

gcmfaces analysis of ECCO V4, Release 4 (1992-2017)

September 5, 2019

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[rms of control adjustment](#)

[std of control adjustment](#)

[mean of control adjustment](#)

[control prior uncertainty](#)

[rms of control adjustment](#)

This document contains a set of analysis plots for ECCO V4r4, covering the time period 1992-2017.
In the cost-related plots, the area-scaling factor (gamma) and the other spatial
scaling factor have been removed in computing the costs.

The plots are generated using the Matlab analysis toolbox gcmfaces
(http://wwwcvs.mitgcm.org/viewvc/MITgcm/MITgcm_contrib/gael/matlab_class/gcmfaces.pdf?view=co).
Although not exhaustive, this document provides a convenient visual description
of the run for users.

fit to in situ data

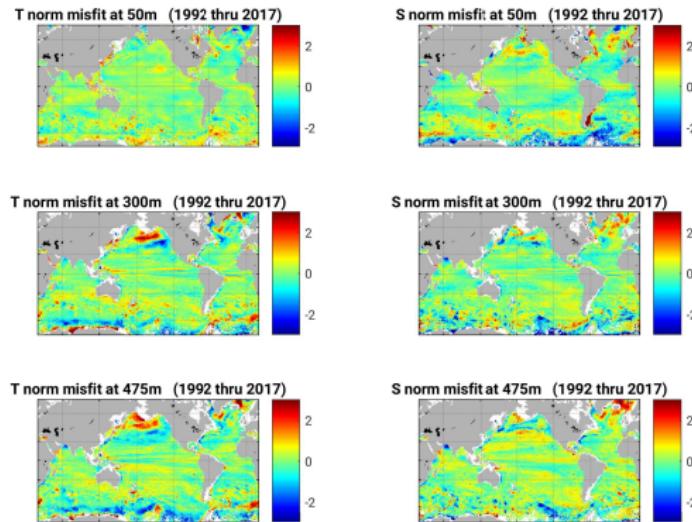


Figure : Time mean normalized misfit ($model - data$)/ σ for in situ profiles, at depths (rows), for T (left) and S (right).

fit to in situ data

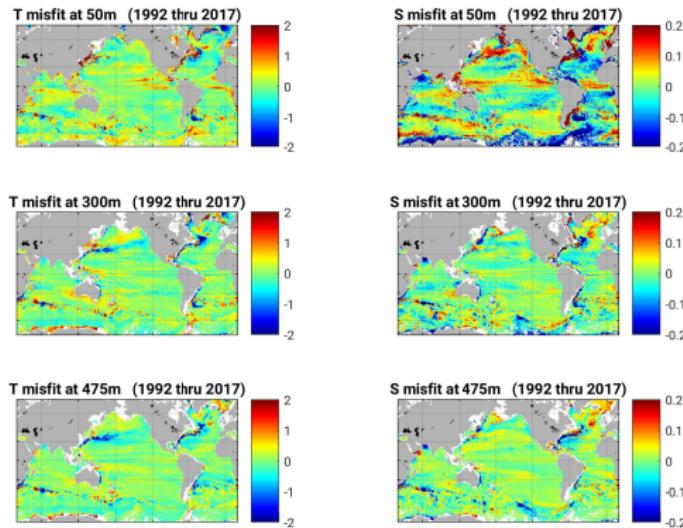


Figure : Time mean misfit (*model – data*) for in situ profiles, at depths (rows), for T (left; K) and S (right; in psu).

fit to in situ data

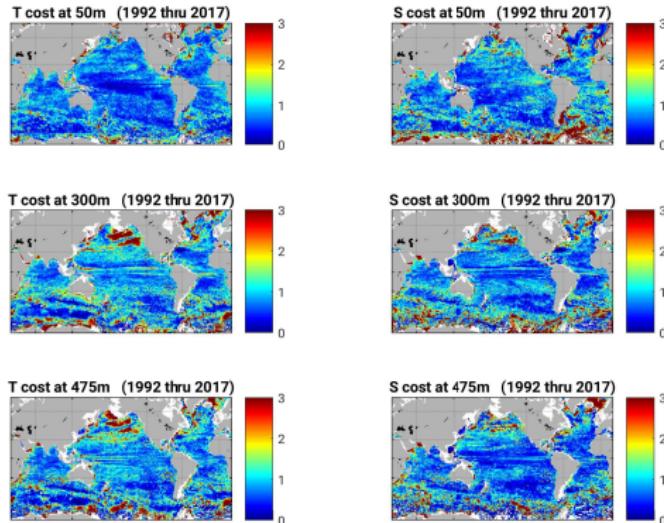


Figure : Time mean cost ($model - data$) $^2 / \sigma^2$ for in situ profiles, at depths (rows), for T (left) and S (right).

fit to in situ data

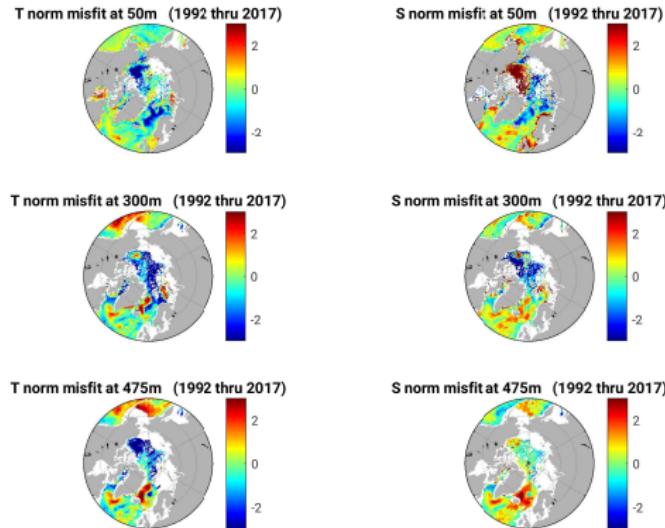


Figure : Time mean normalized misfit ($model - data$)/ σ for in situ profiles, at depths (rows), for T (left) and S (right).

fit to in situ data

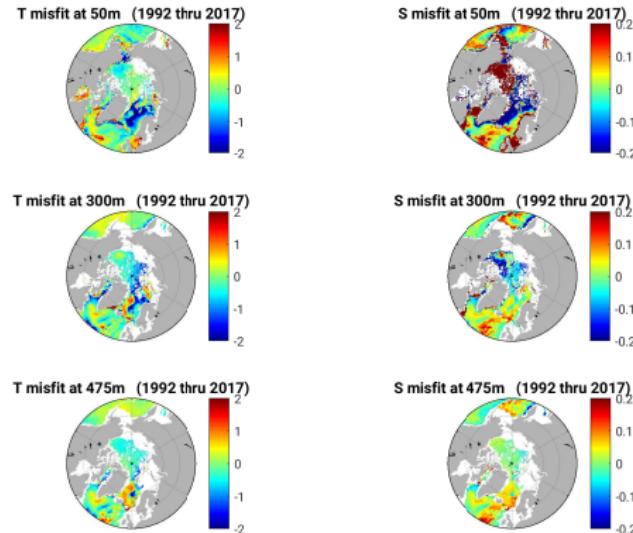


Figure : Time mean misfit (*model – data*) for in situ profiles, at depths (rows), for T (left; K) and S (right; in psu).

fit to in situ data

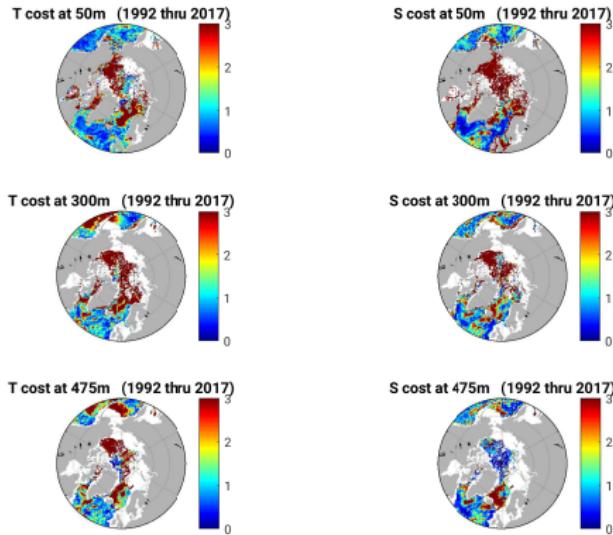


Figure : Time mean cost ($model - data$) $^2 / \sigma^2$ for in situ profiles, at depths (rows), for T (left) and S (right).

fit to in situ data

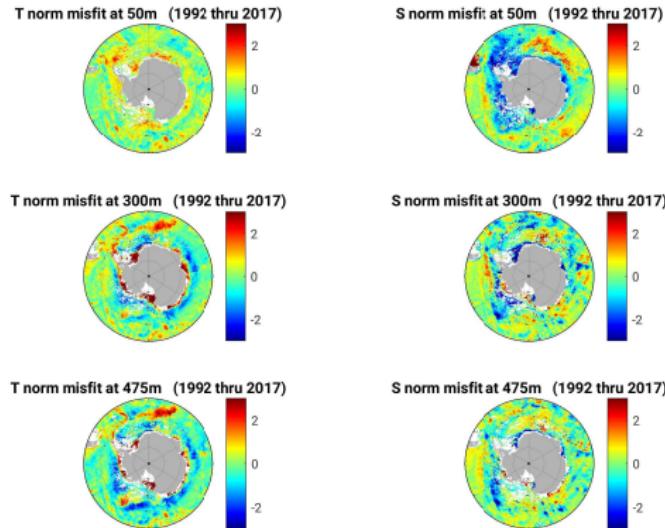


Figure : Time mean normalized misfit ($model - data$)/ σ for in situ profiles, at depths (rows), for T (left) and S (right).

fit to in situ data

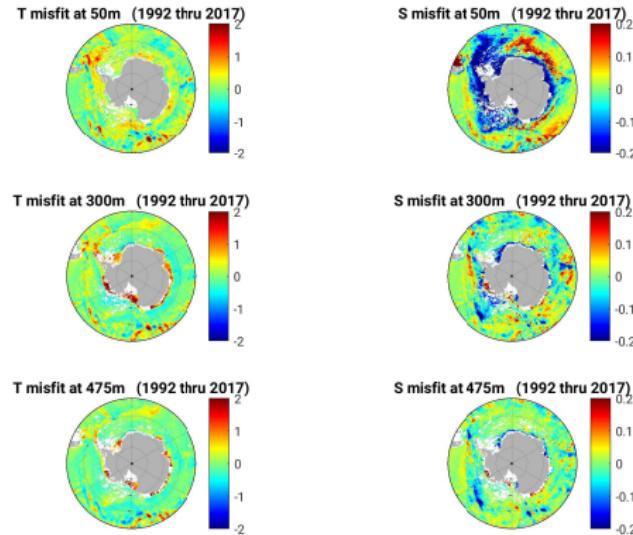


Figure : Time mean misfit (*model – data*) for in situ profiles, at depths (rows), for T (left; K) and S (right; in psu).

fit to in situ data

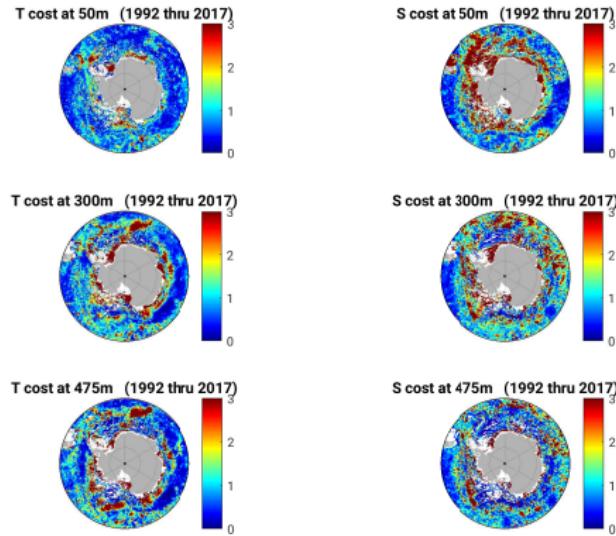


Figure : Time mean cost ($model - data$) $^2 / \sigma^2$ for in situ profiles, at depths (rows), for T (left) and S (right).

fit to altimeter data (RADS)

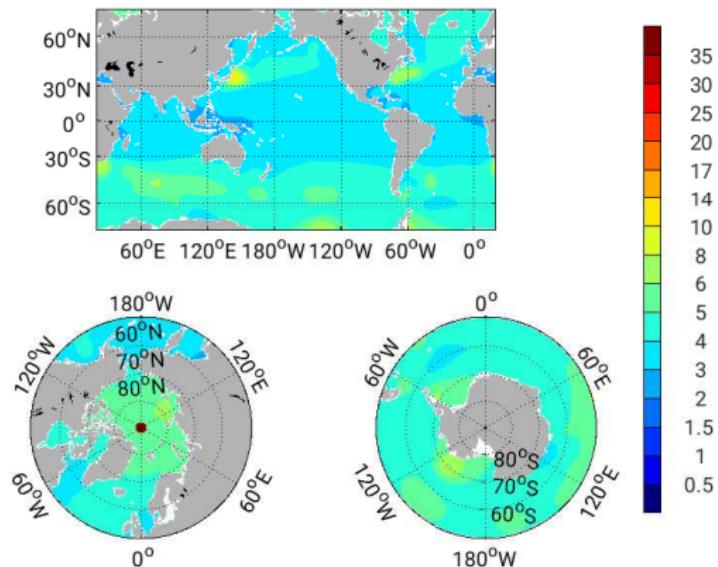


Figure : Mean Dynamic Topography Prior Uncertainty (cm)

fit to altimeter data (RADS)

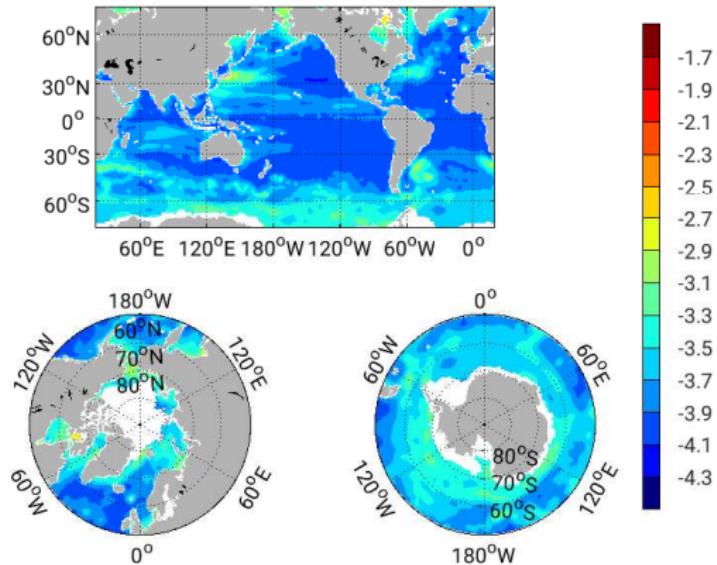


Figure : Sea Level Anomaly, Large Scale: $\log(\text{prior error variance})$ (m^2)

fit to altimeter data (RADS)

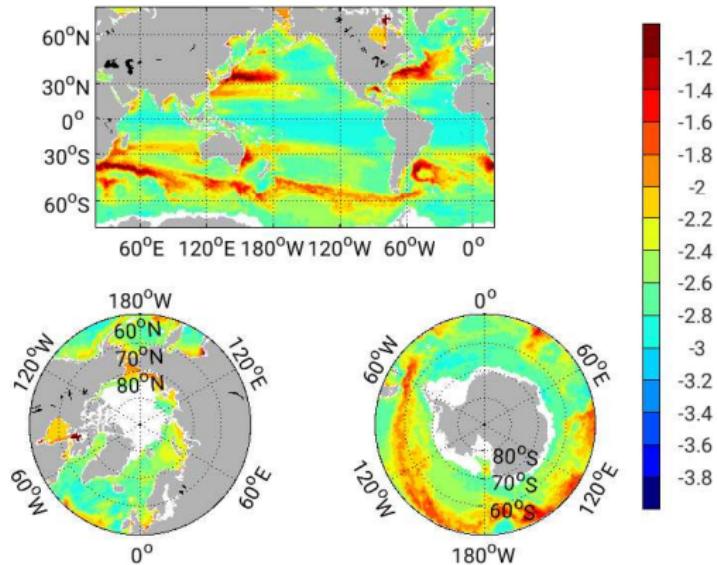


Figure : Sea Level Anomaly, Pointwise: $\log(\text{prior error variance})$ (m^2)

fit to altimeter data (RADS)

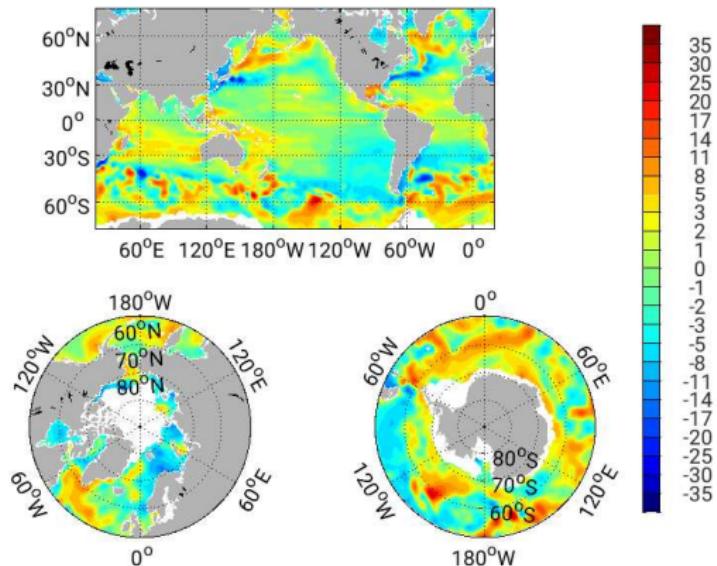


Figure : Mean Dynamic Topography Misfit (cm)

fit to altimeter data (RADS)

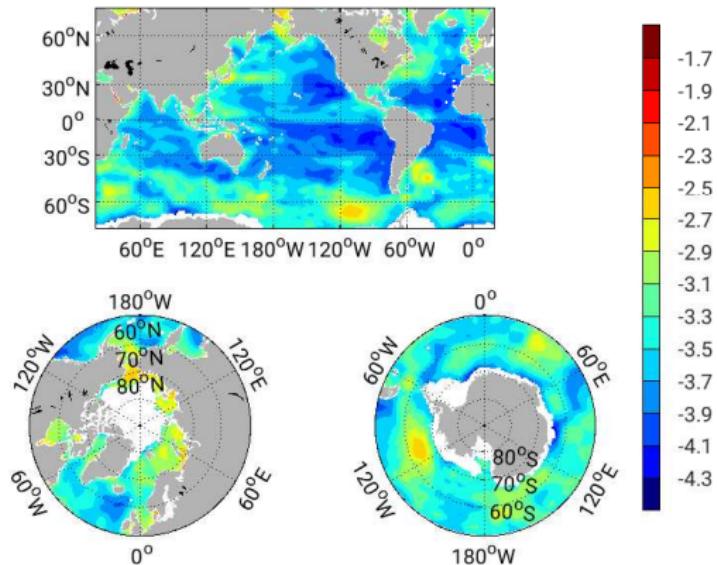


Figure : Sea Level Anomaly, Large Scale: Modeled-Data
 $\log(\text{variance}) (\text{m}^2)$

fit to altimeter data (RADS)

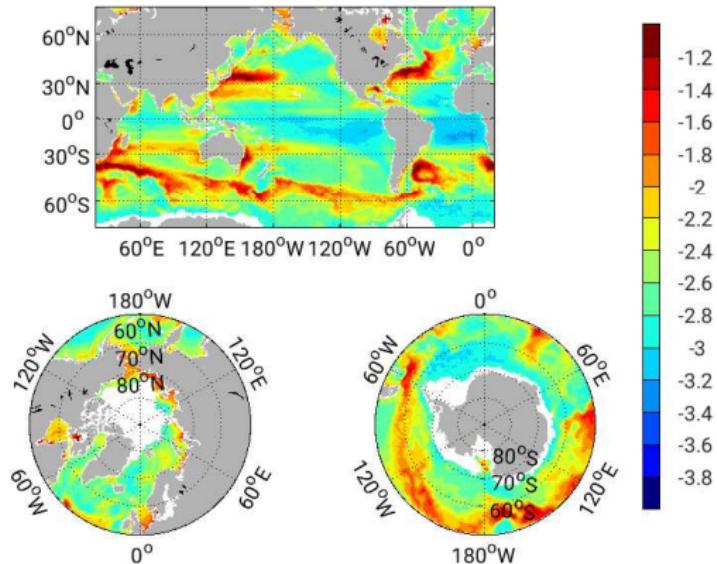


Figure : Sea Level Anomaly, Pointwise: Modeled-Data
 $\log(\text{variance}) (\text{m}^2)$

fit to altimeter data (RADS)

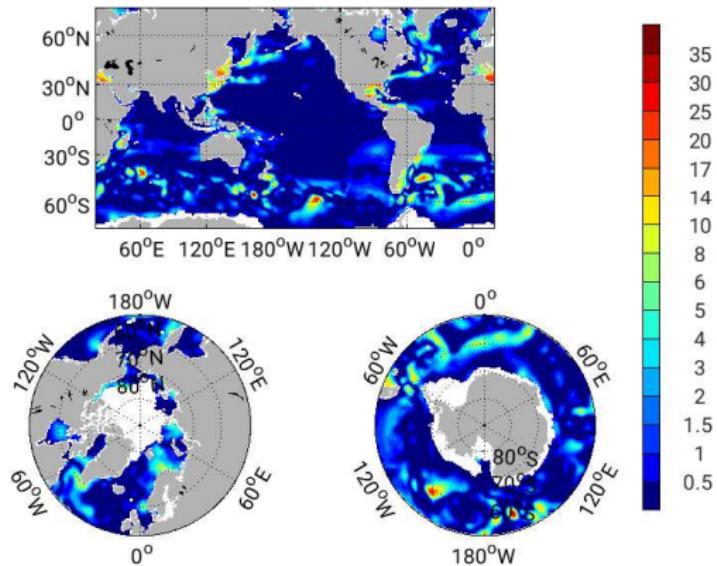


Figure : Mean Dynamic Topography: Modeled-Data Cost

fit to altimeter data (RADS)

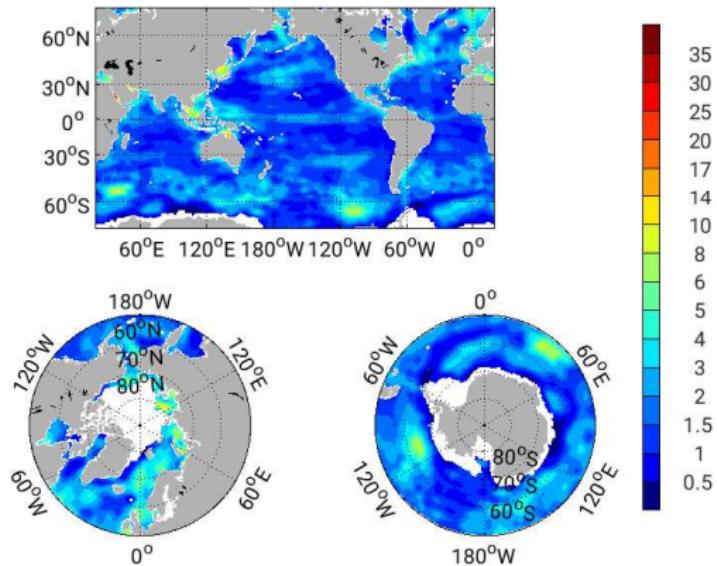


Figure : Sea Level Anomaly, Large Scale: Modeled-Data Cost

fit to altimeter data (RADS)

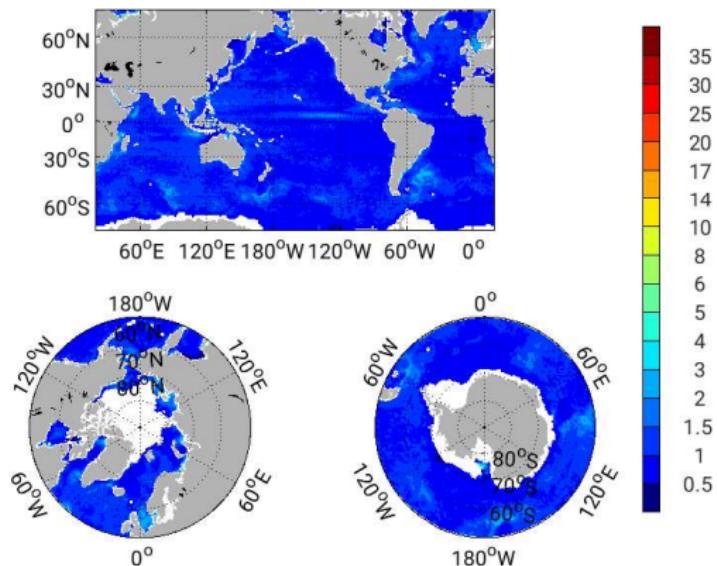


Figure : Sea Level Anomaly, Pointwise: Modeled-Data Cost

fit to altimeter data (RADS)

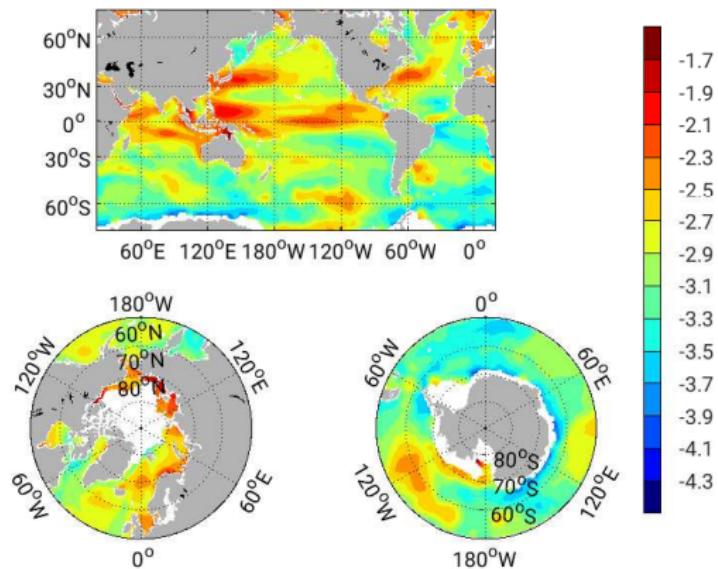


Figure : Sea Level Anomaly, Large Scale: Data $\log(\text{variance})$ (m^2)

fit to altimeter data (RADS)

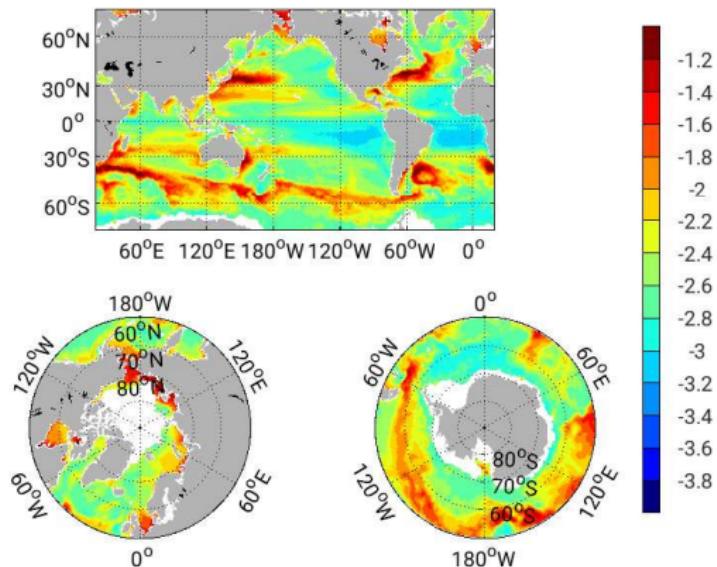


Figure : Sea Level Anomaly, Pointwise: Data $\log(\text{variance})$ (m^2)

fit to altimeter data (RADS)

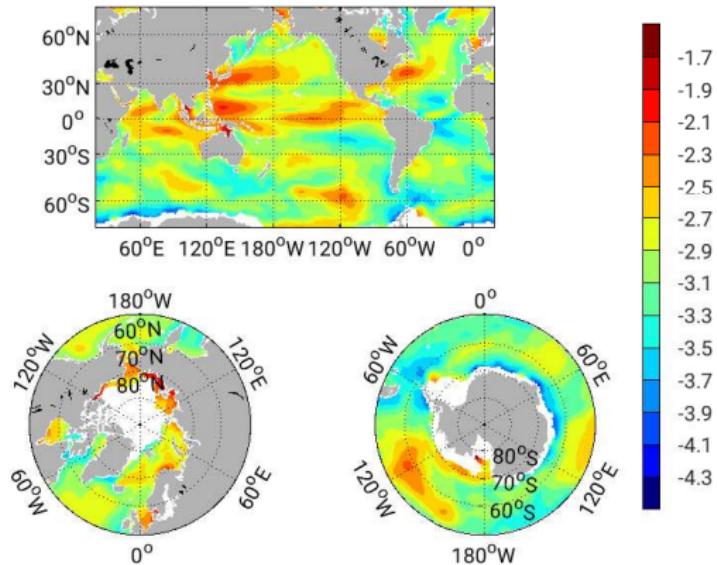


Figure : Sea Level Anomaly, Large Scale: Modeled $\log(\text{variance})$ (m^2)

fit to altimeter data (RADS)

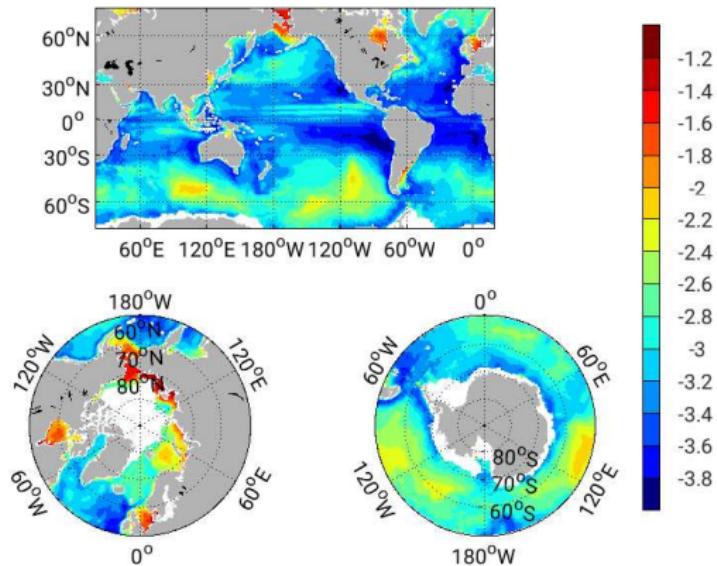


Figure : Sea Level Anomaly, Pointwise: Modeled $\log(\text{variance})$ (m^2)

fit to grace r4 data

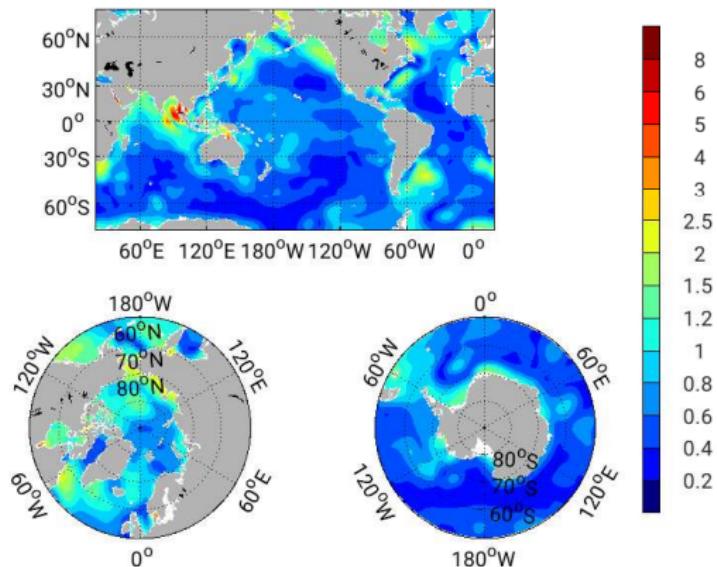


Figure : Bottom Pressure (cm): RMS of Modeled-Data

fit to grace r4 data

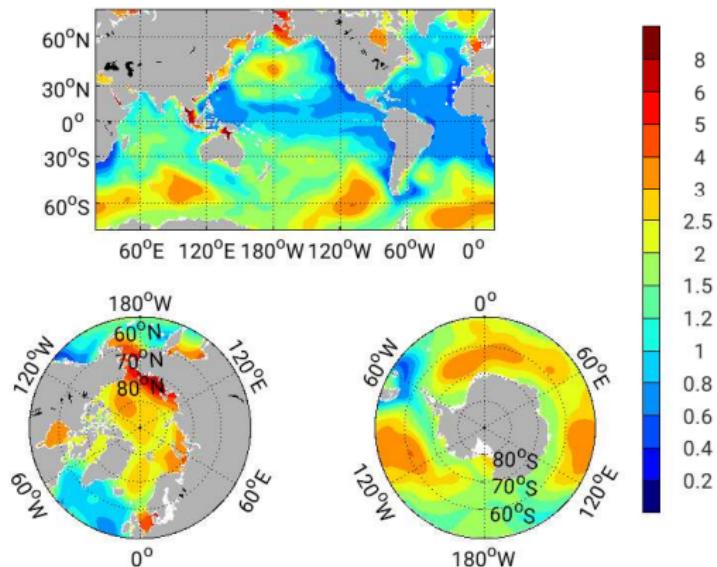


Figure : Bottom Pressure (cm): RMS of Modeled

fit to grace r4 data

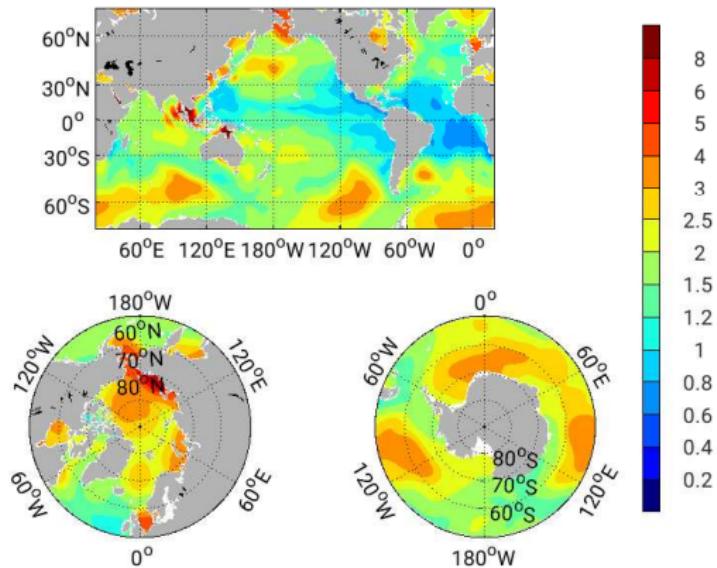


Figure : Bottom Pressure (cm): RMS of Data

fit to grace r4 data

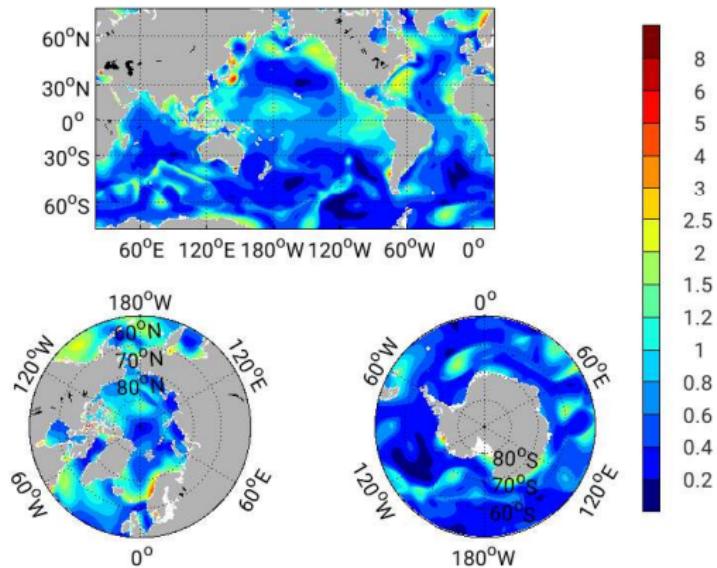


Figure : Bottom Pressure (cm): Cost function

barotropic streamfunction

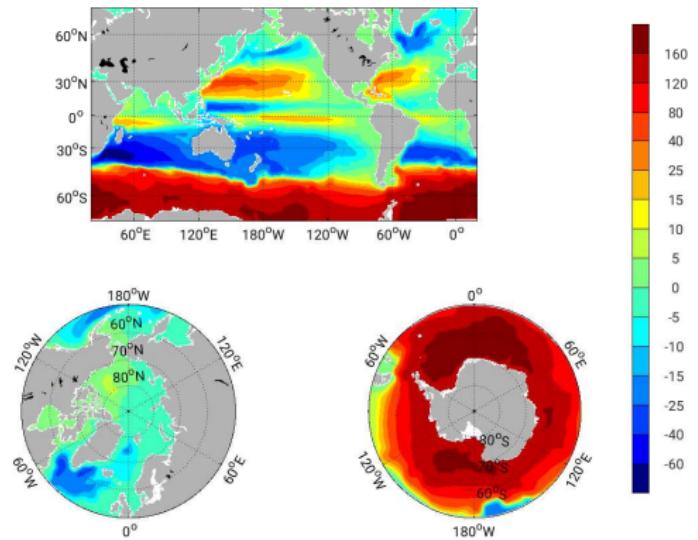


Figure : Barotropic Streamfunction (Sv): 1992 thru 2017 Mean

barotropic streamfunction

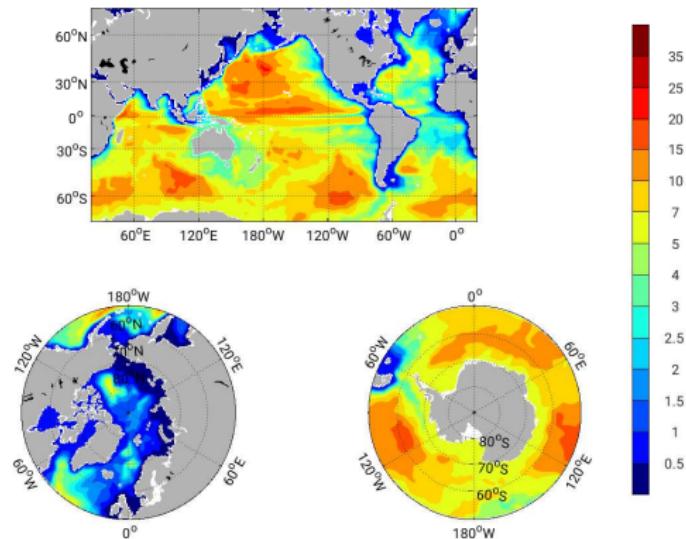


Figure : Barotropic Streamfunction (Sv): Standard Deviation,
1992 thru 2017

meridional streamfunction

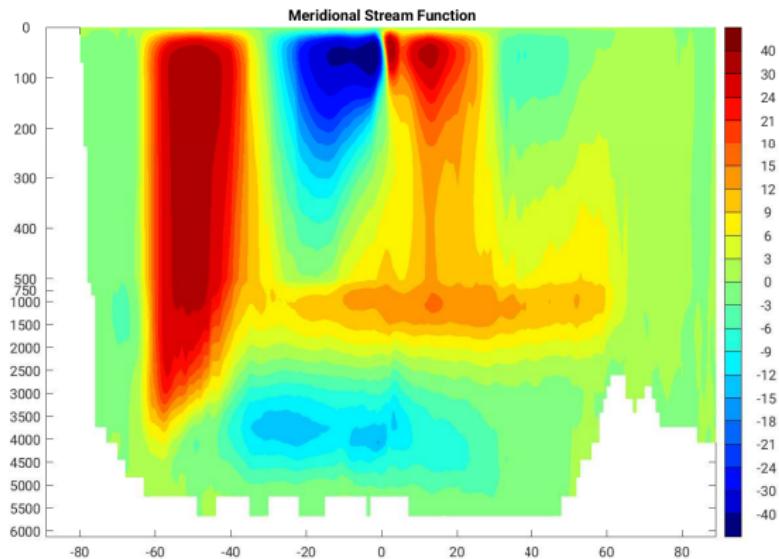


Figure : Overturning Streamfunction (Sv): 1992 thru 2017 Mean

meridional streamfunction

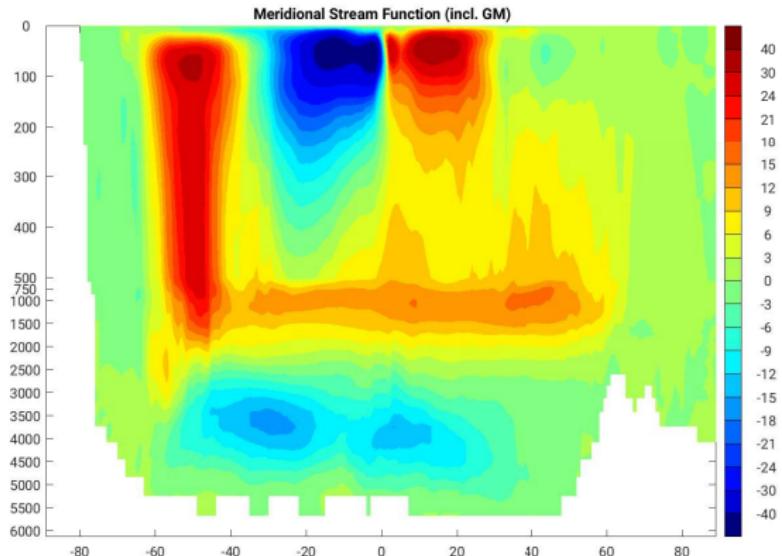


Figure : Overturning Streamfunction incl. GM (Sv): 1992 thru 2017 Mean

meridional streamfunction

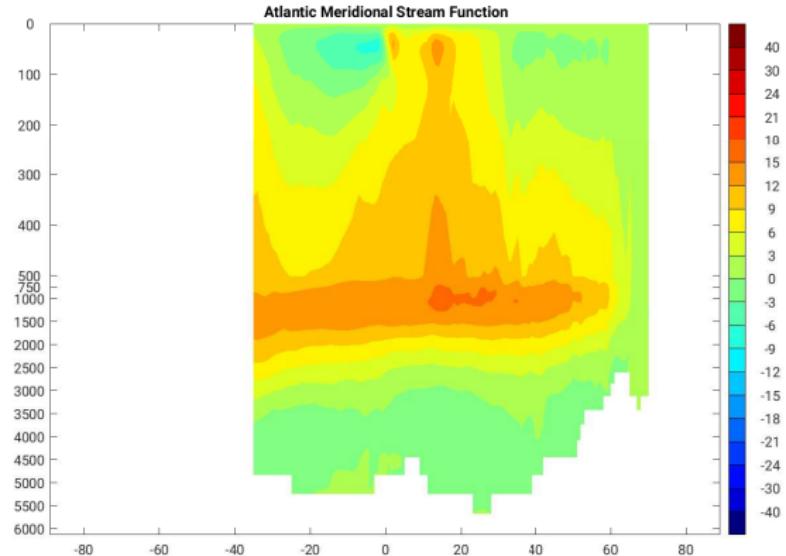


Figure : Atlantic Overturning Streamfunction (Sv): 1992 thru 2017 Mean

meridional streamfunction

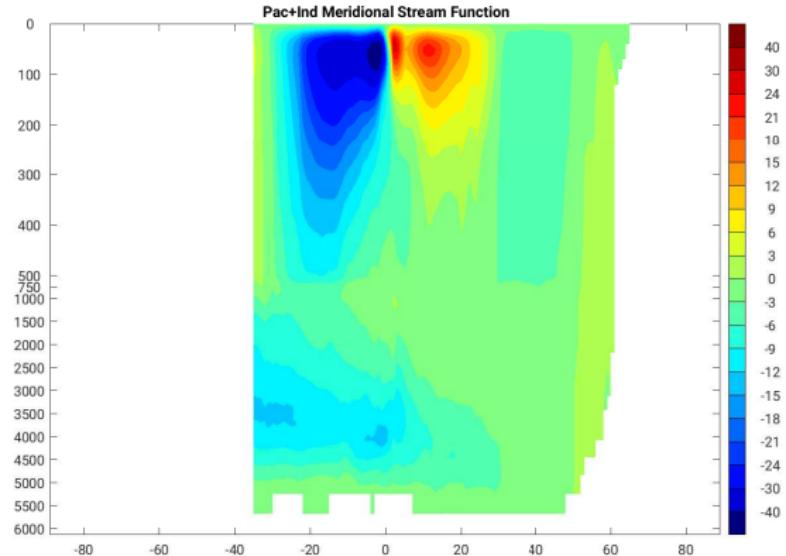


Figure : Pac+Ind Overturning Streamfunction (Sv): 1992 thru 2017 Mean

meridional streamfunction

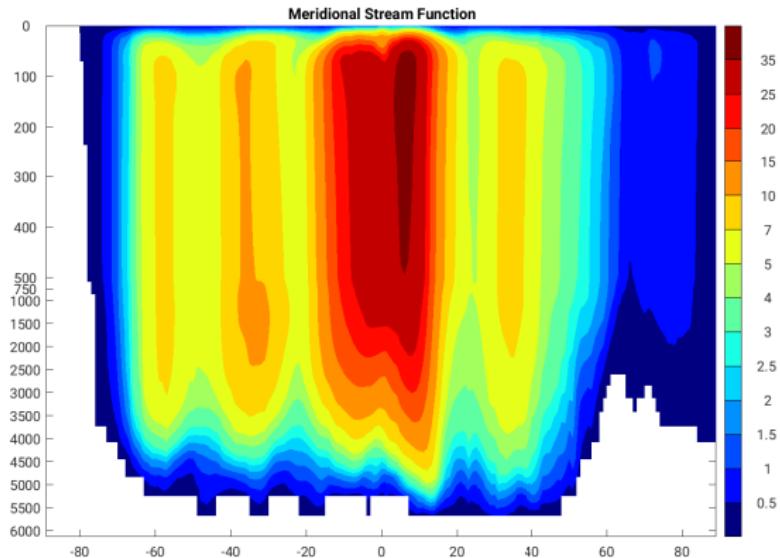


Figure : Overturning Streamfunction (Sv): Standard Deviation,
1992 thru 2017

meridional streamfunction

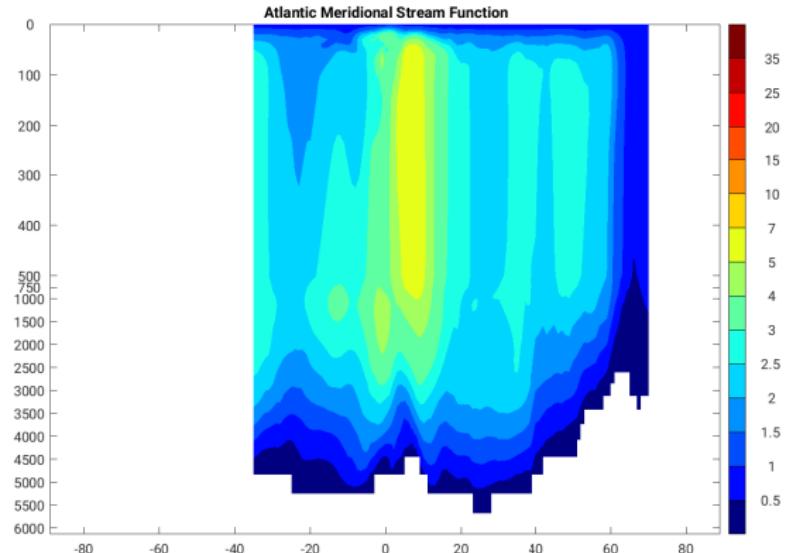


Figure : Atlantic Overturning Streamfunction (Sv): Standard Deviation, 1992 thru 2017

meridional streamfunction (time series)

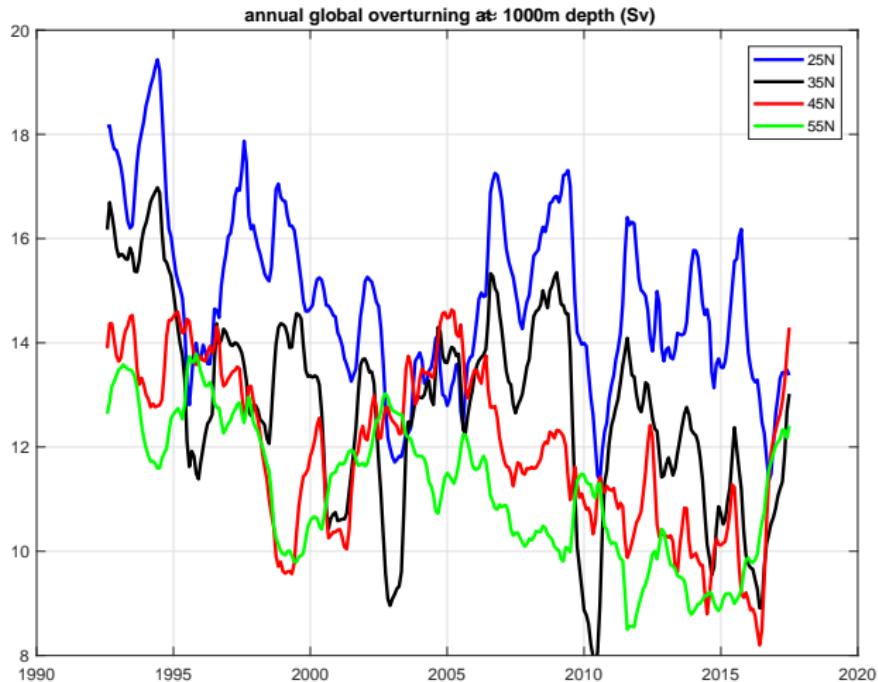


Figure : Annual Global Overturning at Select Latitudes at \approx 1000m Depth

meridional streamfunction (time series)

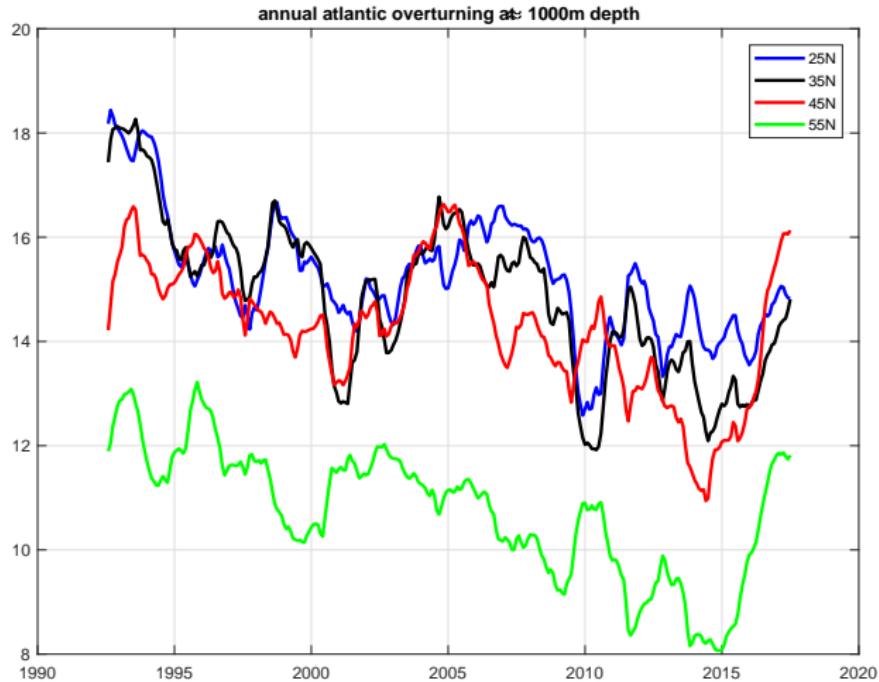


Figure : Annual Atlantic Overturning at Select Latitudes at \approx 1000m Depth (Sv)

meridional heat transport

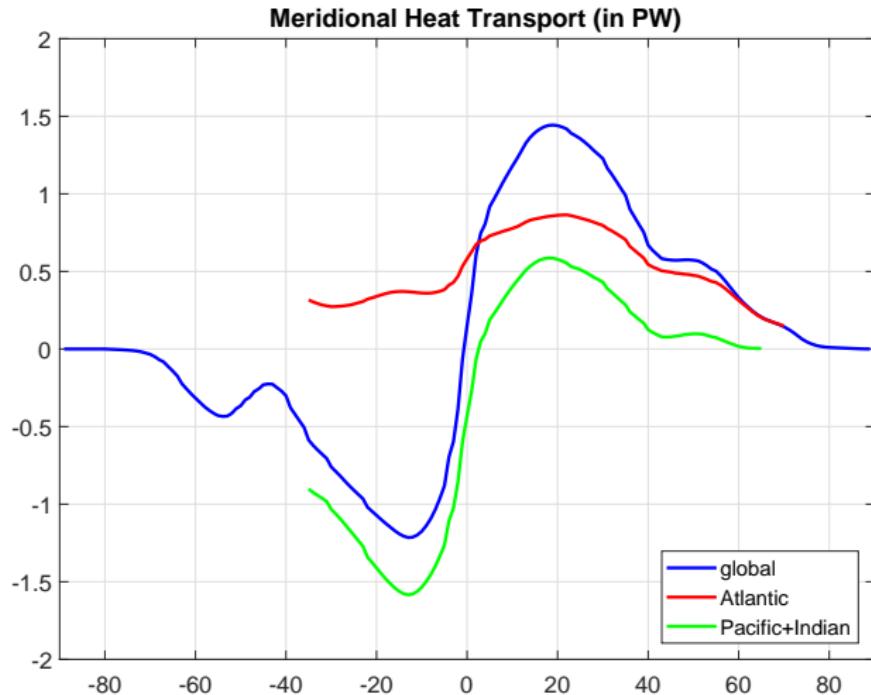


Figure : Meridional Heat Transport (PW): 1992 thru 2017 Mean

meridional heat transport

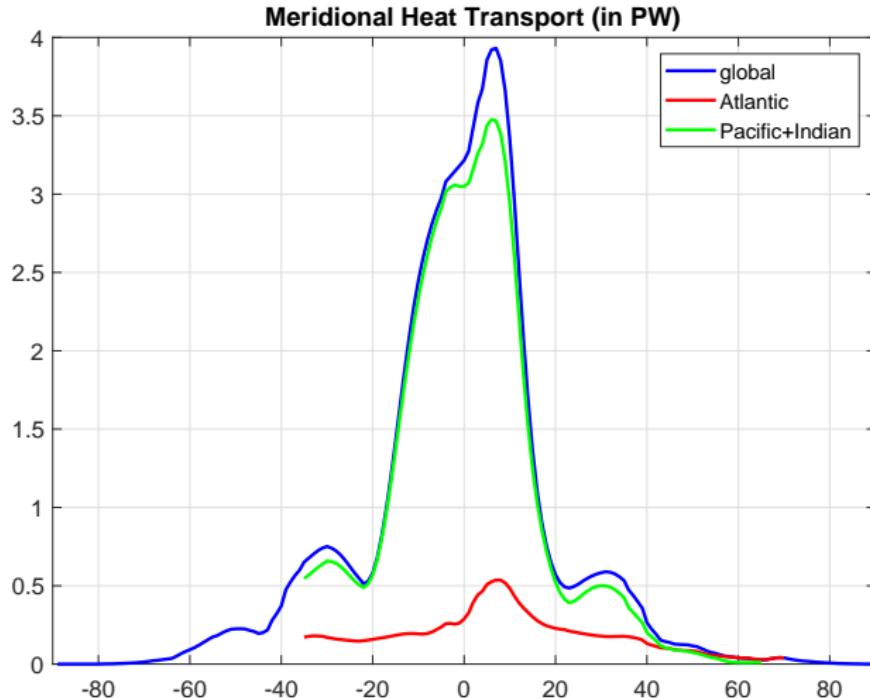


Figure : Meridional Heat Transport (PW): Standard Deviation,
1992 thru 2017

meridional freshwater transport

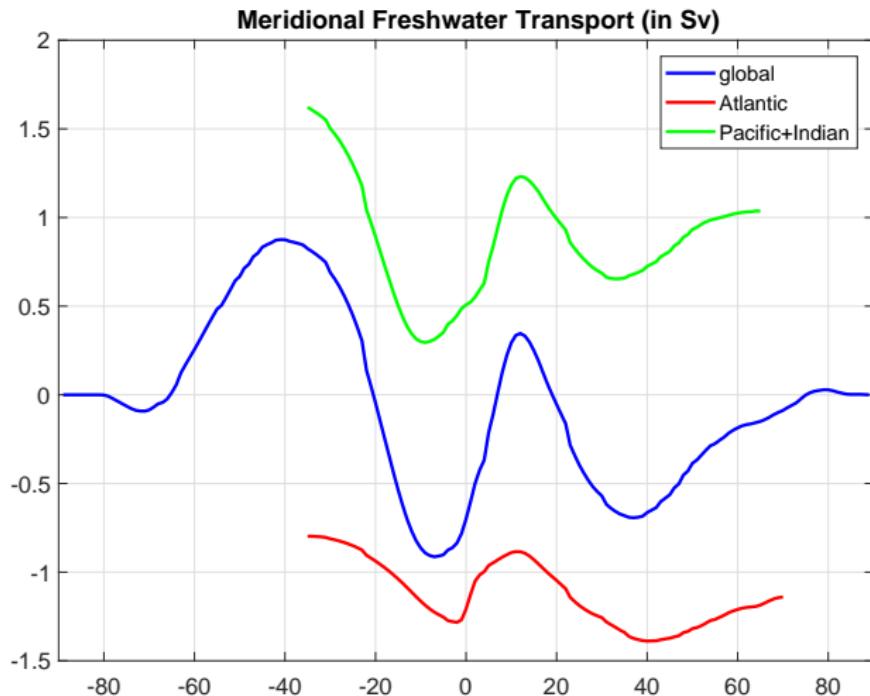


Figure : Meridional Freshwater Transport (Sv): 1992 thru 2017
Mean

meridional freshwater transport

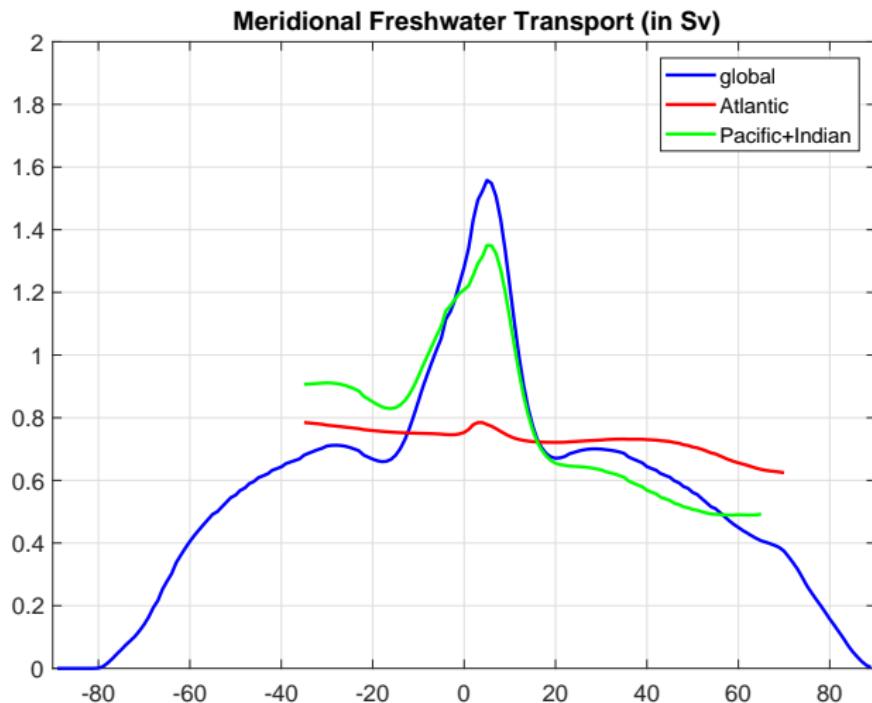


Figure : Meridional Freshwater Transport (Sv): Standard Deviation, 1992 thru 2017

meridional salt transport

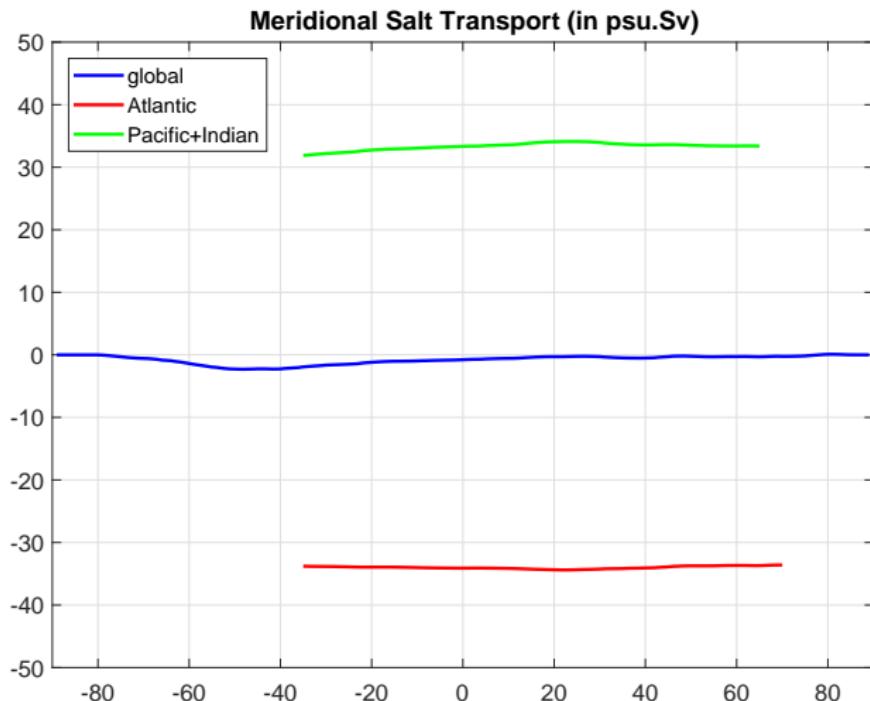


Figure : Meridional Salt Transport (psu.Sv): 1992 thru 2017 Mean

meridional salt transport

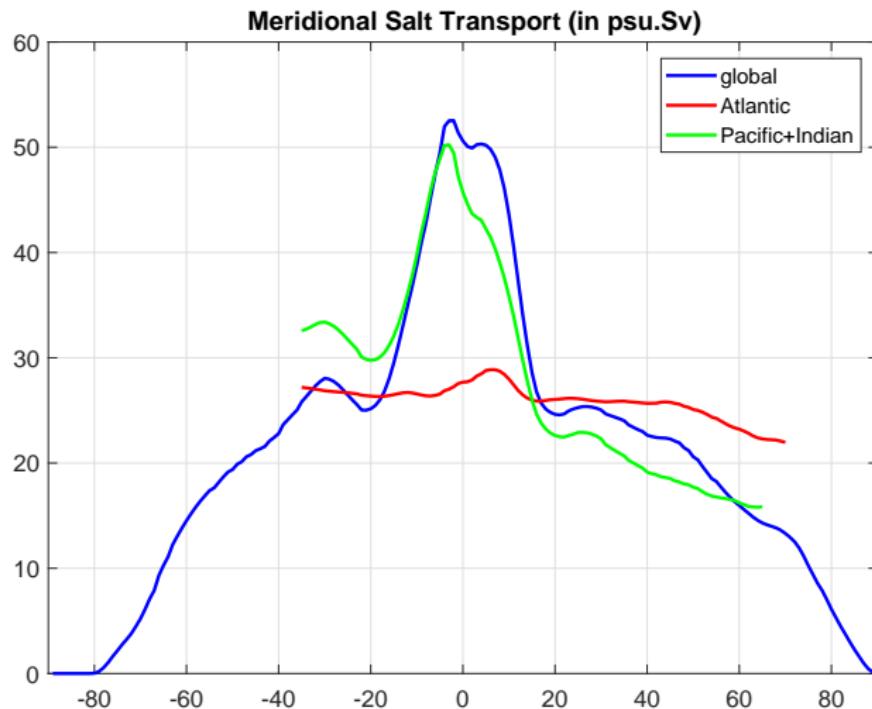


Figure : Meridional Salt Transport (psu.Sv): Standard Deviation,
1992 thru 2017

meridional transports (time series)

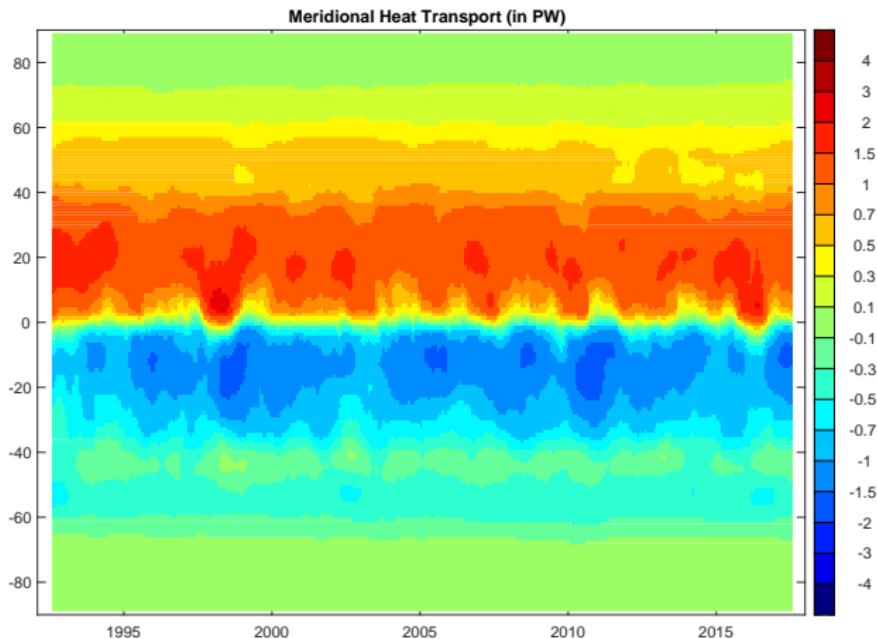


Figure : Meridional Heat Transport (PW, annual mean)

meridional transports (time series)

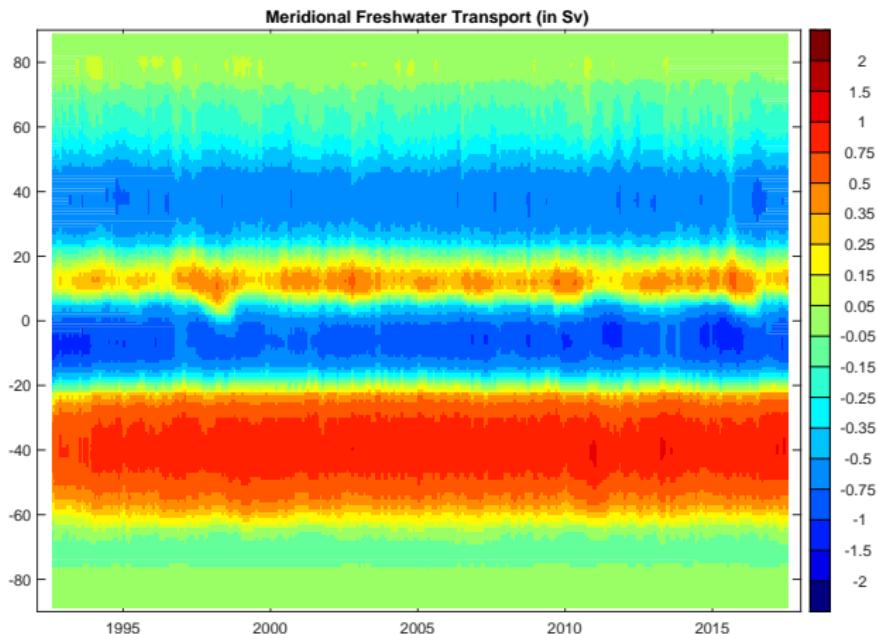


Figure : Meridional Freshwater Transport (Sv, annual mean)

meridional transports (time series)

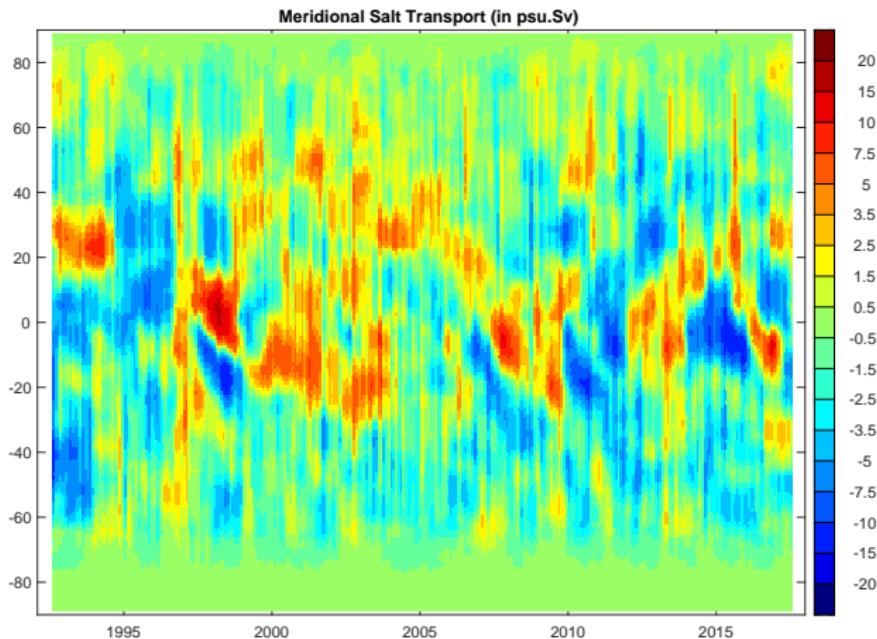


Figure : Meridional Salt Transport (psu.Sv, annual mean)

transects transport

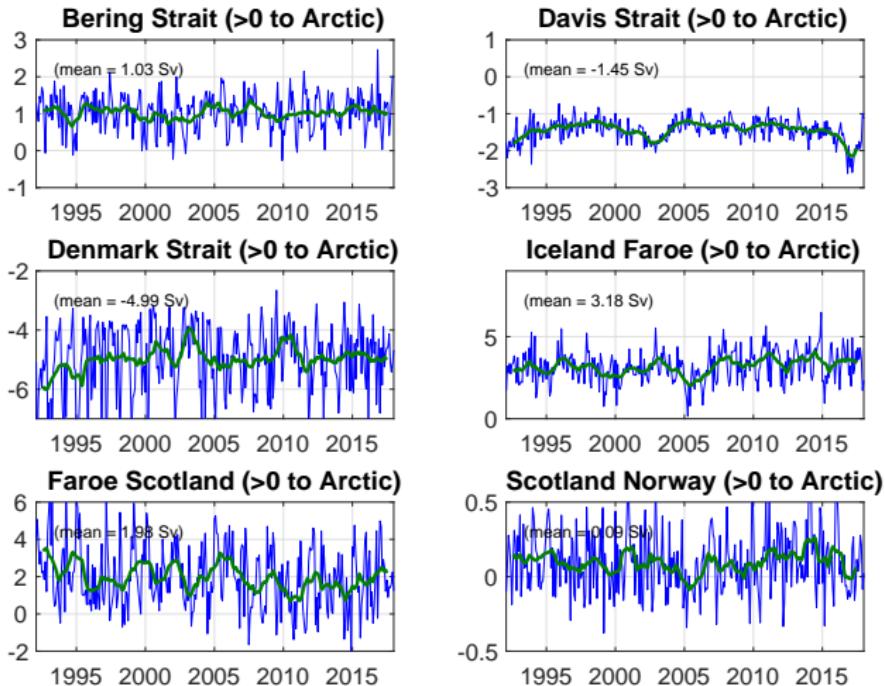


Figure : Volume Transports Entering the Arctic (Sv, annual mean)

transects transport

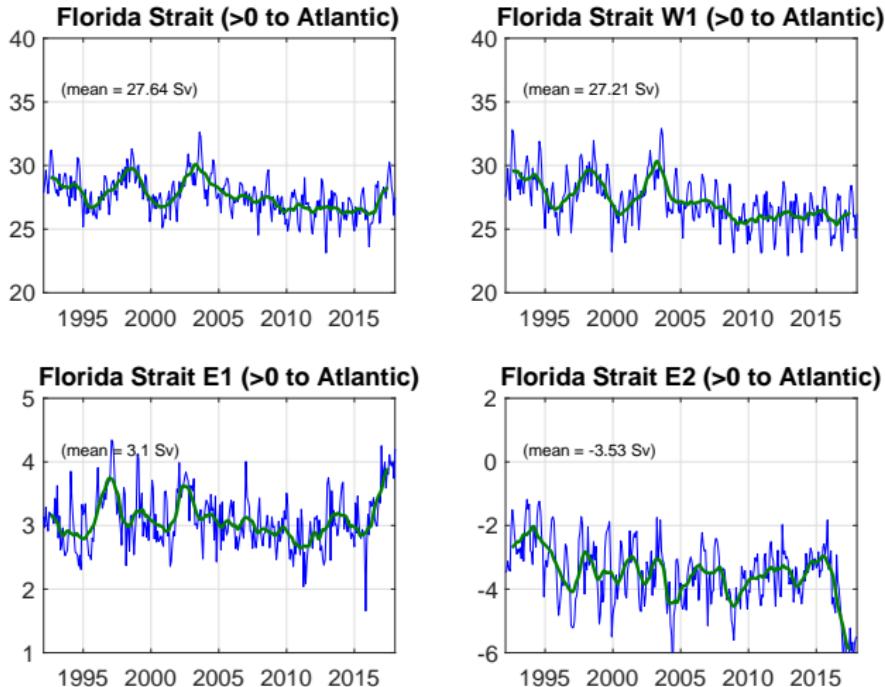


Figure : Volume Transports Entering the Atlantic (Sv, annual mean)

transects transport

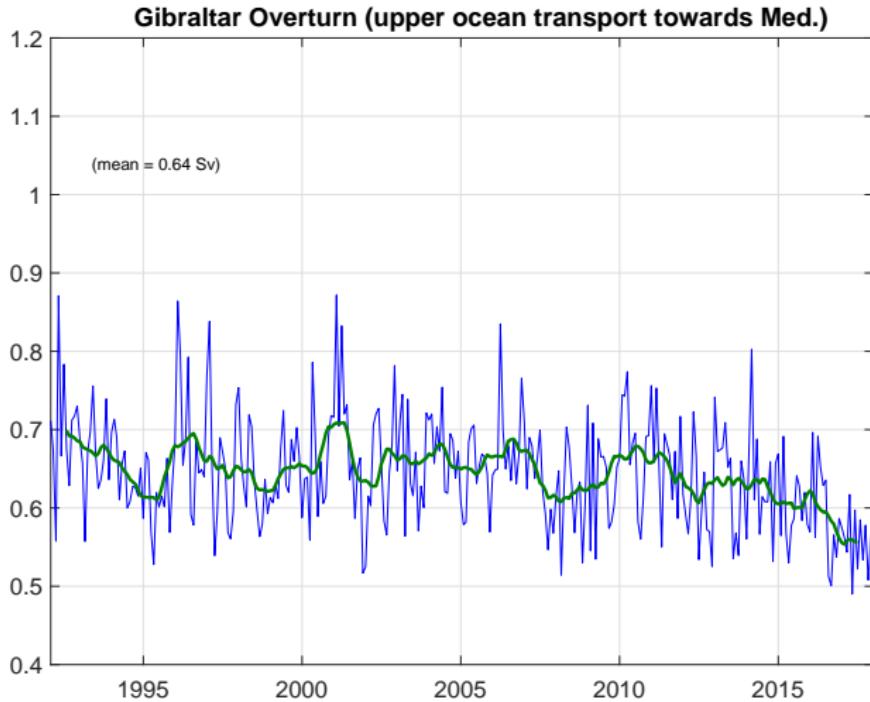


Figure : Gibraltar Overturn (Sv, annual mean)

transects transport

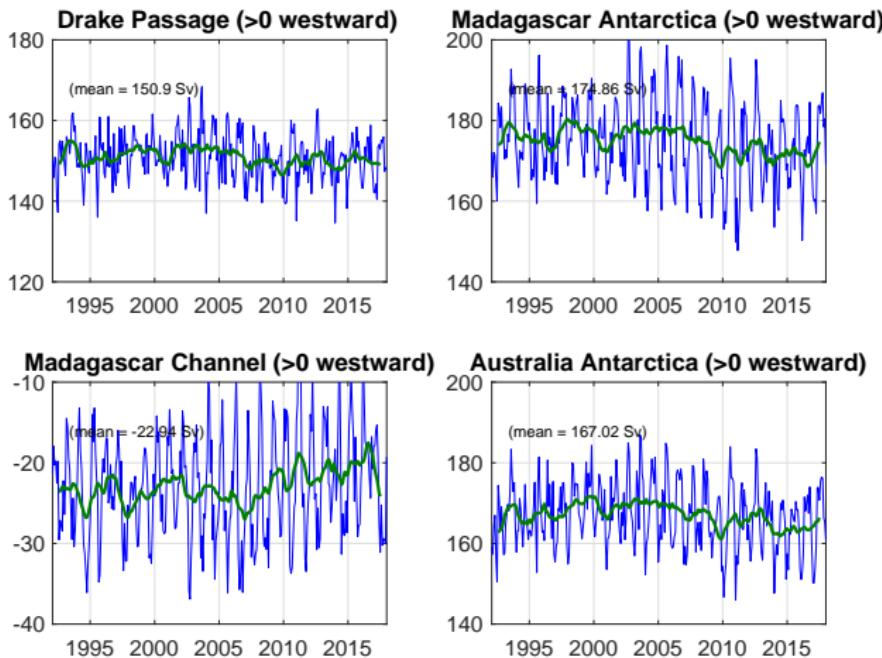


Figure : ACC Volume Transports (Sv, annual mean)

transects transport

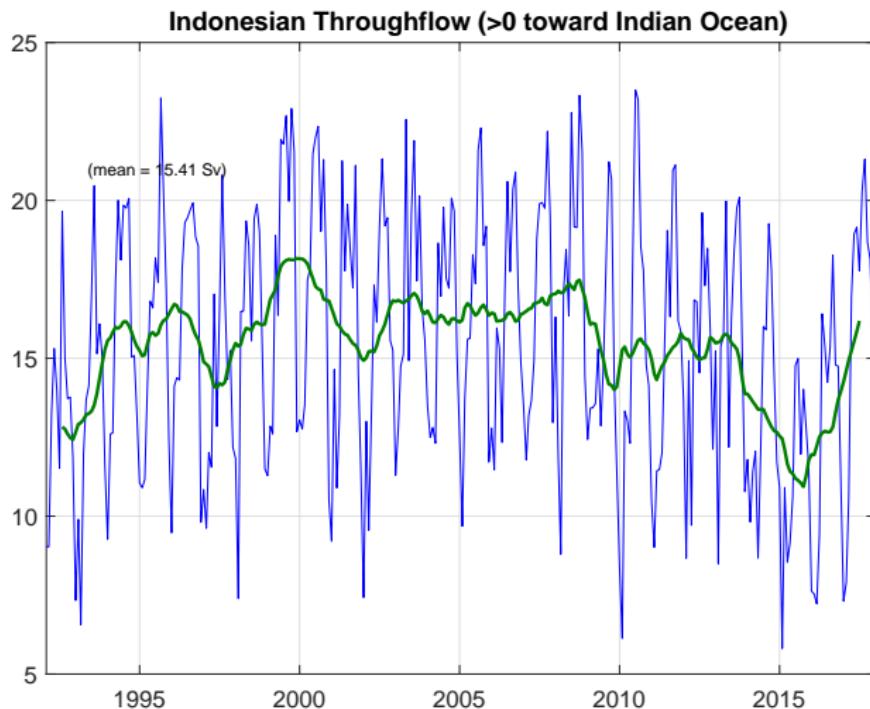


Figure : Indonesian Throughflow (Sv, annual mean)

sea surface height

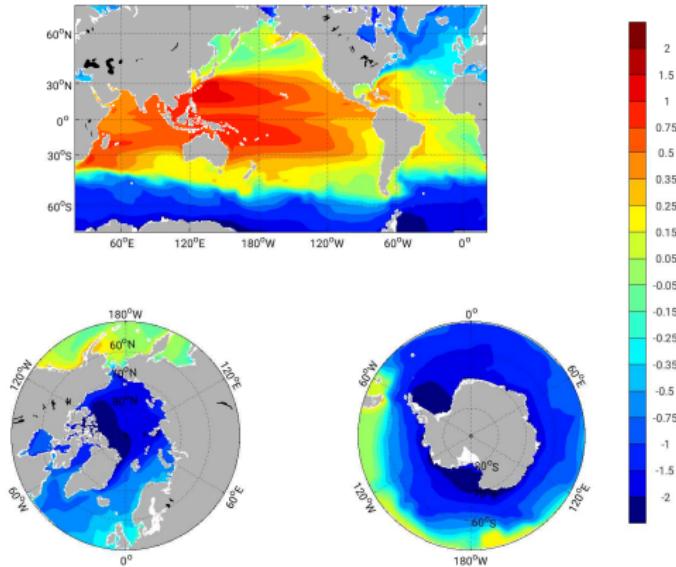


Figure : Sea Surface Height (EXCLUDING sea ice, in m): 1992 thru 2017 Mean

sea surface height

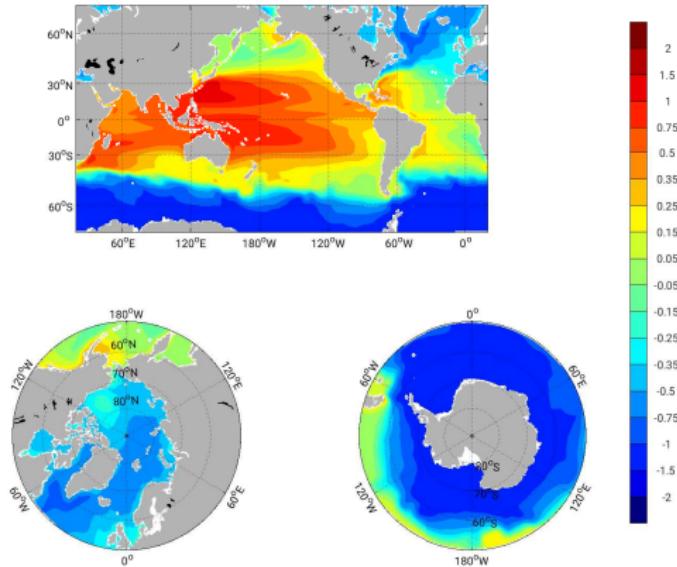


Figure : Sea Surface Height (INCLUDING sea ice, in m): 1992 thru 2017 Mean

sea surface height

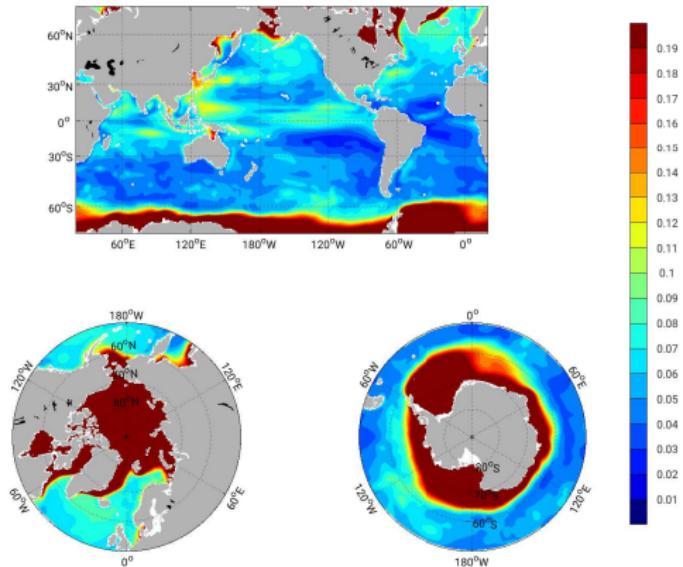


Figure : Sea Surface Height (EXCLUDING sea ice, in m):
Standard Deviation, 1992 thru 2017

sea surface height

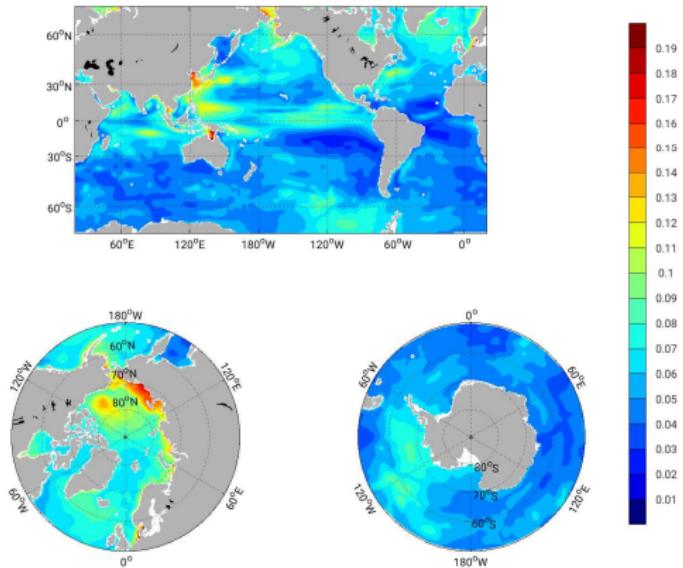


Figure : Sea Surface Height (INCLUDING sea ice, in m): Standard Deviation, 1992 thru 2017

3D state variables

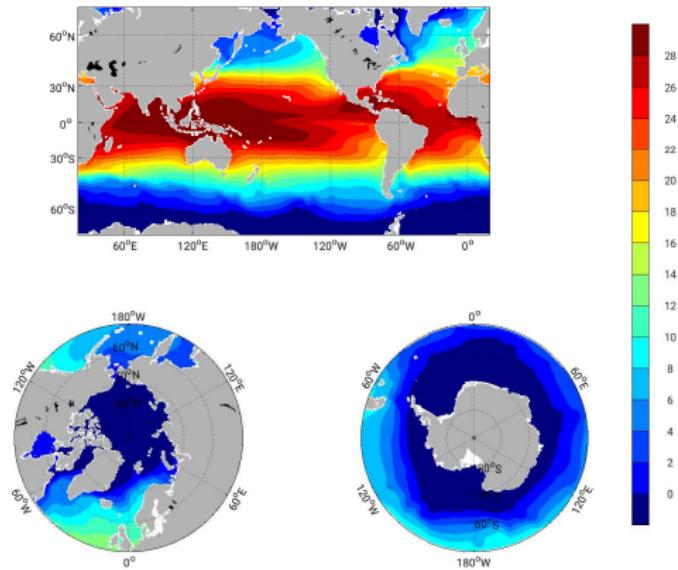


Figure : Temperature (C) at 5m : 1992 thru 2017 Mean

3D state variables

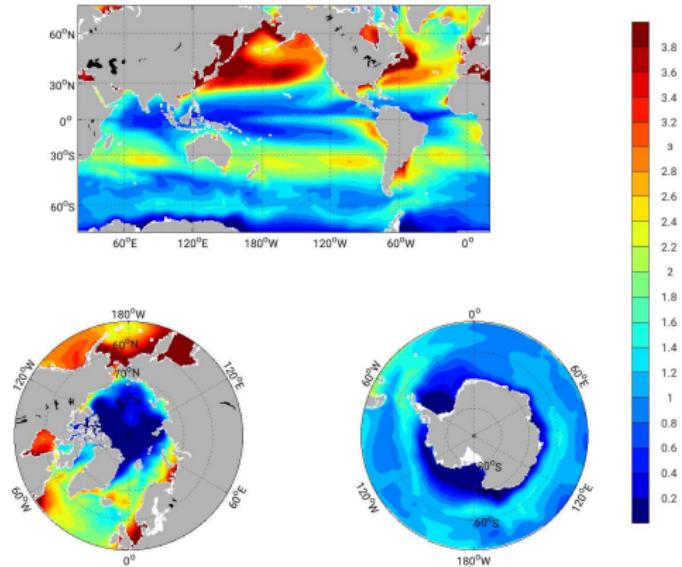


Figure : Temperature (C) at 5m : Standard Deviation, 1992 thru 2017

3D state variables

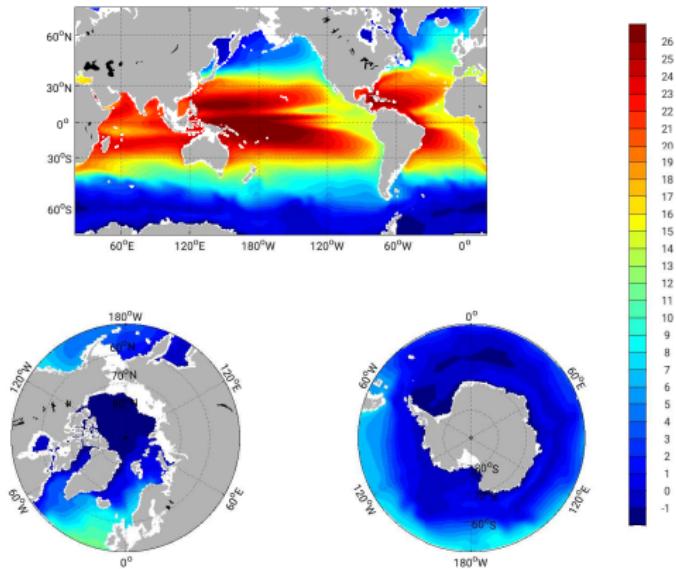


Figure : Temperature (C) at 105m : 1992 thru 2017 Mean

3D state variables

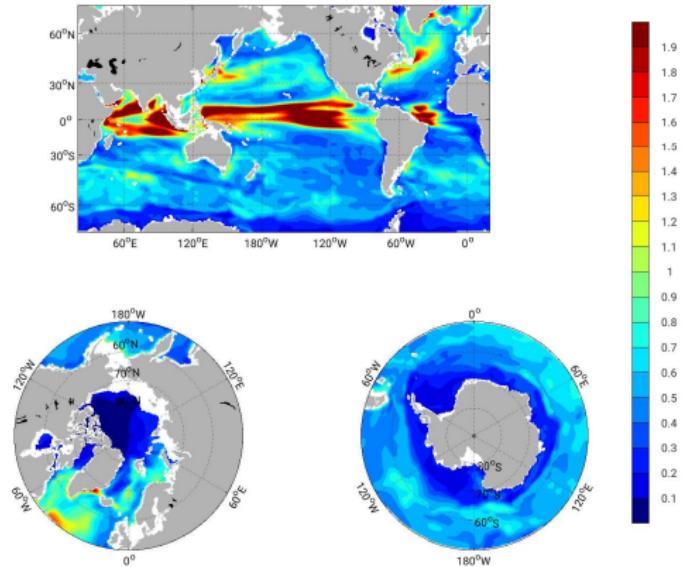


Figure : Temperature (C) at 105m : Standard Deviation, 1992 thru 2017

3D state variables

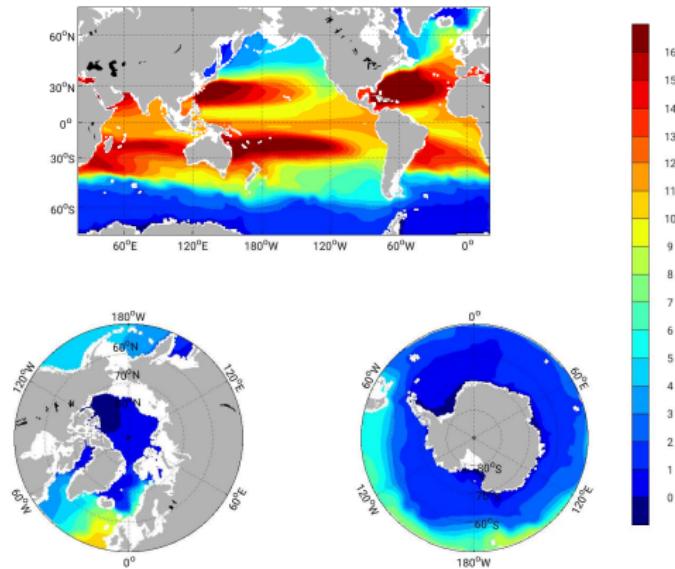


Figure : Temperature (C) at 300m : 1992 thru 2017 Mean

3D state variables

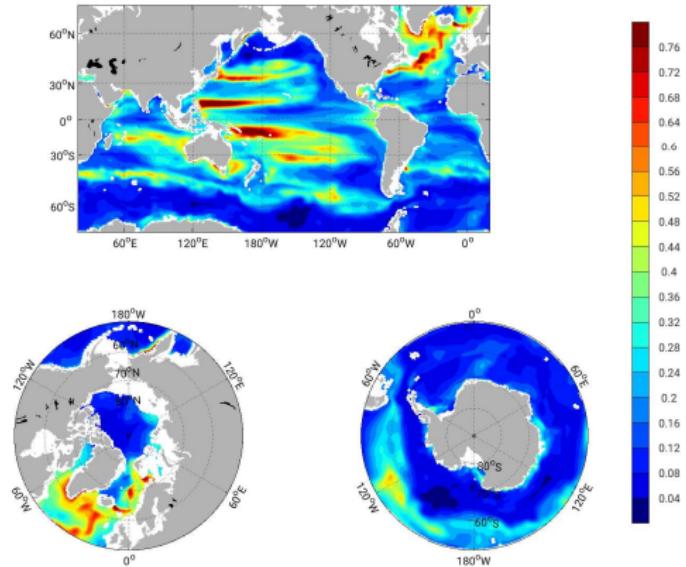


Figure : Temperature (C) at 300m : Standard Deviation, 1992 thru 2017

3D state variables

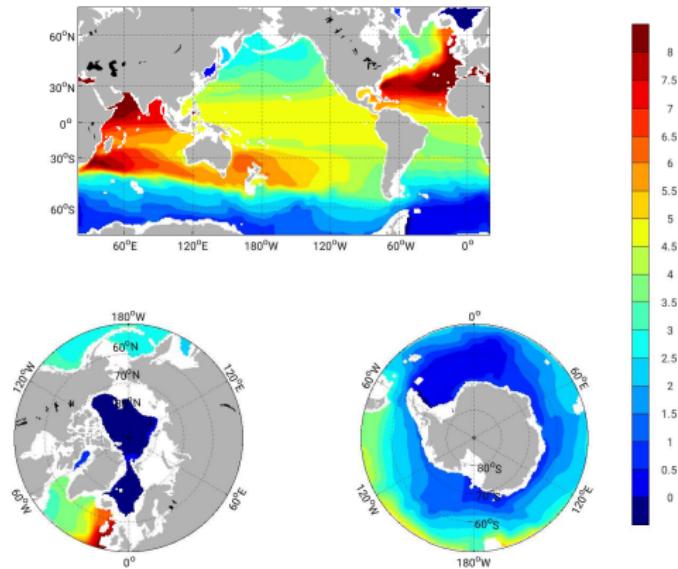


Figure : Temperature (C) at 910m : 1992 thru 2017 Mean

3D state variables

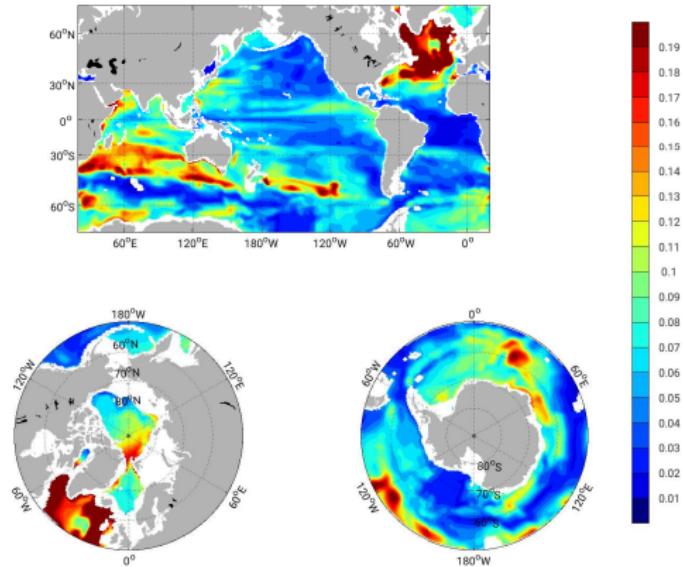


Figure : Temperature (C) at 910m : Standard Deviation, 1992 thru 2017

3D state variables

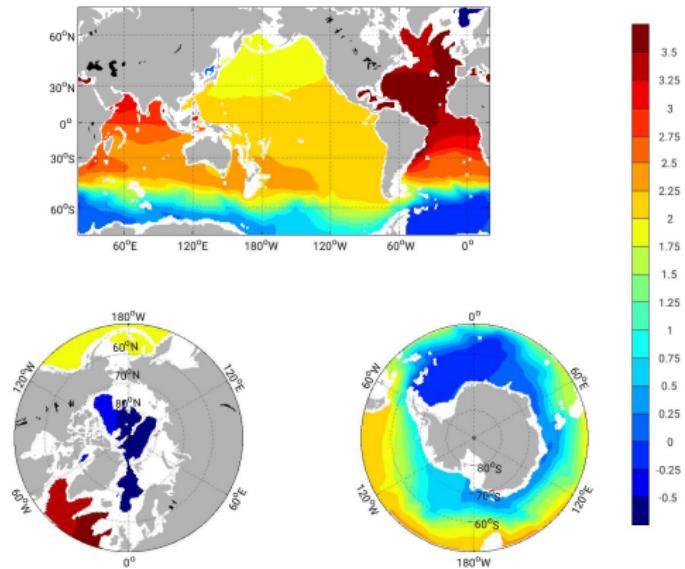


Figure : Temperature (C) at 1914m : 1992 thru 2017 Mean

3D state variables

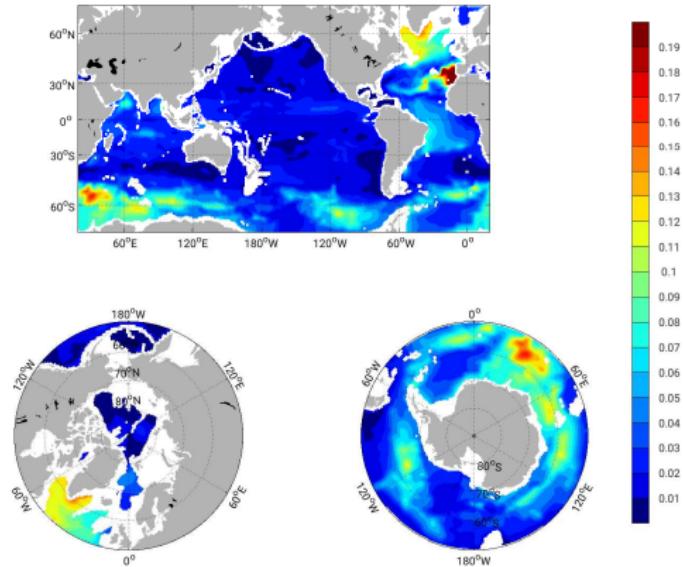


Figure : Temperature (C) at 1914m : Standard Deviation, 1992 thru 2017

3D state variables

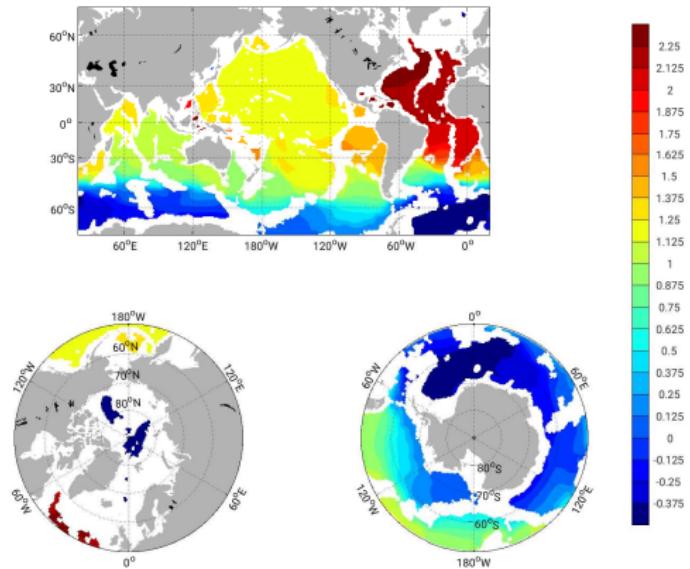


Figure : Temperature (C) at 3581m : 1992 thru 2017 Mean

3D state variables

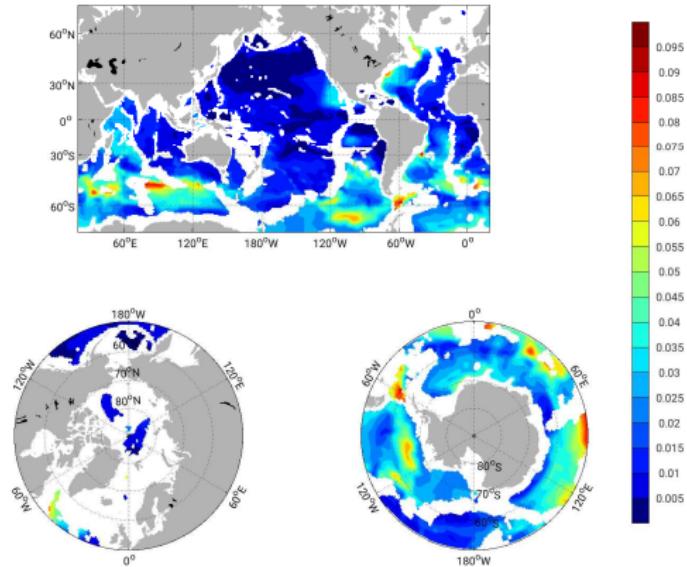


Figure : Temperature (C) at 3581m : Standard Deviation, 1992 thru 2017

3D state variables

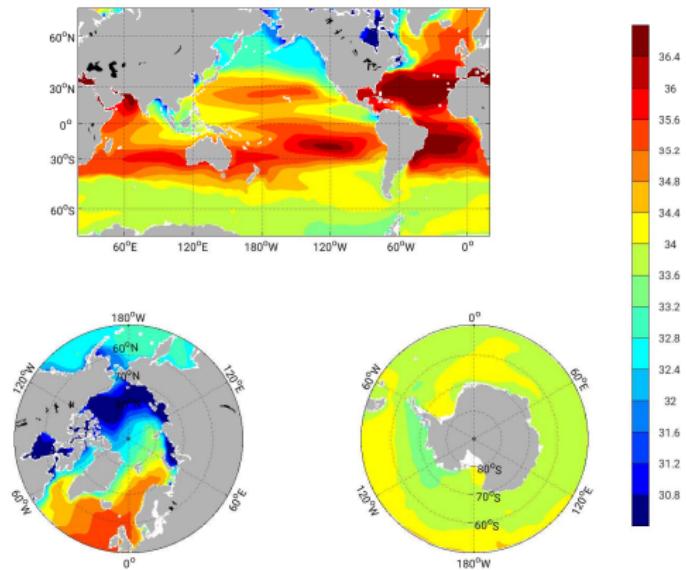


Figure : Salinity (psu) at 5m : 1992 thru 2017 Mean

3D state variables

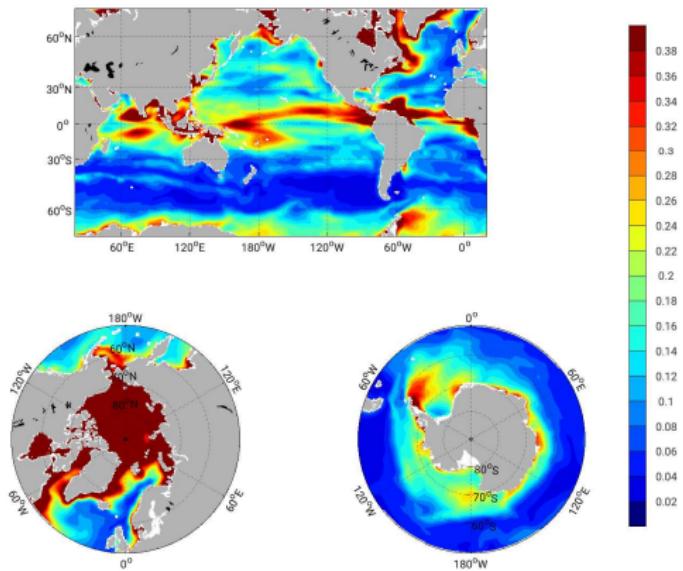


Figure : Salinity (psu) at 5m : Standard Deviation, 1992 thru 2017

3D state variables

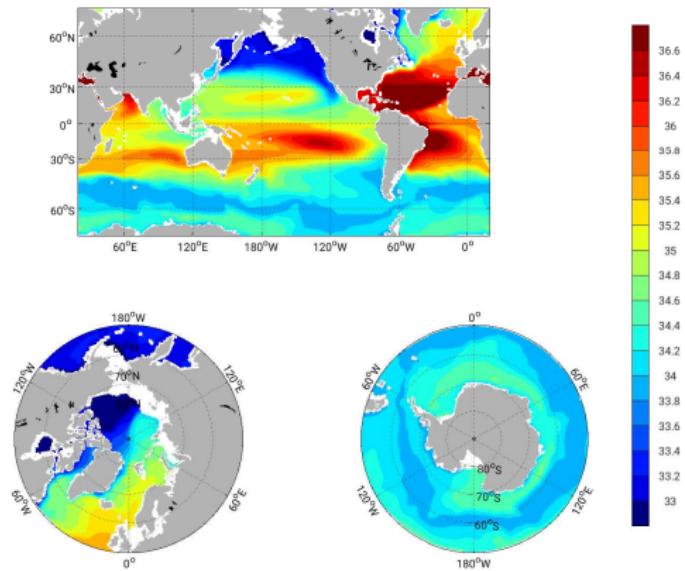


Figure : Salinity (psu) at 105m : 1992 thru 2017 Mean

3D state variables

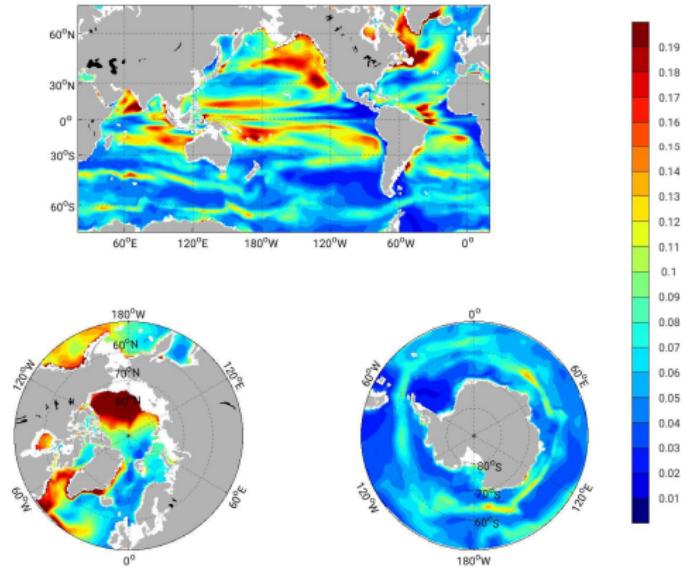


Figure : Salinity (psu) at 105m : Standard Deviation, 1992 thru 2017

3D state variables

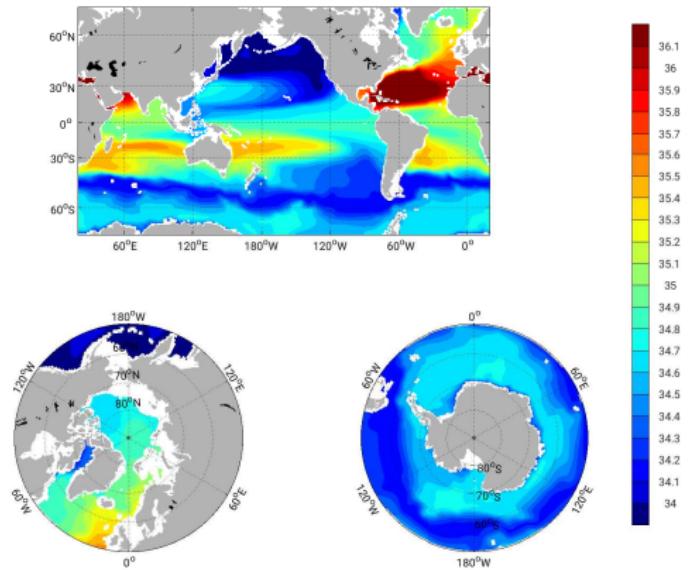


Figure : Salinity (psu) at 300m : 1992 thru 2017 Mean

3D state variables

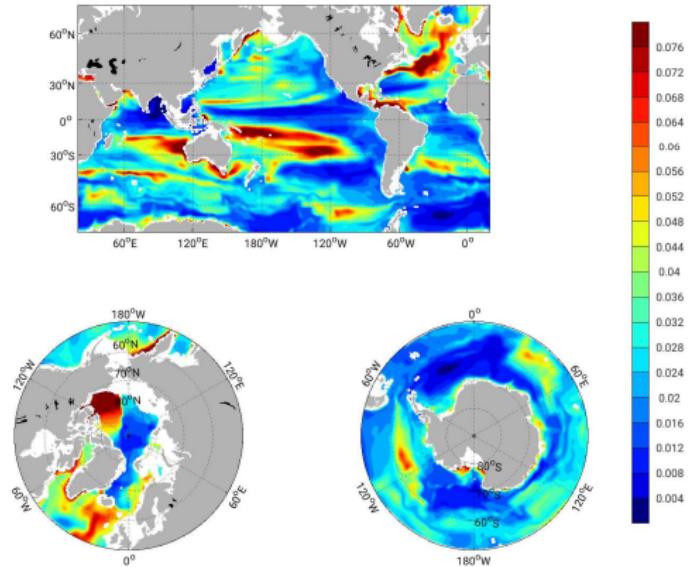


Figure : Salinity (psu) at 300m : Standard Deviation, 1992 thru 2017

3D state variables

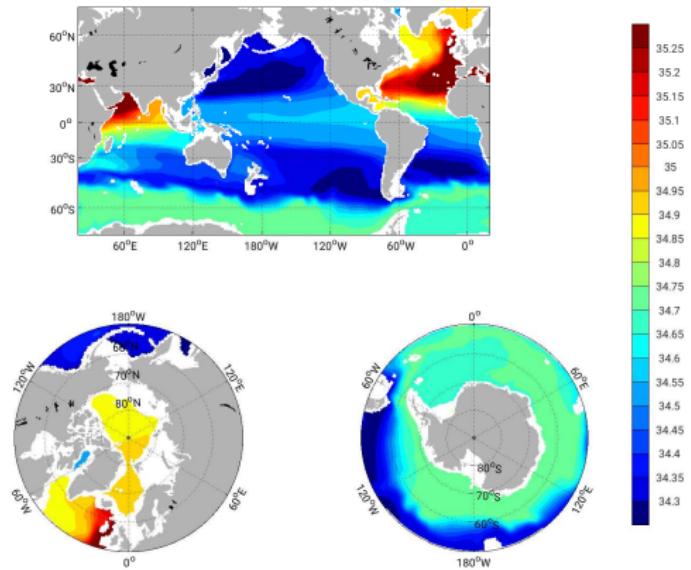


Figure : Salinity (psu) at 910m : 1992 thru 2017 Mean

3D state variables

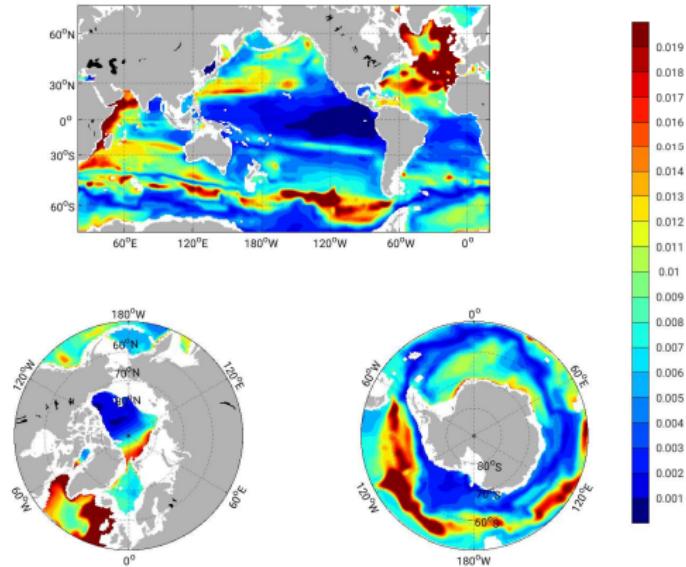


Figure : Salinity (psu) at 910m : Standard Deviation, 1992 thru 2017

3D state variables

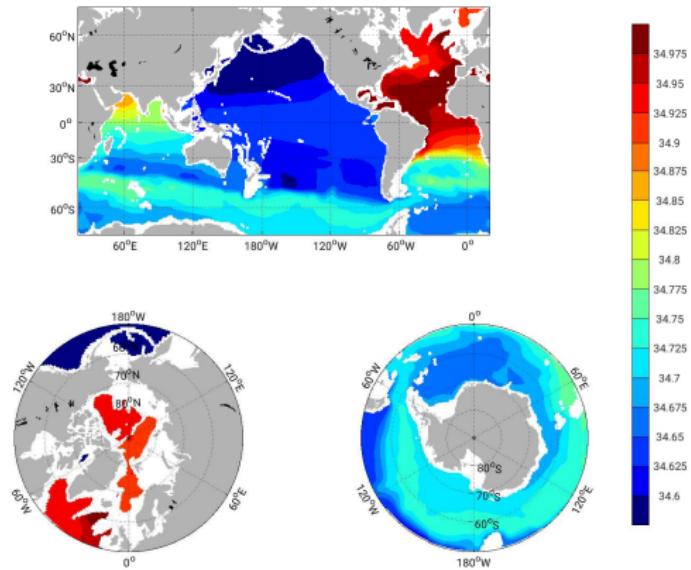


Figure : Salinity (psu) at 1914m : 1992 thru 2017 Mean

3D state variables

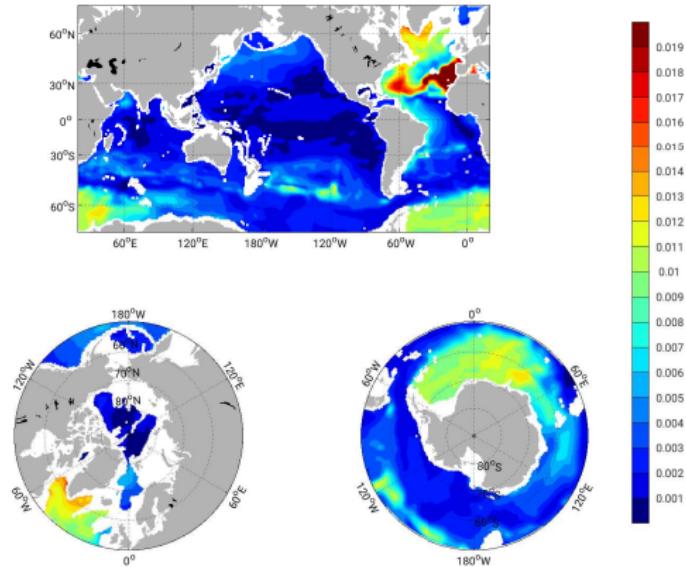


Figure : Salinity (psu) at 1914m : Standard Deviation, 1992 thru 2017

3D state variables

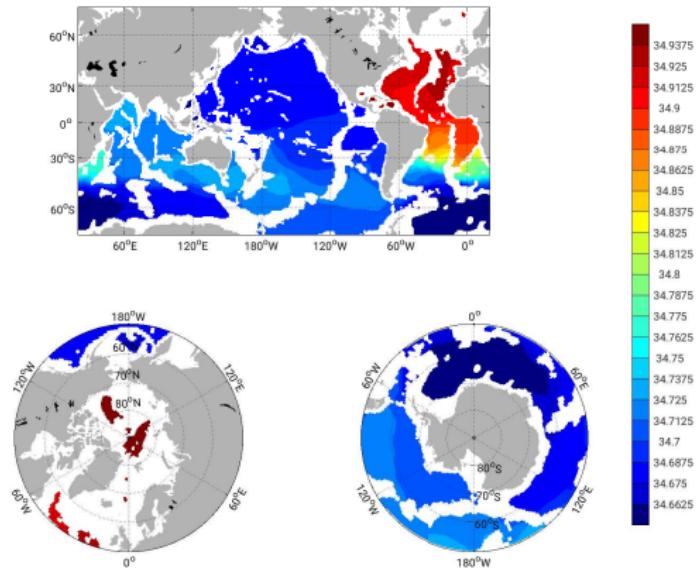


Figure : Salinity (psu) at 3581m : 1992 thru 2017 Mean

3D state variables

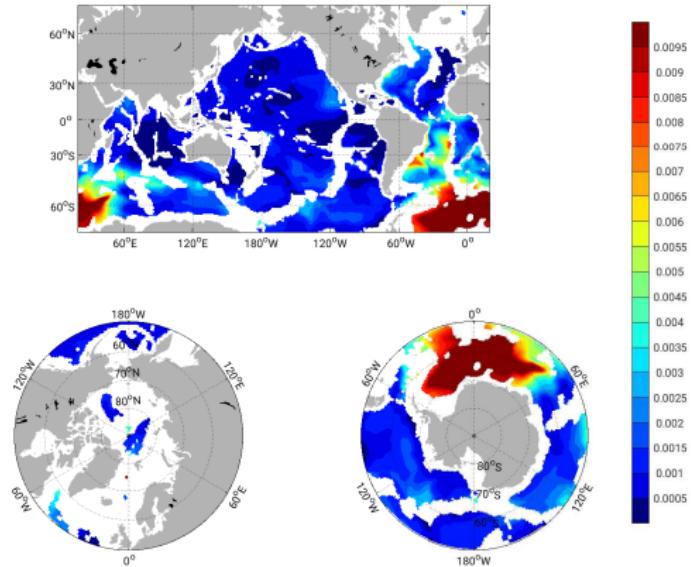


Figure : Salinity (psu) at 3581m : Standard Deviation, 1992 thru 2017

3D state variables

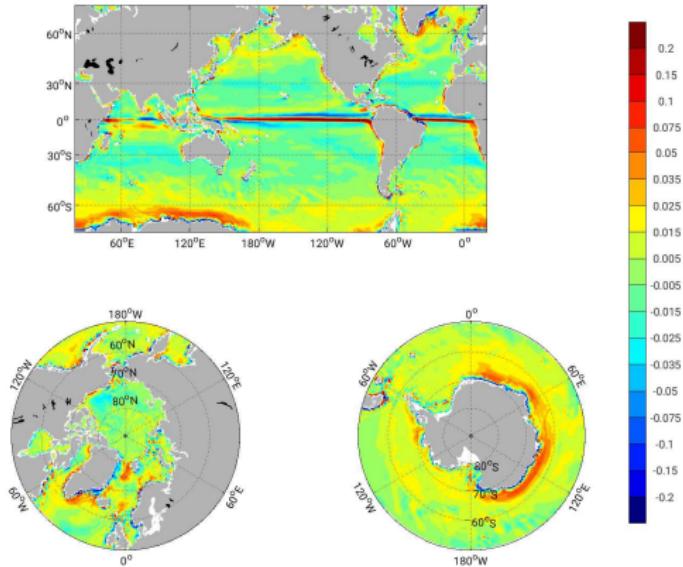


Figure : Vertical Velocity (mm/year) at 15m : 1992 thru 2017
Mean

3D state variables

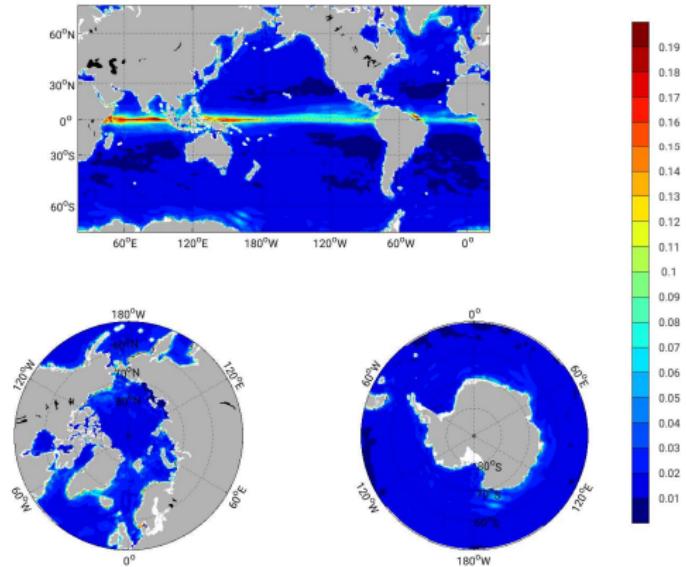


Figure : Vertical Velocity (mm/year) at 15m : Standard Deviation,
1992 thru 2017

3D state variables

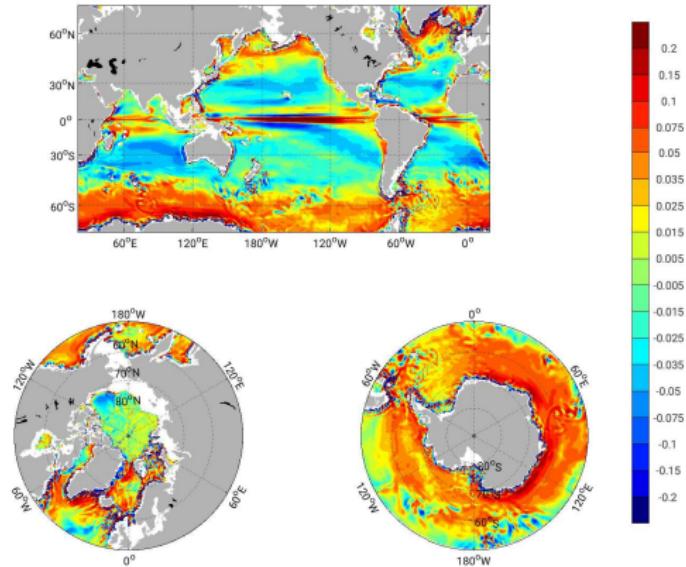


Figure : Vertical Velocity (mm/year) at 105m : 1992 thru 2017
Mean

3D state variables

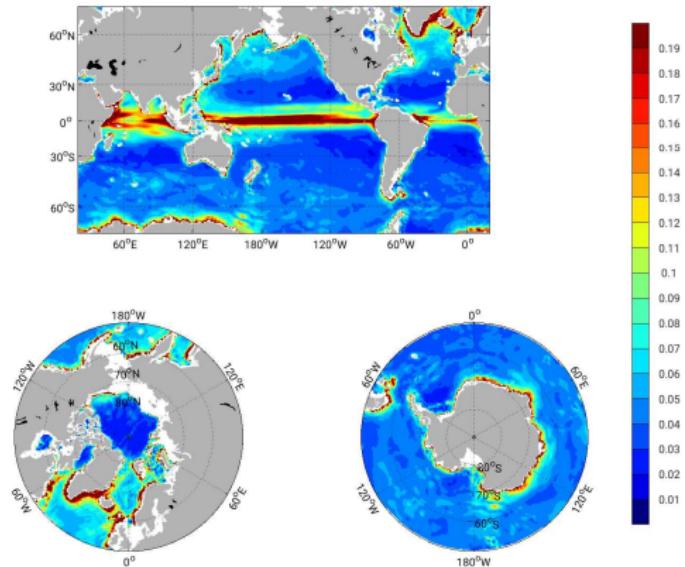


Figure : Vertical Velocity (mm/year) at 105m : Standard Deviation, 1992 thru 2017

3D state variables

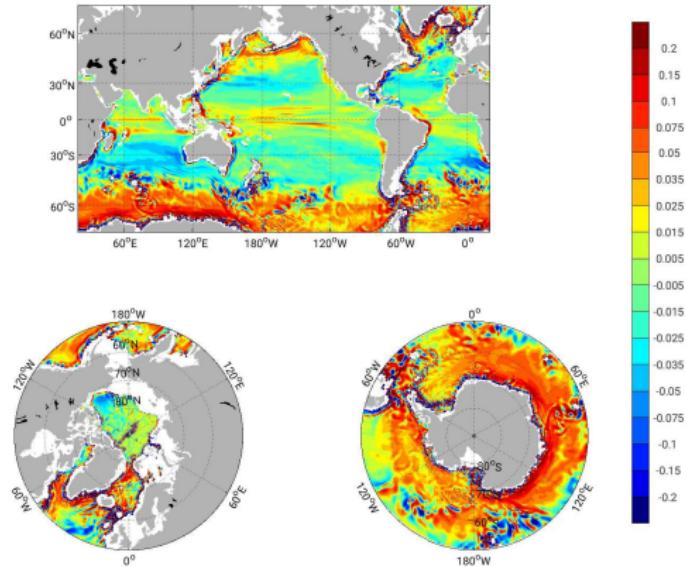


Figure : Vertical Velocity (mm/year) at 300m : 1992 thru 2017
Mean

3D state variables

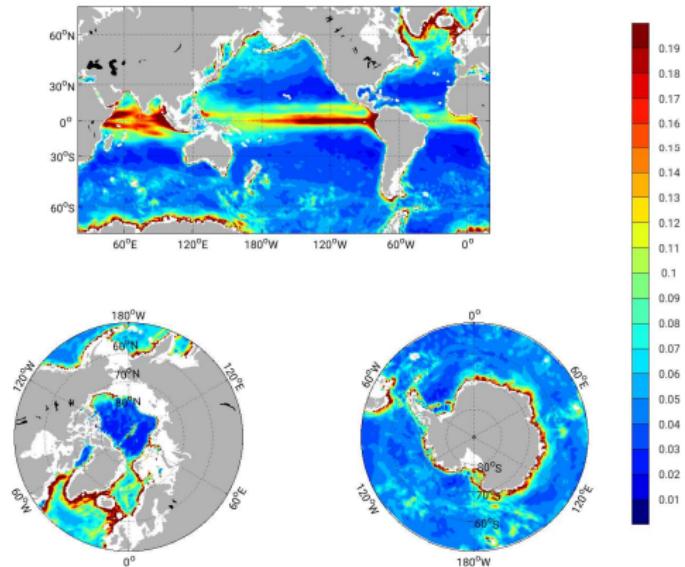


Figure : Vertical Velocity (mm/year) at 300m : Standard Deviation, 1992 thru 2017

3D state variables

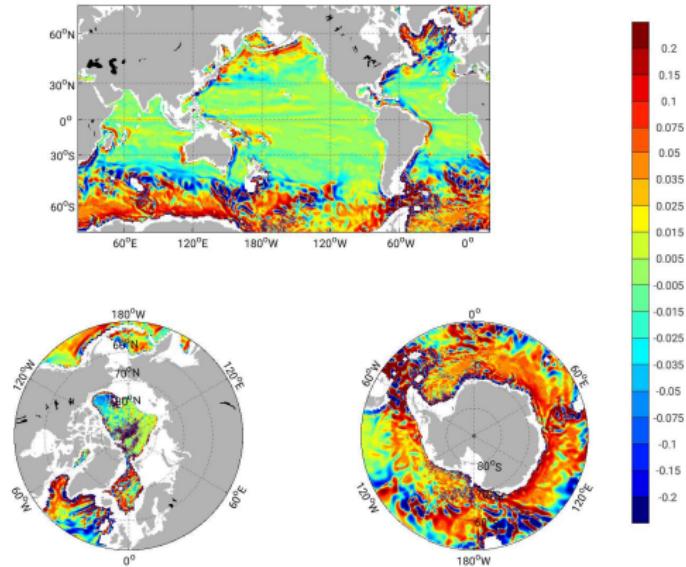


Figure : Vertical Velocity (mm/year) at 910m : 1992 thru 2017
Mean

3D state variables

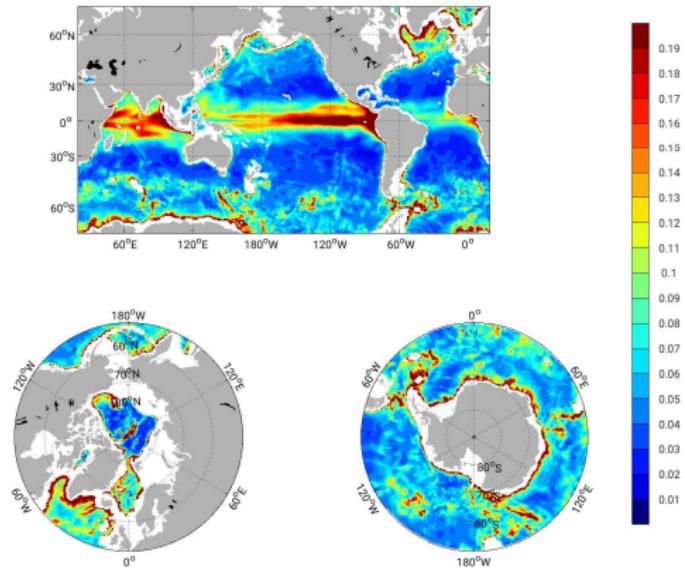


Figure : Vertical Velocity (mm/year) at 910m : Standard Deviation, 1992 thru 2017

3D state variables

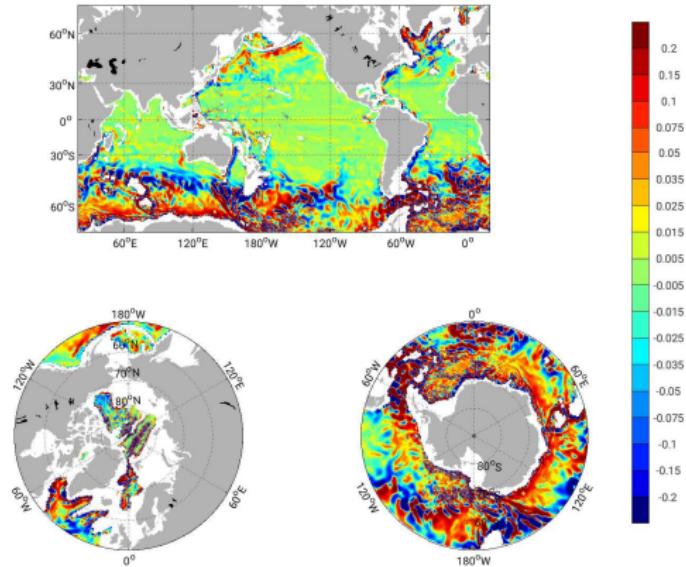


Figure : Vertical Velocity (mm/year) at 1914m : 1992 thru 2017
Mean

3D state variables

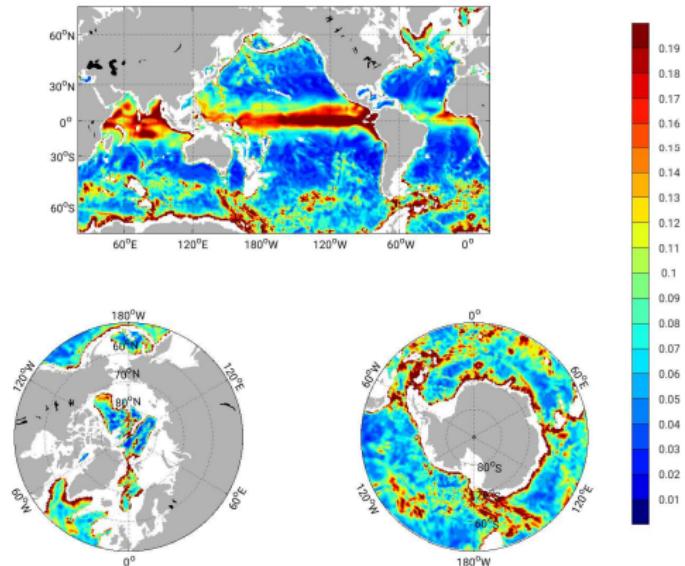


Figure : Vertical Velocity (mm/year) at 1914m : Standard Deviation, 1992 thru 2017

3D state variables

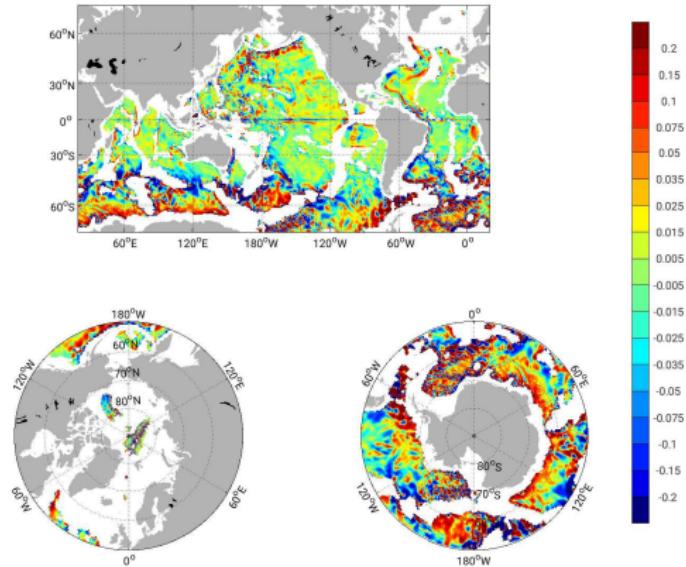


Figure : Vertical Velocity (mm/year) at 3581m : 1992 thru 2017
Mean

3D state variables

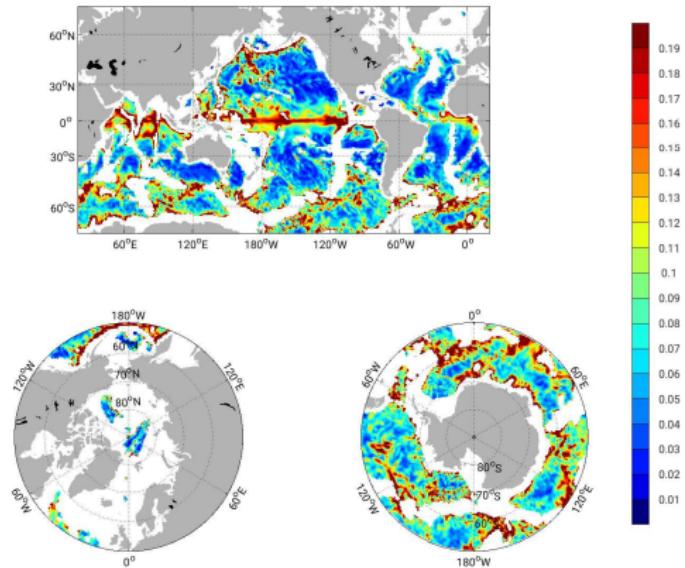


Figure : Vertical Velocity (mm/year) at 3581m : Standard Deviation, 1992 thru 2017

air-sea heat flux

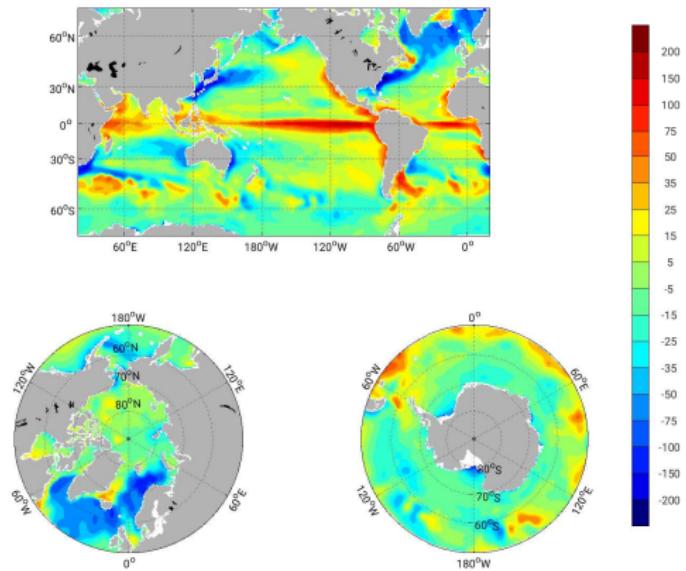


Figure : QNET to ocean+ice (W/m^2): 1992 thru 2017 Mean

air-sea heat flux

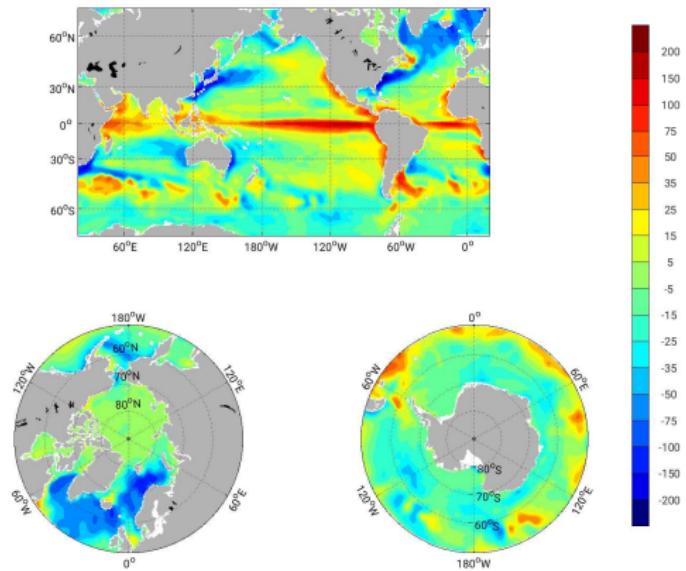


Figure : QNET to ocean (W/m²): 1992 thru 2017 Mean

air-sea heat flux

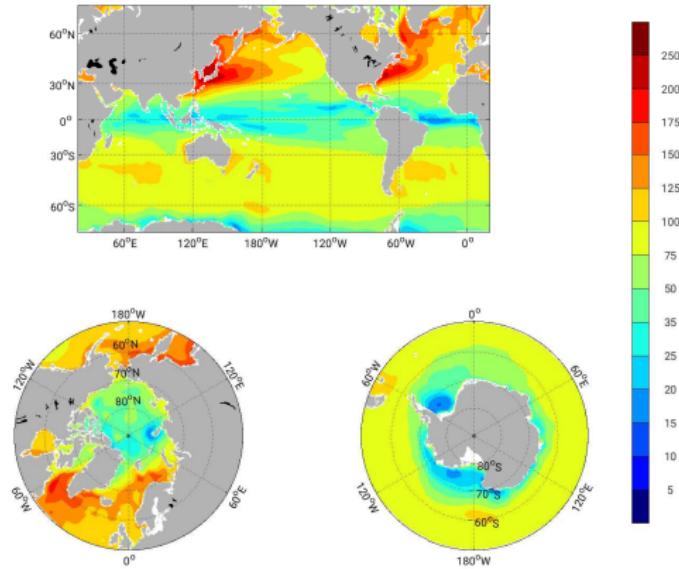


Figure : QNET to ocean+ice (W/m^2): Standard Deviation, 1992 thru 2017

air-sea heat flux

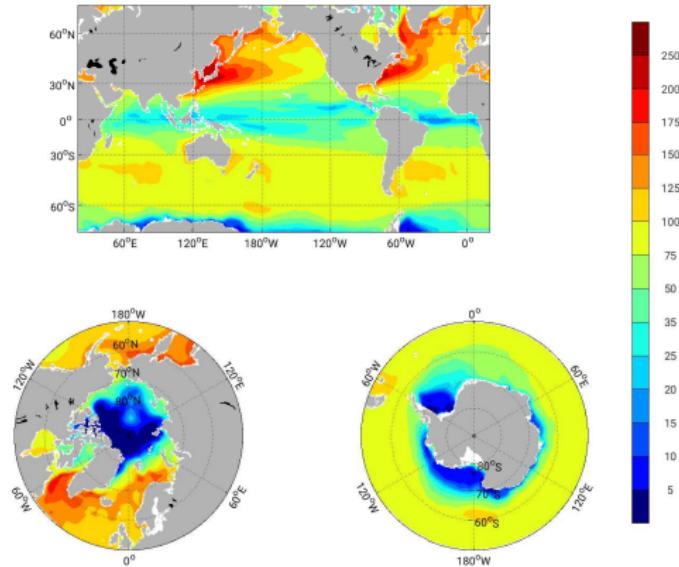


Figure : QNET to ocean (W/m²): Standard Deviation, 1992 thru 2017

air-sea freshwater flux

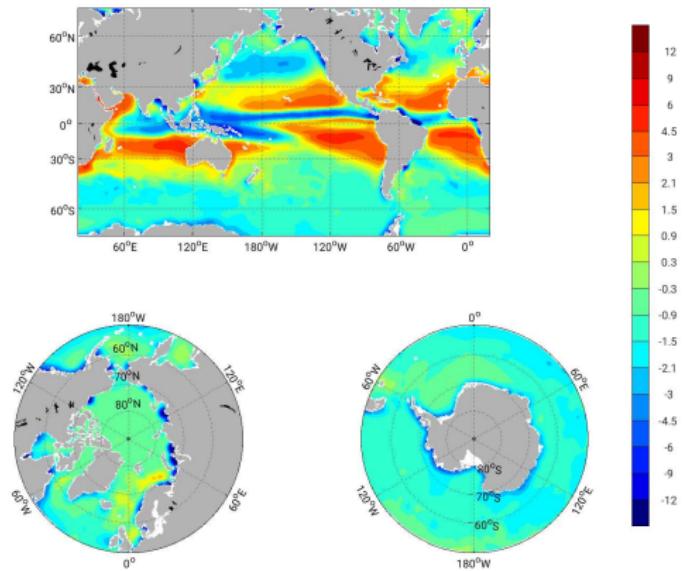


Figure : E-P-R from ocean+ice (mm/day): 1992 thru 2017 Mean

air-sea freshwater flux

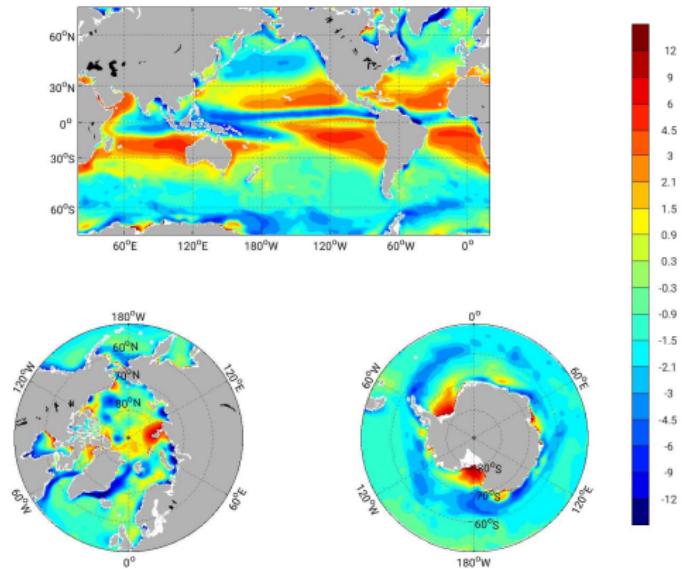


Figure : E-P-R from ocean (mm/day): 1992 thru 2017 Mean

air-sea freshwater flux

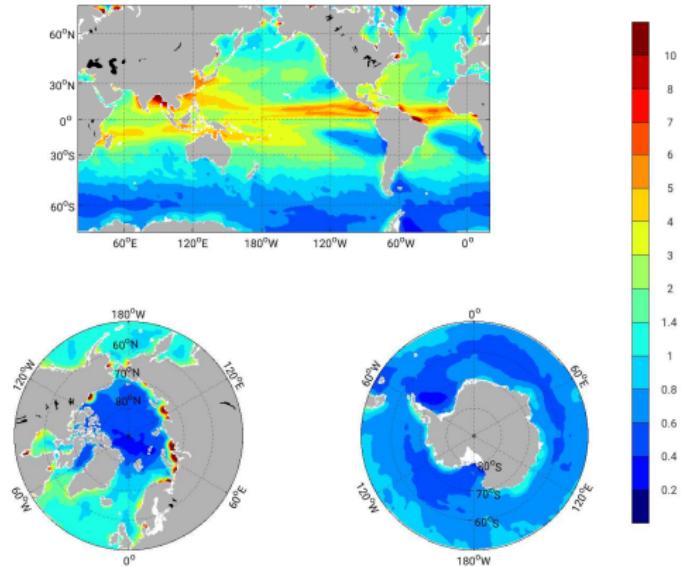


Figure : E-P-R to ocean+ice (mm/day): Standard Deviation, 1992 thru 2017

air-sea freshwater flux

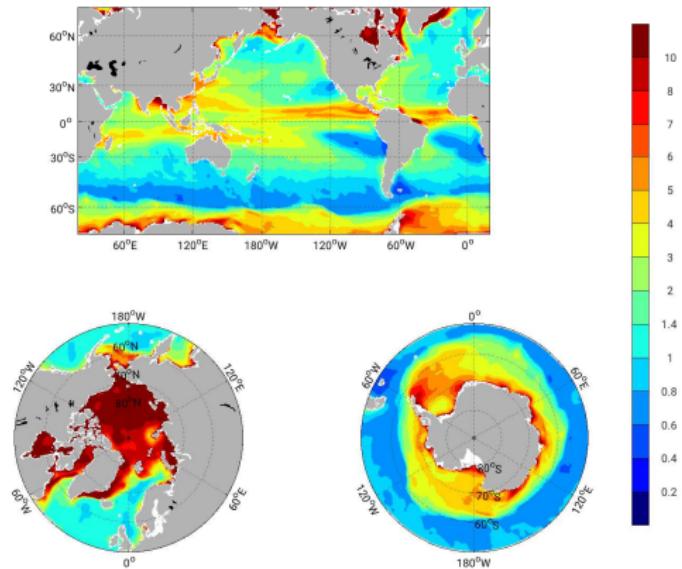


Figure : E-P-R to ocean (mm/day): Standard Deviation, 1992 thru 2017

surface wind stress

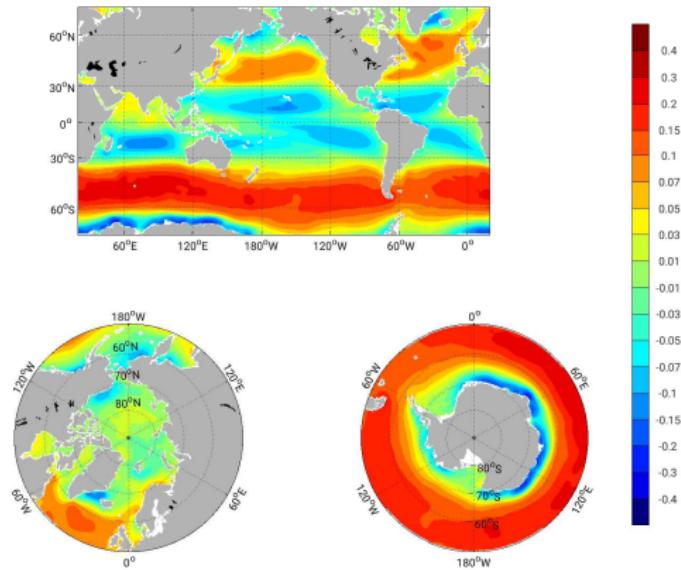


Figure : Zonal Wind Stress (N/m^2): 1992 thru 2017 Mean

surface wind stress

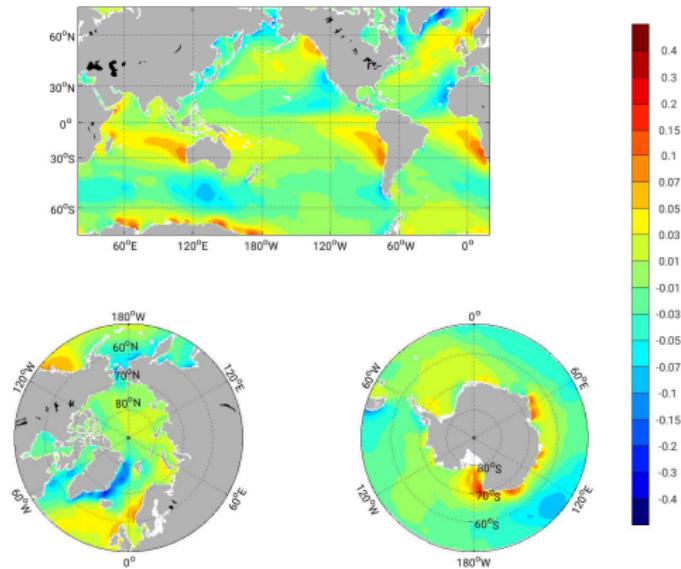


Figure : Meridional Wind Stress (N/m^2): 1992 thru 2017 Mean

surface wind stress

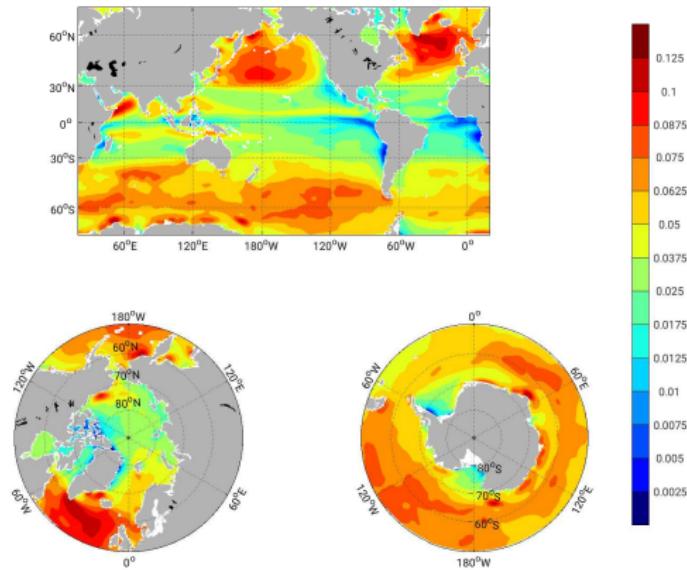


Figure : tauZ (N/m^2): Standard Deviation, 1992 thru 2017

surface wind stress

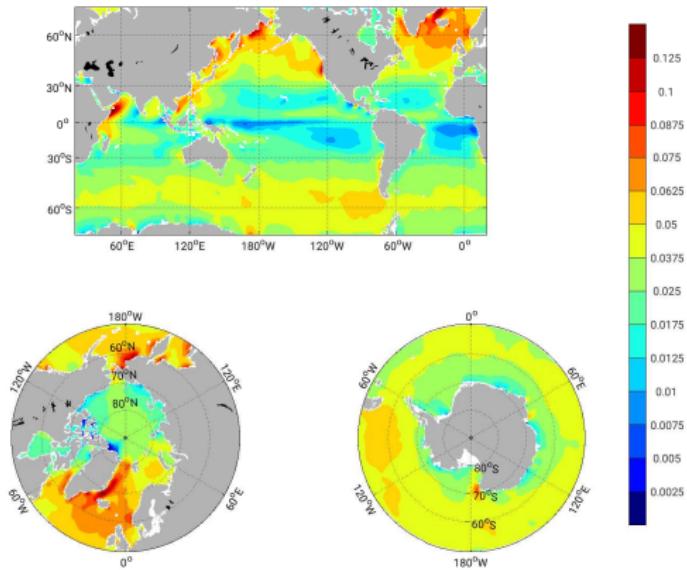


Figure : tauM (N/m^2): Standard Deviation, 1992 thru 2017

zonal mean tendencies

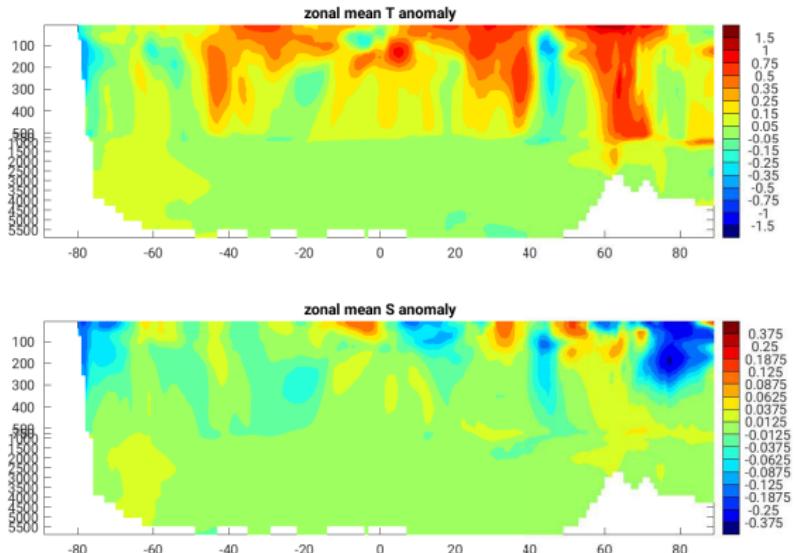


Figure : Last Year (2017) Minus First Year (1992) – Zonal Mean Temperature (C; top) and Salinity (psu; bottom)

equatorial sections

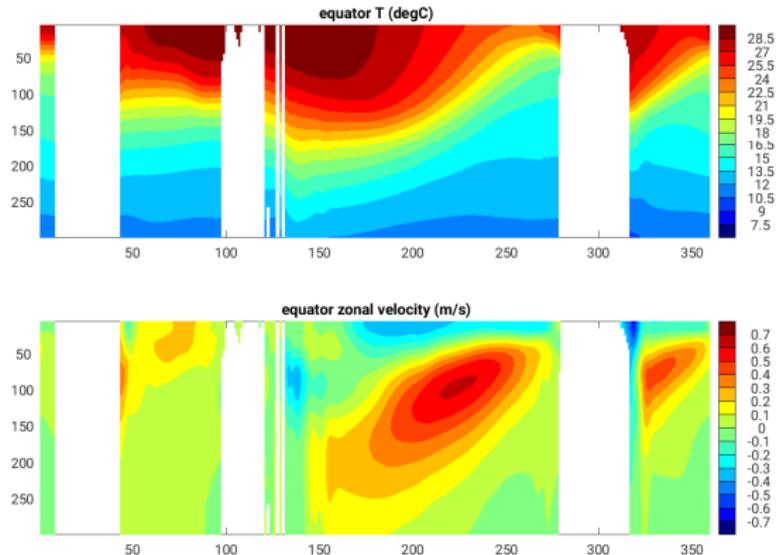


Figure : Equator Temperature (C;top) and Zonal Velocity (m/s;bottom): 1992 thru 2017 Mean

global mean properties

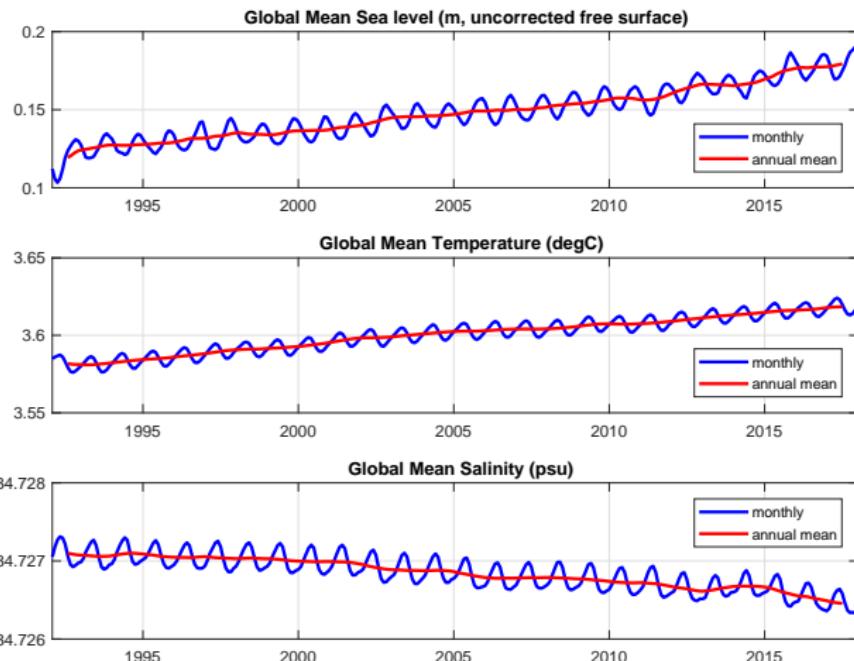


Figure : Global Mean T (C; top) and S (psu; bottom)

global mean properties

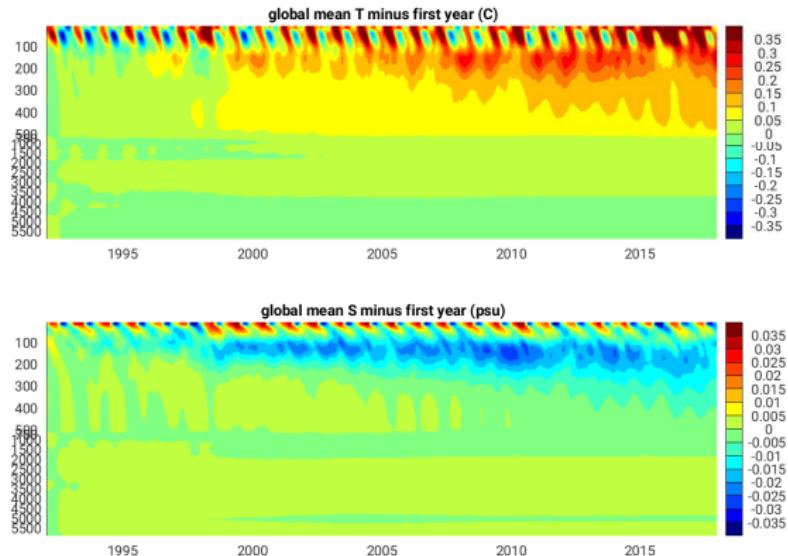


Figure : Global Mean Temperature (C; top) and Salinity (psu; bottom) Minus First Year

zonal mean properties

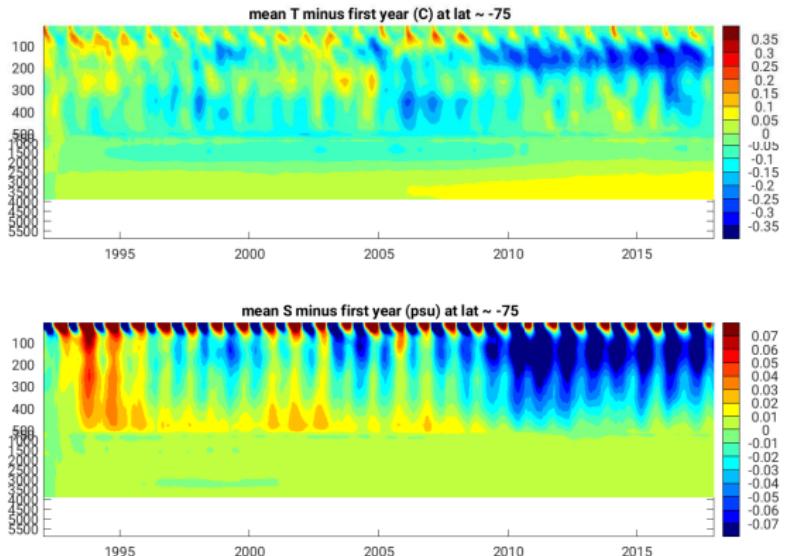


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat ≈ -75

zonal mean properties

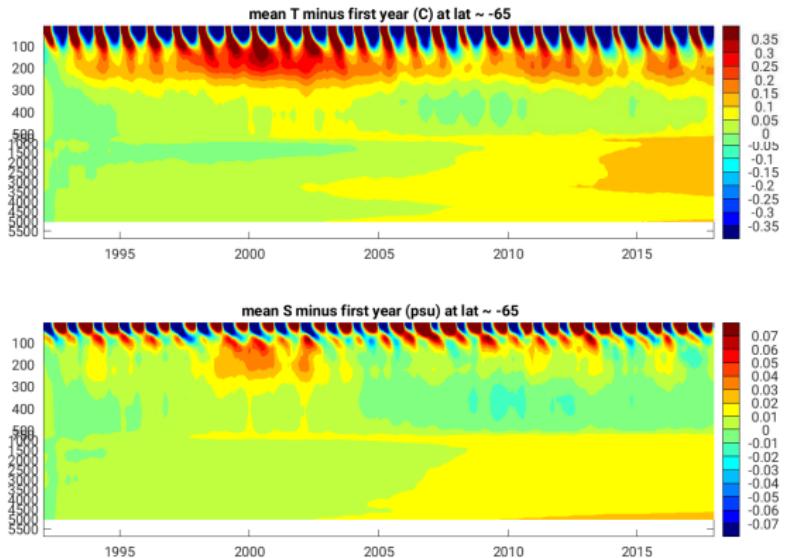


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat \approx -65

zonal mean properties

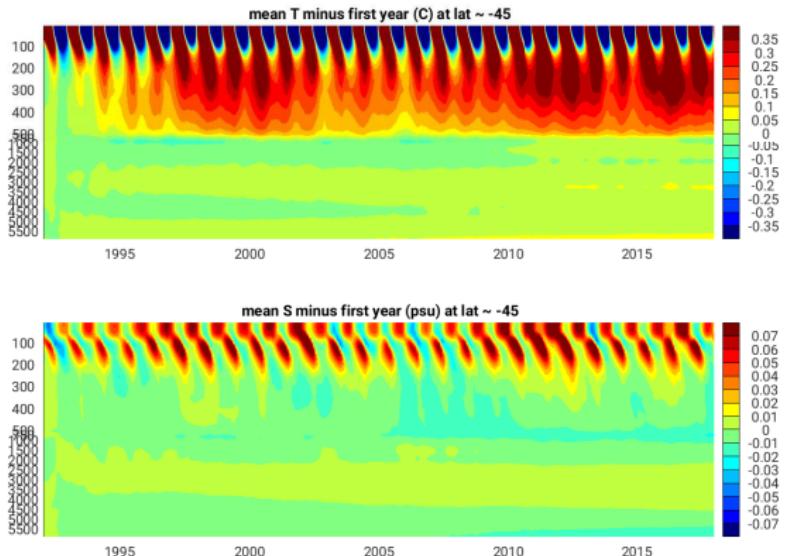


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat ≈ -45

zonal mean properties

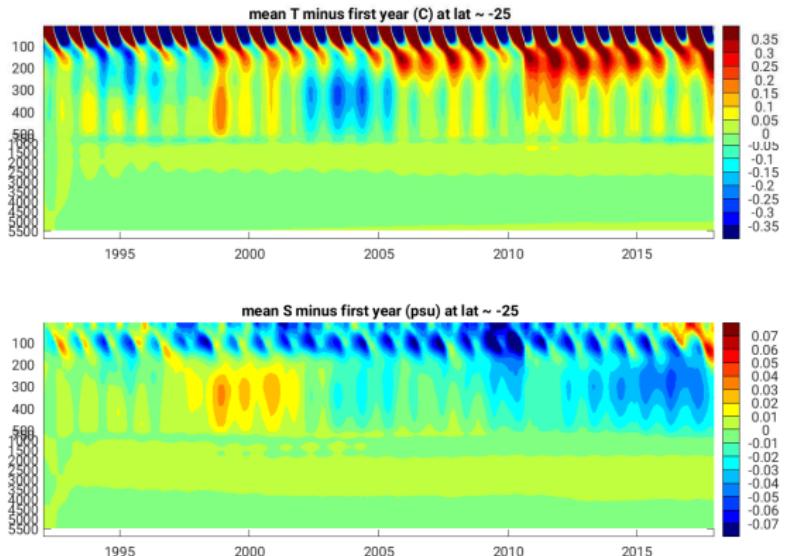


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat \approx -25

zonal mean properties

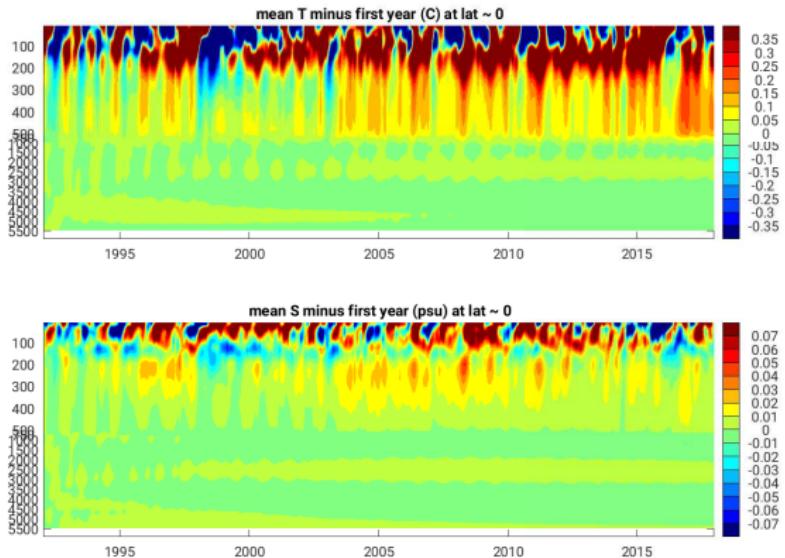


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat ≈ 0

zonal mean properties

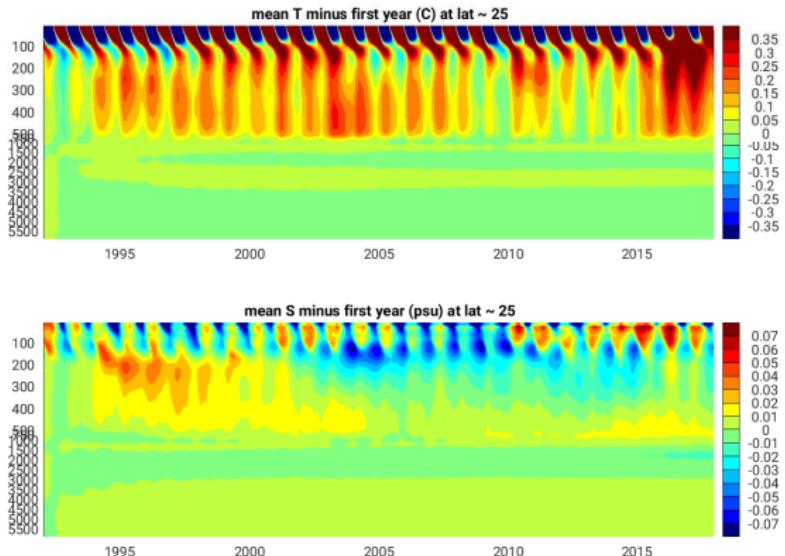


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat ≈ 25

zonal mean properties

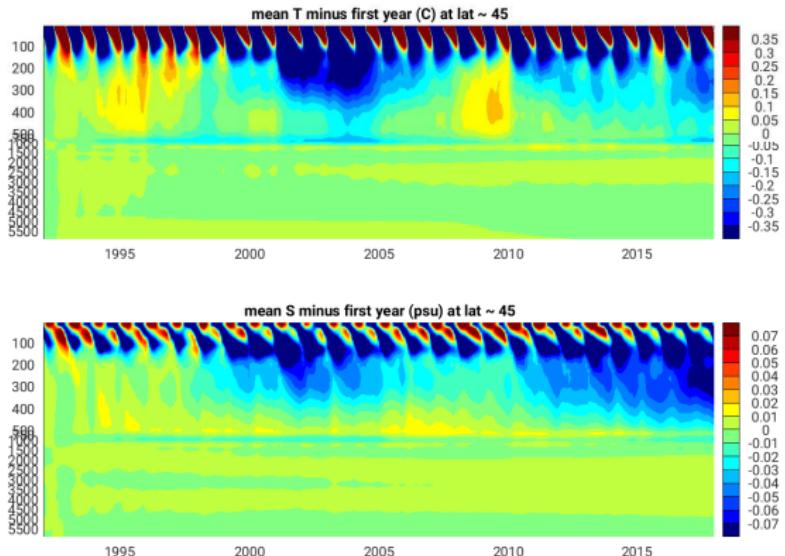


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat ≈ 45

zonal mean properties

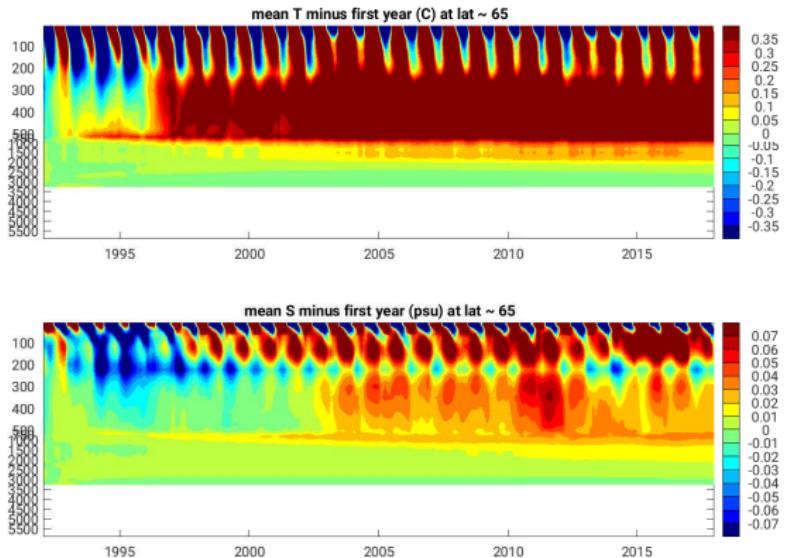


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat \approx 65

zonal mean properties

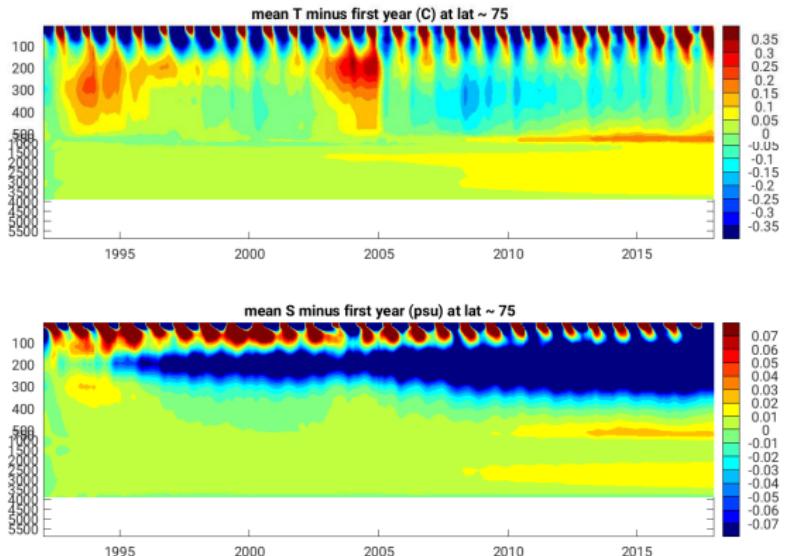


Figure : Mean Temperature (C; top) and Salinity (psu; bottom)
Minus First Year at lat ≈ 75

zonal mean properties (surface)

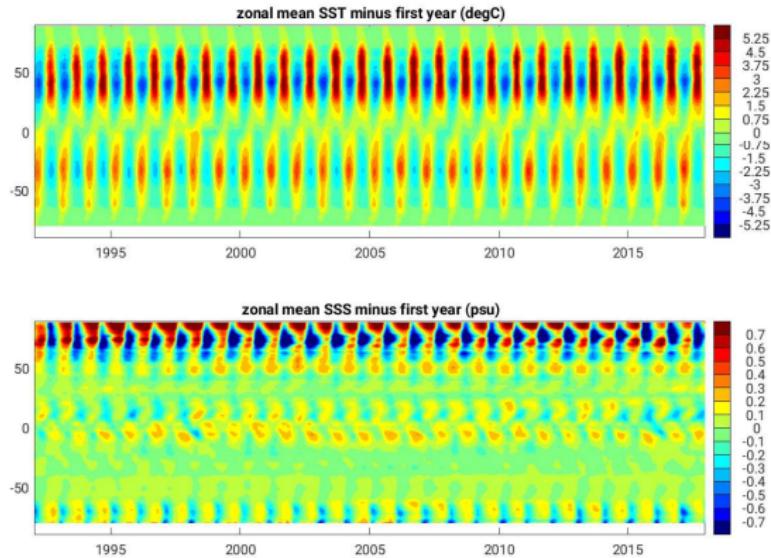


Figure : Zonal Mean Temperature (C; top) and Salinity (psu; bottom) minus first year (psu) at 5m depth

zonal mean properties (surface)

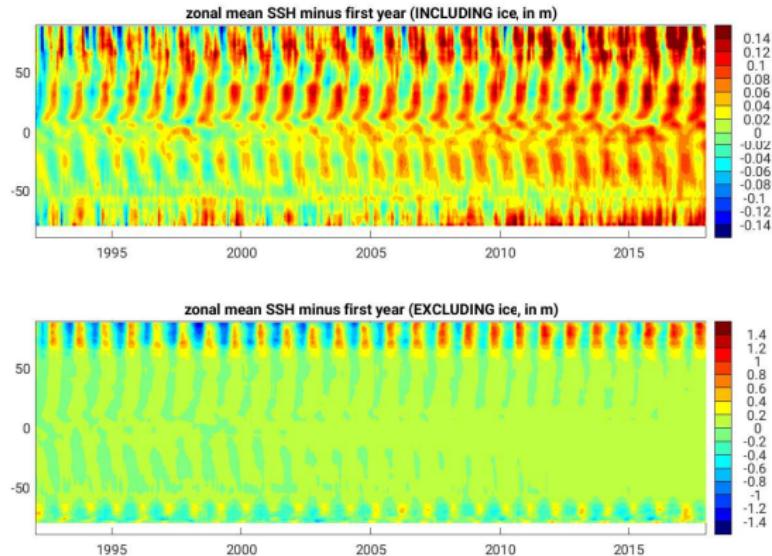


Figure : Zonal Mean SSH (m, uncorrected free surface) Minus First Year, Including Ice (top) and Below Ice (bottom)

zonal mean properties (surface)

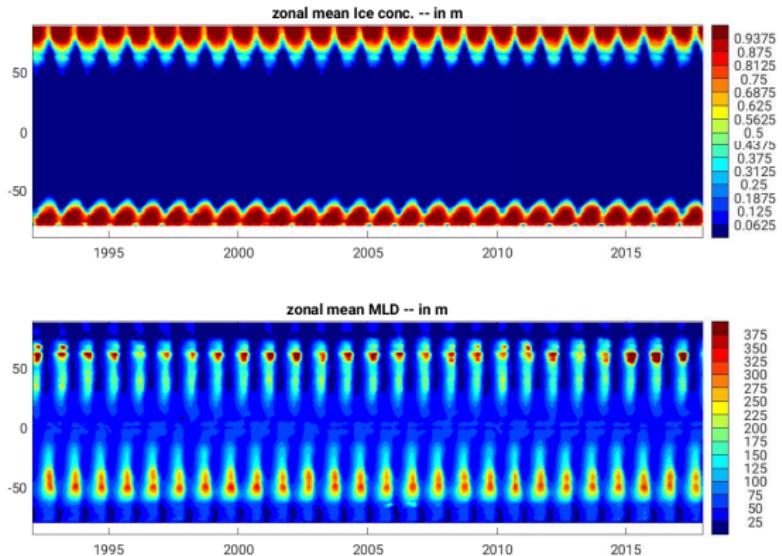


Figure : Zonal Mean Ice Concentration (no units) and Mixed Layer Depth (m)

seaice time series

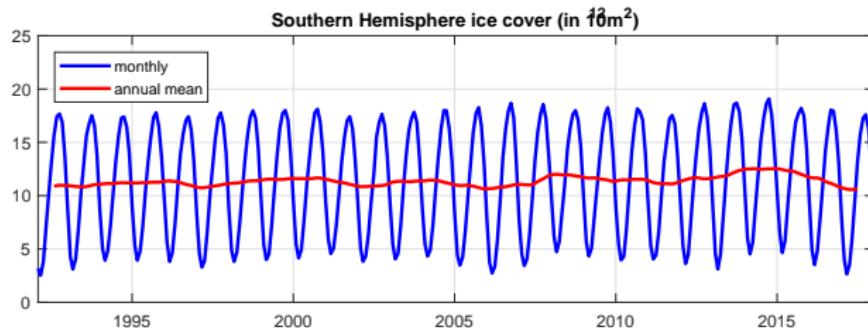
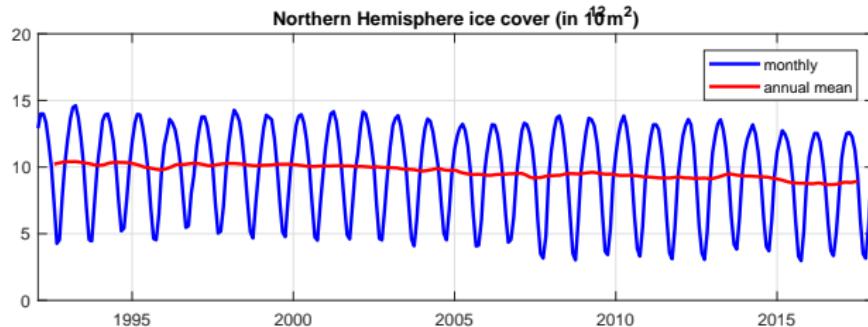


Figure : Sea Ice Cover (in $10^{12} m^2$) in Northern (top) and Southern (bottom) Hemisphere

seaice time series

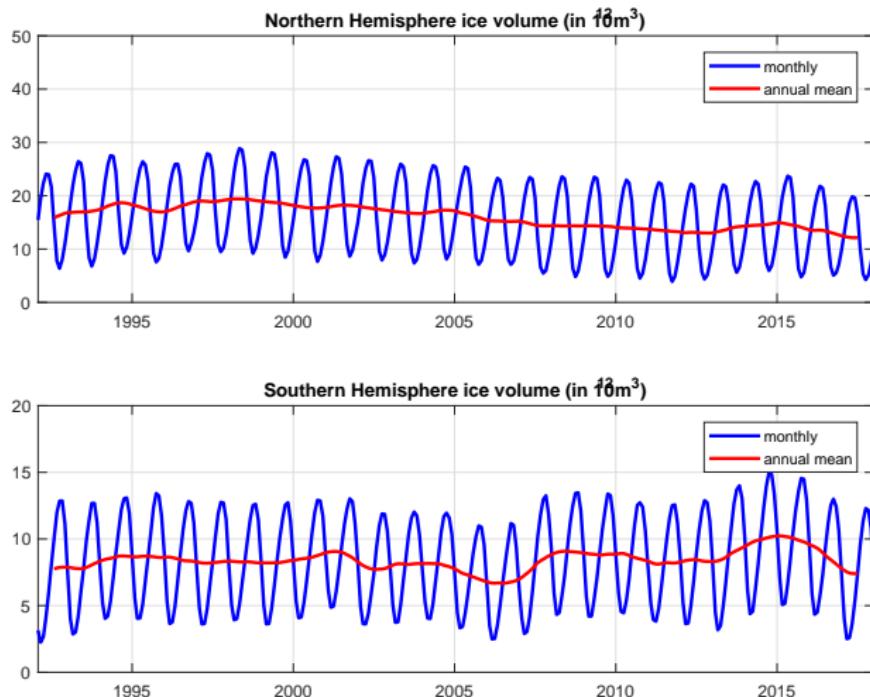


Figure : Sea Ice Volume (in 10^{12} m^3) in Northern (top) and Southern (bottom) Hemisphere

seaice time series

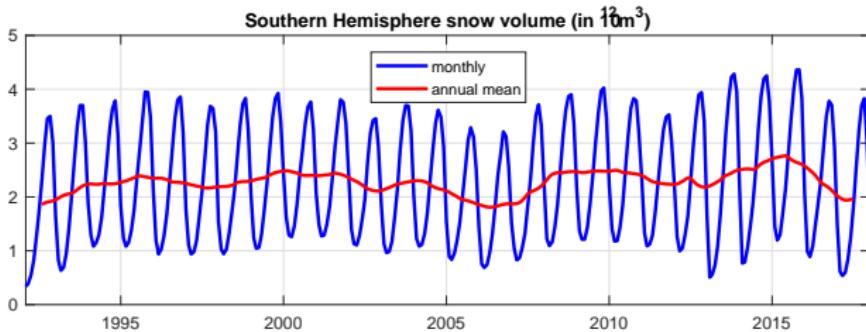
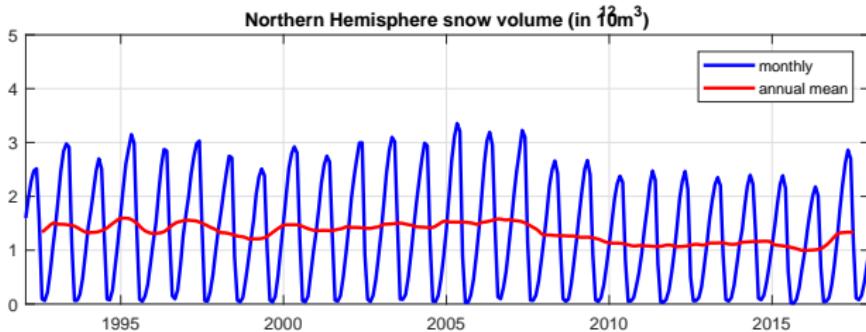


Figure : Snow Volume (in $10^{12} m^3$) in Northern (top) and Southern (bottom) Hemisphere

seaice time series

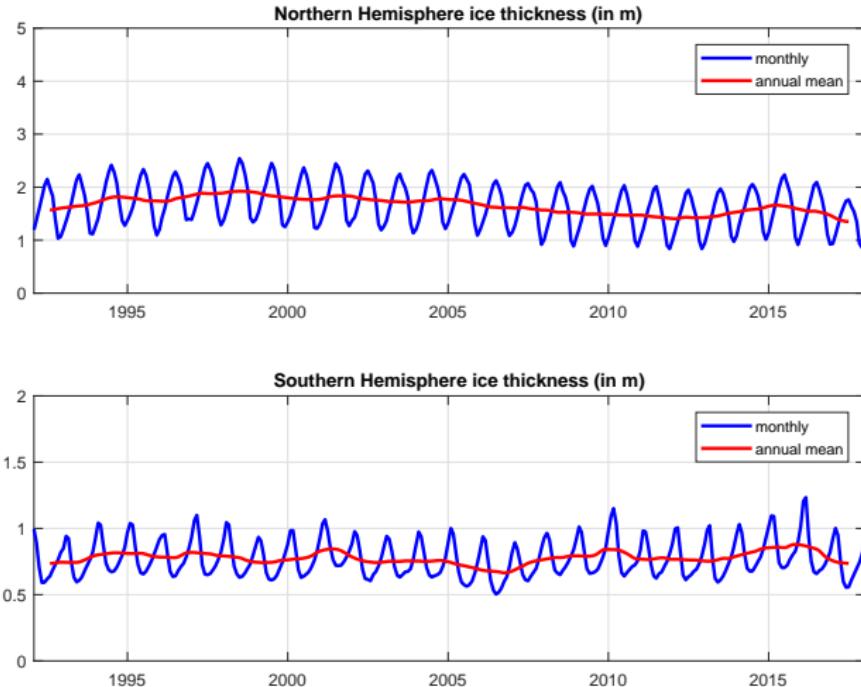


Figure : Sea Ice Thickness (in m) in Northern (top) and Southern (bottom) Hemisphere

seaice time series

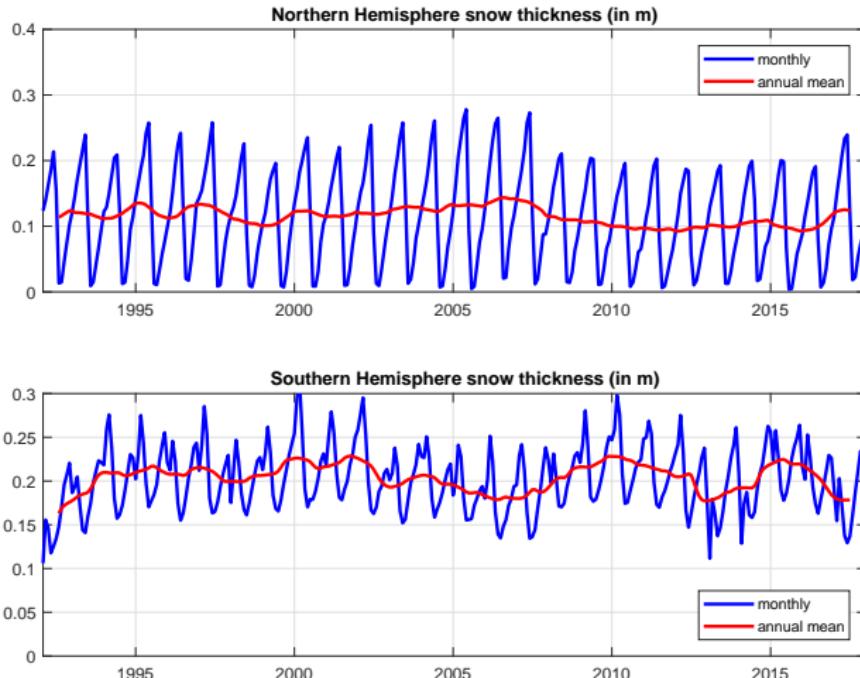


Figure : Snow Thickness (in m) in Northern (top) and Southern (bottom) Hemisphere

budgets : volume, heat and salt (top to bottom)

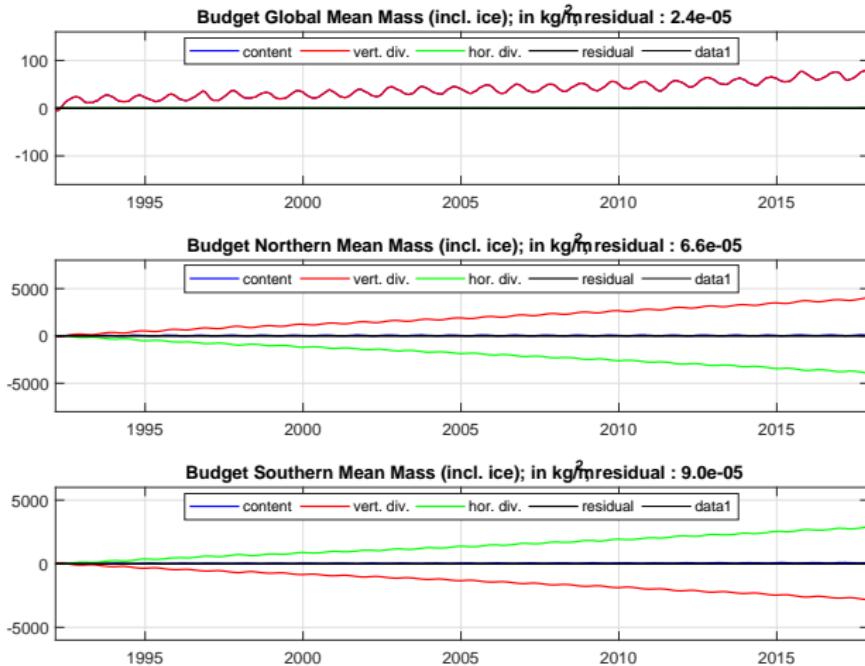


Figure : Global (upper), North (mid) and South (lower) Mass Budget (ocean+ice) in kg/m²

budgets : volume, heat and salt (top to bottom)

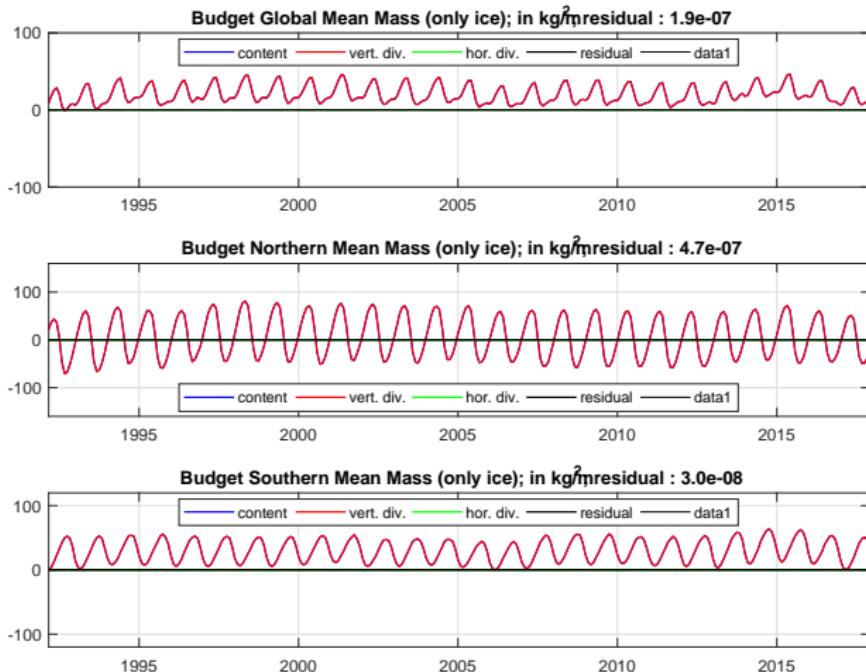


Figure : Global (upper), North (mid) and South (lower) Mass Budget (ice only) in kg/m²

budgets : volume, heat and salt (top to bottom)

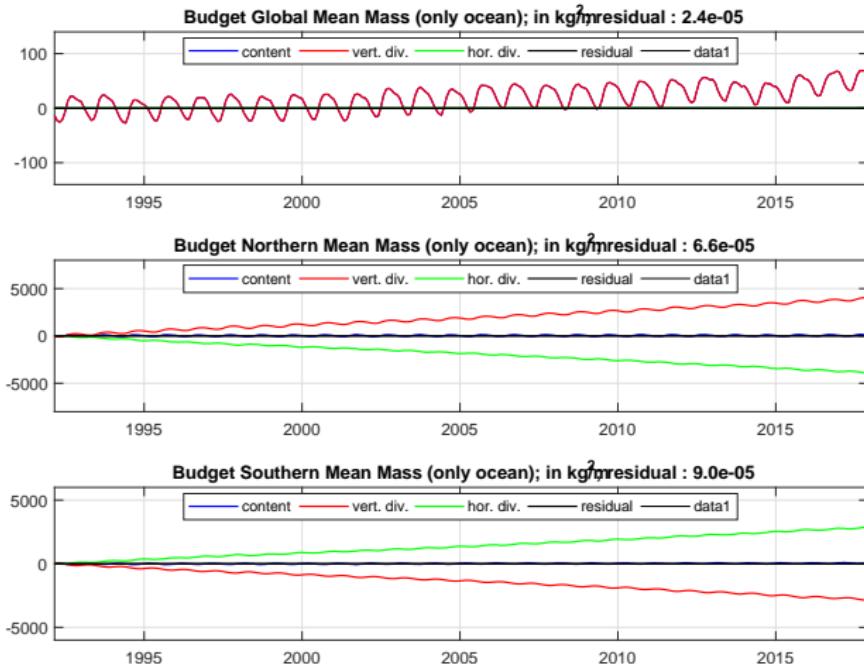


Figure : Global (upper), North (mid) and South (lower) Mass Budget (ocean only) in kg/m²

budgets : volume, heat and salt (top to bottom)

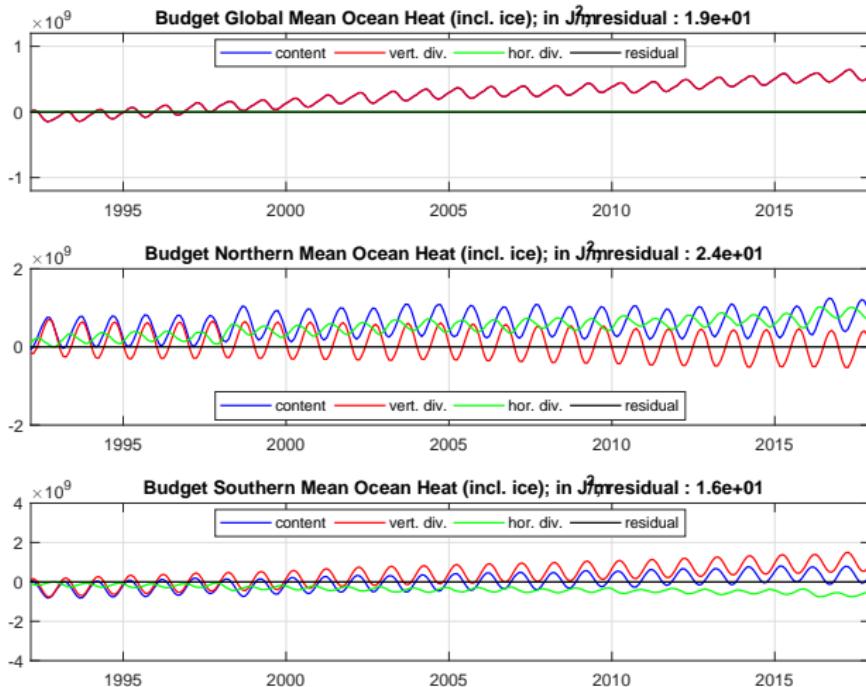


Figure : Global (upper), North (mid) and South (lower) Heat Budget (ocean+ice) in J/m^2

budgets : volume, heat and salt (top to bottom)

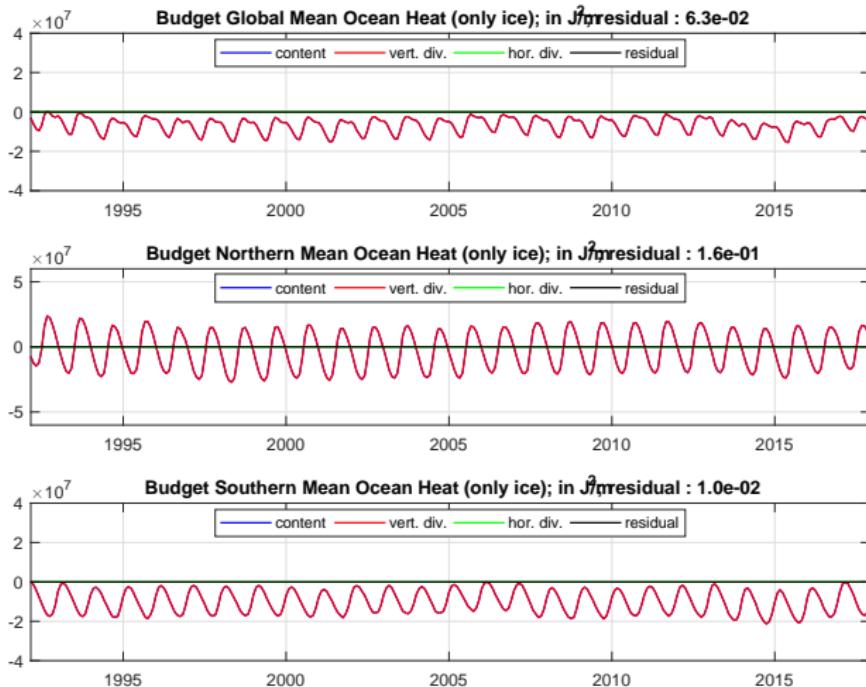


Figure : Global (upper), North (mid) and South (lower) Heat Budget (ice only) in J/m^2

budgets : volume, heat and salt (top to bottom)

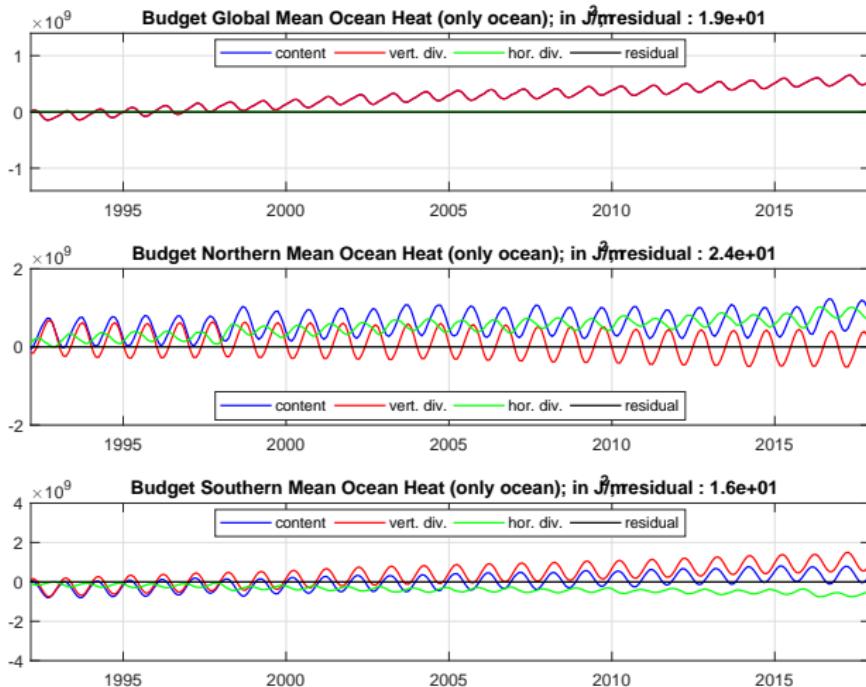


Figure : Global (upper), North (mid) and South (lower) Heat Budget (ocean only) in J/m^2

budgets : volume, heat and salt (top to bottom)

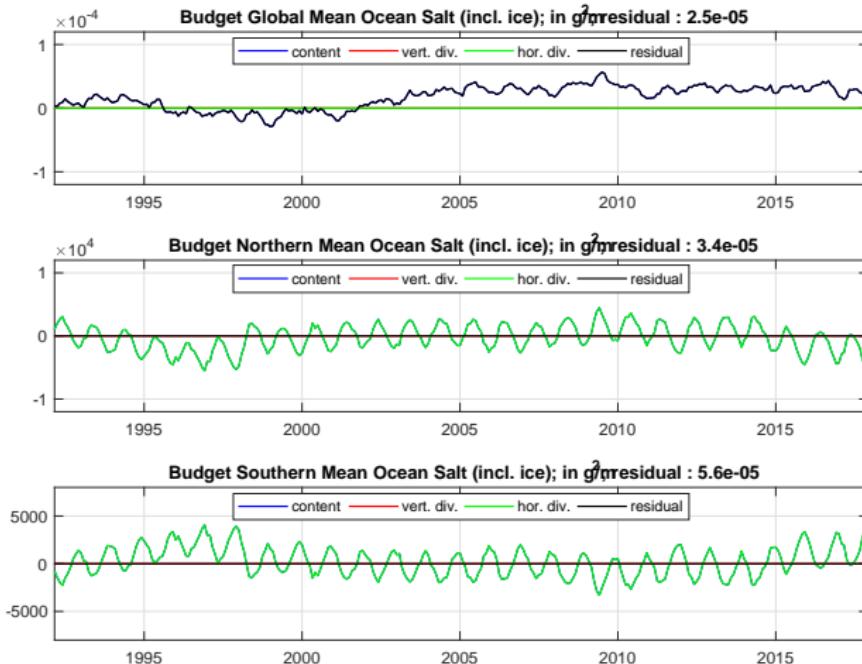


Figure : Global (upper), North (mid) and South (lower) Salt Budget (ocean+ice) in g/m^2

budgets : volume, heat and salt (top to bottom)

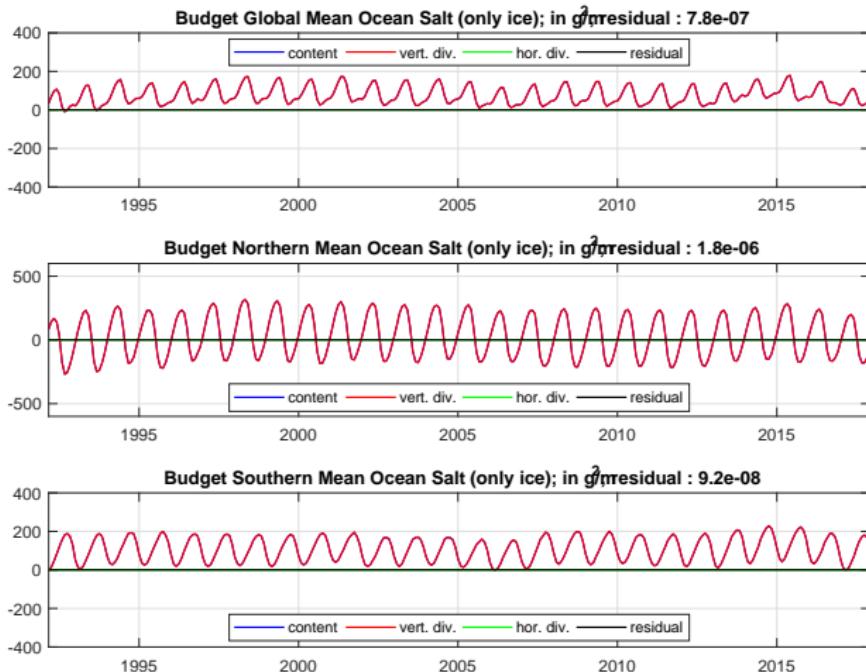


Figure : Global (upper), North (mid) and South (lower) Salt Budget (ice only) in g/m^2

budgets : volume, heat and salt (top to bottom)

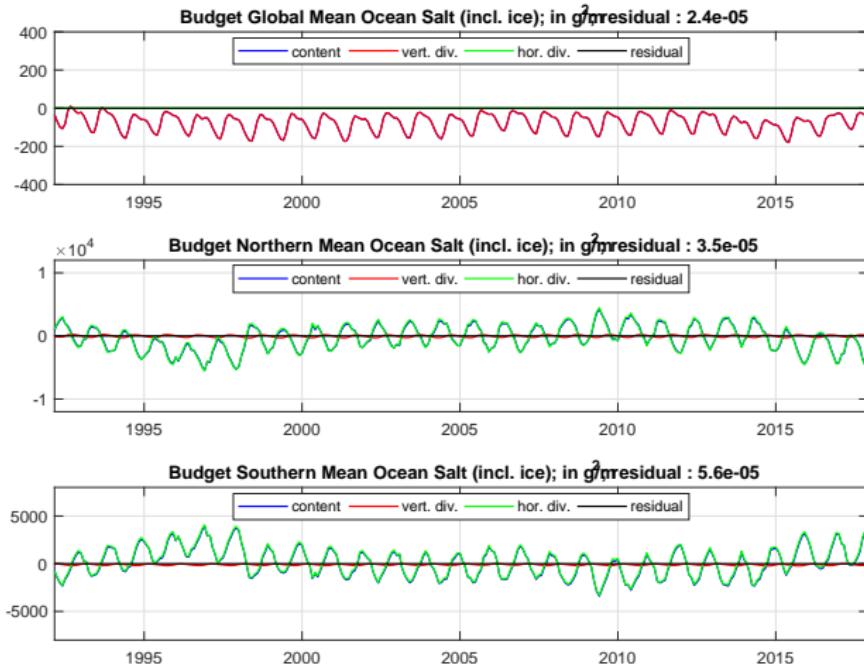


Figure : Global (upper), North (mid) and South (lower) Salt Budget (ocean only) in g/m²

mixed layer depth fields

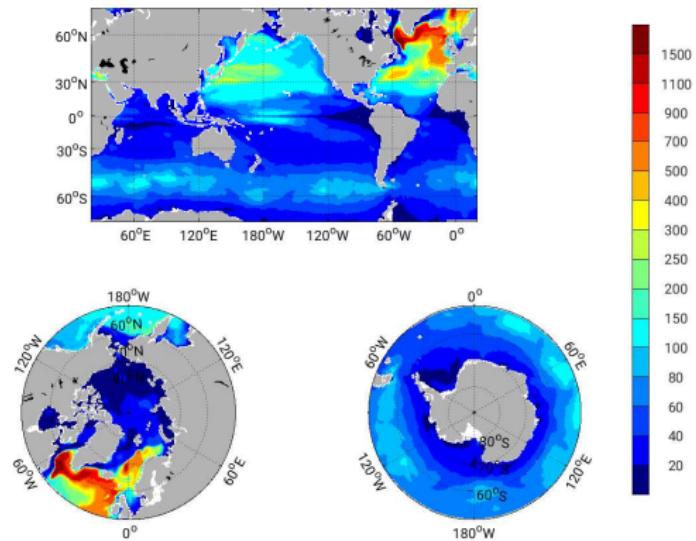


Figure : March Mixed Layer Depth per Kara Formula (m): 1992 thru 2017 Mean

mixed layer depth fields

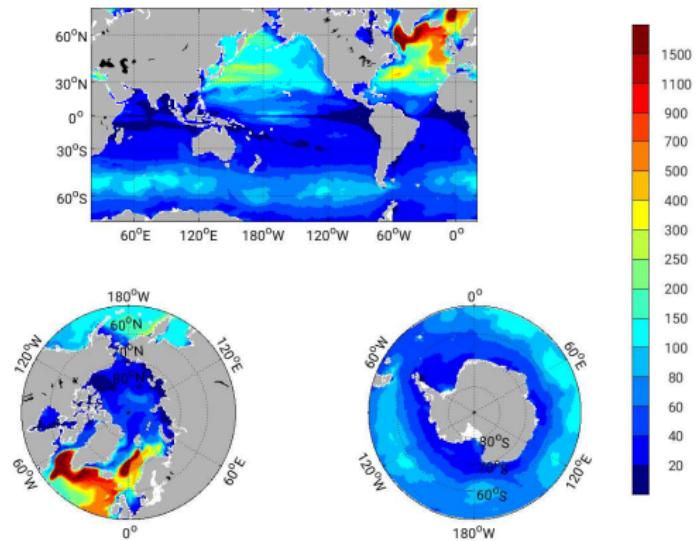


Figure : March Mixed Layer Depth per Suga Formula (m): 1992 thru 2017 Mean

mixed layer depth fields

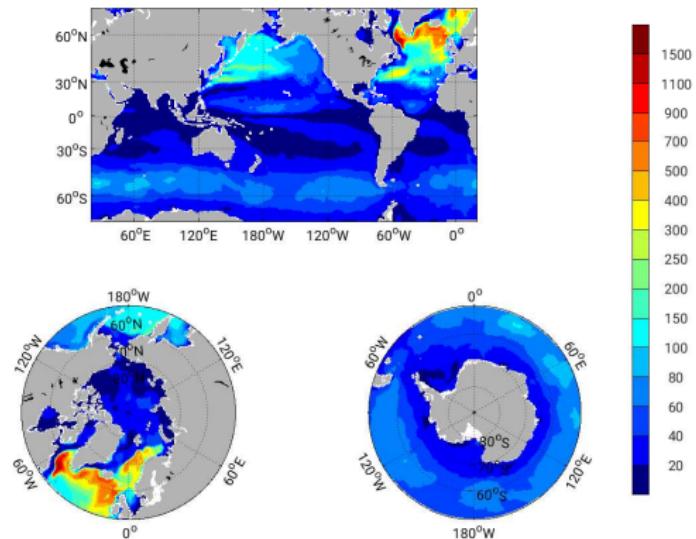


Figure : March Mixed Layer Depth per Boyer M. Formula (m):
1992 thru 2017 Mean

mixed layer depth fields

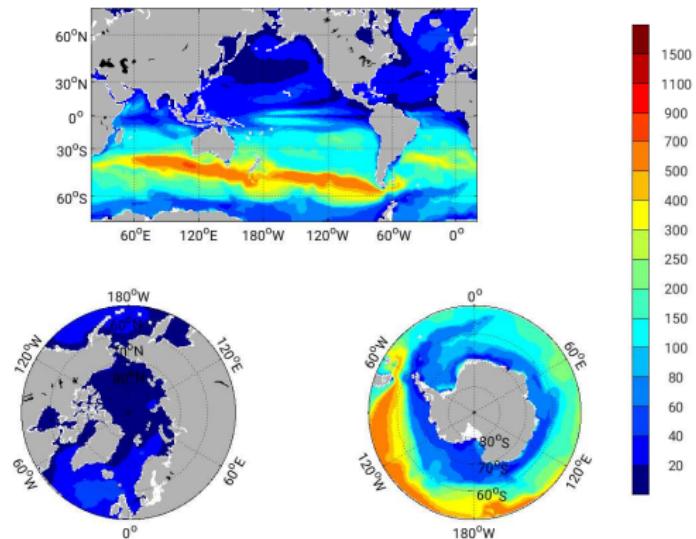


Figure : September Mixed Layer Depth per Kara Formula (m):
1992 thru 2017 Mean

mixed layer depth fields

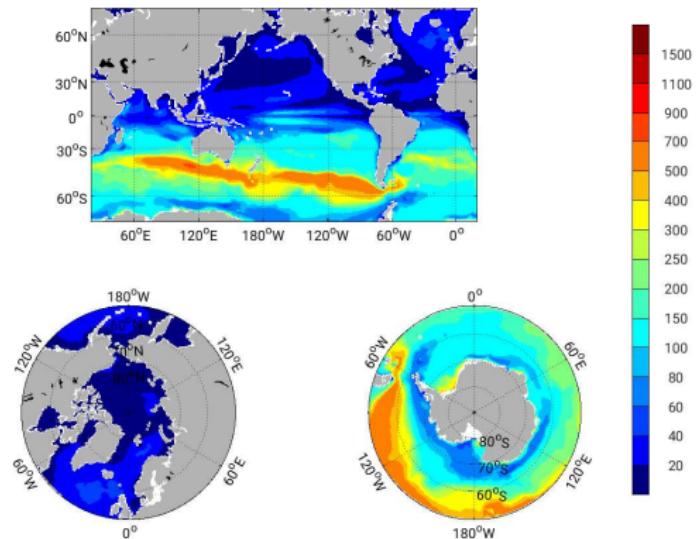


Figure : September Mixed Layer Depth per Suga Formula (m):
1992 thru 2017 Mean

mixed layer depth fields

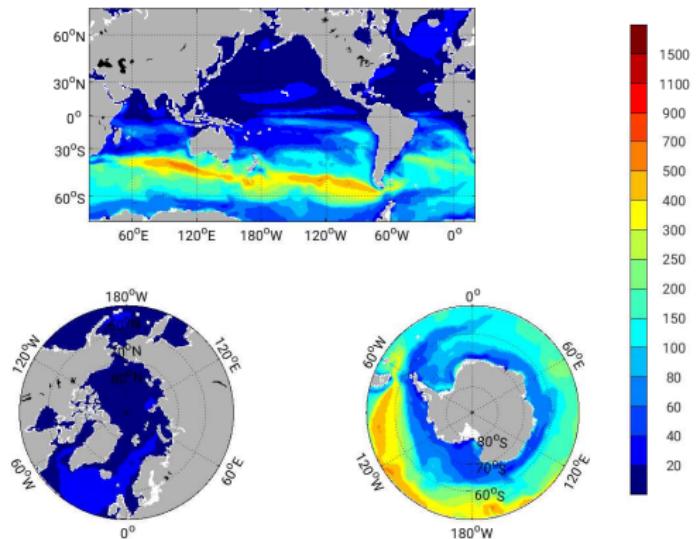


Figure : September Mixed Layer Depth per Boyer M. Formula (m):
1992 thru 2017 Mean

Monthly Thickness Distribution

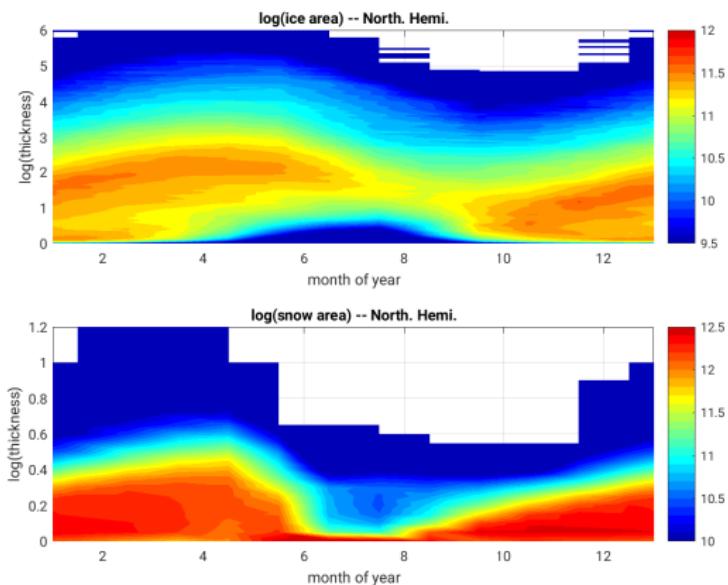


Figure : Northern Hemisphere Monthly Mean Sea Ice (top) and Snow (bottom) Thickness Distribution ($\log(m^2)$): 1992 thru 2017 Mean

Monthly Thickness Distribution

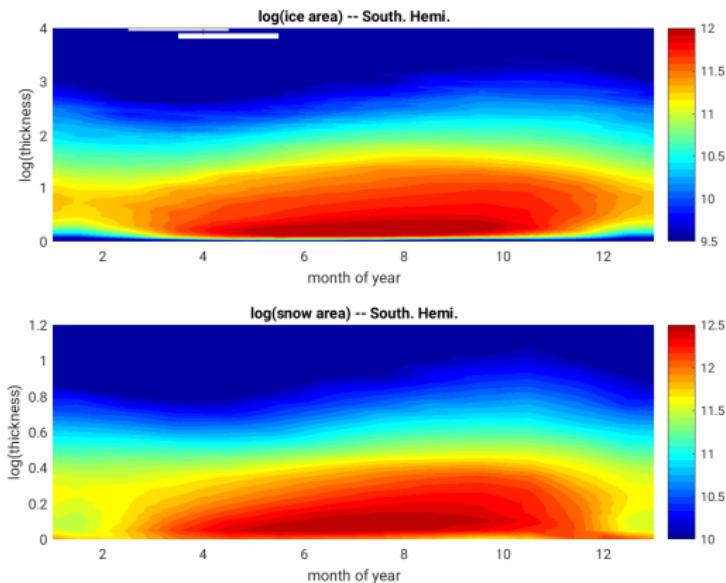


Figure : Southern Hemisphere Monthly Mean Sea Ice (top) and Snow (bottom) Thickness Distribution ($\log(m^2)$): 1992 thru 2017 Mean

Sea Ice Concentration (unitless): March

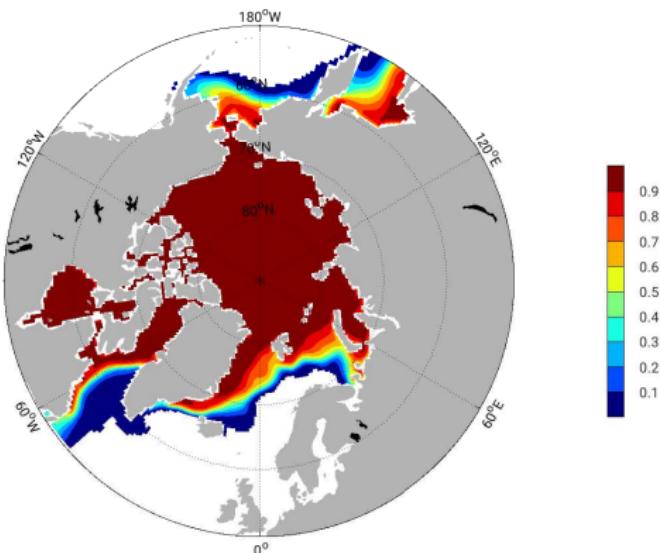


Figure : March Sea Ice Concentration (unitless): 1992 thru 2017
Mean

Sea Ice Thickness (m): March

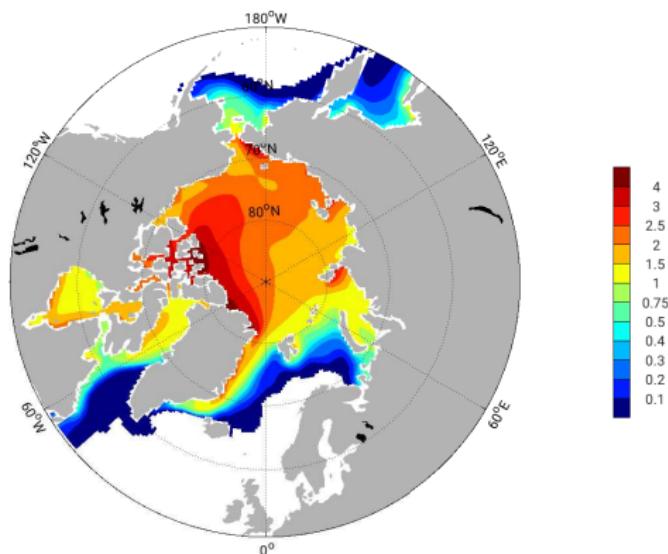


Figure : March Sea Ice Thickness (m): 1992 thru 2017 Mean

Snow Thickness (m): March

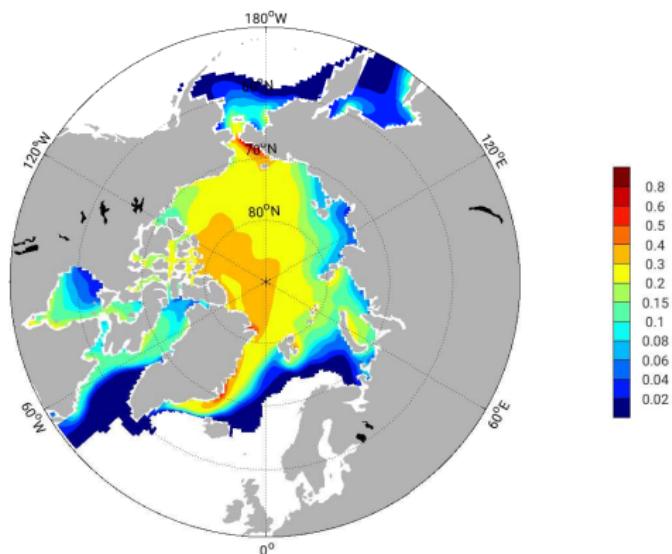


Figure : March Snow Thickness (m): 1992 thru 2017 Mean

Sea Ice+Snow Streamfunction (megaton/s): March

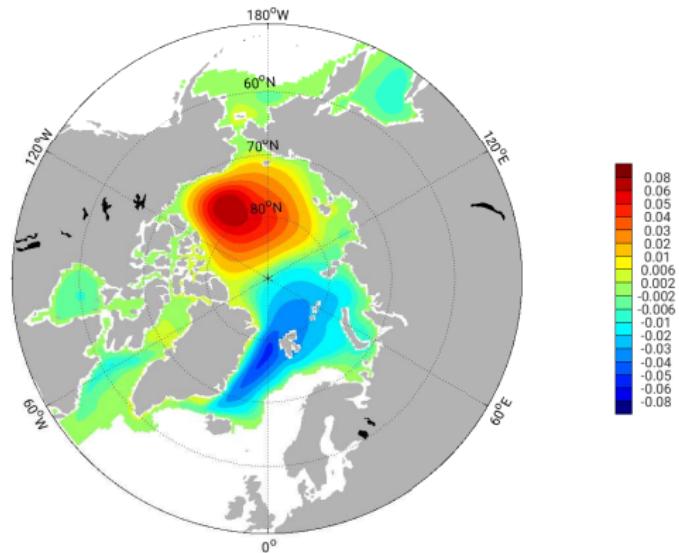


Figure : March Sea Ice+Snow Streamfunction (megaton/s): 1992
thru 2017 Mean

Sea Ice+Snow Convergence (kiloton/s): March

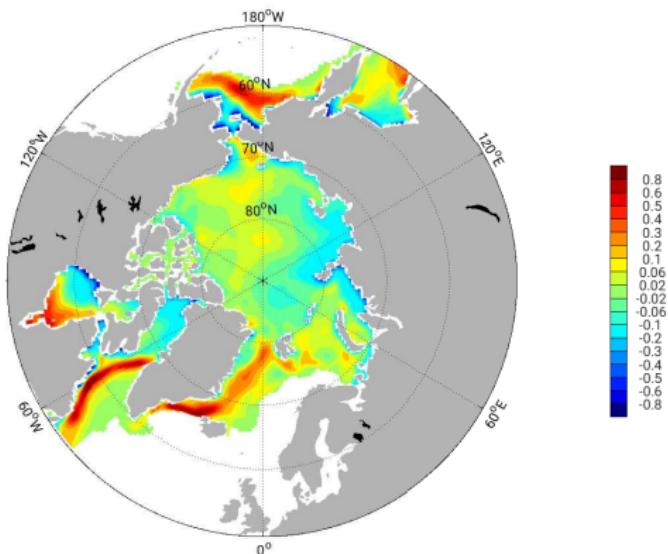


Figure : March Sea Ice+Snow Convergence (kiloton/s): 1992 thru 2017 Mean

Sea Ice Concentration (unitless): September

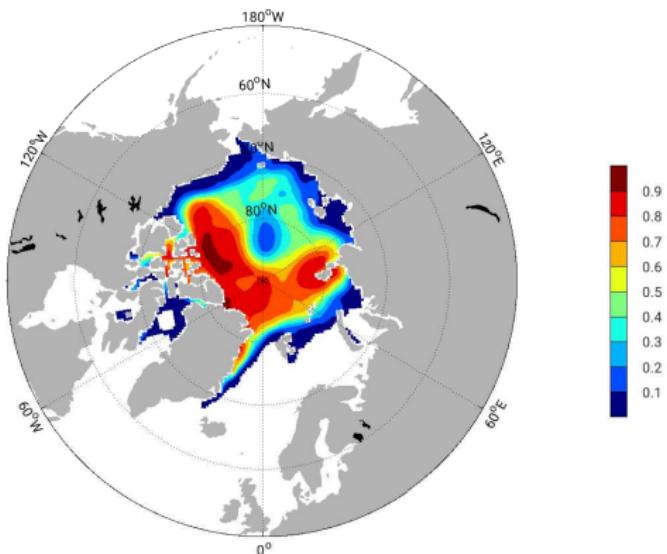


Figure : September Sea Ice Concentration (unitless): 1992 thru 2017 Mean

Sea Ice Thickness (m): September

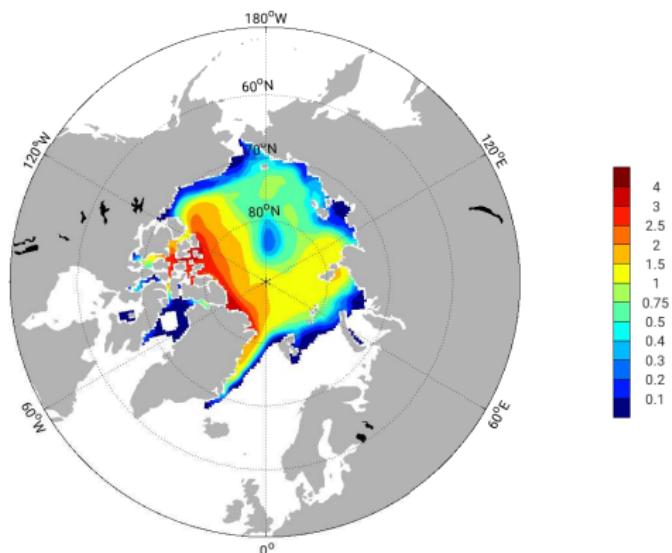


Figure : September Sea Ice Thickness (m): 1992 thru 2017 Mean

Snow Thickness (m): September

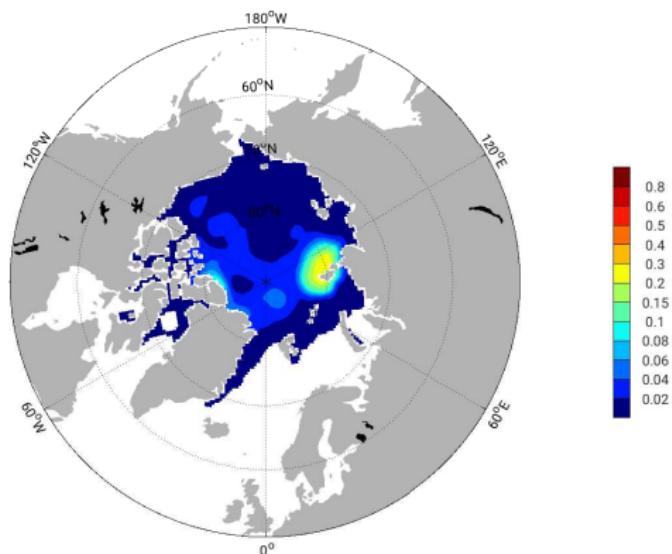


Figure : September Snow Thickness (m): 1992 thru 2017 Mean

Sea Ice+Snow Streamfunction (megaton/s): September

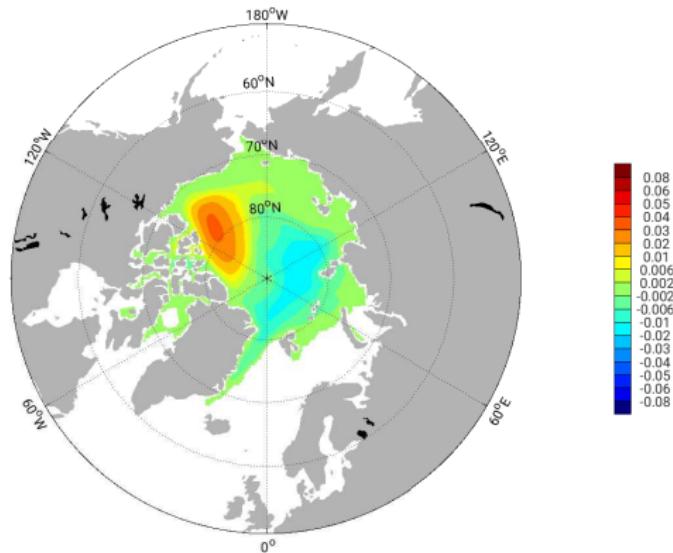


Figure : September Sea Ice+Snow Streamfunction (megaton/s):
1992 thru 2017 Mean

Sea Ice+Snow Convergence (kiloton/s): September

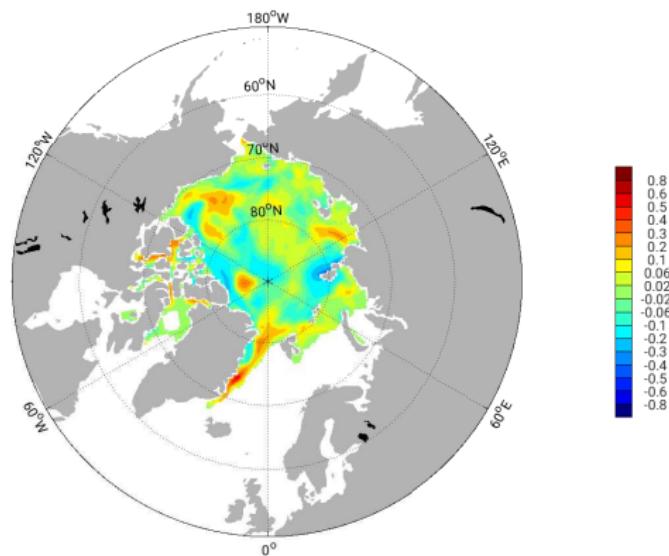


Figure : September Sea Ice+Snow Convergence (kiloton/s): 1992 thru 2017 Mean

Sea Ice Concentration (unitless): March

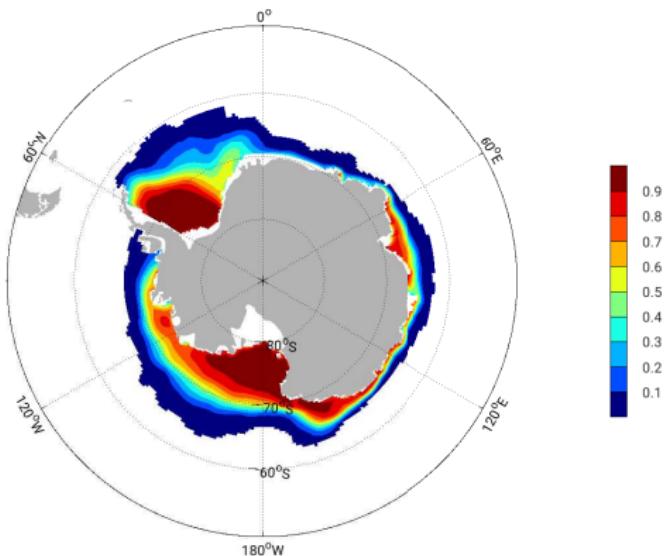


Figure : March Sea Ice Concentration (unitless): 1992 thru 2017
Mean

Sea Ice Thickness (m): March

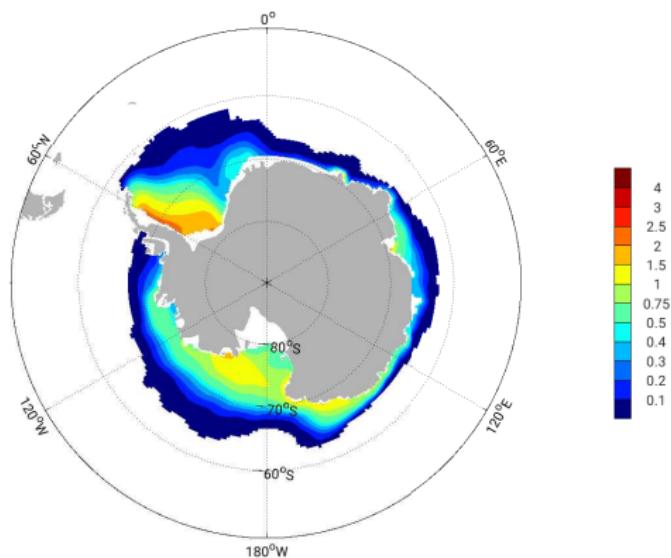


Figure : March Sea Ice Thickness (m): 1992 thru 2017 Mean

Snow Thickness (m): March

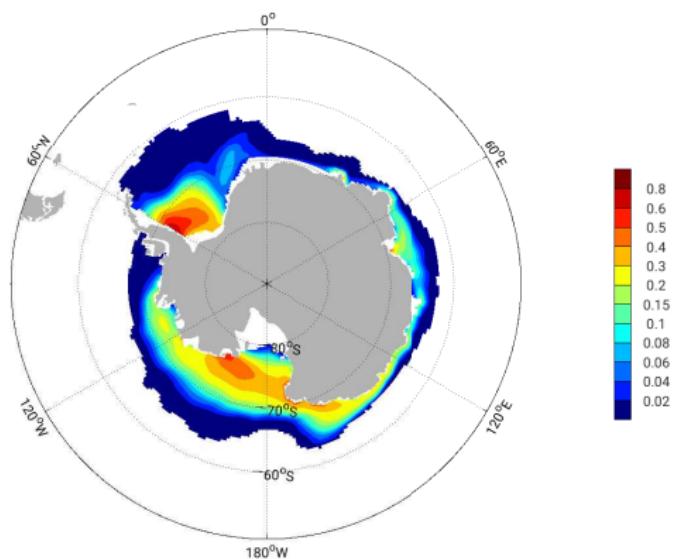


Figure : March Snow Thickness (m): 1992 thru 2017 Mean

Sea Ice+Snow Streamfunction (megaton/s): March

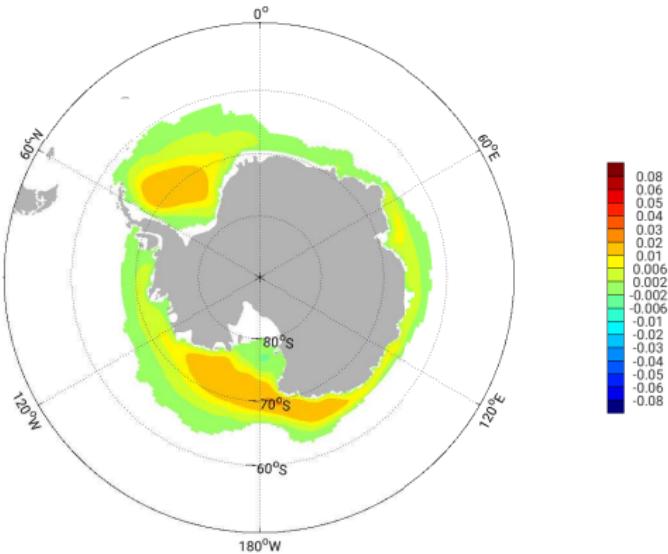


Figure : March Sea Ice+Snow Streamfunction (megaton/s): 1992 thru 2017 Mean

Sea Ice+Snow Convergence (kiloton/s): March

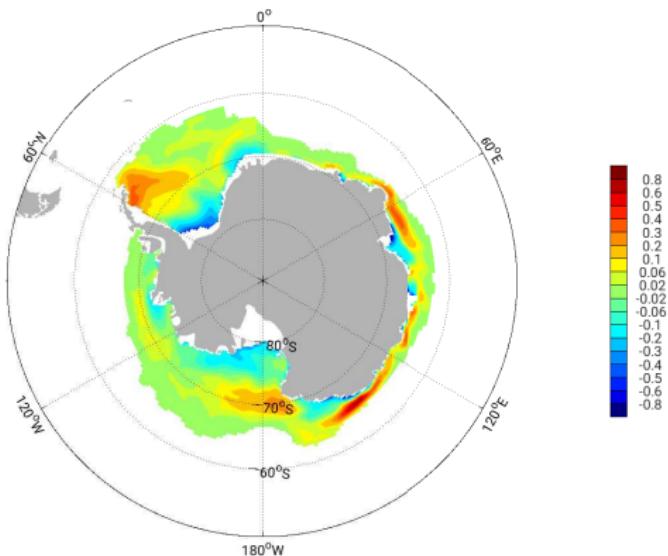


Figure : March Sea Ice+Snow Convergence (kiloton/s): 1992 thru 2017 Mean

Sea Ice Concentration (unitless): September

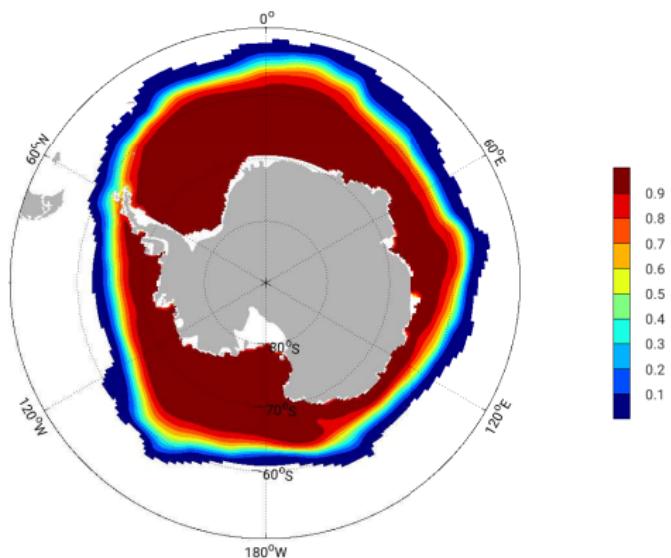


Figure : September Sea Ice Concentration (unitless): 1992 thru 2017 Mean

Sea Ice Thickness (m): September

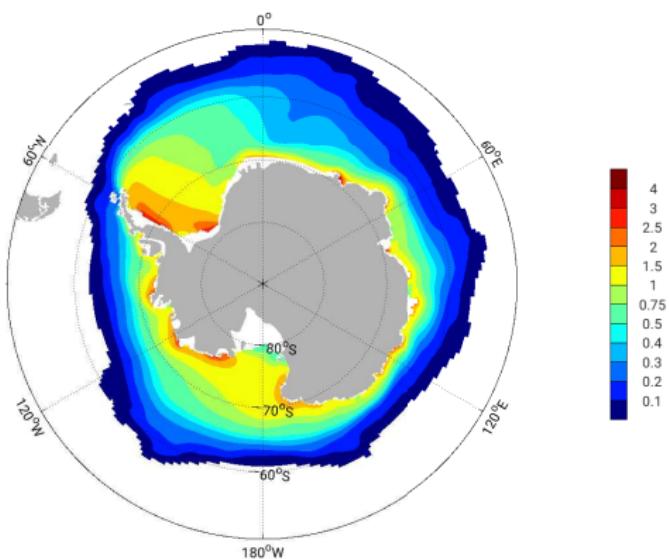


Figure : September Sea Ice Thickness (m): 1992 thru 2017 Mean

Snow Thickness (m): September

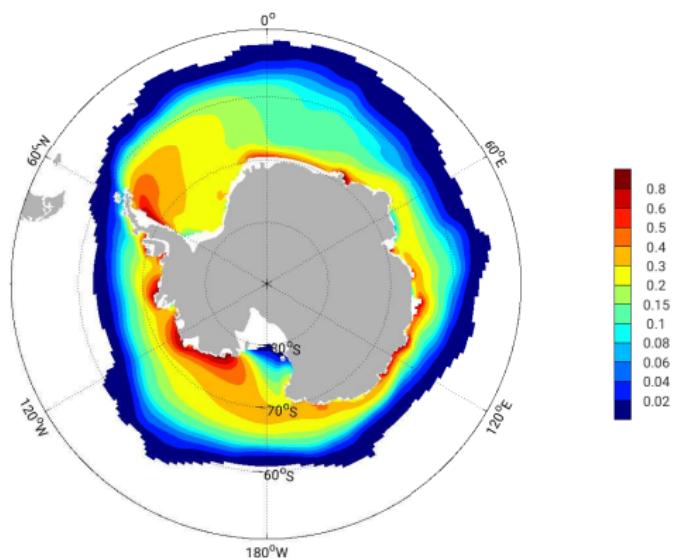


Figure : September Snow Thickness (m): 1992 thru 2017 Mean

Sea Ice+Snow Streamfunction (megaton/s): September

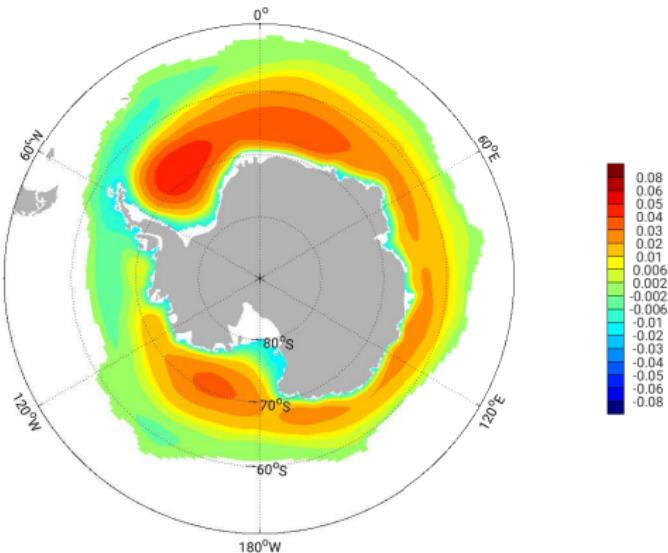


Figure : September Sea Ice+Snow Streamfunction (megaton/s):
1992 thru 2017 Mean

Sea Ice+Snow Convergence (kiloton/s): September

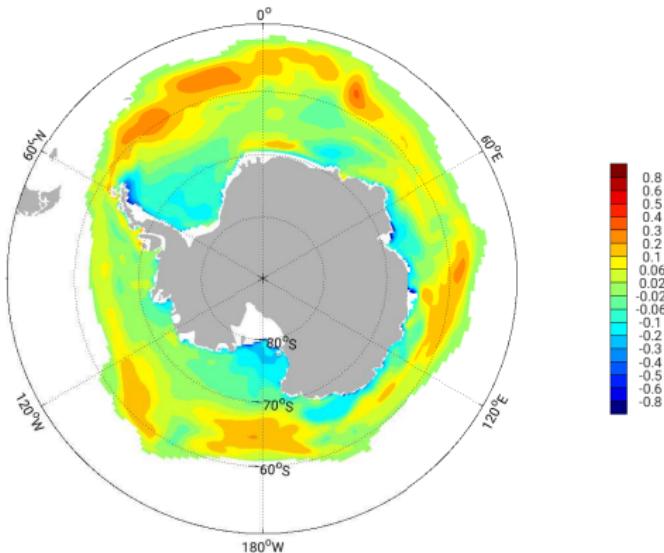


Figure : September Sea Ice+Snow Convergence (kiloton/s): 1992 thru 2017 Mean

control prior uncertainty

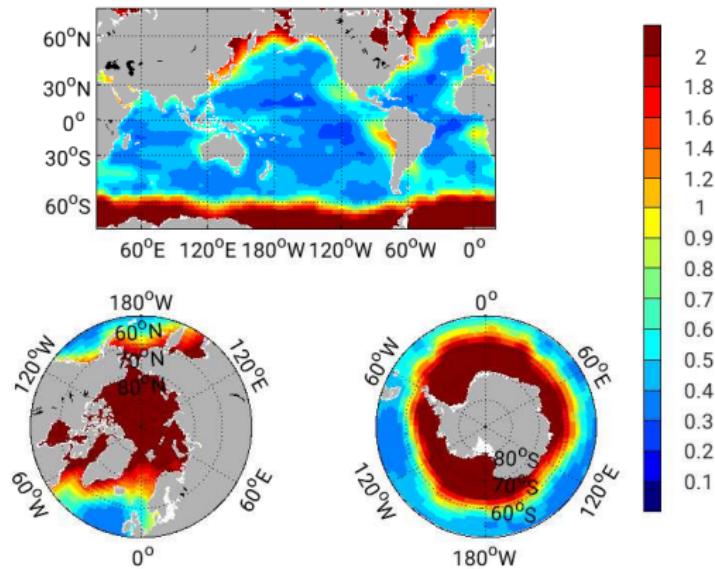


Figure : Prior Uncertainty (K): atemp

rms of control adjustment

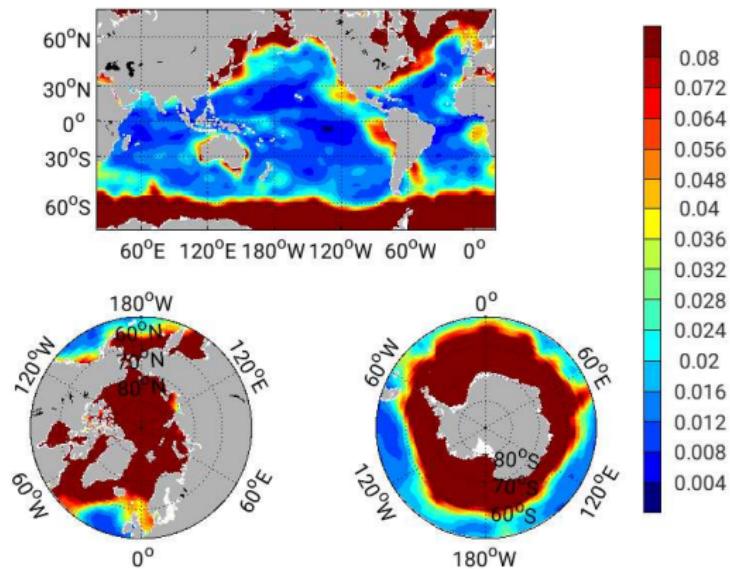


Figure : RMS of Adjustment (K): atemp

std of control adjustment

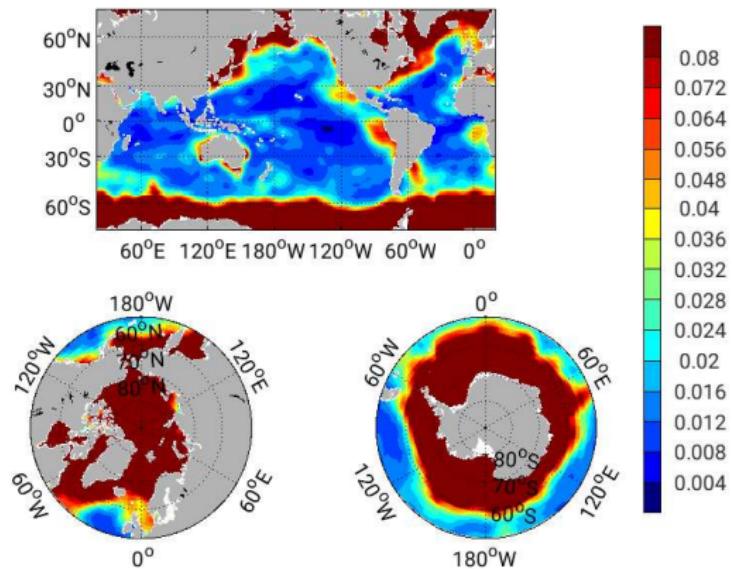


Figure : STD of Adjustment (K): atemp

mean of control adjustment

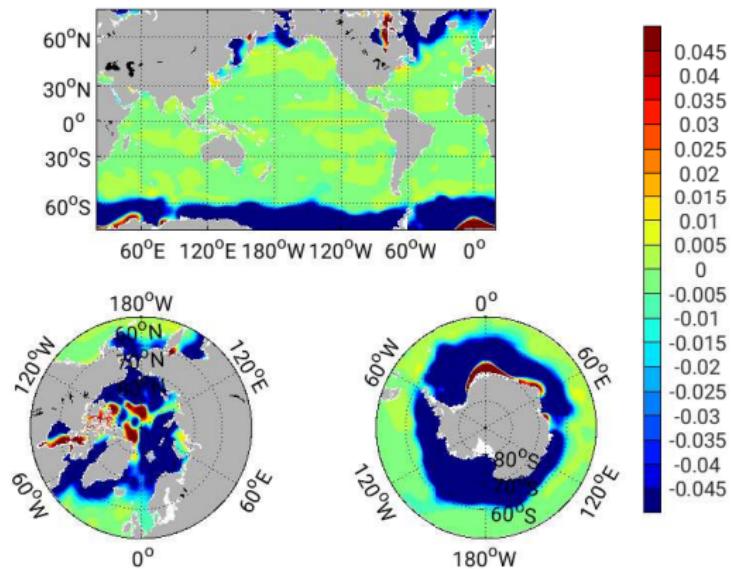


Figure : Mean of Adjustment (K): atemp

control prior uncertainty

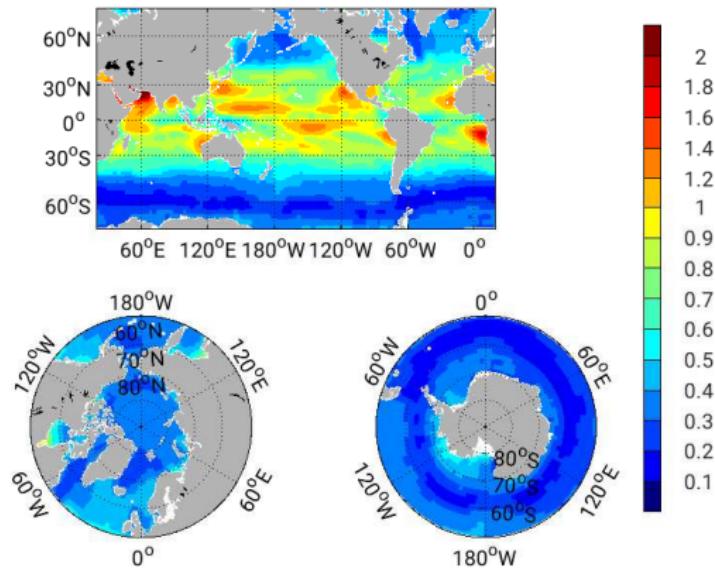


Figure : Prior Uncertainty (g/kg): aqh

rms of control adjustment

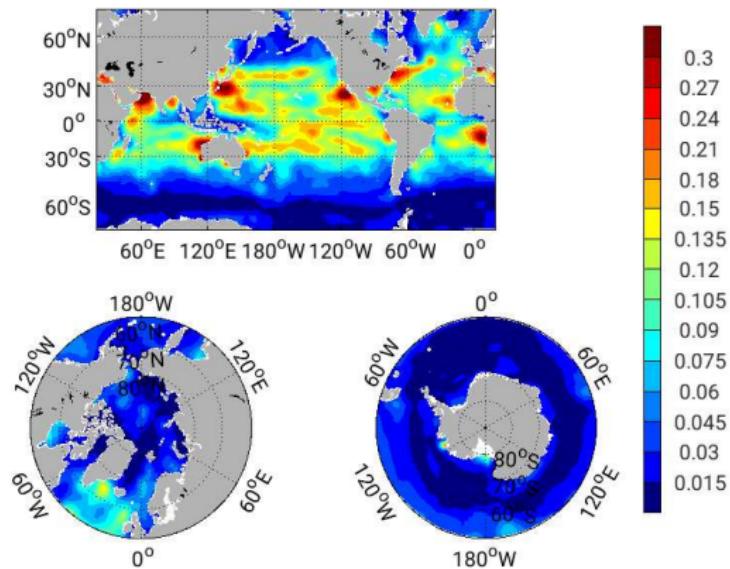


Figure : RMS of Adjustment (g/kg): aqh

std of control adjustment

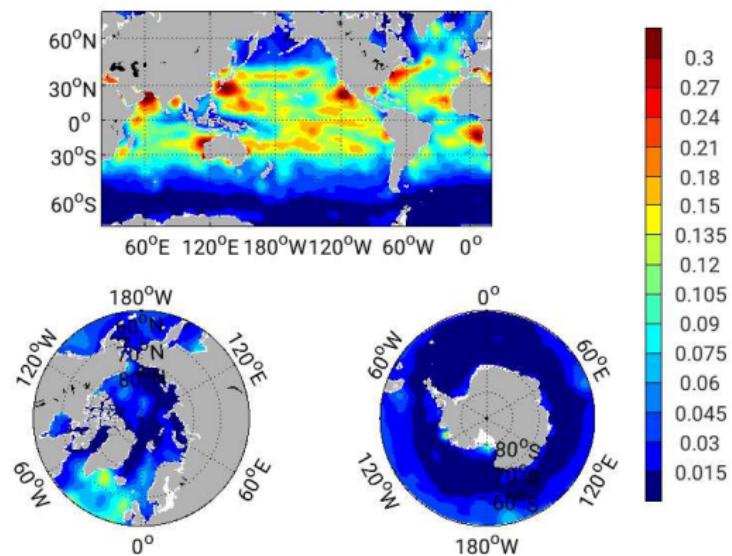


Figure : STD of Adjustment (g/kg): aqh

mean of control adjustment

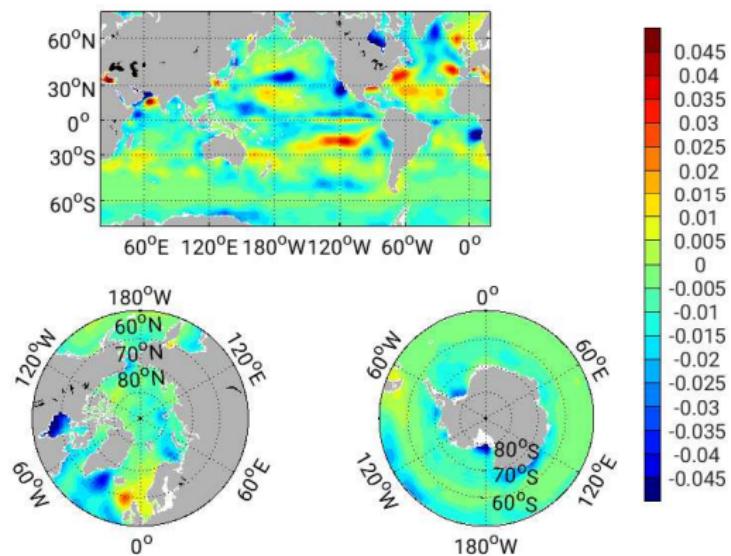


Figure : Mean of Adjustment (g/kg): aqh

control prior uncertainty

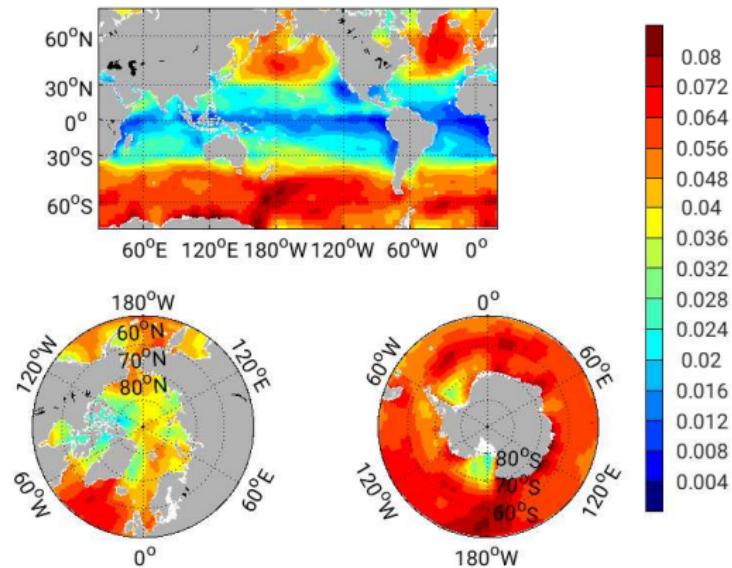


Figure : Prior Uncertainty (N/m²): τ_{uu}

rms of control adjustment

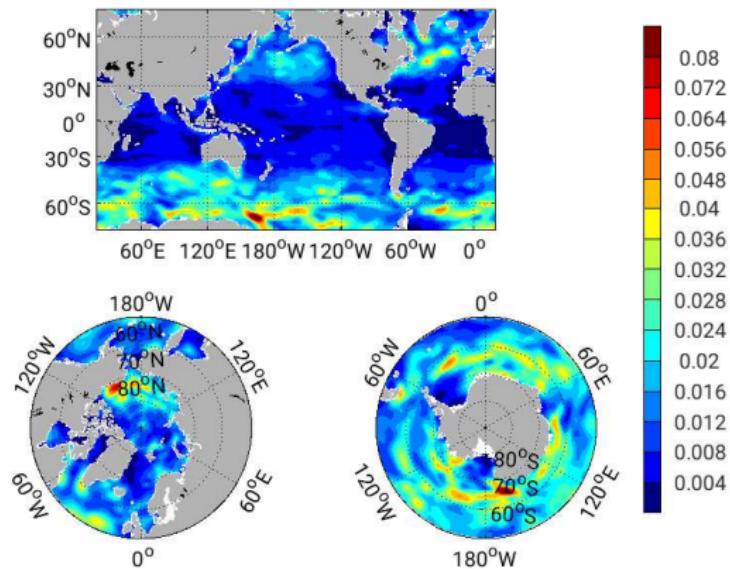


Figure : RMS of Adjustment (N/m^2): τ_{uu}

std of control adjustment

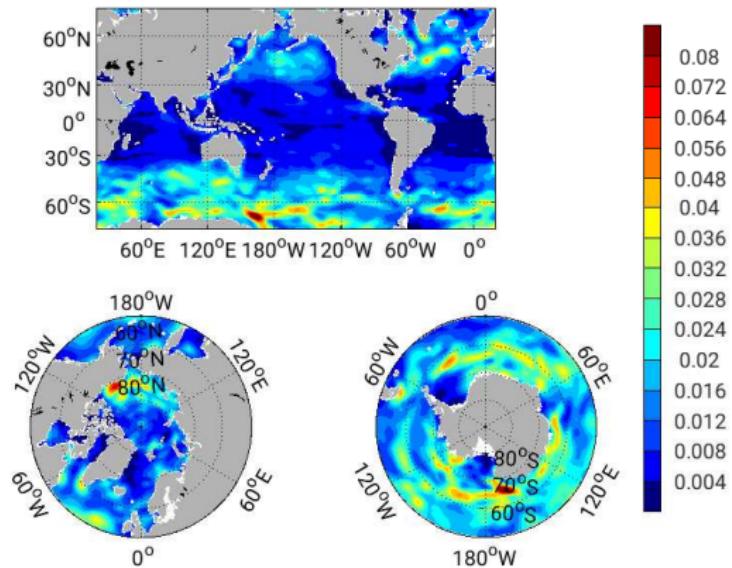


Figure : STD of Adjustment (N/m^2): τ_{uu}

mean of control adjustment

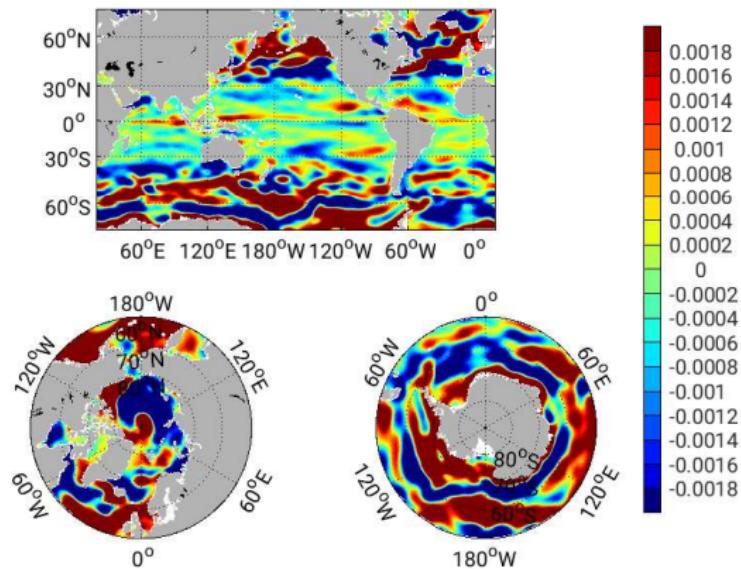


Figure : Mean of Adjustment (N/m²): tauuu

control prior uncertainty

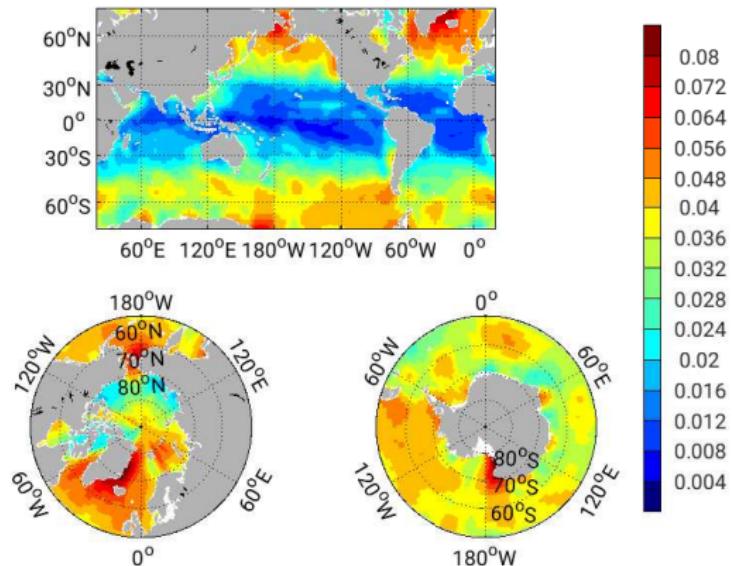


Figure : Prior Uncertainty (N/m^2): τ_{uv}

rms of control adjustment

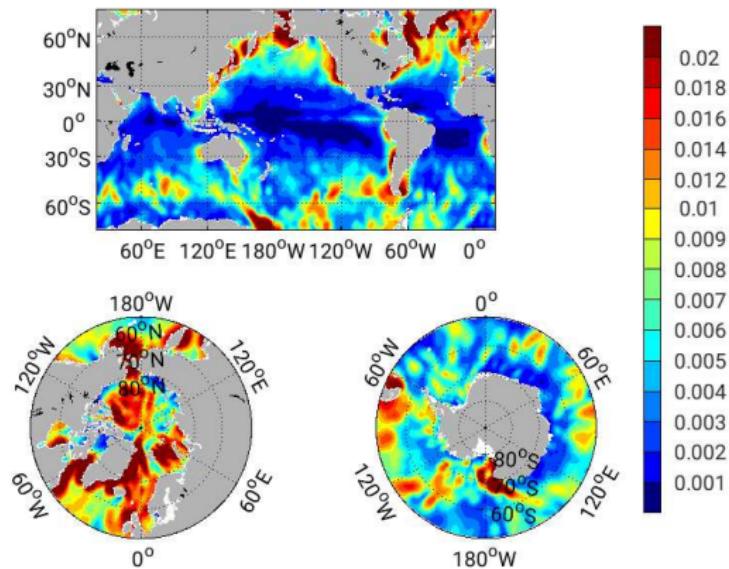


Figure : RMS of Adjustment (N/m²): tauv

std of control adjustment

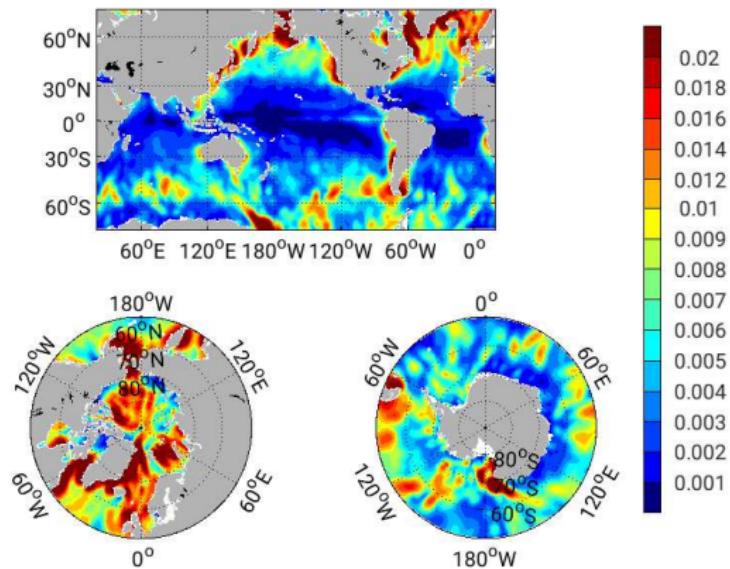


Figure : STD of Adjustment (N/m^2): τ_{uv}

mean of control adjustment

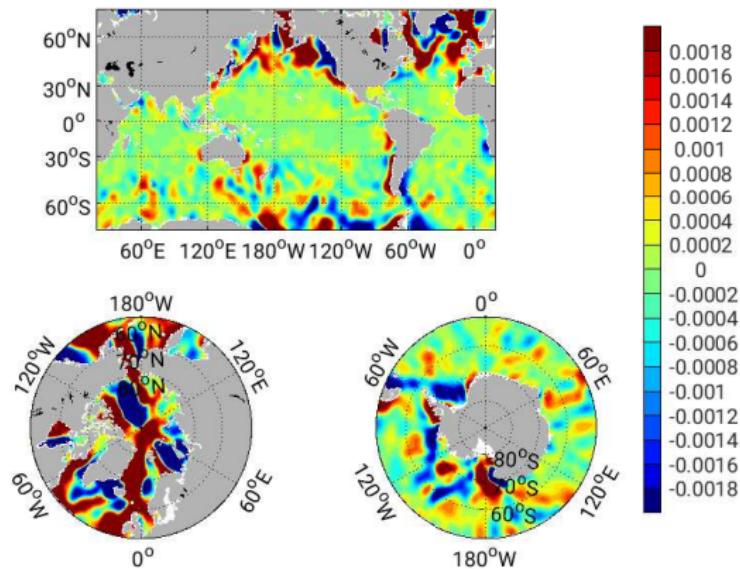


Figure : Mean of Adjustment (N/m^2): τ_{uv}

control prior uncertainty

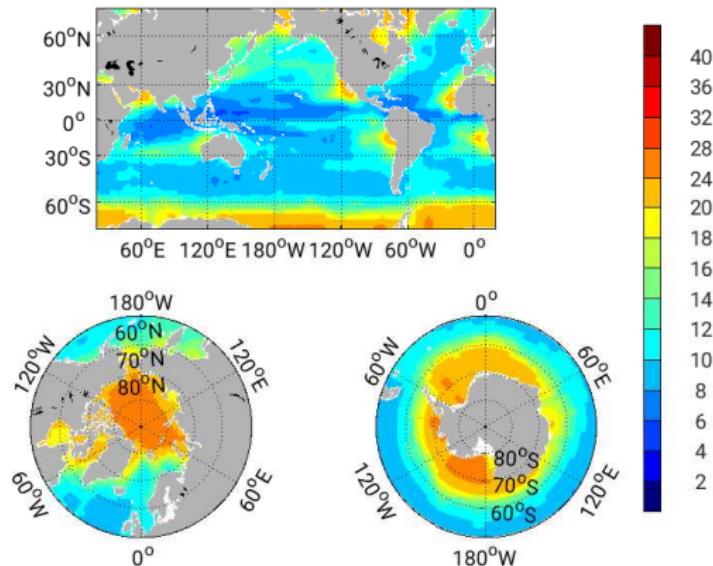


Figure : Prior Uncertainty (W/m^2): lwdown

rms of control adjustment

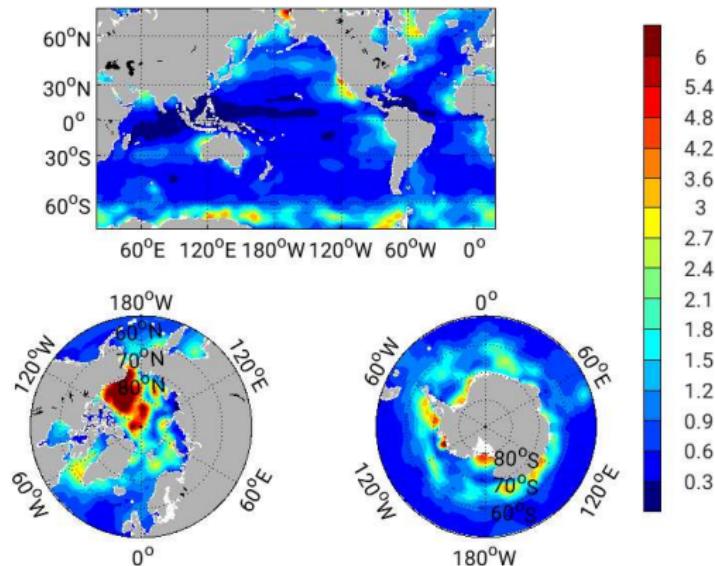


Figure : RMS of Adjustment (W/m²): lwdown

std of control adjustment

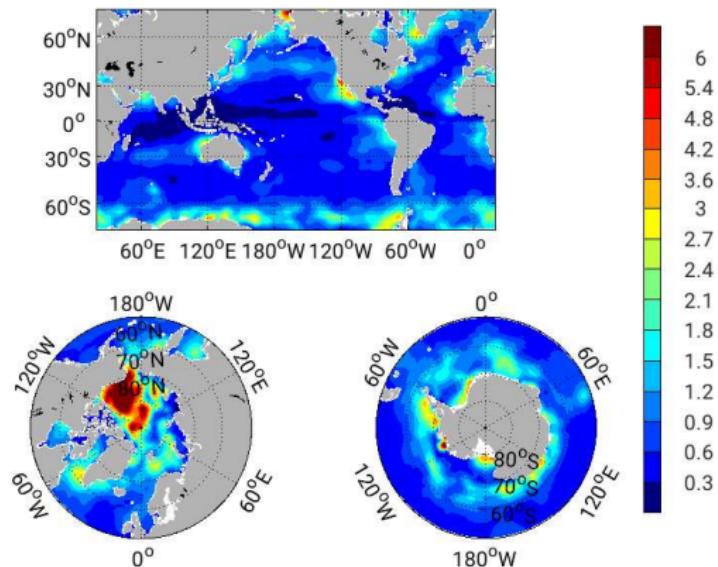


Figure : STD of Adjustment (W/m²): lwdown

mean of control adjustment

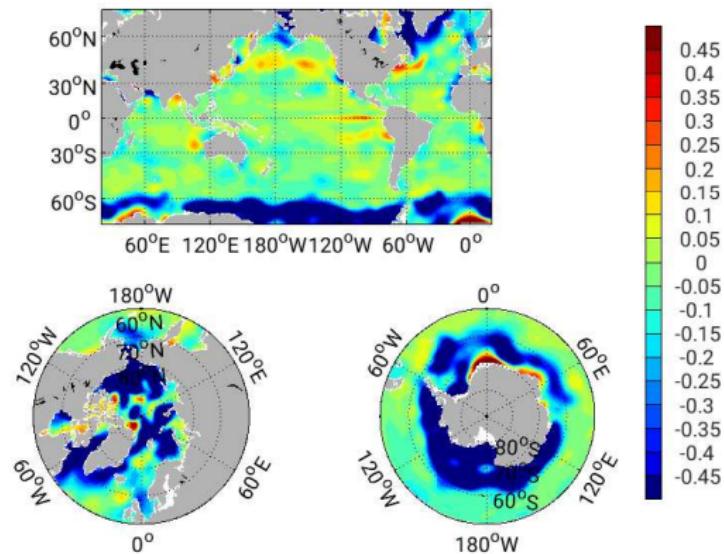


Figure : Mean of Adjustment (W/m^2): lwdown

control prior uncertainty

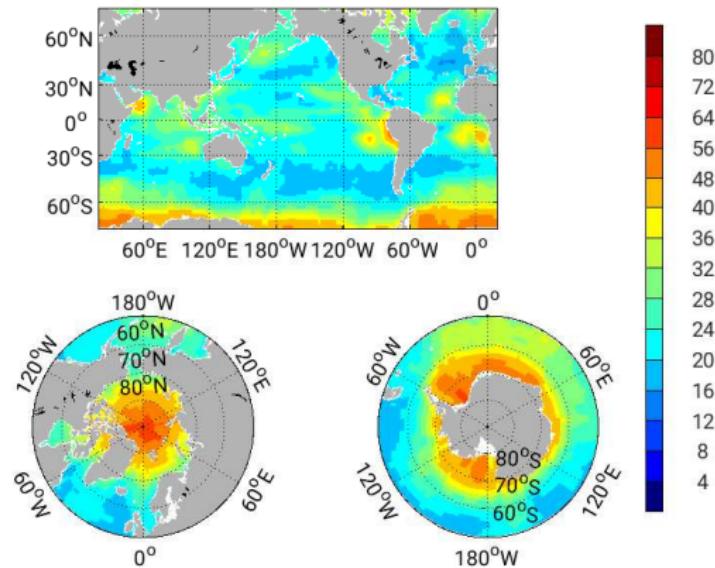


Figure : Prior Uncertainty (W/m²): swdown

rms of control adjustment

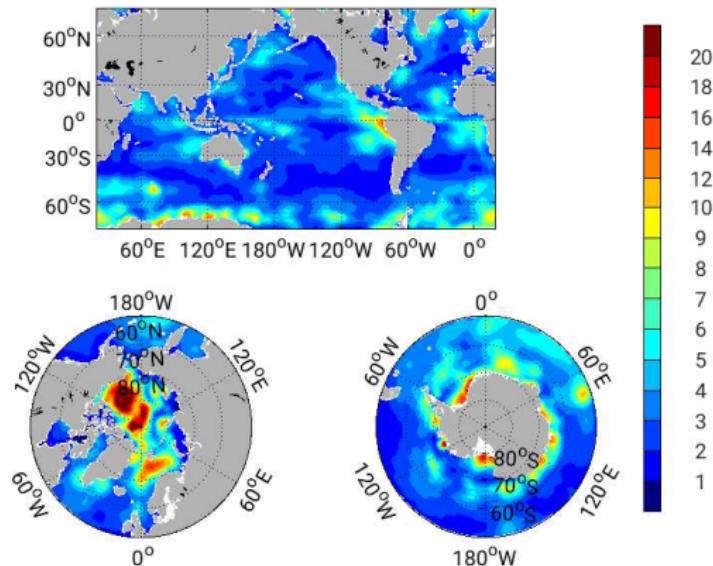


Figure : RMS of Adjustment (W/m²): swdown

std of control adjustment

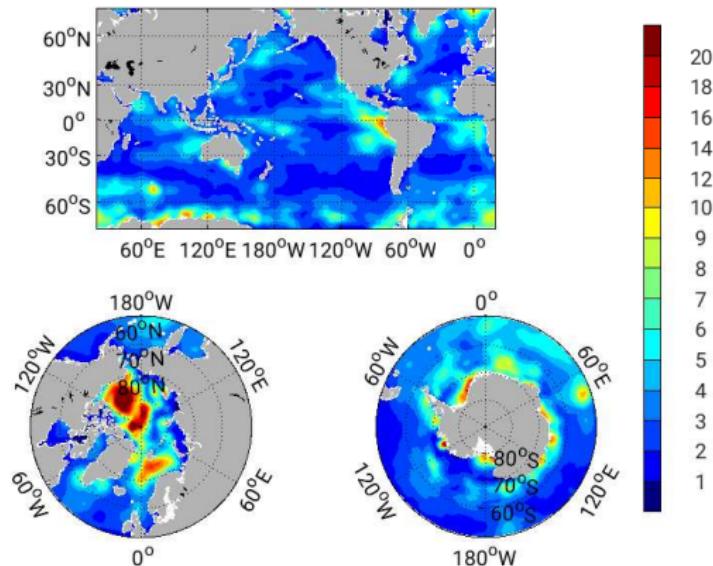


Figure : STD of Adjustment (W/m²): swdown

mean of control adjustment

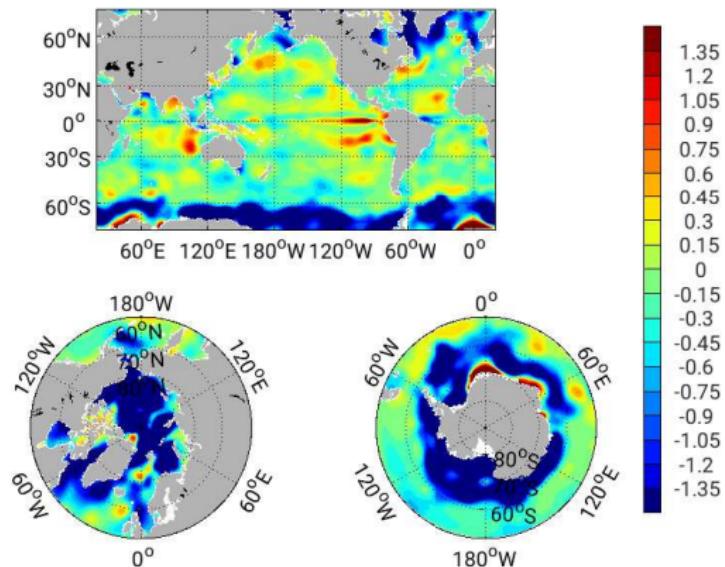


Figure : Mean of Adjustment (W/m²): swdown