



Atlantic origin of Nordic Seas freshwater anomalies

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The Nordic Seas freshwater content is an indicator of climate change. An enhanced hydrological cycle and melting of Arctic sea ice introduce freshwater to the Arctic Ocean, which is then discharged to the Nordic Seas. But the freshwater budget of the Nordic Seas is also influenced by saline Atlantic inflow from the south. We use a most comprehensive dataset of hydrographic observations to determine sources and propagation of anomalous freshwater content in the Nordic Seas over the last 60 years. Complimentary we use a state-of-the-art 600-year climate model simulation for a closed and quantitative assessment. We find consistently, both in model and observational data, that the Atlantic inflow determines most of the variability of the Nordic Seas freshwater content, and that anomalies propagate from the Atlantic inflow through the Norwegian Sea into the Greenland – and later on Iceland Sea with a propagation time around the Nordic Seas of approximately seven years.