

# Project Scoping and Milestones for Synthetic Flight Profiles

## Project Scoping and Milestones for Flight Level Dataset

### Project Milestones

**Milestone 1:** Update code to support conversion of all USAFR and NOAA data formats for *flight level data* and accompanying *SFMR data* for 2010 - 2012 seasons

This milestone was completed as of April 30, 2013.

All of the flight level data have now been processed for the 2010 - 2012 seasons. All of the flight level data (and accompanying SFMR data) for each storm have been read from the original source data files and written into NetCDF file per storm with standardized variable names. All of the data have now been visually checked by plotting the flight and SFMR data in earth relative coordinates. These "quick-look" plots are located at:

<http://www.ral.ucar.edu/staff/jvigh/share/flight/>

Effort needed to reach Milestone 1: 142.6 hrs. This includes all project setup activities.

**Milestone 2:** Finish code to conduct spatial averaging and binning of flight level and SFMR data

Work on this milestone has commenced as of April 30, 2013.

**Milestone 3:** Process all of 2010 - 2012 data into radial legs relative to moving storm center

Work on this milestone has commenced as of April 30, 2013.

**Milestone 4:** Determine appropriate method to track the model storm center in HWRF

Work on this milestone has commenced as of March 10, 2014. As an initial experiment, I will try using the HTCF output (5-second frequency).

**Milestone 5:** Implement simple sampling method (following Uhlhorn and Nolan 2011) to retrieve synthetic flight profiles from post-processed HWRF simulations (code to run on local desktop)

Work on this milestone has commenced as of March 28, 2014.

**Milestone 6:** Prepare documentation of codeset, "release" code into the the hwrf-contrib trunk

**Milestone 7:** Complete project report for DTC Visitor Program

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### Project Stretch Goals

**Stretch Goal 1:** Complete code to support conversion of all USAFR and NOAA flight level and SFMR data formats for 2005 - 2009 seasons (example, legacy netCDF and standard tape format)

This stretch goal was completed February 14, 2014 with funding from the RPI project. Readers have been written for formats all the way back to 1997 (excluding the standard tape format).

**Stretch Goal 2:** Process all 2005 - 2009 data into common formats

This stretch goal was completed February 14, 2014 with funding from the RPI project. Actually, data are now standardized all the way back to 1997.

**Stretch Goal 3:** Implement simple sampling code set on Jet or Zeus supercomputers

**Stretch Goal 4:** Analyze results to determine structural deficiencies in HWRF for at least one season (e.g. 2012), examine alternative metrics (i.e. azimuthally-averaged model storm structure)

**Stretch Goal 5:** Implement more complex sampling method of HWRF simulation to retrieve synthetic flight profiles (use post-processed output files at higher temporal resolution)

**Stretch Goal 6:** Implement "full complexity" sampling method of HWRF simulation to retrieve synthetic flight profiles (use raw HWRF output files at higher temporal resolution)

**Stretch Goal 7: Evaluate differences in sampling methods for accuracy and computational cost**

**Stretch Goal 8: Compute additional advanced diagnostics, such as vorticity and inertial stability**

**Stretch Goal 9: Community release of stand-alone diagnostics module in either community HWRF or TC MET**

**Stretch Goal 10: Publish results of this research in one or more journal articles**