San Francisco State University Name _____
Department of Earth & Climate Sciences Fall 2017

ERTH 465
Homework 1
Due Tuesday 29 August

Please answer on back or on separate sheets, in complete sentences where appropriate.

(Resources: Lecture and ERTH 260 website)

1. How is the rectangular (or cartesian) coordinate system defined?

2. How is the natural coordinate system defined?

3. What are the symbol(s) for the horizontal wind components in the rectangular coordinate system?

4. What are the symbol(s) for the horizontal wind components in the natural coordinate system?

5. What is the meaning of w= -15 cm/s ?

6. What is the meaning of v= -6 m/s?

7. An air parcel is lofting. There is a thermometer inside the air parcel moving with it and measuring temperature changes. Is the thermometer measuring the local (Eulerian) or total (Lagrangian) temperature change? Explain.

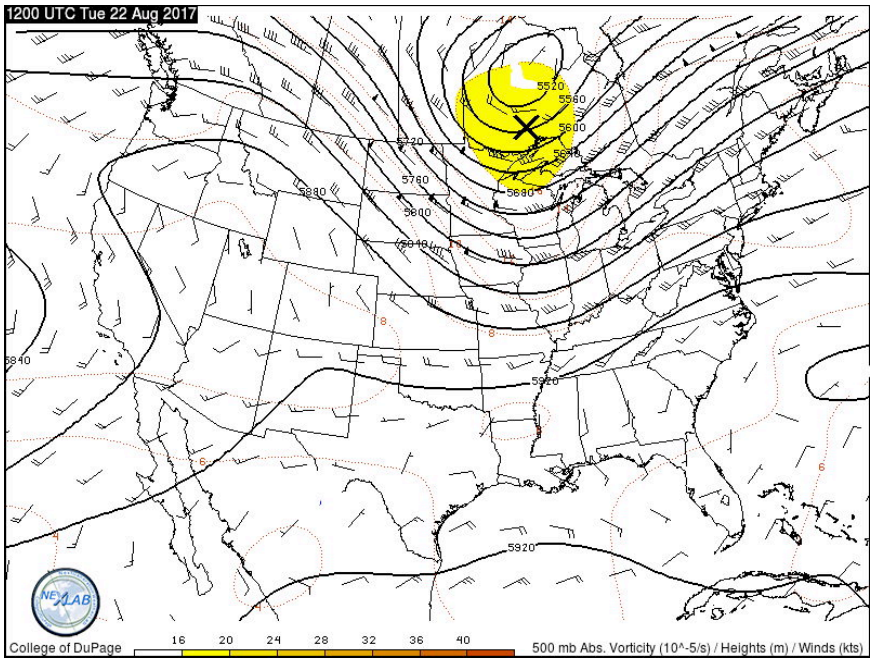
8. A thermometer is at San Francisco International Airport. It measures temperature changes during the day. Is the thermometer measuring the local (Eulerian) or total (Lagrangian) temperature change? Explain.

9. Analyze the 576 dm 500 mb-height contour on the attached chart, Map A.

10. Annotate the following on the attached 500 mb analysis, Map B, using correct notation: (a) a ridge; (b) a trough; (c) a cyclone; (d) an anticyclone.


500 mb Observations Valid SUN 170820/1200 UTC College of DuPage NEXLAB

Map A


1200 UTC Tue 22 Aug 2017
5520
5560
5600
5640
5680
5720
5760
5800
5840
5880
5920
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16 20 24 28 32 36 40
500 mb Abs. Vorticity (10^-5/s) / Heights (m) / Winds (kts)

Map B