

U.S. DEPARTMENT OF COMMERCE

#### National Oceanic and Atmospheric Administration

#### Atlantic Oceanographic and Meteorological Laboratory

#### Hurricane Research Division

#### 4301 Rickenbacker Causeway, Miami FL 33149 USA

October 29, 2018

Letter of Recommendation for Gwendolyn Larson

I am writing this letter of recommendation in support of Gwendolyn Larson whom I had the privilege of mentoring during her one week visit to NOAA’s Atlantic Oceanographic and Meteorology Laboratory (AOML) in August of 2018.

 During the course of her weeklong visit, Gwendolyn performed a statistical analysis of the relationship between the intensity changes of Atlantic tropical cyclones and various predictors that are included in the Statistical Hurricane Intensity Prediction Scheme (SHIPS) database. Specifically, Gwendolyn evaluated various atmospheric and ocean predictors that are employed in both the operational SHIPS intensity model as well as the statistically-based rapid intensification index (SHIPS-RII) both of which are currently employed by the National Hurricane Center as guidance for forecasting tropical cyclone intensity. In addition, Gwendolyn examined various newly developed oceanic predictors and compared the correlations between those new predictors to the observed changes in intensity for all tropical cyclones as well as for systems that underwent rapid intensification. Gwendolyn's analysis showed that several of the newly developed oceanic predictors exhibited a better correlation with TC intensity change than did those presently used in both the operational SHIPS and SHIPS-RII models. Based upon those results, further experiments are planned to evaluate whether inclusion of any of the newly developed oceanic predictors yields an increase in predictive skill in the operational SHIPS RII. Also, since several of the newly developed ocean predictors included the effects of salinity evaluating the correlation of those predictors with tropical cyclone intensity change also serve to provide a means of quantifying salinity's impact on hurricane intensity change in a broader sense. This latter result has important implications as some of the regional operational Hurricane intensity prediction models presently in use are coupled to ocean models that include the effects of salinity.

 It is worth noting that during her one week visit to AOML Gwendolyn had an opportunity to interact with several other scientists with expertise in the interaction between the ocean and atmosphere in a unique scientific environment.

Finally, in addition to the important research findings that she obtained, Gwendolyn also exhibited an excellent work ethic as well as the ability to work and cooperate with her mentor as well as the other scientists that she worked with over the course of her weeklong visit to AOML. It is also worth noting that both Gwendolyn's initial visit and the subsequent research that she performed after returning to the University of Delaware resulted from her independently taking the initiative to gain knowledge in the area of ocean hurricane interactions. For all of the above reasons, I feel that Gwendolyn Larson would be a worthy recipient of an NSF Graduate Research Fellowship.

Sincerely,

John Kaplan

