

# Task Team 4 breakout summary

# Near term priorities

## 1) Impact of the AMOC on the ITCZ and the hydrological cycle

- Modeling experiments seem to clearly suggest an impact between imposed changes in the AMOC and shifts in the ITCZ.
- However, ITCZ shifts in coupled models appear to be damped in contrast to slab models.
- The impact of internal variability of the AMOC is more uncertain, but there are interesting recent results.
  - High predictability of shifts in the ITCZ position (Martin and Thorncroft, 2015)
  - Seems to be related to changes in the AMOC in the subpolar North Atlantic.
  - Need model to be able to capture variability of the AMOC and teleconnections.
- What is the impact of model biases?
- **Interaction between the AMOC, AMV, and changes in different types of clouds**

# Near term priorities

- 2) What are the **relationships** between the AMOC and global and regional sea level?
  - The use of sea level as a proxy for the AMOC.
  - The potential impact of the AMOC and resulting ocean heat transport on regional sea level.
- 3) Impact of the AMOC on the cryosphere.
  - What are the mechanisms for warming along the ice shelf in Greenland? Related to the AMOC? Local winds?
  - Ocean melt in Greenland project.
- 4) **What is the relationship between the AMOC and climate extremes?**
  - **Impact on hurricanes**
  - **Impact on droughts**
  - **CMIP6 decadal MIP**

# Near term priorities

- 5) Impact of the AMOC on the carbon cycle and marine ecosystems
  - North Atlantic is not a region of carbon uptake, but it is a region of carbon sinking and storage.
  - Impact of the AMOC/AMV on fisheries. Special issue in Journal of Marine systems in 2014 on connections between the AMO and fisheries.

# Long term priorities

The long-term goal of Task Team 4 is to understand how AMOC variability affects other components of the Earth system – its climate, hydrologic cycle, atmospheric circulation, coupled phenomena (e.g., ENSO, monsoons), other ocean basins (e.g., Southern Ocean), cryosphere, sea level, marine and terrestrial ecosystems, biogeochemical cycles, and carbon budgets – both locally and remotely.

In particular we would like to engage the paleoclimate community in order to understand the impacts of the AMOC on centennial and longer timescales.

# Review papers

- 1) Rong has volunteered to lead a review paper on the relationship between the AMOC and the AMV and associated climate impacts including modern and paleo-observations. Rowan Sutton from RAPID could be a co-lead. Young-Oh, Steve, and Gokhan join effort.
- 2) Relationships between the AMOC and sea-level, Chris Little and others.
- 3) Anand Gnanadesikan lead a paper on the impact of the AMOC on tracers. Tracers as a method of diagnosing the AMOC. A physical oceanographers guide to ocean tracers.
- 4) Are the recent temperature changes off Greenland related to the AMOC? Idea for a new science paper with some review material to be linked to special collection.