

Carbon and nitrogen cycle in the Benguela upwelling system – a global 3d modelling approach

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Aims:

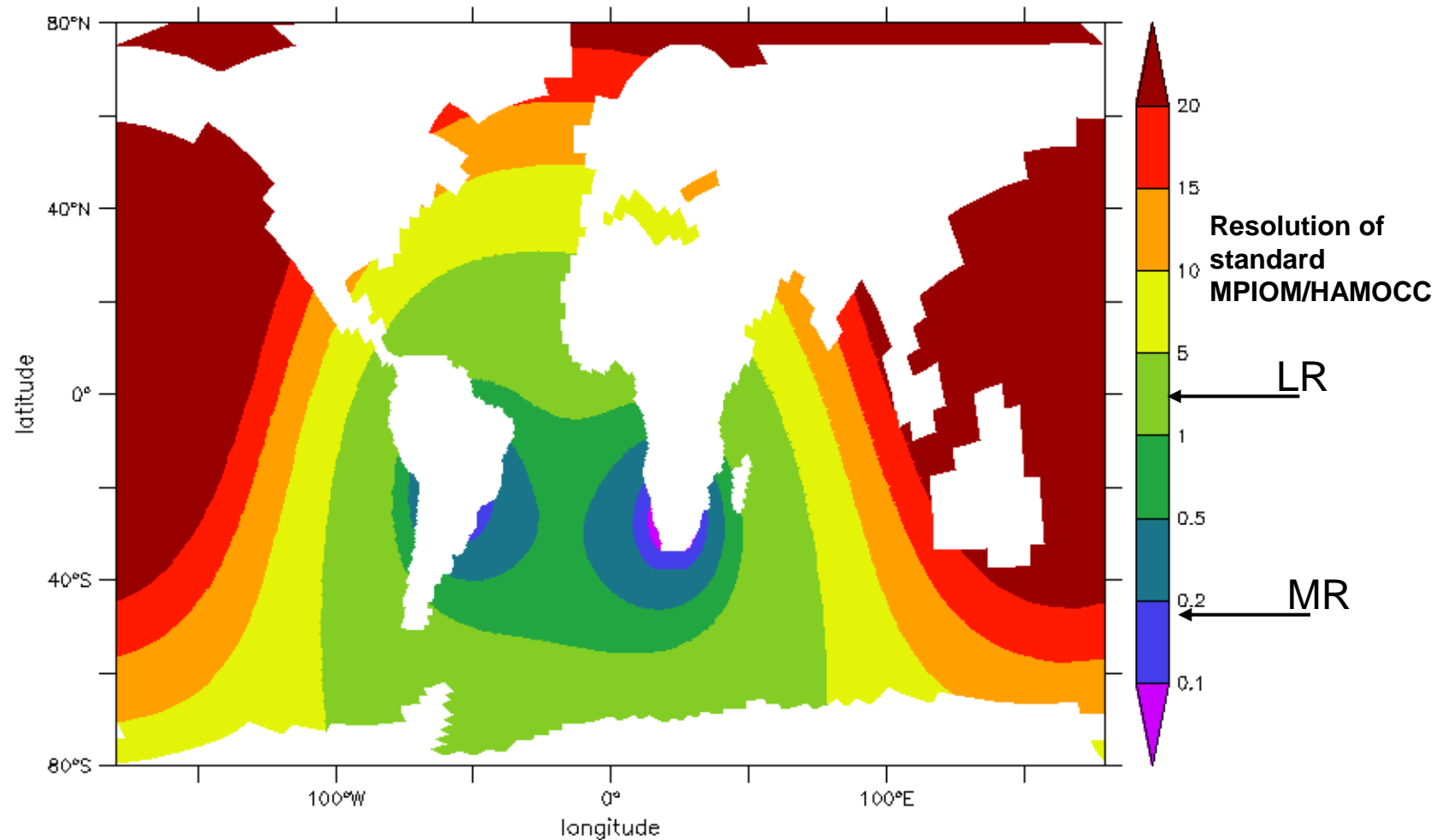
Improve our understanding of

- seasonal and interannual variations of C/N/O₂ fluxes
- open ocean – shelf interaction
- multiple stressors (warming, ocean acidification, deoxygenation) impacting on C/N fluxes

Report on :

- Model – Data - Comparison
- Some notes on ocean forcing

MPIOM/HAMOCC with regional grid refinement Benguela set up

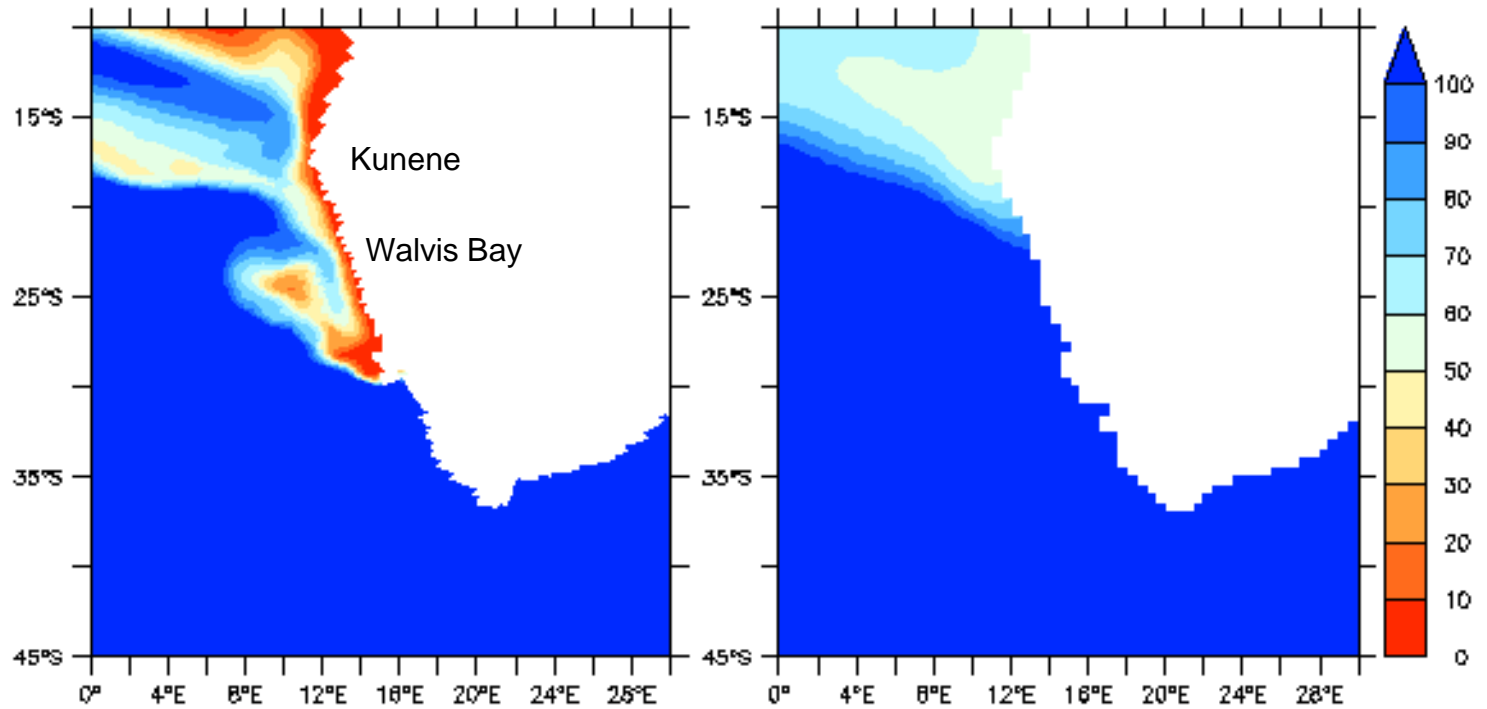


Area of grid cells [10^4 km^2]

Annual mean oxygen (200 m) [$\mu\text{mol/l}$]

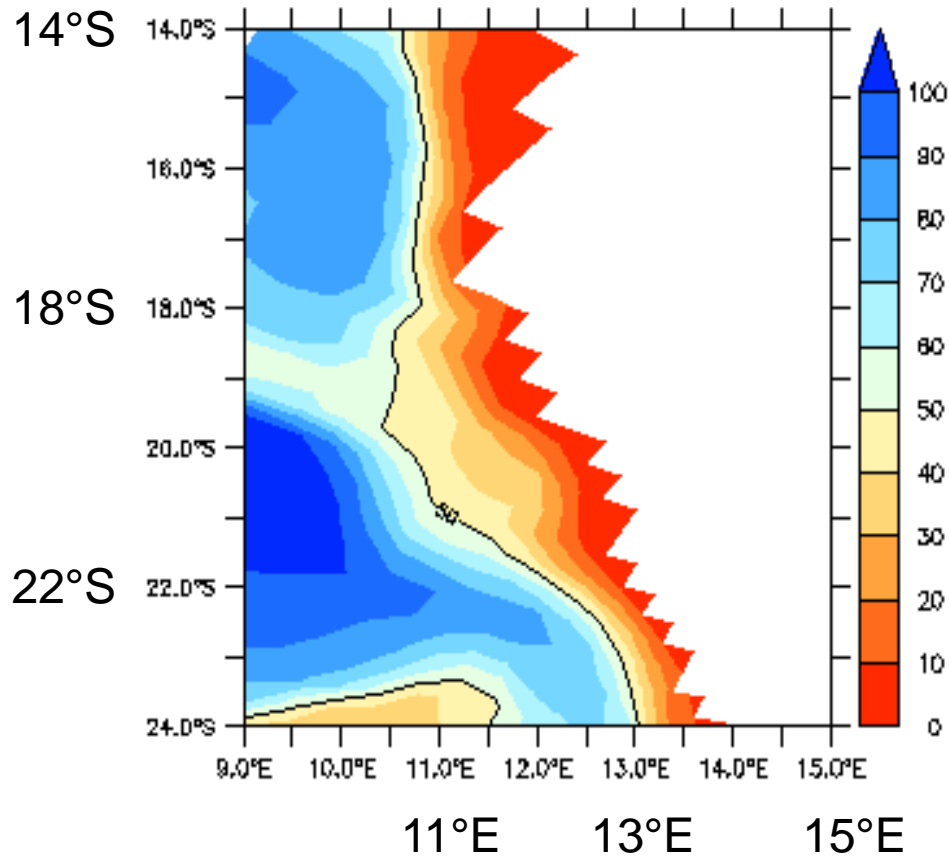
Model

WOA

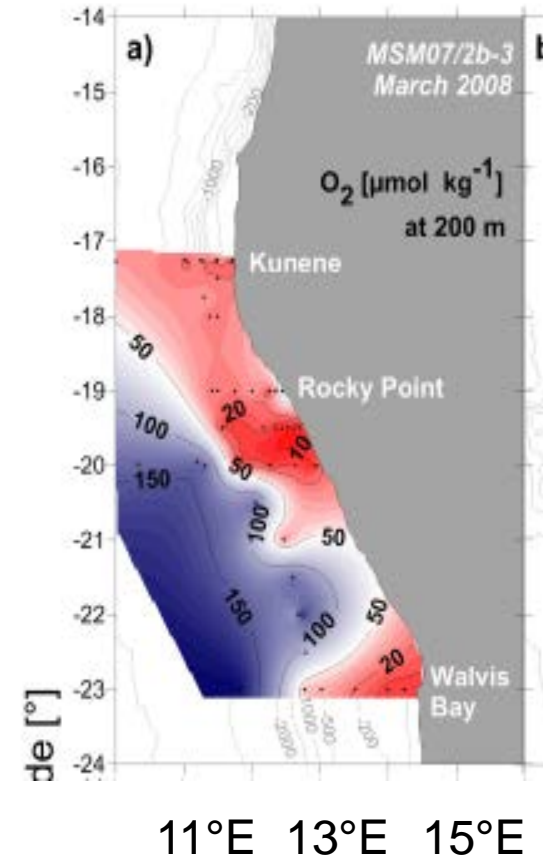


Annual mean oxygen (200 m) [$\mu\text{mol/l}$]

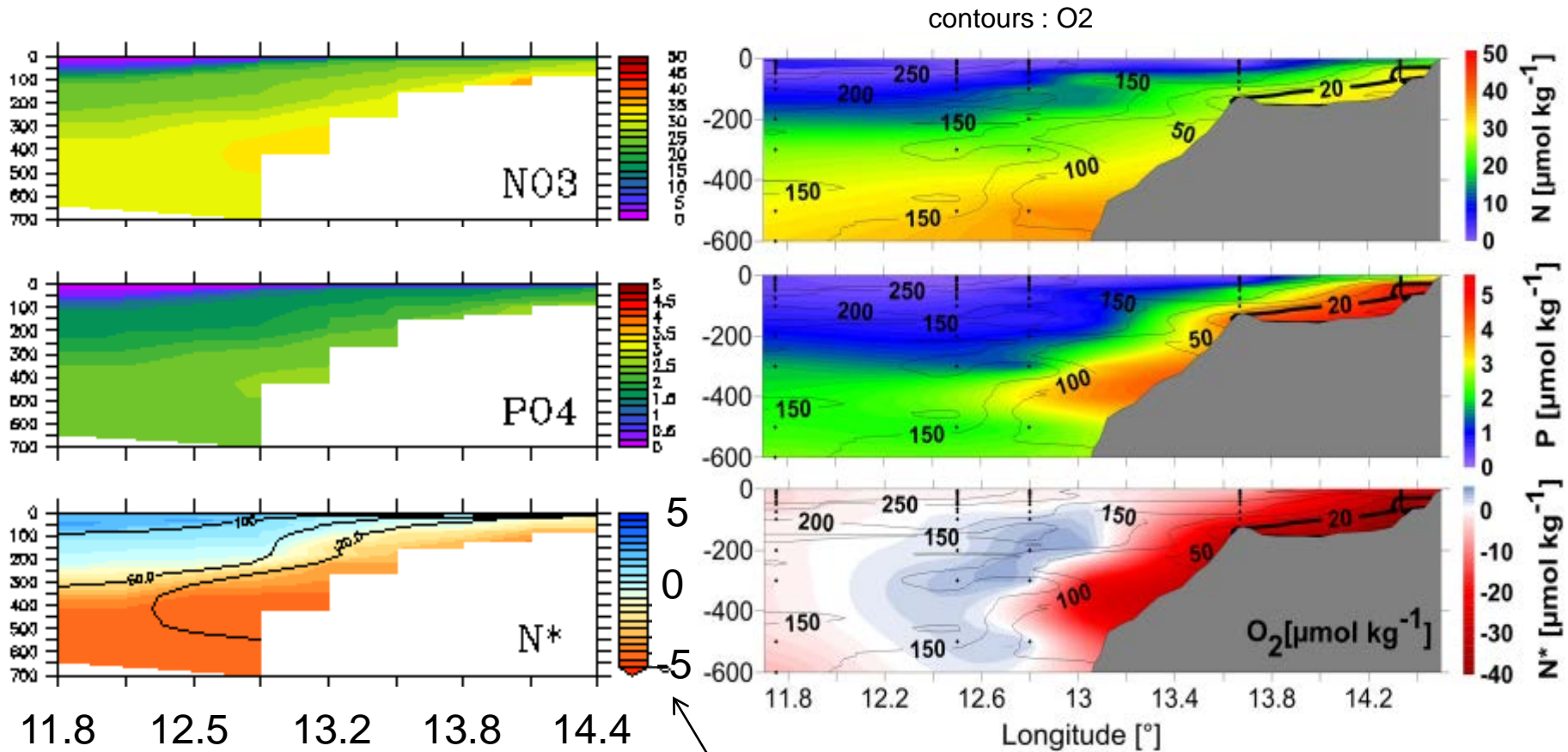
Model



Flohr et al (2014)



Walvis Bay 23°



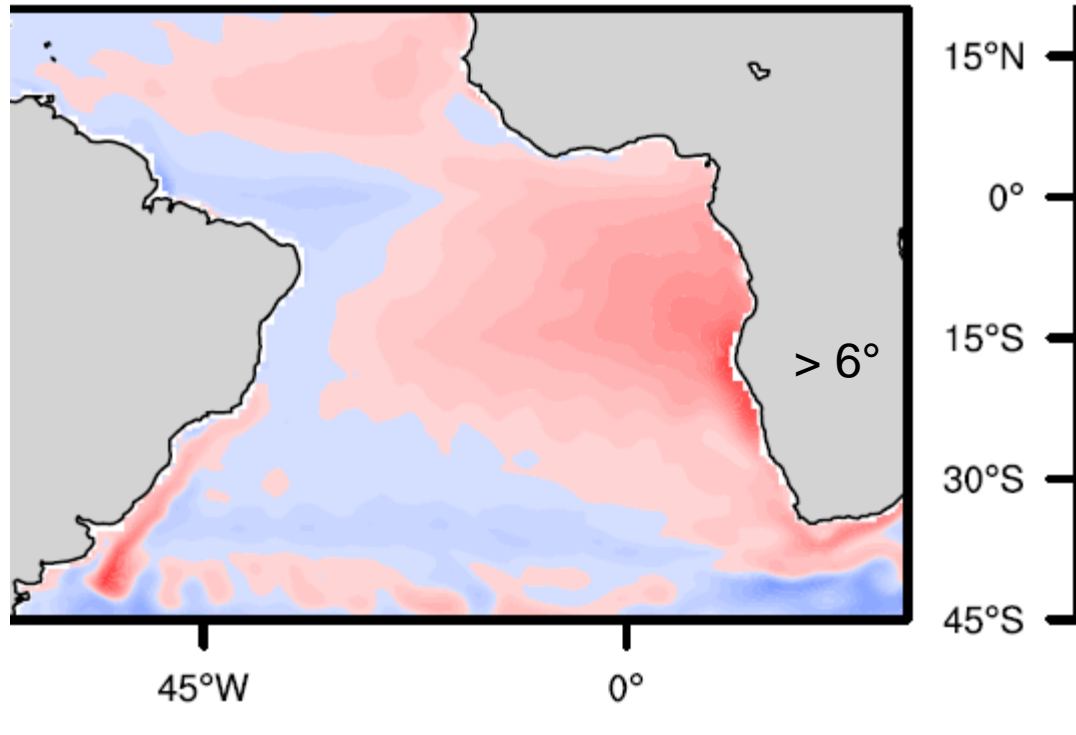
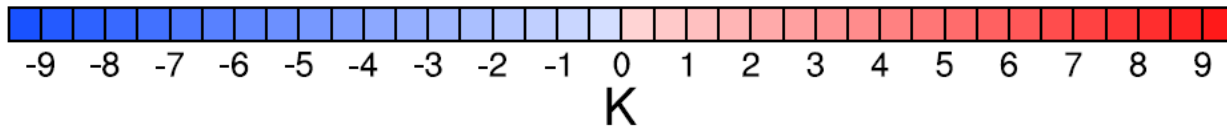
SCALE !

(Flohr et al. BG, 2014)

Oxygen: good spatial agreement with in situ data of Flohr et al,
WOCE data are poor in this region
too low O₂ at shelf edge
N/P/N* generally lower on shelf

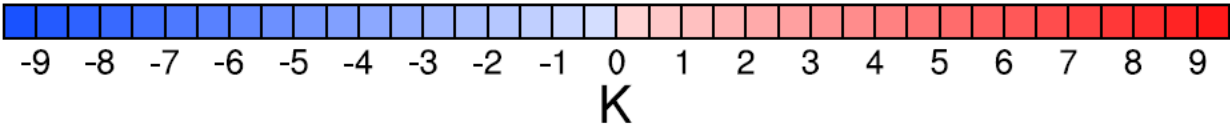
→ Representation of mixing / upwelling ?

Annual bias relative to HadISST CMIP5 : TP04/T63



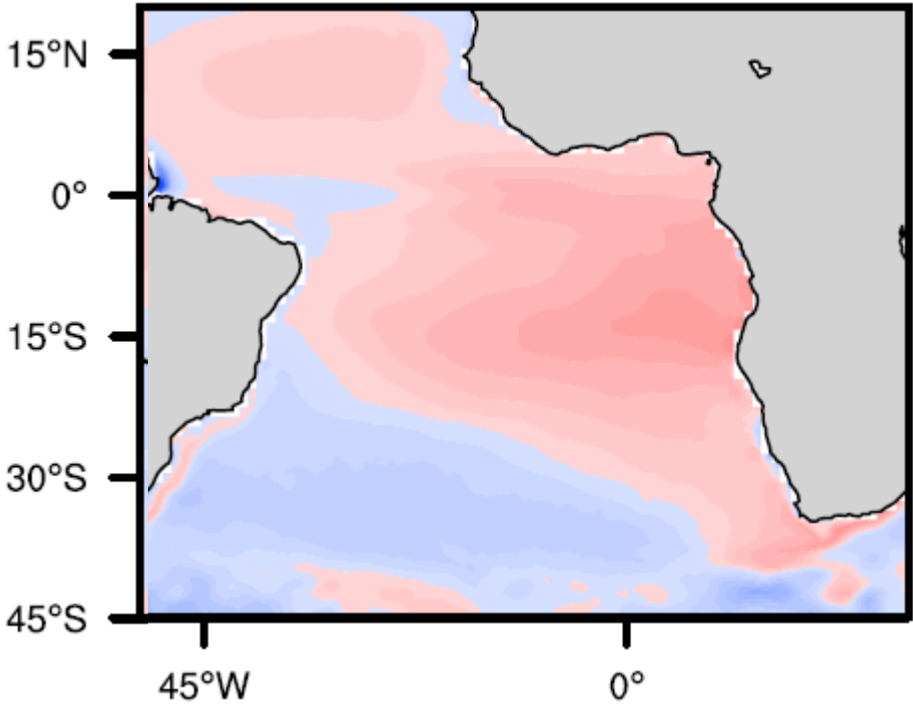
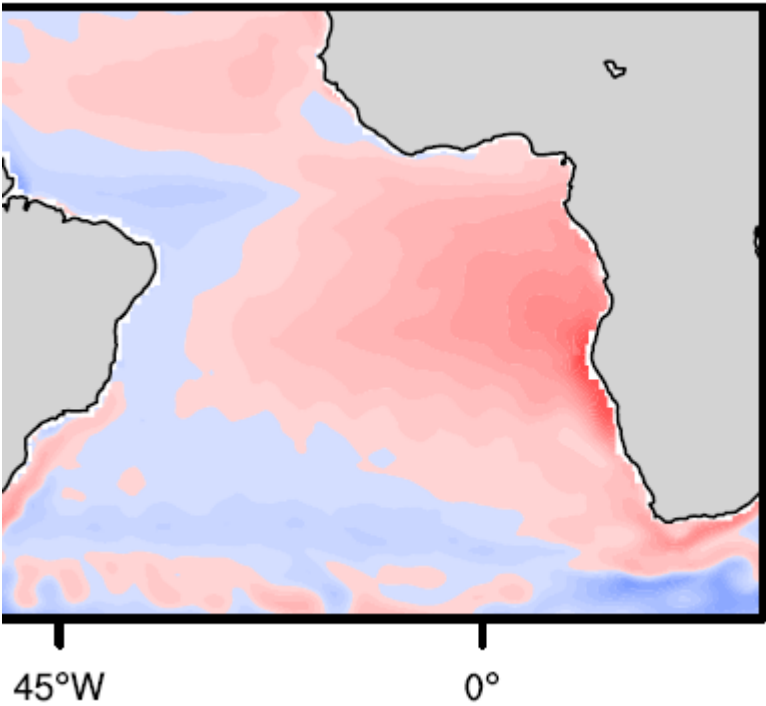
With courtesy of Sebastian Milinski

Annual bias relative to HadISST



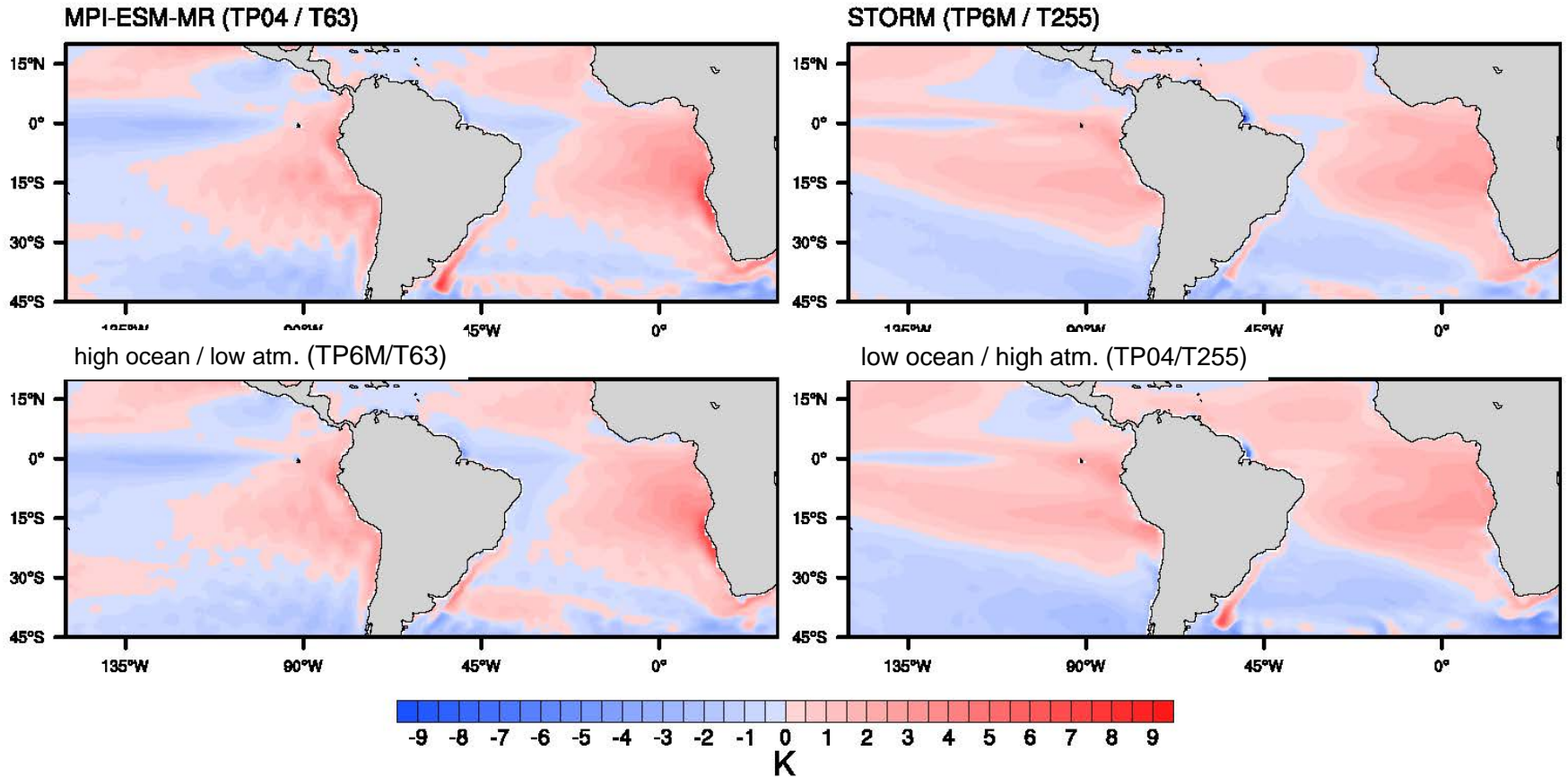
CMIP5 : TP04/T63

STORM: TP6M/T255



With courtesy of Sebastian Milinski

Annual mean SST bias relative to HadISST



With courtesy of Sebastian Milinski

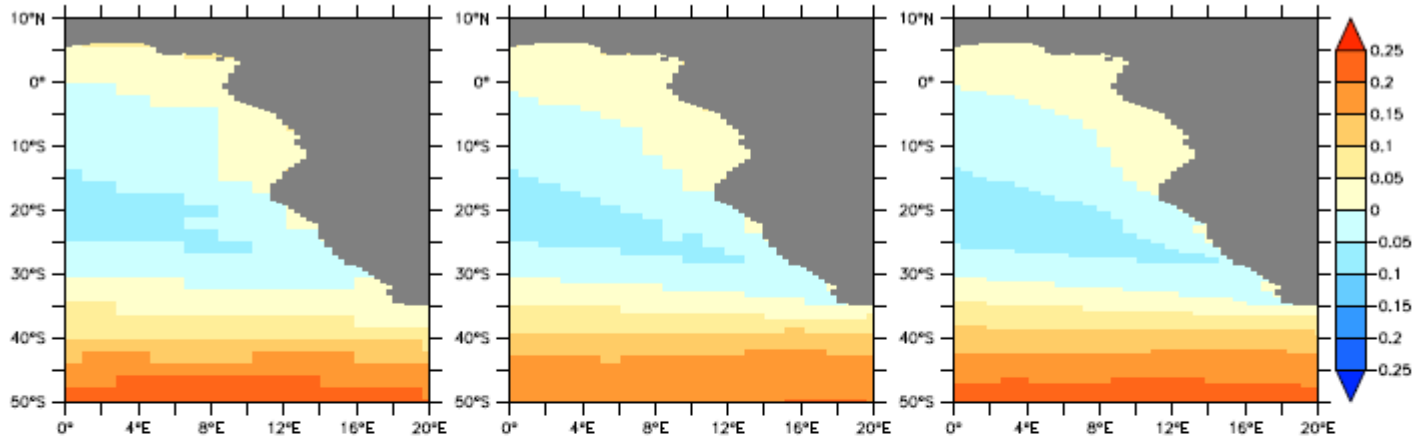
Wind stress components [Pa]

NCEP
T63 (2.5°x2.5°)

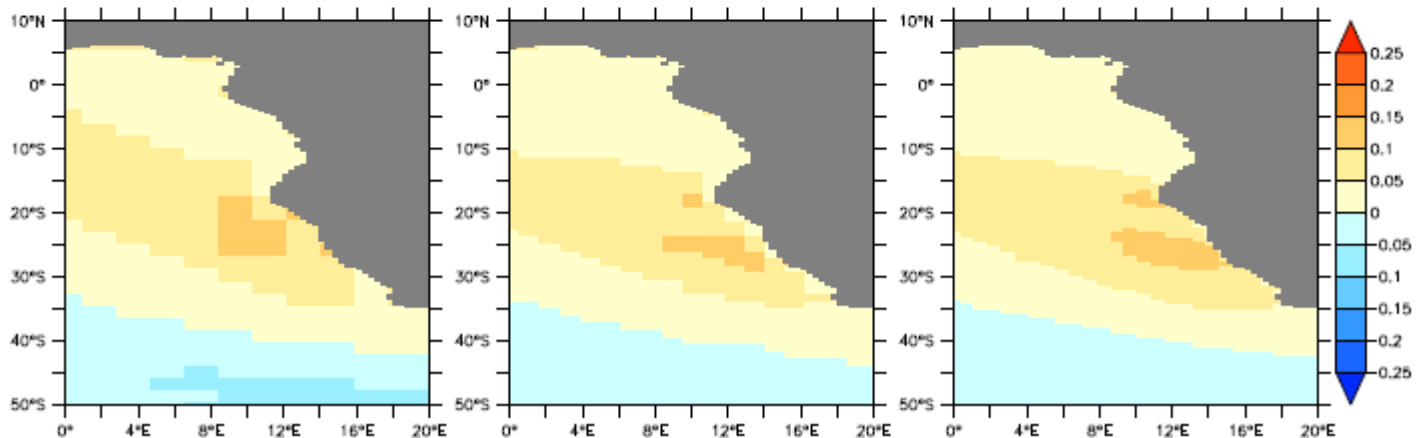
OMIP
T106 (1.18°x1.18)

ERAINT
T255 (0.75°x0.75°)

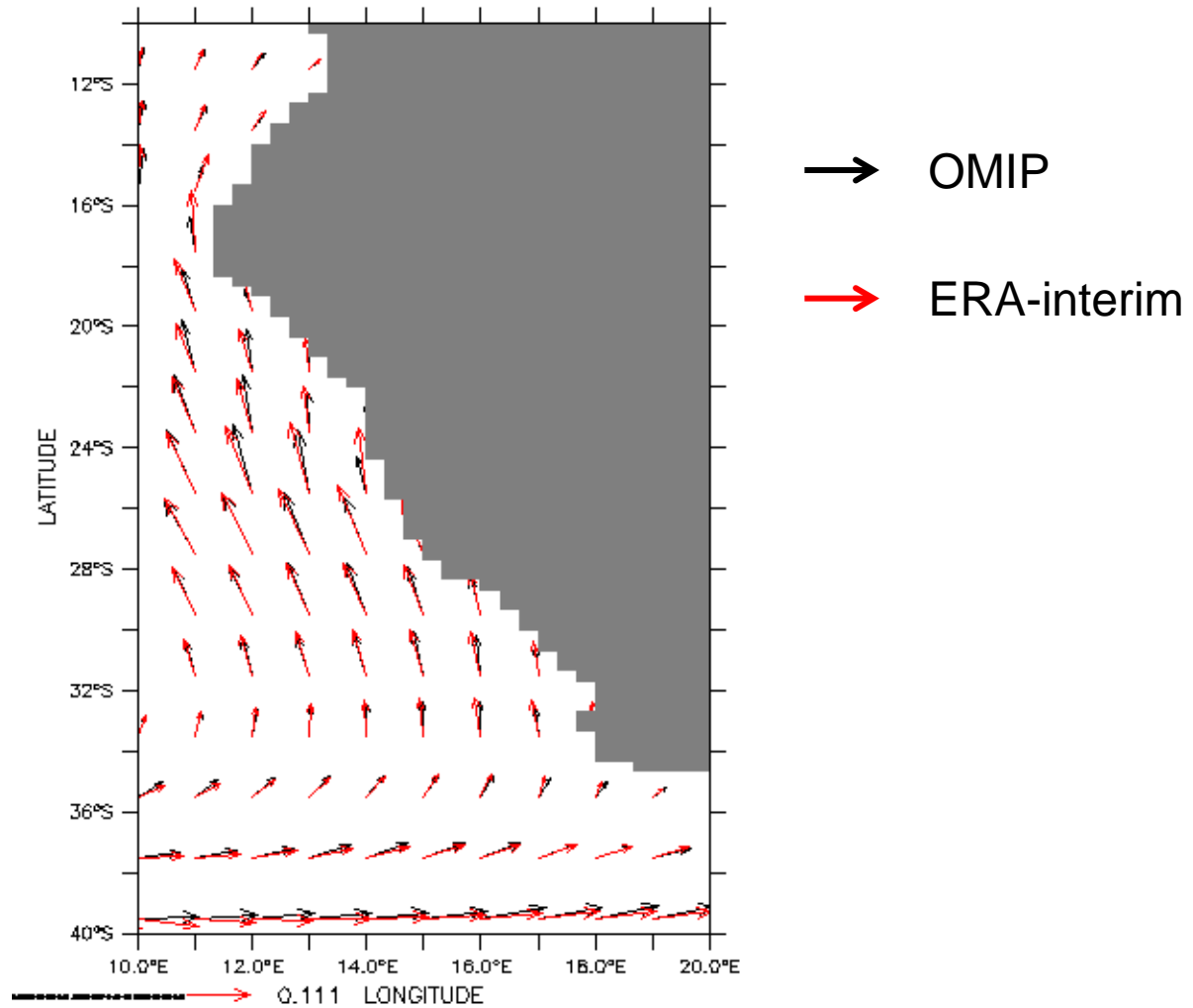
east



north



Wind stress vector

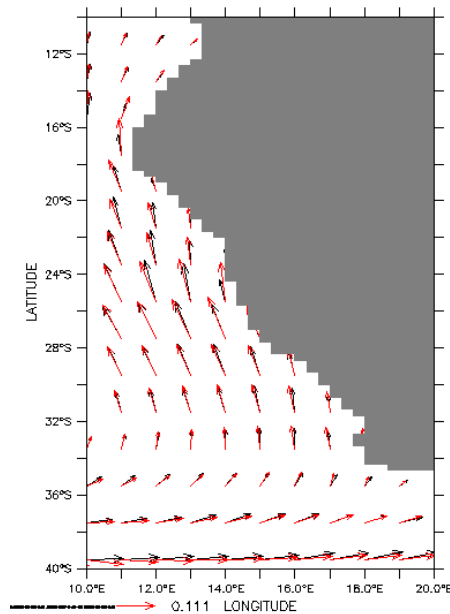


- “missing” northward wind component in NCEP and OMIP
- probably in all wind products from low resolution atm. models

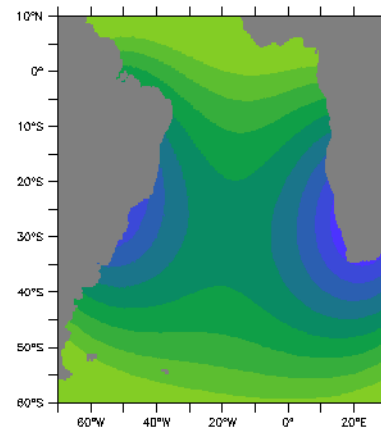
Next set up

- high resolution wind product (ERA-INTERIM)
- high resolution ocean

Resolution:



current set up



next set up

