2021 HAFS-globalnest (HAFSV0.2B) Real-Time Plans

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Overall track performance of HAFSV0.1B was better than most GFS-based guidance in 2020

Somewhat of a right bias at longer leads (TBD if that will persist)

HAFSV0.1B had a high bias at longer leads

This was improved in tests of HAFS-A 2021 baseline tests with ocean coupling
2021 Grid Configuration

- Keep the 2020 “global tropical channel” FV3 layout, with 13-km global resolution (C768)
- Static 3-km nest covering most of the tropical Atlantic
- Plan to use L75 vertical level configuration
- Will expand the eastern edge if enough resources are available
- Current plan is to couple to a “tropical channel” HYCOM
- Uses the “feature/multi_nests” branch of HAFS
- 168h forecasts, hopefully 4x daily
- 4560 cores in ~5.5-5.75 hours
2021 Physics Configuration

➢ PBL: modified EDMF-TKE used in 2020, compared with set of hindcasts using Hybrid-EDMF
➢ MEDMF-TKE will be used again in 2021
➢ Based on results from HAFS-A and GFDL T-SHiELD, we plan to turn on convection for the nest for 2021 to see if this helps reduce the right bias
Global Output Analysis

- feature/multi_nests branch allows for output of global data
- In 2020, analysis of the global skill of the global-nested system was examined for the first time
- Bias in subtropical ridge was noted
- Overall global skill was very similar to GFS
- Global data will be output in 2021 as well for further analysis of global synoptic and TC skill
Addition of Ocean Coupling

- Goal is to couple the tropical-channel HYCOM at ~9 km to the global domain
- Relatively inexpensive (adds ~240 cores x 2 threads)
- Right now there are technical hurdles within ESMF that are being sorted out
- Coupling to *nested* domain is working
- This is a possible fallback option but concerns about SST/flux artifacts along the edge of the nest: potential workarounds being explored
As always, products hosted at AOML model viewer:

https://storm.aoml.noaa.gov/basin/?projectName=BASIN

- Updates to model/radar comparison graphics
- New shear/RH analysis graphics (Trey Alvey)
- ATCF files transferred to NHC in 2020, plan to continue this year
- Plan to run EMC Graphics also
Possible Side Experiments for Comparison With HAFSv0.2B

These are some other tests that may be run (not in real-time) using resources on Hera/Orion pending technical readiness and resource availability:

1. Multiple static nests (EPAC/ATL, WPAC/ATL), coupled to HYCOM globally
2. Test of moving nest capabilities (?)
3. Test of some modifications to a newer version of EDMF-TKE, based on LES results (X. Chen collaborator)
4. Test of cycling/DA capabilities (like what will be in HAFS-D)
Questions?