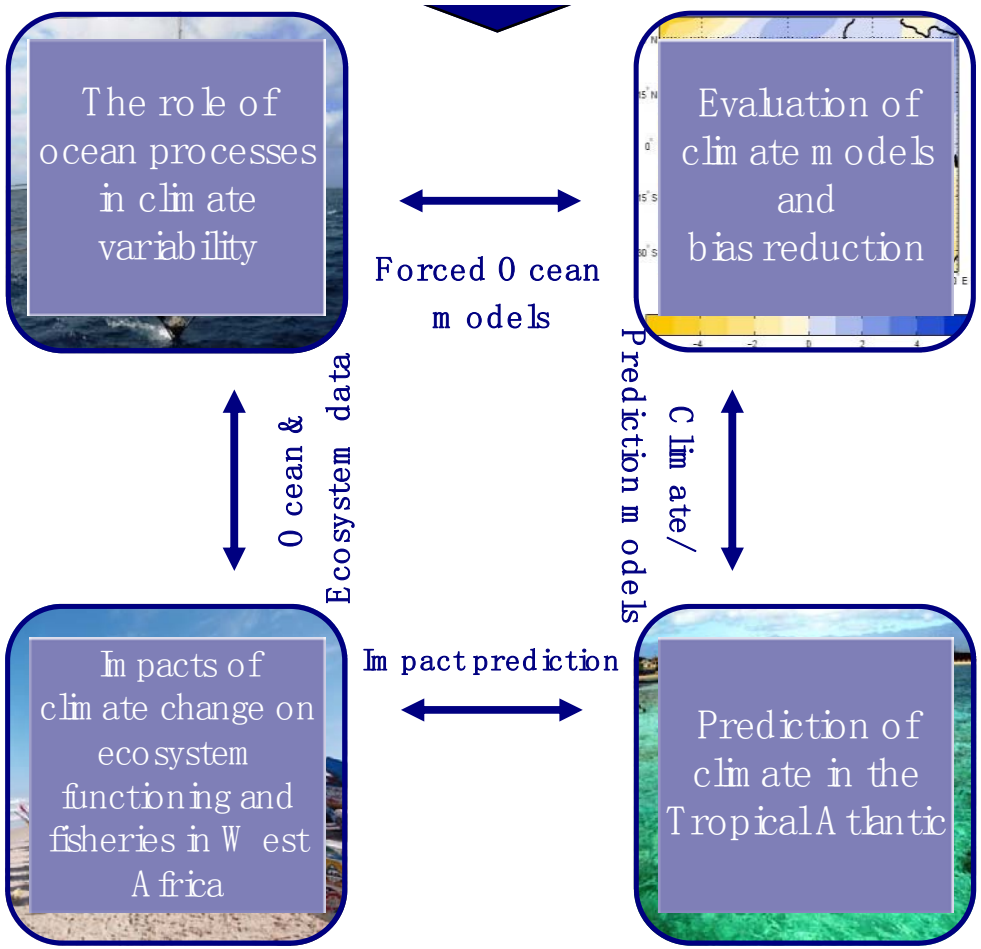
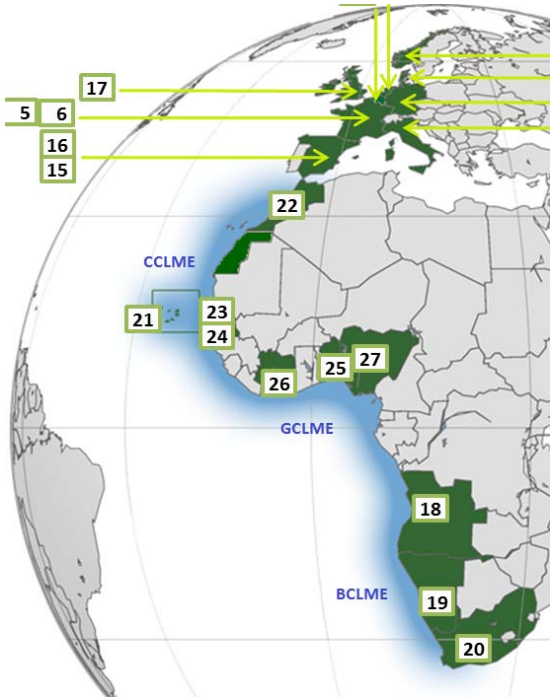
Enhancing Prediction of Tropical Atlantic Climate & its impact (PREFACE)

To improve climate prediction in the Tropical Atlantic to a level where socio-economic benefit can be realised, with focus on sustainable management of marine ecosystems and fisheries



EU FP7, 2014-2017

28 partners, 18 countries

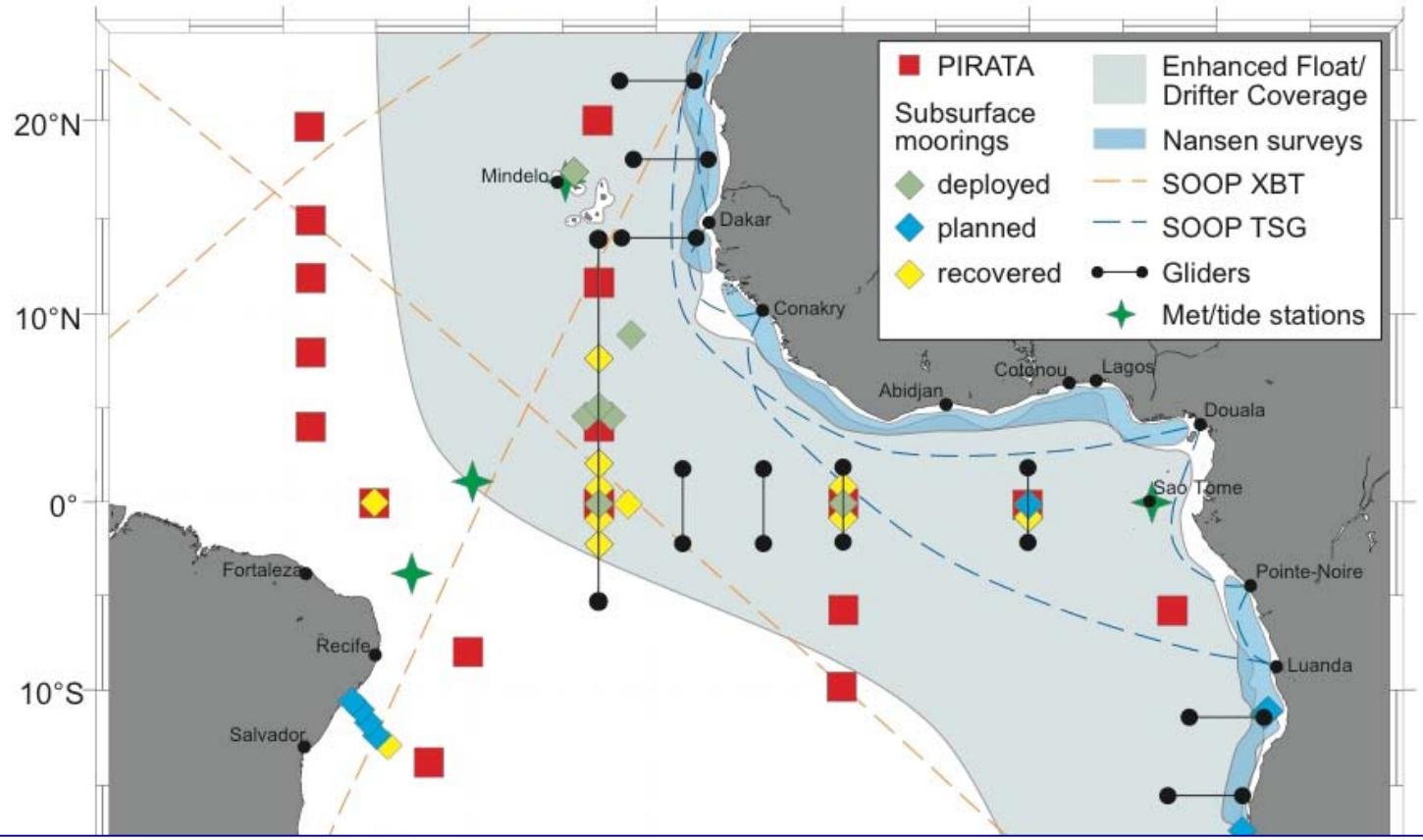


www.preface-project.eu

PREFACE team interests in joint analysis of CORE-II runs for the Tropical Atlantic

- Interest in contributing to a coordinated analysis
- Partners have contributed to the CORE-II project (e.g., CNRM, MICOM, CERFACS)
- No centralised data makes access difficult
- Data useful for master thesis
- Topics of special interest:
  - New observations from the Tropical Atlantic
  - Errors in seasonal cycle and Benguela-Angola Front
  - Studies of Atlantic Niño, Meridional Mode, thermodynamic and dynamical O-A interaction, and mechanisms for decadal modulation of variability

Observing System

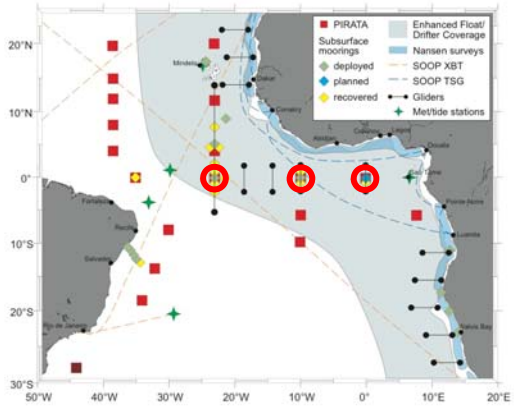


PREFACE has a new mixed-layer heat and freshwater budget climatology, improved using ARGO and coastal data

Download: http://herakles.geomar.de:8000/MLETA

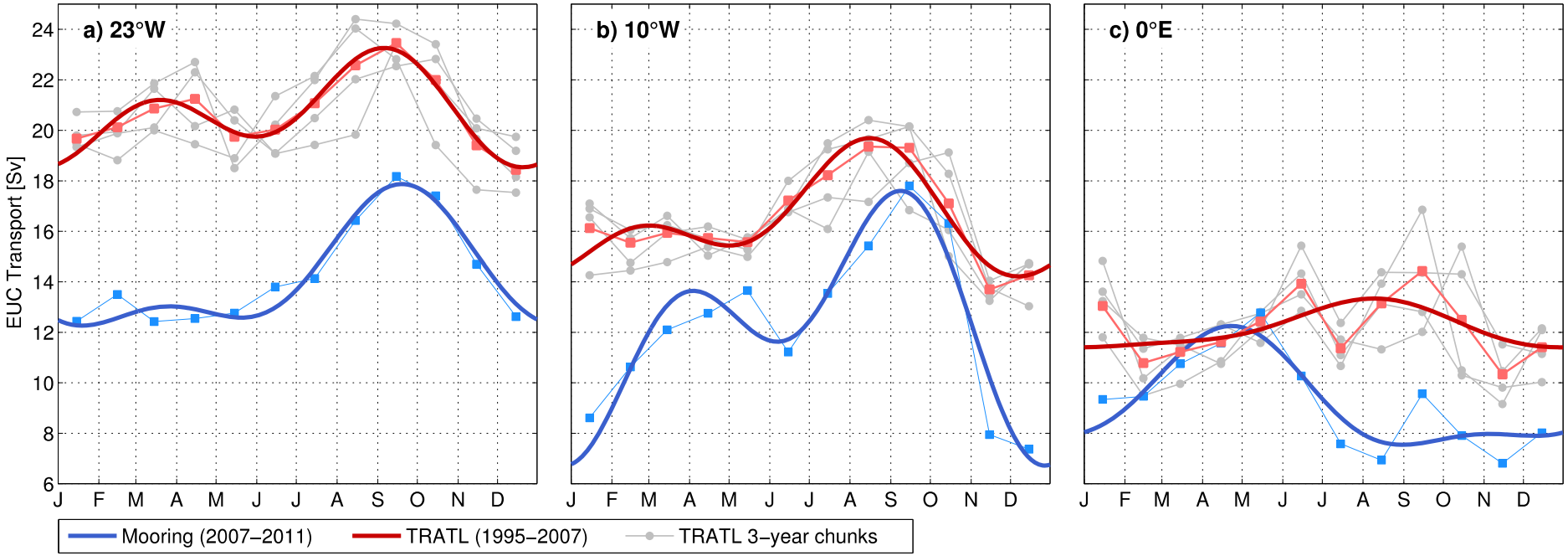
Peter Brandt

EUC seasonal transport variability from observations and GCM



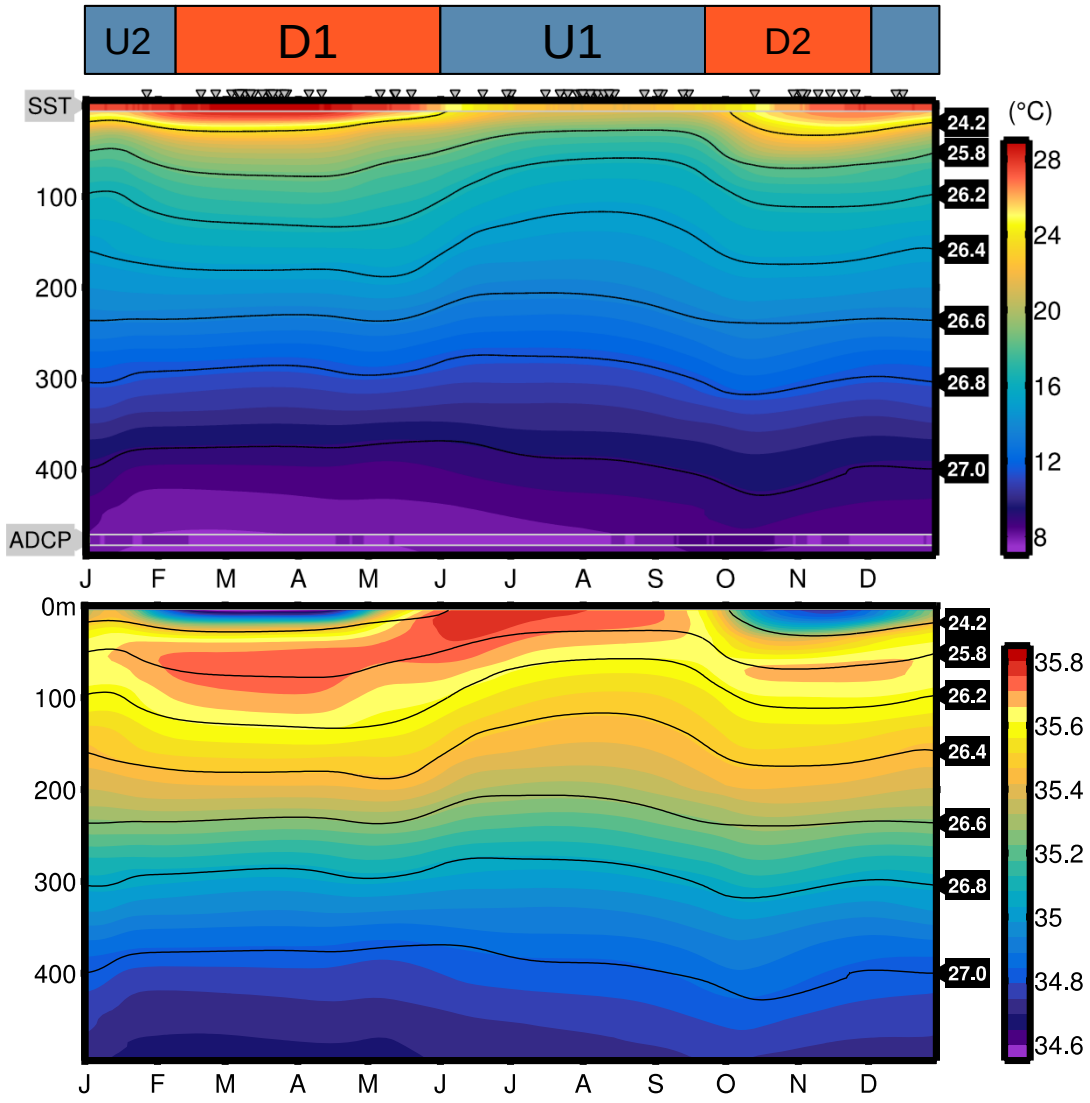
GCM simulations (TRATL01) are obtained using a global NEMO model with a high-resolution (1/10°) tropical Atlantic nest (30°S-30°N)

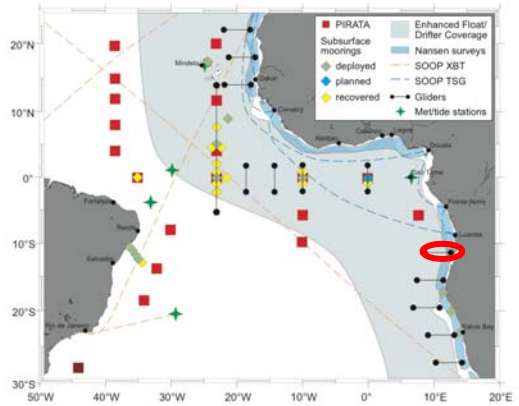
EUC transport in general too large, with some agreement in the EUC seasonal cycle in the central tropical Atlantic with respect to observations



mooring data analysis from Johns et al. (2014) CD

Tropical Eastern Boundary Upwelling



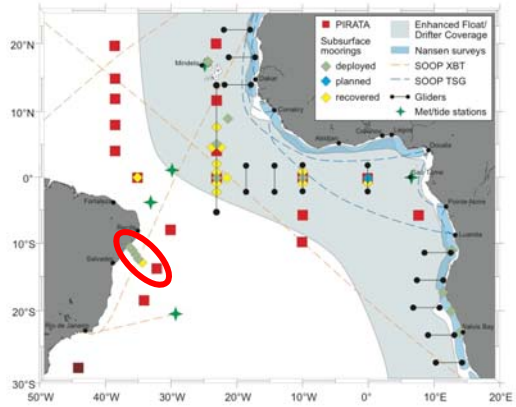


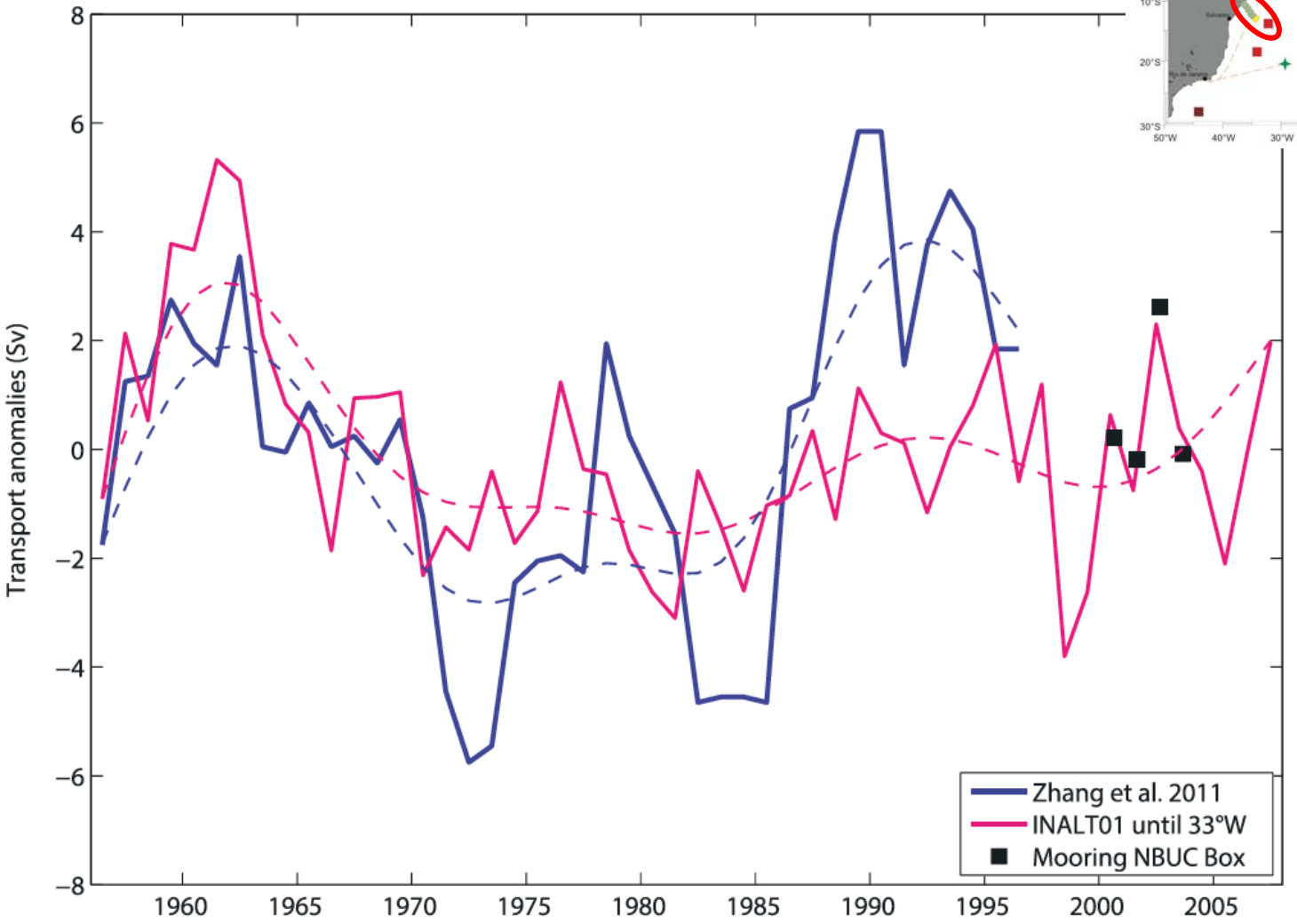
Off Angola, 11°S

- Hydrographic data from the Nansen program (semiannual cruises executed by FAO) and PREFACE/SACUS cruises and gliders
- Near-surface layers are dominated by superposition of semi-annual and annual components

from Kopte et al. (2016) to be submitted to JGR

Western Boundary Circulation

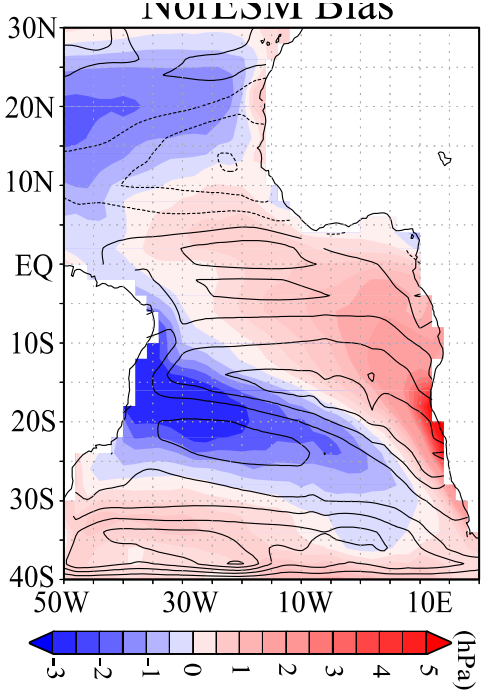


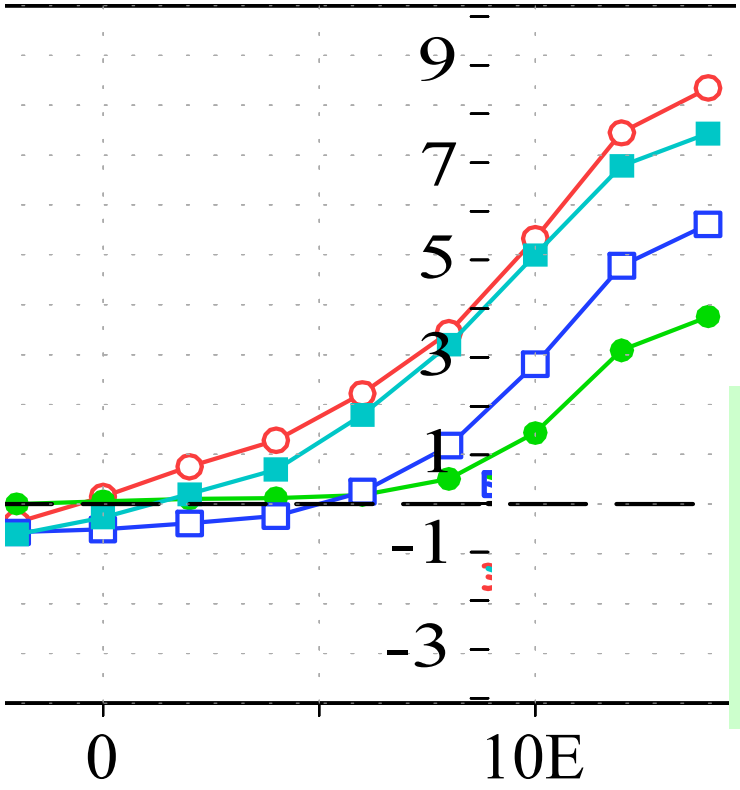


from Hummels et al. (2015) GRL

NorESM SST bias in Angola-Benguela Front Zone: 50% in CORE-II runs + 25% from CAM4 wind errors

Annual mean SST bias averaged between 17-22S
NorESM and uncoupled sensitivity experiments



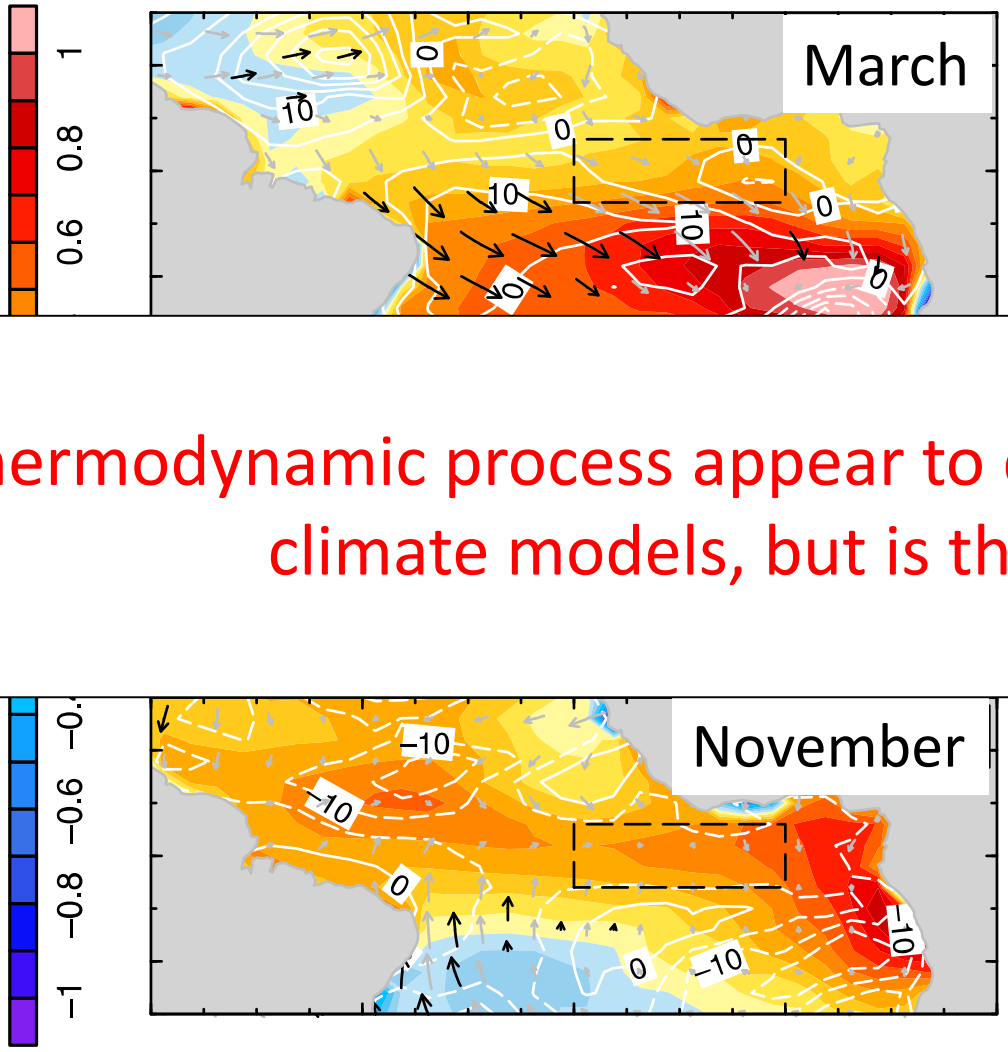


NorESM =
Heat flux discrepancies +
Local atmospheric model error +
CORE-II MICOM,

Probably a large part of the CORE-II biases arises from wind forcing errors. How is the intermodel spread?

Koseki et al. to be submitted

Thermodynamic Ocean-Atmosphere interactions are able to explain key Atlantic Nino features



GFDL – CM2.0 AGCM-slab coupled model

Lag-regression:

and turbulent fluxes

Thermodynamic process appear to dominate variability in climate models, but is this realistic?

Nnamchi et al. 2015,2016, Trzaska et al. 2007

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