TerraMaris

Contact point
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Overview
The overall aim is to determine, quantify and model the atmospheric convective and atmospheric and oceanographical dynamical processes that govern the generation of precipitation and heating over the Maritime Continent and determine their global impacts. Specific objectives are to: (1) Make detailed observations of the convective-dynamical atmospheric systems and their land and ocean interactions over the Maritime Continent by taking a leading role in the international Years of the Maritime Continent field experiment. (2) Quantify the complex interactions that govern the diurnal cycle of precipitation and heating over the Maritime Continent, particularly the development of the boundary layer and convection over the large islands, the generation of land-sea breezes and gravity wave circulations, and the offshore convective response to those circulations. (3) Model the convective systems in a carefully designed hierarchy of numerical modelling experiments to transform our understanding of the Maritime Continent system, and to understand the mechanisms behind the systematic errors in global climate models that stem from deficiencies in their representation of the Maritime Continent.

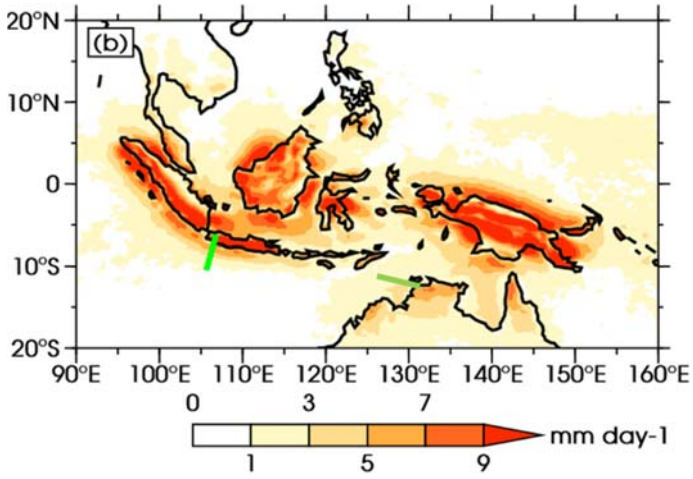
Project status
An outline proposal for a NERC Large Grant was submitted in January 2017. This was successful, and a full proposal will be submitted in November 2017. The funding decision will be made in May 2018.

Period
November 2019 – February 2020 for ocean measurements, and 5-6 weeks in Jan-Feb 2020 for aircraft measurements

Participants
- UK: University of East Anglia (UEA), University of Reading, University of Leeds, Met Office, Facility for Airborne Atmospheric Measurements (FAAM)
- Indonesia: BMKG, LAPAN
- Australia: BoM

Location
- Plan A: Jakarta, Java, Indonesia and Christmas Island, Australia
- Plan B: Darwin, Australia

Figure shows amplitude of diurnal cycle of precipitation, and proposed aircraft sections for Plan A and B.



Observations

- Aircraft (FAAM)
- Land-based: surface fluxes, radiosondes, X-band radar, scanning radiometer, Doppler Aerosol LiDAR
- Ocean: Shallow water Seaglider, regular Seaglider, Waveglider. Planned coordination with R/V Investigator, contingent on funding.

Modelling

Hierarchy of model experiments using Met Office Unified Model (MetUM-GOML): atmospheric model coupled to high resolution KPP mixed-layer ocean model. Cloud-resolving simulations with ~200 m horizontal resolution, 1000 x 2000 km domain size. Convection-permitting simulations at ~2 km resolution, 8000 x 2000 km pan-MC domain. Limited-domain parametrized convection simulations at 15 km resolution. Global model simulations at 60 km resolution.