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Sea ice change in the Amundsen-Bellingshausen Sea since the early 18th century

Content

Satellite observations expose an increasingly complex picture of sea ice change around Antarctica. Steady but irregular increases in sea ice between 1978/9 and 2014 have since been undermined by precipitous declines and a series of record annual and seasonal lows, but with strong regional differences between the Ross, Bellingshausen and Weddell Seas. To aid interpretation of these recent trends, we present a ~300-year record of sea ice change in the Bellingshausen-Amundsen Seas, using proxies archived in a seasonally-resolved, 140 m-long ice core collected in 2010 from Bryan Coast, Ellsworth Land. The record includes a suite of established sea ice chemical markers including methanesulphonic acid, sea-salt sodium (ssNa), non-sea-salt sulphate (nssSO4) and stable water isotopes, measured using Continuous Flow Analysis (CFA) in February 2022. In addition we present preliminary results from marine organic compounds to investigate their application as complementary sea ice markers. The data are compared with satellite observations and other sea ice reconstructions to explore regional variability over decadal to centennial timescales.

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