

More Talk, Better Climate Products: The
Fruits of CPC and NWS Alaska
Collaboration, 2013-2018

Prolouge:

2005-12: Alaska joins the CPC World

- Alaska/Arctic climate workshops hosted by NWS Alaska Region with attendance by CPC Staff (Dave Unger at least)
- Climate training in/for Alaska (Marina Timofeyva, at the time under contract to NWS)
- CPC staff visits to Alaska Region (Jon Gottschalk at least, also WPC staff)

Forecasts beyond the first 7
days to seasonal really matters
in Alaska!

River Ice Breakup Flooding - #1 Federal Disaster Declaration in Alaska

Seasonal
Forecasts In the
April – May Period
Critical to
Forecasting
Potential Breakup
Severity



Galena 2013 – 800 Structures Destroyed
Families Displaces for 2 years

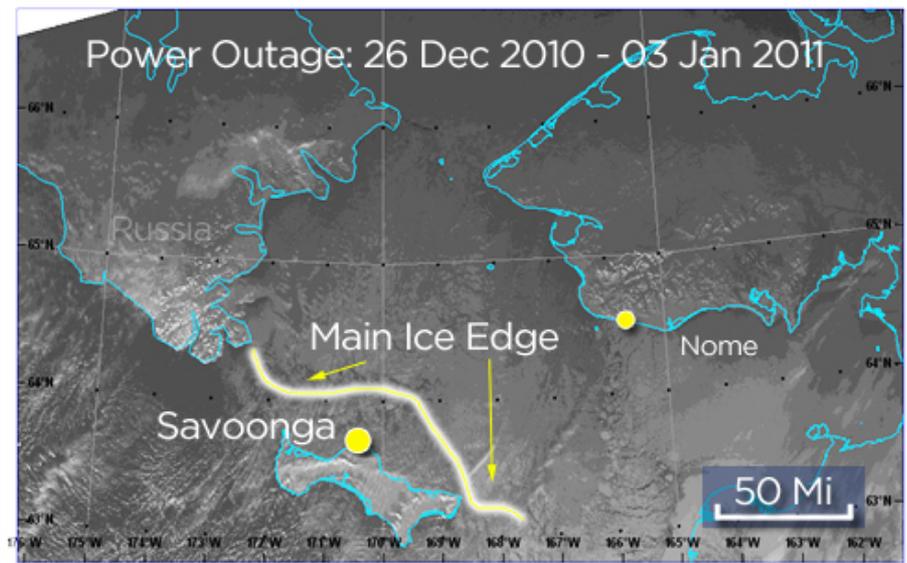
Coastal Flooding - #2 Cause of Federal Disaster Declaration in Alaska

Land / Ice / Storm Interactions

Week 2 Forecasts are Critical due to Time needed to Prepare



Understanding New Hazards in a Rapidly Changing Climate

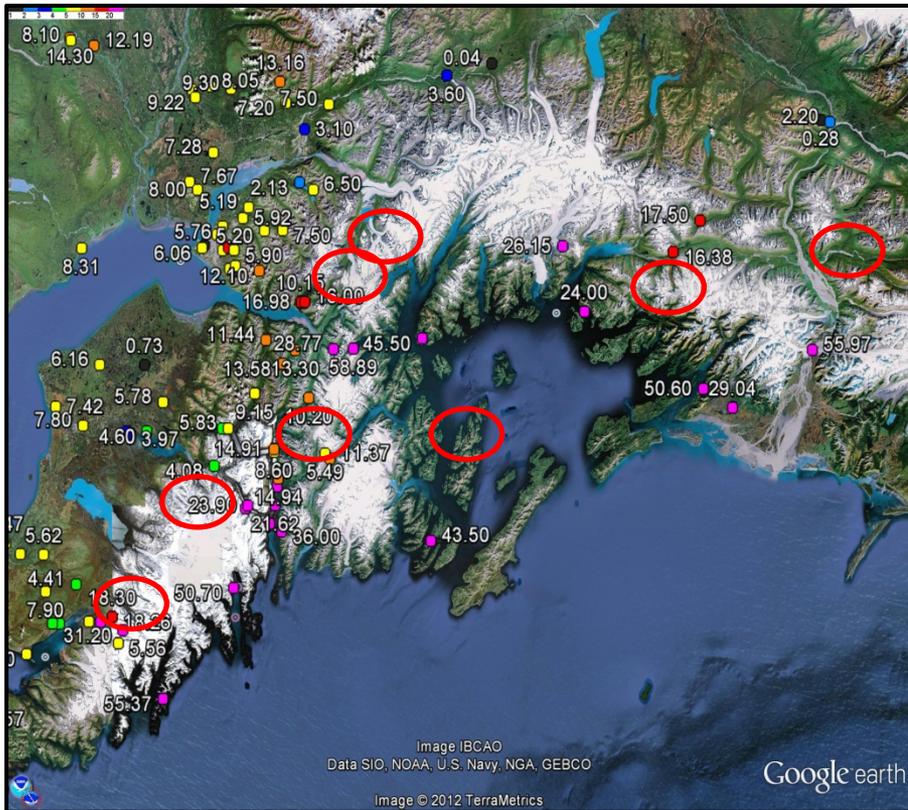


Intermittent power outage for 6 days – $\frac{3}{4}$ of village w/o power
Temperatures ranging from 5° F to -10° F with 30-50 mph winds
25-30 homes (*20% of village*) experienced bursting pipes and flooding
At least 20% of the 700 village residents sought refuge in the school (on generator)

Weather hindered the ability to send in food, plumbing supplies, and repairmen

Persistent Weather Patterns Can Lead to Big Problems

In Alaska it is often not the 1st or 2nd Storm that causes problems...It's the 4th and 5th



- * Storm Track over Central Alaska for almost four weeks.
- * Record monthly river stage heights and flooding.
- * Over \$35M in damage to homes and infrastructure.
- * Unofficial wind gusts to 130 mph recorded in the Anchorage area with 70 to 90 mph common elsewhere in South Central Alaska.
- * Record rainfall and stage height across much of South Central Alaska.

Cumulative Impacts of Snowfall in Cordova - 2012

Weeks with one snowstorm after another

18' Accumulative Total in a community not used to this much snow – Caught the city off guard

National Guard called in to remove snow



Alaska Region Ramps-up

- Climate Science and Services Manager (CSSM) position created Feb 2013
 - First charge from Alaska Regional Director: “I want CPC to know Alaska Region exists!”
- CSSM visits CPC 2013 and 2014
- CPC integrated into Alaska-wide climate conversations (Jon Gottschalk as Alaska’s POC)
- Alaska Region routinely on CPC outlook telecons, e.g. Hazards, Global Tropical, Seasonal Sanity Check

NWS Alaska Region

Benefits from CPC Collaboration

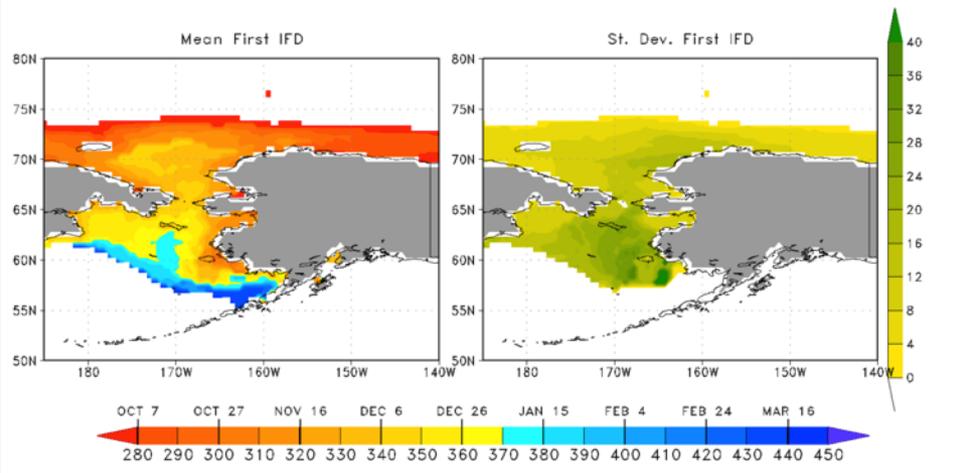
Alaska is on the CPC radar

- Increased awareness by CPC of importance of sea ice and SST anomalies has improved outlooks (especially higher probabilities)
- Significant effort by CPC to improve seasonal sea ice forecasts, including freeze-up and melt-out dates near Alaska (vital component of core partner DSS)
- Better handle on hazards important for Alaska DSS (H/T Melissa Ou)
- Increasing awareness of drought impacts in Alaska

Recently Developed Sea Ice Products

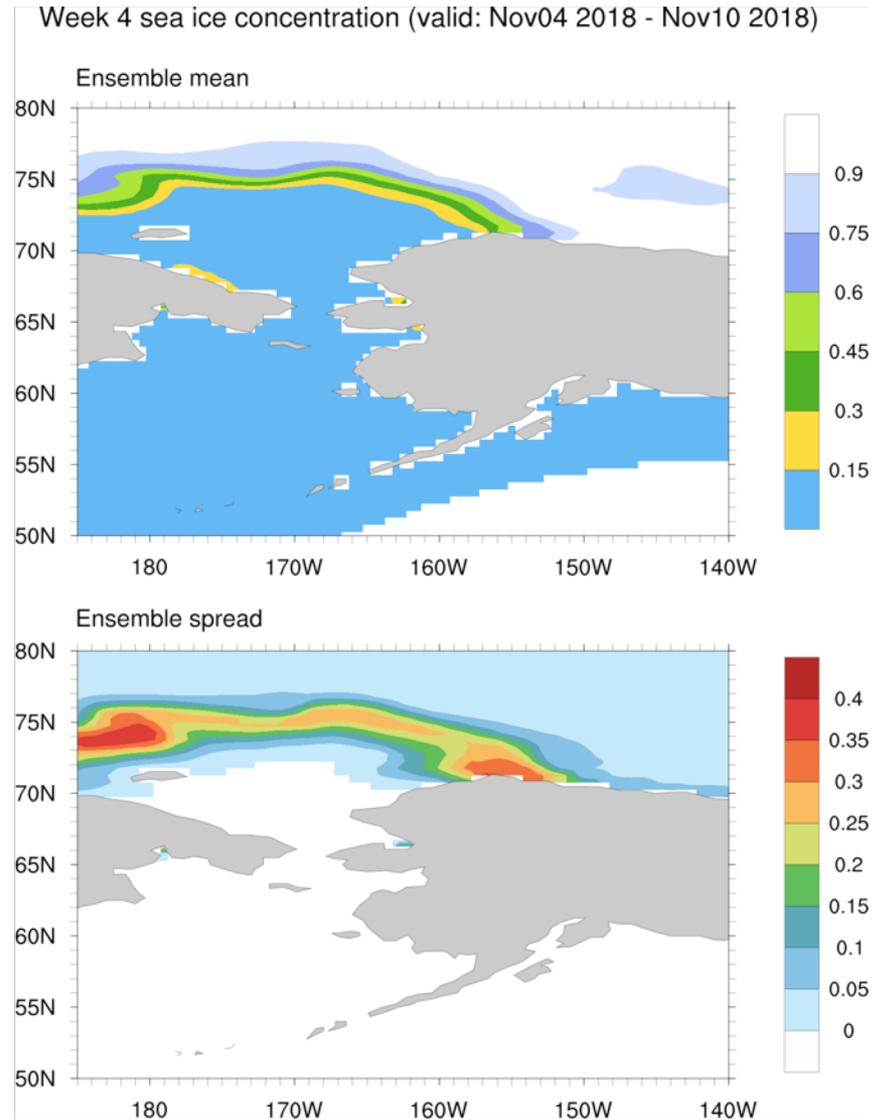
Expanded Sea Ice Requirements due to Offshore Oil Exploration in 2012/2015

First sea ice freeze date of 2018–2019
Experimental CFSv2 initialized September 21–25, 2018



Seasonal Freeze-up Date Outlook

Weekly Sea Ice concentration outlook →



Building Alaskan Expertise

- Important benefit to Alaska Region has been the growth of regional expertise that feeds Outreach and Decision Support

ALASKA REGION CLIMATE FORECAST BRIEFING

October 27, 2017

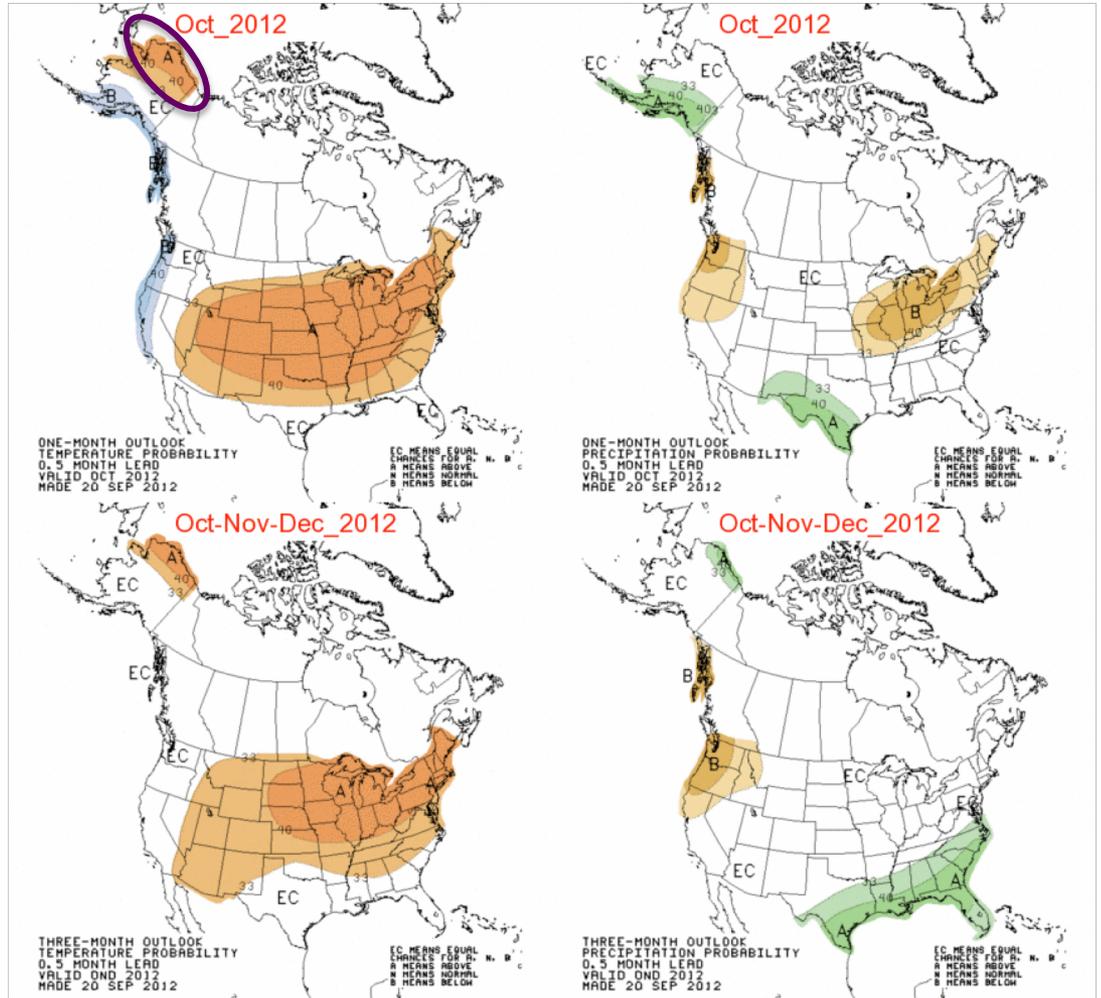
Rick Thoman

National Weather Service Alaska Region



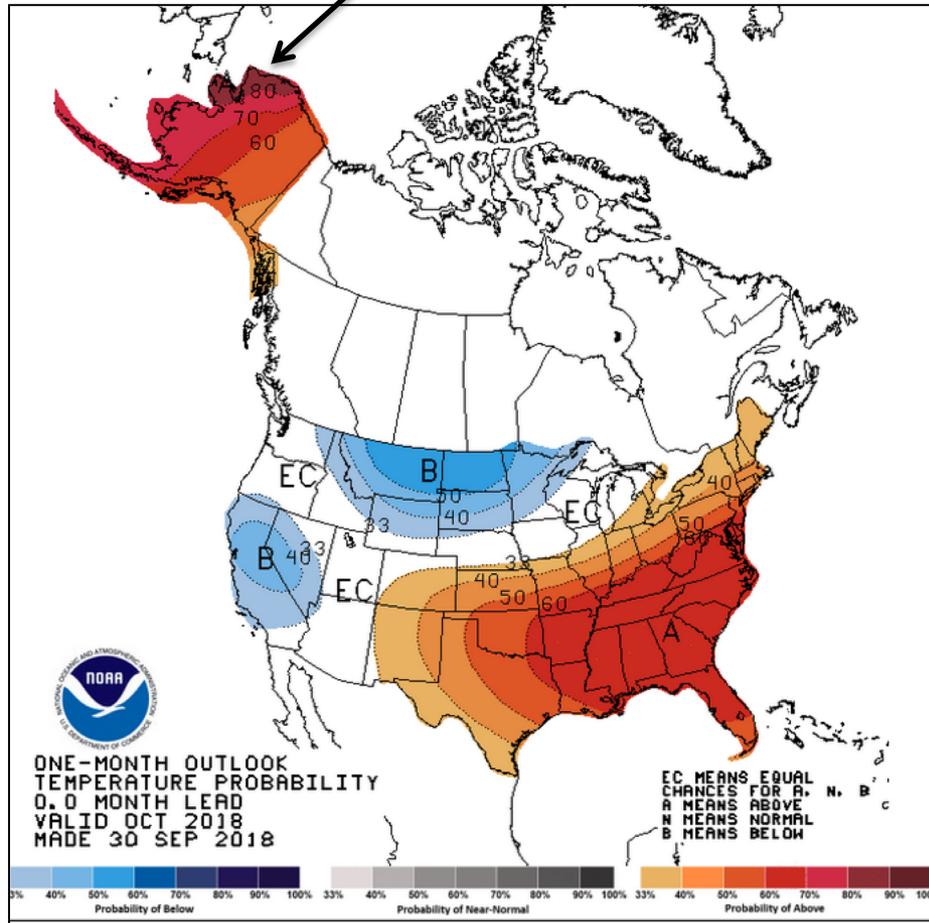
September 2012

- Record low Arctic sea ice extent
- North Slope trend strong since 2002
- Utqiagvik (Barrow) verified with warmest October of record (thru 2012)



Outlook for October 2018

> 80% upper tercile!!





Day 3-7 U.S. Hazards Outlook

Valid: 10/22/2018-10/26/2018



Preliminary

High Winds 10/24

Heavy Rain 10/24

Much Below Normal Temperatures 10/22

Model guidance has indicated that the storm track along the South coast of **Alaska** is expected to be active over the next two weeks. Early next week, surface low pressure is forecast to track along the coast, first bringing heavy rain to the Kenai Peninsula and South coast on Oct 22-23. The system is then expected to shift southeast and cause heavy precipitation in the northern part of the Panhandle Oct 23-24. The previously mentioned strong storm system which is expected to impact parts of the Pacific Northwest is likely to cause heavy precipitation for the southern third of the Panhandle Oct 25. Significant wave heights and high winds (sustained 45 knots) are also forecast for the 25th from this system.

Heavy Precipitation 10/22 - 10/24

Heavy Rain 10/23 - 10/26

For the latest information on flooding - <http://www.wpc.ncep.noaa.gov/nationalfloodoutlook/index.html>

 Flooding Likely
  Flooding Occurring/Imminent
  Flooding Possible
  Severe Drought

Taking CPC Large Scale Expertise and “Alaska-fying”

Alaska Region National Weather Service

Search all sites

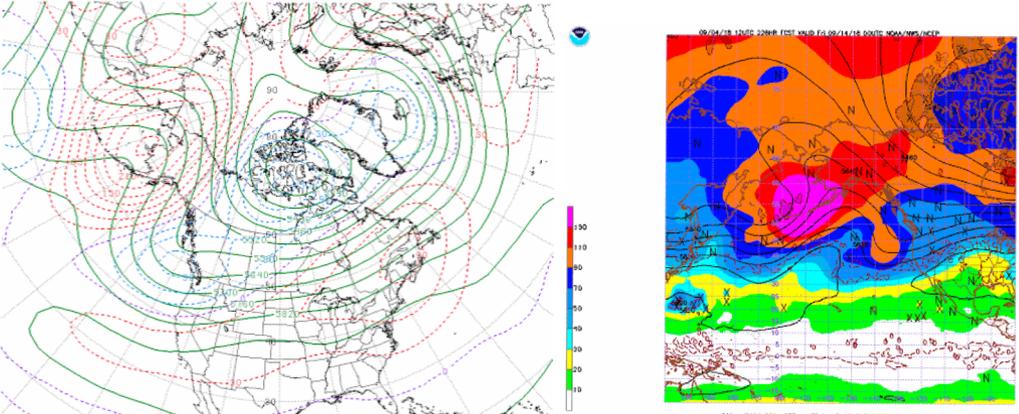
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Week 1-2 Outlook Valid September 10-16, 2018

posted Sep 4, 2018, 3:26 PM by richard.thoman@noaa.gov

The outlook for mid-September is dominated by the persistence of the very strong ridge across the Bering Sea and Chukotka and troughing extending from the central Canadian Arctic southwestward to near Vancouver Island, as seen in the CPC Sep 04 manual blend 500mb heights and anomalies (below left). Only the large scale, the only real question is the evolution of the ridge later in the week 2 period. The 12Z Sep 04 NAEFS 500mb mean heights and spread valid at day 9 (below right) shows a large spread in member heights not only over the Bering sea but also extending northeastward through the mainland as different models handle shortwaves very differently. On the regional scale, short waves riding up and over the ridge will likely impact the North Slope and possibly northeast Interior, and eventually the Aleutians as well. Sensible forecast will be somewhat tricky, though it's still early enough in the autumn that west of 155W it's likely to be quite mild. Probably the most certain portion of the forecast is for dry weather over the southern half of the mainland and northern Southeast, with temperatures modulated by cloud cover.

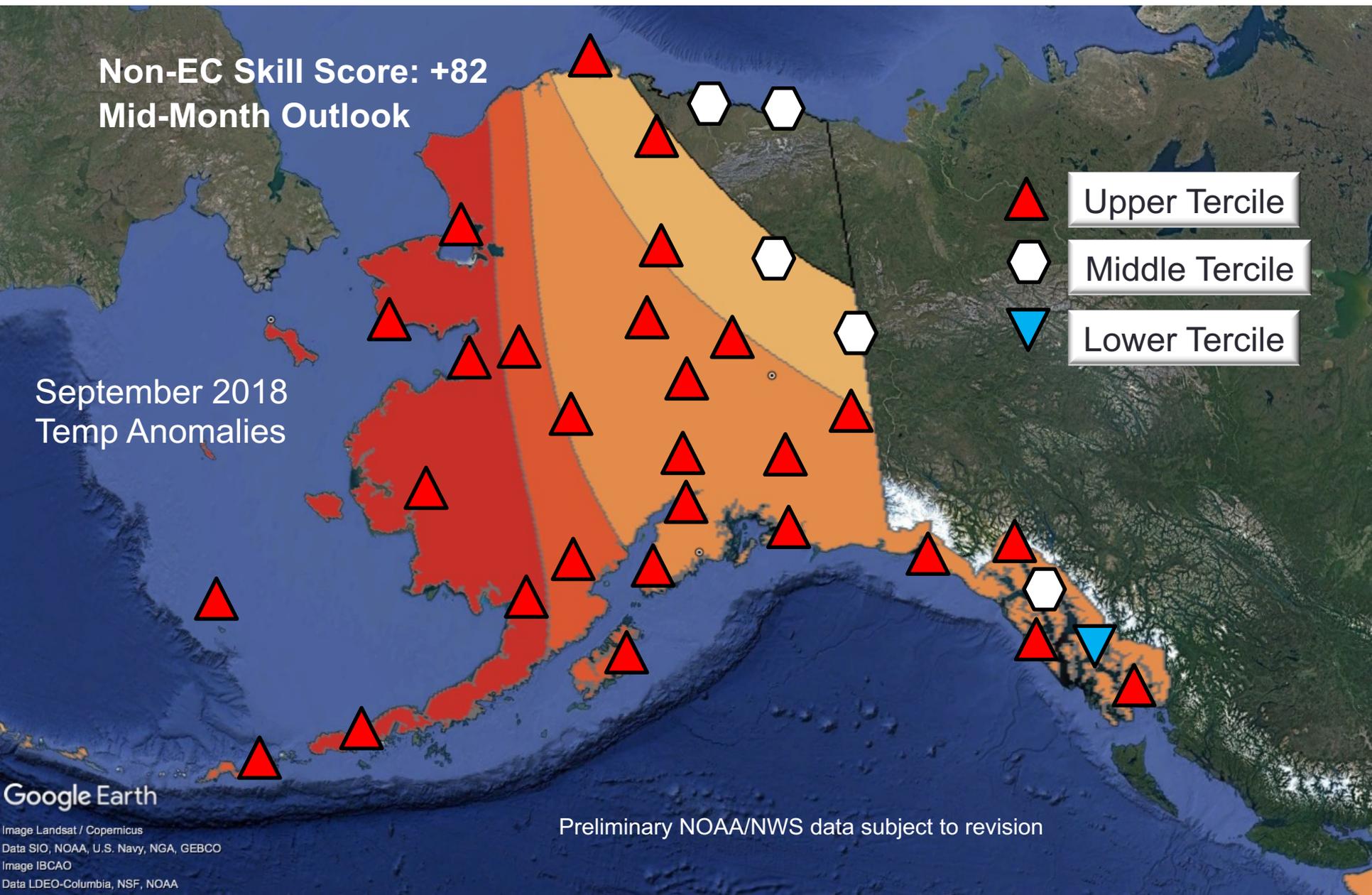
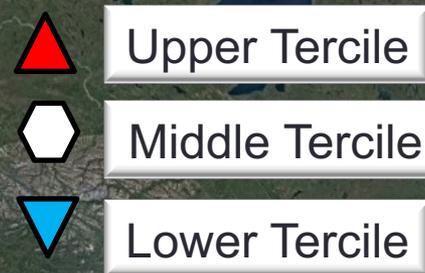


180814/0000ZTS NORTH AMERICAN ENSEMBLE FORECAST SYSTEM
SOURCE: NWS/NOAA/AVL/OPS/AVL/OPS/AVL/OPS

Aiding CPC With Verification

Non-EC Skill Score: +82
Mid-Month Outlook

September 2018
Temp Anomalies



Google Earth

Image Landsat / Copernicus
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image IBCAO
Data LDEO-Columbia, NSF, NOAA

Preliminary NOAA/NWS data subject to revision

Alaska Region Hopes for the Future

- Downscaled Outlooks
 - Complex terrain wrecks havoc with outlooks driven by large scale flow (Southcentral pcpn for example)
- Improved Hazards
 - Greatest Alaska impacts, Coastal Flooding and Ice Jam flooding don't fit into CONUS hazards easily
 - Unique high latitude hazards
 - Mainland: Small amounts of rain in winter (transportation impacts)
 - Interior: Above freezing temps in winter (transportation impacts)
 - Minimal impacts from intense met events (e.g. Aleutians, in effect cry wolf)