ALASKA REGION
CLIMATE FORECAST BRIEFING

June 19, 2015
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Today

• Feature of the month: Arctic Sea Ice
• Climate Forecast Basics
• Active Climate System
  • 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
• CPC Outlooks for July and late summer
  • Next month
  • Next season
Arctic Basin Ice Coverage
Arctic-Wide Sea Ice

Ice Thickness from CryoSat

2015 vs. 2014

PIOMAS: max May volume since 2010
PIOMAS Average Arctic Ice Thickness

Daily Average Arctic Sea Ice Thickness from PIOMAS
Ice coverage in past warm Junes
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)
May 2015 Precipitation Anomalies

Skill Score = +0.17

Preliminary data subject to revision
Mar-Apr-May 2015 Precipitation Anomalies

Skill Score = +0.36

Preliminary data subject to revision
Mar-Apr-May 2015 Temperature Anomalies

Skill Score = +0.94

Preliminary data subject to revision
Mid-June Sea Ice Comparison

2015 vs. 2014:
Much less ice this year than last year
Alaska Near-Shore SSTs

Weekly OI SST Anom. (°C)

10 JUN 2015

20 MAY 2015

03 JUN 2015

13 MAY 2015

27 MAY 2015

06 MAY 2015

Color Bar:

-3.5
-2.5
-1.5
-1
-0.5
0.5
1
1.5
2.5
3.5
May 2015: Standardized SST Anomalies
Upper Ocean Heat Content Anomaly

MAY 2015 Heat Content Anomaly (°C)
(GODAS, Climo 81-10)

MAY 2015 - APR 2015 Heat Content Anomaly (°C)
Global SST Anomalies

Positive PDO Pattern
Tropical Pacific
Tropical Pacific SSTs and Winds

On track for highest early summer Niño 3.4 anomaly since 1997
Equatorial Upper Ocean Heat Anomaly

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

Equatorial Temperature Anom (°C), Jun 12 2015

Equatorial Temperature Anom (°C), Apr 08 2015
OLR past month

30-Day Average OLR Anomaly

2015/05/15 - 2015/06/13

NOAA/ESRL/PSD
Base Period: 1981-2010
Guidance

- ENSO
  - Models
  - Expert Evaluation

- Statistical
  - Trends in the Past 10/15 Years
  - SST Anomalies
  - Oceanic Correlation (PDO and ENSO)

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

El Niño: significant signal for moderate-strong event
More ENSO SST Forecasts

Multivariate ENSO Index (MEI) for five similar El Niño events since 1950 vs. 2015

UKMET
CPC Niño 3.4 Forecast

El Niño Advisory: Issued when El Niño conditions are observed and expected to continue.

This is the forecast probabilities that SST anomaly in Niño 3.4 will be in each of the three category
July: Recent Trends

Temps: 10 years
Pcqn: 15 years

Upper Temp Tercile
Lower Temp Tercile
Upper Pcqn Tercile
Lower Pcqn Tercile
July-August-September
Recent Trends

Temps: 10 years
Pcpn: 15 years

Above Normal Temp
Below Normal Temp
Upper Normal Pcpn
Below Normal Pcpn
Constructed Analogs based on SSTs

\[ \text{T2m (anom C) based on SST CA Forecast: Lead 1: JAS2015 (last data used thru May 2015)} \]

\[ \text{PRECIP (mm/day) based on SST CA Forecast: Lead 1: JAS2015 (last data used thru May 2015)} \]
PDO then and now:
JAS observed against AMJ PDO

1948-88
↓
1989-2013

←Temps→

Jul to Sep: 1948 to 1988: 925mb Air Temperature
Seasonal Correlation w/ Apr to Jun PDO (Index leads by 3 months)

Jul to Sep: 1989 to 2013: 925mb Air Temperature
Seasonal Correlation w/ Apr to Jun PDO (Index leads by 3 months)

←Precip→

Jul to Sep: 1948 to 1988: Surface Precipitation Rate
Seasonal Correlation w/ Apr to Jun PDO (Index leads by 3 months)

Jul to Sep: 1989 to 2013: Surface Precipitation Rate
Seasonal Correlation w/ Apr to Jun PDO (Index leads by 3 months)
Precipitation: Jul-Aug-Sep ENSO Composites

**Fairbanks**

**Anchorage**

**Juneau**

**Nome**

**Bethel**

**Annette**
Dynamic Forecasts

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

Moderately Positive PDO pattern
Operational CFS Sea Ice Forecast

Initial conditions: 3 Jun 2015–12 Jun 2015
Last update: Sat Jun 13 2015

Red curves are 15% concentration contours of NSIDC 1982–2010 climatology.

July Mean Coverage

Sept Mean Coverage
July 2015 Temp Anomaly Forecasts

NMME

Prob fest

IMME

NCEP_CFSv2

CMC1_CanCM3

CMC2_CanCM4

GFDI_FLOR

GFDL_CM2.1

NCAR_CCSM4

NASA_GEOS5
July 2015 Pcpn Anomaly Forecasts
Probability Forecasts for July 2015

Fcst from April
Fcst from May
Fcst from June
July-August-Sept 2015 Temp Anomaly Forecasts
Probability Forecasts for Jul-Aug-Sep 2015
NMME Skill for July and JAS

NMME Forecast of TMP2m Skill (AC) IC=201506 for Lead 2015Jul

NMME Forecast of Prate Skill (AC) IC=06 for Lead 1 Jul

NMME Forecast of TMP2m Skill (AC) IC=06 for JAS

NMME Forecast of Prate Skill (AC) IC=06 for JAS

Temp

Pcpn
CPC May Forecast for July-August-September
And the Answer Is…
CPC July 2015 Outlook

ONE-MONTH OUTLOOK
TEMPERATURE PROBABILITY
0.5 MONTH LEAD
VALID JUL 2015
MADE 18 JUN 2015

ONE-MONTH OUTLOOK
PRECIPITATION PROBABILITY
0.5 MONTH LEAD
VALID JUL 2015
MADE 18 JUN 2015
CPC Jul-Aug-Sep 2015 Outlook

Three-month outlook temperature probability

0.5 month lead

Valid JAS 2015

Made 18 Jun 2015

Three-month outlook precipitation probability

0.5 month lead

Valid JAS 2015

Made 18 Jun 2015
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