

# **How does the Pacific SST influence Alaska?**

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**Pacific Anomalies Science and Technology Workshop**

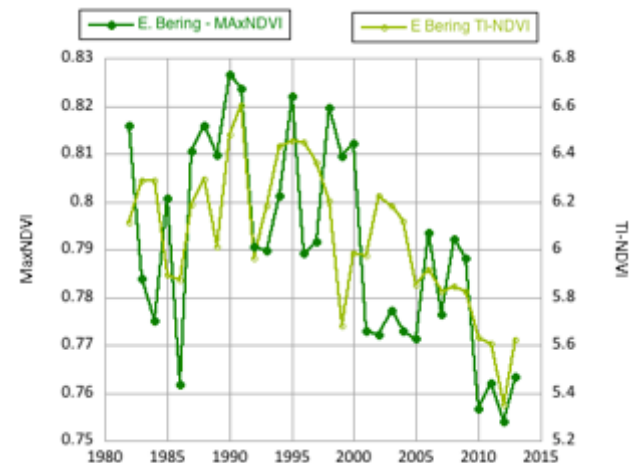
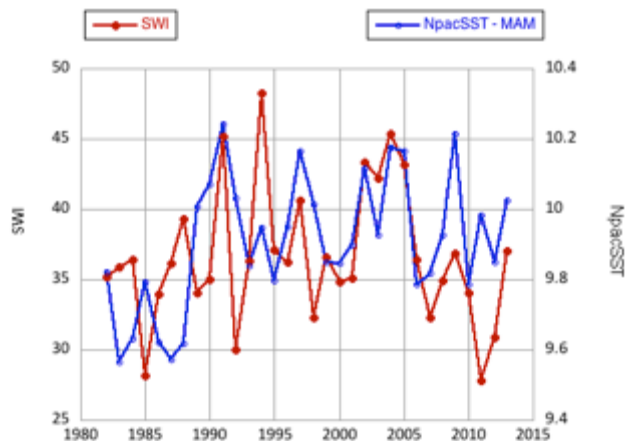
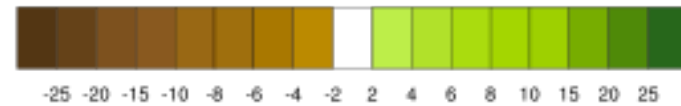
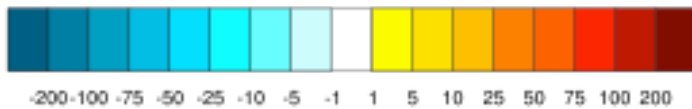
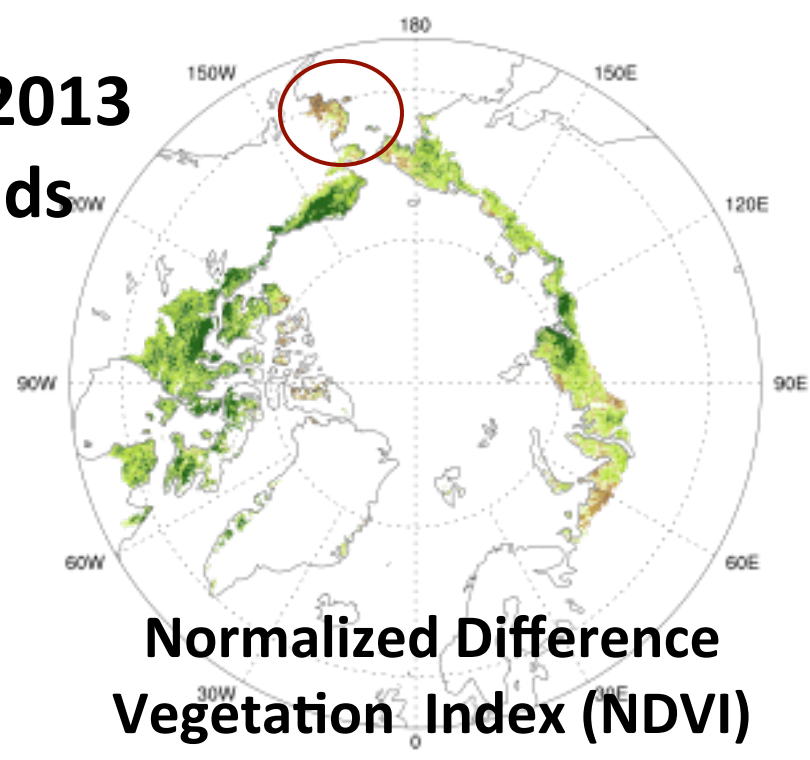
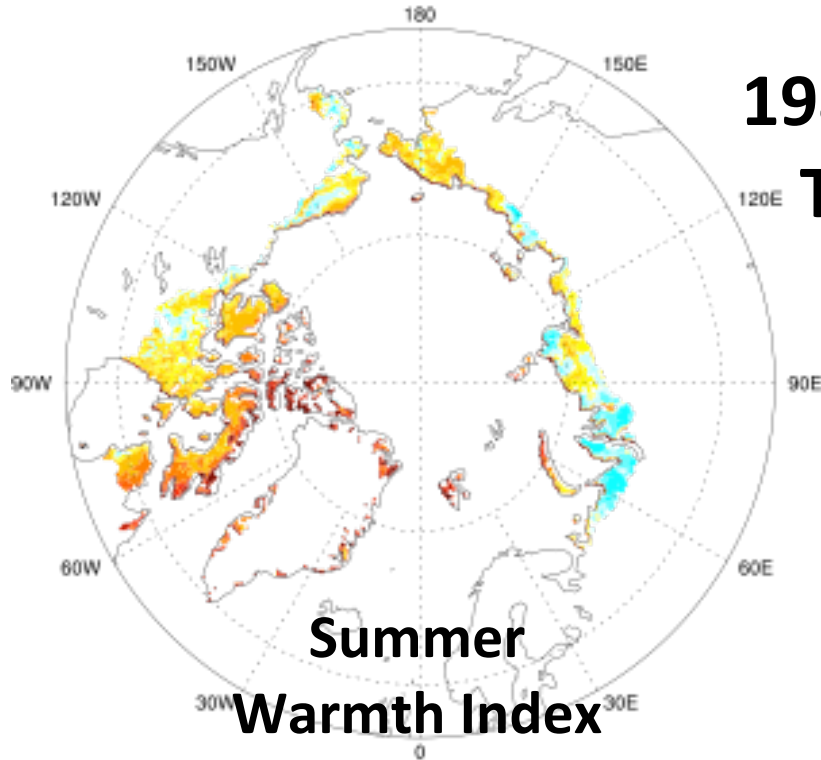
**Tuesday May 5, 2015**

**With contributions from: R. Thoman, P. Bieniek, D.A. Walker, M. Reynolds, M. Steele, and others**

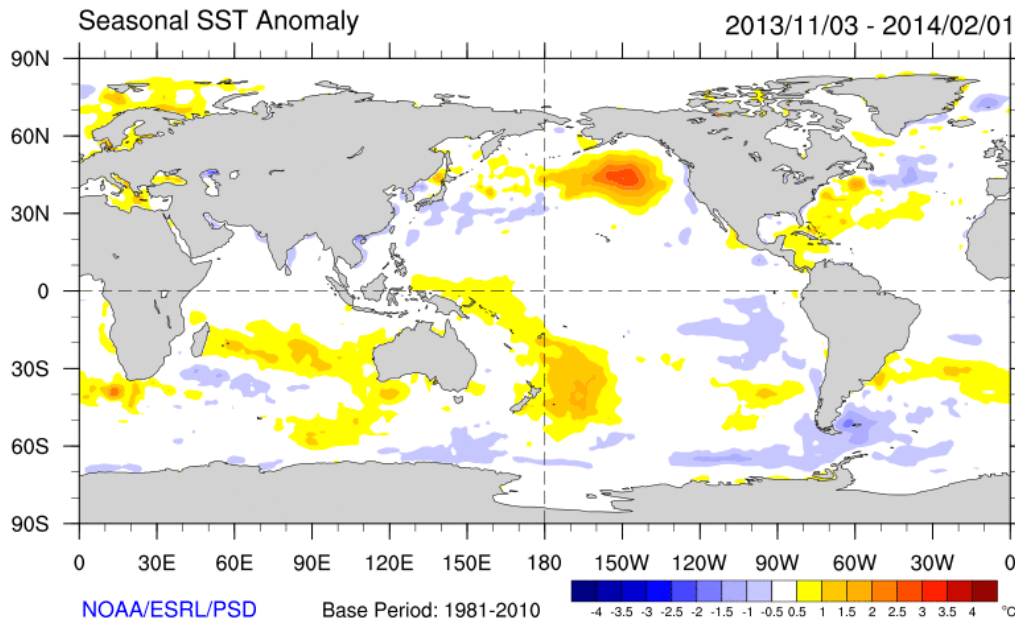
**Use Pacific SST to forecast:  
Tundra Vegetation Productivity  
Alaska Winter Temperatures**

# Tundra a maritime biome - Pac SSTs & SW Alaska?

1982-2013  
Trends

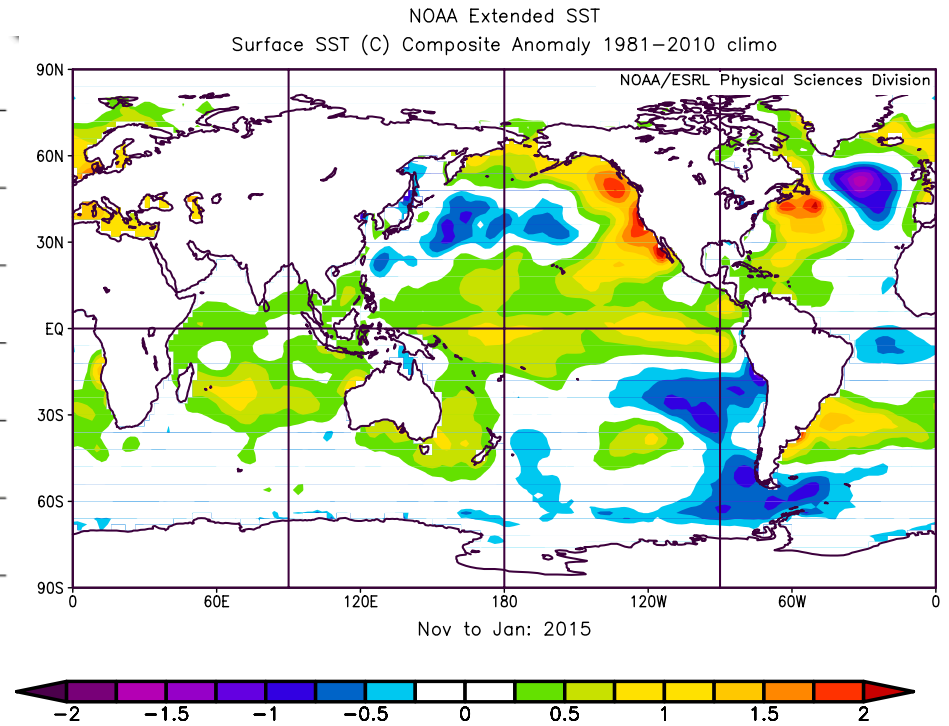


# 'Current' North Pacific SST (Sea Surface Temperature) Patterns (2013-4)



**Nov-Jan SST pattern present in early 2014 after Alaska had a record warm January**

**(2014-5)**



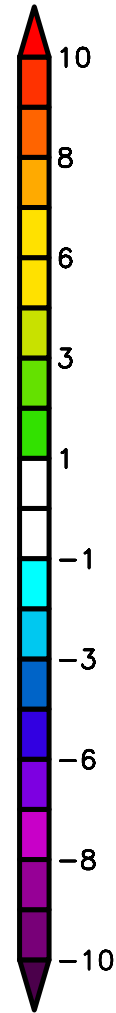
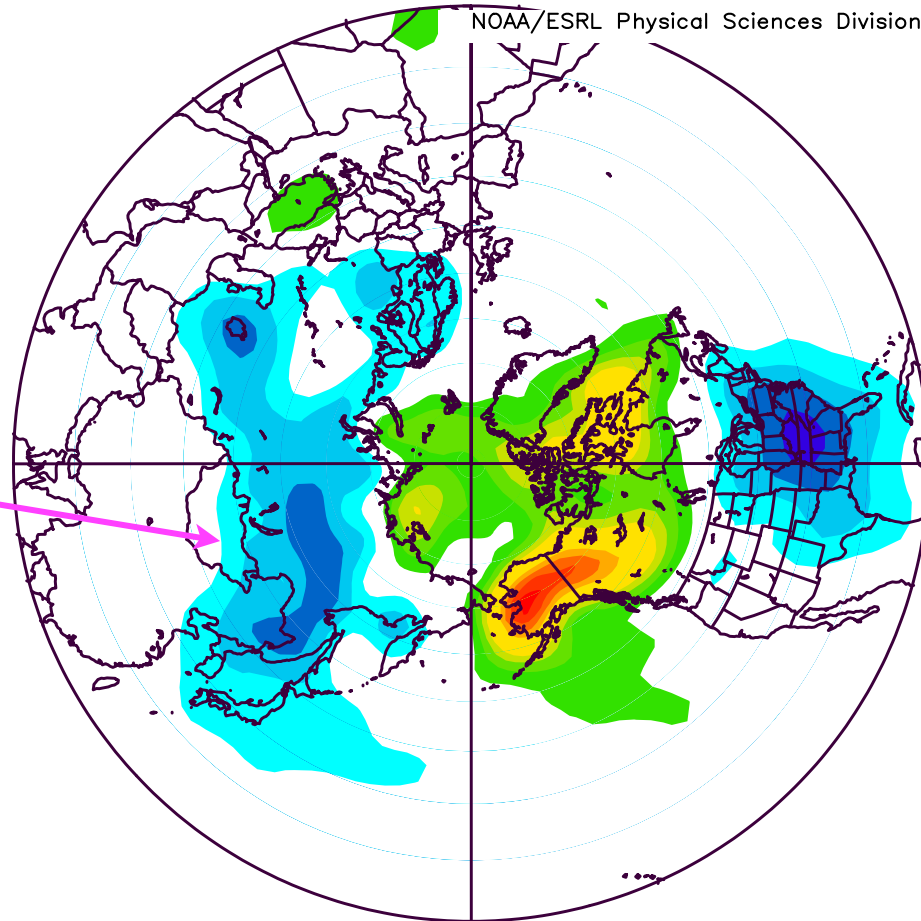
**SST pattern for a year later**

# SAT 5 Warmest Januaries in Alaska (1977, 1981, 1985, 2011, 2014)

NCEP/NCAR Reanalysis  
1000mb air (C) Composite Anomaly 1981–2010 climo

NOAA/ESRL Physical Sciences Division

Cold  
over  
Eurasia

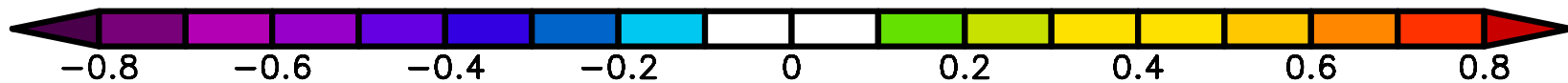
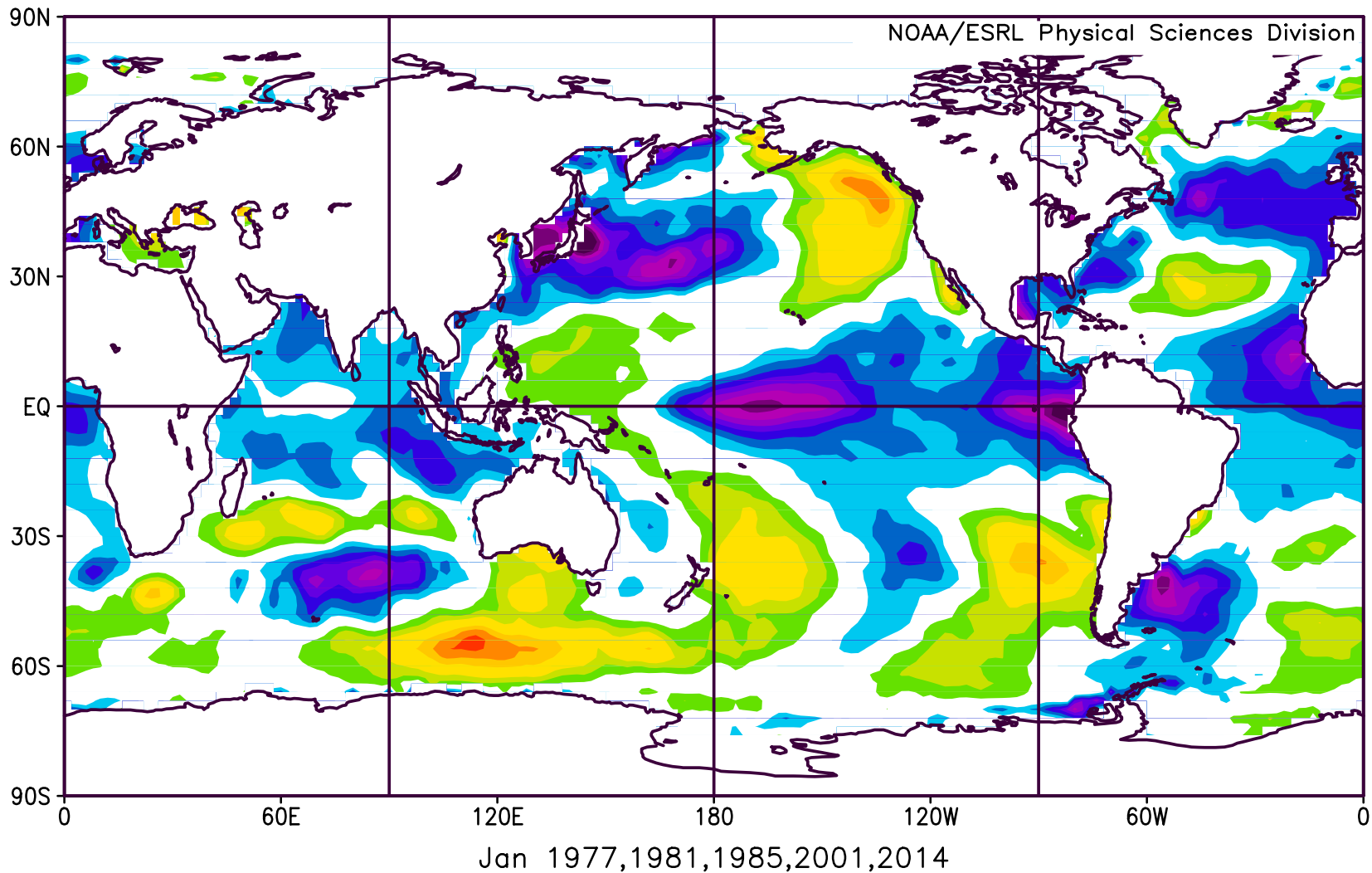


Jan 1977,1981,1985,2001,2014

# Average SST for 5 warmest Januaries

NOAA Extended SST

Surface SST (C) Composite Anomaly 1981–2010 climo

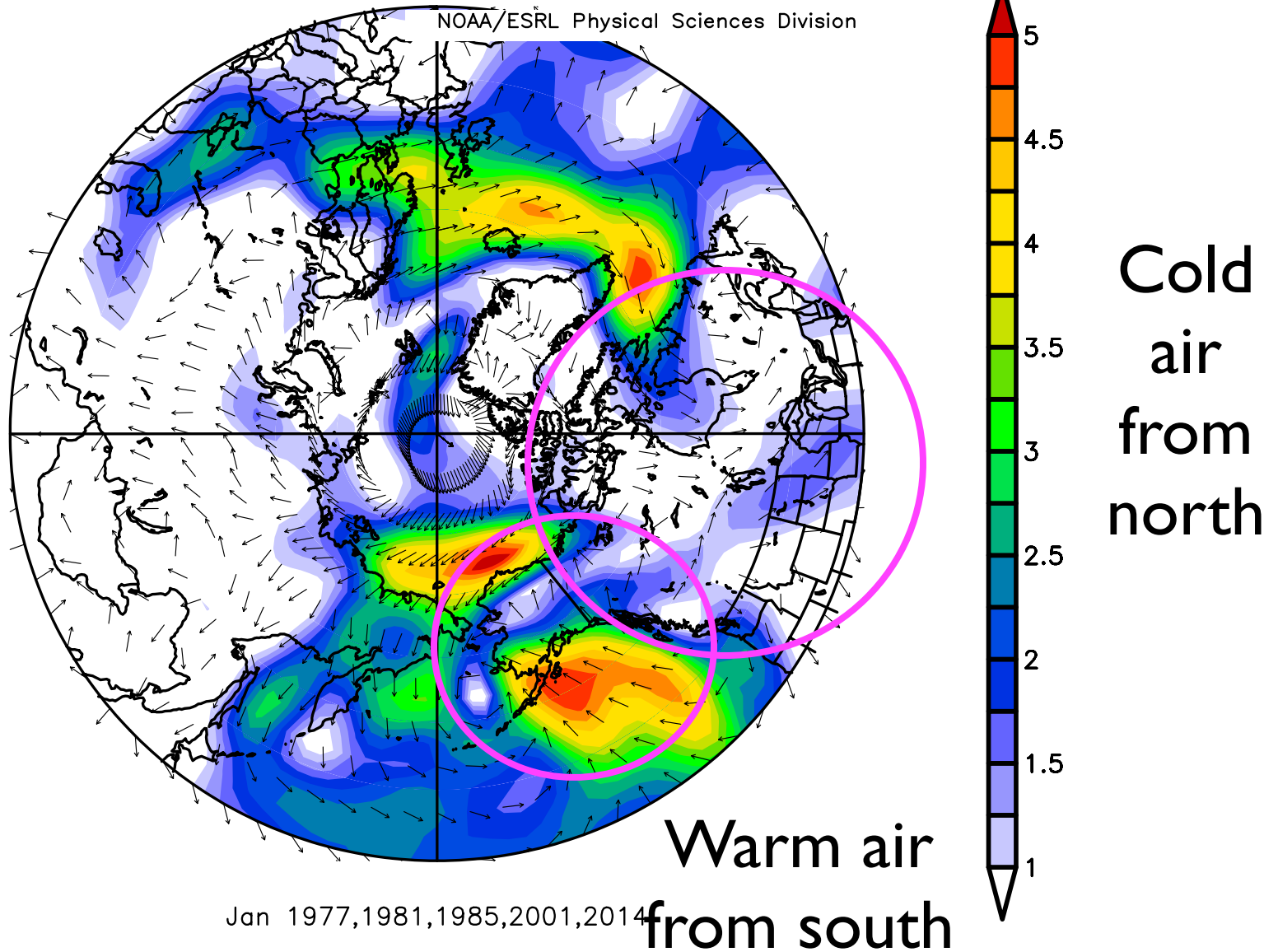


# Average Wind for 5 warmest Januaries

NCEP/NCAR Reanalysis

1000mb Vector Wind (m/s) Composite Anomaly 1981–2010 climo

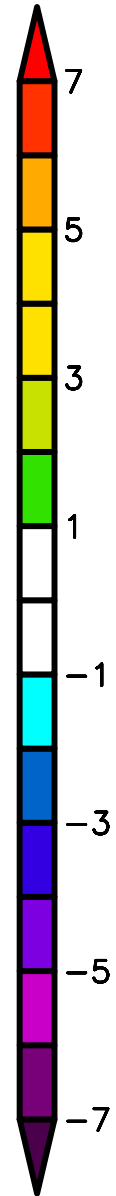
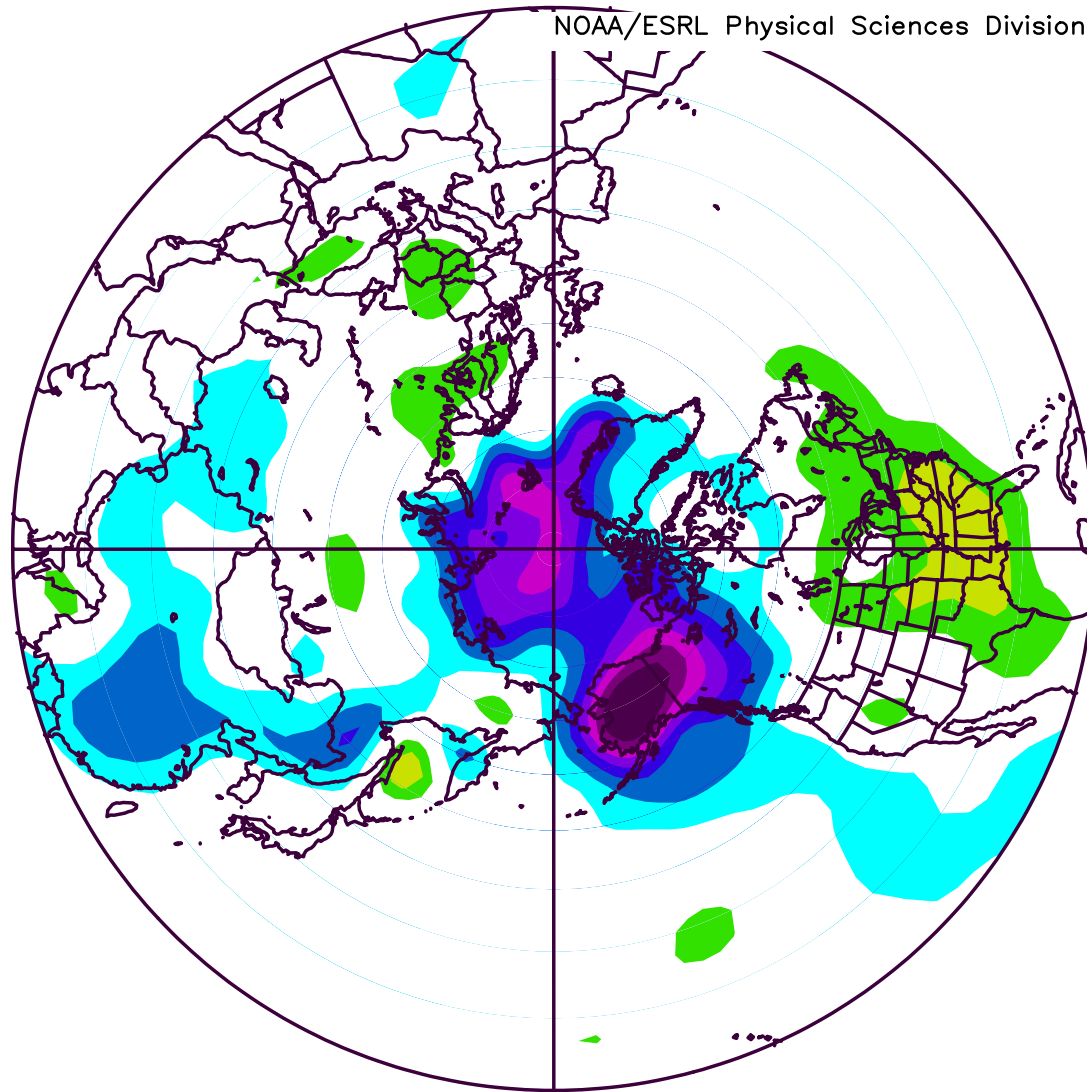
NOAA/ESRL Physical Sciences Division



# What do Coldest 5 Januaries look like?

NCEP/NCAR Reanalysis  
1000mb air (C) Composite Anomaly 1981–2010 climo

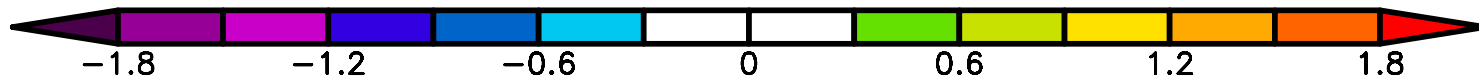
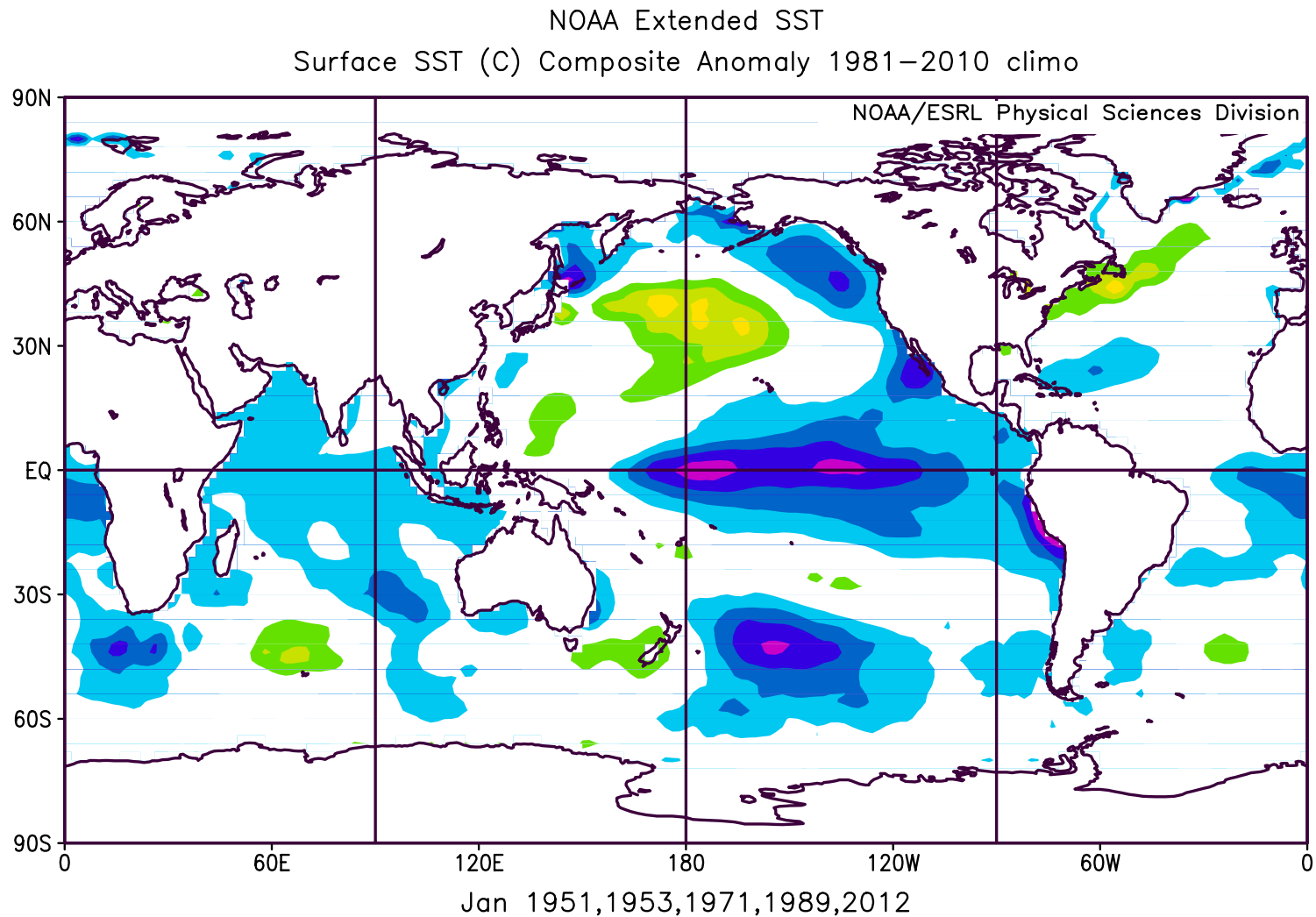
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Jan 1951,1953,1971,1989,2012

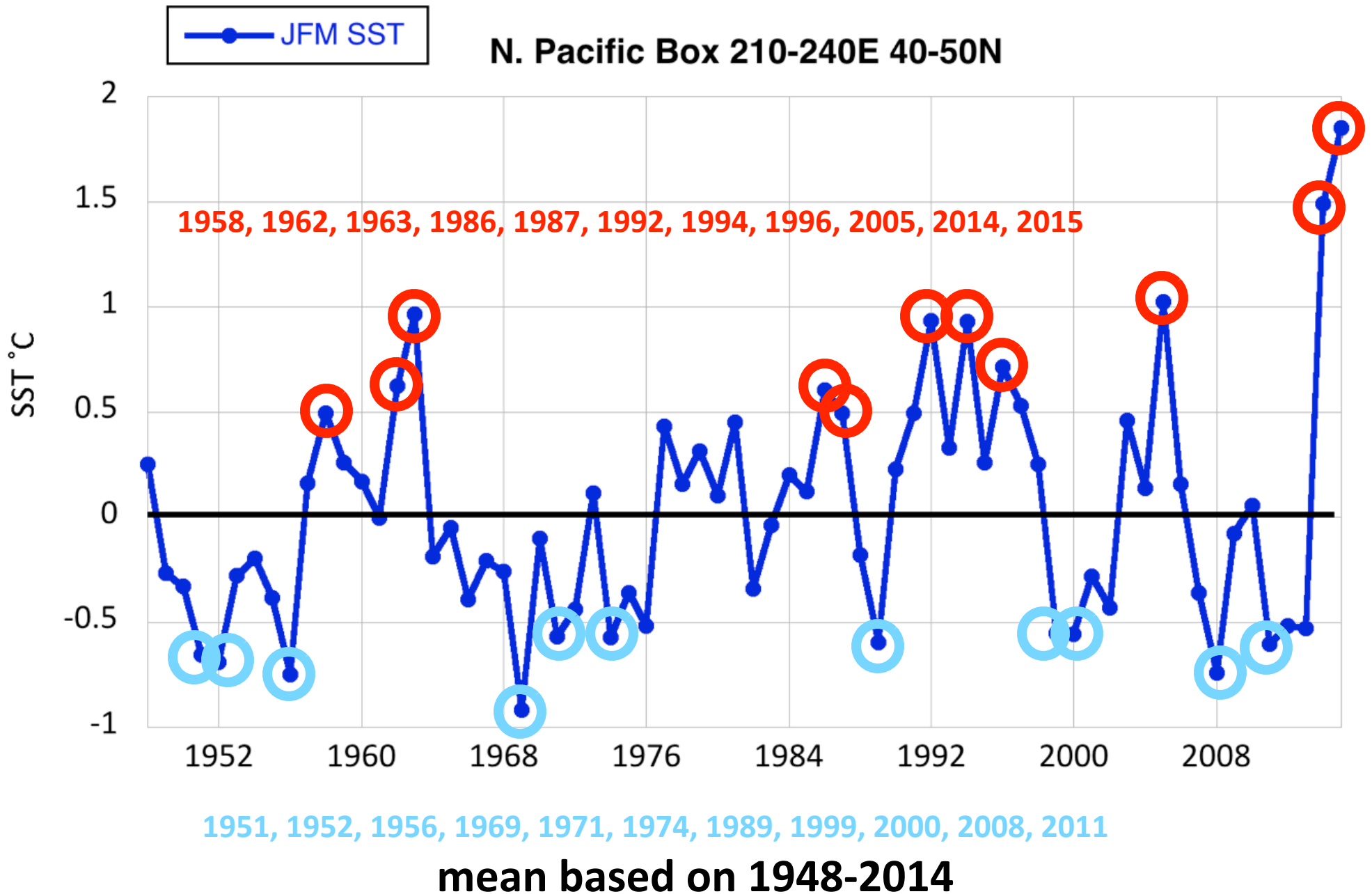


# Average SST for 5 Coldest Alaska Januarys

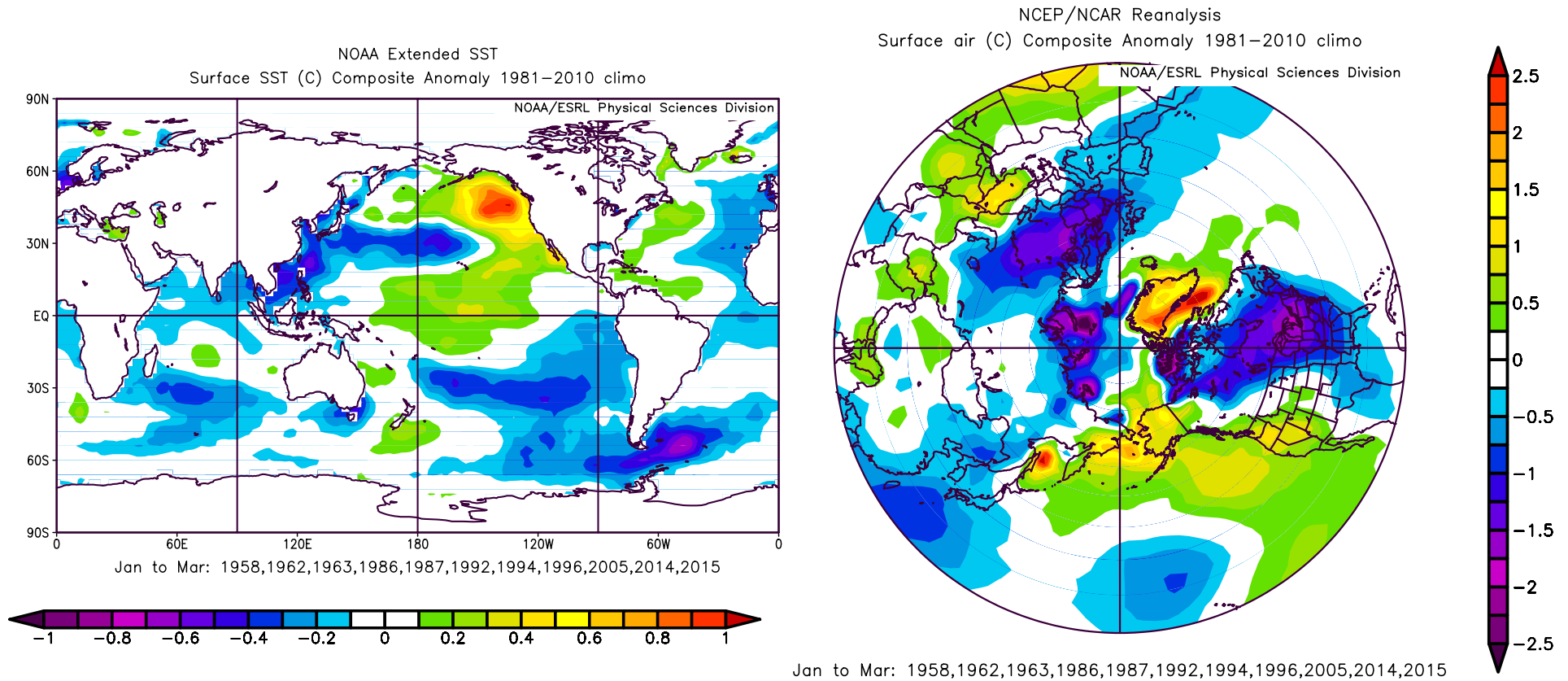




# Pacific SST anomalies > |1σ|



# SST and SAT anomalies Warm Pac



- Composites show some similarity to those for Warm Alaska composites.
- Positive phase of the PDO in North Pacific and negative ENSO phase (perhaps)!

# Final Comments

- **Could North Pacific circulation explain why SW Alaska tundra vegetation productivity has been declining?**
- **Anomalously warm Alaska Januaries tend to occur when eastern US is cooler than normal. Related to proposed sea ice decline mechanism for hot Arctic/cold East coast?**
- **Ocean temperatures tend to be warmer than normal south of Alaska during these extreme warm winters.**
- **Anomalously Cold Alaska Januaries have opposite SAT and SST anomaly patterns to the warm case.**
- **Equatorial Pacific was cooler than normal for both warm and cool AK Januaries. (too few cases?)**
- **Composites based on Pac SST looked similar but not quite.**