



## **How does reduced sea ice and changing Arctic circulation affect biological interactions between the Pacific and Atlantic?**

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The Arctic climate is rapidly changing. Sea ice is declining, and ice-free summers are projected to be the norm from the middle of this century onwards. This has the potential to change the circulation in the Arctic Ocean, which could in turn have an effect on the interaction between the Pacific and Atlantic Oceans.

Possible evidence of increased Pacific / Atlantic interaction via the Arctic has already been identified. In 1999, the Pacific diatom, *Neodenticula Seminae* was observed in a Continuous Plankton Recorder survey of the North Atlantic. It has been hypothesised (Reid et al, 2007) that *N. Seminae* could have been brought to the Atlantic in a pulse of Pacific Water via (then unusually) ice-free waters north of Canada.

We use a Lagrangian particle-tracking technique in conjunction with a high-resolution ocean model (NEMO) to assess this hypothesis. We investigate how advective pathways in the Arctic have changed in recent years, how the timescales associated with these pathways are changing, and the potential biological consequences of new pathways opening up. Evidence of a 'shortcut' pathway associated with reduced ice cover is presented. Finally, we use a version of NEMO with projected atmospheric forcing up to 2100 to explore future changes in the connection between the Pacific and Atlantic Oceans via the Arctic.