

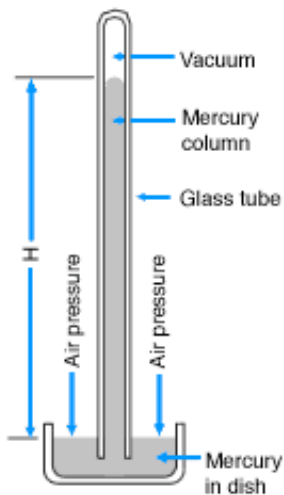
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NATS 101 Introduction to Weather and Climate, Section 54, Fall 2005  
Homework #3: Due at beginning of lecture Thursday, 27 October 2005.

1. Suppose the rate of rotation of the Earth was increased. What effect would this have on the Coriolis force and the strength of the geostrophic wind? [E.C.]

2. What vertical air motion would you expect above a low pressure center in which the surface pressure is falling. Explain.

3. Using the diagram, describe how a mercury barometer works.



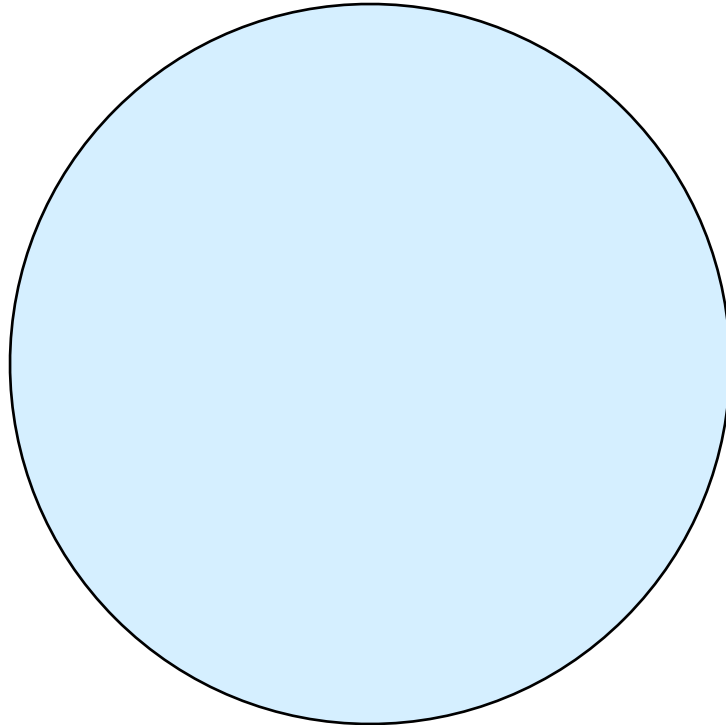
4. Explain how each of the following affect the Coriolis force:

(a) Wind speed.

(b) Latitude (northern and southern latitudes)

5. With the aid of a simple diagram, describe the sea and land breezes.

6. Using the “water world” below, place the major surface semi-permanent pressure systems and the wind belts of the world at their appropriate latitudes. (Three-Cell Model)



7. In the figure above identify the following:

- (a) Trade winds
- (b) Intertropical convergence zone (ITCZ)
- (c) Westerlies
- (d) Subtropical highs
- (e) Subpolar lows
- (f) Polar easterlies
- (g) Hadley cell
- (h) Ferrel cell
- (i) Polar cell

8. Explain why the polar jet stream is stronger in winter than in summer in the northern hemisphere.

9. Using the maps below, draw the location of the subtropical high in June and July and the accompanying surface circulation over Mexico and the southern portion of the US.



June



July

10. Explain why Arizona gets heavy rainfall during July and not during June.

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11. With a simple diagram, describe the Santa Ana wind system.