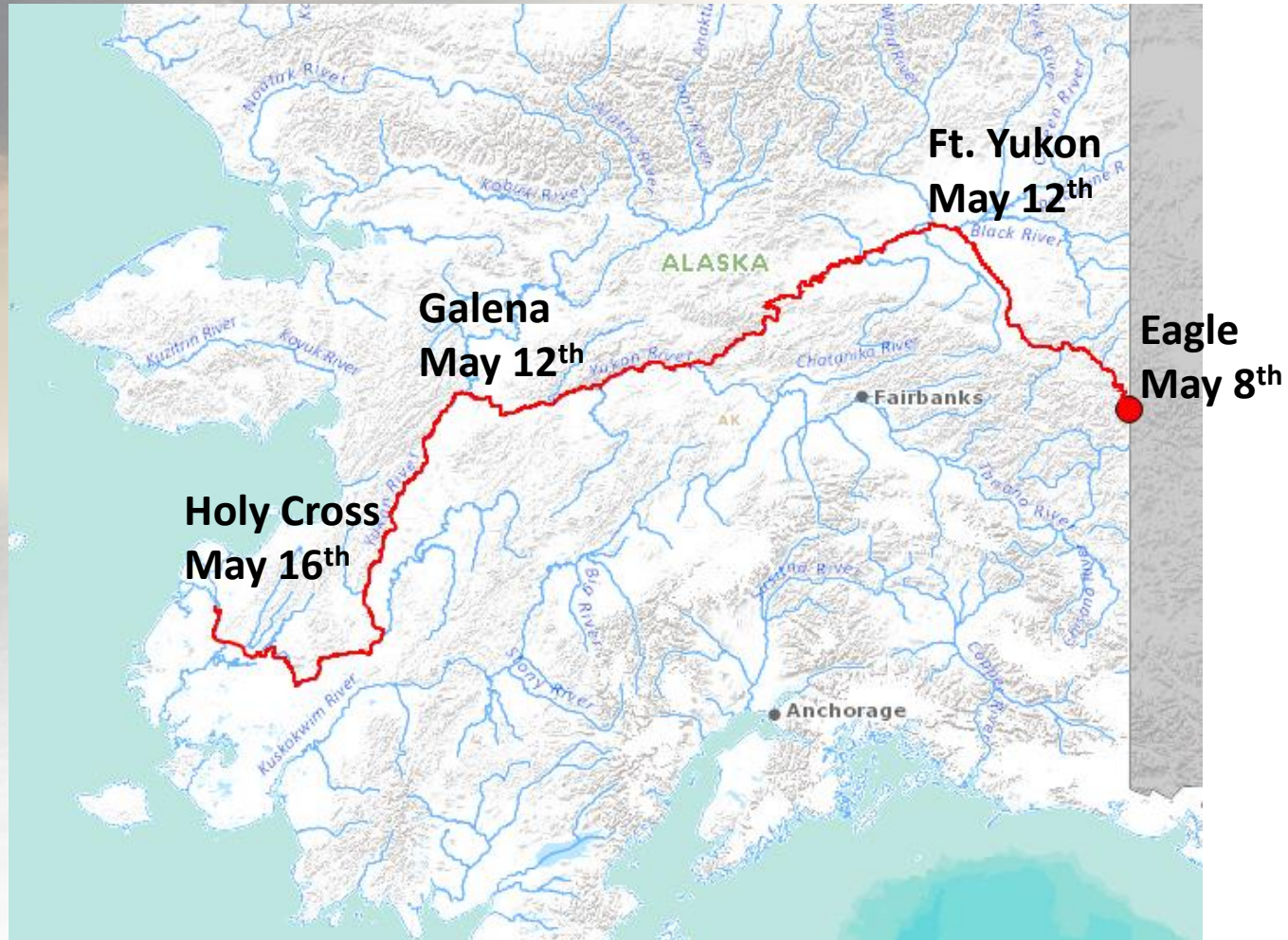
Upper Kuskokwim (McGrath) Breaks Up

May 8th

* Flood Warning for... An Ice Jam in... The Kuskokwim River near Tuluksak



No Flood Products Issued!





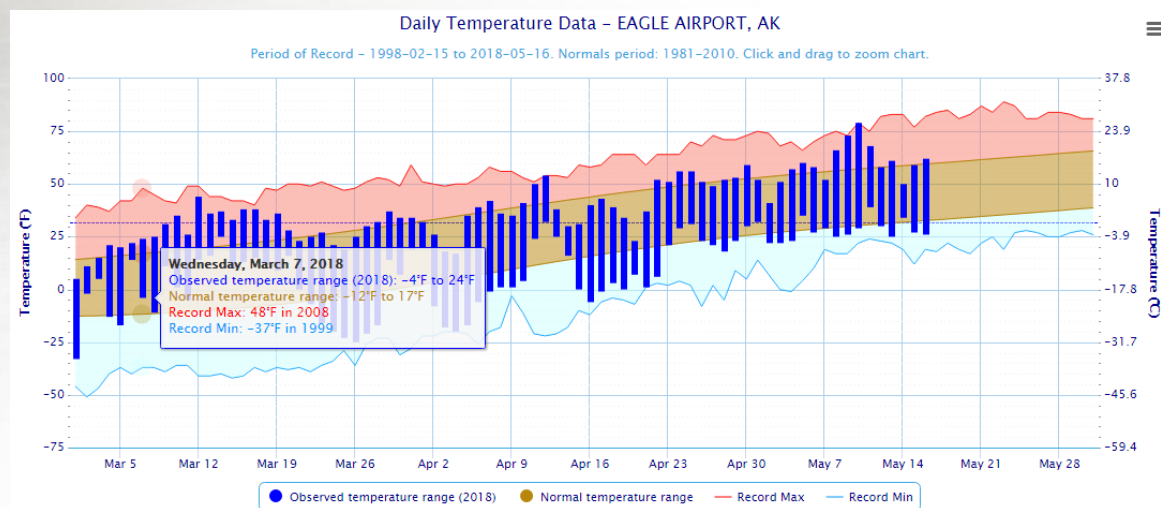
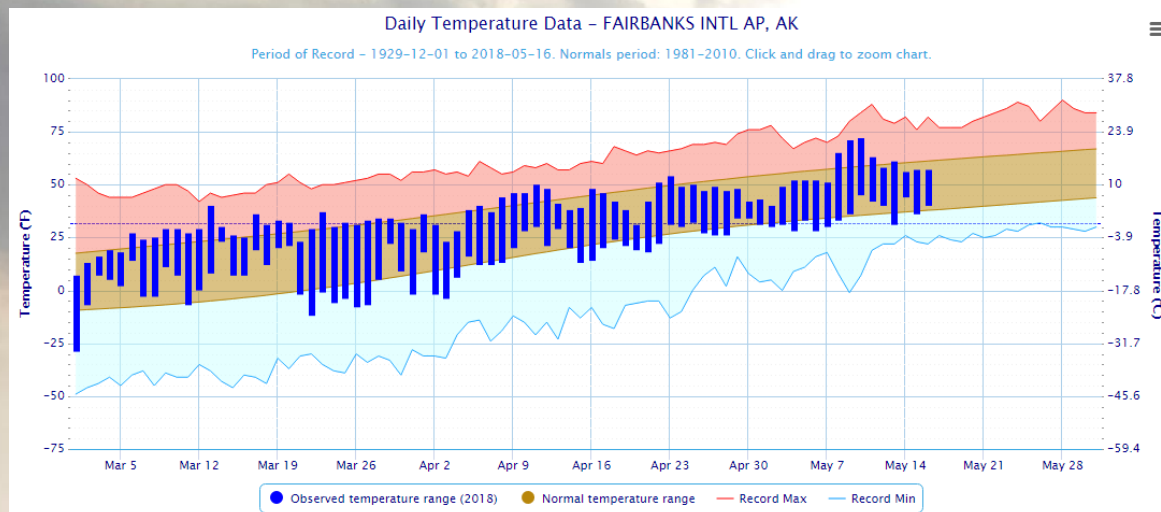
Yukon River



Photo Credit: <http://www.yukonriverbreakup.com/>



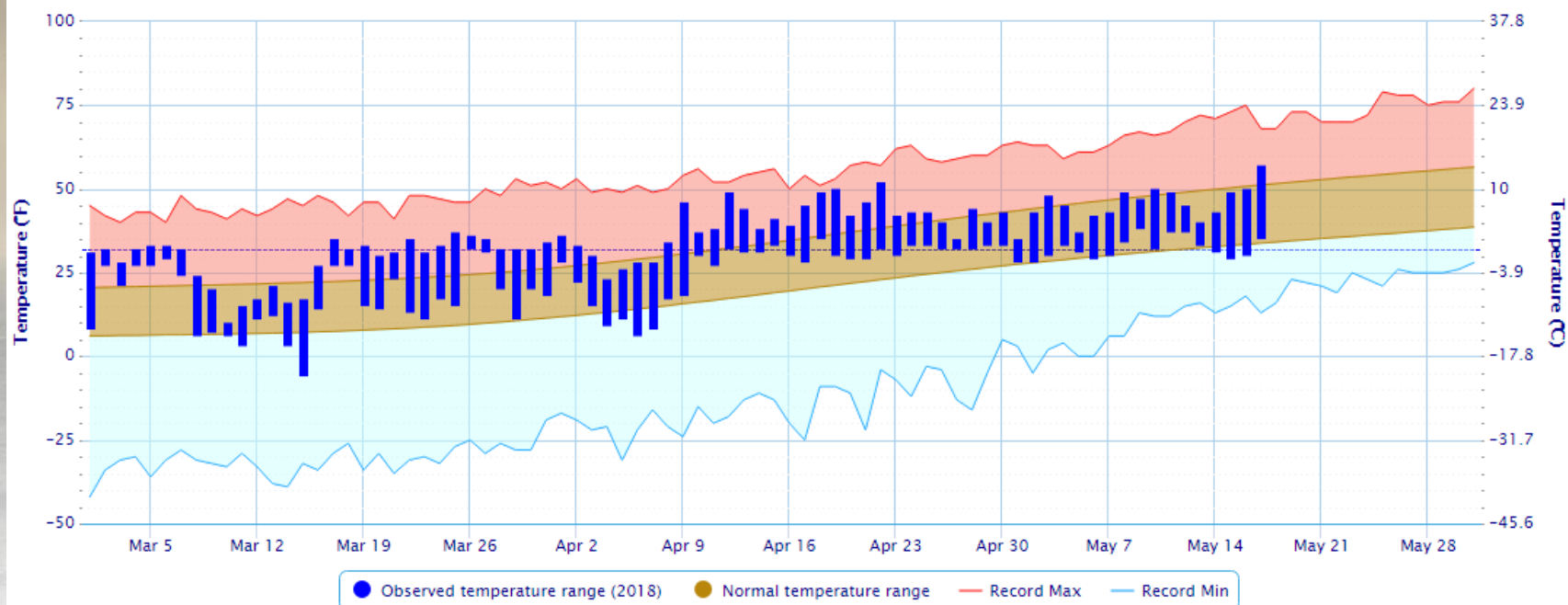
2018 Temperature Influence



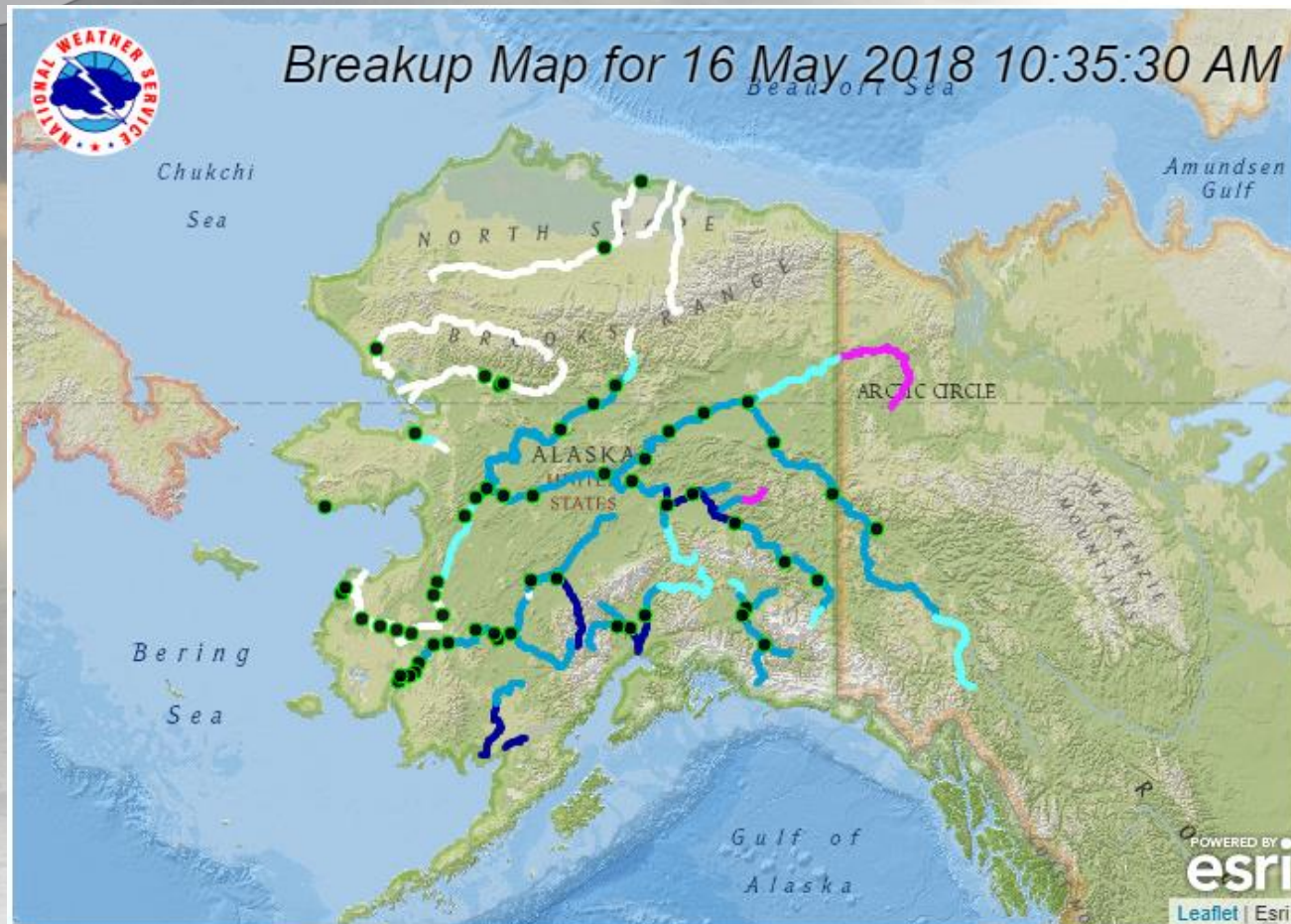
2018 Temperature Influence

Daily Temperature Data – BETHEL AIRPORT, AK

Period of Record – 1923-08-01 to 2018-05-17. Normals period: 1981-2010. Click and drag to zoom chart.



Alaska Breakup Map



This map allows you to view the breakup status of major rivers. Click a site for more breakup information.

River Status

Unknown
Mostly Ice
Some Open
Mostly Open
Open
Flood Watch
Flood Warning

Community Status

No Warning
Flood Advisory
Flood Watch
Flood Warning

Flood Advisory

Issued when flooding is imminent or occurring, generally within the next 1 to 3 hours, but is not expected to substantially threaten life and property.

Flood Watch

Issued when there is the possibility of widespread general flooding over an area within the next 36 hours.

Flood Warning for River Fcst Point

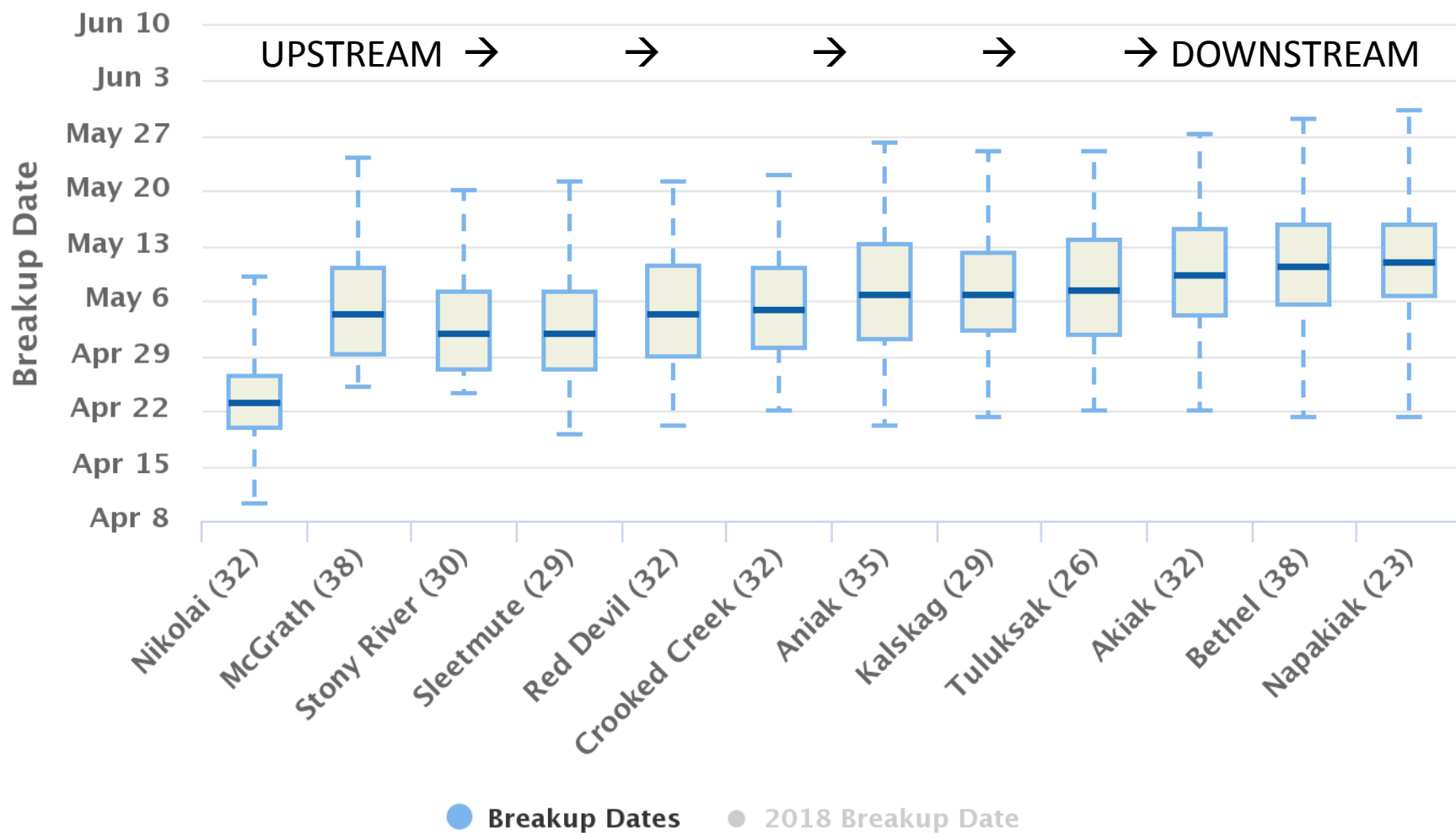
Issued when a river level has exceeded, or is forecast to exceed, moderate or major flood stage.

<https://www.weather.gov/aprfc/>



Kuskokwim Breakup Timing

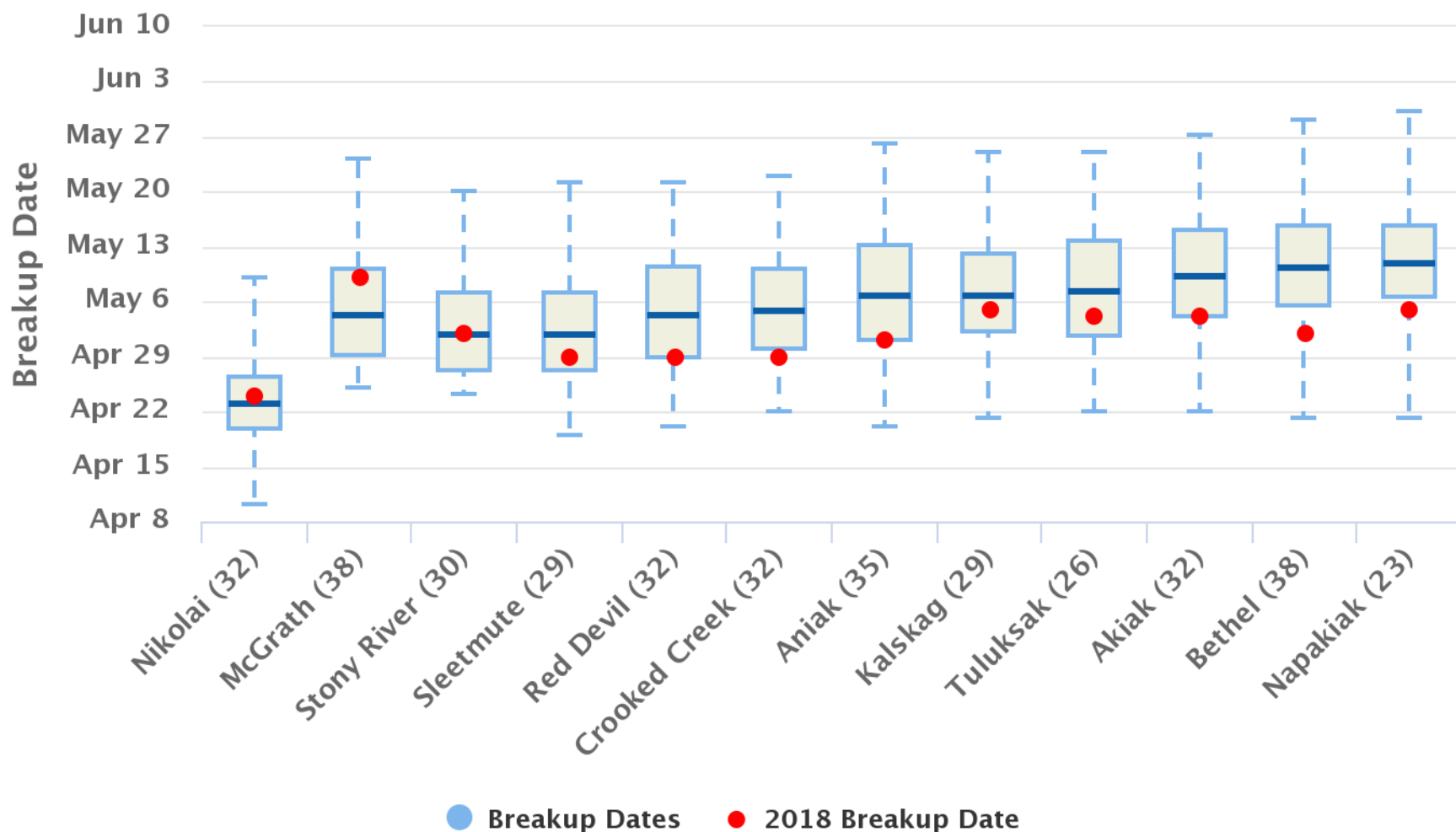
Kuskokwim River Breakup Dates 1980 – 2017

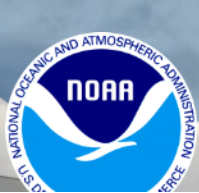




Kuskokwim 2018 Timing

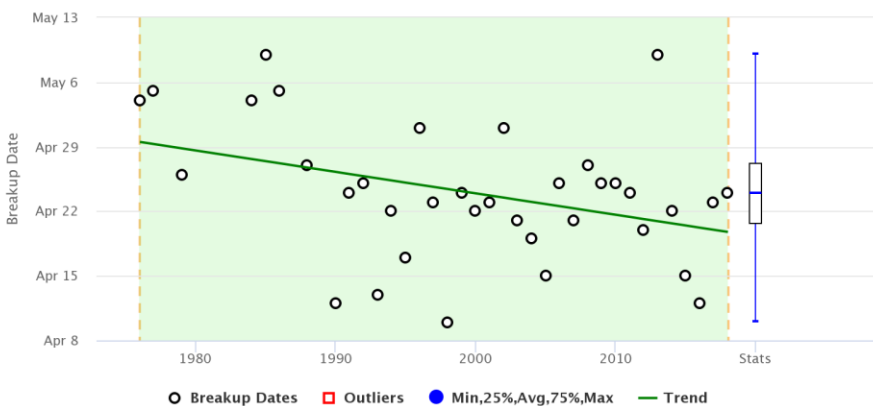
Kuskokwim River Breakup Dates 1980 – 2017





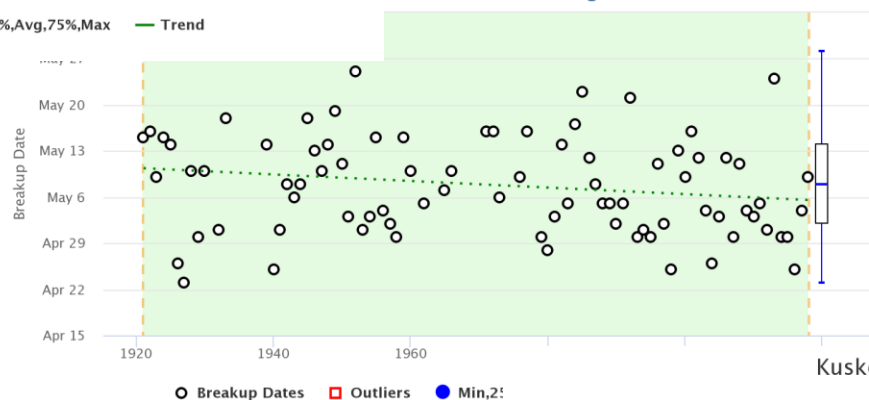
Kuskokwim 2018 Timing

Kuskokwim River at Nikolai



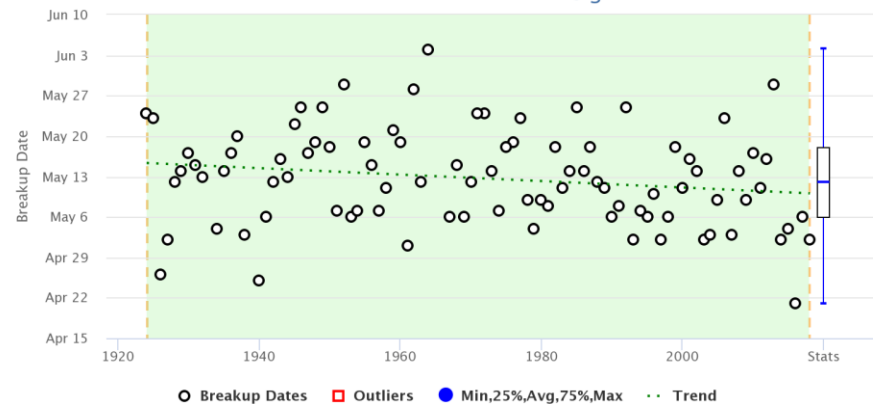
Kuskokwim River at McGrath

No Significant Trend



Kuskokwim River at Bethel

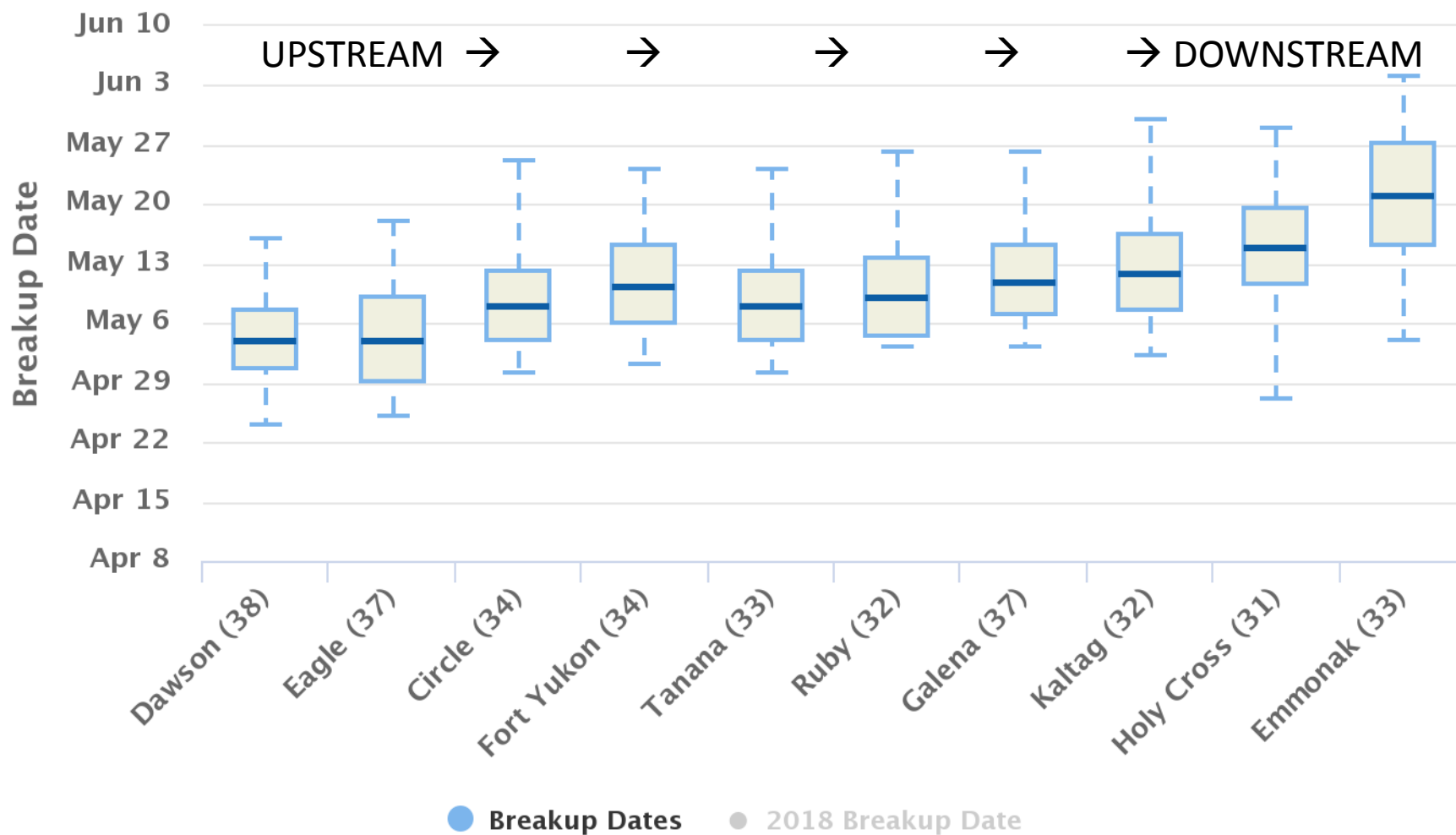
No Significant Trend





Yukon Breakup Timing

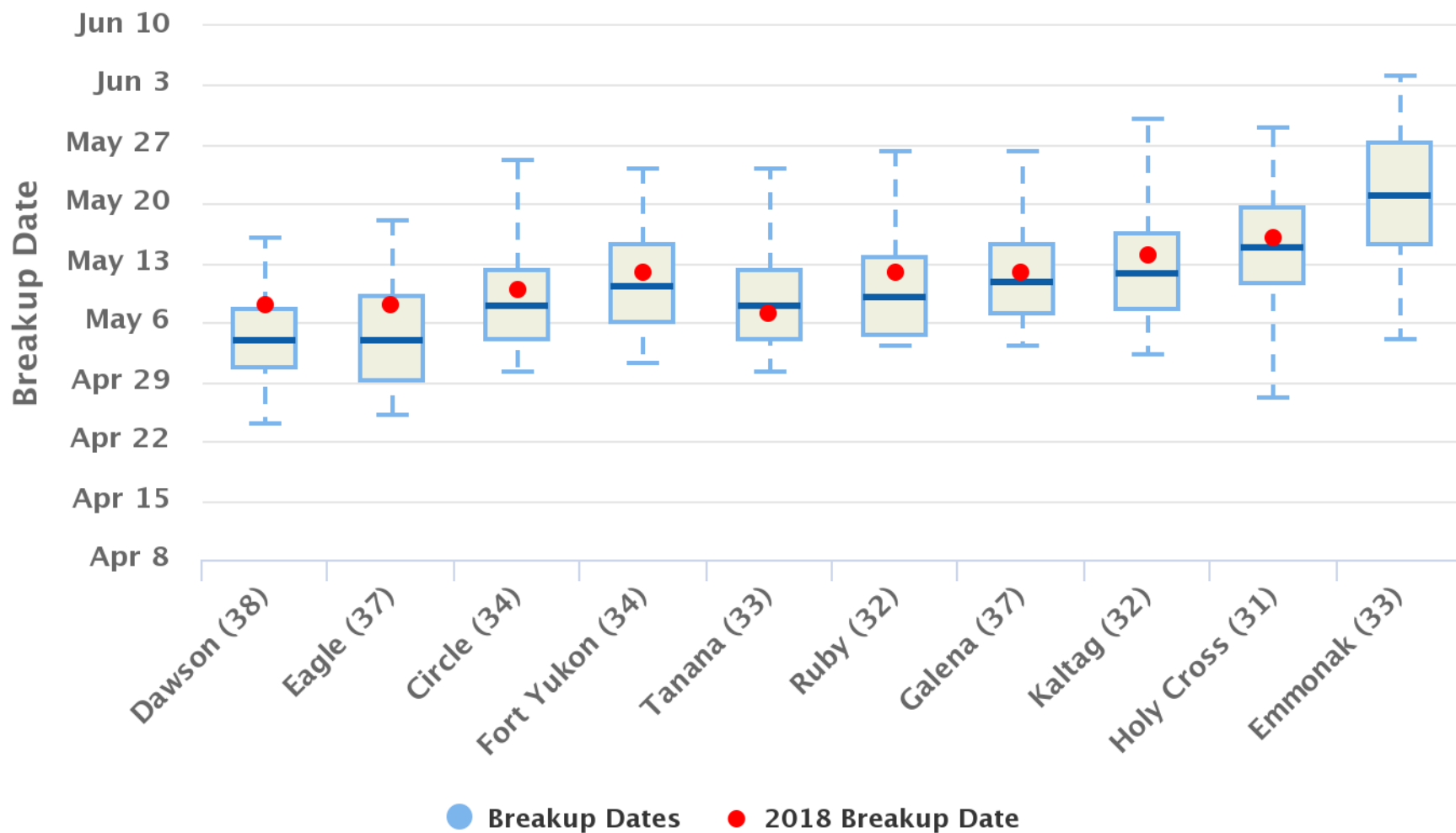
Yukon River Breakup Dates 1980 – 2017





Yukon Breakup Timing

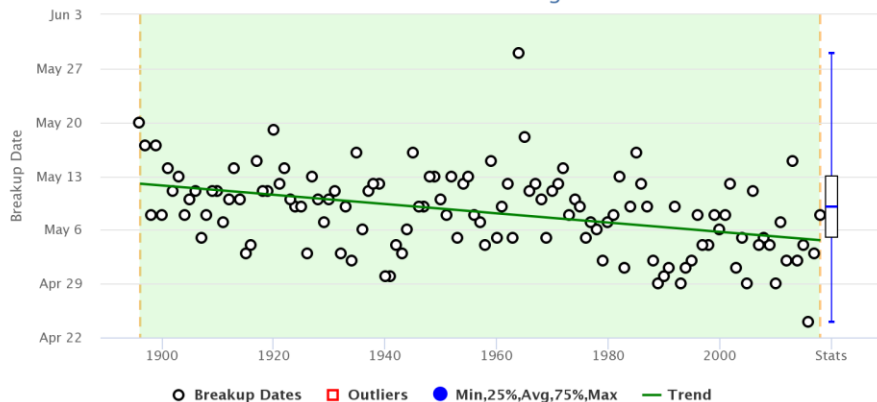
Yukon River Breakup Dates 1980 – 2017



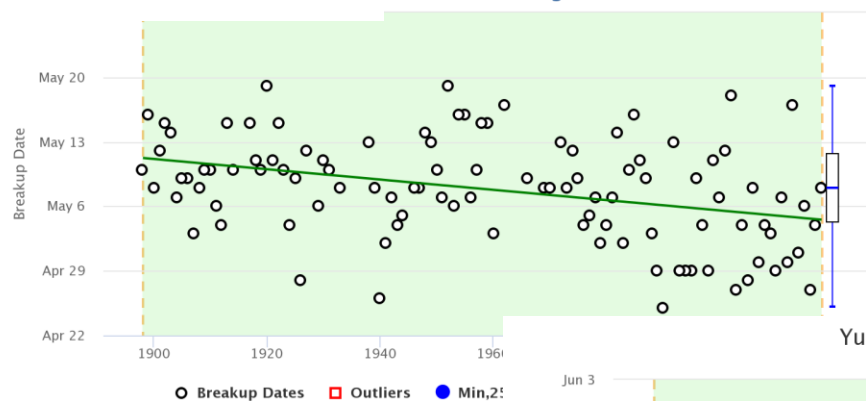


Yukon Breakup Timing

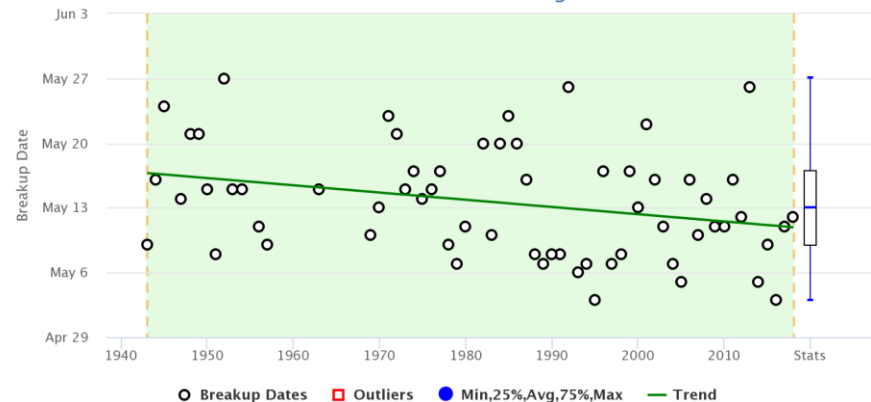
Yukon River at Dawson
Significant Trend



Yukon River at Eagle
Significant Trend

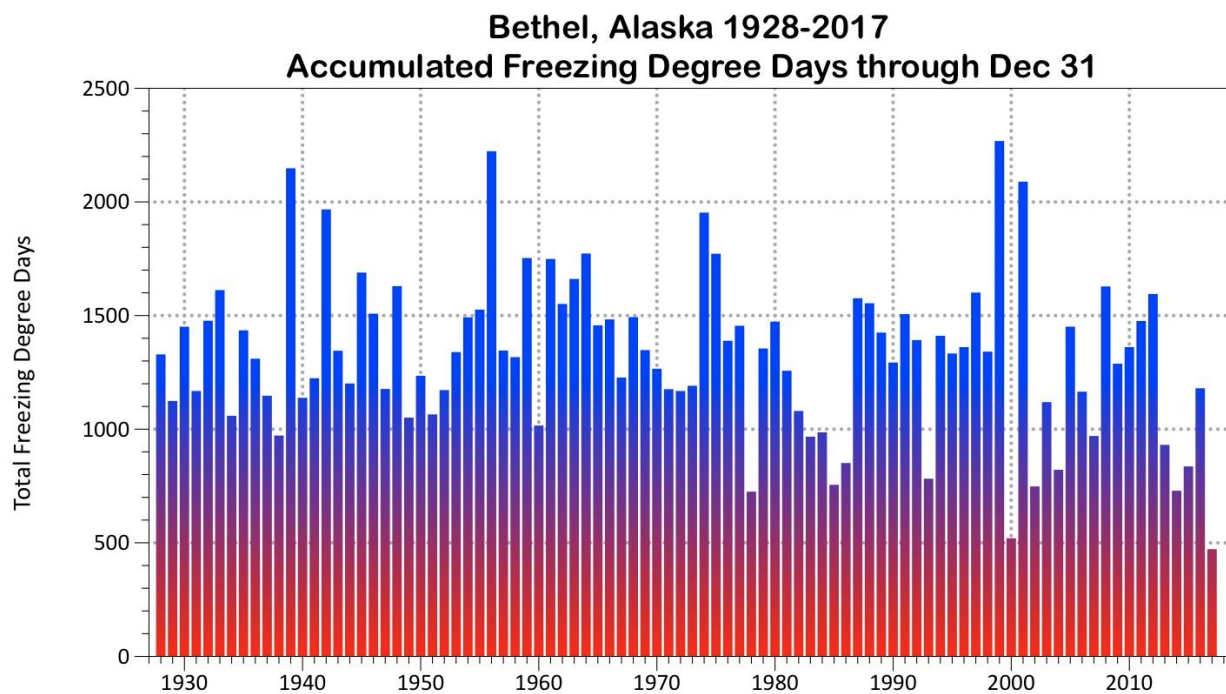


Yukon River at Galena
Significant Trend



Kuskokwim Freeze Up

Leo Observation: This is the second year in a row that people from Chuathbaluk are able to use boats (skiffs) on the Kuskokwim River.....





Data Sharing.....



- Email: nws.ar.aprfc@noaa.gov
- We can follow your social media
- #Akriverwatch, #AKwx
- Call: 907-266-5160
- Submit an observation to the NWS



[Submit a Report](#)

Questions?