R3 Pre-release Evaluation

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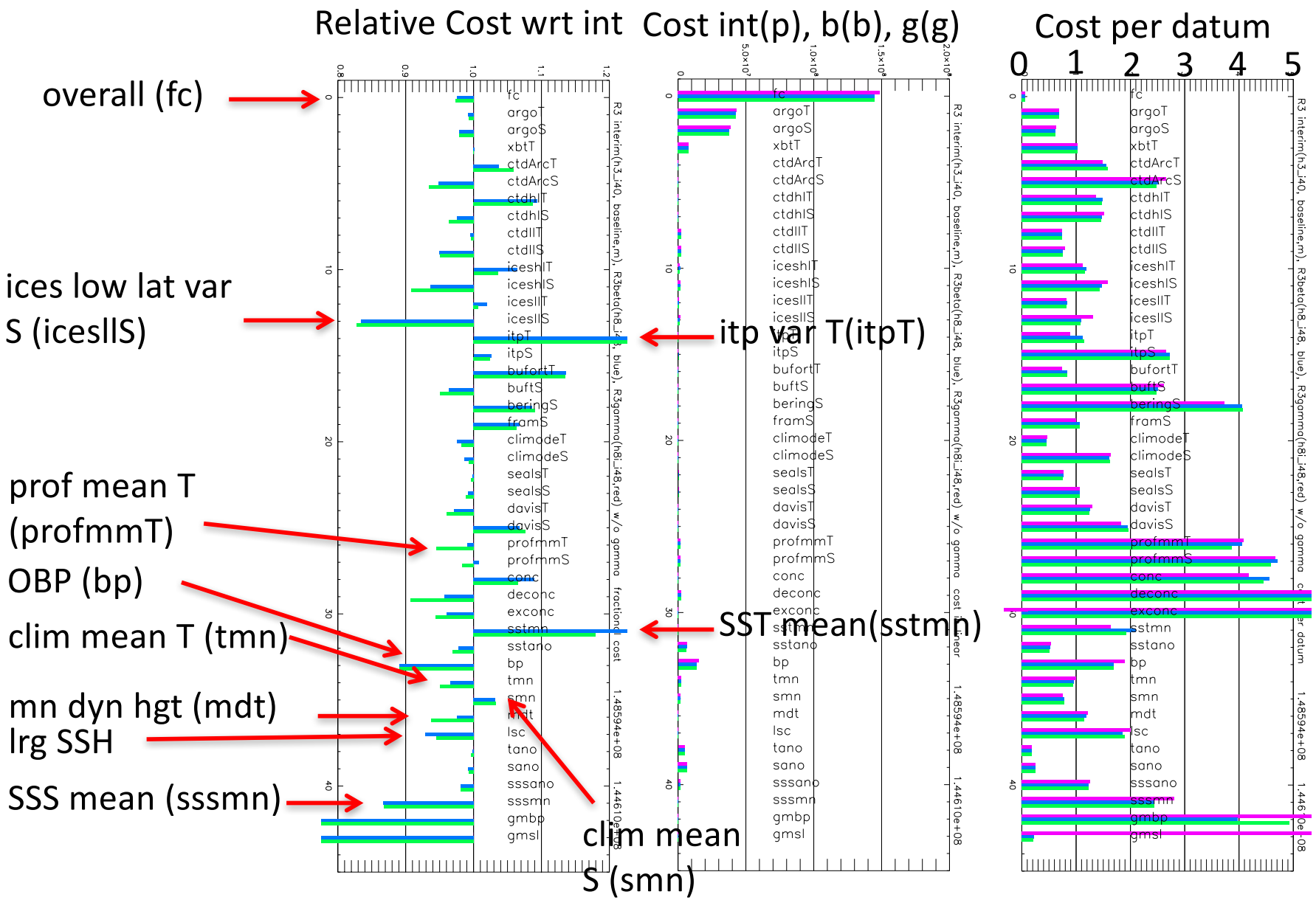
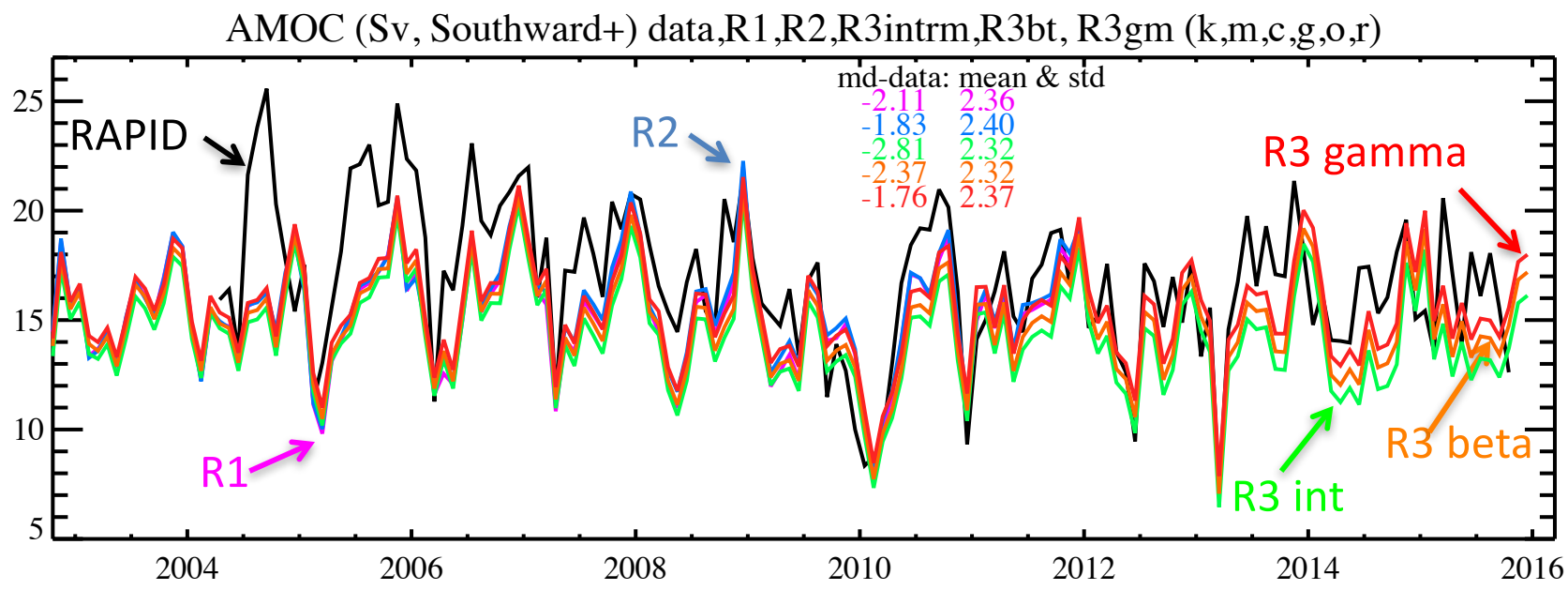
R3 Cost

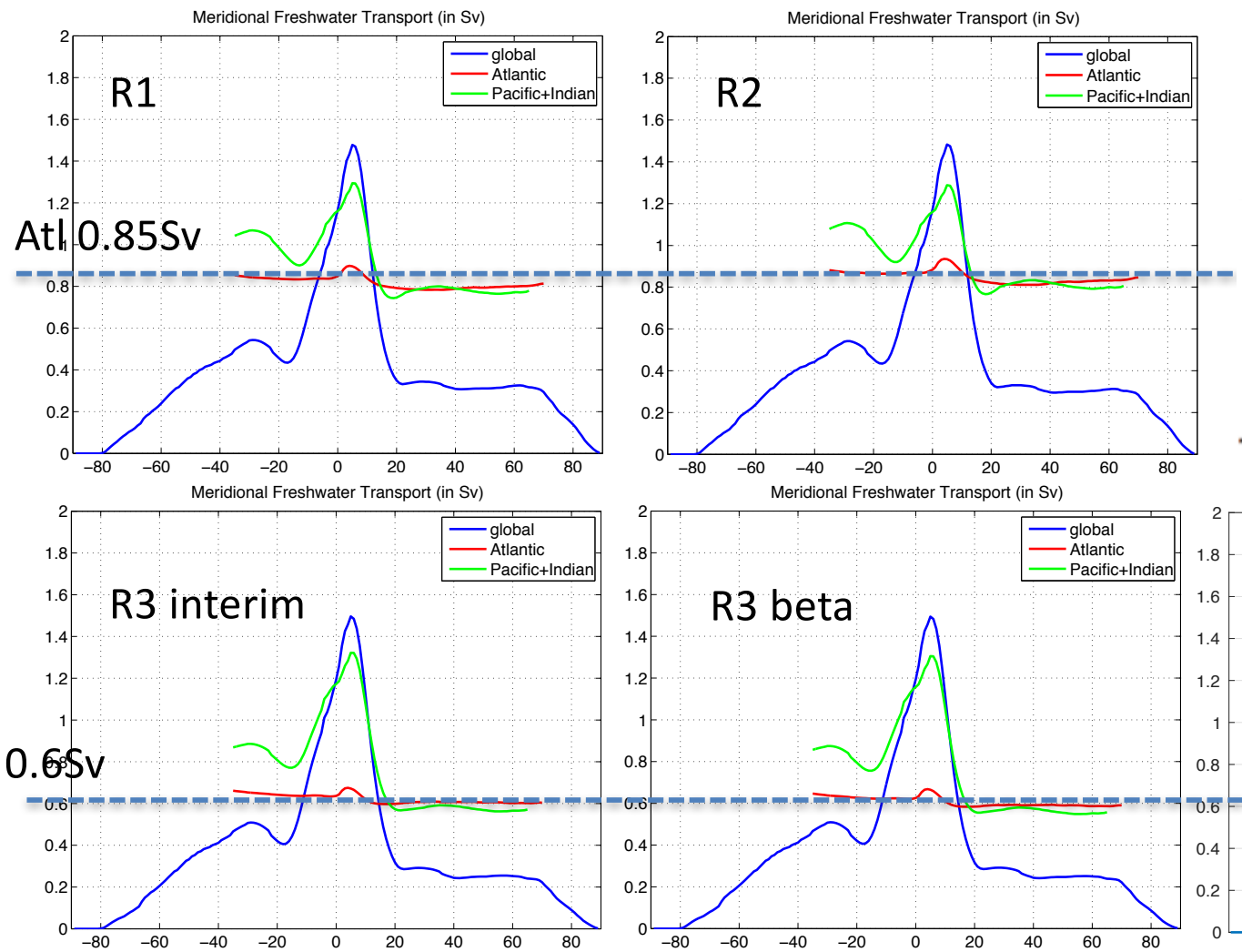

Relative Cost wrt int
Cost int(p), b(b), g(g)
Cost per datum
overall (fc)
ices low lat var S (icesllS)
prof mean T (profmmT)
OBP (bp)
clim mean T (tmn)
mn dyn hgt (mdt)
lrg SSH
SSS mean (sssmn)
itp var T(itpT)
SST mean(sstmn)
clim mean S (smn)
fc
argoT
argoS
xbtT
ctdArcT
ctdArcS
ctdhlT
ctdhlS
ctdllT
ctdllS
iceshlT
iceshlS
icesllT
icesllS
itpT
itpS
bufortT
buftS
beringS
framS
climodeT
climodeS
sealsT
sealsS
davisT
davisS
profmmT
profmmS
conc
deconc
exconc
sstmn
sstano
bp
tmn
smn
mdt
lsc
tano
sano
sssano
sssmn
gmbp
gmsl

AMOC at 26N

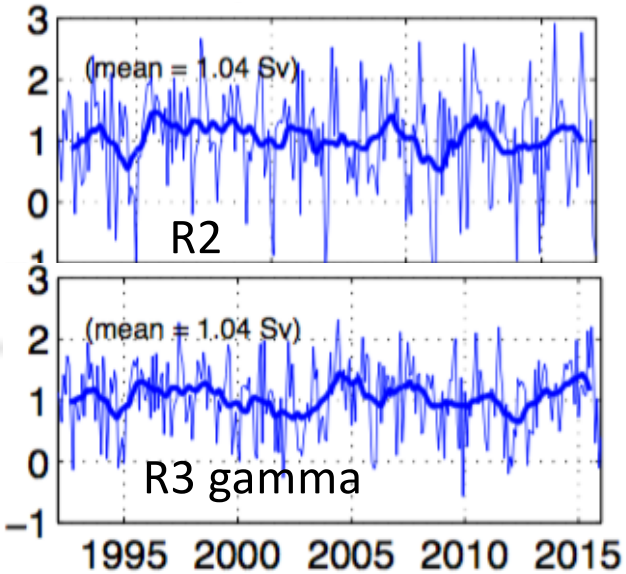


AMOC Transport (Sv) at 26N

Meridional FW Transport STD

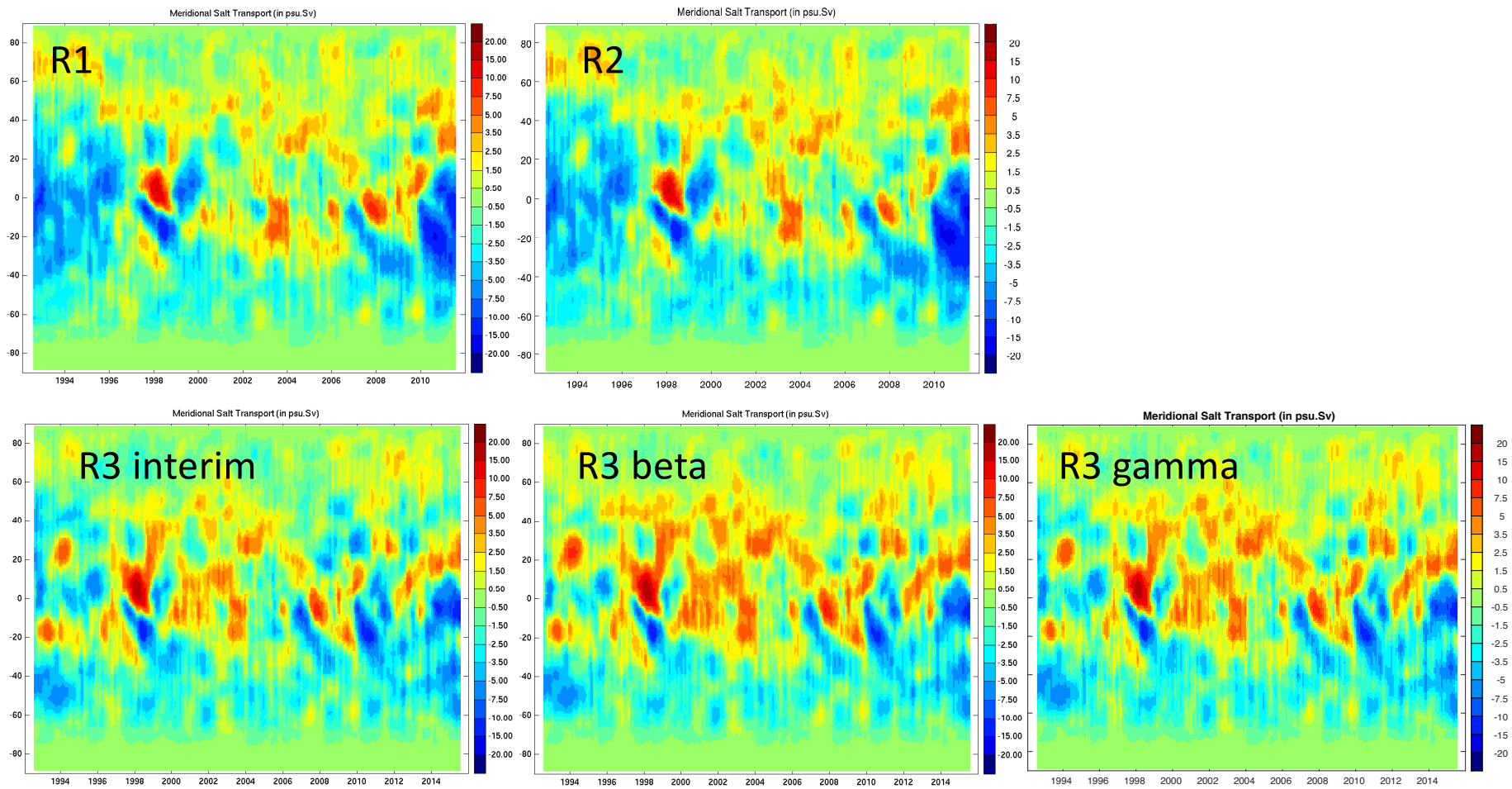


Bering Strait Transport



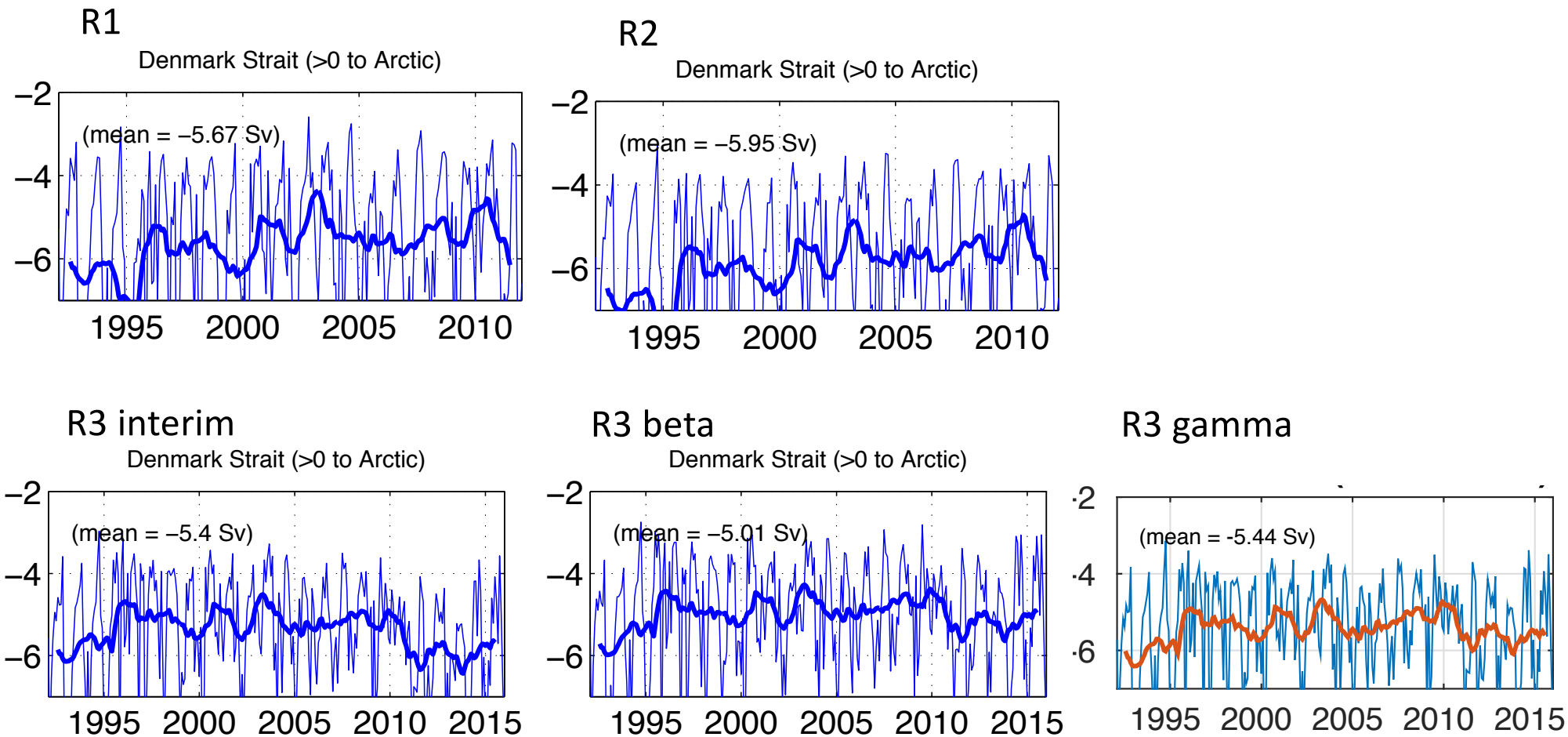
1992-2011 Standard Deviation - Meridional Freshwater Transport (Sv)

Meridional S Transport



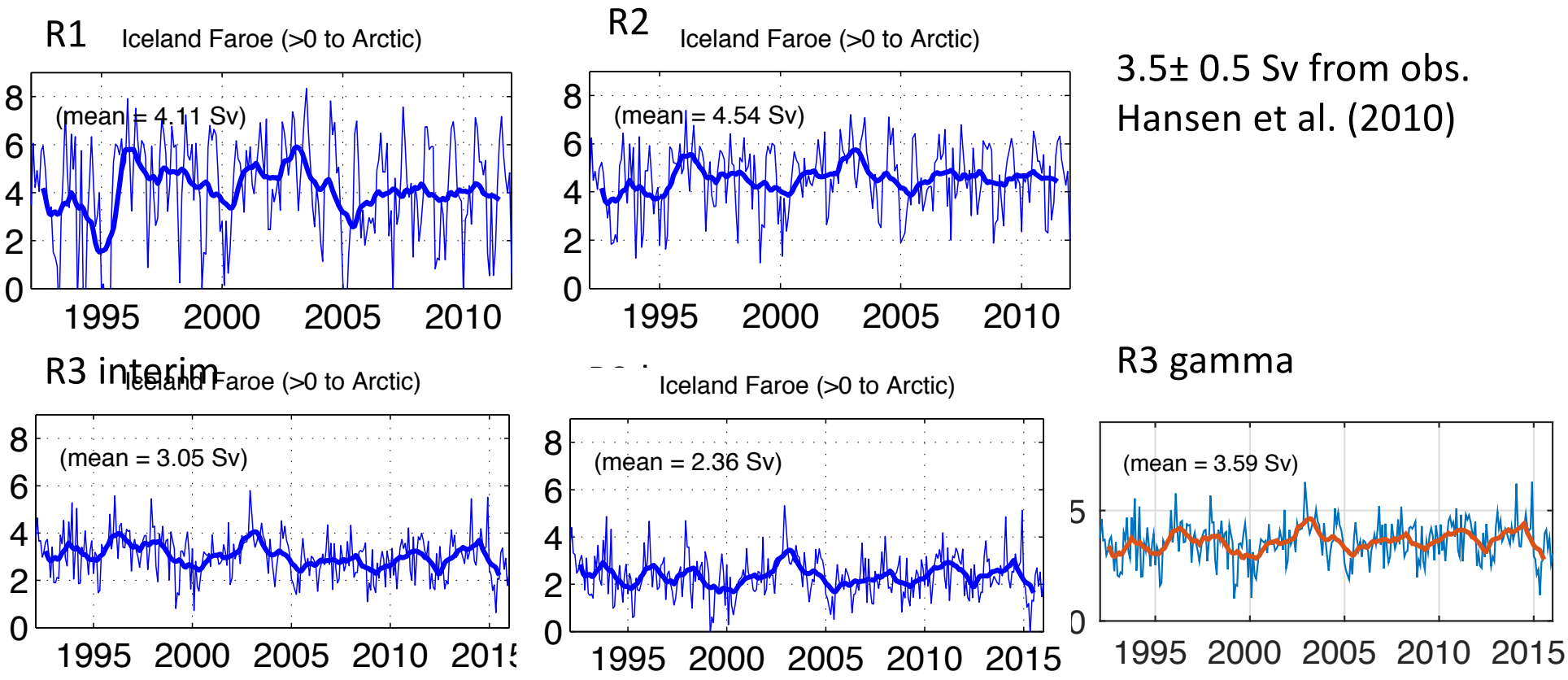
Meridional Salt Transport (psu.Sv, annual mean)

Denmark Strait Transport



Volume Transports Entering the Arctic (Sv, annual mean)

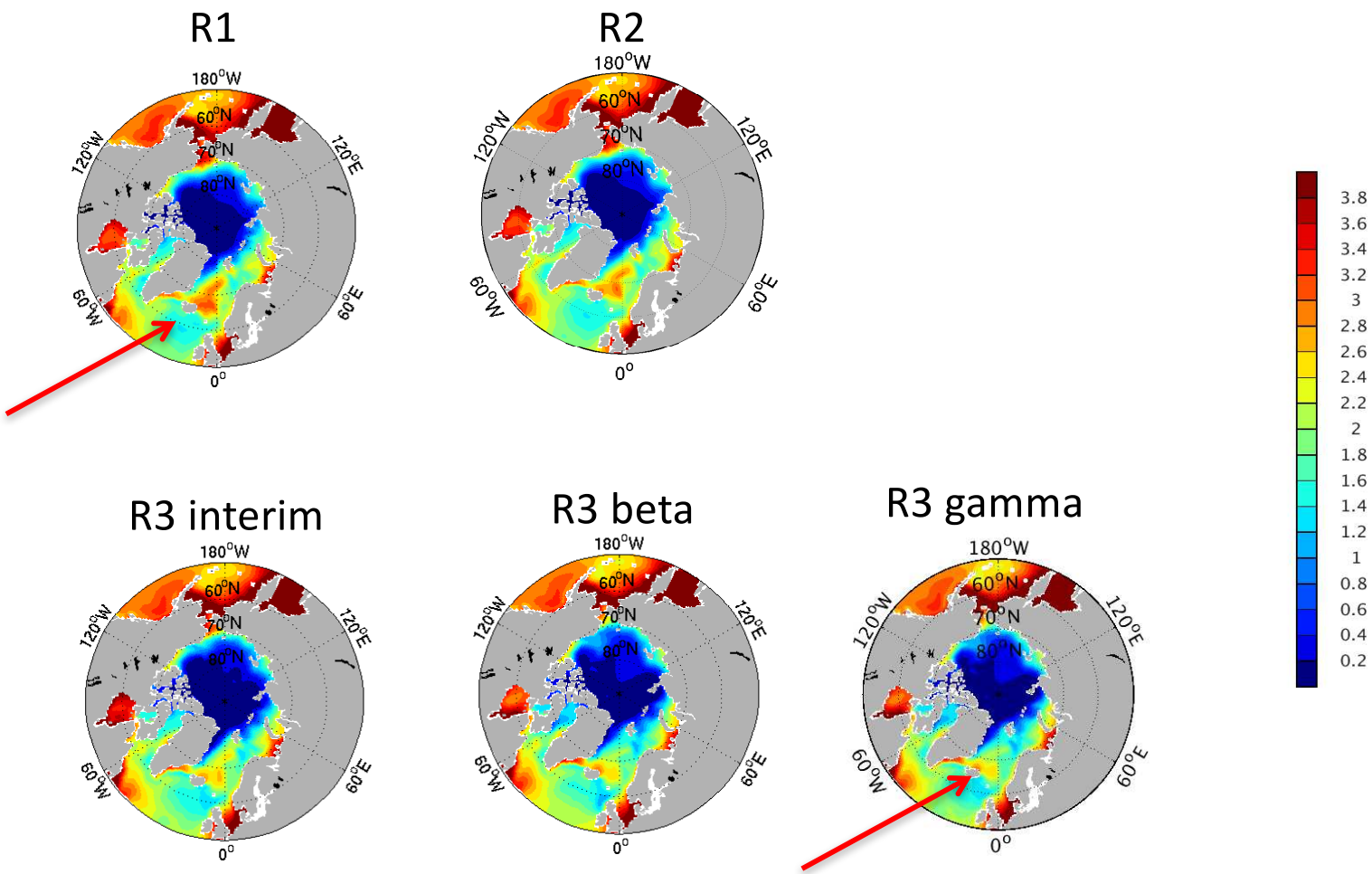
Iceland-Faroe Strait Transport



3.5± 0.5 Sv from obs.
Hansen et al. (2010)

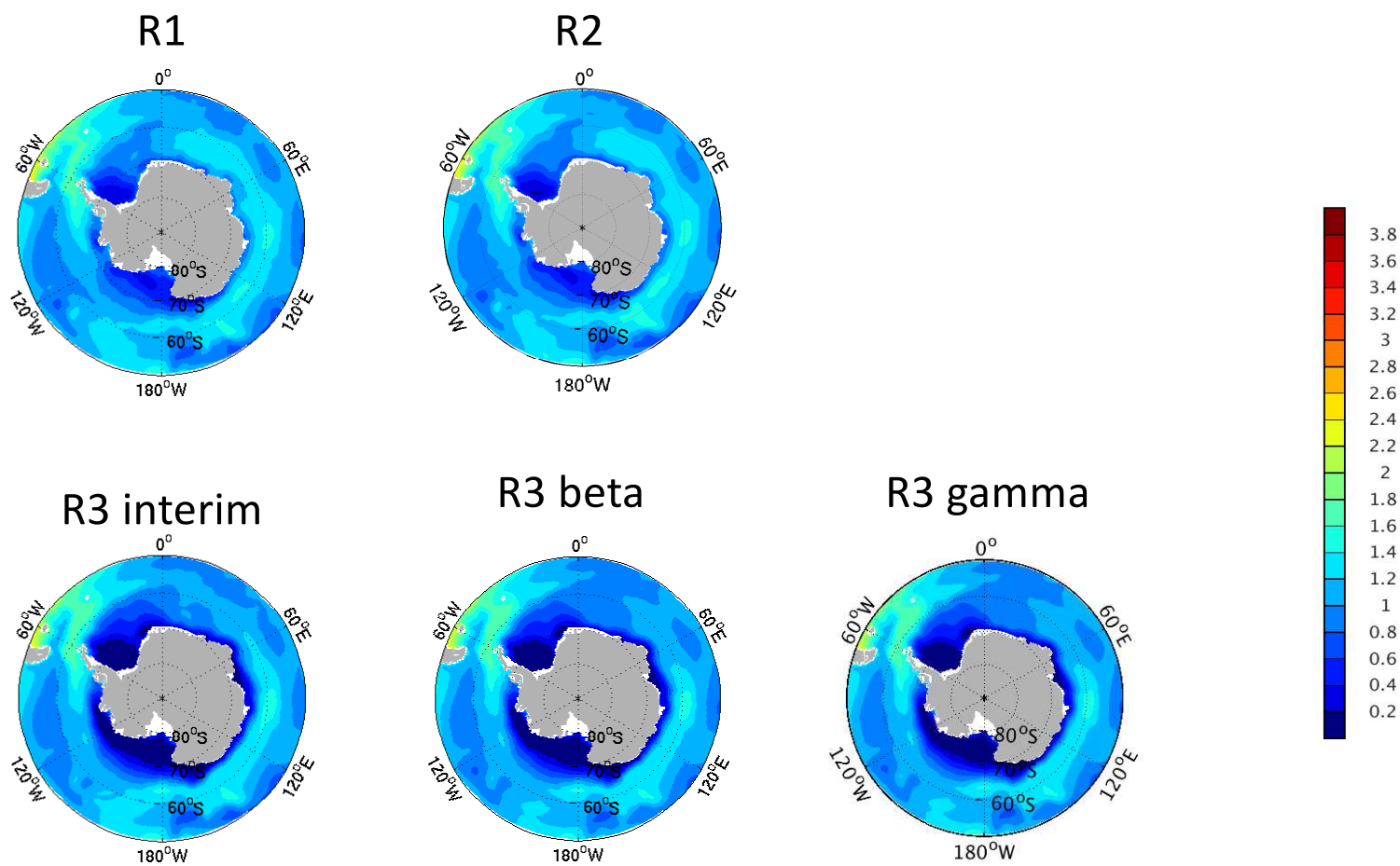
Volume Transports Entering the Arctic (Sv, annual mean)

3D State Variables



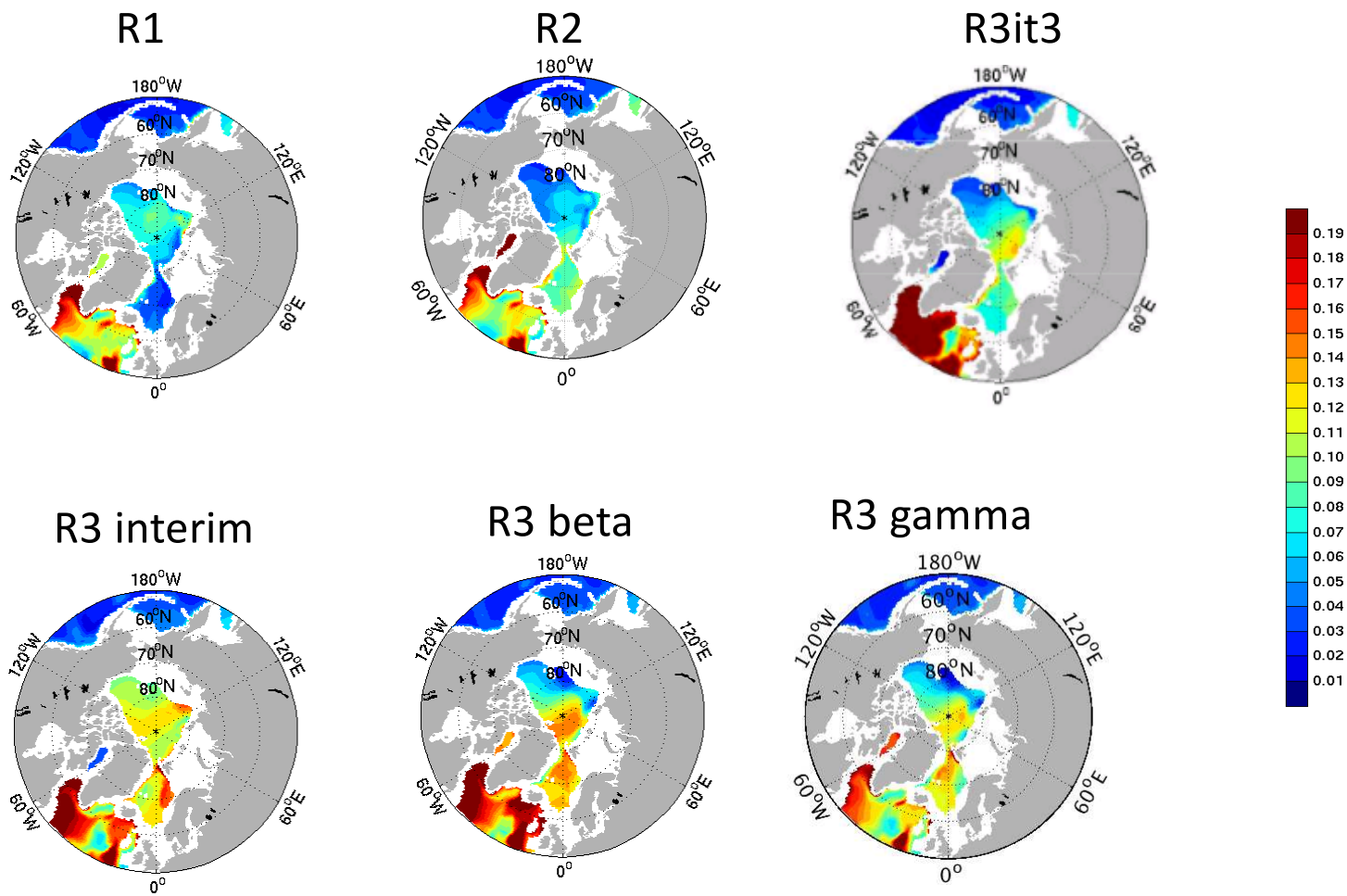
Standard Deviation – Temperature (in degC) at 5m

3D State Variables



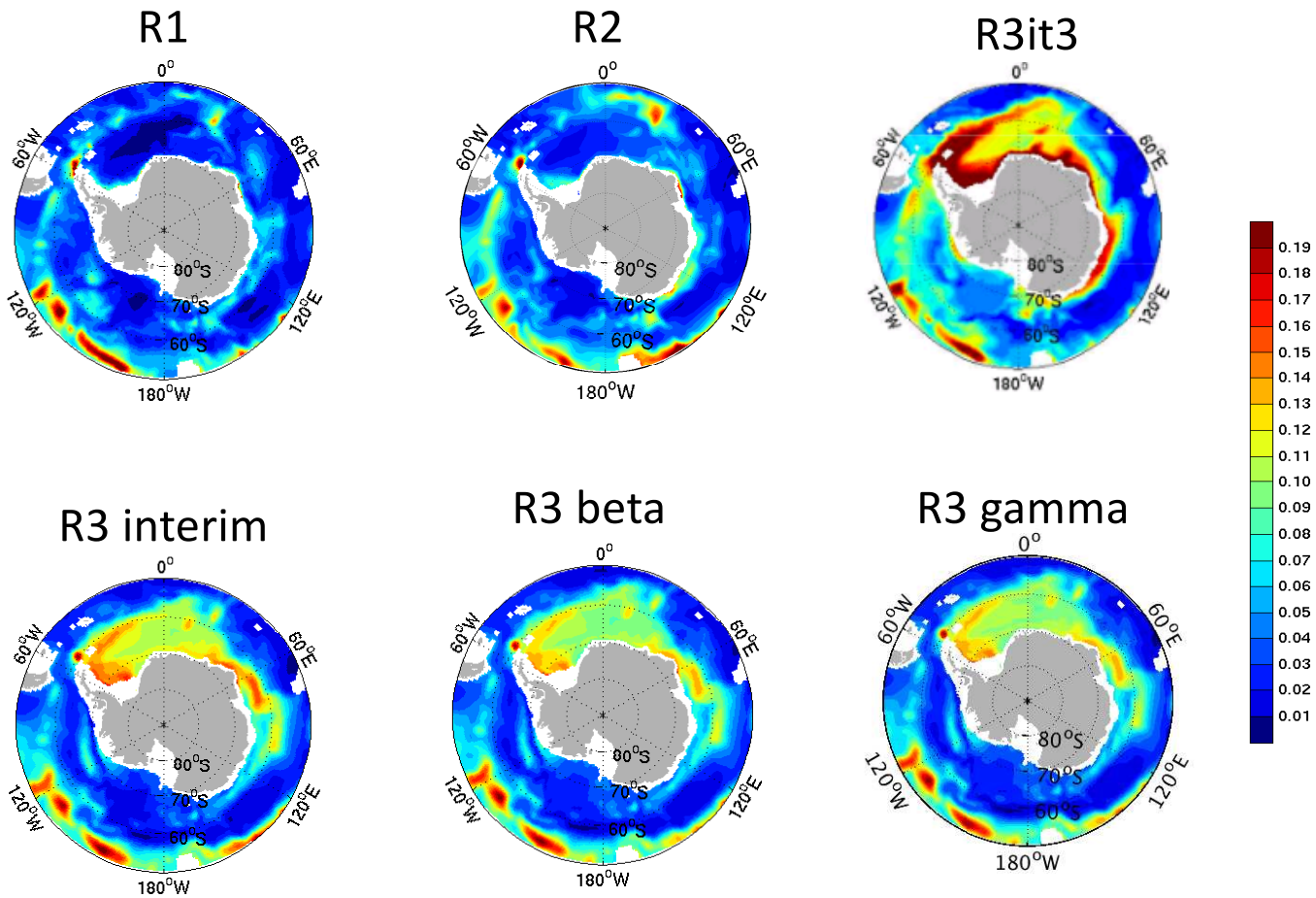
Standard Deviation – Temperature (in degC) at 5m

3D State Variables



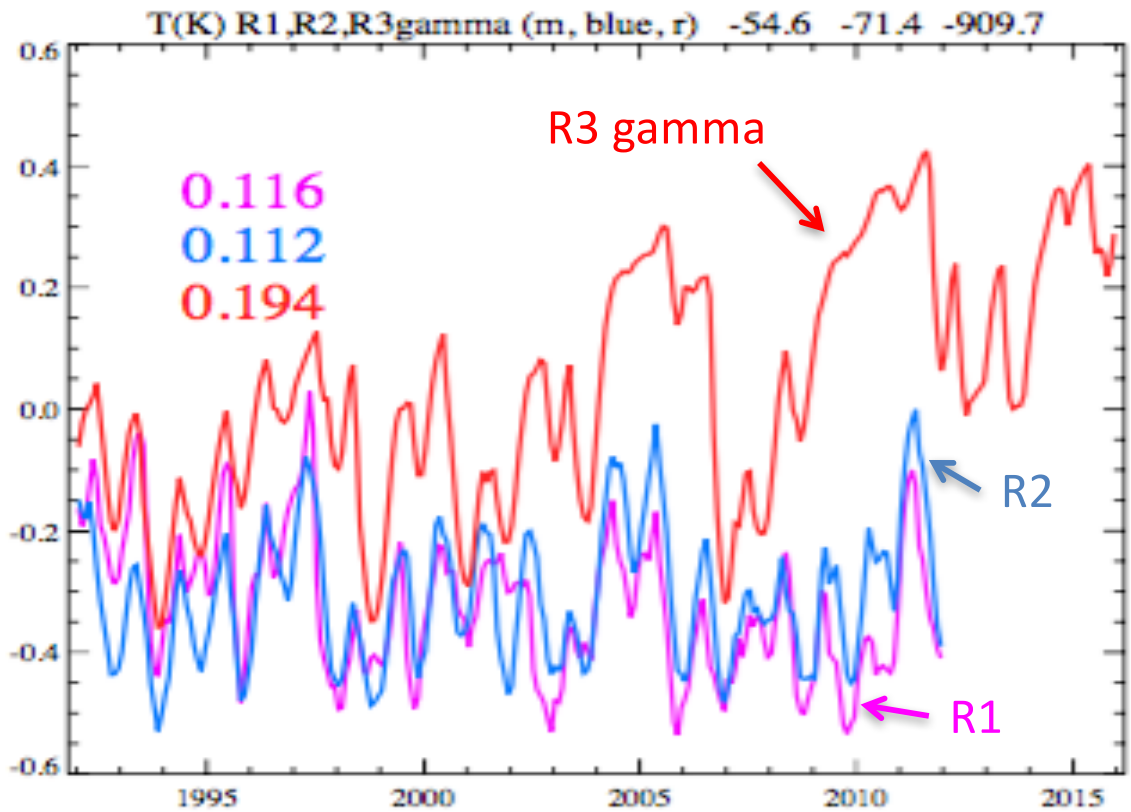
Standard Deviation – Temperature (in degC) at 910m

3D State Variables

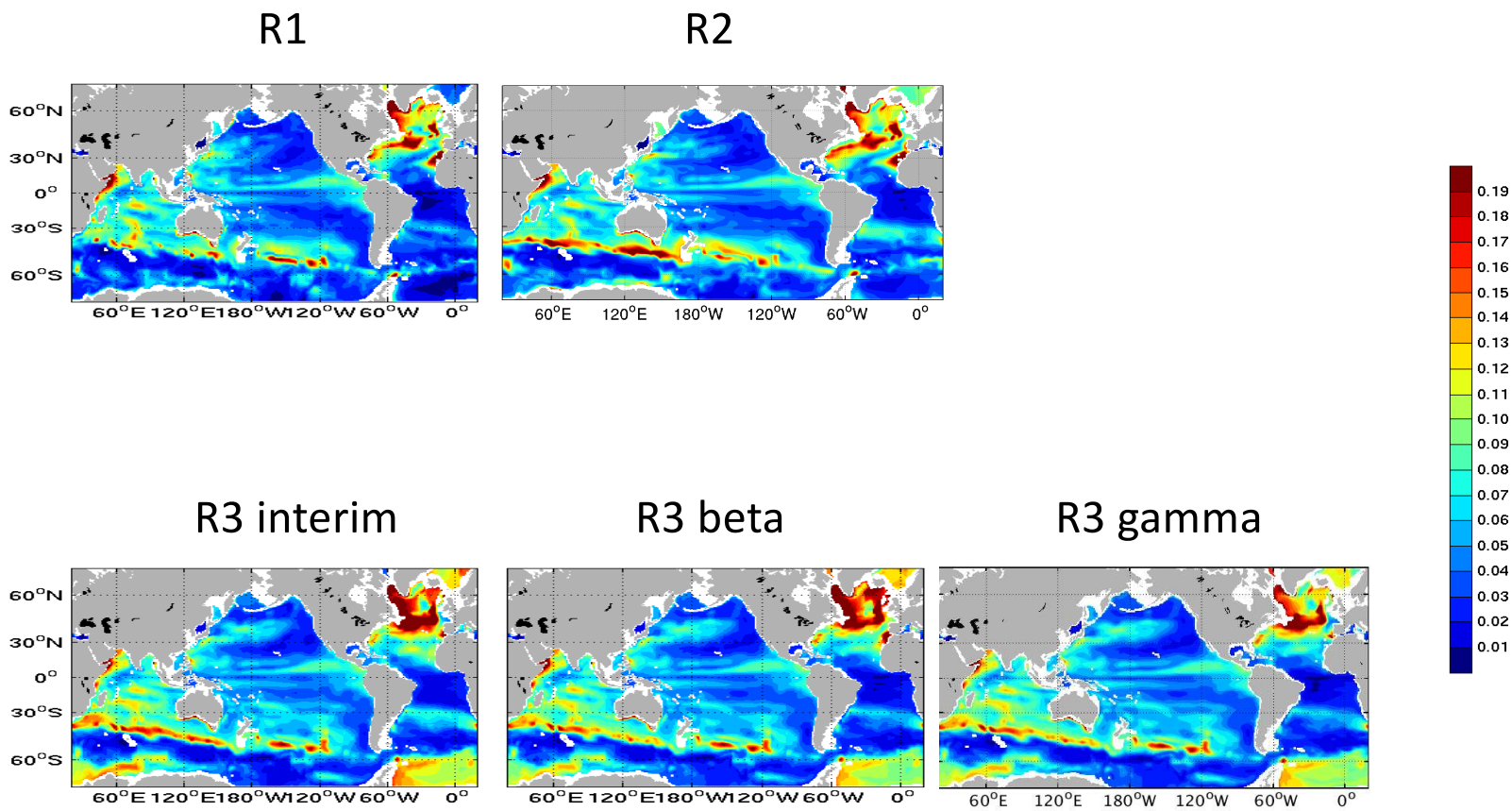


Standard Deviation – Temperature (in degC) at 910m

Time-series of T at 910 m in the Southern Ocean

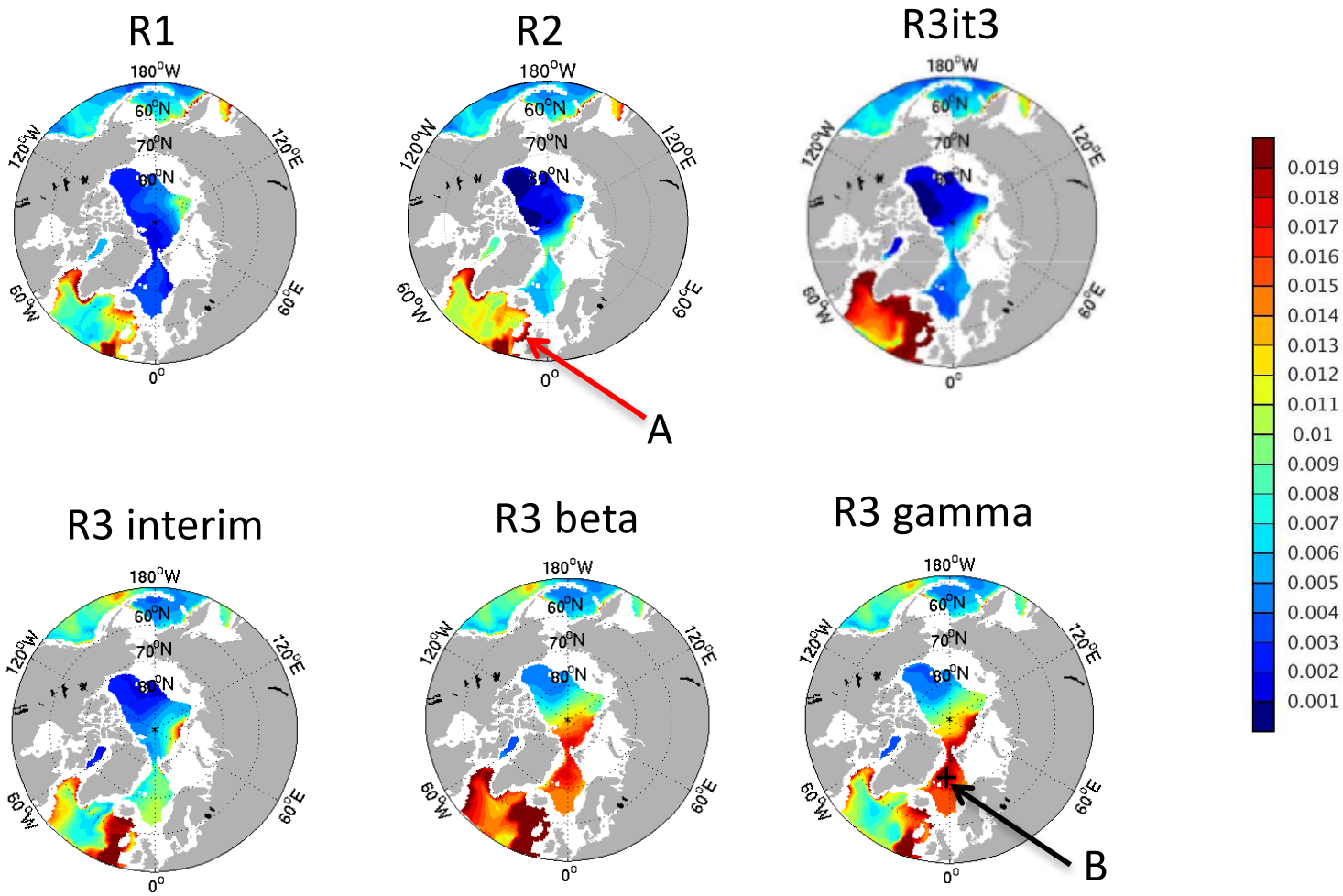


3D State Variables



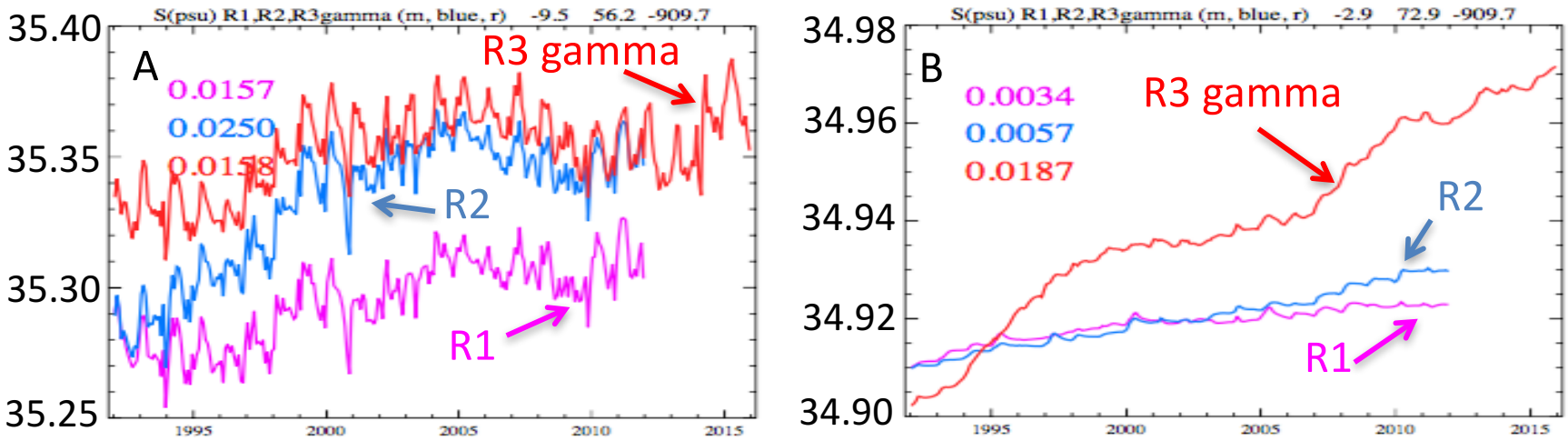
Standard Deviation – Temperature (in degC) at 910m

3D State Variables

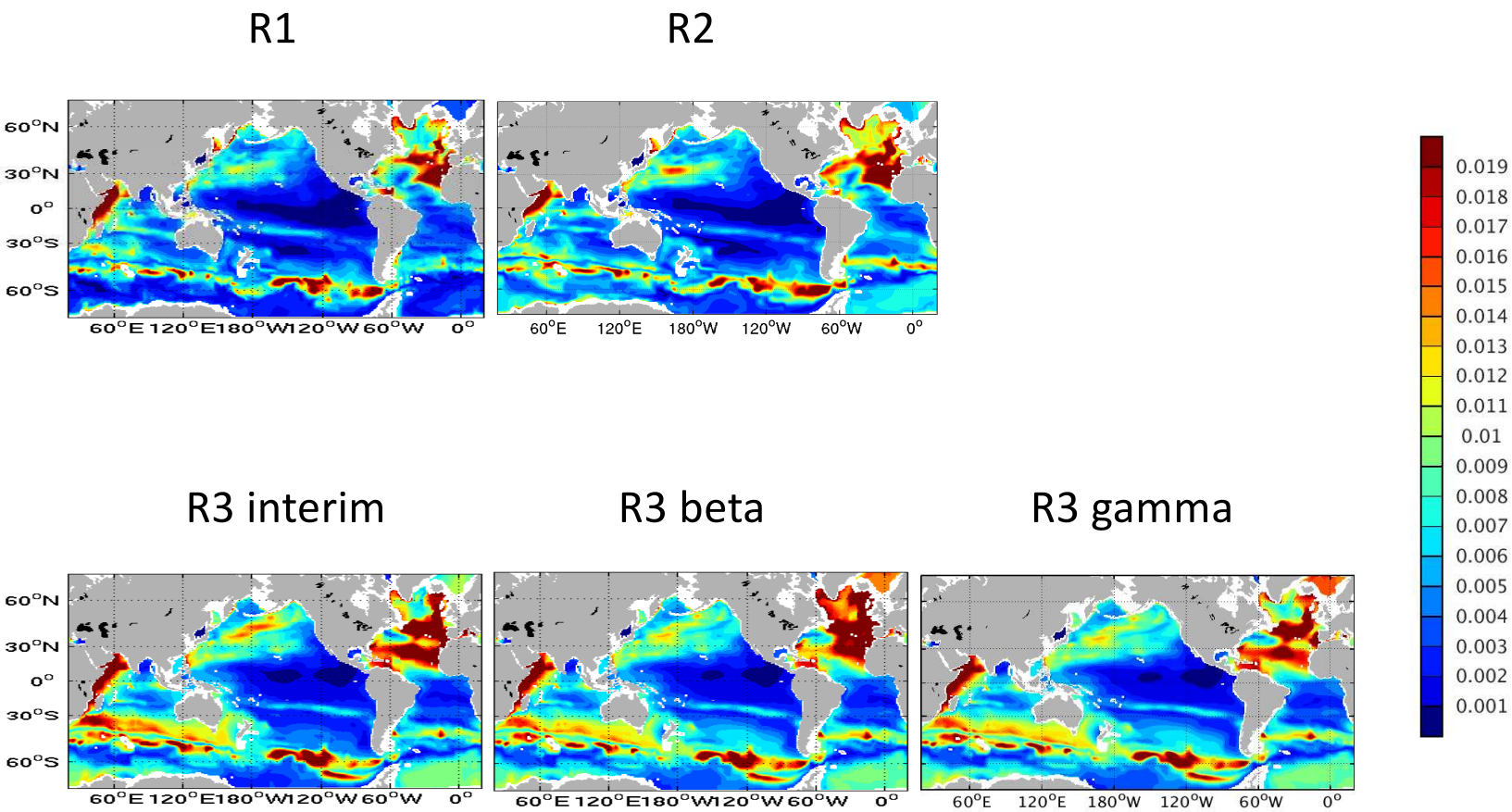


Standard Deviation – Salinity (in psu) at 910m

Time-series of S at 910 m in the N Atlantic (A) and Arctic (B) Oceans

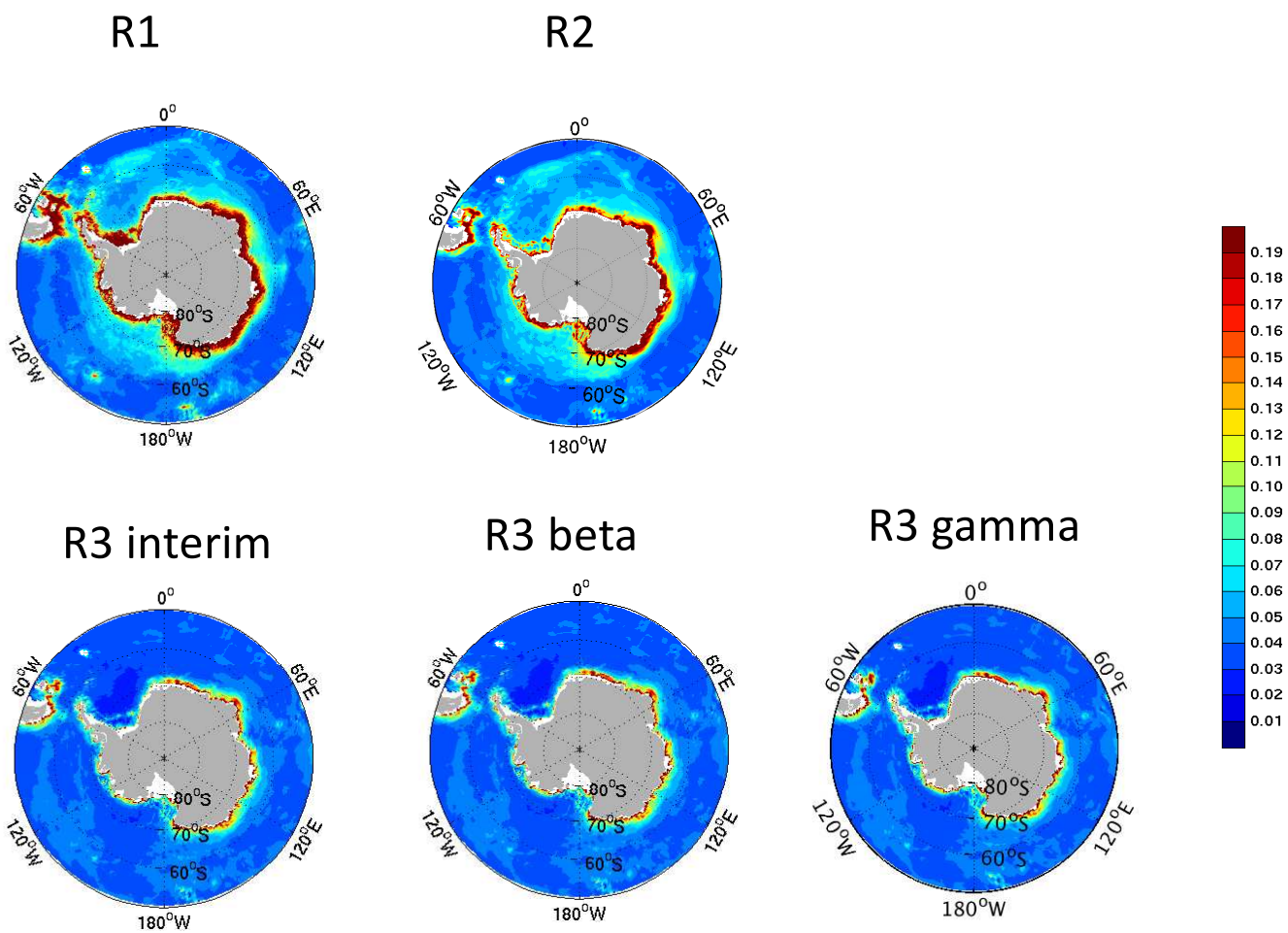


3D State Variables



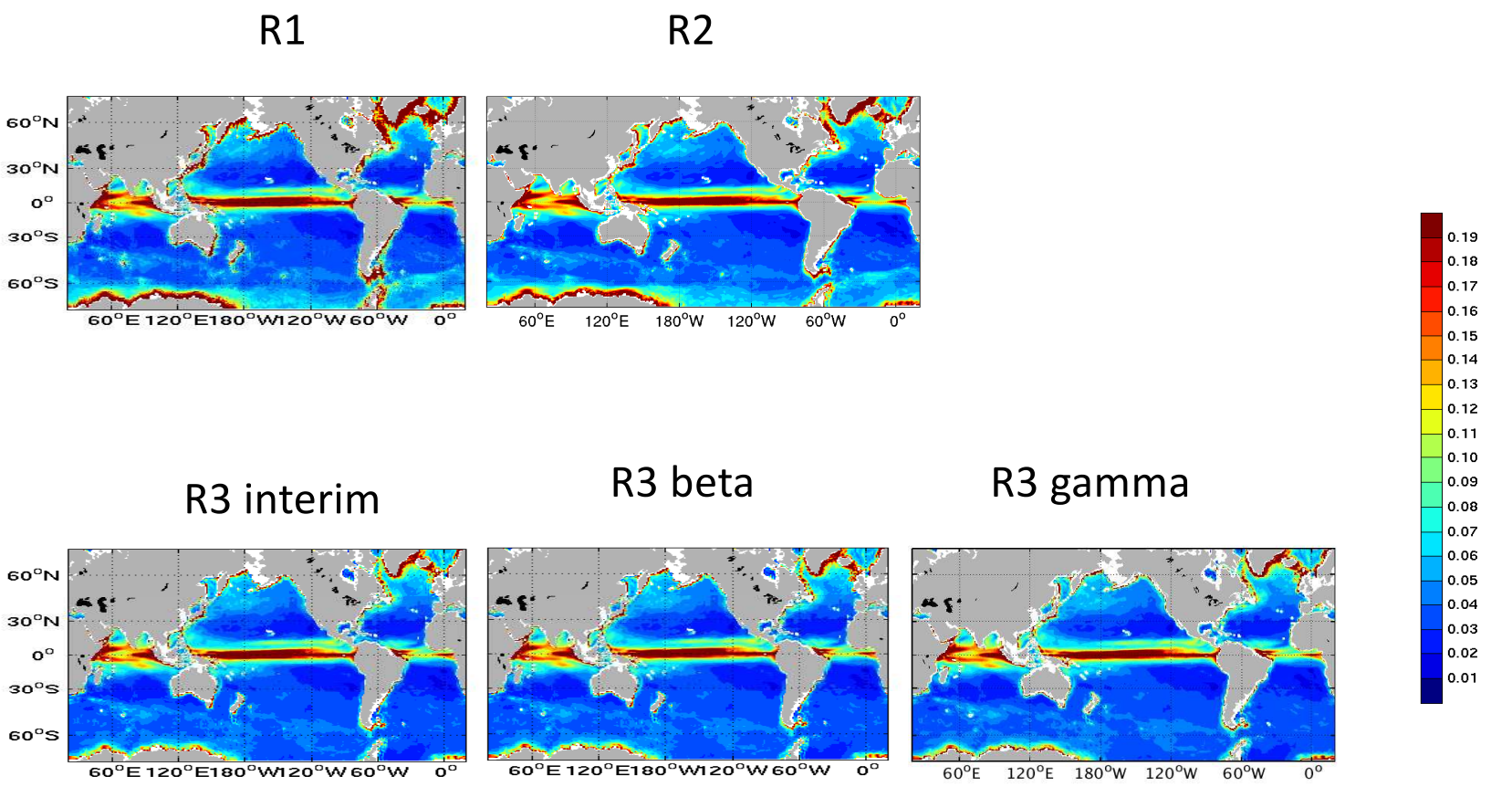
Standard Deviation – Salinity (in psu) at 910m

3D State Variables



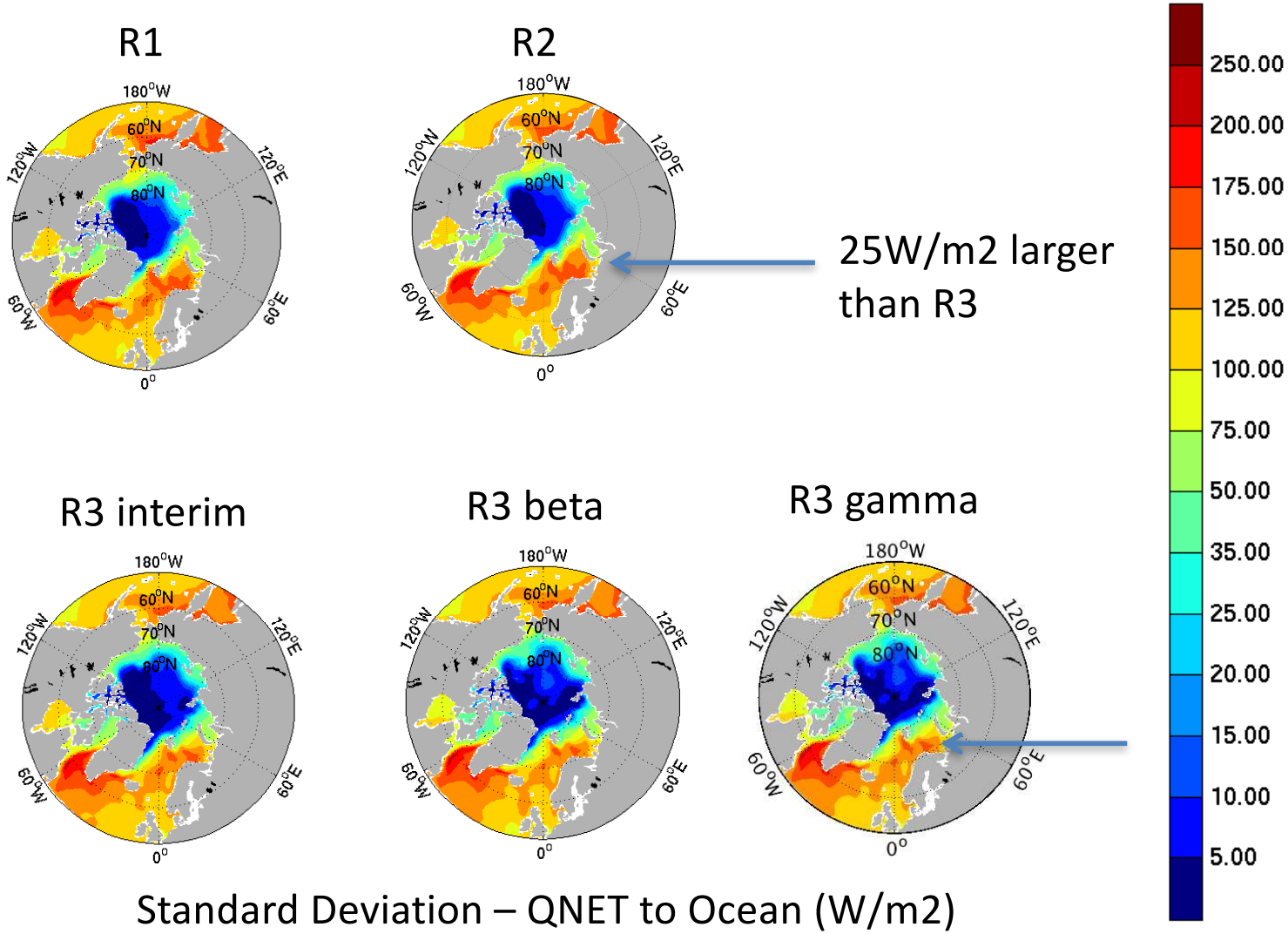
Standard Deviation – Vertical Velocity (in mm/s) at 105m

3D State Variables



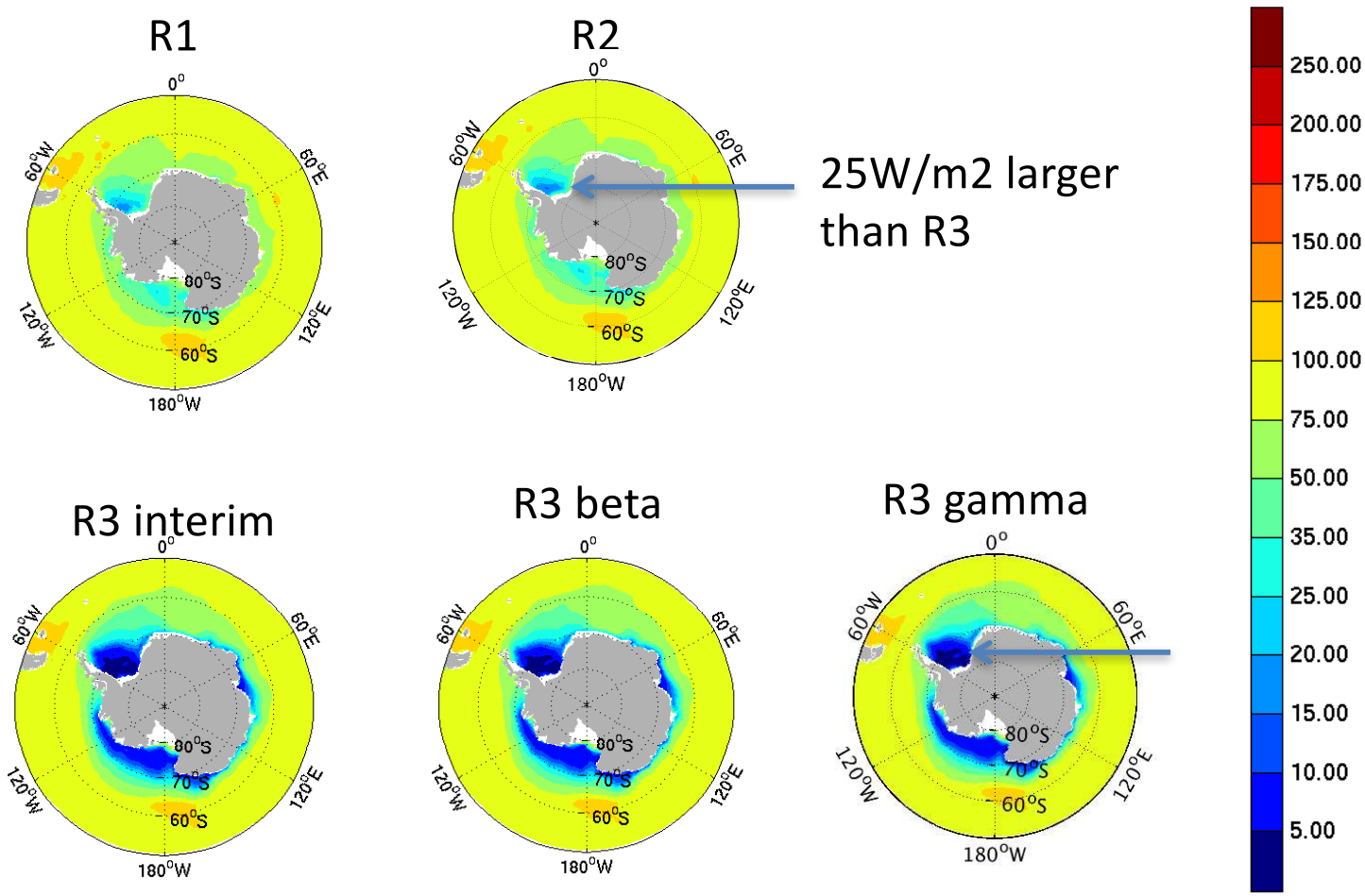
Standard Deviation – Vertical Velocity (in mm/s) at 105m

Air-Sea Heat Flux STD



Standard Deviation – QNET to Ocean (W/m2)

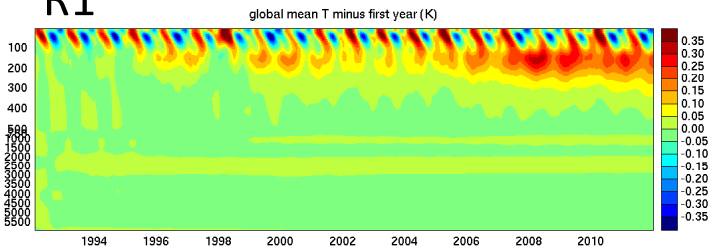
Air-Sea Heat Flux STD



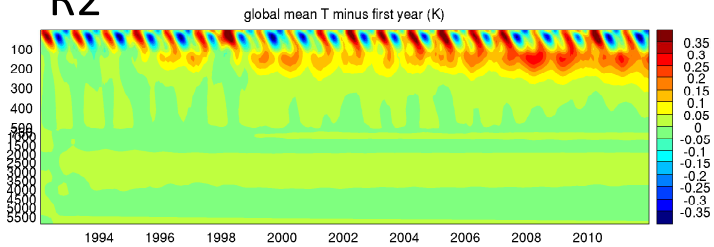
Standard Deviation – QNET to Ocean (W/m2)

Global Mean Properties

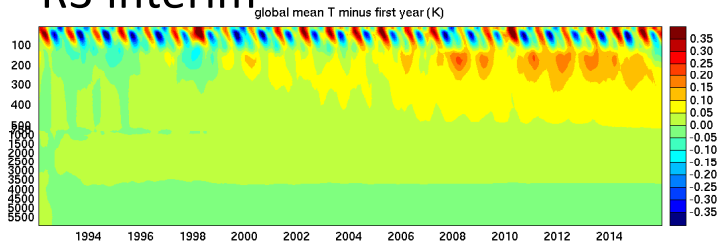
R1



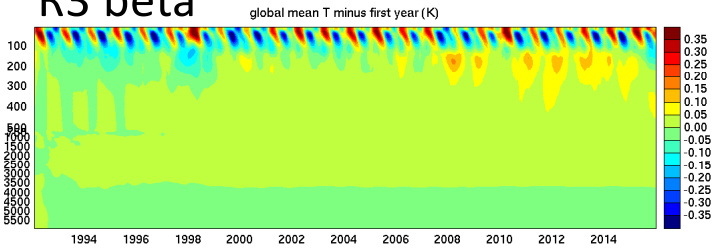
R2



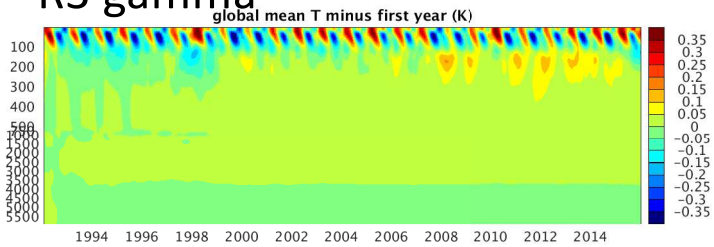
R3 interim



R3 beta



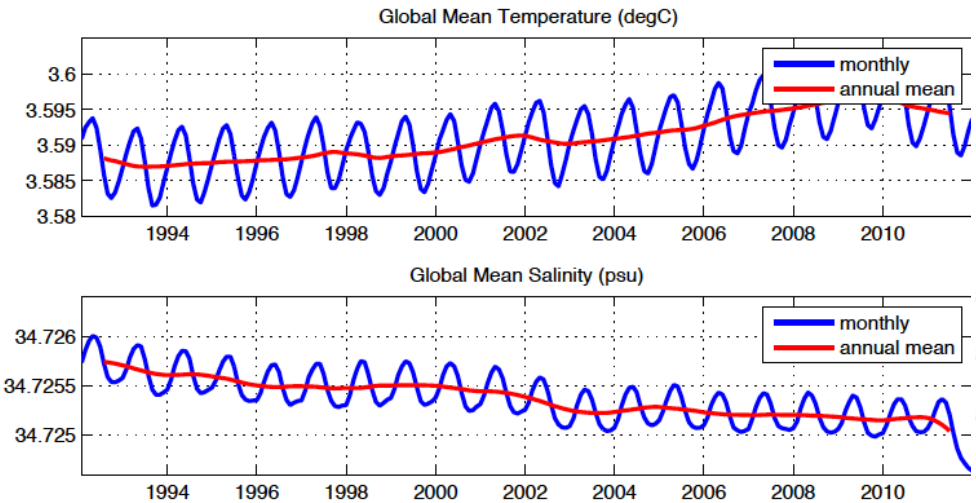
R3 gamma



Global Mean Temperature (K) Minus First Year

Global mean T & S

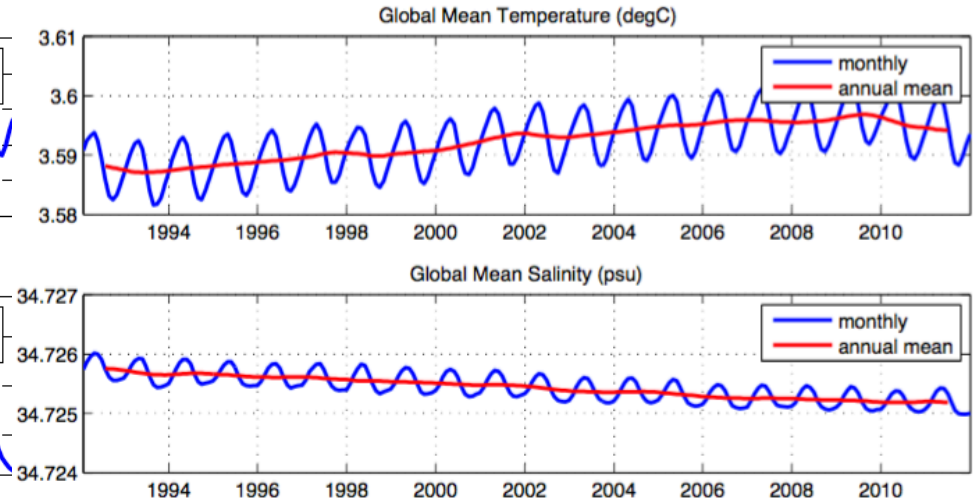
R1



$\Delta T \approx +1e\text{-}2°C/20yr$

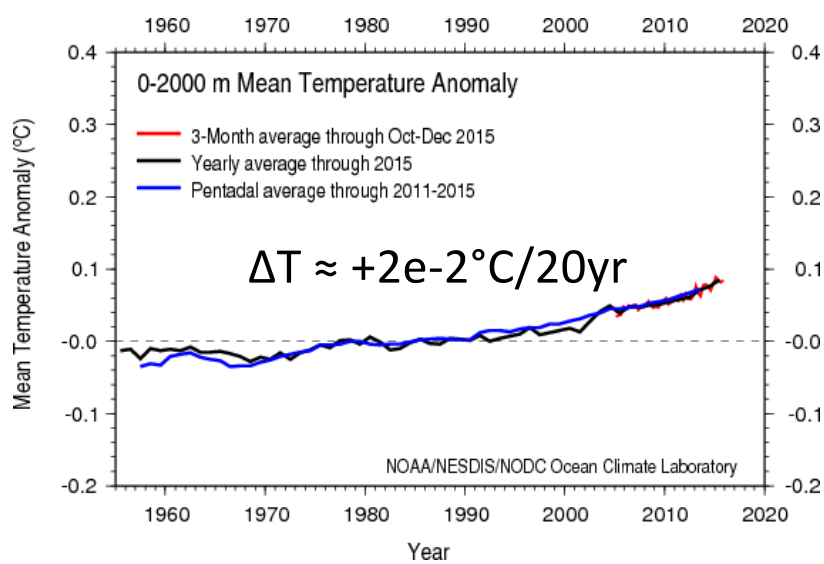
$\Delta S \approx -1e\text{-}3$ psu/20yr

R2



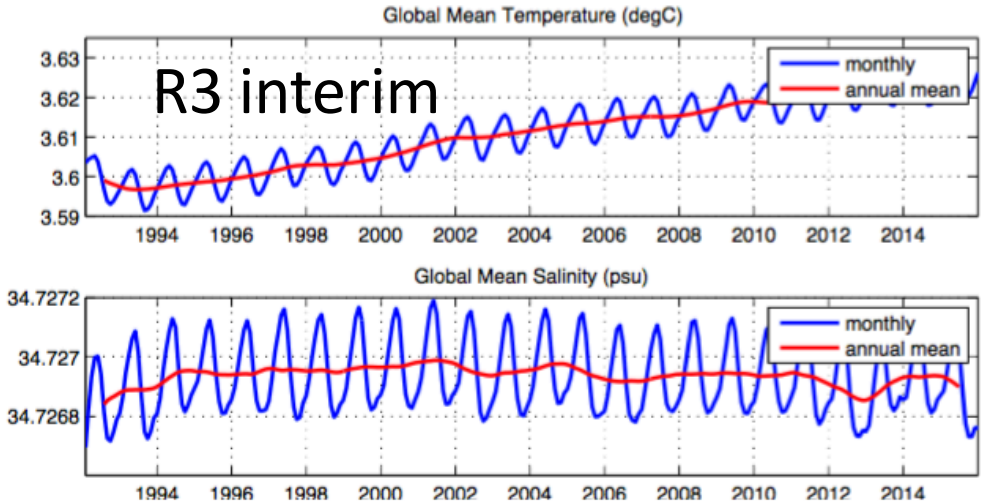
$\Delta T \approx +1e\text{-}2°C/20yr$

$\Delta S \approx -1e\text{-}3$ psu/20yr



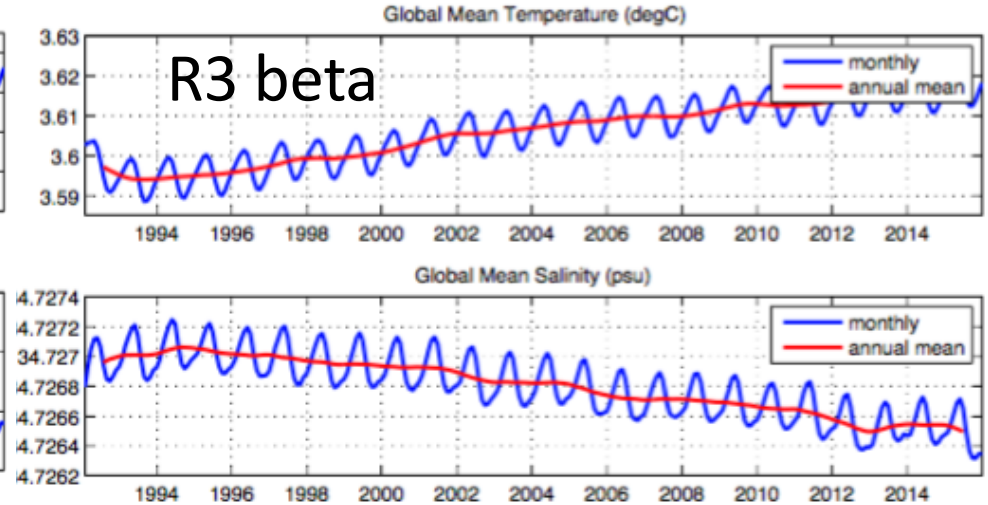
GRACE suggests $\Delta S \approx -4e\text{-}4$ psu/20yr

Global mean T & S (Cont'd)



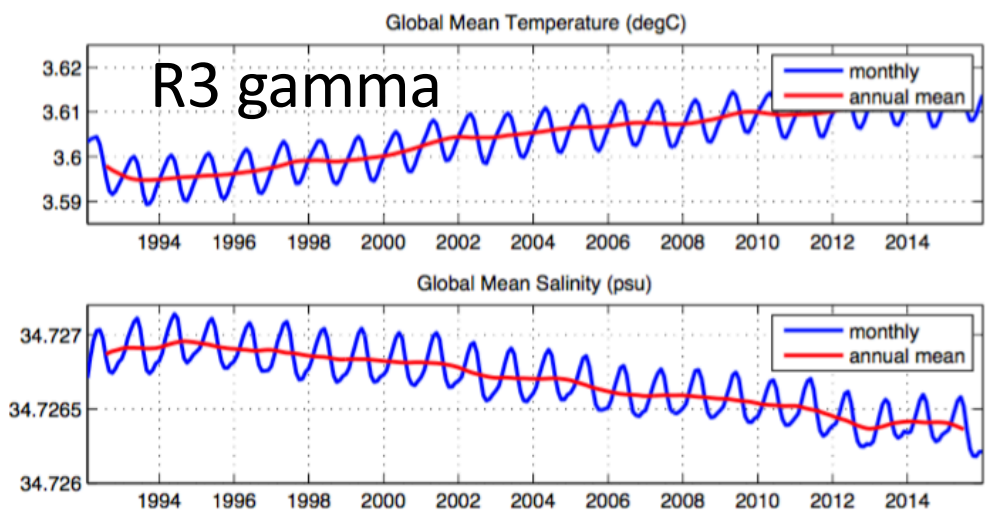
$\Delta T \approx +2e\text{-}2°C/20yr$

$\Delta S \approx -1e\text{-}4$ psu/20yr



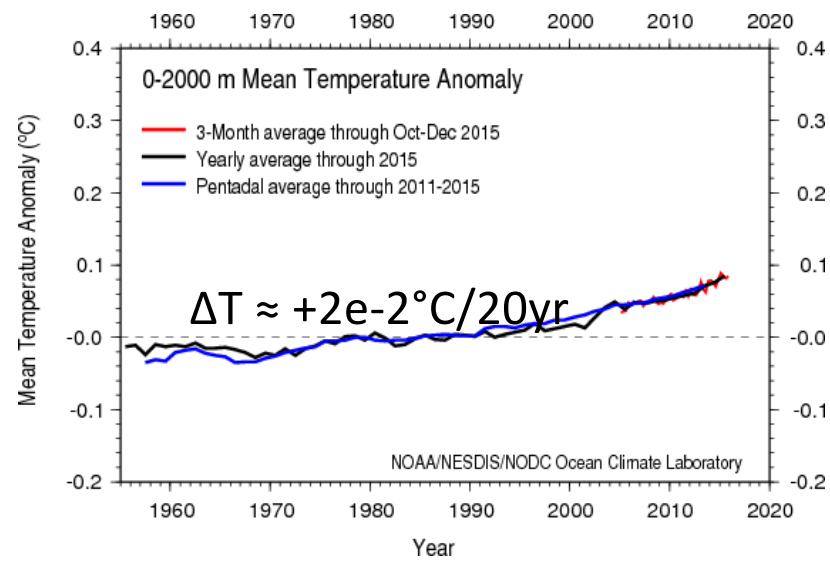
$\Delta T \approx +2e\text{-}2°C/20yr$

$\Delta S \approx -5e\text{-}4$ psu/20yr



$\Delta T \approx +2e\text{-}2°C/20yr$

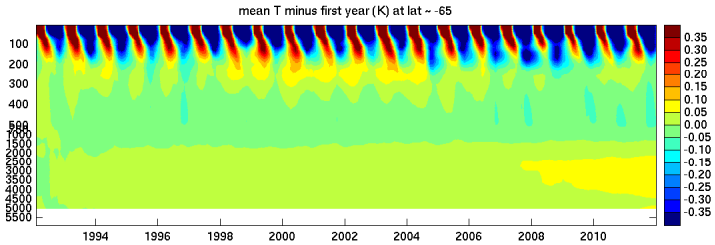
$\Delta S \approx -5e\text{-}4$ psu/20yr



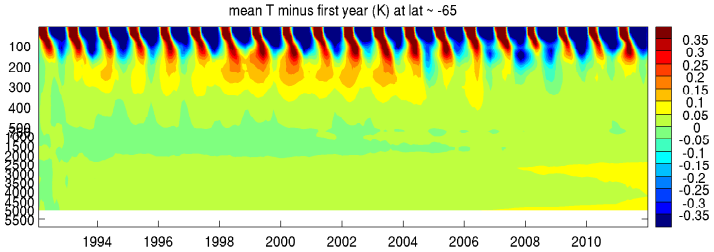
GRACE suggests $\Delta S \approx -4e\text{-}4$ psu/20yr

Zonal Mean Properties

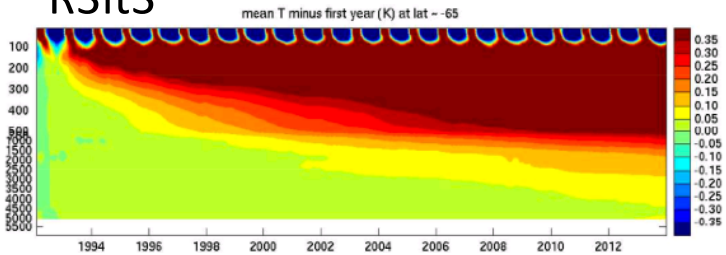
R1



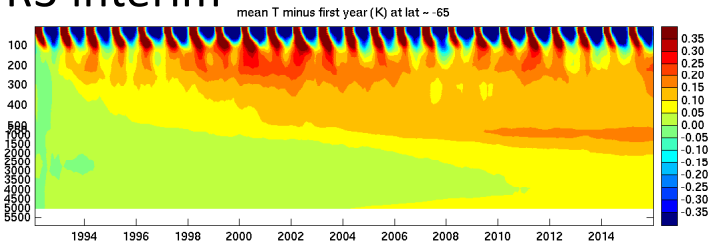
R2



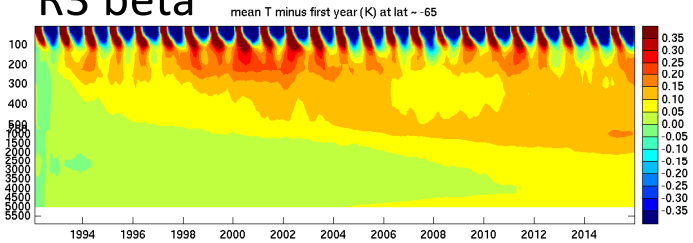
R3it3



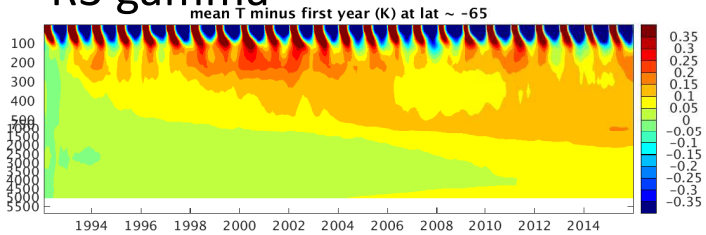
R3 interim



R3 beta



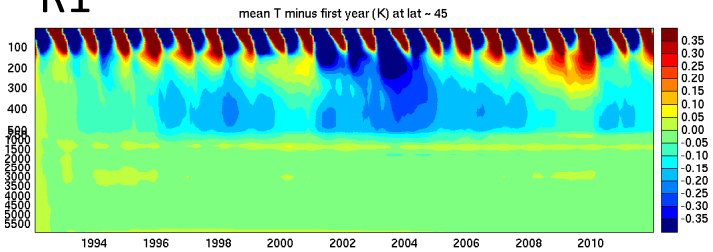
R3 gamma



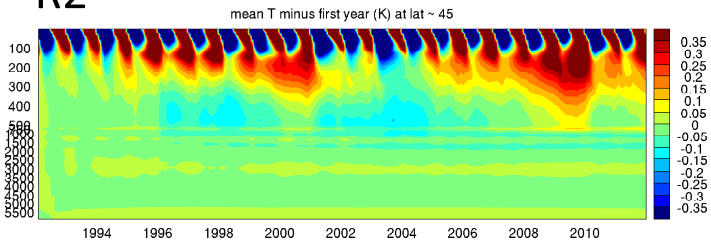
Mean Temperature (K) Minus First Year at Lat ≈ -65

Zonal Mean Properties

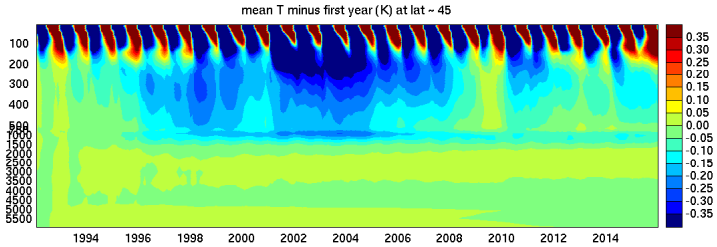
R1



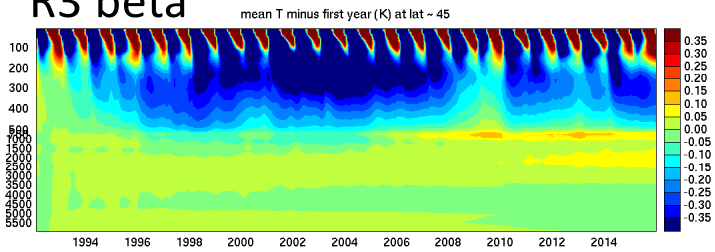
R2



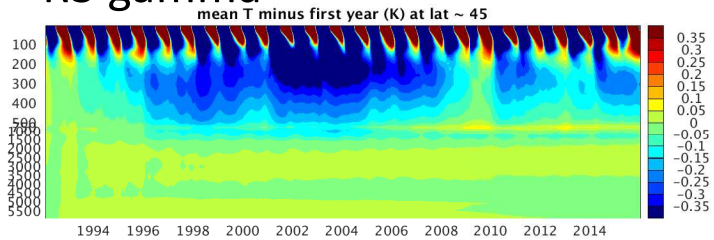
R3 interim



R3 beta

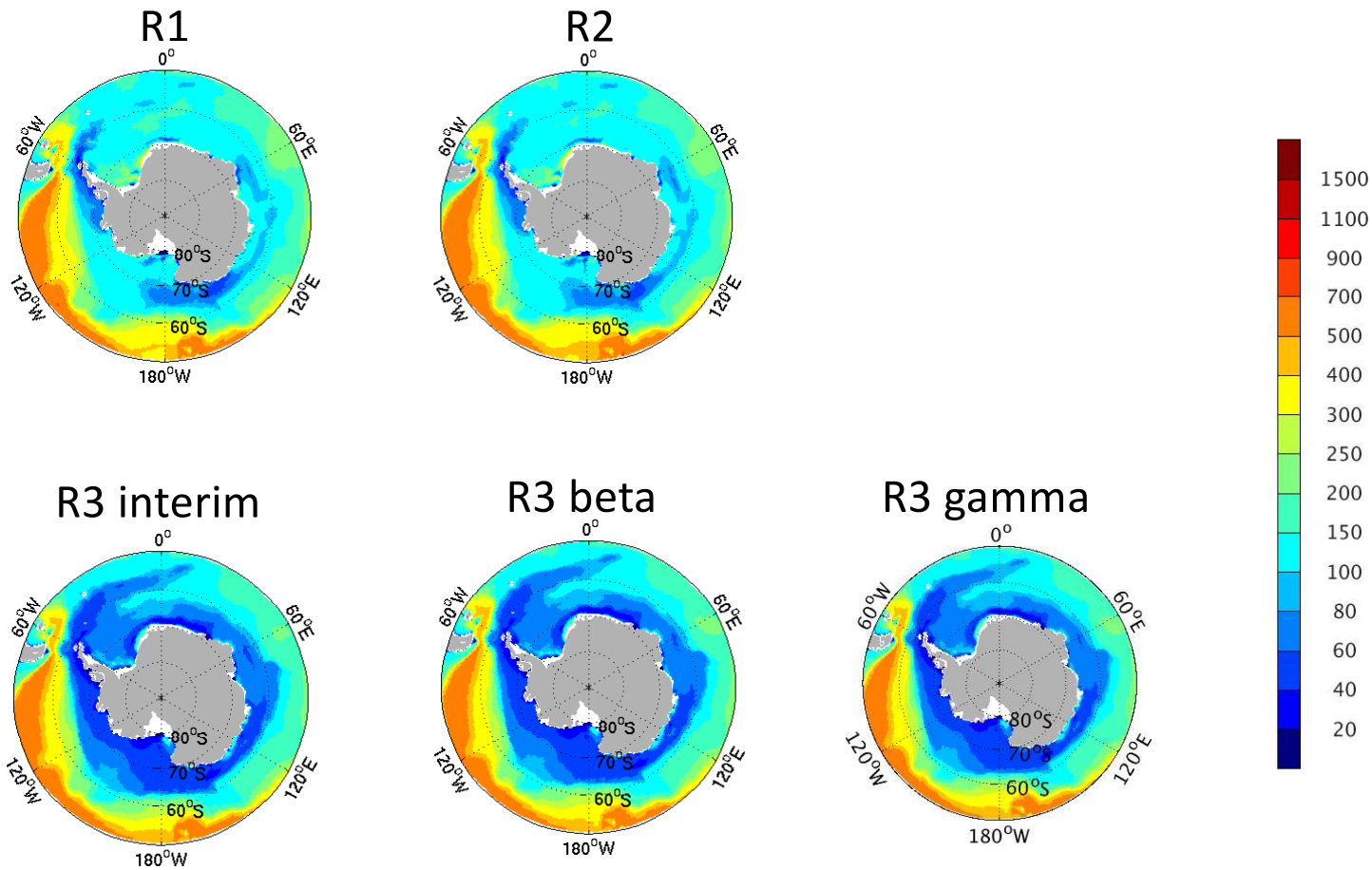


R3 gamma



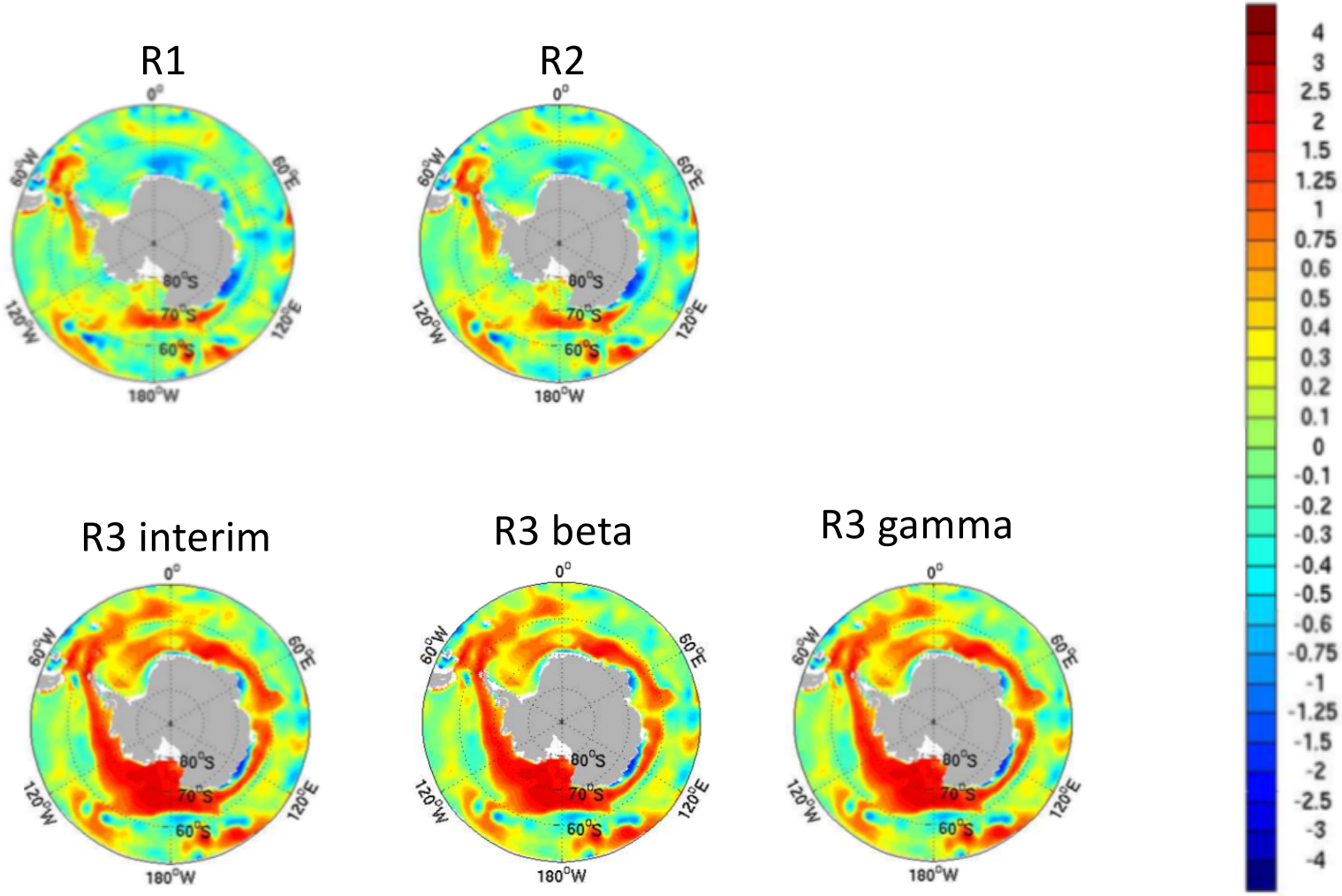
Mean Temperature (K) Minus First Year at Lat ≈ 45

Mixed Layer Depth Fields



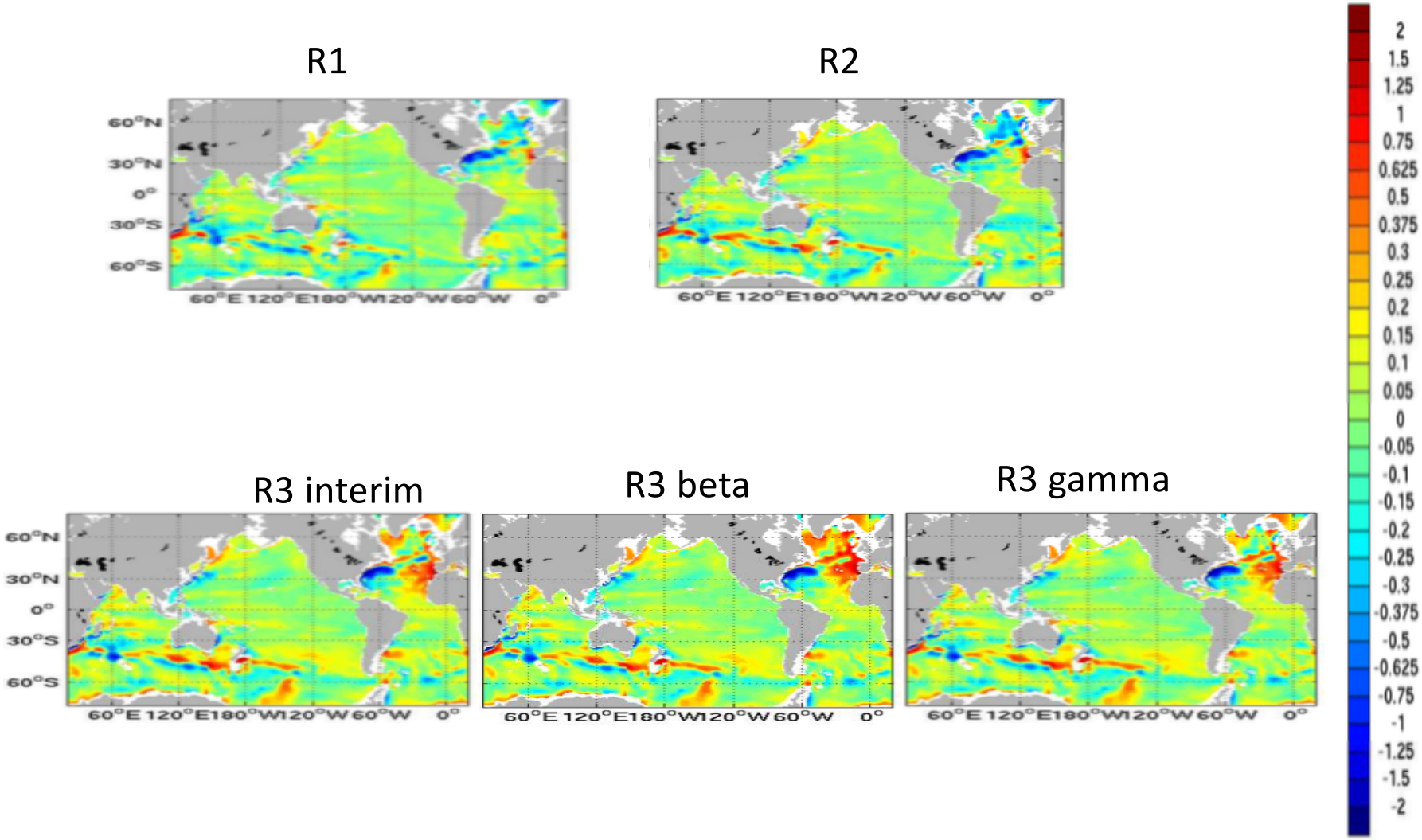
September Mean – Mixed Layer Depth per Kara Formula (m)

Climatology Temperature



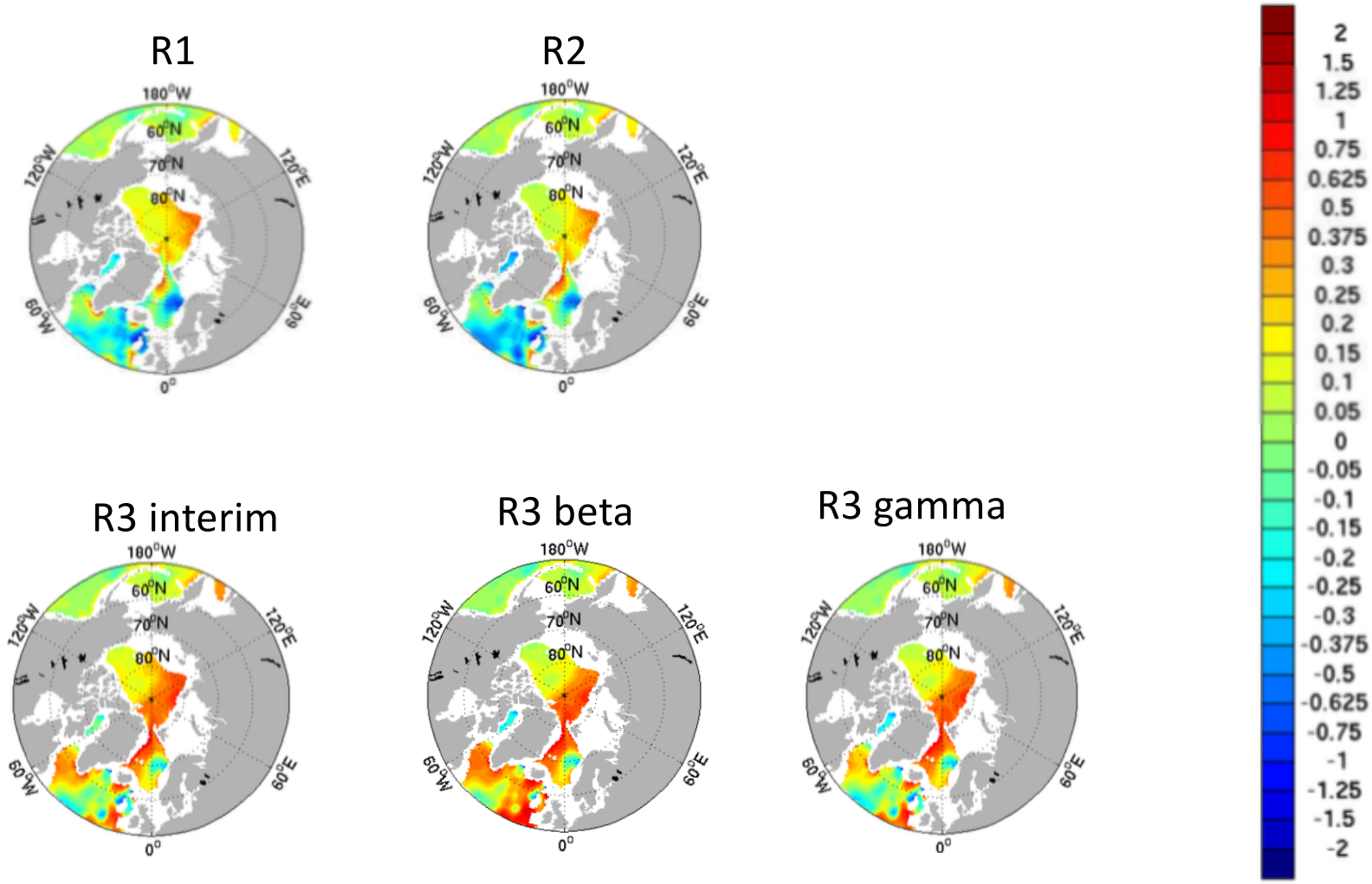
modeled-climatology mean – T (K) at 105m depth

Climatology Temperature



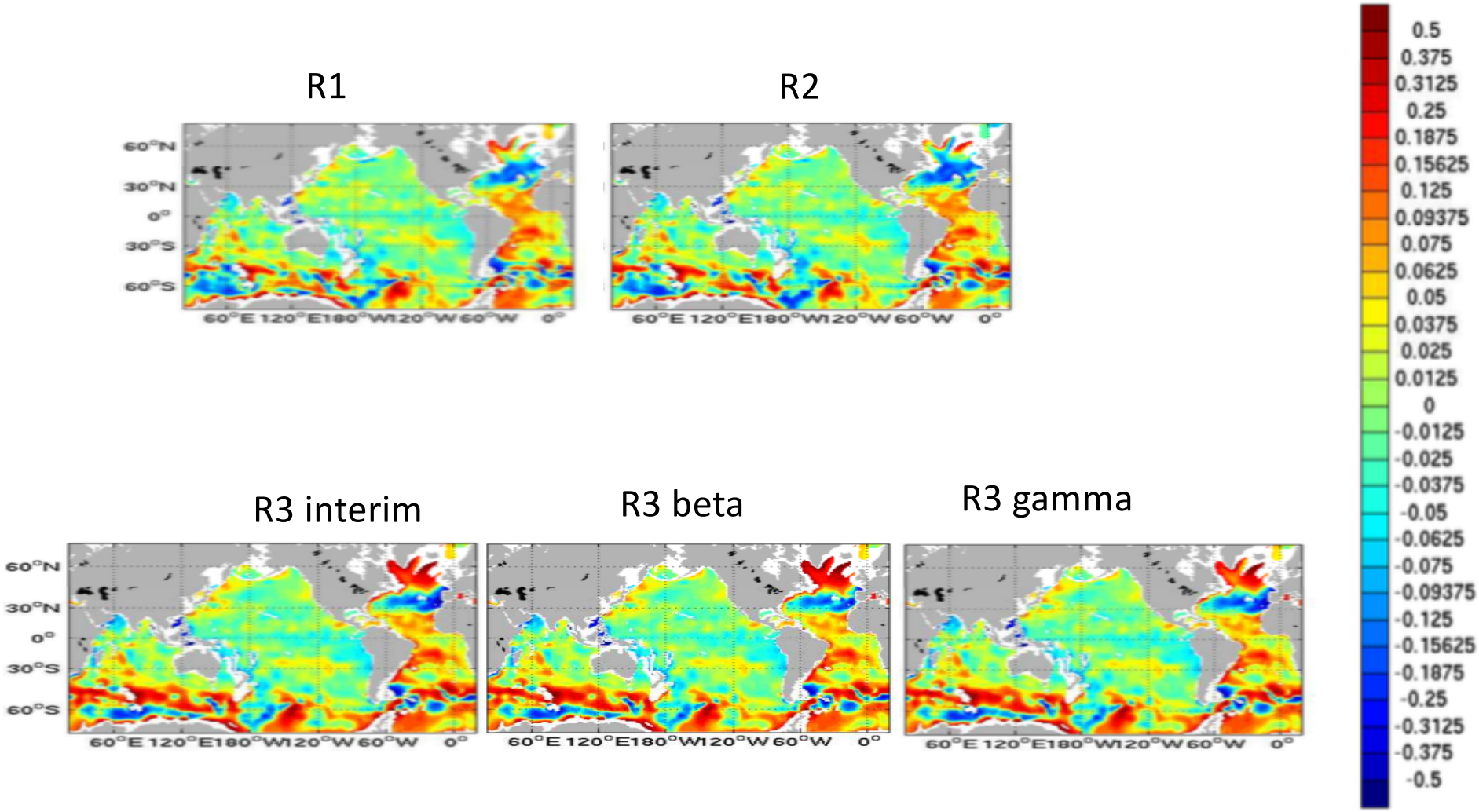
modeled-climatology mean – T (K) at 910m depth

Climatology Temperature



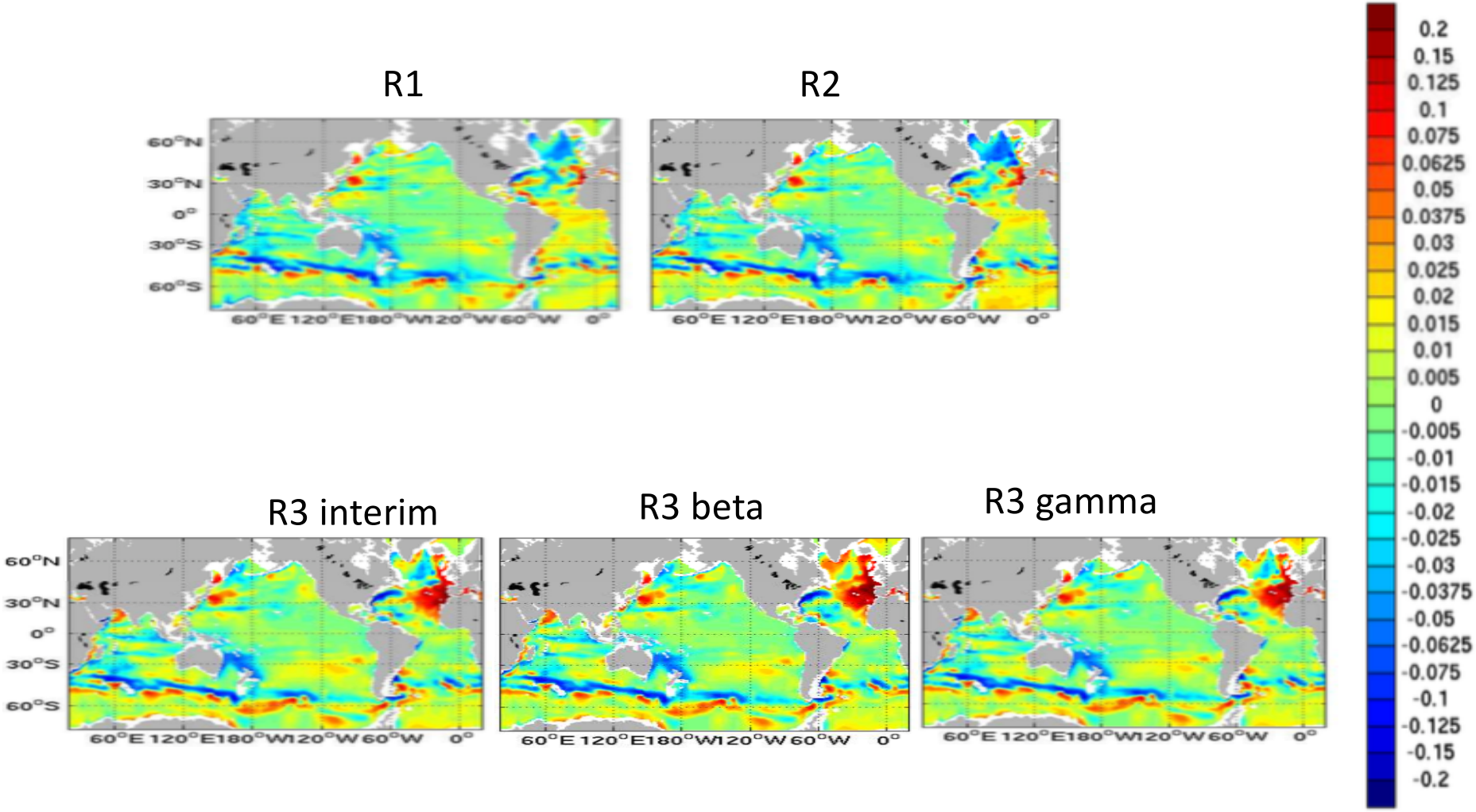
modeled-climatology mean – T (K) at 910m depth

Climatology Temperature



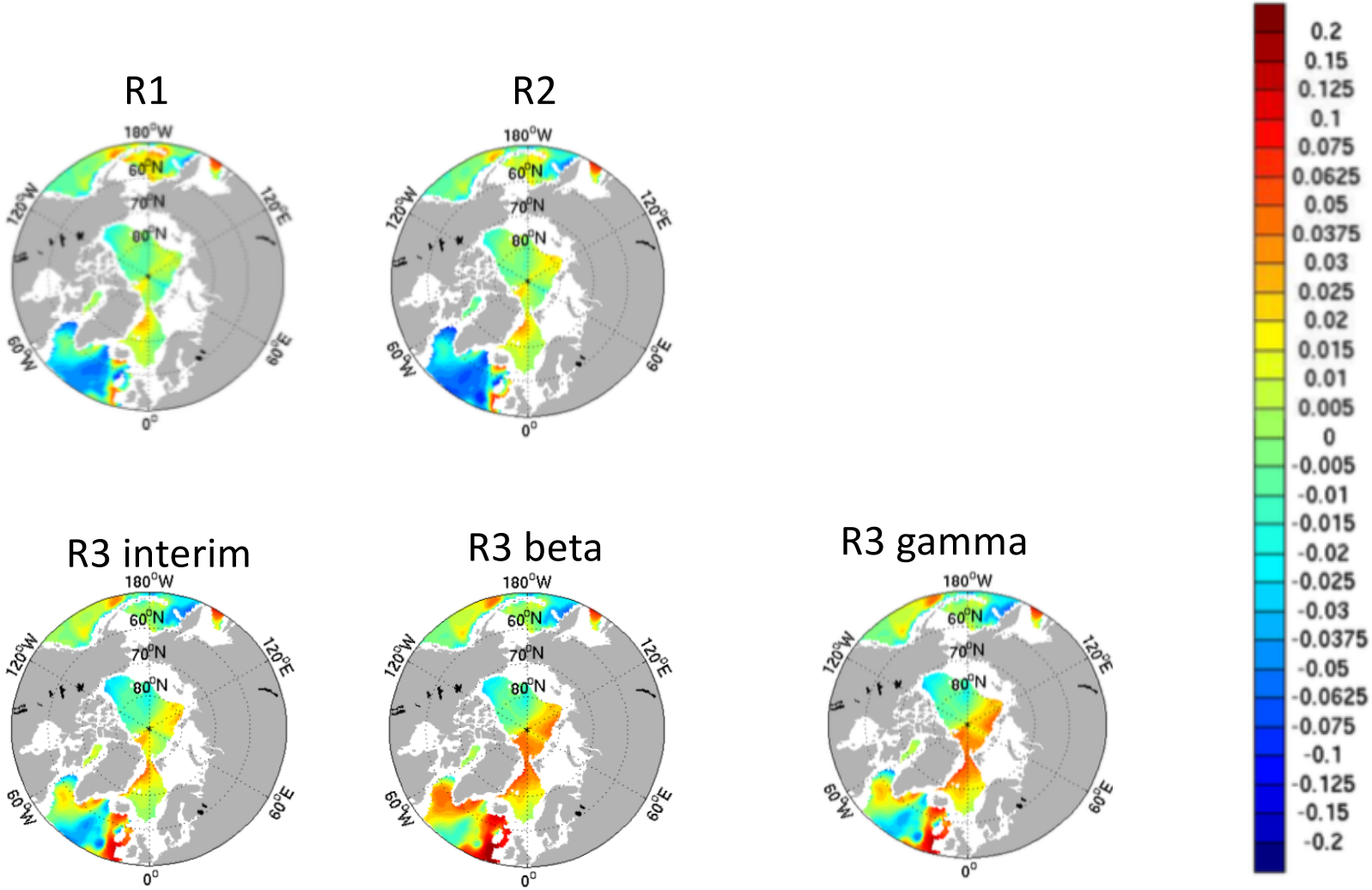
modeled-climatology mean – T (K) at 1914m depth

Climatology Salinity



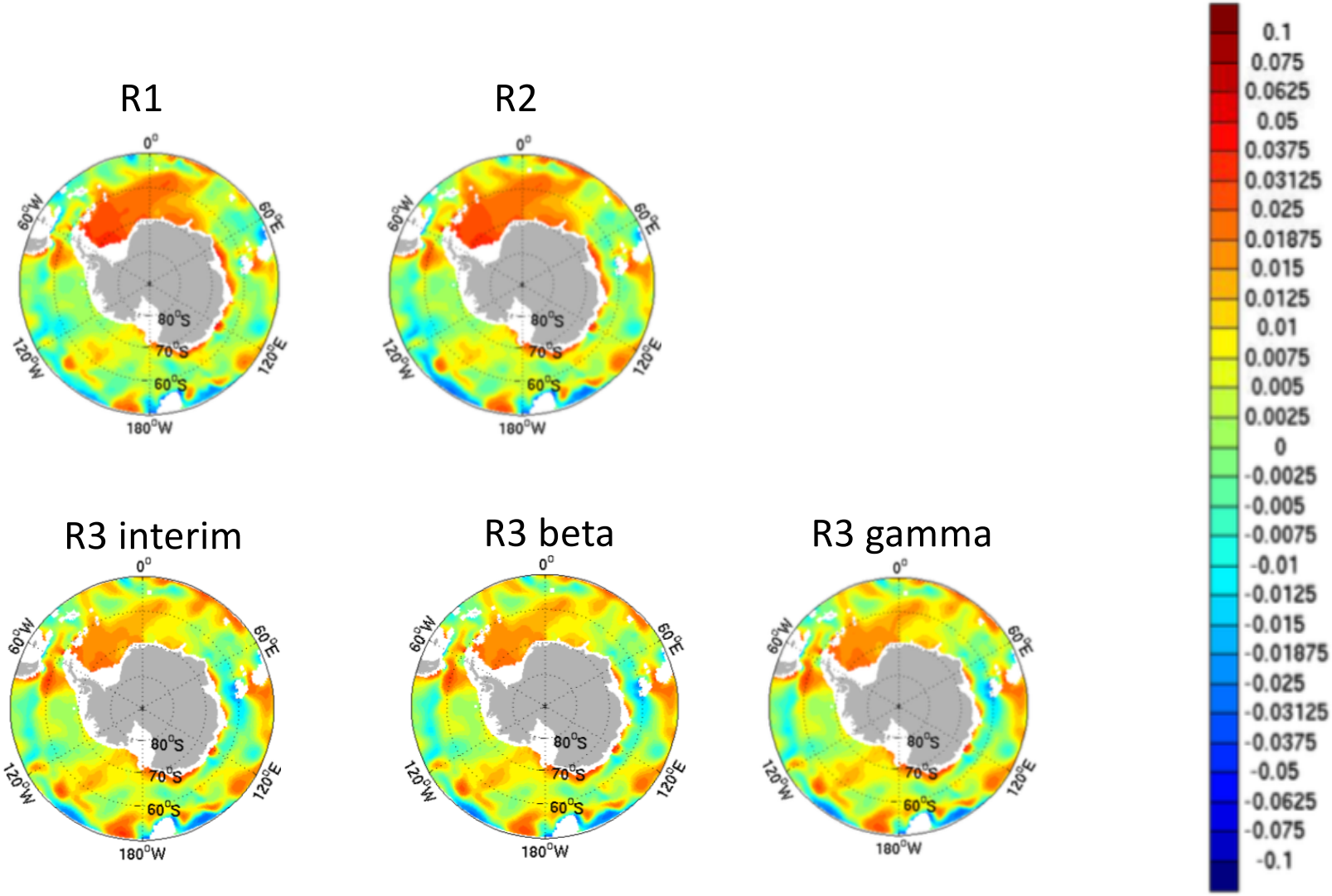
modeled-clim mean – S (psu) at 910m depth

Climatology Salinity



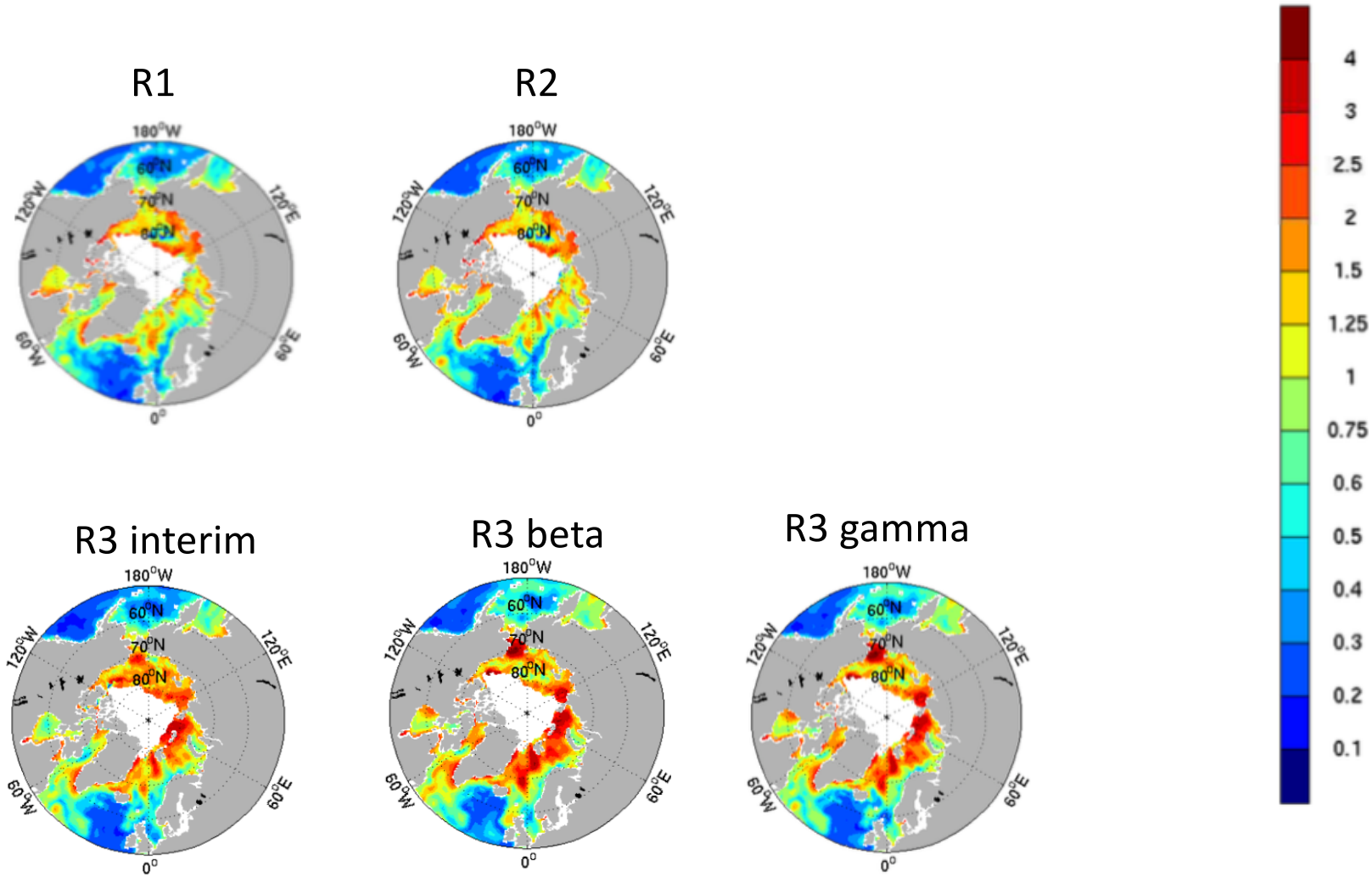
modeled-clim mean – S (psu) at 910m depth

Climatology Salinity



modeled-clim mean – S (psu) at 1914m depth

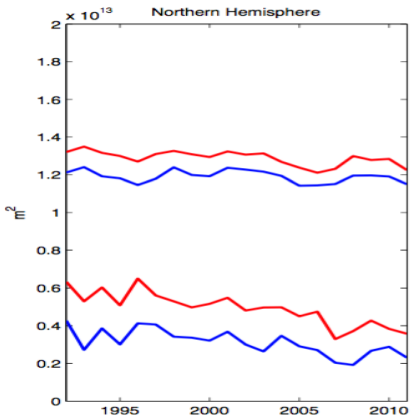
Sea Surface Temperature



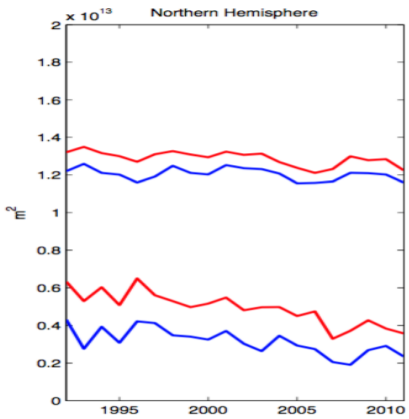
modeled-Reynolds rms – sea surface temperature (K)

Sea Ice Concentration

R1



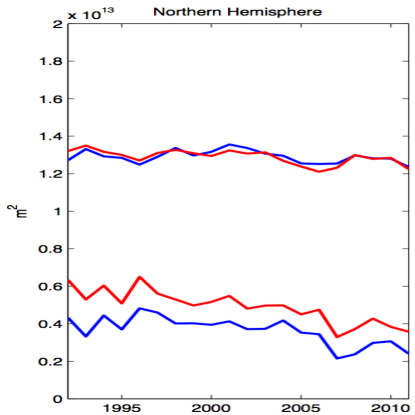
R2



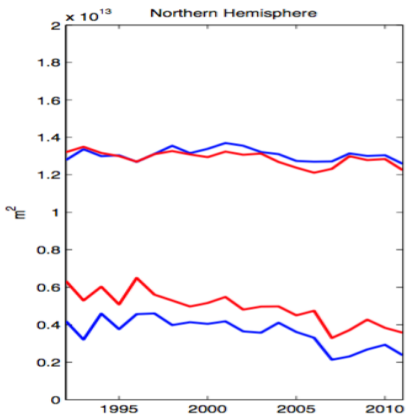
September

March

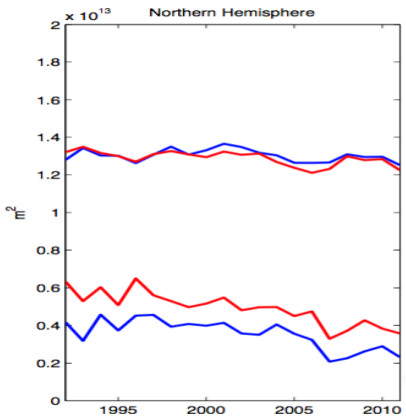
R3 interim



R3 beta



R3 gamma



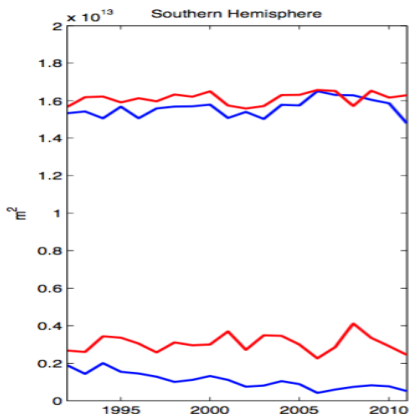
NSIDC

model

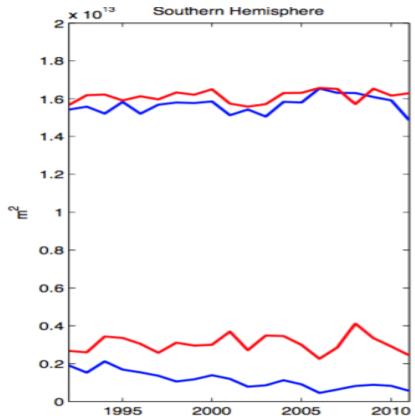
Northern Hemisphere Sea Ice Concentration

Sea Ice Concentration

R1



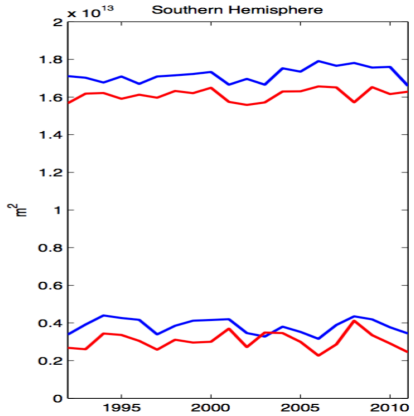
R2



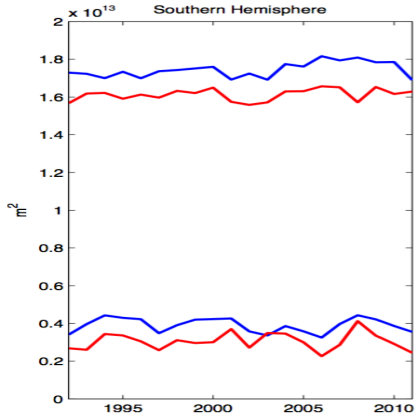
September

March

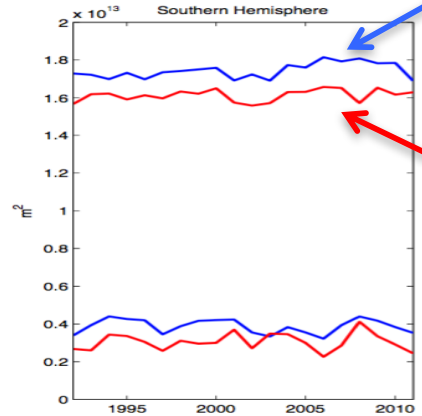
R3 interim



R3 beta



R3 gamma

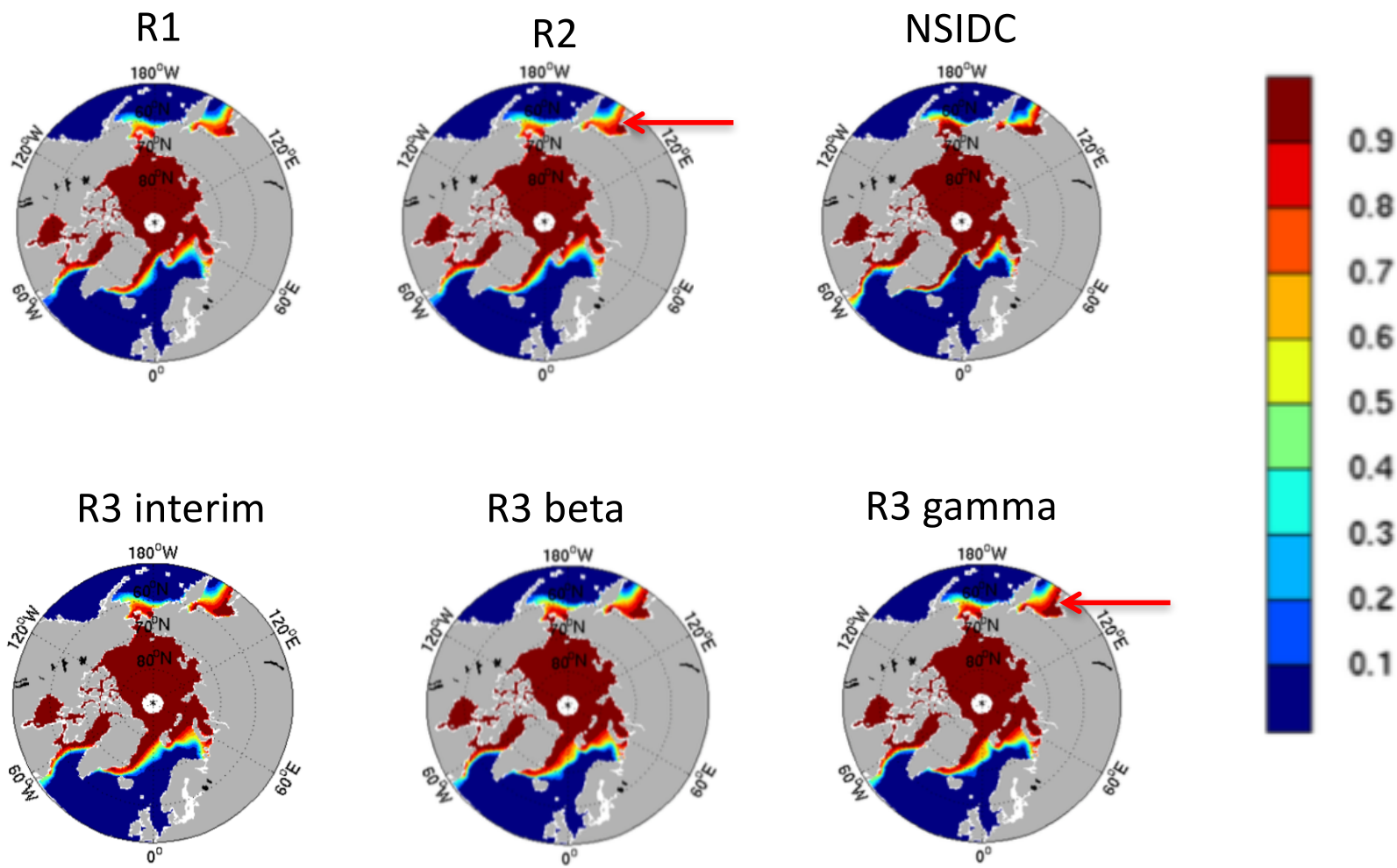


model

NSIDC

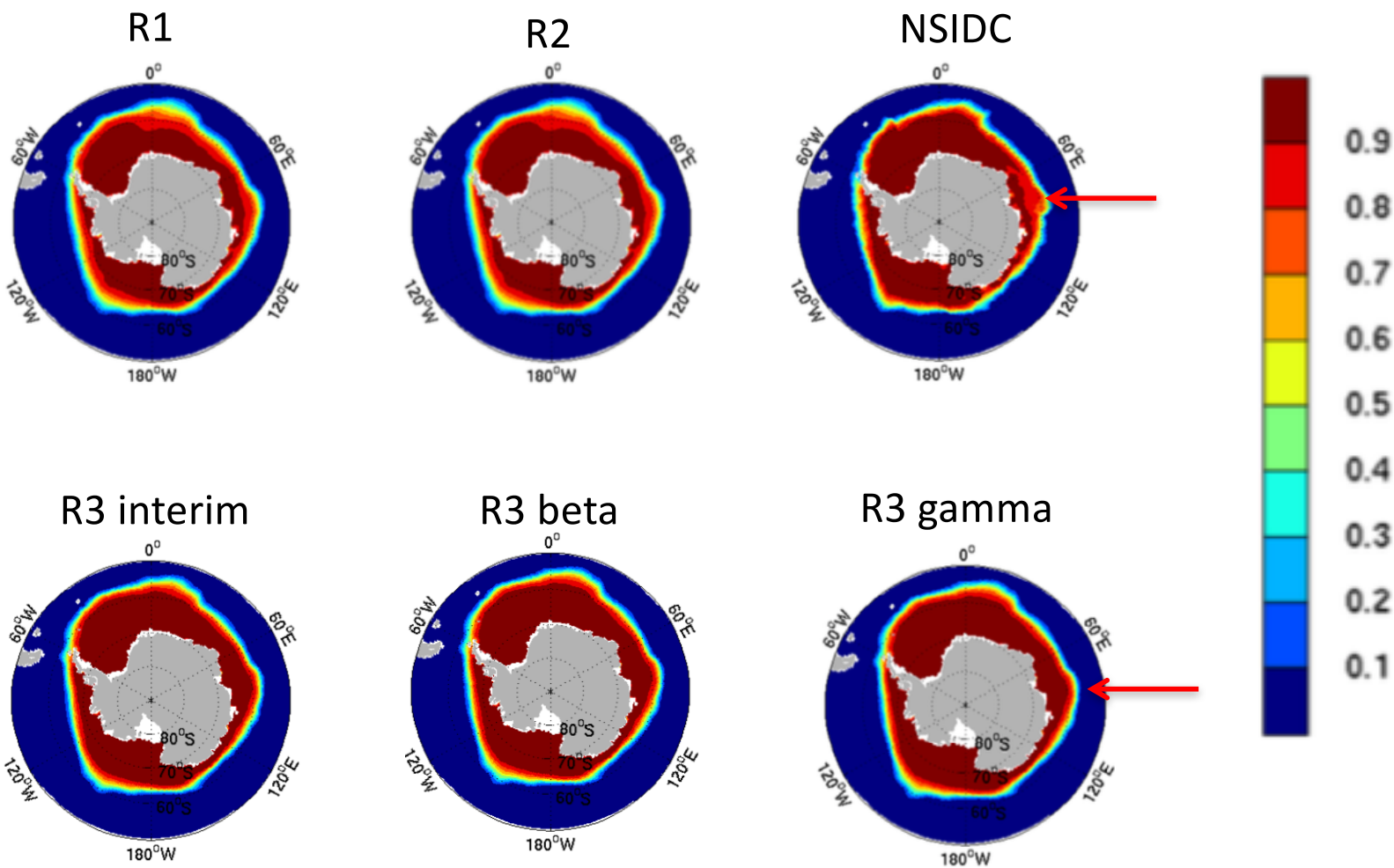
Southern Hemisphere Sea Ice Concentration

Sea Ice



March Sea Ice Concentration

Sea Ice



September Sea Ice Concentration