GEWEX Global Atmospheric System Studies (GASS)

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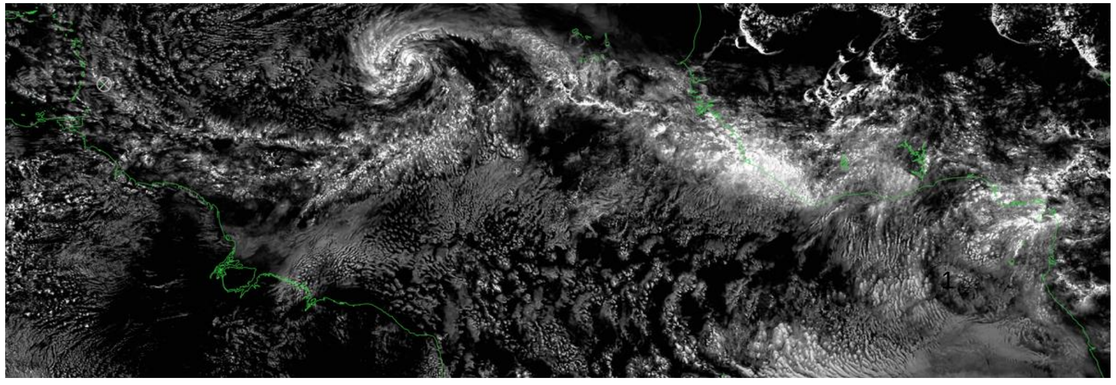
25 Feb – 1 Mar 2019
GEWEX SSG
Geneva, Switzerland



Highlights - Part I

- Highly successful Pan-GASS Conference in Australia from 26 Feb – 2 Mar 2018
- Four new projects initiated, another is close to being launched
- They are highly related to the top three errors from WGNE Systematic Error Survey Results Summary (2/11/2019, C. Reynolds et al.)

  --- Precipitation diurnal cycle, intensity and frequency
  --- Surface fluxes and temperature diurnal cycle
  --- Cloud microphysics

- Panel members recruited, based on projects
- Streamlining the GASS relationship with PROES (GAP, UTCC)
- Comprehensively revised the GASS projects web site

Understanding and Modelling Atmospheric Processes

The 2nd Pan-GASS meeting sponsored by the ARC Centre of Excellence for Climate System Science

26TH FEBRUARY 2018 - 2ND MARCH 2018, LORNE, VICTORIA, AUSTRALIA

- 200+ abstracts
- 168 accepted
- 160+ registrations
- 10 sessions
- breakout groups
- planery discussions

with the goal to initiate projects

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Future Community Efforts in Understanding and Modeling Atmospheric Processes

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Future Community Efforts in Understanding and Modeling Atmospheric Processes

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Featured Special Colle

Waves to Weather (W2W)
- JAS, MWR, JHM, WAF

Process-Oriented Model Diagno
- JCLI, JAS

How we initiated projects:

Bottom up…
Motivate groups to write white paper,
Iterate with GASS panel,
Iterate with other international programs (if relevant),
Iterate with the GASS community of 500+ scientists in the email list,
Define deliverables and stages

- Only when ready, we launch

Project descriptions and white paper:
https://www.gewex.org/panels/global-atmospheric-system-studies-panel/gass-projects/

GASS Projects Launched in 2018

Surface drag and momentum transport (COORDE)

Impact of initalized land temperature and snowpack on sub-seasonal to seasonal prediction (LS4P)

Demistify: An LES & NWP fog modelling intercomparison

Improving the simulation of diurnal and sub-diurnal precipitation over different climate regimes

GASS Project to be Launched in 1st half of 2019

Second phase of the "Grey Zone" project based on the EUREC4A and phase III of the GATE field campaigns

Highlights - Part II

- **Close collaboration with the DOE ARM:**

ARM Technical Director Jim Mather and Zeng attended the GASS and ARM meetings respectively; ARM observations will be used in GASS projects; ARM provides small support for GASS-related meetings, and ARM is willing to host GASS data.

- **Enhanced communication with WGNE and WWRP:**

meeting with WWRP and WGNE leaders; direct engagement of them in developing GASS projects; gave GASS updates at their SSG meetings; GASS Panel member Irina Sandu has a joint membership in GASS and WWRP Polar Program Committee.

- **Pursuit of collaboration with the WCRP CFMIP:**

Zeng gave an invited talk at CFMIP Conference, followed by the conversation on future joint projects.

Direction of future GASS projects

Potential Gaps:

- Dynamics-physics coupling (White Paper prepared)
- Stable boundary layer (follow-up on GABLS3/4); e.g. around the MOSAiC campaign over the Arctic– under discussion
  -- Papers on GABLS4 are still on progress, with three papers (SCM, Land model, LES) under preparation.
- Joint effort on the surface flux project of WGNE along with other programs
- Radiation: circulation coupling; interaction between radiation and clouds
- High Impact and Extreme Weather: role of convective scale models; ensembles; relevant challenges for model development
- Processes relevant for polar prediction: mixed-phase clouds, coupling to the surface

Direction of future GASS projects

Partnerships:

WGNE: **Joint** “Drag” and “Grey-Zone” projects; **future**: atmospheric model bias reduction (?) surface flux project?

WWRP: Directly involved in “S2S”, “Grey-Zone”, and other projects

WWRP/WCRP S2S Project: the GASS GS4P project cooperated with S2S in the development of the white paper and implementation

ACPC: One mechanism is through the GEWEX Aerosol Precipitation (GAP) initiative

CFMIP: CFMIP and GASS collaborated on the CGILS project (CFMIP-GASS Intercomparison of LES and SCMs); Discussion ongoing on a potential joint project

Contributions to GEWEX Science Questions

a. Observations and Predictions of Precipitation

- Three existing GASS projects directly address precipitation: the precipitation diurnal cycle, land impact on S2S prediction, and GAP
- Two projects to be launched in 2019 will also address precipitation: the gray zone project and the physics-dynamics coupling project.

b. Global Water Resource Systems

- One GASS project (land impact on S2S prediction) is directly related to the global water resources systems

c. Changes in Extremes

- All GASS projects aim to improve weather and climate models, including their capability in studying weather and climate extremes

d. Water and Energy Cycles

- All GASS projects aim to improve weather and climate models, including their capability in studying the water and energy cycles

Contributions to WCRP including Current Grand Challenges

- Weather and climate extremes: All GASS projects aim to improve weather and climate models, enabling the modeling study of weather and climate extremes

- Water for the food baskets: Several current and planned GASS projects (precipitation diurnal cycle, land impact on S2S prediction, GAP, gray zone, and physics-dynamics coupling) address precipitation that is directly related to water for the food basket

- Clouds, circulation and climate sensitivity: UTCC PROES, the gray zone project and the physics-dynamics coupling project (to be launched by GASS in 2019) are directly relevant to the study of clouds, circulation and climate sensitivity

- Near-term climate prediction: the GASS project on the land impact on S2S prediction is directly relevant to near-term climate prediction; the GASS COORDE project is also very relevant for prediction on all time scales.

Goals for Next Year

Initiate at least two new projects

Expand the panel by adding at least four new panel members

Increase cooperation with other international programs (particularly WGNE and WWRP) by attending both WGNE and WWRP steering group meetings and establishing 1 or 2 direct links (i.e. GASS representatives on WGNE and WWRP)

Questions for SSG

- What organizational structure would be most helpful for PROES to succeed?
  UTCC and GAP are part of GASS, and UTCC also reports to GDAP. How about WR?

  If these PROES projects are covered by GASS, should their leaders be GASS Panel members?

- We currently have six GASS Panel members (two co-chairs and four members leading the four GASS projects). We are ready to add a few Panel members not leading, but are interested in, GASS projects.

  We are seeking names (particularly for inclusion and diversity).

- GASS already has close interactions with WGNE and WWRP and some other programs.

  Are these interactions appropriate for GASS (e.g., considering the re-organization of WCRP)?