



## **Contribution of glacial melt water to the recent Southern Ocean sea ice increase**

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In recent years climate change and global warming are topics that are discussed everywhere. Big concerns are the melting of land ice, the reduced summer sea ice cover in the Arctic Ocean, and the general decline of the cryosphere. In contrast to those scenarios, the response of Antarctic sea ice to a warming climate is elaborate and puzzling: sea ice extent has been slightly increasing on a circumpolar scale during the last decades. Atmospheric data analysis ascribed this expansion to changes in the wind dynamics; simulations with climate-scale ocean model suggest that accelerated basal melting of ice shelves plays a major role.

We investigate the influence of the glacial melt water on the sea ice of the Southern Ocean on the circumpolar and regional scales employing the ocean/sea ice NEMO-LIM coupled system at eddy-permitting resolution. The forcing of the sea ice-ocean model is supplied from the ERA-Interim data set. After a 25-year spin-up period the reference run supplies a realistic simulation of the period 2004-2013. Different volumes and distributions of melt water are applied in individual model runs spanning the same period and results are compared with the reference run.

The results of this study will increase our understanding of the effect of climate change on the Southern Ocean at present and thus also of the future development. Questions like how long the increasing trend in sea ice will last or how fast it will be reversed once the tipping point is reached will be able to be addressed with more accuracy.