HRH – work towards report

5/9

Issues for Final Report

- Allow modelers time to complete all cases.
- Do a final report on Q4 and a follow-up report later
- Compare Maximum Winds average with instantaneous to see if it is important to compute average.
- On website line plot of winds, delta-wind, indicate landfall
- Identify the most difficult cases for each model and see if there is match.- label them the "hard cases" .
- Identify if source of problem is from large-scale model by seeing if NRL, initialized from NOGAPS, has different "hard cases" from other models (whose initializations is based on GFS/GFDL).
- Write publication (journal and/or book)

Issues on verification

- Should current operational techniques of post-processing results be applied before verifying (e.g., in operations the intensity for a model is adjusted based on deficit of intensity existing at initialization)

- Compare Maximum Winds average with instantaneous to see if it is important to compute average.

- OK to drop RMW verification?

- Verification of consistency: should DTC develop its own algorithm, or is there a best-practices way of doing this?

- Should DTC try to separate track and intensity errors by verifying intensity only for a) forecasts with good track (how?); b) forecasts over water.

- Should NHC Vx computation include extratropical transition?

- Compare DTC Vx of GFDL model against URI's to sort out reason for differences (do they originate from Output Module, tracker, or use of Vx?)

- If we would ever do another high res test again, would we do anything differently? What did we miss on this test?

Recommendations for Future Studies I

- Case studies of the "hard cases". More diagnostics on those cases.

- Idealized studies.

- Work with field experiment to have extensive datasets for verification and diagnostics.

- Predictability issue

Recommendations for Future Studies II

- Address data assimilation, ensemble and physics.
- Study how to compose best ensemble. Ensemble may be based on uncertainties on large-scale (IC), model formulation or parameters in physics.
- Ensemble postprocessing.
- Ensemble verification
- How can we use the HRH dataset for ensemble studies?

Recommendations for Future Studies III

- Identifying biases of each model to give guidance on guidance
- Form new team for guidance on guidance
- Apply post-processing, de-biasing techniques or statistical models to complement dynamical models for the intensity problem.

Discussion items…

- For assessing our progress towards HFIP 5- and 10-year goals, should any metrics other than these four be verified and tracked year to year: (1) 5-day track forecast errors; (2) 5-day intensity forecast errors; (3) RI/RW forecast statistics; (4) Skillful 7-day forecasts?

- Should forecasting of tropical cyclogenesis be an area addressed by the verification team?

- Verification team Year 1 milestone #5: "*Perform baseline verification for existing HFIP models and provide annual report to HFIP management and other HFIP teams.*" Which models should be in that group for this first (baseline) year?

Discussion items…

- How can the verification team best interact with the various modeling & diagnostic teams?

- How and when will verification tools be made available to the modeling groups for development use?

- Regarding submission of verification tools to the "verification toolbox" by the modeling groups: Will developers be willing to submit any verification packages they have, and will they be willing to offer support?

Discussion items…

- DTC is collecting an invaluable suite of model forecast data. What happens after June with this data, and should more be done in terms of diagnostics and verification than simply track, intensity, and RI/RW?

- If we would ever do another high res test again, would we do anything differently? What did we miss on this test?

Discussion items…

- A major thrust of HFIP is the utilization of ensemble forecasts. Besides ensemble <u>mean</u> track & intensity forecasts, what ensemble-based guidance can we envision that is directed towards the primary HFIP goals, and what methods, algorithms and software are available for verification?

  - One guidance possibility: Wind speed probability guidance, mimicking the DeMaria product, but derived instead from dynamical models.