



Historical linkages between Alaska seasonal temperature, river ice breakup and Pacific SSTs

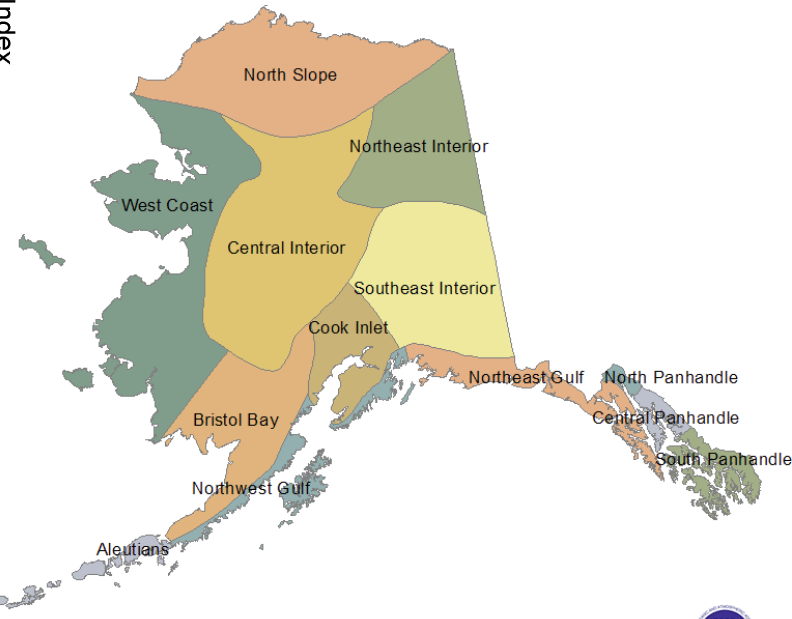
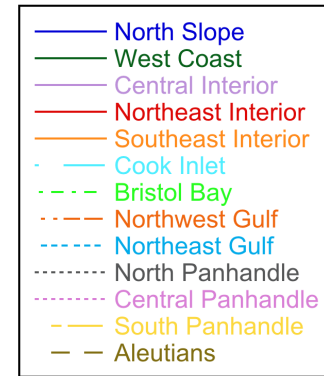
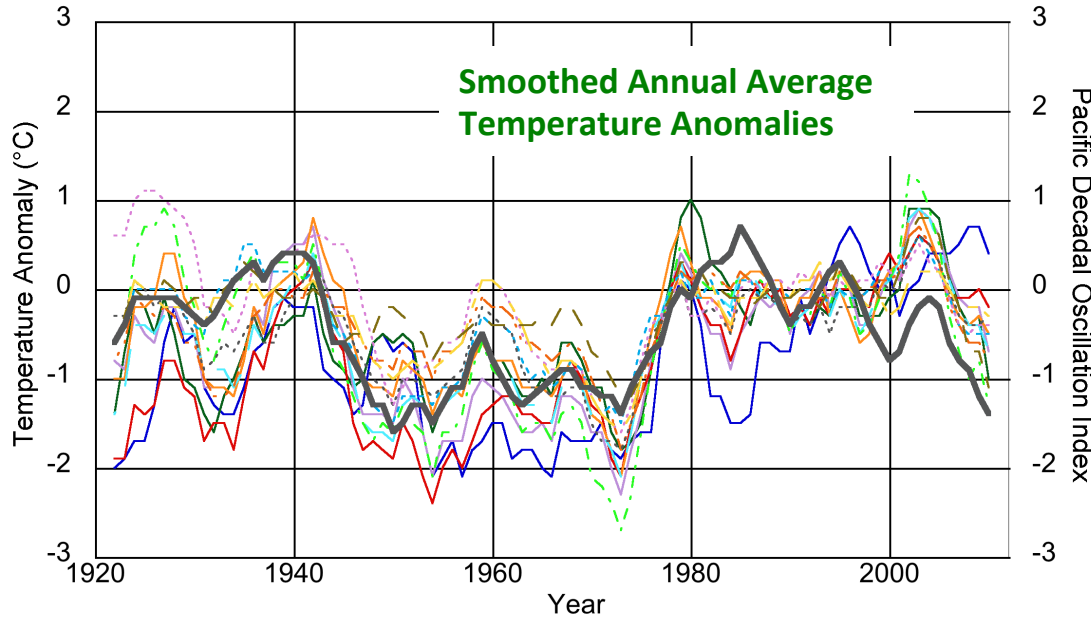
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2014-15 Pacific Anomalies S&T Workshop

May 5, 2015

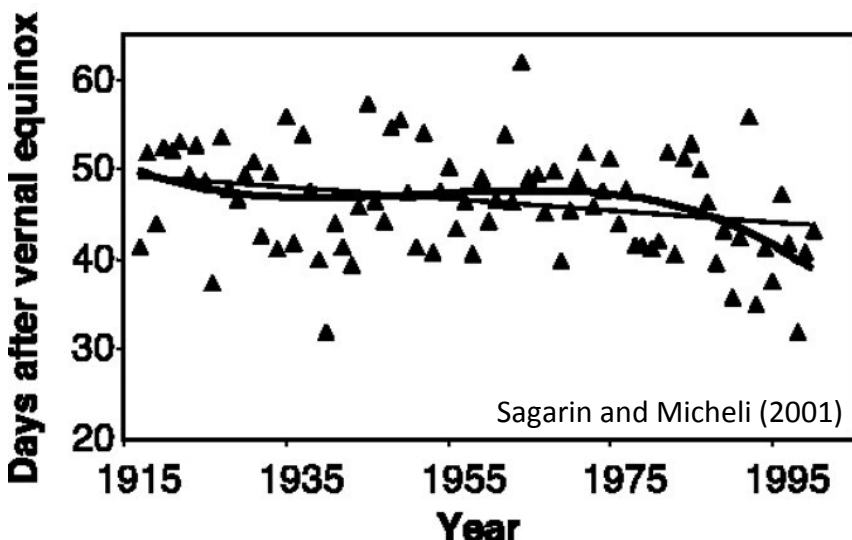
Multi-decadal variability in Alaska temperature



- Annual temperatures in most divisions trace Pacific Decadal Oscillation low-frequency variability over the last 93 years
- Consistent with previous findings (i.e. Hartman and Wendler 2005)

River ice breakup is linked with winter and spring climate

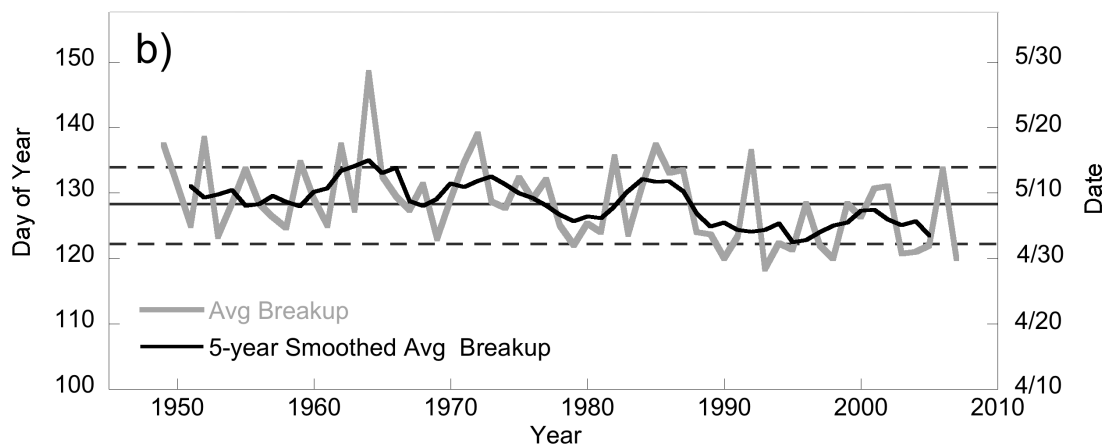
- Occurs in April/May
- Trend to earlier breakup dates



- Nenana ice classic occurring closer to the equinox
- **How is climate influencing breakup?**

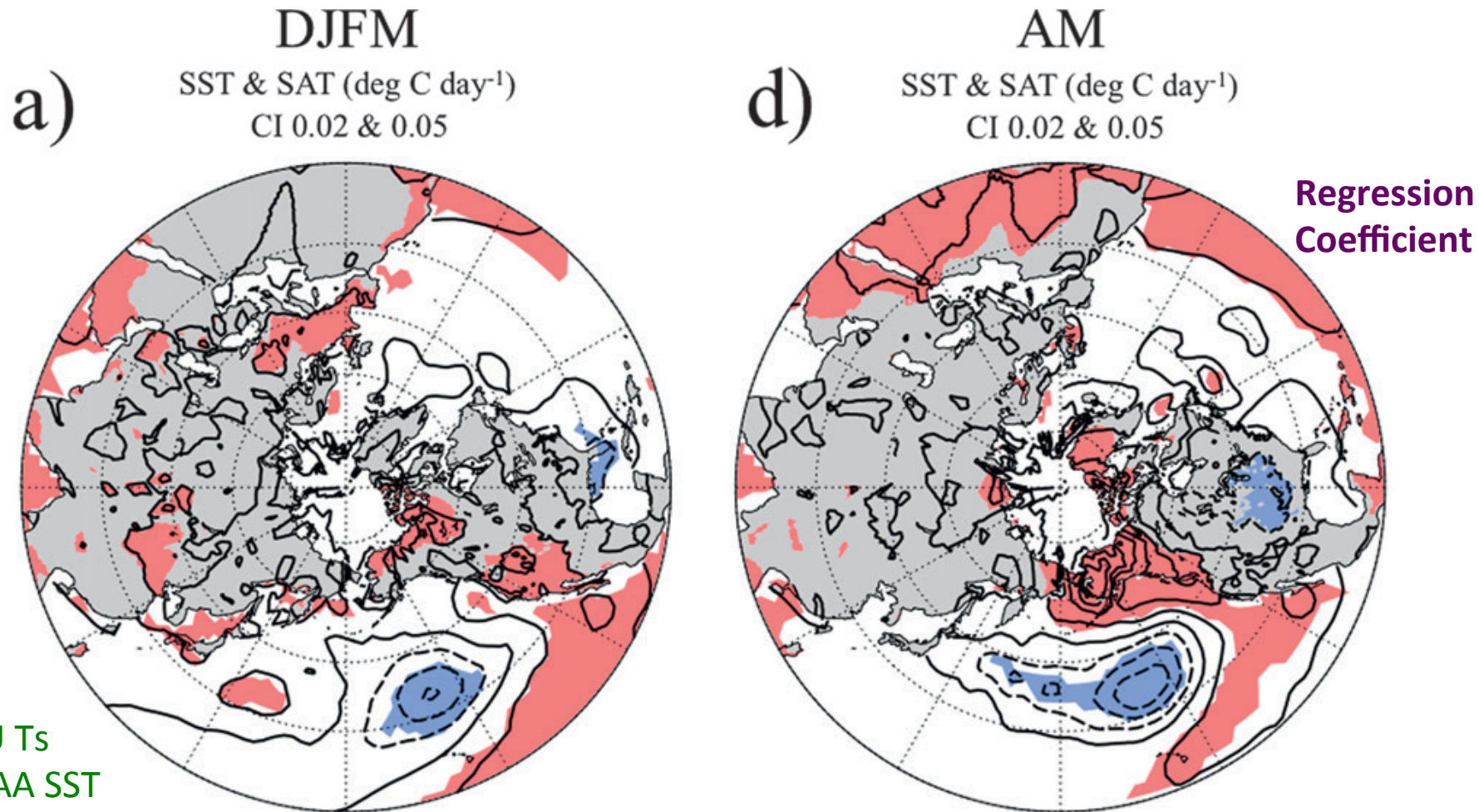
Breakup date: interrelated across Alaska

- Somewhat arbitrary definition
- Interrelated across Alaska
- Low-frequency variability
- Trend to earlier breakup dates (1.3 days/decade)



How is river ice breakup related to the large-scale climate?

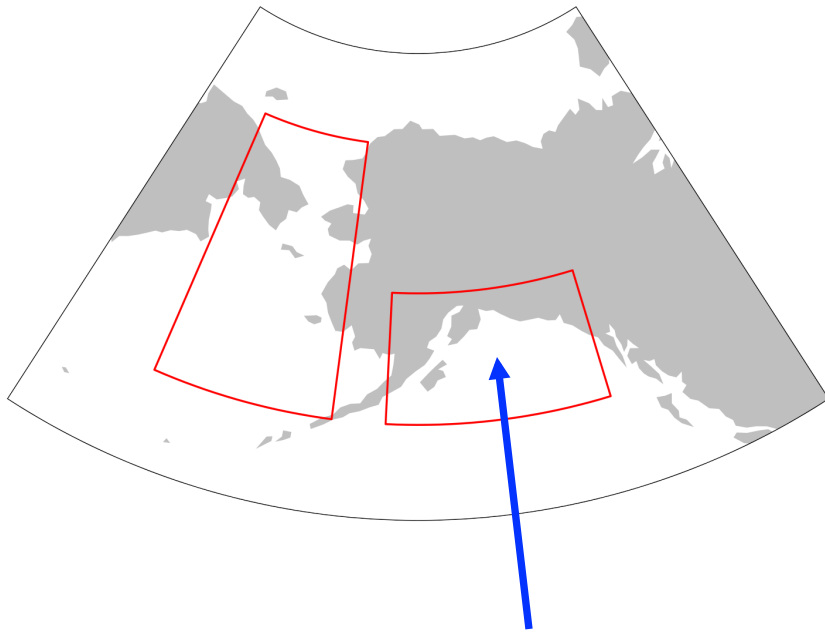
Best predictor is Apr-May temps



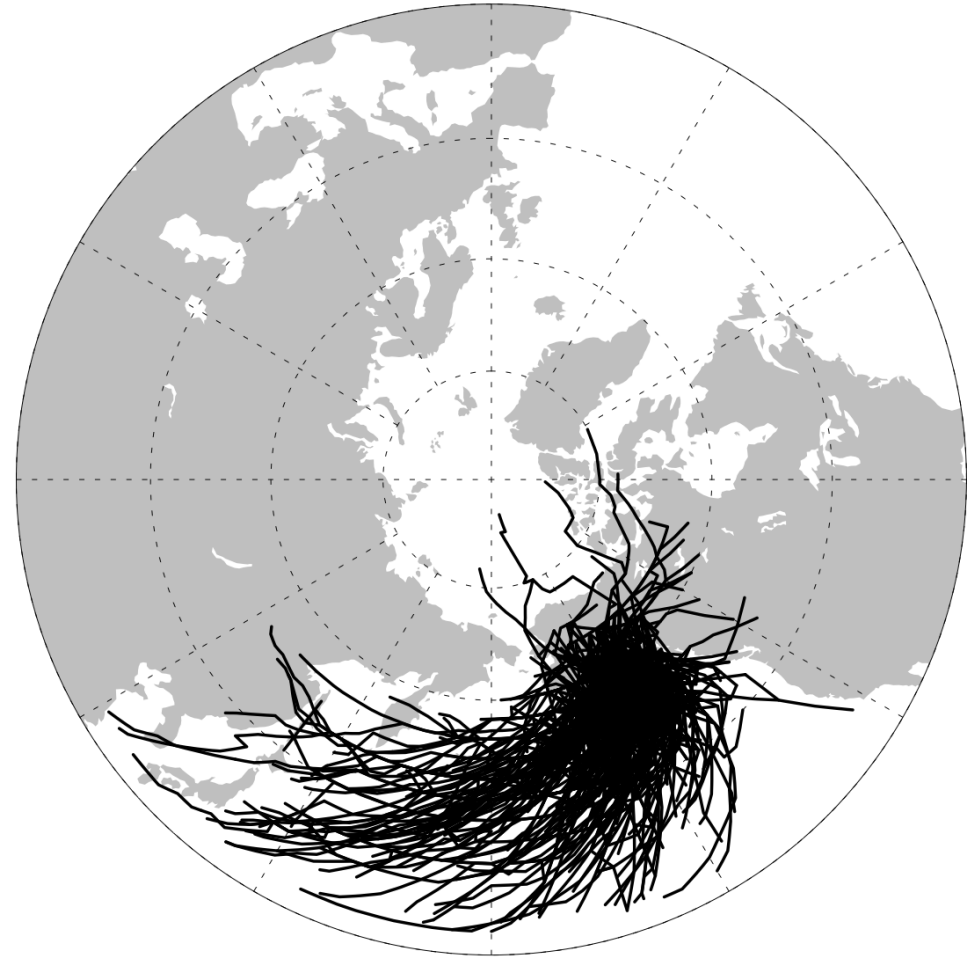
- Temps linked with ENSO/PDO (i.e. Papineau 2001)

Apr-May Temps linked to Gulf of Alaska storms

Apr-May Gulf of Alaska Storms 1948-2010



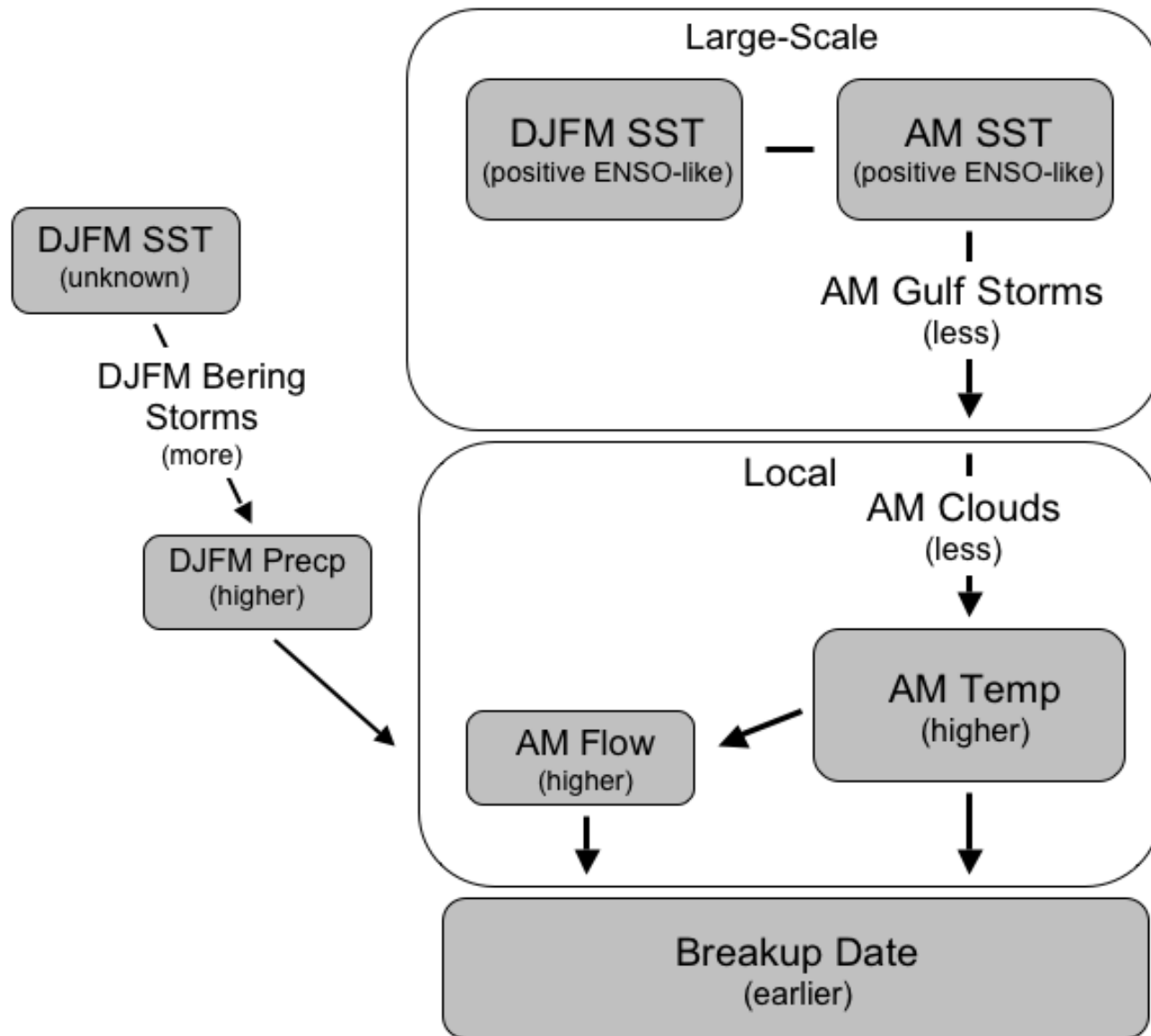
Gulf of Alaska storms play biggest role in Apr-May temperatures



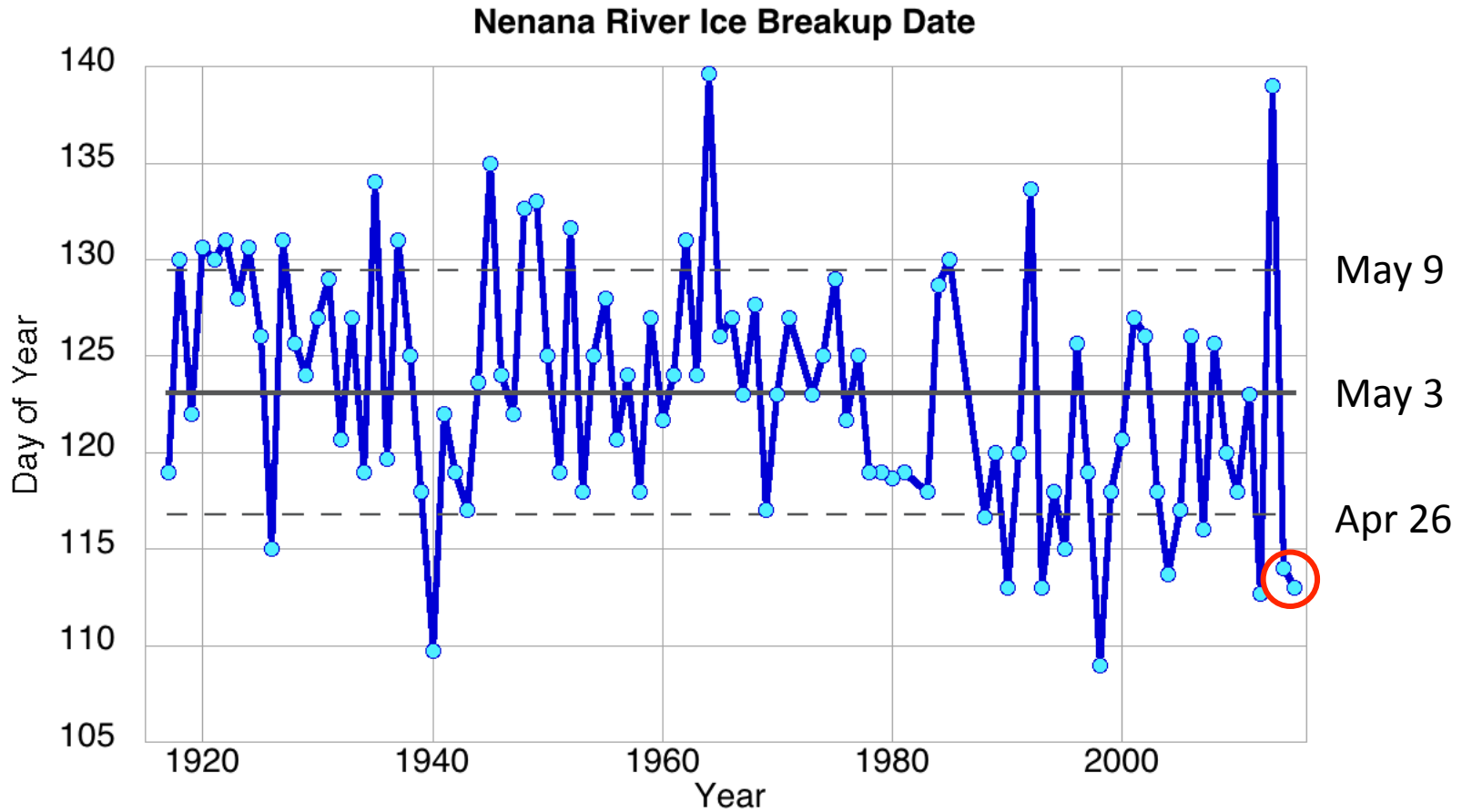
SLP from NCEP/NCAR R1

Algorithm: Zhang et al. (2004)

Mechanism Summary

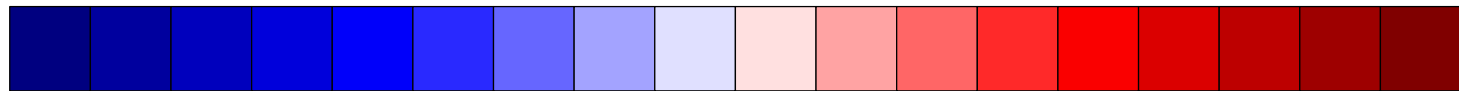
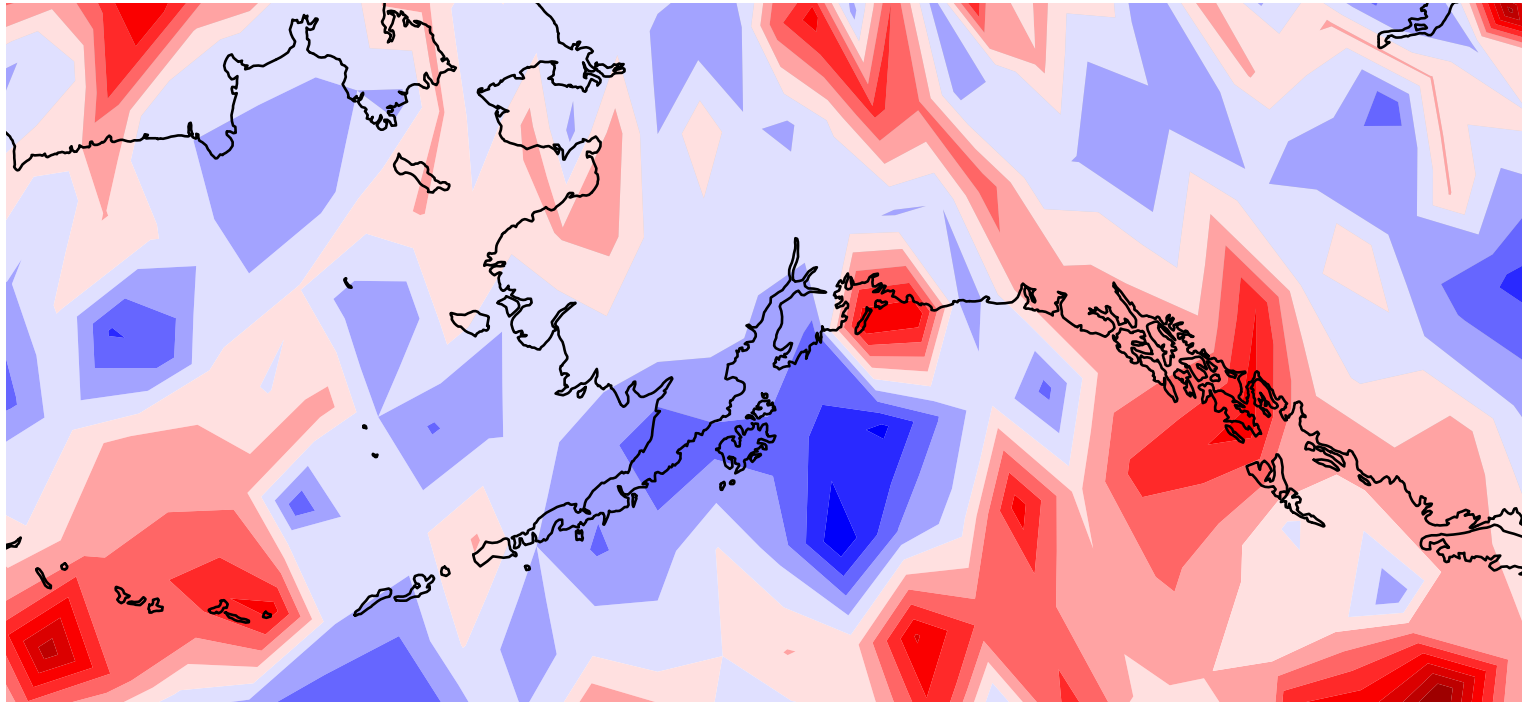


2014-15 Early Breakup at Nenana



Less storms tracking into Gulf of Alaska in Spring 2014?

2014 Mar-May Storm Track Density Anomaly



-4 -3.5 -3 -2.5 -2 -1.5 -1 -0.5 0 0.5 1 1.5 2 2.5 3 3.5 4

Maybe? More analysis is still needed!

References

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