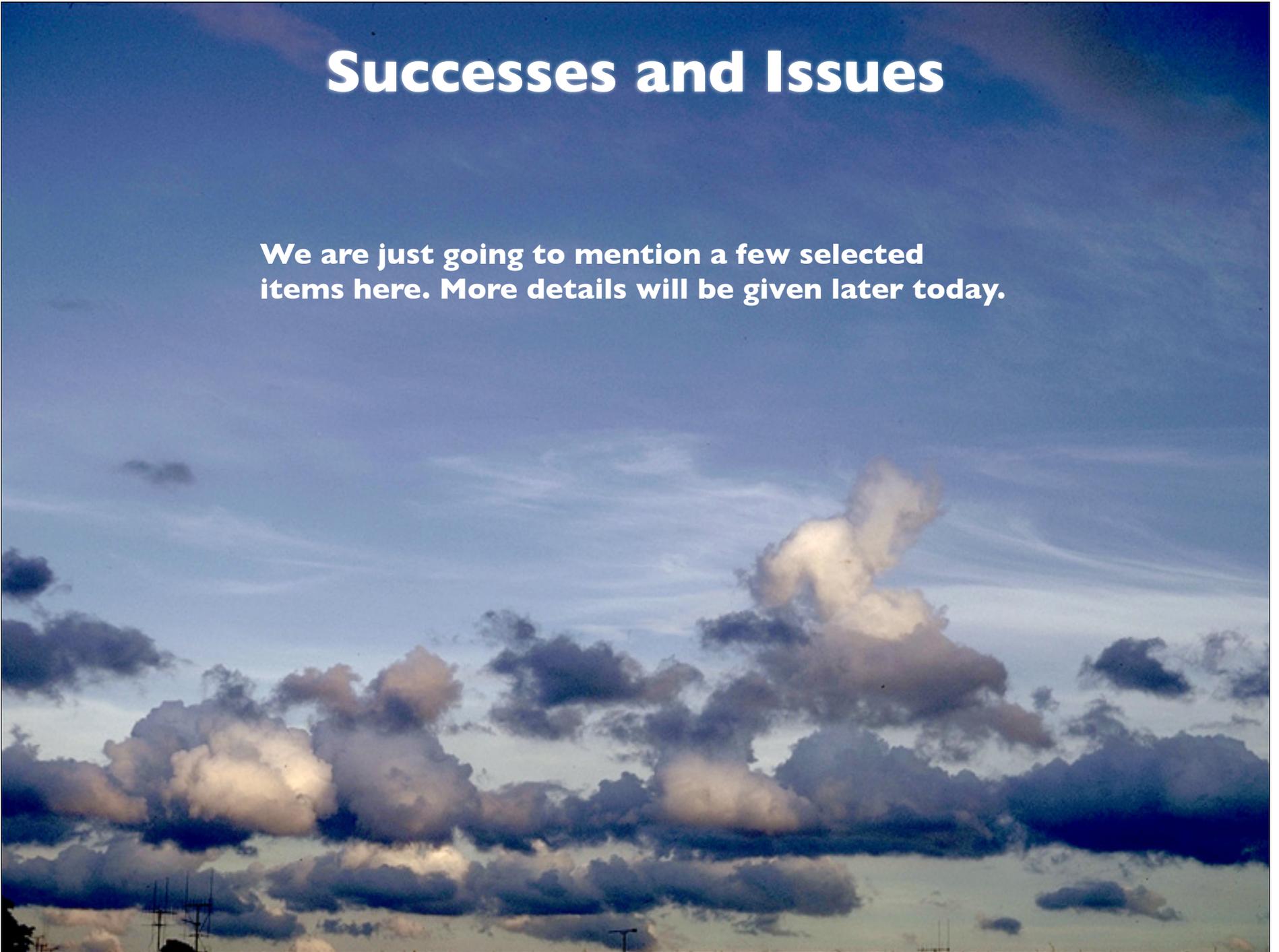
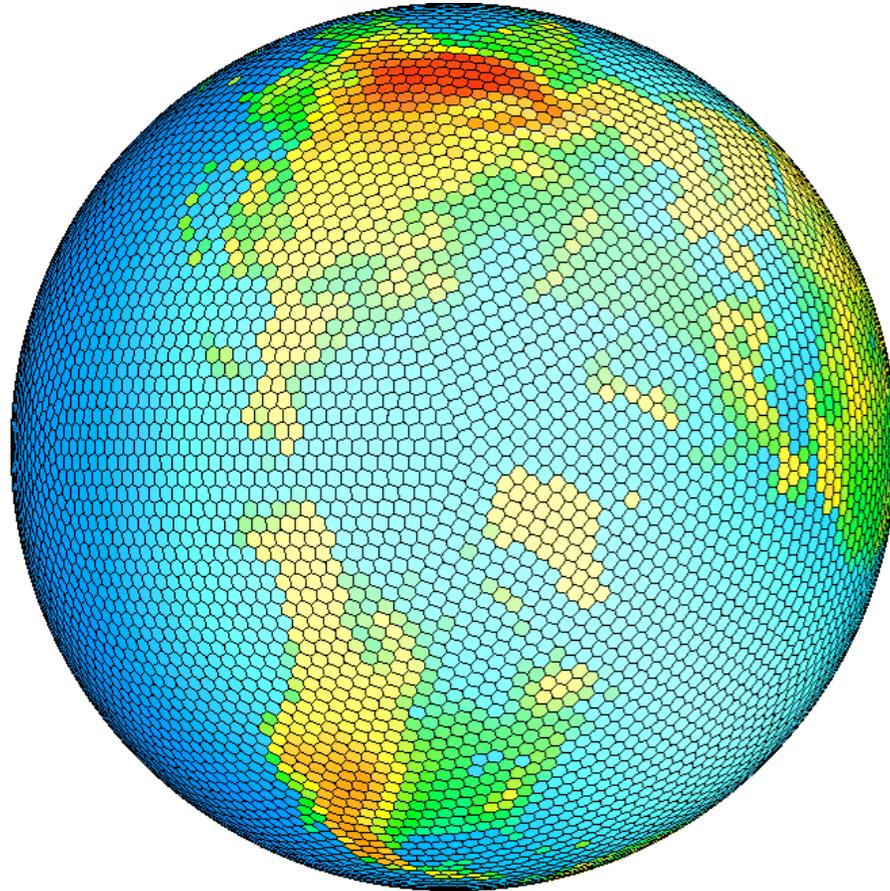


Successes and Issues

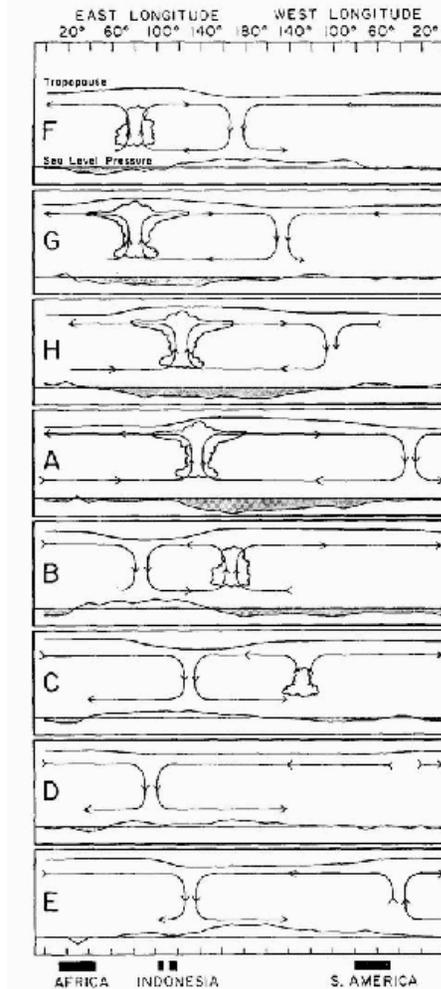
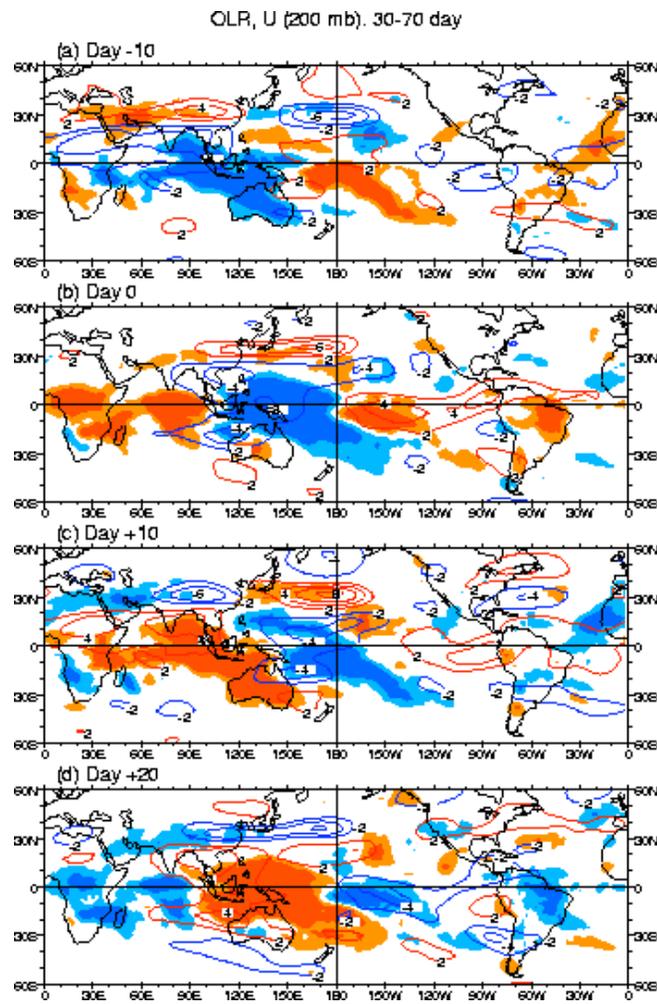
We are just going to mention a few selected items here. More details will be given later today.



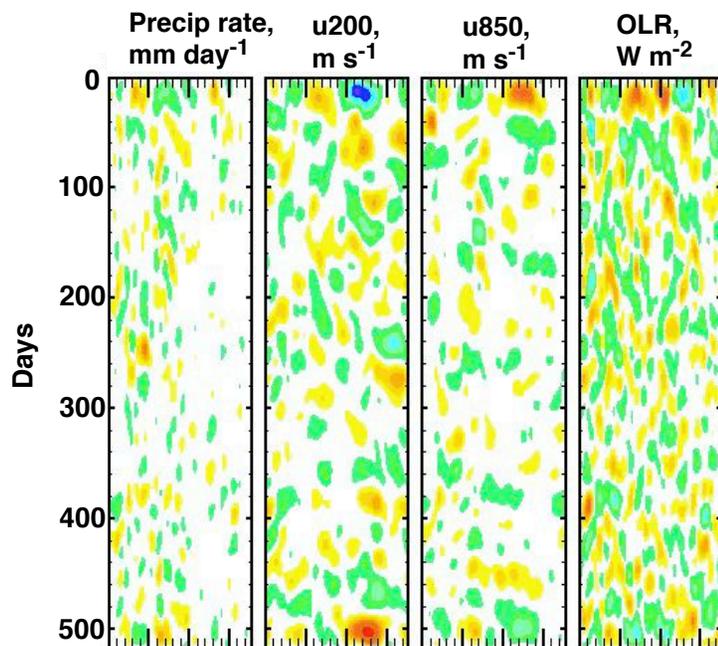
Research Successes



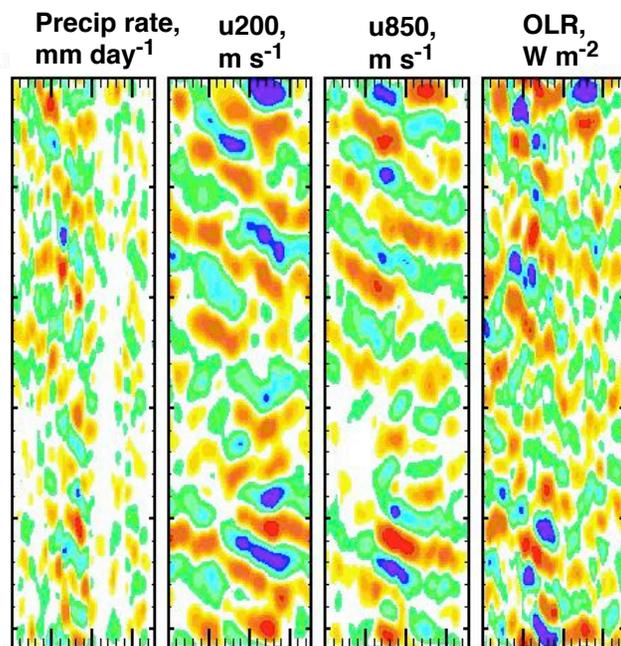
The Madden-Julian Oscillation



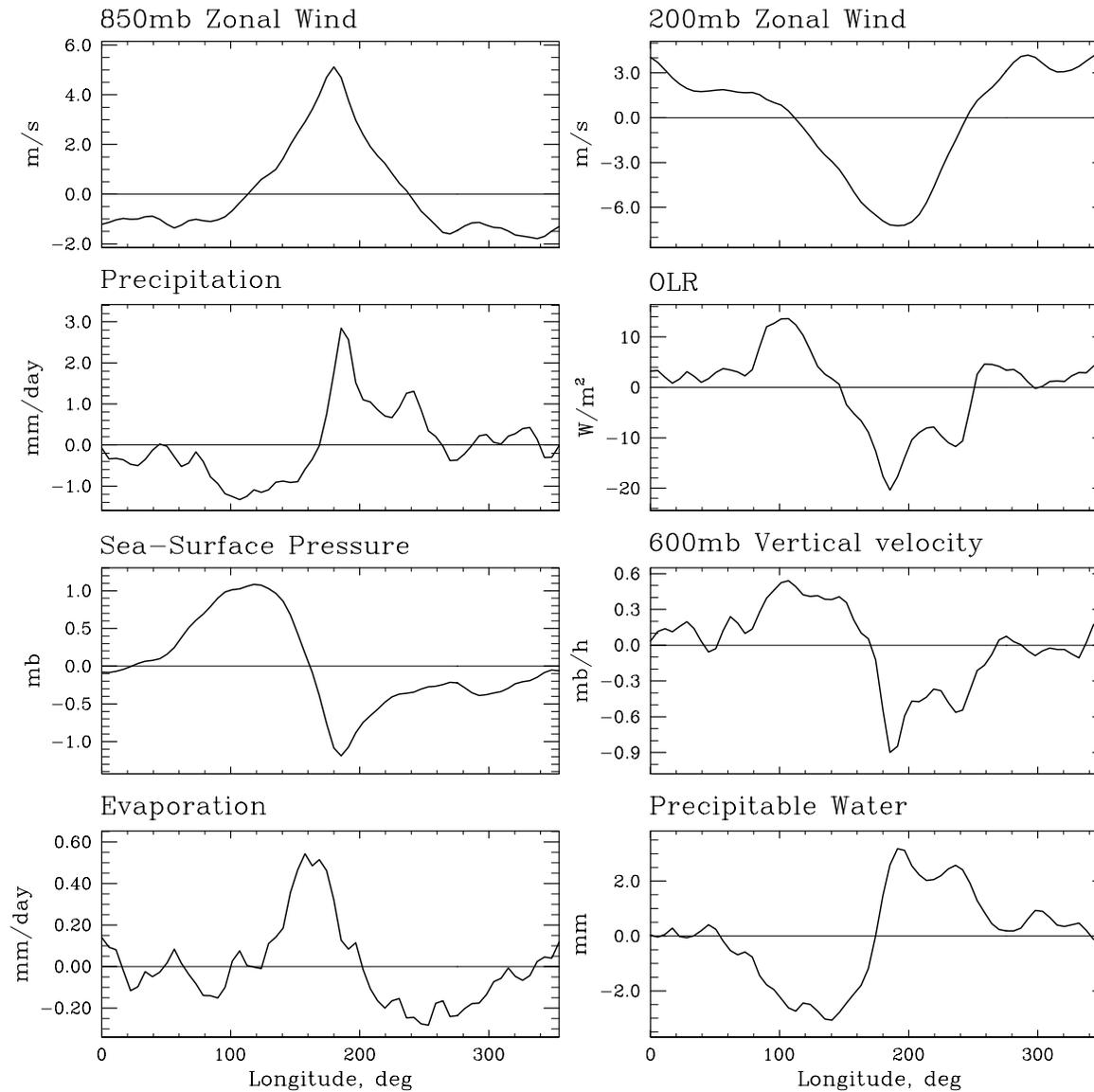
Control



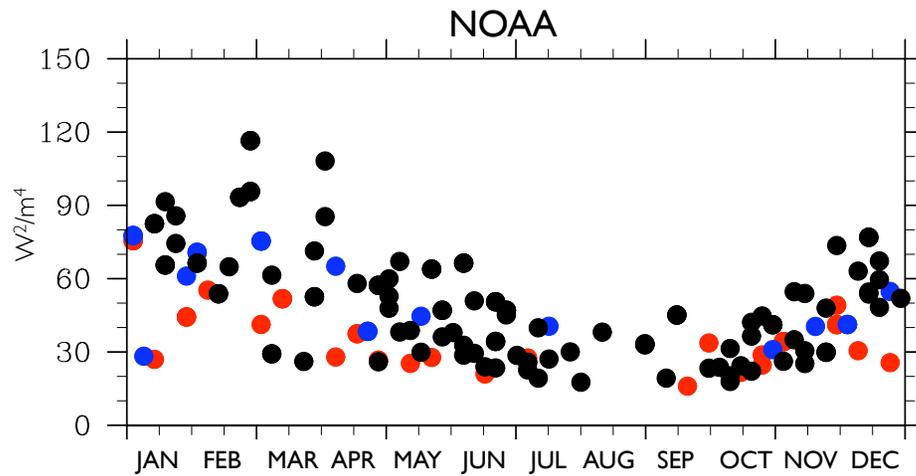
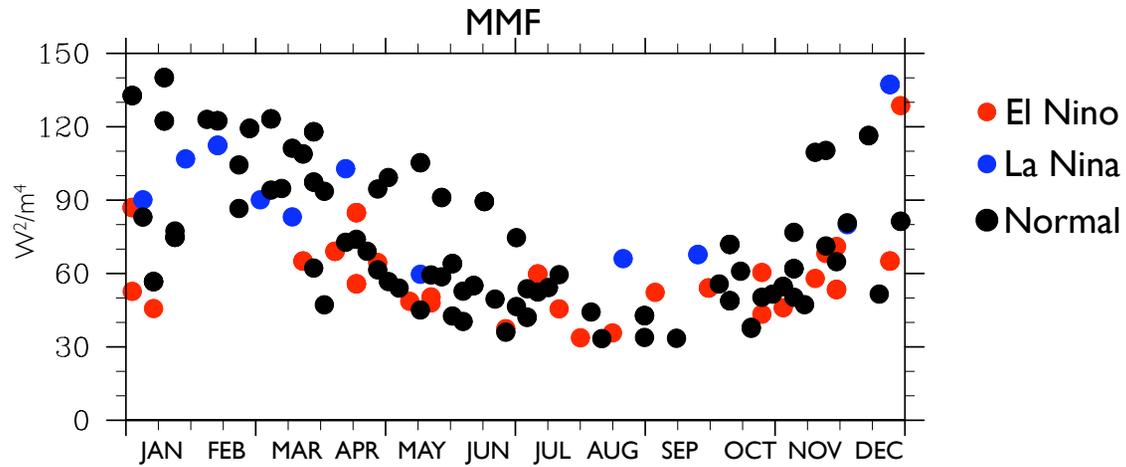
Multiscale Model



Composite MJO structure



MJO-event OLR anomalies 1986-2003



Evaluation of the Multiscale Model using CAPT

CAPT = CCPP-ARM Parameterization Testbed

CCPP - Climate Change Prediction Program

ARM - Atmospheric Radiation Measurement Program

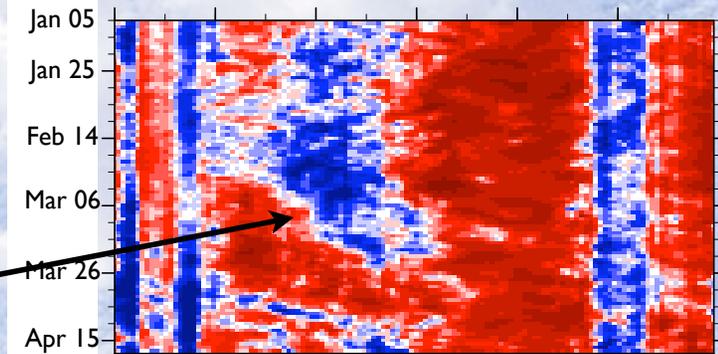
- In a nutshell, CAPT is a way of testing GCMs in weather forecasting mode;
- CAPT reveals model biases in short simulations hence avoiding complexities of large-scale dynamics and local-physics interactions;
- CAPT allows case studies of specific phenomena, for example, MJO-events using high-frequency point observations such as ARM;
- Relatively short CAPT forecasts provide very economical framework for MMF evaluation
- The standard version of CAM will be subjected to the same tests as the MMF

MJO hindcasts using MMF-CAPT

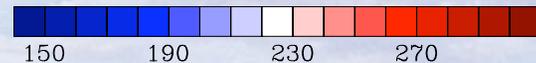
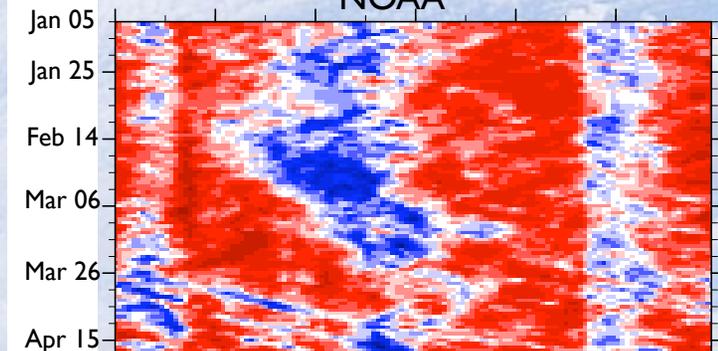
- **Create continuous initial conditions by nudging the GCM grid-scale U, V, T, Q, and PS to ERA-40 or NCEP reanalysis over duration of an MJO event**
- **Clouds are not nudged but simulated by the MMF**
- **CRM fields are also saved, thus, no CRM spin-up during forecast initialization is needed**
- **Created initial conditions will be used to branch out forecasts during any stage of an MJO using a free running MMF**

Outgoing Longwave Radiation (W/m²)

MMF: Nudging time-scale 6 hours

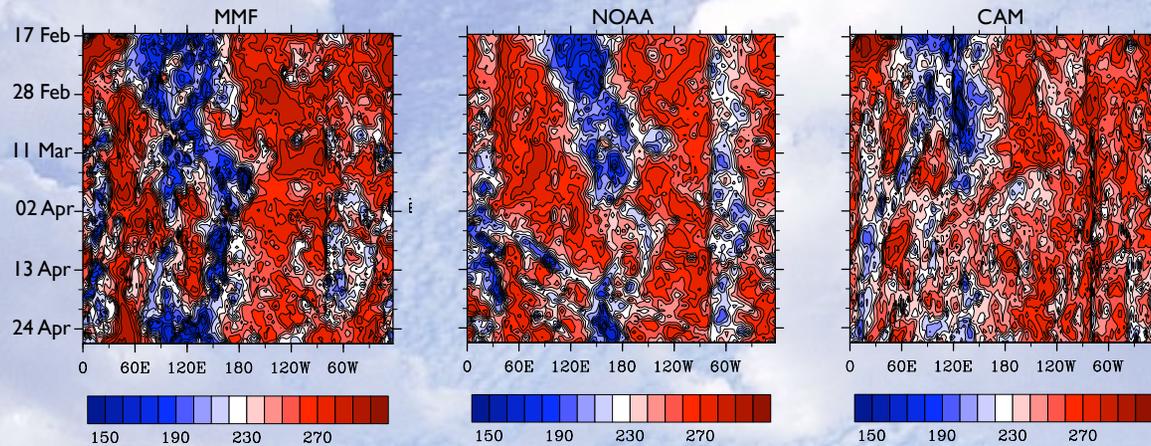


NOAA

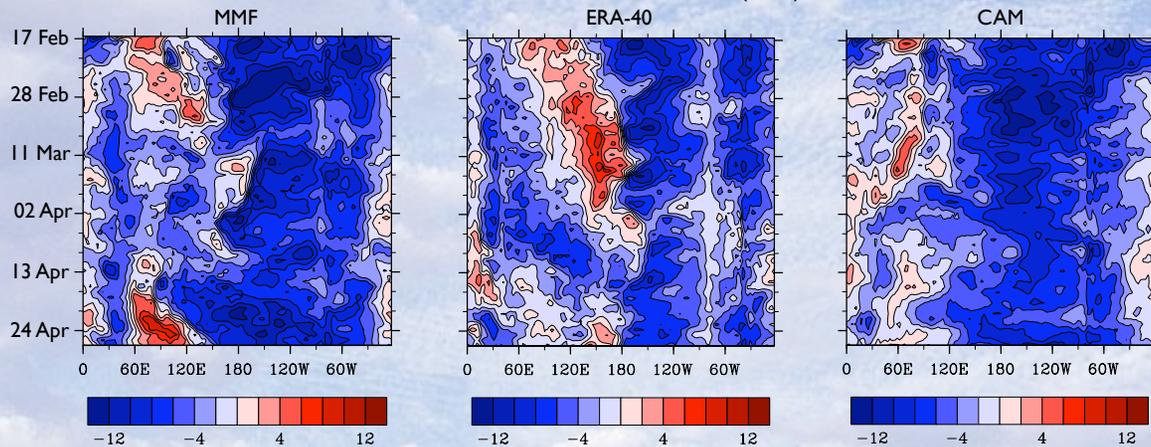


Preliminary MJO forecast

Outgoing longwave radiation (W/m^2)



Zonal wind at 850 mb (m/s)



The Multiscale Model is able to maintain the observed structure of MJO for a week or more.

The CAM tends to suppress westward MJO propagation.

Research Issues

- ◆ **No major issues at this time.**
- ◆ **Minor issues:**
 - ▲ **Reprogramming of new cloud-resolving model so that it can run on multi-processor computers**
 - ▲ **Computational slowness of new turbulence parameterization being tested**

Education



Education Successes

◆ **Colorado Climate Conference**





Diversity



Knowledge Transfer



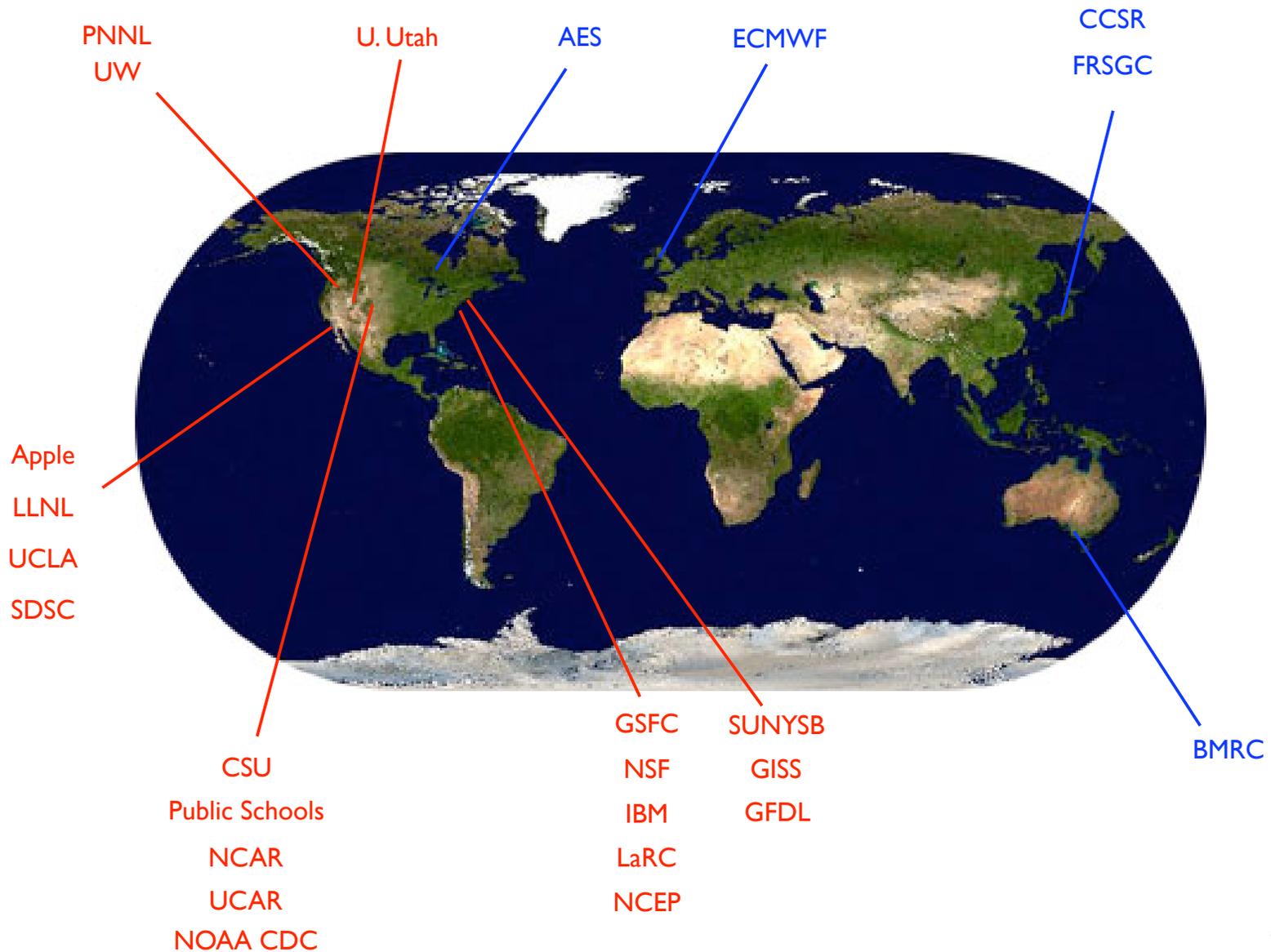
KT Successes

- ◆ **Book is moving quickly**
- ◆ **CMMAP participation in IPCC**

KT Issues

- ◆ **Increasing NCEP involvement**
- ◆ **Increasing CGD involvement**
- ◆ **Constraints on interactions with non-US participants (England, Canada, Japan, Australia)**
- ◆ **Identifying a publisher for the journal**

CMMAP participants



Computational Expense

- ◆ **The MMF is about 250 times more expensive than the standard CAM.**
- ◆ **MMAF will use lots of computer time.**
- ◆ **This is discussed further in a later talk.**



A CENTURY OF WEATHER SERVICE

*A History of the Birth and Growth of the
National Weather Service*

1870 - 1970

PATRICK HUGHES

Environmental Data Service
Environmental Science Services Administration
U. S. Department of Commerce
Washington, D. C.

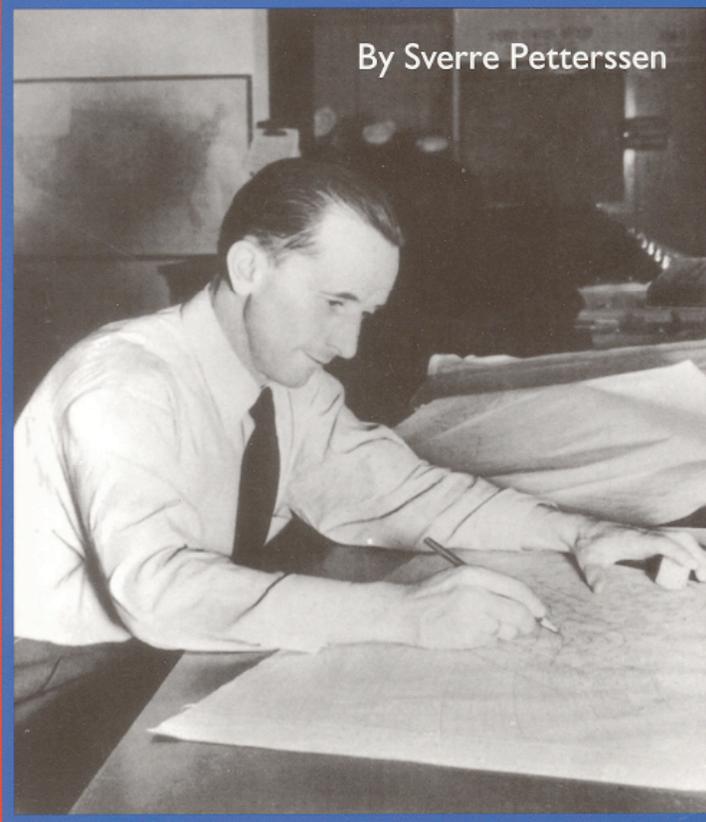
GORDON AND BREACH, SCIENCE PUBLISHERS, INC.

NEW YORK LONDON PARIS

*Weathering the Storm:
Sverre Petterssen, the D-Day Forecast,
and the Rise of Modern Meteorology*

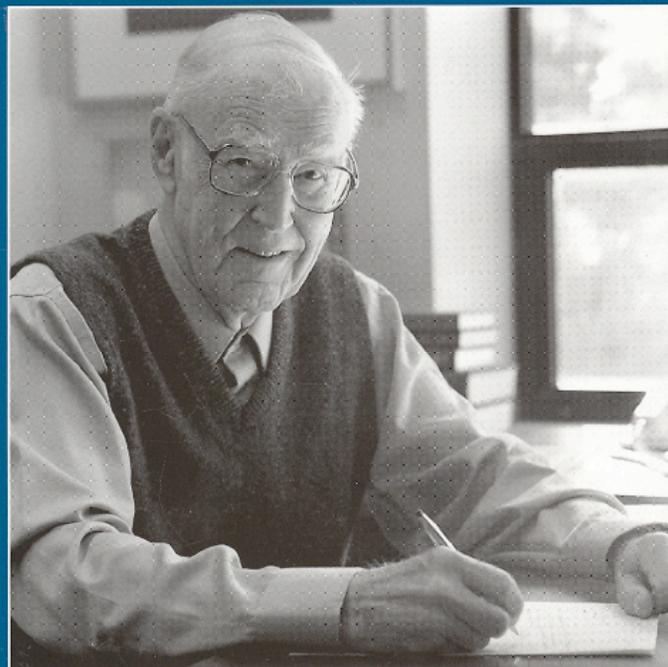
Edited by James Rodger Fleming

By Sverre Petterssen



AMERICAN METEOROLOGICAL SOCIETY

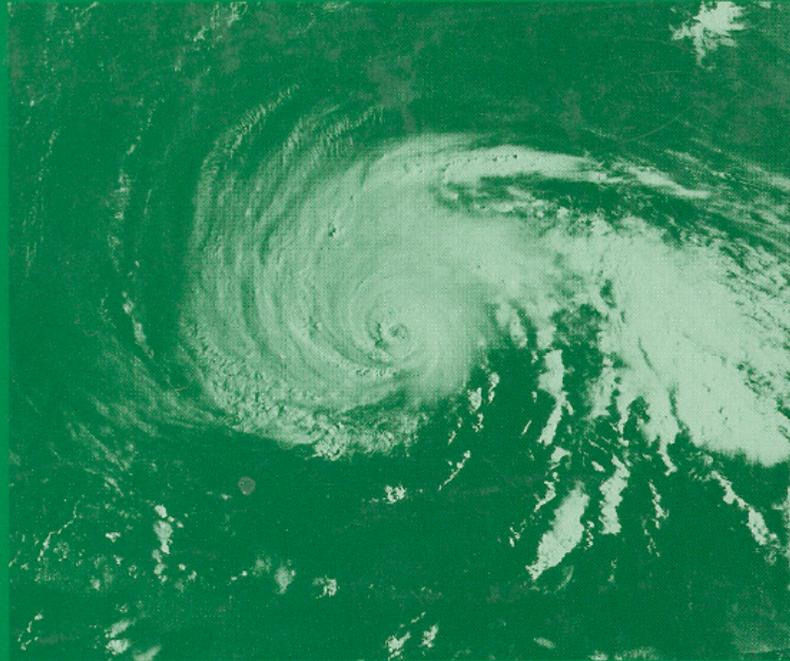
Eyewitness:
Evolution of the Atmospheric Sciences



By Robert G. Fleagle

American Meteorological Society

Calculating the Weather



Meteorology in the 20th Century

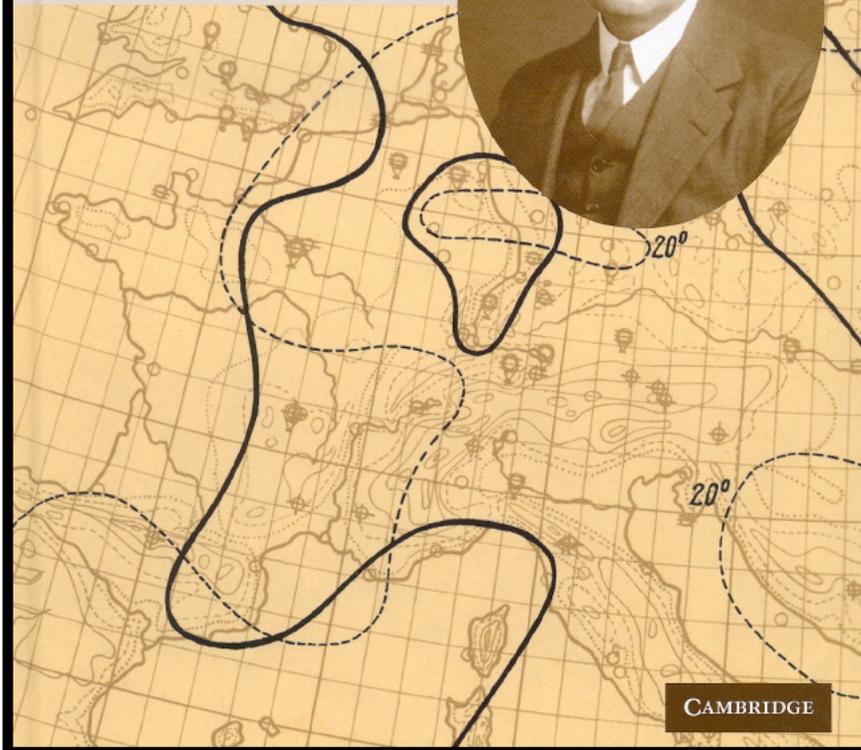
Frederik Nebeker



The Emergence of
**Numerical Weather
Prediction**

Richardson's Dream

PETER LYNCH



CAMBRIDGE

*John von Neumann and the Origins of
Modern Computing*

William Aspray

The MIT Press
Cambridge, Massachusetts
London, England

KT Success #1

The Center will produce an edited book on the History of Atmospheric General Circulation Modeling.

Authors for nine subject chapters have been lined up.

Next steps: Leo Donner and Rodger Ames will write a book proposal to submit to multiple prospective publishers.

The Center will make available to the authors interviews from the NCAR historical archives.

A History of Atmospheric General Circulation Modeling

Forward (Lorenz?)

1. Introduction (Editors)

2. From Richardson to Early Numerical

Weather Prediction (Peter Lynch)

3. From Early Numerical Weather Prediction to General
Circulation Models for Climate (Lennart Bengtsson)

4. The Evolution of Research Goals for General Circulation Models (Warren Washington and Akira Kasahara)

5. The Evolution of Complexity in General Circulation Models (David Randall)

6. Numerical Weather Prediction in the Era of Climate General Circulation Models (?)

7. The Role of Observations in Developing and Evaluating General Circulation Models (V. Ramanathan)

8. The Societal Context of General Circulation Model Research and Development

9. Coupling Atmospheric General Circulation Models to Oceans (Kirk Bryan)

10. Coupling Atmospheric General Circulation to Land, Chemistry, and Biology (Robert Dickinson)

KT Success #2

Related to KT Objective 4: Create a new all-electronic open-access journal for the publication of research on global environmental modeling, including a section for publication of review articles.

KT Success #2

Rodger Ames has researched online journal formats, the current issues surrounding open access publishing, and accumulated statistics on impact and cost of scientific journals in atmospheric and environmental science. The relatively new open access journal ACP has recently become the highest impact journal in atmospheric sciences, surpassing the Journal of Climate for top spot.

KT Success #2

A fact sheet outlining the scope and description of the new journal has been prepared.

Next steps: The fact sheet will be sent to potential publishers to determine their interest in affiliating with the Center in this publishing venture.

KT Success #3

Relates to KT Objectives 1 and 2: (1) Provide to climate modeling centers improved tools for the simulation of global cloudiness, as well as innovative tools for the analysis of such simulations, and (2) Provide improved cloud parameterizations to numerical weather prediction centers.

KT Success #3

Efforts are underway to promote student and post doc involvement at CMMAP partner Centers. These interactions are a mechanism to transfer `fruits' of CMMAP research to Climate and NWP Centers.

Progress to date evaluating MMF-enabled SuperCAM using the DOE CCPP-ARM Parameterization Testbed (CAPT)

KT Success #4

Relates to KT Objective 5: Create and maintain a website containing a section designed to make CMMAP results easily available to the scientific community, and a section designed to increase public understanding of issues in global climate modeling.

KT Success #4

A design document for the KT corner of the web site has been prepared. This design document will be further developed jointly by members of the EC, ED Committee, and CIWG so that web development efforts best suit the Center's objectives.

KT Issues

- Issue/Opportunity: potential overlap between how the Center achieves certain KT Objectives and ED activities.
 - The Center wants to involve students and post docs at partner organizations as a means to facilitate KT Objectives 1 & 2 (KT to Climate and NWP Centers).
 - ED has set up a summer institute where students will share research projects and establish future collaborations.
- Resolution/Action: KT will host a poster and information table at the summer institute to inform students about resources and opportunities at partner organizations.
 - Students can meet PIs at partner centers.
 - Identify projects that relate to KT Objectives 1 & 2.
 - KT and ED Managers are working together to identify synergies

Management Successes

- ◆ **Creation of financial tracking system**
- ◆ **Creation of reporting system**
- ◆ **Hiring of SE and KT managers**

Management Issues

- ◆ **Increasing the interactions between the researchers and the educators**
- ◆ **Need for MOU regarding Intellectual Property?**
 - ▲ **MOU not needed**
 - ▲ **IPA for subawardees only**
 - ▲ **Non-disclosure agreement for all, on an as-needed basis**

Global Issues

- ◆ **Increasing the interactions between the researchers and the educators**

Questions?

