

Sea Ice Index Monitors Polar Ice Extent

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In September 2002, Arctic sea ice extent reached a minimum unprecedented in 24 years of satellite passive microwave observations, and almost certainly unmatched in 50 years of charting Arctic ice [Serreze *et al.*, 2003]. Again, in September 2003, ice retreated to an unusually low extent, almost equaling the previous year's minimum (Figure 1). The Sea Ice Index (http://nsidc.org/data/seaice_index/), an easy-to-use source of information on sea ice trends and anomalies, assists in observing these minima. The Sea Ice Index is intended for both researchers and the scientifically inclined general public.

Monthly mean sea ice concentration estimates from satellite passive microwave data are used to generate images showing ice conditions, trends, and anomalies for the Arctic and Antarctic. These images answer general questions such as, Is the ice extent in the Chukchi Sea about where it usually is this time of year? Was there less ice in the Weddell Sea last spring than is typical? Is the trend of decreasing Arctic sea ice extent more pronounced in winter or in summer?

A Web Image Spreadsheet Tool displays archived images in tabular format to show, for example, that winter ice extent was normal preceding the low summer extent of the last 2 years, and that in both years anomalous conditions developed rapidly beginning in July. Users may download images, as well as data on ice extent (the areal extent of ice-covered ocean

at any concentration greater than about 15%) and area (the extent weighted by the concentration) via file transfer protocol. Animations are available to provide a visual impression of the annual cycle and inter-annual variability.

Documentation addresses image derivation, data sources, and satellite data validation issues. Interpretive text outlines the natural variability of sea ice and the uses and limitations of linear regression for sea ice trend analysis.

Reference

Serreze, M. C., et al. (2003), A record minimum Arctic Sea ice extent and area in 2002, *Geophys. Res. Lett.*, 30(3), 1110, doi:10.1029/2002GL016406.

—FLORENCE FETTERER and KENNETH KNOWLES,
University of Colorado, Boulder

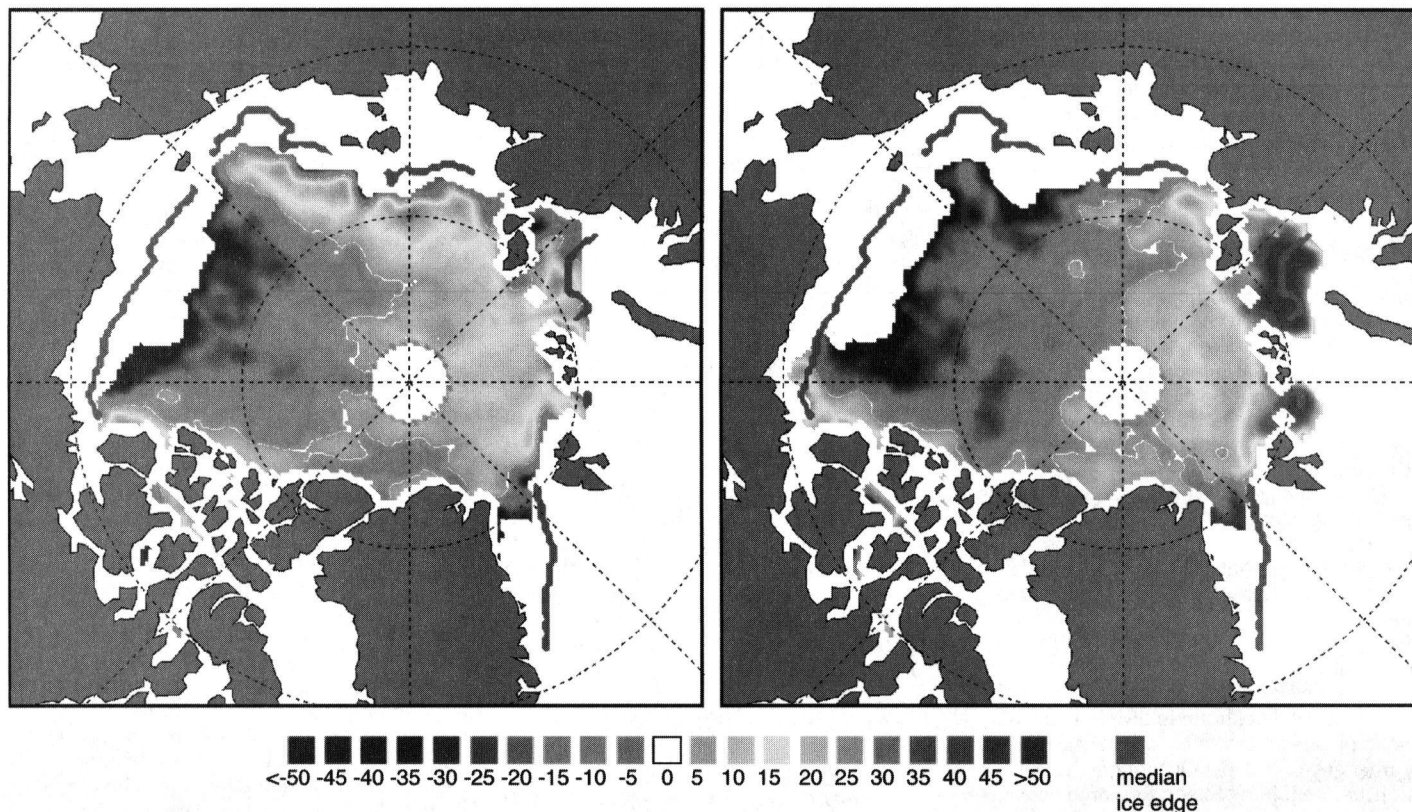


Fig. 1. Two Sea Ice Index features—ice concentration anomaly images (the difference in estimated concentration from the mean) and 1988–2000 median September ice edge position—are combined in this figure. The images highlight the distinctive characteristics of the 2002 (left) and 2003 (right) summer minima: the ice edge is well north of its median extent in the east Siberian and Beaufort sectors, and there is a striking lack of sea ice off east Greenland. The absence of ice in the Greenland Sea appears in the satellite data record for the first time in 2002. Original color image appears at back of volume.

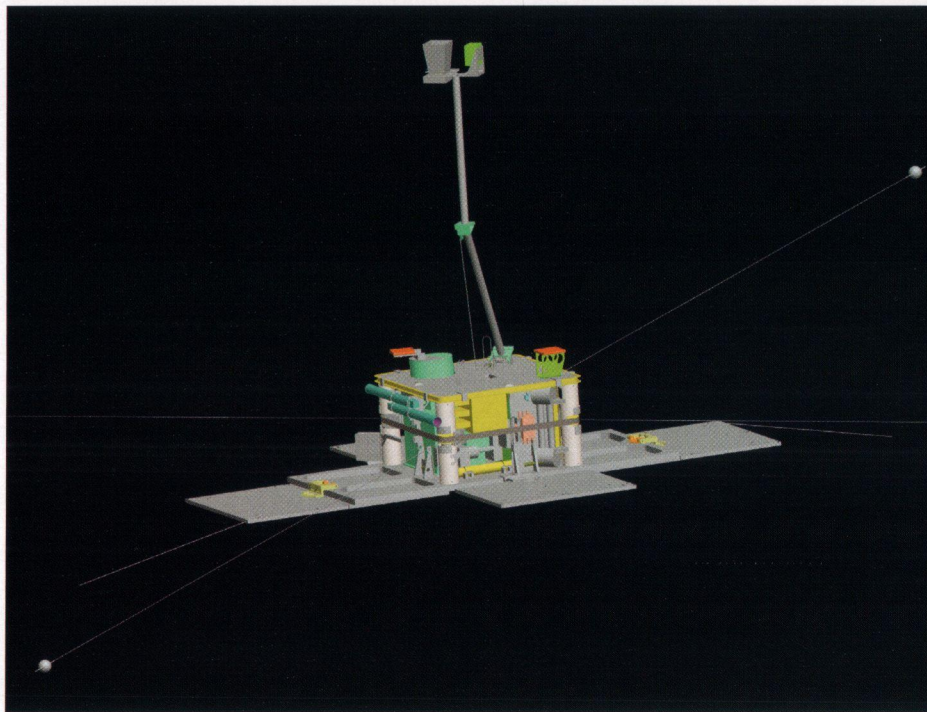


Fig. 3. The Astrid-2 micro-satellite.

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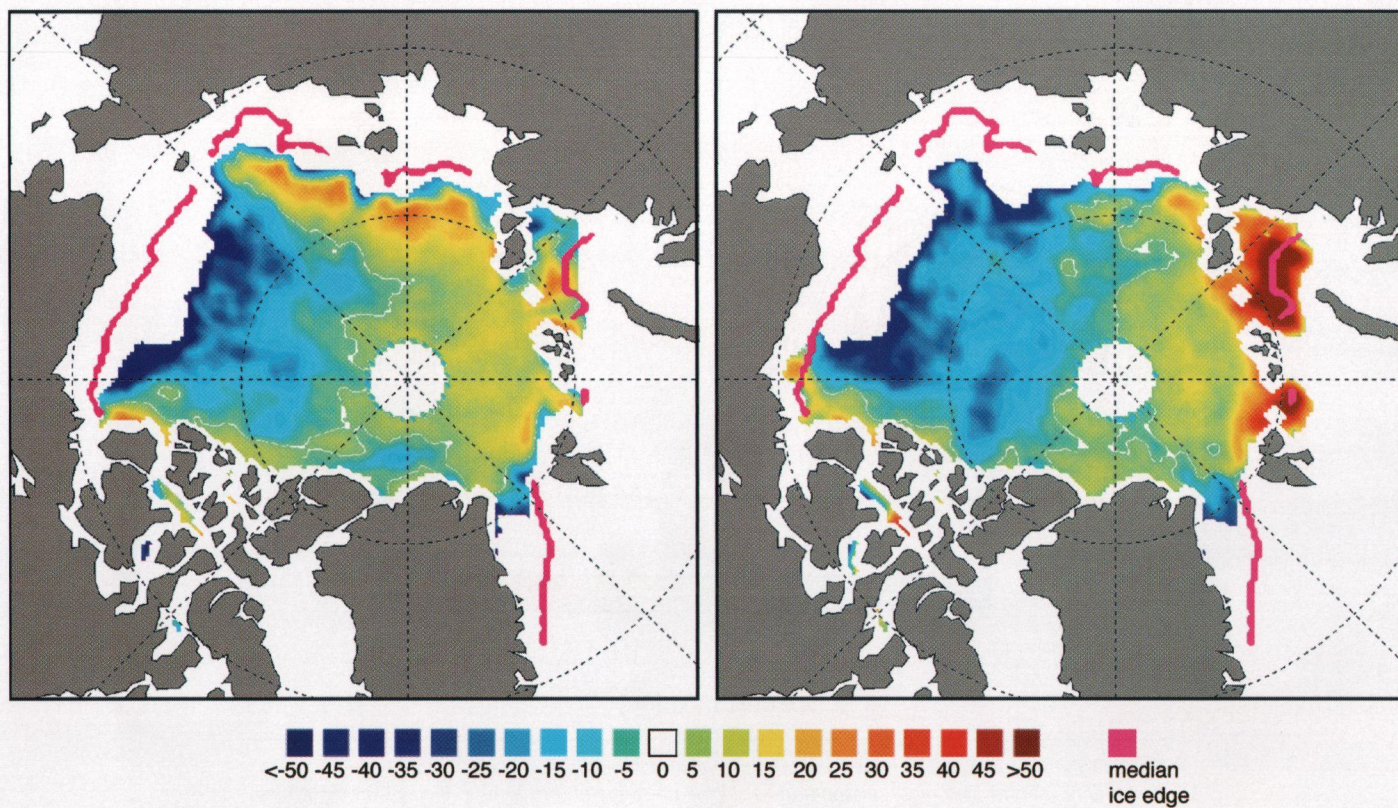


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