

Evaluating and Improving Cloud, Aerosol, Precipitation and their Interaction (CAPI) Schemes in the GFS-CFS-NGGPS Systems

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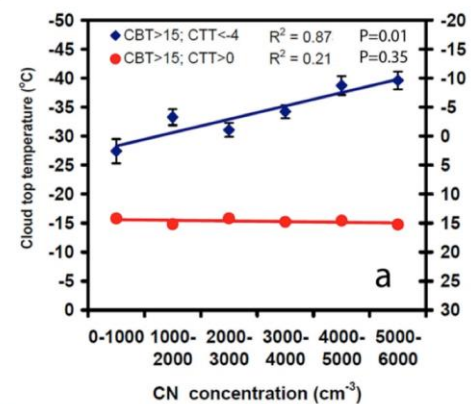
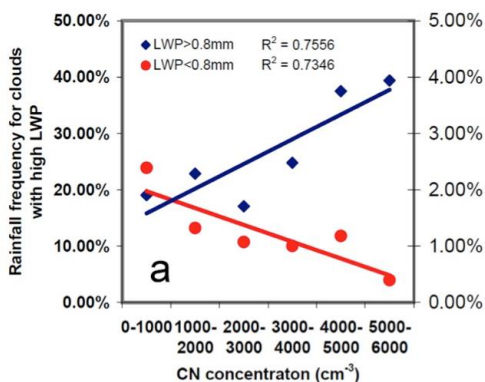
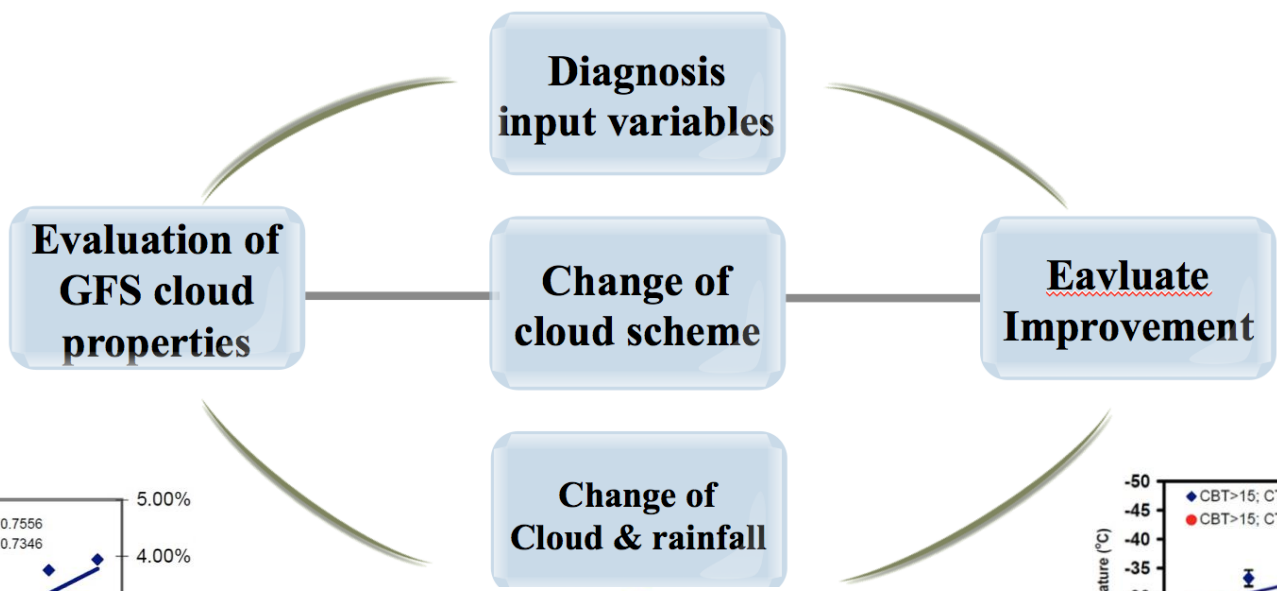
Summary of previous studies

- Evaluation of cloud properties in the NOAA/NCEP Global Forecaster System using multiple satellite product (Yoo and Li, 2012, *Climate Dynamics*)
- Testing and improving low-level cloud parameterizations for the NCEP/GFS model satellite and ground-based measurements (Yoo et al. 2013, *Climate Dynamics*)
- Cloud vertical distribution from radiosonde, remote sensing, and model simulations (Zhang et al, 2014, *Climate Dynamics*).

Objectives of future studies:

- Evaluating the performance of the new physical schemes associated with accounting for the aerosol effects that affect rainfall forecasts and cloud simulations through in-depth comparisons with extensive global satellite and ground-based products and observation-based findings;
- Understanding the causes of discrepancies in simulating clouds and their interactions with aerosol between current and new schemes, and between model simulations and observations by virtue of a high-resolution cloud-resolving model (CRM).

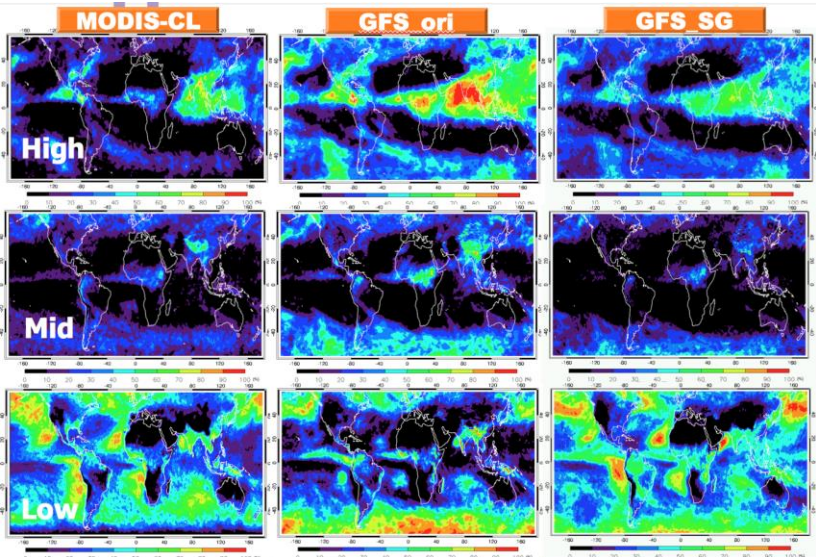
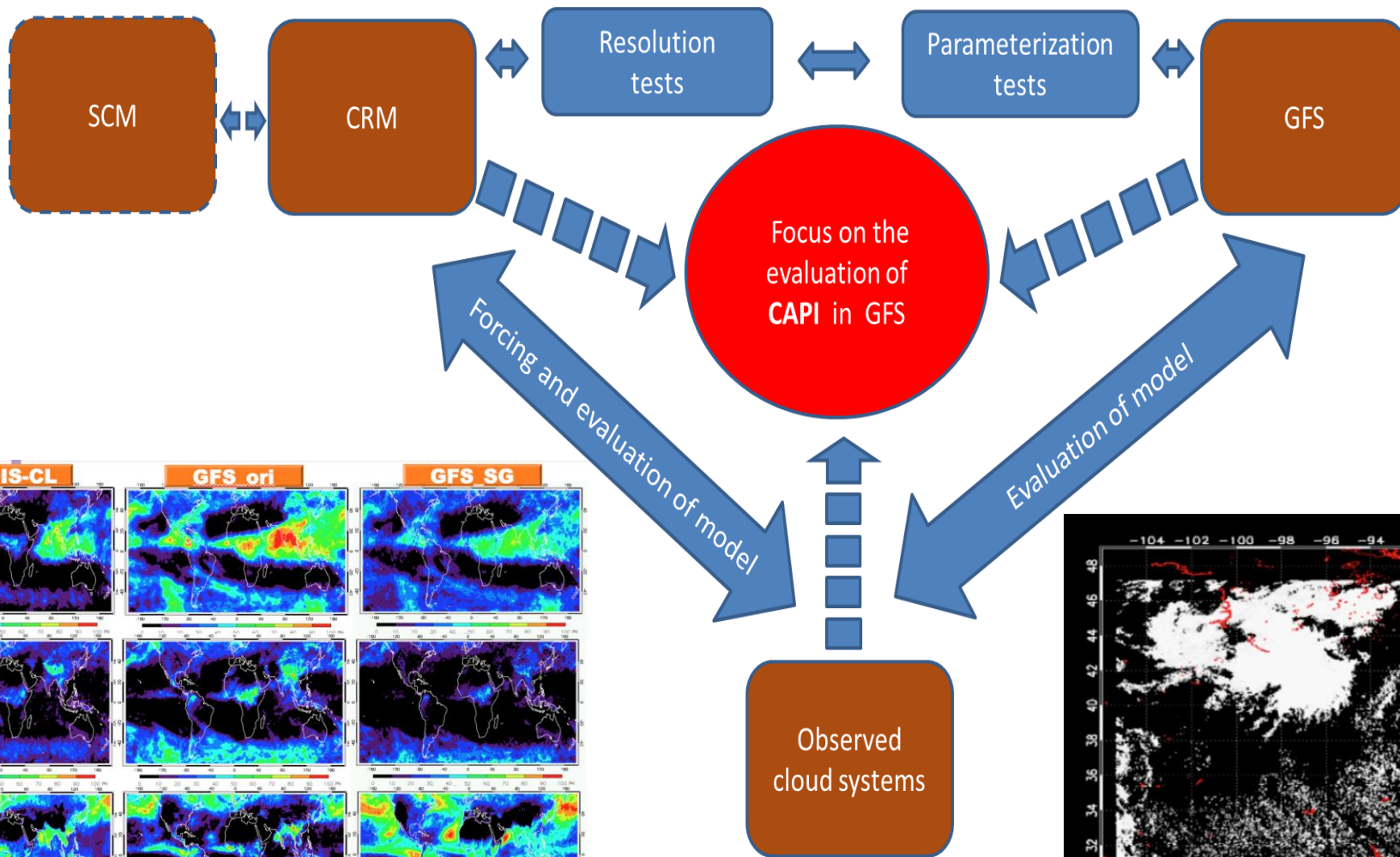
Observation-based diagnosis and testing approaches



Li et al. (2011, Nature-Geosci_)



Modeling framework for testing physical schemes



Yoo et al. (2013, Cli. Dyn)

