The 2019 Arctic Sea Ice Wrap-Up

Walt Meier, National Snow and Ice Data Center
September extent

The last 13 years (2007-2019) are the lowest 13 years in the 41-year record

Average Monthly Arctic Sea Ice Extent September 1979 - 2019

Trend = -82,400 km²/year = -12.9 %/decade

2019 = 4.32 x 10⁶ km²
3rd lowest, above 2007 and 2012

https://nsidc.org/arcticseaicenews/
September extent

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September 1979 - 2019

Trend = -82,400 km²/year
= -12.9 %/decade

2019 = 4.32 x 10⁶ km²
3rd lowest, above 2007 and 2012

Trend 2007-2019 = -1200 km²/year

https://nsidc.org/arcticseaeicenews/
Sea Ice Outlooks

August 2019 SIO Arctic predictions by contributor (n=42)

June, July & August 2019 SIO Arctic predictions by method (n = 112)

Precursors: low Bering, early melt onset

Bering Sea Ice Extent

Melt onset date anomaly

3 March 2018

Melt onset data courtesy J. Miller, NASA Goddard; image by J. Stroeve, NSIDC/UCL/UManitoba
Warm temperatures, SLP meh?

925 mb air temperature anomaly

Sea level pressure

June – August average

NCEP/NCAR Reanalyses from NOAA ESRL, https://www.esrl.noaa.gov/
Decompression: summer sea level pressure

June
July
August

NCEP/NCAR Reanalyses from NOAA ESRL, https://www.esrl.noaa.gov/
The heat is on in the Chukchi (in the ocean)

Images from UpTempO
SST data from NOAA OISST
http://psc.apl.washington.edu/UpTempO/
Conclusion

- 2019 summer season typical of recent years
  - Early melt onset
  - Warm ocean (especially in the Chukchi) and air temperatures
  - No “perfect storm” of conditions as in 2012
- 2006/2007 seems be a step-change transition – Why?
  - Loss of old ice, thinning likely culprit – 2007 strong advection
  - Will there be another step-change? When?