

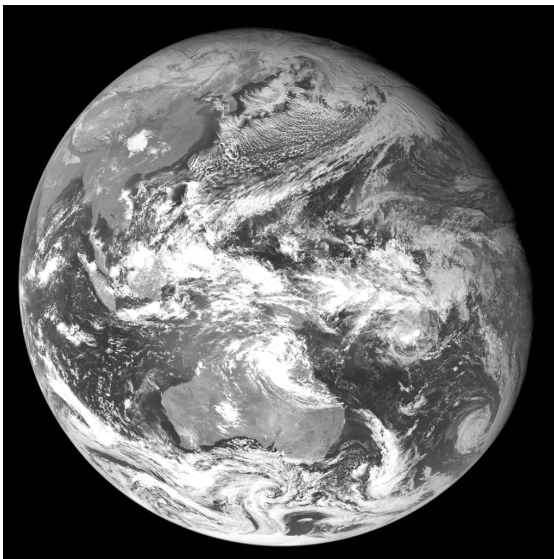
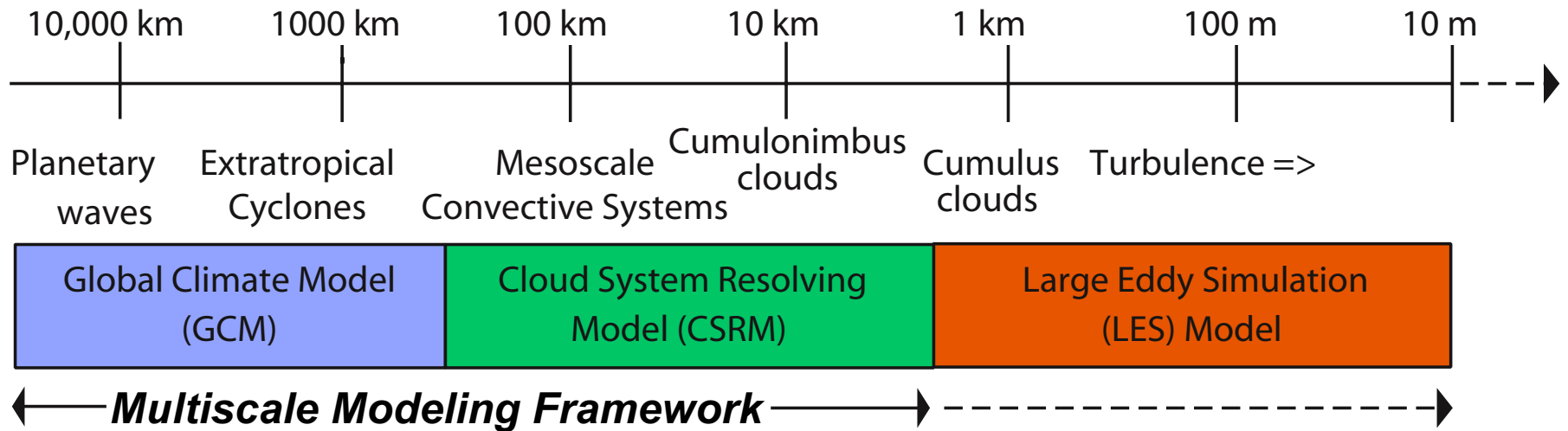


Focus on deep and shallow convection, and turbulence

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Scales of Atmospheric Motion



Boundary layer clouds in cloud-system-resolving models (CSRMs)

- CSRMs may have horizontal grid sizes of 4 km or more.
- Such CSRMs are used in MMF, GCRMs (global CSRMs), and tropical cyclone models.
- In MMF and GCRMs, CSRMs are expected to represent all types of cloud systems.
- However, many cloud-scale circulations are not resolved by CSRMs.
- Representations of SGS circulations currently used in CSRMs can be improved.



Strategy

- **Objectives:**

Improve the representation of SGS convection, turbulence, and microphysics in CSRMs used in MMFs, GCRMs, and NWP.

- **Proposed parameterizations**

- *PDF/HOC*: Cheng & Xu, Lappen & Randall
- *Two-scale MMF*: CSRM plus boundary-layer-eddy-resolving model (ERM)

- **Additional physics to be included**

- **SGS microphysics**
- Effects of *surface inhomogeneity* (elevation, land surface properties): both resolved by the CSRM and SGS

Strategy

- **Proposed evaluation methods**

- Analysis of and comparison to existing and new *benchmark simulations*
- Comparison to *observational datasets*

Focus group action items for Aug 2007

- **Identify or execute useful benchmark LES simulations:**
 - *Identify existing small-domain:* GCSS cases (all)
 - *Identify existing large-domain:* LBA, RICO, etc (all)
 - *Obtain forcing datasets from MMF and execute LES:* (Tao)
 - *Execute new idealized large-domain:* (Moeng)
 - *Update and test LES models with improved microphysics* (Krueger, Blossey, others)
- **Test and evaluate CRM/NWP/GCM parameterizations against benchmark simulations and/or observations**
 - *In SCMs and CRMs* (Cheng, Krueger, Lappen, Grabowski)

Focus group action items for Aug 2007

- **Analyze benchmark simulations**
 - *With goal to improve CSRM simulations (Moeng, others)*
 - *With goal to improve conventional GCM parameterizations (Krueger)*
- **Process relevant observational datasets**
 - *New products (Krueger, others)*
- **Collaborate with Low Cloud Feedbacks and MJO focus groups**
(Bjorn, Marat, Mitch, Steve)

Additional action items for next 2-3 years

- **Test and evaluate CRM/NWP/GCM parameterizations against benchmark simulations and/or observations**
 - In MMF
 - In NWP models
- **Optimize MMF CRM configuration**