

# CLIMATE RESPONSE IN THE NORTHERN PART OF EURASIA TO A DECREASE IN OCEANIC HEAT TRANSPORT IN THE NORTH ATLANTIC AND BARENTS SEA

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Shelekhova E.A.<sup>1,4</sup>, Zuev V.V.<sup>1</sup>, Semenov V.A.<sup>2,3,4</sup>

1 Institute of Monitoring of Climatic and Ecological Systems SB RAS (Tomsk)

2 A.M. Obukhov Institute of Atmospheric Physics RAS (Moscow)

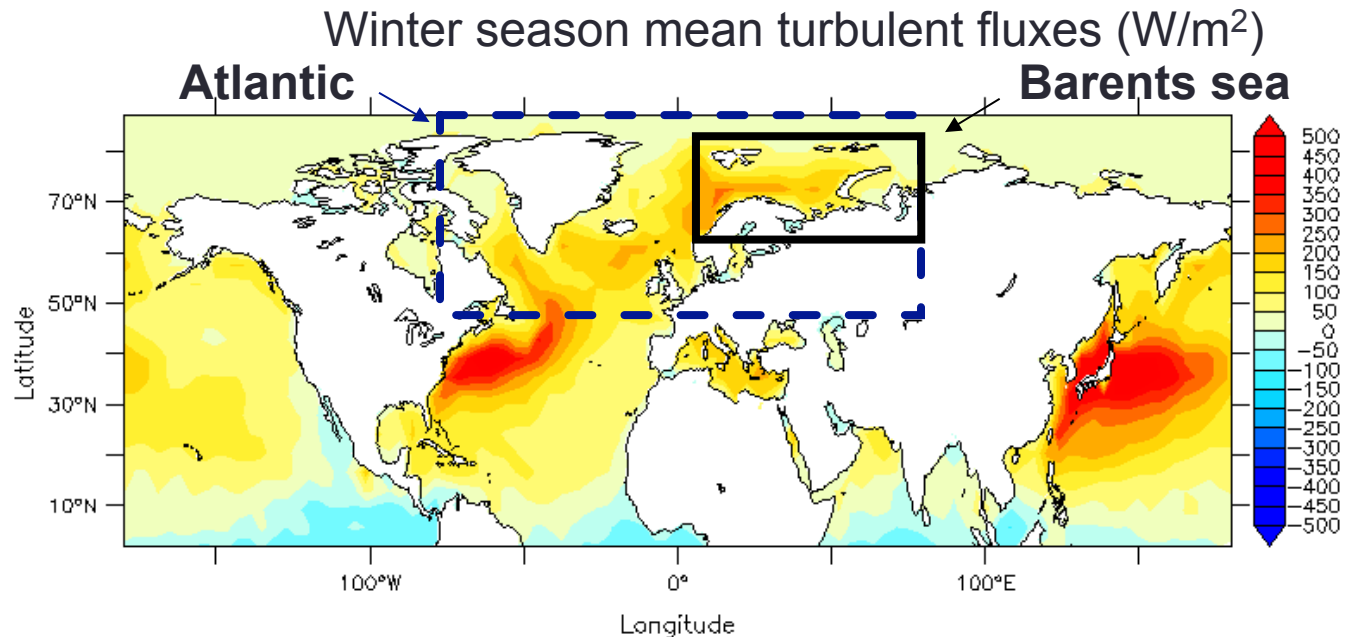
3 Helmholtz Centre for Ocean Research Kiel (GEOMAR) (Kiel, Germany)

4 Lomonosov Moscow State University, MSU, Faculty of Geography, (Moscow)

# Experiments descriptions

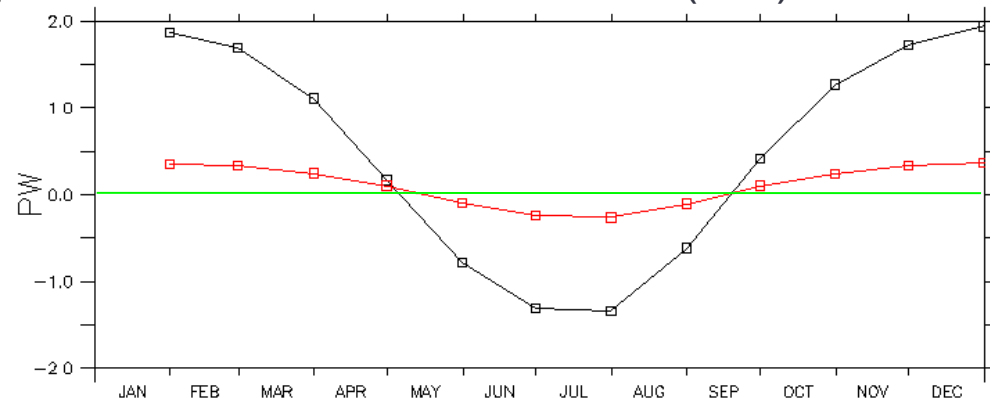
- Atmospheric general circulation model ECHAM5 (Max Planck Institute for Meteorology, Germany)
- T31 horizontal resolution with 19 vertical levels
- All simulations were of 100 years duration
- Lower boundary conditions (repeating annual cycle of sea surface temperatures and sea ice concentrations)
- Sea ice concentration and sea surface temperatures in all simulations was assigned to the 1987–2006 climatological mean data (HadISST1.1)

# Turbulent heat fluxes



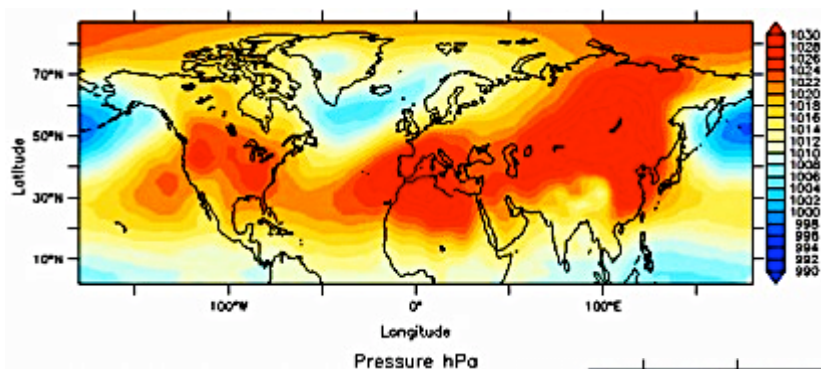
q-flux  $\text{W/m}^2$

Turbulent heat fluxes (PW)

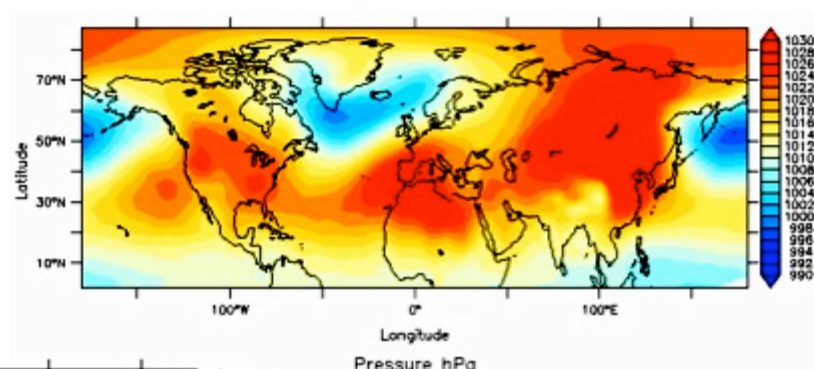


# Results: pressure

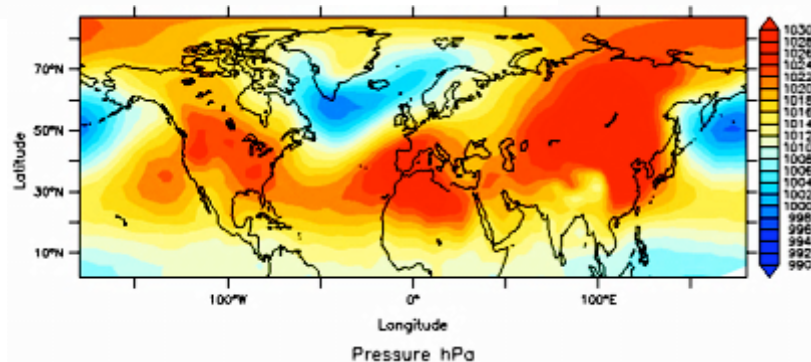
## Atlantic



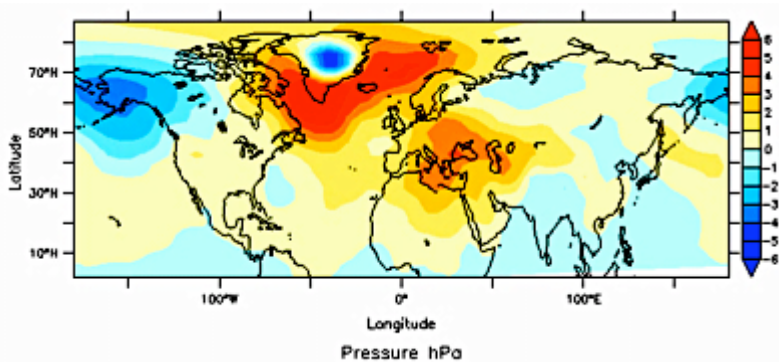
## Barents sea



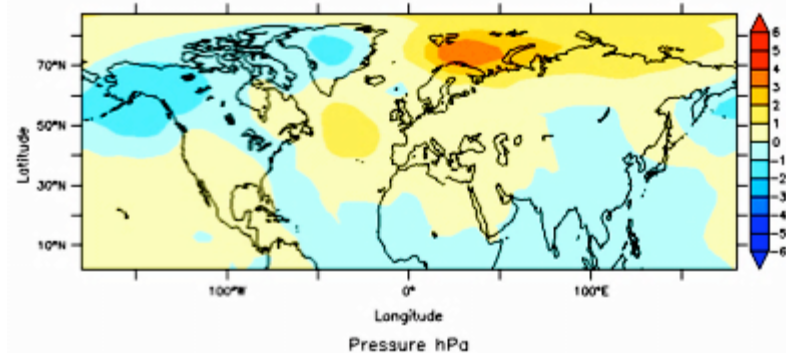
## Control



## Atlantic-Control

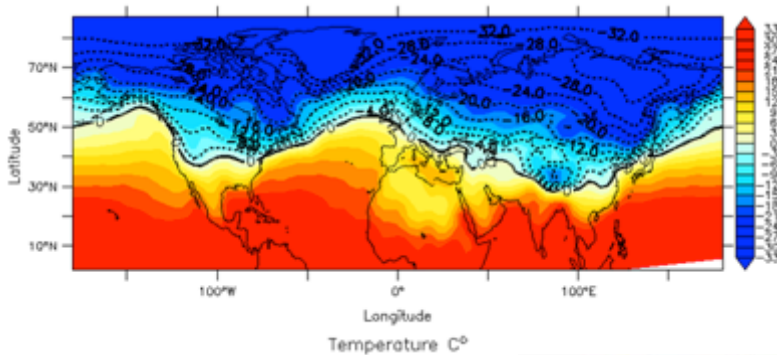


## Barents sea-Control

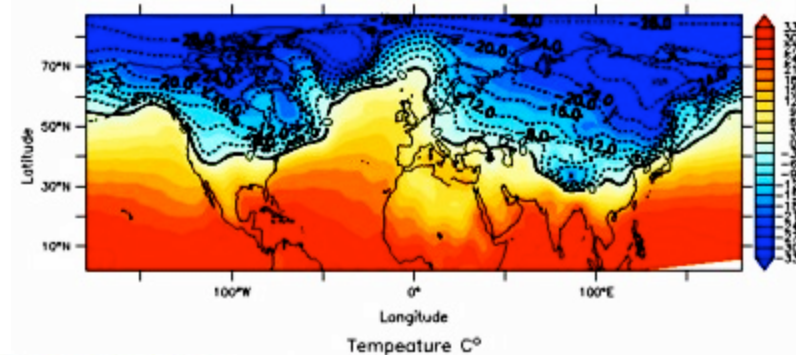


# Results: temperature

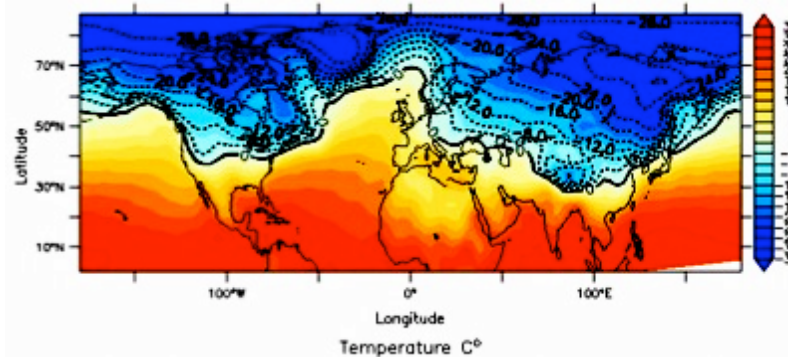
**Atlantic**



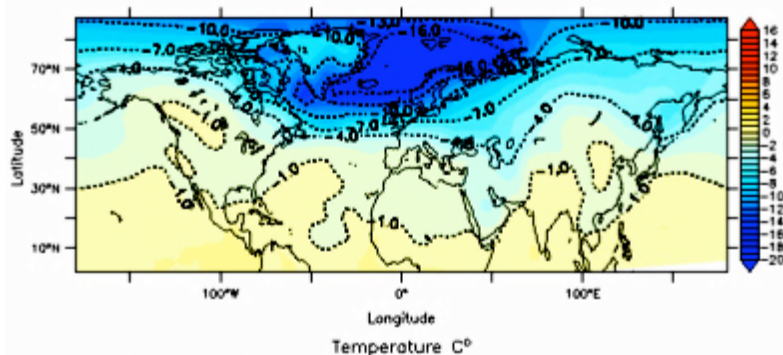
**Barents sea**



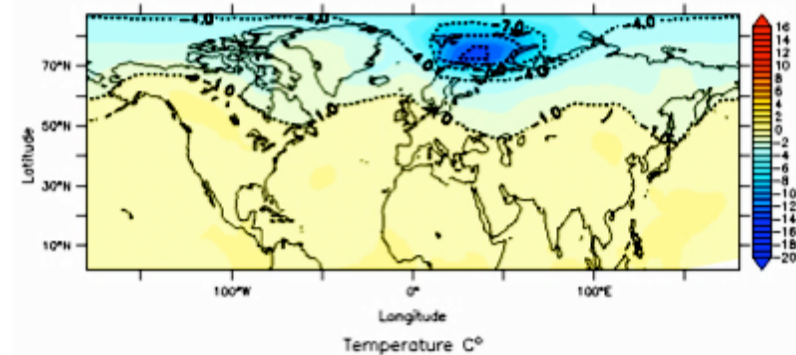
**Control**



**Atlantic-Control**

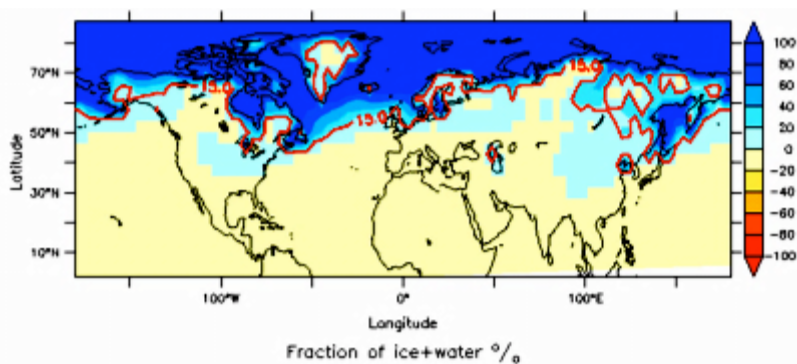


**Barents sea-Control**

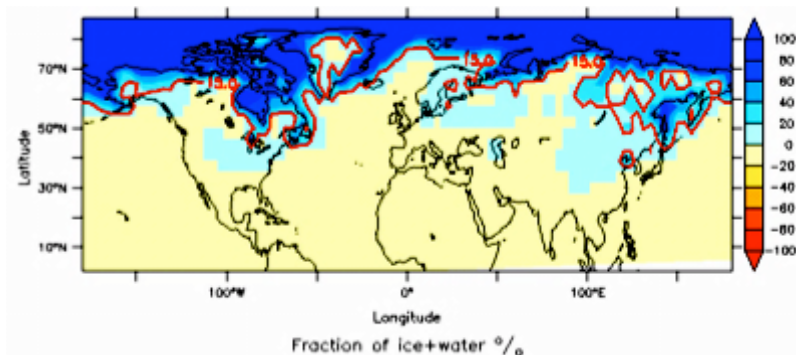


# Results: Sea ice concentration

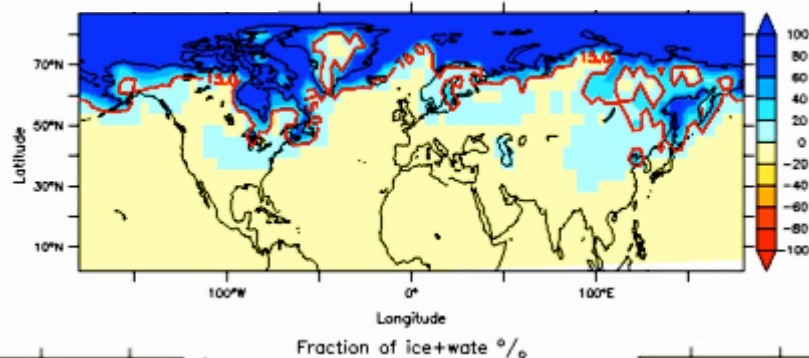
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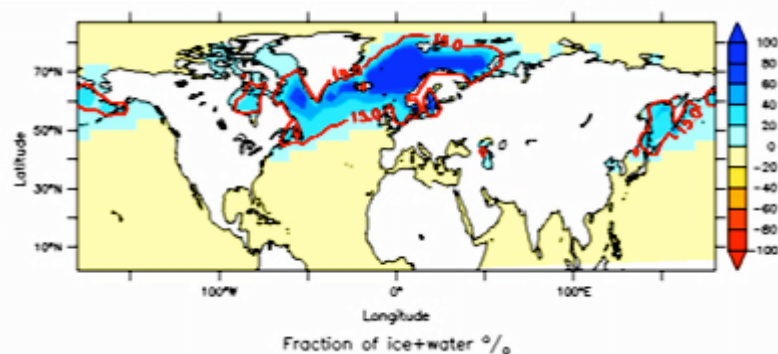
**Barents sea**



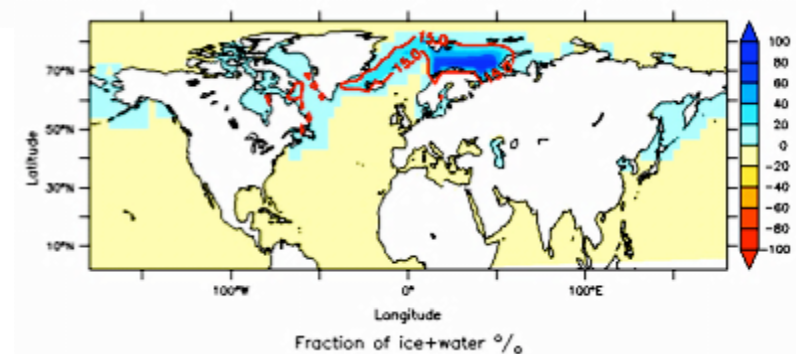
**Control**



**Atlantic-Control**



**Barents sea-Control**



# Conclusion

- The global climate response to an decrease in heat transport in response to a climate variation was studied with an atmospheric general circulation model (ECHAM5) coupled to a fixed-depth (50 m) ML
- The changes in atmospheric circulation and surface temperature were analyzed
- Termination of the oceanic heat flux leads to
  - a weakening of the atmospheric centers of action in the North Hemisphere (3-5 hPa)
  - significant cooling over the continents with the strongest decrease in temperature to -10 °C in the north-western part of Eurasia
  - an increase in the sea ice concentration