



August 22, 2002 - (date of web publication)

SATELLITES SHOW OVERALL INCREASES IN ANTARCTIC SEA ICE COVER

While recent studies have shown that on the whole Arctic sea ice has decreased since the late 1970s, satellite records of sea ice around Antarctica reveal an overall increase in the southern hemisphere ice over the same period. Continued decreases or increases could have substantial impacts on polar climates, because sea ice spreads over a vast area, reflects solar radiation away from the Earth's surface, and insulates the oceans from the atmosphere.

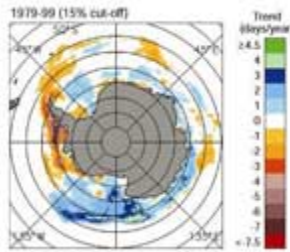


Image 1

In a study just published in the *Annals of Glaciology*, Claire Parkinson of NASA's Goddard Space Flight Center analyzed the length of the sea ice season throughout the Southern Ocean to obtain trends in sea ice coverage. Parkinson examined 21 years (1979-1999) of Antarctic sea ice satellite records and discovered that, on average, the area where southern sea ice seasons have lengthened by at least one day per year is roughly twice as large as the area where sea ice seasons have shortened by at least one day per year. One day per year equals three weeks over the 21-year period.

"You can see with this dataset that what is happening in the Antarctic is not what would be expected from a straightforward global warming scenario, but a much more complicated set of events," Parkinson said.



Image 2

The length of the sea ice season in any particular region or area refers to the number of days per year when at least 15 percent of that area is covered by sea ice. Some areas close to the Antarctic continent have sea ice all year long, but a much larger region of the Southern Ocean has sea ice for a smaller portion of the year, and in those regions the length of the sea ice season can vary significantly from one year to another.

For more information contact:

Krishna Ramanujan
Goddard Space Flight Center,
Greenbelt, Md.
(Phone: 301/286-3026)

Viewable Images

Caption for Image 1: Trends in Length of Sea-Ice Season Around Antarctica (1979-1999)

This graphic shows trends in the length of the sea-ice season throughout the Southern Ocean over 21 years (1979-1999), as calculated from satellite data. Credit: Claire Parkinson, NASA GSFC

Caption for Image 2: Southern Ocean and Antarctica

Map of Antarctica and the surrounding seas and oceans. Credit: Claire Parkinson, NASA GSFC

Story Archives

The [Top Story Archive](#) listing can be found by clicking on this link.

All stories found on a Top Story page or the front page of this site have been archived from most to least current on this page.

[For a list of recent press releases, click here.](#)

To calculate the lengths of the sea ice seasons, Parkinson used satellite data gridded to 25 by 25 kilometer grid cells for the Southern Ocean region. For each grid cell, the satellite data were used to determine the concentration, or percent area, of the sea ice cover. Whenever the percentage was at least 15 percent, the grid cell was considered to have ice. Using this method, Parkinson went through the entire data set and for each grid cell had a computer count how many days of each year had ice, then calculated trends over the 21-year record.

Overall, the area of the Antarctic with trends indicating a lengthening of the sea ice season by at least one day per year was 5.6 million square kilometers (2.16 million square miles), about 60 percent the size of the United States. At the same time, the area with sea ice seasons shortening by at least one day per year was 3 million square kilometers (1.16 million square miles).

Regionally, the Ross Sea, on average, had its sea ice seasons getting longer, while most of the Amundsen Sea and almost the entire Bellingshausen Sea had their sea ice seasons getting shorter.

“The Antarctic sea ice changes match up well with regional temperature changes,” Parkinson said. “The one region in the Antarctic where the temperature records have shown prominent warming over this period is the Antarctic Peninsula, and indeed it’s immediately to the west and east of the Antarctic Peninsula, in the Bellingshausen/Amundsen and western Weddell seas, respectively, that the sea ice seasons have been shortening rather than lengthening.”

The Arctic also shows a mixed pattern of sea ice trends over the 1979-1999 period, but in contrast to the Antarctic, the area with shortening seasons in the Arctic is far greater than the area with lengthening seasons. The Arctic patterns suggest some connections with major oscillations in large-scale atmospheric pressures, called the Arctic Oscillation and the North Atlantic Oscillation, and it is possible the ice covers of both hemispheres could be influenced by oscillations that are still not fully identified, Parkinson said.

The study used data from NASA’s Nimbus 7 Scanning Multichannel Microwave Radiometer (SMMR) and the Defense Meteorological Satellite Program (DMSP) Special Sensor Microwave Imagers (SSMIs) and in the future will be extended with data from the National Space Development Agency of Japan’s Advanced Microwave Scanning Radiometer for the Earth Observing System (AMSR-E) recently launched on board NASA’s Aqua satellite.

[Back to Top](#)