



*Supplement of*

## **Assessing the destructiveness of tropical cyclones induced by anthropogenic aerosols in an atmosphere–ocean coupled framework**

**Yun Lin et al.**

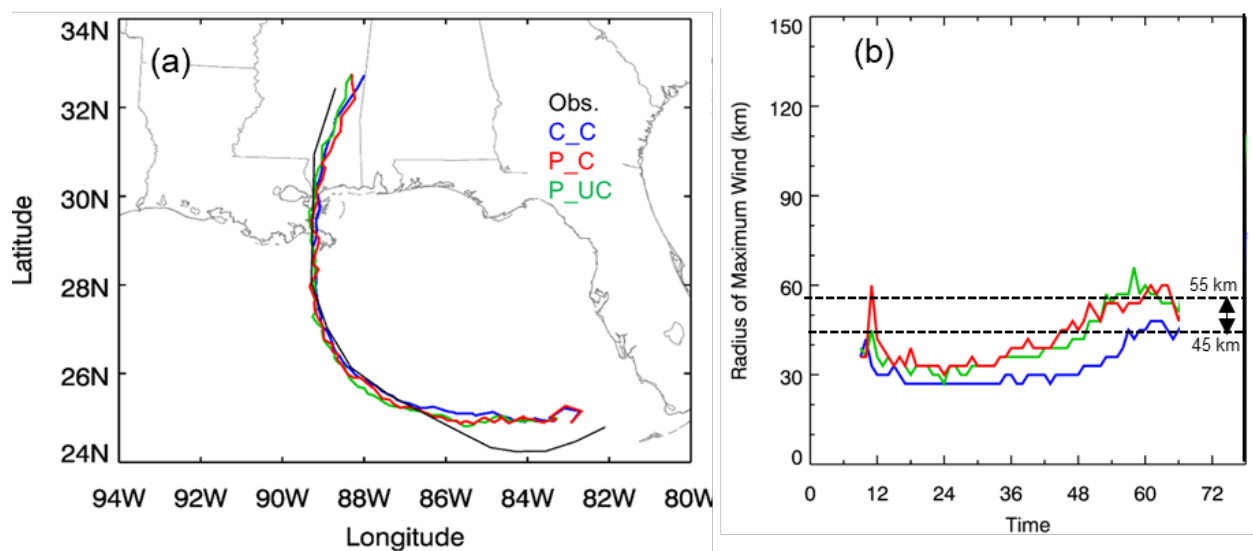
*Correspondence to:* Yuan Wang ([yzwang@stanford.edu](mailto:yzwang@stanford.edu)) and Renyi Zhang ([renyi-zhang@geos.tamu.edu](mailto:renyi-zhang@geos.tamu.edu))

The copyright of individual parts of the supplement might differ from the article licence.

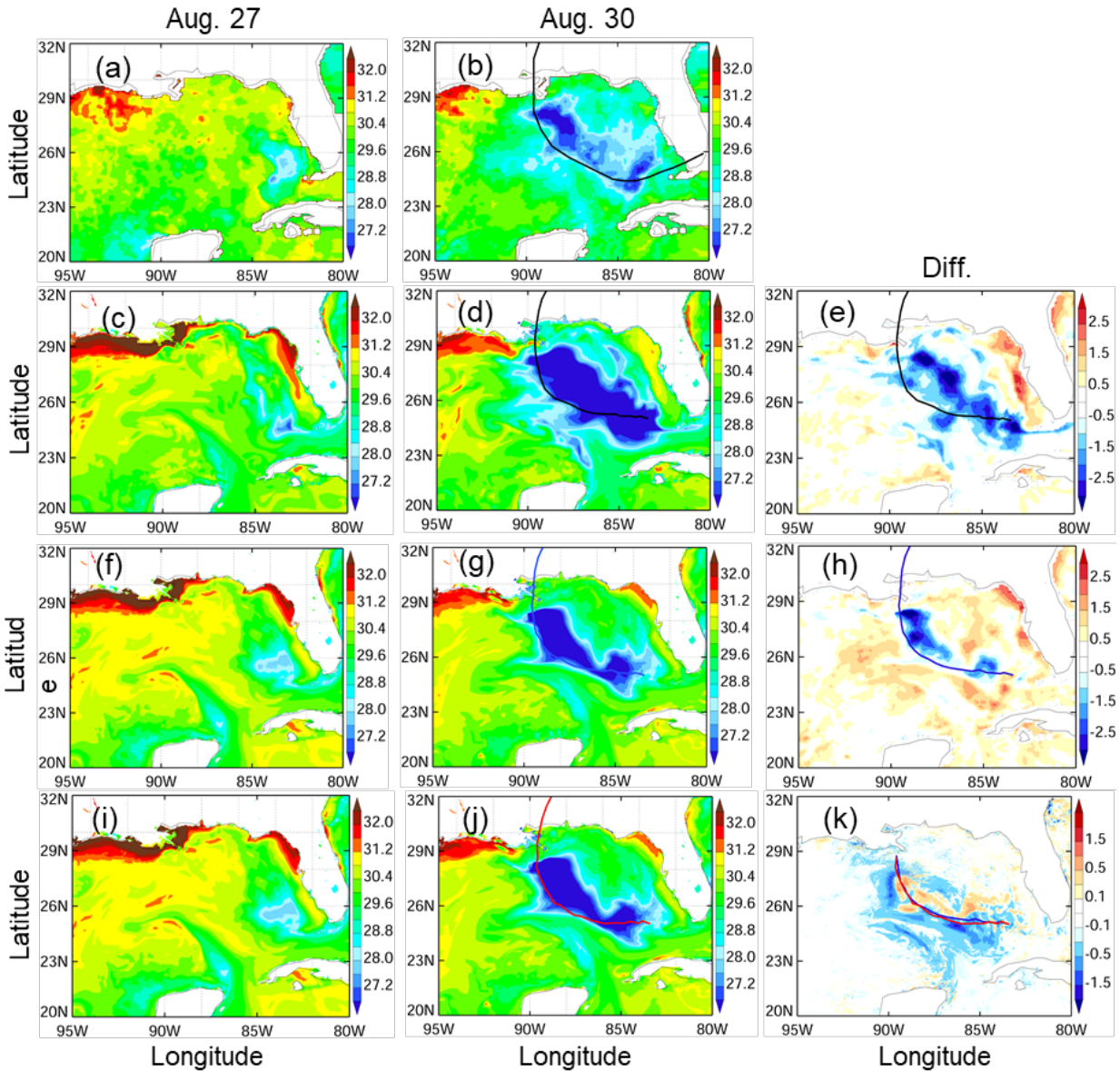
Supplement of

**Assessing the destructiveness of tropical cyclone by anthropogenic aerosols under an atmosphere-ocean coupled framework**

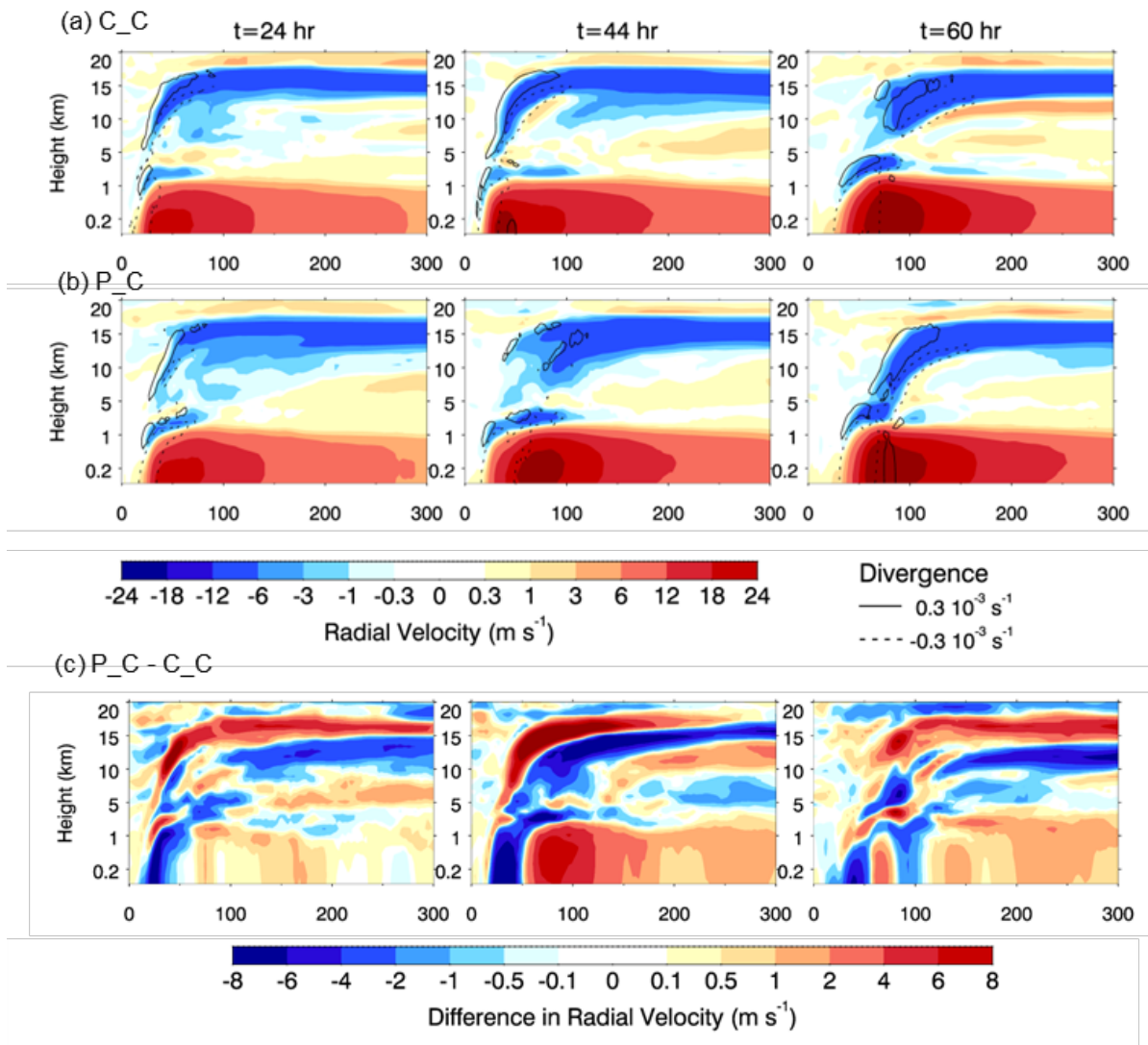
Y. Lin *et al.*



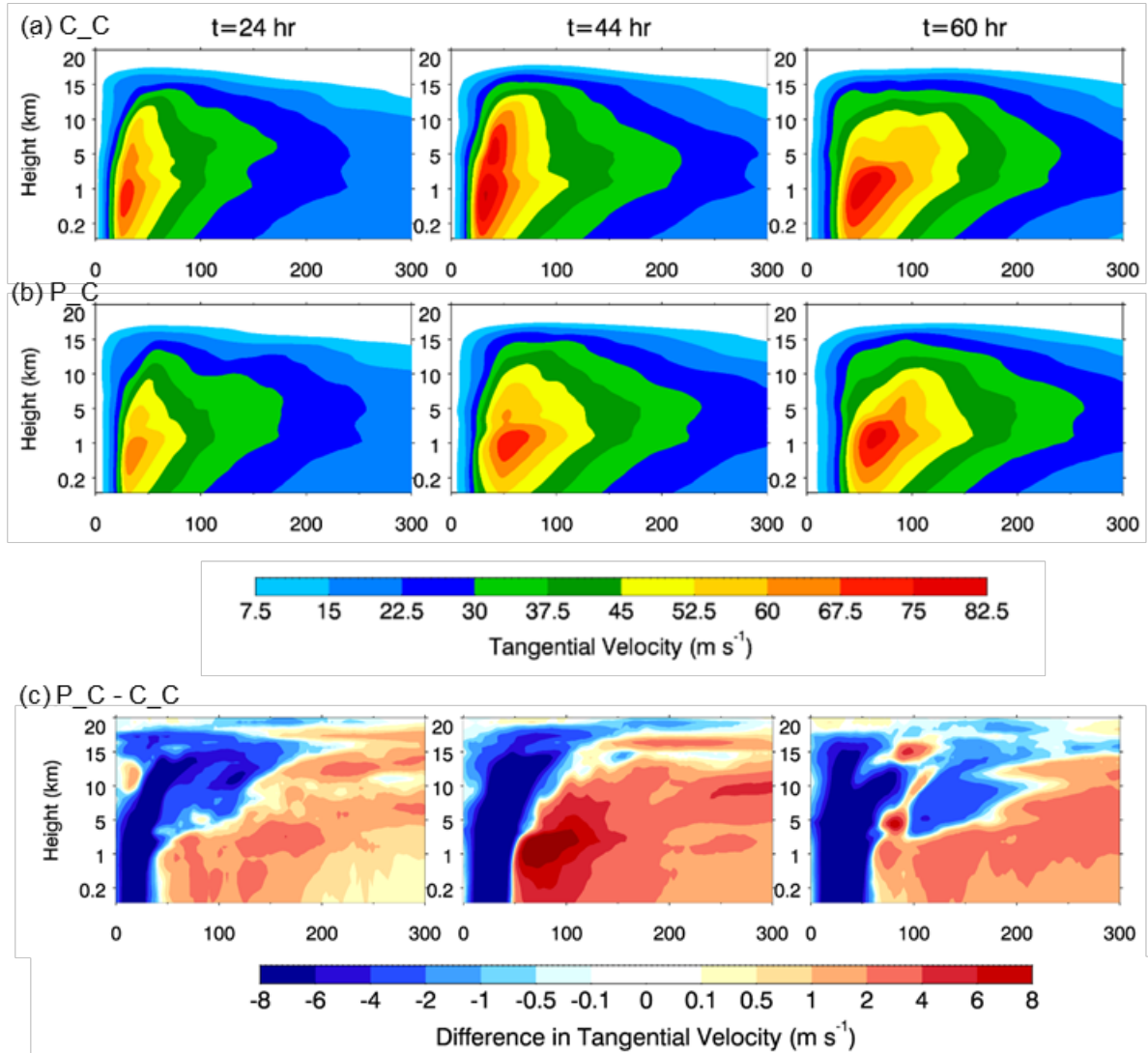
**Figure S1.** The simulated and observed evolution of the hurricane in terms of (a) storm track and (b) radius of maximum wind (RMW) for C\_C (blue), P\_UC (green) and P\_C (red) cases. In (a) the black is the NHC Best Track Data; and in (b) the two dashed horizontal lines denote the range of observed RMW on 29 August, 2005 based on NHC Tropical Cyclone Report of Hurricane Katrina ([https://www.nhc.noaa.gov/data/tcr/AL122005\\_Katrina.pdf](https://www.nhc.noaa.gov/data/tcr/AL122005_Katrina.pdf)).



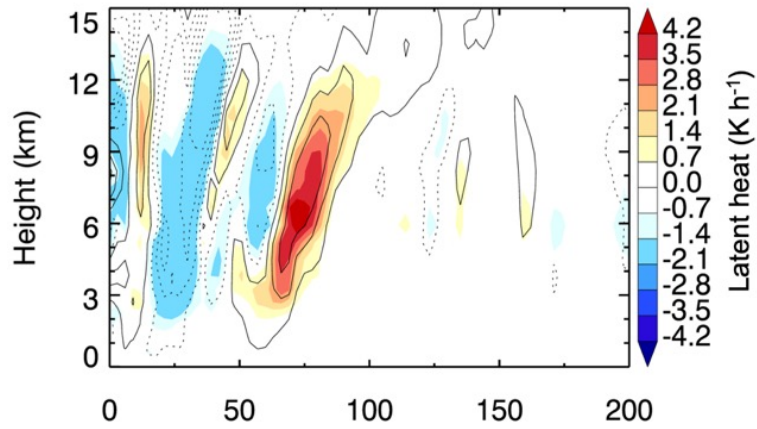
**Figure S2.** Daily mean SST fields before (Aug. 27) and after Katrina passage (Aug. 30) of (a,b) OI MW\_IR SST observations, (c,d) HYCOM, (f,g) the clean coupled simulation (C\_C), and (i,j) the polluted coupled simulation (P\_C); the differences between (e) HYCOM and the observations on 30 August, 2005, (h) C\_C and observations on 30 August, 2005, and (k) P\_C and C\_C at 12:00Z 29 August, 2005 when Katrina made the landfall. The curves in panels denote the hurricane tracks.



**Figure S4.** Vertical-radial cross-sections of azimuthal means of radial velocity for C-C case (a) and P\_C case (b), as well as their difference (c).



**Figure S4.** Vertical-radial cross-sections of azimuthal means of tangential velocity for C-C case (a) and P\_C case (b), as well as their difference (c).



**Figure S5.** Azimuthally-averaged radial profiles of latent heating (color shading) and vertical velocity (contour lines with an interval  $0.02 \text{ m s}^{-1}$ ) perturbations induced by ocean coupling effect during S2 (P\_C - P\_UC).