Arctic Climate Forum
May 2020

ACF
Arctic Climate Forum

Arctic Consensus Statement: Summary of Winter 2020 and Outlook for Summer 2020

Arctic Regional Climate Center

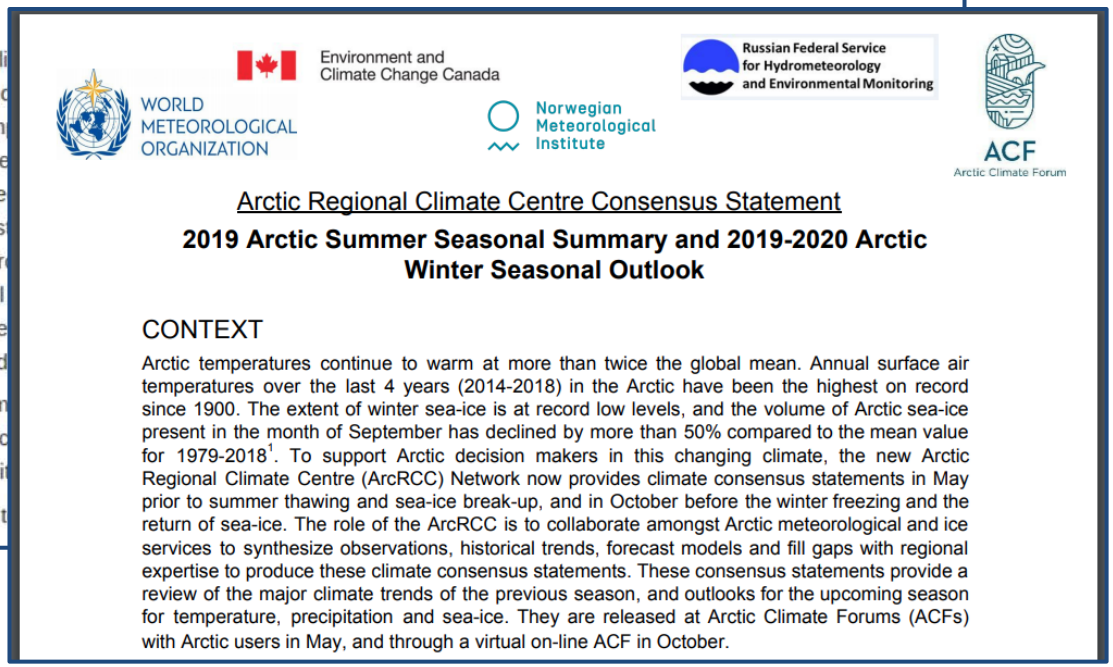
What is ArcRCC Consensus Statement?

A collaborative product developed amongst Arctic meteorological and ice services to synthesize observations, historical trends, forecast models and fill gaps with regional expertise.

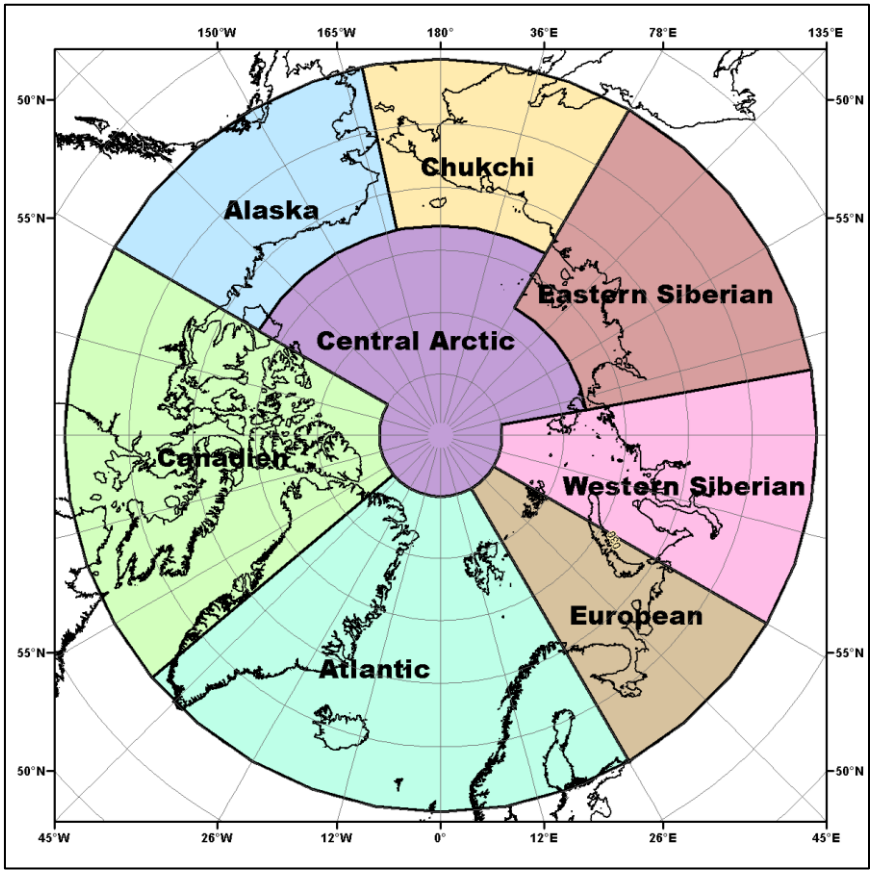
The consensus statement provides:

- a review of the major Arctic climate trends of the previous season,
- verification of the previous seasons outlooks and
- outlooks for the upcoming season for temperature, precipitation and sea-ice.

Will be published on https://arctic-rcc.org/acf



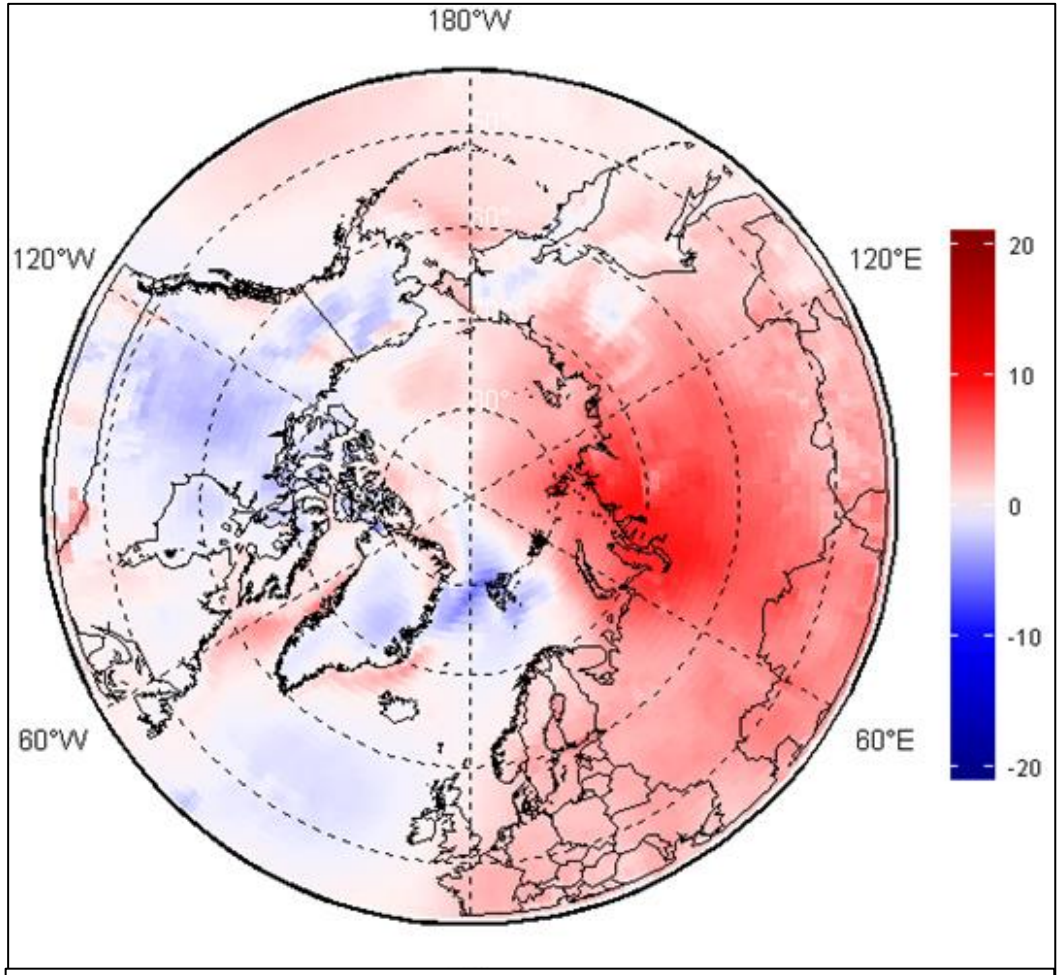
Circumpolar Arctic Perspective Temperature & Precipitation



- Outlooks are based on **eight** WMO Long-Range Forecasts models.
- All the model forecasts are compared and areas where all eight models
  - agree = high forecast confidence
  - disagree = low forecast confidence

- Called a multi-model ensemble (MME) approach
- A methodology reputed as providing the most reliable objective forecasts.

TEMPERATURE: Observations from Winter 2020



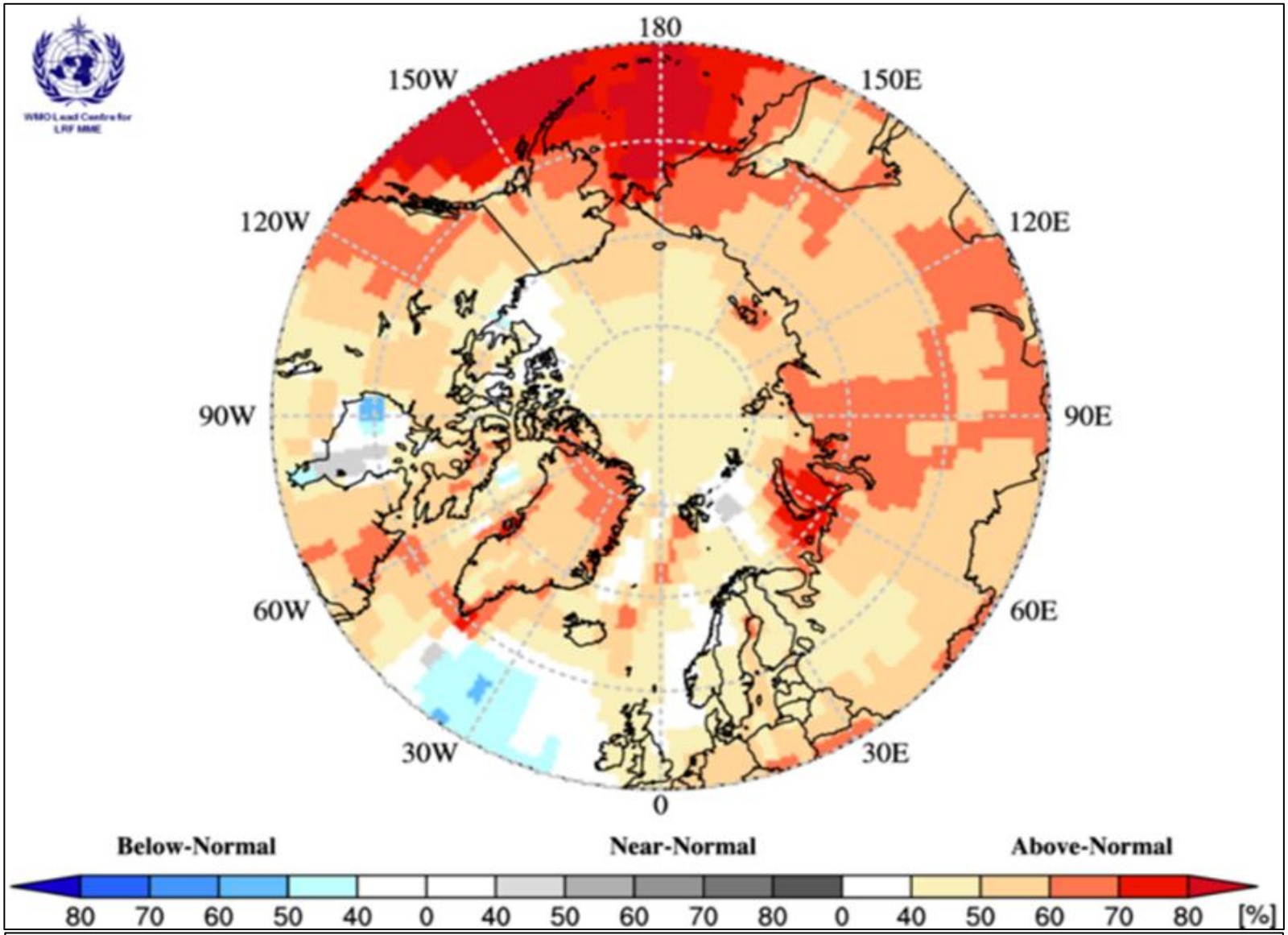
February, March, and April (FMA) 2020 surface air temperature anomaly based on the 1981-2010 reference period. Red indicates warner than normal temperature, and blue indicates cooler than normal temperatures. Map produced by the Hydrometcenter of Russia https://meteoinfo.ru/ Data source: ERA-5.

- Higher than normal in the eastern hemisphere
- Lower than normal in the western hemisphere
- Scandinavia and the majority of the Eastern and Western Scandinavia regions experienced warmer than normal conditions (red areas)
- Parts of Eastern and Western Siberia saw their fifth warmest FMA since the start of the record in 1949.
- Canada, Alaska, Greenland, and the North Atlantic Ocean experienced near normal (white areas) or slightly below normal (light blue) conditions.

TEMPERATURE: Winter 2020
How did the forecasts perform ?

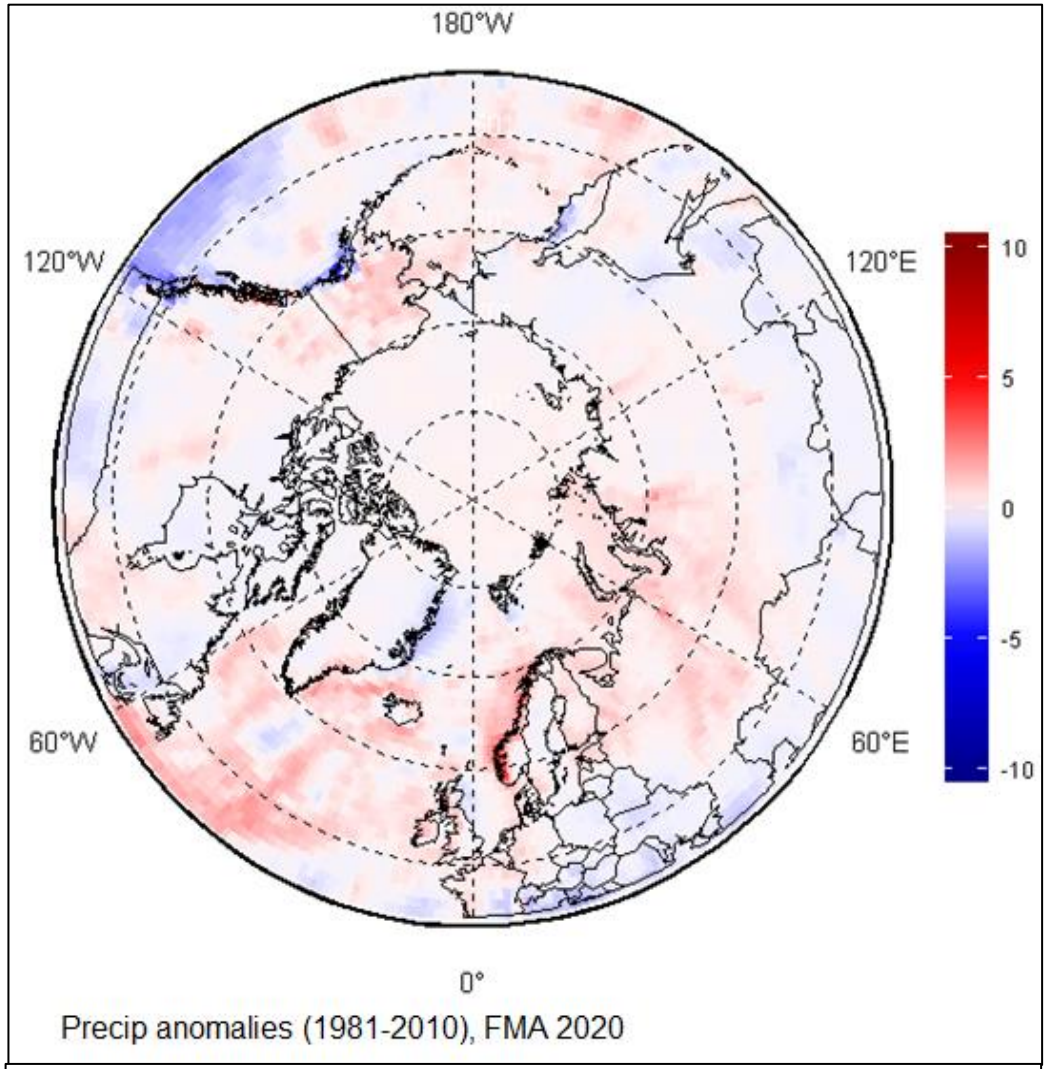
Regions	MME Temperature Forecast Agreement	MME Temperature Forecast	Observations NCAR CFSR Reanalysis	MME Temperature Forecast Accuracy
Alaska	Low	Above normal	Near normal	**Low**
Chukchi	High	Above normal	Above to near normal	**Moderate**
Eastern Siberia	High	Above normal	Above normal	**High**
Western Siberia	High	Above normal	Above normal	**High**
European	Moderate	Above normal	Above normal	**High**
Atlantic	Moderate	Mostly near normal	Above normal (Scandinavia only)	**Moderate**
Canada	Low	Above normal	Near to below normal	**Low**
Central Arctic	High	Above normal	Above normal	**High**

TEMPERATURE: Outlook Summer 2020



Multi model ensemble probability forecast for surface temperature for June, July, and August 2020. Three categories: below normal (blue), near normal (grey), above normal (red) and no agreement amongst the models (white). Source: www.wmolc.org.

PRECIPITATION: Observations from Winter 2020



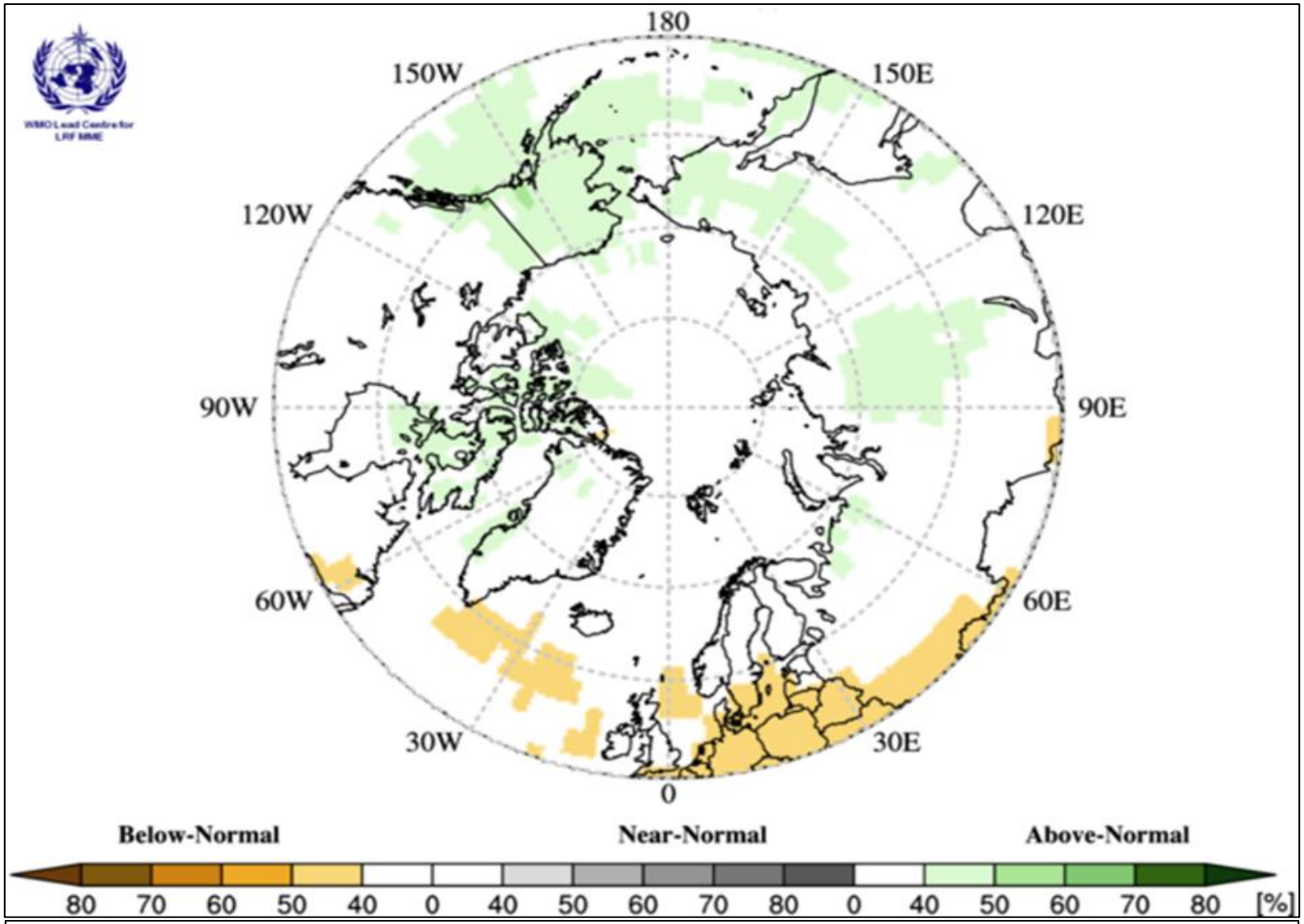
February, March, and April (FMA) 2020 precipitation based on the 1981-2010 reference period. Red indicates wetter than normal conditions, and blue indicates drier than normal conditions. Map produced by the Hydrometcenter of Russia https://meteoinfo.ru/ Data source: ERA-5.

- Wetter than average conditions were observed across a majority of Arctic region (red areas).
- Only a few isolated areas, including the northeastern coast of Greenland, northern Canada, and a small swath over southern Alaska, experienced drier than average conditions (blue areas)

PRECIPITATION: Winter 2020
How did the forecasts perform ?

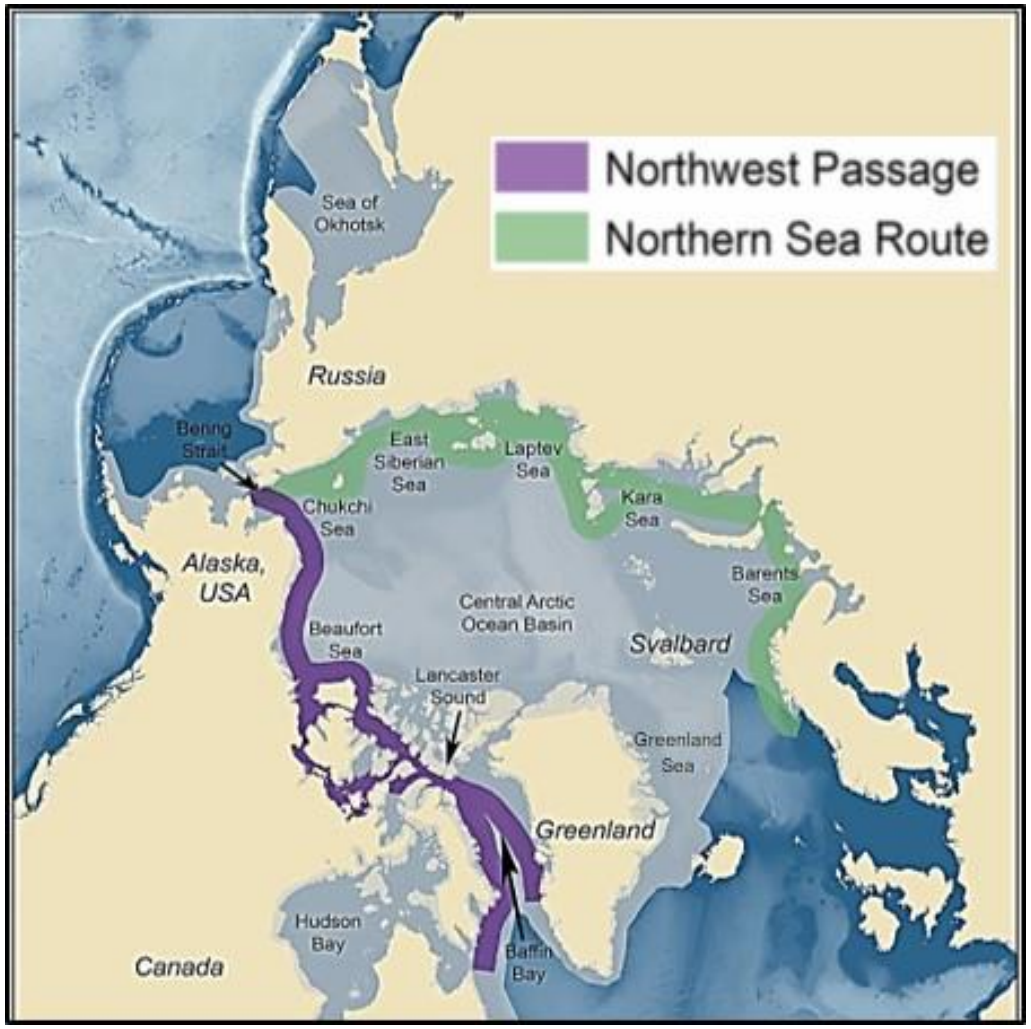
Regions	MME Precipitation Forecast Agreement	MME Precipitation Forecast	Observations NCAR CFSR Reanalysis	MME Precipitation Forecast Accuracy
Alaska	Moderate	Above normal	Above normal	**High**
Chukchi	Moderate	Above normal	Near normal	**Low**
Eastern Siberia	Moderate	Above normal	Above normal	**High**
Western Siberia	Moderate	Above normal	Above normal	**High**
European	Moderate	Above normal	Above normal	**High**
Atlantic	Moderate	Above normal (continental regions only)	Above normal (continental regions only)	**High**
Canada	No agreement	No forecast	Near normal in the south and west, below in the center	**N/A**
Central Arctic	No agreement	No forecast	N/A	**N/A**

PRECIPITATION: Outlook Summer 2020



Multi model ensemble probability forecast for precipitation for JJA 2020. Green indicates wetter conditions, orange drier conditions and white, no agreement amongst the models. Source: www.wmolc.org.

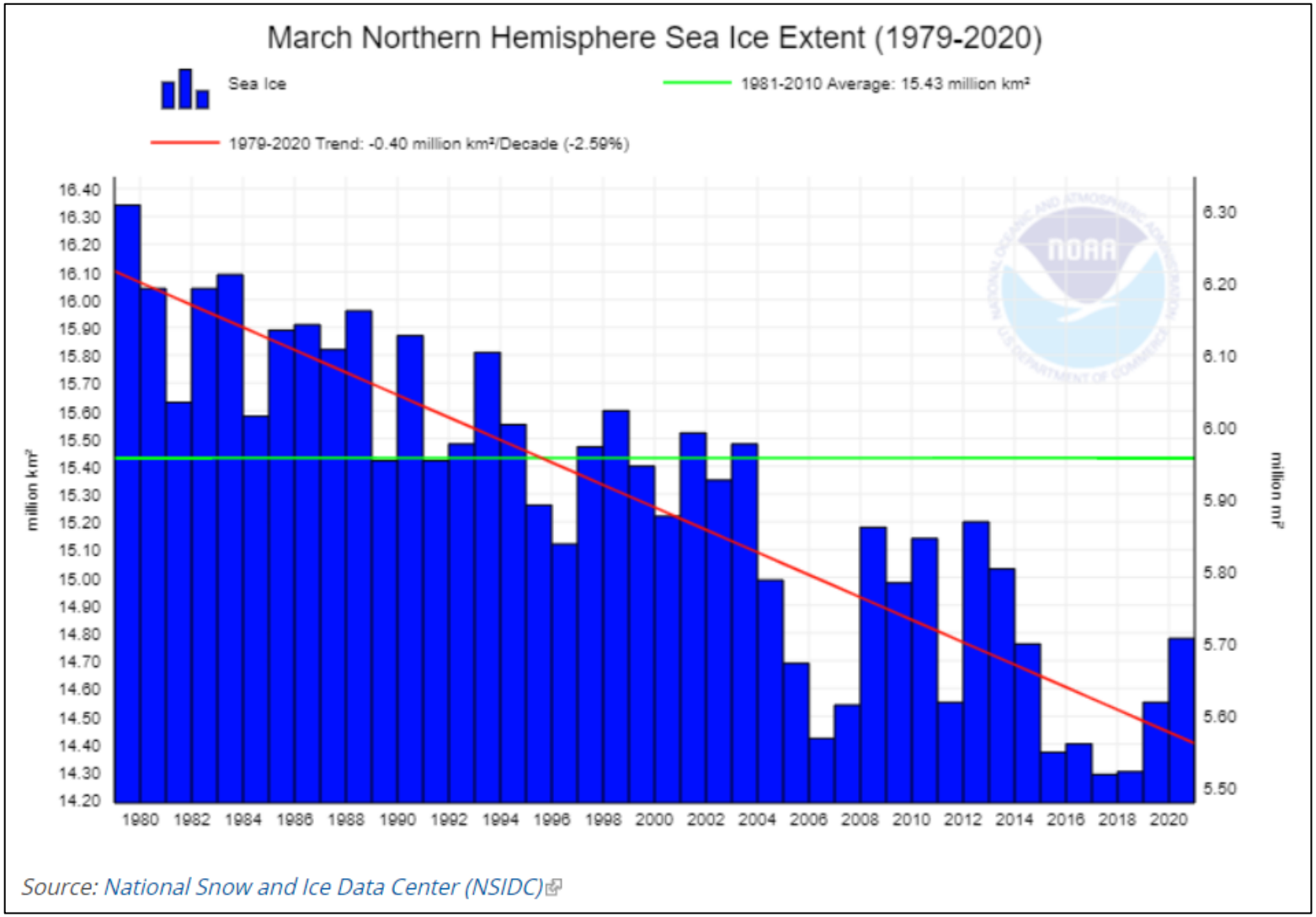
Sea-Ice: From a Circumpolar Perspective



Maximum sea-ice extent, volume and thickness is normally reached each year in the Arctic during the month of March.

The forecast for March 2020 sea ice extent was based on output from CanSIPSv2, an MME of two climate models

SEA-ICE Extent: Observations from Winter 2020

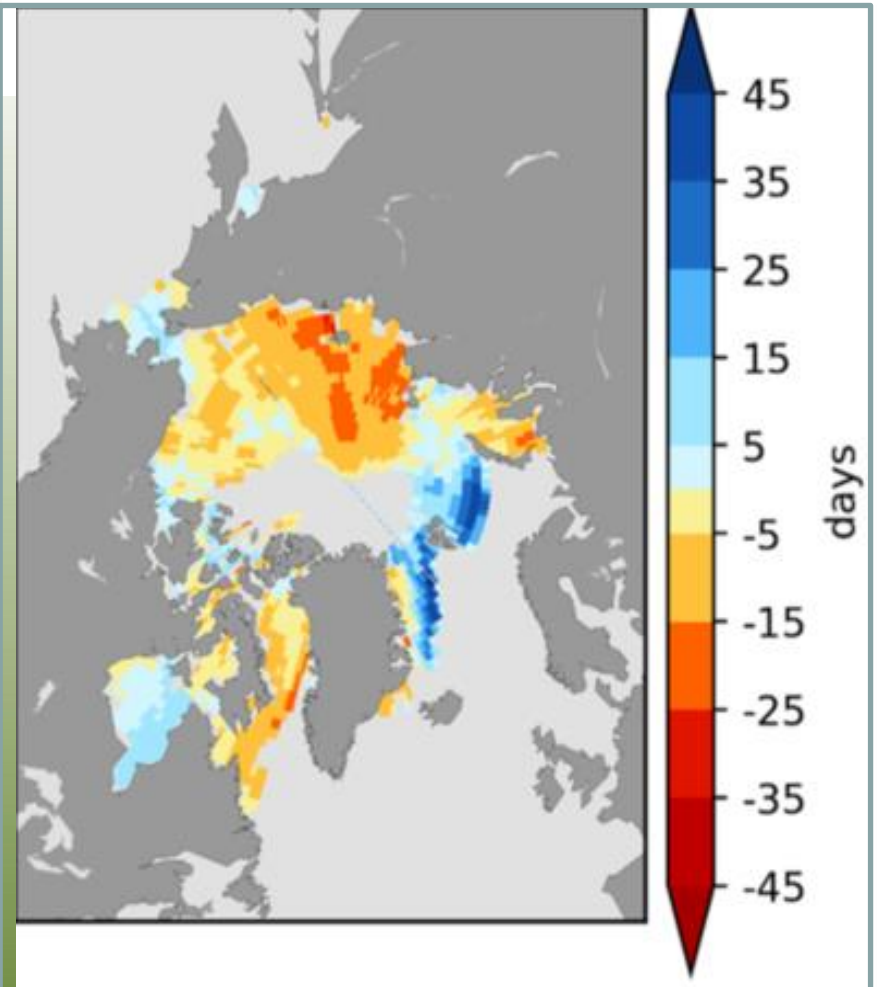


Source: National Snow and Ice Data Center (NSIDC)

SEA-ICE: Winter 2020
How did the forecasts perform ?

Regions	CanSIPS Sea-Ice Forecast Confidence	CanSIPS Sea-Ice Forecast	Observed Ice Extent	CanSIPS Sea-Ice Forecast Accuracy
Bering Sea	Low	Below normal	Normal	**Low**
Sea of Okhotsk	Low	Below to near normal	Below to near normal	**High**
Barents Sea	Low	Near normal	Below normal	**Low**
Greenland Sea	High	Near normal	Below to near normal	**Moderate**
Gulf of St. Lawrence	Low	Below normal	Below to near normal	**High**
Labrador Sea	Moderate	Below normal	Below to near normal	**Moderate**

SEA-ICE: Break-up Outlook 2020



Forecast for the 2020 spring/summer break-up expressed as an anomaly (difference from normal) Source: CanSIPS (ECCC)

What is Normal break-up?

- The first day in a 10 day period when the ice concentration goes below 50%
- based on climatological period (2009-2017)

Break-Up Categories:

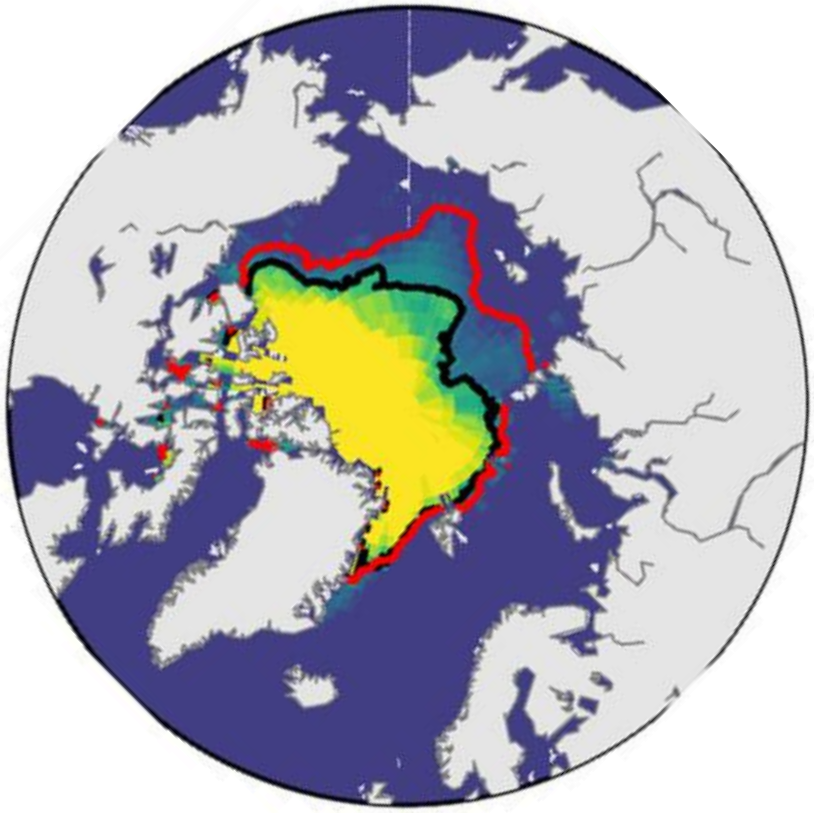
- Late break-up
- Near normal break-up
- Early break-up

Regions	CanSIPS Sea-Ice Forecast Confidence	CanSIPS Sea-Ice Break-up Forecast
Baffin Bay	**High**	**Early**
Barents Sea	High	Late in northern section
Beaufort Sea	High	Early
Bering Sea*	Moderate	Near normal to late
Chukchi Sea	High	Early
East Siberian	Low	Early southern section, near normal northern section
Greenland Sea	High	Late
Hudson Bay	Moderate	Late eastern half, near normal western half
Kara Sea	Moderate	Early in the west, near normal in the east
Labrador Sea	High	Early
Laptev Sea	Low	Early

Minimum SEA-ICE Extent: Outlook September 2020

observed mean ice edge (2011-2019)

forecast median ice edge



Regions	CanSIPS Sea-Ice Forecast Confidence	CanSIPS Sea-Ice Forecast
Barents Sea	Low	Above normal (northern section)
Beaufort Sea	Moderate	Below normal
Canadian Arctic Archipelago	Moderate	Below normal
Chukchi Sea	High	Below normal
Eastern Siberian Sea	Moderate	Below normal
Greenland Sea	High	Above normal
Kara Sea	High	Below normal
Laptev Sea	High	Below normal

September 2020 probability of sea ice at concentrations greater than 15% from CanSIPSv2 (ECCC). Forecast median ice extent from CanSIPSv2 (black) and observed mean ice edge 2011-2019 (red).

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Questions & Wrap Up

Arctic Regional Climate Center