

The H*Wind Real-time Hurricane Wind Analysis System

Third Quarter JHT Progress Report

Period: March-May 2002

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1. Prioritized User Requirements (see revised list attached at bottom)

- In March, after we received NHC's list of priorities, we established use cases and timelines according to NHC's priorities.

- On May 7th, NHC (Ed Rappaport, James Franklin, Jiing, Miles Lawrence) and HRD (Mark Powell, Peter Black, Russell St. Fleur, Nick Carrasco, Sonia Otero) met to discuss the proposed use cases and timelines. Conclusions reached can be obtained from the minutes of the meeting (email from Jiing).

- Item #1 (Due 7-1-2002) "GPS sonde WL150 wind", of the prioritized requirement list, has been implemented but will require additional realtime testing. Decoder for parsing out the winds is complete. Adjustment routine for adjusting WL150 winds to the surface based on James Franklins algorithm have been implemented. Scripts have been tested using test observations sent over the LDM feed. Need to add GPSSONDE_WL150 (_OCEANIC) platform to database.

- Item #3, (Due 6-1-2001) Automatic analysis product annotation, is nearing completion. A perl script calls the GIMP graphics editing program and adds the required text elements to the analysis graphic. The graphical file is then converted to a web-ready (.png) format. A procedure must still be developed to automatically create a file containing the text elements of the annotation based on the various observation platforms and associated time periods used in the analysis.

-Item #4, (Due 6-1-2002) Automatic storm track updating has been implemented.

-Item #7 (Due 8-1-2002) Creation of an Intranet page to access color wind analysis products. A preliminary design of the page sequence has been completed.

-Item #9 (previously#10, Due 7-1-2002) The default time range for accessing observations has been implemented ahead of schedule.

-Item #12 (previously #13, Due 5-1-2002) An arrow indicating the location and direction of the maximum wind speed has been added to the IDL plotting code. Database changes are still in progress.

-Item #17b (previously #19b, Due 6-1-2002) The source name for fixes has been changed from ATCF_FIXES to CARQ_FIXES and the ATCF parser programs changed. We still need to change database platform.

-Item #17c (previously #19c, Due 5-1-2002) A five mesh domain and parameter set has been tested on small (Iris 2002), large (Floyd 1999), and weak (Debby 2000). We will make this available as the "novice" analysis default choice. The storm size based analysis parameter sets will then be listed as "2001".

- Item #18 (previously #21 (Due 5-1-2002) Maximum zooming ability has been increased from 1 x 1 degree to 0.1 x 0.1 degree.

2. Database

The H*Wind database server "chac" was upgraded from Oracle8i release 8.1.7 to Oracle 9i release 9.0.1. Oracle 8i had limitations with column precision, column editing, query definitions, array passing, schema updating, and data retrieval. The upgrade to 9i overcomes these problems and will allow reorganizing the database to accommodate JHT's new requirements for year two.

At the present time, our database consists of 4 schema: Observation schema, stormfix schema, quality control schema, and analysis schema. A testing database (Oracle 9i) was installed on an MS2000 machine at AOML to allow changes to be tested without affecting the our server at NHC. The observation schema columns were updated (adding new fields and renaming old ones in the observation schema to better identify their contents) and we are currently updating code for queries and insertions.

Data collection scripts need to be adapted to start ingesting the new fields. These changes are the first steps to implement items 12 and 15 of the prioritized user requirement list.

- Sonia has given Nirva a list of changes for the analysis schema, in order to capture all parameters involved in an analysis with the purpose of making it reproducible if need be in the future. Currently, we were concentrated on storing analysis results, but not the input parameters.

3. Analysis

- George Soukup has made great progress on establishing the most generic parameters for the majority of types of storms in a 5-mesh analysis (see Item 19c above). Sonia and George will meet on the week of May 20th to integrate the new IDL scripts with the Quality Control client. It was decided that during this season, there would be 3 levels of analysis expertise:

a) novice - new 5-mesh generic analysis

b) 2001 - refers to the old way of choosing an analysis size

c) expert - remains the same interface for maximum flexibility in selecting analysis parameters.

4. Data flow

- Scripts have been tested using test observations sent over the LDM feed.

-Need to add platform to database for GPSSONDE_WL150 (_OCEANIC) platform.

Decoders have been updated and are ready to run this season, they are also being documented for better understanding by others than the original developer. These new decoders need to be tested with the scripts to make sure that they still work properly. While testing the new scripts, they will be updated where need be and cleaned for easier readability and use by others. Brian Maher has informed us that the data locations for this season remain as they were for the 2001 season. Pre-existing time delay as seen in the 2001 season with data collection may remain. Based on communications with Paul Chang of NESDIS we will take another look at the qscat server to see if we can determine a better time to run the script or maybe run it multiple times in the hour to try and make qscat and tmi data more timely.

5. Testing and Evaluation

Shirley Murillo has set up H*Wind at University of Hawaii and in cooperation with the Central Pacific Hurricane Center, Sam Houston will be using H*Wind for forecaster training sessions on tropical cyclone wind field analysis. Forecasters from the Joint Typhoon Warning Center have been invited to observe these sessions. Shirley will visit JTWC to assist them in setting up H*Wind for evaluation. Jeff Hawkins of NRL Monterey has been given an evaluation password to assist JTWC.

6. Presentations and papers

Jason Dunion presented papers on H*Wind at the 2002 National Hurricane Conference in Orlando and the AMS Conference on Hurricanes and Tropical Meteorology in San Diego.

The H*Wind team conducted a hurricane wind analysis laboratory as part of the WMO Tropical Meteorology course at NHC. A Quicktime movie was created from video footage and is available on our ftp site.

A paper on the impact of surface-adjusted GOES cloud drift winds on the H*Wind analysis by Jason Dunion with Chris Velden, Mark Powell, and Sam Houston as coauthors was published in *Monthly Weather Review*.

Dunion, J. P., S. H. Houston, C. S. Velden, and M. D. Powell, 2002: Application of surface-adjusted GOES low-level cloud-drift winds in the environment of Atlantic tropical cyclones. Part II: Integration into surface wind analyses. *Monthly Weather Review*, **130**, 1347-1355.

7. Updated Prioritized User Requirement Table

<u>User Requirement task</u>	<u>Persons</u>	<u>Deadline</u>
GPS sonde WL150 wind	Nick	7/1/2002
User-defined reduction factors	Sonia	8/1/2002
Automatic annotation	Russell	6/1/2002
Automated storm track updates	Sonia	6/1/2002
Automated generation of time window, storm track, and data retrieval	Sonia	8/1/2002
Output results (radii, max wind) to ATCF fix format message	Nick	??
Output display to Intranet Web page. Assist proving NHC format to convert to Gempak for N-AWIPS	Russell	7/1/2002
One-click data flagging (Note this was previously #9, old #8 was eliminated)	Sonia	10/1/2002
Default time window for data retrieval	Sonia	7/1/2002
Flagging by data type	Sonia	10/1/2002
Restricted data retrieval to environment (1000 km?) of selected storm	Sonia	4/2003
Analysis maximum wind on the graphical output and annotation	George, Russell	5/1/2002
Default set of data types that are already checked off (Add GPS WL 150, NHC colors to list)	Sonia	7/1/2002
Default mesh drawing	Sonia	4/2003

Ability to turn off the Soukup postprocessing(Note: This item was previously #16, old #15 removed, NHC colors added to #13)	Sonia	8/1/2002
Glossary of H*wind terms (Tutorial)	Sonia	7/1/2002
a)Ob labels,	Sonia	10/1
b) fix label	Sonia	6/1
c) Analysis parameters	Sonia	5/1
d) sfc/upper loading	Sonia	7/1
e) start end times	Sonia	8/1
f) track load labels	Sonia	7/1
More detailed zoom capability (Note This item was previously #21, old #20 removed)	Sonia	5/1/2002