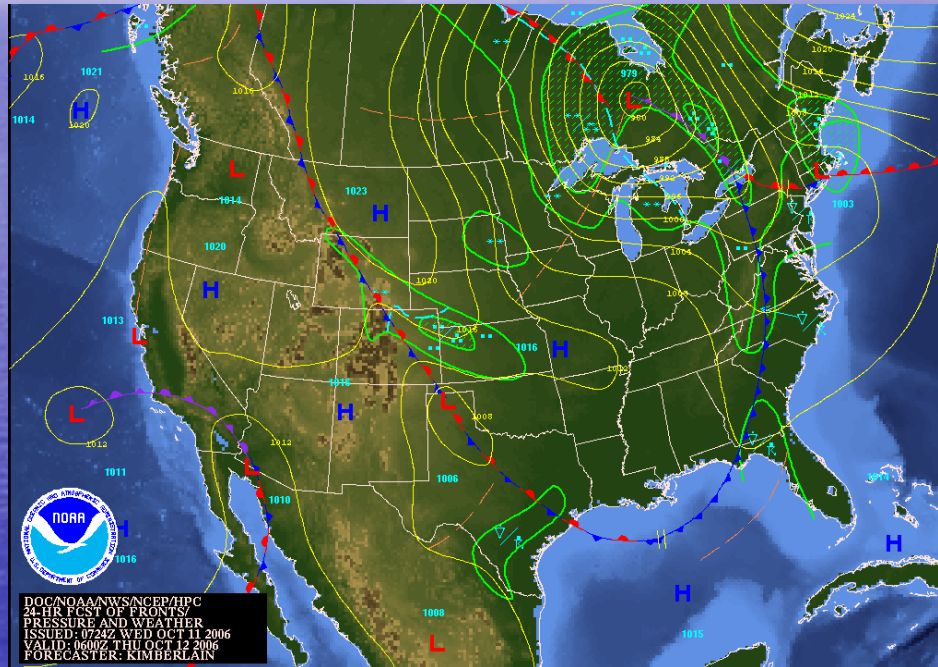


Bell Ringer

1. Mr. Hammer plans to go out over the weekend on his new sailboat. First, he must know how fast the wind is blowing to see if it's appropriate to sail. What instrument should he use?

2. A meteorologist observes some cumulonimbus clouds outside. He speculates that there is LOW air pressure. What instrument should he use to determine the air pressure?

General Meteorology and Forecasting

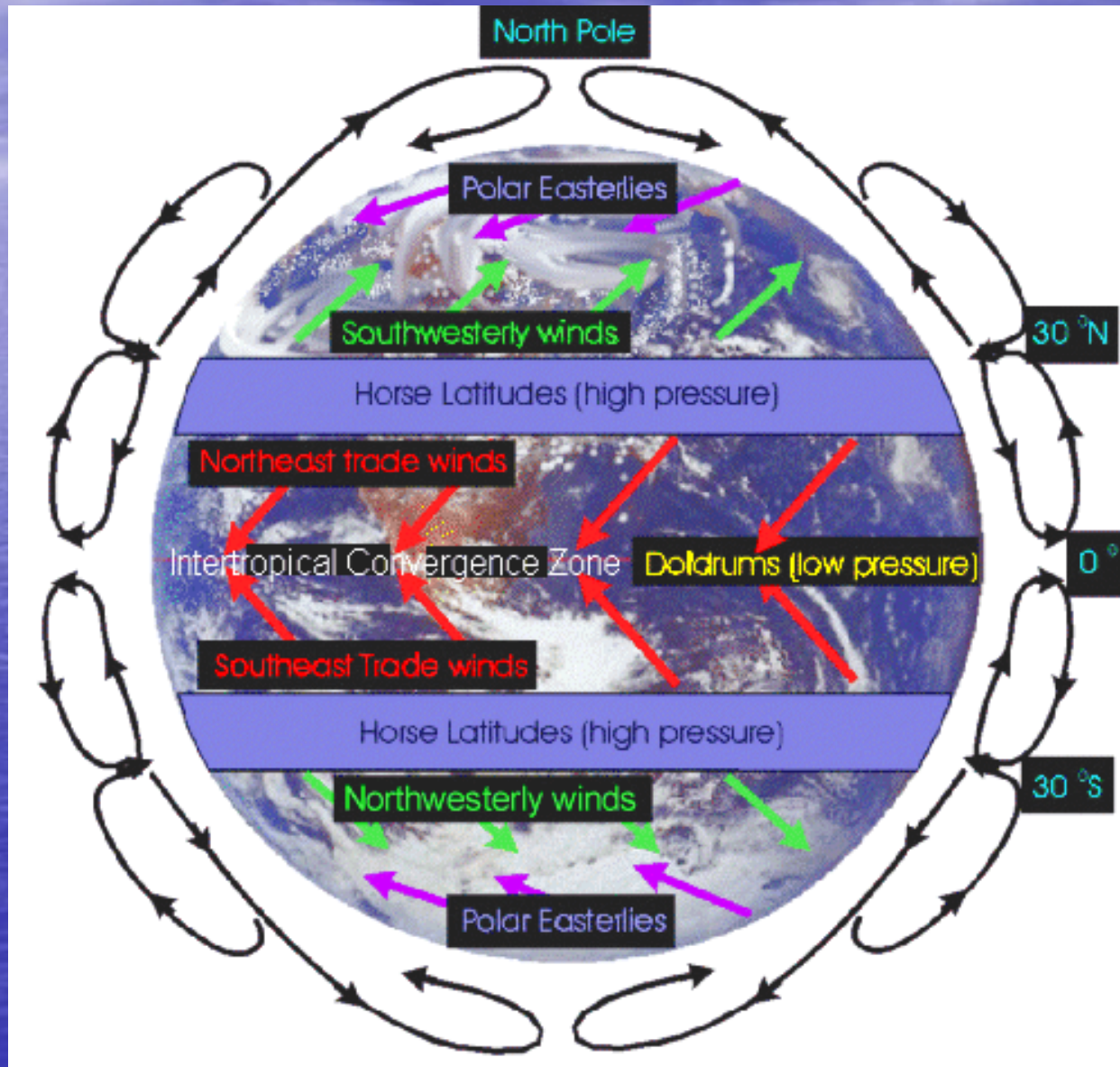


<https://www.youtube.com/watch?v=XiAyWYCcAI0>

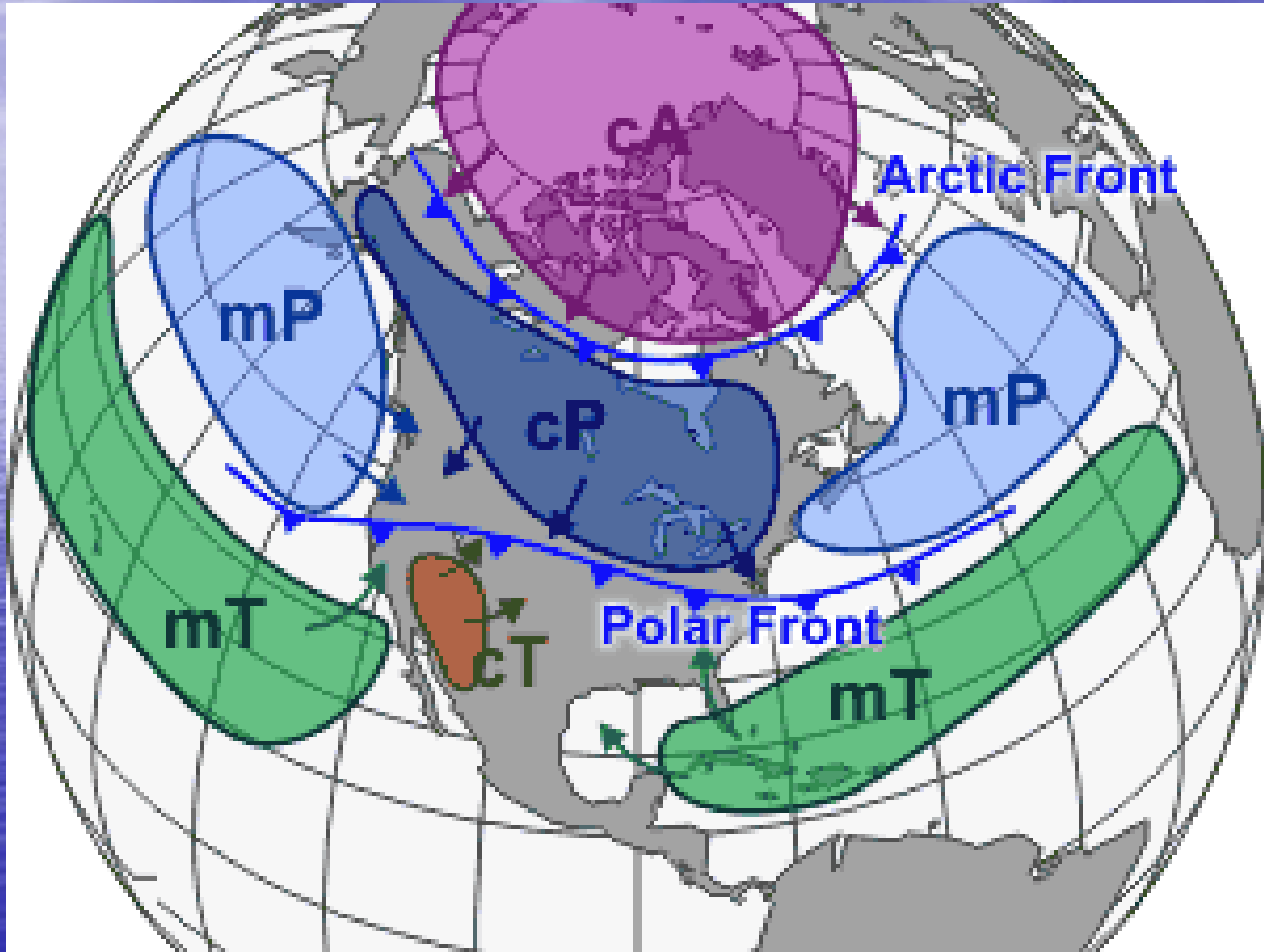
<https://www.youtube.com/watch?v=mwUREWWRTaU>

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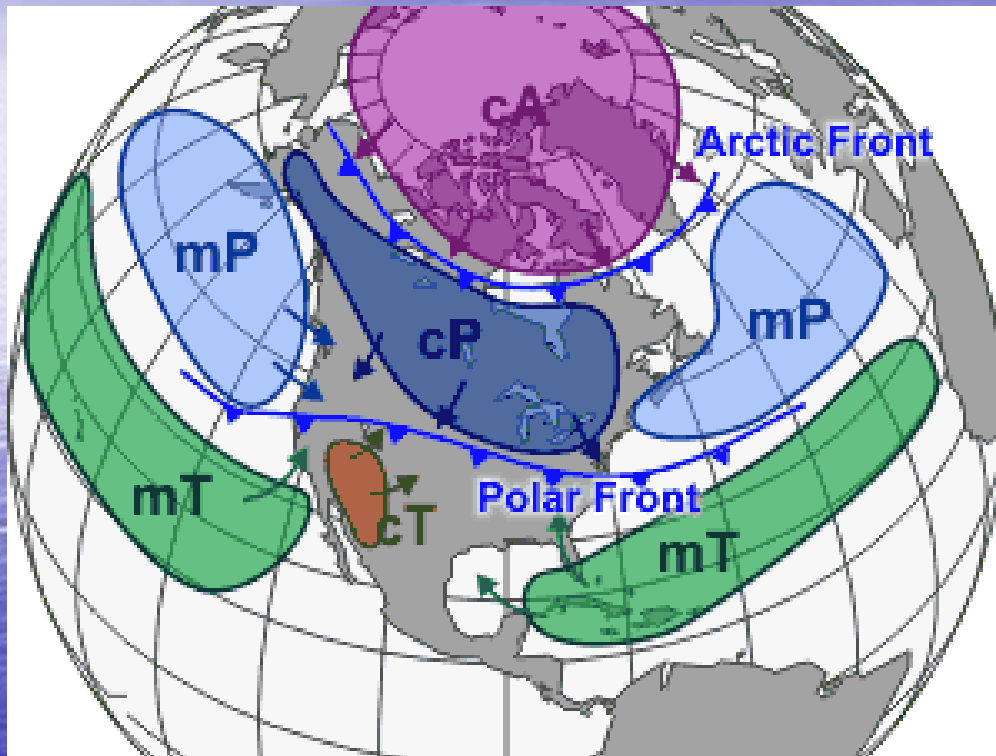
Air Masses



Air Masses



Air Masses

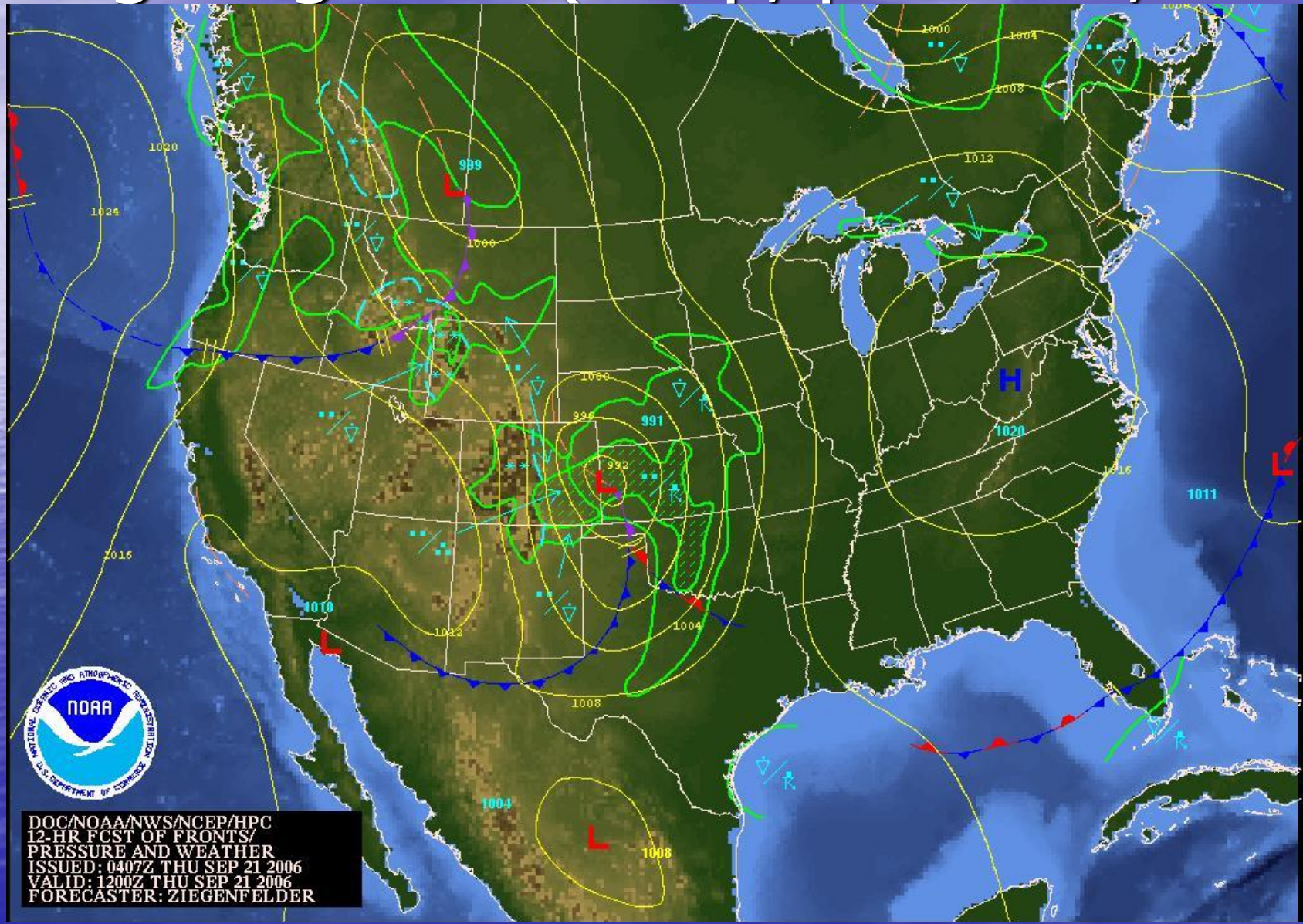


4 Main types of air masses

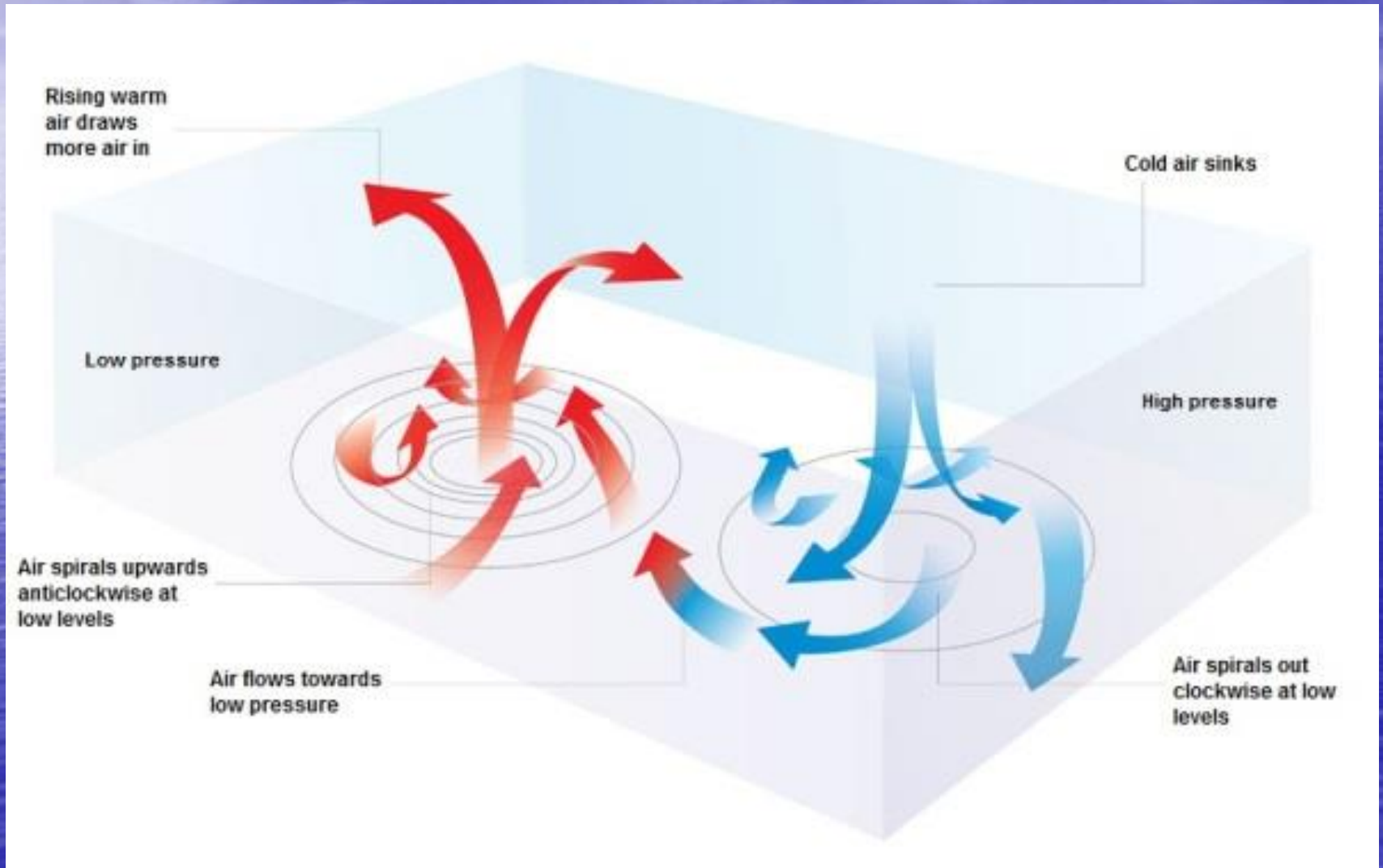
1. Polar latitudes (P)
2. Tropical (T)
3. Continental (c)
4. Maritime (m)

Most weather occurs at the edge of these air pockets, called fronts.

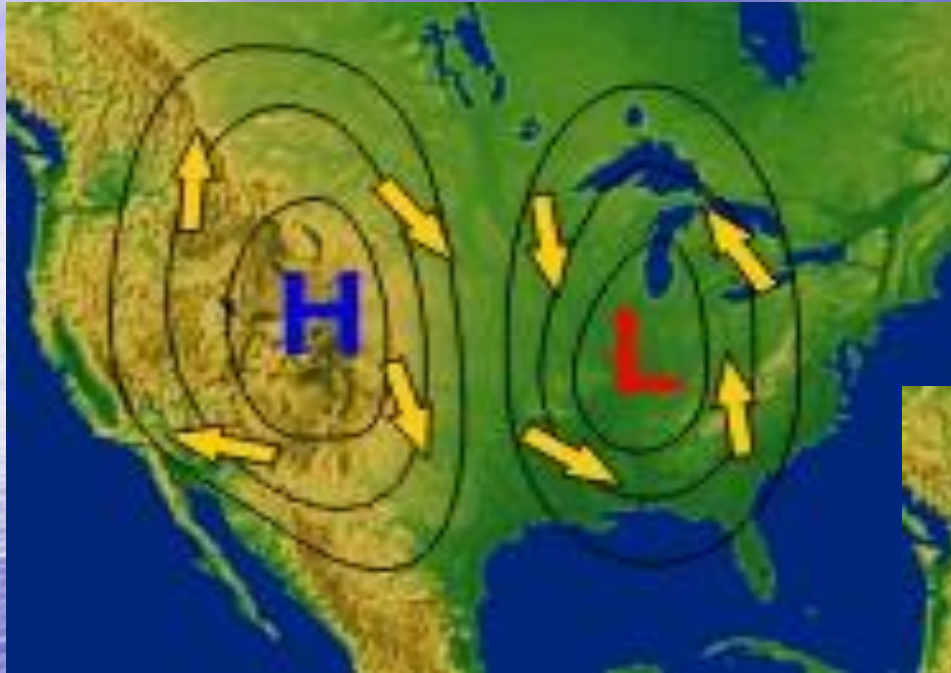
Synoptic Meteorology – Putting lots of things together (temp, pressure, etc.)



Pressure and Wind



Pressure and Wind

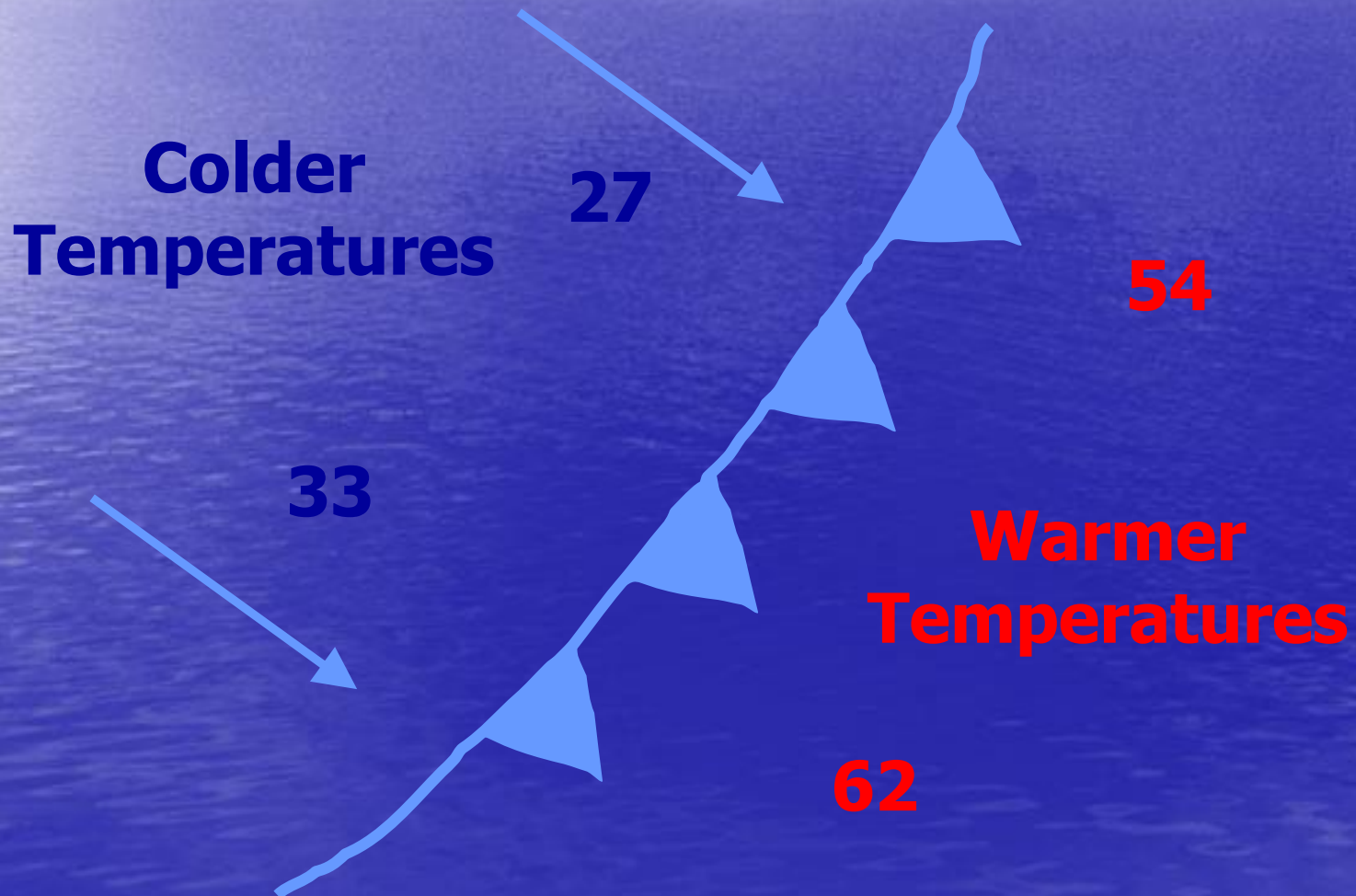


Types of Fronts

- 1) Cold Front
- 2) Warm Front
- 3) Stationary Front
- 4) Occluded Front

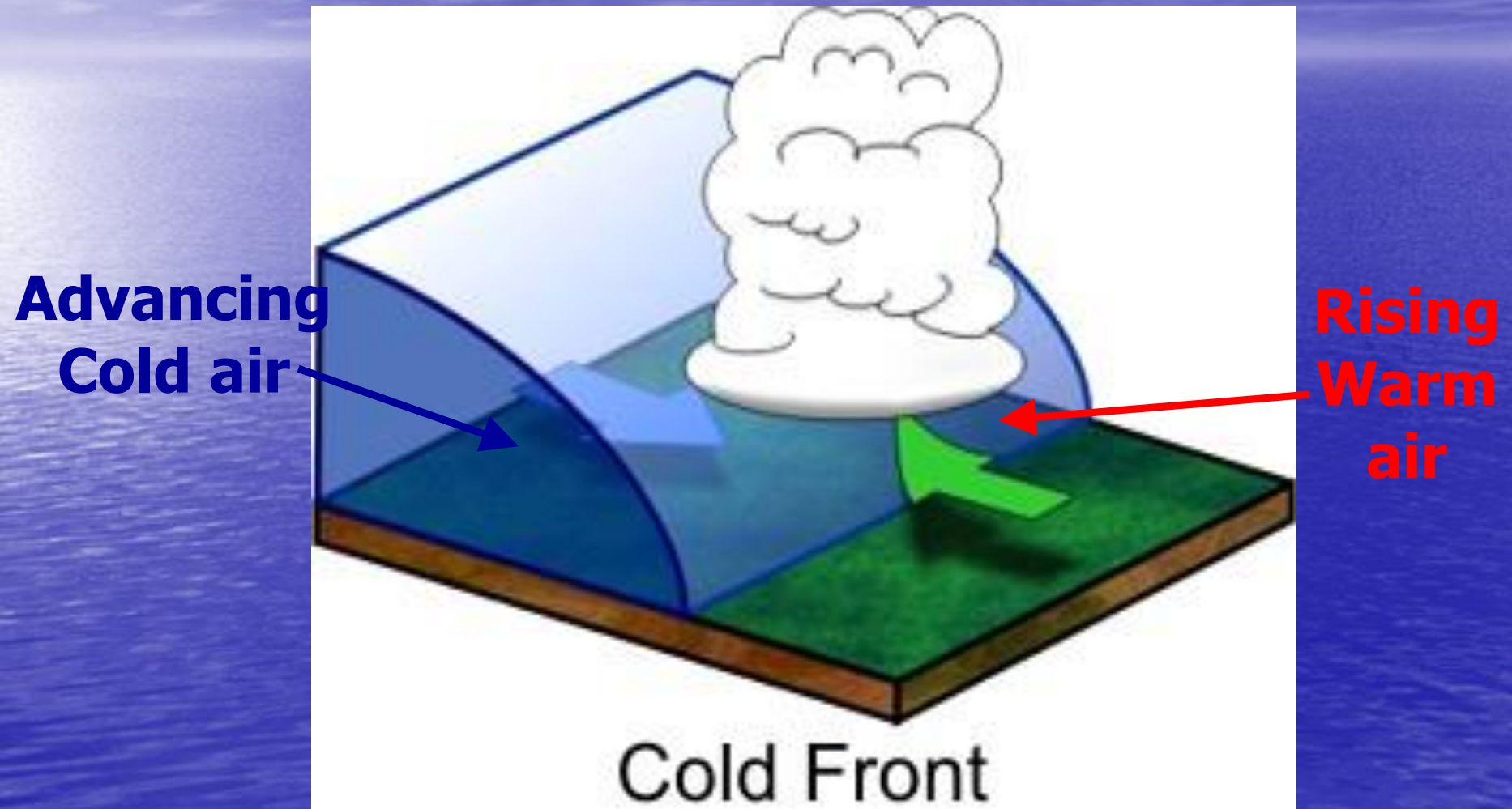
Cold Front

A transition zone where cold/dry, and stable air, replaces warm/moist, and unstable air. It is depicted by a blue line with triangles pointing towards the direction of movement.



Cold Front (Vertical Profile)

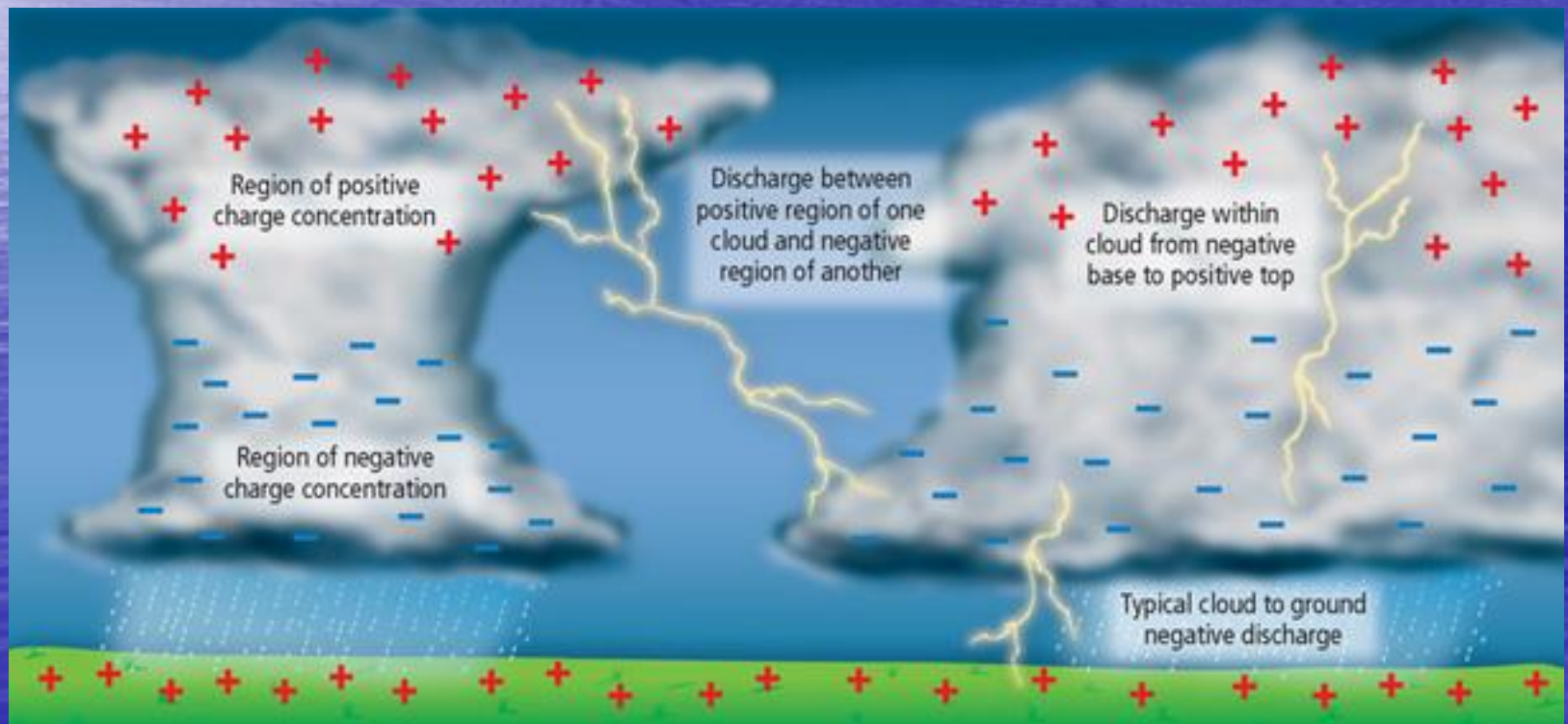
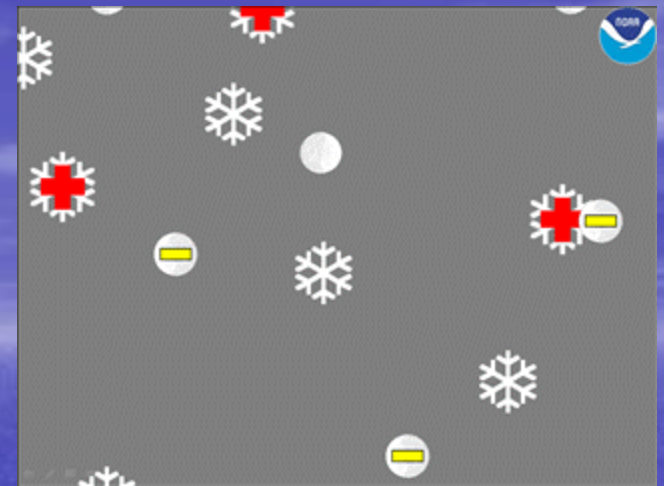
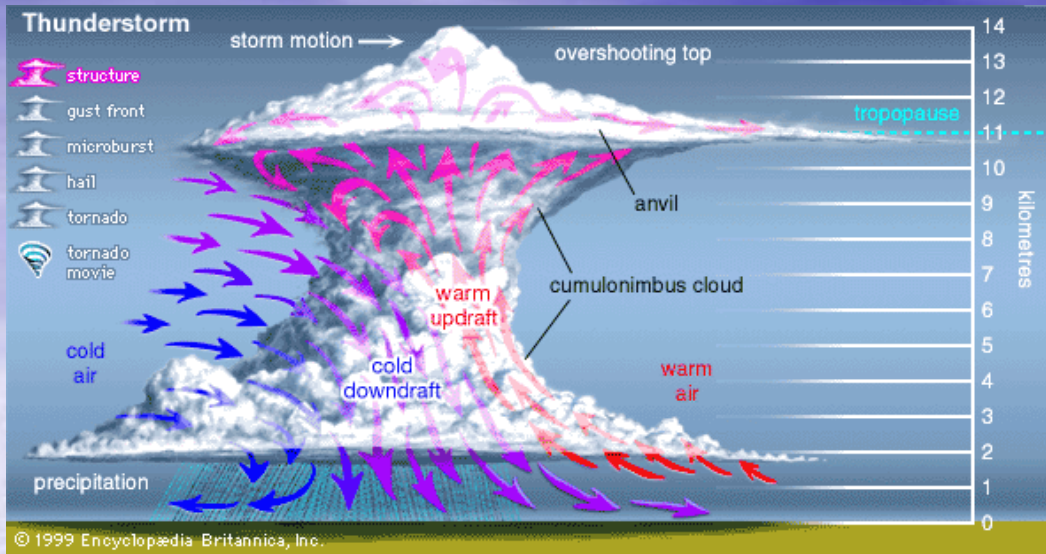
Typically lots of bad weather with cold fronts (Thunderstorms/rain/hail)



Rain / Hail / Lightning

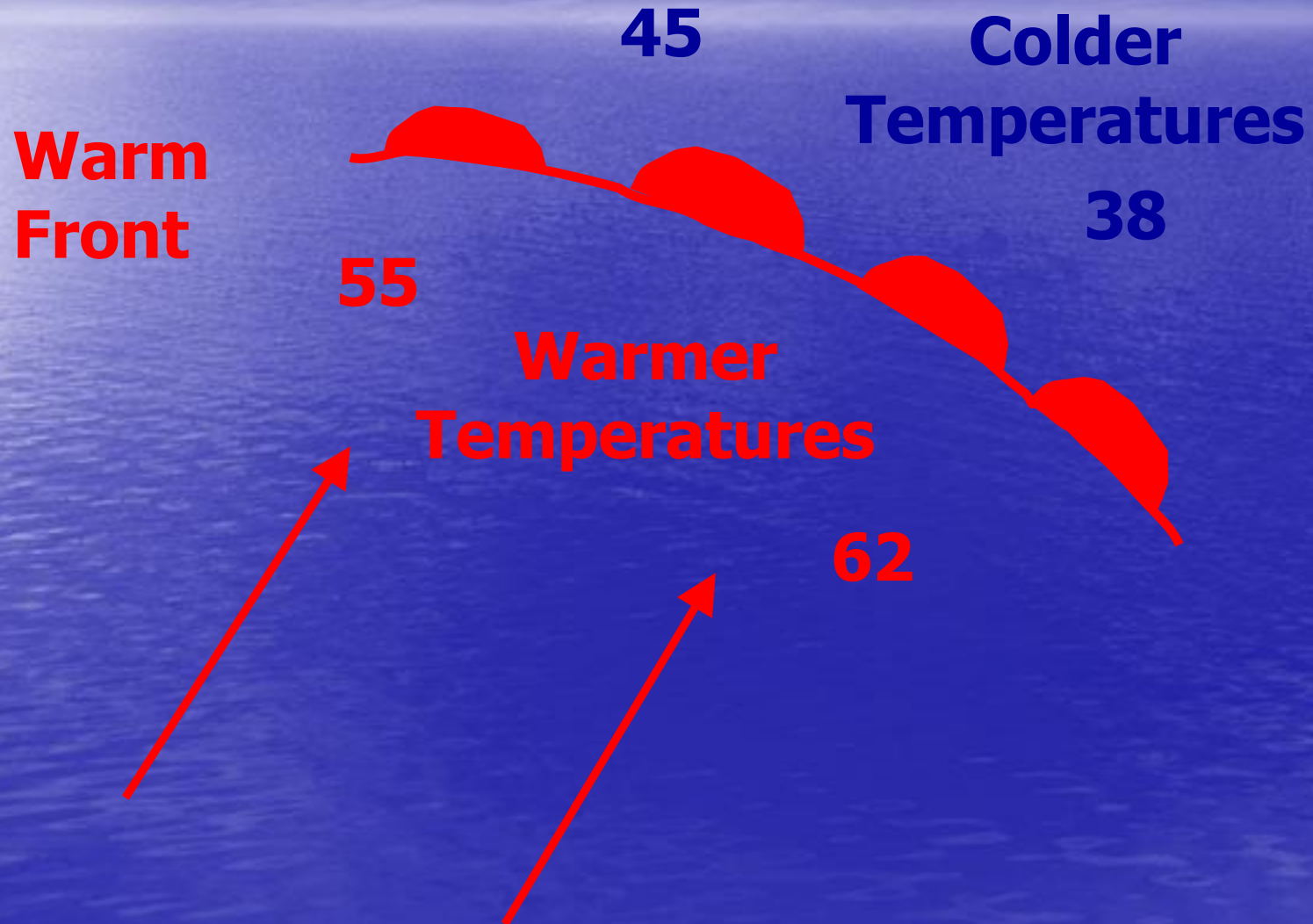
Supercell Thunderstorm



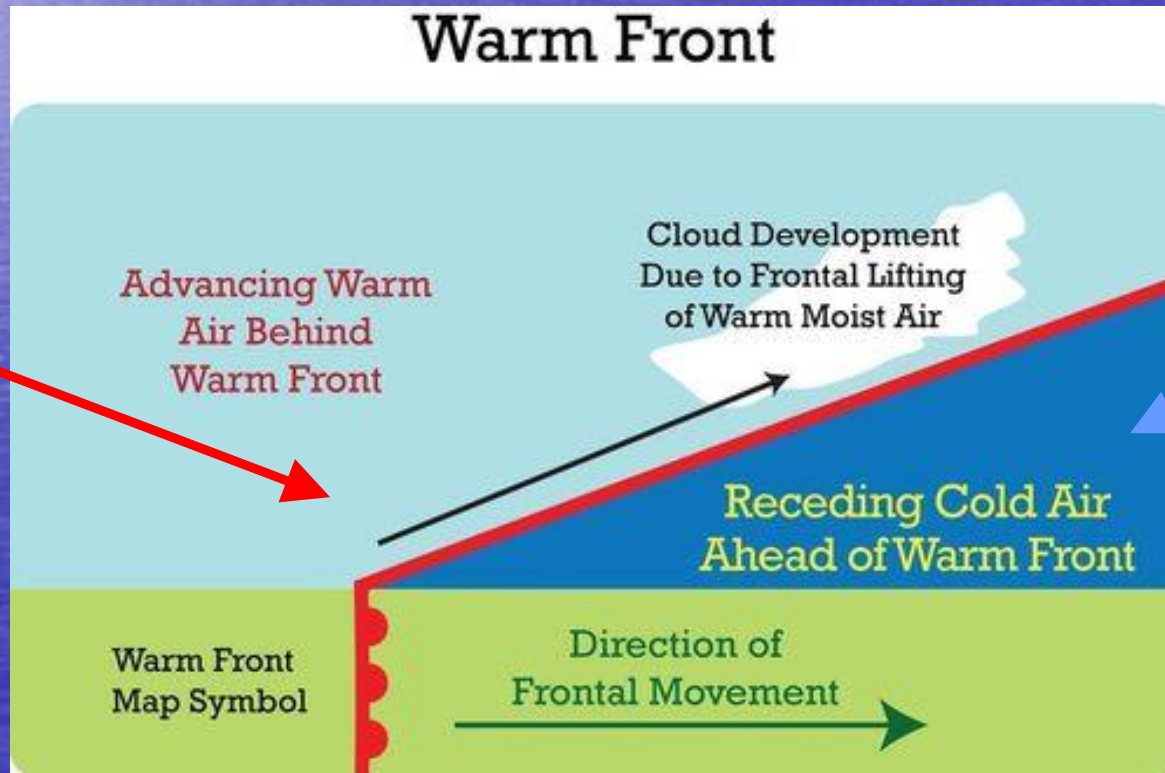


Warm Front

A transition zone where warm, moist air replaces cold, dry air. Typically, warm fronts only travel at half the speed than that of cold fronts



Warm Front (Vertical Profile)

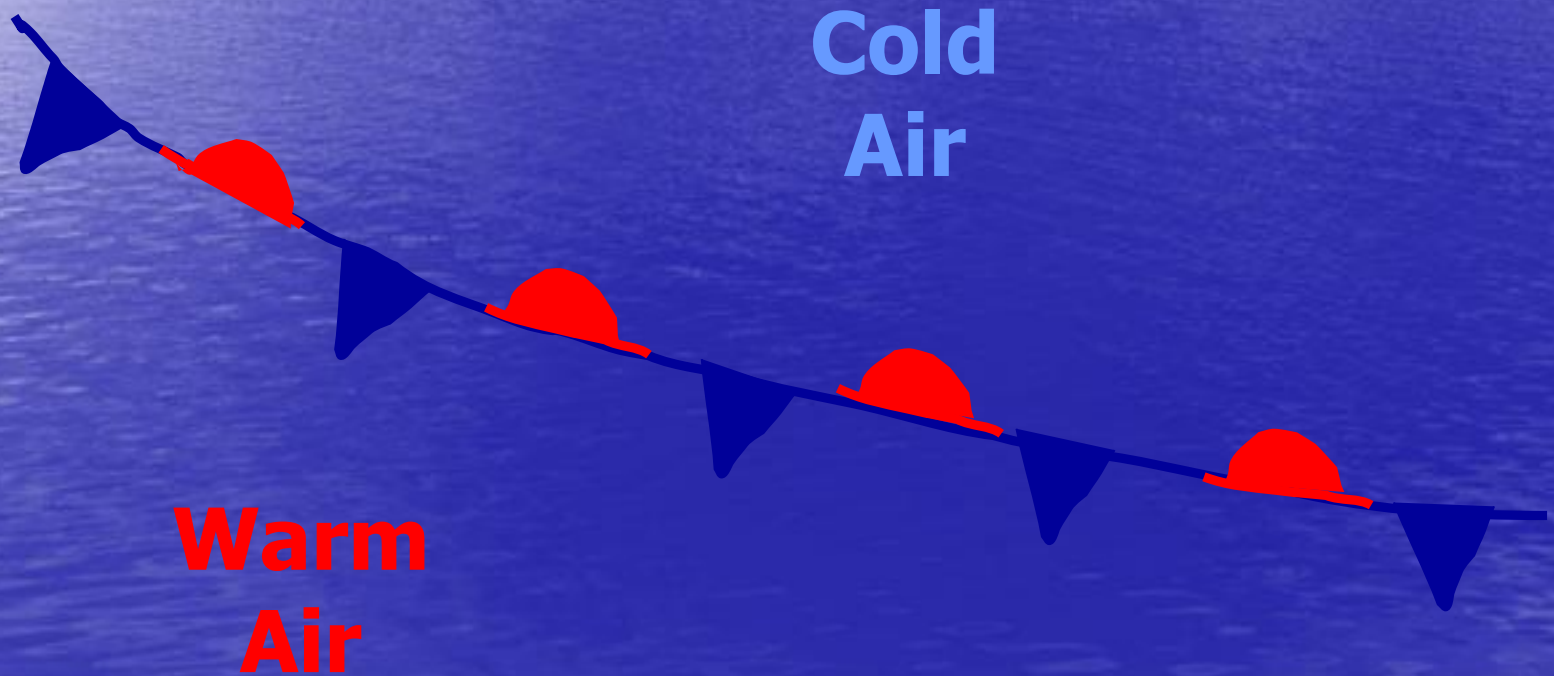


Warm air

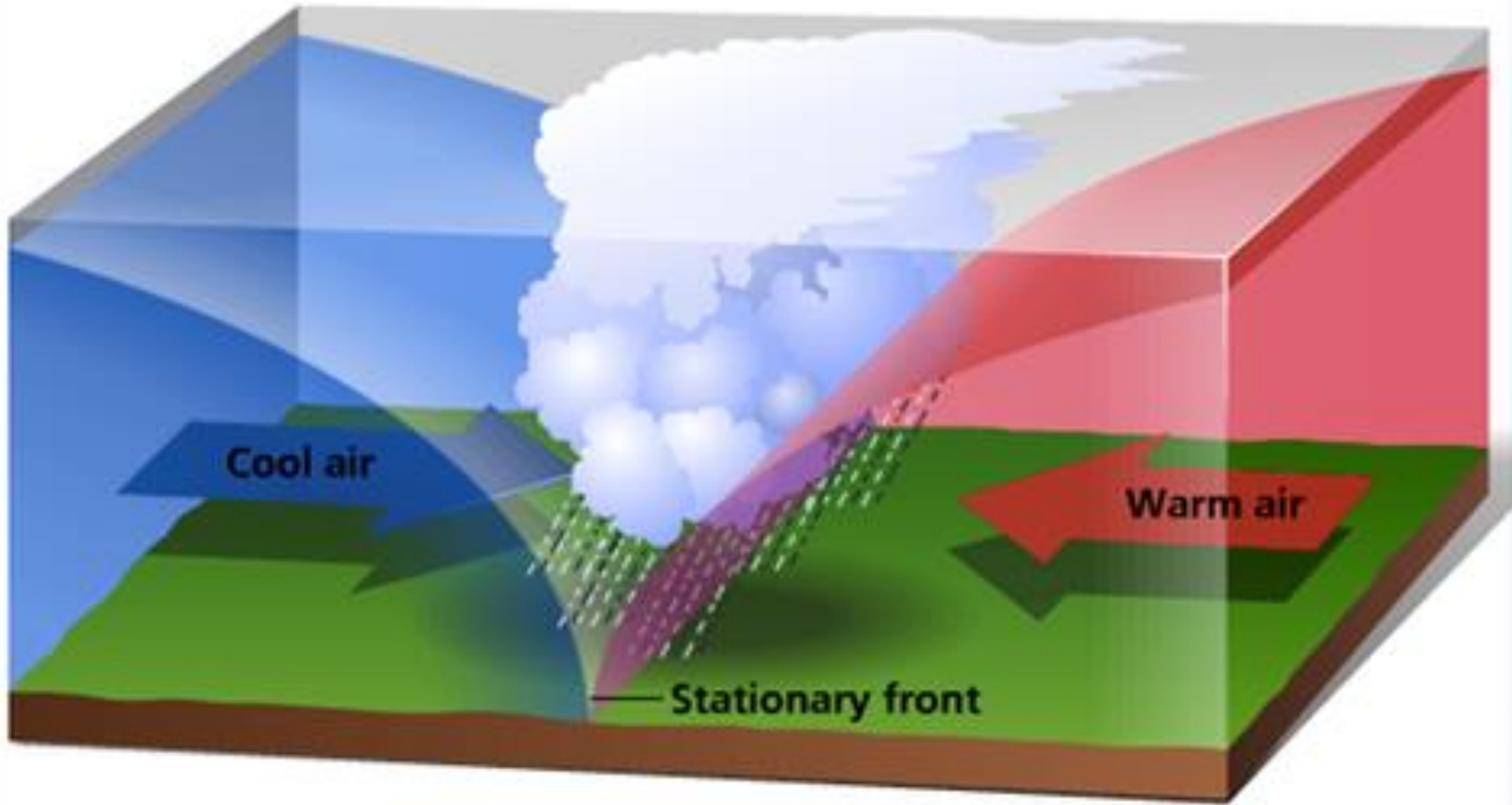
Cold air

Stationary Front

A boundary that has essentially no movement, but separates warm, moist air from cold, dry air. It is depicted by an alternating red and blue line containing blue triangles and red semicircles. The triangles point towards the warmer air, while the semicircles point towards the cooler air.

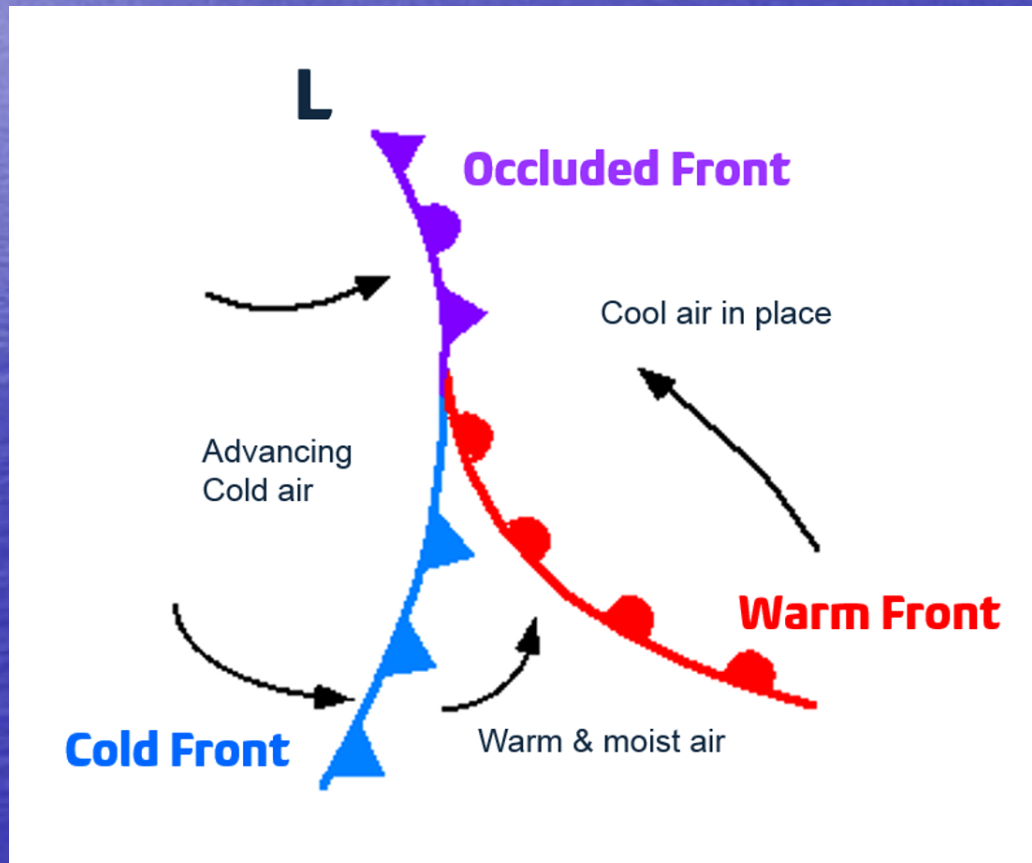


Stationary Front

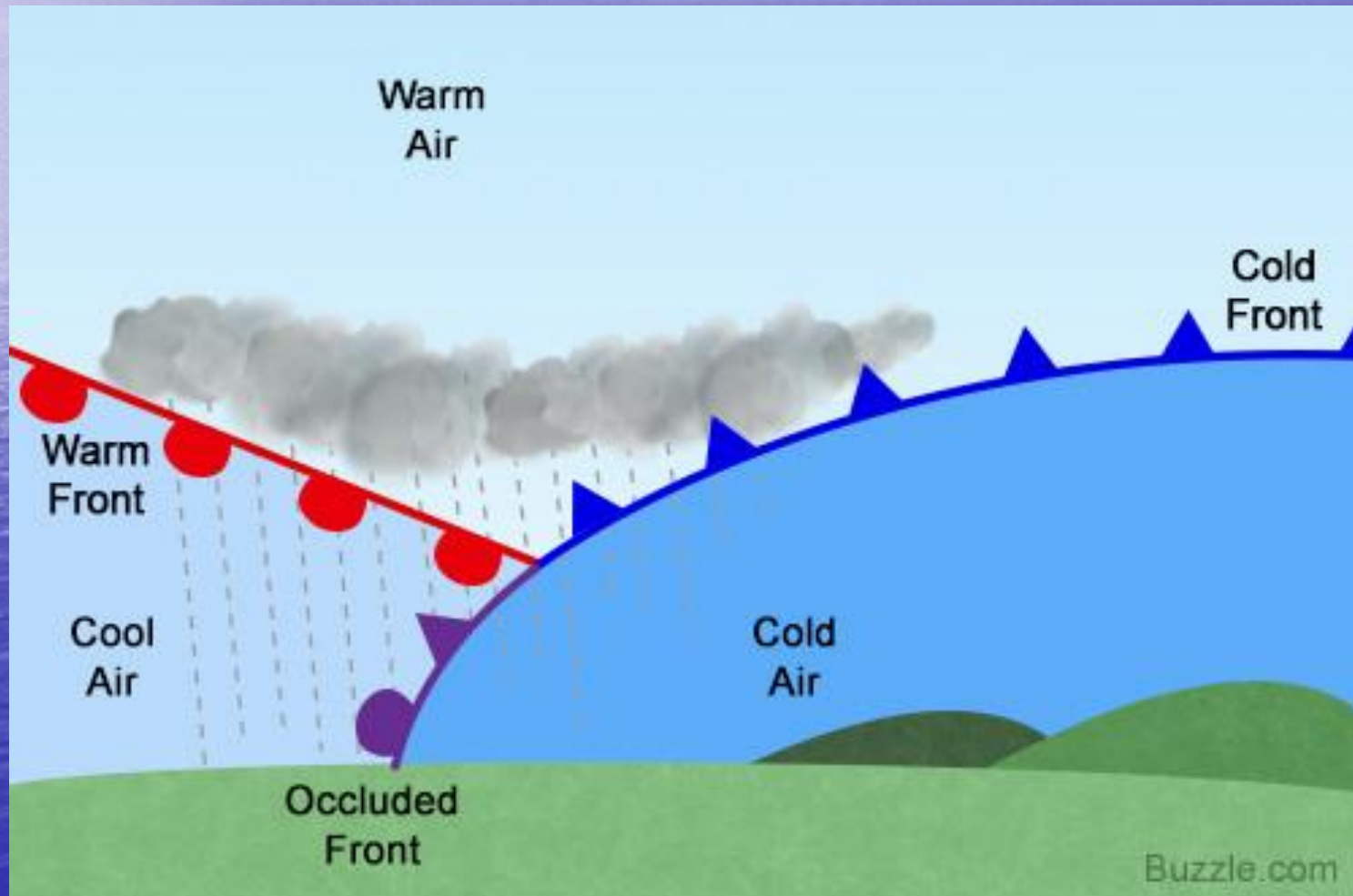


Occluded front

When a warm front gets trapped above two cold air masses.

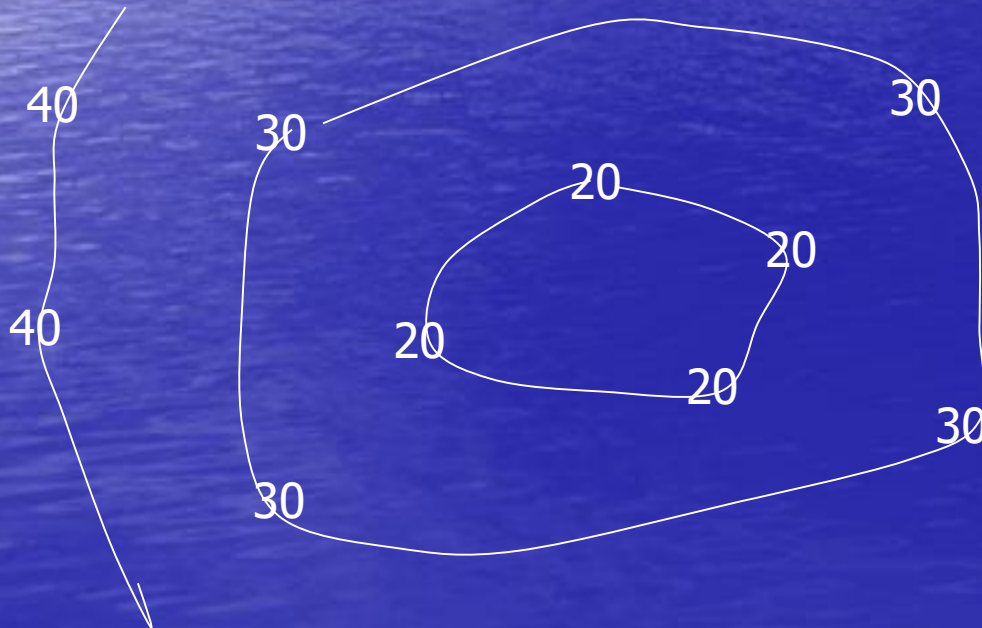


Occluded front

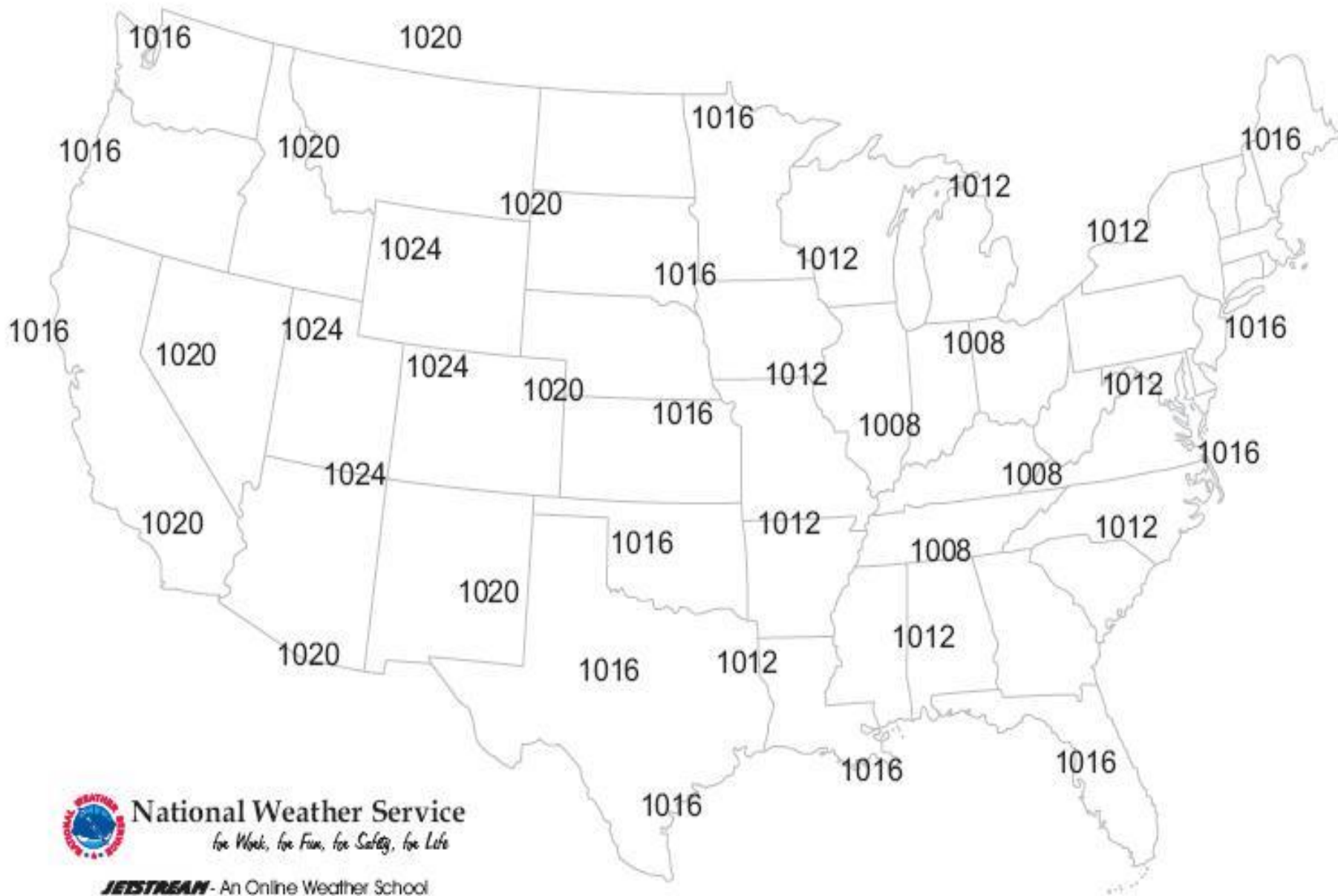


Mapping Exercise

- Draw and analyze a surface weather map for pressure and temperature, and draw the fronts that are indicated by these two variables.
- Discuss our results.



Surface Pressure



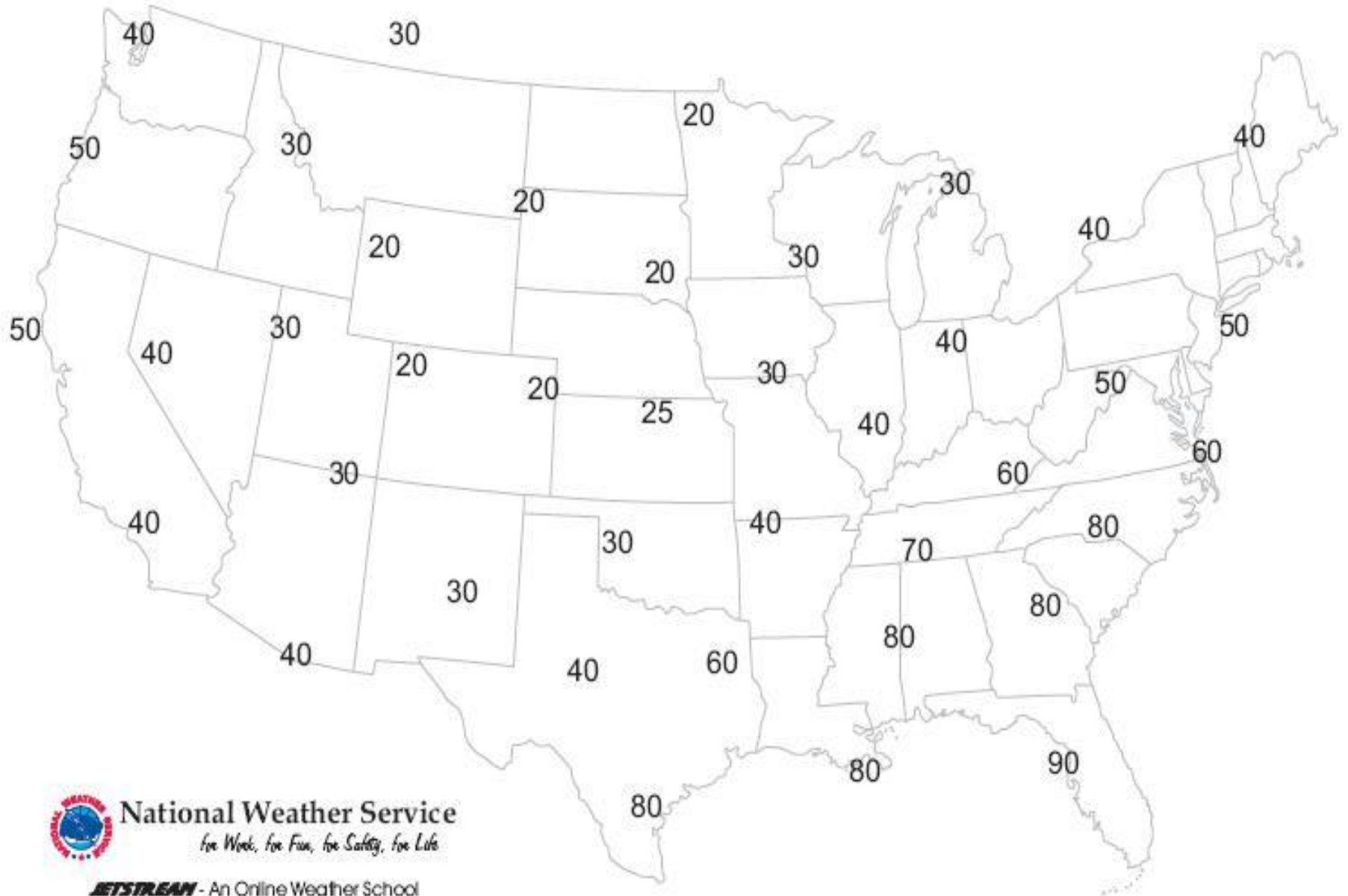
National Weather Service
for Work, for Fun, for Safety, for Life

JETSTREAM - An Online Weather School

Learning Lesson: Analyzing a Weather Map

<http://www.srh.weather.gov/srh/jetstream/synoptic/images/press.pdf>

Surface Temperature



National Weather Service

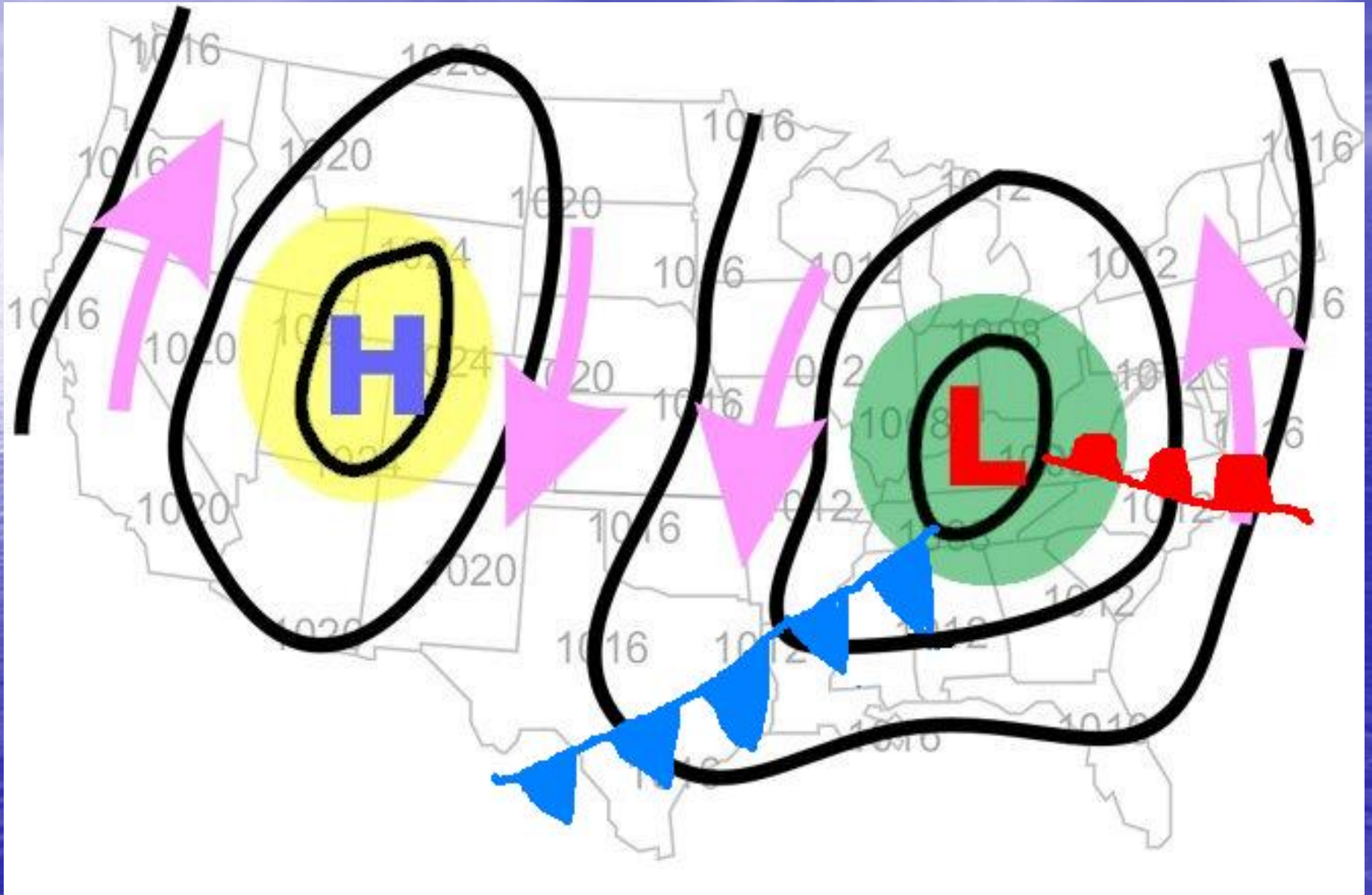
For Work, for Fun, for Safety, for Life

JETSTREAM - An Online Weather School

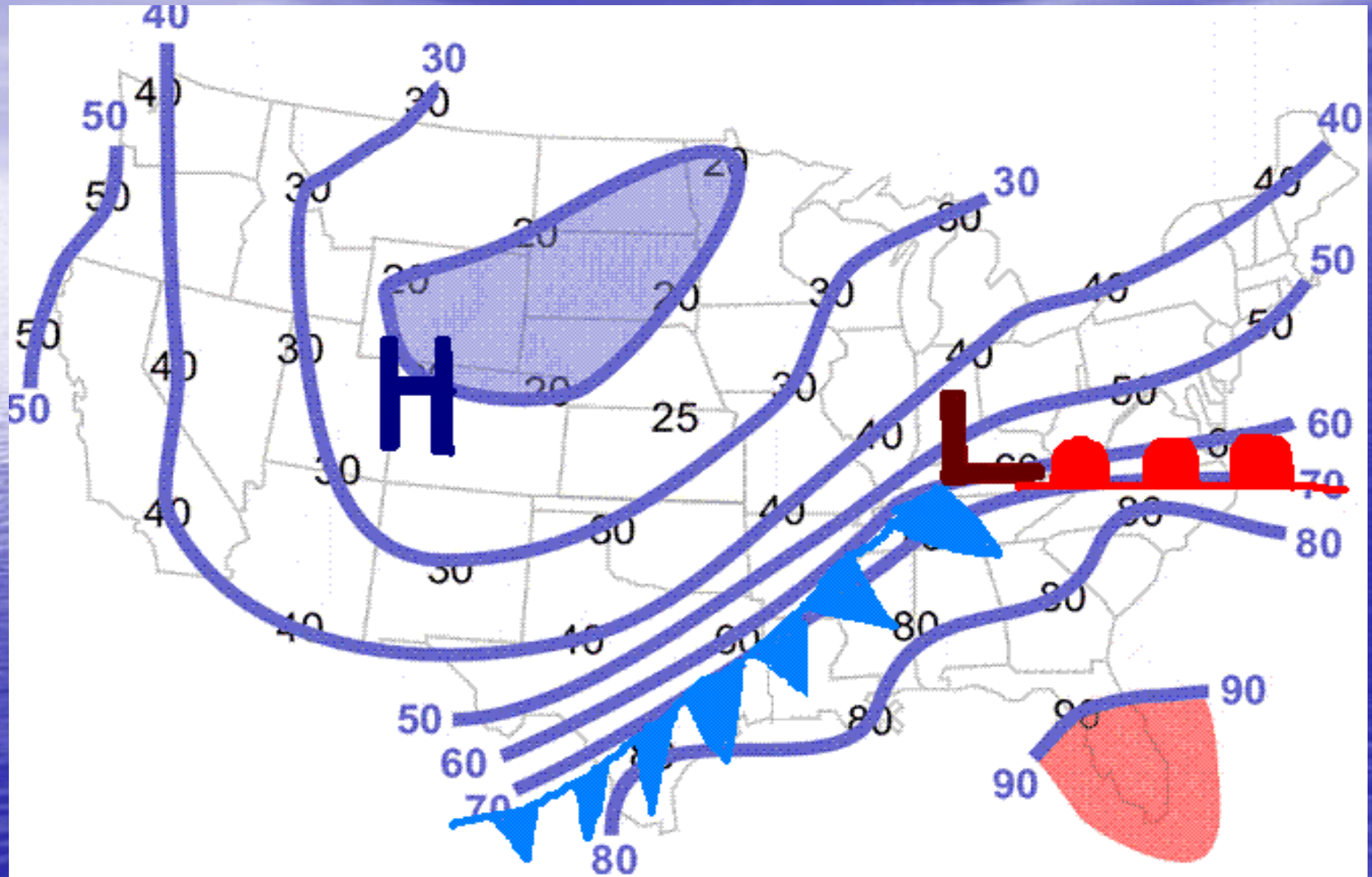
Learning Lesson: Analyzing a Weather Map

http://www.srh.weather.gov/srh/jetstream/synops/colimages/temp_large.pdf

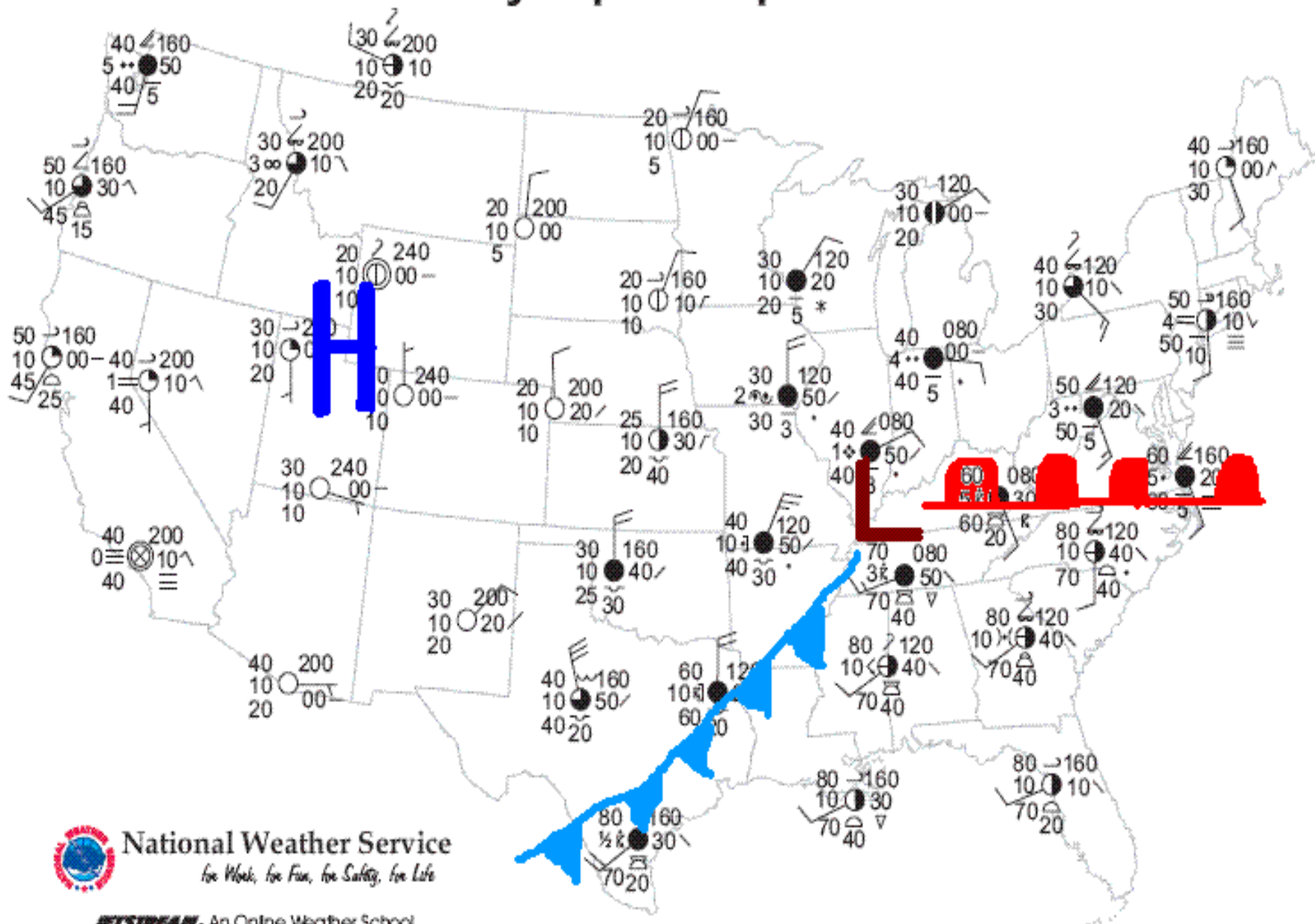
Pressure/Front Map



Temperature/Front Map



Synoptic Map



National Weather Service

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WETSTREAM - An Online Weather School

Learning Lesson: Analyzing a Weather Map

http://www.srh.noaa.gov/txh/jetstream/synoptic/images/synoptic_map.pdf