

GEWEX Global Atmospheric System Studies (GASS)

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8-9 December 2018
ILSTSS2S Workshop
Washington D.C., USA

2nd Pan-GASS meeting from 28 Feb – 2 Mar 2018 in Australia

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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 Collections

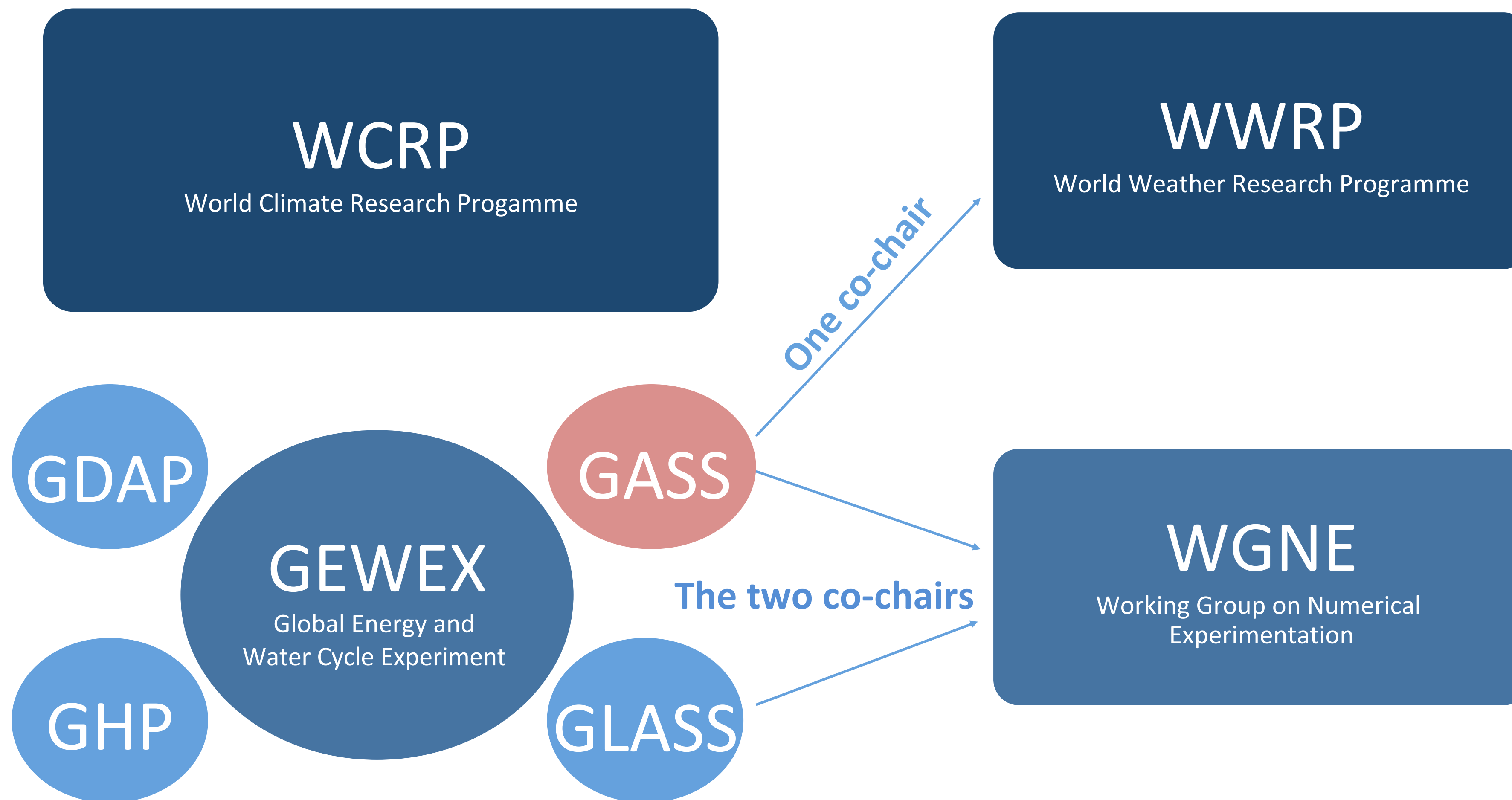
Waves to Weather (W2W)
- JAS, MWR, JHM, WAF

Process-Oriented Model Diagnosis
- JCLI, JAS

Aerosol-Cloud-Precipitation-Climate Interaction
- JAS

IFloodS 2013: A Field Campaign Support the NASA-JAXA Global Precipitation Measurement Mission
- JHM

Ontario Winter Lake-effect System (OWLeS)
- MWR, BAMS, WAF, JAMC



Goal of GASS: to understand the physical processes and their coupling to atmospheric dynamics ...

Mission of GASS:

- to develop and improve the representation of the atmosphere in weather and climate models.
- to contribute to the development of atmospheric models.

1993



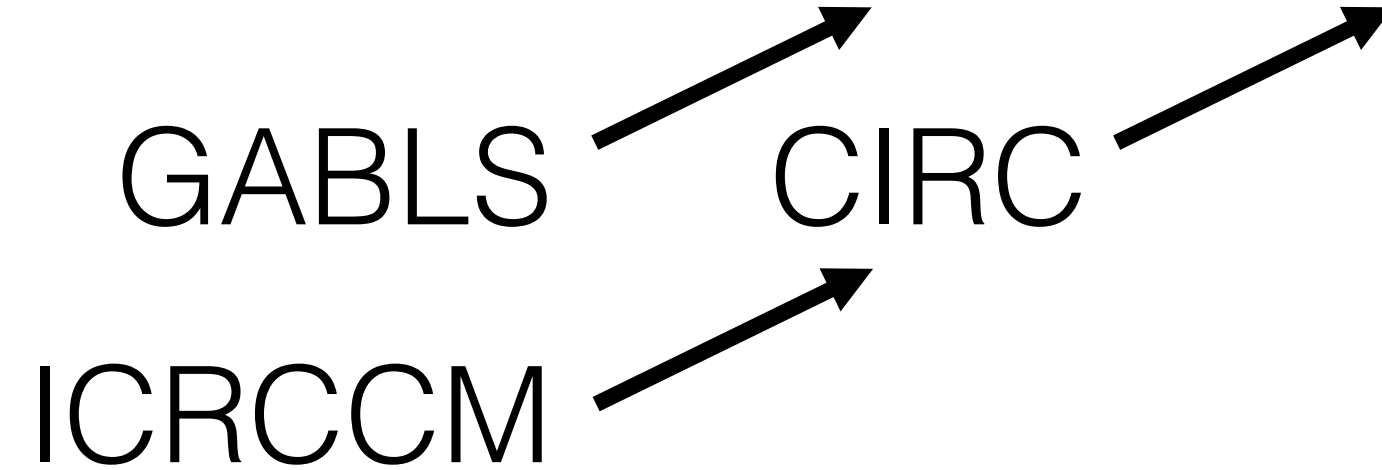
2011



2017



GCSS → GASS →



GASS - last year:

- Two new co-chairs
- No panel
- No projects
- Conference coming up



GASS - this year:

- Pan-GASS Conference
- Panel starts to form
- Four projects launched
- Two more projects coming up

- Alignments with GEWEX Process Evaluations (PROES):
- Upper Tropospheric Clouds and Convection (UTCC PROES)
 - GEWEX Aerosol Precipitation (GAP) initiative

GASS Projects Launched in 2018

Surface drag and momentum transport (COORDE)

Impact of initialized land temperature and snowpack on sub-seasonal to seasonal prediction (ILSTSS2S)

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 early 2019

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

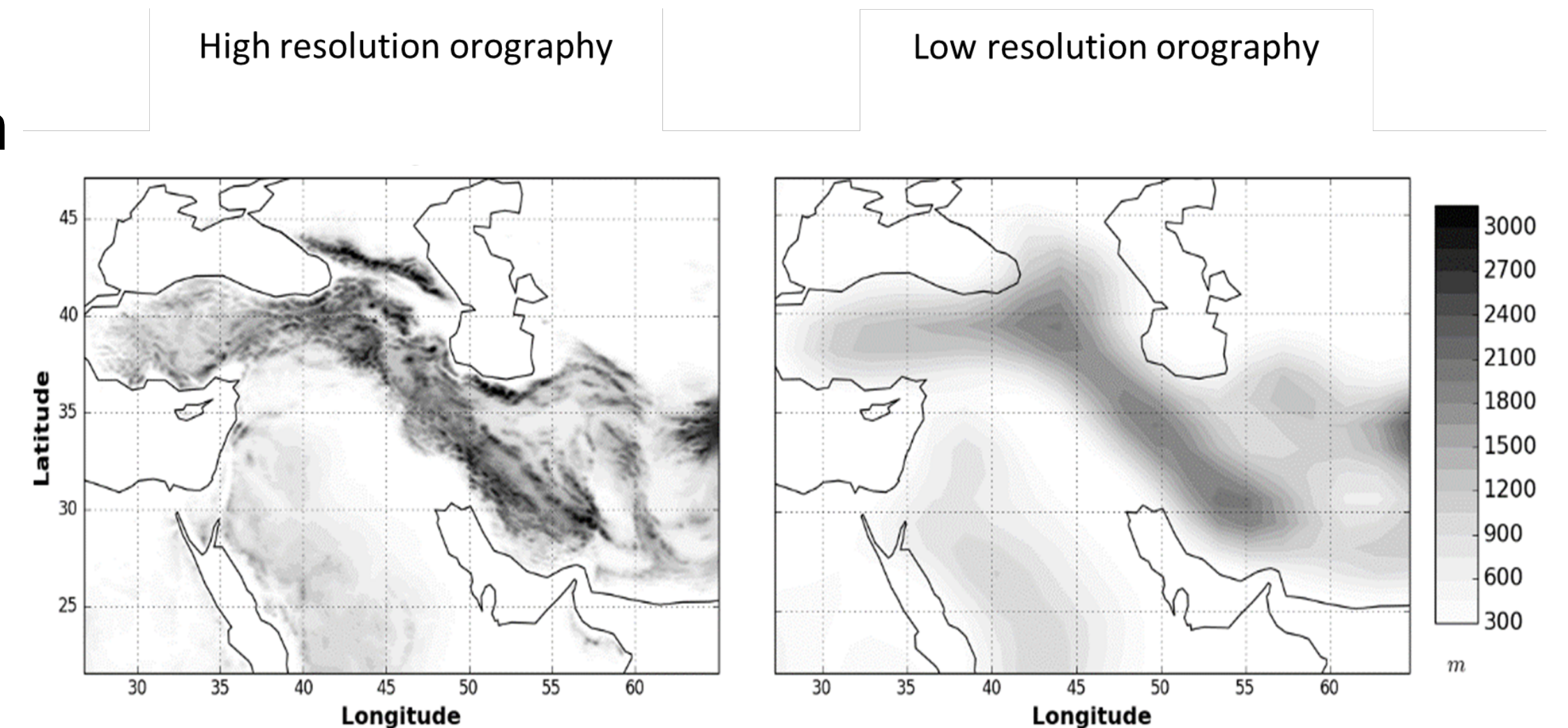
Project descriptions and white paper:

<https://www.gewex.org/panels/global-atmospheric-system-studies-panel/gass-projects/>

COnstraining ORographic Drag Effects (**COORDE**) joint with **WGNE**

Aims:

- Expose differences in orographic drag parametrization formulation between models
- Understand impacts of differences in orographic drag parametrizations for modelled circulation
- Use high resolution simulations to quantify drag from small-scale orography, typically unresolved in models used for climate/seasonal projections, in order to evaluate orographic drag parametrizations
- Understand differences in resolved and parametrized orographic drag across models



Workshop at UCP2019 in Berlin on EUREC4A-Wind (15. Feb. 2019)
-> measure wind and momentum flux over ocean, joint with grey-zone

Potential participants include: Environment Canada, DWD, CMA, NOAA/NCEP, KIAPS, Meteo-France, Met Office, ECMWF, and other centers/groups.

Contact: Annelize.vanNiekerk@MetOffice.gov.uk and irina.sandu@ecmwf.int

Impact of initialized land temperature and snowpack on sub-seasonal to seasonal prediction (ILSTSS2S)

By focusing on the processes:

- What is the impact of land surface/subsurface temperature and snowpack on S2S predictions?
- What is the relative role of uncertainties in land processes versus SST?

Initial focus on land temperature effect on S2S prediction – in partnership with “Third Pole Experiment Multi-Model Intercomparison” (TPEMIP).

The kick-off workshop will be held in Washington, D.C. on 8-9 December 2018 (right before the AGU Fall Meeting) with different modeling centers to show preliminary results.

30+ people have confirmed to participate.

Contact: Yongkang Xue (yxue@geog.ucla.edu)

Demistify: An LES & NWP fog modelling intercomparison

Errors in fog forecasting are among the priorities for model improvement in many NWP centres (e.g. for aviation).

Goals:

- Document the state of NWP (SCM, later 3D) and LES (few meter resolution) fog modeling.
- Identify key processes for the development of radiation fog.
- What level of complexity is necessary from NWP models to simulate the relevant processes?
- What is the role of land-surface interaction in the fog development.

Experimental design has been finalized.

Nine centers/groups have confirmed to participate.

Contact: Ian Boutle (ian.boutle@metoffice.gov.uk)

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

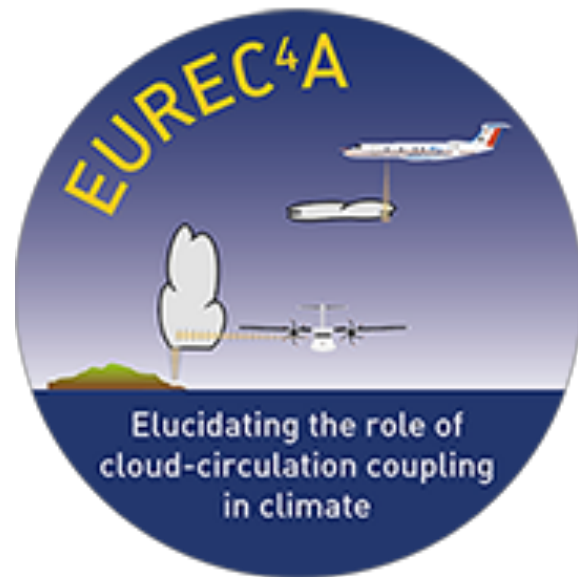
Research themes:

- 1.) Interaction between convection and water vapor
- 2.) Nocturnal convection over land
- 3.) Diurnal cycle of convection over ocean
- 4.) Convection transition

Status: Finalizing experiment protocol for phase I. Tools will be GCMs, CRMs and SCMs

Contact: Shaocheng Xie (xie@lnl.gov)

Second phase of the "Grey Zone" project based on the EUREC4A
and phase III of the GATE field campaigns – **joint with WGNE**
Scale-awareness, stochasticity and convective organization



Jan/Feb 2020

Investigate how shallow
cumulus clouds respond to
changes in their large scale
environment

Discussion of final experiment
setup at UCP2019 conference in
Berlin (25 Feb 2019).



Aug/Sep1974

Scale interactions between
convective and the large-
scale atmospheric
circulation

Project meeting at the ParaCon
convection conference in Exeter
(15 Jul 2019).

Contact: Lorenzo Tomassini (lorenzo.tomassini@metoffice.gov.uk)

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**
- 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

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Will attend the AGU meeting from Tuesday evening to Thursday late afternoon