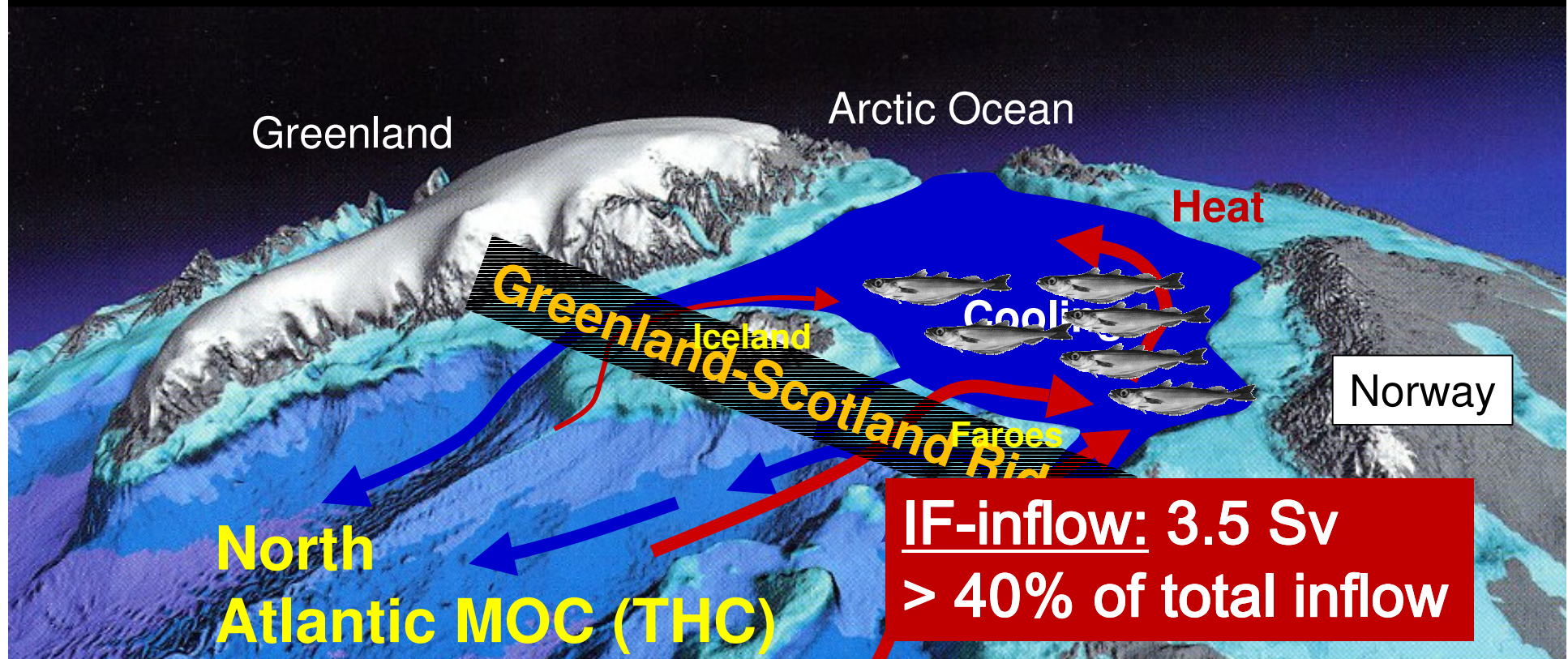


# Monitoring volume transport in a branch of warm inflow towards the Arctic by satellite altimetry

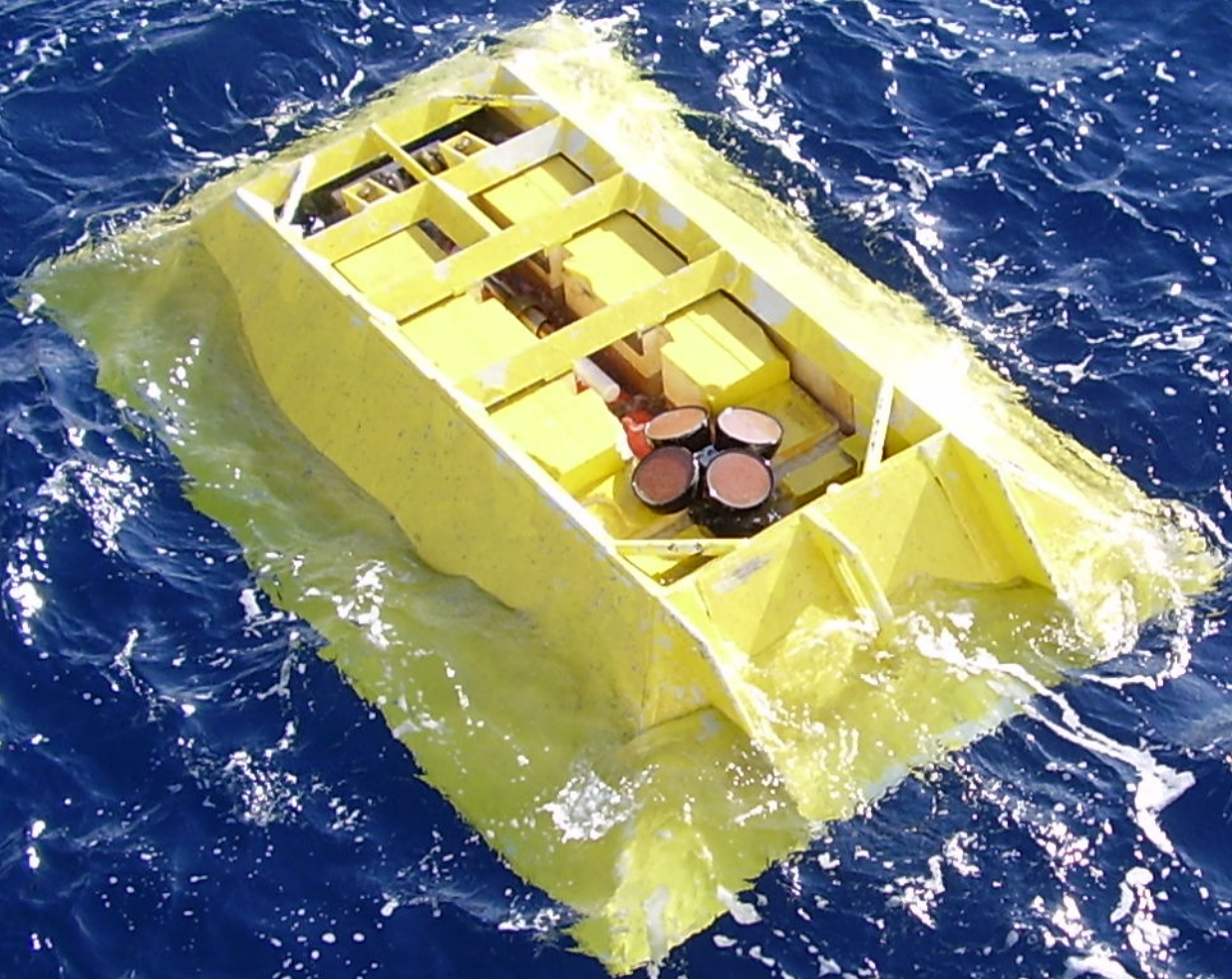
Bogi Hansen, Steffen M. Olsen, and Svein Østerhus



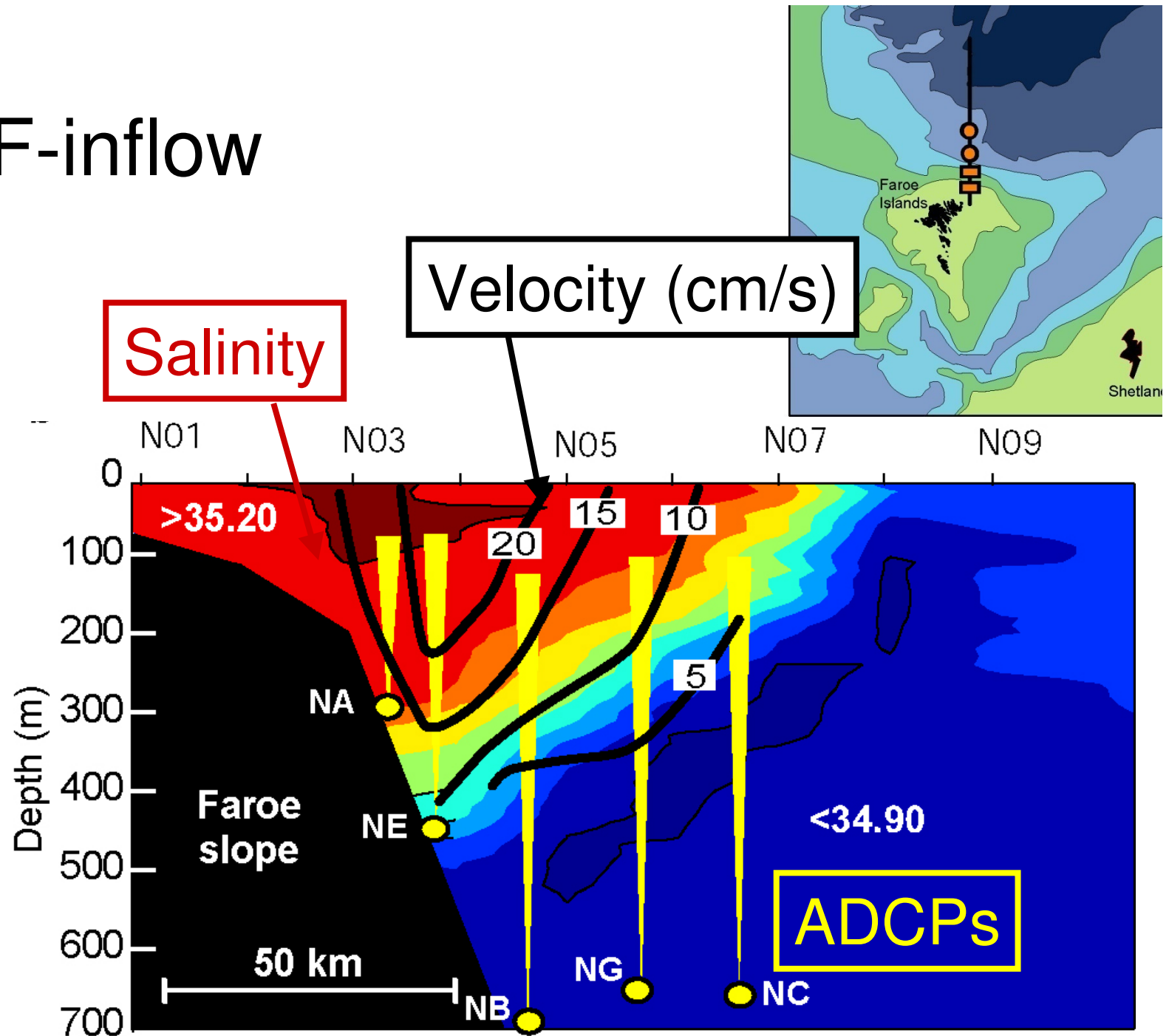
IPCC-2007: it is *very likely* that the North Atlantic MOC will slow down during the 21st century



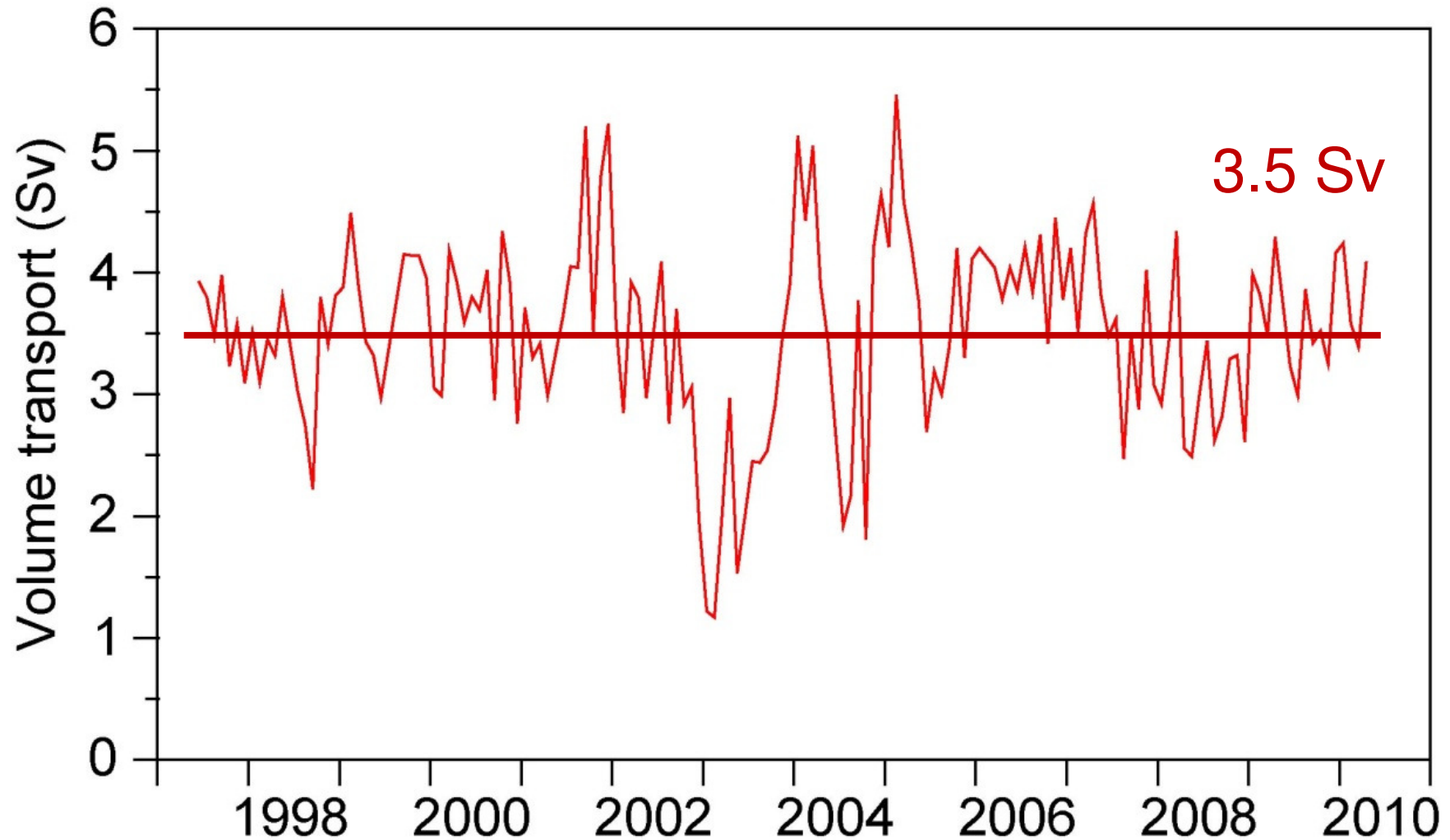
# Recovering trawlprotected ADCP



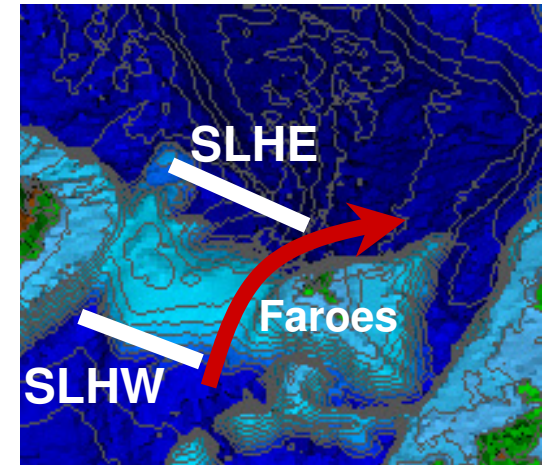
# The IF-inflow



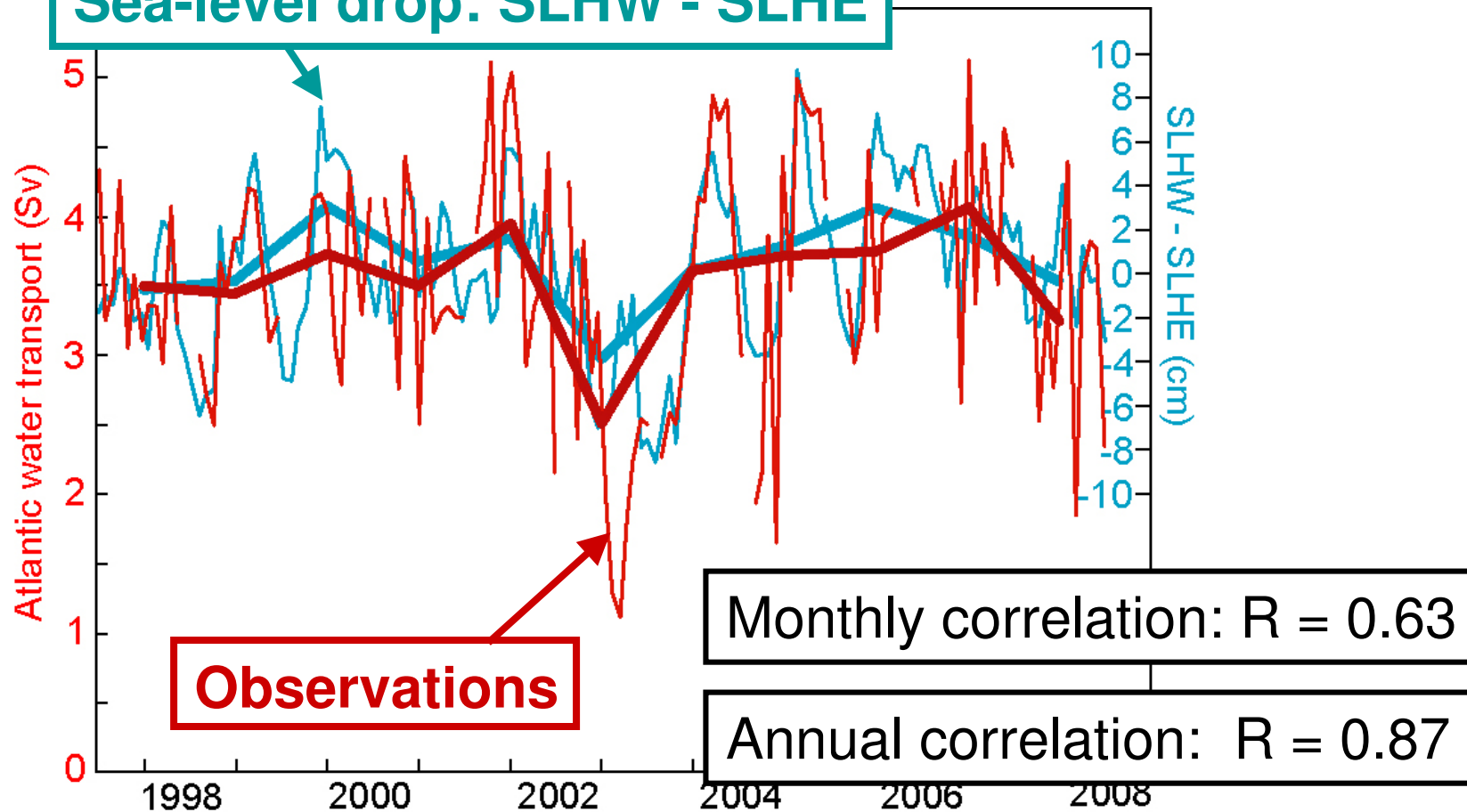
# Monthly averaged volume transport



# Measured volume transport and sea-level drop across the Ridge



Sea-level drop: SLHW - SLHE

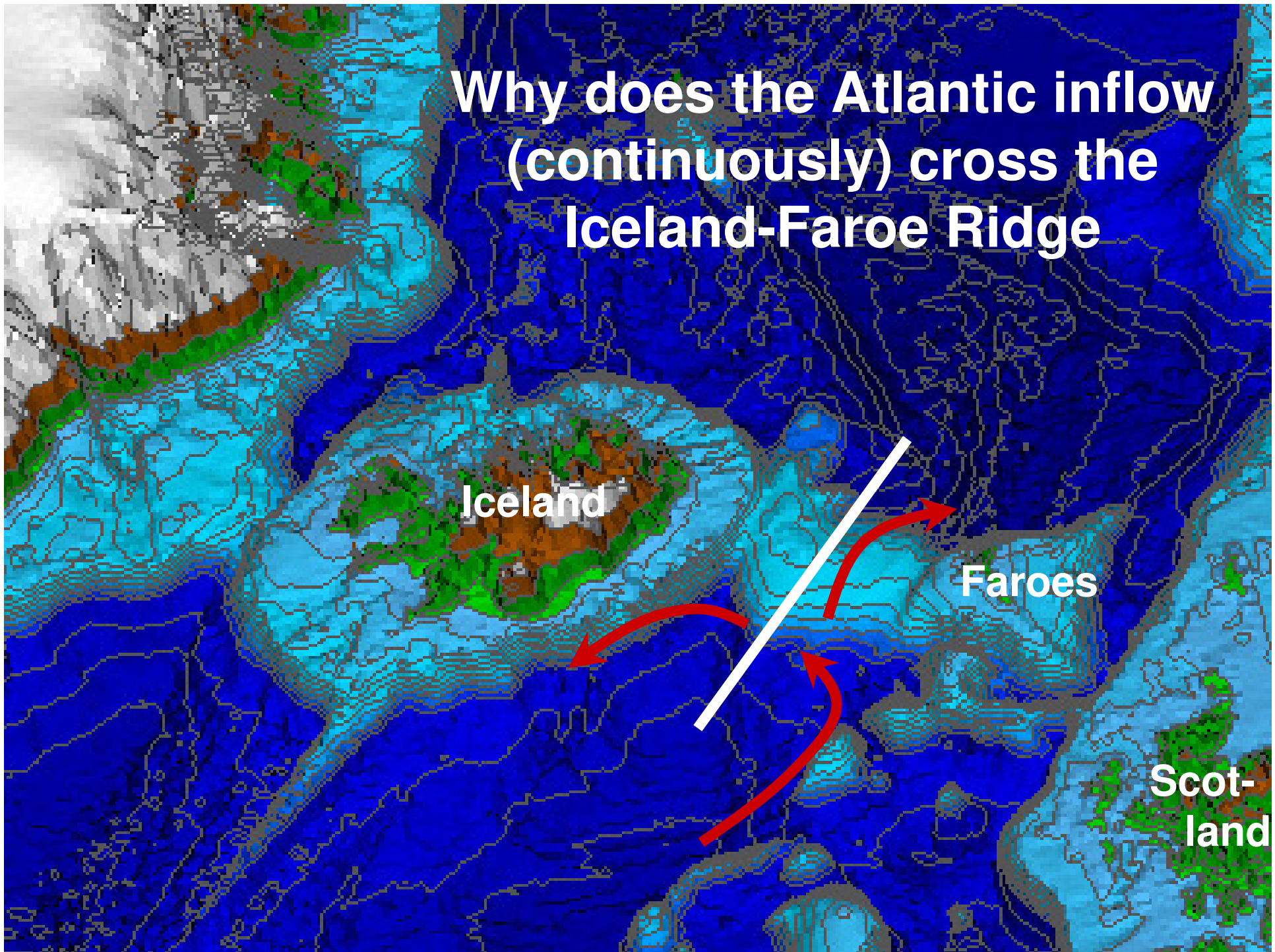


**Why does the Atlantic inflow  
(continuously) cross the  
Iceland-Faroe Ridge**

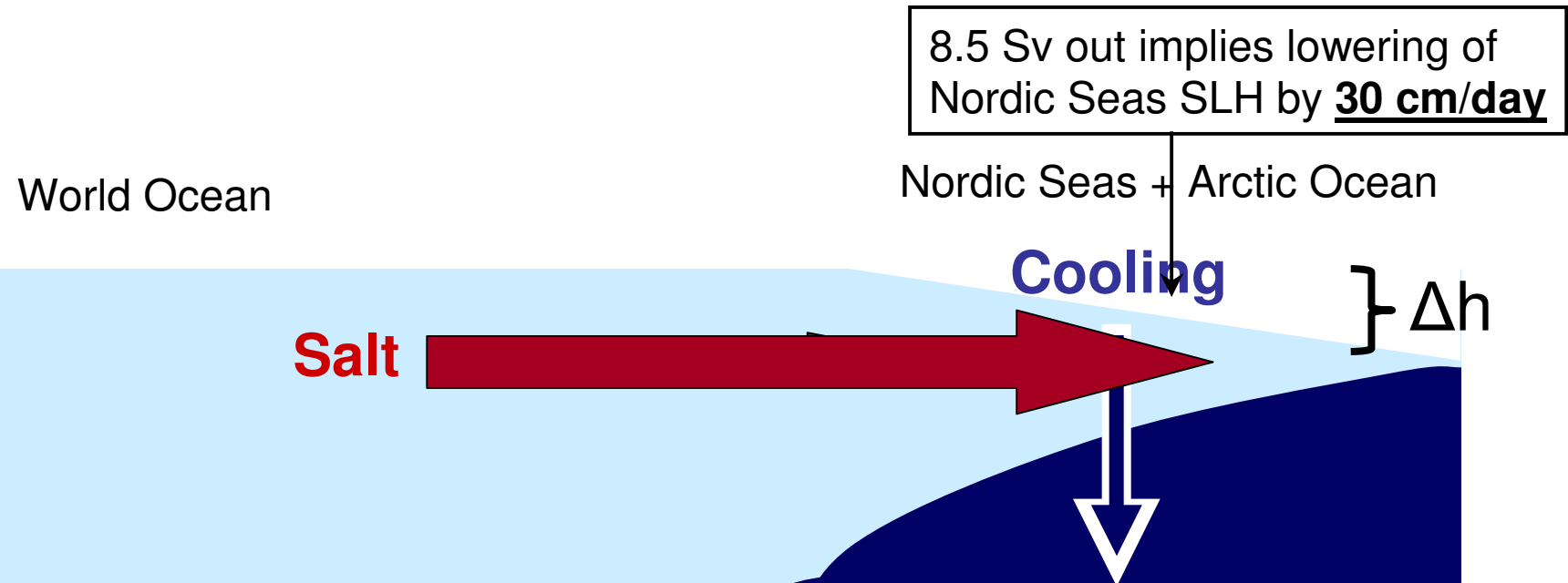
**Iceland**

**Faroese**

**Scot-  
land**



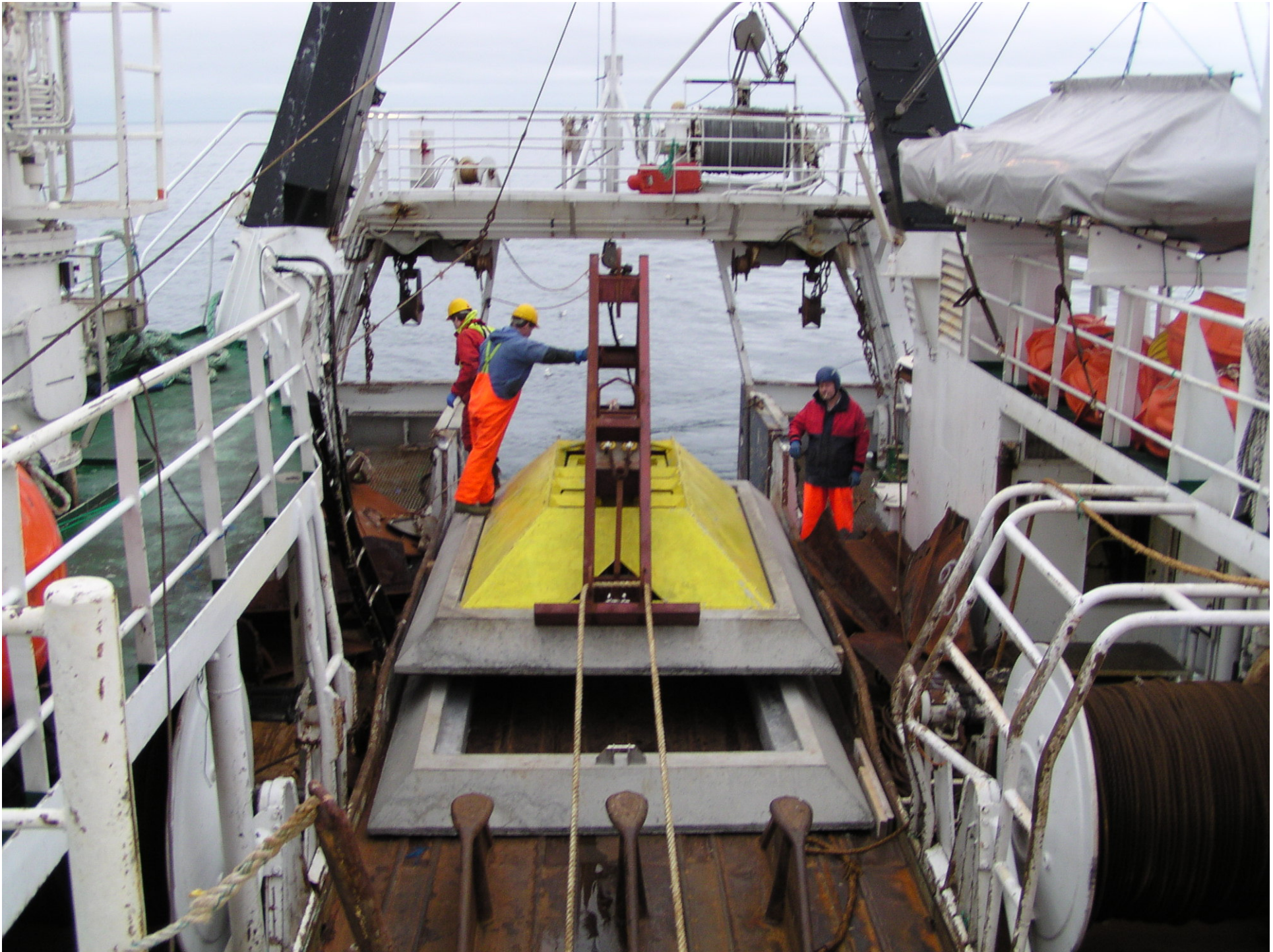
# The main driving mechanism



Hansen et al. (2010): A simple model with Bernoulli + Coriolis, for periods  $> 1$  day:

$$\text{Volume transport} = \alpha \cdot \Delta h$$

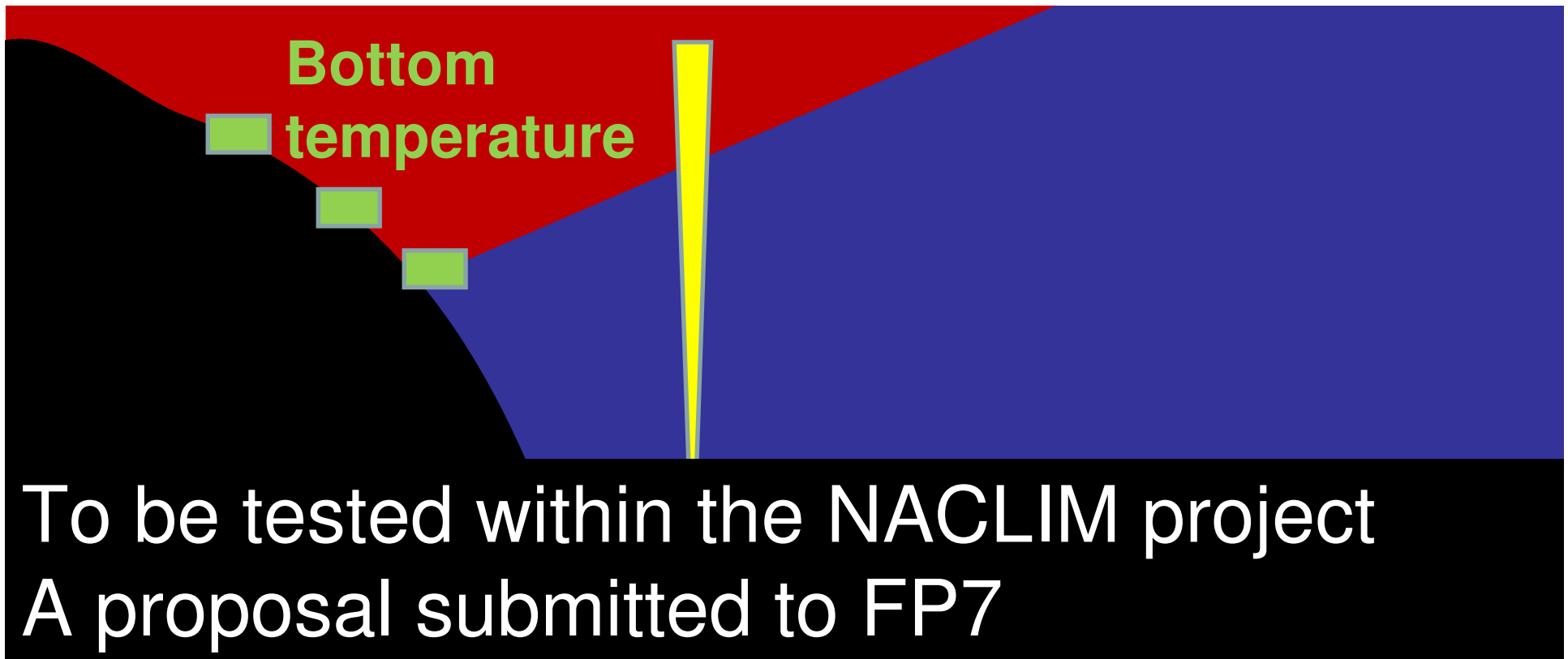
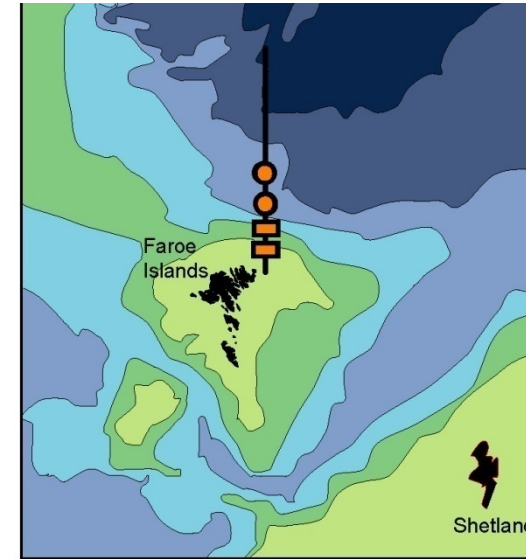




# The new monitoring system

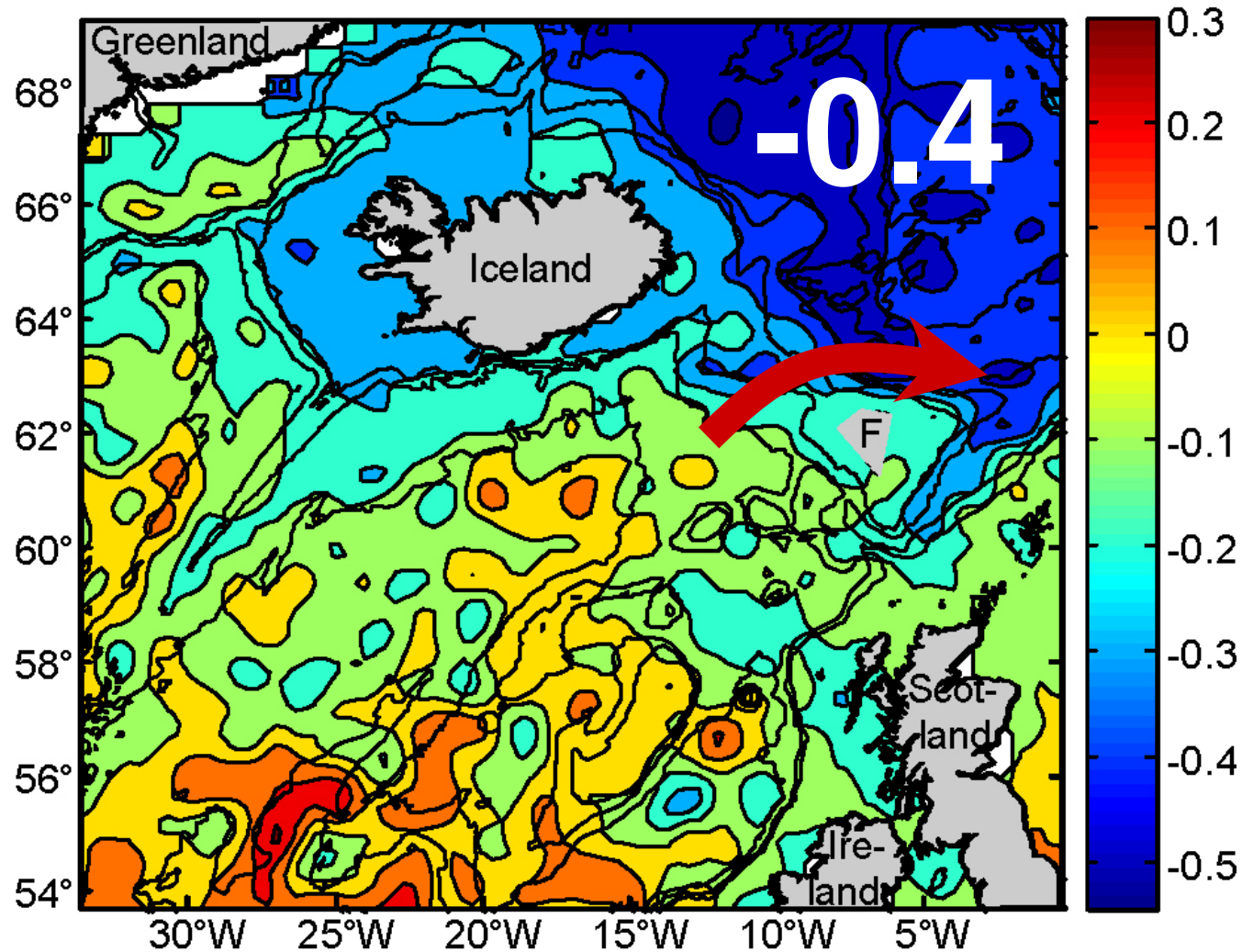


**Remote sensing**

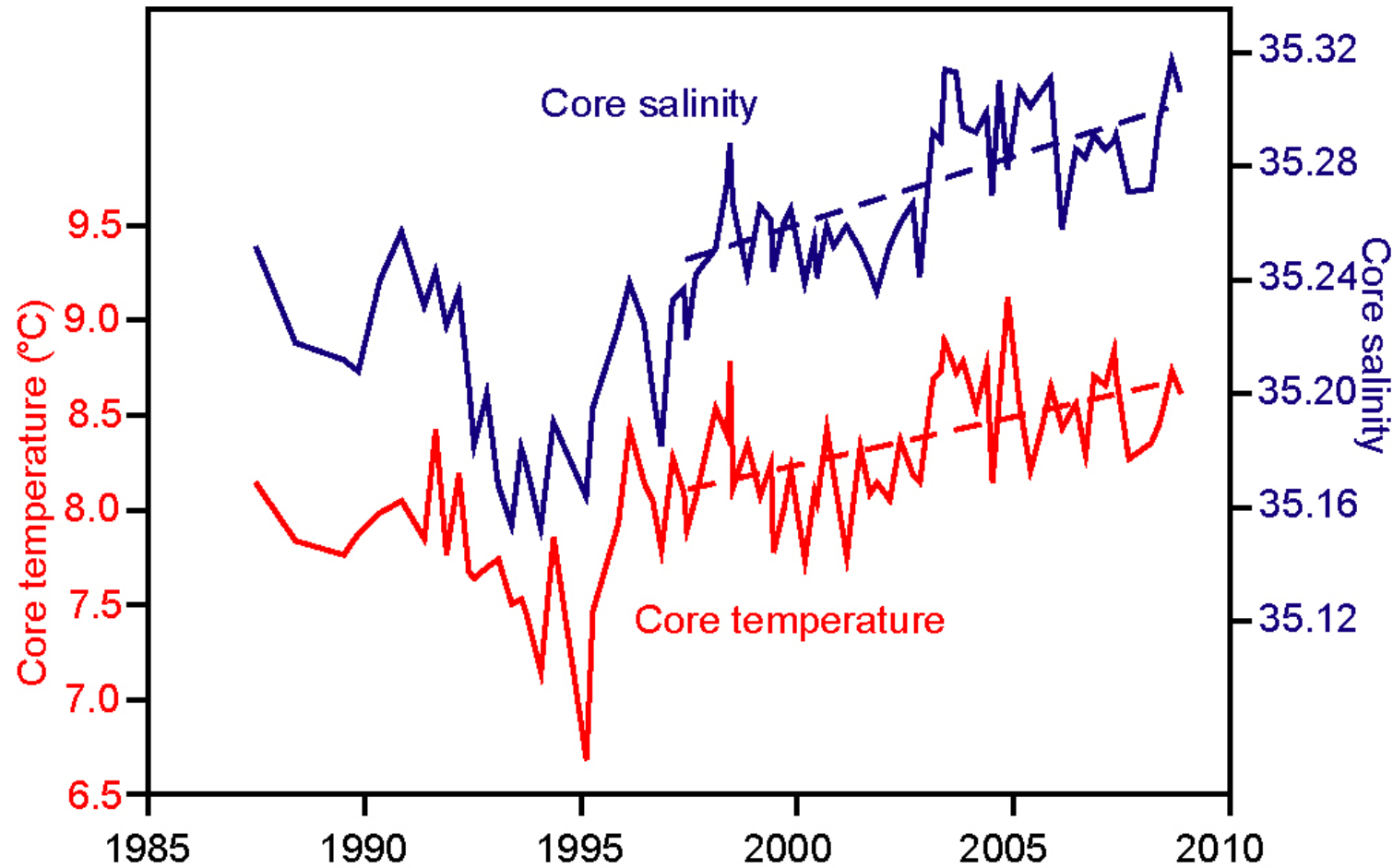


# Discussion slides

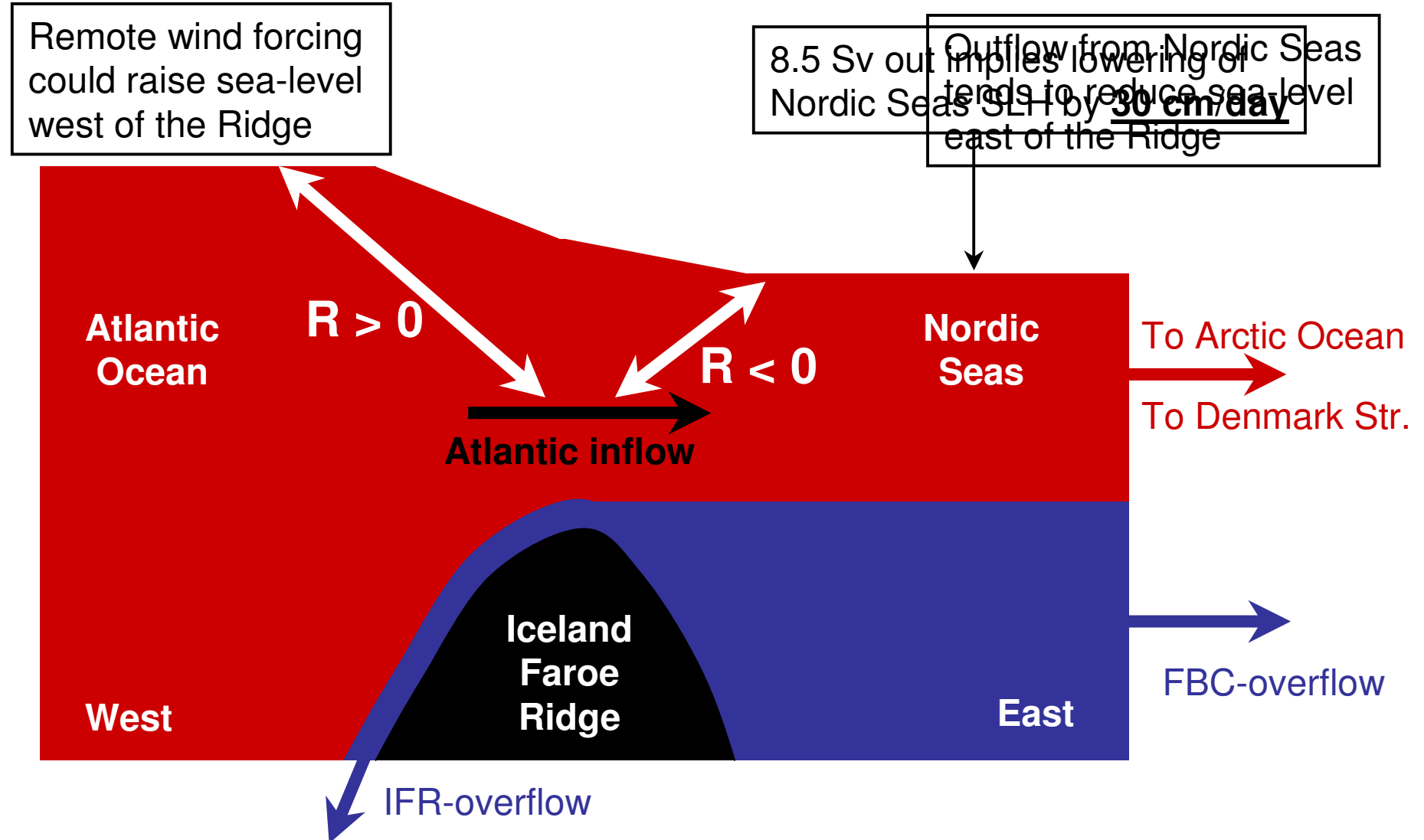
# Correlation coefficient between monthly sea-level height and IF-inflow



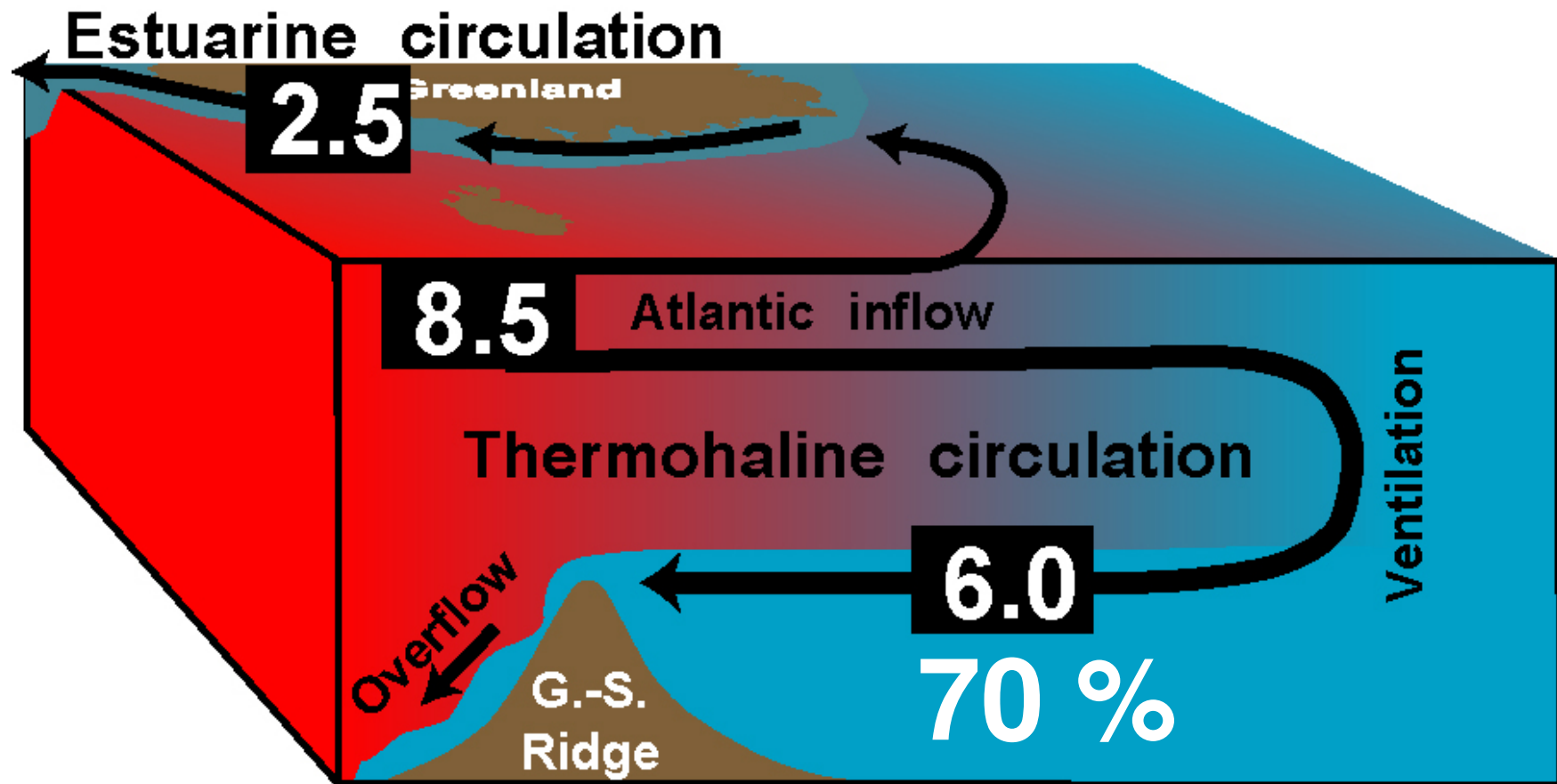
# T and S in the core of the IF-inflow



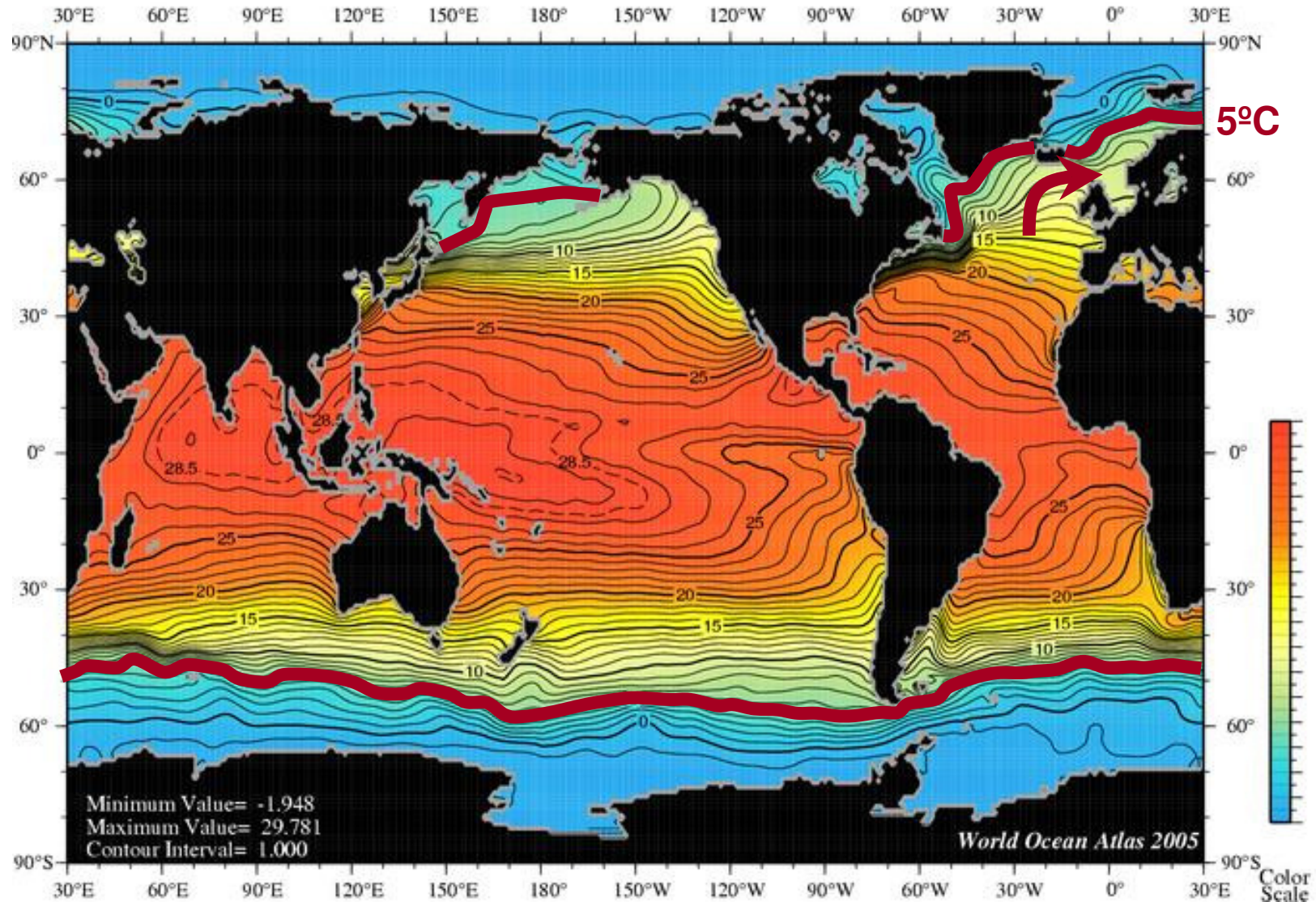
# Local and Remote forcing



Most of the Atlantic inflow goes into the thermohaline loop



# Annual mean surface temperature



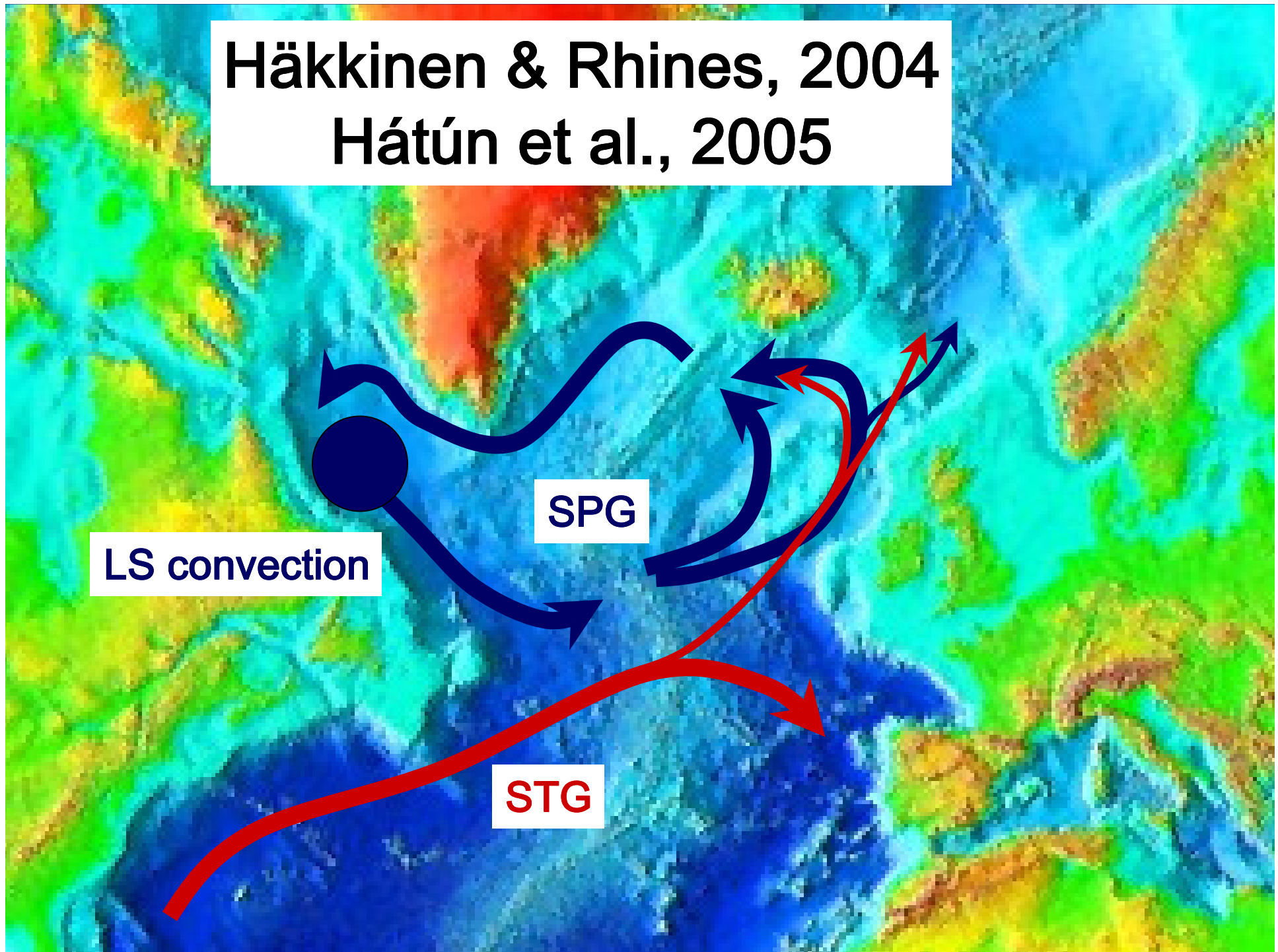


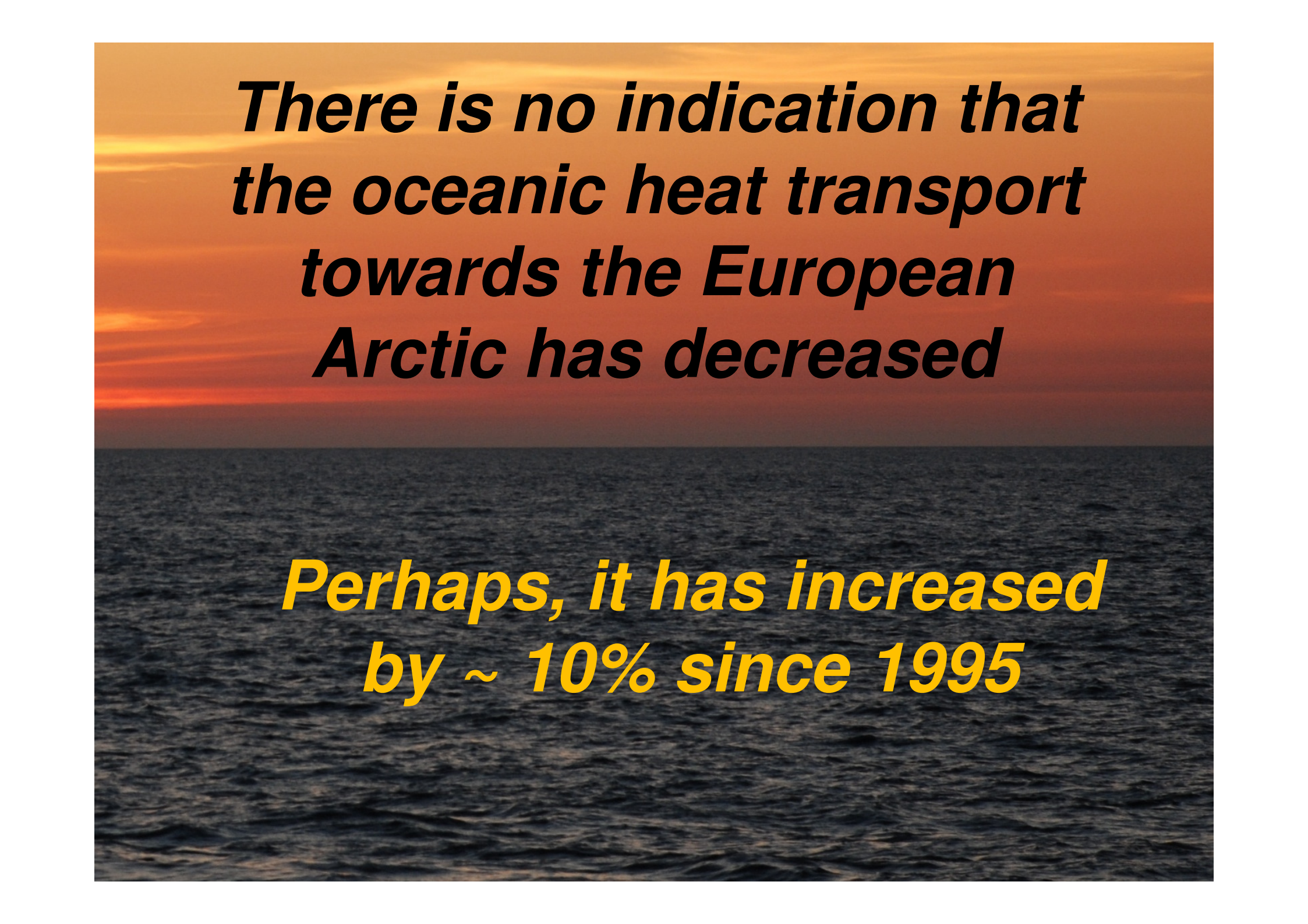
Häkkinen & Rhines, 2004  
Hátún et al., 2005

LS convection

SPG

STG





***There is no indication that  
the oceanic heat transport  
towards the European  
Arctic has decreased***

***Perhaps, it has increased  
by ~ 10% since 1995***