

gcmfaces analysis of the solution for JRA55-DO daily runoff

August 1, 2023

Table of contents

Volume, Heat, And Salt Transports

- barotropic streamfunction
- meridional streamfunction
- meridional streamfunction (time series)
- meridional heat transport
- meridional seawater transport
- meridional salt transport
- meridional transports (time series)
- transects transport

Mean And Variance Maps

- sea surface height
- 3D state variables
- air-sea heat flux
- air-sea freshwater flux

- surface wind stress

Global, Zonal, Regional Averages

- zonal mean tendencies
- equatorial sections
- global mean properties
- zonal mean properties
- zonal mean properties (surface)
- seaice time series

Mixed Layer Depth Fields

Seaice And Snow Fields

- Monthly Thickness Distribution
- Northern Hem. in March
- Northern Hem. in September
- Southern Hem. in March
- Southern Hem. in September

barotropic streamfunction

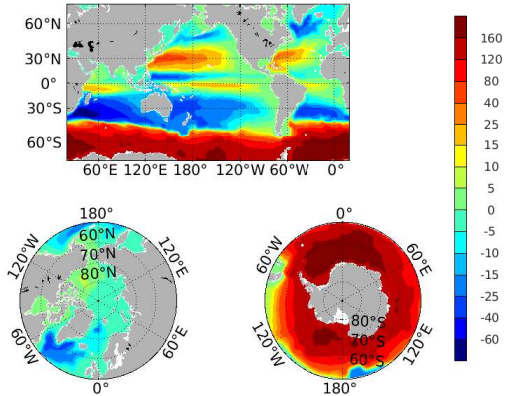


Figure : 1992-2019 mean – barotropic streamfunction (Sv)

barotropic streamfunction

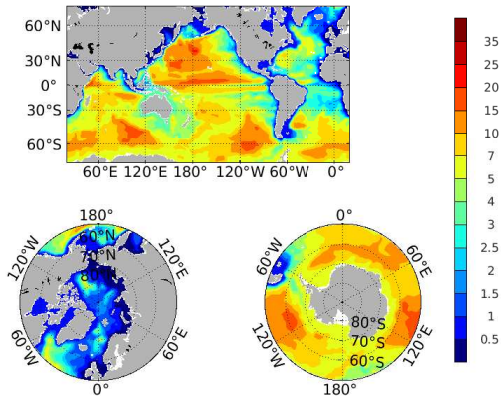


Figure : 1992-2019 standard deviation – barotropic streamfunction (Sv)

meridional streamfunction

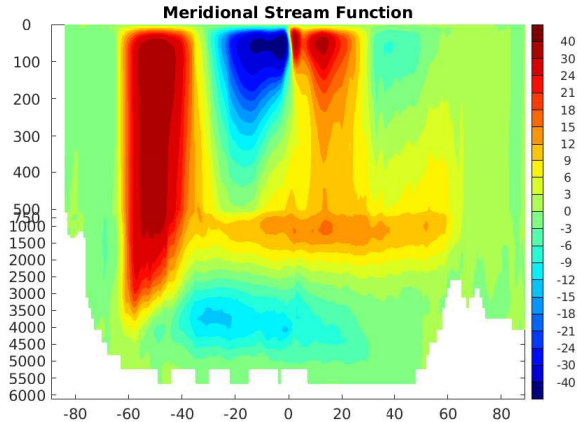


Figure : 1992-2019 mean – overturning streamfunction (Sv)

meridional streamfunction

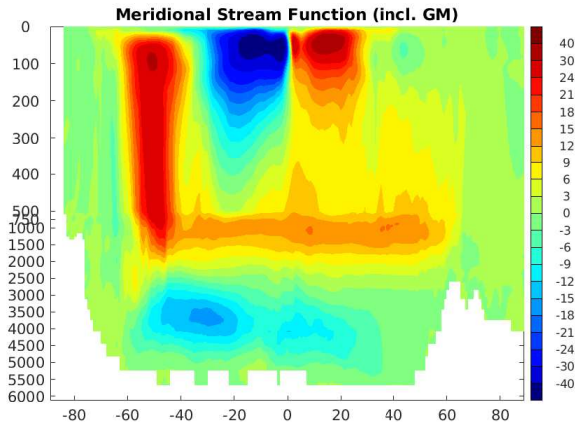


Figure : 1992-2019 mean – overturning streamfunction incl. GM (Sv)

meridional streamfunction

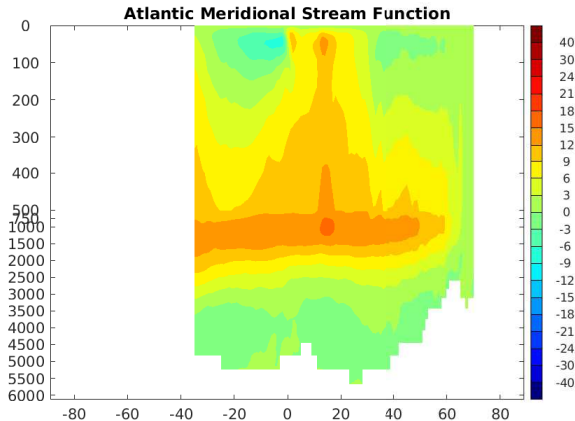


Figure : 1992-2019 mean – Atlantic overturning streamfunction (Sv)

meridional streamfunction

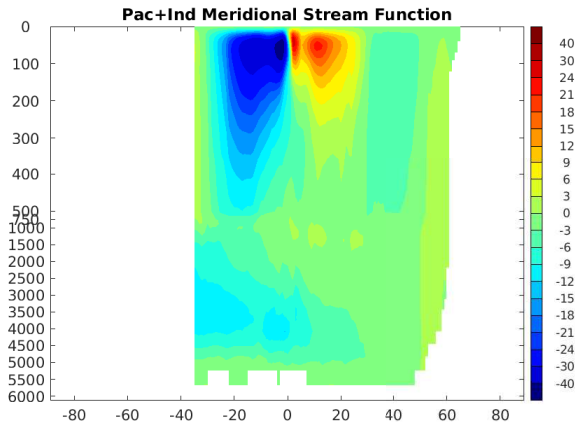


Figure : 1992-2019 mean – Pac+Ind overturning streamfunction (Sv)

meridional streamfunction

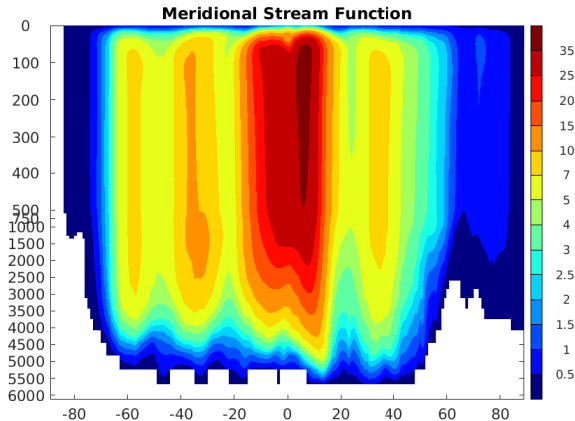


Figure : 1992-2019 standard deviation – overturning streamfunction (S_v)

meridional streamfunction

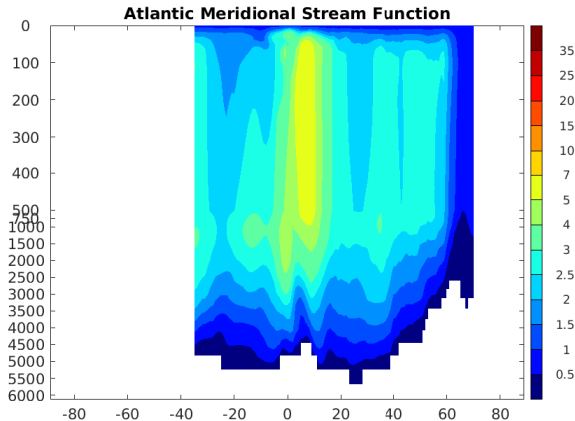


Figure : 1992-2019 standard deviation – Atlantic overturning streamfunction (Sv)

meridional streamfunction (time series)

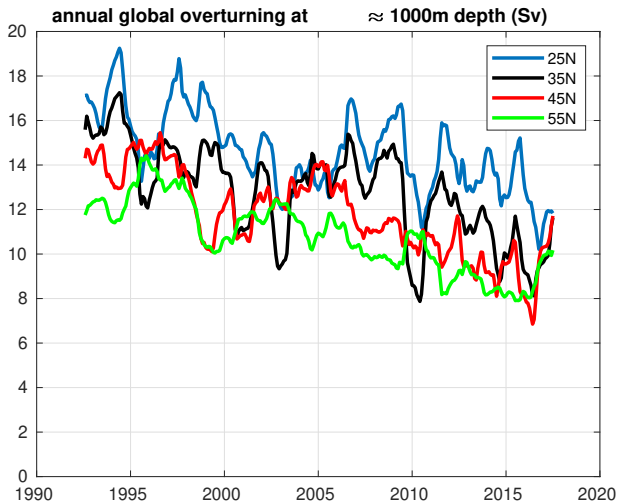


Figure : annual global overturning at select latitudes at $\approx 1000\text{m}$ depth

meridional streamfunction (time series)

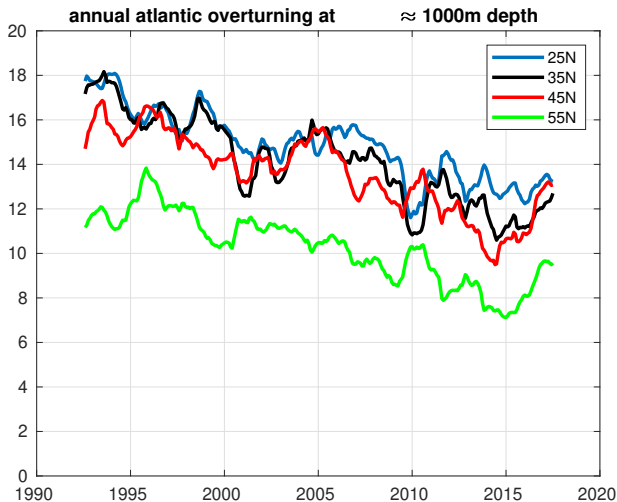


Figure : annual Atlantic overturning at select latitudes at $\approx 1000\text{m}$ depth (Sv)

meridional heat transport

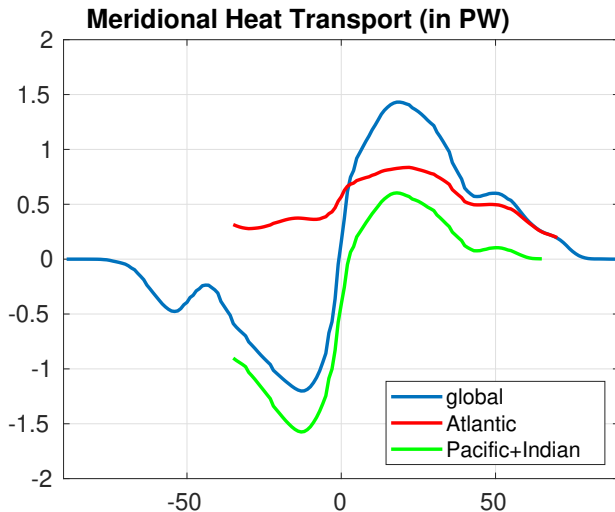


Figure : 1992-2019 mean – meridional heat transport (PW)

meridional heat transport

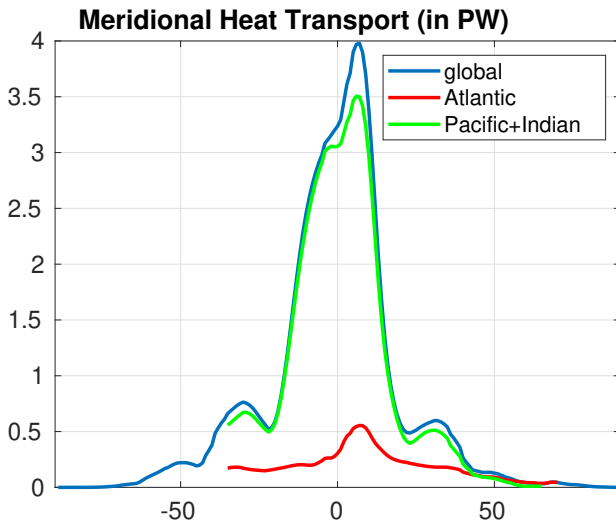


Figure : 1992-2019 standard deviation – meridional heat transport (PW)

meridional seawater transport

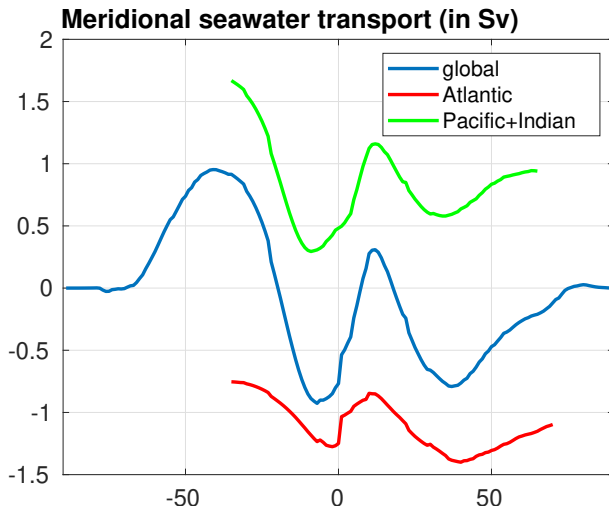


Figure : 1992-2019 mean – meridional seawater transport (Sv)

meridional seawater transport

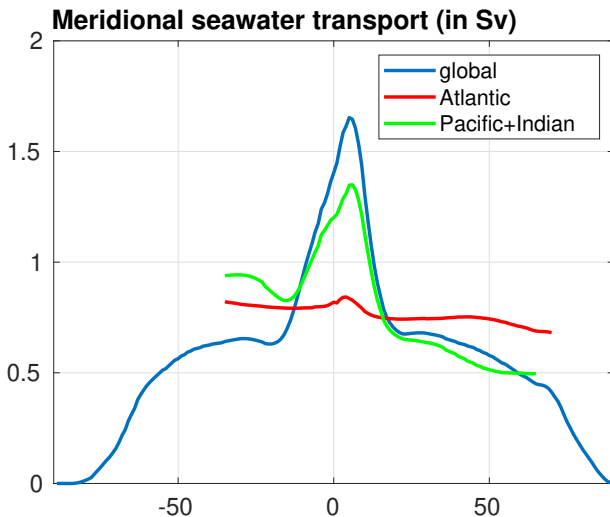


Figure : 1992-2019 standard deviation – meridional seawater transport (Sv)

meridional salt transport

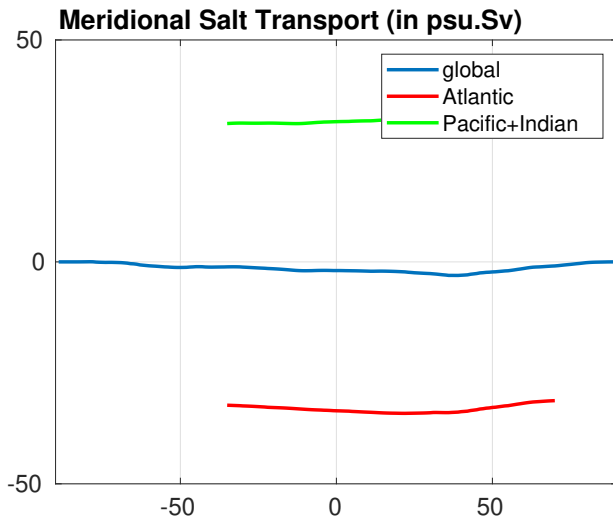


Figure : 1992-2019 mean – meridional salt transport (psu.Sv)

meridional salt transport

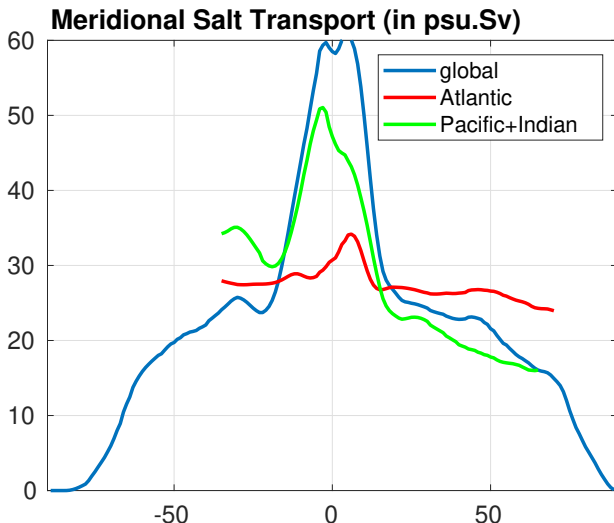


Figure : 1992-2019 standard deviation – meridional salt transport (psu.Sv)

meridional transports (time series)

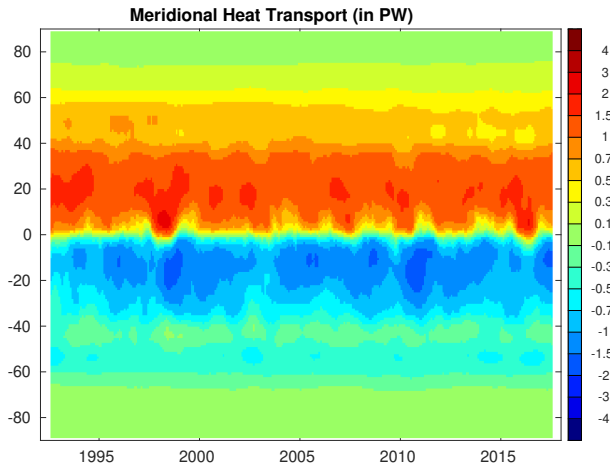


Figure : meridional heat transport (PW, annual mean)

meridional transports (time series)

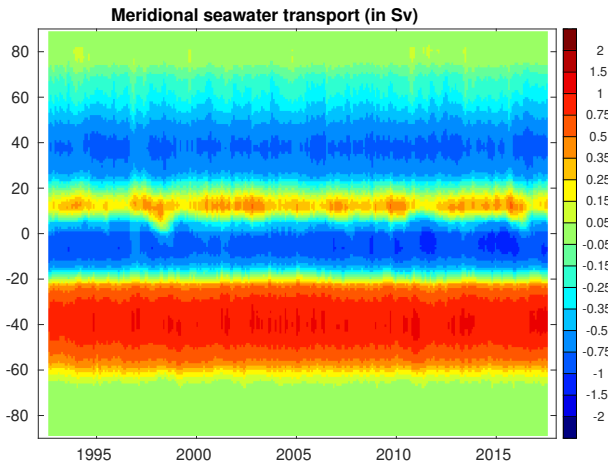


Figure : meridional seawater transport (Sv, annual mean)

meridional transports (time series)

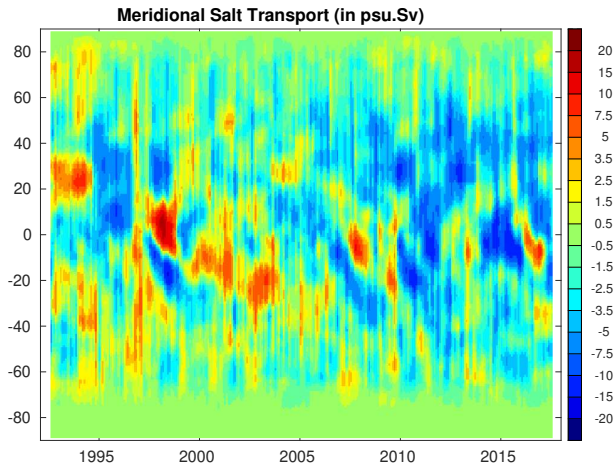


Figure : meridional salt transport (psu.Sv , annual mean)

transects transport

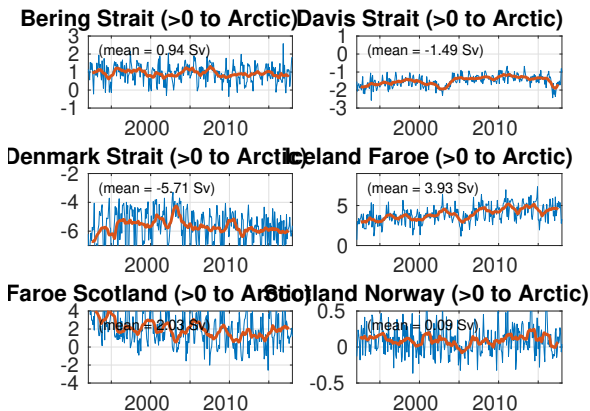
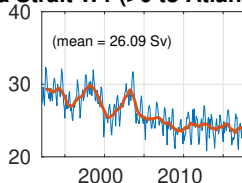
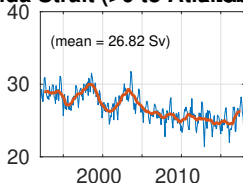


Figure : volume transports entering the Arctic (Sv, annual mean)

transects transport

Florida Strait (>0 to Atlantic) **Florida Strait W1 (>0 to Atlantic)**



Florida Strait E1 (>0 to Atlantic) **Florida Strait E2 (>0 to Atlantic)**

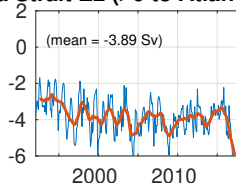
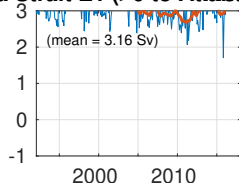


Figure : volume transports entering the Atlantic (Sv, annual mean)

transects transport

altar Overturn (upper ocean transport towards Med.)

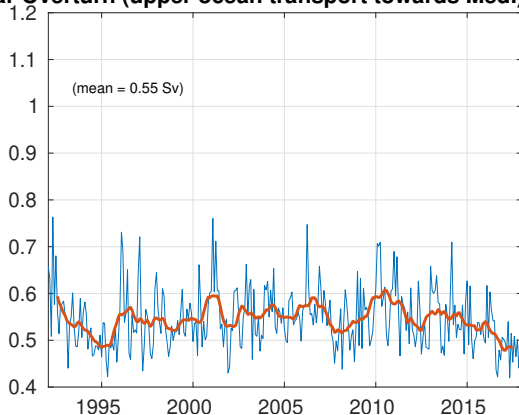
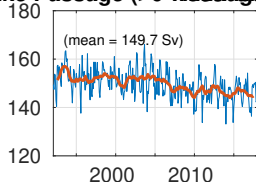


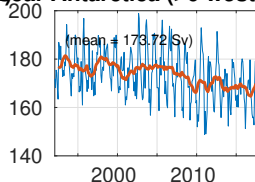
Figure : Gibraltar Overturn (Sv, annual mean)

transects transport

Drake Passage (>0 westward) Madagascar



Agulhas Current Antarctica (>0 westward)



Agulhas Channel (>0 westward) Antarctica (>0 westward)

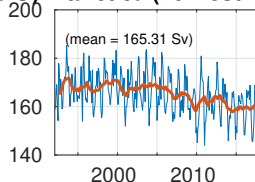
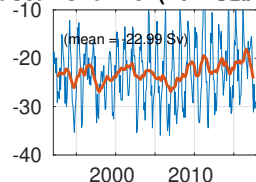


Figure : ACC volume transports (Sv, annual mean)

transects transport

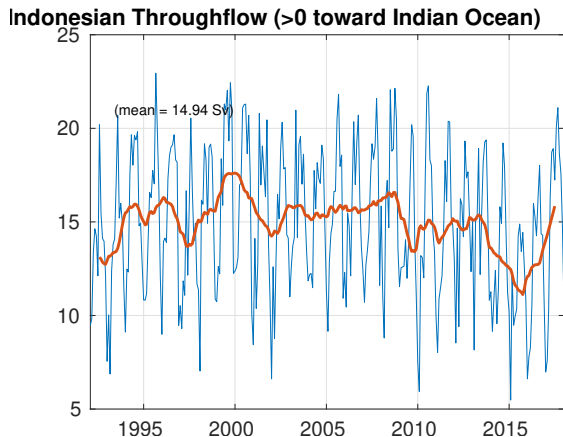


Figure : Indonesian Throughflow (Sv, annual mean)

sea surface height

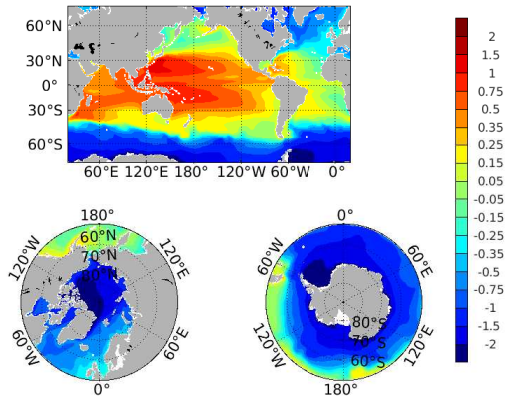


Figure : 1992-2019 mean – sea surface height (EXCLUDING ice, in m)

sea surface height

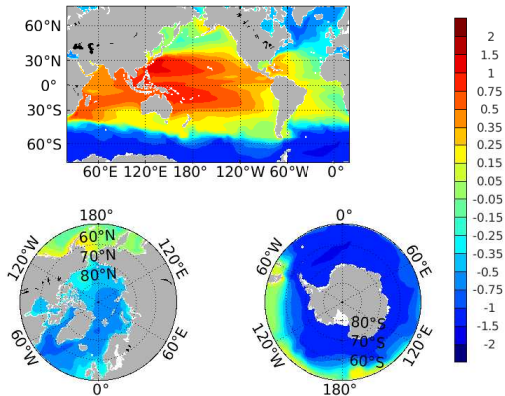


Figure : 1992-2019 mean – sea surface height (INCLUDING ice, in m)

sea surface height

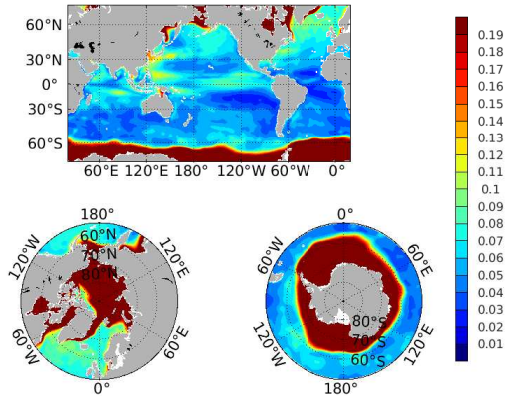


Figure : 1992-2019 standard deviation – sea surface height (EXCLUDING ice, in m)

sea surface height

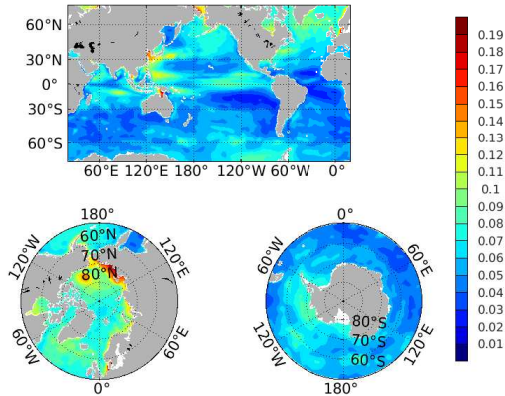


Figure : 1992-2019 standard deviation – sea surface height
(INCLUDING ice, in m)

3D state variables

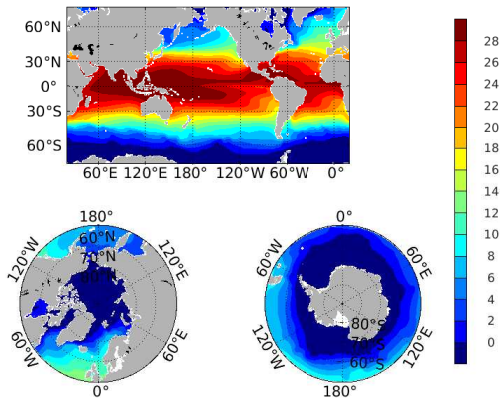


Figure : 1992-2019 mean – temperature (in degC) at 5m

3D state variables

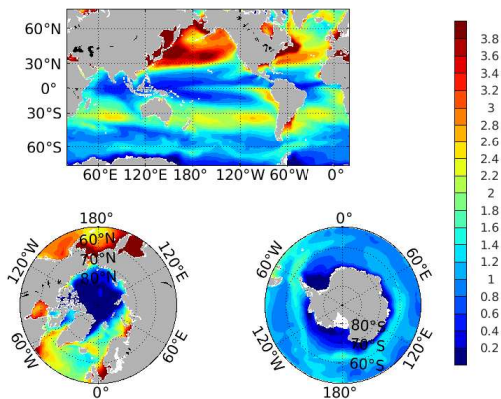


Figure : 1992-2019 standard deviation – temperature (in degC) at 5m

3D state variables

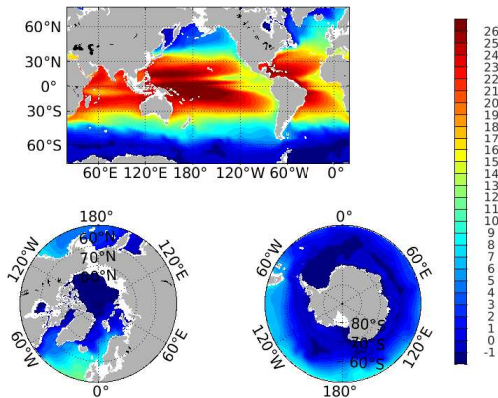


Figure : 1992-2019 mean – temperature (in degC) at 105m

3D state variables

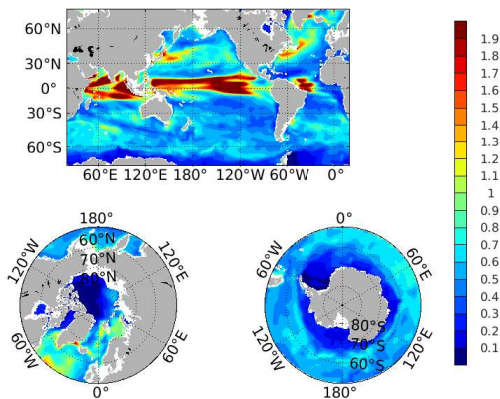


Figure : 1992-2019 standard deviation – temperature (in degC) at 105m

3D state variables

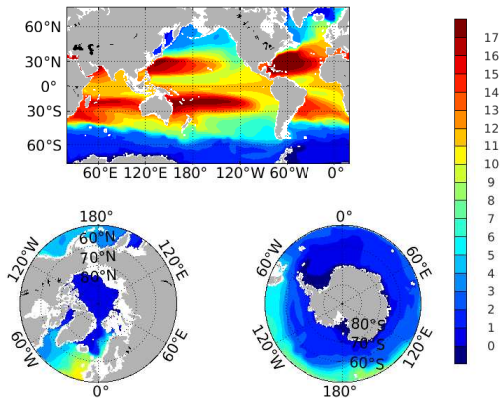


Figure : 1992-2019 mean – temperature (in degC) at 300m

3D state variables

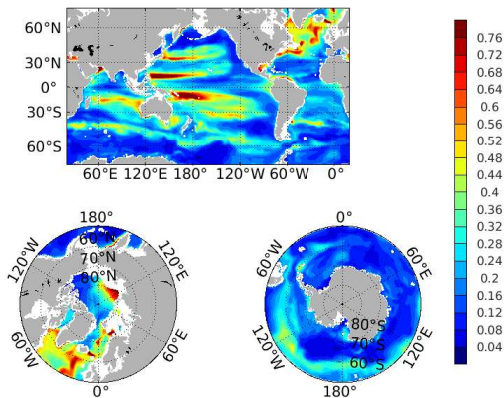


Figure : 1992-2019 standard deviation – temperature (in degC) at 300m

3D state variables

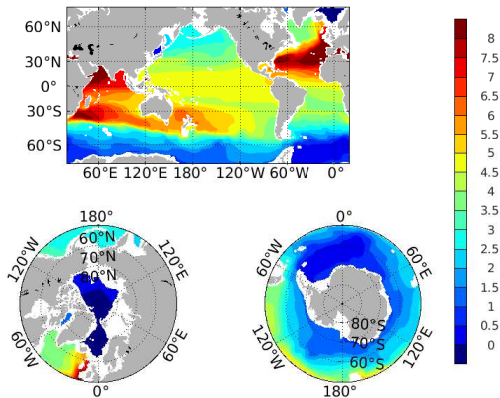


Figure : 1992-2019 mean – temperature (in degC) at 910m

3D state variables

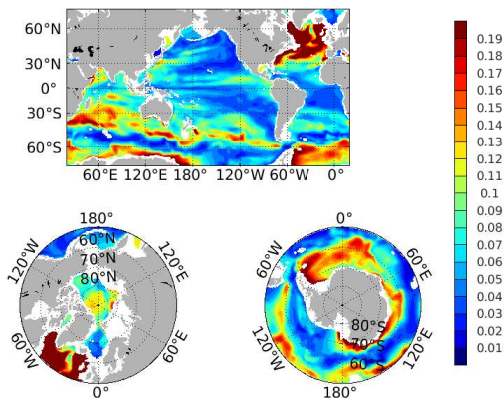


Figure : 1992-2019 standard deviation – temperature (in degC) at 910m

3D state variables

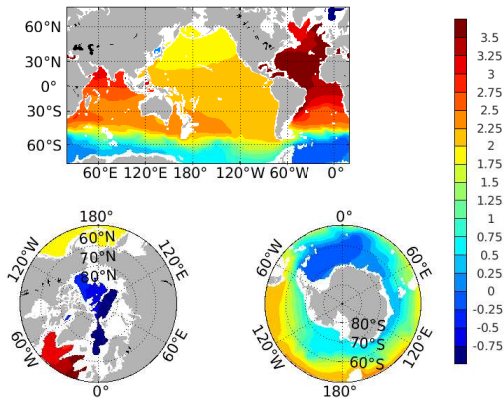


Figure : 1992-2019 mean – temperature (in degC) at 1914m

3D state variables

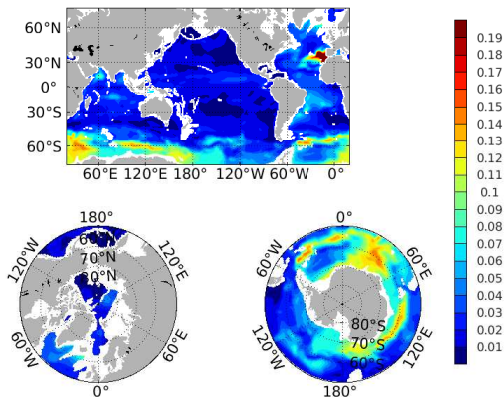


Figure : 1992-2019 standard deviation – temperature (in degC) at 1914m

3D state variables

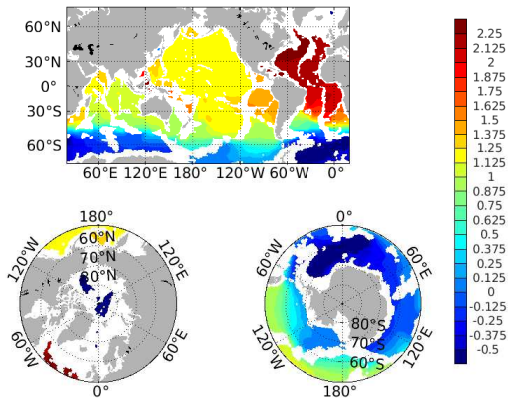


Figure : 1992-2019 mean – temperature (in degC) at 3581m

3D state variables

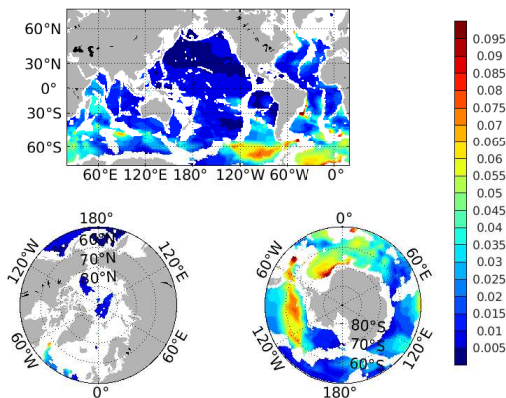


Figure : 1992-2019 standard deviation – temperature (in degC) at 3581m

3D state variables

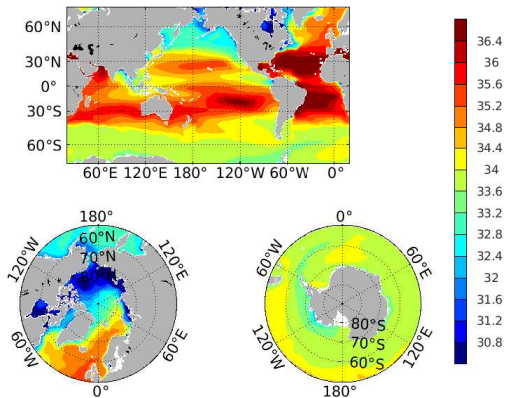


Figure : 1992-2019 mean – salinity (in psu) at 5m

3D state variables

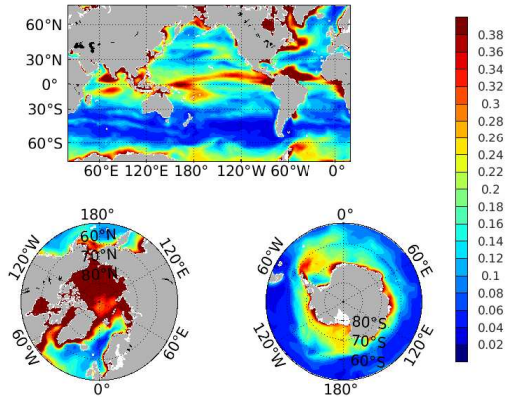


Figure : 1992-2019 standard deviation – salinity (in psu) at 5m

3D state variables

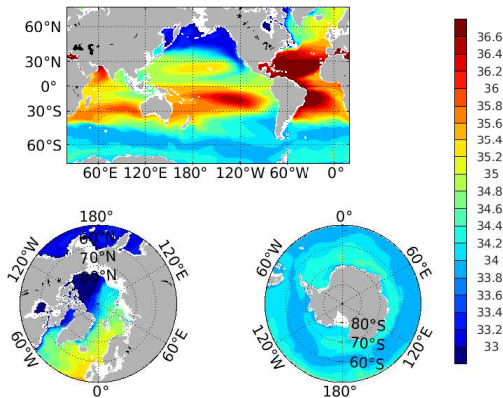


Figure : 1992-2019 mean – salinity (in psu) at 105m

3D state variables

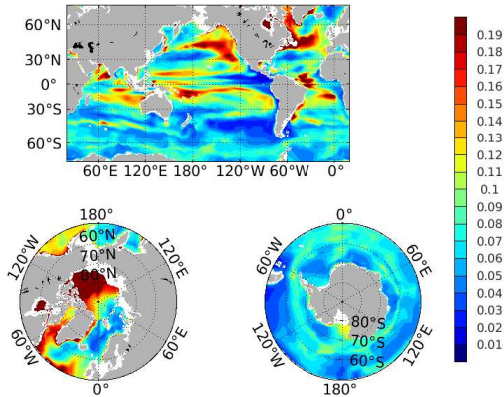


Figure : 1992-2019 standard deviation – salinity (in psu) at 105m

3D state variables

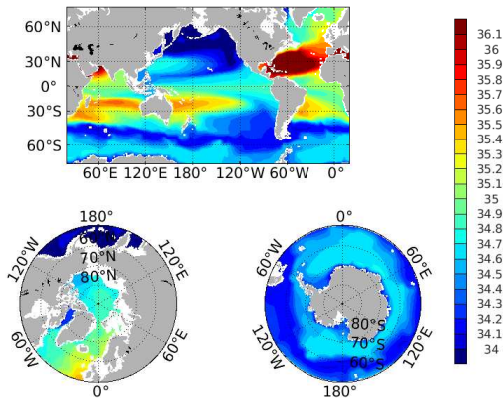


Figure : 1992-2019 mean – salinity (in psu) at 300m

3D state variables

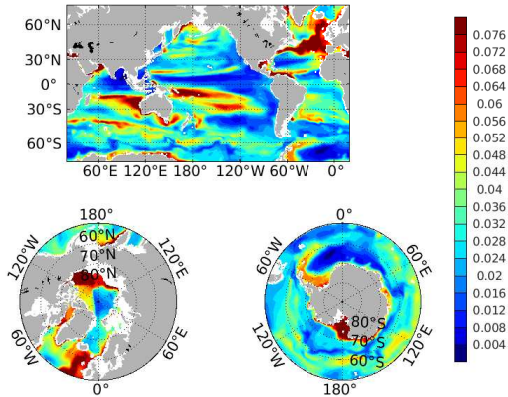


Figure : 1992-2019 standard deviation – salinity (in psu) at 300m

3D state variables

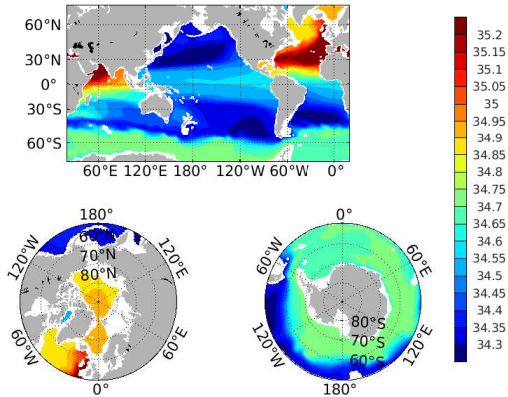


Figure : 1992-2019 mean – salinity (in psu) at 910m

3D state variables

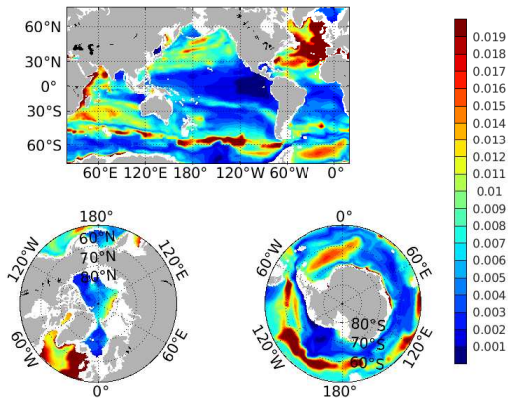


Figure : 1992-2019 standard deviation – salinity (in psu) at 910m

3D state variables

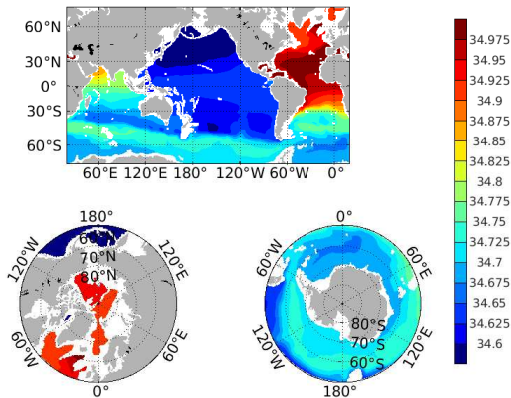


Figure : 1992-2019 mean – salinity (in psu) at 1914m

3D state variables

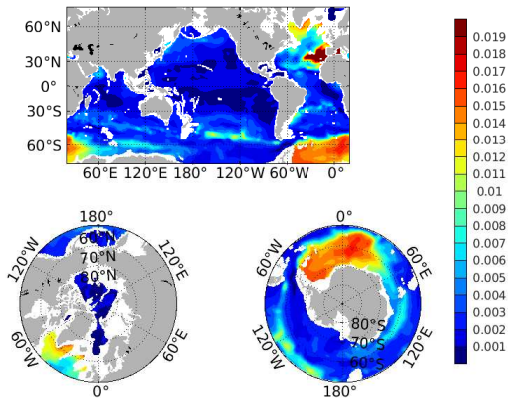


Figure : 1992-2019 standard deviation – salinity (in psu) at 1914m

3D state variables

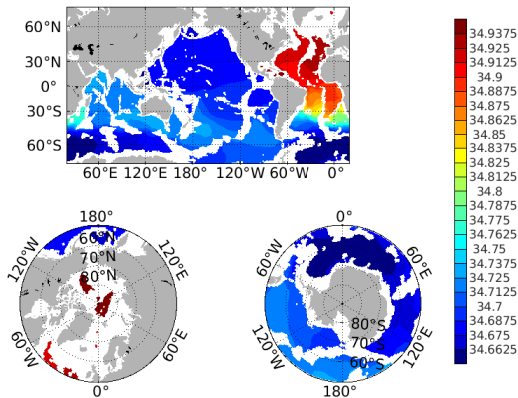


Figure : 1992-2019 mean – salinity (in psu) at 3581m

3D state variables

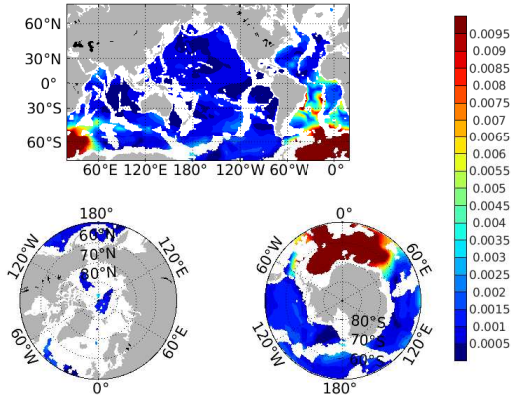


Figure : 1992-2019 standard deviation – salinity (in psu) at 3581m

3D state variables

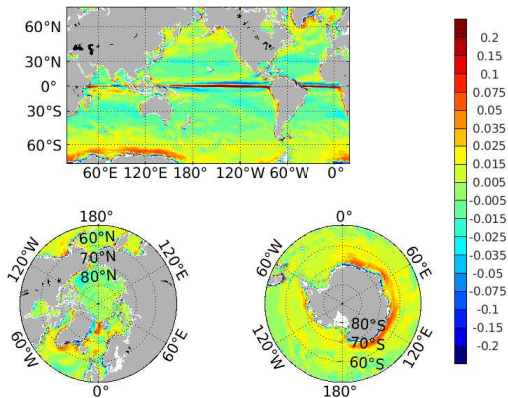


Figure : 1992-2019 mean – vertical velocity (in mm/year) at 15m

3D state variables

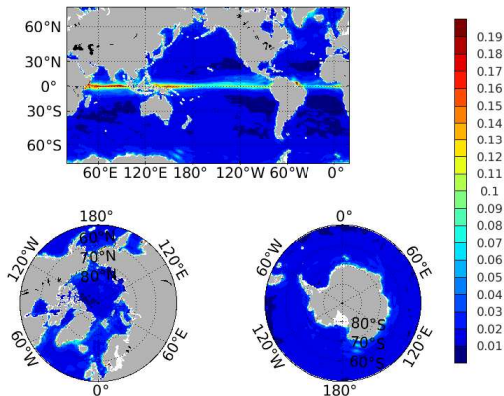


Figure : 1992-2019 standard deviation – vertical velocity (in mm/year) at 15m

3D state variables

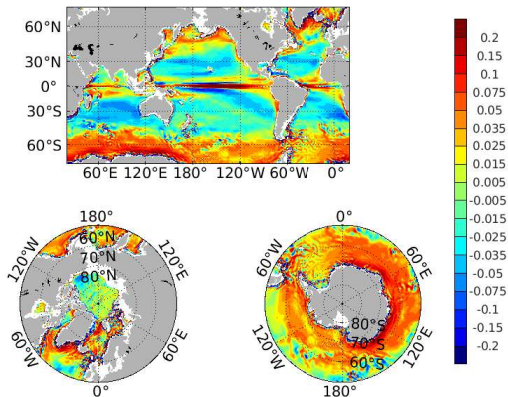


Figure : 1992-2019 mean – vertical velocity (in mm/year) at 105m

3D state variables

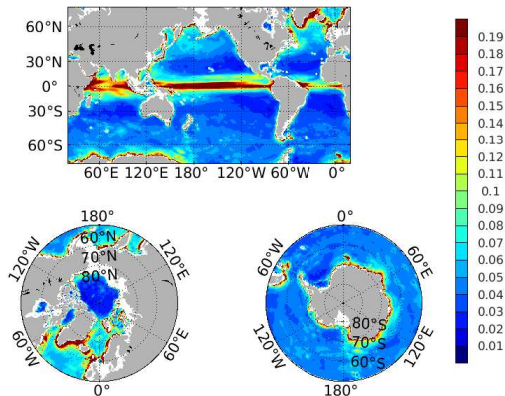


Figure : 1992-2019 standard deviation – vertical velocity (in mm/year) at 105m

3D state variables

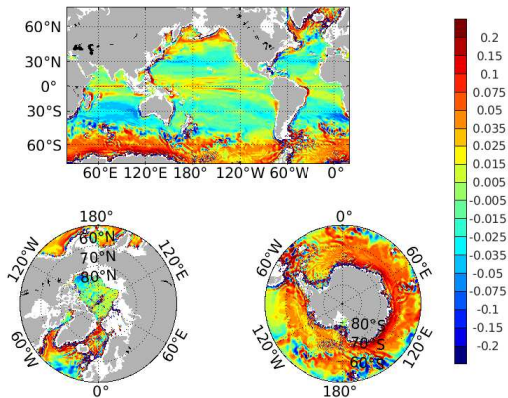


Figure : 1992-2019 mean – vertical velocity (in mm/year) at 300m

3D state variables

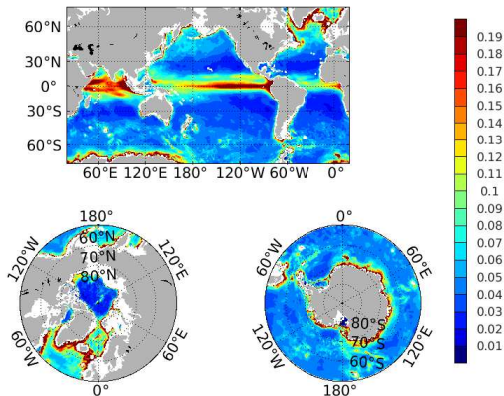


Figure : 1992-2019 standard deviation – vertical velocity (in mm/year) at 300m

3D state variables

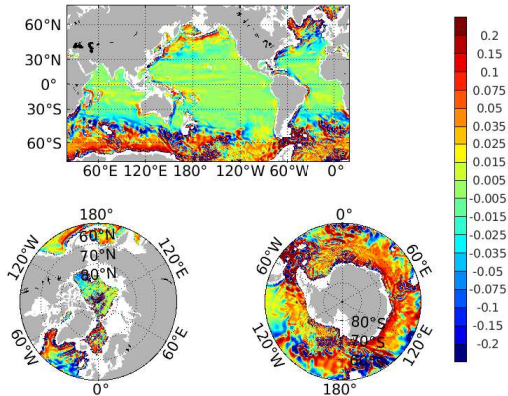


Figure : 1992-2019 mean – vertical velocity (in mm/year) at 910m

3D state variables

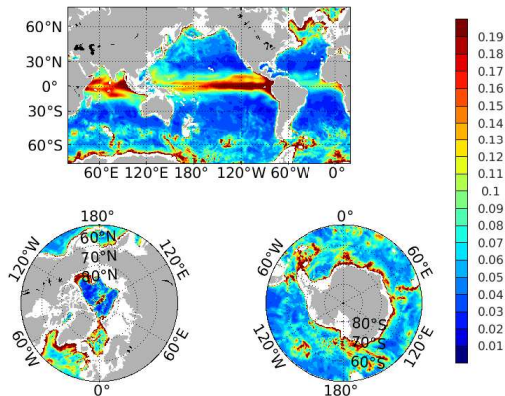


Figure : 1992-2019 standard deviation – vertical velocity (in mm/year) at 910m

3D state variables

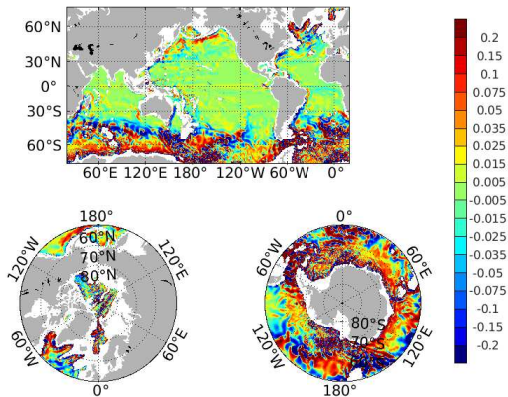


Figure : 1992-2019 mean – vertical velocity (in mm/year) at 1914m

3D state variables

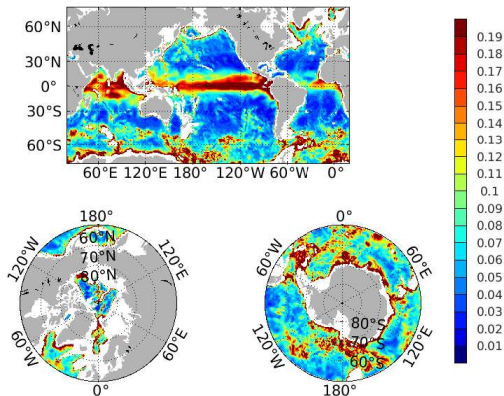


Figure : 1992-2019 standard deviation – vertical velocity (in mm/year) at 1914m

3D state variables

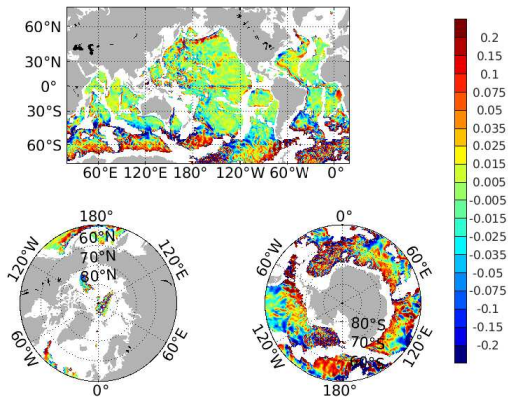


Figure : 1992-2019 mean – vertical velocity (in mm/year) at 3581m

3D state variables

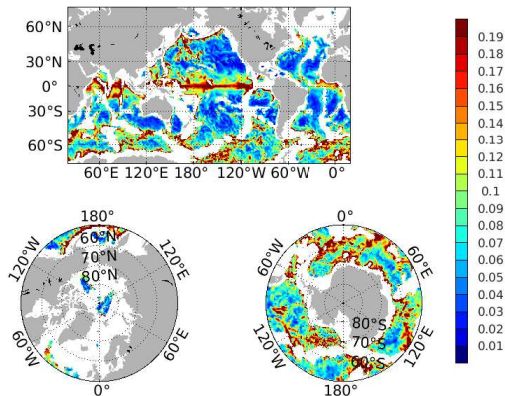


Figure : 1992-2019 standard deviation – vertical velocity (in mm/year) at 3581m

air-sea heat flux

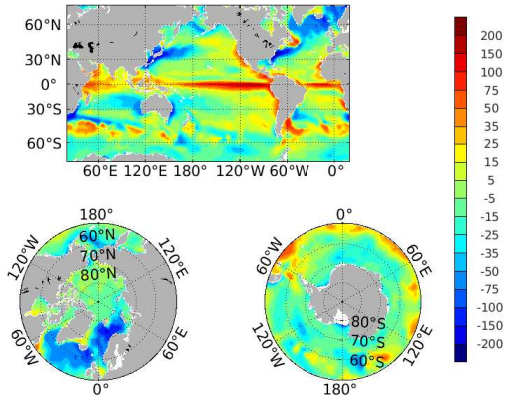


Figure : 1992-2019 mean – QNET to ocean+ice (W/m^2)

air-sea heat flux

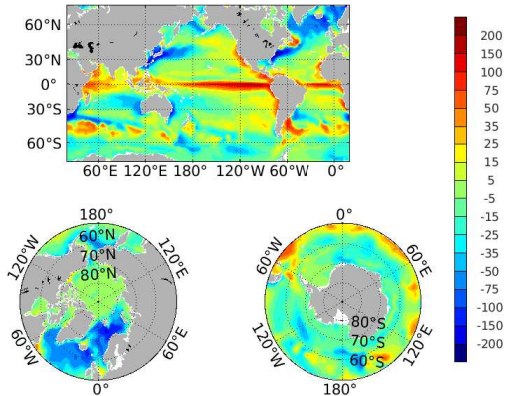


Figure : 1992-2019 mean – QNET to ocean (W/m^2)

air-sea heat flux

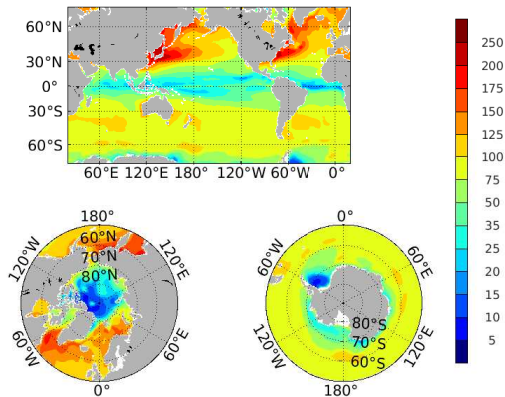


Figure : 1992-2019 standard deviation – QNET to ocean+ice (W/m^2)

air-sea heat flux

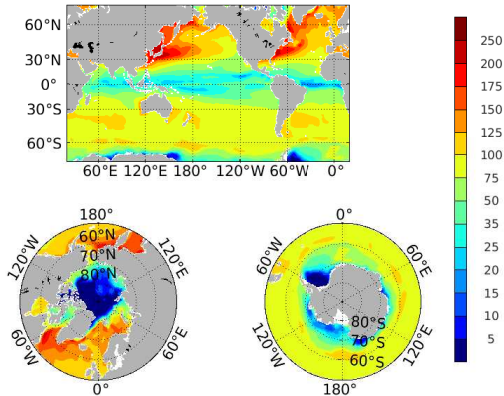


Figure : 1992-2019 standard deviation – QNET to ocean (W/m^2)

air-sea freshwater flux

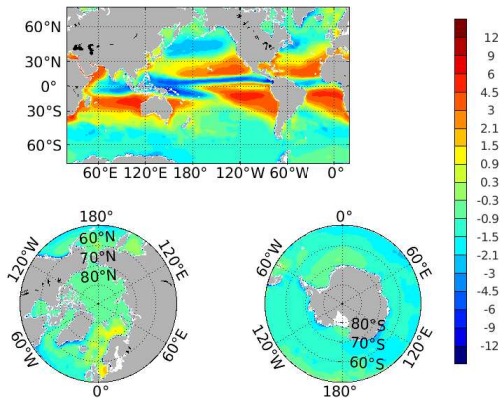


Figure : 1992-2019 mean – E-P-R from ocean+ice (mm/day)

air-sea freshwater flux

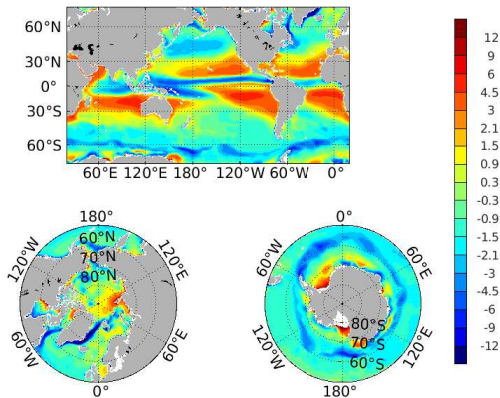


Figure : 1992-2019 mean – E-P-R from ocean (mm/day)

air-sea freshwater flux

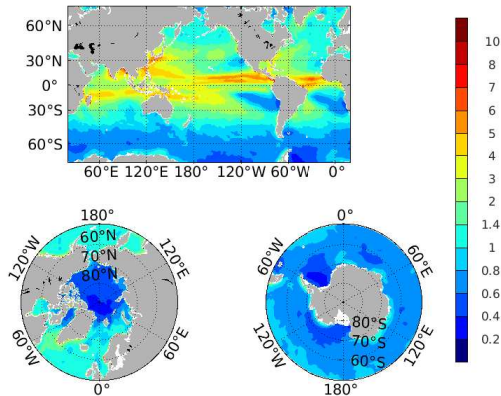


Figure : 1992-2019 standard deviation – E-P-R to ocean+ice (W/m^2)

air-sea freshwater flux

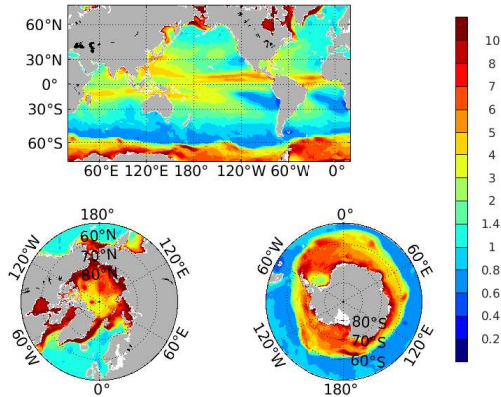


Figure : 1992-2019 standard deviation – E-P-R to ocean (W/m^2)

surface wind stress

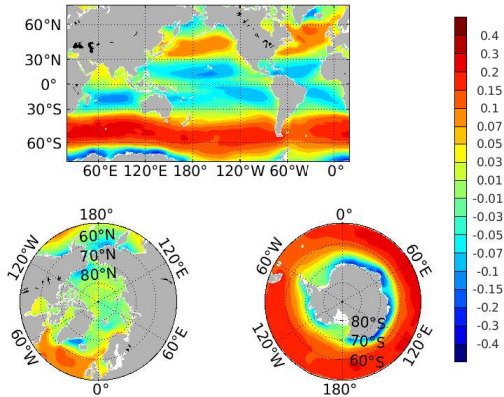


Figure : 1992-2019 mean – zonal wind stress (N/m^2)

surface wind stress

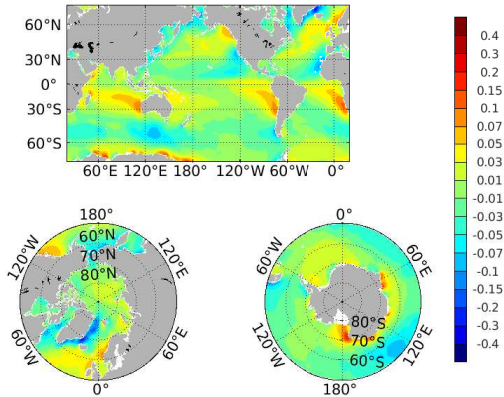


Figure : 1992-2019 mean – meridional wind stress (N/m^2)

surface wind stress

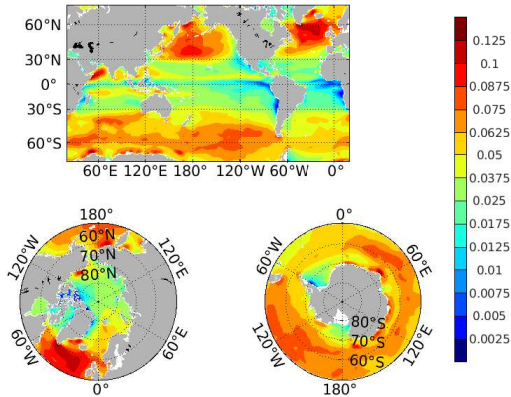


Figure : 1992-2019 standard deviation – τ_Z (W/m^2)

surface wind stress

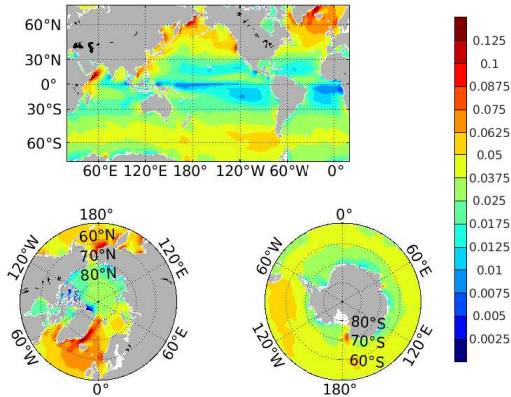


Figure : 1992-2019 standard deviation – tauM (W/m^2)

zonal mean tendencies

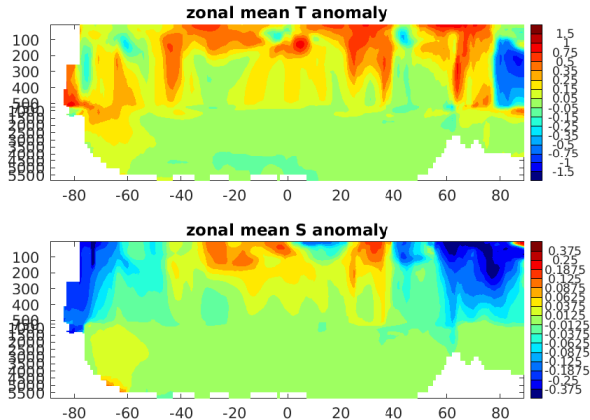


Figure : 1992-2019 , last year minus first year – zonal mean temperature (degC; top) and salinity (psu; bottom)

equatorial sections

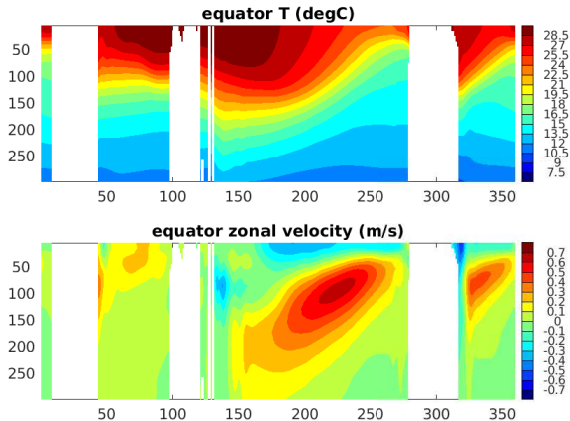


Figure : 1992-2019 mean – equator temperature (degC;top) and zonal velocity (m/s;bottom)

global mean properties

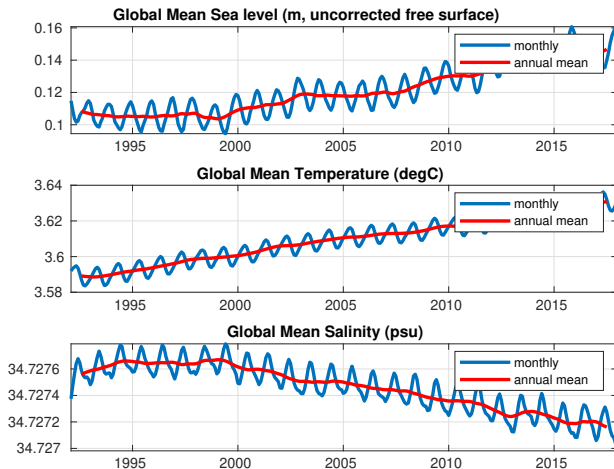


Figure : global mean T (degC; top) and S (psu; bottom)

global mean properties

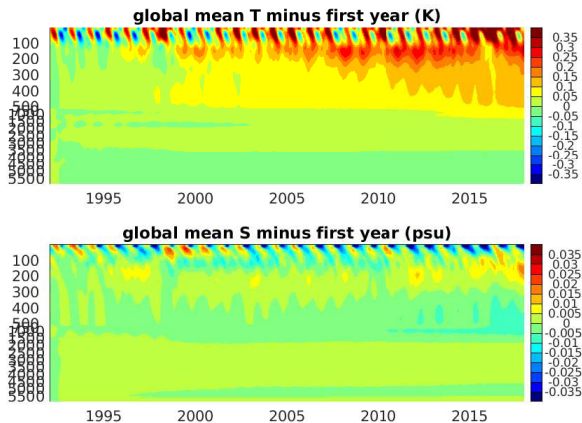


Figure : global mean temperature (K; top) and salinity (psu; bottom) minus first year

zonal mean properties

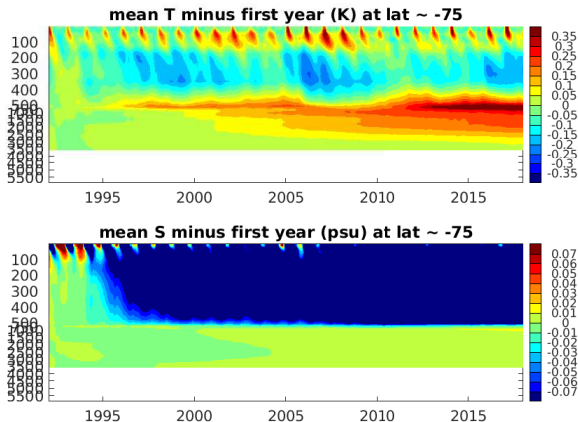


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ -75

zonal mean properties

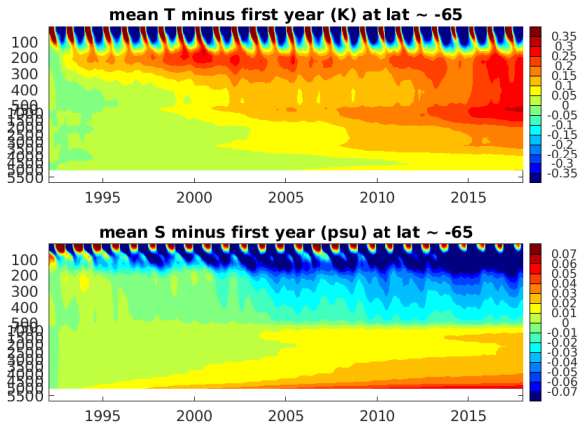


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ -65

zonal mean properties

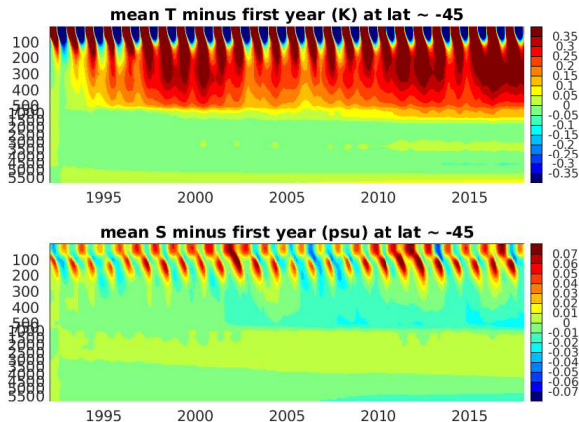


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ -45

zonal mean properties

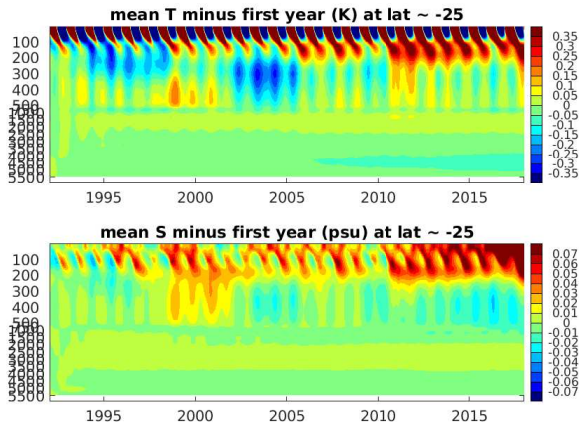


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ -25

zonal mean properties

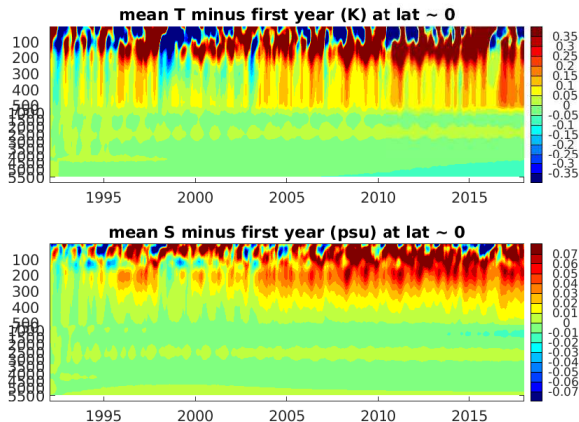


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ 0

zonal mean properties

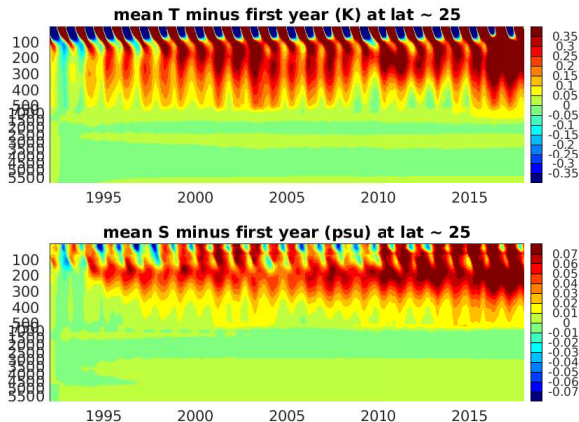


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ 25

zonal mean properties

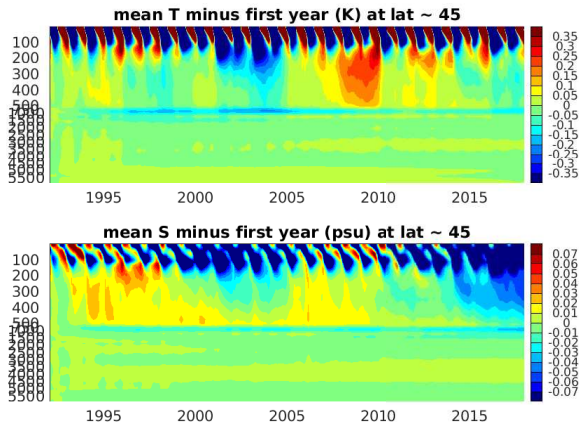


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ 45

zonal mean properties

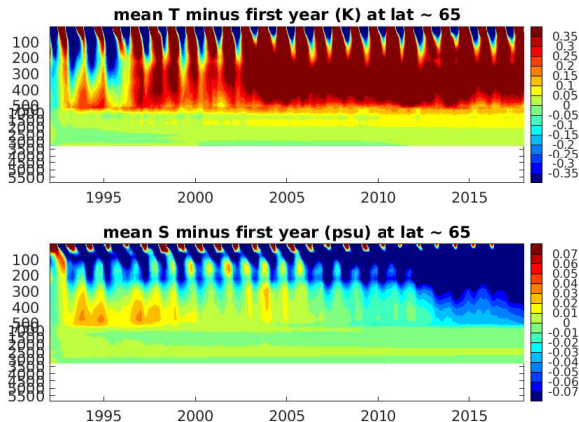


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ 65

zonal mean properties

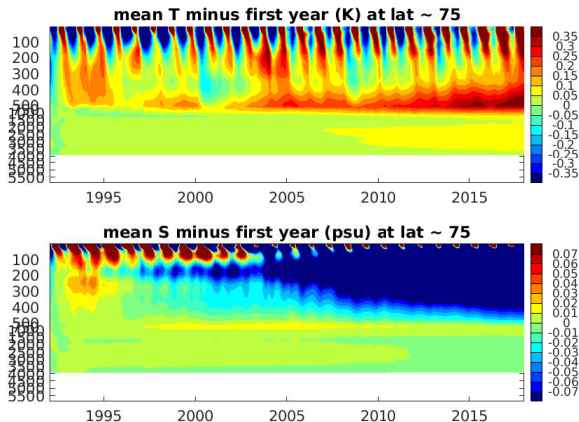


Figure : mean temperature (top; K) and salinity (bottom; psu) minus first year at lat ≈ 75

zonal mean properties (surface)

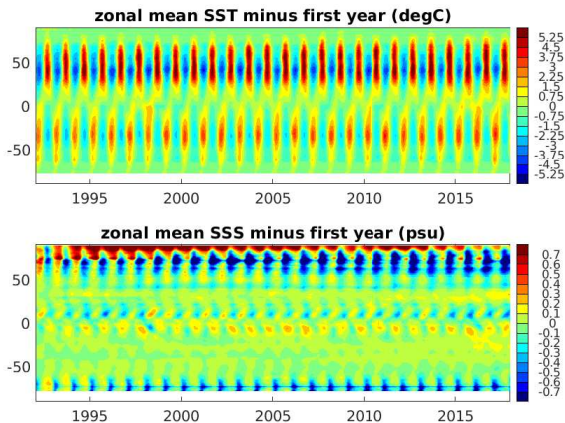


Figure : zonal mean temperature (degC; top) and salinity (psu; bottom) minus first year (psu) at 5m depth

zonal mean properties (surface)

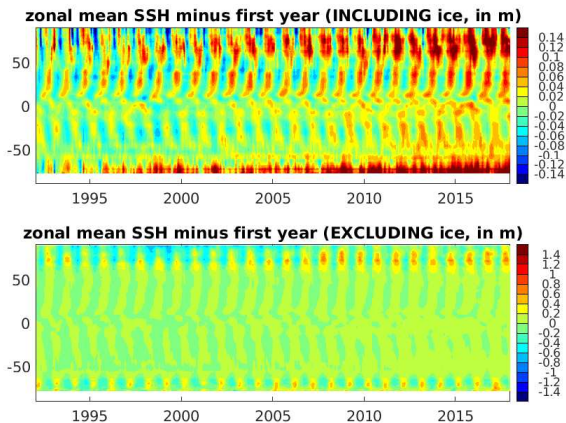


Figure : zonal mean SSH (m, uncorrected free surface) minus first year, including ice (top) and below ice (bottom)

zonal mean properties (surface)

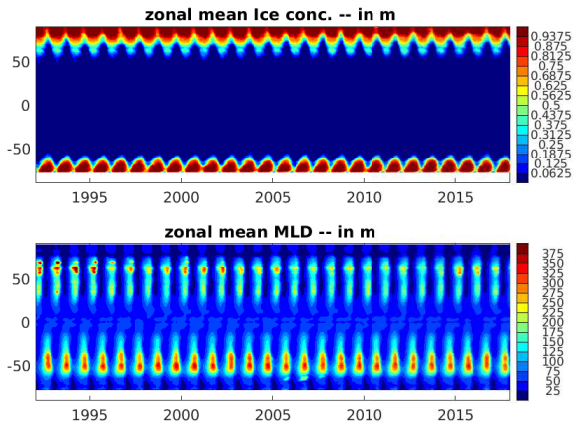


Figure : zonal mean ice concentration (no units) and mixed layer depth (m)

seaice time series

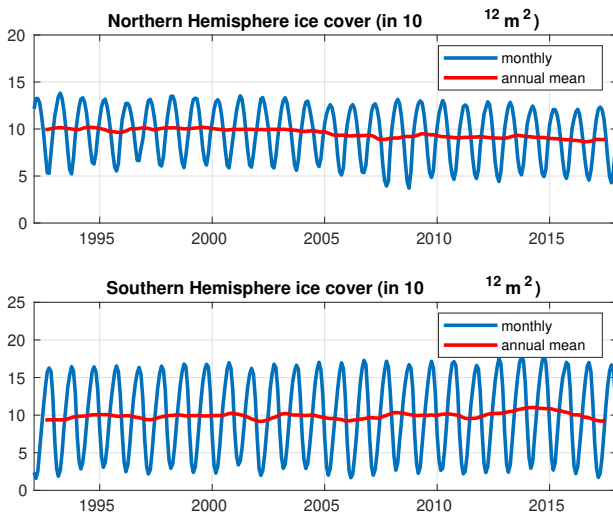


Figure : sea ice cover (in $10^{12} m^2$) in northern (top) and southern (bottom) hemisphere

seaice time series

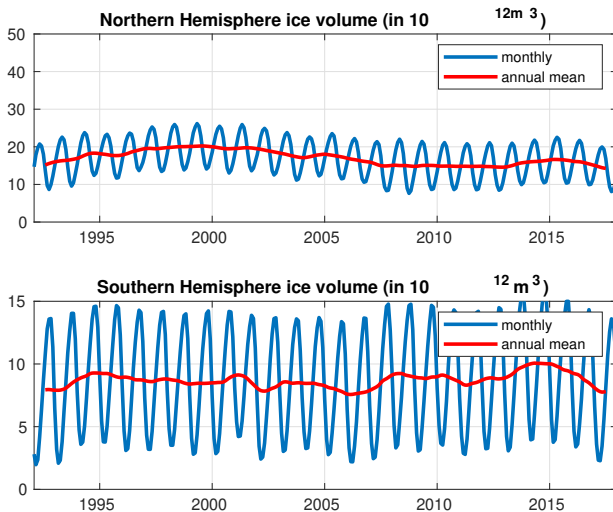


Figure : sea ice volume (in 10^{12} m^3) in northern (top) and southern (bottom) hemisphere

seaice time series

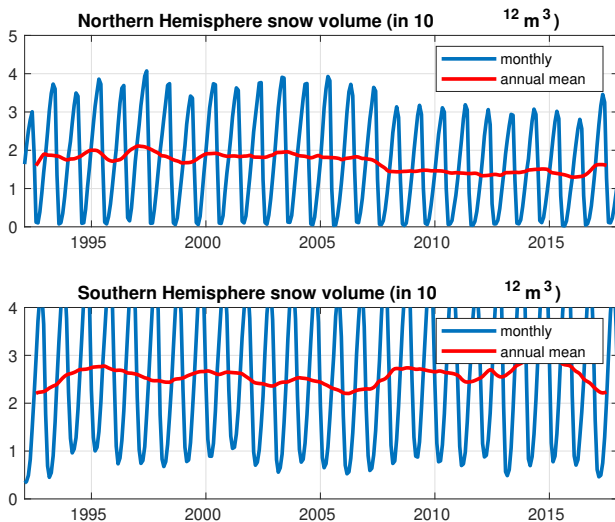


Figure : snow volume (in $10^{12} m^3$) in northern (top) and southern (bottom) hemisphere

seaice time series

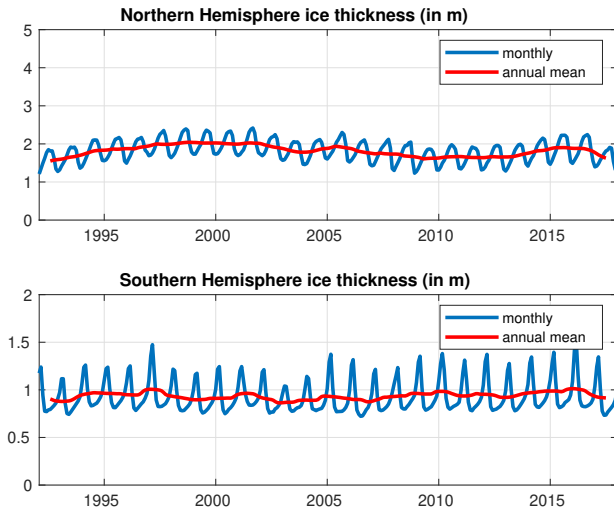


Figure : sea ice thickness (in m) in northern (top) and southern (bottom) hemisphere

seaice time series

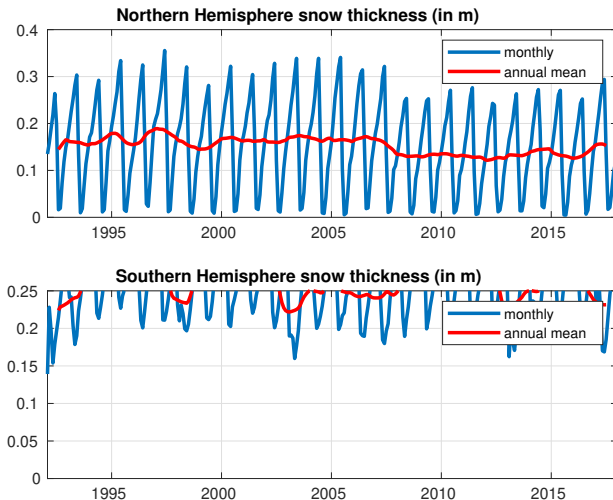


Figure : snow thickness (in m) in northern (top) and southern (bottom) hemisphere

Mixed Layer Depth Fields

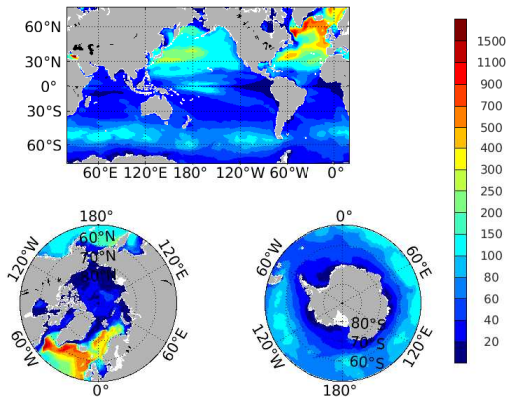


Figure : 1992-2019 March mean – mixed layer depth per Kara formula (m)

Mixed Layer Depth Fields

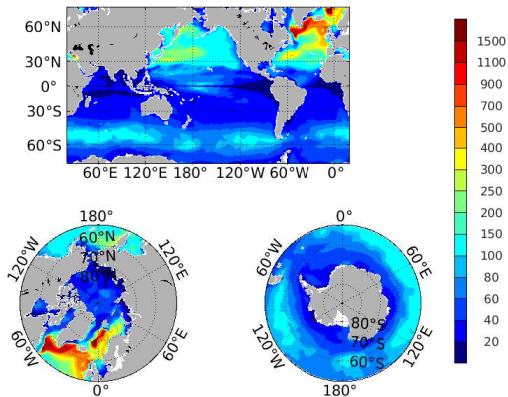


Figure : 1992-2019 March mean – mixed layer depth per Suga formula (m)

Mixed Layer Depth Fields

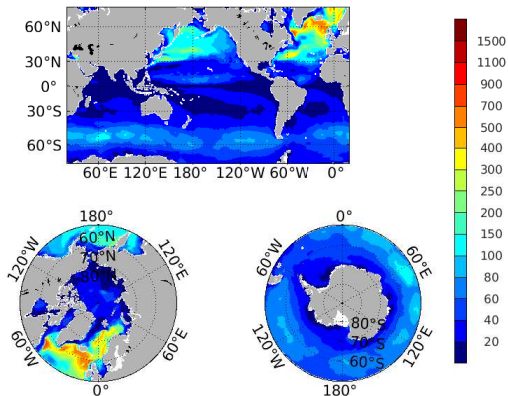


Figure : 1992-2019 March mean – mixed layer depth per Boyer M. formula (m)

Mixed Layer Depth Fields

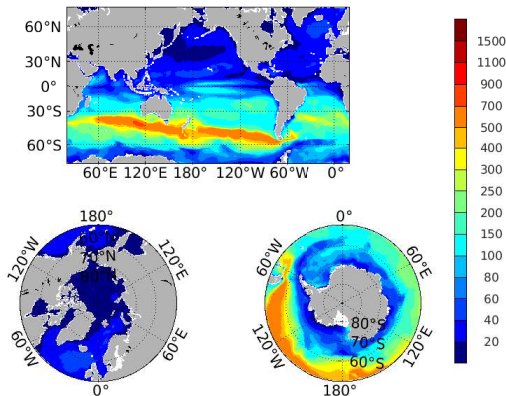


Figure : 1992-2019 September mean – mixed layer depth per Kara formula (m)

Mixed Layer Depth Fields

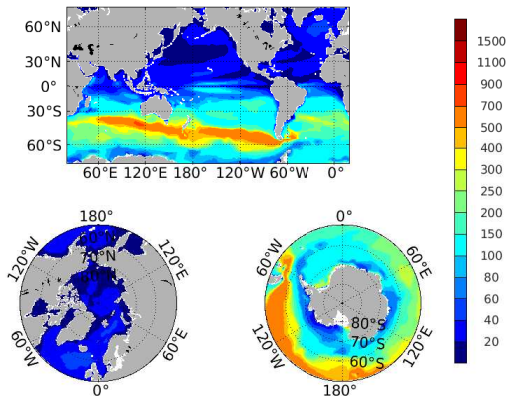


Figure : 1992-2019 September mean – mixed layer depth per Suga formula (m)

Mixed Layer Depth Fields

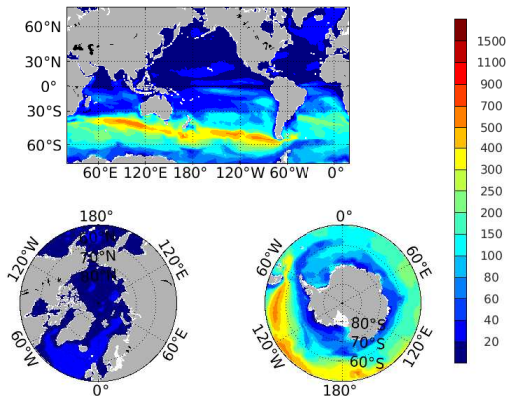


Figure : 1992-2019 September mean – mixed layer depth per Boyer M. formula (m)

Monthly Thickness Distribution

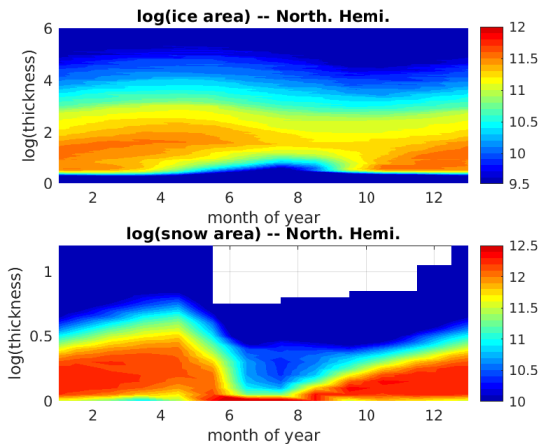


Figure : 1992-2019 Northern Hemisphere : monthly mean ice (top) and snow (bottom) thickness distribution (in $\log(\text{m}^2)$)

Monthly Thickness Distribution

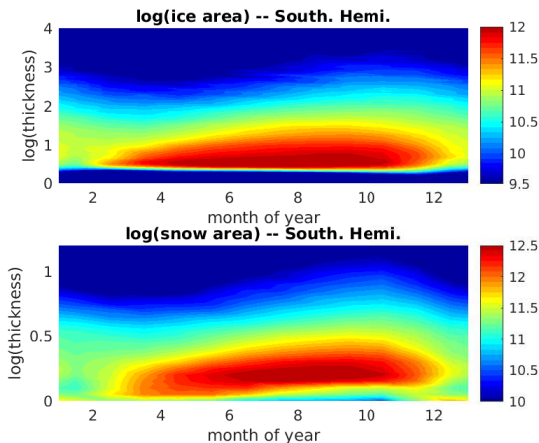


Figure : 1992-2019 Southern Hemisphere : monthly mean ice (top) and snow (bottom) thickness distribution (in $\log(\text{m}^2)$)

Northern Hem. in March

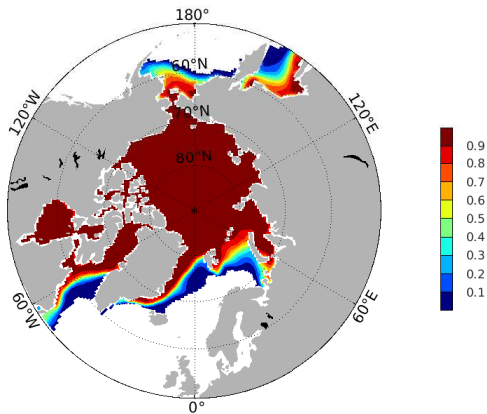


Figure : 1992-2019 March mean – ice concentration (unitless)

Northern Hem. in March

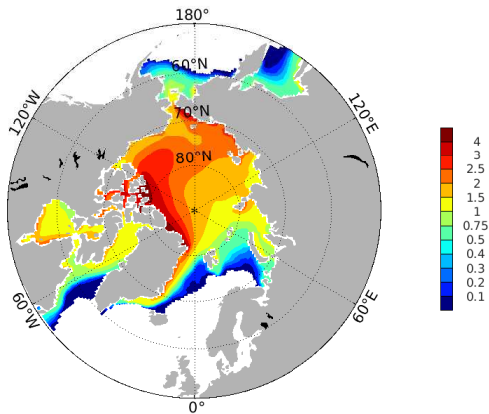


Figure : 1992-2019 March mean – ice thickness (m)

Northern Hem. in March

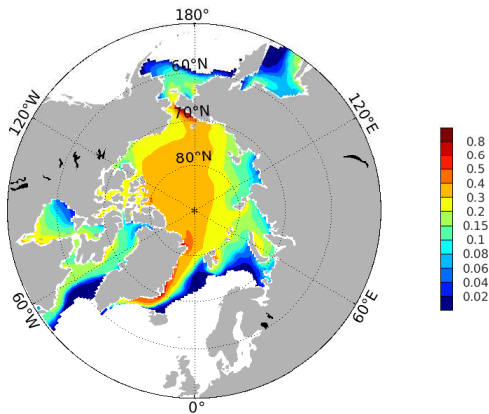


Figure : 1992-2019 March mean – snow thickness (m)

Northern Hem. in March

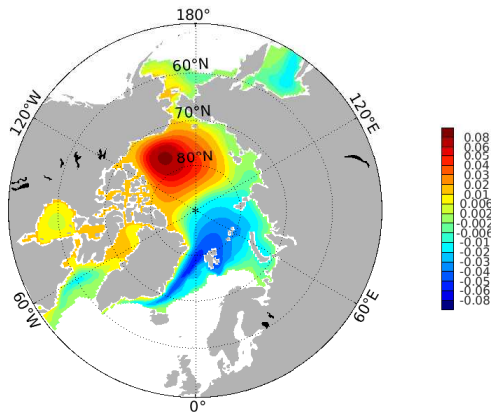


Figure : 1992-2019 March mean – ice+snow streamfunction (megaton/s)

Northern Hem. in March

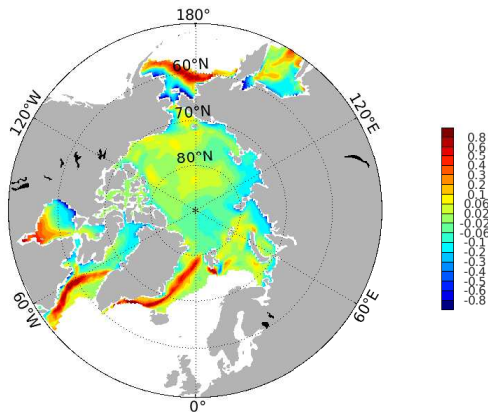


Figure : 1992-2019 March mean – ice+snow convergence (kiloton/s)

Northern Hem. in September

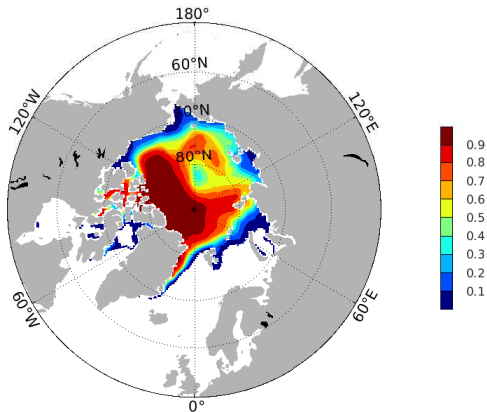


Figure : 1992-2019 September mean – ice concentration (unitless)

Northern Hem. in September

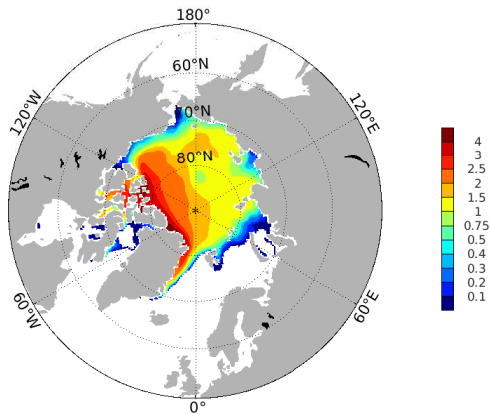


Figure : 1992-2019 September mean – ice thickness (m)

Northern Hem. in September

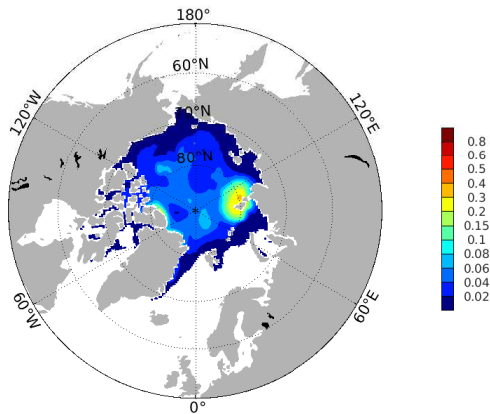


Figure : 1992-2019 September mean – snow thickness (m)

Northern Hem. in September

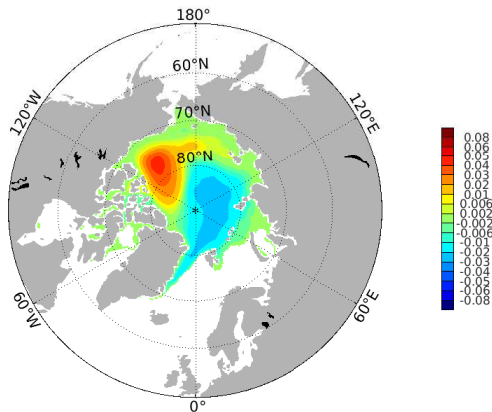


Figure : 1992-2019 September mean – ice+snow streamfunction (megaton/s)

Northern Hem. in September

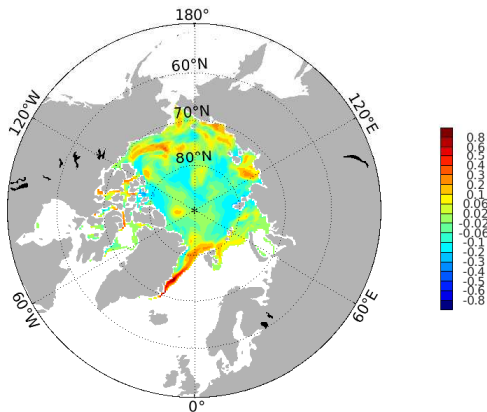


Figure : 1992-2019 September mean – ice+snow convergence (kiloton/s)

Southern Hem. in March

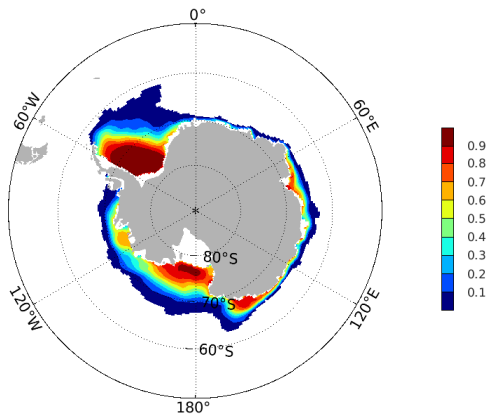


Figure : 1992-2019 March mean – ice concentration (unitless)

Southern Hem. in March

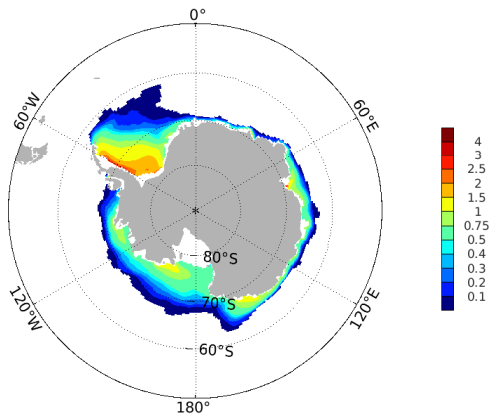


Figure : 1992-2019 March mean – ice thickness (m)

Southern Hem. in March

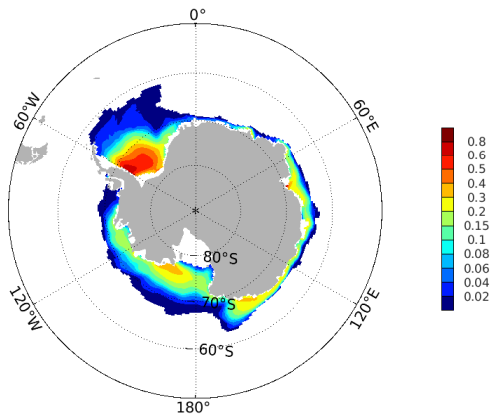


Figure : 1992-2019 March mean – snow thickness (m)

Southern Hem. in March

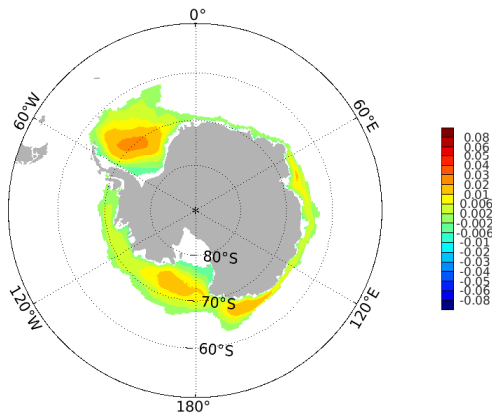


Figure : 1992-2019 March mean – ice+snow streamfunction (megaton/s)

Southern Hem. in March

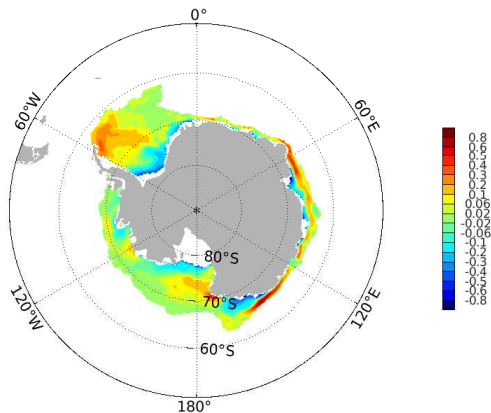


Figure : 1992-2019 March mean – ice+snow convergence (kiloton/s)

Southern Hem. in September

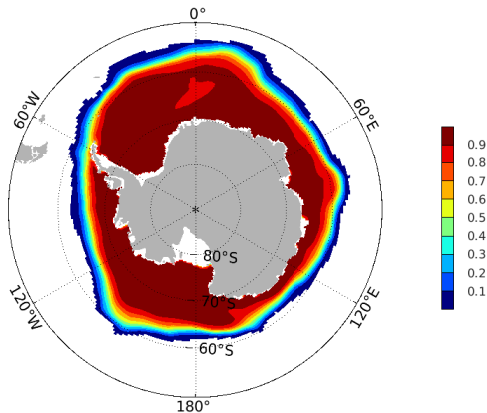


Figure : 1992-2019 September mean – ice concentration (unitless)

Southern Hem. in September

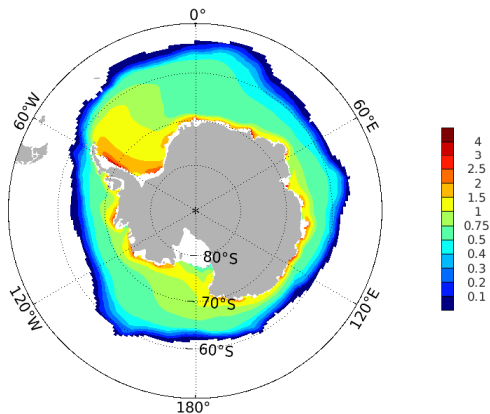


Figure : 1992-2019 September mean – ice thickness (m)

Southern Hem. in September

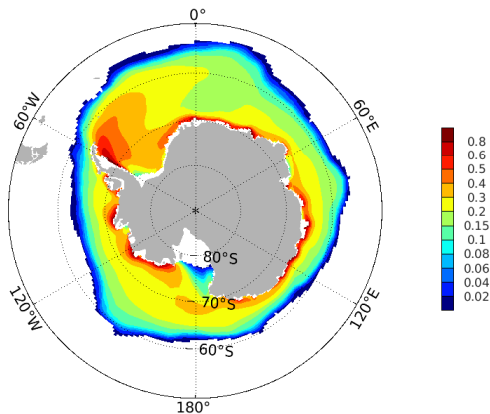


Figure : 1992-2019 September mean – snow thickness (m)

Southern Hem. in September

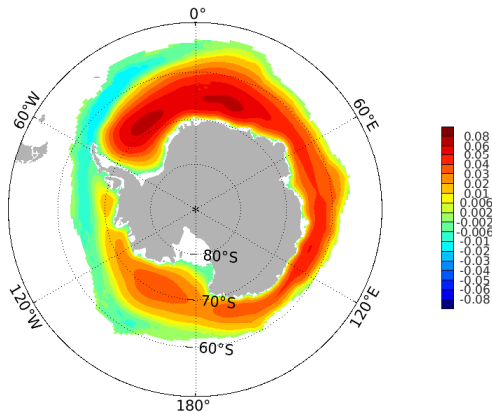


Figure : 1992-2019 September mean – ice+snow streamfunction (megaton/s)

Southern Hem. in September

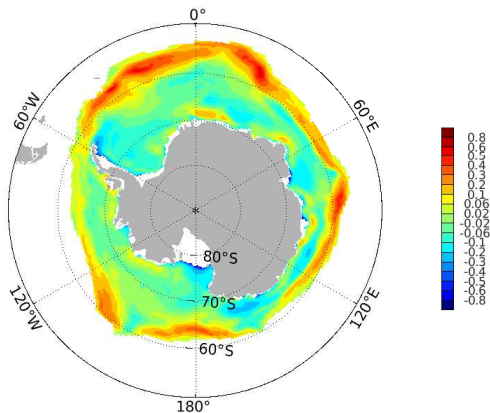


Figure : 1992-2019 September mean – ice+snow convergence (kiloton/s)