Atlantic Meridional Overturning Circulation Implementation Planning

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Ocean Research Priorities Plan
Near-Term Priority

Abrupt Climate Change and the Atlantic Meridional Overturning Circulation (AMOC)

Anticipated Outcomes

- Enhanced understanding of the MOC system
- Design a comprehensive MOC observation and monitoring program.
- New forecasting capabilities
- Improved ocean models, coupled models, and ocean analyses for their initialization.
- Characterize the impacts and feedbacks of changes in the MOC on ecosystems, carbon budgets, and regional climate.

Linked to CCSP/CVC Abrupt Change Initiative
Scientific Questions

• What is current state (and recent variations) of the AMOC?
• How will/has it changed?
• What are the causes of AMOC variability?
• Can those changes be predicted?
• What are the impacts of the AMOC on other aspects of the climate system?
Charge to the Planning Team

To improve our description and understanding of the causes and implications of AMOC changes and to develop new capabilities for monitoring and predicting AMOC changes

- 5-year AMOC implementation guide
- measure changes in circulation and properties
- analyze the ocean’s interaction with atmosphere and cryosphere
- model ocean circulation and its connection to climate
- experimental nowcasting and forecasting
- characterize potential impacts of rapid AMOC changes
Impact Areas

- Climate and Extreme Events
- Ecosystems
- Cryosphere
- Carbon Uptake and Storage
- Sea Level Rise
Simulated decadal mean surface temperature and Atlantic overturning streamfunction. (a-d) surface temperature anomaly (70-180 yr periods) at phases of 0°, 60° and 120°, and 180° relative to maximum mean NH temperature. (e–h) phases of the covarying signal in streamfunction anomaly. Knight et al. (2005)
Simulated distribution of pelagic juvenile cod late June, 204 months old, using a) control run and b) a run with a THC reduction of 35%. The color scale indicates wet weight in milligrams. Vikebo et al, 2007

Linkage between AMOC variability and distribution of juvenile cod in the northern North Atlantic
Schedule

July 2007 Planning Team Workshop
August Draft for Review
September/October Initial Request for Proposals