



Science Focus Area (SFA)

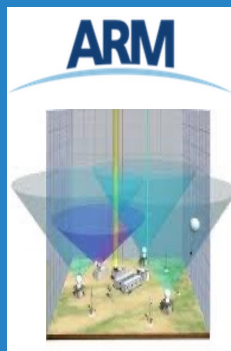
Regionally Refined SCREAM (RRM-SCREAM) for ARM Sites

Tying in High Resolution E3SM with ARM Data (THREAD)

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THREAD

LLNL ASR SFA

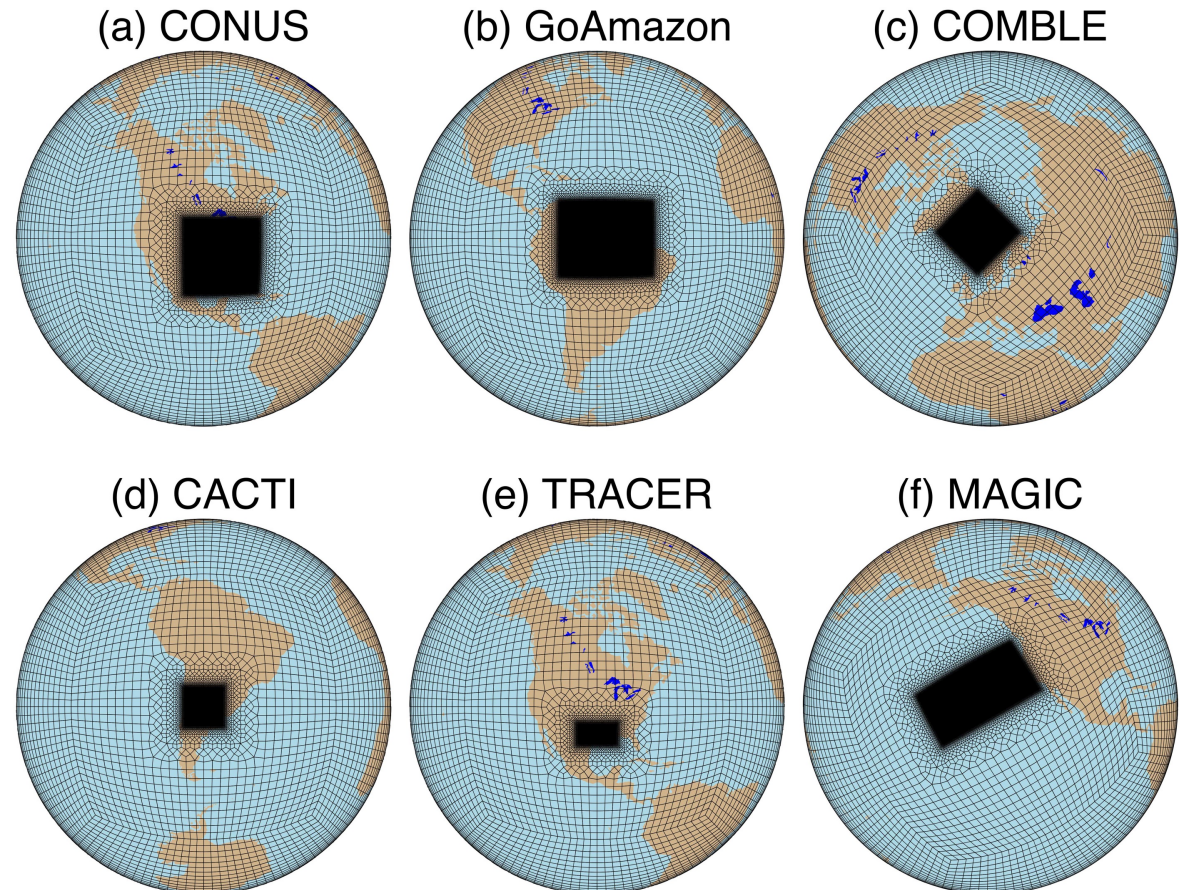


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RRM-SCREAM

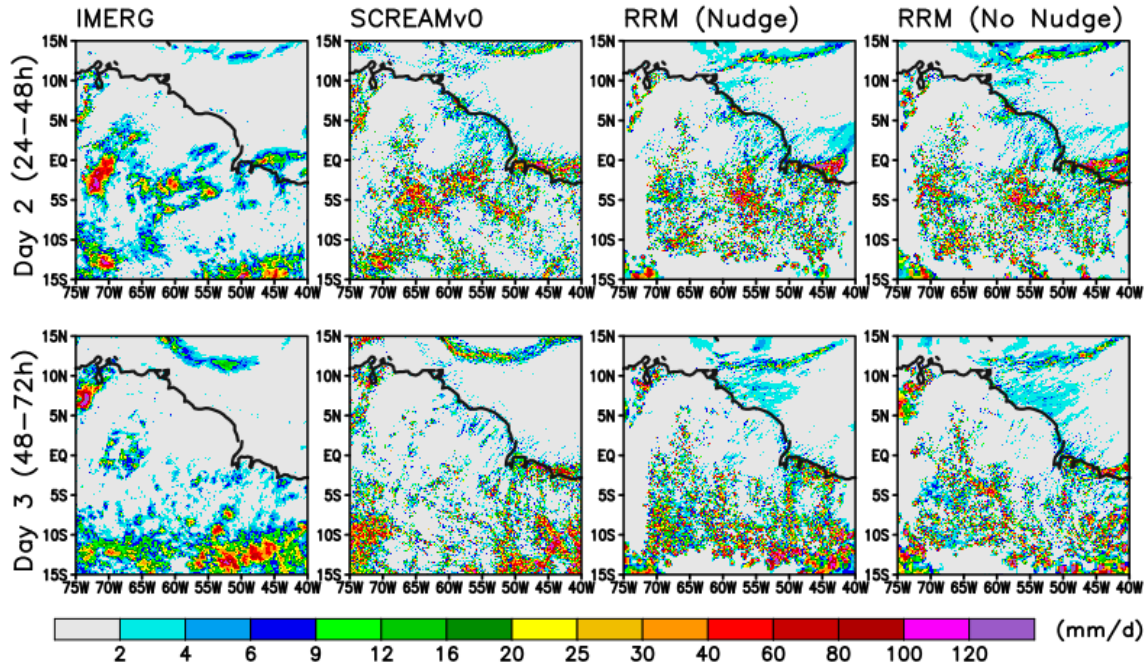
- RRM: An effective and efficient tool for high-resolution model development and diagnosis
- Six RRM-SCREAM configurations are proposed to study convection over land, marine low clouds and land-atmosphere interactions in THREAD.
- Inner domain (refined region) will be ~ 3.25 km or 1.6 km, and will be free-running. Outer domain will be ~ 100 km, and the dynamical fields in the outer domain will be nudged toward the ERA5 reanalysis

RRM-SCREAM configurations

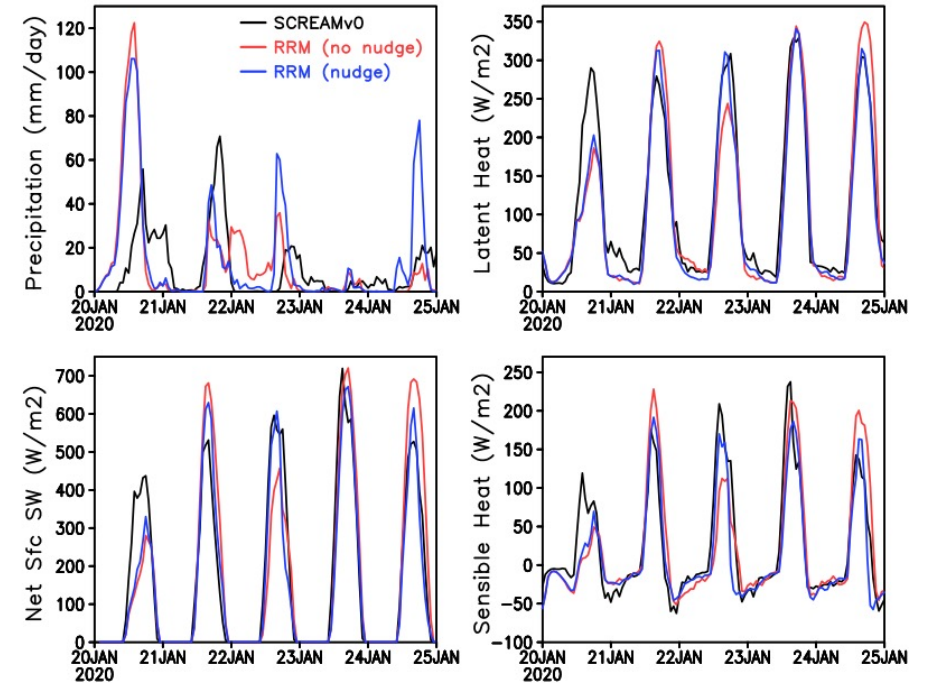


Validation of RRM-SCREAM simulations

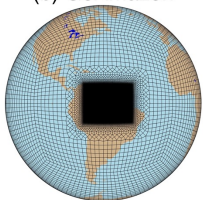
Precipitation



AMF domain (128km radius)



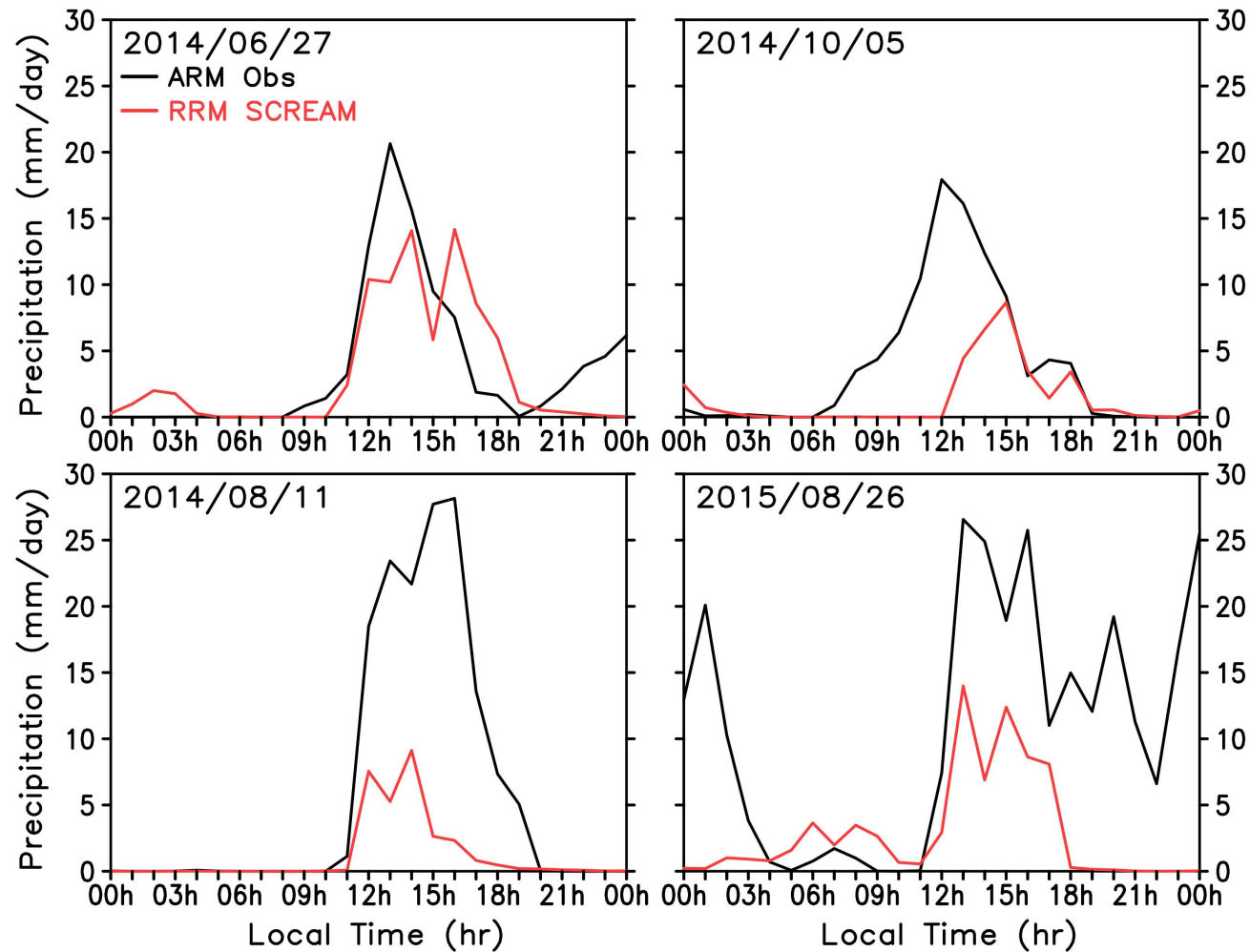
(b) GoAmazon



■ Experiments:

- SCREAMv0, starting from 2020/01/20, 40-day long (DYAMOND II)
- 2 RRM-SCREAM, 5-day long hindcasts starting from 2020/01/20 (w/ and w/o nudging)

Transition of shallow to deep convection (GoAmazon)



■ Case study:

— Transition of shallow to deep convection:

- Single-peak days: 2014/6/27, 2014/10/05
- Double-peak days: 2014/8/11, 2015/8/26

- How to better coordinate our modeling effort (RRM-SCREAM) with the AMF3 BNF?
 - Observations and model needs for AMF3 and planned experiments
 - Case studies to address specific science questions
 - Convective cloud processes
 - Land-Atmosphere interactions
 - Could compare simulation results with GoAmazon and SGP cases
 - Aerosol processes (?) – only prescribed aerosols available for SCREAM at the moment
 - Computational framework for AMF3 model-observation integration
 - Experiment domain design
 - Land component configuration, resolution (finer than 3km?)
 - Continuous run with smaller domain vs short runs (e.g., IOPs) with larger domain