
EAS 309, Fall 2019
DUE: Monday Dec 9

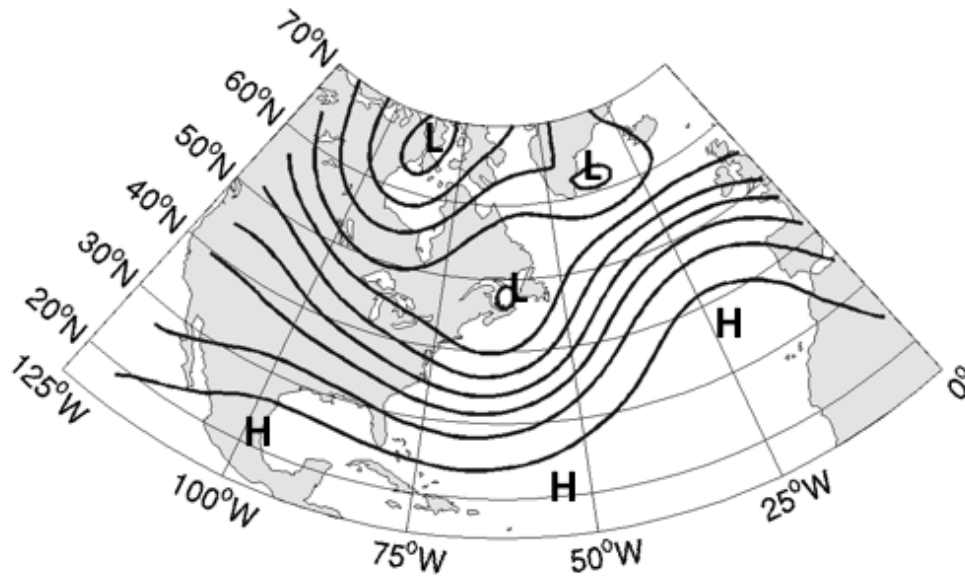
1. (3 points) The geostrophic winds are defined as:
- $$u_g = -\frac{1}{f} \frac{\partial \phi}{\partial y}$$
- $$v_g = \frac{1}{f} \frac{\partial \phi}{\partial x}$$

Starting from the horizontal equation of motion: $\frac{d\vec{V}}{dt} = P + C + F$

Derive the geostrophic wind equations written above. Use scale analysis to explain why certain terms can be assumed to be negligible.

2. (2 points) Explain the relationship between the following naming conventions: Hurricanes, Typhoons, and Tropical Cyclones

3. (3 points) The following is an example of a pressure pattern. Use the information in the chart to sketch the geostrophic winds. Note that the L and the H symbols mark regions of local low and high pressures. Draw arrows for the geostrophic winds between the isobars. *The length of the arrows should correspond to the amplitude of the winds.*



4. (2 points) Use the thermal wind equation to explain the presence of the jet stream.