

HAFS Coordination Meeting Summary **Feb 5, 2020 (2-3 pm ET)**

Participants: Henry Winterbottom, Xuejin Zhang, Lew Gramer, Andy Hazelton, Bill Ramstrong, Gus Alaka, Frank Marks, Andrew Kren, Bin Liu, Jili Dong, Zhan Zhang, Weiguo Wang, Lin Zhu, Man Zhang, Evan Kalina, Mrinal Biswas, Ligia Bernardet, Mike Ek, Morris Bender, Tim Marchok, Rocky Dunlap, Kathryn Newman, Nysheema Lett, Sikchya Upadhayay.

AOML/HRD (HAFS Moving Nest and Physics Development, Tests & Evaluations at AOML- Xuejin Zhang, Bill Ramstrong, Andy Hazelton)

- Moving Nest Development
 - Running prototype nest motion code based on FMS
 - Cell-centered prognostic variables
 - Nearest neighbor for surface parameters
 - Current Coding
 - Staggered C/D grid variables (u,v wind)
 - Unit tests on single processor for interpolation algorithms
 - Upcoming work
 - Integrate nest motion code into dynamic core
 - Run tests of prescribed nest motion
 - Validate stability of model with nest motion
 - Implement moving nest with full physics
- Physics Development and evaluation in Hurricane Michael
 - Three PBL schemes were considered to test and evaluate eddy diffusivity: EDMF-Control, EDMF-N2, EDMF-TKE
 - Inflow layer is much deeper in EDMF-TKE
 - EDMF-N2 has the strongest inflow and tangential wind
- Microphysics development and evaluation
 - Plan to implement ice/snow/graupel into GFDL microphysics
- HPC Resource usage
 - Code transition and testing on HERA is completed
 - Model code transition to Orion is underway.

Q. Is the microphysics different from GFDL MP? No, it is based on GFDL MP.

GFDL (HAFS Development updates - Tim Marchok/Morris Bender)

- Nearly finished with public FMS new features, updated codes will appear on Github.
- New hire coming in to help with grid functionality.
- Looking into HAFS evaluation on the cases from last season to better understand why skill improved when microphysics was turned off.
- Evaluating improvements to Microphysics, considering Hebrew University microphysics package on particle size distribution.
- New FV3 technical release on NOAA tech node.

DTC (DTC Update on Hurricane Supplemental Projects - Evan Kalina, Man Zhang, Mrinal Biswas)

- HAFS Infrastructure: In process of CROW review through survey and workflow workshop planned for late April 2020.
 - [https://github.com/NCAR/ufs_workflows_sandbox/issues - DTC requests feedback from HAFS developers on preferred/desired features]
- HWRF Physics in CCPP
 - A steady version with separated cloud species advection in Ferrier-Aligo microphysics scheme was tested and is available in CCPP.
 - Effort has been made to modify the existing GFS saSAS in CCPP so that they can operate in their current way as well as in the HWRF way. The evaluation team has passed the regression tests.
 - Added Thompson cloud fraction scheme, more testing underway.
 - GFS EDMF scheme is now CCPP compliant.
 - Noah LSM code is now in Github. Grant is reviewing the code and will perform testing.
 - Weiguo's version of the GFS surface layer is already in CCPP. HWRF GFDL surface layer is being reviewed.

Questions from speakers:

Q1. : Shall we still stick to the mid-May deadline for decisions on final configuration for HAFS real-time experiments starting on 1st Aug?

A: To have the final configuration by May would be ideal to get ready for the real-time testing in July.

Q2. Is there a related effort at EMC in GFS RRTMG? Yes. (*EMC folks to provide Man Zhang with the contact*).

Discussion on change in workflow with moving nest:

- CROW is not likely to impact the moving nest, as it doesn't have direct impact to the source code.
- Additional files may need to be created for terrain etc, some additional adaptation may be needed.
- A separate tag-up between HRD-DTC-EMC was desired to discuss further on 'moving nest workflow'.

NESII (Rocky Dunlap)

- Working on two-way coupling between atm-ocean and further between atm-ocean and wave.
- Side-by-side runs with FV3GFS and HYCOM, validating that it can be run together.
- Atm. data is fed into HYCOM from FV3GFS in one way coupling in the NUOPC connector using nearest neighbor for testing.
- Ran for 6-hrs that validated atm is unresponsive as expected.
- Still looking into stand-alone HYCOM response to dynamic inputs.

- Next step - turning on more diagnostic, output in the coupling field for sanity check, preliminary impact of coupling using connectors, final goal is to be using CMEPS mediator in atm-ocean-wave.

Q. How is the global FV3 simulations resolved with regional atlantic basin?

A: Atm. domain and ocean domain are not the same, the nearest neighbor scheme resolves the edges.

Q. Is it consistent with the moving nest coupling?

A: There is an intermediate grid in the atmosphere that is being interpolated which is a fixed grid. The coupler will pick up from there.

Q. Is geolocation the coupler's concern?

Yes, there is a need to create an MPI.

Comment: Coupling is done only in regional domain and not the parent domain yet. EMC is working closely with NESII to modify workflow.