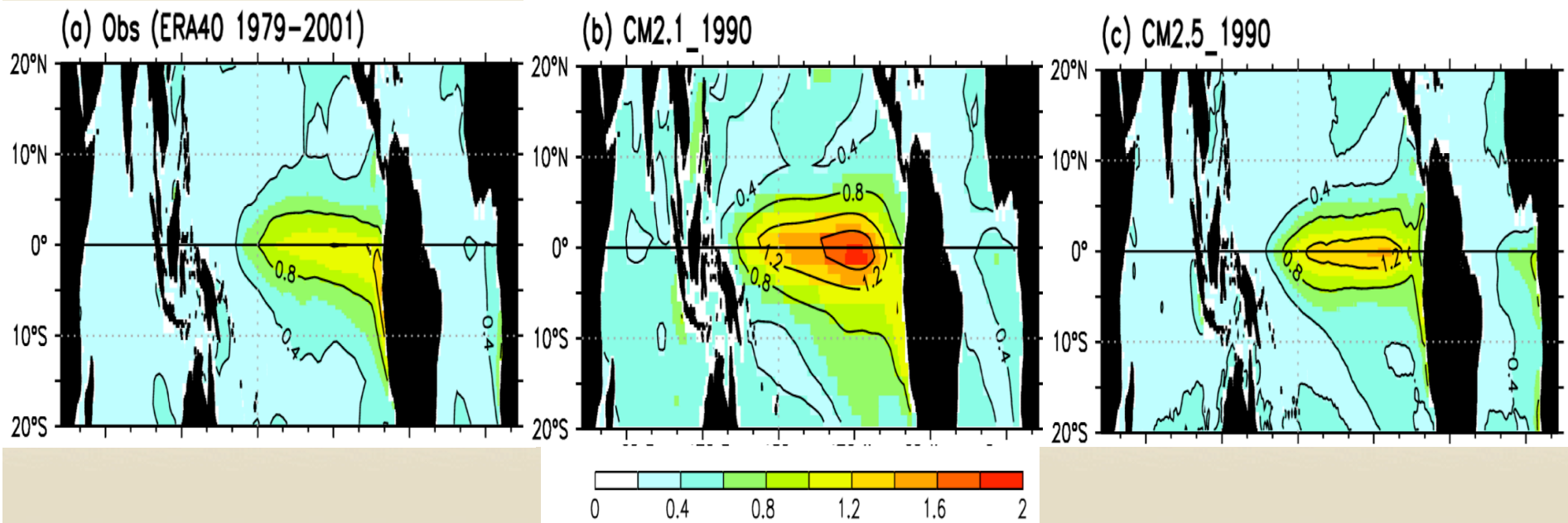
Aspects of Tropical Climate Improve with Resolution

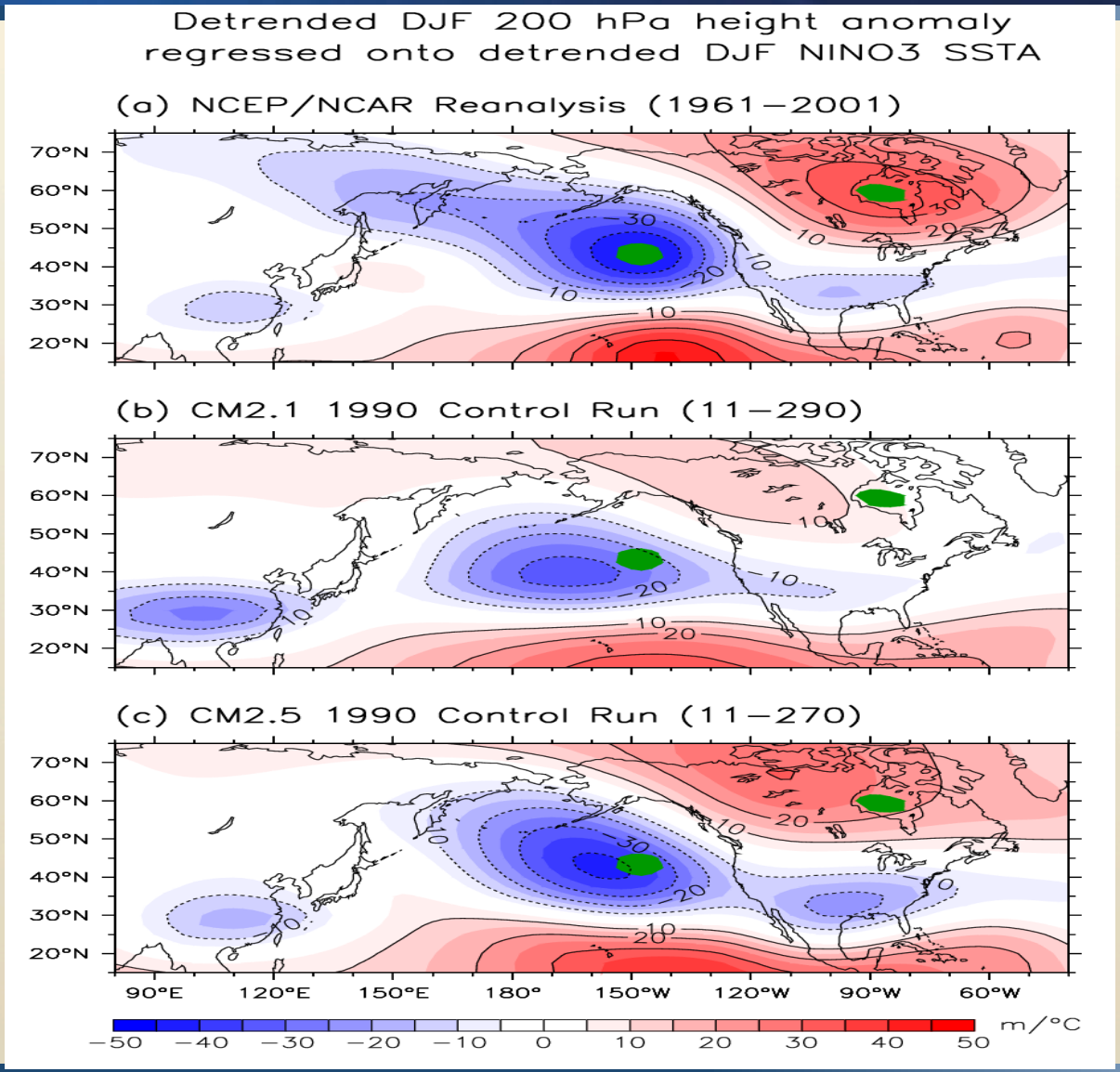
Structure of SSTA Variability



SSTA Standard deviation (°C)

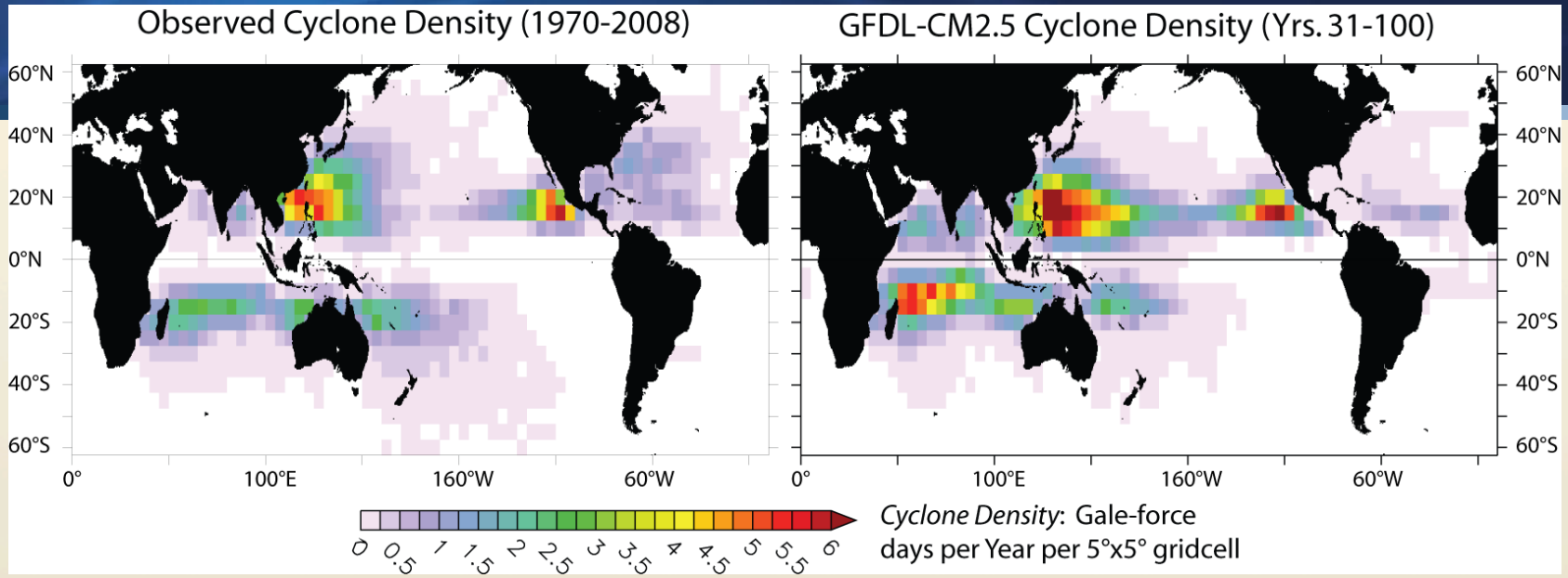
Delworth et al (2012)

ENSO Teleconnections Improve with Resolution

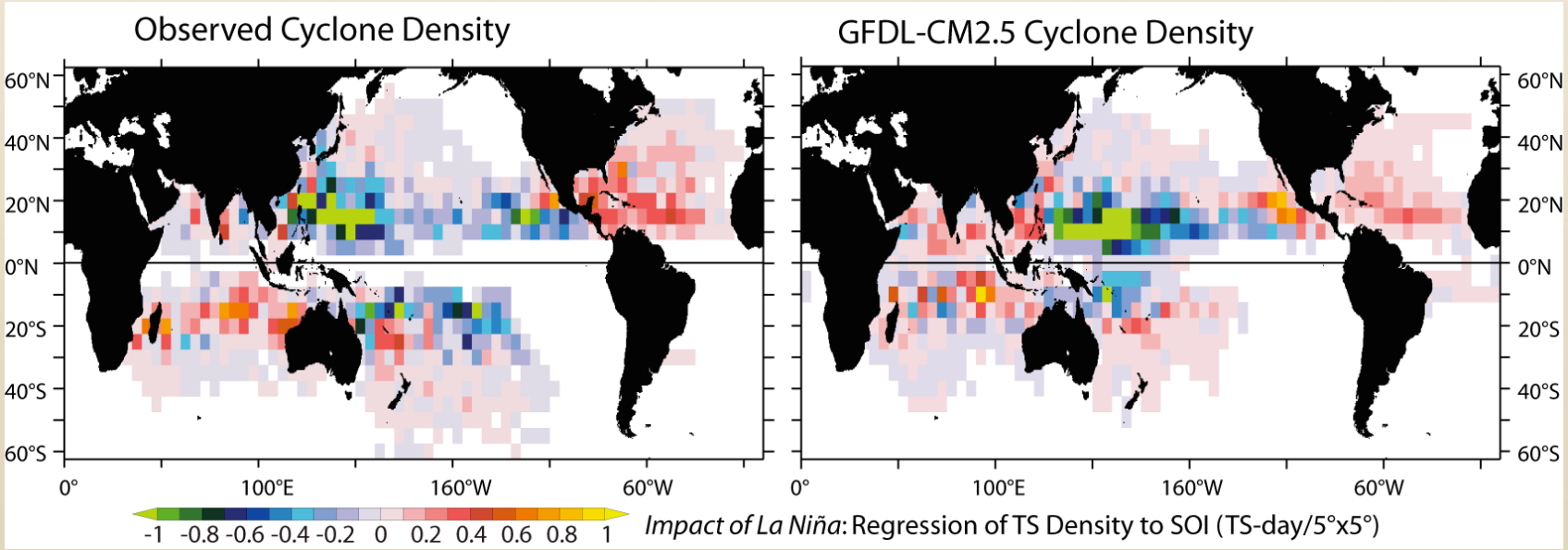


Delworth et al (2012)

Mean



Regression to SOI



Kim et al. (2012, in prep.)

Coupling appears to improve GFDL high-res model's MJO

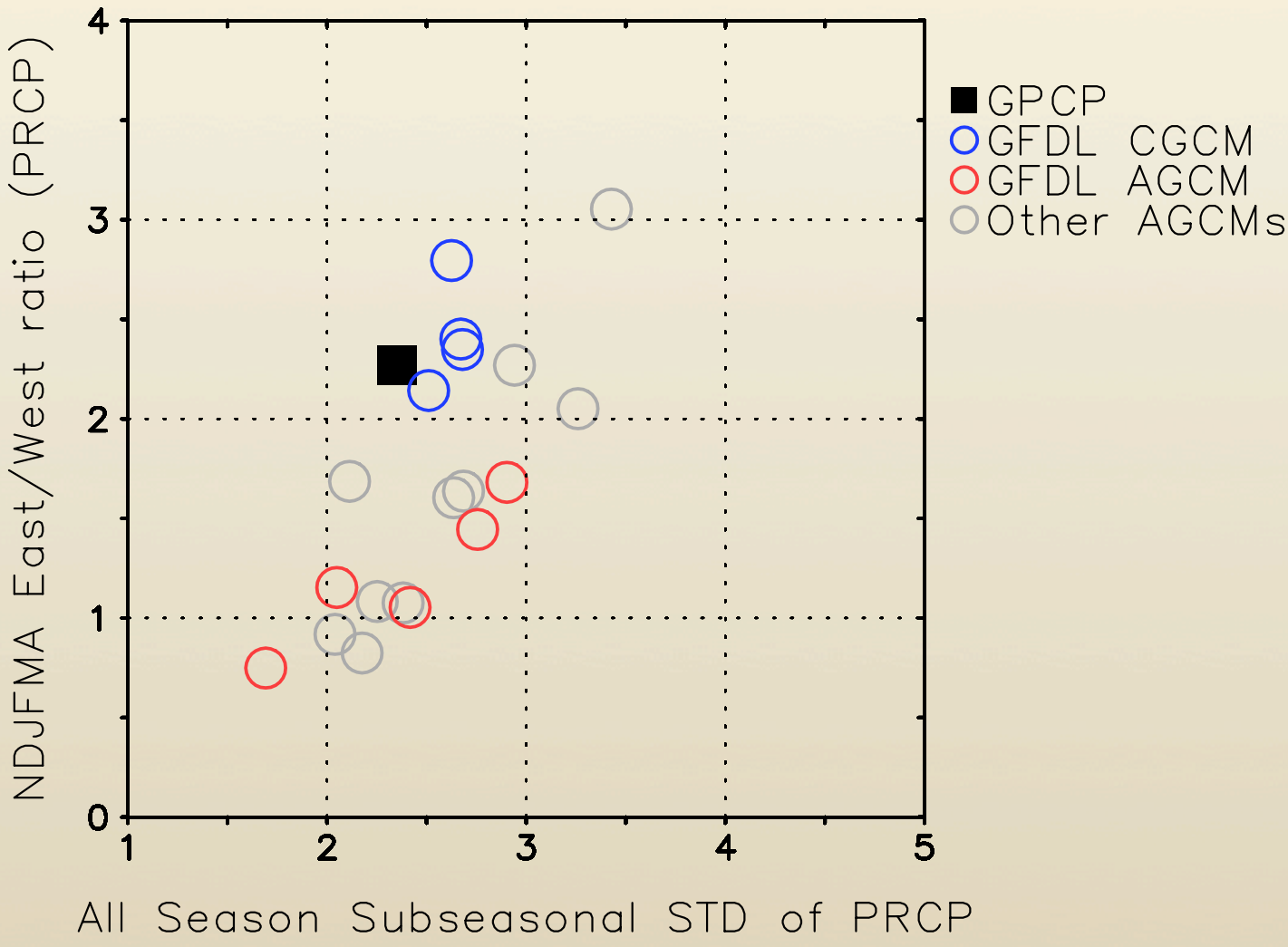


Figure: Daehyun Kim (Columbia U.)

Use GFDL CM2.x series of models with increasing resolution to build experimental high-res assimilation and prediction systems.

2005 ---------- 2013 ---------- 2015 ---------- 2020

CM2.1
200 Km atm
1 degree ocean
MOM 4 (early)

IPCC AR4 & AR5 Model → ***Current NMME contributor***

CM2.5-series
50 Km atms.
0.25 degree ocean
MOM 4/5

Planned future NMME contributor

High-resolution gives improved representation of processes and phenomena, hypothesize:

- Improved predictions of large-scale
- Improved predictions of regional climate and extremes

High-resolution coupled assimilation remains a scientific challenge, prototype within a year or so…