

JHT Mid-term Report

September 1, 2011 – February 17, 2012

Improvements to the SHIPS Rapid Intensification Index

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1. Introduction

Below is a brief summary of the accomplishments that have been achieved during the first 6 months of our current JHT project. A comparison of these accomplishments against the most recent timeline for our project (see Appendix) indicates that we are significantly ahead of the deliverables timeline that was established for our project since completion of the development of discriminant versions of the Atlantic rapid intensification index (RII) for the new added lead-times of 12-h, 36-h and 48-h is listed as the sole deliverable for this initial 6 month period in that timeline.

2. Accomplishments

Preliminary versions of the discriminant SHIPS RII (Kaplan et al. 2010) were derived at the new added lead times of 12-h, 36-h, and 48-h for both the Atlantic and eastern North Pacific basins utilizing the 1995-2010 developmental SHIPS database. As was agreed upon at a meeting that was held between the PI and the NHC points of contact in October 2012, the initial predictors that were utilized to develop the discriminant versions of the RII at these new added lead times included those that were employed in the revised version of the 24-h SHIPS RII that was developed as part of a recently completed JHT project (Kaplan et al. 2011). Versions of the Bayesian and logistic probabilistic rapid intensification (RI) models were also developed for the Atlantic and eastern North Pacific basins at each of the aforementioned added lead times. These new Bayesian and logistic probabilistic models were developed utilizing both the predictors that Rozoff and Kossin (2011) employed to develop the 24-h versions of those models as well as predictors that were chosen to optimize the skill of each version of those same models at each of the new lead times.

Independent estimates of the probability of RI have also been obtained by leaving

out one year of data and then re-deriving each of the three versions of the RI models (i.e., discriminant, Bayesian, and logistic probabilistic) at each of the lead-times (12-h, 24-h, 36-h, and 48-h) for the Atlantic and eastern North Pacific basins. These independent estimates are currently being used to develop an ensemble-based version of the RII that employs the probability of RI estimates from all three versions of the RI models following the methods described in Rozoff and Kossin (2011). Development of Fortran code and scripts for use in producing ensemble-based RI forecasts in real-time during the upcoming 2011 Hurricane Season has also commenced.

In addition, data feeds have been established that make it possible to transfer SSM/I, SSMI/S, AMSU-B, TRMM-TMI output from NESDIS to CIMSS in preparation for real-time testing of the new RI models that are currently being developed utilizing microwave-based predictors.

Finally, the Naval Research Laboratory ran a real-time modified version of the RI aid described in Sampson et al (2011) starting in late June of 2011. This version as well as the original version of the RI aid that is described in the Sampson et al. (2011) study were evaluated for the entire 2011 Atlantic and eastern North Pacific Hurricane Season. There was also one bug in the RI aid code that was identified and fixed early in the 2011 season.

Appendix

Revised JHT year 1 timeline (9/12/2011)

Project: Improvements to the SHIPS rapid intensification index

PIs: John Kaplan, James Kossin, Christopher Rozoff, Christopher Velden, and Charles Sampson

September 1, 2011	Project begins
January 2012	Complete development of discriminant Atlantic RII for added lead-times of 12-h, 36-h and 48-h.
March 1, 2012	Mid-year progress report due
March 2012	Present year 1 results at the IHC
April 3, 2012	Renewal proposal due
April 2012	Complete development of Atlantic ensemble RII at 12-h, 24-h, 36 and 48-h lead times
Aug 1, 2012	Complete development of new RAPID Aid at lead-times of 12-h, 24-h, 36-h, and 48 h for the Atlantic basin
Aug-Nov 2012	Perform real-time tests of new Atlantic RII guidance products
September 3, 2012	Annual Report due (Year 1)

References

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