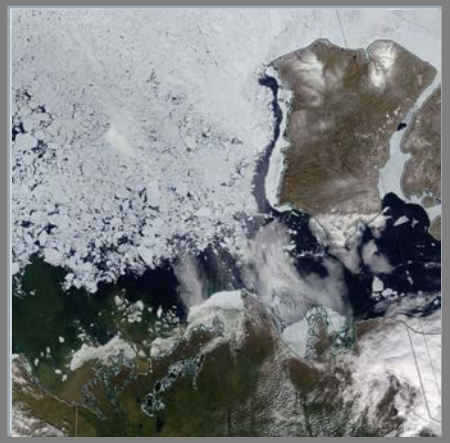

2021 summer sea ice:

Summary of conditions for SIPN

Walt Meier

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NOAA @NSIDC

NASA

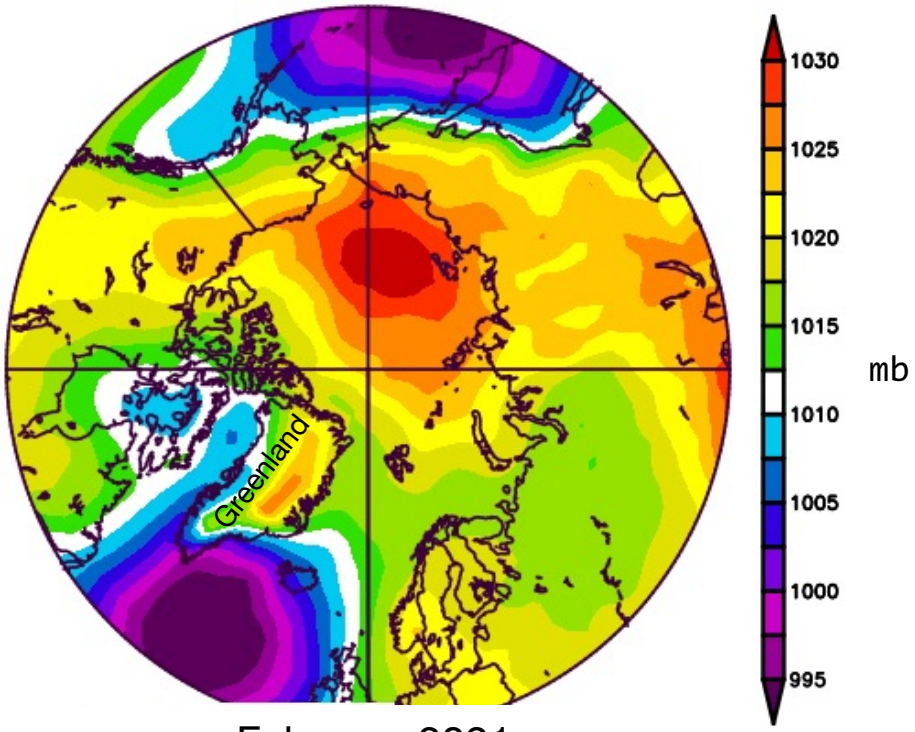
NSIDC DAAC
Distributed Active Archive Center

NSIDC National Snow and Ice Data Center
Advancing knowledge of Earth's frozen regions

CIRES

Pre-cursor: February circulation

- High pressure in January
- Even stronger high in February, shifted west of the typical Beaufort High circulation

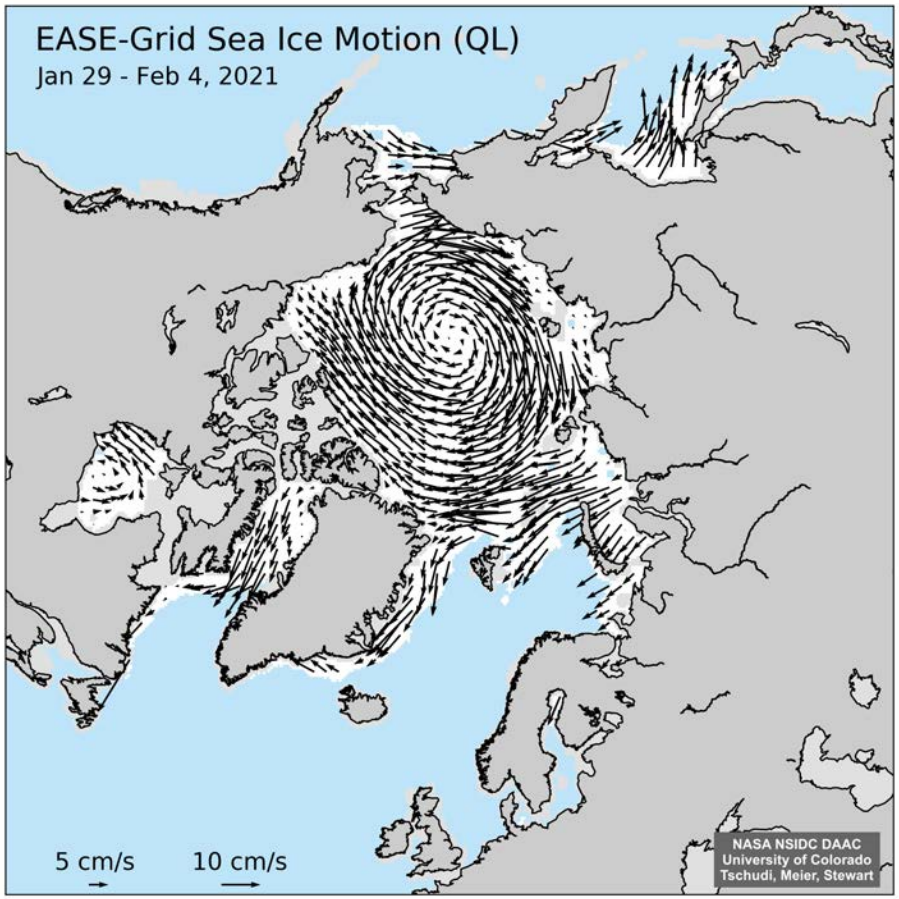


February 2021
Sea Level Pressure

NCEP/NCAR Reanalysis Monthly Composites
https://psl.noaa.gov/cgi-bin/data/composites/comp.pl

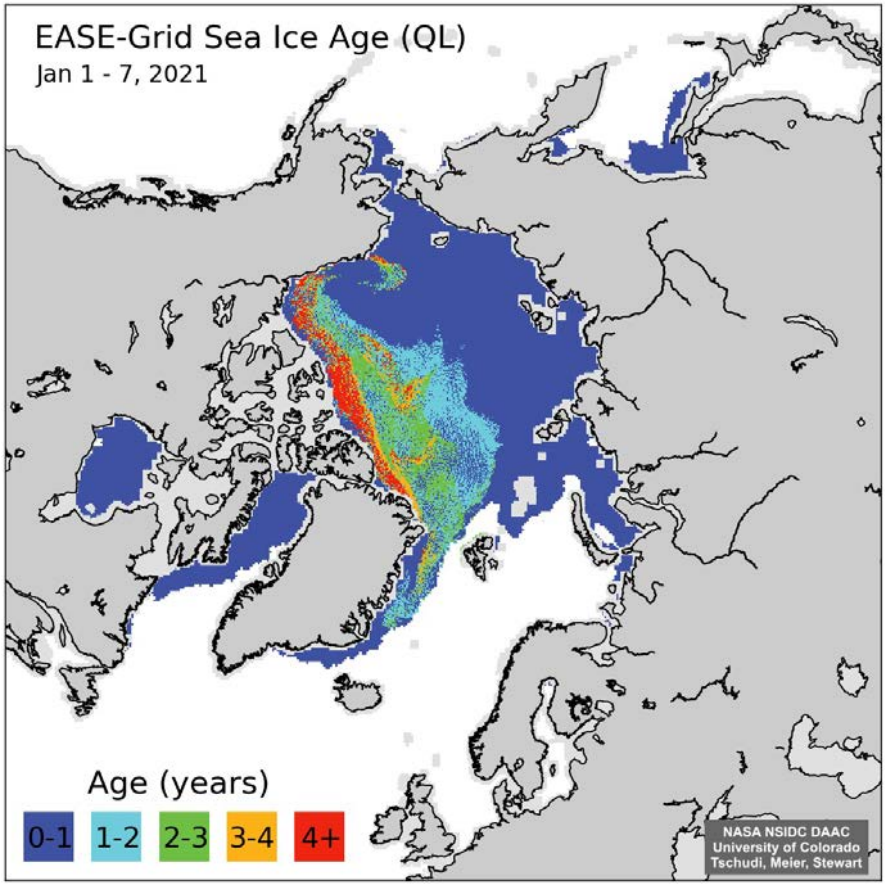
Pre-cursor: Jan - Feb motion

- Strong sea ice drift toward Beaufort Sea coastline
- MYI infiltration into region
- Convergence along coastline



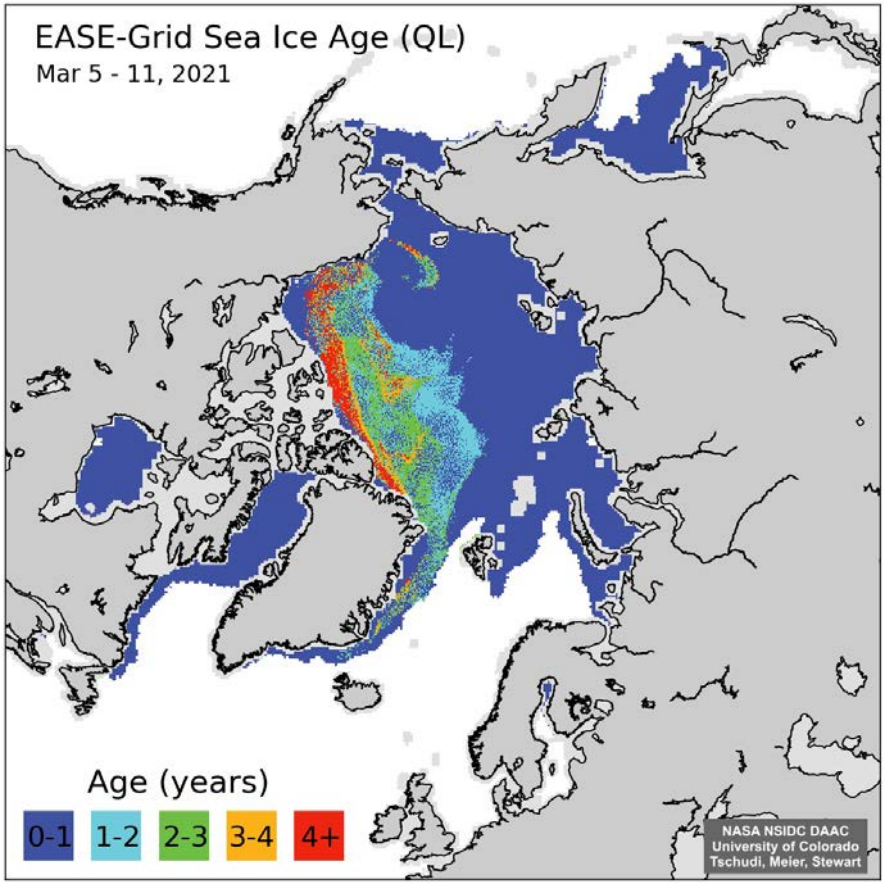
Quicklook Arctic Weekly EASE-Grid Sea Ice Motion Vectors, Version 1
Tschudi et al., 2019, https://doi.org/10.5067/O0XI8PPYEZJ6

Pre-cursor: Jan - Feb ice age



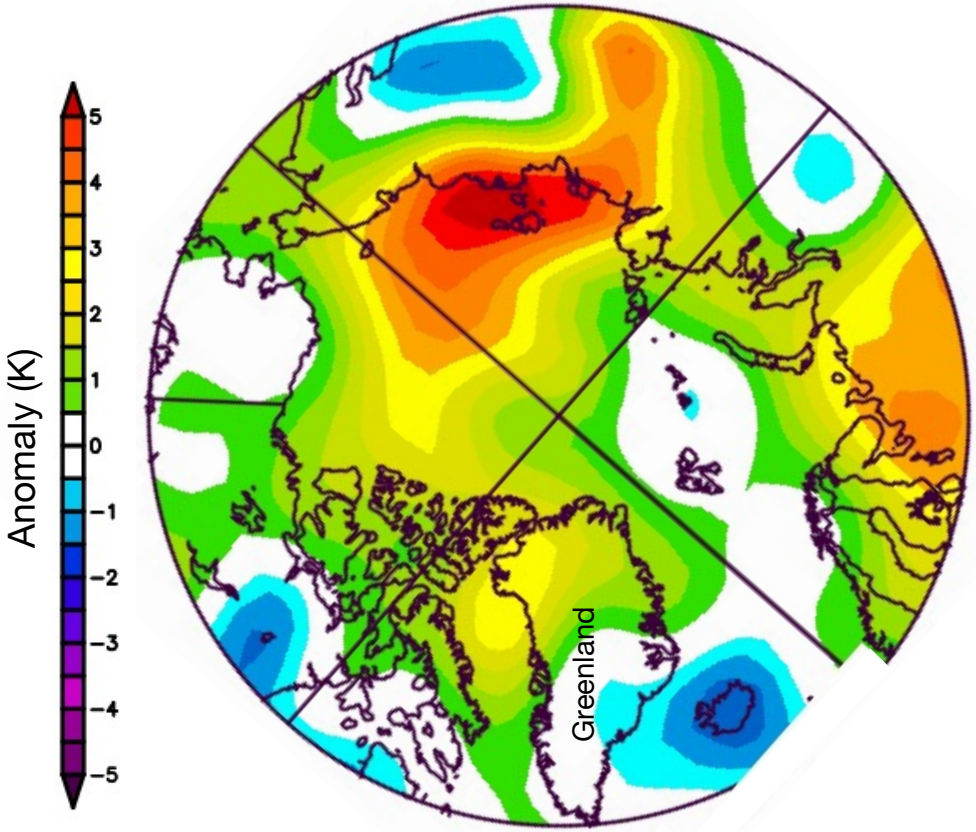
Quicklook Arctic Weekly EASE-Grid Sea Ice Age, Version 1
Tschudi et al., 2019, https://doi.org/10.5067/2XXGZY3DUGNQ

Pre-cursor: Jan - Feb ice age

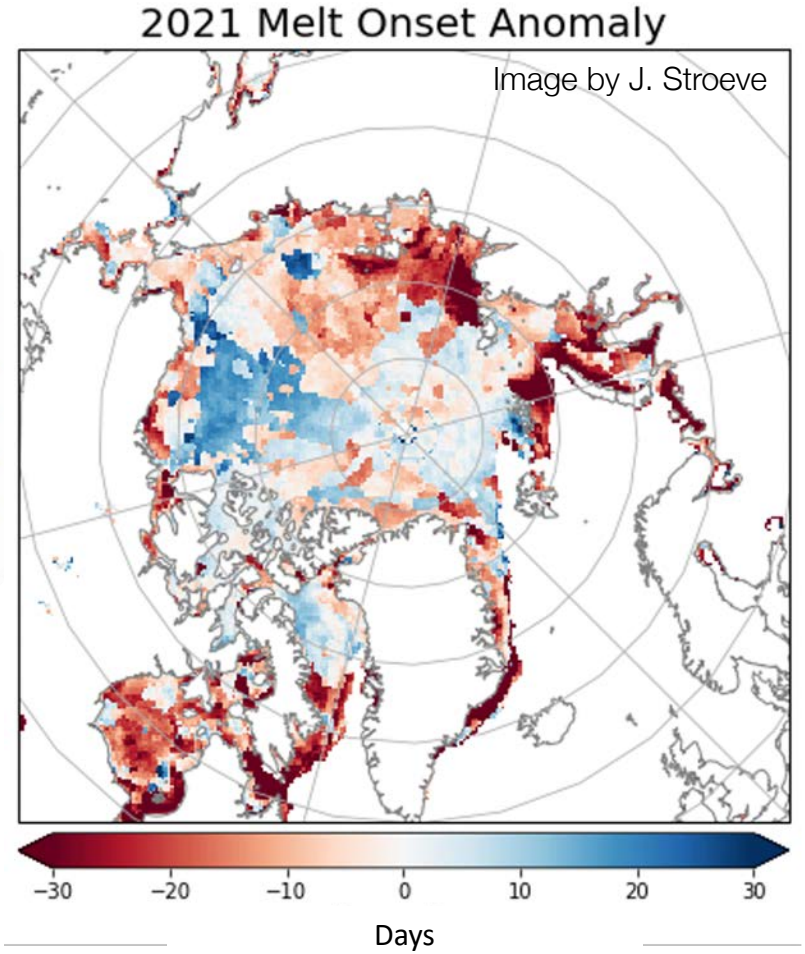


Quicklook Arctic Weekly EASE-Grid Sea Ice Age, Version 1
Tschudi et al., 2019, https://doi.org/10.5067/2XXGZY3DUGNQ

Early melt in the Laptev

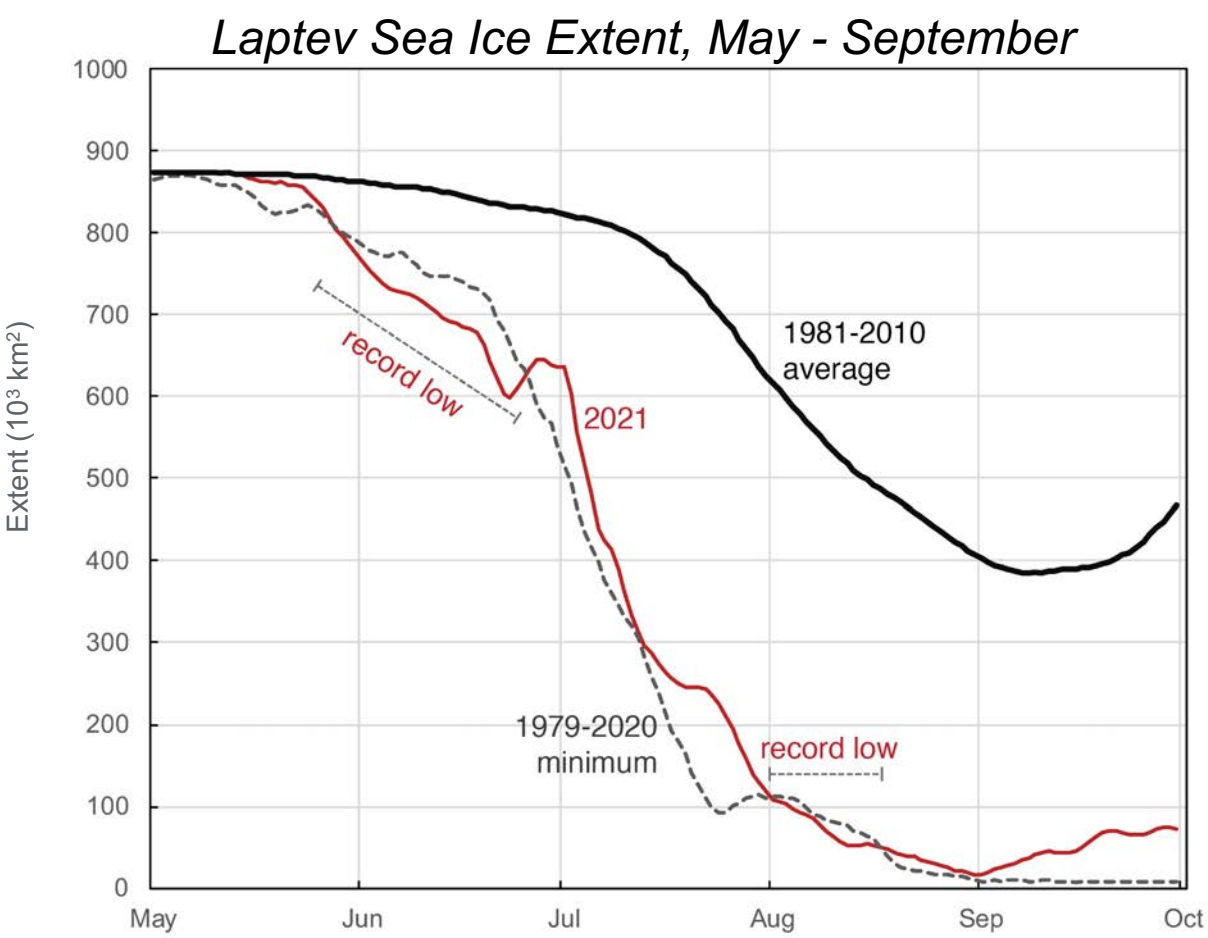


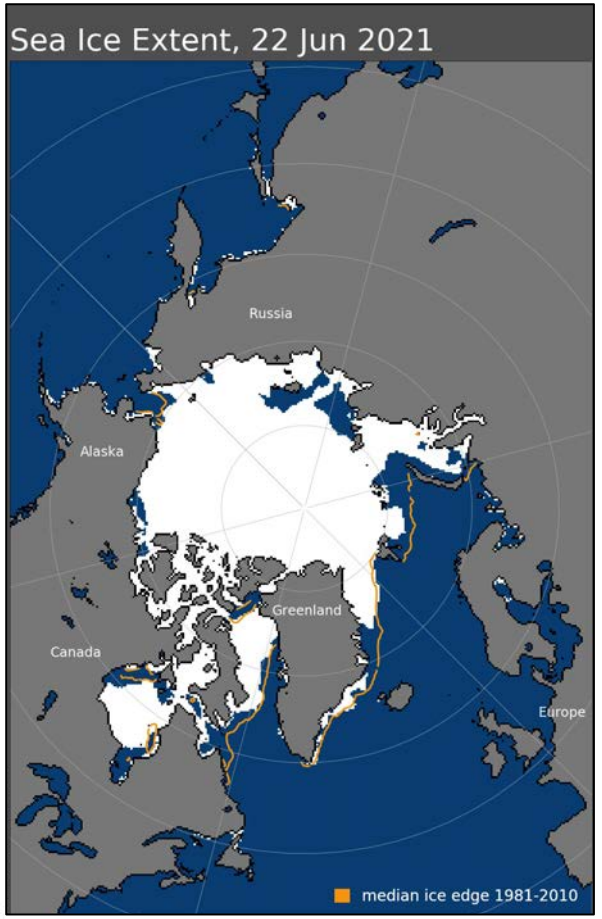
May-June 925 mb
Air Temperature Anomaly



NCEP/NCAR Reanalysis Monthly Composites, https://psl.noaa.gov/cgi-bin/data/composites/comp.pl
Melt onset updated from Markus et al., 2009, doi:10.1029/2009JC005436
https://earth.gsfc.nasa.gov/index.php/cryo/data/arctic-sea-ice-melt

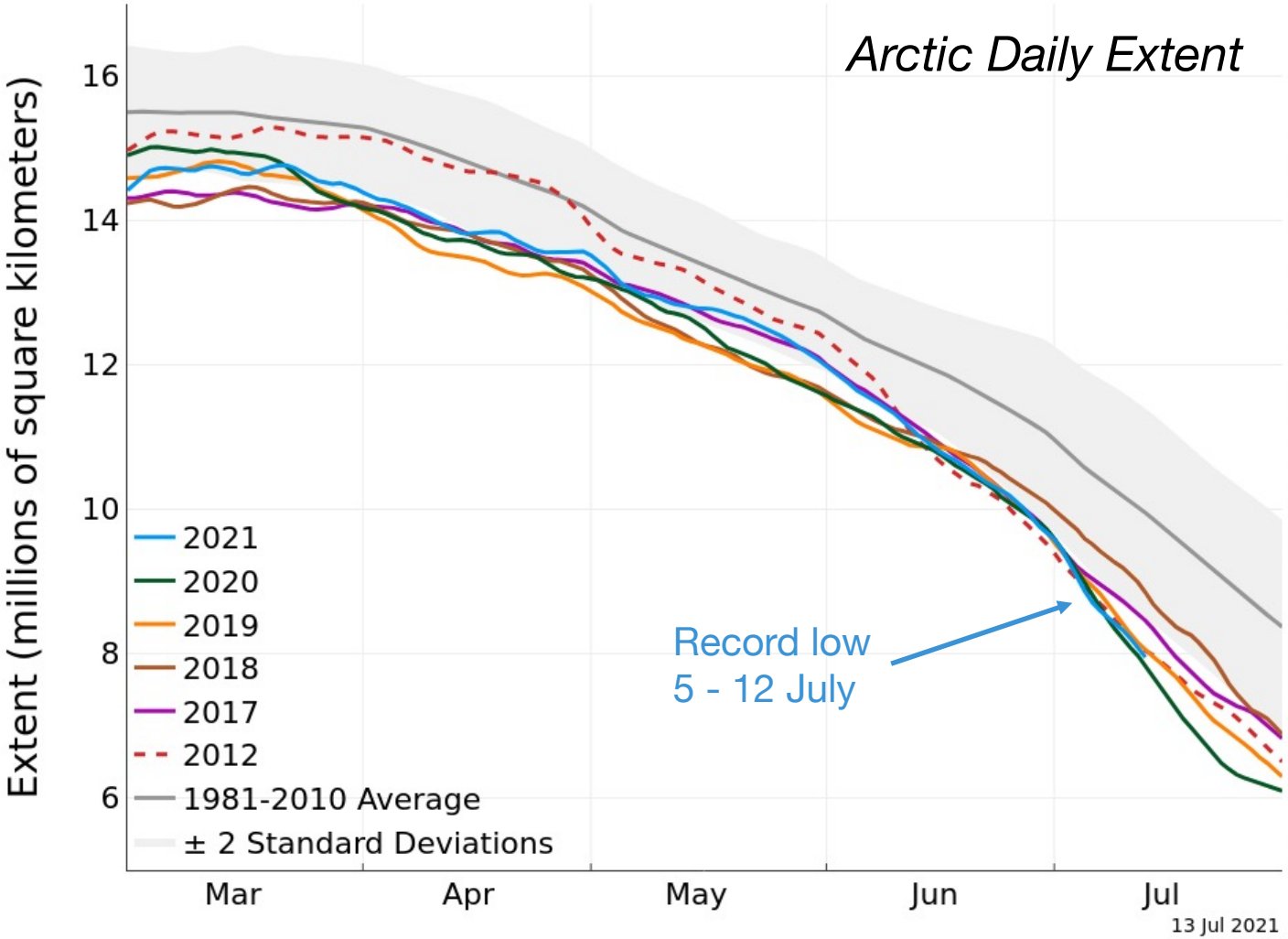
Record low June extent in Laptev



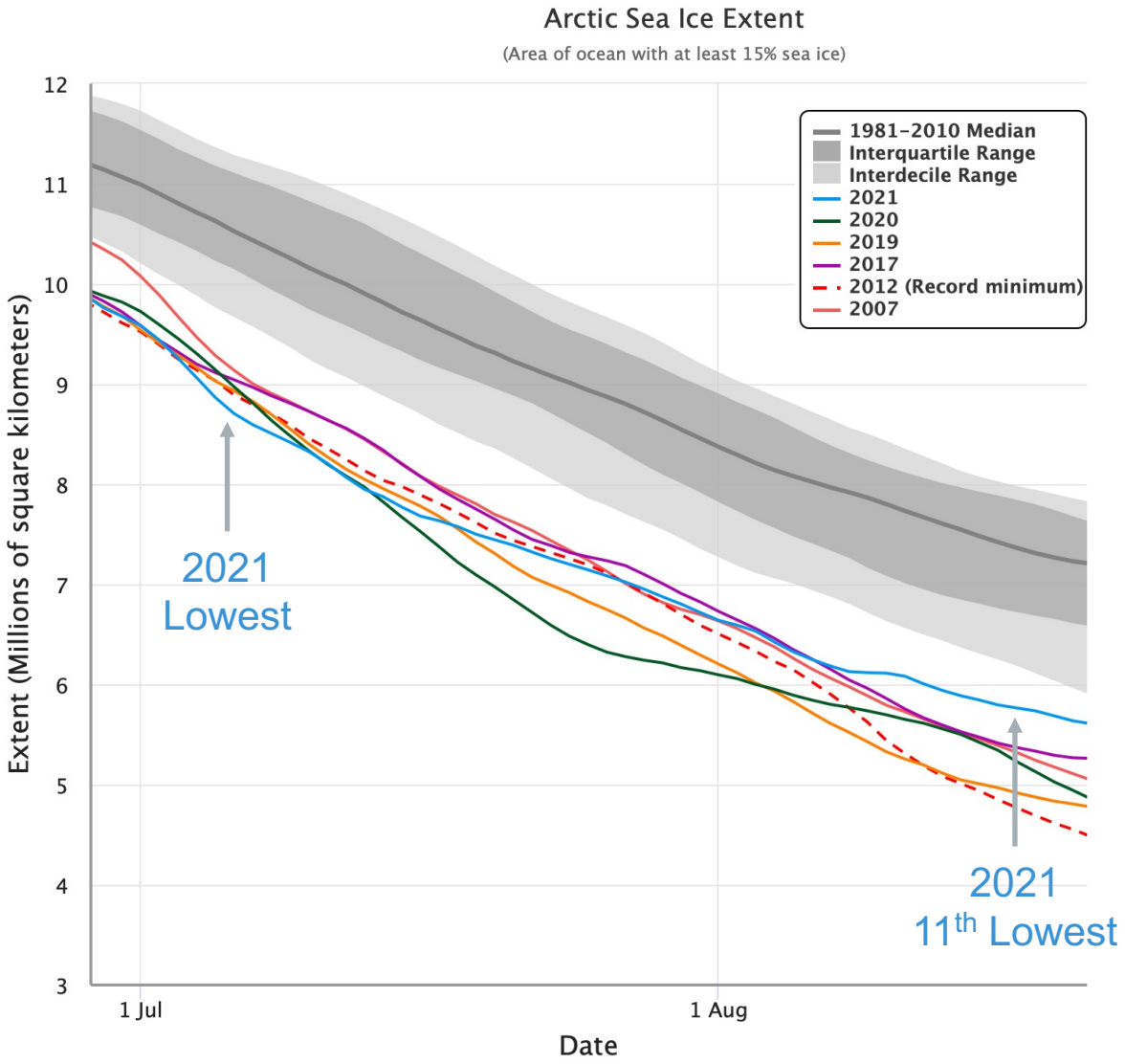


NSIDC Sea Ice Index, https://nsidc.org/data/seaice_index/

Heading for a record minimum?



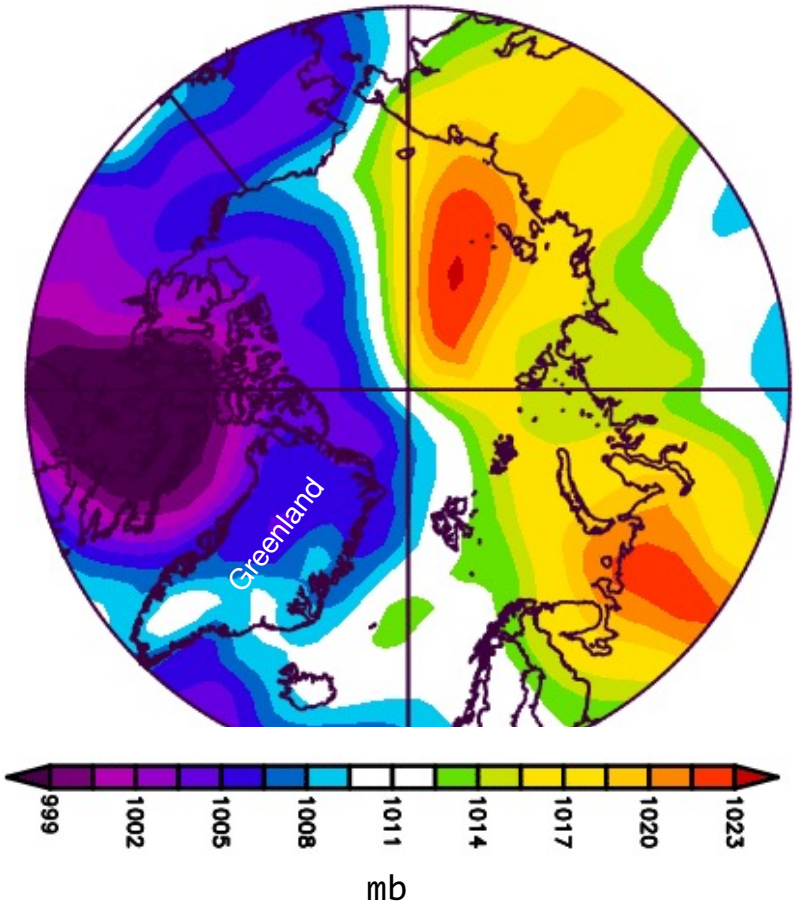
Slowdown

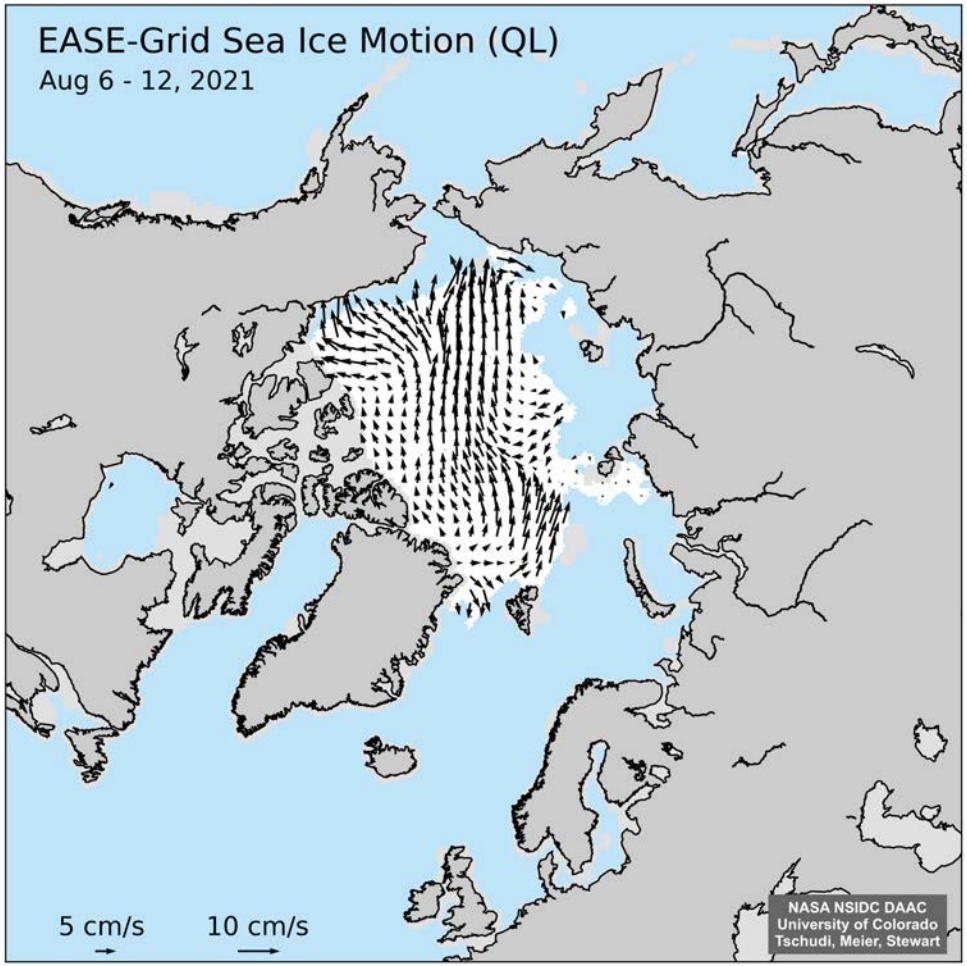


NSIDC Arctic Sea Ice News and Analysis, Charctic
https://nsidc.org/arcticseaicenews/

Slowdown

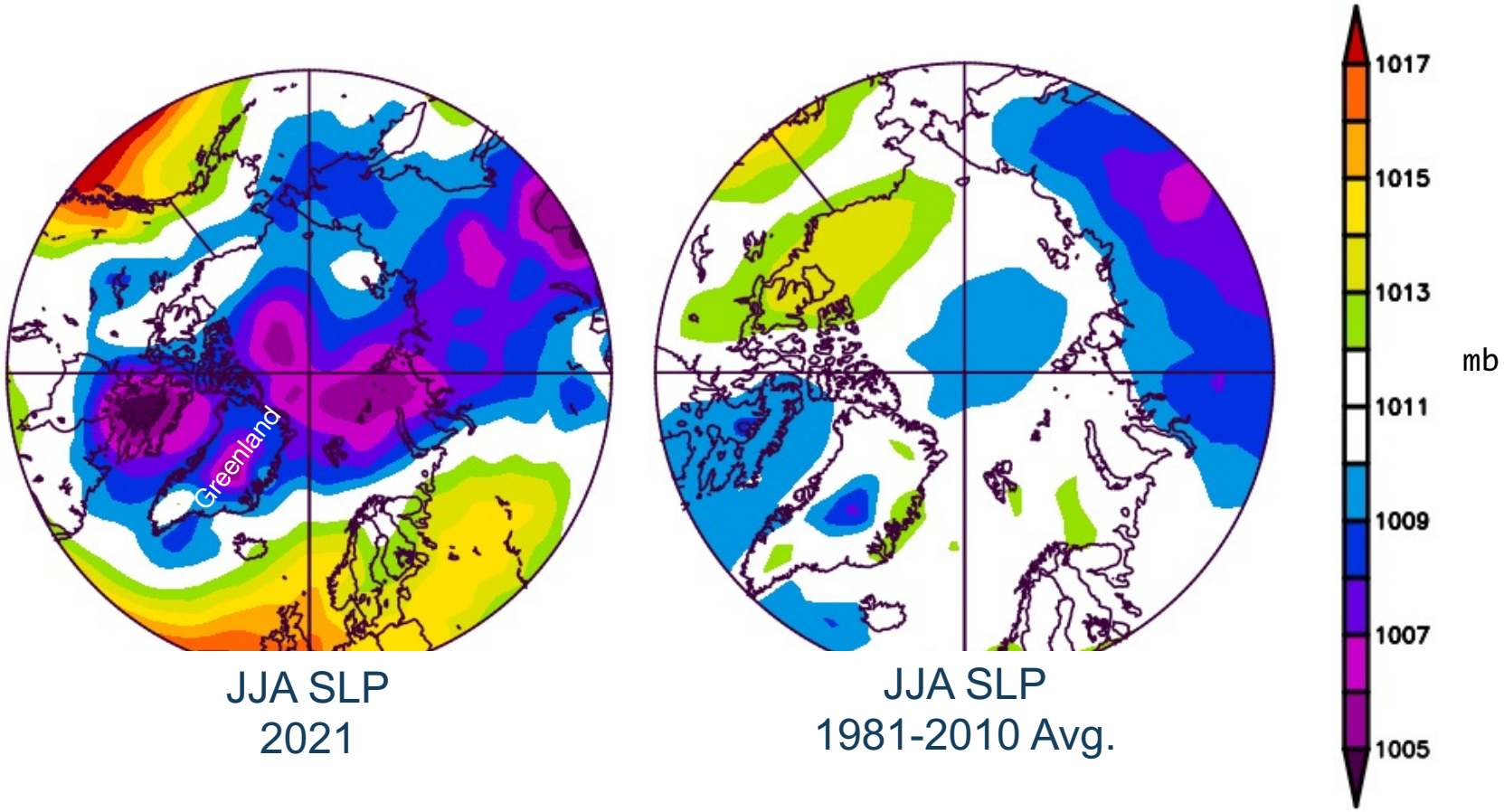
SLP, Aug 6 - 12





NCEP/NCAR Reanalysis Monthly Composites
https://psl.noaa.gov/cgi-bin/data/composites/comp.pl

A different summer SLP pattern

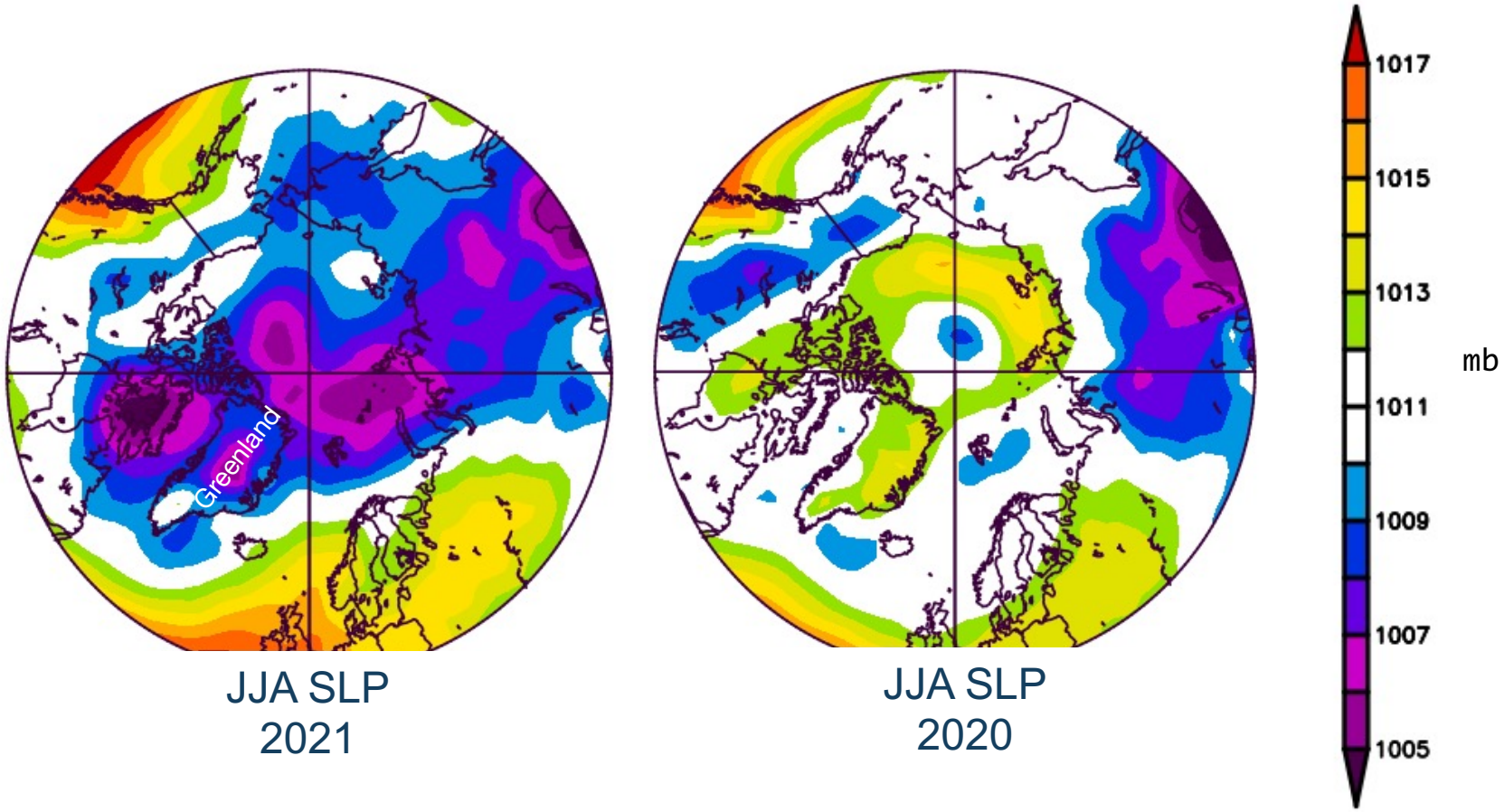


JJA SLP
2021

JJA SLP
1981-2010 Avg.

NCEP/NCAR Reanalysis Monthly Composites
https://psl.noaa.gov/cgi-bin/data/composites/comp.pl

A different summer SLP pattern

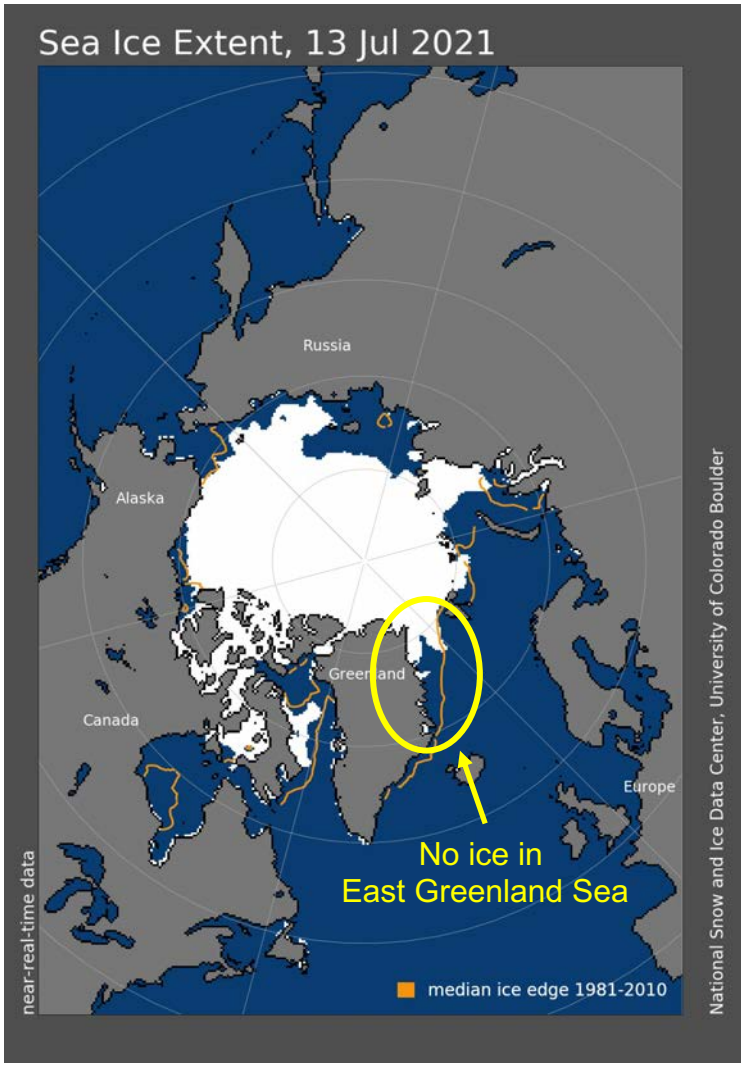


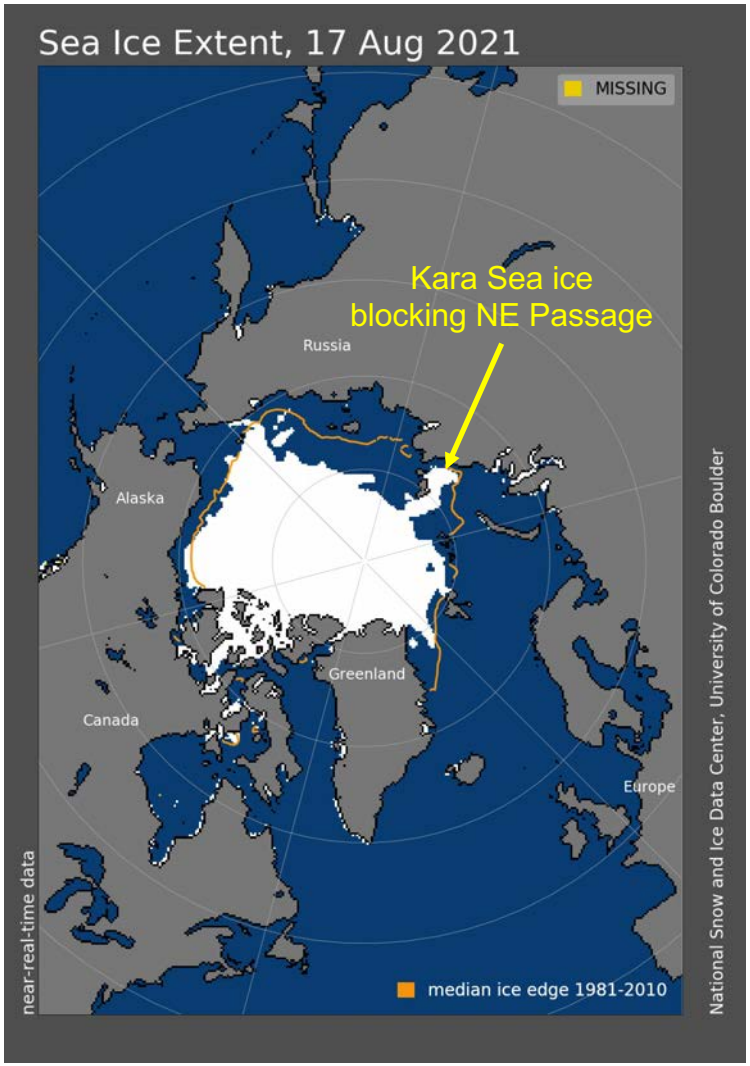
JJA SLP
2021

JJA SLP
2020

NCEP/NCAR Reanalysis Monthly Composites
https://psl.noaa.gov/cgi-bin/data/composites/comp.pl

A couple other interesting things:





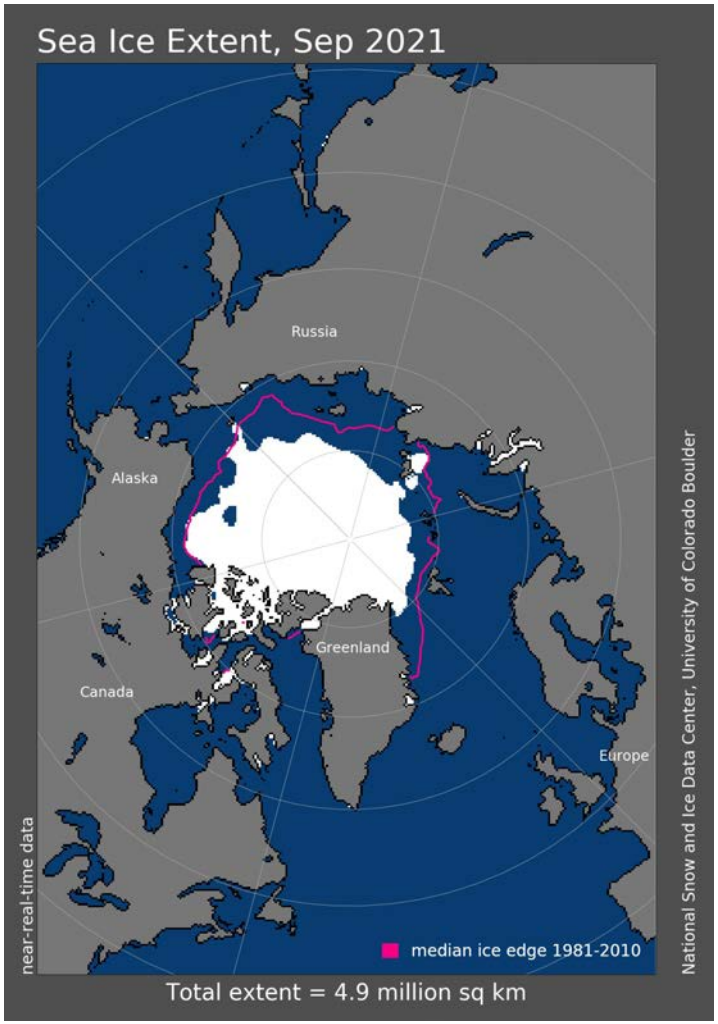
NSIDC Sea Ice Index, https://nsidc.org/data/seaice_index/

A modest September

- 4.92 x 10^6 km^2
- 12th lowest in the 1979 to 2021 satellite record
- Highest September extent since 2014
- Last 15 years (2007 to 2021) have had the 15 lowest minimum extents in the 43-year satellite record

- Trend = -81,200 km^2 yr^{-1}
- Trend = -12.7 % $decade^{-1}$

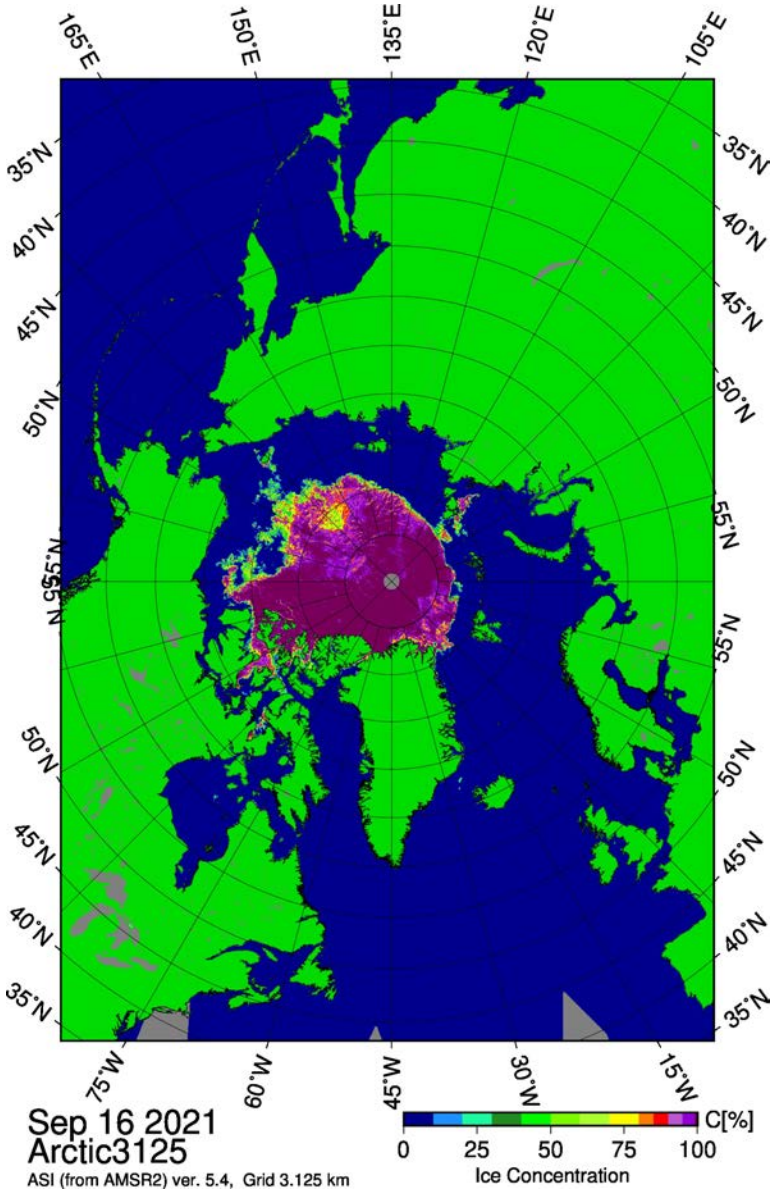
(rel. 1981-2010 avg.)



NSIDC Arctic Sea Ice News and Analysis
http://nsidc.org/arcticseaicenews/2021/09/arctic-sea-ice-at-highest-minimum-since-2014/

Saved by the bell?

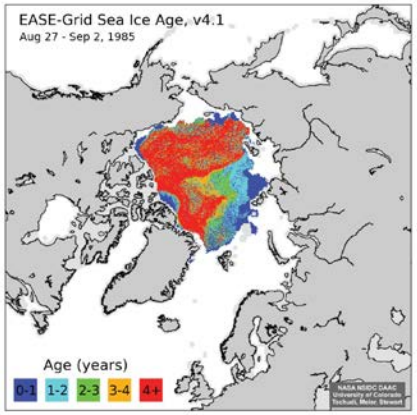
- Thin, sparse ice in the Beaufort and Chukchi
- Just a little more melting may have removed that ice
- These regions seem to correspond to the multiyear ice that as advected into the region during December - February

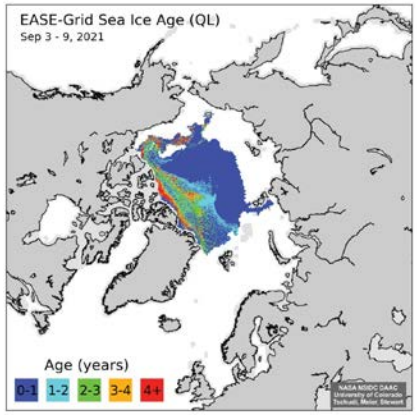


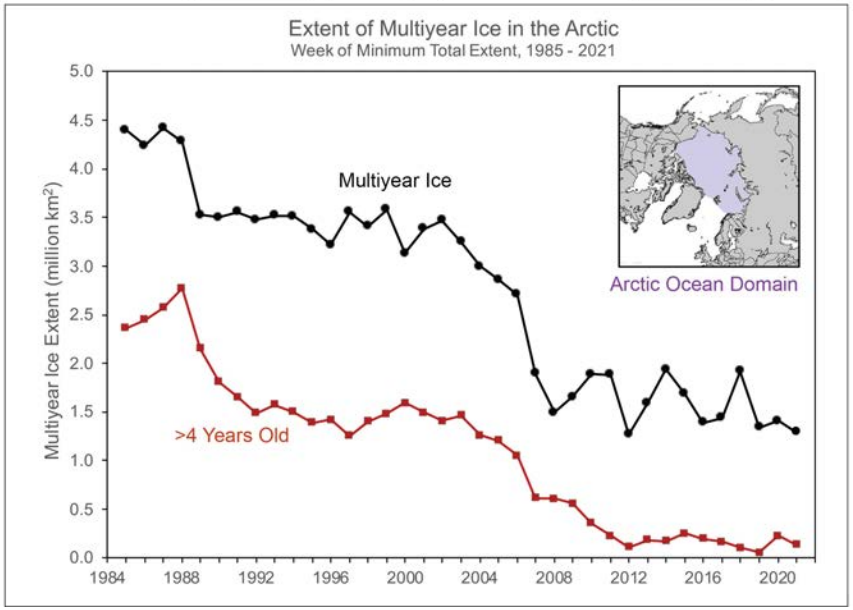
AMSR2 ASI sea ice concentration from Univ. Bremen
Spreen et al., 2008, doi:10.1029/2005JC003384
https://seaice.uni-bremen.de/sea-ice-concentration/amsre-amsr2/

Dearth of MYI

- Multiyear ice 2nd lowest in the satellite record, barely above 2012
- Old (>4 years) ice has been continuously low since 2012
- Sea ice no longer lasting long in the Arctic

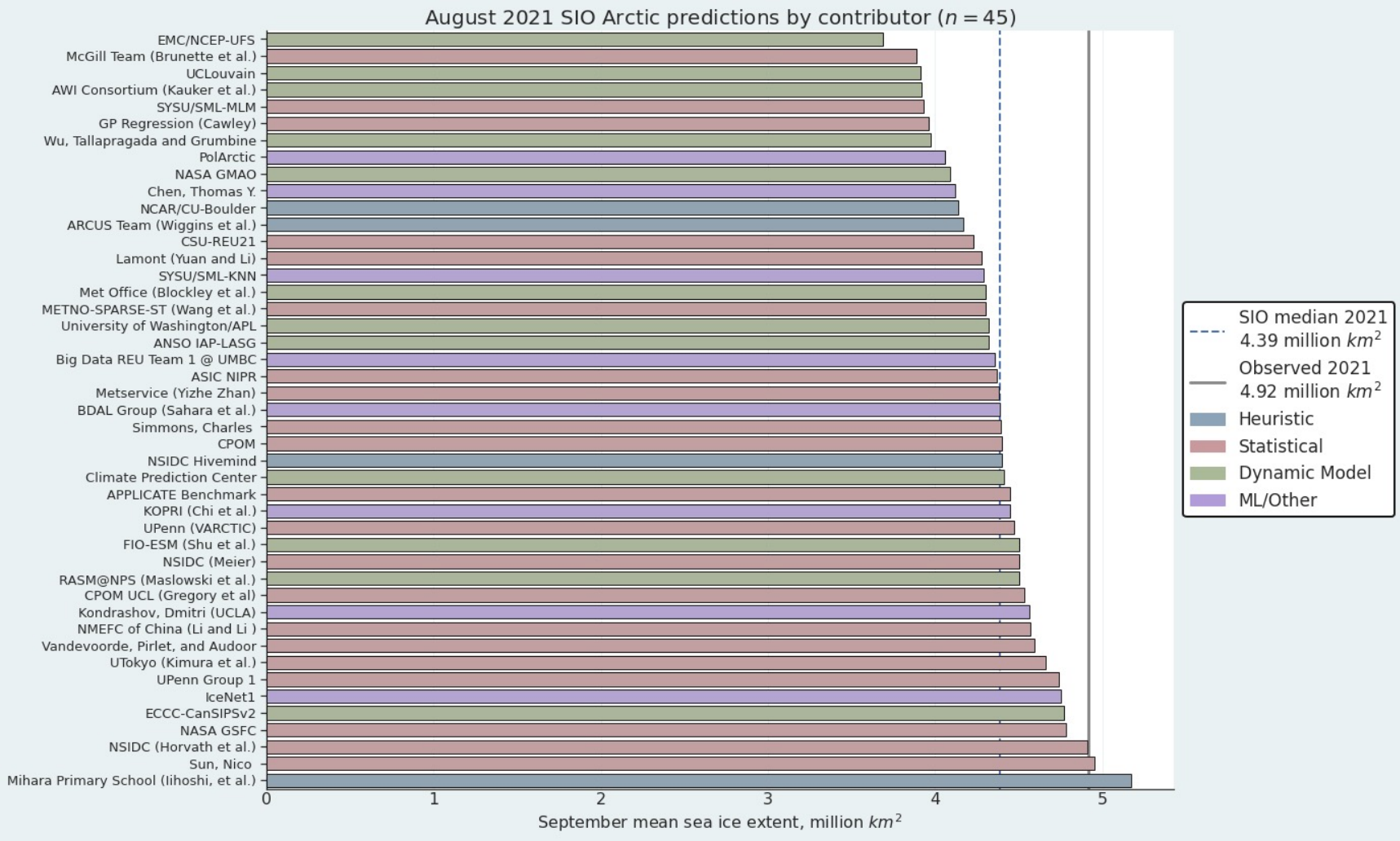






Quicklook EASE-Grid Sea Ice Age, Version 1, Tschudi et al., 2019a, https://doi.org/10.5067/2XXGZY3DUGNQ
EASE-Grid Sea Ice Age, Version 4, Tschudi et al., 2019b, https://doi.org/10.5067/UTAV7490FEPB

Outlook comparison



Outlook comparison