ATMO 1300 Section 001
In-class Worksheet #6
July 26th, 2017

1. What are the four lifecycle stages of an extratropical cyclone? Briefly describe the characteristics of each.

1. Frontal wave – Kink in stationary front
2. Open wave – cold and warm fronts developed with a warm sector
3. Occluded system – cold front has advanced to undercut warm front. Warm air into low pressure center is aloft
4. Death (cutoff) – Warm air is now separated from low center (energy source). Cyclone is removed from warm/cold front and gradually decays.

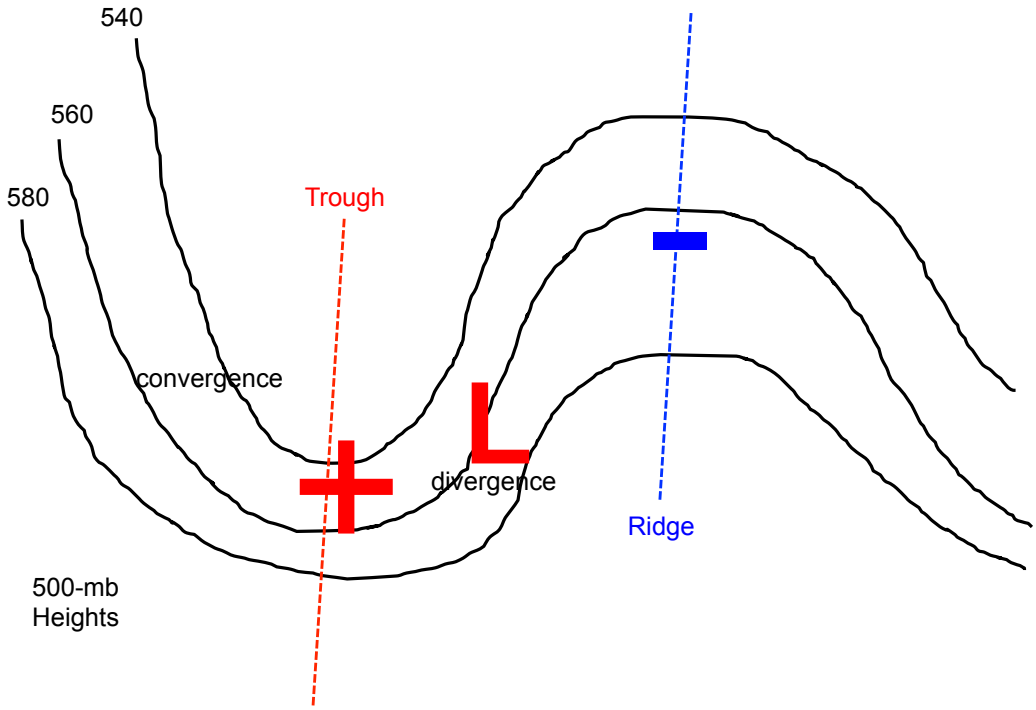
2. Where do the strongest winds in mature, northward moving hurricanes exist, relative to the central circulation? Why do they occur there?

To the right of the central pressure. The motion of the storm has to be added to the winds on the right side (of a northward moving storm) and subtracted from winds on the left.

3. Complete all following steps on the map below

    a. Draw where the troughs and ridges are located in the upper-level flow pattern.
    b. Draw an "L" where you might expect a surface cyclone to develop and strengthen.
    c. Illustrate where you expect the location of upper-level divergence and convergence.
    d. Draw a "+" or "-" where you expect cyclonic and anticyclonic absolute vorticity.
    e. Why is the vertical structure of pressure (i.e. position of troughs relative to lows at the surface) important for cyclone maturity? What wind process plays an important role in deepening of the surface cyclone?

Divergence (both speed divergence and diffluence). Need this to "ventilate" the column of air so that convergence at the surface does not raise surface pressure.



4. a) What is *upwelling*?

Upwelling is the process by which cold ocean water is brought closer to the surface due to ocean currents "pushing" surface ocean water out to see, away from the coasts.

b) How does upwelling impact local economies on the coasts where it occurs?

Upwelling brings nutrient rich water to the surface where ocean life resides, providing food for plant/species life. Coastal economies may depend on the presence of these species for food/distribution.

c) What ENSO signal would you expect to be present if you observed upwelling along the coast of California?

Upwelling is most common during La Nina

5. ENSO oscillations can have a direct impact on atmospheric patterns in West Texas.

a) What kind of weather anomalies would you expect during an El Nino in West Texas?

Wetter and cooler winter

b) What about during a La Nina?

Drier and warmer winter as the sub-tropical jet is displaced