

Understanding and Modeling Atmospheric Processes: The 2nd Pan-GASS Meeting

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Atmospheric processes are important for weather, climate, and water prediction, as well as climate change projection. The 2nd Pan-GASS meeting was held to review the progress in understanding and modeling atmospheric processes and to develop ideas for future projects of the GEWEX Global Atmospheric System Studies (GASS) Panel. The meeting was sponsored by the Australian Research Council's Centre of Excellence for Climate System Science and about 160 participants from around 20 countries, including individuals from government agencies, academia, private sector, and international organizations, attended. For more information about the meeting, see: <http://singh.sci.monash.edu/Pan-GASS/index.shtml>.

The five-day conference included oral presentations, posters, plenary discussions and parallel discussion sessions. The oral presentation sessions covered these topics: shallow and deep convection; clouds, radiation and circulation feedback; new observational efforts; surface drag and momentum feedbacks; next generation modeling; physics-dynamics coupling; polar prediction; microphysics and aerosol interactions; methods for gaining model insight and land-atmosphere interactions.

The parallel sessions discussed seven white papers on the following topics: constraining drag processes, modeling the precipitation diurnal cycle, fog modeling intercomparison, dynamics-physics coupling, joint modeling activity over the Caribbean, land temperature and snowpack impacts on sub-seasonal to seasonal prediction, and grey-zone modeling.

Looking forward, GASS is proactively pursuing new projects in four theme areas: model physics, high-resolution modeling, dynamics-physics coupling, and prediction. The white papers discussed in the parallel sessions are being considered as six GASS projects. Some of these will be jointly sponsored by GASS and other international programs. The following lists the topic for each proposed GASS project and one of the science questions to be addressed.

Surface drag and momentum feedbacks. Can high-resolution simulations and Large-Eddy Simulations (LES) really be used as a proxy for the truth, and at which resolutions are we fully resolving particular processes?

Modeling the precipitation diurnal cycle. Which subdiurnal processes are most essential for the simulation of the diurnal cycle and subdiurnal extreme events, and how can these be improved in weather and climate models?

Fog modeling intercomparison. What are the key processes governing the development of radiation fog (e.g., aerosol, cloud microphysics, radiation, turbulence, dew deposition)?

Grey-zone modeling (with grid sizes from 100 m to 10 km). What controls the convective mass flux, convective mixing, cloud depth and cloud fraction of shallow cumulus clouds?

Physics-dynamics coupling. How do different models perform when run with different timesteps, and how do changes in behavior relate to climate sensitivities or sensitivities in model tuning?

Land temperature and snowpack impacts on subseasonal to seasonal (S2S) prediction. What is the impact of the initialization of large-scale land surface and subsurface temperature and snow pack, including aerosols in snow and in climate models on the S2S prediction over different regions?

Implementation plans are being prepared for each of these topics to become GASS projects whenever they are ready.



Participants at the 2nd Pan-GASS Conference