Koninklijk Nederlands
Meteorologisch Instituut
Ministerie van Verkeer en Waterstaat

EC-Earth Ocean Working Group

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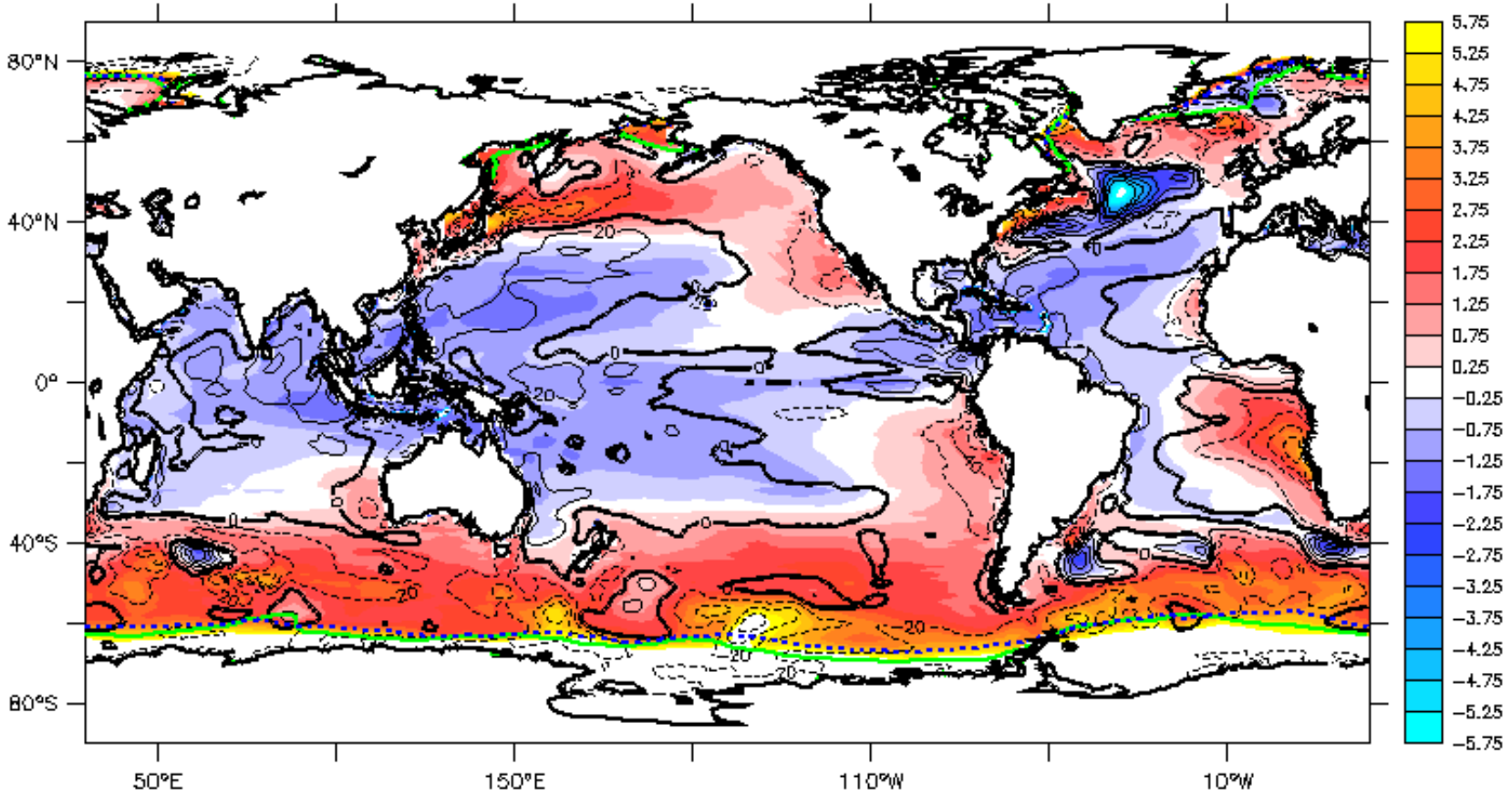
Action items from Lisbon meeting

- Warm bias in ACC. Mention to NEMO group that it is a dominant feature in coupled model biases
- Contribute to tuning of v2 (see also Torben S)
- Contribute to implementation of NEMO3, including LIM3 (Uwe)
- Work with ECMWF on ice model and coupling through OASIS3
- Explore implementation of PISCES biogeochemistry component
- Coordinate the choices on initialization for the decadal prediction/hindcast runs for CMIP5. Preferably make use of NEMOVAR

years 31-40
color: SST diff wrt ERA-40
isolines: qnet diff wrt ERA-40

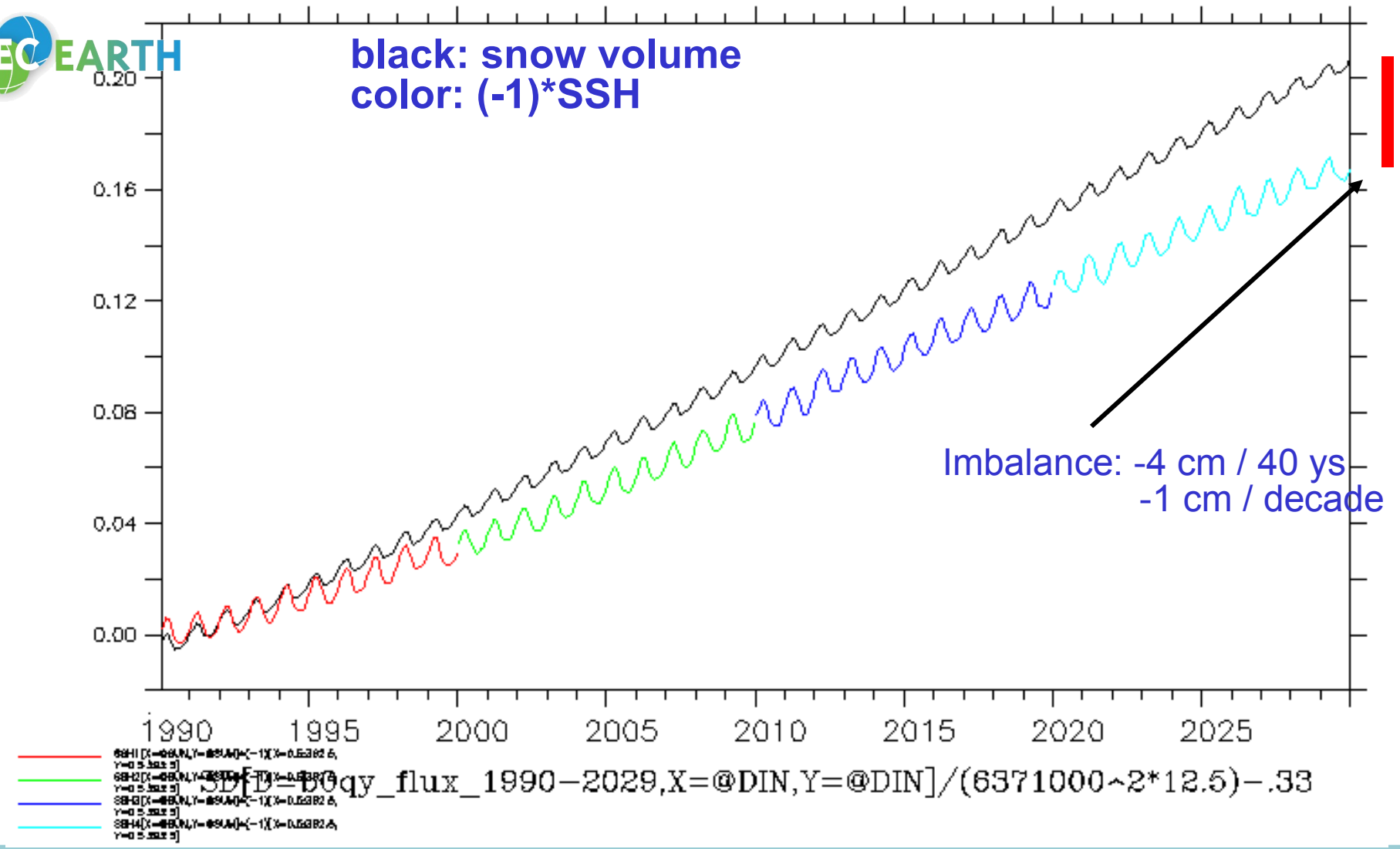


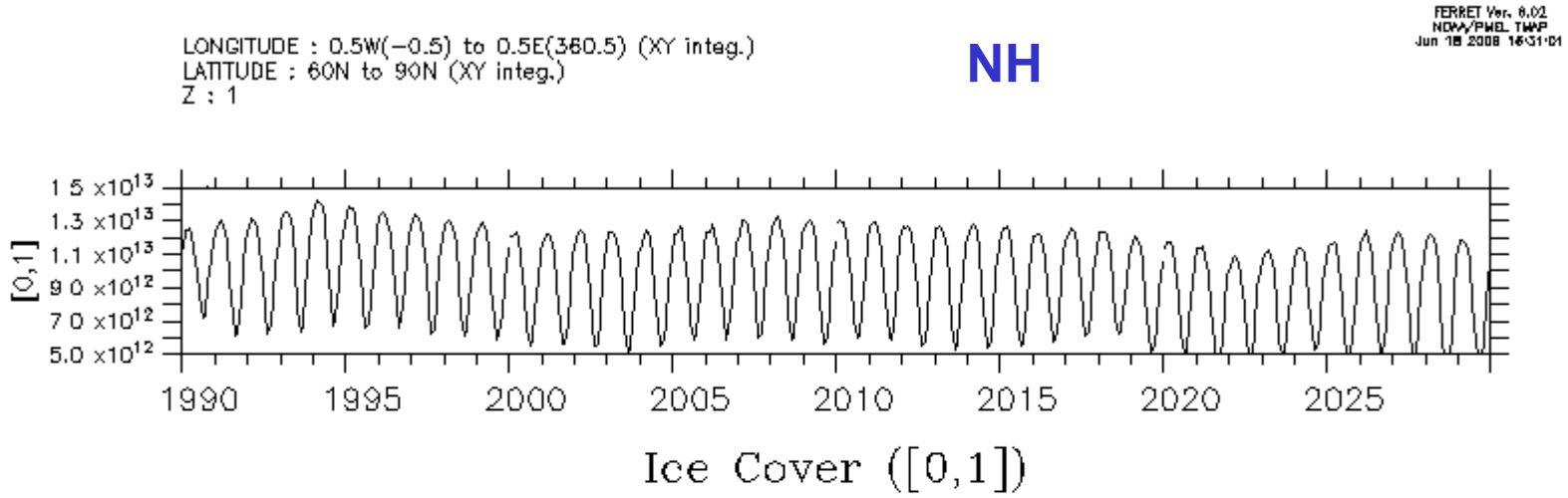
Warm bias in ACC – NEMO group

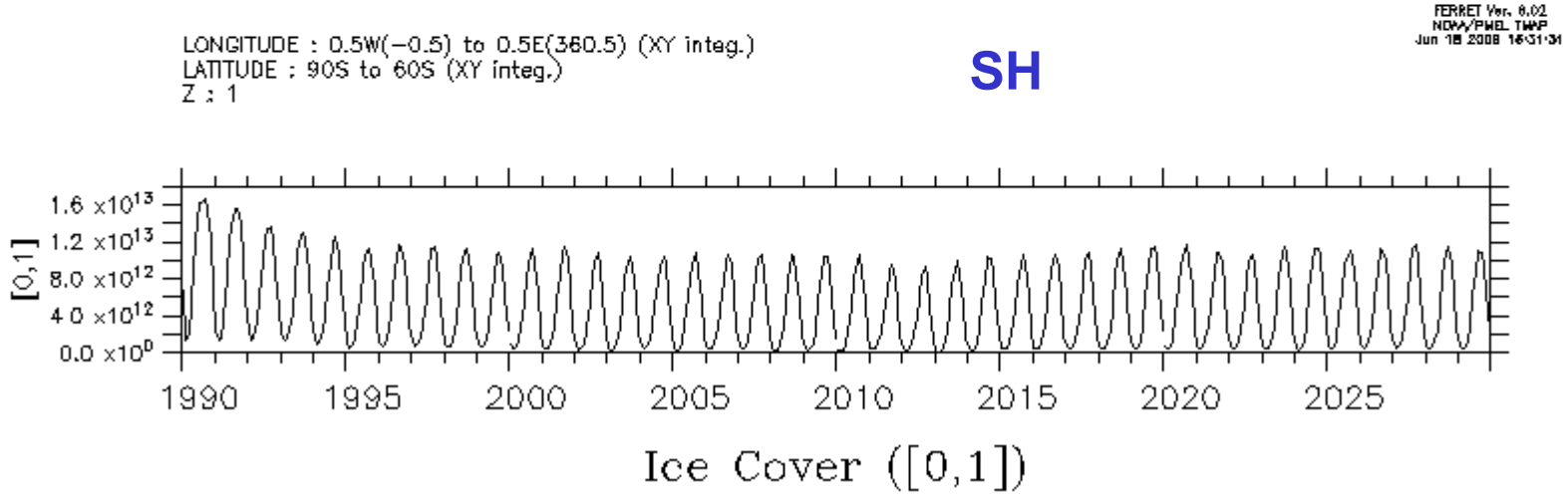
- meeting on NEMO in coupled models (Toulouse, 27.05.2009):
  - about 20 participants from 7 groups
  - problem known, solution not
  - all (sea ice) models are poor around Antarctica
- energy budget: vertical mixing is the culprit
- tuning of vertical mixing: no conclusive result

Tuning

- vertical mixing
  - changing parameter values in TKE scheme
  - changing parameter values in GM scheme
  - TKE *vs* PacPhil
  - incorporate elements from NEMOv3 (penetration depth of wind-generated TKE)
- bugs in freshwater forcing (Shuting + Torben S)

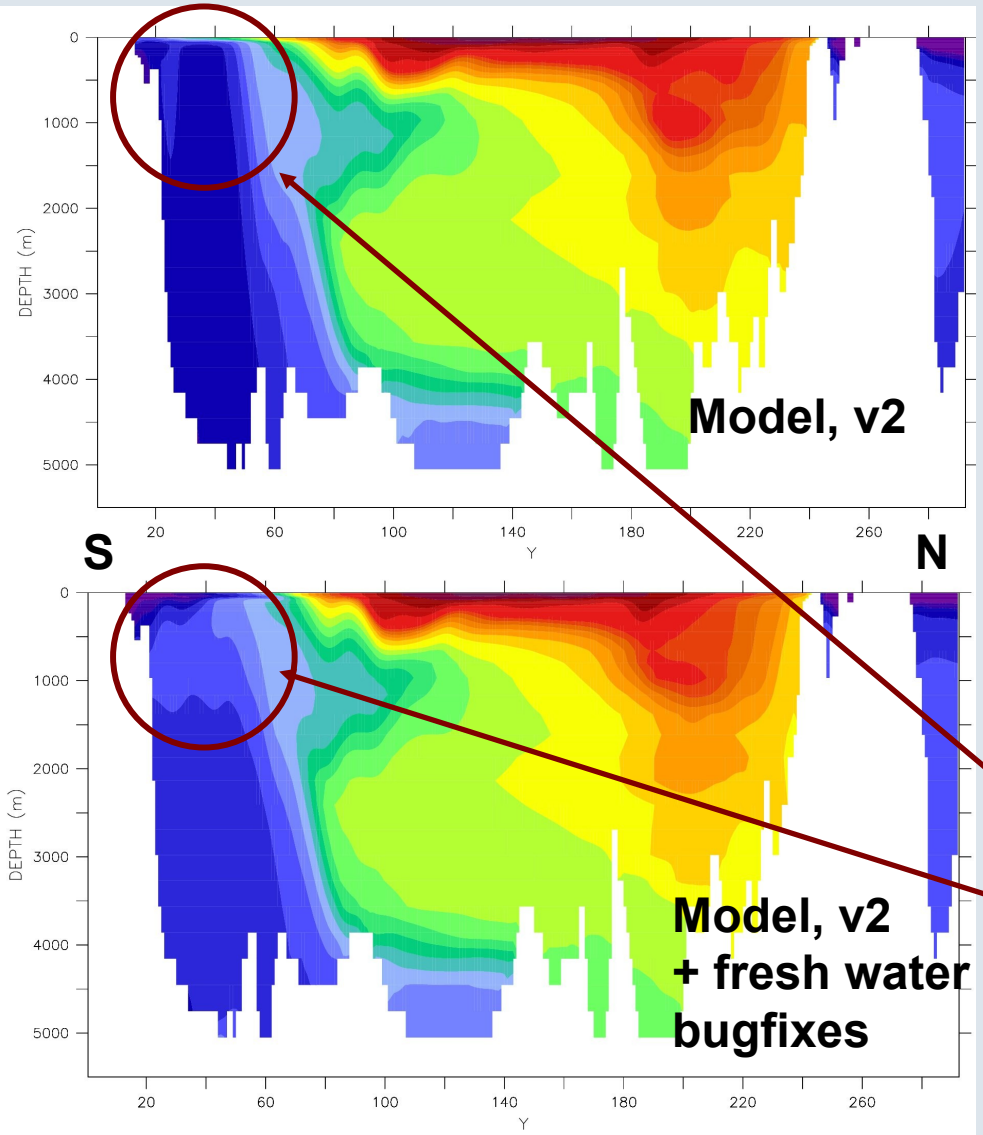

black: snow volume
color: (-1)*SSH
0.20
0.16
0.12
0.08
0.04
0.00
1990
1995
2000
2005
2010
2015
2020
2025
Imbalance: -4 cm / 40 ys
-1 cm / decade
SD[D=b0qy_flux_1990-2029,X=@DIN,Y=@DIN]/(6371000^2*12.5)-.33

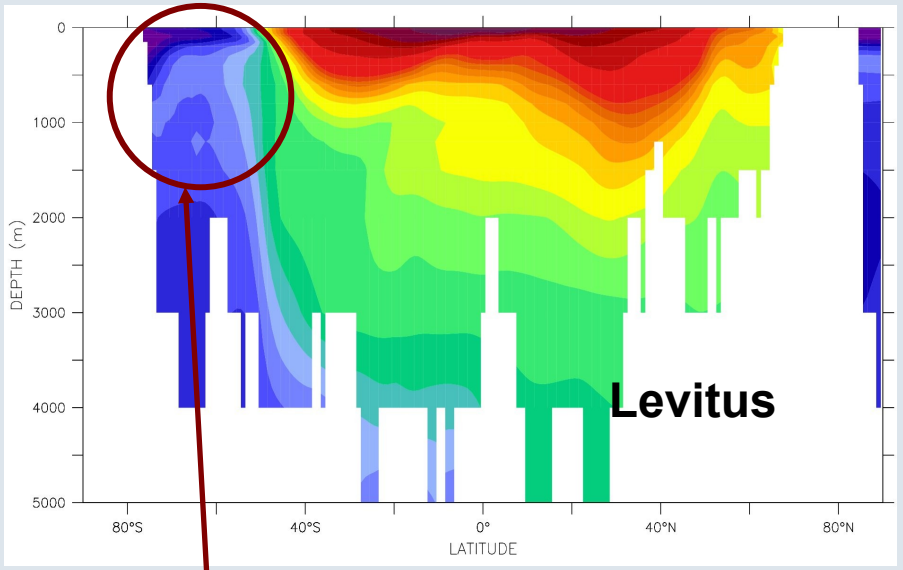

FERRET Ver. 6.02
NOAA/PMEL TMAP
Jun 18 2008 16:31:01
LONGITUDE : 0.5W(−0.5) to 0.5E(360.5) (XY integ.)
LATITUDE : 60N to 90N (XY integ.)
Z : 1
NH
[0,1]
1.5 x10^13
1.3 x10^13
1.1 x10^13
9.0 x10^12
7.0 x10^12
5.0 x10^12
1990
1995
2000
2005
2010
2015
2020
2025
Ice Cover ([0,1])

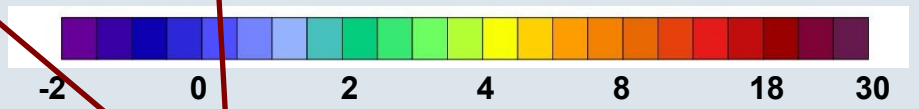

FERRET Ver. 6.02
NOAA/PMEL TMAP
Jun 18 2008 16:31:34
LONGITUDE : 0.5W(−0.5) to 0.5E(360.5) (XY integ.)
LATITUDE : 90S to 60S (XY integ.)
Z : 1
SH
[0,1]
1.6 x10^13
1.2 x10^13
8.0 x10^12
4.0 x10^12
0.0 x10^0
1990
1995
2000
2005
2010
2015
2020
2025
Ice Cover ([0,1])

Temperature section along 30 W

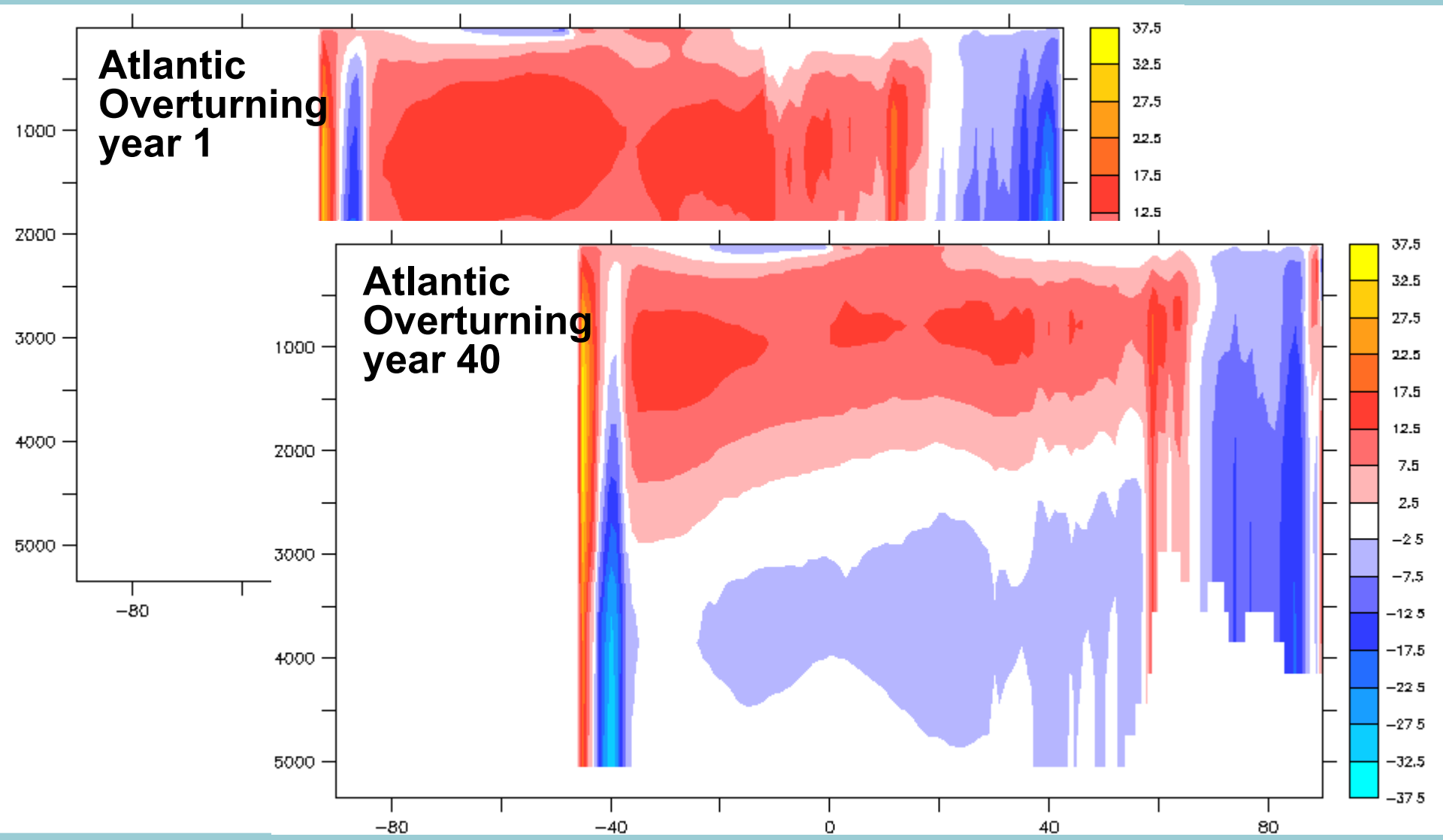
mean 2000-2010



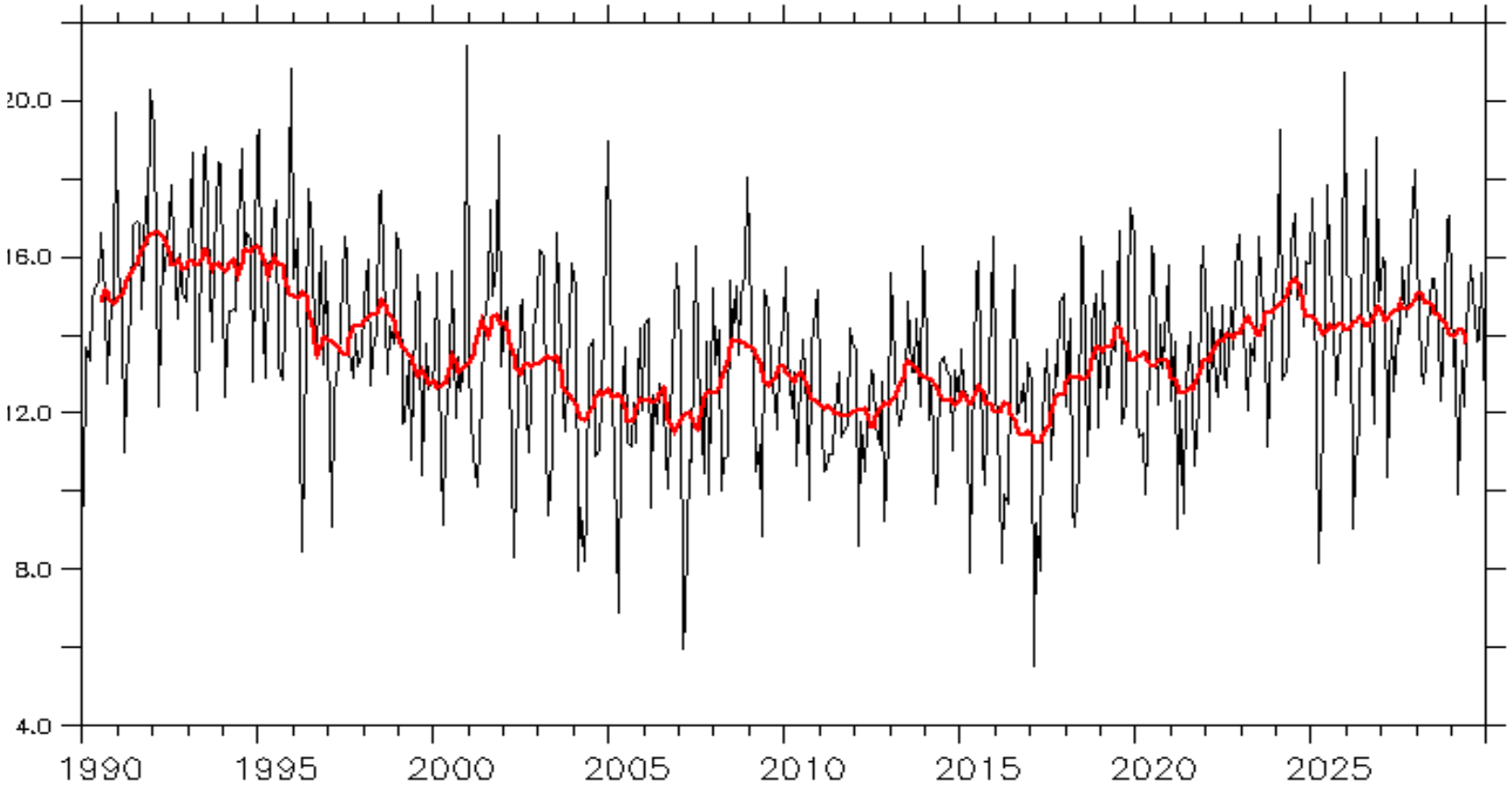


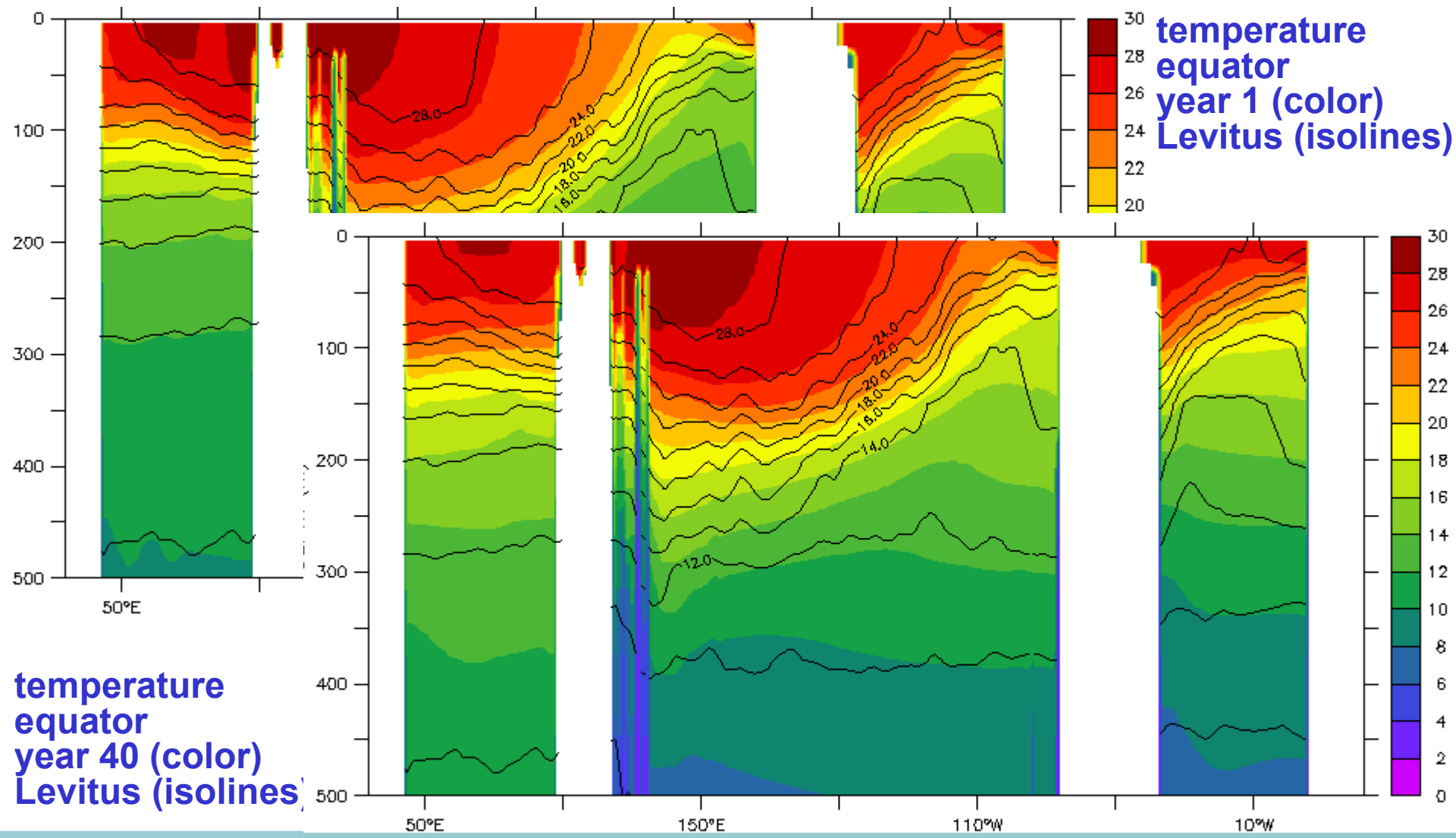


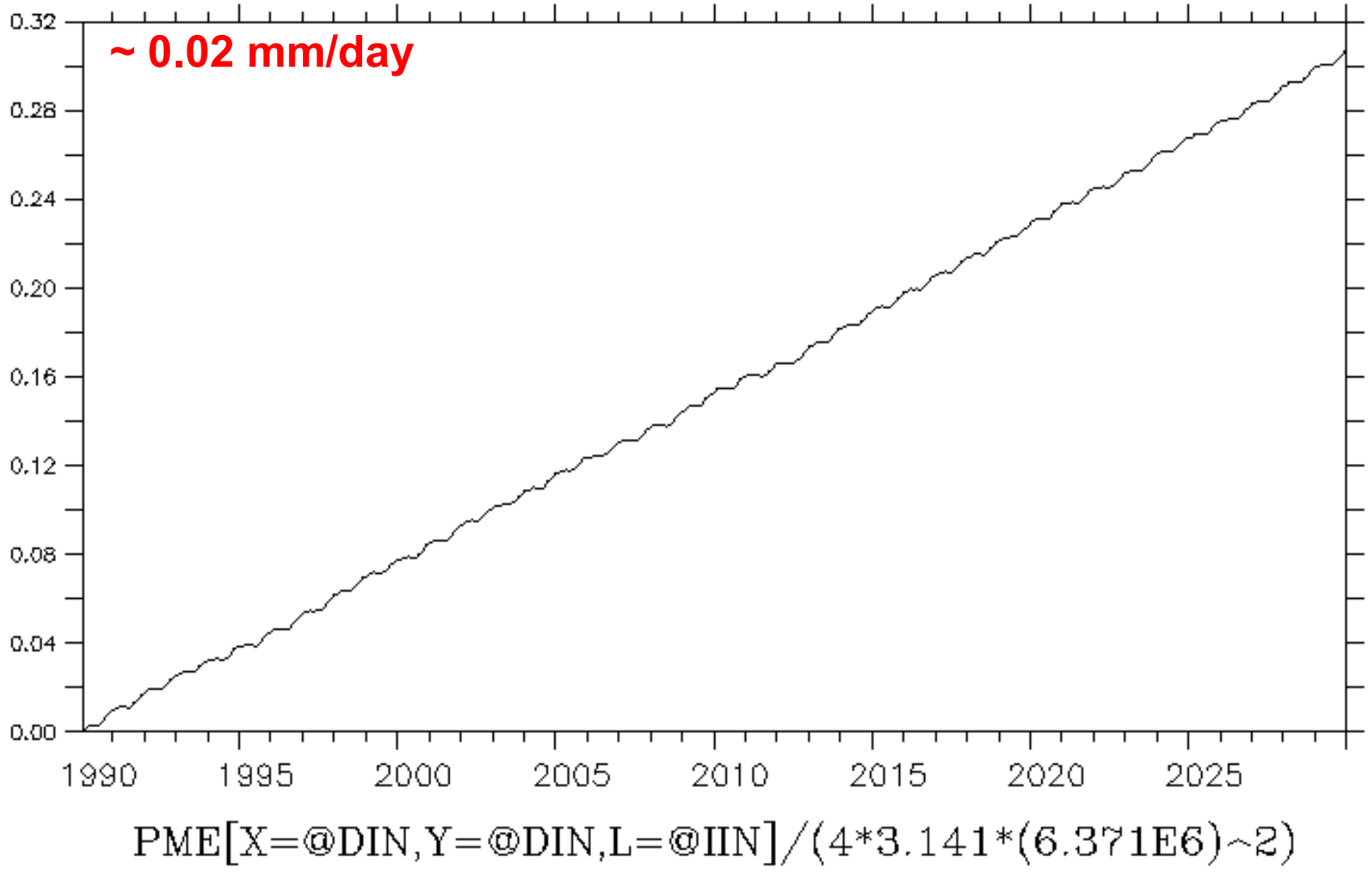
Improvement in high southern latitudes


Atlantic Overturning year 1
1000
2000
3000
4000
5000
−80
37.5
32.5
27.5
22.5
17.5
12.5
Atlantic Overturning year 40
1000
2000
3000
4000
5000
−80
−40
0
40
80
37.5
32.5
27.5
22.5
17.5
12.5
7.5
2.5
−2.5
−7.5
−12.5
−17.5
−22.5
−27.5
−32.5
−37.5

Maximum overturning at 30N




temperature
equator
year 1 (color)
Levitus (isolines)
temperature
equator
year 40 (color)
Levitus (isolines)
0
100
200
300
400
500
50°E
150°E
110°W
10°W
28.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0


~ 0.02 mm/day
0.32
0.28
0.24
0.20
0.16
0.12
0.08
0.04
0.00
1990
1995
2000
2005
2010
2015
2020
2025
PME[X=@DIN,Y=@DIN,L=@IIN]/(4*3.141*(6.371E6)~2)

$\lambda_{evap} = 2.5\ 10^6$ J/kg
$\lambda_{subl} = 2.84\ 10^6$ J/kg

evap / (qlat / ρ λ_{evap})