

Knowledge Transfer Working Group

Wednesday, Jan. 13, 2010

1. **Review of progress of KT activity** [Bill, w / Rodger and Wayne]
2. **Comparison of convective PDFs in SP-CAM and AM3** [Leo]
3. **Discussion of optimal organization of book** [Leo]
4. **Propagating summertime precipitation systems over US** [Mitch]
5. **Transpose-AMIP simulations of the MJO in YOTC** [Mitch]
6. **Bridging the Gap between Simulation and Understanding in Climate Modeling** [Wayne]

Update on NCEP

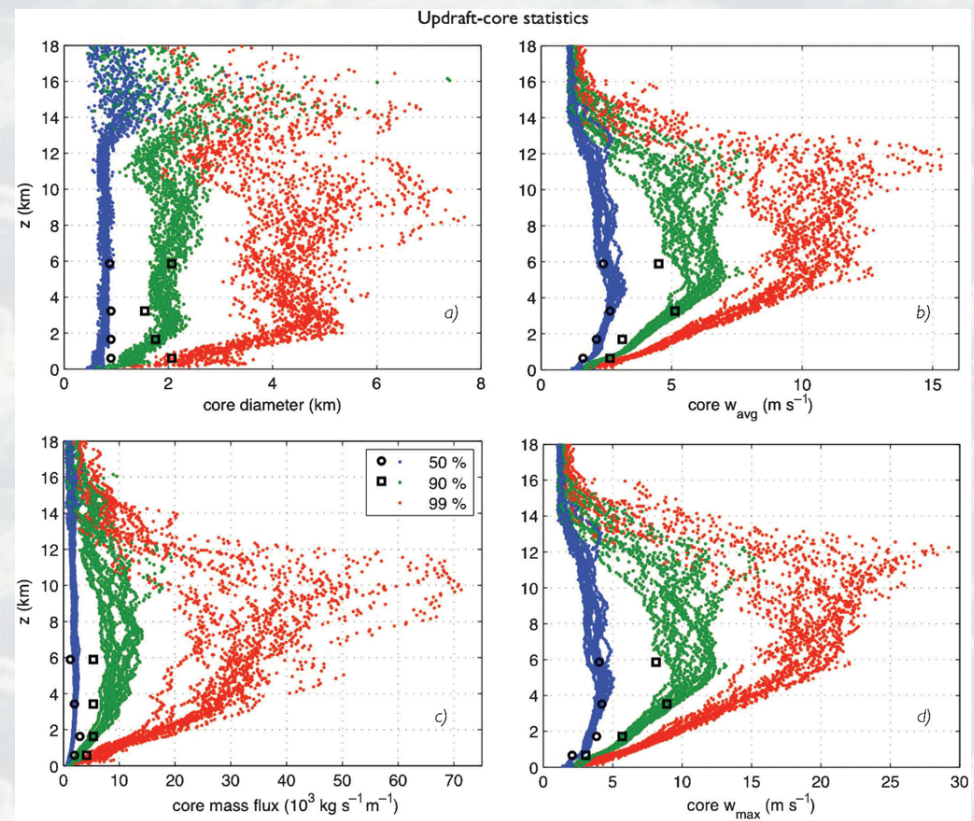
- Steve Krueger and Pete Bogenschutz visited NCEP on Nov. 13, 2009.
- They gave talks on:
 - **PDF methods for representing turbulence and clouds in coarse-grid CRM**
 - **Giga-LES as a potential resource for evaluating and improving cloud and convection parameterizations**
- NCEP Global modeling branch is interested in
 - **The assumed PDF method for cloud fraction parameterization**
 - **The Giga-LES, especially for improving the cumulus parameterization**
- Utah and NCEP are resolving 'Top 10' questions.

Update on NCAR

- NCAR intends to add super-parameterization as a supported configuration in the supported CCSM code base.
- NCAR recently discussed this with CMMAP.
- CMMAP and CCSM will pursue IPCC runs.

MMF analysis for GFDL

- Steve Krueger is comparing Giga-LES vs. GATE
- If Giga-LES is realistic, bootstrap to MMF runs.
- Use MMF runs to generate PDFs of vertical velocity.
- Compare MMF vs. AM3.
- Pursue 5-km AM3 global run.



Khairoutdinov et al, JAMES, 2009

Optimal organization of book



Current Chapter Order

- Foreword, Introduction (Held, Editors)
2. Richardson to Early NWP (Lynch)
3. Evolution of GCM Research Goals (Washington and Kasahara)
4. NWP/Climate Synergies (Senior)
5. Observations (Lau)
6. Societal Context (Fleming)
7. IPCC (Somerville)
8. Ocean Coupling (Bryan)
9. Land Coupling (Dickinson)
10. Complexity (Randall)



Optimal organization of book



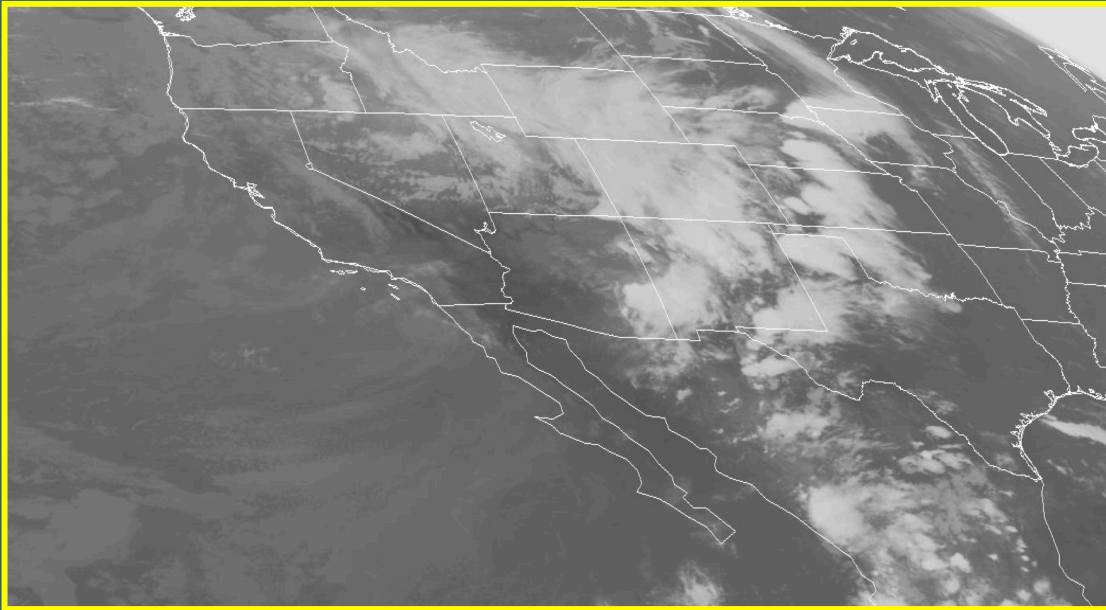
Revised Chapter Order

Foreword (Held)

1. Introduction (Editors)
2. Richardson to Early NWP (Lynch)
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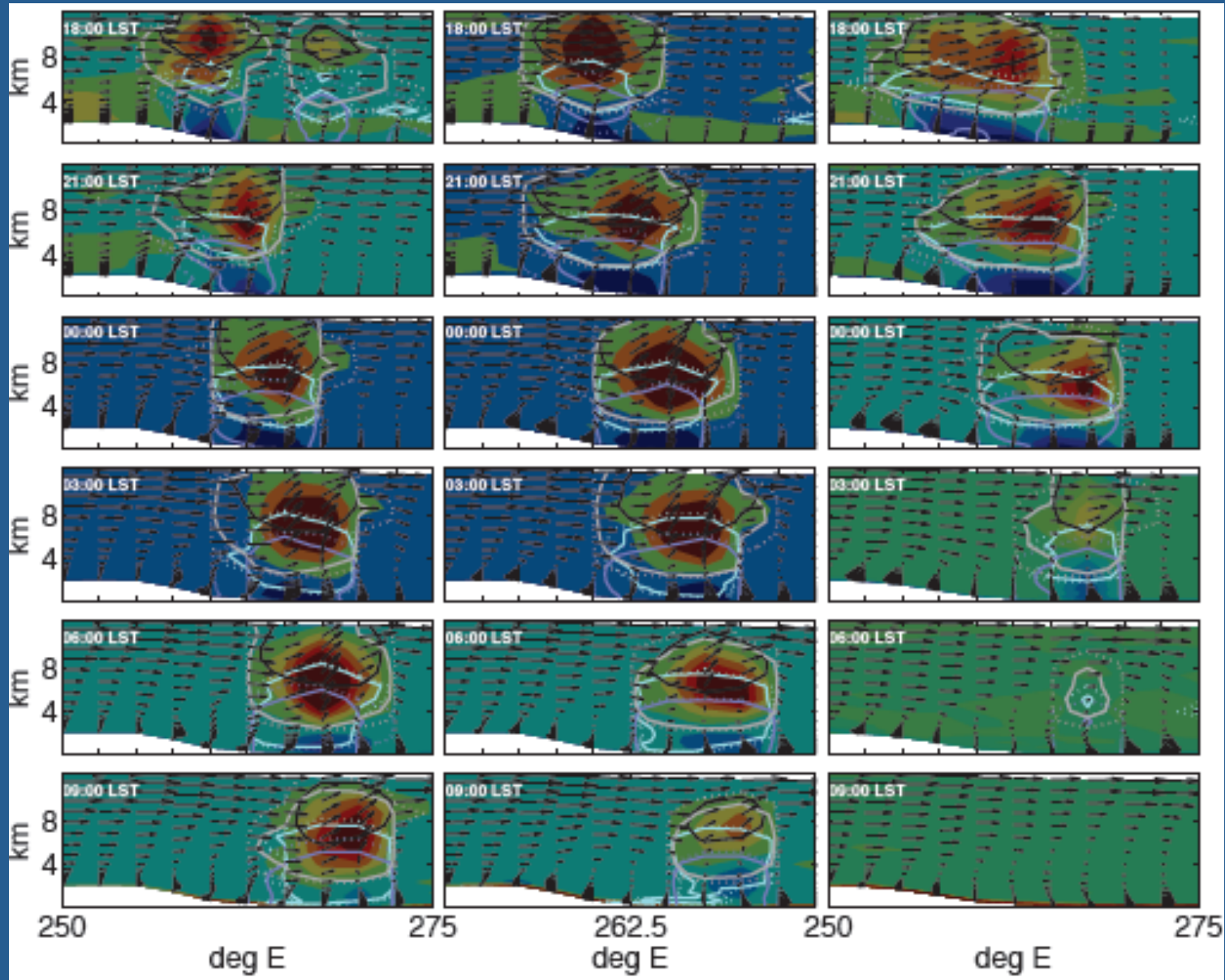
Orogenic Propagating Precipitation Systems over the Continental US



**Mitch Moncrieff
NCAR**

- Orogenic propagating convection not represented in climate models
- Even highest resolution global NWP models do not well represent the stratiform heating, mesoscale downdraft, if at all
- Parameterization development underway
- Investigations of SP-CAM propagating convection over US underway

Propagating orogenic convective systems in SPCAM



Global Prediction

High-resolution operational deterministic-model data sets

Integrated Observations

Satellite, field-campaign, *in-situ* data sets

Organized Tropical Convection



Year of Tropical Convection

Global Interaction

Research

Attribution studies of global data sets; parameterized, superparameterized, and explicit convection in regional-to-global models; theoretical studies

Focus Period

May 2008 – Apr 2010

Focus Areas

MJO & CCEWs
Easterly Waves & TCs
Trop-ExtraTrop
Interaction
Diurnal Cycle
Monsoons

Global Prediction

High-resolution operational deterministic-model data sets

Integrated Observations

Satellite, field-campaign, *in-situ* data sets

Organized Tropical Convection



Global Interaction

Research

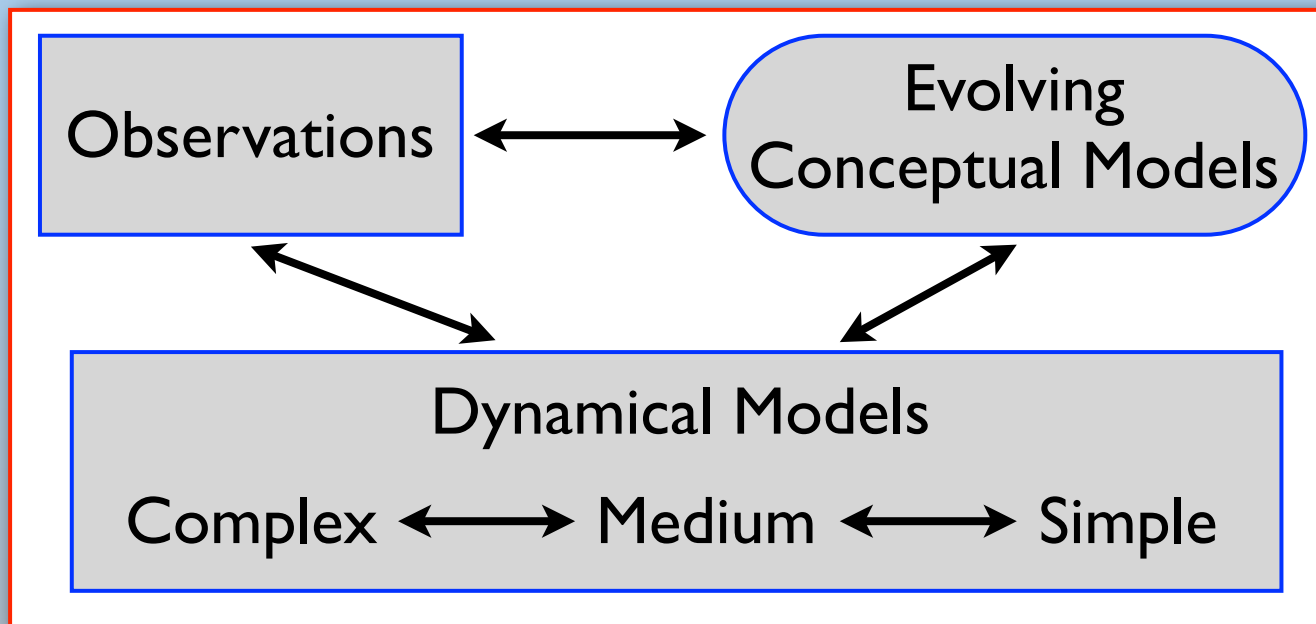
Attribution studies of global data sets; parameterized, superparameterized, and explicit convection in regional-to-global models; theoretical studies

High-res. simulations:

- CAM
- SP-CAM
- SP-CCSM
- CMIP5 Models
- NICAM
- Etc.

New!

The Optimum Situation in Meteorological Research

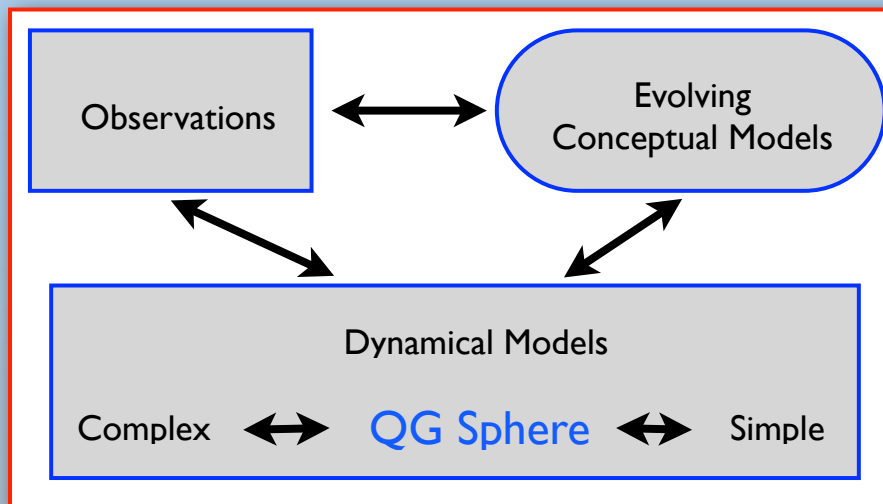


Observations and models of all complexities are used to produce evolving conceptual models.

(inspired by Hoskins, QJRMS, 1983)

Quasi-Geostrophic Theory on the Sphere

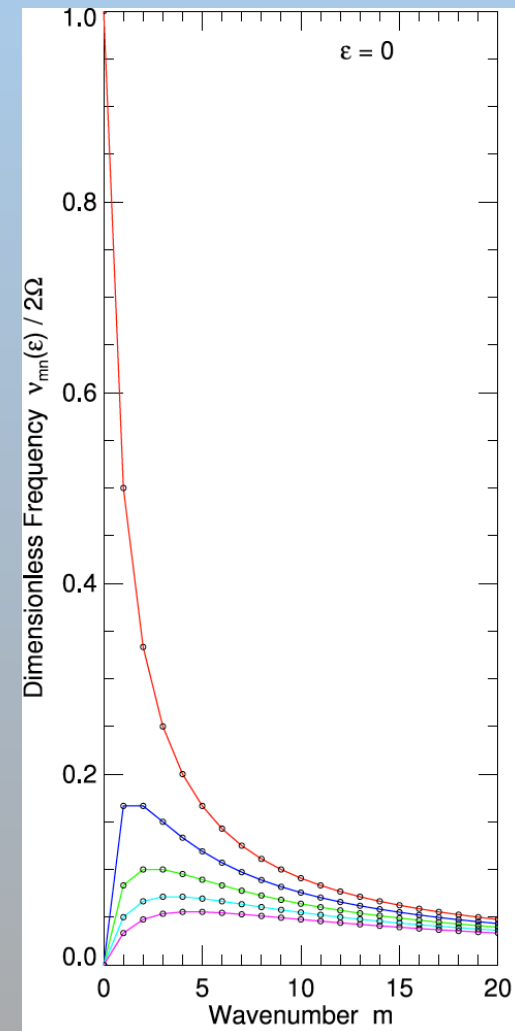
W. H. Schubert, R. K. Taft, L. G. Silvers



Rossby-Haurwitz Waves

- Linearized PV equation:

$$\frac{\partial}{\partial t} \left(\nabla^2 \psi - \frac{\epsilon \mu^2}{a^2} \psi \right) + \frac{2\Omega}{a^2} \frac{\partial \psi}{\partial \lambda} = 0$$



KT Action Items

- SP-CCSM will contribute run to YOTC project.
- SP-CCSM will conduct simulations with “ocean in motion” rather than at rest.
- SP-CCSM will consult with NCAR on ocean initialization, fast ocean adjustment, etc.
- GFDL will continue to monitor analysis of Giga-LES vertical velocities.