

ALASKA CLIMATE & WEATHER

A PAST PERSPECTIVE

INFORMING THE FUTURE

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Alaska Region

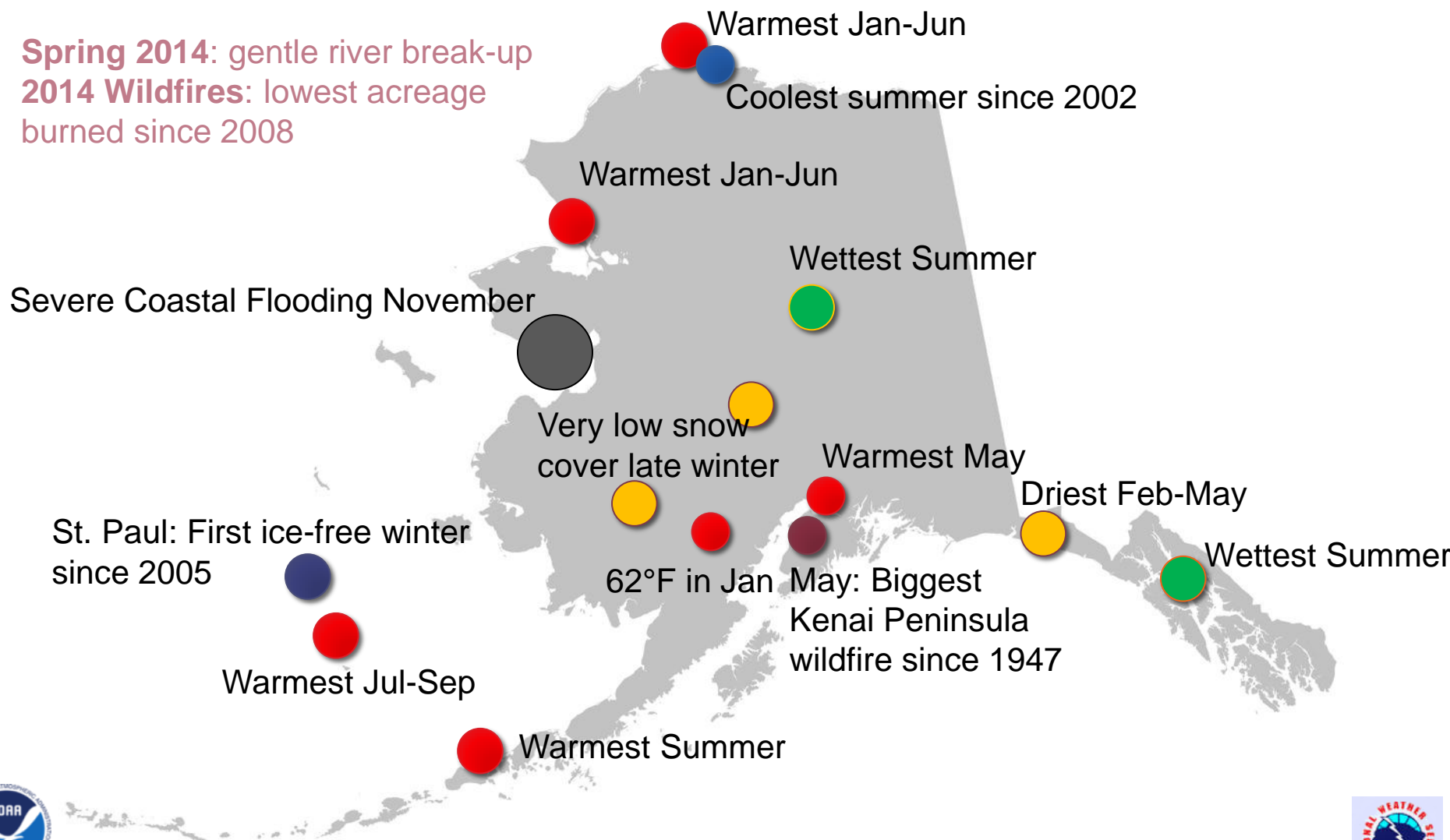


AFN 2014

- **Alaska Weather & climate highlights since AFN 2013**
- **Arctic Sea Ice Review**
- **Recent Alaska climate & weather in historical context**
- **Look ahead: the near-term climate outlook**



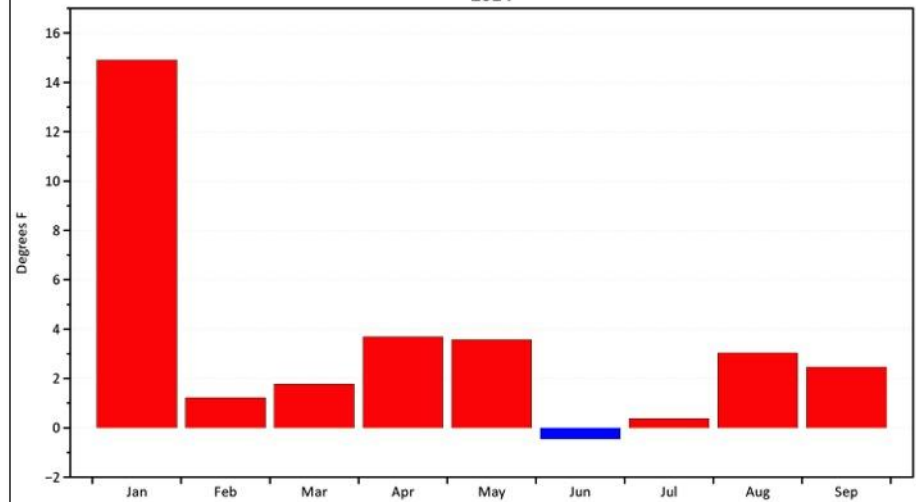
Highlights Since AFN 2013



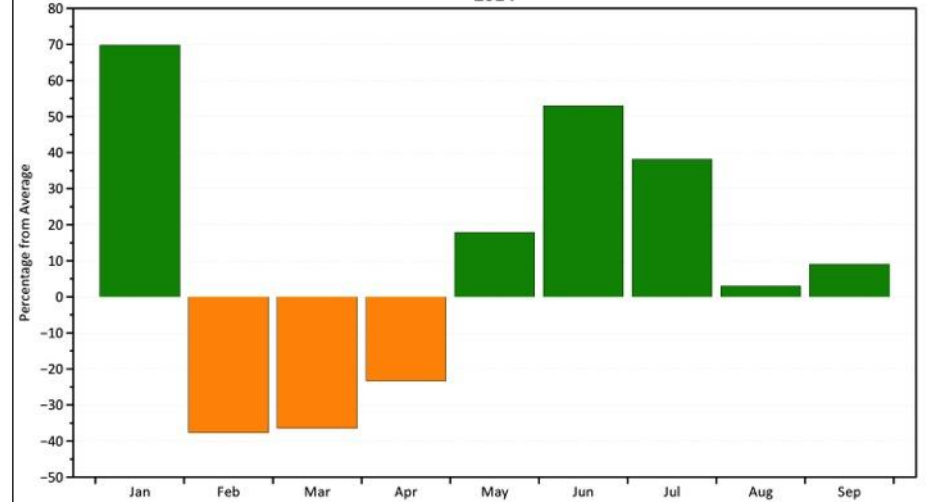
Alaska 2014

So far...warm and a little wet

Alaska Temperatures (Difference from Average)
2014

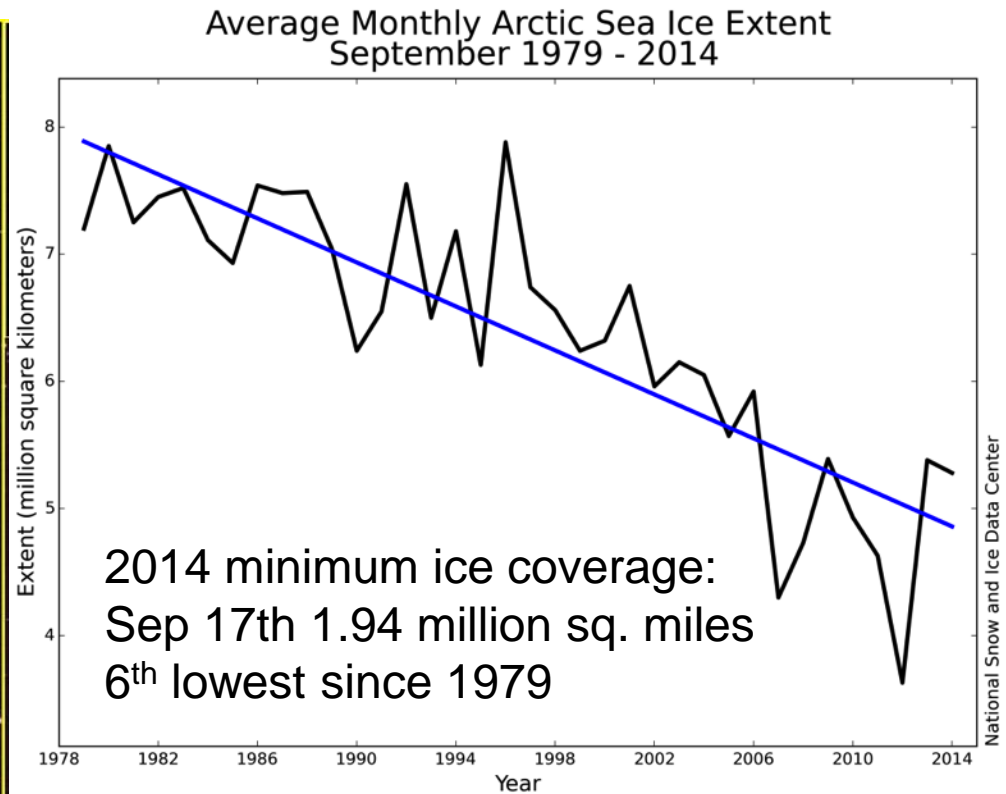
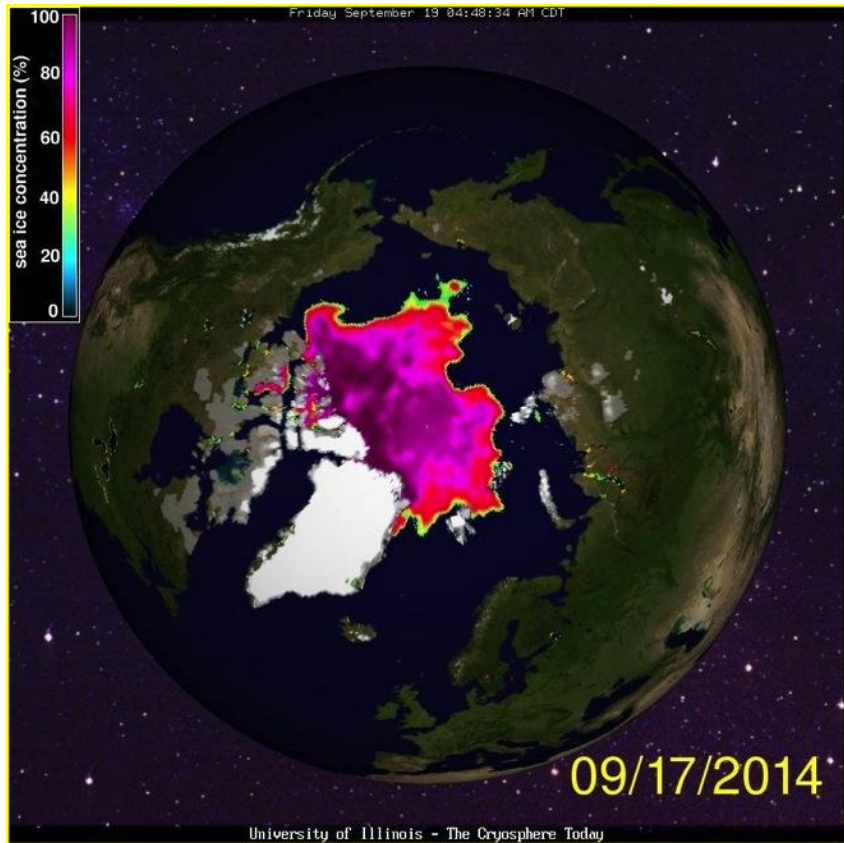


Alaska Precipitation (Percentage of Average)
2014

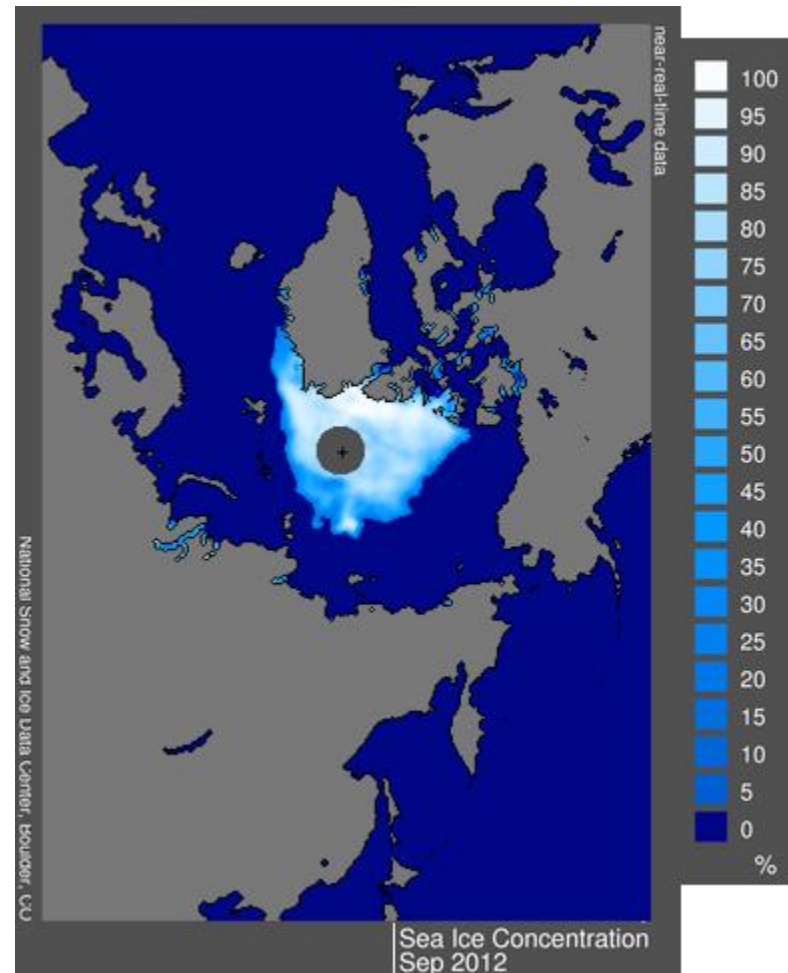
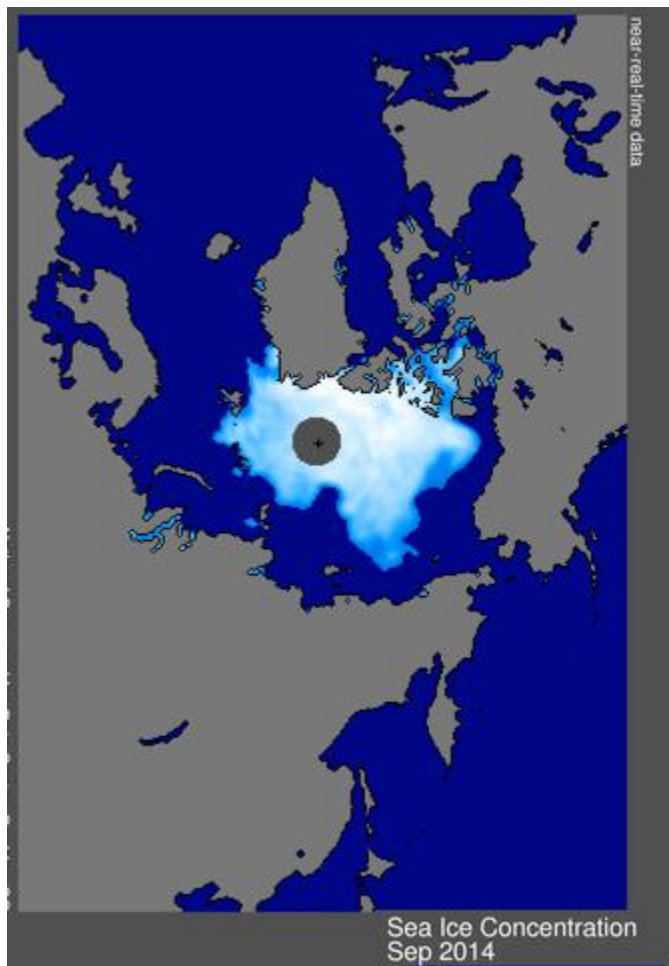


Data from NCDC

Arctic-Wide Sea Ice 2014

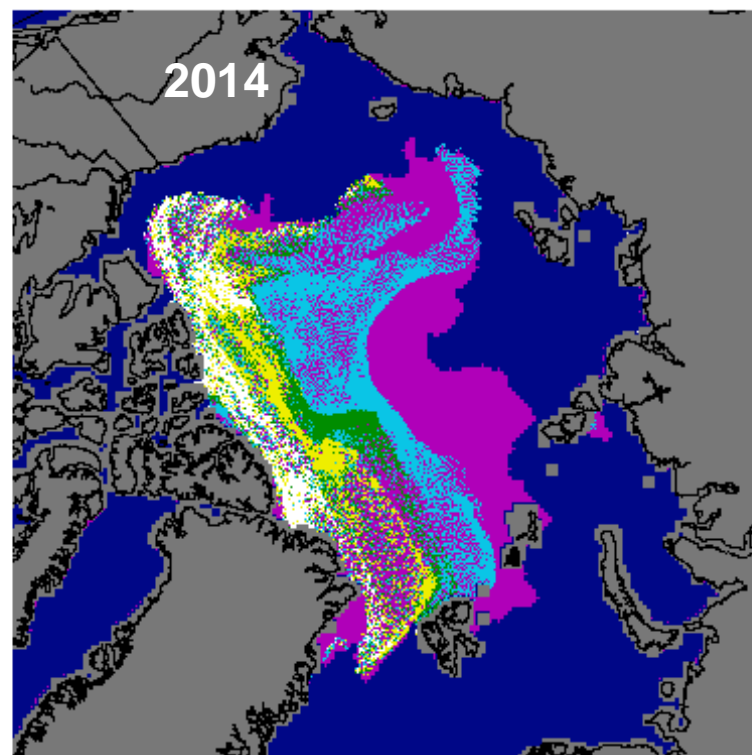
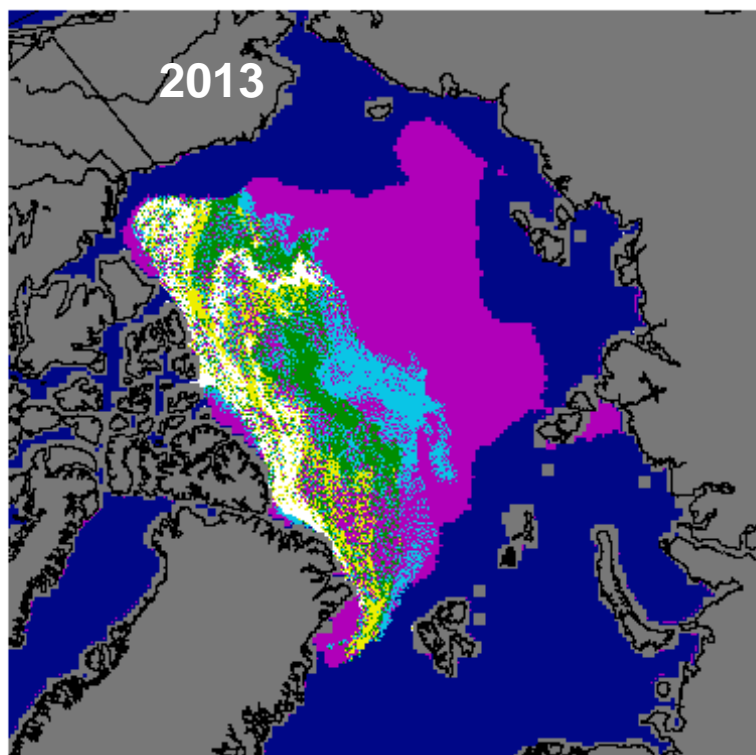


Arctic-Wide Sea Ice: 2014 vs. 2012



Source: NSIDC

Age of September Sea Ice



First-year ice
(<1 year old)

Second-year ice
(1-2 years old)

Third-year ice
(2-3 years old)

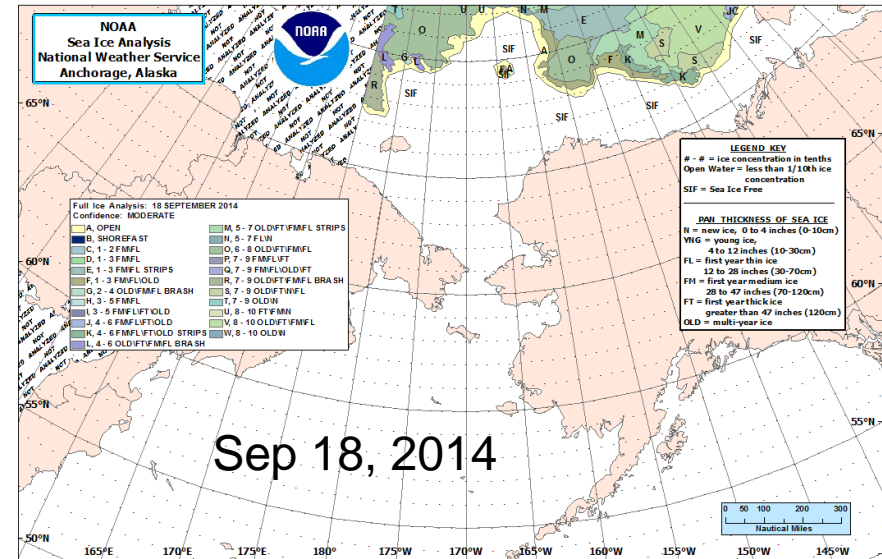
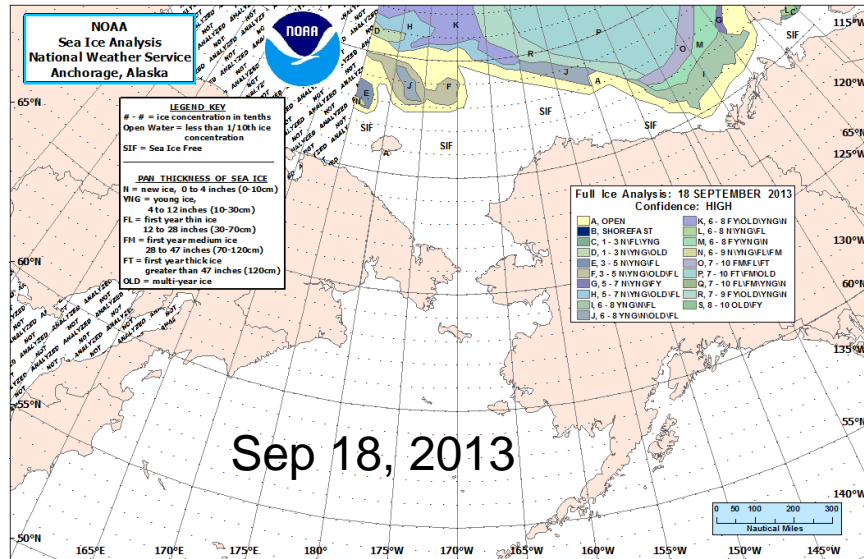
Fourth-year ice
(3-4 years old)

Fifth-year ice
(4+ years old)

Source: NSIDC

NSIDC courtesy M. Tschudi, University of Colorado Boulder

Near Minimum Sea Ice Snapshot



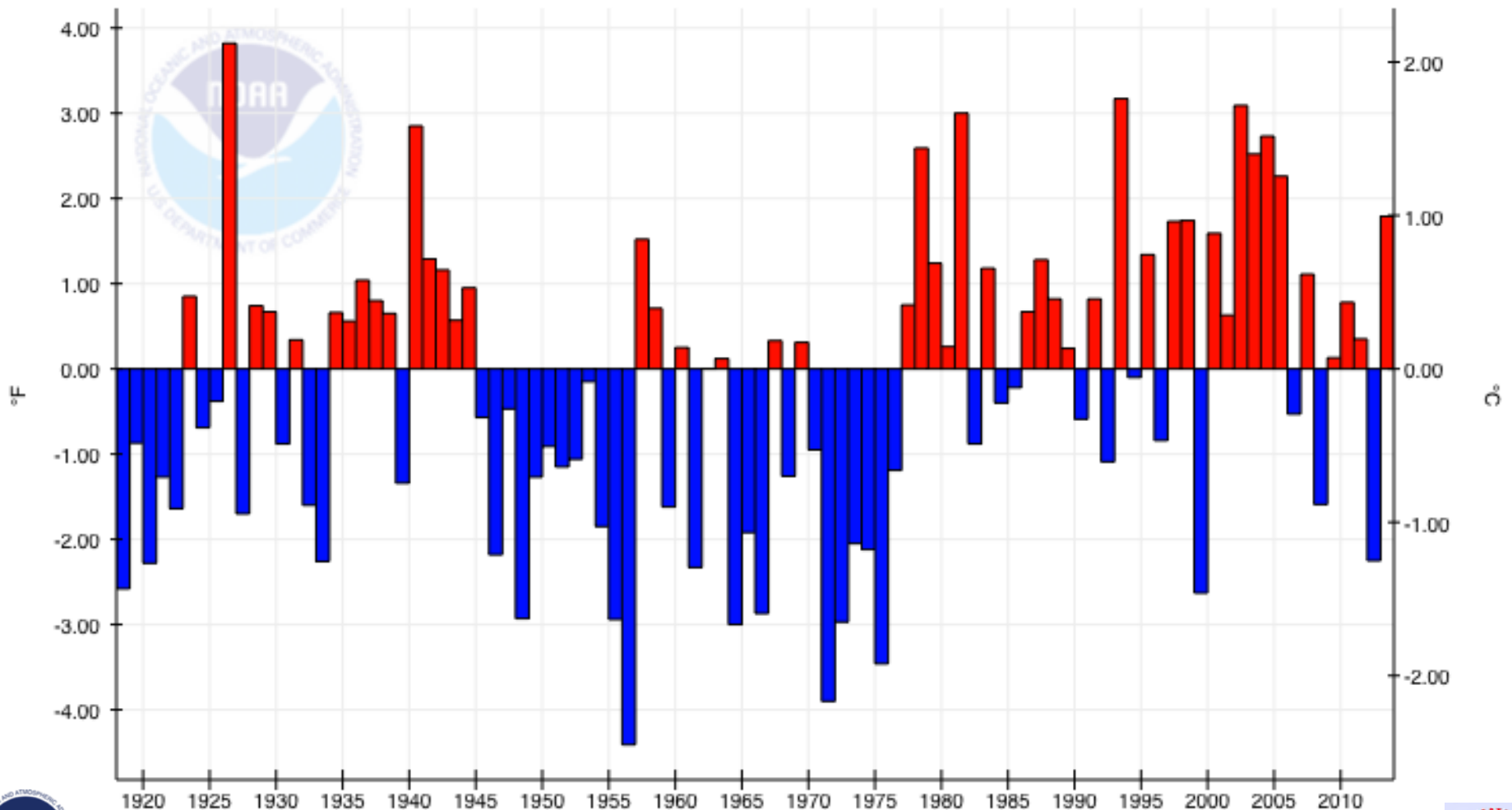
Analyses by NWS Alaska Region

Recent Alaska-Wide Climate in Context

- For Alaska as a whole, about a century reasonably reliable climate records
 - Temperatures: mid-20th century colder than before or since
 - Precipitation: early 20th century wet, mid to late dry, recently wet
 - Sea Ice
 - Recent summer/autumn sea ice loss unprecedented (no, the 1930s were NOT like present conditions)
 - Winter/Spring sea ice shows no sustained changes in coverage

Alaska Temperatures

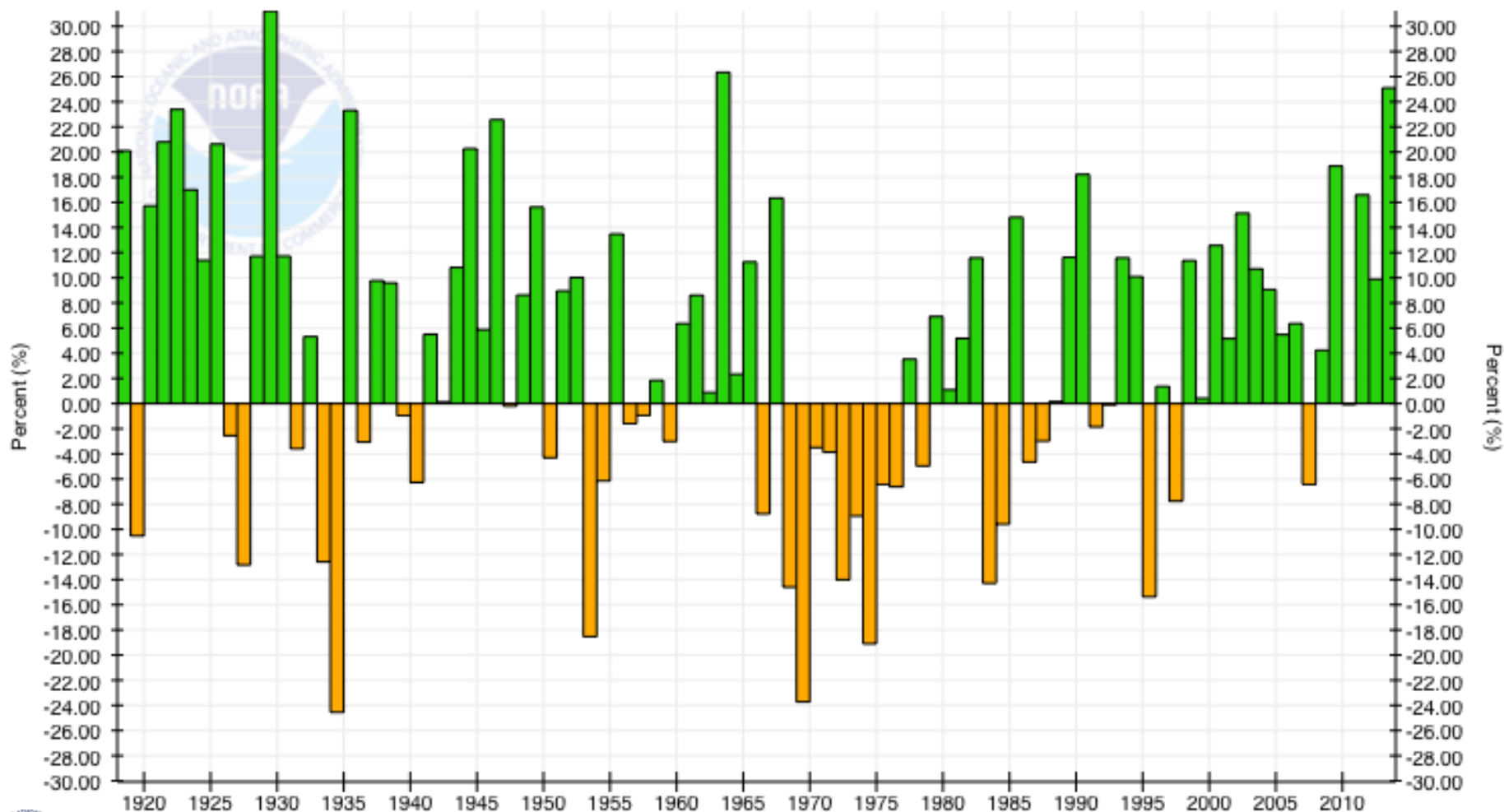
Alaska Statewide December Year-to-Date Temperature Anomalies (1918-2013)



Source: NCDC

Alaska Precipitation

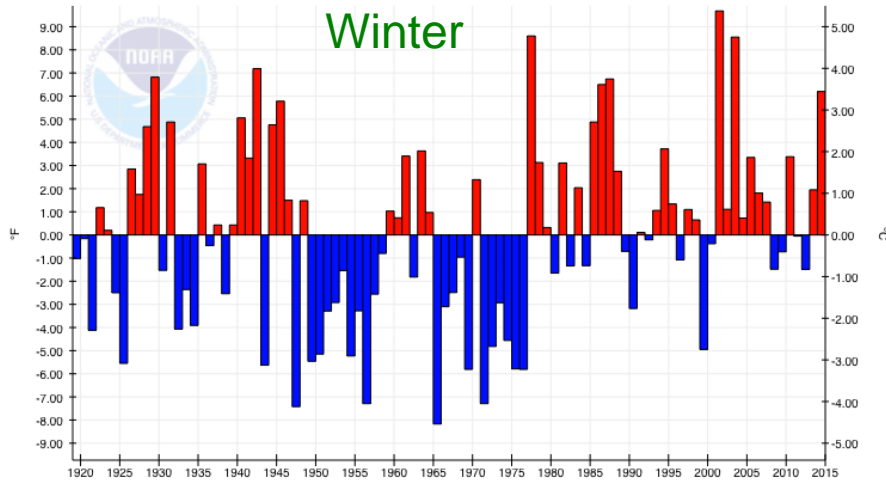
Alaska Statewide December Year-to-Date Precipitation Anomalies (1918-2013)



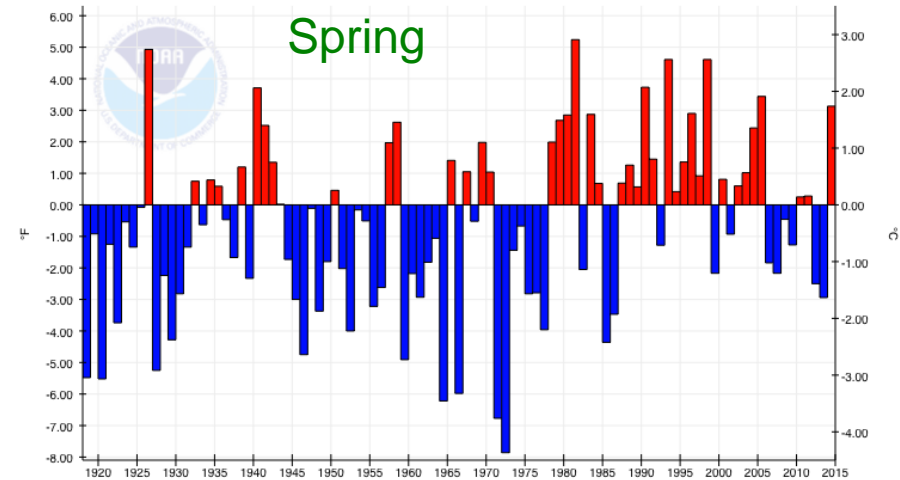
Source: NCDC

Seasonal Temperatures

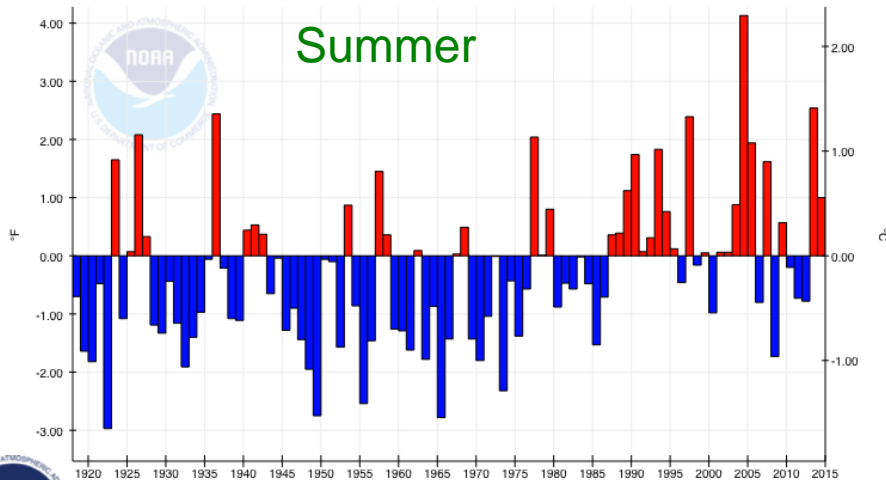
Alaska Statewide February 3-Month Temperature Anomalies (1919-2014)



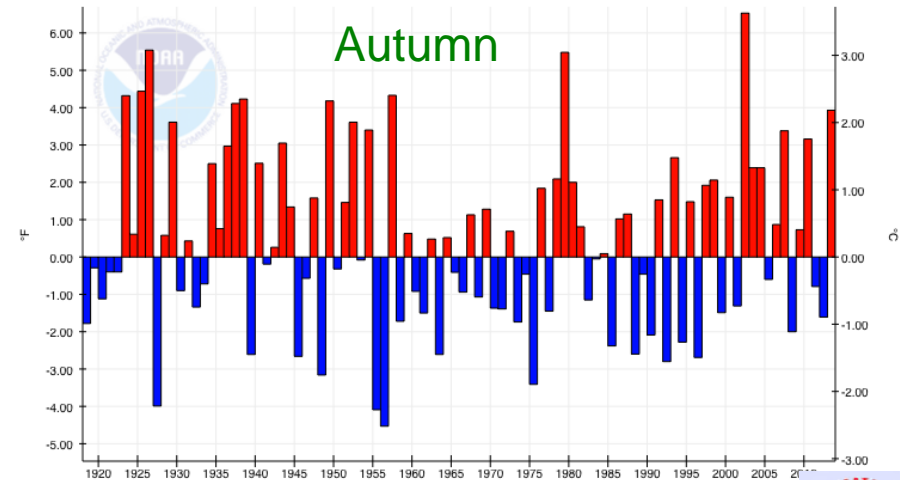
Alaska Statewide May 3-Month Temperature Anomalies (1918-2014)



Alaska Statewide August 3-Month Temperature Anomalies (1918-2014)



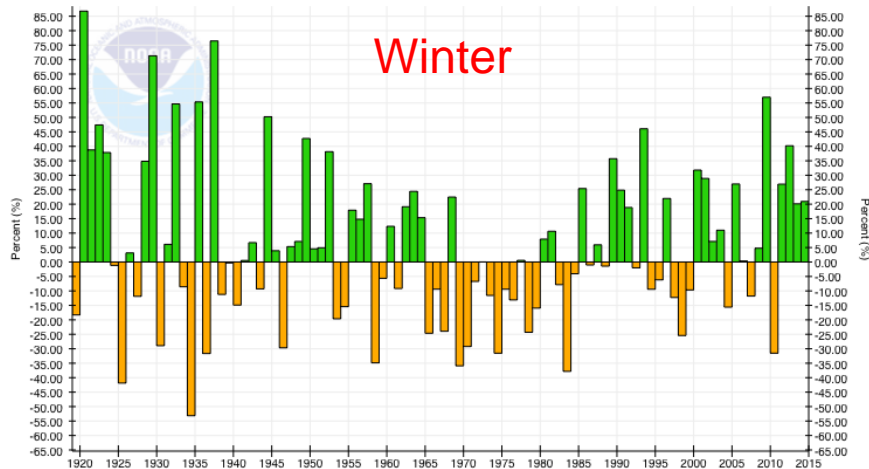
Alaska Statewide November 3-Month Temperature Anomalies (1918-2013)



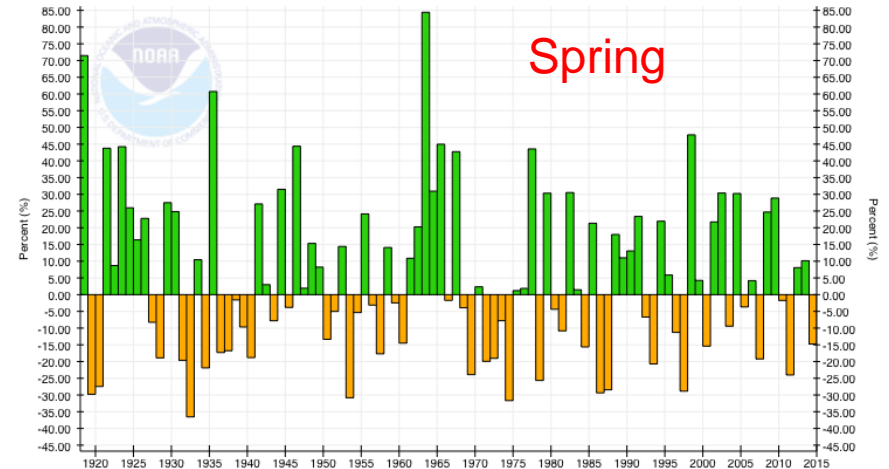
Source: NCDC

Seasonal Precipitation

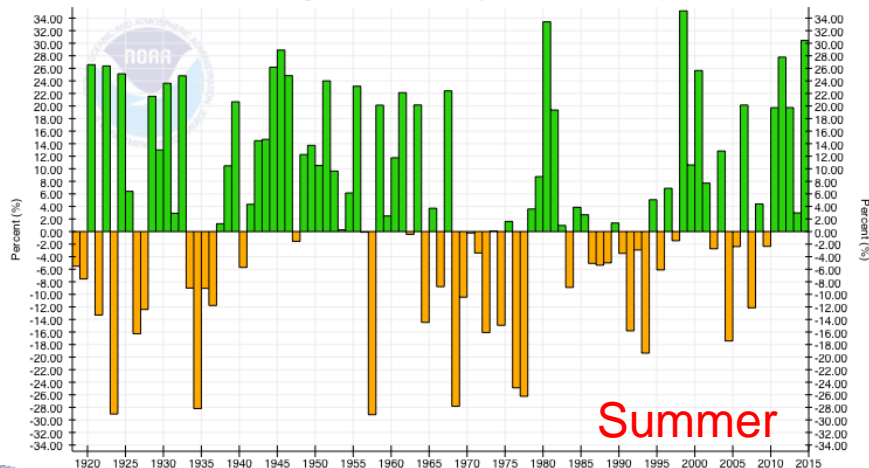
Alaska Statewide February 3-Month Precipitation Anomalies (1919-2014)



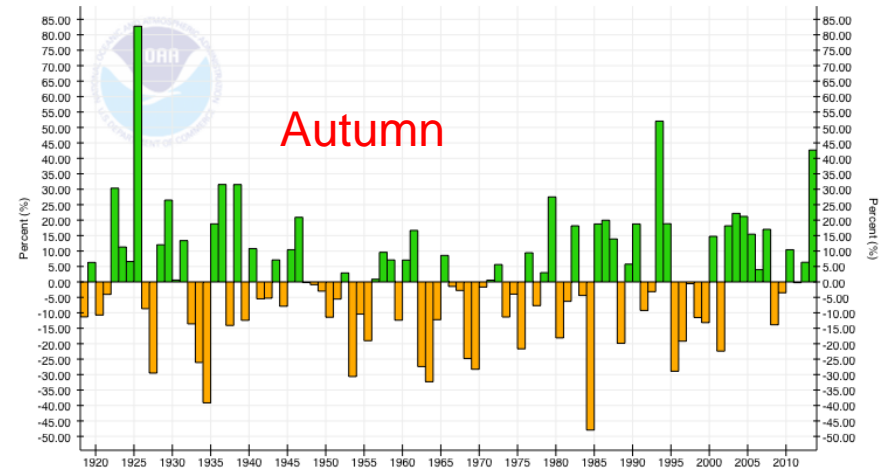
Alaska Statewide May 3-Month Precipitation Anomalies (1918-2014)



Alaska Statewide August 3-Month Precipitation Anomalies (1918-2014)



Alaska Statewide November 3-Month Precipitation Anomalies (1918-2013)



Source: NCDC

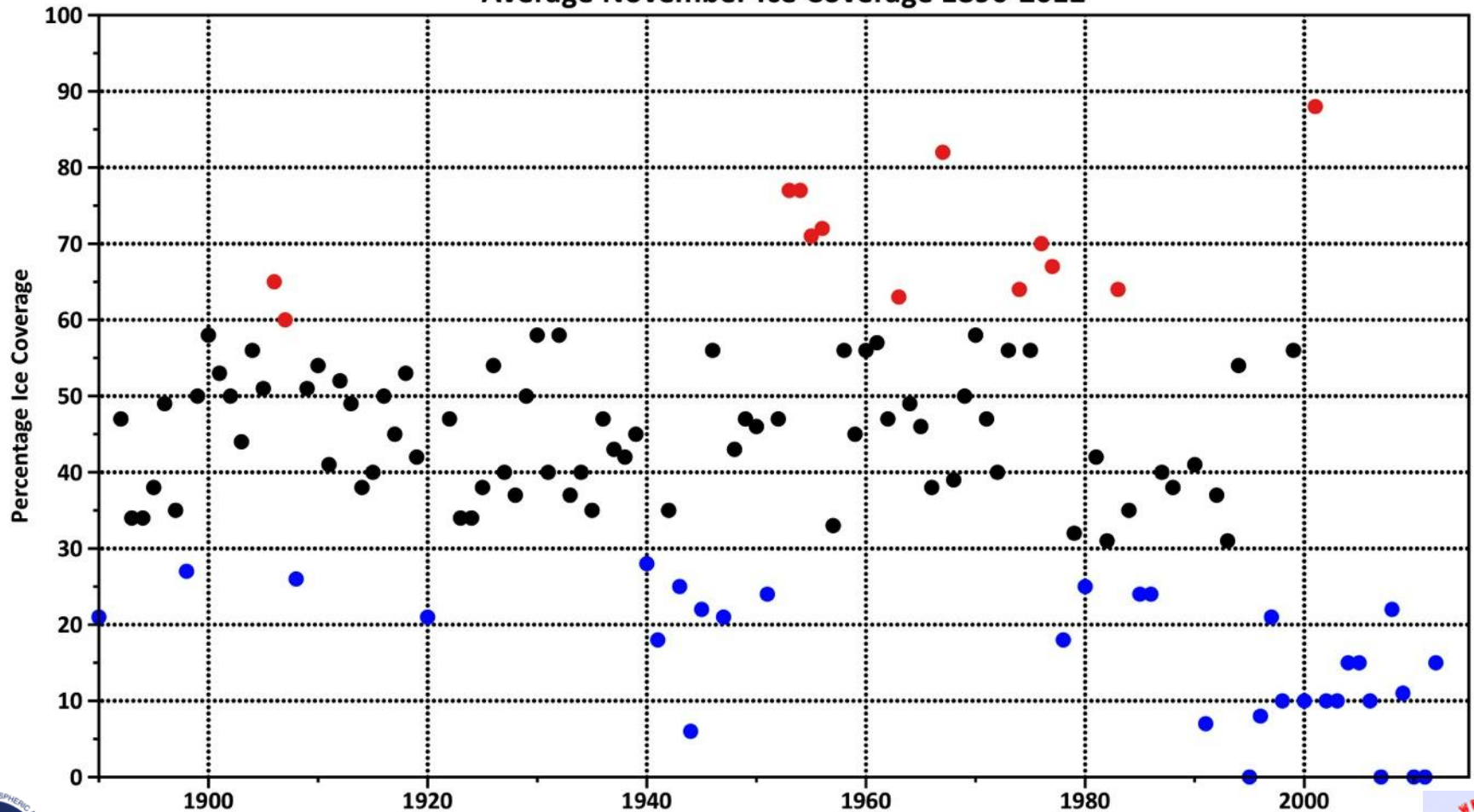
Recent Events in Historical Context

- Bering Sea Storminess and Temperatures
- Spring River Ice Break-up
- Freezing Rain
- One effect of autumn sea ice decline



Sea Ice Coverage Changes

Offshore Shismaref (67N, 167W)
Average November Ice Coverage 1890-2012

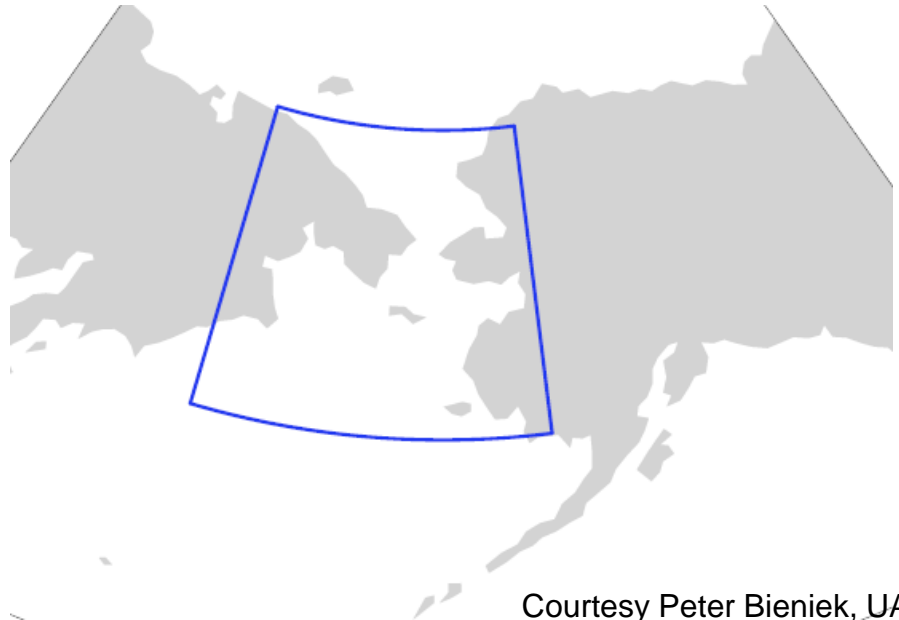


Source: ACCAP Sea Ice Atlas

Bering/Chukchi Sea Storminess

Q. Are moderate and strong autumn storms becoming more frequent?

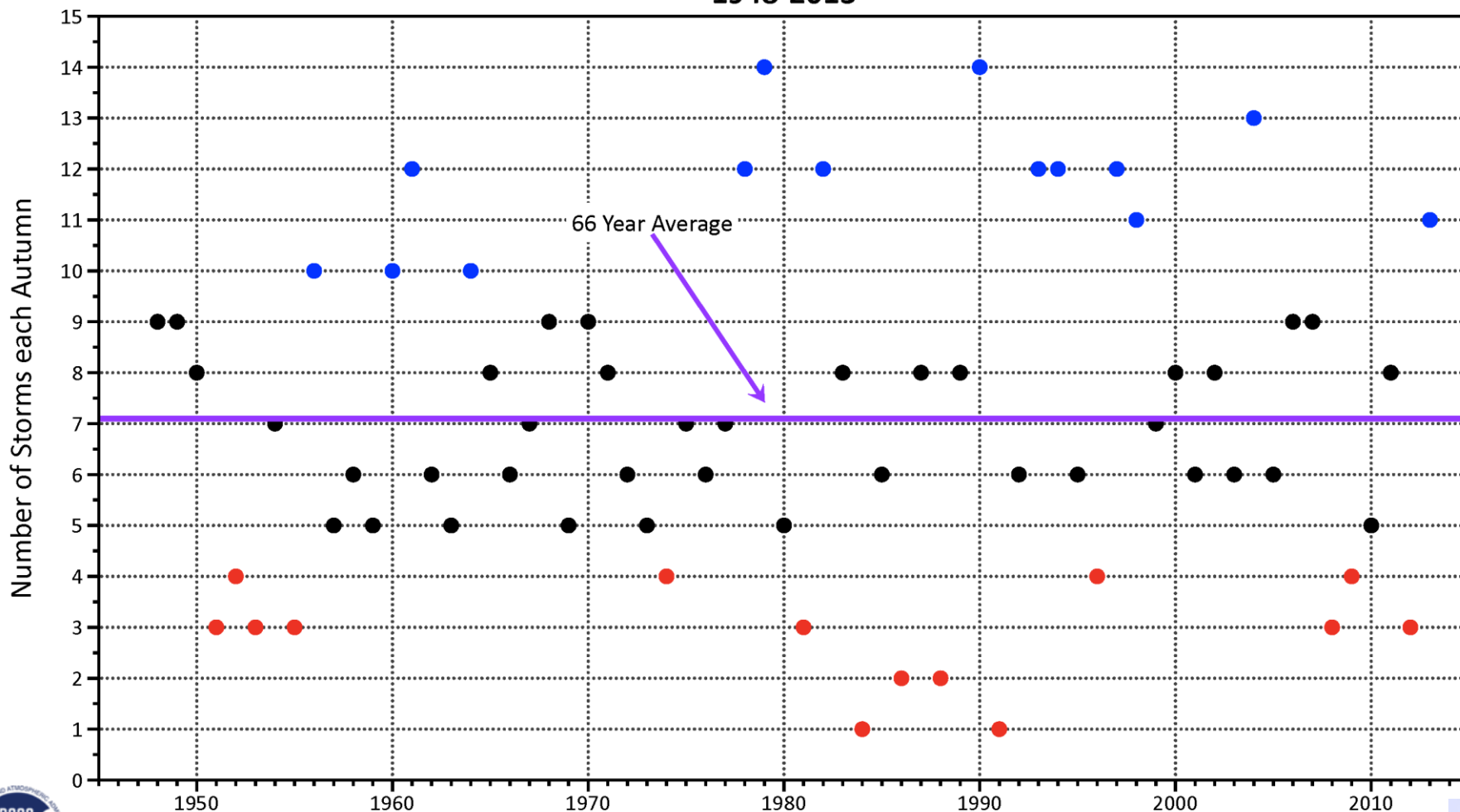
A. Let's look at a consistent set of storm analyses and tracks. For each autumn (Sep-Nov), count storms exceeding some intensity.



Courtesy Peter Bieniek, UAF

Number of Significant Bering Sea Storms

Bering Sea Autumn Storminess
1948-2013



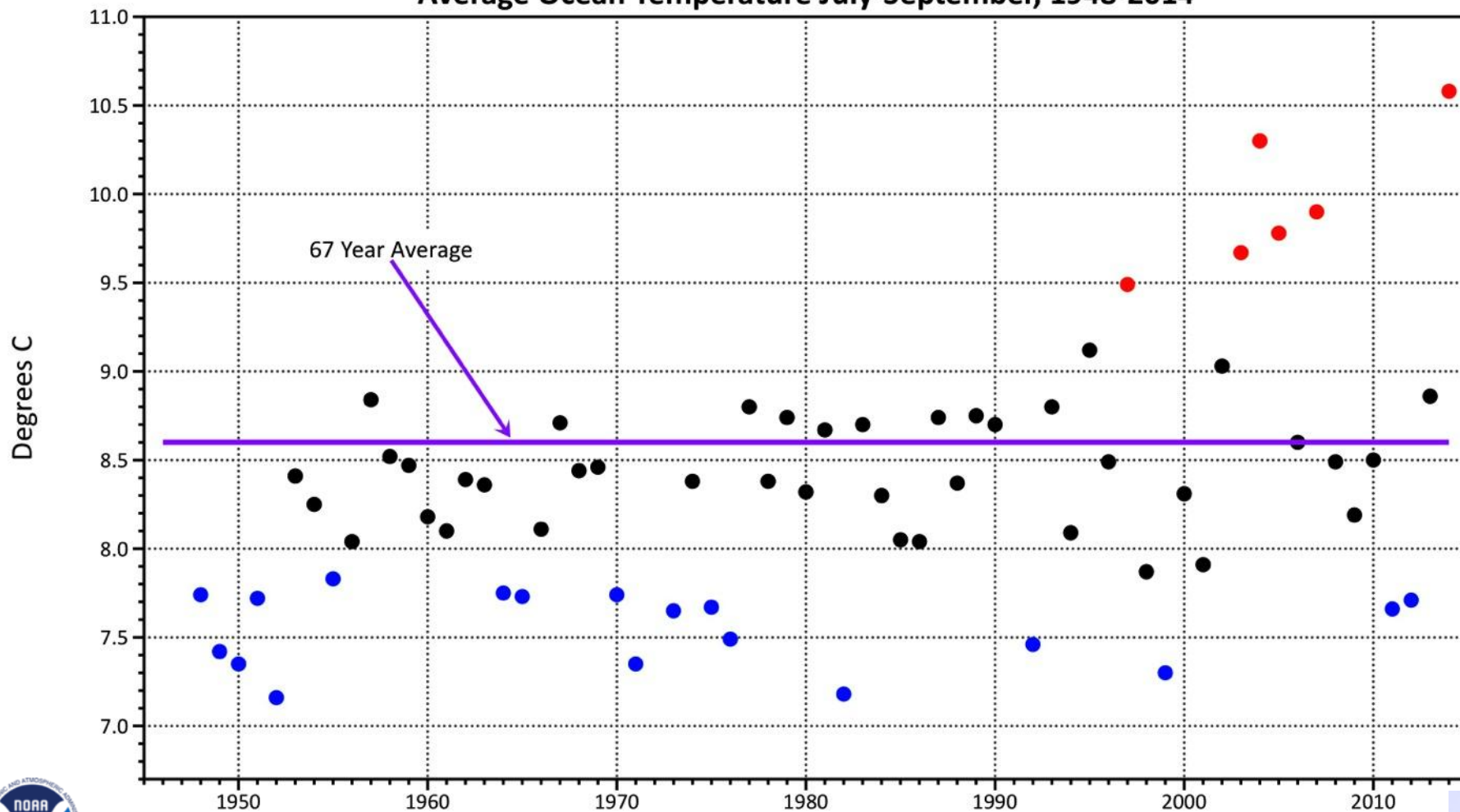
Analysis courtesy of Peter Bieniek, UAF



Bering Sea Summer Temperatures

Bering Sea (east of 180 Long)

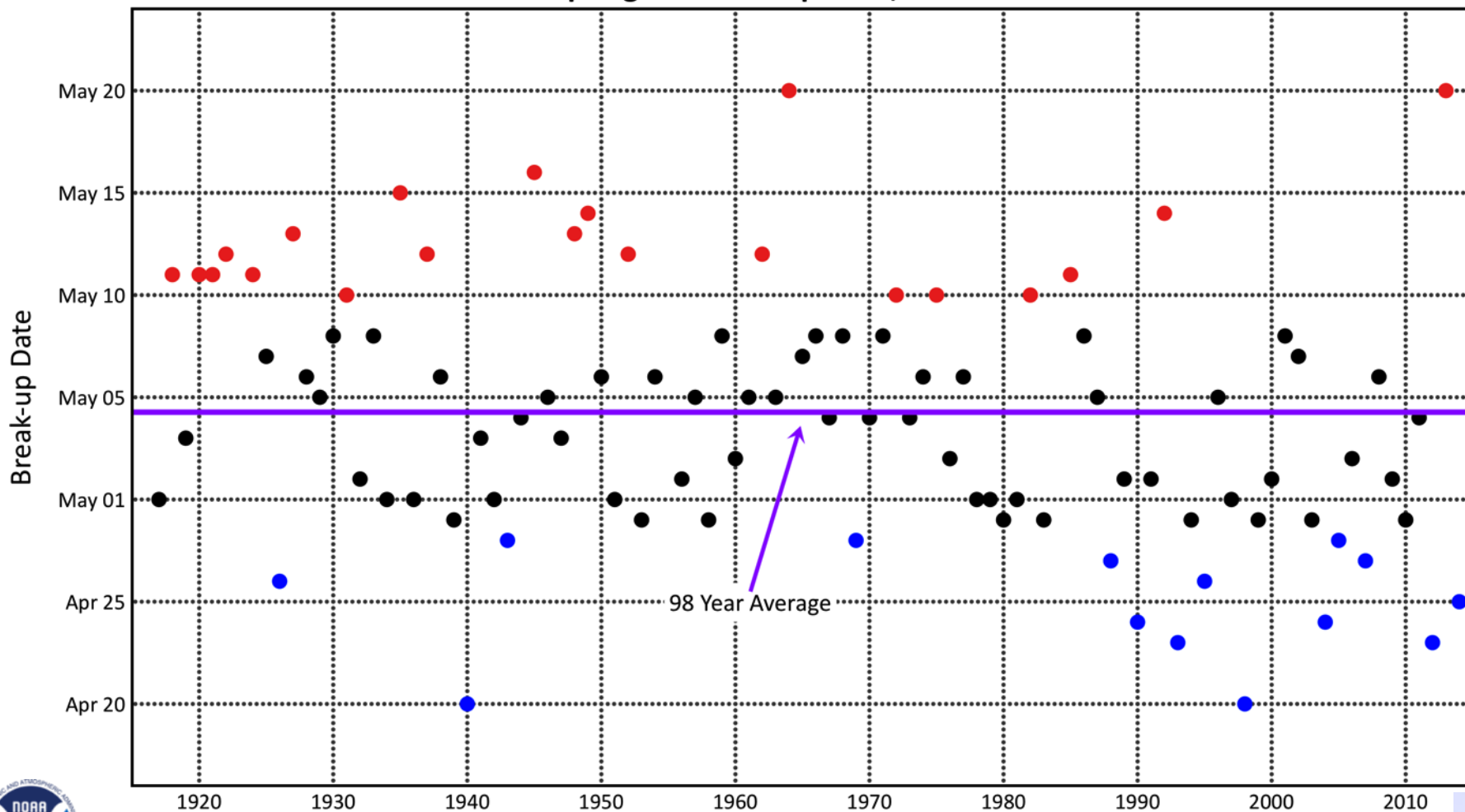
Average Ocean Temperature July-September, 1948-2014



Source: NCDC

Tanana River at Nenana

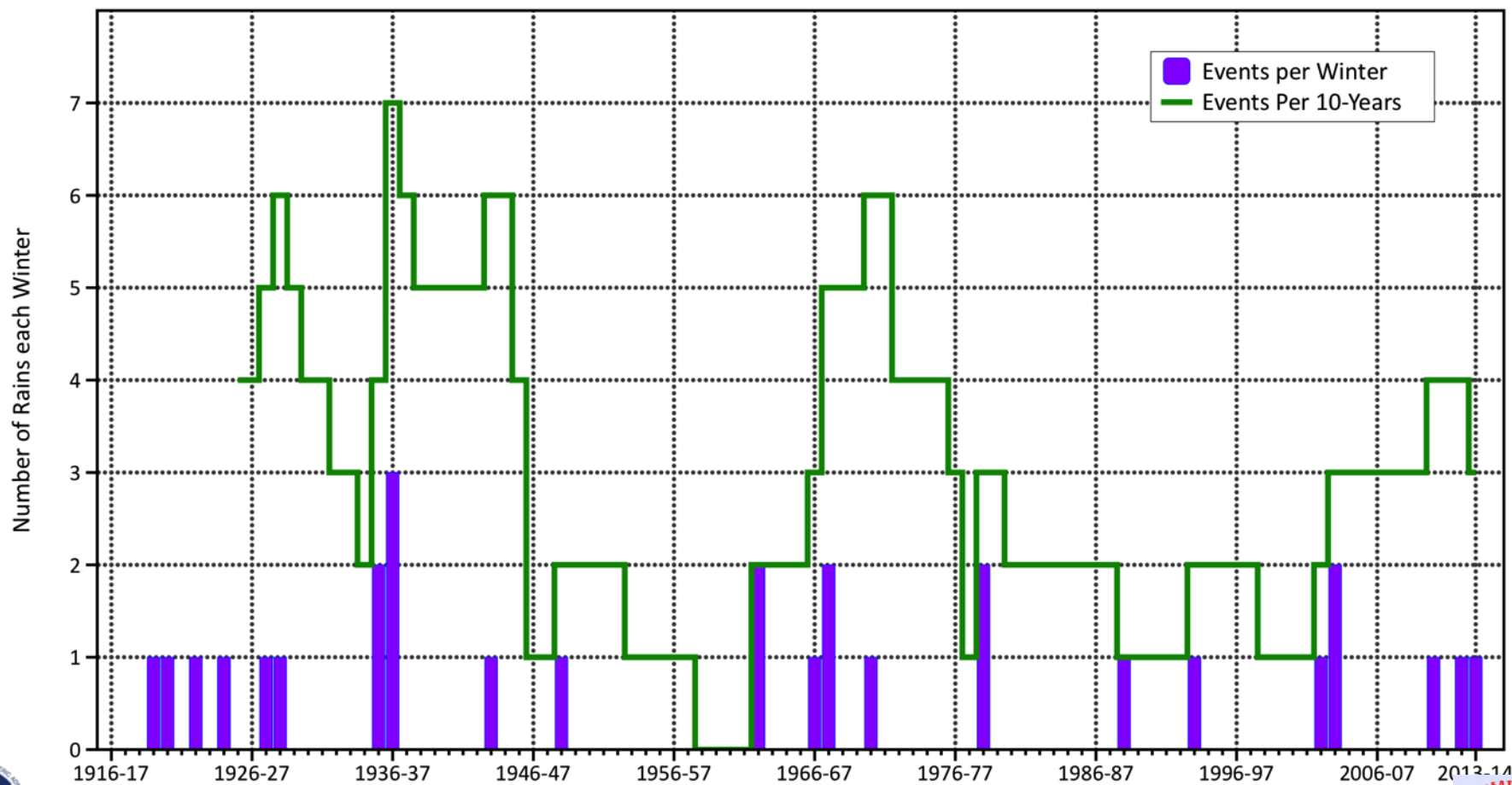
Tanana River at Nenana
Spring Ice Break-up Date, 1917-2014



Source: RFC/NWS

Fairbanks Freezing Rain

Fairbanks, Alaska
Significant Winter Rain Events
1916-2014

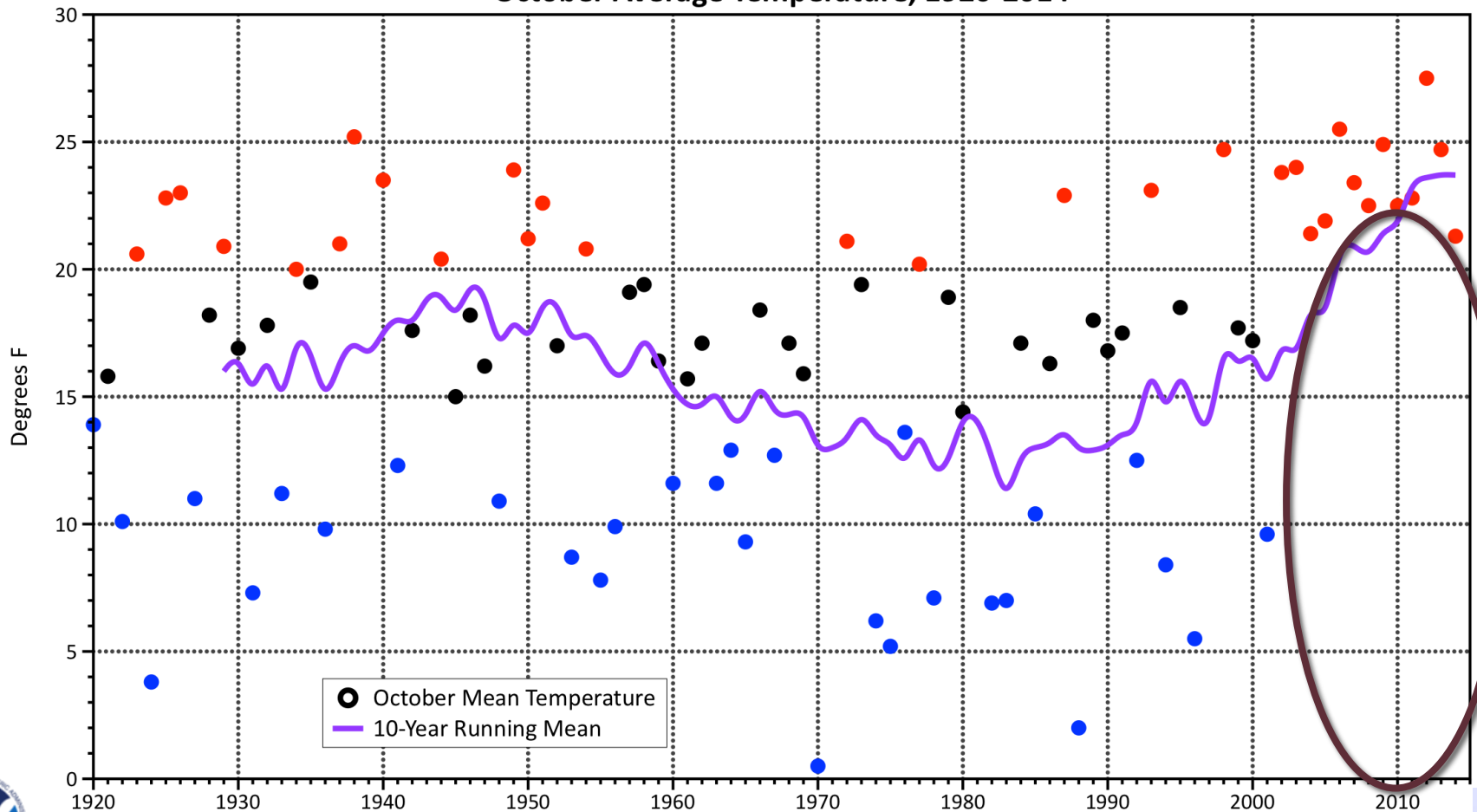


Source: NWS

Sea Ice and Temperature Impacts

Barrow, Alaska

October Average Temperature, 1920-2014



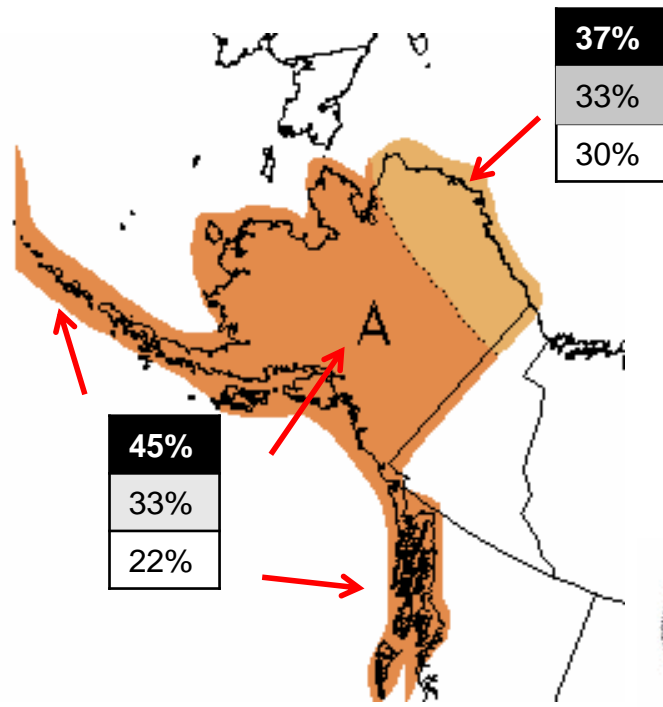
Source: NWS

Storm Term Climate: Upcoming Winter

- Equatorial Pacific Ocean surface temperatures are warmer than normal
 - **El Niño** likely (influences Alaska weather and seasonal climate by modifying jet stream over the Pacific Ocean)
 - Recent El Niño winters average somewhat warmer than normal (south of Brooks Range) and wetter than average South Central Coast and Southeast
- North Pacific and Bering Sea surface temperatures are warmer than normal
- Computer model consensus for over-all above average temperatures

Climate Prediction Center

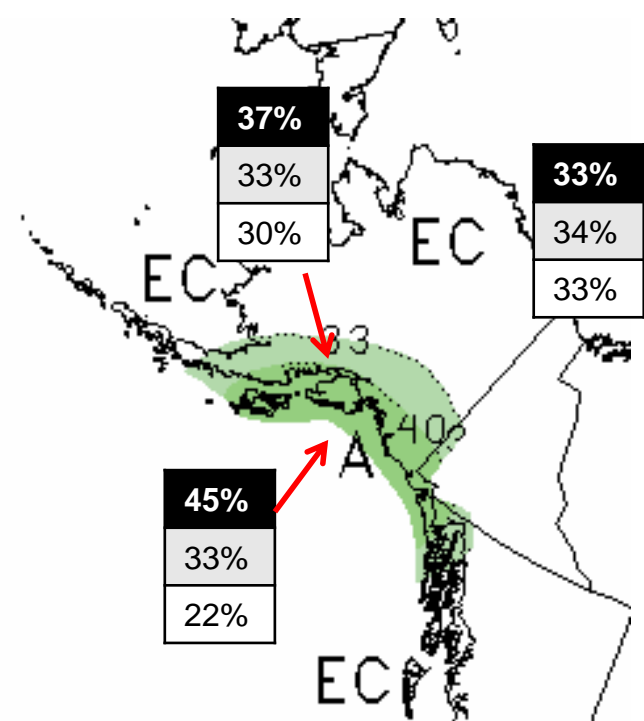
December-January-February Outlook



THREE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
1.5 MONTH LEAD
VALID DJF 2014
MADE 16 OCT 2014



%Above
%Normal
%Below



THREE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
1.5 MONTH LEAD
VALID DJF 2014
MADE 16 OCT 2014



Climate and Weather Wrap-up

- 2014 has been warm and (a little) wet state-wide. 2014 sea ice coverage slightly less than 2013, far below 20th century.
- Patterns
 - Far less autumn sea ice compared to 20th century average...**increased coastal flood threat**
 - Above average temperatures compared to mid 20th century continue
 - Wetter than average compared to 1960s to 1980s
- Specific Events in Historical Context
 - Some (recent Fairbanks freezing rain) have historical precedent
 - Some (autumn Bering Sea storminess) have no evident change
 - Some (Tanana River at Nenana break-up) have obvious change

Tsin'ee

- Alaska Federation of Natives and Ben Mallott
- Dr. Peter Bieniek/UAF
- NOAA Colleagues
- YOU

