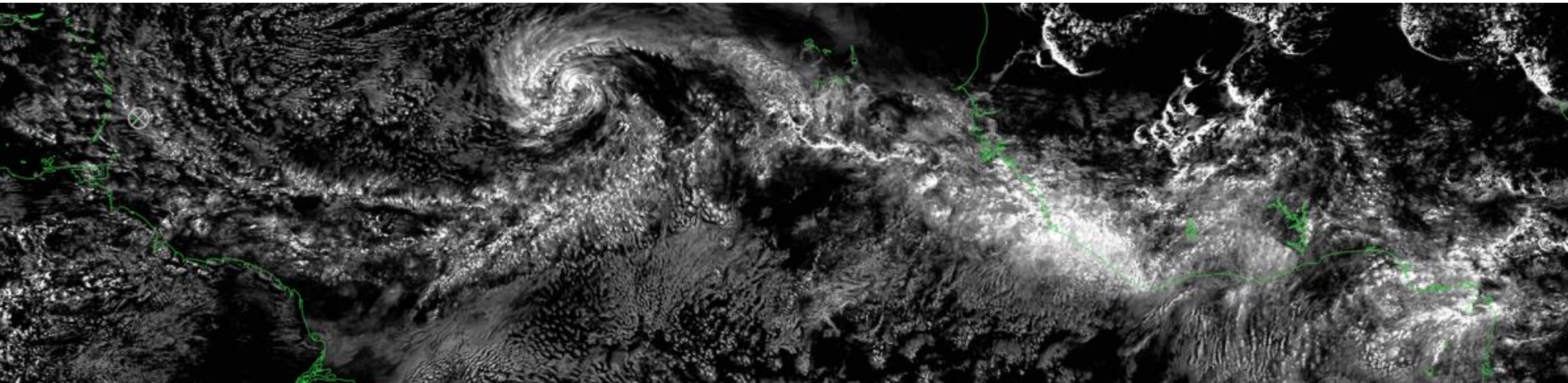


GASS

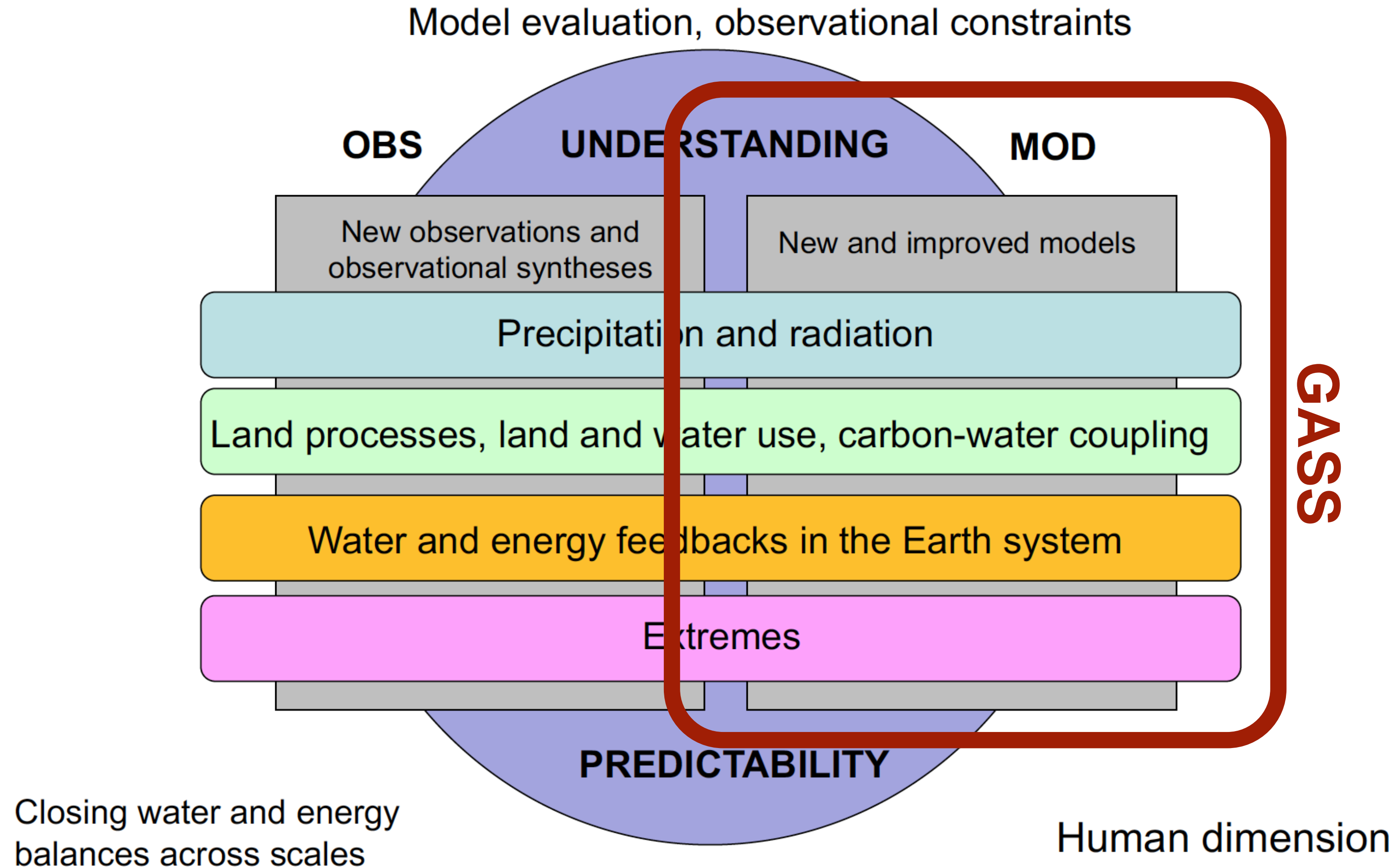
Global Atmospheric System Studies

WGNE-33, JMA, Tokyo, Japan, 09-12 October 2018
Daniel Klocke, Xubin Zeng & GASS panel members



GEWEX vision

Sonia Seneviratne and
GEWEX SSG Jan 2018



GEWEX and GASS relevance to WGNE:

Process-level understanding and improvements to weather and climate models

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

Some of the projects with direct involvement of WGNE

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
- plenary 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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⁵ European Centre for Medium Range Weather Forecasts, Reading, UK

⁶ Lawrence Livermore National Laboratory, Livermore, CA, USA

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⁸ University of California, Irvine, CA, USA

⁹ Centre National de Recherches Météorologiques, CNRS, Toulouse, France

Ahead of Print



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Featured Special Collections

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

Process-Oriented Model Diagnosis
- JCLI, JAS

Annual Cloud Precipitation

How we initiated projects:

- Bottom up...
- Motivate groups to write white paper
- Iterate with us
- Iterate with the community
- Define deliverables and stages

- Only when ready, we launch

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

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/>

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WGNE co-sponsored

COnstraining ORographic Drag Effects (**COORDE**)

Understanding the effects of resolved and parametrized orographic drag through the **COORDE**-nation of different modeling groups.

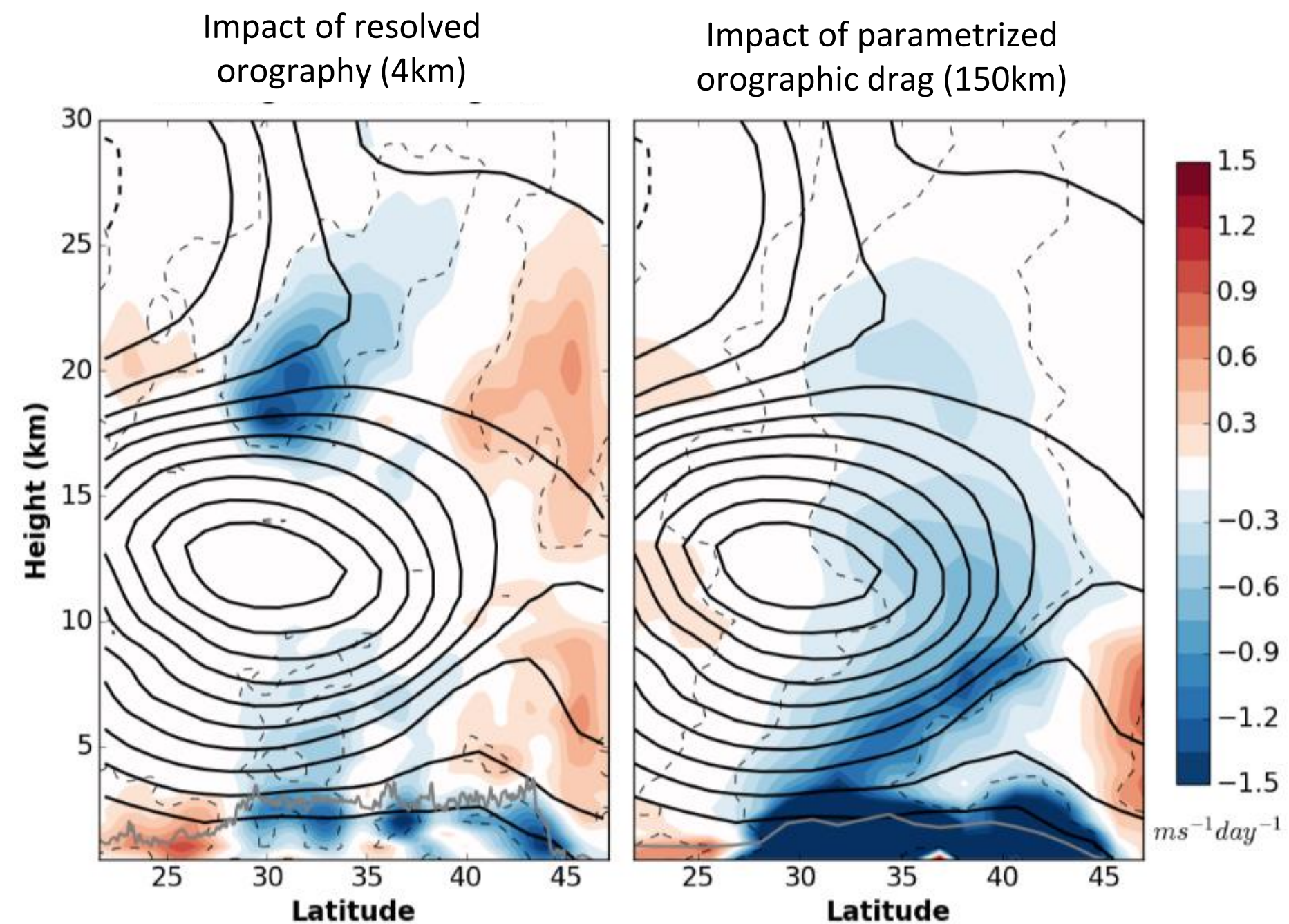
Aims:

- 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

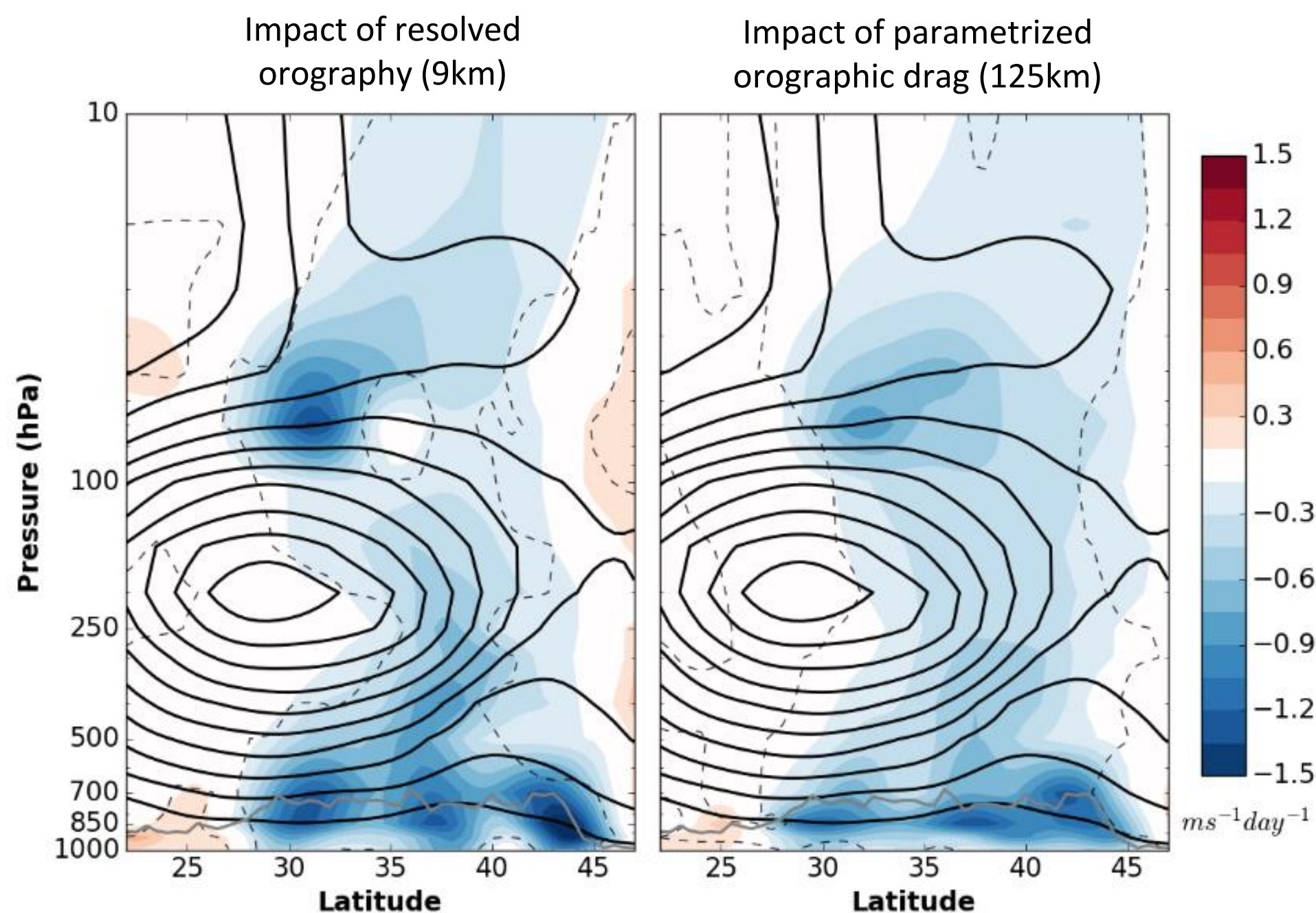
Potential participants currently include: Environment Canada, DWD, CMA, NOAA/NCEP, KIAPS, Meteo-France, Met Office and ECMWF.

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

Met Office
UM

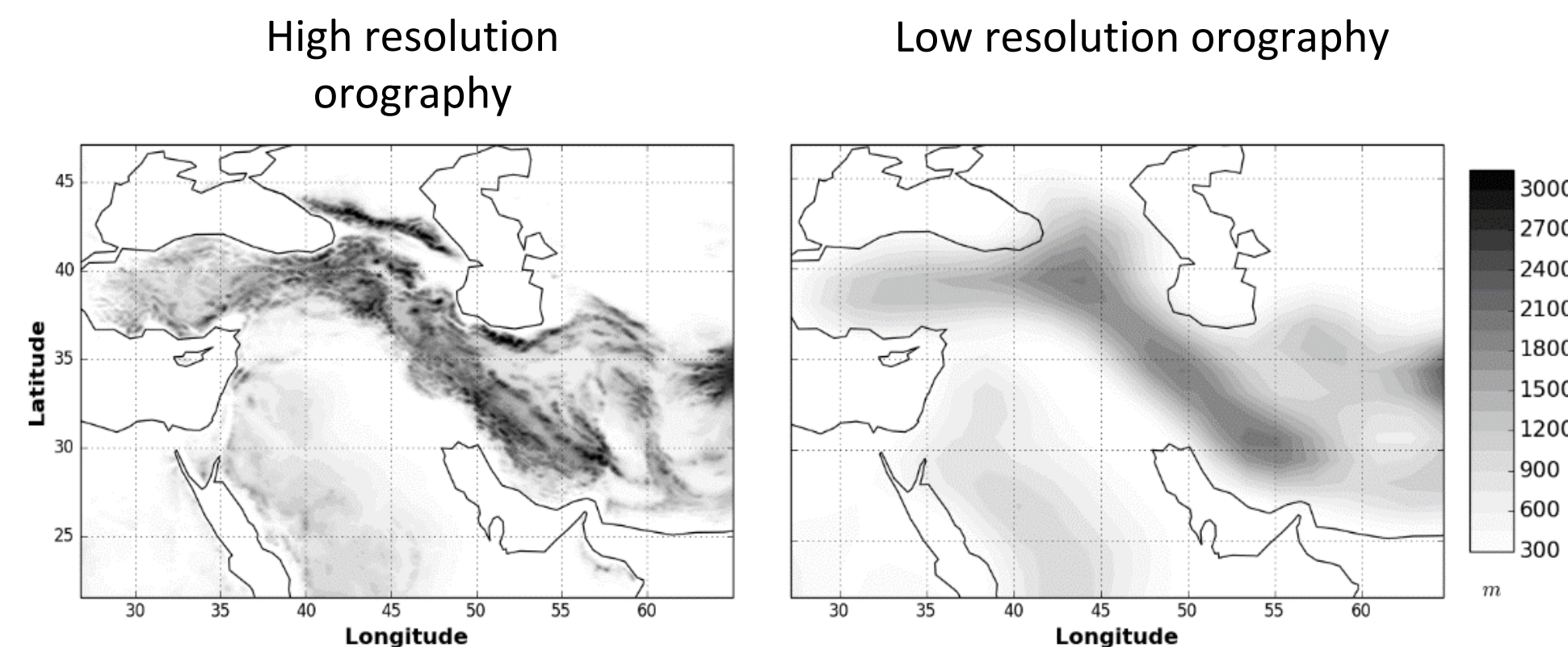


ECMWF
IFS



Method:

1) High resolution experiments (4km / 9km) with high resolution and low resolution orography are used to determine impact of resolved orography on circulation



2) Low resolution experiments (150km / 125km) with and without parametrized orographic drag used to determine impact of parametrized orographic drag on circulation

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

Experimental protocol is being finalized

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 snow pack 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 three modeling centers to show preliminary results.

More than 10 groups have confirmed to participate.

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

Several actives across WCRP/WWRP:
-> coordinate and complement

Demistify: An LES & NWP fog modelling intercomparison

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

Intercomparison based on LANFEX (Local and Non-local Fog Experiment, Price et al. 2018) starting with fog forming in a nocturnal stable boundary-layer (IOP1).

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 land-surface interaction for the development.

Later stages depending on results...

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

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

Research themes:

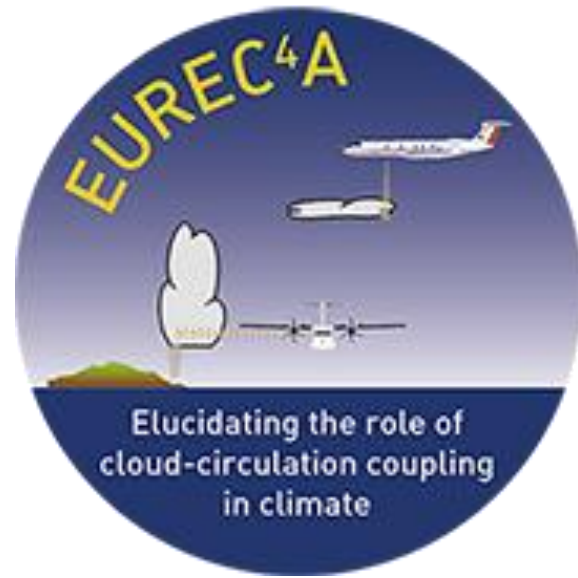
- 1.) Interaction between convection and water vapor
- 2.) Nocturnal convection over land
- 3.) Diurnal cycle of convection over ocean
- 4.) Convection transition

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

Contact: Shaocheng Xie (xie@llnl.gov)

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

Scale-awareness, stochasticity and convective organization



Jan/Feb 2020

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



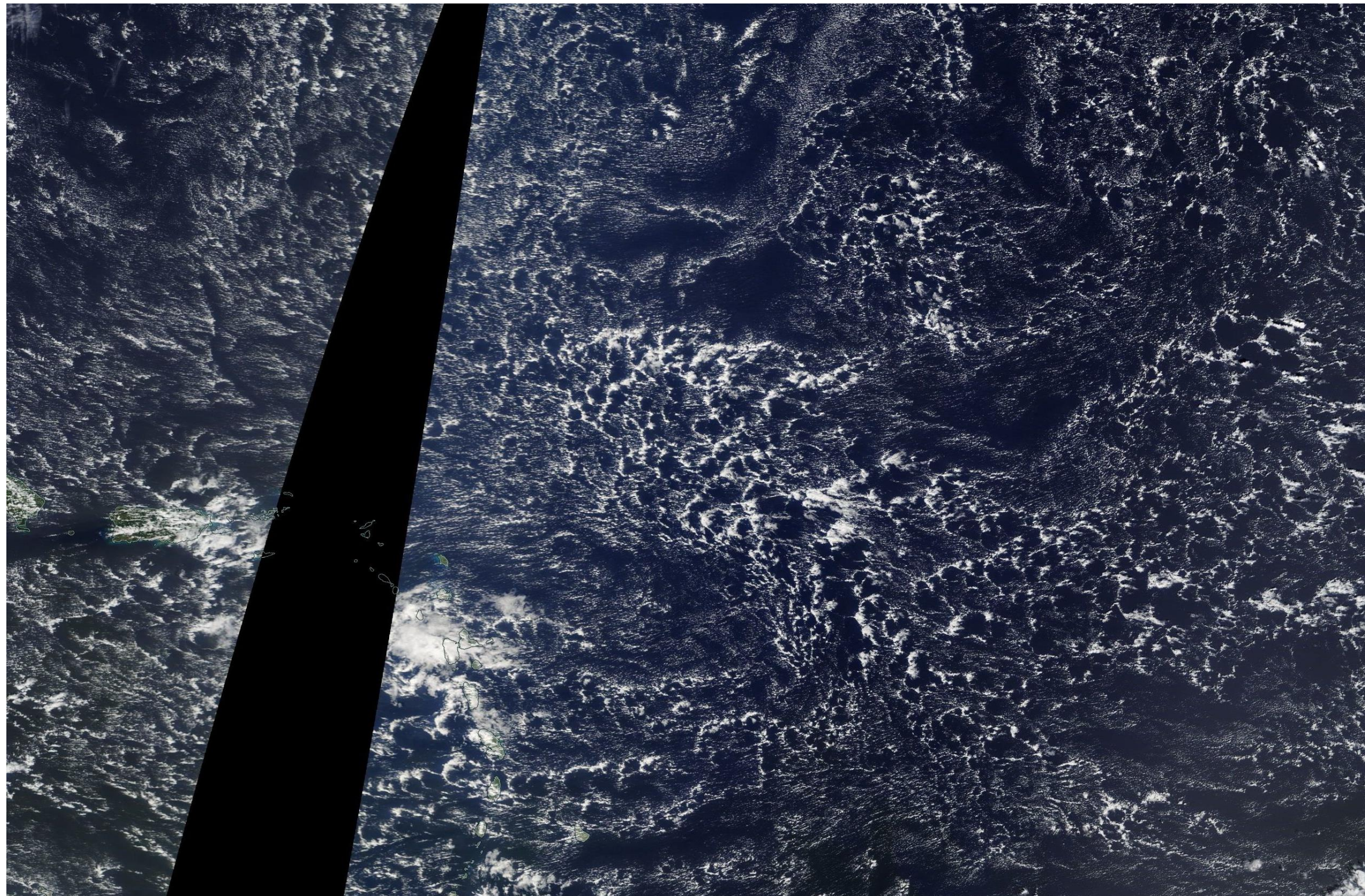
Aug/Sep1974

Scale interactions between convective and the large-scale atmospheric circulation

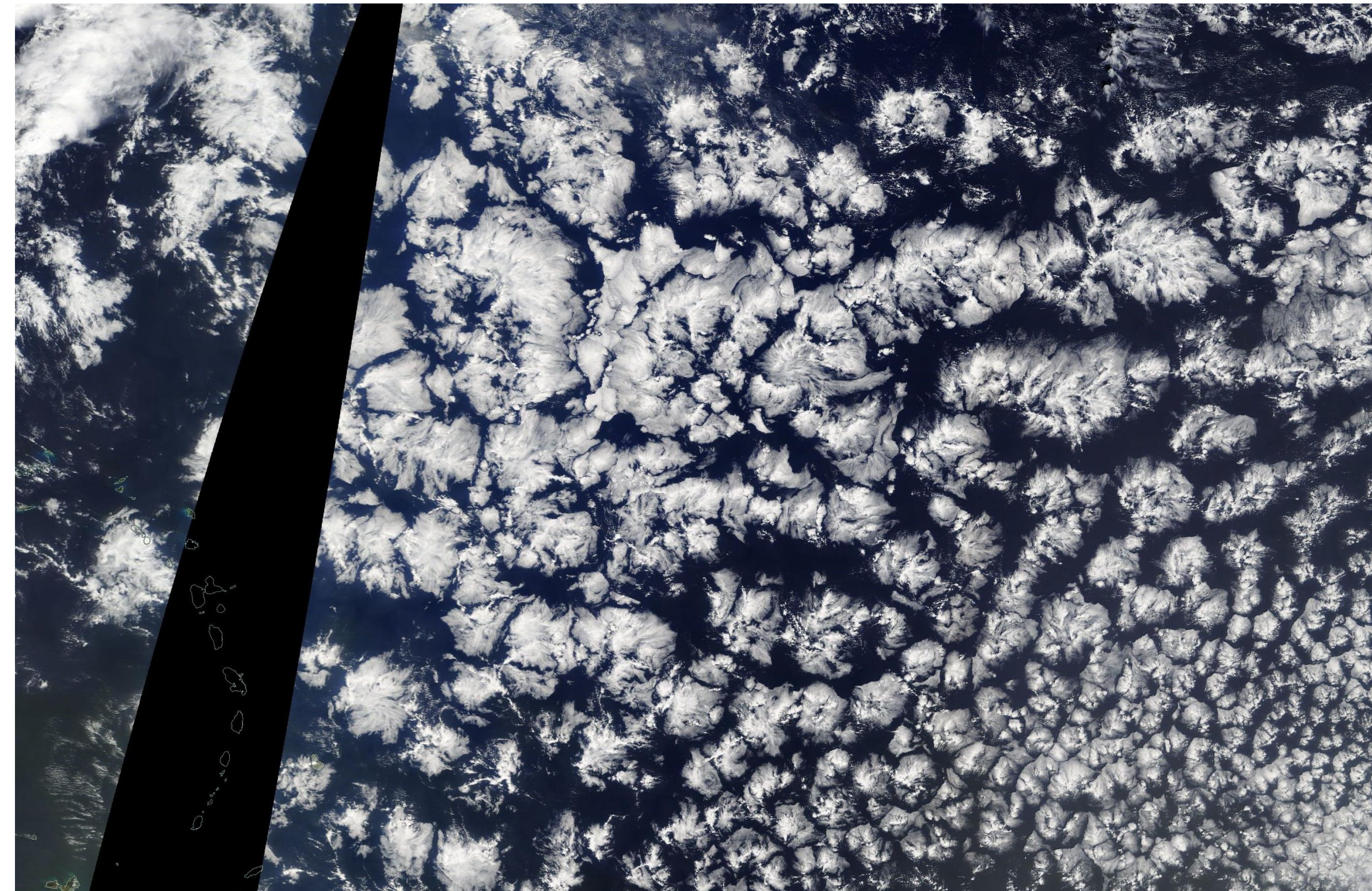
Contact: Lorenzo Tomassini (lorenzo.tomassini@metoffice.gov.uk)

Large (30x27 degree) domain with 1km resolution
Small (3x3 degree) domain with 100m resolution

Feb 2017



Feb 2018



Discussion of final experiment setup at UCP2019 conference in Berlin (25. Feb. 2019).
Project meeting at the ParaCon convection conference in Exeter (15. Jul. 2019).

Outlook:

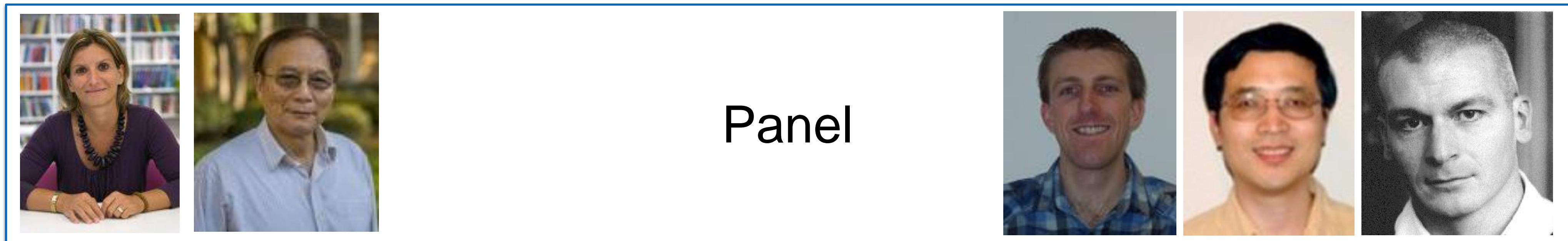
Stable boundary layer (follow up on GABLS3/4) eg. around the MOSAiC campaign
Physics dynamics coupling

Input very welcome!

Next time results!!



Xubin Zeng Daniel Klocke



Confirmed

Pending