



Science Focus Area (SFA)

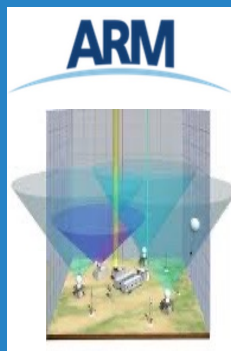
Regionally Refined SCREAM (RRM-SCREAM) for ARM Sites

Tying in High Resolution E3SM with ARM Data (THREAD)

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THREAD

LLNL ASR SFA

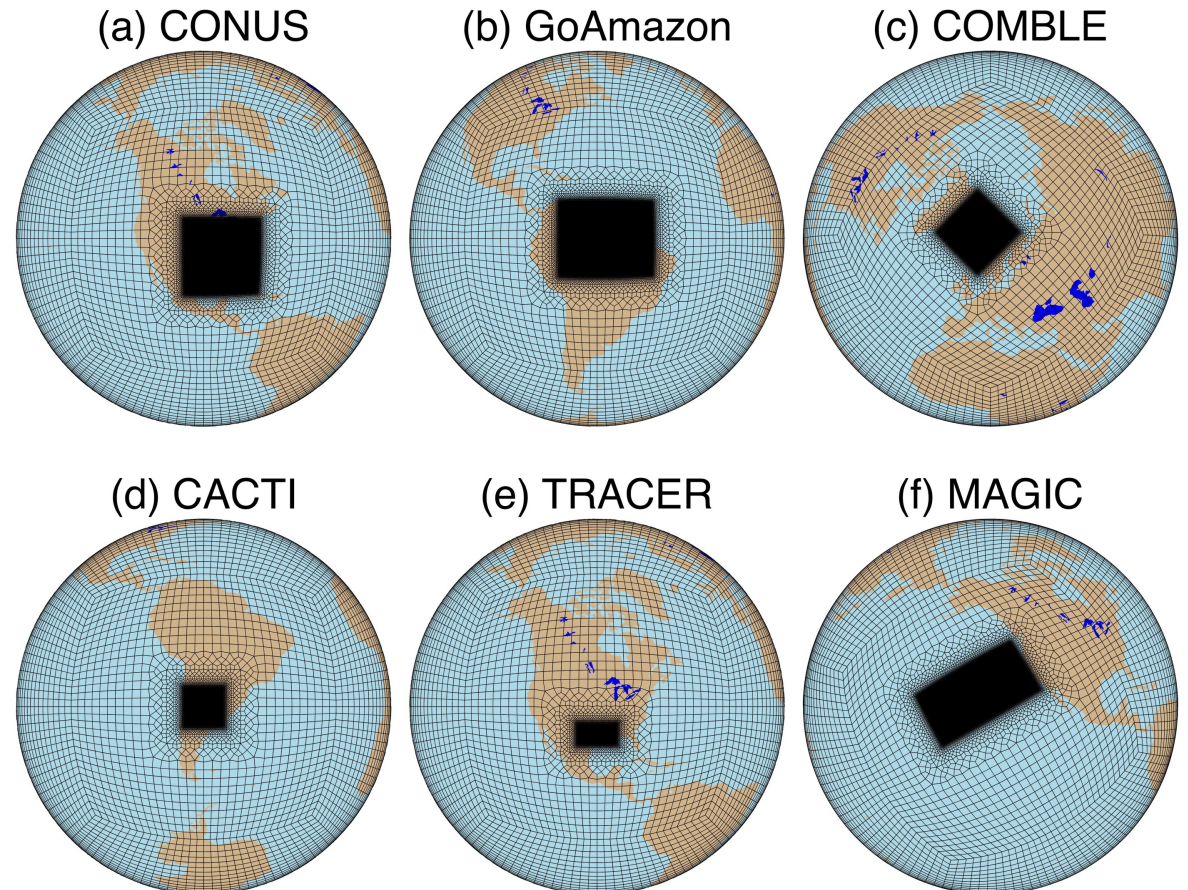


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RRM-SCREAM

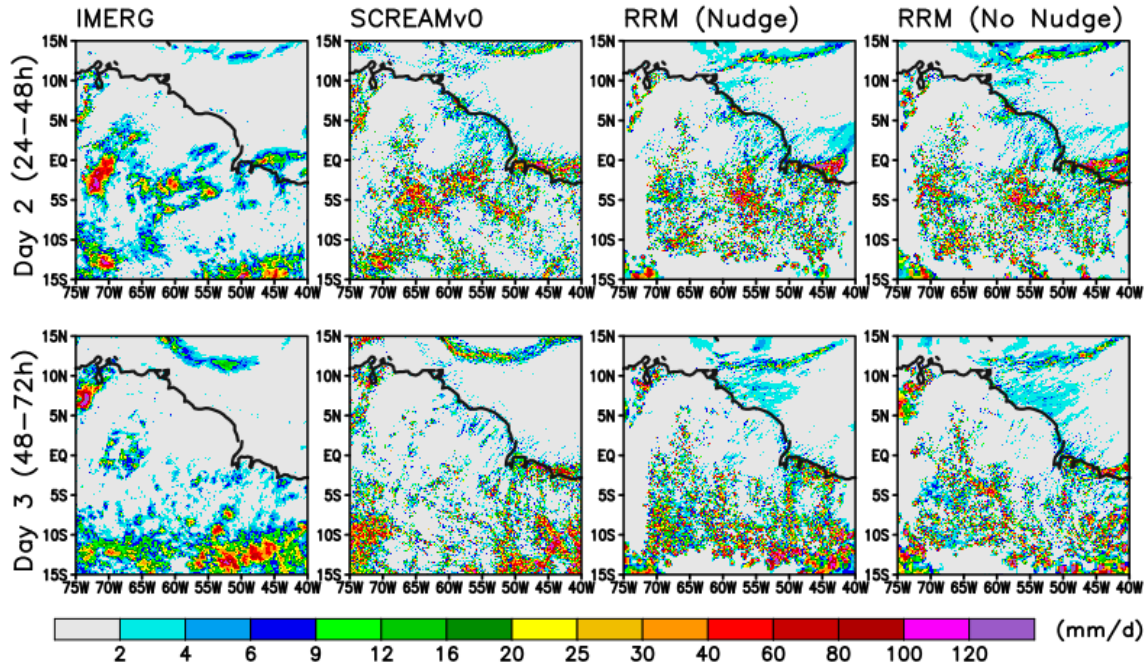
- RRM: An effective and efficient tool for high-resolution model development and diagnosis
- Six RRM-SCREAM configurations are proposed to study convection over land, marine low clouds and land-atmosphere interactions.
- Inner domain (refined region) will be ~ 3.25 km or 1.6 km, and will be free-running.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

RRM-SCREAM configurations

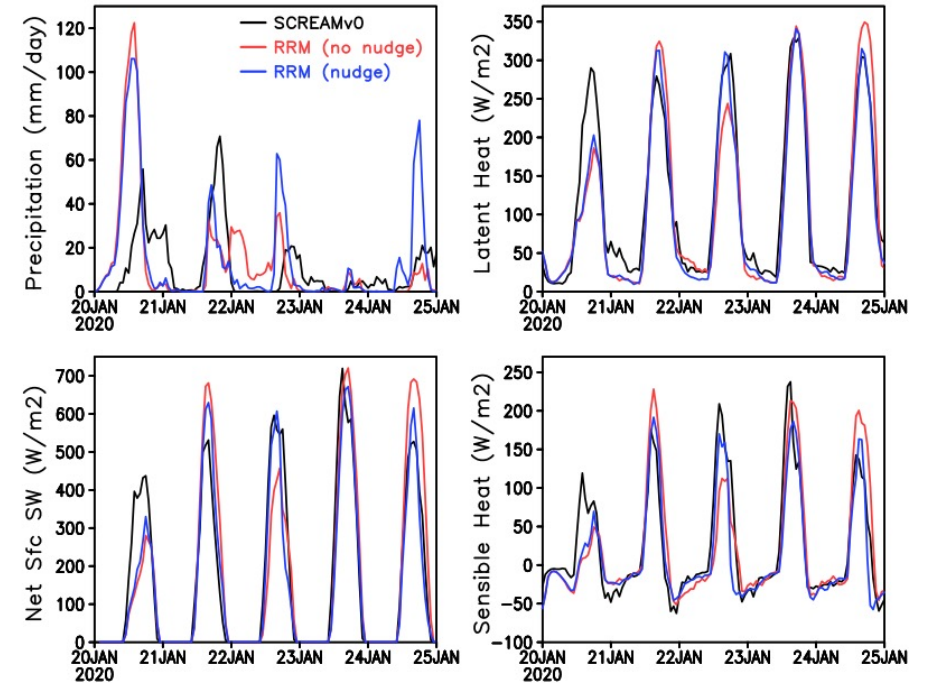


Validation of RRM-SCREAM simulations

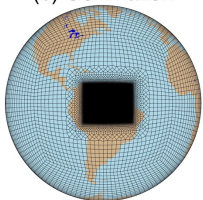
Precipitation



AMF domain (128km radius)



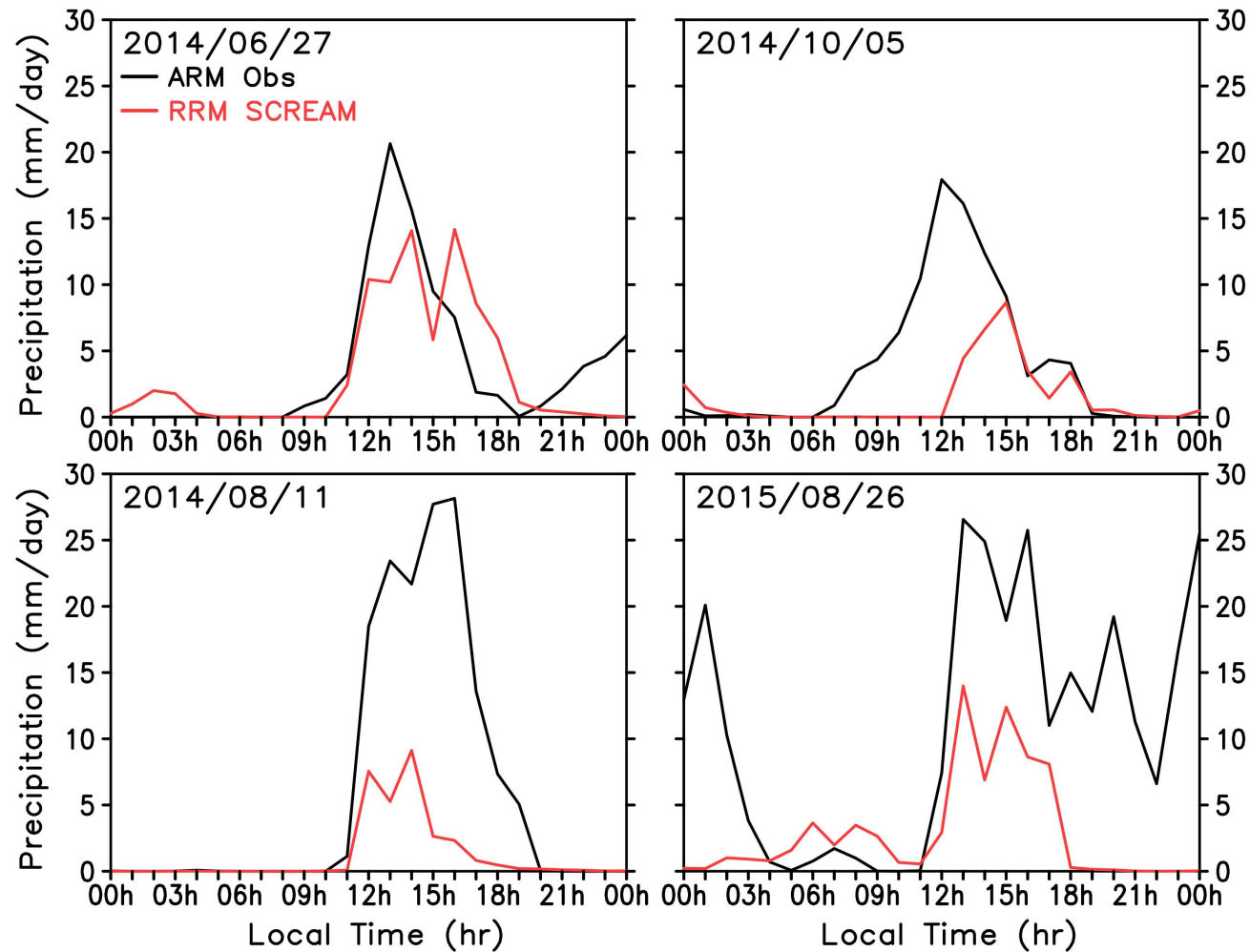
(b) GoAmazon



■ 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

Discussion

- Relevant to our current GoAmazon model simulations and analysis:
 - How can we better utilize ARM data to compare with km-scale model output (making meaningful comparison, e.g., using instrument simulators)?
 - What are the limitation in applying these data?
- We are looking for ideas on how to better utilize RRM-SCREAM configuration for relevant cloud, convection and L-A interactions with ARM data:
 - What other field campaign locations would you mostly be interested in using RRM-SCREAM for modeling studies (e.g., AMF3 BNF, EPCAPE)?