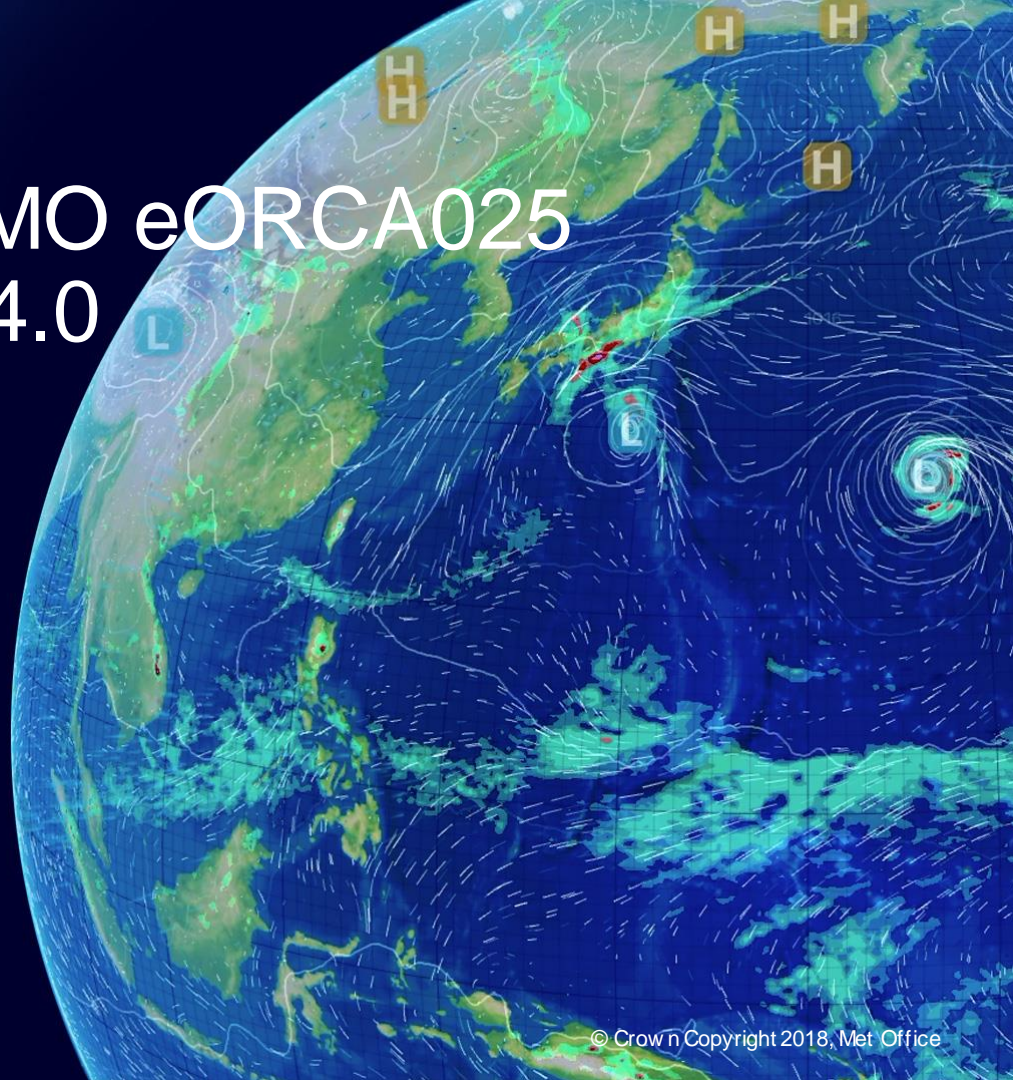


Comparison of the UKMO eORCA025 NEMO-3.6 and NEMO4.0

Dave Storkey, Pierre Mathiot and
Join Marine Modelling Program
NEMO System Team



GO6 description

- NEMO 3.6 based
- Z^*
- ISF param.
- ICB module
- CICE

- Filtered free surface
- TKE
- Vector form
- EEN (old formulation)
- TVD
- CORE bulk formula
- EOS80

- eORCA025
- CORE2
- 1976 -> 2005
- EN4

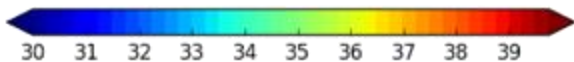
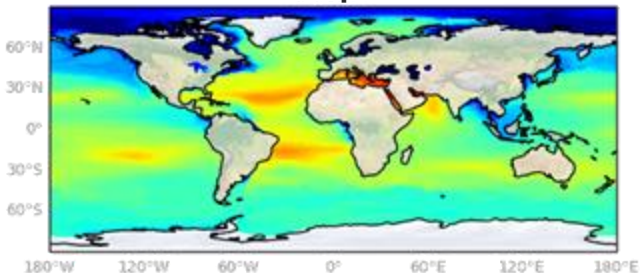
GO8 description

- NEMO ~~3.6~~ **4.0 beta** based
- Z*
- ISF param.
- ICB module
- ~~CICE~~ **SI3**
- **Split-explicit** ~~Filtered~~-free surface
- TKE
- Vector form
- EEN (old formulation)
- TVD
- CORE bulk formula **updated** (AEROBULK module)
- EOS80
- eORCA025
- CORE2
- 1976 -> 2005
- EN4
- **Default values for all the new functionality**

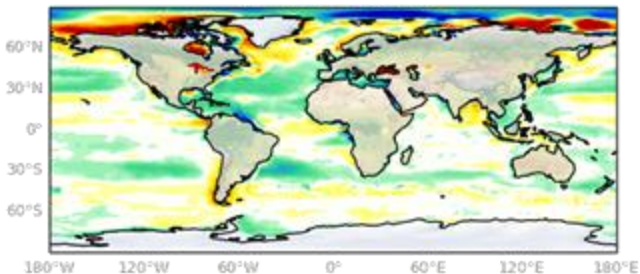
SSS change

Sea surface salinity 1995-2005

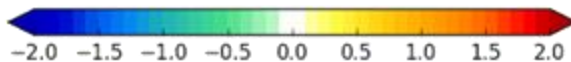
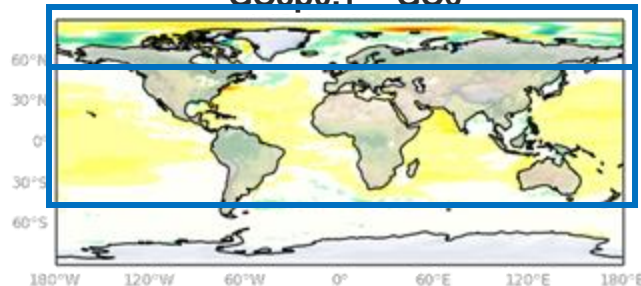
GO8p0.1



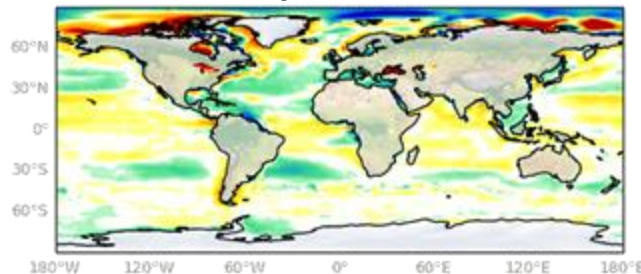
GO6 – EN4.1.1



GO8p0.1 – GO6



GO8p0.1 – EN4.1.1



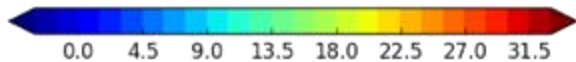
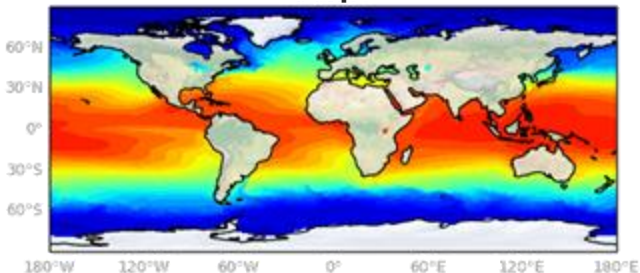
Change in sea
ice model

Change in bulk
formulation

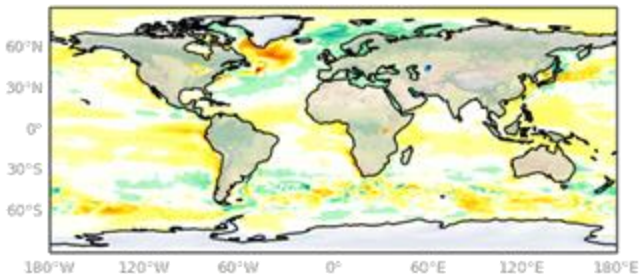
SST change

Sea surface temperature 1995-2005

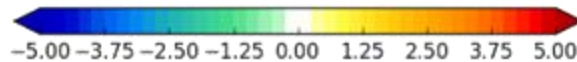
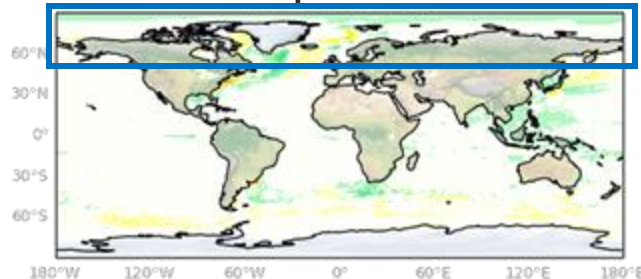
GO8p0.1



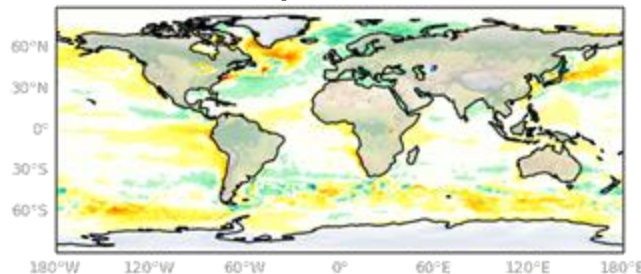
GO6 – EN4.1.1



GO8p0.1 – GO6



GO8p0.1 – EN4.1.1

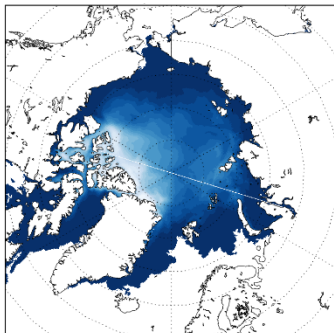


Change in sea
ice model

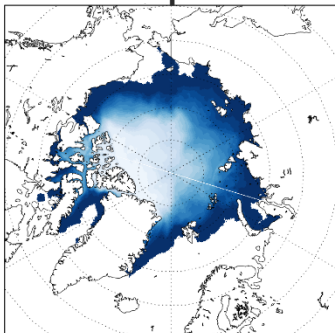
Sea ice change

sea ice concentration

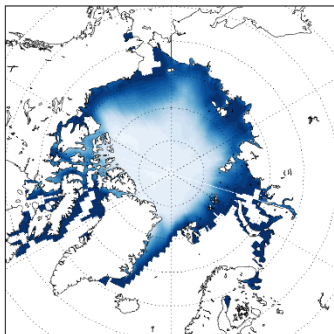
GO6



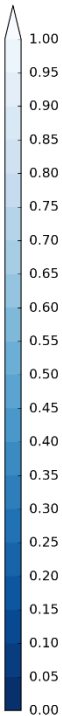
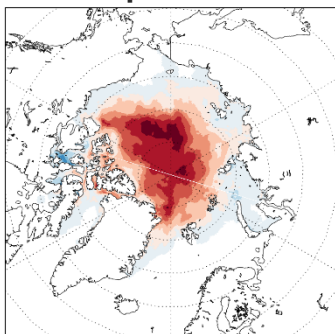
GO8p0.1



HadISST

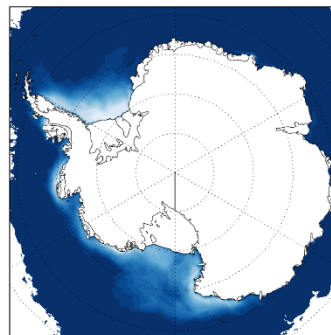


GO8p0.1 – GO6

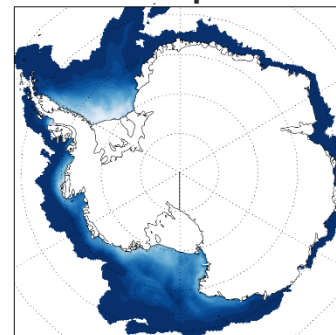


sea ice concentration (march)

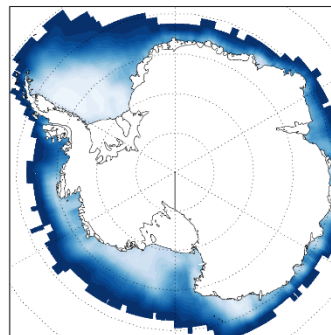
GO6



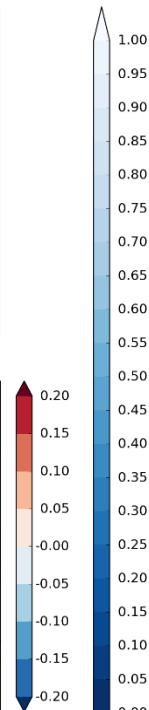
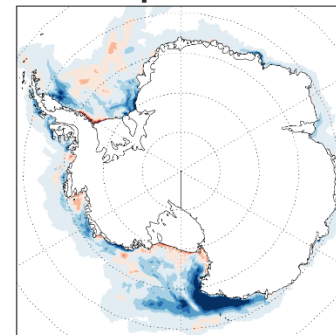
GO8p0.1



HadISST



GO8p0.1 – GO6

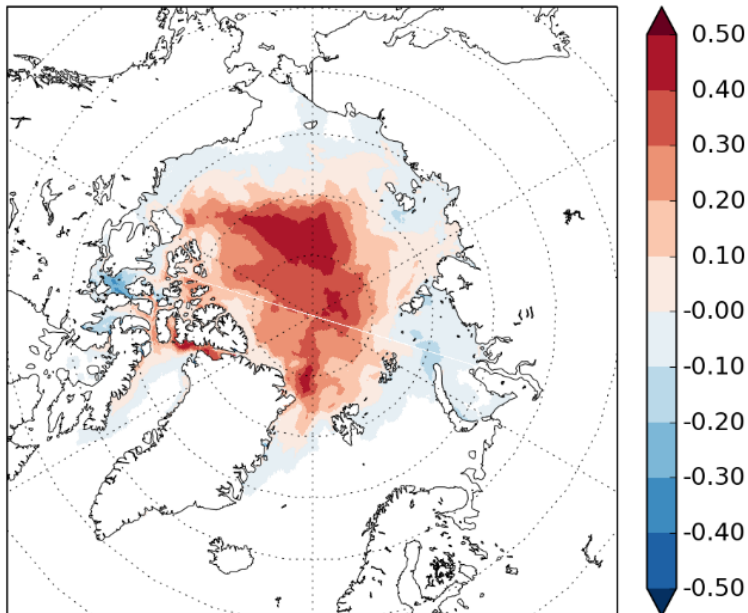


CICE -> SI3 change

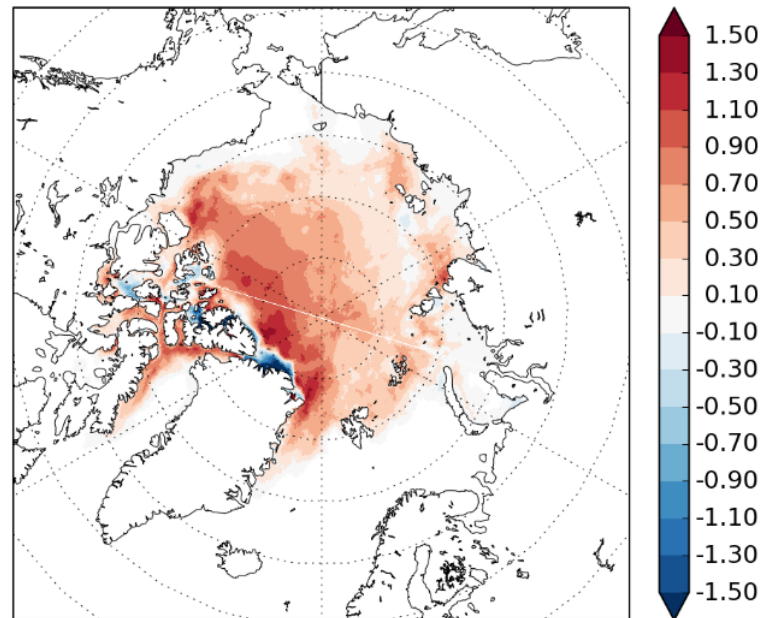
sea ice concentration (september)

sea ice thickness (september)

SI3 - CICE

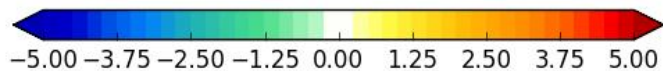
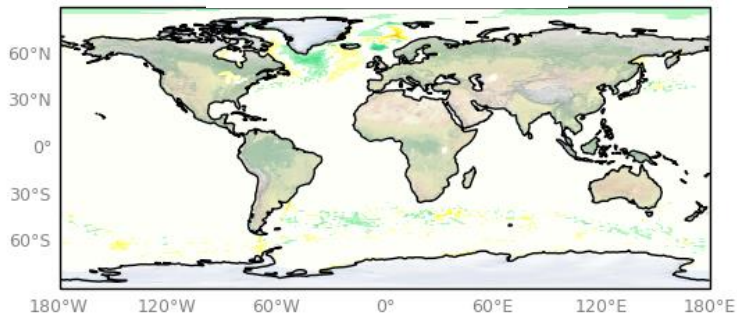


SI3 - CICE

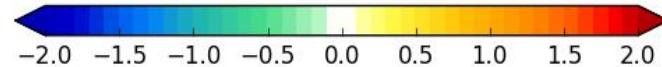
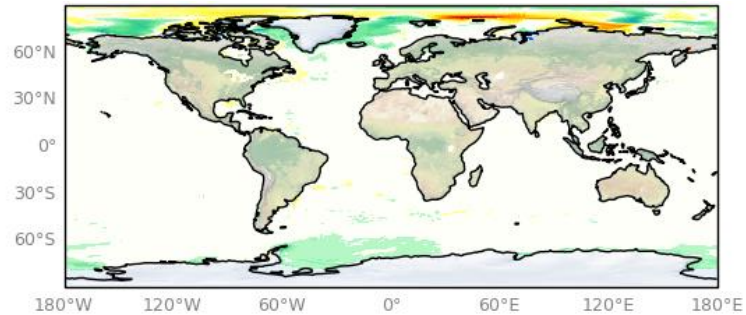


CICE -> SI3 change

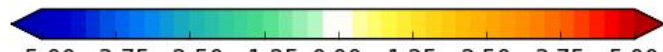
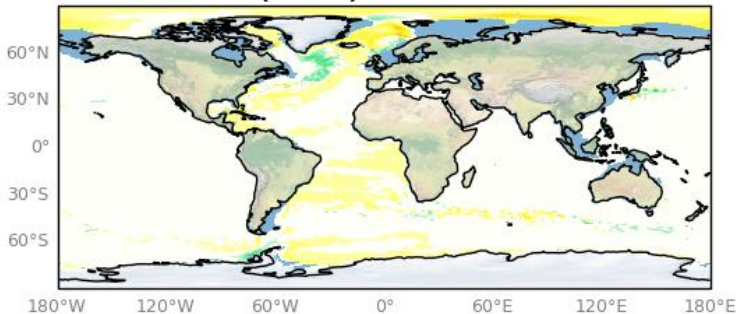
SST SI3 - CICE



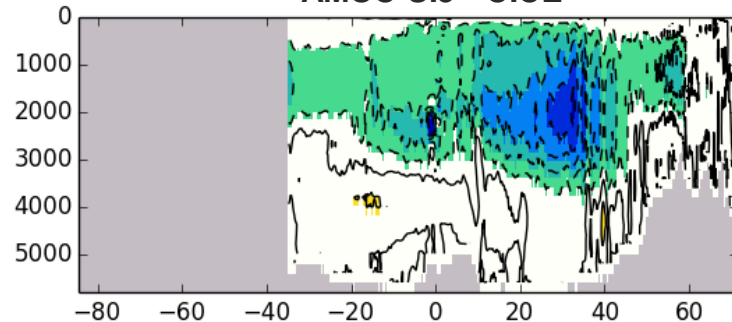
SSS SI3 - CICE



T (500m) SI3 - CICE



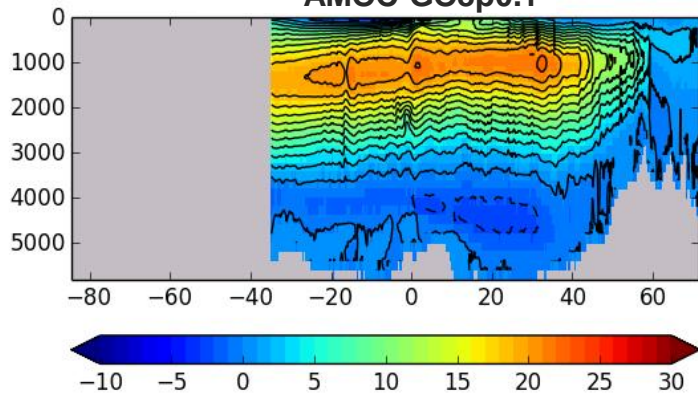
AMOC SI3 - CICE



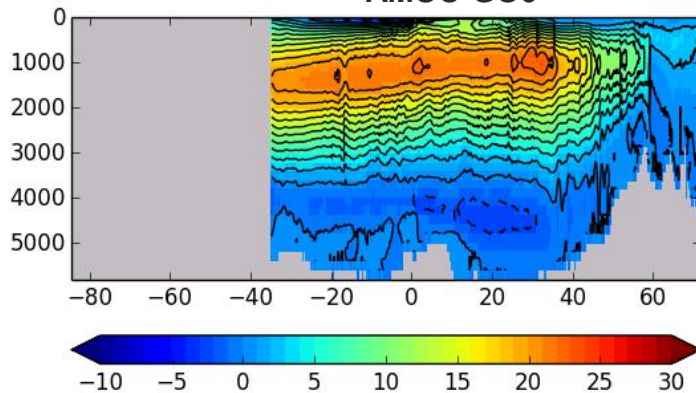
AMOC change

Meridional overturning streamfunction (atlantic)

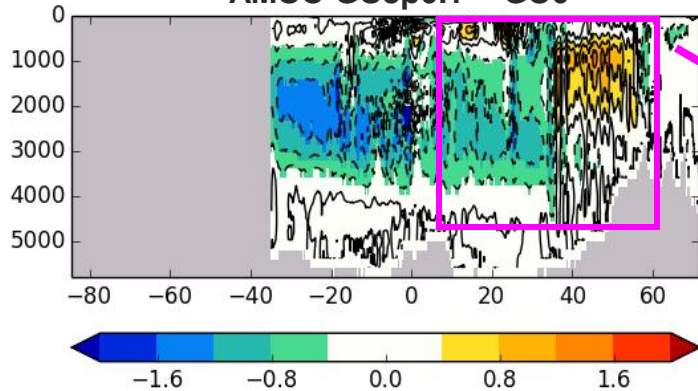
AMOC GO8p0.1



AMOC GO6

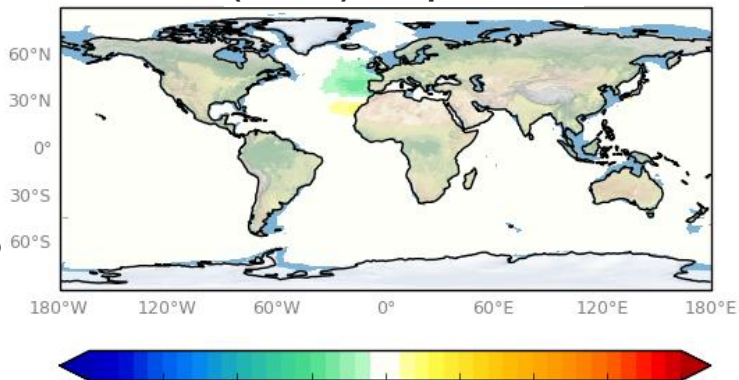


AMOC GO8p0.1 – GO6



Change in Med.
Sea overflow ?
Something else ?

S (1000m) GO8p0.1 – GO6



AMOC change

Main change between GO6 and GO8p0.1 :

- GO8p0.1 is as close as possible to our NEMO3.6 based GO6
- Arctic sea ice more compact and thicker in GO8p0.1
- Arctic sub-surface water warmer in GO8p0.1
=> move from CICE to SI3
- Sea surface saltier in the tropics and mid-latitude GO8p0.1
- Weaker AMOC GO8p0.1

At Met-Office we are happy with the NEMO 4.0 beta version.