

# HFIP Annual Review Meeting

## November 5-7, 2018

Embassy Suites by Hilton Miami International Airport  
3974 NW S River Dr, Miami, FL 33142

### Overall Objectives

The new HFIP Strategic Plan detailing the specific research, development, and technology transfer activities necessary to sustain HFIP in response to Section 104 of the Weather Research Forecasting Innovation Act was approved by NOAA and awaits Congressional approval. The major goals of the act are planned to be addressed through the development of a multi-scale, multi-model system called Hurricane Analysis and Forecasting System (HAFS). The HAFS is NOAA's next-generation multi-scale numerical model and data assimilation package, which will provide an operational analysis and forecast out to seven days, with reliable and skillful guidance on Tropical Cyclone (TC) track and intensity (including rapid intensification), storm size, genesis, storm surge, rainfall and tornadoes associated with Tropical Cyclones within the framework of the Unified Forecast System (UFS) and its rolling three-year Strategic Implementation Plan (SIP). Central to the development of HAFS will be the FV3 dynamical core with embedded moving nest capable of tracking the inner core region of the hurricane at 1-2 km resolution.

The primary objective of this meeting will be to discuss the current state of operational hurricane capabilities and challenges, transition to the UFS-based FV3 system consistent with SIP with the development of HAFS, physics and DA advancements, set out NHC priorities, and build storm surge strategy. The results, accomplishments, and lessons learned from the 2018 hurricane season will be discussed allowing the development of a multi-year strategy for improving hurricane forecast guidance.

### Agenda Outline

Day 1 (Nov 5 - **INVITE ONLY**): Developer's workshop for transitioning HWRF to the UFS-based FV3 system

Day 2 (Nov 6): Results, challenges, and lessons learned from FY18

Day 3 (Nov 7): Development Plans and Science Priorities for 2019 and beyond

- HAFS developments (out-brief from focused workshop)
- Physics and DA advancements
- NHC priorities
- Socio-economic WG plans
- Storm surge strategy

# HFIP Annual Meeting Agenda

## Day 1 - INVITE ONLY

**Day 1 Remote Attendees:** Please join the meeting from your computer, tablet or smartphone.

<https://global.gotomeeting.com/join/171041325>

Join the conference call:

1-877-985-3644; pscd 584664

### Monday, November 5, 2018

This HAFS developers' workshop will primarily focus on re-engineering capabilities and functionality of existing operational HWRF and HMON into the next hurricane modeling system, consistently with the broader UFS SIP framework.

8:30 am Welcome remarks and Charge for the day (Marks)

#### 8:45 am State of FV3 CAM developments (Chair: Gopal)

8:45 am Updates from EMC (Mehra)

9:10 am Updates from GFDL (Harris)

9:35 am Updates from HRD (Zhang)

10:00 am Updates from ESRL/NSSL (Alexander/Wicker)

10:20 am Updates from OU CAPS (Xue)

10:40 am Break

#### 11:00 am - 12:00 pm Panel discussion: Moderator - Vijay Tallapragada

Panelist: Frank Marks (HRD), Avichal Mehra (EMC), S. Gopal (HRD), Lucas Harris (GFDL), Curtis Alexander (ESRL)

Discussion Topics:

- FV3 CAM development results into HAFS
- Planned HAFS development timelines based on Hurricane Supplemental proposals and overall consistency with SIP-CAM plans
- Motivation for developing the 3km standalone regional FV3 and global FV3 with nest (3km)
- Common repositories for shared development
- Key challenges (i.e. inner core DA, ensembles and multiple nesting)

12:00 pm Working Lunch (provided)

**1:00 pm - 4:15 pm Strategy Discussion:** Address strategies to achieve HAFS goals and devise a path forward for improvements to the hurricane application. Consider following expected outcomes for the workshop during the huddles for preparing the report out.

- Discuss science development efforts and challenges
- Detailed description and timeline of each deliverable (based on a common understanding)
- Identify required resources, organization responsible and interdependencies for deliverable

**1:00 pm Obs and DA Strategies**

- Inner Core Data Assimilation
- Use of observations to improve RI
- Vortex Initialization
- JEDI for HAFS

**1:45 pm Nesting Strategies**

- Algorithms of moving nests in FV3
- Algorithms for telescopic nests in FV3
- Crossing the faces of the cubed sphere edges

**2:30 pm Break**

**2:45 pm Physics Strategies**

- Physics packages & CCM3 for HAFS
- Coupling FV3 to other earth system component models (Ocean, Waves, Land, Surge etc.)

**3:30 pm Testing and Validation Strategies**

- Real-time/retrospective testing at various stages
- Model diagnostics for HAFS
- Storm Tracker

**4:15 pm Panel discussion on Outcomes**

Panelist: Frank Marks (HRD), Avichal Mehra (EMC), S. Gopal (HRD), Lucas Harris (GFDL), Curtis Alexander (ESRL)

**5:00 pm Adjourn**

Note 1: Please send your presentations to: [nysheema.lett@noaa.gov](mailto:nysheema.lett@noaa.gov) and [sikchya.upadhayay@noaa.gov](mailto:sikchya.upadhayay@noaa.gov) by 2 Nov 2018; final presentations will be posted on [hfip.org](http://hfip.org) by November 15

Note 2: Please allow at least 5 min for questions within the allotted time.

## HFIP Annual Meeting Agenda

**Day 2 Remote Attendees:** Please join the meeting from your computer, tablet or smartphone.

<https://global.gotomeeting.com/join/238667381>

Join the conference call:

1-877-985-3644; pscd 584664

### **Tuesday, November 6, 2018**

8:30 am Registration, Name Badge Pickup, Continental Breakfast

8:50 am Welcome remarks, Introductions, facility logistics

### **Results from 2018 – (Chair: DeMaria)**

9:00 am FY18 NHC Verification (Cangialosi)

9:20 am NHC's forecast challenges in 2018 – Florence/Lane (Brennan/Blake)

9:40 am NHC's view on developmental priorities (Brennan/Blake)

10:00 am 2018 Year in Review: JTWC TC Activity, Forecast Challenges, and Priorities (Strahl)

10:20 am Open Discussion on Best Practices and lessons learned from 2018

### **10:35 am Break**

### **Operational Modeling Session- Stream 1 (Chair: DeMaria)**

11:00 am NHC's perspective on priorities for the next generation hurricane model (DeMaria)

11:20 am 2018 Hurricane Model Performance (Liu)

11:50 am EMC Hurricane model upgrades and priorities for 2019 (Mehra)

12:10 pm COAMPS-TC FY18 Performance and FY18-FY19 Plans (Doyle)

**12:30 pm**      **Working Lunch** (provided)

**Results from Jet: Real-time Reservations - Stream 2 (Chair: Tallapragada)**

1:30 pm          HWRf driven by FV3GFS (Thomas)

1:40 pm          Basin-scale HWRf (Alaka)

1:50 pm          3-km nested hfvGFS (Hazelton)

***Continue...* Results from Jet: Real-time Reservations - Stream 2 (Chair: Tallapragada)**

2:00 pm          HWRf Ensemble (Zhang)

2:10 pm          HMON Ensemble (Wang)

2:20 pm          FV3GFS, C768 with DA cycle (Grell)

2:30 pm          Analog Ensemble (Lewis)

**HFIP Supported Research Reports - (Chair: Gopal)**

2:40 pm          Data Assimilation efforts (Wang)

3:00 pm          Physics developments (P. Zhu)

3:20 pm          DTC hurricane research activities (Newman/Kalina)

**3:40 pm**      **Break**

4:00 pm          NHC experimental ensemble products (Penny)

4:20 pm          Ensemble Products Tiger Team (Torn)

4:40 pm          HFIP Metrics (DeMaria, Franklin, Brennan)

5:00 pm          Summary and Wrap up from Day 2

- Discuss Day 3 agenda and optional group dinner

**5:00 pm**      **Adjourn**

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Note 2: Please allow at least 5 min for questions within the allotted time.

Note 3: Invited attendees: Bill Lapenta, John Cortinas, Ming Ji

## HFIP Annual Meeting Agenda

**Day 3 Remote Attendees:** Please join my meeting from your computer, tablet or smartphone.

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### Wednesday, November 7, 2018

- 8:30 am Continental Breakfast
- 9:00 am Description of Goals and Status of HFIP Strategic Plan (Marks)
- 9:20 am Next Phase of HFIP – Realignment of base program strategy (Toepfer)
- 9:40 am Plans for Jet (HPC) and Research to Operations (Tallapragada)
- 10:00 am Hurricane Supplemental Update (Toepfer)

### 10:20 am Break

### Development Plans and Science Priorities for 2019 and beyond (Chair: Marks)

- 10:45 am Development Plans and Science Priorities for 2019 (Marks)
- 10:50 am HAFS developments out-brief from Day 1 workshop (Gopal)
- 11:15 am Physics priorities next 1-3 years (Weiguo Wang)
- 11:35 am Data Assimilation advancements (Sippel/Winterbottom)
- 11:55 am HAFS Community Support (OAR and NWS - HFIP Prgm Office)

### 12:15 pm Working Lunch (provided)

### Storm Surge Session (Chair: Rhome)

- 1:30 pm Current Operational status (Fritz)

- 1:50 pm Storm surge modeling gaps and priorities (Alaka)
- 2:10 pm 5-year plan to advance storm surge modeling for operational requirements (Upadhayay)

**Socio-economic session (Chair: Sprague-Hilderbrand)**

- 2:30 pm Socio-economic WG status (Sprague-Hilderbrand)
- 2:50 pm Accelerate effective risk communication of warnings (Eosco)
- 3:10 pm Status of Tropical Program (Schauer)
- 3:30 pm Plans for modernizing TC product suite (Sprague-Hilderbrand)
- 4:00 pm Adjourn**

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Note 2: Please allow at least 5 min for questions within the allotted time.

Note 3: Bill Lapenta (NOAA/), John Cortinas (OAR/OWAQ), Ming Ji (NWS/STI)