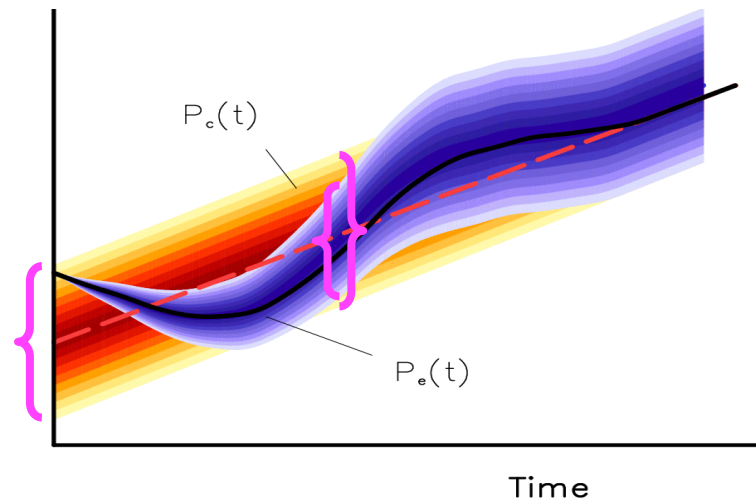


Is AMOC More Predictable than North Atlantic Heat Content?

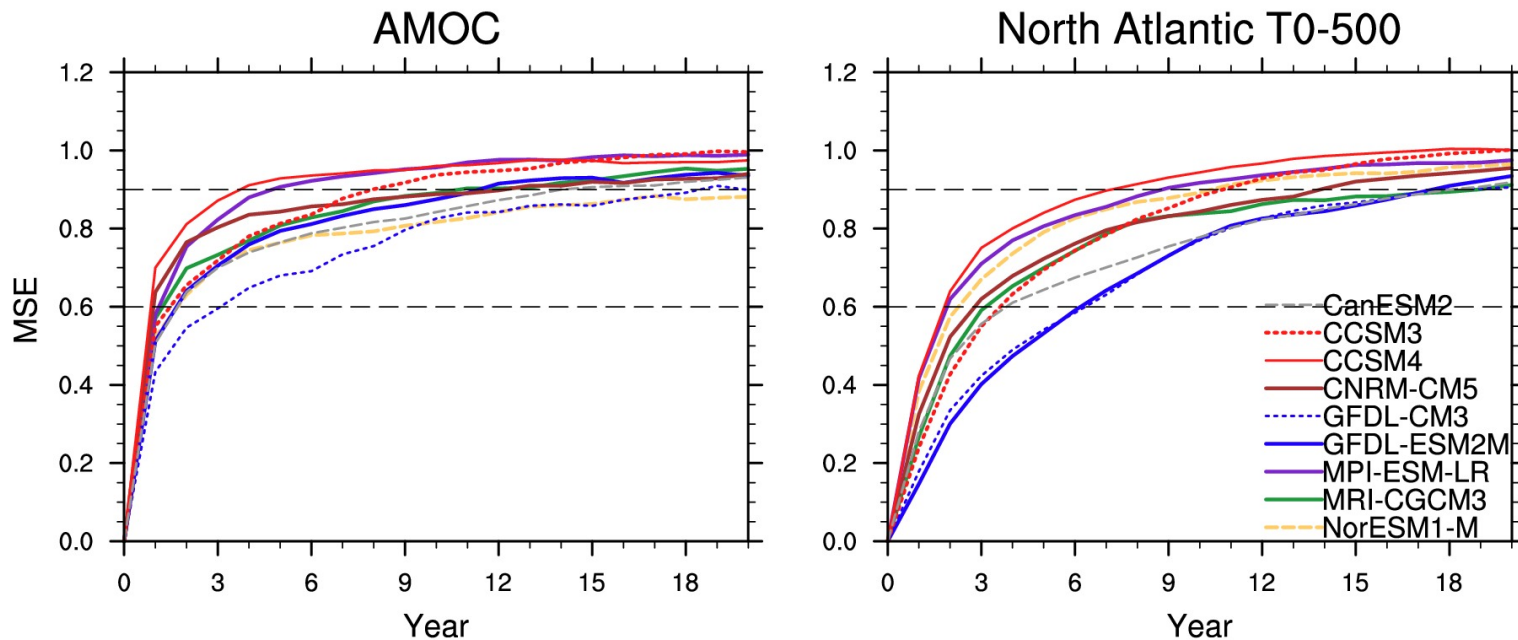
Grant Branstator & Haiyan Teng
NCAR



Predictability of CMIP5 Models

(forecast distribution variance / climatological variance)

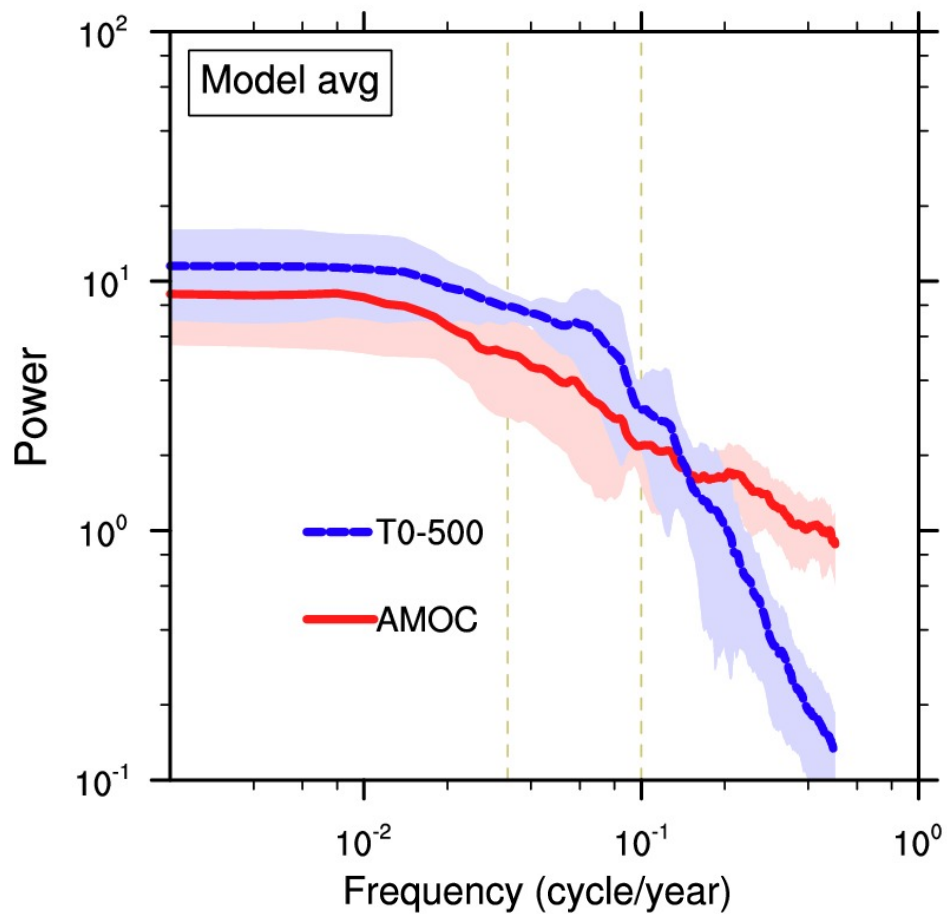
Attractor average 10PCs



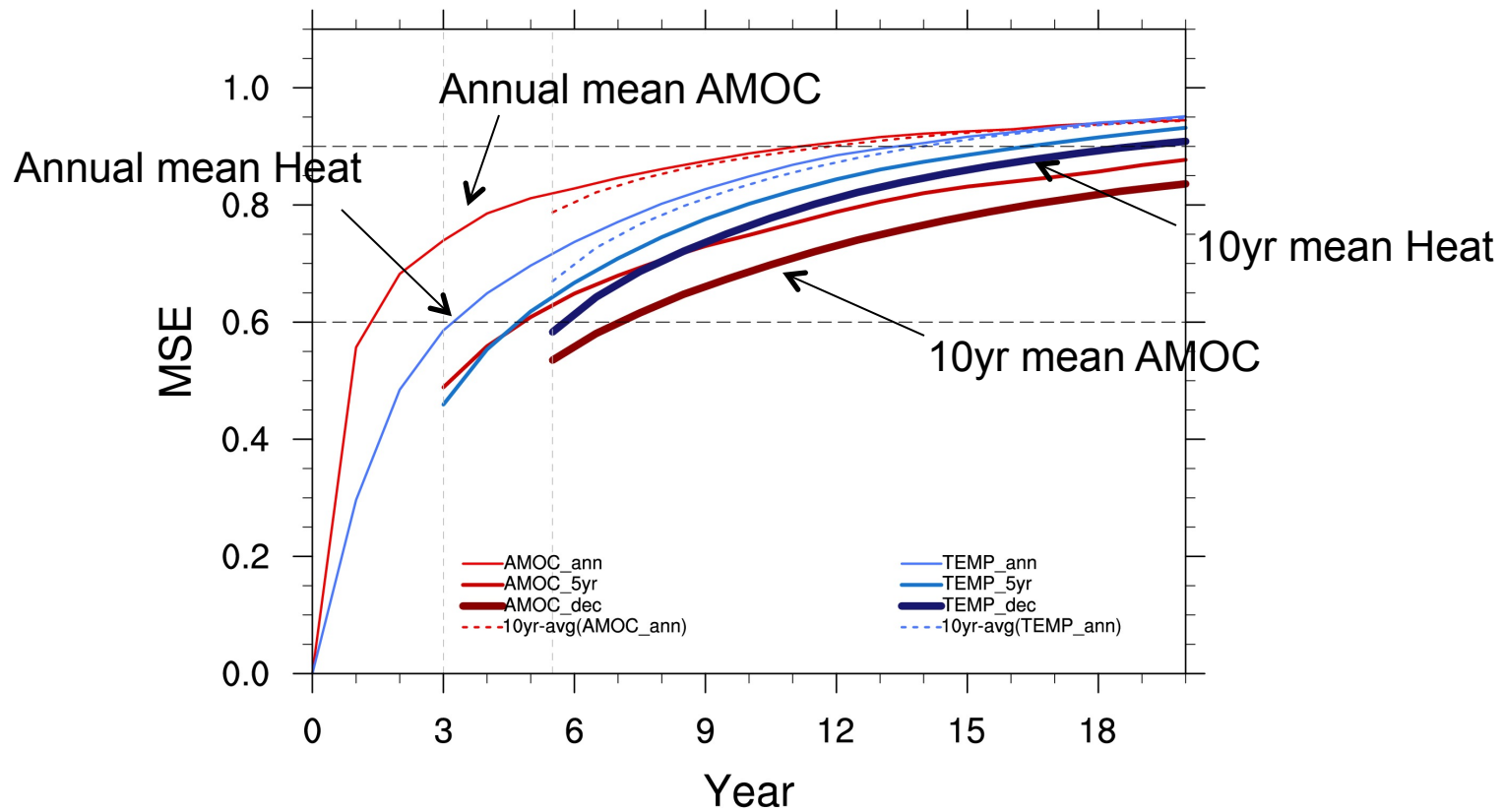
based on approximating model dynamics with linear regression operators

Average Power Spectra AMOC & N Atl Heat Content

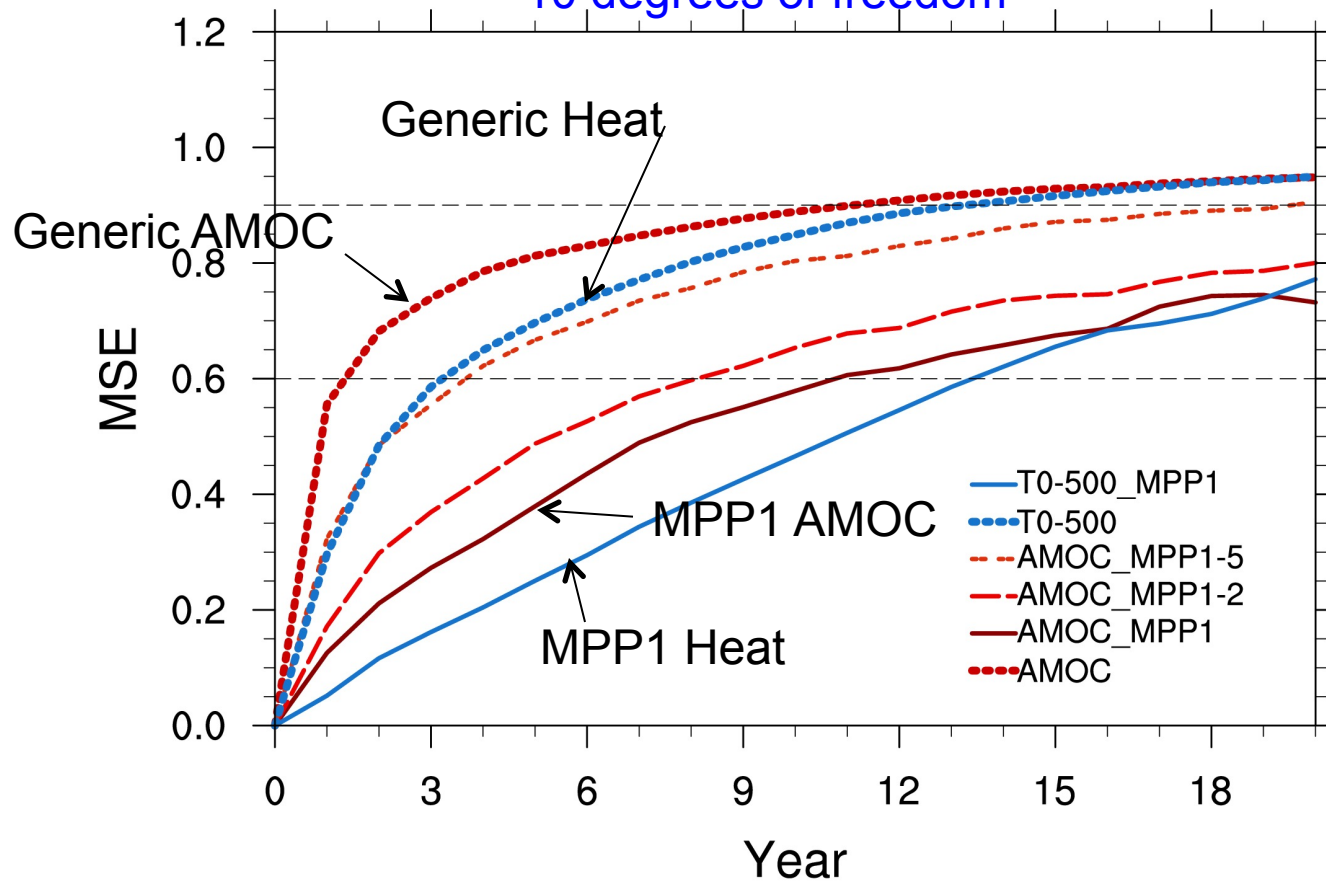
9 CMIP5 models
10 PCs



Predictability of 5- & 10-year means CMIP5 Models

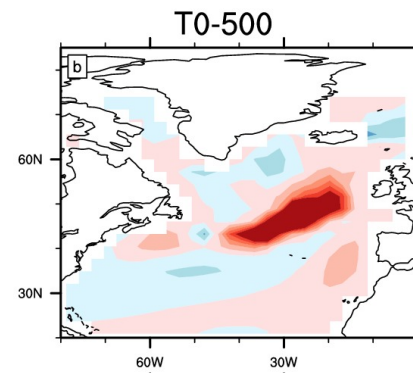
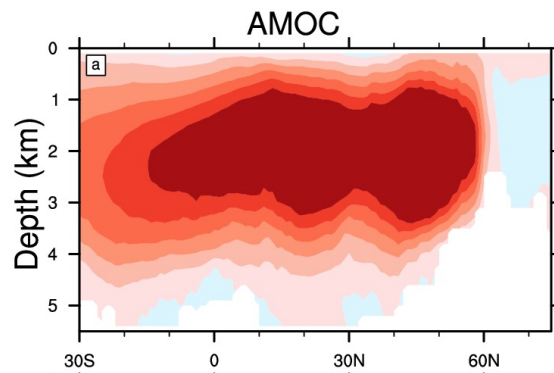


Predictability of Most Predictable Patterns *(canonical correlation analysis)* 10 degrees of freedom

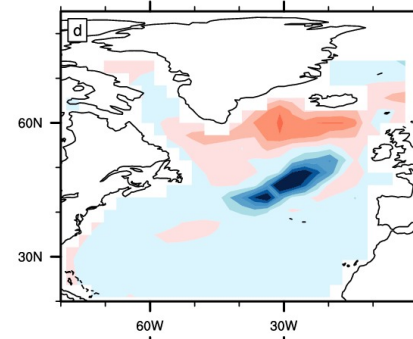
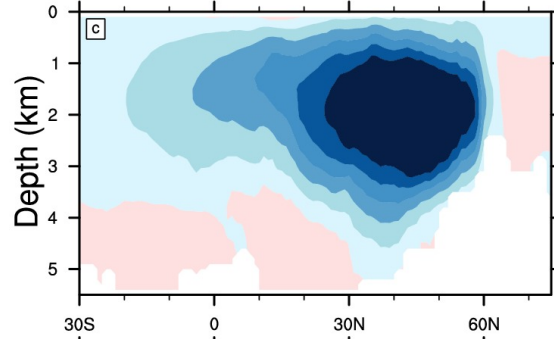


Most Predictable Pattern *CCSM3 T42*

yr 0



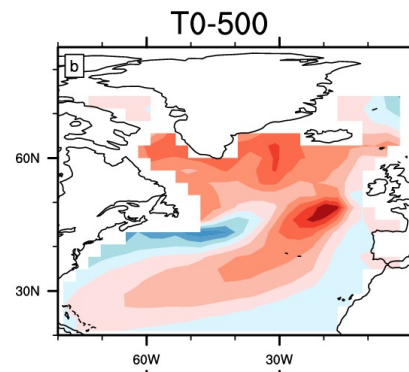
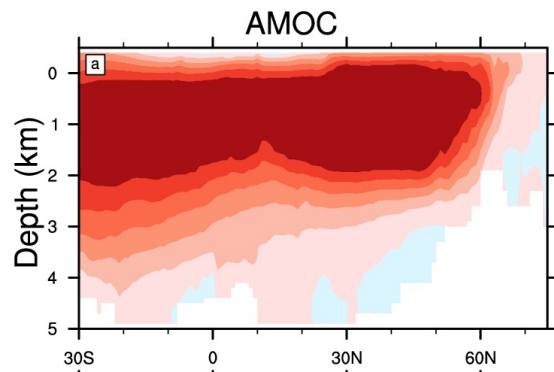
yr 10



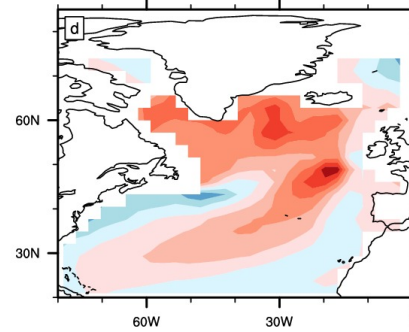
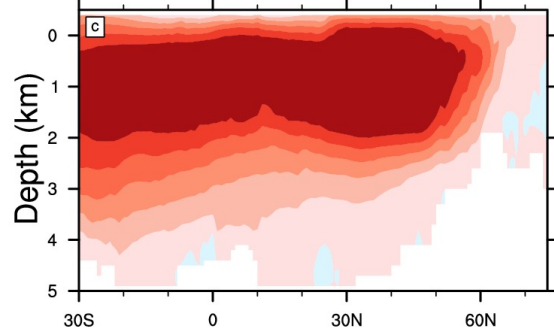
Optimize
AMOC

Most Predictable Pattern *CNRM-CM5*

yr 0



yr 10



Optimize
AMOC

The answer to
“Is AMOC more predictable than N Atl heat content?”
depends on

- Time scale (*annual mean, decadal mean...*)
- Mode/pattern
- Model (*CNRM-CM5, CanESM2, ..., nature*)
- Particular initial condition
- Geographical location (*subpolar gyre,...*)
- Initial value or forced predictability

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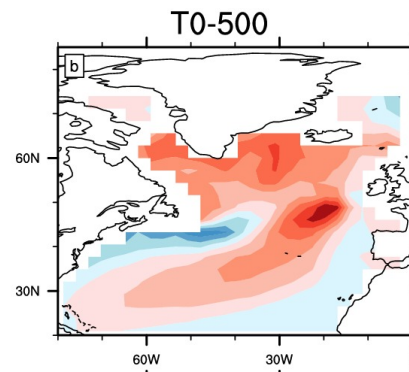
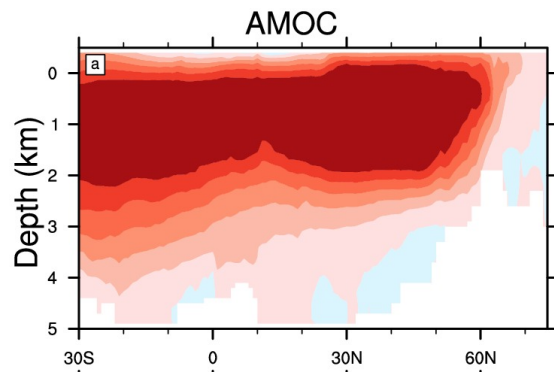
Good news:

There is predictability beyond a decade...for
time averages and particular patterns

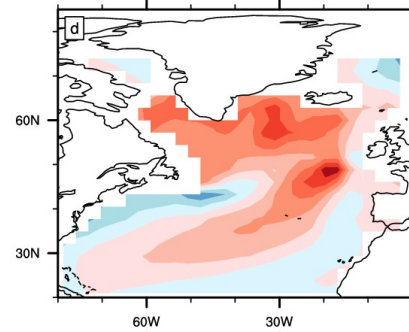
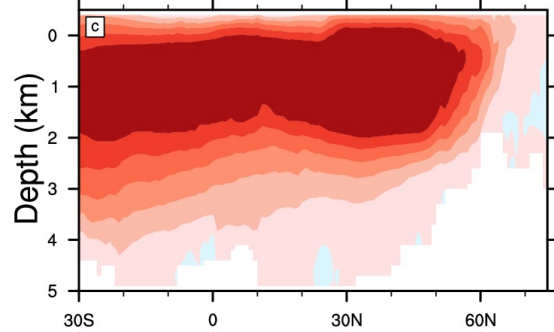


Most Predictable Pattern *CNRM-CM5*

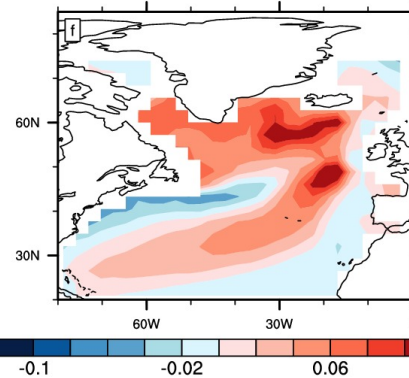
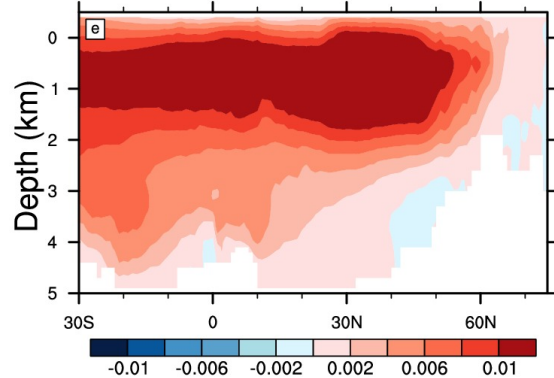
yr 0



yr 10



yr 10

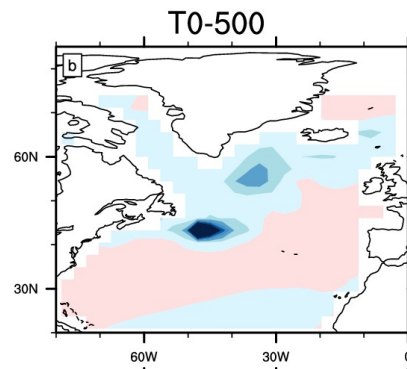
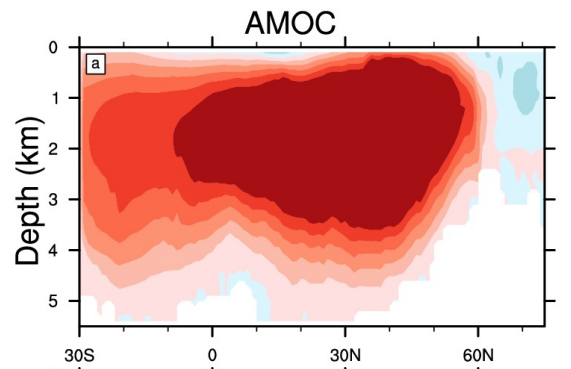


Optimize
AMOC

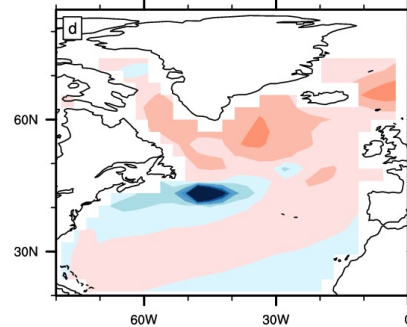
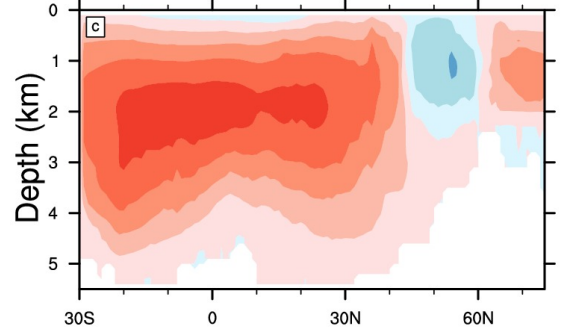
Optimize
Heat
Content

Most Predictable Pattern CCSM4 1°

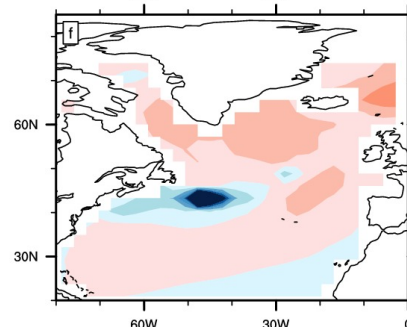
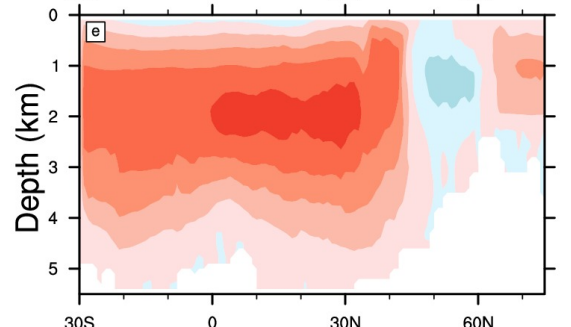
yr 0



yr 10



yr 10

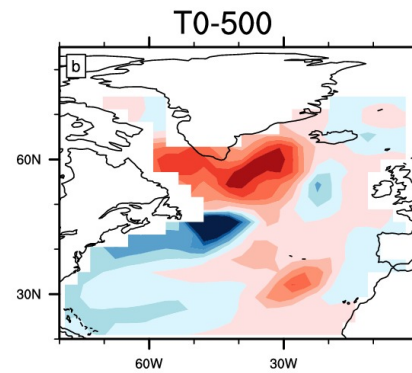
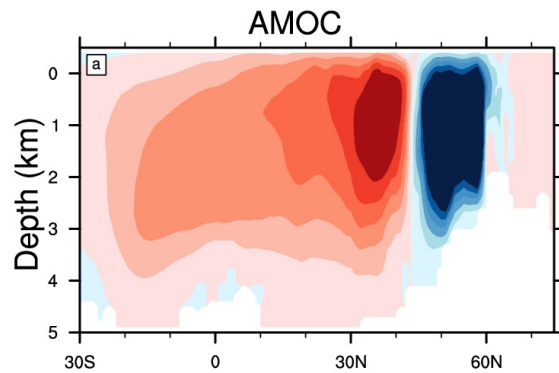


Optimize
AMOC

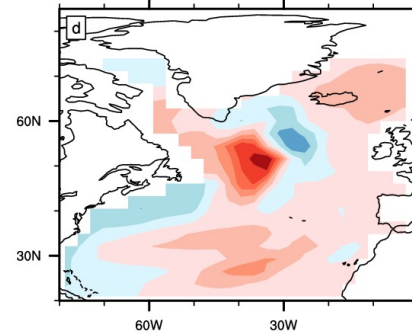
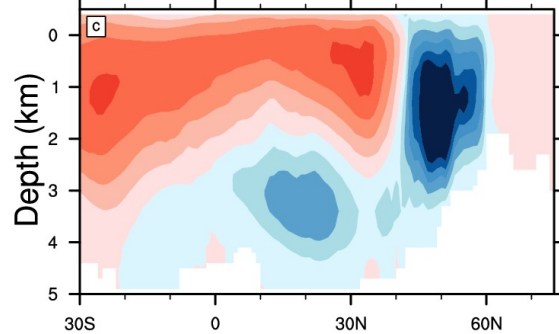
Optimize
Heat
Content

Most Predictable Pattern *GFDL-CM3*

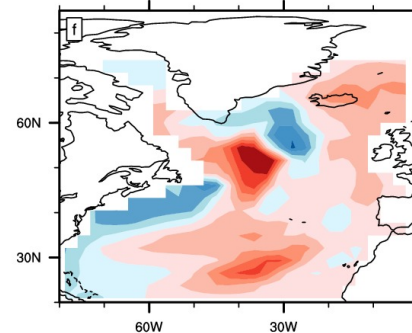
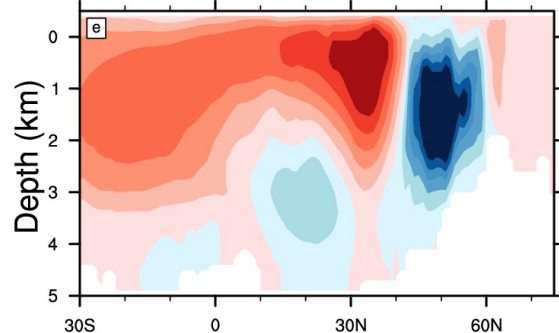
yr 0



yr 10



yr 10



Optimize
AMOC

Optimize
Heat
Content

