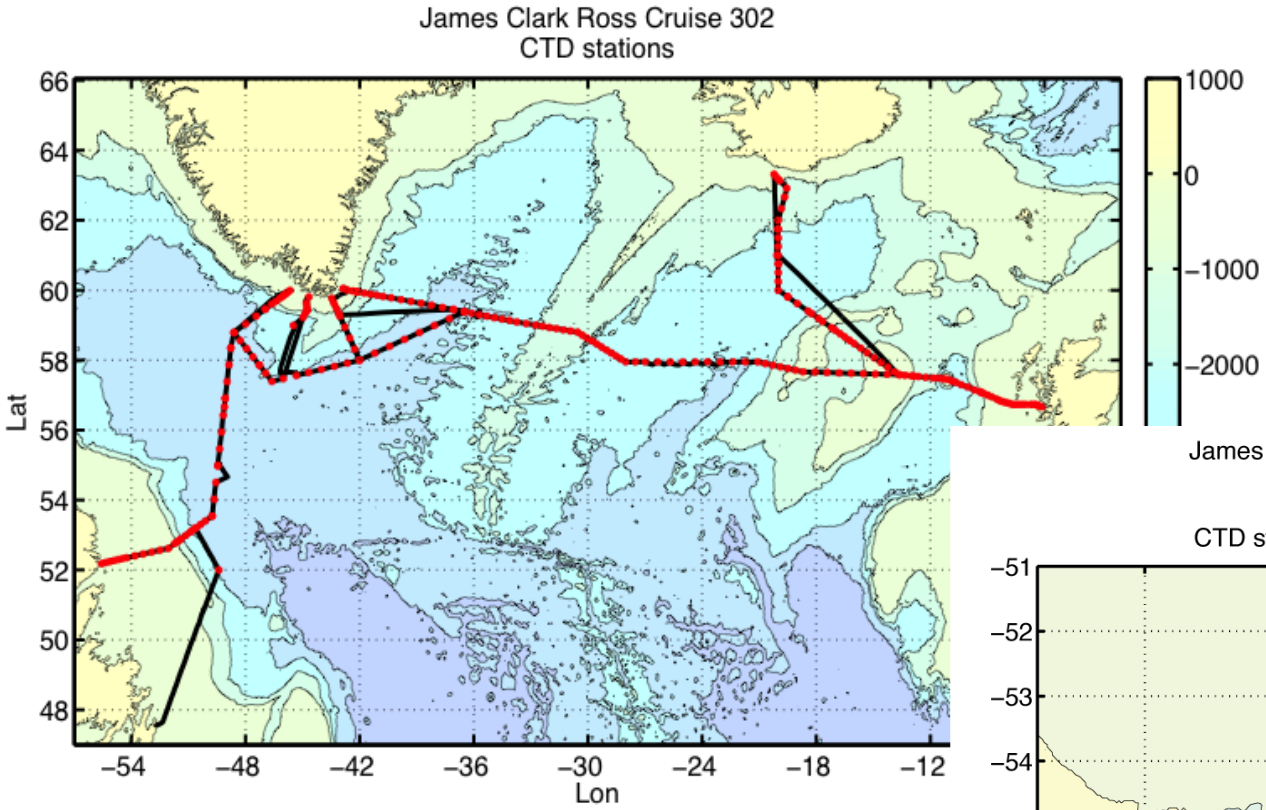
BODC activities

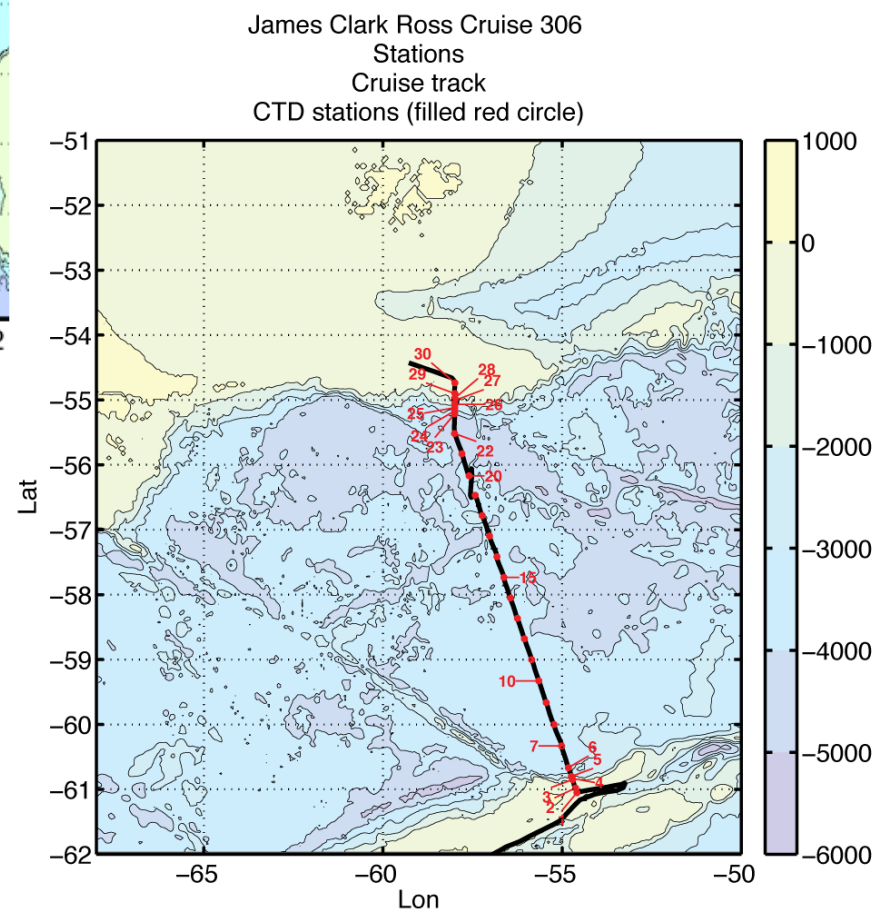
Justin Buck, and others

BODC/National Oceanography Centre, Liverpool

One of two European DACs
RT & DMQC for UK and other floats

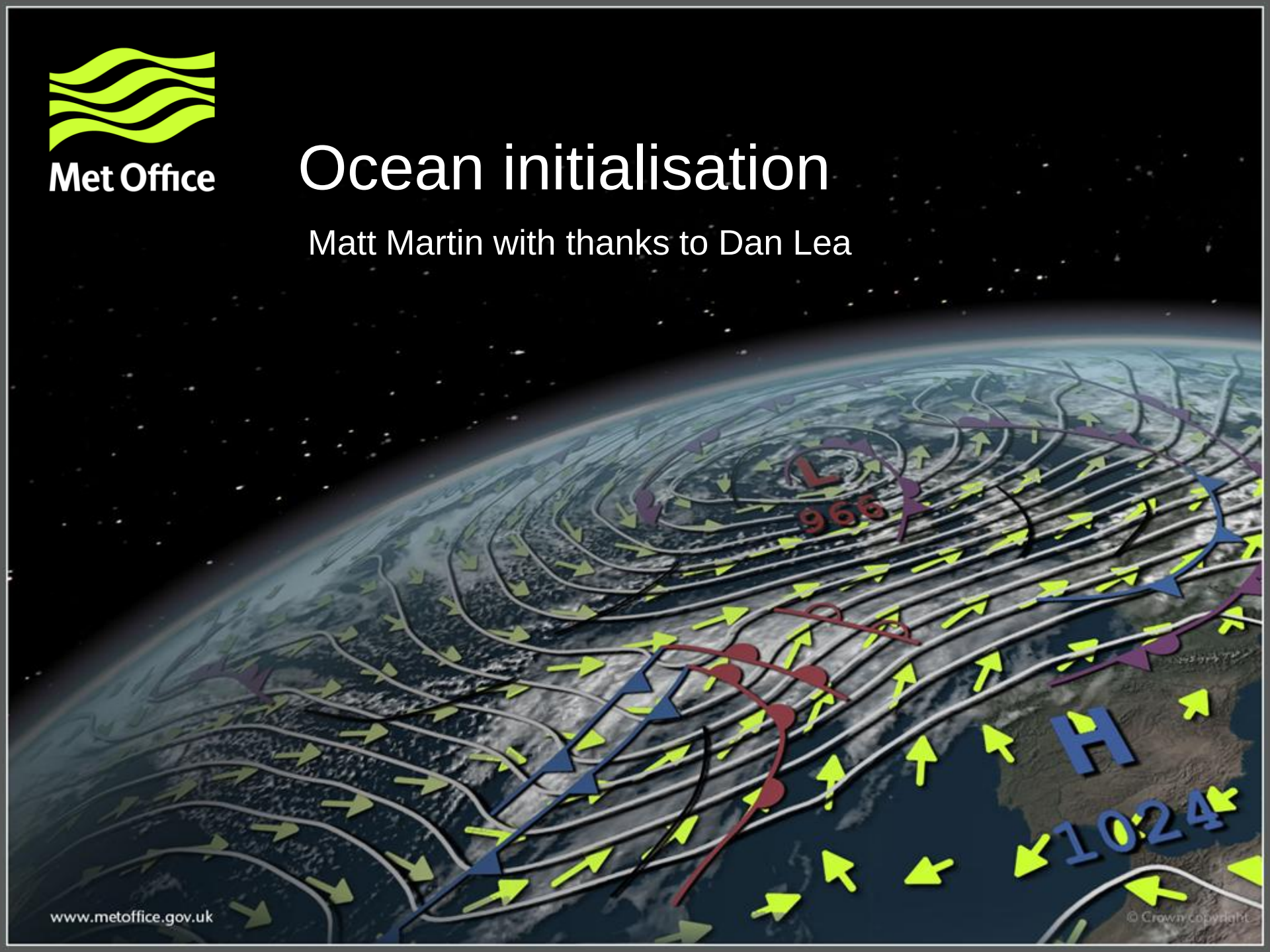
Areas of special interest
- DMQC methods and documentation
- Data formats and documentation, esp Bio Argo
- Near-surface temperature
- Sub-polar floats
- Southern Ocean (ARC)
- UK floats mainly N&S Atlantic and Indian
- DOIs


James Clark Ross Cruise 302
CTD stations
Lat
Lon
66
64
62
60
58
56
54
52
50
48
−54
−48
−42
−36
−30
−24
−18
−12
1000
0
−1000
−2000


James Clark Ross Cruise 306
Stations
Cruise track
CTD stations (filled red circle)
Lat
Lon
−51
−52
−53
−54
−55
−56
−57
−58
−59
−60
−61
−62
−65
−60
−55
−50
1000
0
−1000
−2000
−3000
−4000
−5000
−6000

Ocean initialisation

Matt Martin with thanks to Dan Lea



Introduction
Forecasting systems

Met Office systems which produce ocean forecasts for different time ranges:

- Forecasting Ocean Assimilation Model (FOAM):
  - Data assimilation and short-range forecasts out to 7-days.
  - NEMO/CICE model.

- Global seasonal coupled forecasting system (GloSea):
  - Uses ocean initial conditions from FOAM.
  - Atmosphere initial conditions from Met Office NWP system.
  - NEMO/CICE/UM model.

- Decadal Prediction System (DePreSys):
  - Creates its own ocean initial conditions.
  - NEMO/CICE/UM model.

- DePreSys currently uses a different system for initialisation due to the need to make best use of very sparse observation sampling in historical period. Work underway to enable the scheme used for FOAM/GloSea to be able to do that too.

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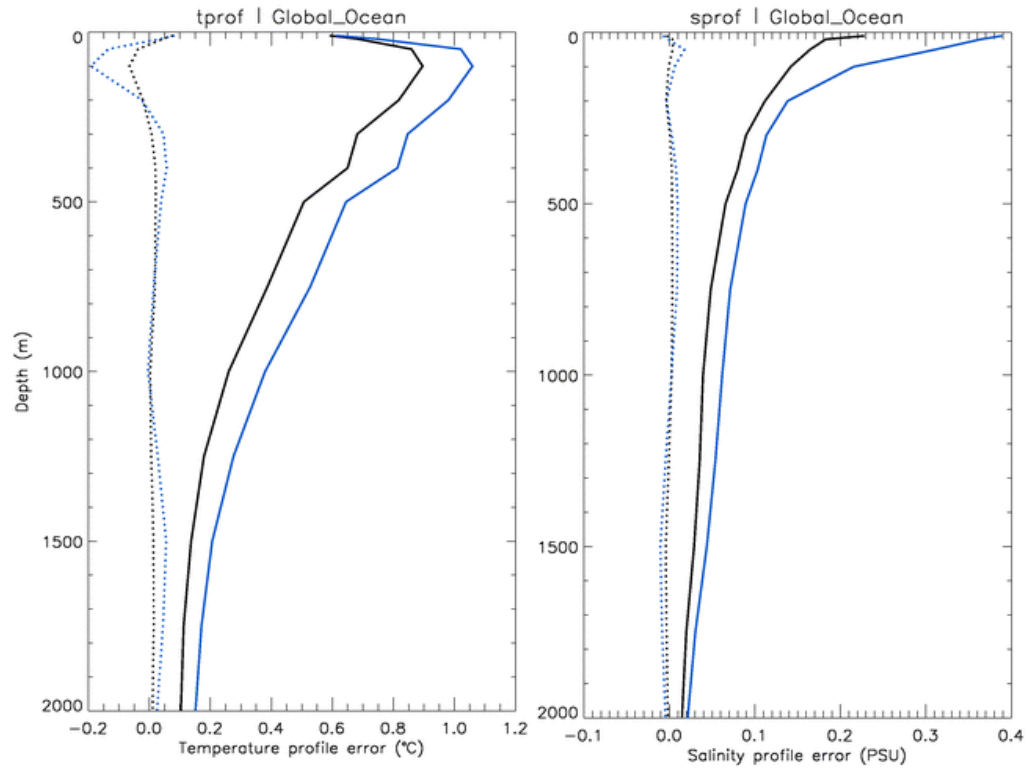
Observing System Experiments with Argo

- Our recent development of short-range coupled prediction systems which assimilate data into both ocean and atmosphere components of the coupled model, provide the first opportunity to assess the potential for Argo to improve weather forecasts.

- To assess the impact of Argo data we have run observing system experiments (OSEs) where we with-hold the Argo data from the coupled system and compare this to a run of the full system assimilating all available ocean, sea-ice, atmosphere and land observations.

- Argo has a significant, positive impact over the 13-month analysis run.
  - Only the temperature error of topmost layer is unaffected due to the assimilation of a large amount of SST observations.



The mean (dashed) and RMS (solid) errors as a function of depth over the 13-month OSE for temperature (left) and salinity (right). The black line shows the errors when all observations are assimilated and the blue line shows the errors when all observations except Argo are assimilated.

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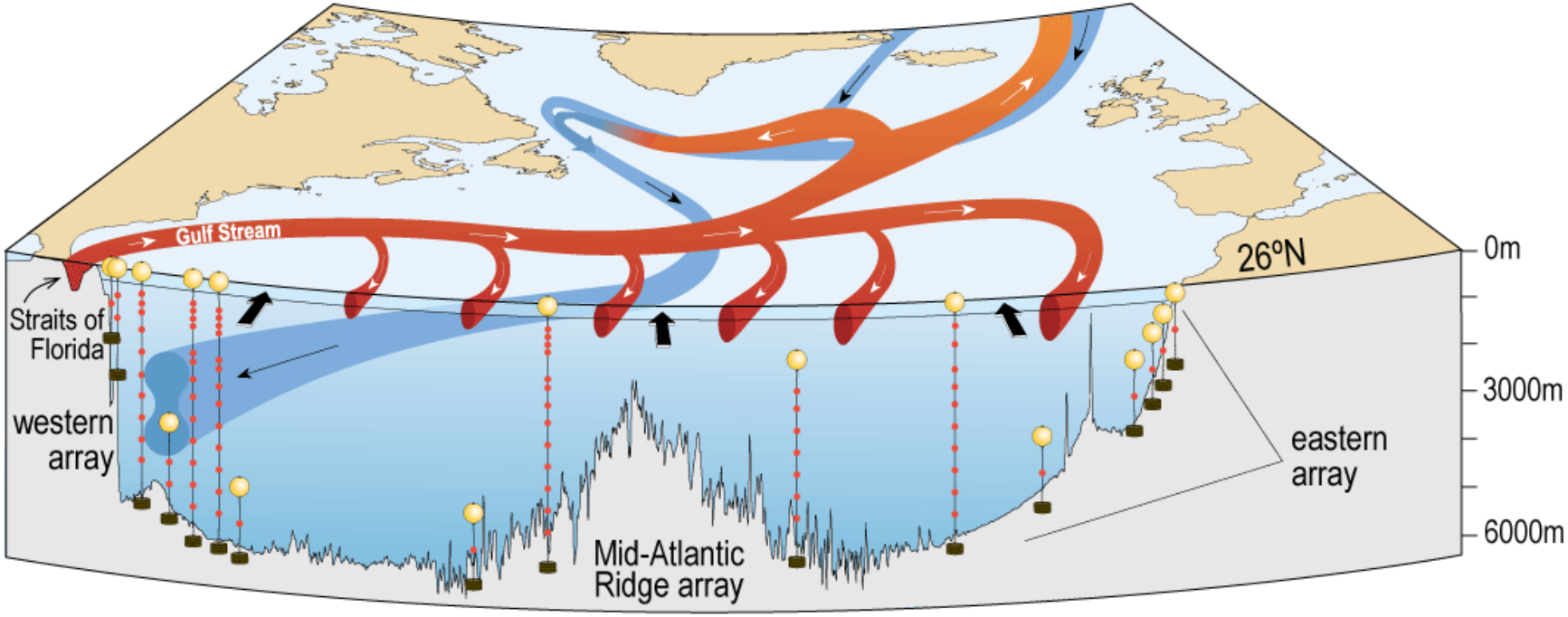
Storage of heat and freshwater in the subtropical North Atlantic

Brian King, Damien Desbruyères

Elaine McDonagh

National Oceanography Centre, Southampton



Heat and salt content

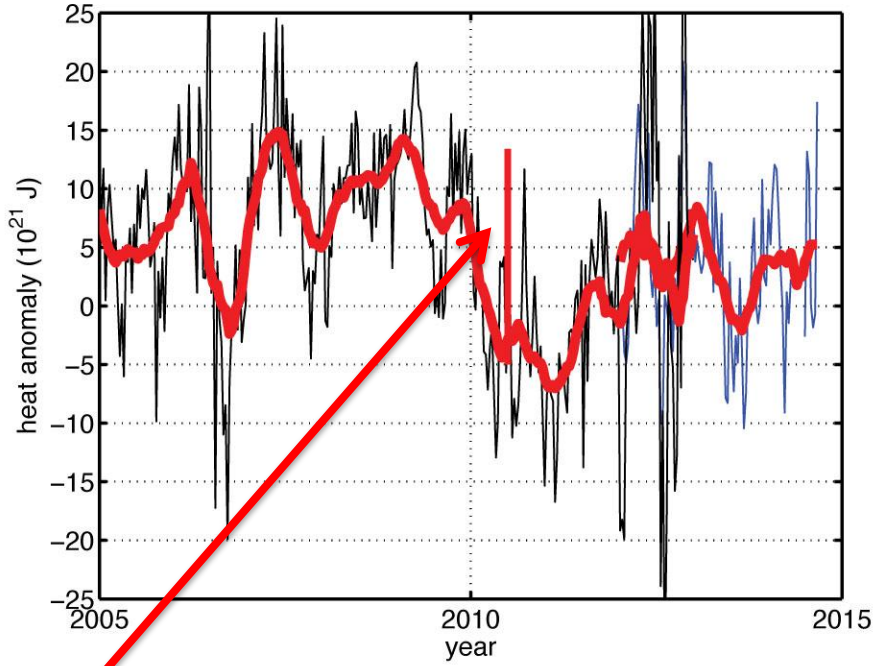
60W to 20W
25N to 45N
Upper 1800 metres

10-day independent values and
180-day running means

Anomalies relative to Hydrobase
climatology

Vertical red bar is shortfall in
heat from reduction in overturning
at 26N of 8 Sv for 1 year

Heat (x 10^{21} J)



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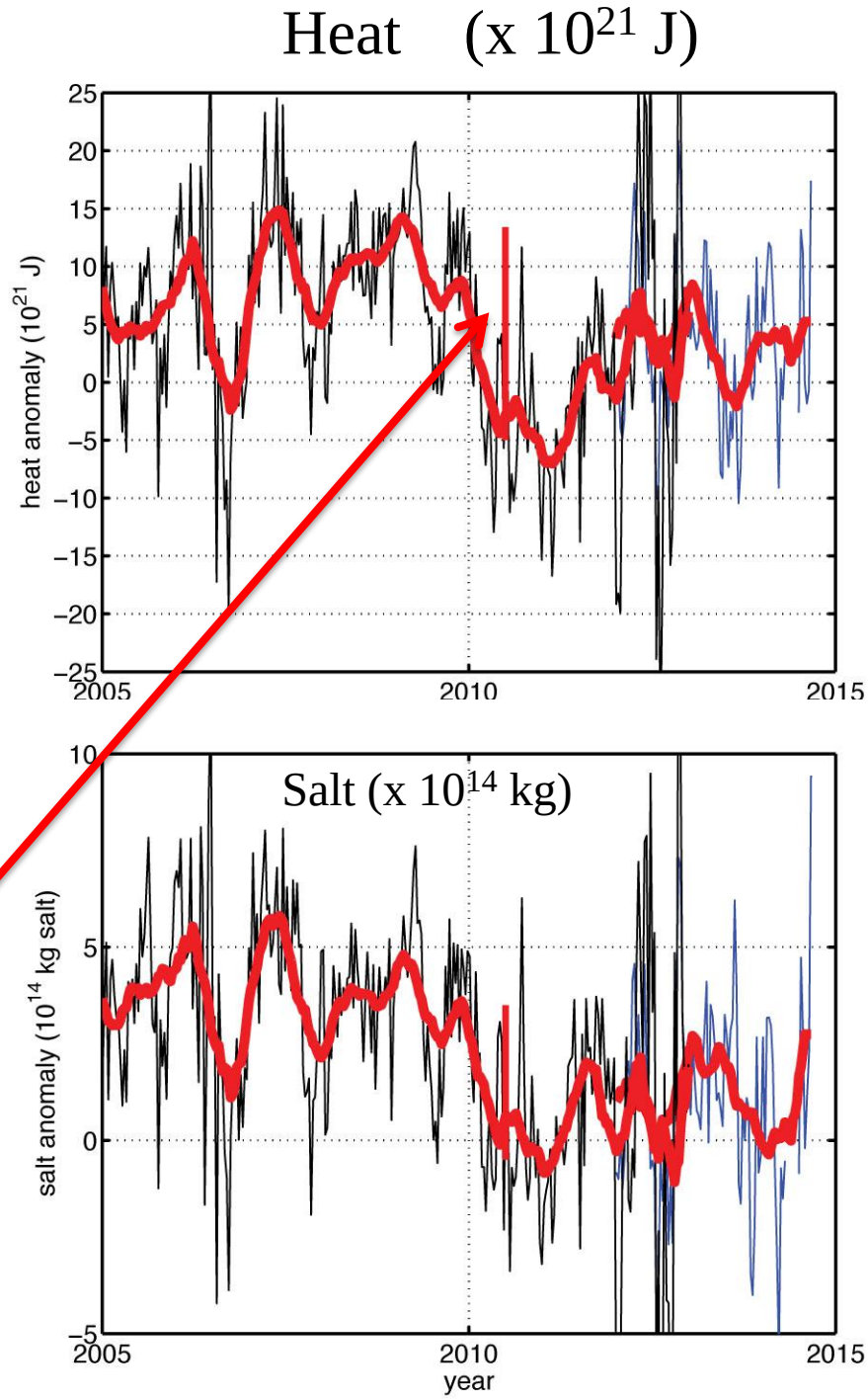
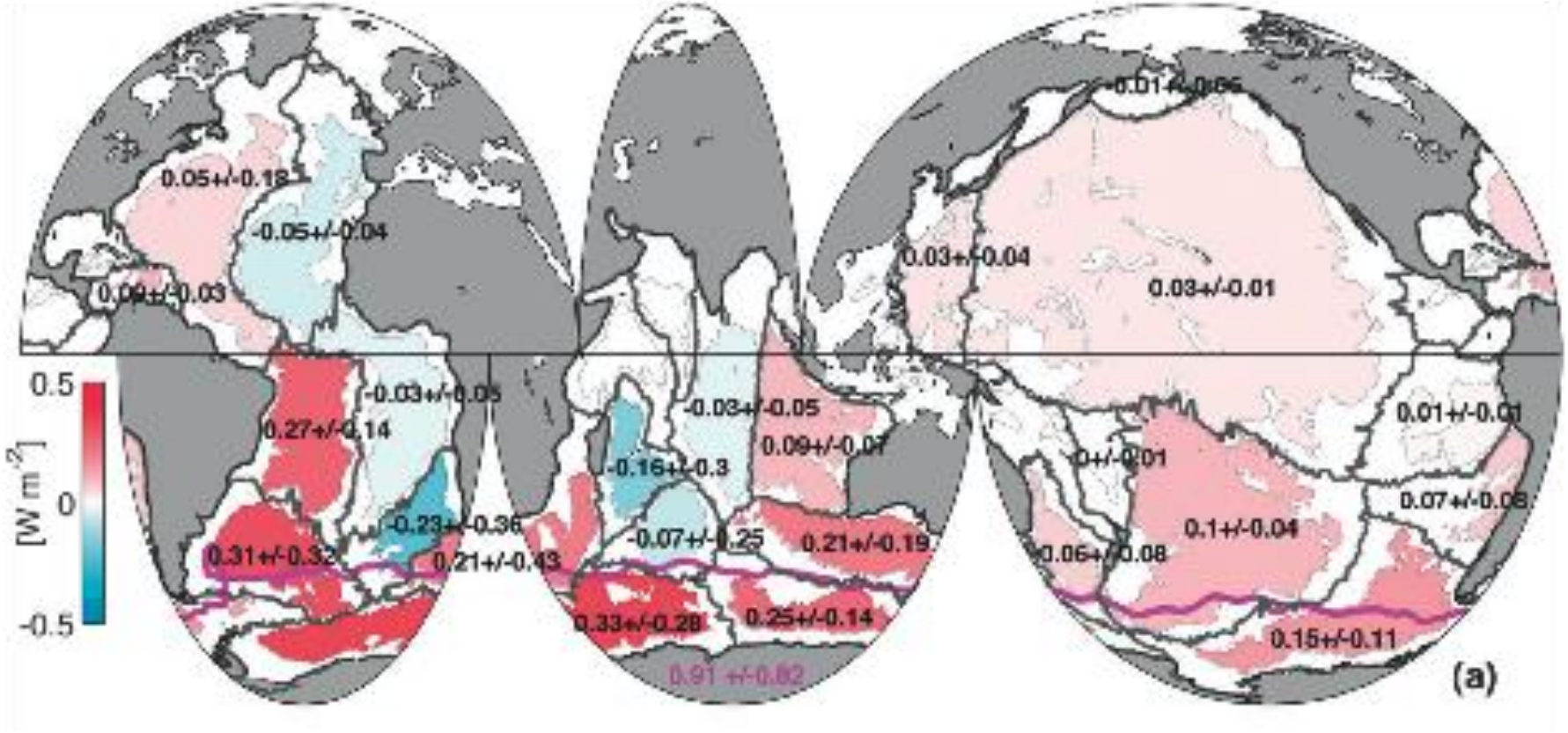


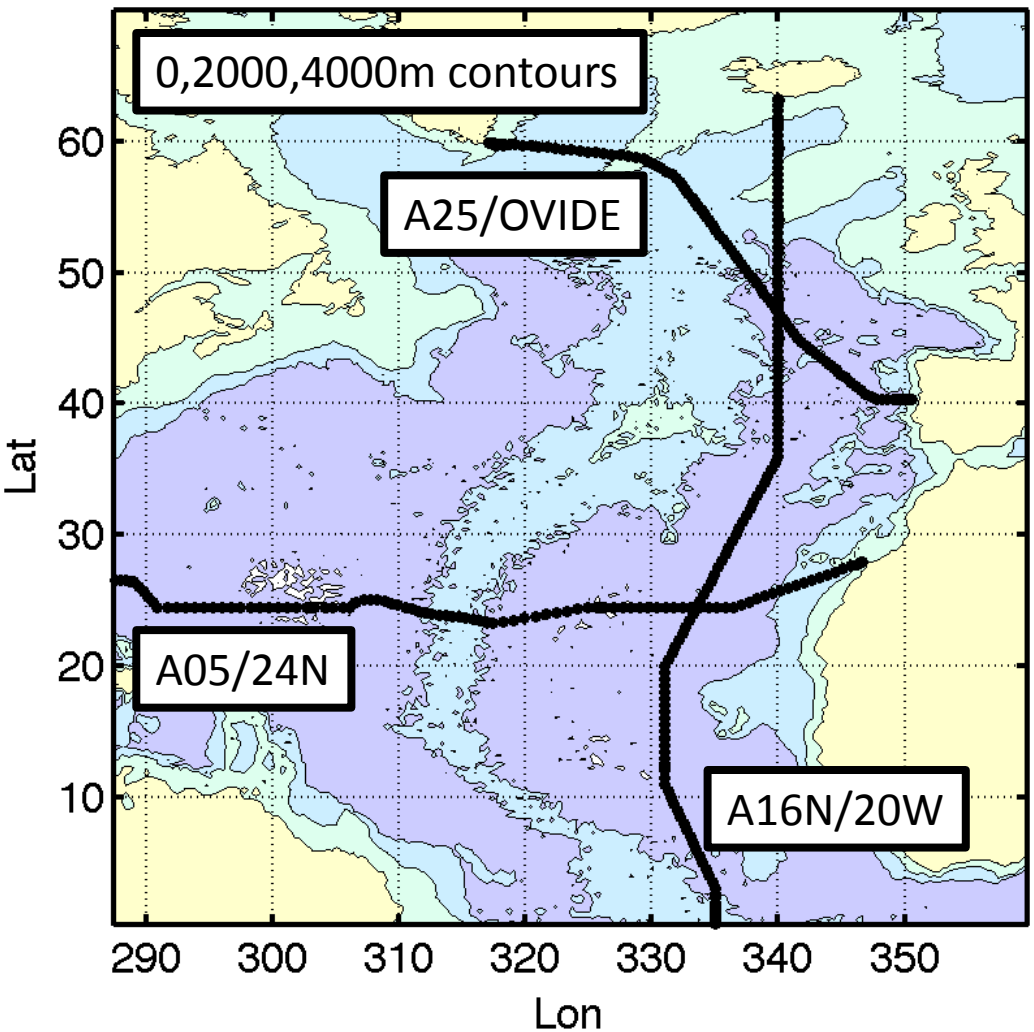
Heat content trend: red areas are warming below 4000m.

The NE Atlantic was the only deep basin that was cooling at a rate greater than the uncertainty



Purkey and Johnson , 2010

We use mainly the same data used by Purkey and Johnson, with some additions



A05 :
4 cruises from 1992 to 2010

A16N :
4 cruises: 3 exact repeats 1988 to 2003, plus new data from 2011

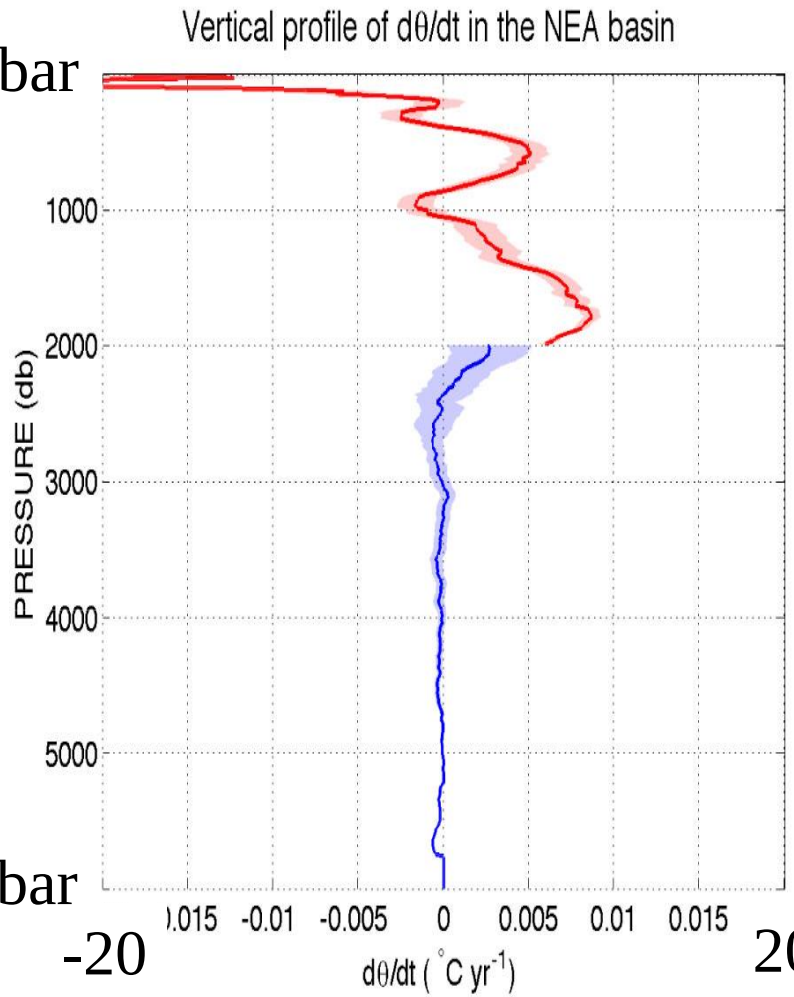
A25 OVIDE:
5 cruises in the northern part of the basin since 2000

Temperature trend (millidegrees C/yr)

Upper ocean from Argo Deep ocean from repeat ship data

Argo + ship since 2000

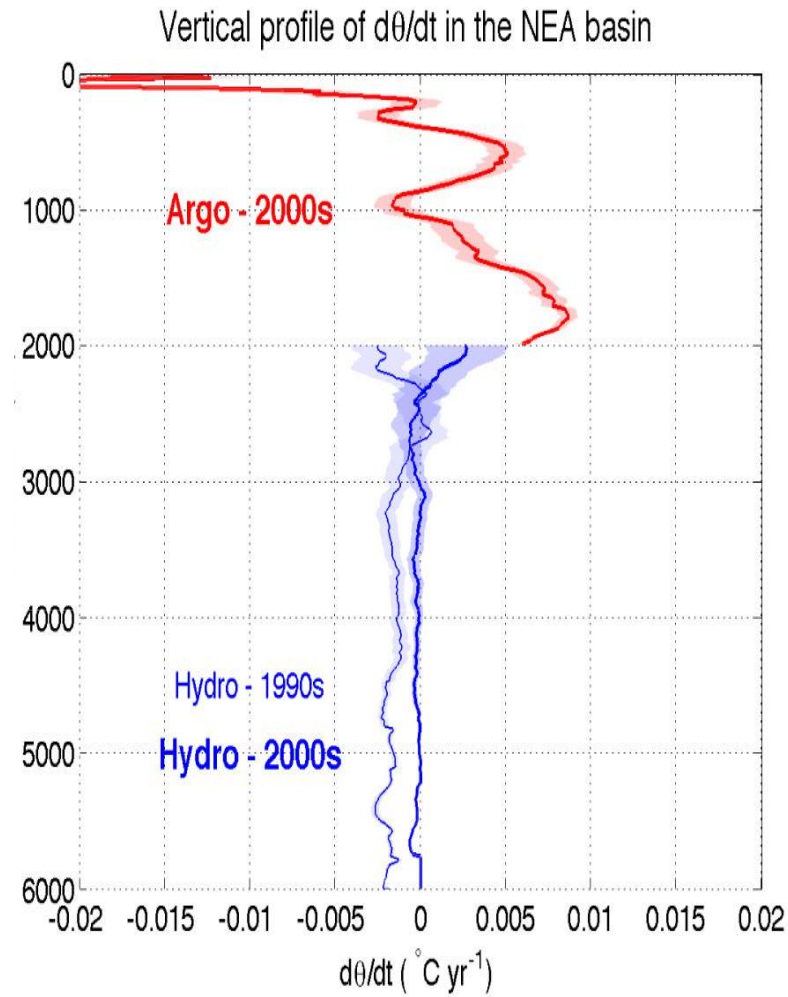
0 dbar



6000 dbar

-20

20



D. Desbruyeres, NOC