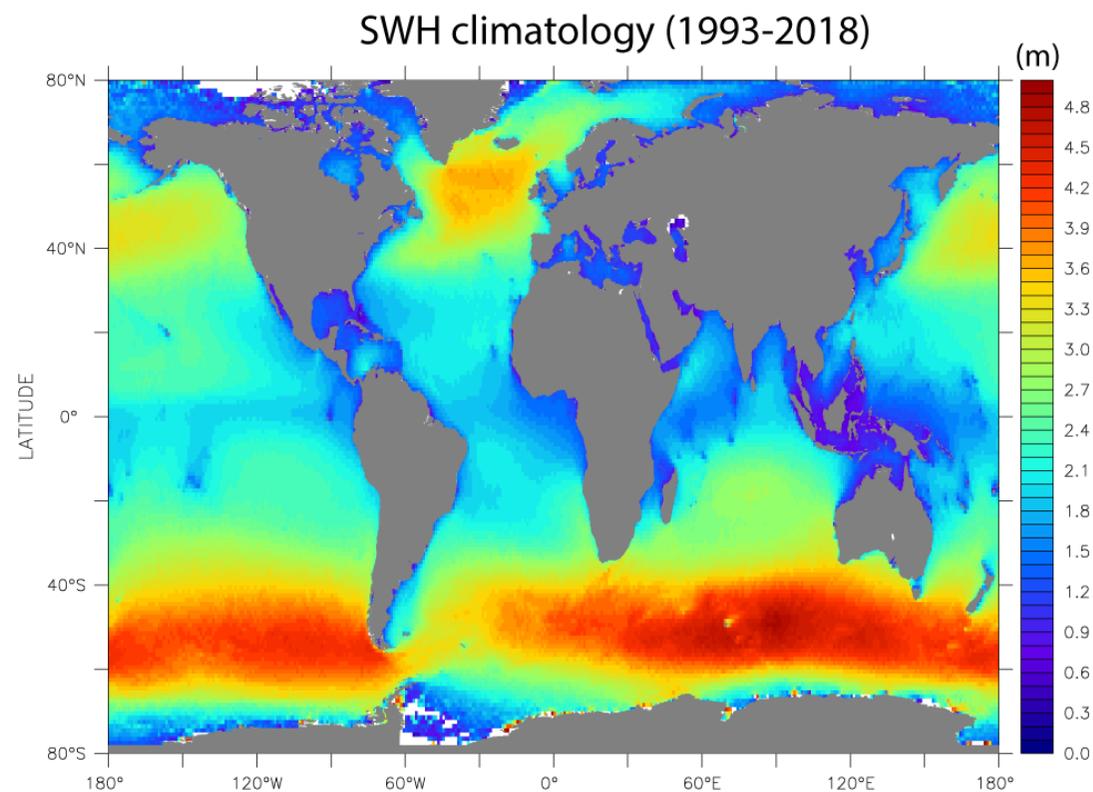




Assessing SWH in the Northeast Atlantic and the Nordic Seas

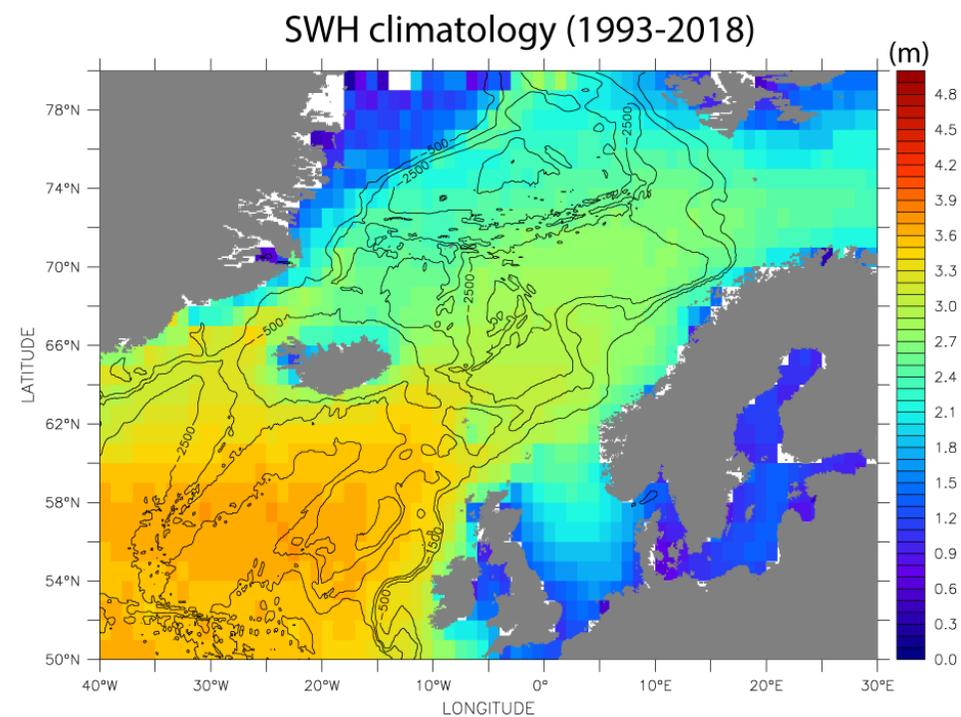
Roshin Raj and Johnny A. Johannessen
Nansen Center Bergen, Norway



8-9 September 2019, Sea State CCI User Consultation Meeting, Ifremer, Brest, France

Content of Presentation

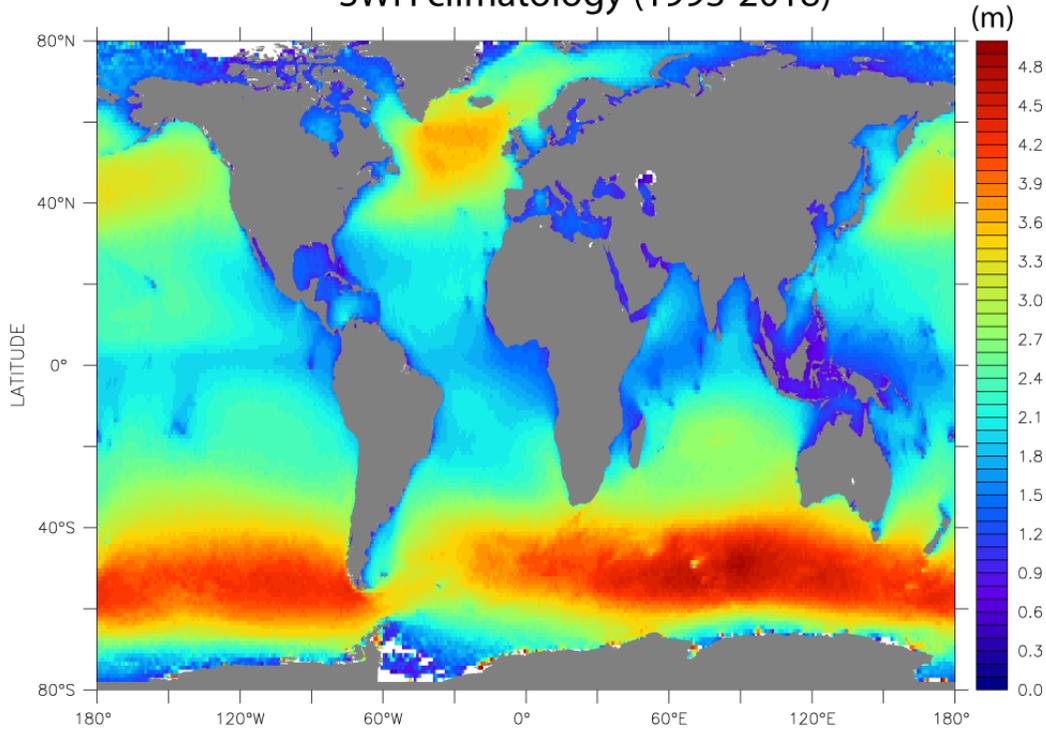
- Characteristic wind and current conditions in the study region
- SWH climatology and SWH patterns
- Trends in SWH
- Summary



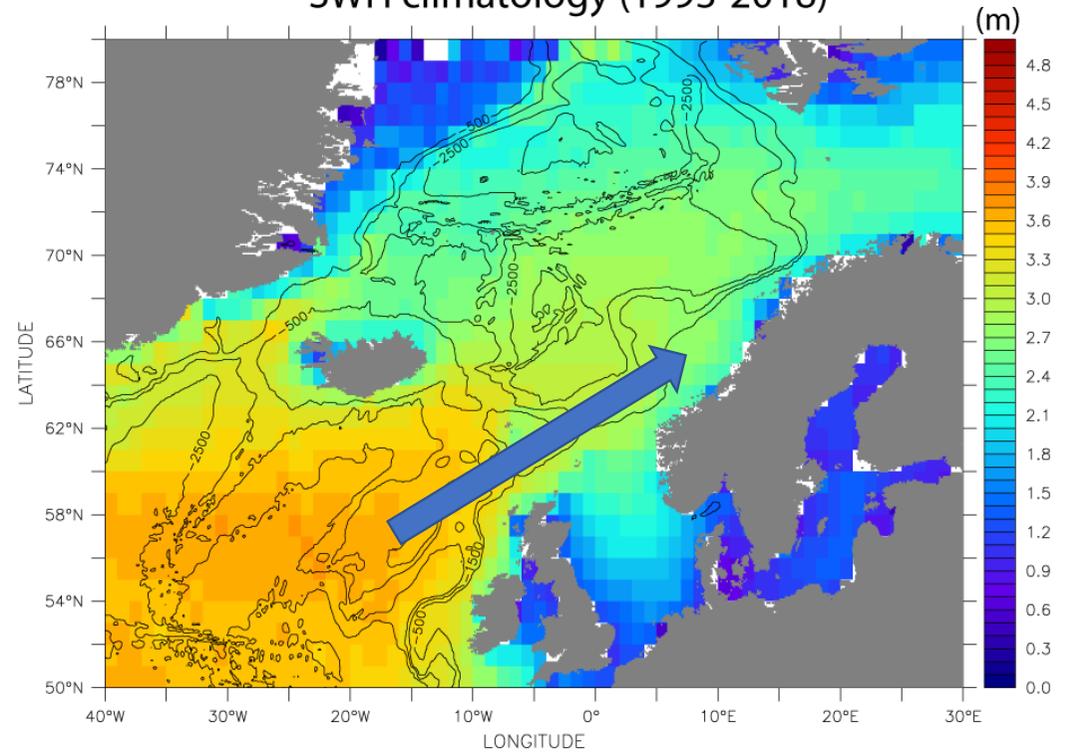
100 km spatial resolutions



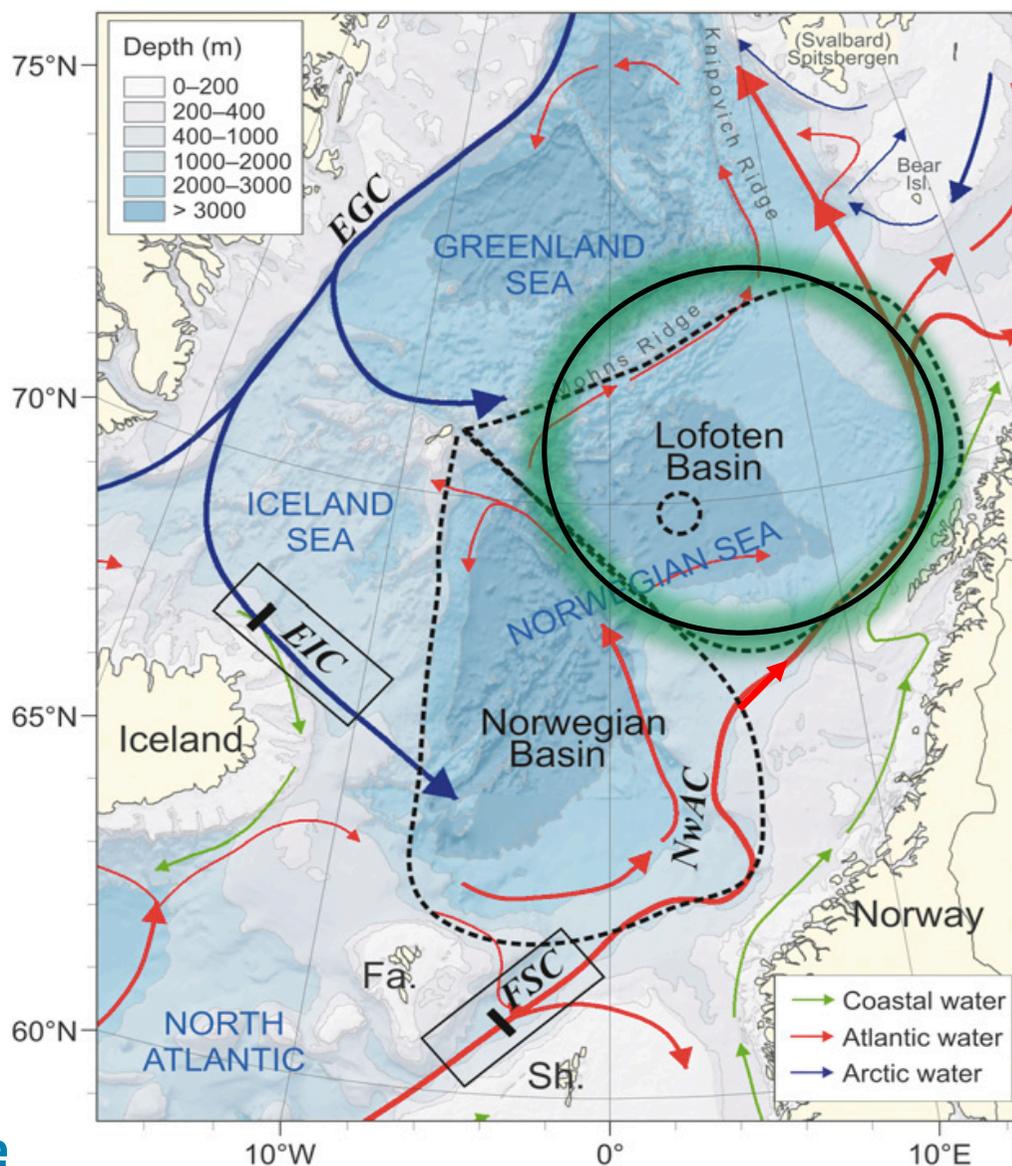
SWH climatology (1993-2018)



SWH climatology (1993-2018)



- (i) Is there a korridor of SWH extending into the Nordic Seas*
- (ii) Can patterns in SWH be detected and explained?*
- (iii) Are there relationship to dominant regional wind - and/or current regimes?*

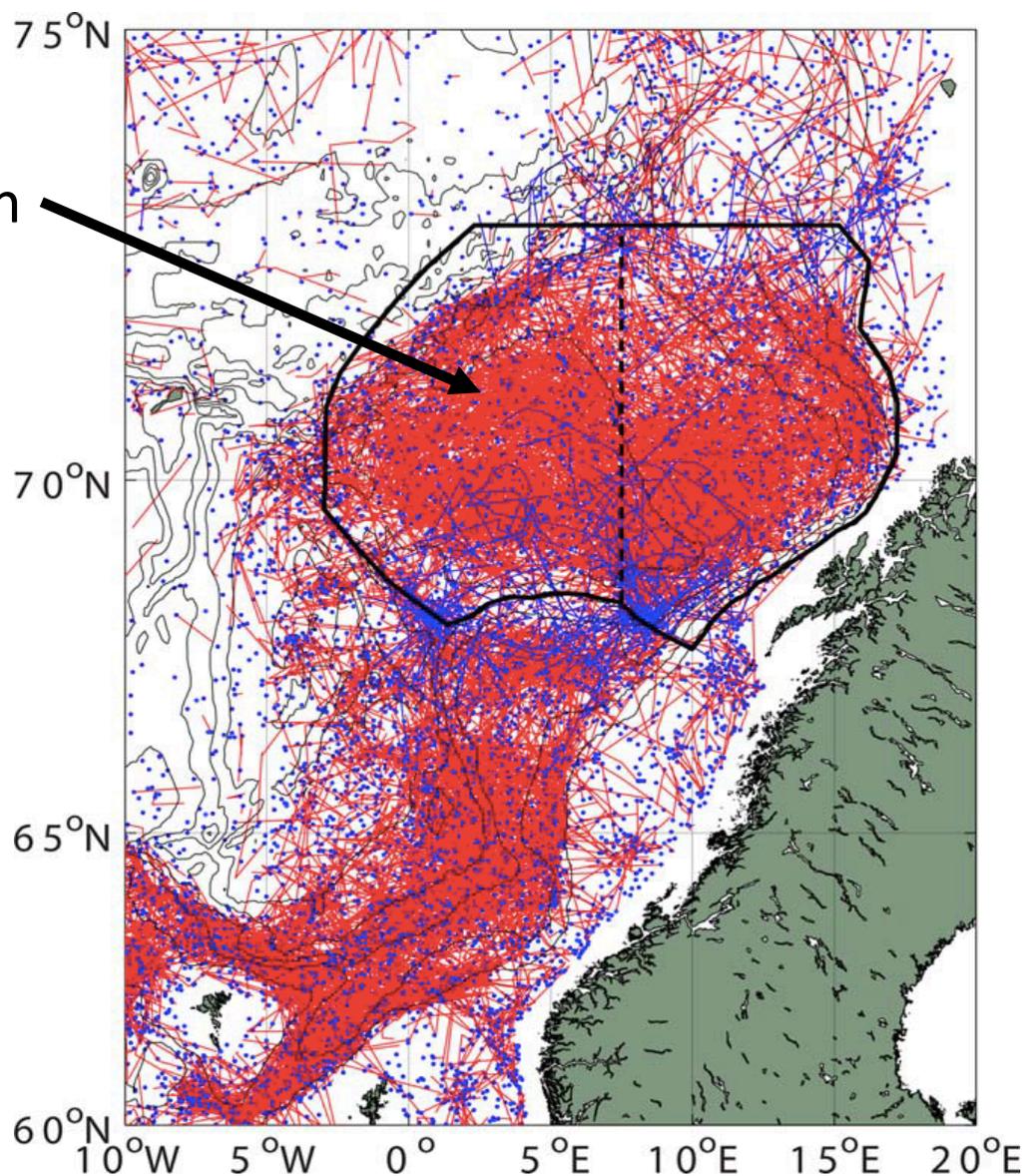


Characteristic upper ocean current circulation regimes in the Nordic Seas.

Pertains a large scale cyclonic turning wheel

Is the Lofoten Basin special??

Lofoten Basin

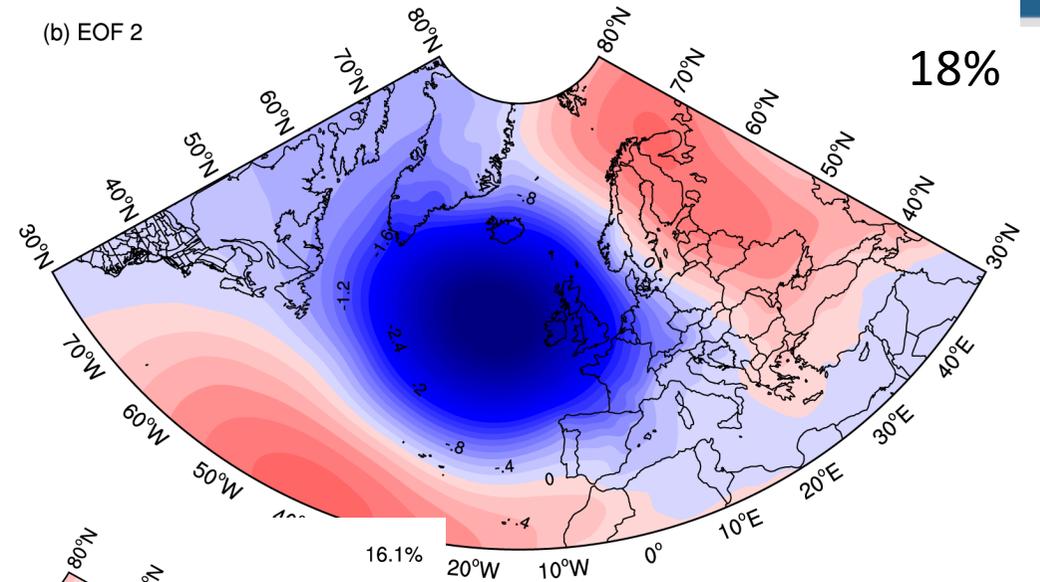
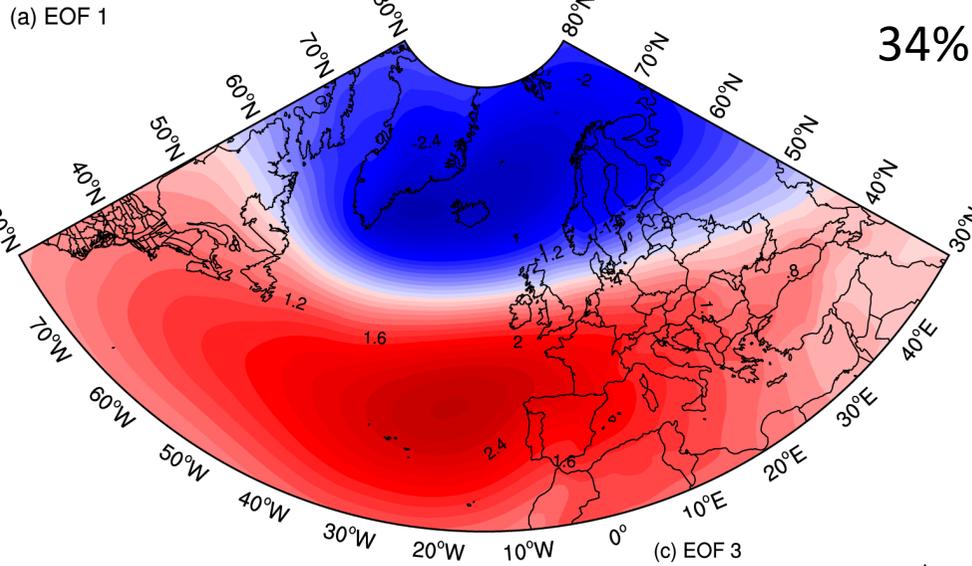


Map of mesoscale eddies
(> 30 km) in the Nordic Seas
from 1995 to 2013.

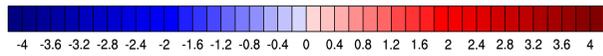
Only 1% of the upstream
eddies propagate into the
Lofoten Basin.

Only 1% of the eddies
formed in the Lofoten Basin
leave the basin

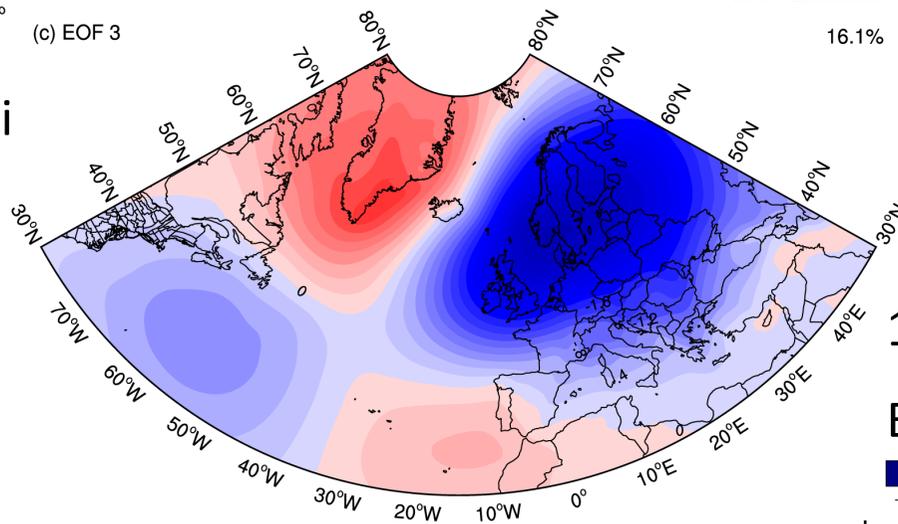
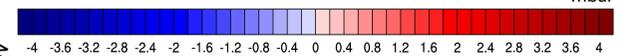
Leading modes of atmospheric variability in the North Atlantic and Nordic Sea



EOF1: North Atlantic Oscillation

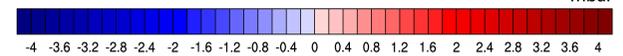


EOF2: East Atlantic Pattern



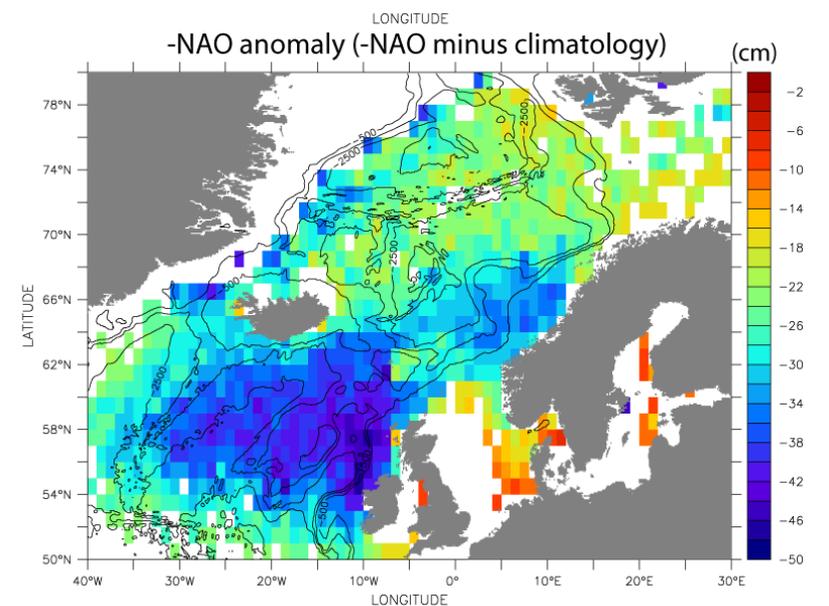
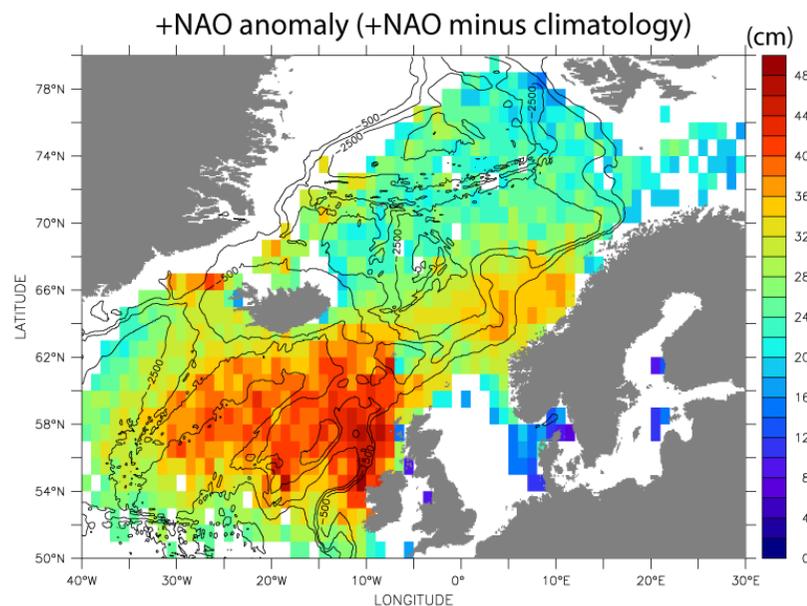
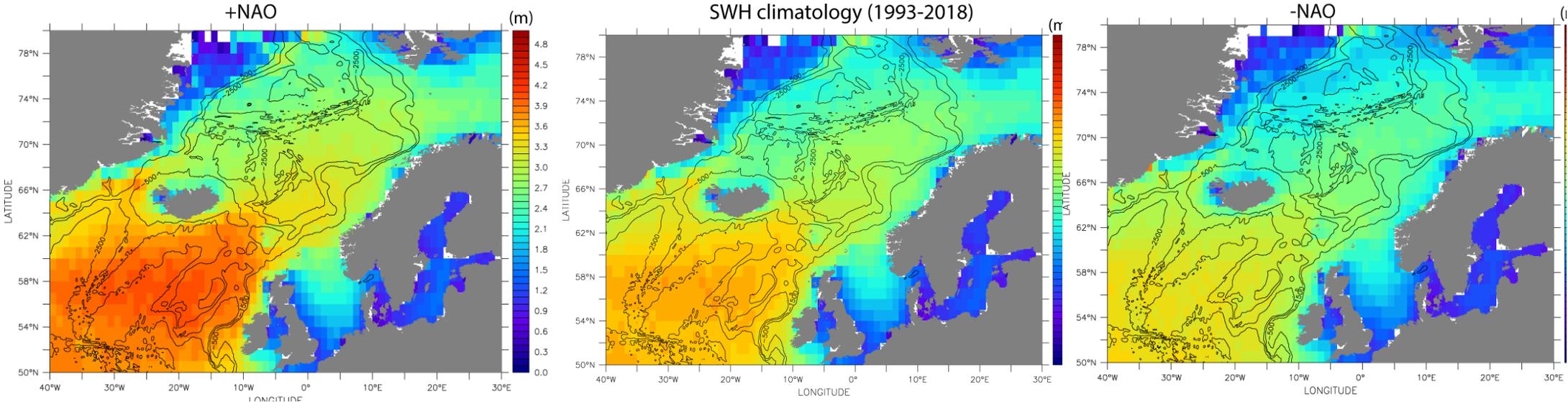
16%

EOF3: Scandinavian pattern



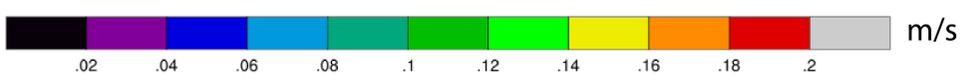
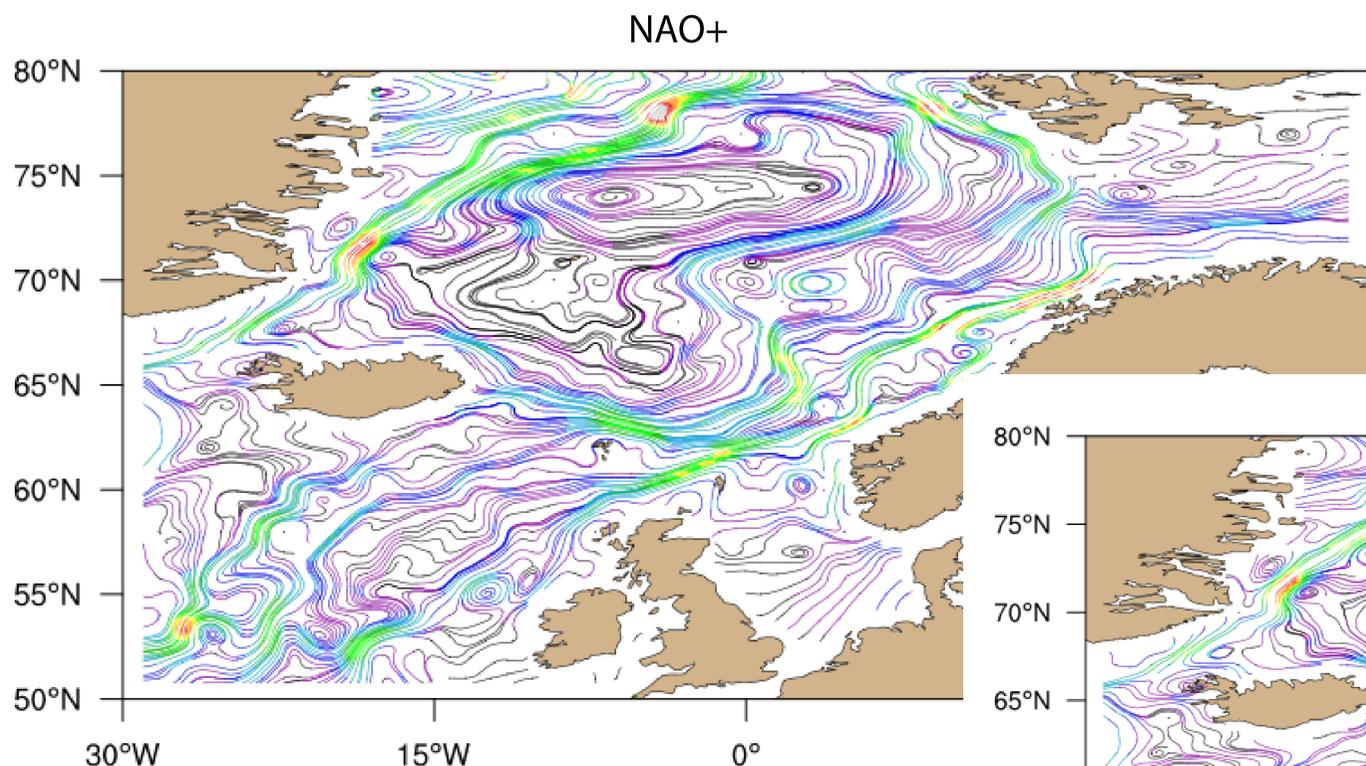
mbar



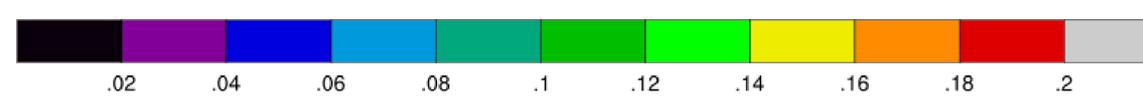
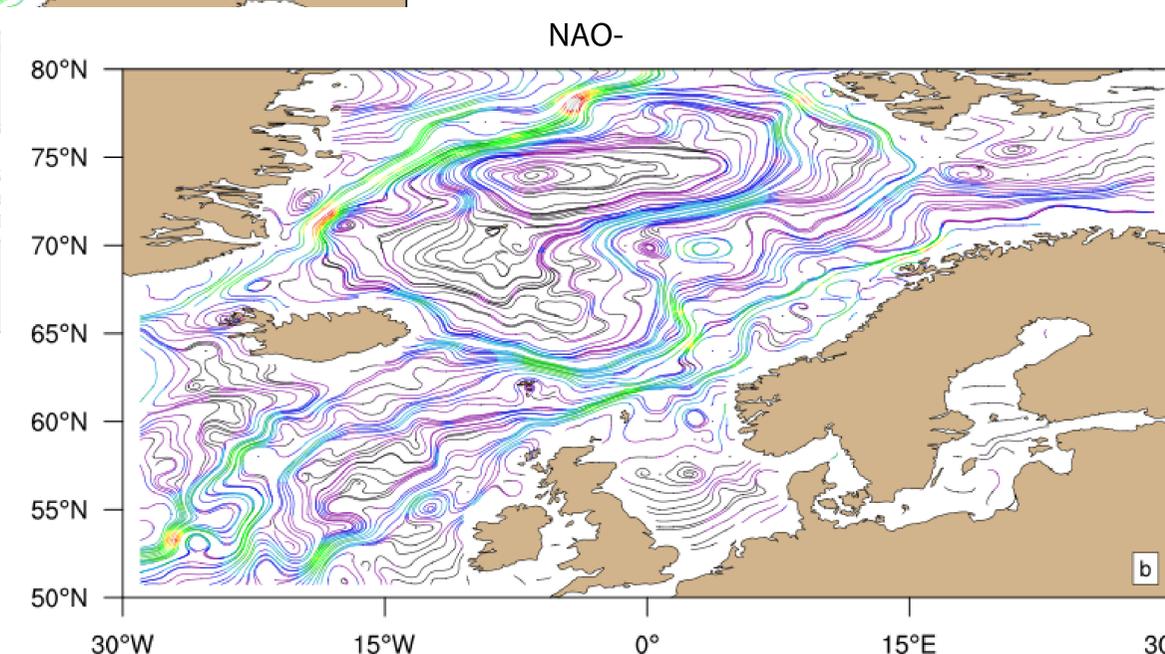


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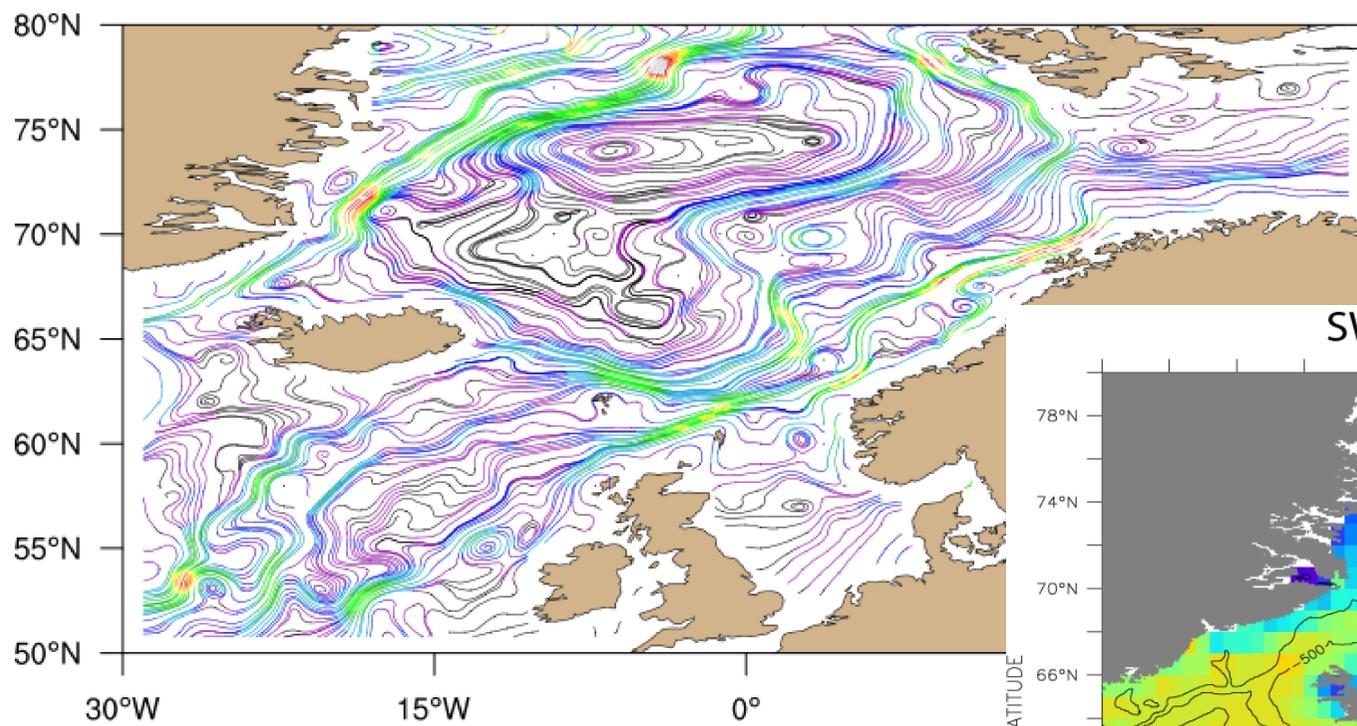


Streamlines of geostrophic current -
Predominantly cyclonic motion

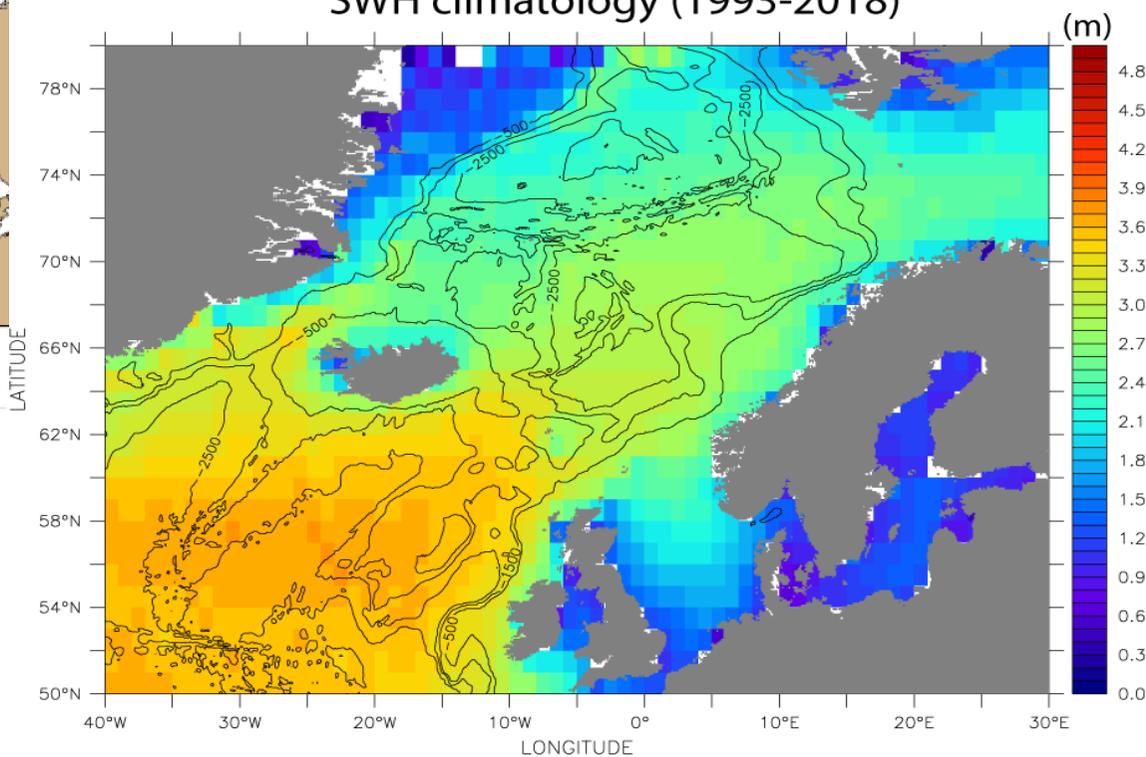




NAO+

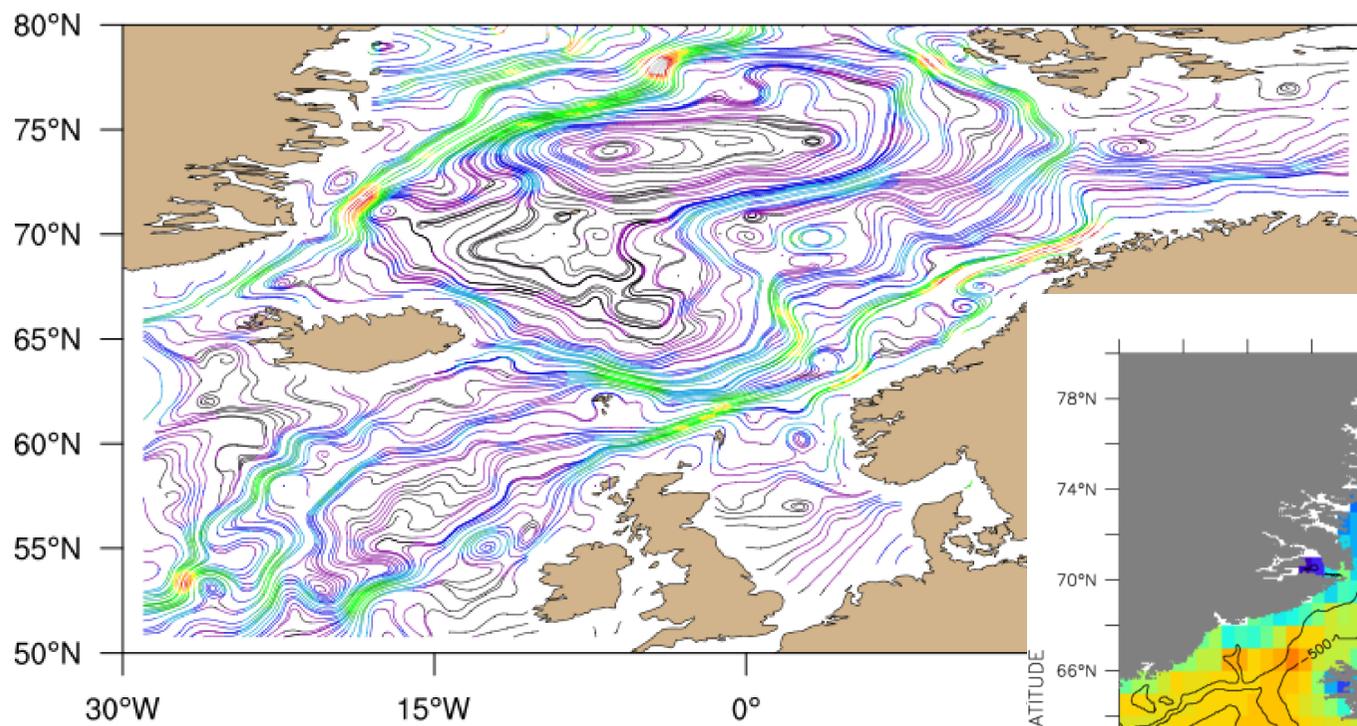


SWH climatology (1993-2018)

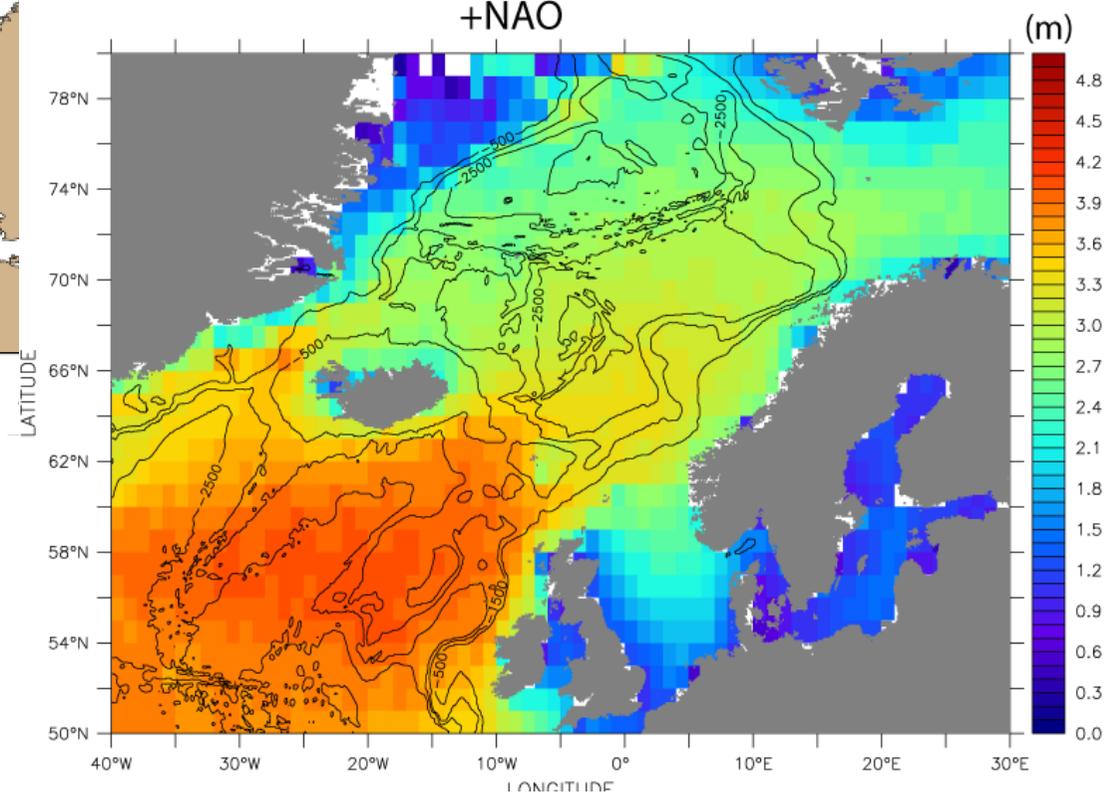




NAO+

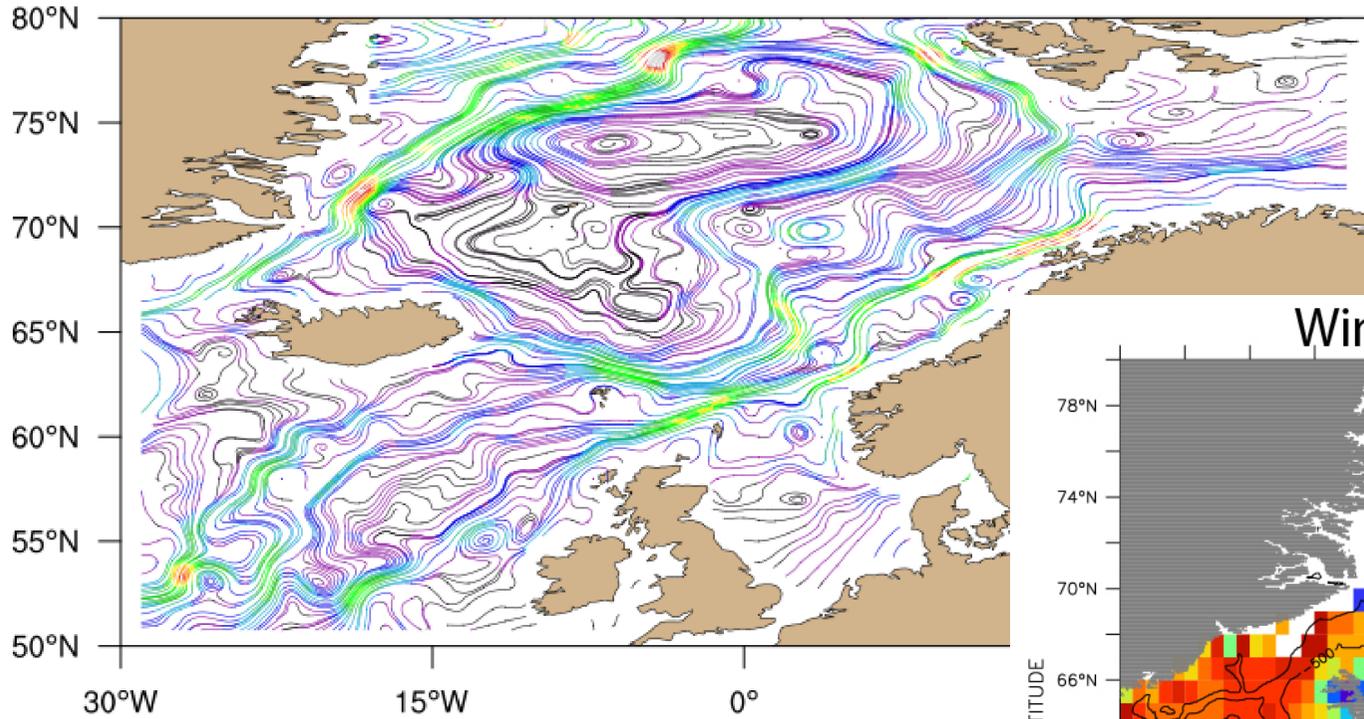


+NAO

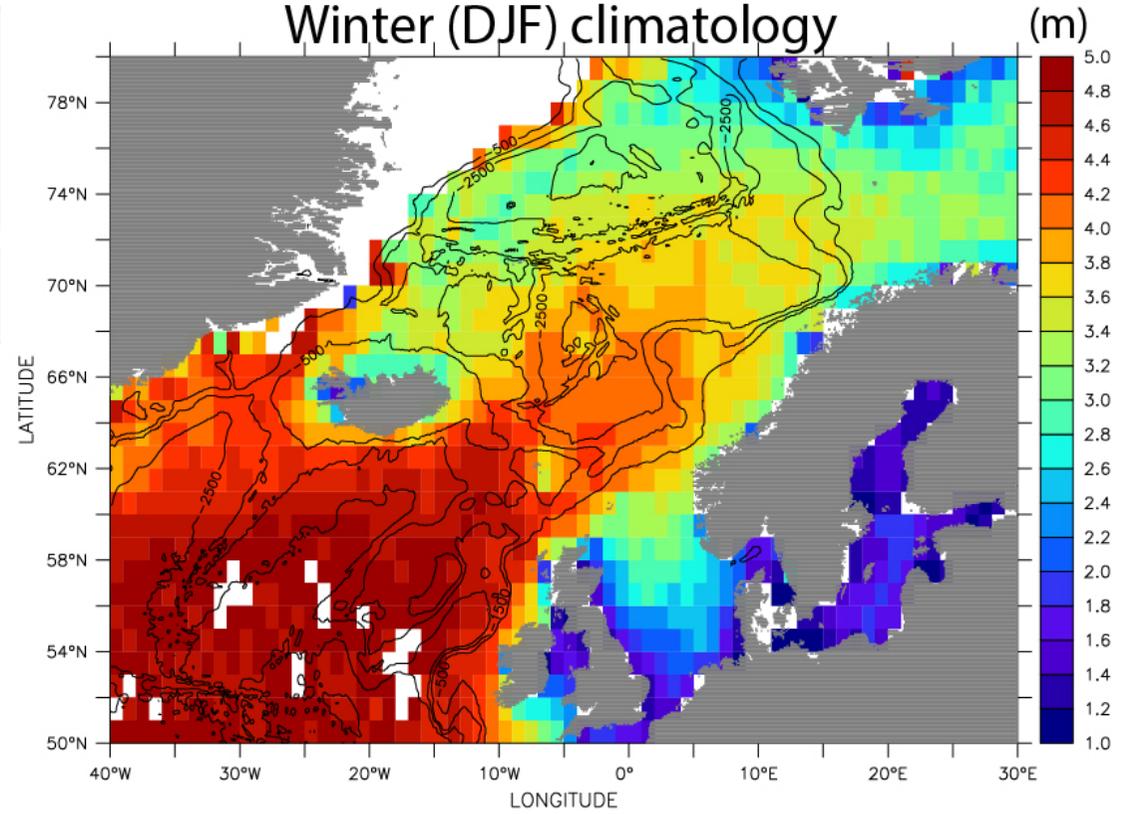




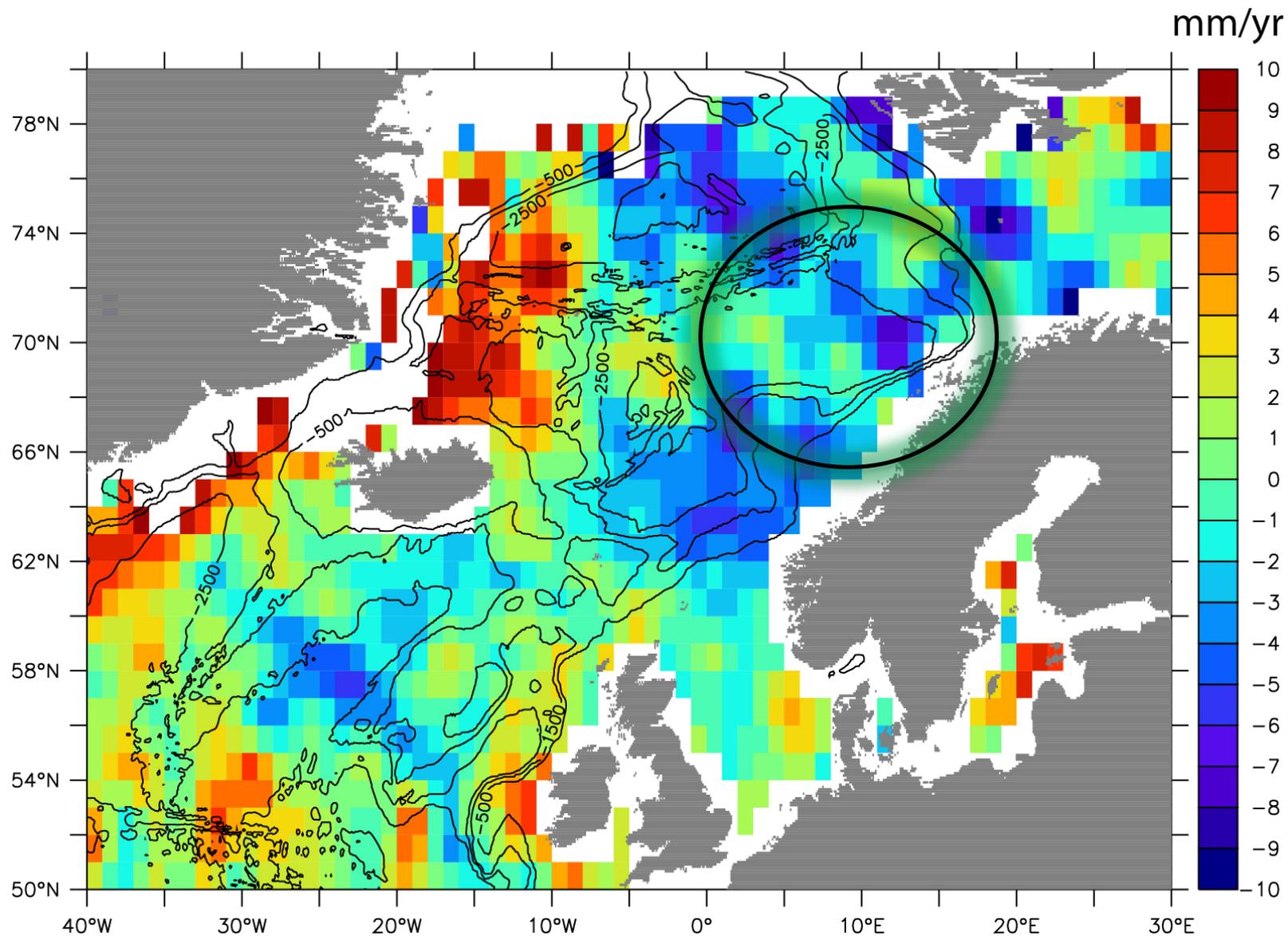
NAO+



Winter (DJF) climatology



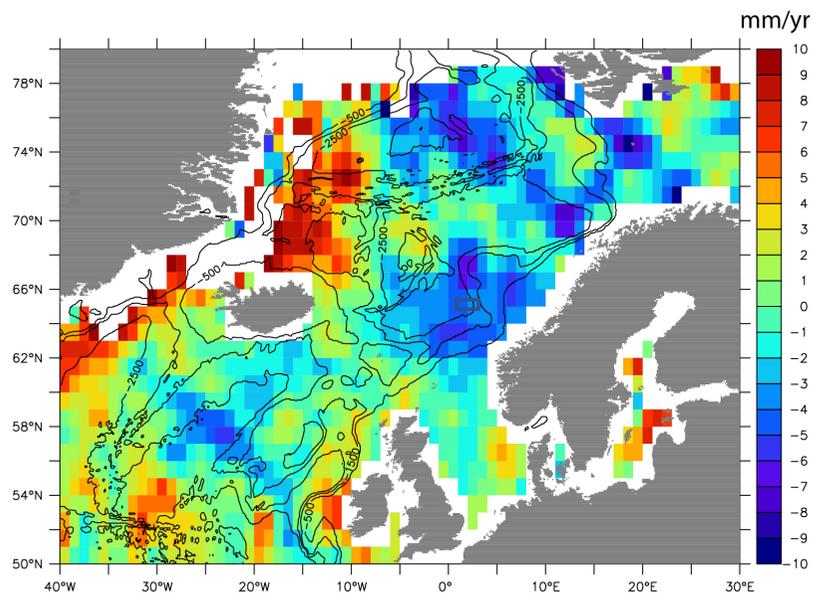
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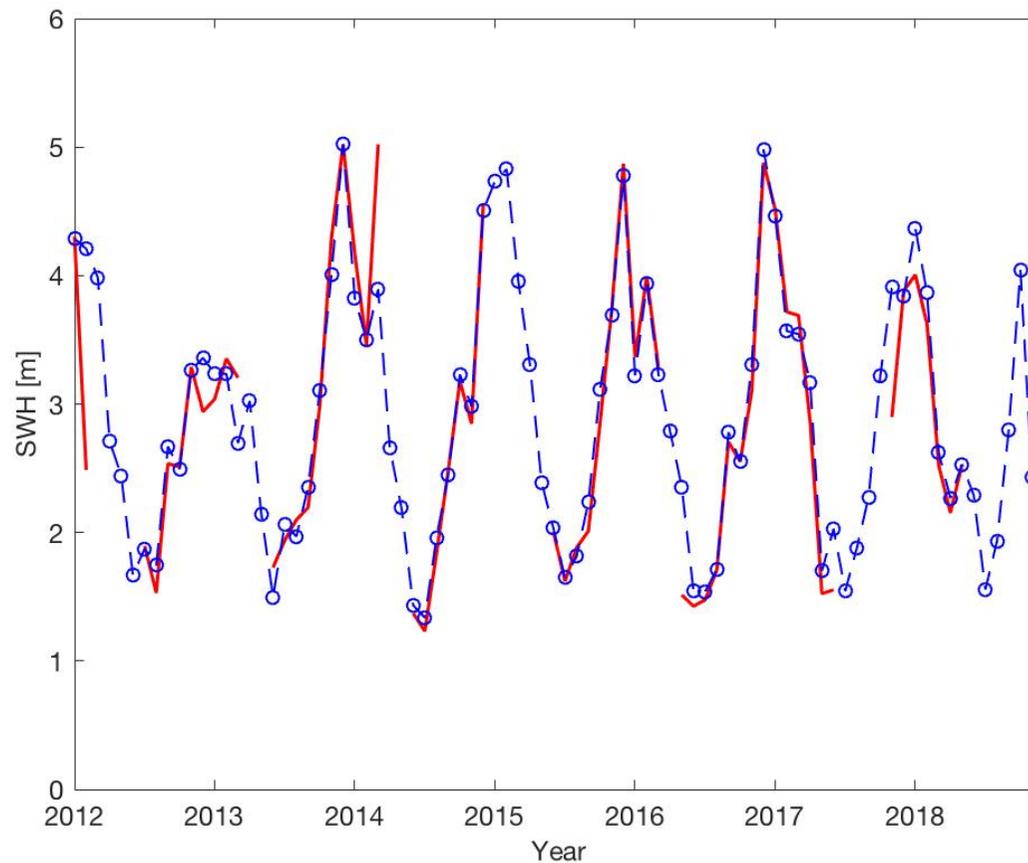
Trend in SWH
(1993-2018)

Lofoten basin
predominantly
negative





Trend in SWH
(2012-2018)
at OWS Mike



Blue – altimetry
Red -buoy

Summary



- Pattern in SWH associated with NAO and winter storms
- Spatial variability related to surface current regimes, more work
- The details of the wind field in the Nordic Seas should be explored
- Trend in SWH is in general minor but indicate reductions in Lofoten Basin.
- Trend indicate distinct increase in the Icelantic Sea

