AMOC Mini-Workshop #1

Casey Saenger – SST Proxies

- SST Proxies are based on the expected dipole pattern, warm N, cold S Atlantic
- Both high and low resolution proxies are concentrated largely in the Northern Hemisphere.
- High Res. – suggest multi-decadal variability in the most recent century, but perhaps not earlier centuries
- low res – suggests long-term cooling for past 2000 years. Is this AMOC slow-down? How is it forced?

Ben Horton – Sea Level Record

- Proxies for sea level on the US East Coast.
- Salt Marshes provide several thousand year records with decimeter vertical accuracy and decadal temporal accuracy
- N. Carolina, New Jersey & Florida all show accelerating SLR since 1800.
- All three records have different amounts of rise during the MWP
- Could these be developed as AMOC proxies?

Rong Zhang – AMOC Fingerprints

- The origin of the 20th century multidecadal NASST variations is complicated by anthropogenic forcings.
- AMOC fingerprints have been identified, using variables such as altimetry SSH, subsurface temperature, and bring evidence that the observed multidecadal NASST variations are indeed linked to AMOC variations.
- A high priority is to develop a multivariate fingerprint of the AMOC using those variables that are observed extensively or can be reconstructed from paleoclimate archives.

Discussion

- How do we define the AMOC (volume transport, AMOC in density coordinates, AMOC on T/S Plane, transport of NAIW,NADW, MHT, focusing on deep branch)?
- What is the influence of the ocean in the broader climate context?
- How can we exploit synergy of the AMOC Science Team (Obs., Models, Proxies)?
  - Ocean mixing measurements/water mass transformation

Discussion

- How can we exploit synergy of the AMOC Science Team (cont.)?
  - Diagnose AMOC mechanisms and variability more thoroughly using models
  - Address biases in GCMs.
  - Develop robust fingerprints (using selected models?)
  - Are fingerprints different for different time scales?
  - Explore the possibility of coastal sea level as a proxy for AMOC

Discussion

- Can we develop a list of diagnostic variables to request from CMIP? How important are convective adjustment schemes in models?
- Meridional coherence? Would it be clearer in another framework (like density coordinates)? Can data assimilation help here?
- Conundrum: Why do tracer pathways seem to differ from Lagrangian float trajectories?

Recommendations

- Develop a more robust definition for AMOC
- Explore the possibility of coastal sea level as a proxy for AMOC
- Develop a list of diagnostic variables to request from CMIP (such as AMOC in density coordinator)