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Climate change 'irreversible' as Arctic sea ice fails to re-form

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Sea ice in the Arctic has failed to re-form for the second consecutive winter, raising fears that global warming may have tipped the polar regions in to irreversible climate change far sooner than predicted.

Satellite measurements of the area of the Arctic covered by sea ice show that for every month this winter, the ice failed to return even to its long-term average rate of decline. It is the second consecutive winter that the sea ice has not managed to re-form enough to compensate for the unprecedented melting seen during the past few summers.

Scientists are now convinced that Arctic sea ice is showing signs of both a winter and a summer decline that could indicate a major acceleration in its long-term rate of disappearance. The greatest fear is that an environmental "positive feedback" has kicked in, where global warming melts ice which in itself causes the seas to warm still further as more sunlight is absorbed by a dark ocean rather than being reflected by white ice.

Mark Serreze, a sea ice specialist at the US National Snow and Ice Data Centre in Colorado, said: "In September 2005, the Arctic sea ice cover was at its lowest extent since satellite monitoring began in 1979, and probably the lowest in the past 100 years. While we can't be certain, it looks like 2006 will be more of the same," Dr Serreze said.

"Unless conditions turn colder, we may be headed for another year of big sea ice losses, rivalling or perhaps even exceeding what we saw in September 2005. We are of course monitoring the situation closely ... Coupled with recent findings from Nasa that the Greenland ice sheet may be near a tipping point, it's pretty clear that the Arctic is starting to respond to global warming," he added.

Although sea levels are not affected by melting sea ice - which floats on the ocean - the Arctic ice cover is thought to be a key moderator of the northern hemisphere's climate. It helps to stabilise the massive land glaciers and ice sheets of Greenland which have the capacity to raise sea levels dramatically.

Dr Serreze said that some parts of the northern hemisphere experienced very low temperatures this winter, but the Arctic was much warmer than normal. "Even in January, when there were actually record low temperatures in Alaska and parts of Russia, it was still very warm over the Arctic Ocean," he said.

"The sea ice cover waxes and wanes with the seasons. It partly melts in spring and summer, then grows back in autumn and winter. It has not recovered well this past winter - ice extent for every month since September 2005 has been far below average. And it's been so warm in the Arctic that the ice that has grown this winter is probably rather thin," he explained.

Professor Peter Wadhams, of Cambridge University, who was the first Briton to monitor Arctic sea ice from nuclear submarines, said: "One of the big changes this winter is that a large area of the Barents Sea has remained ice-free for the first time. This is part of Europe's 'back yard'. Climate models did predict a retreat of sea ice in the Barents Sea but not for a few decades yet, so it is a sign that the changes that were predicted are indeed happening, but much faster than predicted."