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New warning on Arctic ice melt

By Richard Black Environment correspondent, BBC News

The researchers are now working with a new computer model for Arctic ice

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Scientists who predicted a few years ago that Arctic summers could be ice-free by 2013 now say summer ice will probably be gone within this decade.

The original prediction, made in 2007, gained Wieslaw Maslowski's team a deal of criticism from some of their peers.

Now they are working with a new computer model - compiled partly in response to those criticisms - that produces a "best guess" date of 2016.

Their work was unveiled at the European Geosciences Union (EGU) annual meeting.

The new model is designed to replicate real-world interactions, or "couplings", between the Arctic ocean, the atmosphere, the ice and rivers carrying freshwater into the sea.

"In the past... we were just extrapolating into the future assuming that trends might persist as we've seen in recent times," said Dr Maslowski, who works at Naval Postgraduate School in Monterey, California.

"Now we're trying to be more systematic, and we've developed a regional Arctic climate model that's very similar to the global climate models participating in Intergovernmental Panel on

Climate Change (IPCC) assessments," he told BBC News.

"We can run a fully coupled model for the past and present and see what our model will predict for the future in terms of the sea ice and the Arctic climate."

And one of the projections it comes out with is that the summer melt could lead to ice-free Arctic seas by 2016 - "plus or minus three years".

Thin evidence

One of the important ingredients of the new model is data on the thickness of ice floating on the sea.

Satellites are increasingly able to detect this, usually by measuring how far the ice sits above the sea surface - which also indicates how far the ice extends beneath.

Inclusion of this data into the team's modelling was one of the factors causing them to retrench on the 2013 date, which raised eyebrows - and subsequently some criticism - when it emerged at a US science meeting four years ago.

Since the spectacularly pronounced melting of 2007, a greater proportion of the Arctic Ocean has been covered by thin ice that is formed in a single season and is more vulnerable to slight temperature increases than older, thicker ice.

Even taking this into account, the projected date range is earlier than other researchers believe likely.

But one peer - Dr Walt Meier from the US National Snow and Ice Data Center in Boulder, Colorado - said the behaviour of sea ice becomes less predictable as it gets thinner.

"[Maslowski's] is quite a good model, one thing it has is really high resolution, it can capture details that are lost in global climate models," he said.

"But 2019 is only eight years away; there's been modelling showing that [likely dates are around] 2040/50, and I'd still lean towards that.

"I'd be very surprised if it's 2013 - I wouldn't be totally surprised if it's 2019."

Crystal method

The drastic melt of 2007 remains the record loss of ice area in the satellite era, although subsequent years have still been below the long-term average.

But some researchers believe 2010's melt was equally as notable as 2007's, given weather conditions that were favourable to the durability of ice.

Although many climate scientists and environmental campaigners are seriously concerned about the fate of the Arctic ice, for other parts of society and other arms of government its degradation presents challenges and opportunities.

The Russian and Canadian governments, for example, are looking to the opportunities for mineral exploitation that will arise; while the US military has expressed concern about losing a natural defence around the country's northern border for part of the year.

"I'm not trying to be alarmist and not trying to say 'we know the future because we have a

crystal ball'," said Dr Maslowski.

"Basically, we're trying to make policymakers and people who need to know about climate change in the Arctic realise there is a chance that summer sea ice could be gone by the end of the decade.

"For the national interest, the defence interest, I think it's important to realise that 2040 is not a crystal ball prediction."