

On the course website, you'll find the following journal article on Hurricane Katrina (2005):

McTaggart-Cowan et al., 2007: Hurricane Katrina (2005). Part I: Complex Life Cycle of an Intense Tropical Cyclone. *Mon. Wea. Rev.*, **135**, 3905-3926.

In your own words, answer the following questions:

1. What was the lowest sea level pressure Katrina attained, and what day did this occur?
2. Figure 2 displays the *mean* conditions of the weeklong period leading up to Katrina's development. Think of the colors in this plot simply as upper-level vorticity, so there is a rather stagnant positively tilted trough in this region before Katrina's development. How might this feature set the stage for a tropical transition (TT)?
3. Figure 9 shows the average Gulf of Mexico SSTs (and anomalies) prior to (9a), and during (9b) Katrina's movement through the Gulf. From Fig. 9a, why do you suppose Katrina intensified as much as it did while over the Gulf? In comparing Fig. 9a to 9b, where did the SST change the most in this period? Why do you think this change occurred?
4. Figure 10 graphs peak winds, Potential Intensity (PI), SST and troposphere-deep shear in the vicinity of Katrina. As Katrina crossed Florida, did it weaken? Why/why not?
5. How did Katrina's extratropical transition change the overall longwave upper-tropospheric pattern over the eastern United States into September 2005?
6. Figure 16 shows a "cyclone phase space" for Hurricane Katrina's entire lifecycle. The purpose of this figure is to illustrate which type of cyclone (cold/warm core and symmetry) Katrina was throughout its lifetime. Describe the lifecycle of Katrina from A (24 Aug) to Z (4 Sep). Do you think Katrina's progression through the cyclone phase space is typical of a tropical cyclone's lifecycle? Why/why not?