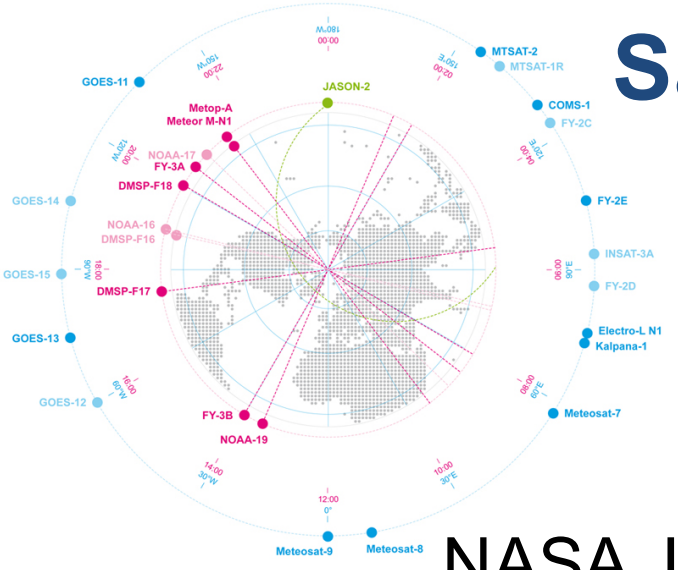

Satellite Sea Ice Measurements in the Arctic Ocean

Presented to CGMS- 44 Plenary, Session C.8

David Halpern
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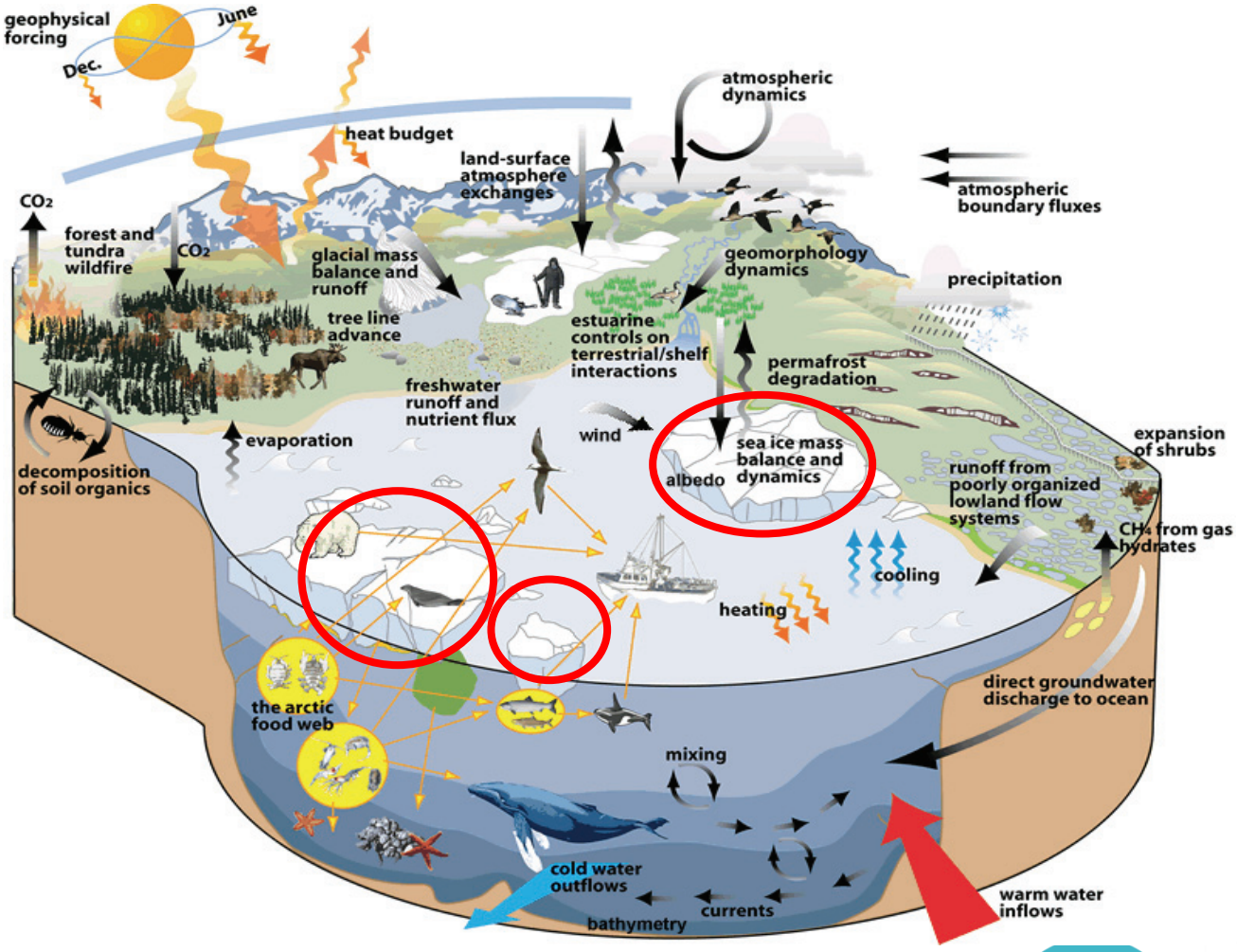
Integrated Arctic System Science

Schematic diagram of the Arctic Ocean system showing a complex network of processes, interactions, interdependent feedbacks, and interconnections among system components.



Sea Ice

Extracted from NRC (2012) *Seasonal-to-Decadal Predictions of Arctic Sea Ice: Challenges and Strategies.*

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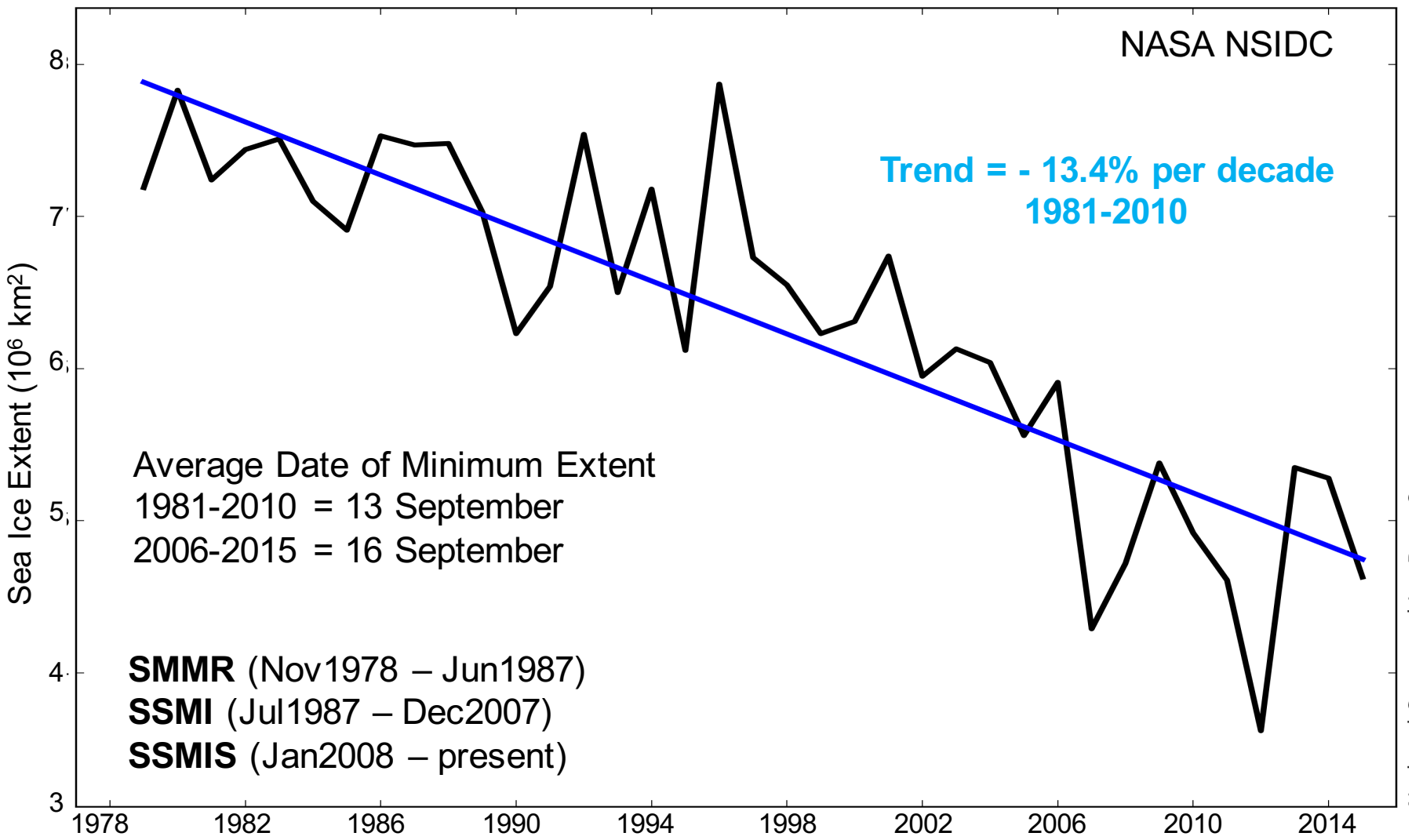
Decreasing Trend of Arctic Sea Ice Minimum Extent



https://nsidc.org/news/newsroom/PR_2015meltseason

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Decreasing Trend of Arctic Sea Ice Minimum Extent

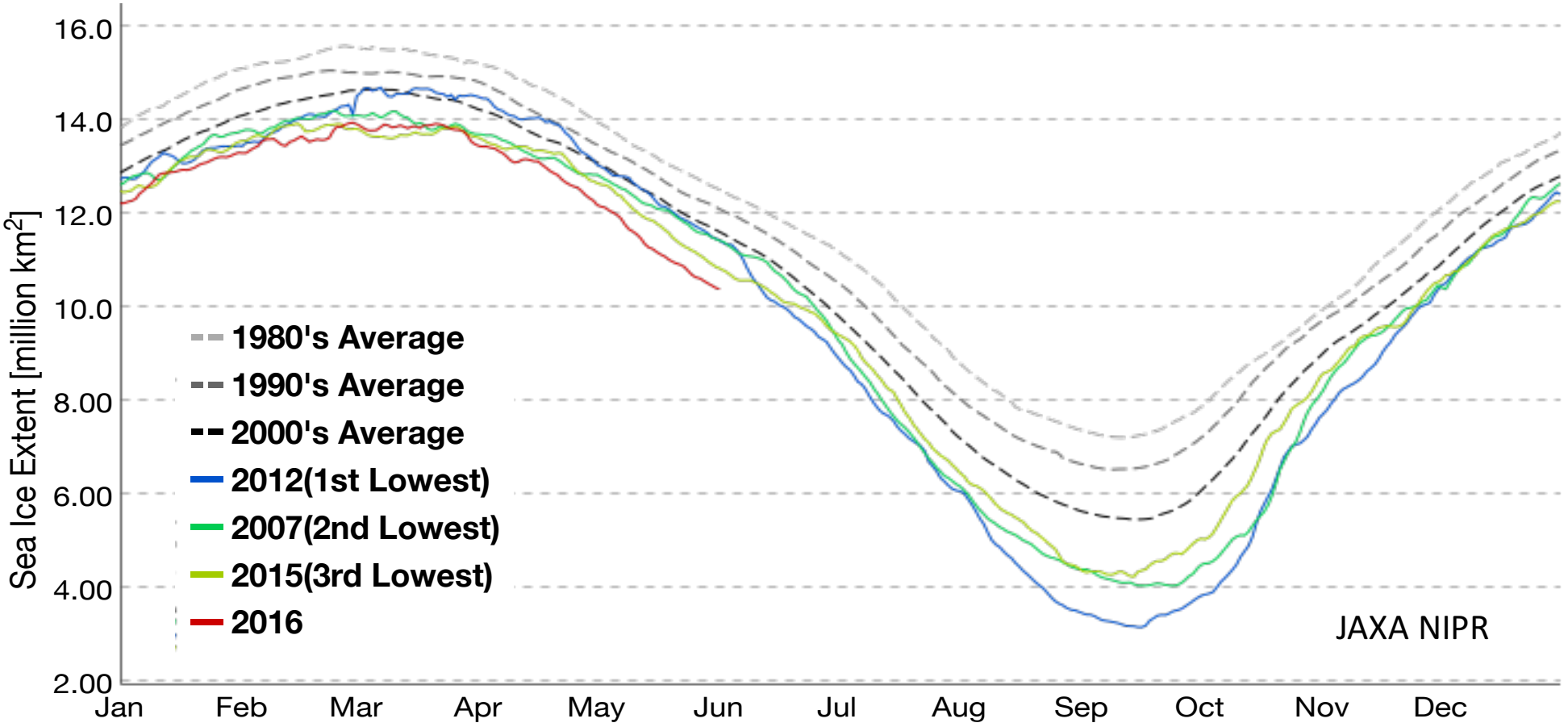

Diagram extracted on 2 June 2016 (red line) 27 March 2016. Produced by JAXA Arctic Data archive System (ADS) with: **SMMR**, January 1980 – July 1987; **SSMI**, July 1987 – June 2002; **AMSR-E**, June 2002 – October 2011; **WindSat**, October 2011 – July 2012; and **AMSR2**, July 2012 – present.

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https://ads.nipr.ac.jp/vishop/vishop-extent.html?N

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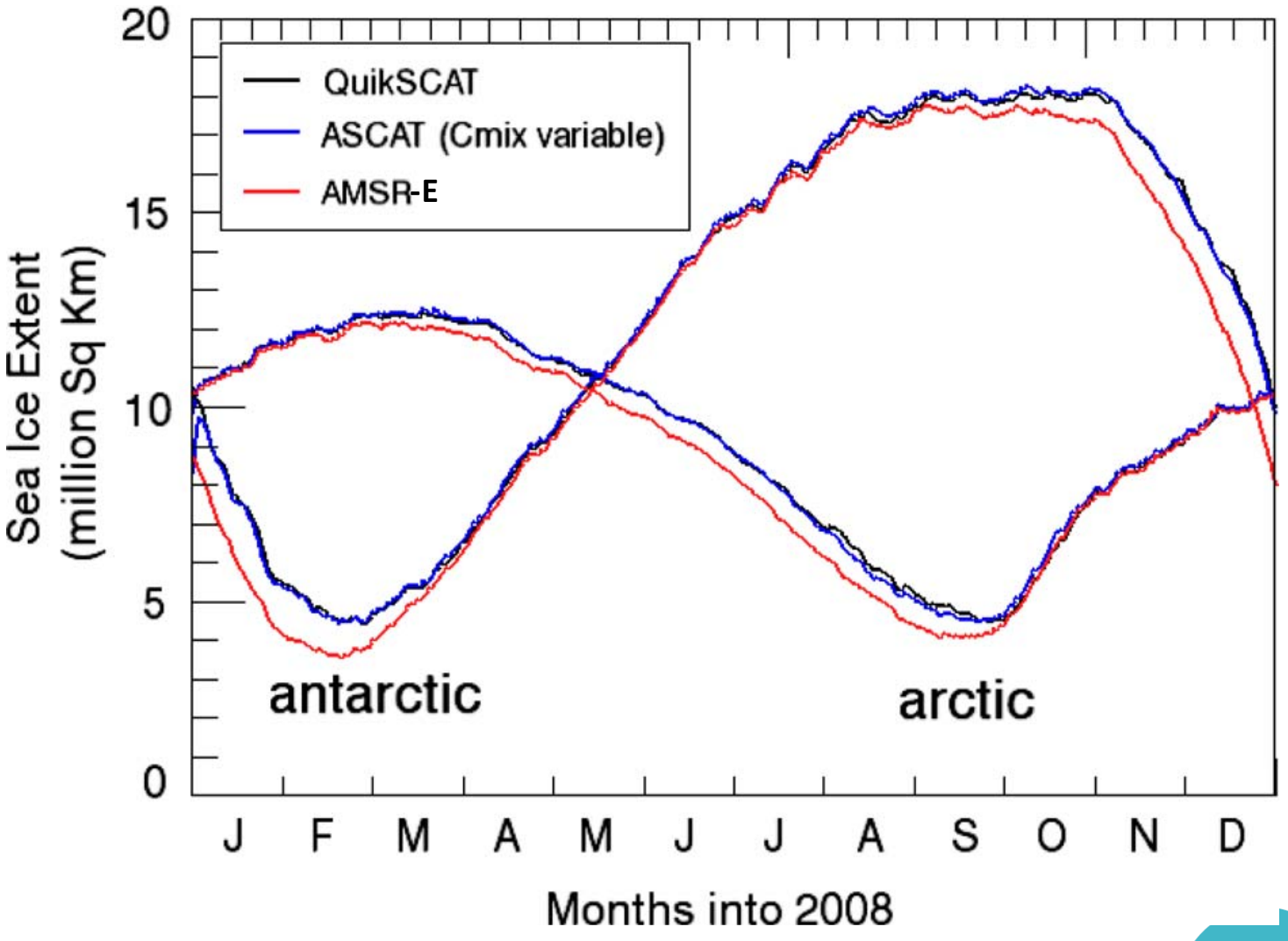
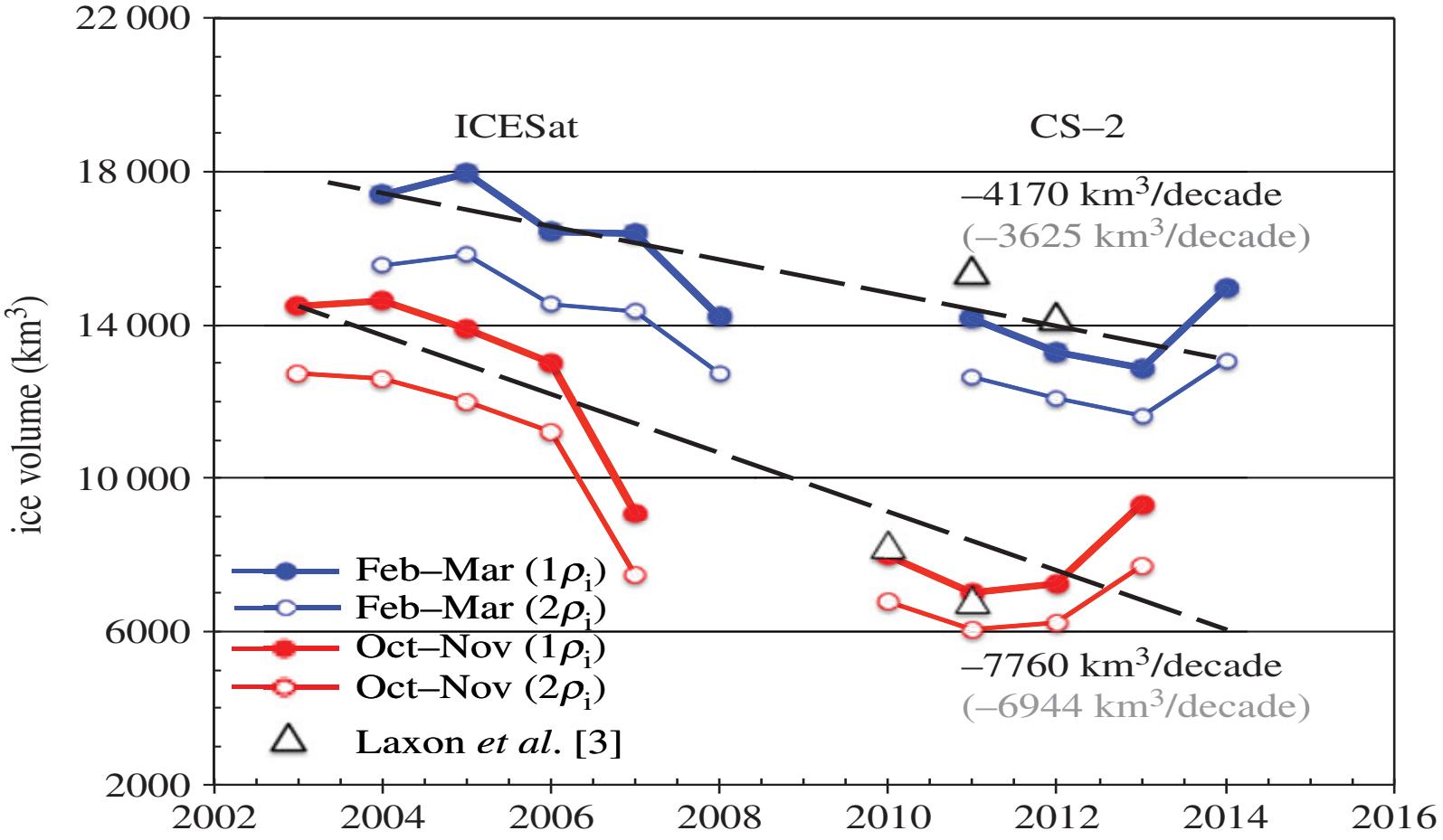
Daily Sea Ice Extent



Passive microwave measurements underestimated sea ice extent compared to scatterometer observations.

Rivas et al. (2012)

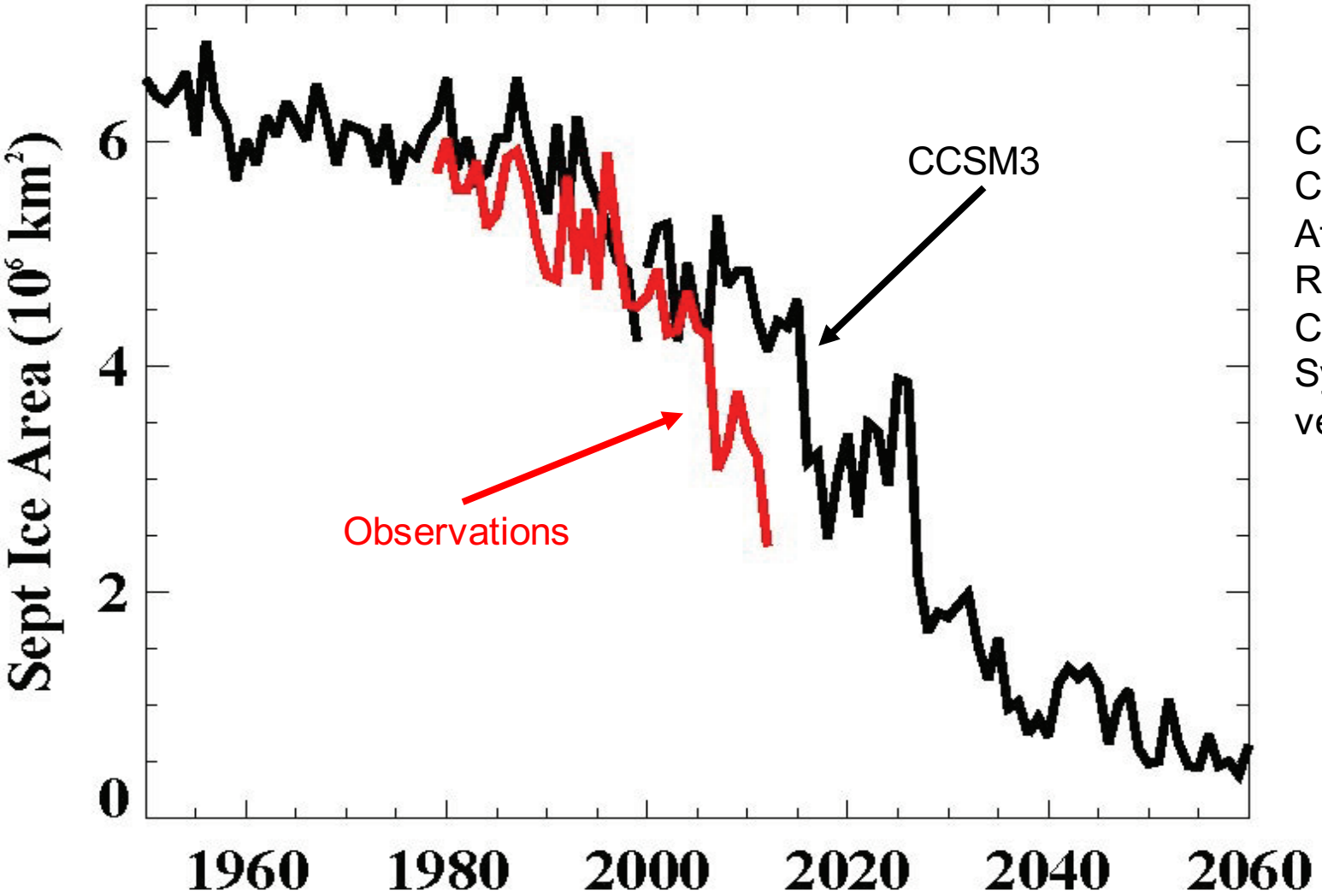
ICESat and CryoSat-2 Arctic Ocean Sea Ice Volume



Arctic sea ice volumes in February-March and October-November with ICESat and CryoSat-2 data. Two values of sea ice bulk density, with "1" and "2" representing upper and lower estimates, respectively.

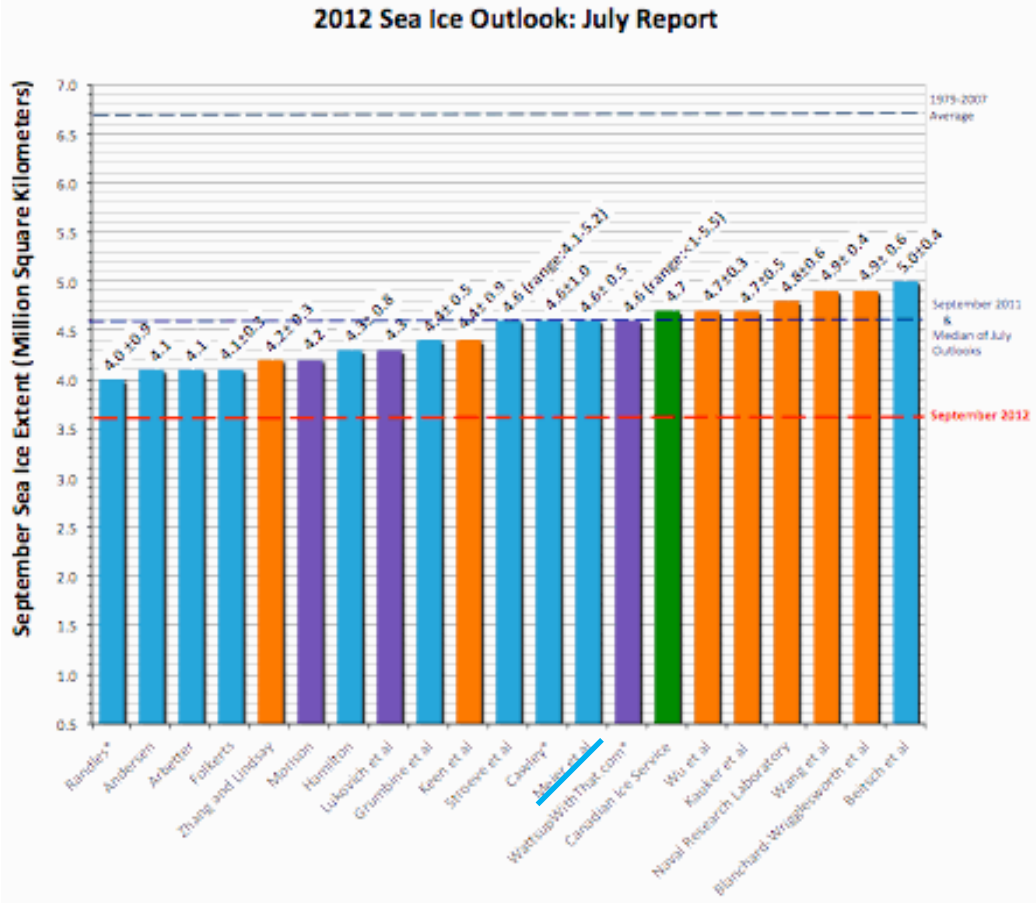
Kwok et al. (2015)

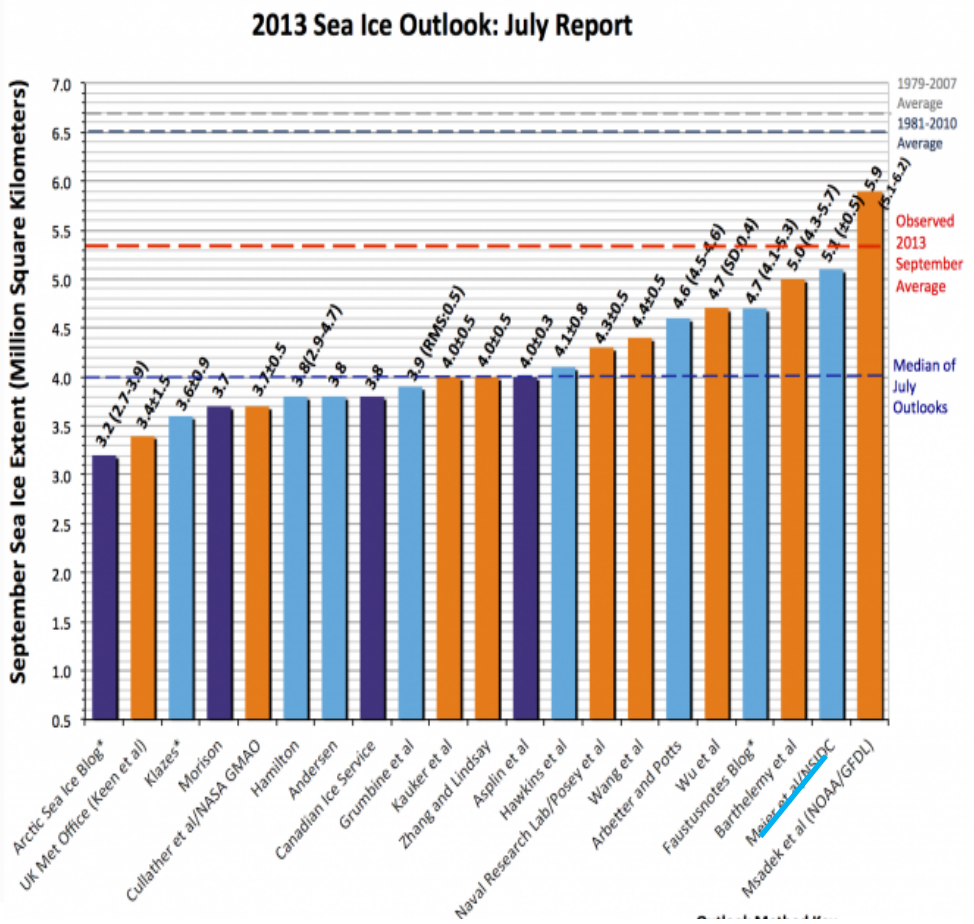
Arctic Ocean Sea Ice Extent in September



CCSM – National Center for Atmospheric Research (NCAR) Community Climate System Model version 3

NRC (2012)





LEFT: https://www.arcus.org/search-program/seaiceoutlook/2012/summary

RIGHT: https://www.arcus.org/search-program/seaiceoutlook/2013/summary

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To be considered by CGMS:

Recommendation 1: Enable sustainability of satellite passive microwave sea ice extent measurements begun in 1978.

Recommendation 2: Promote the implementation of sustained satellite scatterometer sea ice observations with scatterometer to provide an independent source of information concerning climate change impacts on the marine cryosphere.

Recommendation 3: Enable sustainability of satellite frequent high-spatial marginal ice zone measurements for navigation and other near-real time applications.

Recommendation 4: Promote the implementation of sustained satellite measurements of Arctic Ocean sea ice thickness.

Recommendation 5: Encourage Joint CEOS/CGMS Working Group on Climate, in consultation with WMO PSTG, to establish a CEOS Virtual Constellation on GCOS ECV Sea Ice Measurements.

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Thank You