ACCESS-CM 2.0 Development: Preliminary Results

Hailin Yan & Arnold Sullivan
ACCESS Coupled Modelling Team

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ACCESS-CM2.0 Configurations and Experiments

Submodels Upgrade (from ACCESS1.4)

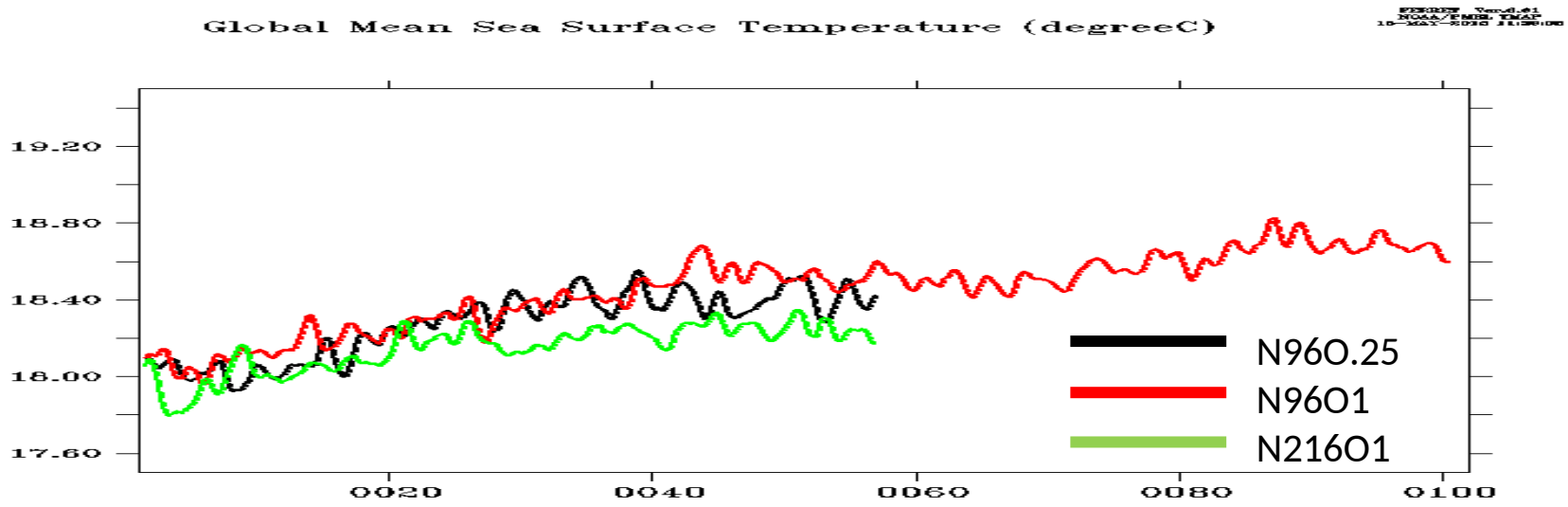
- UM8.5 with GA6.0: L85, ENDGame dynamics
- CICE5
- MOM5

Configurations and Experiments

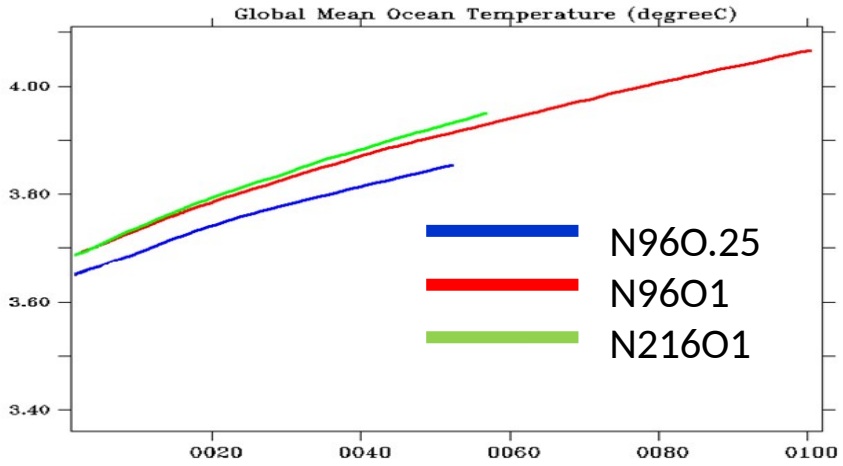
Resolution	UM8.5	MOM5 /CICE5	Job Status	Computing Efficiency
N96O1	N96	1 degree	100 years, done	496 cores, 5 y/d
N216O1	N216	1 degree	56 years, UM fails	1376 cores, 2.5 y/d
N96O.25	N96	0.25 degree	60 years, ongoing	2112 cores, 2.2 y/d
N216O.25	N216	0.25 degree	2 years, UM fails	2688 cores, 1.5 y/d

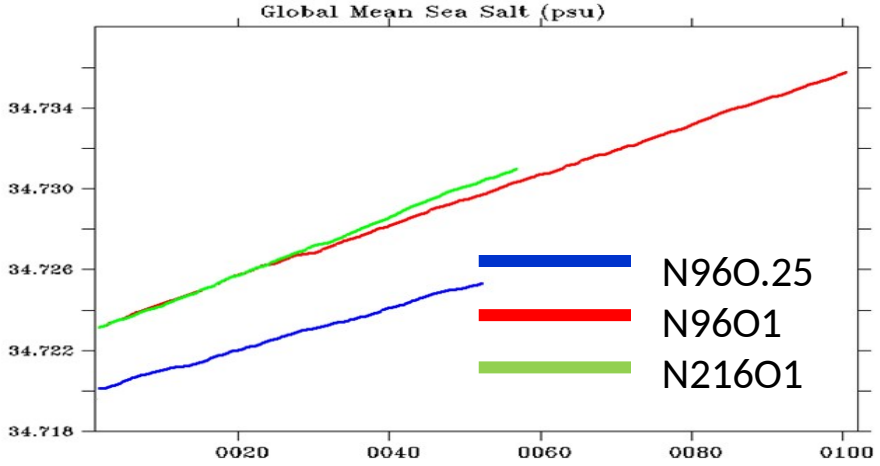
Preliminary results are presented below for model assessment……

SST Evolution



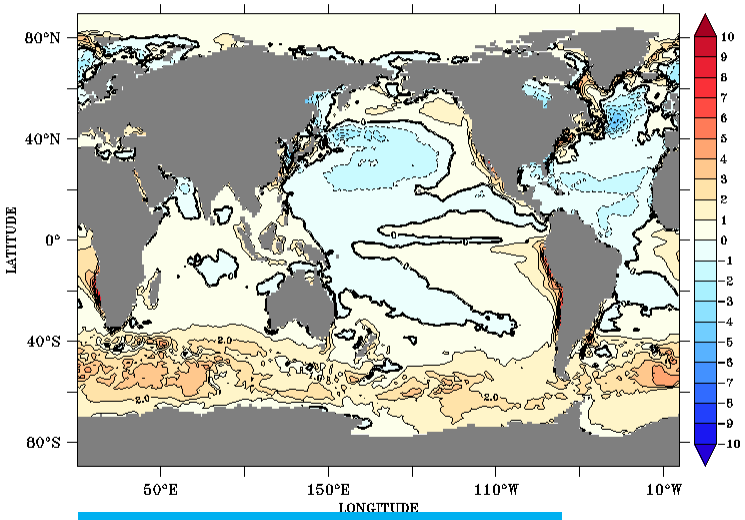
Global ocean temperature & salinity



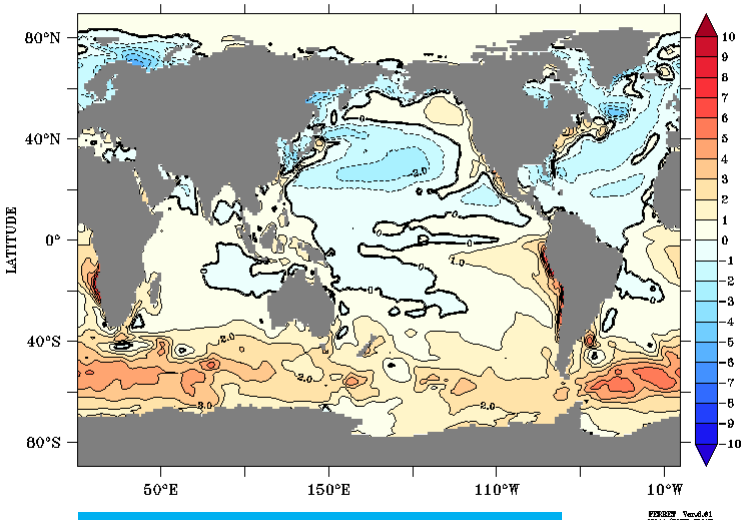


SST Bias

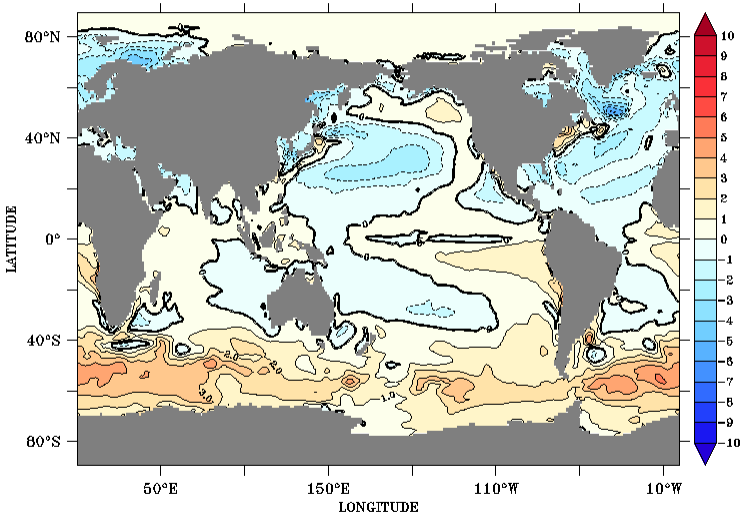
N96O.25 (yrs 41-50)



N96O1 (yrs 41-50)

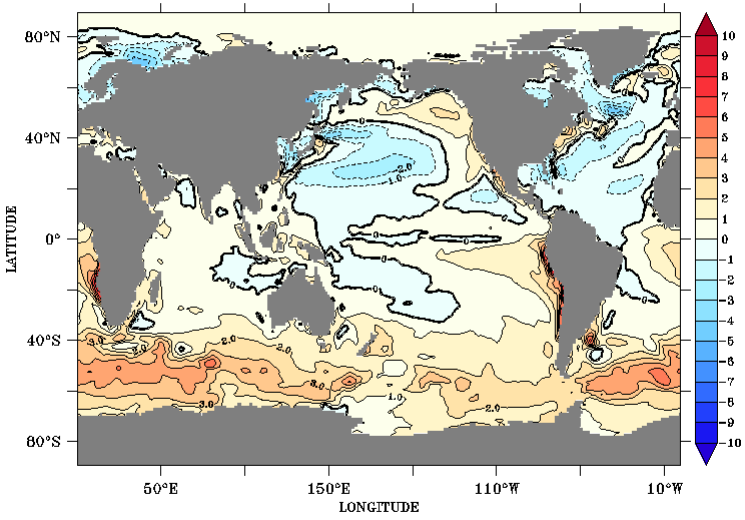


N216O1 (yrs 41-50)



$REG_TEMP - OBS_TEMP$

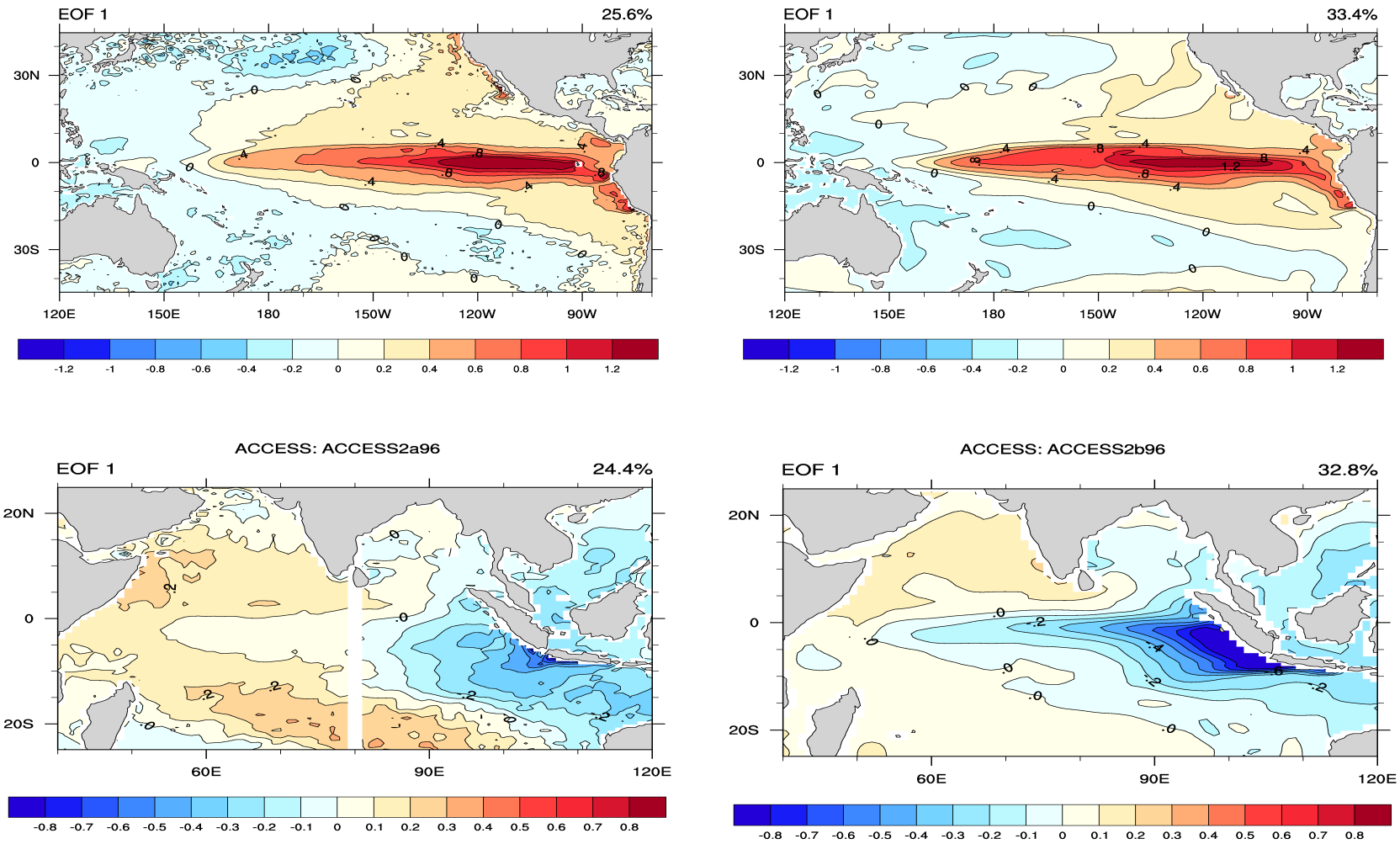
N96O1 (yrs 91-100)



$REG_TEMP - OBS_TEMP$

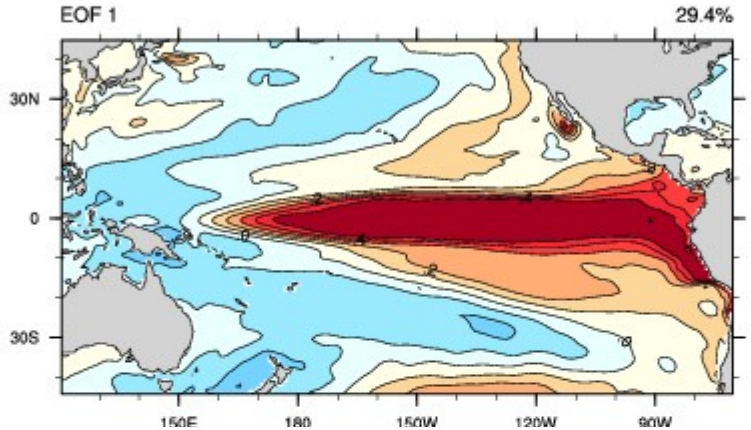
Simulated ENSO and IOD Variability (SON)

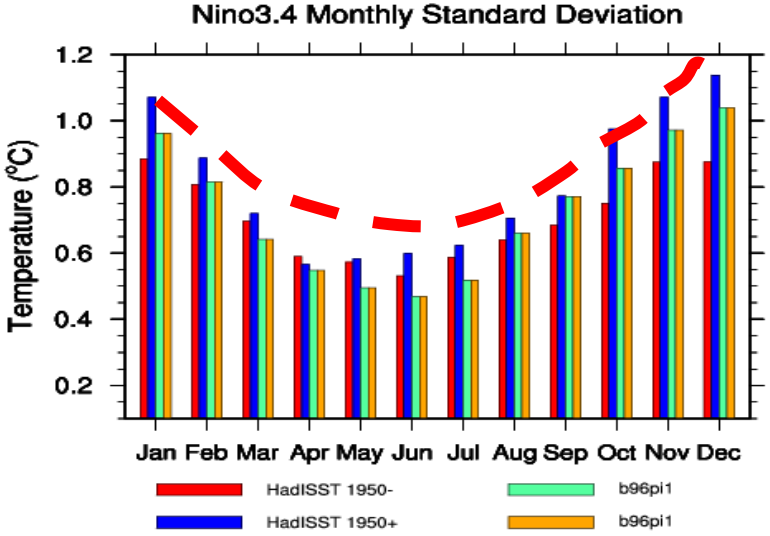
N96O.25 Yrs: 1-50 **N96O1**

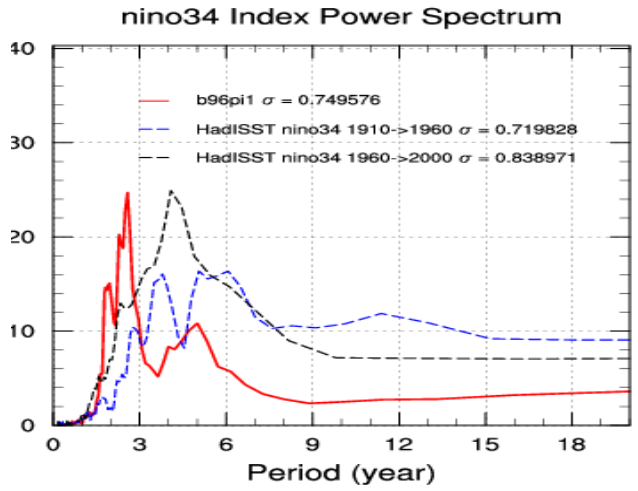


ENSO Variability, Seasonality & Power spectrum

N96O1 Yrs: 21-100

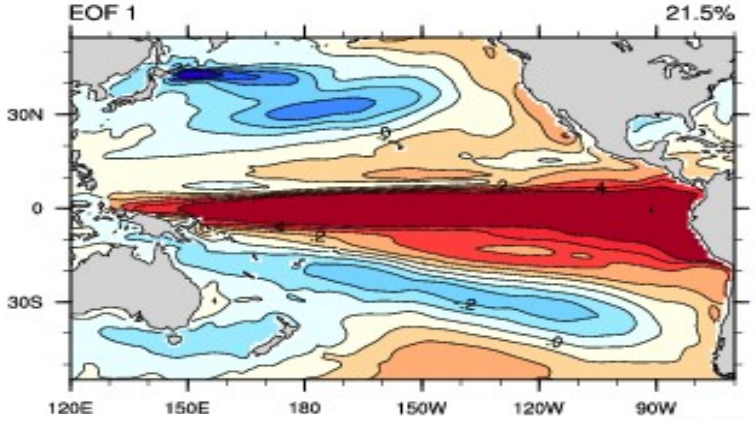


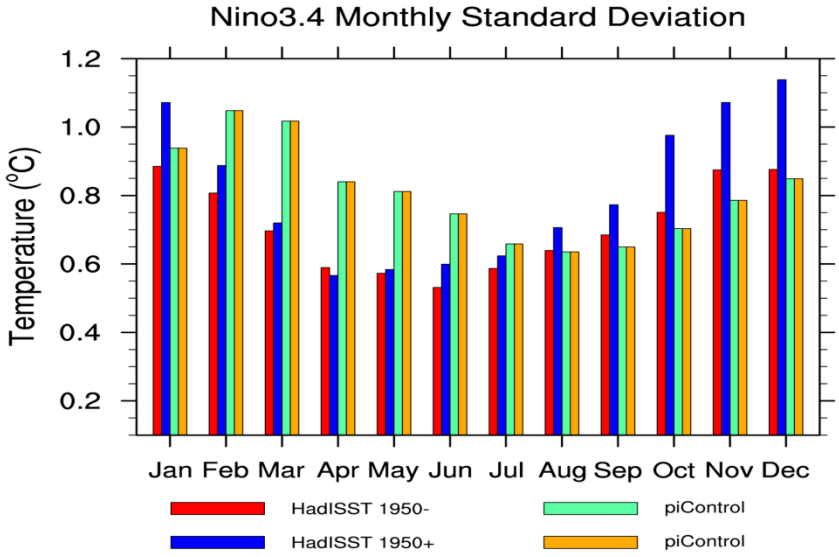


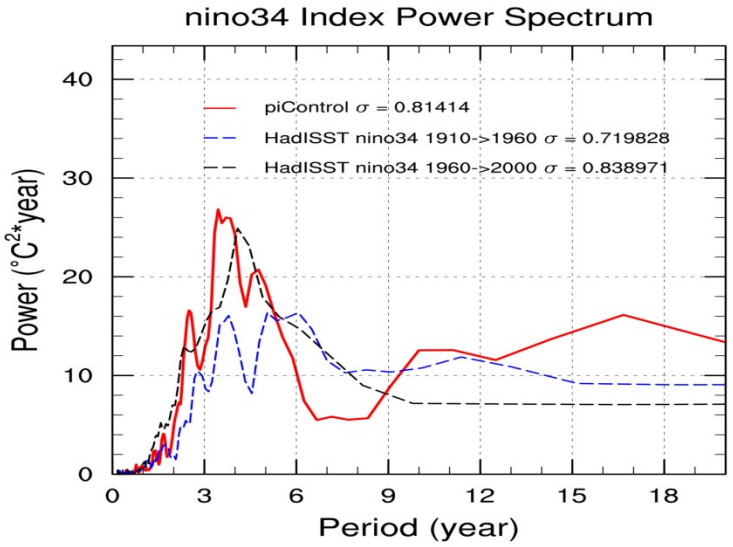


ENSO Variability, Seasonality & Power spectrum

ACCESS1.4 Yrs: 650-749







Oceanic Thermohaline Circulations (SV)

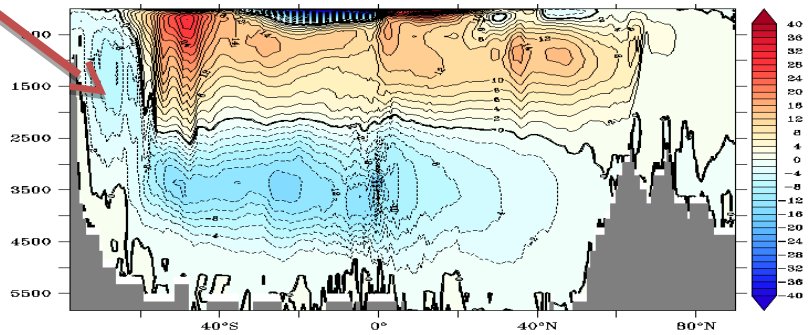
Global ocean

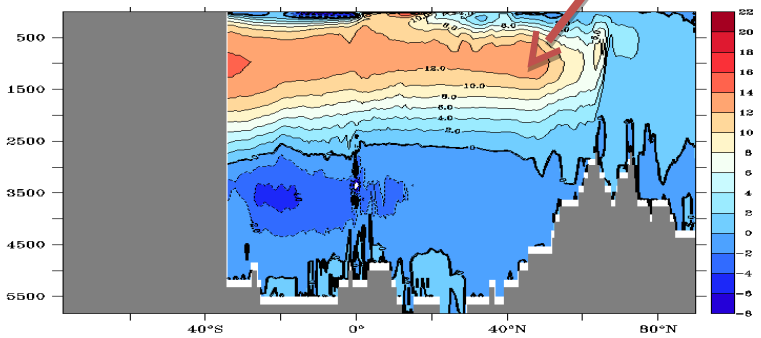
Atlantic

AABWF

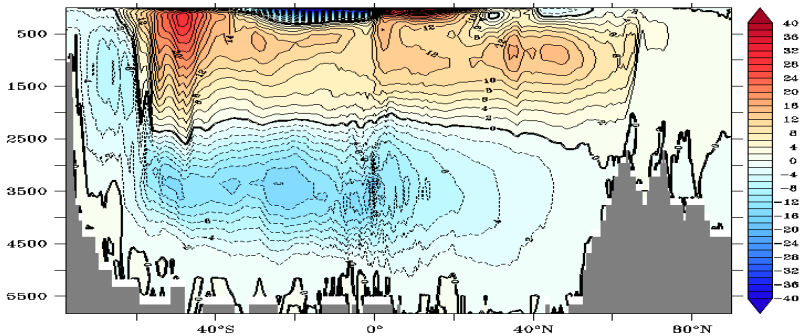
NADWF

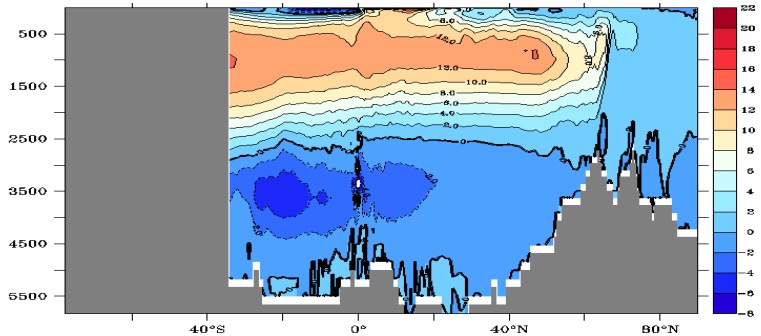
N216O1
Yrs31-60



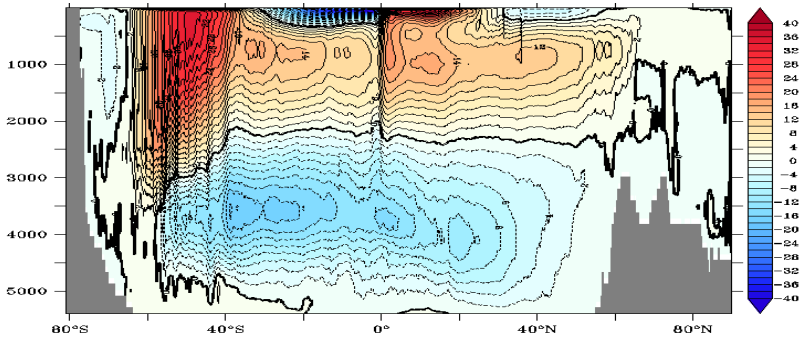


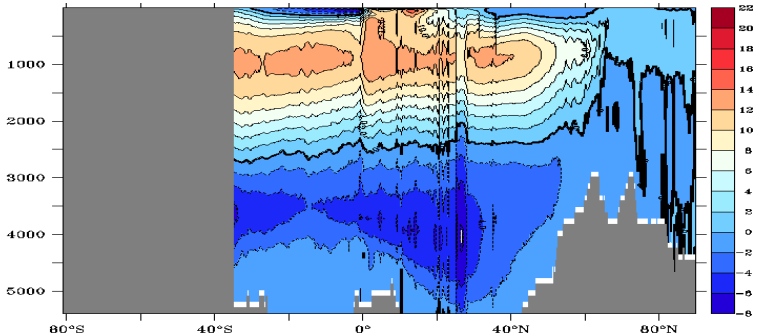
N96O1
Yrs31-60





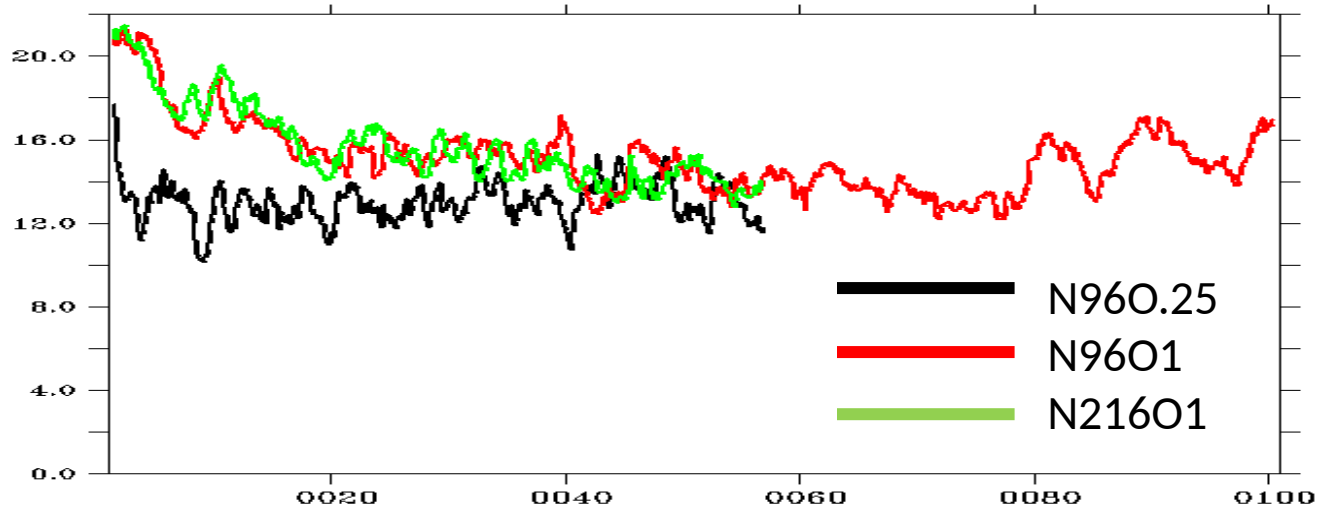
N96O.25
Yrs27-56



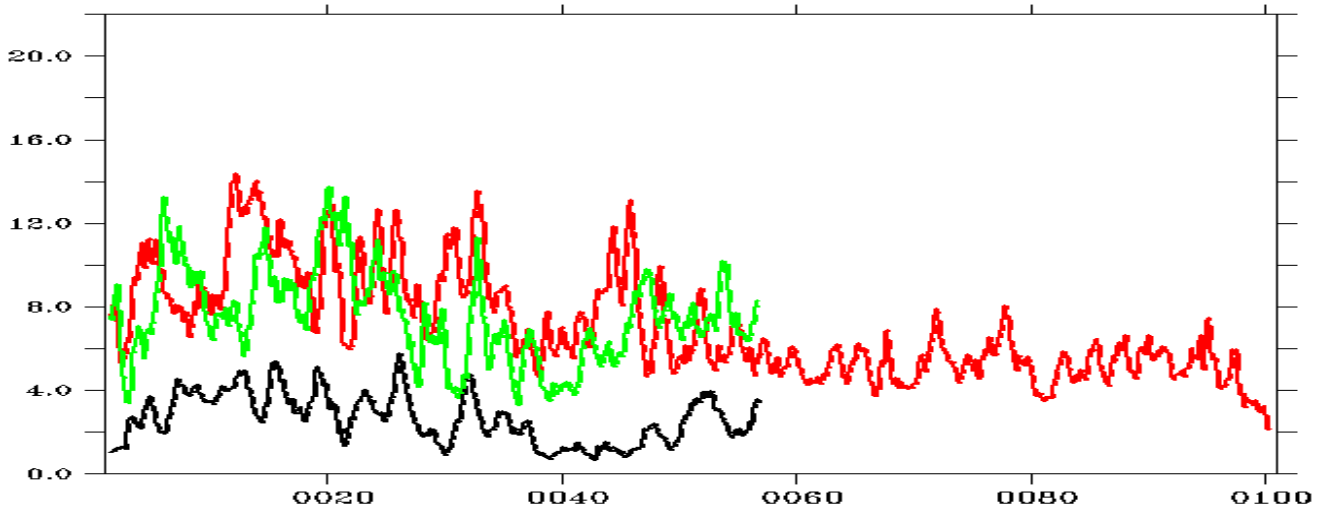


Mass transports: NADWF & AABWF (Sv)

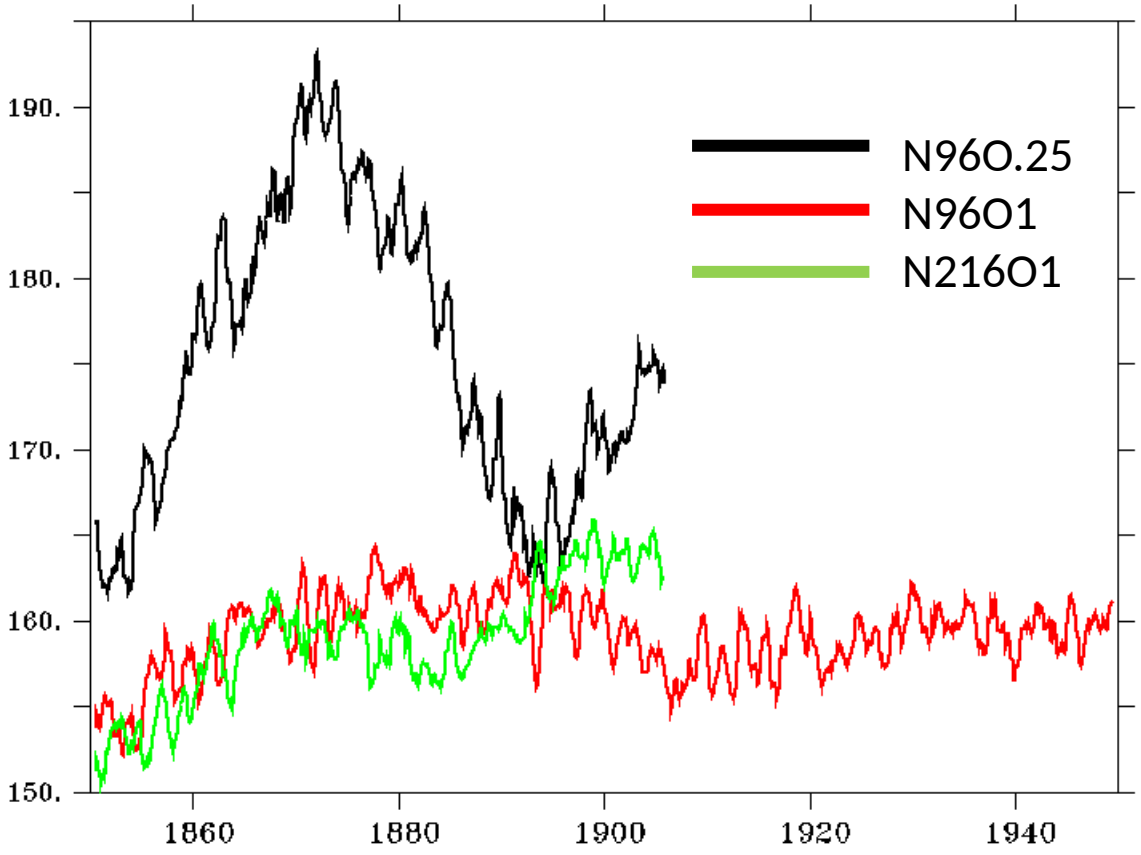
Atlantic Meridional Overturning Circulation



Antarctic Upwelling Circulation



ACC Transport (Sv) through Drake Passage



Summary and future work

Progress and problem:

- ACCESS-CM2 has been developed with a few prototype configurations
- The test runs produce many “familiar” features of the climate system, with some advantages and disadvantages over ACCESS1.x models
- Configurations with high resolution UM (N216) failed in UM for similar reason, although at different stages……

Work to do:

- UM10 with GA7
- MOM5 grid refinement for 0.25deg resolution
- CABLE2.x integration
- Scalability performance improvement
- Model tunning on scientific performance