HFIP Annual Review Meeting
November 17-19, 2015

Embassy Suites Miami Airport
3974 NW S. River Dr.
Miami, FL 33142

Overall Objectives

The agenda will consist of three parts;

1. Ensemble Workshop (Nov 17, 8:30-5:30 with 1 hour lunch time)
2. Reports from each of the strategic and tiger teams on activities and results from 2015 and plans for 2016 and path forward (Nov 18, 8:30-5:30 and Nov 19, 09:00-12:30 with 1 hour lunch)
3. Optional Python scripting tutorial for HWRF developers (Nov 19, 1:30-5:00 and Nov 20: 9:00-12)

Ensemble Workshop: This scientific focus session on hurricane ensembles is relevant to the HFIP demo project this year with special attention given to ensembles of high-resolution regional models (Navy, NCEP, GFDL). Workshop topics include design and implementation of hurricane ensembles, ensemble post-processing techniques (weighted means, superensemble techniques), probabilistic forecasts, representation of uncertainty, use of ensembles in data assimilation, observation sensitivity experiments, single model vs. multi-model ensembles etc.

At NCEP operations, there is continued emphasis on the use of ensembles more so than we do today. Even after the HFIP workshop dedicated to the subject five or so years ago, we still don't have good, new ensemble techniques to improve deterministic forecasts. We would like to use this opportunity to review the state-of-the-art in the science and application of hurricane ensembles, and discuss on prioritized development of new applications for effective use of ensemble products for operational needs at NHC. The goal of this workshop is to encourage more community involvement and come up with a set of recommendations for consideration by HFIP.

HFIP annual meeting: The HFIP program is guided with the advice of Strategic Planning teams and Tiger teams. The purpose of the HFIP Strategic Planning teams is to develop a multi-year (1-5 years) strategy for improving hurricane forecast guidance. The Tiger teams will be responsible for overseeing the development of specific new capability for the hurricane forecast guidance system. Overall, the role of the team members are to ensure the HFIP plan represents an integrated plan across NOAA and involving the community outside NOAA and that it will lead meeting the overall HFIP goals. This meeting will provide updates from the various teams and also discuss on future NOAA strategy related to next generation model developments and its relevance to the hurricane problem. The HWRF tutorial will be complimentary to the annual meeting this year and will be open to all HWRF developers who are interested in learning the recent advancements made to the HWRF system using Python scripts and Rocoto workflow.

Workshop on Effective Use of Hurricane Ensembles
17 November 2015

All Talks 20 minutes, unless otherwise noted.

Welcome and Workshop Goals: 8:30 AM
- Frank Marks, Fuqing Zhang, Ryan Torn
- NHC Perspective – James Franklin (NHC)

HFIP Dynamical Ensembles
- 8:45 AM - HWRF Ensemble Prediction System and its Verification for 2015 Real time parallel experiment – Zhan Zhang (NCEP/EMC)
- 9:05 AM – Evaluation of 2015 GFDL Hurricane Ensemble – Matt Morin (GFDL)
- 9:35 AM - Performance of the 2015 real-time COAMPS-TC ensemble and combined COAMPS-TC/HWRF/GFDL multi-model ensemble – Jon Moskaitis (NRL)

Break: 10:05 - 10:25 AM

- 10:25 AM - FSU Multi-Model Ensemble- Krish or other member

HFIP Non-Dynamical Ensembles
- 10:45 AM - Development and performance of a statistical-dynamical ensemble technique for tropical cyclone intensity guidance – Kate Musgrave (CIRA)
- 11:05 AM - A hybrid statistical-dynamical approach to tropical cyclone wind speed probabilities – Andrea Schumacher (CIRA)
- 11:25 AM - Probabilistic prediction of tropical cyclone intensity change using an analog ensemble, Chris Rozoff (CIMSS)
- 11:45 AM - NHC's uses and needs for ensemble prediction systems, Eric Blake (NHC)

Lunch: 12:05-1:30 PM

Ensemble generation: representation of IC and model errors
- 1:30 PM - Using Stochastic Ensembles to Better Understand Hurricane Predictability - Falko Junt (RSMAS)
- 1:50 PM - Impact of Model Uncertainty on Hurricane Ensembles – Carolyn Reynolds (NRL)
- 2:10 - A Multiple-Model Ensemble Examination of the Probabilistic Prediction of Hurricanes Sandy (2012), Edouard (2014), and Joaquin (2015) - Christopher Melhauser (PSU)
- 2:30 PM - The ensemble Forecasting of Tropical Cyclone Track in GEFS – Kate Zhou (NCEP/EMC)
- 2:50 PM – Storm-scale ensemble design: Model error representation with WRF-ARW for severe storm prediction - Glen Romine (NCAR)

Break: 3:10-3:30 PM

Ensemble Applications
- 3:30 PM - The ensemble forecast of Hurricane Isaac (2012) –Hua Chen, Rogers
- 3:50 PM - Application of HWRF ensemble forecasts for prediction and observation targeting – Ryan Torn

Panel Discussion: 4:10-5:15 PM
- Panel Members: Altug Aksoy, Jun Du, James Franklin, Jon Moskatis, Jeff Whitaker, Zhan Zhang
- Moderator: Fuqing Zhang
- How can we create more skillful EPSs?
- What are the best methods of taking advantage of these EPS?
- How do we better deal with model error? Ocean uncertainty?
- What kinds of products would justify the computational cost, especially over the current non-dynamical ensemble products
- What products are missing?
- What kinds of scientific experiments could answer these questions?

Annual Meeting Agenda

Wednesday, November 18, 2015

8:30 AM	Welcome, State of the Program (Toepfer)
8:45 AM	Summary of Ensemble workshop recommendations (Torn, F. Zhang)

Stream 1 – Gopal (Chair)

9:15 AM	Preliminary FY15 verification (Franklin)
9:35 AM	HWRF in FY15 (Zhan Zhang)
9:55 AM	HWRF upgrades and priorities for 2016 at EMC (Trahan)
10:15 AM	Long Range Plans (Tallapragada)
10:30 AM	Break
11:00 AM	JTWC report (Strahl)
11:20 AM	COAMPS-TC updates (Doyle, Moskaitis)
11:40 AM	Stream 1.0 Discussion (Penny or Pasch, Tallapragada)
12:00 PM	Lunch

1:15 PM **HFIP Team Reports (20 min each) - (Chairs: Marks and Tallapragada)**

Strategic Teams

- Model Developments (Xuejin Zhang, Trahan)
- Web Page (McCaslin, Kucera)
- Physics Strategy (J.W.Bao, Abarca)
- Post Processing/verification (DeMaria, Zelinisky, Marchok)
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3:20 PM **Break**

3:40 PM **Continue Team Reports (20 min each)**

- DA/Initialization/Ensemble Development (Whitaker, X.Wang)
- ATCF developments NRL (Buck Sampson)

4:10 PM **Discussion on Focus topic: Ocean Impact – Marks (Chair)**

- Ocean Model Impact (Kim, Halliwell & Cione) 3-4 brief presentations to lead discussions

5:10 PM　　**Continue Team Reports (20 min each)**

- Recon Data Impact: TDR/Dropsonde DA Impacts for HWRF (Tong, Sippel)

5:30 PM　　**Adjourn**

Thursday, November 19, 2015

8:30-9:00 AM Discussion on Genesis Product (Chair: Tim Marchok)

- FSU Genesis Products – Dan Halperin (Albany)
- Proposal for a new tiger team on genesis prediction (TBD)

Continue Team Reports (25 min each) (Chairs: Marks and Tallapragada)

9:00 AM　　　HFIP Socio-economic Working Group (Sprague)

9:25 AM　　　DTC core activities (Newman, Nance)

Satellite Data Assimilation (Chair: Fuzhong Weng)

9:50 AM　　　HWRF Satellite DA progress and plans (Fuzhong Weng)

10:05 AM　　All sky radiance assimilation overview (Jeff Whitaker)

10:20 AM　　Promises in assimilating all-sky radiances for future convection-permitting hurricane analysis and prediction (Fuqing Zhang)

10:35 AM　　Discussion on Satellite Data Assimilation (Fuzhong, Jeff and Fuqing)

10:50 AM　　Break

11:05 AM　　NGGPS for hurricanes (Toepfer, Marks and Tallapragada)

11:30 AM　　**Continue Future Priorities for HFIP (Chair: Gopal)**

- Role of the teams/ new team leads?
- Continuation of HFIP Web Page
- Creation of Genesis Tiger Team

- Stream 1.5/Real-time demo system
- Continuation of regional ensembles
- Computational resources

12:15 PM   Day 2 Wrap-up and next steps – (Tallapragada and Gopal)

12:30 PM   Adjourn

Agenda for Python Training

Training Timeline.

Thursday, November 19 – 1:30 PM – 5:30 PM (EST)		
	Topic	**Speaker**
1:30 PM	System Overview	Kathryn
2:00 PM	Object-oriented Scripts	Sam
2:30 PM	Rocoto for HWRF	Christina
3:00 PM	Configuring	Sam
3:30 PM	**Break**	
3:50PM	Logs Overview	Christina
4:20 PM	Scripts: Part 1	Christina
Friday, November 20 – 9 AM – Noon (EST)		
	Topic	**Speaker**
9:00 AM	Scripts: Part 2	Christina
10:00 AM	Database	Sam
10:30 AM	**Break**	
10:45 AM	Debugging	Christina

System Overview
- Current HWRF capabilities
- Purpose of each Rocoto task
- Resources for users and developers

Object-oriented Scripts
- Overview of O-O programming
- How it's implemented for HWRF

Rocoto for HWRF
- Purpose
- How it works
- Effectively running HWRF with Rocoto

Configuring HWRF
- Parm overview
- Methods to configure a run

Scripts: Part 1
- Driving HWRF: interaction of Rocoto, scripts, and ush
- hwrf_expt.py overview

Scripts: Part 2
- Reading the scripts for better understanding of the system

Database
- Why is it there?
- What does it do?
- How does it work?

Logs
- Overview of Rocoto, jlog, task, and component logs

Debugging
- Running scripts from command line
- Using an interactive session
- Practical application