Major Priorities over the next 3-5 years for the HFIP Post-Processing and Verification Team

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Outline

- **PPAV Team: FY14 Priorities**
- **PPAV Team: Priorities over the next 2-5 years**
- **PPAV Team: Suggested milestone additions for FY15 – FY19**

Development of PPAV Team Milestone Recommendations

- Original planning occurred at the HFIP annual meeting (Feb 19-20, 2014)
  - HFIP management provided a starting point for milestones
  - Original milestones included no PPAV activities
- A follow up telecon open to everyone associated with HFIP occurred on March 12.
- PPAV team activities were split into 4 main categories:
  - Development of new products & statistically post-processed guidance
  - Development of new diagnostic & verification techniques
  - Real-time display, diagnostics and verification
  - Community tool development

PPAV Team: FY14 Priorities

- **Development of new products & statistically post-processed guidance**
  - Expansion of statistical-dynamical Intensity guidance (SHIPS, LGEM, SPICE)
  - Continuing to produce ensemble-based genesis guidance
  - Track and intensity guidance (weighted consensus developed at NHC)
  - Evaluation of HWRF applications for wave, surge, hydrology, and severe weather forecasts
  - Development of forecast tools for diagnosing ensemble forecasts
  - Ensemble-based probabilistic forecast products, including wind speed probabilities.

PPAV Team: FY14 Priorities

- **Development of new diagnostic & verification techniques**

  - Apply new RI / RW verification methodologies to HWRF and HFIP research models
  - Development of verification techniques for surface wind structure
  - Development of vortex-scale and convective-scale diagnostics for HWRF
  - Development of physics diagnostics for HWRF, including PBL and surface layer.
  - Continue development of methods for quantifying “windshield wiper” effect in track forecasts, including a review by NHC
  - Development of verification techniques for synthetic satellite imagery and moisture fields
  - Development of verification techniques for ensemble-based products such as QPF probability and wind speed probability

PPAV Team: FY14 Priorities

- **Real-time display, diagnostics and verification**

  - Real-time displays via HFIP webpage as well as via NHC ATCF
  - Real-time diagnostics support at NHC & EMC for operational models
  - Develop new internal NHC tools for real-time verification.

- **Community tool development**

  - Improve the GFDL vortex tracker and release latest version to the community
  - Update the MET-TC software and release the next community version.
  - Improve ensemble-based verification methods and transition methods into the MET-TC software

PPAV Team priorities: FY15 and beyond

- **Development of new products & statistically post-processed guidance**

  - Transition the NHC-HFIP corrected consensus to operations.
  - Continue to expand the use of SHIPS, LGEM, and SPICE to use input from global ensembles.
  - Develop and implement techniques that provide guidance on guidance (in coordination with JHT efforts on this topic).
  - Develop a web-based interface that can display ensemble forecast tracks, stratified by parameters such as intensity, moisture, or shear.

PPAV Team priorities: FY15 and beyond

- **Development of new diagnostic & verification techniques**

  - Include new DTC/TCMT verification techniques into MET-TC, and promote the expanded use of MET-TC by modelers and forecasters.
  - Survey the HFIP groups to develop a list of available verification and diagnostic tools, and make a list of these tools available on the HFIP website so other groups can benefit.
  - Develop new verification techniques that evaluate storm size and structure forecasts
  - Continue advanced diagnostics work for model improvement. Examples include, but are not limited to, diagnostics of model RMW, vortex tilt, eyewall slope, convective bursts, PBL, surface layer, and microphysics.
  - Use the HWRF (or other models) to develop tools that distinguish tropical cyclones that undergo RI from those that do not.

PPAV Team priorities: FY15 and beyond

- **Real-time display, diagnostics and verification**

  - Continue to support upgrades to operational diagnostic code, such as the GFDL Vortex Tracker.
  - Develop and refine tools for making real-time verification statistics available to forecasters at NHC.
  - Expand the HFIP demo webpage, and integrate more interactive displays, such as the new ensemble track display system.

PPAV Team priorities: FY15 and beyond

- **Community tool development**

  - Expand the CIRA (SHIPS) model diagnostic code to include additional output parameters and update the documentation
  - Upgrade the CIRA diagnostic verification code and update the documentation
  - The PPAV team recommends that both codes be entered into DTC as a community code

PPAV Team: New Milestones FY15-FY19

PPAV Team: Milestone Additions for FY15-FY19

- **FY15**
  - Implement the NHC-HFIP Corrected Consensus in operations
  - Develop techniques that provide guidance on guidance
  - Upgrade the CIRA model diagnostic code
  - Enter CIRA model diagnostic code into DTC as a community code
  - Develop a set of standard metrics and verification techniques that assess surface wind structure and storm size.
  - Continue HRD vortex- and convective-scale diagnostics (e.g., RMW, vortex tilt, eyewall slope, convective burst radial and azimuthal locations, CFADs of vertical velocity)
  - Continue HRD PBL & surface layer diagnostics (e.g., inflow depth and strength, PBL potential temperature)
  - Include new DTC/TCMT verification techniques into MET-TC (e.g., forecast consistency verification, RI, genesis verification)
  - Release latest version of GFDL vortex tracker to the community
  - Evaluate HFIP website for content and revisions
  - Create a link on the HFIP web page of the list of available verification and diagnostic tools from all the various groups.
  - Begin to transfer selected experimental web-based HFIP products to NHC for implementation.

PPAV Team: Milestone Additions for FY15-FY19

- **FY16**
  - Test versions of LGEM, SHIPS and SPICE that use input from global ensembles
  - Implement graphical displays that can show tracks & intensities based on various thresholds of environmental parameters
  - Develop techniques that provide guidance on guidance
  - Enter CIRA model diagnostic verification code into DTC as community code
  - Continue HRD vortex- and convective-scale diagnostics (e.g., RMW, vortex tilt, eyewall slope, convective burst radial and azimuthal locations, CFADs of vertical velocity)
  - Continue HRD PBL & surface layer diagnostics (e.g., inflow depth and strength, PBL potential temperature)
  - Release latest version of GFDL vortex tracker to the community
  - Release latest version of CIRA diagnostic code to the community
  - Evaluate HFIP website for content and revisions
  - Update and release the MET-TC software

PPAV Team: Milestone Additions for FY15-FY19

- **FY17**
  - Implement versions of LGEM, SHIPS and SPICE that use input from global ensembles
  - Develop techniques that provide guidance on guidance
  - Continue HRD vortex- and convective-scale diagnostics (e.g., RMW, vortex tilt, eyewall slope, convective burst radial and azimuthal locations, CFADs of vertical velocity)
  - Continue HRD PBL & surface layer diagnostics (e.g., inflow depth and strength, PBL potential temperature)
  - Release latest version of GFDL vortex tracker to the community
  - Release latest version of CIRA diagnostic and verification codes to the community
  - Evaluate HFIP website for content and revisions
  - Update and release the MET-TC software

PPAV Team: Milestone Additions for FY15-FY19

- **FY18**
  - Implement techniques that provide guidance on guidance
  - Continue HRD vortex- and convective-scale diagnostics (e.g., RMW, vortex tilt, eyewall slope, convective burst radial and azimuthal locations, CFADs of vertical velocity)
  - Continue HRD PBL & surface layer diagnostics (e.g., inflow depth and strength, PBL potential temperature)
  - Release latest version of GFDL vortex tracker to the community
  - Release latest version of the CIRA diagnostic and verification codes to the community
  - Evaluate HFIP website for content and revisions
  - Update and release the MET-TC software

PPAV Team: Milestone Additions for FY15-FY19

- **FY19**
  - Implement techniques that provide guidance on guidance
  - Release latest version of GFDL vortex tracker to the community
  - Release latest version of the CIRA verification and diagnostic codes to the community
  - Ensure that all relevant content from the HFIP website has been transferred to / implemented at NHC (the transition of useful products will begin sooner)
  - Update and release the MET-TC software