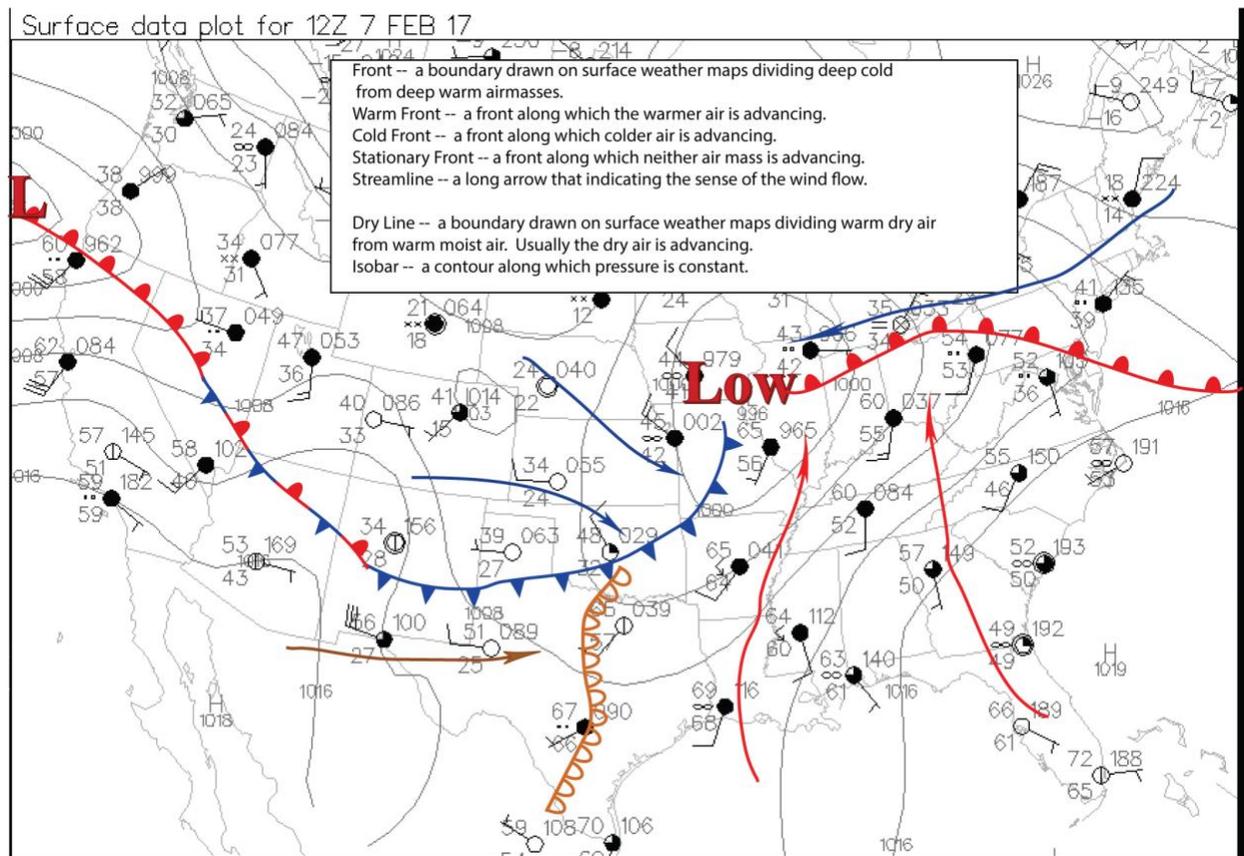# ERTH 260 In-class Exercise 3: Weather Map Features—Introduction to Boundaries

100 points
Due Wednesday 14 February 2018

1) Here is the surface weather plot for the United States for 1200 UTC 7 February 2017.   The arrows are streamlines that show the sense of the windflow observed at ground level over the south central United States. The colored lines with symbols are boundaries…a sharp division between air of certain characteristics and air of different characteristics. (30 pts)

Surface data plot for 12Z 7 FEB 17

Front -- a boundary drawn on surface weather maps dividing deep cold
 from deep warm airmasses.
Warm Front -- a front along which the warmer air is advancing.
Cold Front -- a front along which colder air is advancing.
Stationary Front -- a front along which neither air mass is advancing.
Streamline -- a long arrow that indicating the sense of the wind flow.

Dry Line -- a boundary drawn on surface weather maps dividing warm dry air
 from warm moist air. Usually the dry air is advancing.
Isobar -- a contour along which pressure is constant.

a) On a separate sheet, describe the general characteristics (general wind directions and temperatures) of the air in the region of the two blue streamlines over Kansas/Oklahoma/Nebraska/eastern Colorado).

b) On a separate sheet, describe the general characteristics (general wind directions and temperatures) of the air in the region of the two red streamlines over eastern Texas/Arkansas/Louisiana.
c) On a separate sheet, describe the relative amount of water vapor of the air in the region of the brown streamline over west Texas) compared to that over central and eastern Texas.

2) Describe how the information shown on the surface chart above corroborates the fact that a warm front was located in the position shown over the eastern part of the United States. (10 pts)

3) Here's the meteogram for Dallas-Fort Worth International Airport (KDFW) for the 24 hours from 04 UTC 7 Feb to 04 UTC 8 Feb 2017, showing the run of weather observations for the 24 hours ending 0400 UTC.

Meteogram for KDFW from 0400Z 7 FEB 17 to 0400Z 8 FEB 17
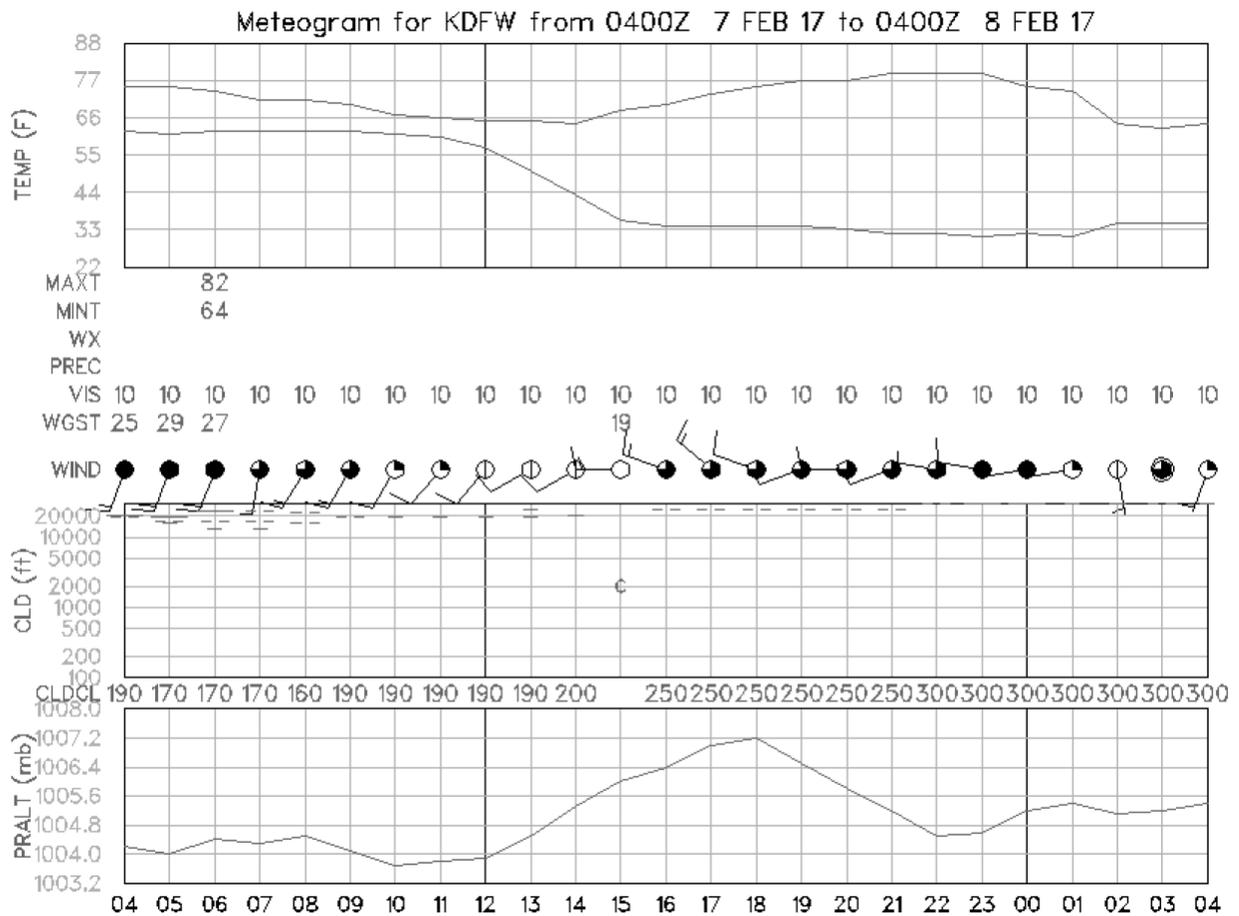
a) On a separate sheet, briefly discuss the nature (not the reason) of the change of the **temperature**, **dew point temperature**, **wind direction** changed from 10 UTC to 17 UTC. (20 pts)

b) Given our discussion in class and your examination of the surface chart above, on a separate sheet, now discuss the reason for the change you observed in (1). (20 points)

4) Here's a closeup surface chart (called a subsynoptic plot) with some streamlines and the position of the dry line at 1700 UTC 7 February. Note the weather stations at A and at B. On the basis of what we discussed in class, on a separate sheet discuss how the weather data at the two stations corroborates the position of the dry line analyzed on the chart and direction in which the scallops on the line are pointing. (20 points)