

Project Progress Report

Title: *Developments in the High-Impact Weather Prediction Project*

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Research Summary:

Advancements to the HNMMB 'end-to-end' automation system: As of the end of Q4 2015, **all major milestones of the HIWPP project have been achieved**, with the exception of comprehensive testing and evaluation- a task that is recommended to be merged with the on-going HNMMB R2O efforts at EMC (HNMMB is a potential replacement for the operational GFDL hurricane model). It should also be noted that there were few land-falling storms in the 2015, the season on which our developmental efforts were focused. The defined milestones and their respective completion dates are shown in Table 1 below.

Milestone	Completed
✓ Configuration & Testing	Dec 2014
✓ HWRF Physics Transitions	Sept 2014
✓ Idealized Framework	April 2015
✓ HWRF Vortex Tracker	Jun 2015
✓ HWRF vortex initialization and cycling	Dec 2015
✓ Semi-Real Time testing	Complete
Multi-Season Testing, Verification, Rainfall Evaluation	On-going at EMC

Table 1: Milestones of the HIWPP project and their completion date.

To systematic improvements and upgrades, the most notable addition to the packages in Q4 was the inclusion of multi-storm initialization and relocation. The capacity to forecast and track multiple storms as existed for some time, but only for cold-start cases. The addition of multi-storm initialization allows for improved initial conditions in the model, resulting in more improved forecasts. The tool is fully version controlled and continues to

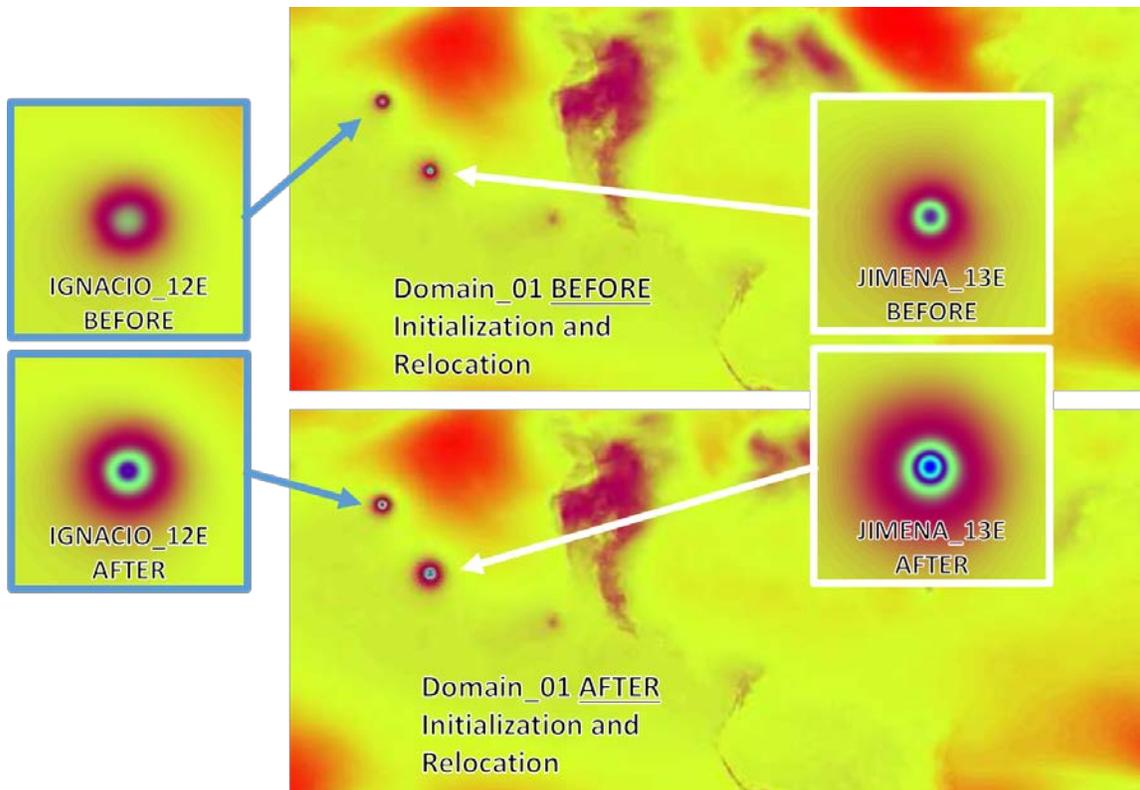


Figure 2: ‘Before and After’ plots of Mean Sea-Level Pressure (MSLP) for the outer and innermost domains, demonstrating initialization and relocation for multiple storms, namely Hurricanes Ignacio and Jimena for the cycle beginning Sept 03 at 00Z during the 2015 Pacific season.

Hurricane HNMMB SVN repository: All development relative to the HIWPP program is version controlled in accordance with NOAA standard practices and procedures. In collaboration with partners at EMC, the HRD modeling team maintains the SVN repository, “<https://svnemoc.ncep.noaa.gov/projects/hnmmb>”. Use of the repository ensures the contributions from all collaborators are integrated into a common "latest and greatest" version of the code. Updates to the existing scripts and codes are periodically committed by team members. We also periodically updated and documented the project progress to the umbrella project HIWPP.

Presentation: A project update entitled “HNMMB: Weaving the Proven Successes of HWRF into the NEMS Framework” by Steven Diaz and co-authors was presented at the American Meteorological Society’s 32nd conference on Hurricanes and Tropical Meteorology, April 17-22, 2016, San Juan, PR (<https://ams.confex.com/ams/32Hurr/webprogram/Paper293537.html>). This presentation provides an overview of the developments and also on some of the results related to impacts of physics, vortex cycling and real-time testing of the multi-storm capability.

Management Activities

No activity of note.

Research Performance Measure: All objectives are on track.