

Two-week forecast skill for October-November-December

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What forecast skill is there for 15-day October, November, December forecasts in the Pacific Northwest (PNW)?

Madden and Julian Oscillation:

M. Brugman's presentation

ENSO: Document 15-day forecast skill as a function of ENSO polarity.

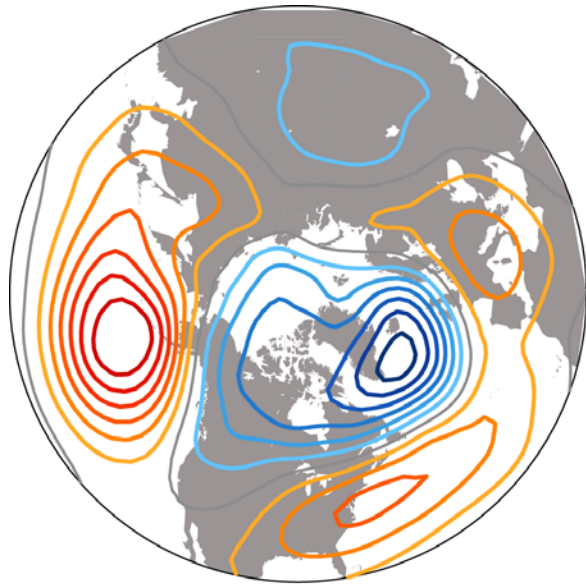
Data from the NOAA “reforecast” project

- Every day run the forecast model out 15 days.
- Do this 15 times and take the mean.
- Do this for every day since 1979.
- Examine 500mb geopotential height for 1979-2004.

Characterize the patterns of variability that the model forecasts best.

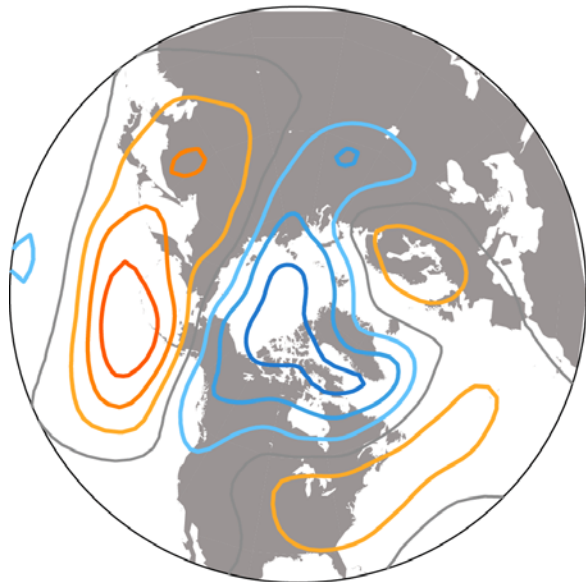
Canonical correlation analysis (forecast, verification anomalies).

Output: pairs of spatial maps (forecast, verification). Calculate the amplitude of each pattern for each day of the input data. The temporal correlation of these timeseries is the skill score.



December-January-February 1981-94:

- Leading verification map (top panel) is a mix of Pacific North American and Northern Annular Modes (map shows typical anomalies, contour interval 10m)
- Associated forecast map (not shown) similar and weaker
- Temporal amplitudes of verification and forecast maps correlated at 0.67



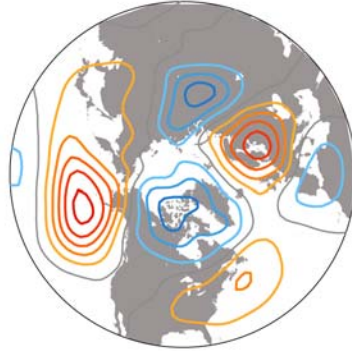
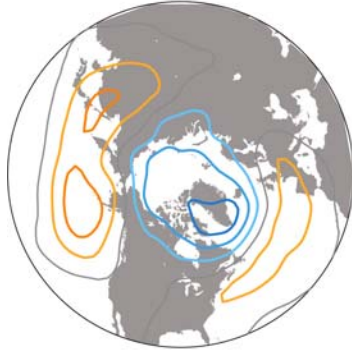
October-November-December:

- Leading verification map similar to that for DJF, albeit weaker and more of a Pacific / Polar emphasis
- Temporal correlation 0.52

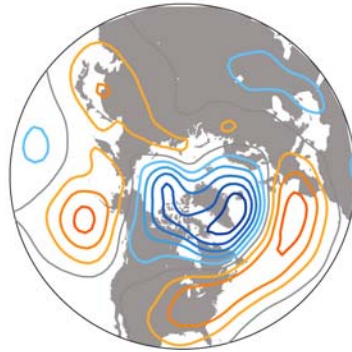
All years



Cold ENSO



Neutral ENSO



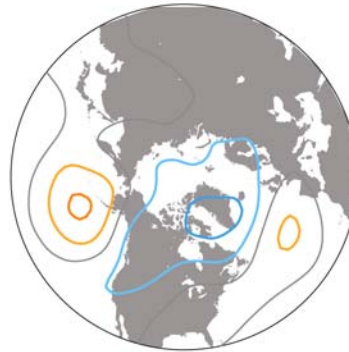
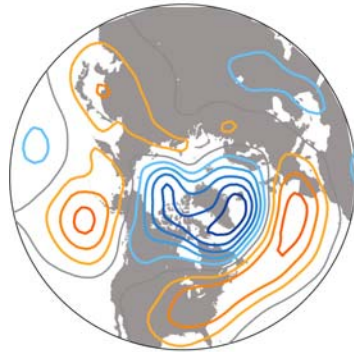
Warm ENSO

Warm ENSO CCA modes

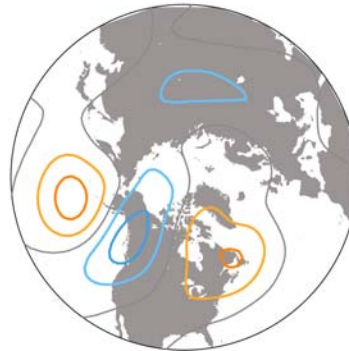
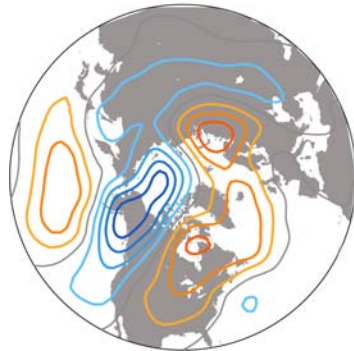
verification

forecast

1



2

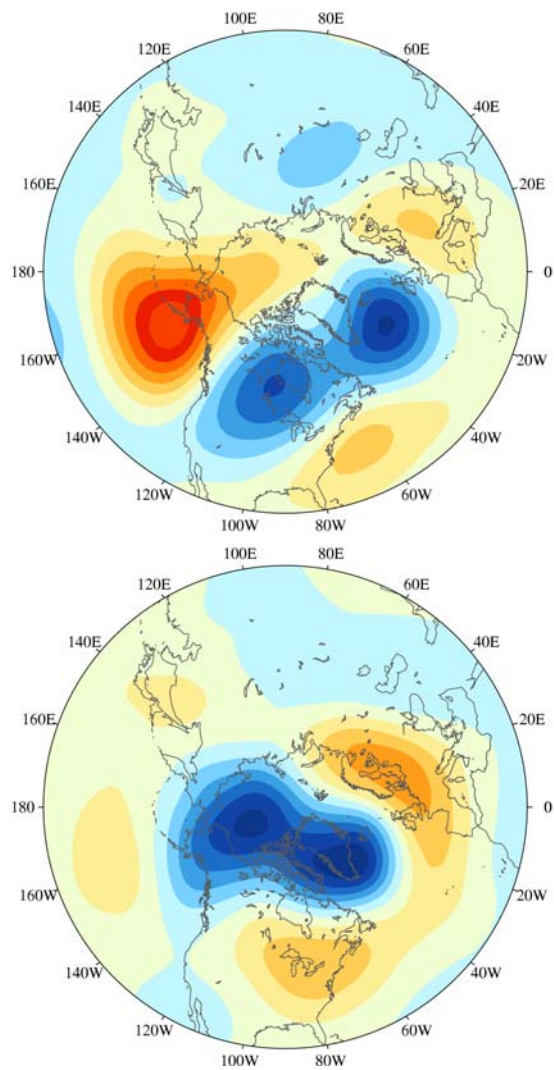


15-day Forecast skill October-November-December

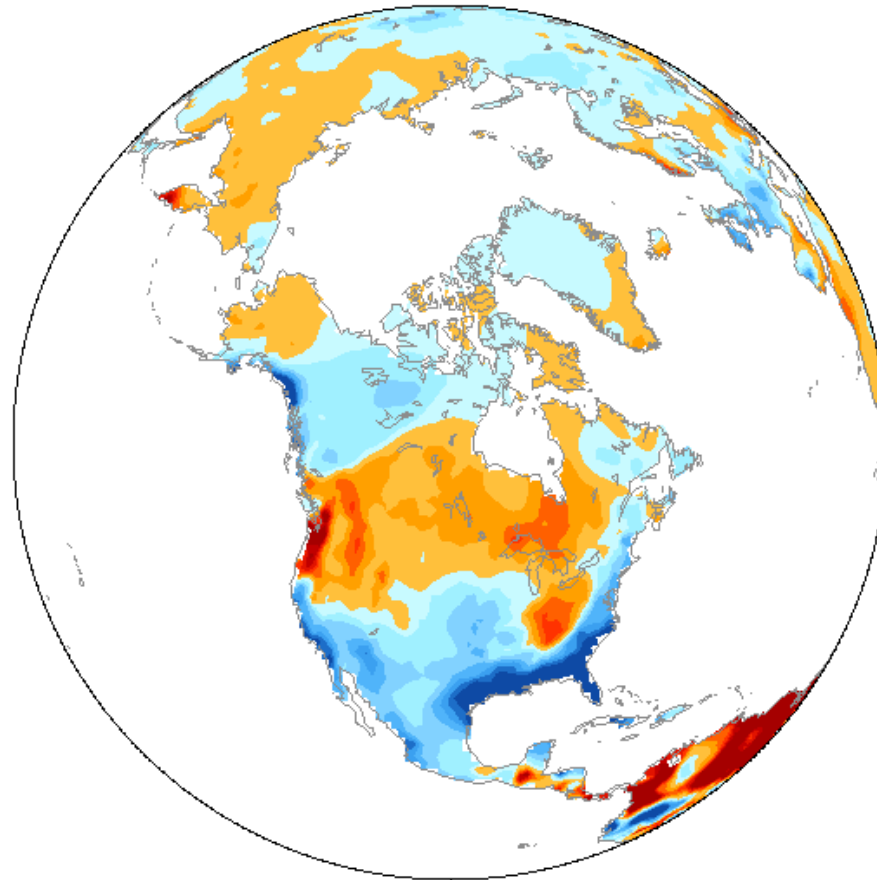
Leading pattern and skill independent of ENSO polarity:
perhaps much of the model skill is due to persistence

Second pattern characterized by east-west wavetrain:
more skill during warm ENSO

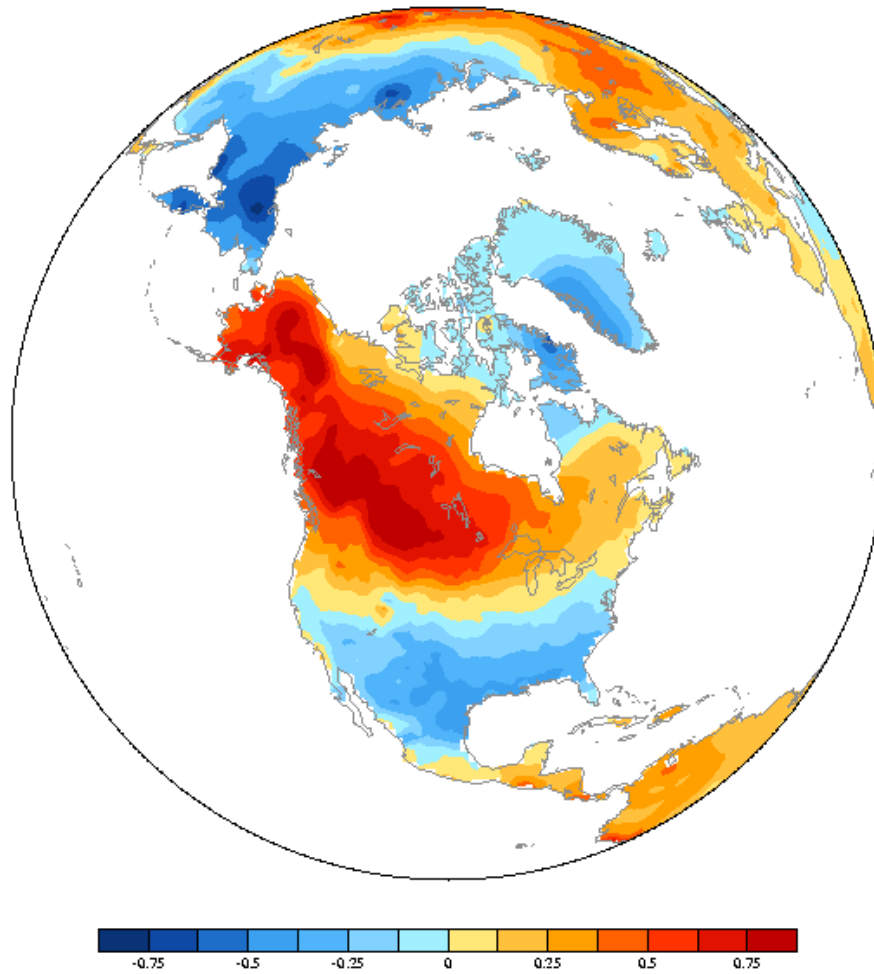
EOFs 1 and 2 December-January-February 500mb geopotential height (m)



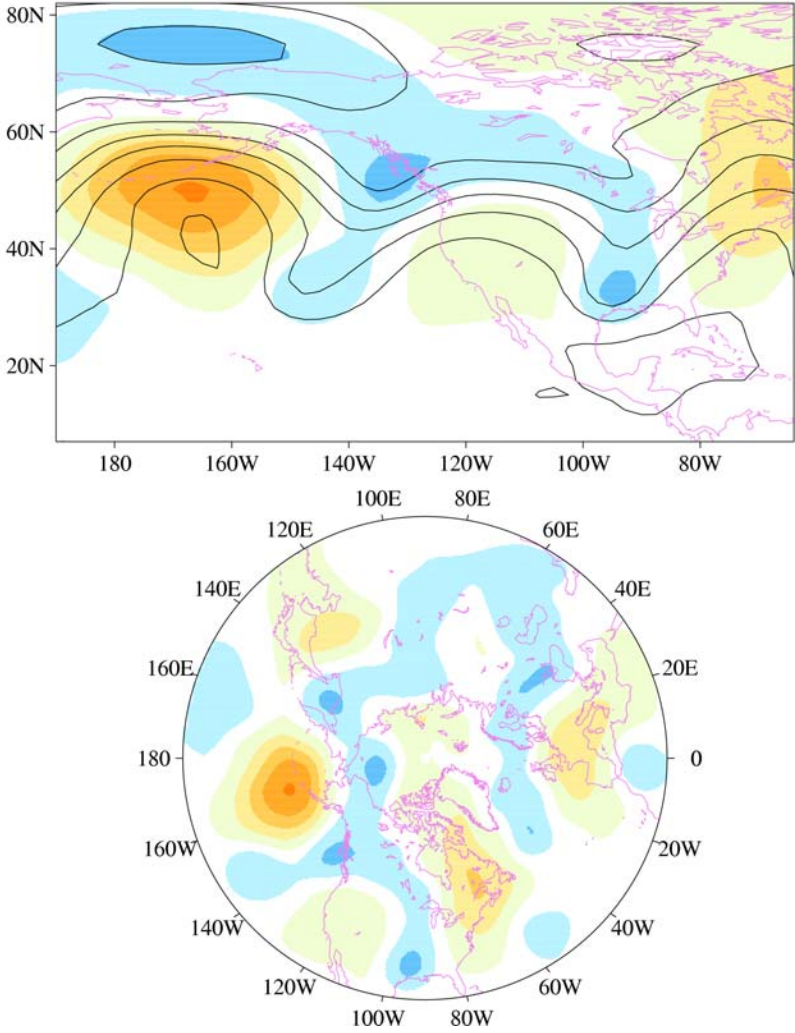
ENSO winter precipitation anomalies 1950-96 (cm/month)



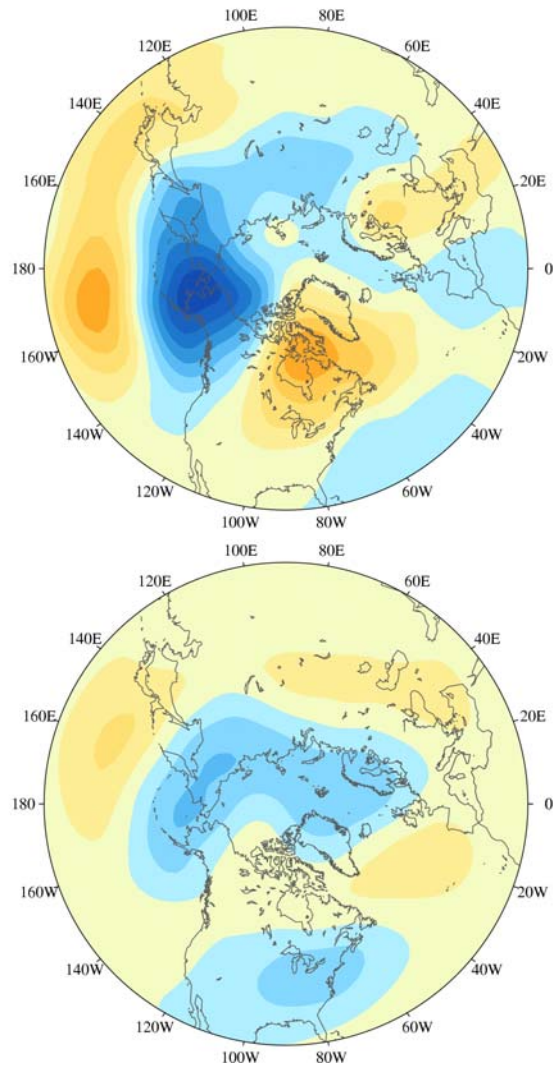
ENSO winter temperature anomalies 1950-96 (C)



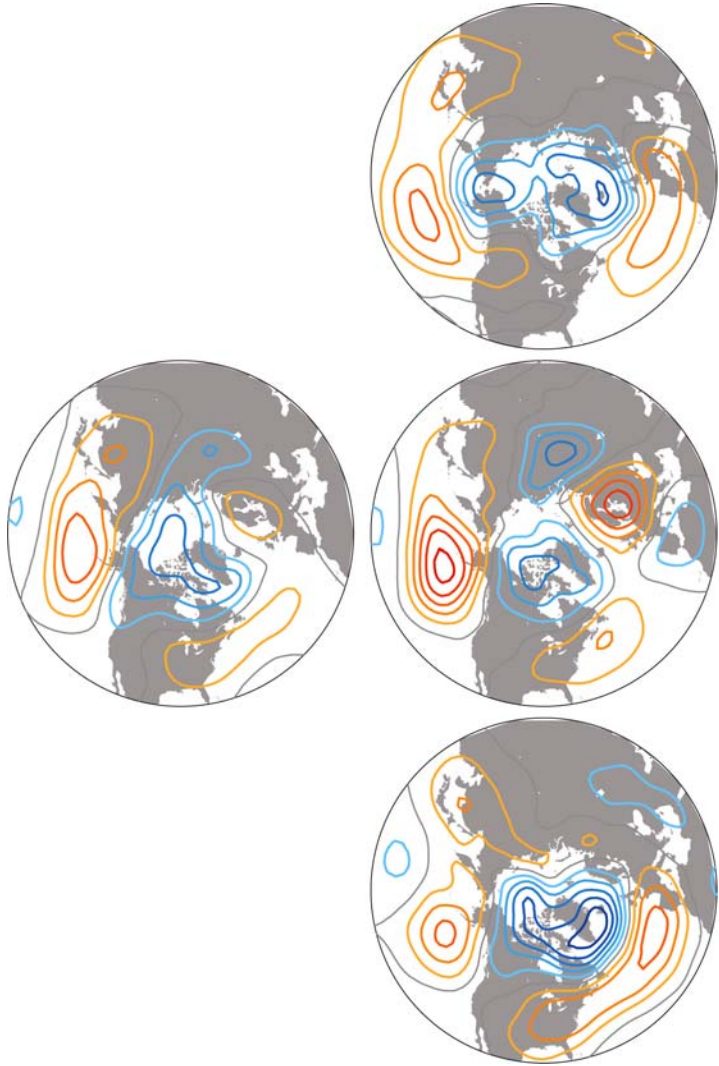
Wet day in Sedro Woolley (19 November 2003, 1.95 inches)



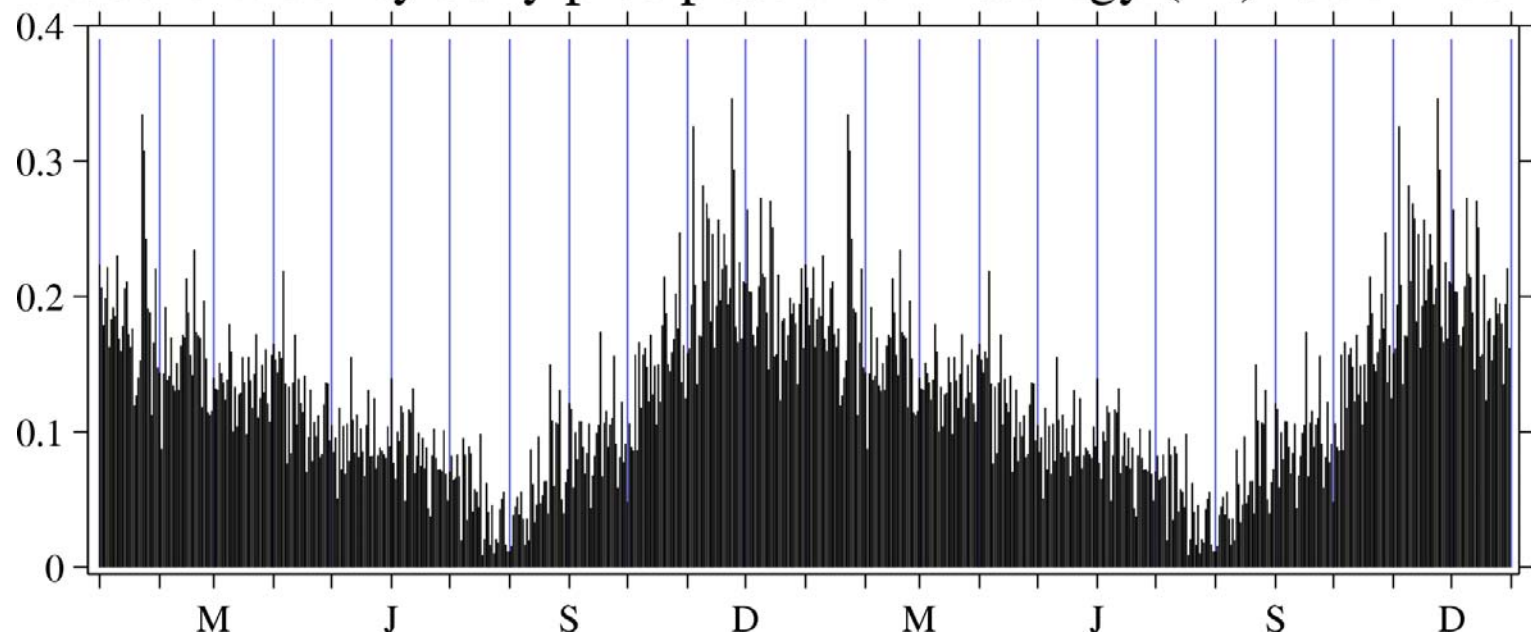
CCA mode 4: initialization and 15-day forecast, $r=0.44$



- Examine skill in shorter forecasts.
- Skill in forecast for average of days 11-15.
- Skill in precipitable water forecasts
- Skill in warm, neutral, and cold ENSO
- Skill for phases of the tropical intraseasonal oscillation (Madden and Julian oscillation)



Sedro Woolley daily precipitation climatology (in.) 1950–2004



Flood amplitudes and Madden-Julian Oscillation phase

3 rivers, 32 floods, 1979-2000 (Bond and Vecchi 2003)

MJO-related precipitation
passed Indonesia 5-10 days previous

