# Atlantic Meridional Overturning Circulation Implementation Planning

*USCLIVAR Summit, July 2007*

*Kathie Kelly*
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*Co-chairs*

# Planning Team

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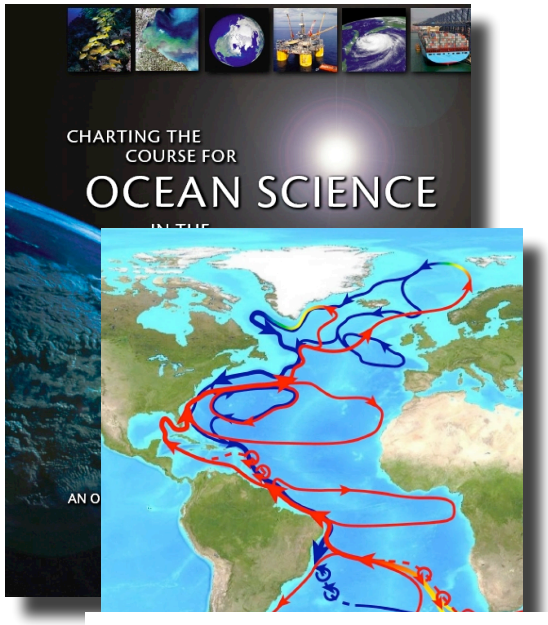
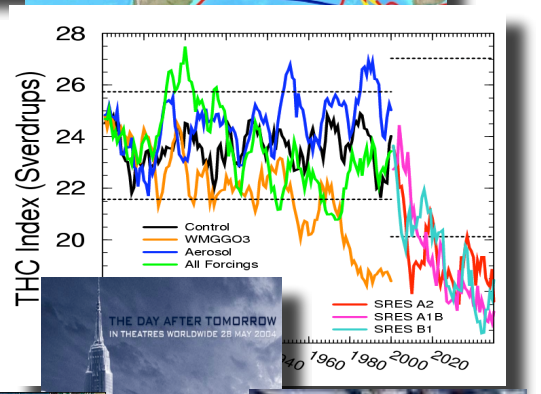
Yochanan Kushnir, LEO
Tom Delworth, GFDL
Tom Haine, Johns Hopkins
Tony Lee, JPL/NASA

# 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*

US Climate Change Science Program
www.climatescience.gov

# 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

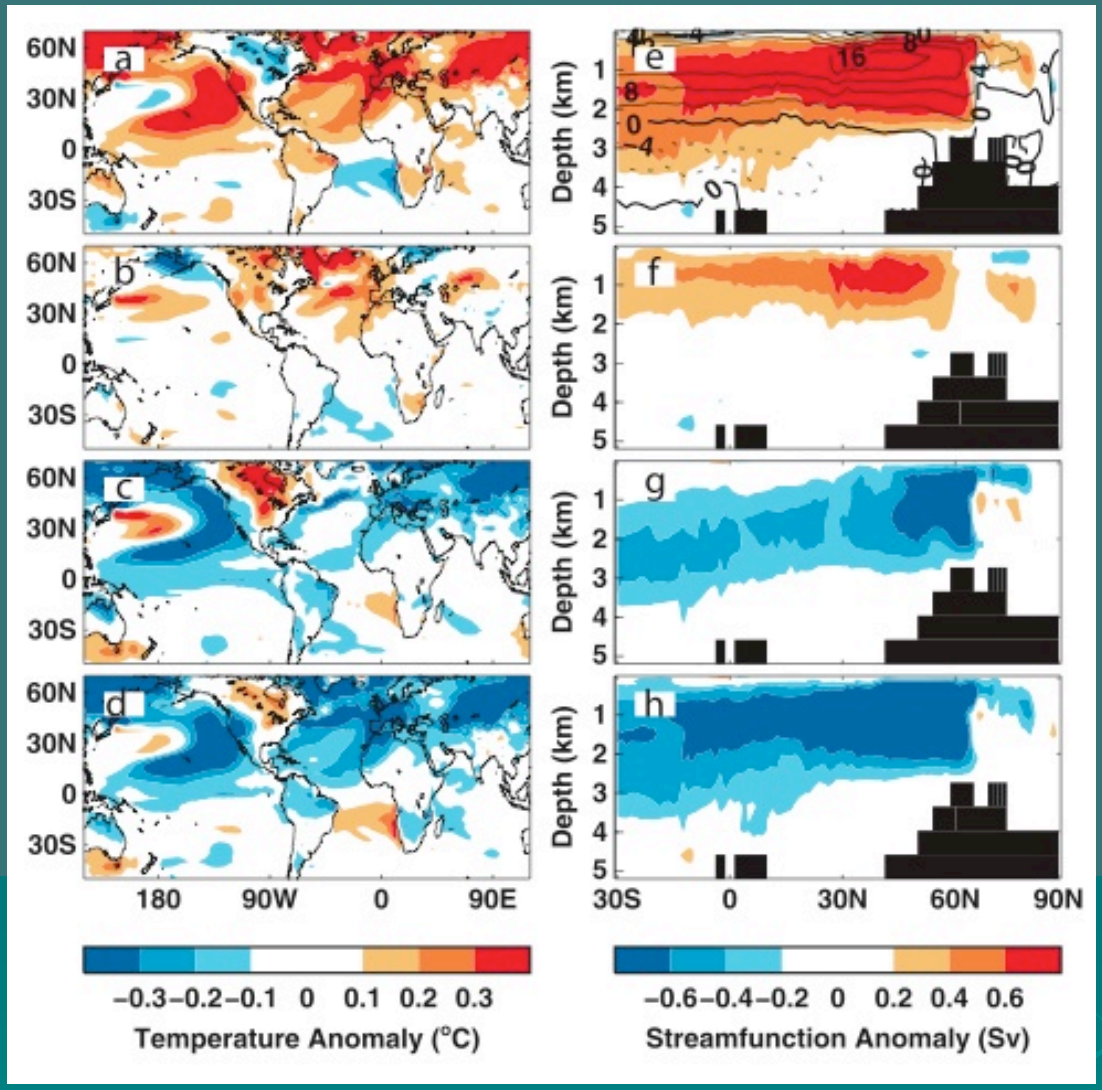
***To improve our description and understanding of the causes and implications of AMOC changes and to develop new capabilities for monitoring and predicting AMOC changes***

- **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

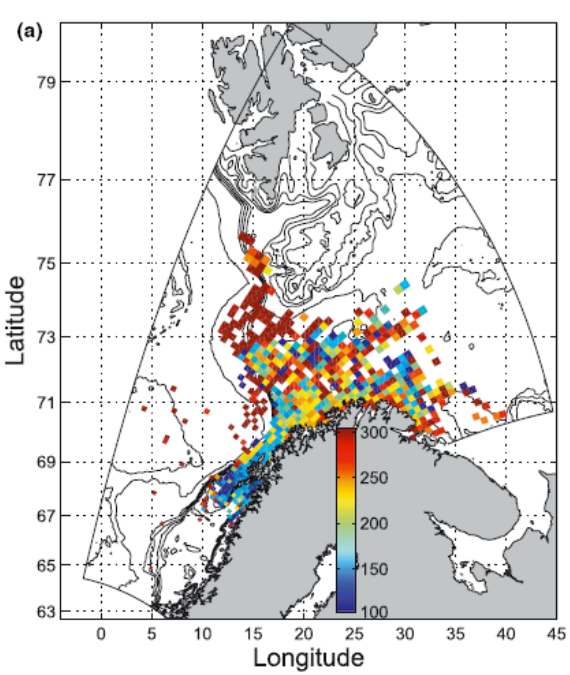
# Atlantic Overturning Circulation and Surface Temperatures



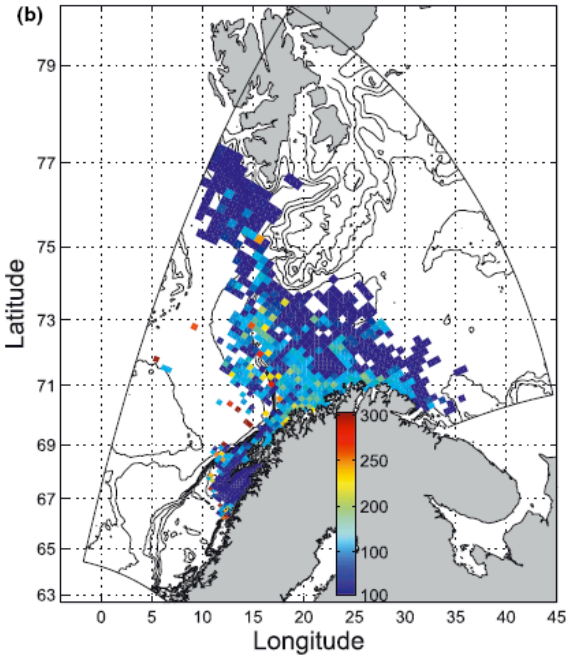

***Simulated decadal mean surface temperature and Atlantic overturning streamfunction. (a-d) surface temperature anomaly (70 -180 yr periods) at phases of 0°, 60° and 120°, and 180° relative to maximum mean NH temperature. (e–h) phases of the covarying signal in streamfunction anomaly.***
*Knight et al. (2005)*

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

Present-day THC




Reduced THC




*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*

# Schedule

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