

ERTH 260 Lab 3: Hypothesis Formulation (100 pts)
Last Day to Work on this in class Wednesday 14 February 2018; Due at the
beginning of class Friday 16 February 2018

We are discussing the scientific method in lecture. The first three steps are listed below under the definition.

Scientific Method -- An organized approach utilized to systematically study and solve problems of the natural world.

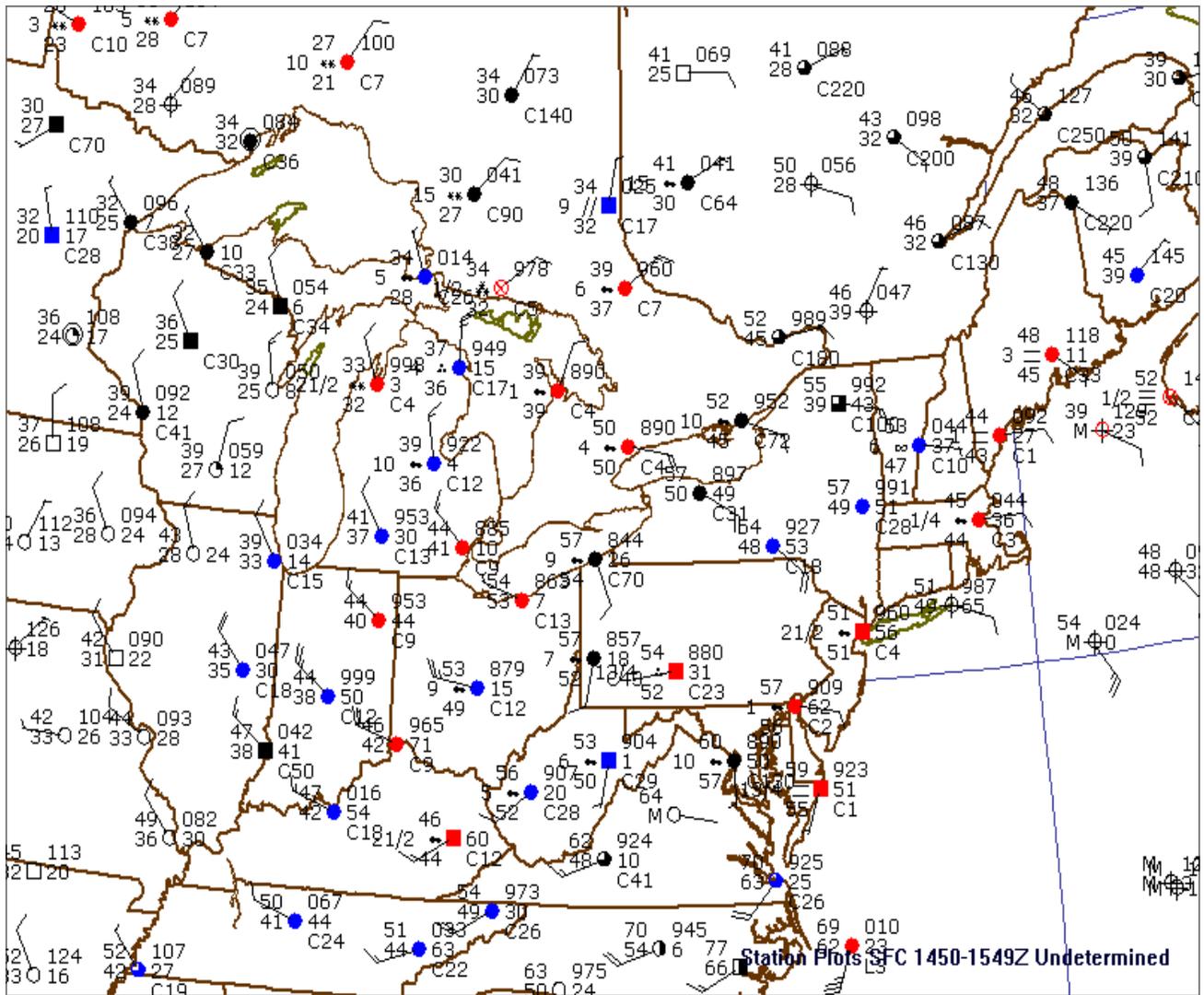
1. Define a **Problem**: Obtain and/or **examine data** and **discern a pattern of**
2. Make a **Hypothesis**: Make a first guess about the reasons for the pattern or problem based upon proven principles or understood causes/effects.
3. Test the **Hypothesis**: See if the same hypothesized cause is associated with the same effects in other places, or for other times etc.

In this lab exercise, you will construct streamlines on the basis of weather information (data). You will then discern patterns in the streamlines.

And then you will apply a proven principle on (***on a level surface, in the absence of other effects, air blows directly from areas of higher values of pressure to areas of lower values of pressure***) to form a hypothesis.

Then you will test the hypothesis on a different weather map. In reality, you'd need to test the hypothesis on many weather maps to "prove" the stated relationship statistically.

1. Draw streamlines on this chart (discussed in class). (15 points)



2. What is the pattern you discern in the streamlines? (10 points)

(Answer in complete sentences, in this space, or on the back, or on separate sheets)

- c) For this rule to work absolutely, air should flow at right angles from higher valued isobars to the lowest pressure on the map, called a "low pressure area" or "cyclone." How would you modify your rule in 3(a) to account for the difference between your analysis and what would be expected by the general principle. (15 points)

I'll start you out:

General Rule for Sea Level Weather Map

On the sea level weather map, air spirals _____ (counterclockwise/clockwise) and _____ (inward, outward) relative to areas of low pressure.

4. The last step in the scientific method shown above is to test the hypothesis or principle you formulated by looking at many different sea level weather maps. Below find the sea level chart of isobars and station data we used in the last lab.

- a) Draw streamlines on this chart; (15 pts)
- b) Does the relationship of the streamlines relative to the isobars generally conform to the General Rule for the Sea Level Weather Map you developed in 3 (c) above? Explain. Answer in two or three complete sentences. (15 pts)
- c) (Answer in complete sentences, in this space, or on the back, or on separate sheets)

Surface data plot for 21Z 29 JAN 15

