



Vision Statement for Research

To understand and predict the effects of clouds on a wide range of Earth-system processes.

A photograph of a bright blue sky filled with large, white, fluffy cumulus clouds. The clouds are scattered across the frame, with a particularly large one on the left side. The text is overlaid on the right side of the image.

**Research Objective I.
Extensions, evaluations
and applications of the
prototype MMF**

Glossary

Term/Acronym	Meaning
GCM	General Circulation Model or Global Climate Model
Resolved	Capable of being represented on a particular grid
CRM, GCRM	(Global) Cloud Resolving Model
MMF, Q3D MMF	(Quasi-Three-Dimensional) Multiscale Modeling Framework
Radiative Transfer	The flow of solar and infrared radiation through the atmosphere
Coupling	Interactions between processes in the atmosphere
MJO	Madden-Julian Oscillation, a major weather phenomenon in the tropical atmosphere
SGS	Subgrid-scale, i.e., too small to represent on a given grid
PBL	Planetary boundary layer, the turbulent layer of air near the ground
NWP	Numerical weather prediction
Giga, Tera	Giga = 10^9, Tera = 10^{12}
Advection	The movement of air from place to place
Anelastic	An approximation that eliminates sound waves.

Research Objective 2. Development of a second-generation Multiscale Model and a Global Cloud Resolving Model

Akio Arakawa will discuss.



Research Objective 3. Develop and test improved microphysics parameterizations for MMFs and GCRMs

Hugh Morrison will discuss.



An aerial photograph showing a vast, flat landscape, possibly a coastal plain or delta region. The terrain is covered with a dense layer of low-lying vegetation or fields, interspersed with numerous small, scattered clouds. The sky is a clear, pale blue, and the overall scene is captured from a high altitude, providing a wide perspective of the terrain.

Research Objective 4. Develop and test improved turbulence parameterizations for MMFs and GCRMs

Chin-Hoh Moeng will discuss this afternoon.

Research Objective 5. Test sensitivity of CSRMs to more detailed radiation calculations

Robert Pincus will discuss.



Research Objective 6. Innovative analysis, evaluation and interpretation of Multiscale Model results using emerging datasets



**Research Objective 7. Accelerating
improvement of conventional
parameterizations**



An aerial photograph of a mountain range. The mountains are rugged and covered in green vegetation. A large valley is filled with a thick layer of white clouds, creating a sea of clouds effect. The sky is a clear, pale blue.

Research Objective 8. Optimal use of computational and data storage resources

John Helly will discuss this afternoon.

Questions?

