

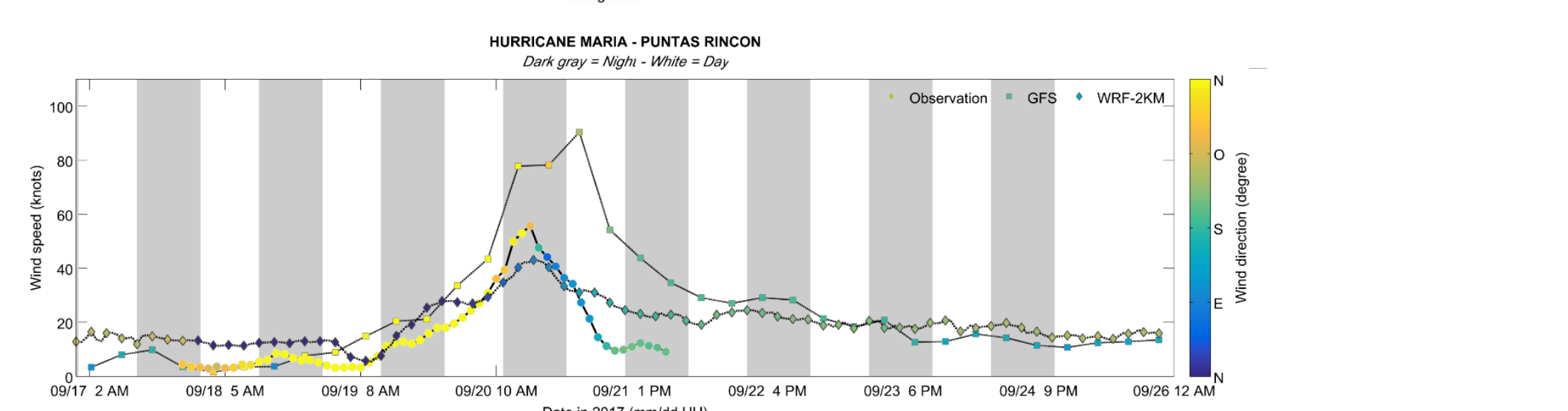
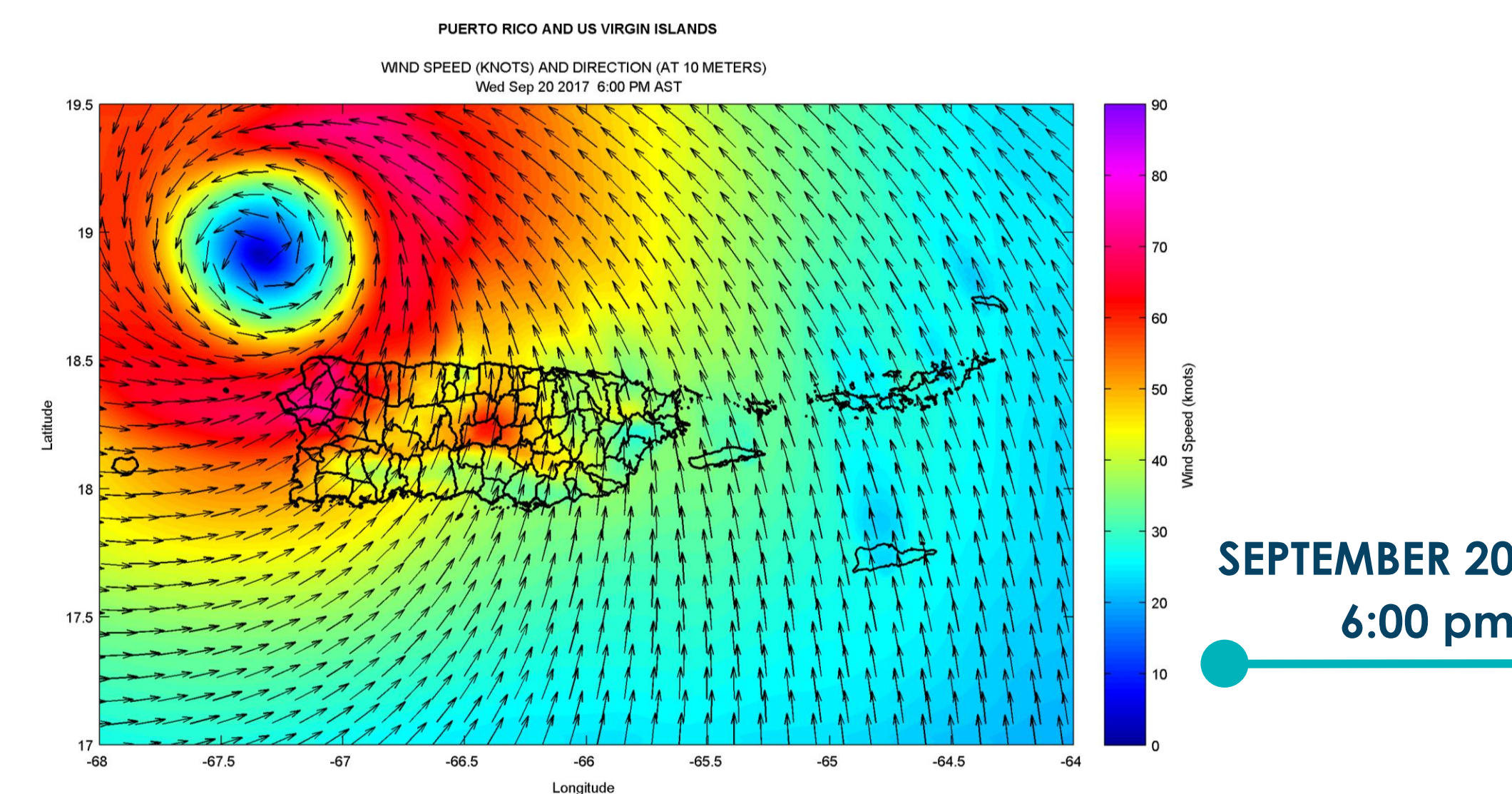
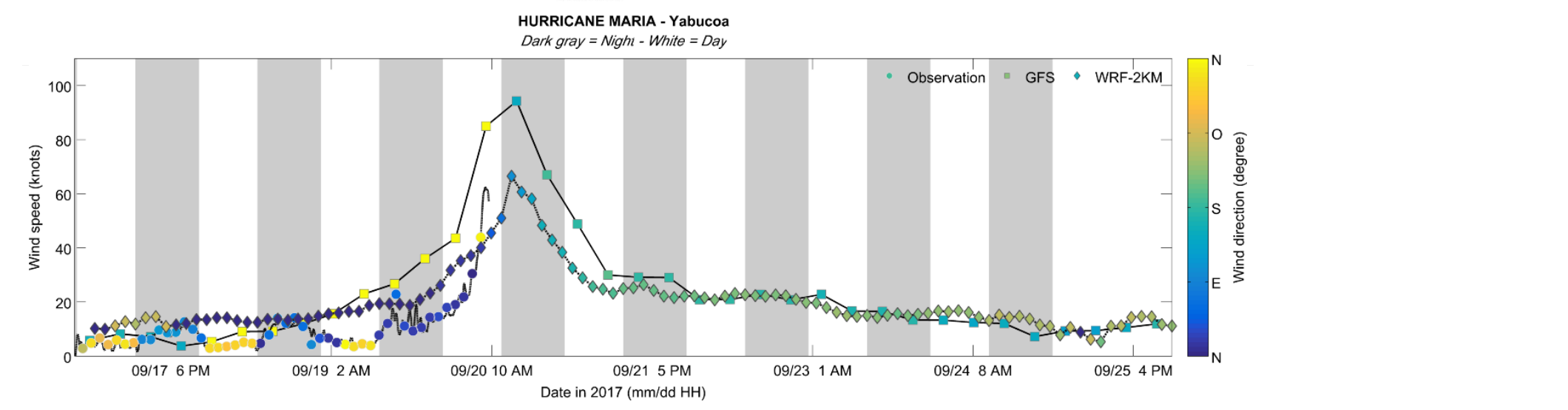
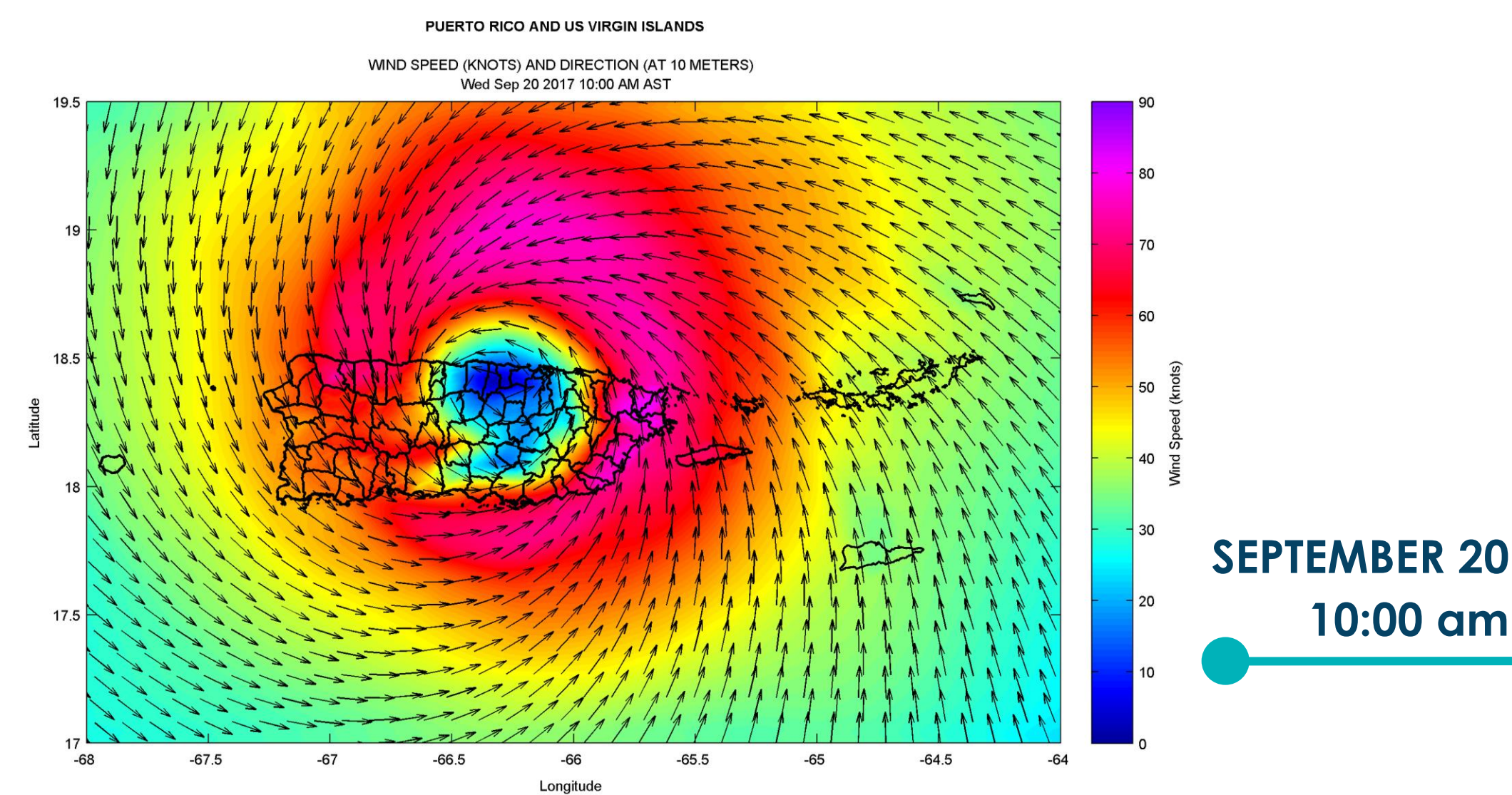
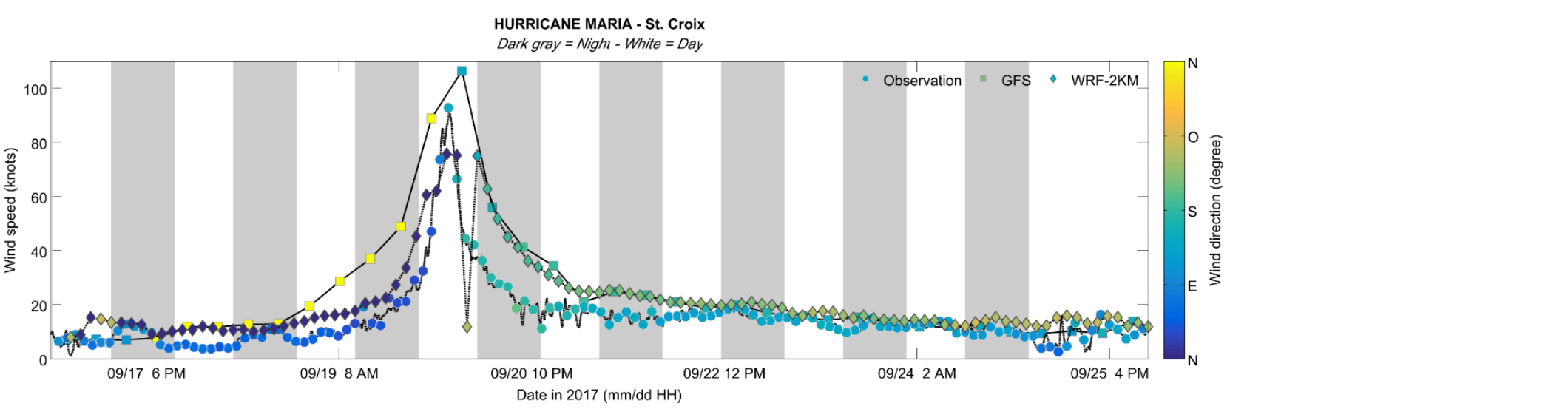
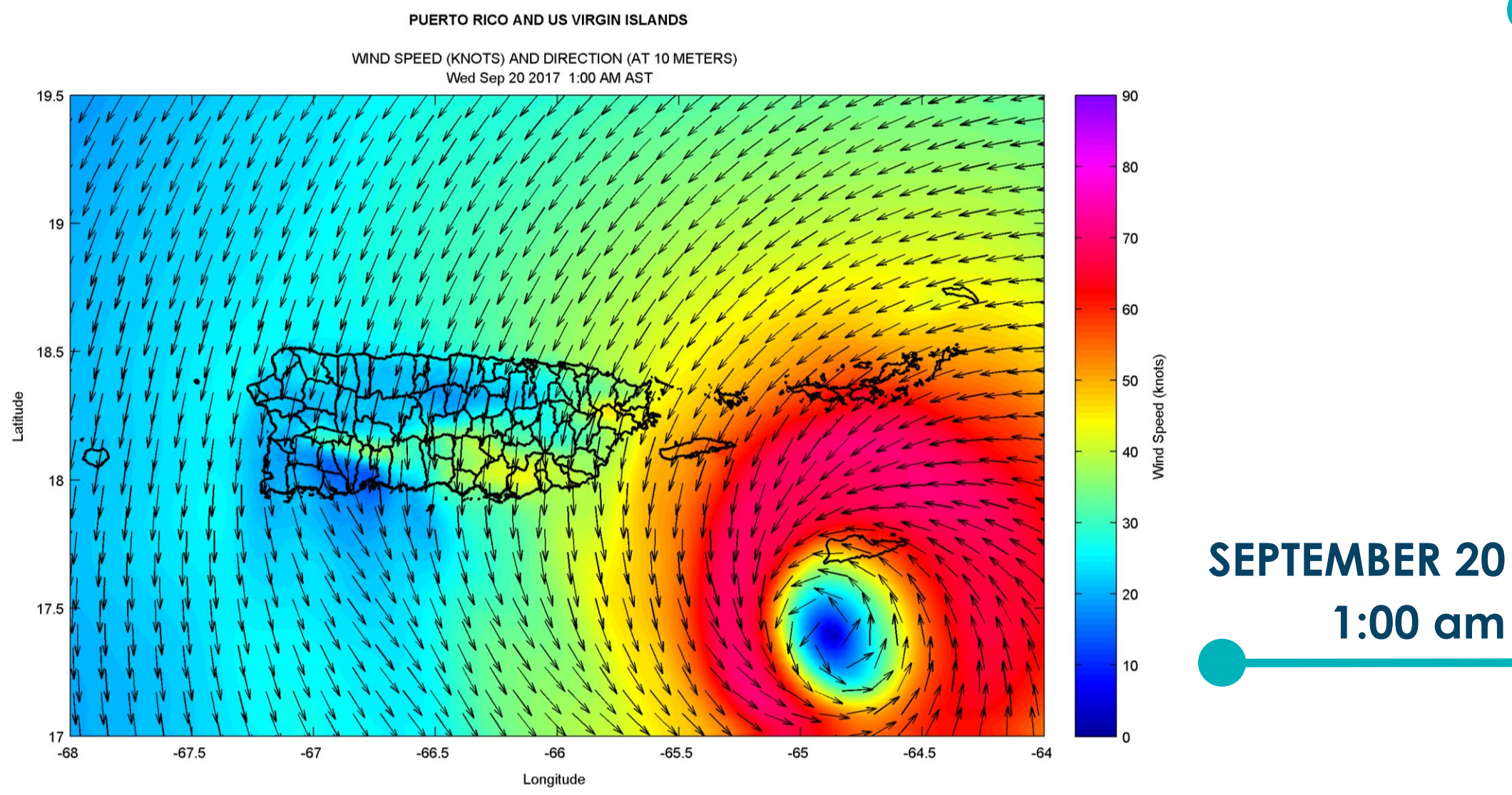
ABOUT

Hurricane María, a powerful Category 5 storm (downgraded to a Category 4 at landfall), struck the island of Puerto Rico on September 20, 2017 causing widespread destruction. The objective of this study is to carry out a high-resolution wind model hindcast of Hurricane María using the best available data to leverage wind modeling capabilities for disaster response. This study will support decision making for the Department of Interior Puerto Rico: Hurricane recovery efforts. This will also address the need for science support to assess shoreline changes and identify beach erosion amelioration strategies. The numerical results will be used as boundary conditions for wave and storm surge numerical hindcasts.



Figure 1 Map showing CARICOOS wind stations locations. Red circles mark sites at which the WRF model was validated.

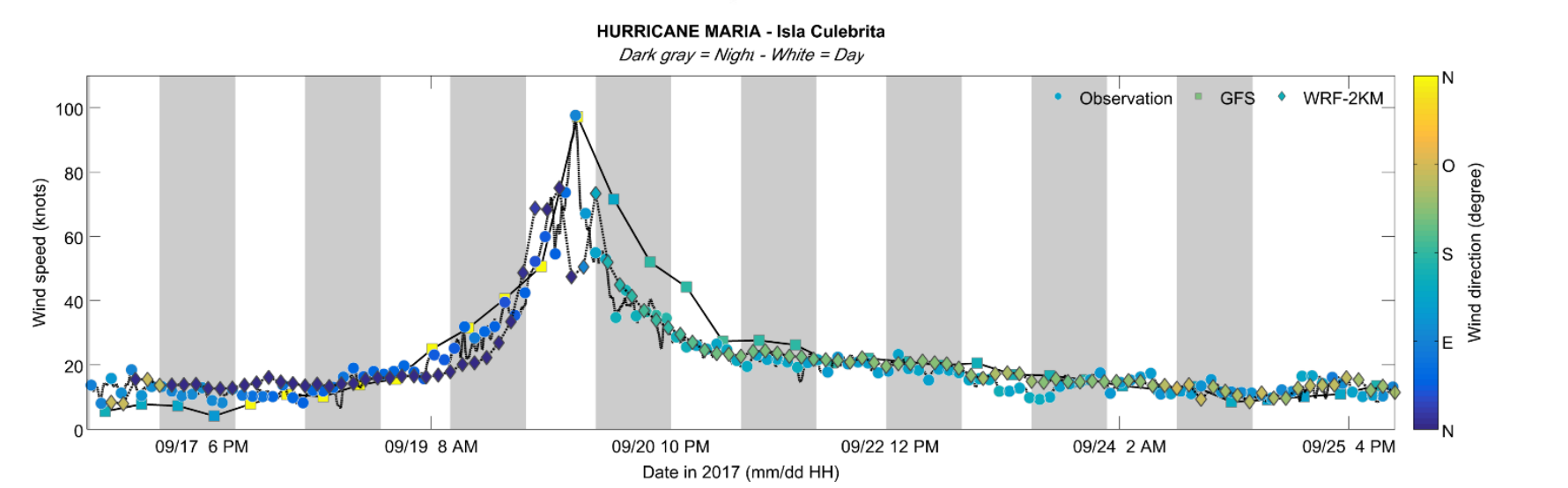
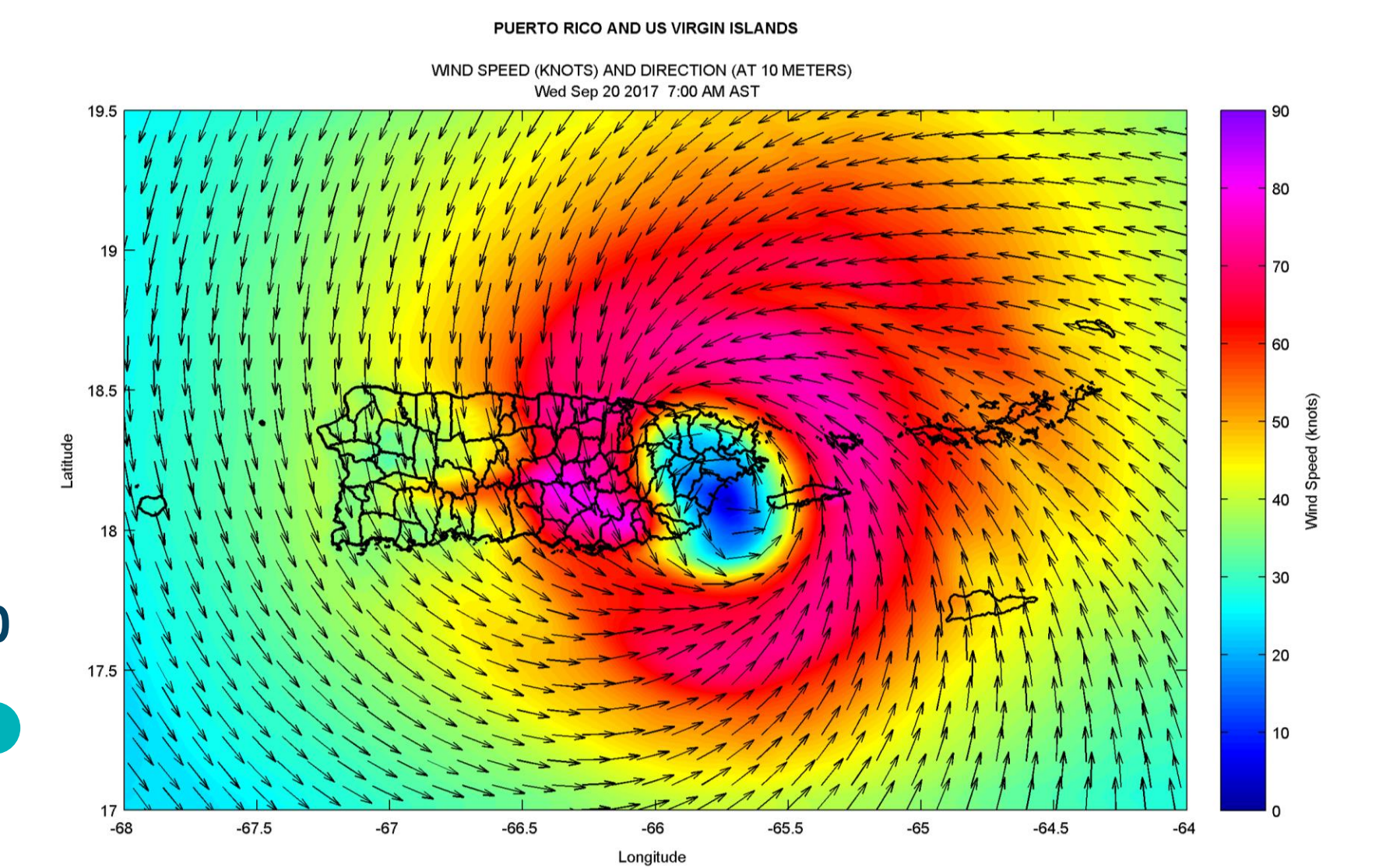
HINDCAST



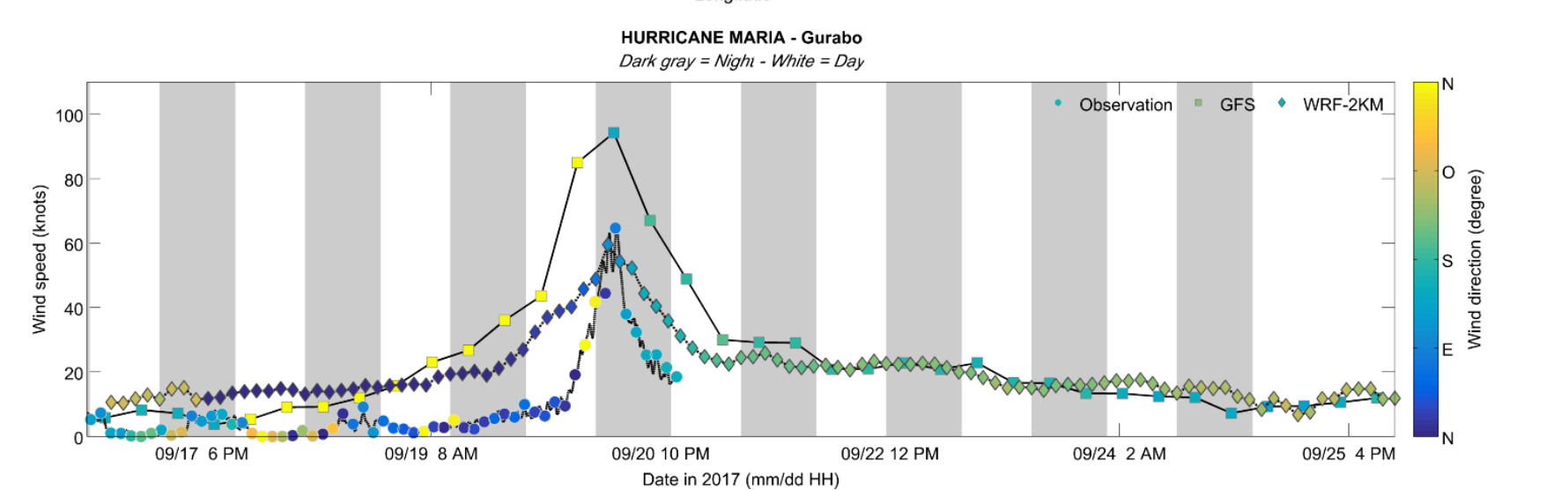
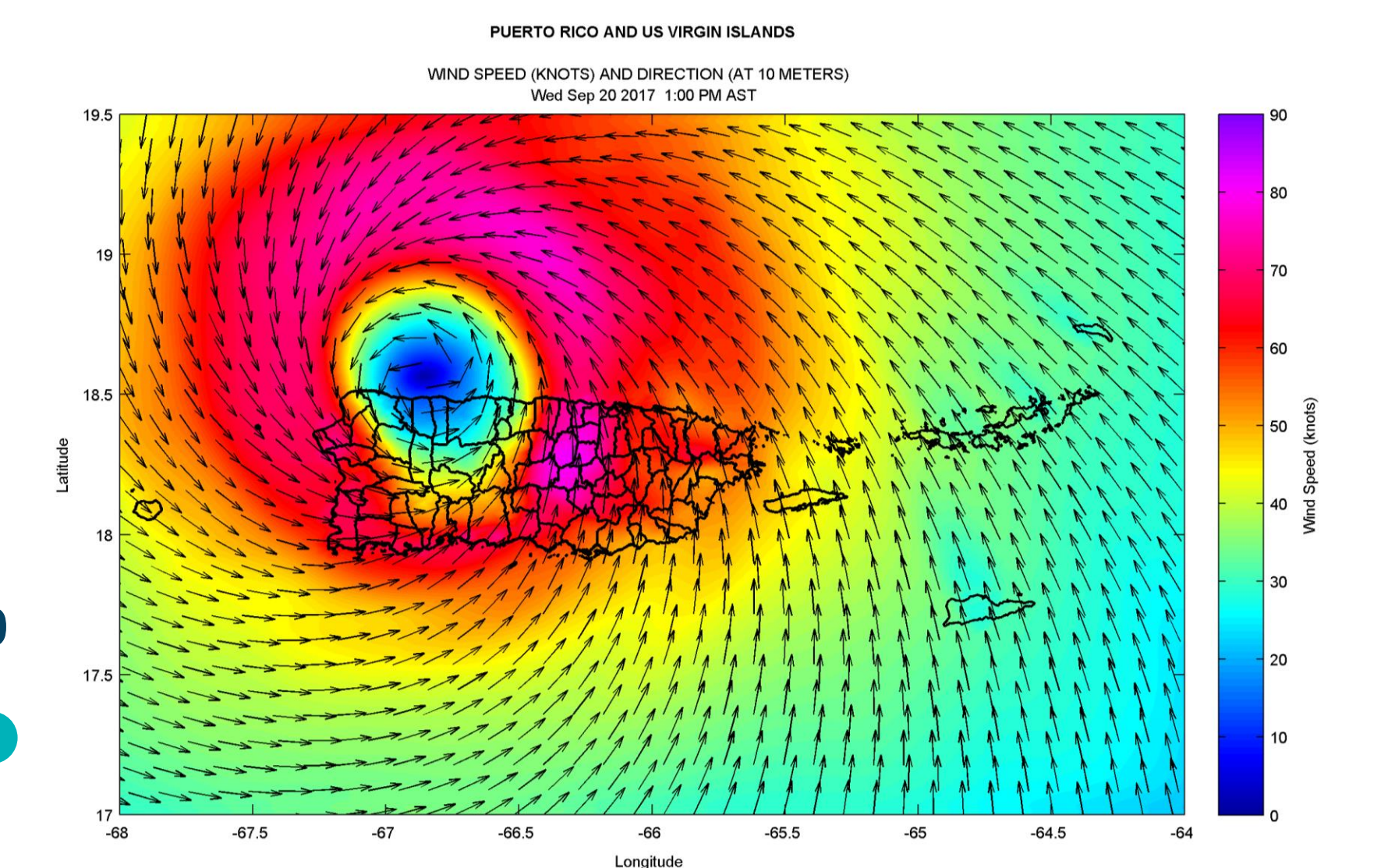
- The following figures show maps of wind speed at 10 meters when the maximum winds were close to CARICOOS wind stations in St. Croix, Culebrita, Yabucoa, Gurabo and Rincón (Figure 1), and the time series of model-data comparisons at each station.

- Model predictions are shown as a dashed lines with **square (GFS Boundary Condition)** and **diamond (CARICOOS WRF 2 km Wind Model)** markers while **wind observations** are shown as a solid line with a **circle marker**.

SEPTMBER 20 7:00 am



SEPTMBER 20 1:00 pm



- The GFS model predictions (used as boundary condition for WRF model) overestimated by up to 12 knots the wind speed measured at all stations.
- The model predictions from CARICOOS 2 km WRF model deviated from the observations by up to 6 knots.

- It is evident that CARICOOS 2 km WRF model simulated better the timing, speed, and direction of the winds. However, we expect an improvement after performing re-runs with adjusted physical parameters and using boundary conditions from the 12 km NAM atmospheric model.