# 7th CMMAP Team Meeting

# Introductions

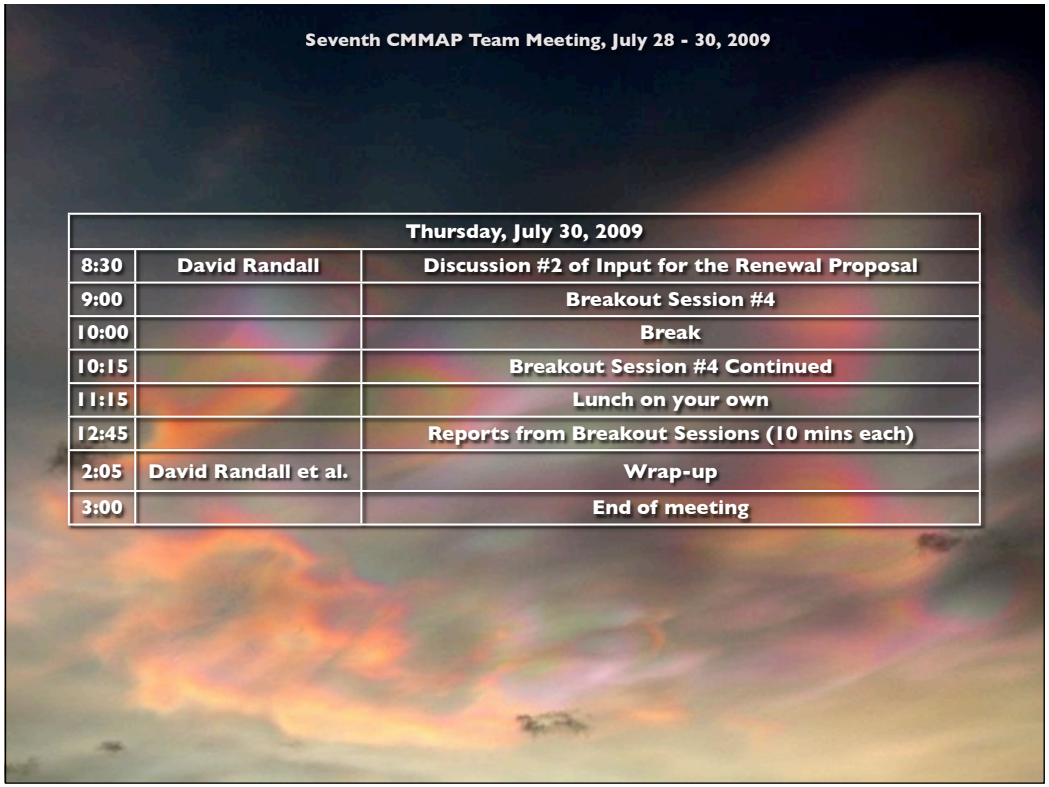
- Eric DeWeaver, NSF
- Interns
- Larissa Back, MIT (EAP)
- Marco Molinaro, UC Davis (EAP)
- Gordon Bonan, NCAR
- Jin Lee, NOAA
- Kiranmayi Landu, GFDL → CSU
- Parthasarathi Mukhopadhyay, IITM Pune, and now on sabbatical at JPL
- Alexandra Jonko, Oregon State
- Ming Cai, FSU
- Cecelia DeLuca, NCAR → NOAA
- Gary Wick & Marty Ralph, NOAA
- Barbara Whitten, CC

## Seventh CMMAP Team Meeting, July 28 - 30, 2009

| Tuesday, July 28, 2009 | | |
|---|---|---|
| 8:30 | David Randall, Eric DeWeaver, Cindy Carrick | Opening remarks/Agenda/Logistics |
| 8:45 | David Randall | Updates |
| 9:15 | David Randall, Scott Denning, Wayne Schubert | CMMAP Renewal Proposal |
| 10:15 | | Break |
| 10:30 | Steve Krueger | What Can CRM and MMF Simulations Tell Us About Critical Phenomena in Atmospheric Precipitation? |
| 11:00 | John Calderazzo & SueEllen Campbell | Changing Climates Beyond the Ivory Tower |
| 11:30 | | Lunch on your own |
| 1:00 | Gordon Bonan | CCSM Community Land Model Developments for AR5 |
| 1:45 | | Breakout Session #1 |
| 3:00 | | Break |
| 3:15 | | Breakout Session #1 Continues |
| 4:00 | Connie Uliasz | Ethics Discussion |
| 4:45 | | Adjourn for the day |
| 5:30 | | Team Dinner at David Randall's house |

Seventh CMMAP Team Meeting, July 28 - 30, 2009

| Wednesday, July 29, 2009 | | |
|---|---|---|
| 8:30 | Joon-Hee Jung | Progress with the Q3D MMF |
| 9:15 | | Breakout Session #2 |
| 10:15 | | Break |
| 10:30 | | Breakout Session #2 continues |
| 11:30 | | Lunch on your own |
| 1:00 | | Breakout Session #3 |
| 3:00 | | Break |
| 3:15 | Mike Pritchard | Taking a Closer Look at the Daily Rainfall Cycle in the CSU MMF |
| 3:45 | Brian Medeiros | Ordinary Clouds and their Extraordinary Impacts |
| 4:15 | David Randall | Progress with the GCRM |
| 4:45 | David Randall | Discussion #1 of Input for the Renewal Proposal |
| 5:15 | | Adjourn, travel to CMMAP Building |
| 5:45 | | Poster Session and Reception at CMMAP Building |


Seventh CMMAP Team Meeting, July 28 - 30, 2009
Thursday, July 30, 2009
8:30 David Randall Discussion #2 of Input for the Renewal Proposal
9:00 Breakout Session #4
10:00 Break
10:15 Breakout Session #4 Continued
11:15 Lunch on your own
12:45 Reports from Breakout Sessions (10 mins each)
2:05 David Randall et al. Wrap-up
3:00 End of meeting

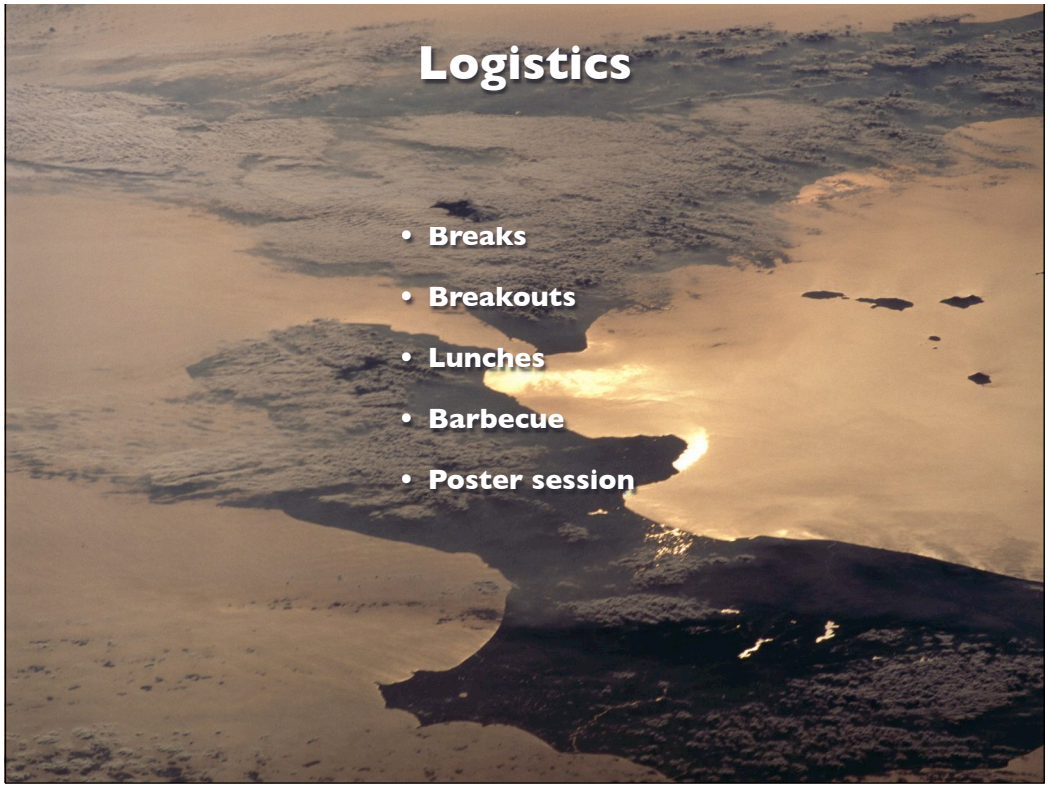
Seventh CMMAP Team Meeting, July 28 - 30, 2009

# List of Breakout Sessions:

| Where | Breakout Session #1<br>Tuesday PM | Breakout Session #2<br>Wednesday AM | Breakout Session #3<br>Wednesday PM | Breakout Session #4<br>Thursday AM |
|---|---|---|---|---|
| Main Meeting Room | MJO<br>*Maloney and Waliser* | KT to NWP and Climate Centers<br>*Collins* | *Education & Diversity*<br>*Burt* | Low-cloud feedbacks<br>*Stevens and Bretherton* |
| Breakout room** | *Multiscale Land Surface Interactions*<br>*Denning* | Physical Processes<br>*Moeng and Krueger* | Dynamical Framework<br>*Randall and Arakawa* | CyberInfrastructure Working Group<br>*Helly* |

**Tuesday and Wednesday in the Windsor I & II Rooms

**Thursday in Salons F-H


Logistics
• Breaks
• Breakouts
• Lunches
• Barbecue
• Poster session


CMMAP has just finished its third year.
• GCRM mid-term review
• Annual report submitted
• Site visit
• CCSM Workshop
• CFMIP + GCSS meeting
• CMMAP building completed
• Diversity recruiting
• JAMES publishes first eight papers
• Colorado Global Climate Conference
• Teacher training course
• Summer interns
• Graduate student colloquium
• John & Sue Ellen's visit to NSF

# Taking stock

- What is going well
  - Education, across the board
  - Coupled run
  - Q3D, but it's taking time
  - GCRM
  - Testing parameterizations in CRMs
  - Book
  - Journal
- What needs work
  - Implementing parameterizations in the MMF
  - Interactions with climate centers
  - Interactions with NWP centers
  - Diversity recruiting


Renewal

# The process, I

- First five years end on June 30, 2011.
- Renewal proposal is due October 9, 2009.
- The budget is flat.
- Cost share is unchanged: 30%.
- NSF will conduct a site visit (3 days), mid-February 2010.
- We will be notified of the outcome by June 2010.

# The process, 2

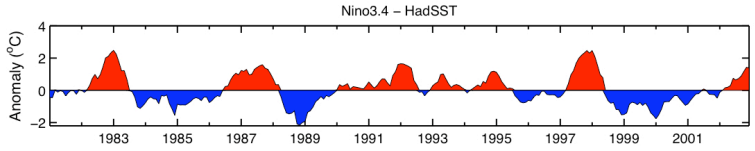
- This is the “inclusive” phase of proposal preparation.
- Ideas / “content” are solicited from all Team Members, including students.
- Text is by far the most useful form.
- We will discuss the renewal proposal in multiple sessions at this meeting.
- Deadline is August 31.
- The proposal is being prepared by the EC, based in part on input received from the Team.
- Not all suggestions will make it into the proposal.

# Research I

| Future Objective | Actions Required |
|---|---|
| 1. Further development of global models with explicit representations of cloud processes | Q3D MMF |
| | GCRM |
| | Others? |
| 2. Application of the MMF to study the coupled climate system and anthropogenic climate change | High-resolution simulations of the interactions of the atmosphere with the land-surface, with foci on water, energy and carbon. |
| | Academic CMIP run |
| | Academic AR5 scenario |
| 3. Accelerating improvement of conventional parameterizations. | Cumulus convection |
| | Turbulence in and above the boundary layer |
| | Momentum transport by convectively generated gravity waves |
| 4. Further development and testing of improved parameterizations of microphysics, turbulence, and radiation for MMFs and GCRMs. | Develop new parameterizations |
| | Test in CRMs |
| | Test in MMFs and GCRMs |

# ENSO Simulation

## Niño 3.4 (5S-5N,170W-120W)

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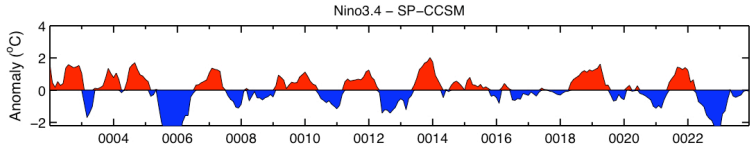
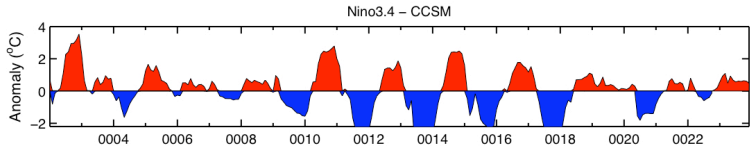



**SP-CCSM**




**CCSM**

# ENSO Simulation

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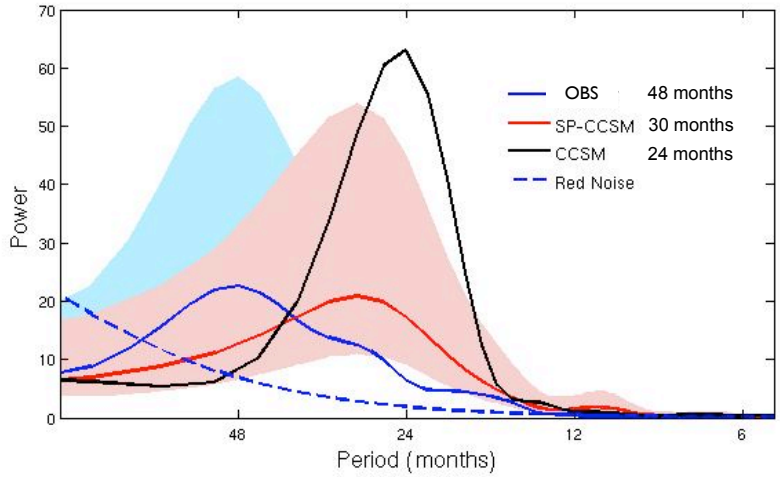


# Research 2

| Future Objective | Actions Required |
|---|---|
| 5. Innovative analysis, evaluation and interpretation of model results using emerging data sets. | Participation in CFMIP |
| | Participation in GEWEX intercomparisons |
| | Experimental NWP using the GCRM |
| 6. Application of the MMF and GCRM to study multiscale interactions of the atmosphere and the land-surface. | Hydrology |
| | Topography |
| | Monsoons |
| 7. Management, analysis, and visualization of very large model output datasets -- creation of infrastructure | Creating model output |
| | Accessing/transporting model output |
| | Analyzing model output |
| | Visualizing model output |

# Future KT Objective: New Interactions with ESRL

## NOAA/ESRL

**Flow-following-finite-volume**

**Icosahedral**

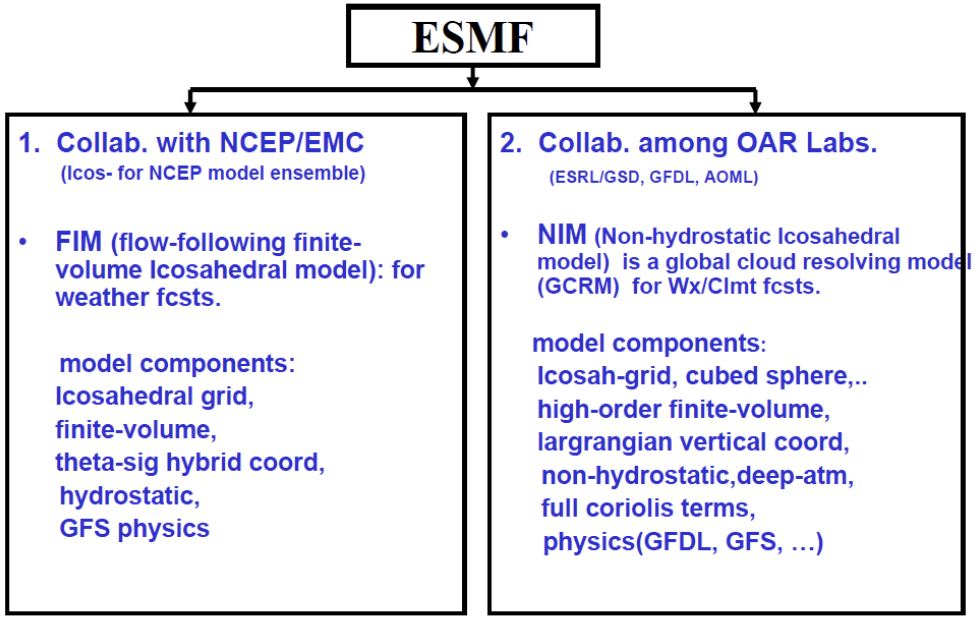
**Model**

### FIM


Jin Lee
Sandy MacDonald
Rainer Bleck
Stan Benjamin
Jian-Wen Bao
John M. Brown
Jacques Middlecoff
Ning Wang


*Earth System Research Laboratory*

# ESRL f.-v. Icos- models (FIM and NIM)



## ESRL global models development plan

- A finite-volume Icosahedral Shallow Water Model (SWM)
- Convert SWM to Single-Layer Model (SLM);
  Implement FCT for monotonicity and positive definite
- A 3-D model composed of Stacked SLMs using
  Lagrangian-type of vertical coordinate.
- Implement physics packages for weather and climate forecasts
- Implement Earth System Modeling Framework (ESMF)

# Global Modeling/Assimilation Theme Presentation

## Review Icosahedral Global Models Development /Overview NIM (non-hydrostatic Icos-model)

Jin Lee

# Knowledge Transfer

| Future Objective | Actions Required |
|---|---|
| 1. Interact with CCSM (and GFDL?) | Outreach |
| | Joint project(s) |
| | Offer parameterizations and/or dynamics through Working Group process |
| 2. Interact with ESRL and NCEP | Continue interactions with NCEP |
| | Create new interactions with ESRL |
| 3. Create a national training resource for global modelers (NOAA connection) | Create instructional materials |
| | Organize summer school |
| | Make instructional materials broadly available |
| 4. Wean JAMES from CMMAP. | Establish financial self-sufficiency |
| | Establish managerial self-sufficiency |
| | Hand-off to IGES |


Questions?