

→ SNOW AND ICE

Earth's snow and ice-covered areas are, for the most part, found around the poles but these frozen places also extend across the globe, with glaciers found right up to the equator. These areas are sensitive to climate change, responding early and rapidly to any changes. Satellite observations are key for monitoring these often inhospitable areas and the changes they're undergoing.

Fifteen years ago only a third of the world's 200,000 glaciers had been mapped but now, partly thanks to the efforts of the Climate Change Initiative Glaciers team, there exists a globally complete inventory of glaciers.

Alongside the mapped area, satellites can also provide information about the volume of a glacier and the speed that it is shrinking or growing. Knowing the volume of all the world's glaciers is vital for more accurate estimates of how much they have contributed to global sea level rise in the past, and could potentially contribute in the future.

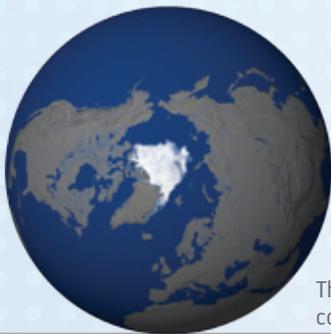
Another big influence on how much future sea level rise we'll see is changes in the amount of ice stored in Antarctica and Greenland. These are the two ice sheets of the world; found at the south and north poles respectively, which together contain 99% of the world's freshwater ice. It's often hard to tell from conventional maps but the Antarctic Ice Sheet is over 8 times larger than the Greenland Ice Sheet.



Satellites are able to routinely monitor the rate at which ice flows through, and is lost, from the polar ice sheets. The amount of ice being lost from Greenland and Antarctica has increased recently, with the ice sheets now losing almost three times as much ice as they were in the early 1990's.

Surrounding the ice sheets at both poles you can find sea ice, which grows and melts on a seasonal basis. In the Arctic, the ice pack can reach an area of around 15 million square kilometres at the end of winter, whilst at the end of the summer, it melts to an area about a quarter of this size. That's equivalent to an area the size of Europe disappearing between the winter and the summer.

Satellites provide the only observations of sea ice that are good enough to measure overall trends, to find out how sea ice is changing over long time periods. The variations measured by satellites demonstrate a significant loss of ice in the Arctic over the last 15 years, while in the Antarctic there has been a slight increase.



The Arctic Sea Ice minimum concentration in September 2012.

