ALASKA REGION
CLIMATE FORECAST BRIEFING

October 24, 2014
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Environmental and Scientific Services Division
Today

- Climate Forecast Basics
- Review of recent climate forecasts and conditions
  - CPC Forecasts and observations for most recent month and season
  - Current Atmosphere and Ice
  - Climate Drivers: SSTs, PDO, ENSO
- Climate Forecast Guidance
  - ENSO
  - Statistical
  - Dynamic--NMME
  - Climate Prediction Center Last Month
- CPC Outlooks
  - Next month
  - Next season
- Requested Bonus: NMME
Climate Forecast Basics

**Climate Prediction Center**: primary NOAA/NWS forecast responsibility

- **Climate Forecasts**
  - Relation to some long term normal (1981-2010)
  - Categorical (often three)
  - Probabilistic

- **Traditional Elements**
  - **Temperature**: centered around average
  - **Precipitation**: centered around median (can significantly differ from the “normal”, which by convention is the mean)
CPC Lead 1 Forecasts: September & JAS 2014
September 2014 Precip

Preliminary data subject to revision
September 2014 Temps

Preliminary data subject to revision
Jul-Aug-Sep 2014 Precip

- Sig Above
- Near Normal
- Sig Below
Jul-Aug-Sep 2014 Temps

Sig Above
Near Normal
Sig Below
Mid-October Sea Ice Comparison

This year very similar to 2013
Global SST Anomalies

Positive PDO Pattern
Pacific Decadal Oscillation

Pacific Decadal Oscillation Index
2000-2014
Tropical Pacific SSTs and ENSO

Through Oct 15th
Equatorial Upper Ocean Heat Anomaly

EQ. Upper-Ocean Heat Anoms. (deg C)

Equatorial Temperature Anom (°C), Oct 15 2014

Equatorial Temperature Anom (°C), Sep 10 2014
Guidance

• ENSO
  • Models
  • Expert Evaluation

• Statistical
  • Trends in the Past 10/15 Years
  • Oceanic Correlation

• Dynamic
  • SST Anomalies
  • Global Temp and Pcpn Anomalies
CPC Niño 3.4 Forecasts

Plumes: El Niño this fall persisting through late winter
CPC Niño 3.4 Forecast

El Niño Watch: Issued when conditions are favorable for the development of El Niño conditions within the next six months.
November Temp and Pcpn Trends

Temps 10 years
Pcpn 15 years

Sig Abv Temp
Sig Below Temp
Sig Abv Pcpn
Sig Below Pcpn
Nov-Dec-Jan Temp and Pcpn Trends

Temps 10 years
Pcpn 15 years

- Sig Abv Temp
- Sig Below Temp
- Sig Abv Pcpn
- Sig Below Pcpn
PDO: Then and now during NDJ

1948-88

↓

1989-2013

←Temps→

←Precip→

Nov to Jan: 1949 to 1988: 925mb Air Temperature Seasonal Correlation w/ Nov to Jan PDO

Nov to Jan: 1989 to 2013: 925mb Air Temperature Seasonal Correlation w/ Nov to Jan PDO

NOAA/ESRL Physical Sciences Division
ENSO: Correlations and Composites

Correlation since 1980

El Niño Composites since 1976
Dynamic Forecasts

• Extratropical SSTs
• Arctic Sea Ice
• Temp and Pcpn Anomalies
NMME Forecast SST Anomalies

NMME Forecast of SST Anom  IC=201410 for Lead 1 2014Nov

Moderately positive PDO pattern
NDJ SST Anomalies and Skill

NMME Forecast of SST Anom IC=201410 for 2014NDJ

NMME Forecast of SST Skill (AC) IC=10 for NDJ
CFSv2 Sea Ice Forecast

November Anomaly

November Coverage
November 2014 Temp Anomaly Forecasts
November 2014 Pcpn Anomaly Forecasts
Nov-Dec-Jan 2015 Temp Anomaly Forecasts
Nov-Dec-Jan 2015 Pcpn Anomaly Forecasts
NMME Skill for November and NDJ

Temp

Pcpn
CPC September Forecast Nov-Dec-Jan
And the Answer Is…
CPC November Outlook

ONE-MONTH OUTLOOK TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID NOV 2014
MADE 16 OCT 2014

ONE-MONTH OUTLOOK PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID NOV 2014
MADE 16 OCT 2014

Above%
Norma%l%
Below%
Climate Forecast Links

- CPC Monthly
  - [http://www.cpc.ncep.noaa.gov/products/predictions/30day/](http://www.cpc.ncep.noaa.gov/products/predictions/30day/)

- CPC Seasonal
  - [http://www.cpc.ncep.noaa.gov/products/predictions/90day/](http://www.cpc.ncep.noaa.gov/products/predictions/90day/)

- NMME

- ENSO at CPC (including weekly briefing)

- ENSO at IRI
But Wait... There’s More

- NMME: North American Multi-Model Ensemble
- Real Time (each month) Monthly to Seasonal Forecasts from leading North American based climate models
- Fluid collection of climate models
- Hindcasts for ~30 years for all participating models
  - Skill assessment
  - Bias Correction
- All real-time and hindcast data publically available
# Current NMME Model Suite

<table>
<thead>
<tr>
<th>Group</th>
<th>Model</th>
<th>Ensemble Members</th>
<th>Atmosphere Resolution</th>
<th>Ocean Resolution</th>
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<tbody>
<tr>
<td>NCEP/NOAA</td>
<td>CFSv2</td>
<td>24</td>
<td>T126 L64</td>
<td>L40 0.25°</td>
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<tr>
<td>Environment Canada</td>
<td>CanCM3</td>
<td>10</td>
<td>T63 L31</td>
<td>L40 0.94°</td>
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<tr>
<td></td>
<td>CanCM4</td>
<td>10</td>
<td>T63 L35</td>
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<tr>
<td>GFDL/NOAA</td>
<td>CM2.1</td>
<td>10</td>
<td>2°x2.5° L24</td>
<td>L50 0.30°</td>
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<tr>
<td></td>
<td>CM2.5 (FLOR)</td>
<td>24</td>
<td>50km L32</td>
<td>L50 0.30°</td>
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<tr>
<td>NASA</td>
<td>GEOS5</td>
<td>11</td>
<td>1°x1.5° L72</td>
<td>L40 0.25°</td>
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<tr>
<td>NCAR</td>
<td>CESM</td>
<td>06</td>
<td>T85 L26</td>
<td>L42 0.30°</td>
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<tr>
<td>NCAR/U. Miami</td>
<td>CCSM4.0</td>
<td>10</td>
<td>0.9°x1.25° L26</td>
<td>L60 0.25°</td>
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