

Priorities for HFIP in 2017

- Retirement of GFDL hurricane model
 - Future of GFDL hurricane model
 - Replacement with HUMM in operations for 2017 season
- HFIP Priorities for 2017
 - Generating new ensemble-based products
 - Continuation of multi-model regional ensembles
 - Continuation of HFIP Web Page
 - Stream 1.5/2.0 for 2017 hurricane season
 - HFIP Computational resources – utilization stats & priorities
- Recap of HFIP Annual Review Meeting so far....

Retirement of GFDL Model from operations

After 22 years of glorious service, GFDL Hurricane model is planned to be retired!

Thank you Morris, Bob, Tim, Matt along with past research personnel at GFDL and their collaborators (NHC, HRD, EMC, FLEET, URI, others) for valuable operational guidance to NHC and JTWC and key contributions to the broader worldwide Tropical Storms research community!!

The new FV3 Model Development Team @ GFDL



PNS to be released to announce retirement of GFDL hurricane model from operations

Last day of operations is May 10, 2017 (or when new GFS goes operational)

HFIP/Jet based GFDL runs could continue in real-time (both all-basin GFDL runs and GFDL ensembles) – needs further discussion with NWS and GFDL management

Alternate options include replacing GFDL model with FV3 global model for hurricanes for 2017 hurricane season and beyond (potentially including global ensembles -- TBD)

URI to continue collaborating with EMC, AOML and DTC on ocean/wave coupling

Replacement of GFDL model with HUMM

- HUMM -- **Hurricane (prediction using a) Unified Multiscale Model**
- Developed over the past 3-4 years (EMC-HRD collaboration using HIWPP support)
- Large pool of talent at EMC to maintain and advance the model for hurricanes
- Robust T&E showing superior results over GFDL and different characteristics than HWRF
- Shared infrastructure with unified model development in NEMS
- A step closer towards NEMS/FV3 Unified Modeling System for hurricanes
- Much faster, scalable and uses CCPP style physics package

Generating new ensemble based products

- One BIG question: How do we use ensembles to make a better deterministic forecast?
- HFIP supported projects to develop ensemble techniques that will help make the deterministic forecast (pending budget availability and prioritization).
- What additional products can be developed or existing products continued for 2017 hurricane season?
- Under/Over dispersiveness of global ensembles: Additional research to guide future ensemble techniques (Physically based perturbations, Stochastic Physics) and post-processing techniques
- More products and additional evaluation of high-resolution HFIP real-time regional multi-model ensembles

Continuation of HFIP Real-time High-Resolution Regional Model Ensembles

- Plans to continue further testing and evaluation of HWRF/COAMPS-TC ensembles
- Add HUMM ensembles????
- Add FV3 ensembles to the mix???

- Continued need for supporting field program (SHOUT, IFEX, EPOCH...) for OSSE/sampling strategies

- Jet resources can be made available on a priority basis

Continuation of HFIP Web Page for graphics

- 42K views with 9K unique users.... HFIP webpage still attracts larger research community
- PPAV team inputs to sharpen what graphics are relevant and should be retained/added
- Minimize manual processing, fully automate....
- Leverage development group's resources (links to HRD/GFDL/EMC websites as well as prominent graphics.....)

Stream 1.5/2.0 Discussion

- Planning on continued use of Jet resources for real-time demonstration of advanced NWP techniques
- NGGPS/FV3 development needs might start tapping into Jet resources (already reserved 4M hrs per month + 300 TB disk for hfv3gfs)
- Reservations is a time consuming and complex process requiring continuous monitoring and support
- Justification for running in real-time vs. retrospective (at will) mode will determine the priorities
- Experiments directly help or feed products to operational forecasters will get the highest priority (Stream 1.5)

Jet Information

- Software stack will be refreshed this year.
 - A survey of used modules.
 - Possibility of adding new default versions.
- At this time, there are no plans for new compute hardware.
 - Optimization and Scaling Studies will be crucial.
- Real-time Reservers will be from the 1st August to the 1st Nov.
 - Pre-production testing will start on the 1st of July.
 - Call for proposals go out early May
- 24-hr downtime for Jet on 1/17 --- any need to change this date? (AMS is the following week)

2016 HFIP Major Projects Allocations Usage

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Alloc
hfip-gfdl	83	52	71	74	27	74	100	100	100	100	14	19	2M
hfip-psu	13	100	100	98	95	99	0	100	100	100	0	0	1.5M
hur-aoml	100	100	51	93	29	28	91	100	100	100	73	89	2.5M
hwrfv3	100	68	97	60	46	31	100	100	100	100	89	100	8M
hybda	100	100	100	100	96	100	100	100	100	100	100	68	2M
swash	10	10	10	10	100	100	100	100	100	100	100	100	1.5M

	Jan		Feb			Mar			Apr			May			Jun			
hfip-gfdl	844	1019	83	495	951	52	723	1016	71	724	984	74	272	1016	27	728	984	74
hfip-psu	130	1019	13	951	951	100	1016	1016	100	968	984	98	964	1016	95	971	984	99
hur-aoml	1015	1019	100	1050	1050	100	523	1016	51	916	984	93	296	1016	29	280	984	28
hwrfv3	6596	6596	100	3256	4754	68	5409	5582	97	2936	4918	60	2339	5082	46	1317	4283	31
hybda	764	764	100	713	713	100	762	762	100	1484	1488	100	1445	1513	96	1488	1488	100
swash	60	10	10	60	10	10	60	10	10	60	10	10	60	60	100	60	100	100
	Jul		Aug			Sep			Oct			Nov			Dec			
hfip-gfdl	365	365	100	101	101	100	42	42	100	16	16	100	140	984	14	194	1016	19
hfip-psu	0	1016	0	3695	3695	100	5553	5553	100	7	7	100	0	984	0	0	1016	0
hur-aoml	925	1016	91	76	76	100	41	41	100	35	35	100	1431	1967	73	2250	2532	89
hwrfv3	37	37	100	44	44	100	8248	8248	100	10	10	100	6121	6885	89	8610	8615	100
hybda	762	762	100	3046	3046	100	5684	5684	100	6	6	100	1475	1475	100	1038	1524	68
swash	60	160	100	60	1560	100	60	110	100	60	460	100	1524	2000	100	1524	6100	100

Recap of 2016 HFIP Annual Workshop

Frank Marks

Summary

- James Franklin - "We've clearly met the 5 year goals, particularly intensity, but concern about where we can make further gains."
- 2016 issues
 - Matthew HWRF **RI failure**
 - **Strong bias for HWRF weak systems**
 - Hermine genesis failure
 - Nicole genesis failure
 - Matthew genesis very good
 - **GFS underpredicts genesis**, more in EPAC than ATL, worse than EC and UK. 5-day worse than 2-day
 - **GFS ensemble underdispersive.**

NHC priorities

- HWRF RI
- Satellite DA
- HNMMB guidance verification
- HWRF weak storm over prediction
- GFS genesis issues
- GFS ensemble issues
- Work with ensemble tiger team to develop products useful for forecast guidance
- Upgrades to statistical dynamic models e.g., HCCA

HFIP 2017 priorities

- Focus HRD, EMC, & NHC HFIP resources on Matthew and Hermine to address RI, ensemble spread, and initialization issues by bringing model, physics, and DA teams to bear on common problem rather than on each group's interest.
- Physics team - Need more work on this model bias - initialization, physics, etc.? Idealized runs needed. Any role in spin down? RI? Need to add DA team in any physics evaluation to ascertain impact on DA.
- OMITT - Need to start stratifying cases that have potential strong ocean impact along lines of Cione's observations.

HFIP 2017 prioritiesContinued

- DA team – Work with model teams to solve spin down issue. Focus should be with operational HWRF system.
- Model team – need more evaluation of HNMMB to satisfy NHC. Should include physics and DA team evaluations. Need transition plan for Basin HWRF working with EMC.
- Ensemble team - Need NHC and JTWC involved in identifying ensemble products that improves forecast guidance. Workshop? Recommend bi weekly presentation on this work in the next month to get feedback from NHC.

HFIP 2017 priorities ... Continued

- PPAV team - Need to develop evaluation/ verification focused on weak storm/non developing over prediction. Basin scale HWRF? Upgrade to statistical dynamic models e.g., HCCA. Work with ensemble team to provide NHC timely products to evaluate multi model ensemble for guidance.