

Supplemental Material

**Simulation and Prediction of Category 4 and 5 Hurricanes
in the High-Resolution GFDL HiFLOR Coupled Climate
Model**

H. Murakami^{1,2}, G. A. Vecchi^{1,2}, S. Underwood³, T. L. Delworth^{1,2},
A.T. Wittenberg¹, W. Anderson¹, J. -H Chen¹,
R. Gudgel¹, L. Harris¹, S. -J. Lin¹, and F. Zeng¹

¹National Oceanic and Atmospheric Administration/Geophysical Fluid
Dynamics Laboratory, Princeton, NJ, USA

²Atmospheric and Oceanic Sciences Program, Princeton University, Princeton,
NJ, USA

³Engility, NOAA/GFDL, Princeton, NJ, USA

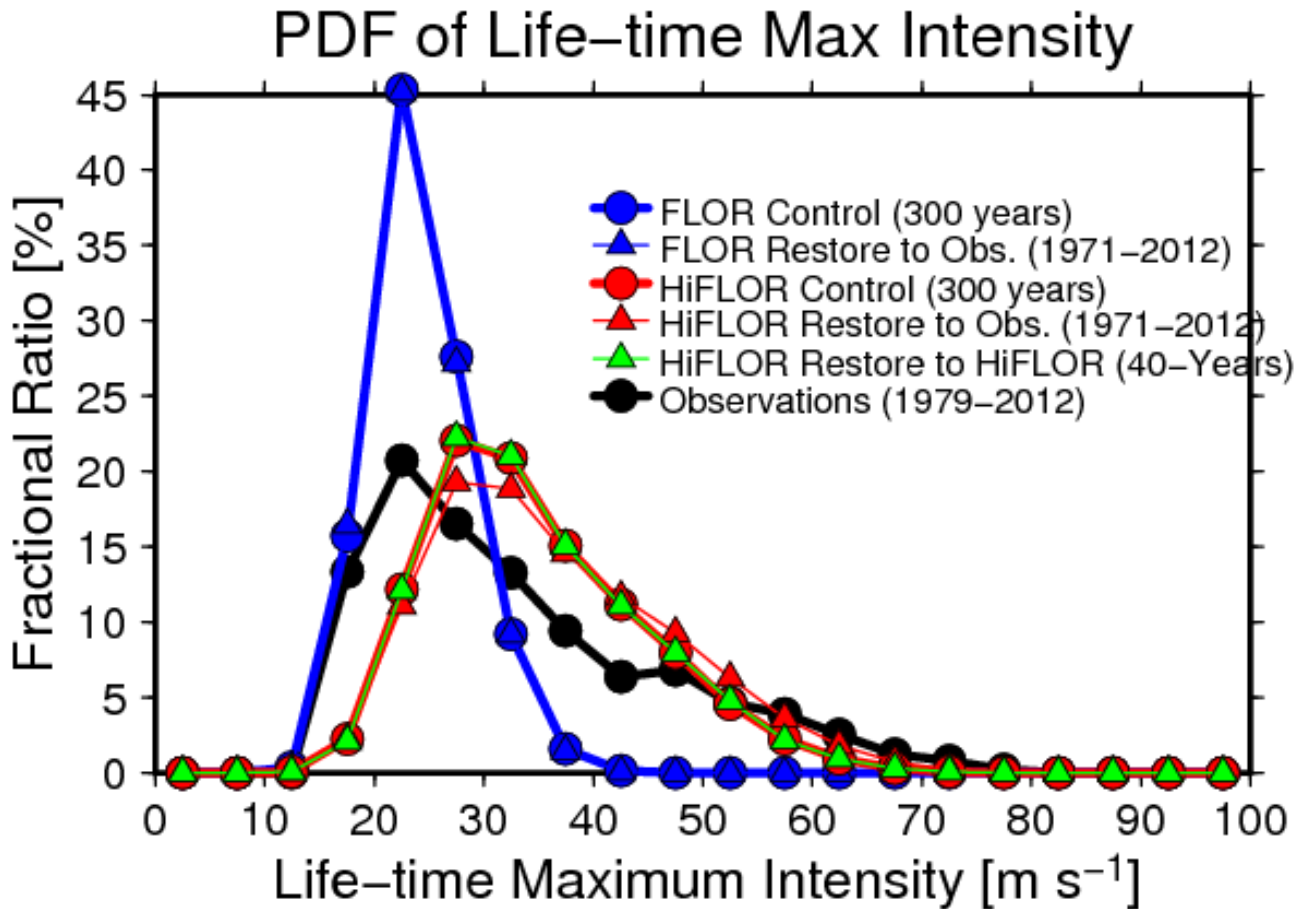


FIG S1 Fractional ratio of annual mean TC number for the life-time maximum surface wind speed (m s^{-1}) simulated using the control simulation in FLOR (300 years, blue circle), the restoring experiment in FLOR (1971–2012, 3-member mean, blue triangle), the control simulation in HiFLOR (300 years, red circle), the restoring experiment in HiFLOR (1971–2012, 3-member mean, red triangle), and the restoring experiment in which simulated SSS and SST are restored to the simulated climatological mean of the HiFLOR control simulation (40 years, green rectangle) along with observations (1979–2012, black circle).

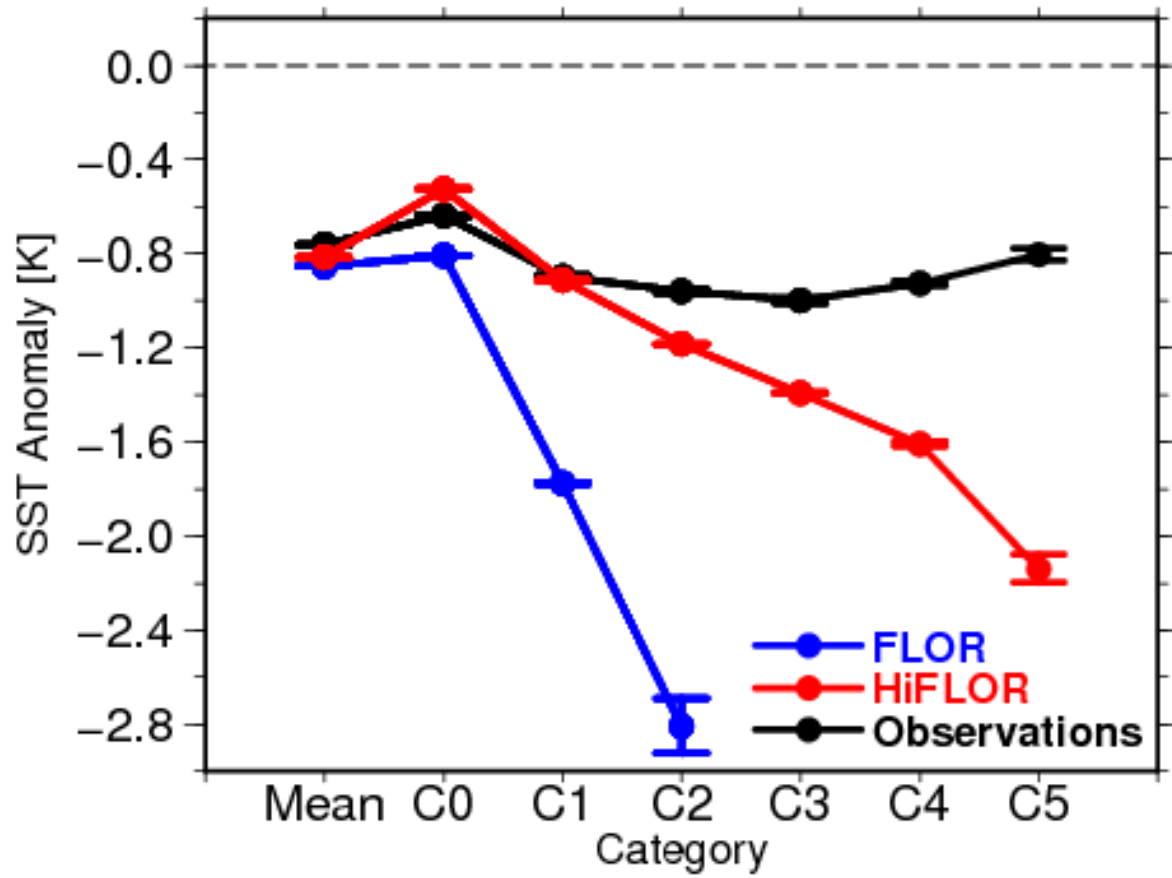


FIG S2 The Lagrangian composite for the SST anomaly response on day +2 minus the day -12 to -2 averaged for each tropical cyclone category. The y-axis values indicate the mean SST response, with error bars showing the 90% confidence interval. Composites are for the storms with $V/f < 1$ (i.e., slow moving or high latitude) in the all ocean basins.

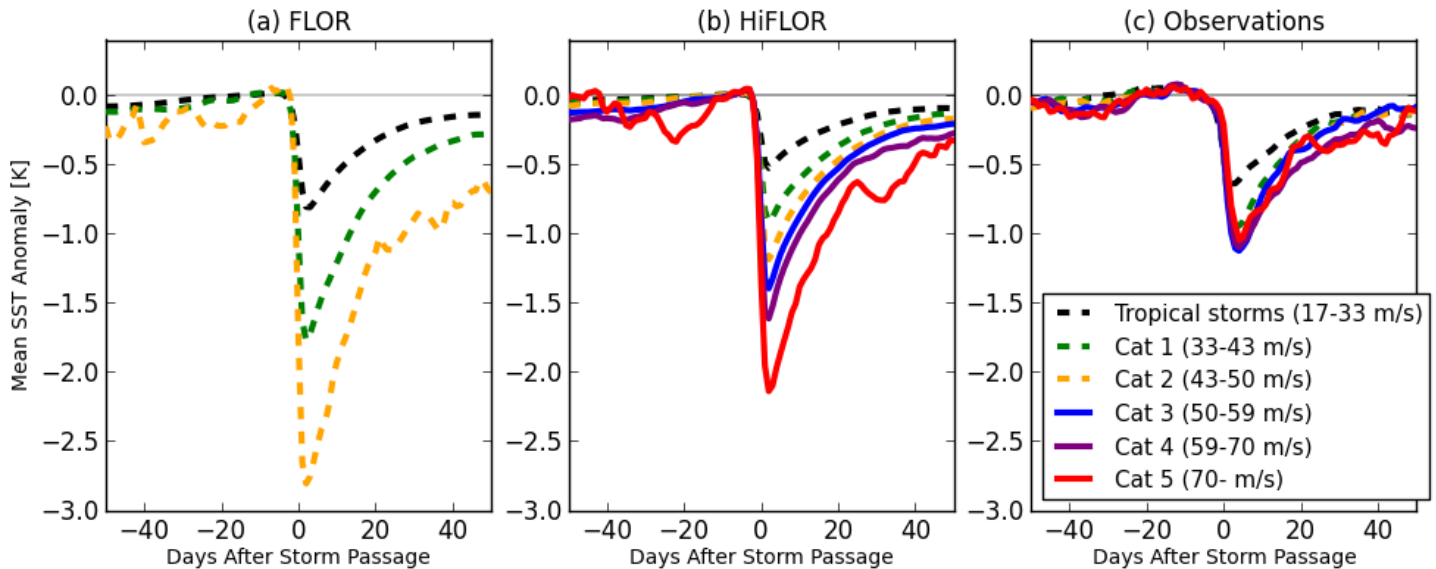


FIG S3 Composite mean SST anomaly [K] for each day before and after storm passage averaged for each tropical cyclone category. (a) FLOR, (b) HiFLOR, and (c) Observations. SST anomaly is averaged over the domain of 100 km from the TC center relative to the average over days -12 to -2 (i.e., center of the domain for average is fixed at the storm center at day 0). Day 0 is when the storm reaches the track position, and positive (negative) days indicate the day after (before) the storm has passed. Composites are for the storms with $V/f < 1$ (i.e., slow moving or high latitude) in the all ocean basins.

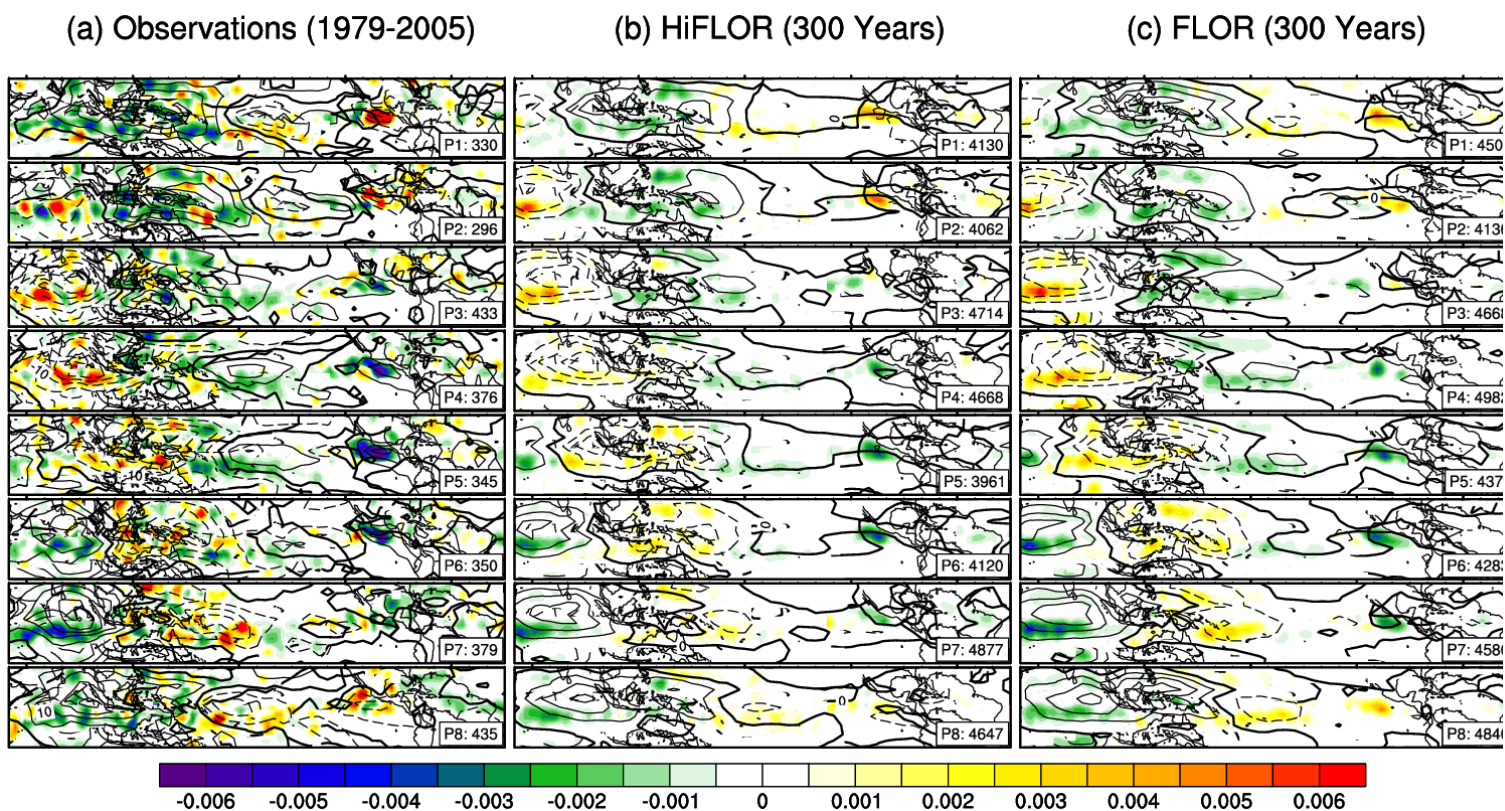


FIG S4 As in Fig. 12, but for boreal winter (November–April).