

Coupled Atmosphere-Ocean-Earth System Modeling for Subseasonal Forecasting

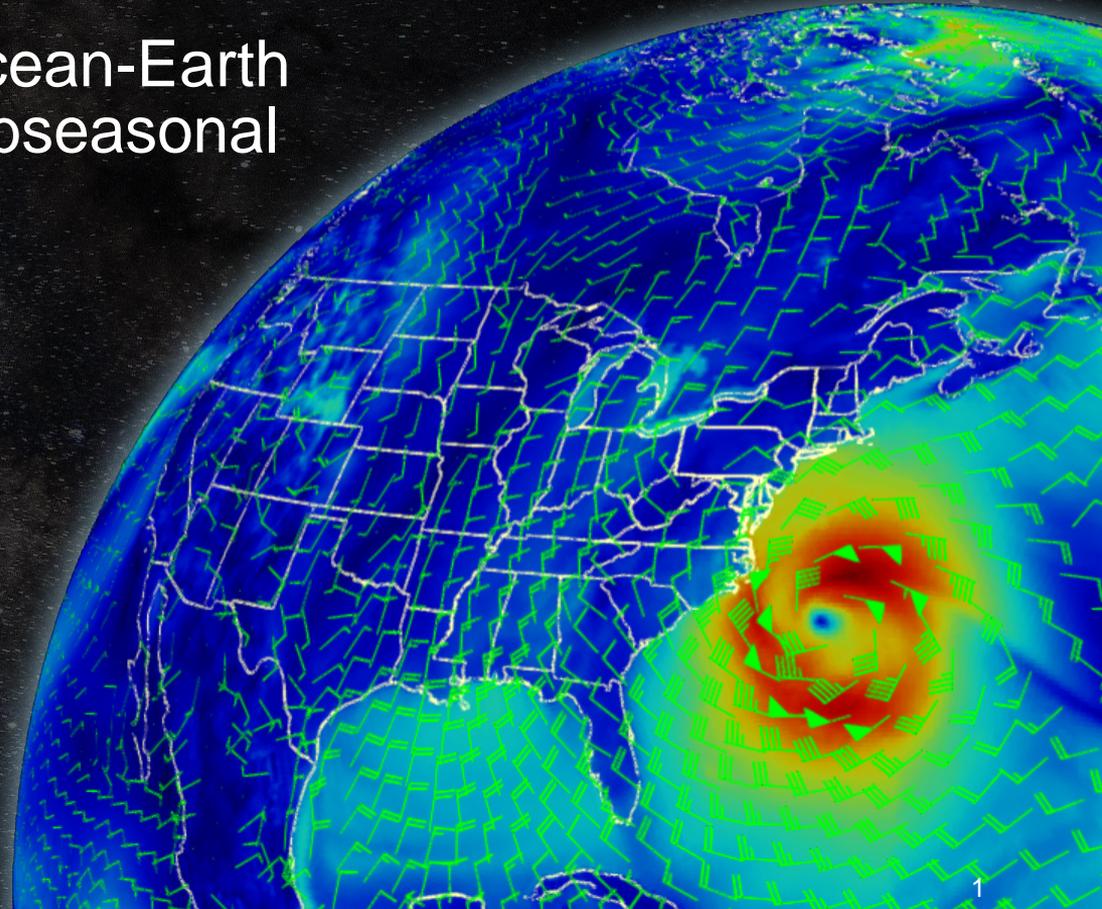
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CIRES

Performing work for NOAA/ESRL/GSD



GSD Science Review
3-5 Nov 2015



Goal: Seamless prediction from days to months



- Traditional Numerical Weather Prediction (NWP): Up to 2 weeks; Rossby wave interactions, baroclinic instability;
- Sub-seasonal prediction: Week 3-4; persistent flow anomalies, coherent structures, e.g. Madden-Julian Oscillation and blocking;
- Model skills are limited on sub-seasonal time scales.

- Ensemble forecasting improves skill by reducing uncertainty in the initial conditions;
- Multi Model Ensemble forecasting further improves skill by reducing uncertainty in both the initial conditions and model numerics;
- NMME (North American Multi Model Ensemble project has started subseasonal hindcast experiments with FIM-iHYCOM participating.

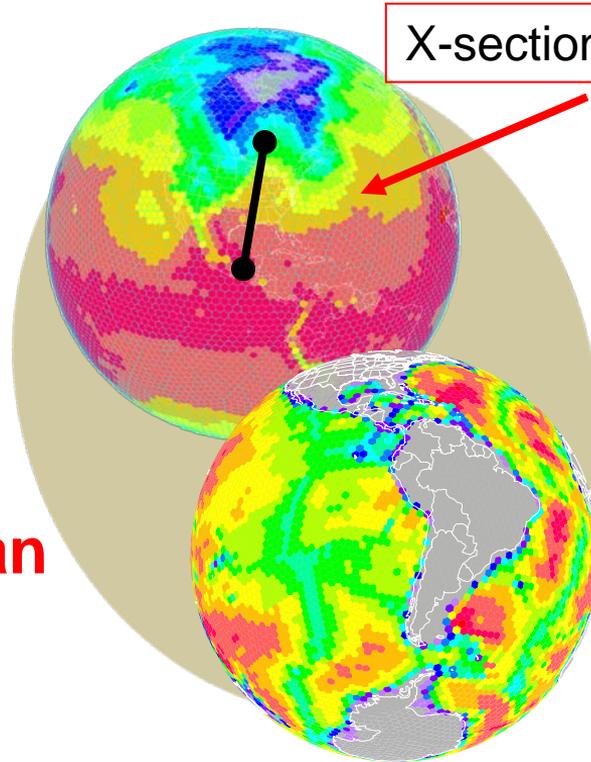
Coupled FIM-iHYCOM Model

Unstructured horizontal grid

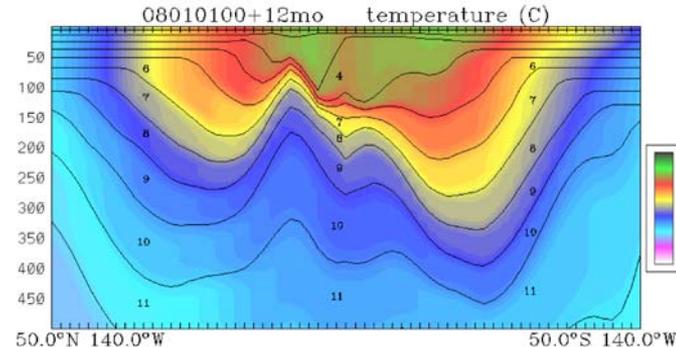
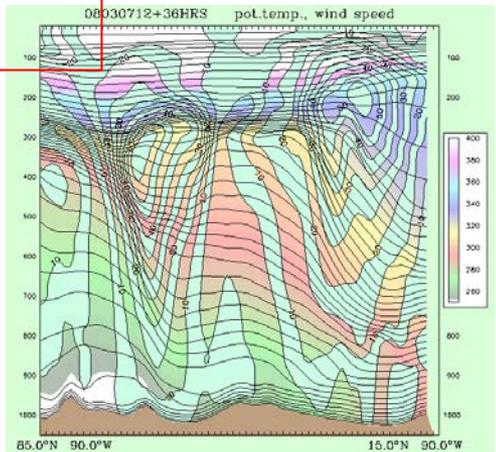
Adaptive Vertical Coordinate

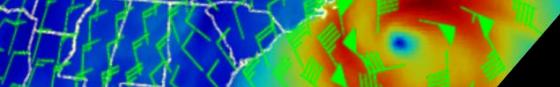
**Flow-following
Icosahedral Model
(FIM)**

**Icosahedral Ocean
Model (i-HYCOM)**



X-section location





Summary

See details in the poster ...

- Different from the current NMME models: FIM and iHYCOM would enrich gene pool of the NMME ensemble;
- Individual model improvement is the ultimate goal for better prediction;
- Preliminary studies show FIM-iHYCOM presently has skill similar to CFSv2;
- More model improvements on the way: subgridscale param., vert.resolution.