Global Energy Policy Research | GEPR

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?? ?? · Saturday, November 6th, 2021

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A.1.5 Human influence is *very likely* the main driver of the global retreat of glaciers since the 1990s and the decrease in Arctic sea ice area between 1979–1988 and 2010–2019 (about 40% in September and about 10% in March). There has been no significant trend in Antarctic sea ice area from 1979 to 2020 due to regionally opposing trends and large internal variability. Human influence *very likely* contributed to the decrease in Northern Hemisphere spring snow cover since 1950. It is *very likely* that human influence has contributed to the observed surface melting of the Greenland Ice Sheet over the past two decades, but there is only *limited evidence*, with *medium agreement*, of human influence on the Antarctic Ice Sheet mass loss. {2.3, 3.4, 8.3, 9.3, 9.5, TS.2.5}

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Final Government Distribution Chapter 2 IPCC AR6 WGI

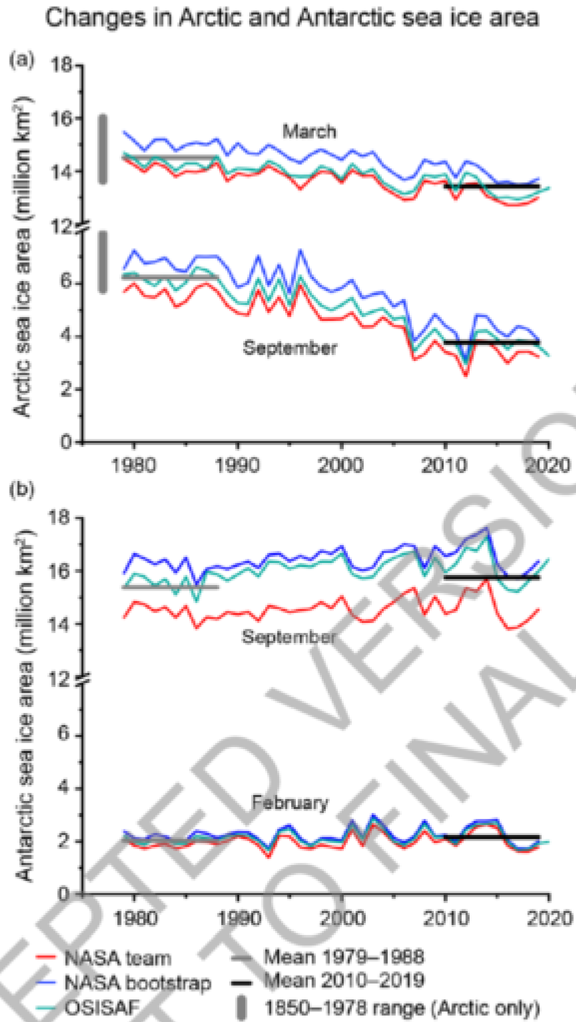

Figure 2.20: Changes in Arctic and Antarctic sea ice area. (a) Three time series of Arctic sea ice area (SIA) for March and September from 1979 to 2020 (passive microwave satellite era). In addition, the range of SIA from 1850–1978 is indicated by the vertical bar to the left. Decadal means for the three series for the first and most recent decades of observations are shown by horizontal lines in grey (1979–1988) and black (2010–2019). (b): Three time series of Antarctic sea ice area for September and February (1979–2020). Sea ice area values have been calculated from sea ice concentration fields. Available data for 2020 (OSISAF) is shown in both (a) and (b). Further details on data sources and processing are available in the chapter data table (Table 2.SM.1).

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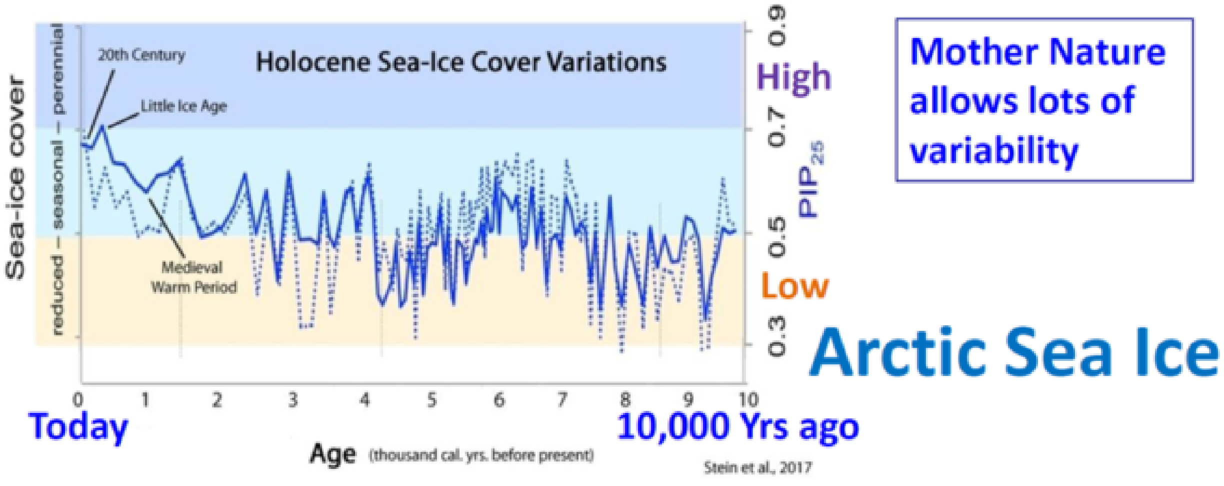

Stein et al. 2017

??2??????????????????????(Stein 2017)
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???(?3)??????????IP25???2?PIP25??

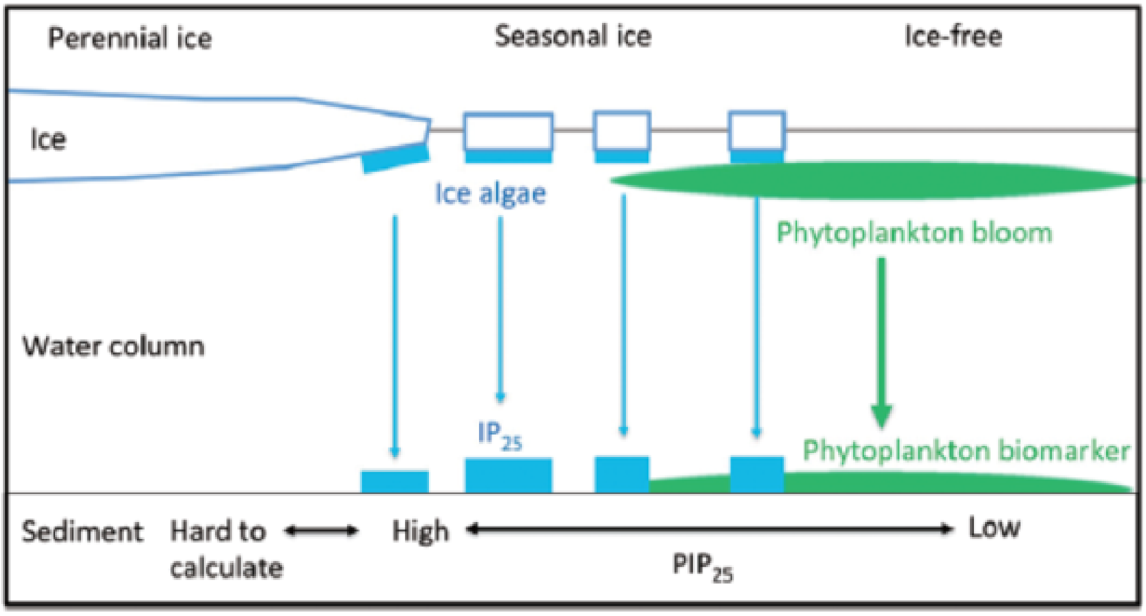

Fig. 10. IP_{25} and sediment phytoplankton biomarker content for different sea-ice conditions and the resulting PIP_{25} indices (modified from Müller et al., 2011).

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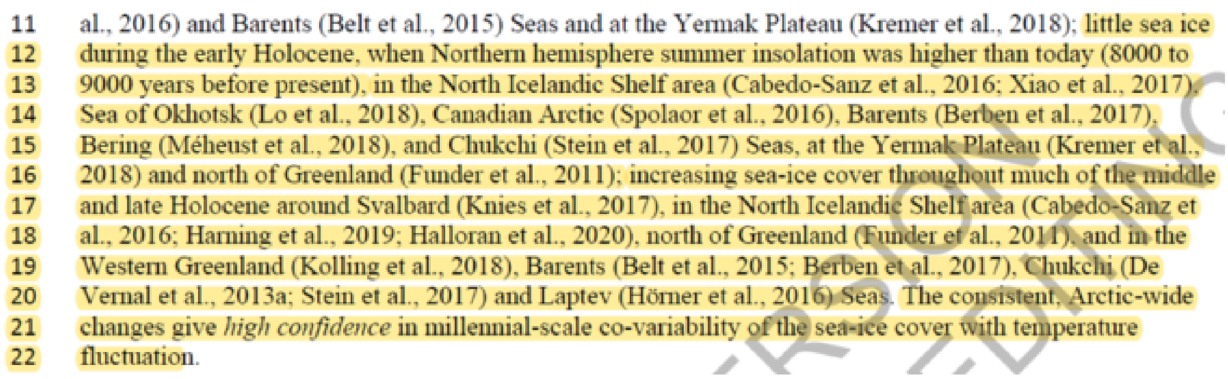
al., 2016) and Barents (Belt et al., 2015) Seas and at the Yermak Plateau (Kremer et al., 2018); little sea ice during the early Holocene, when Northern hemisphere summer insolation was higher than today (8000 to 9000 years before present), in the North Icelandic Shelf area (Cabedo-Sanz et al., 2016; Xiao et al., 2017), Sea of Okhotsk (Lo et al., 2018), Canadian Arctic (Spolaor et al., 2016), Barents (Berben et al., 2017), Bering (Méheust et al., 2018), and Chukchi (Stein et al., 2017) Seas, at the Yermak Plateau (Kremer et al., 2018) and north of Greenland (Funder et al., 2011); increasing sea-ice cover throughout much of the middle and late Holocene around Svalbard (Knies et al., 2017), in the North Icelandic Shelf area (Cabedo-Sanz et al., 2016; Harning et al., 2019; Halloran et al., 2020), north of Greenland (Funder et al., 2011), and in the Western Greenland (Kolling et al., 2018), Barents (Belt et al., 2015; Berben et al., 2017), Chukchi (De Vernal et al., 2013a; Stein et al., 2017) and Laptev (Hörner et al., 2016) Seas. The consistent, Arctic-wide changes give *high confidence* in millennial-scale co-variability of the sea-ice cover with temperature fluctuation.

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