Contribution ID: **23** Type: **30 minute oral presentation**

# Variable-resolution weather and climate modeling using GFDL FV3

*Wednesday, 26 September 2018 16:15 (30 minutes)*

Limited-area models are much more economical than uniform-resolution global models for high-resolution climate and weather modeling, but boundary errors become a problem after a few days of integration. We present results from variable-resolution approaches available to models using the GFDL Finite-Volume Cubed-Sphere Dynamical Core (FV3), including grid stretching and grid nesting. In the HiRAM climate and seasonal prediction model, a ˜10 km region is able to greatly improve the representation of precipitation systems and especially intense tropical cyclones, without degrading (and in some cases improving) the large-scale atmospheric circulation. In the fvGFS weather prediction model, 3-km domains are able to explicitly represent convective features, including intense hurricanes and severe thunderstorms, again without degrading the hemispheric skill of the model. Promising results for medium-range prediction of severe weather are shown with this global-to-regional weather model. Prospects for further developments in the model infrastructure and in model science supporting new applications will be discussed.

## Affiliation

NOAA/GFDL

**Primary authors:** HARRIS, Lucas (NOAA/GFDL); ZHOU, Linjiong (Princeton University/GFDL); LIN, Shian-Jiann (NOAA/GFDL)

**Presenter:** HARRIS, Lucas (NOAA/GFDL)

**Track Classification:** 18th Workshop on high performance computing in meteorology