

GREAT LAKES SURF FORECASTING WORKSHOP

PRESENTED BY THIRD COAST SURF SHOP

Weather 101

Temperature differences across the planet drive differences in pressure.

Differences in pressure drives wind.

The greater the pressure DIFFERENCE over an area, the stronger the wind, and ultimately the bigger the waves.

Wind Drives Waves



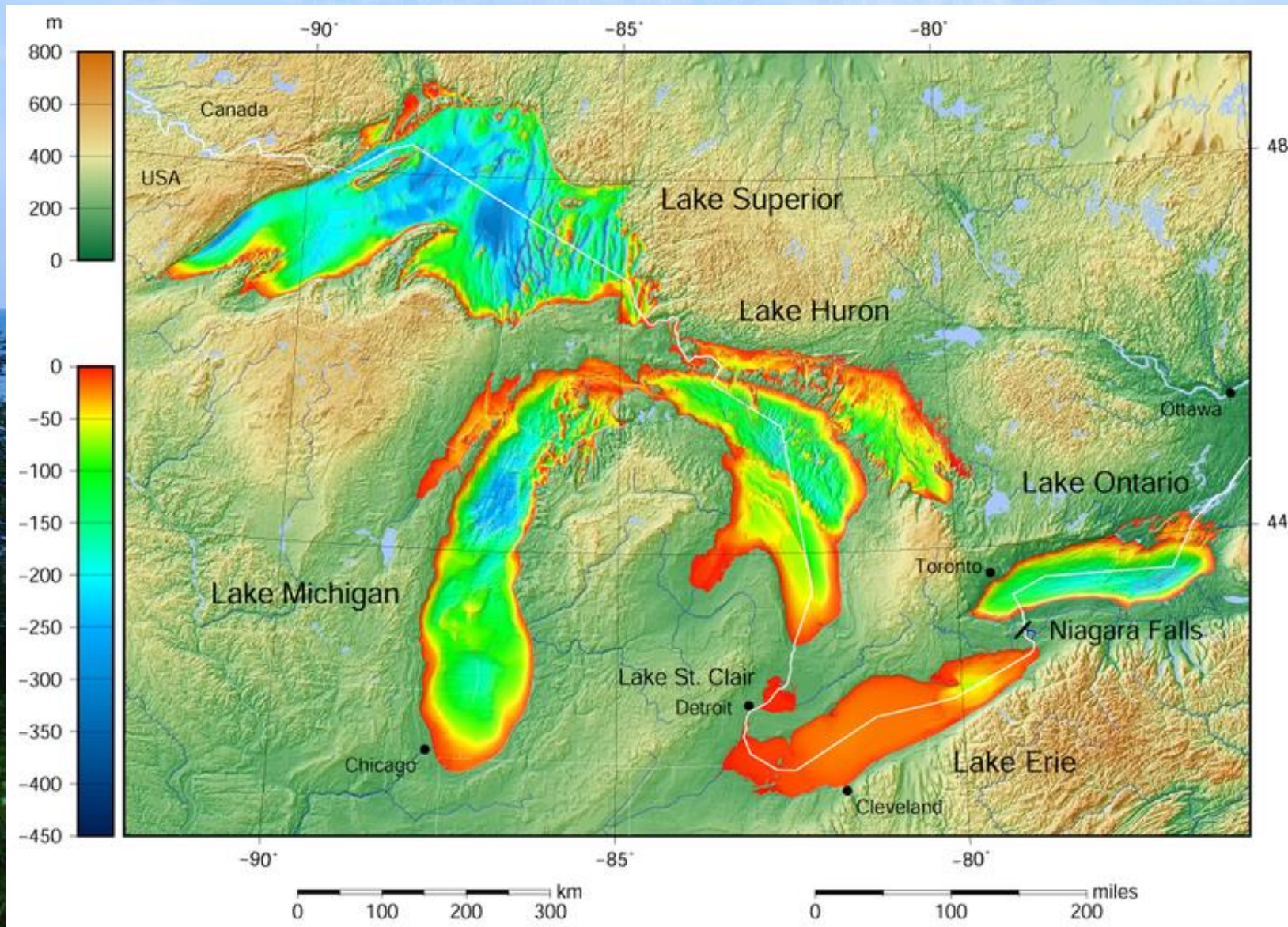
Weather 101

Fetch – The distance wind travels over water. The greater the fetch, the better the wave.

Significant Wave Height – The average height of the highest one-third of the waves.

Wave Period – The time it takes for two wave crests to pass a fixed point (i.e. buoy). It gives you a good idea on the waves energy. This is the most overlooked variable.

Wind Drives Waves

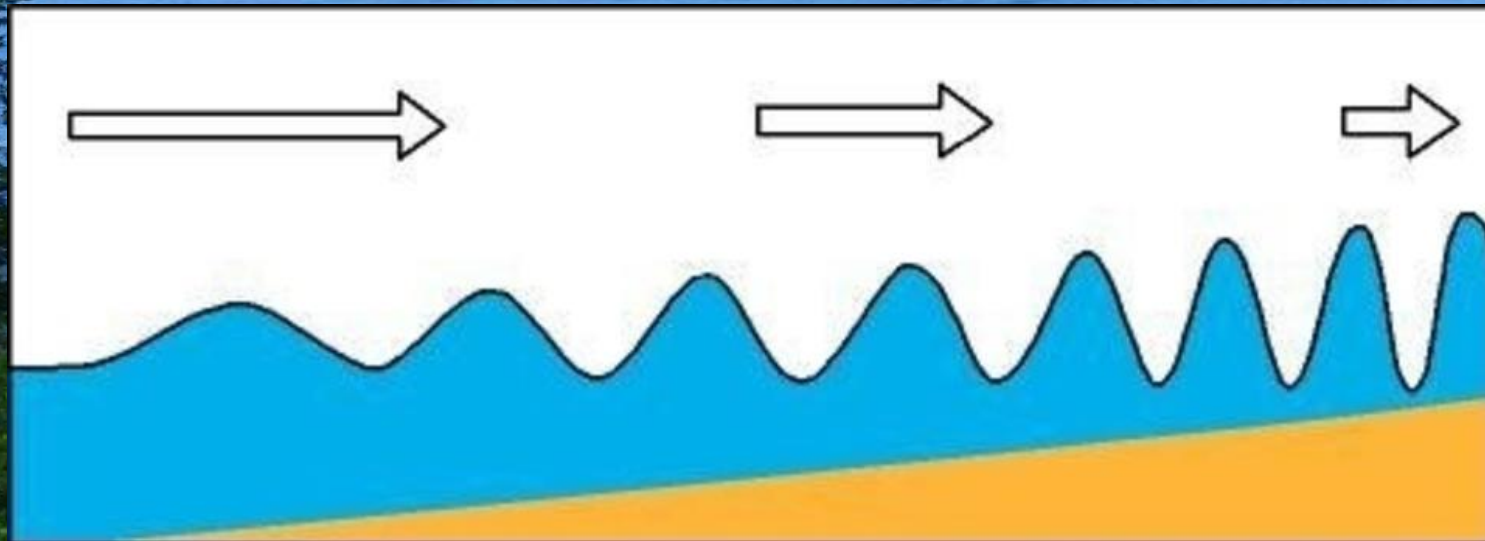


Wave Shoaling

$$\text{Wave Period} = \frac{1}{\text{Frequency}} \quad \text{or} \quad T = \frac{1}{f}$$

$$\text{Wave Period} = \frac{\text{Wavelength}}{\text{velocity}} \quad \text{or} \quad T = \frac{\lambda}{v}$$

Unit of Wave Period: s



Weather 101

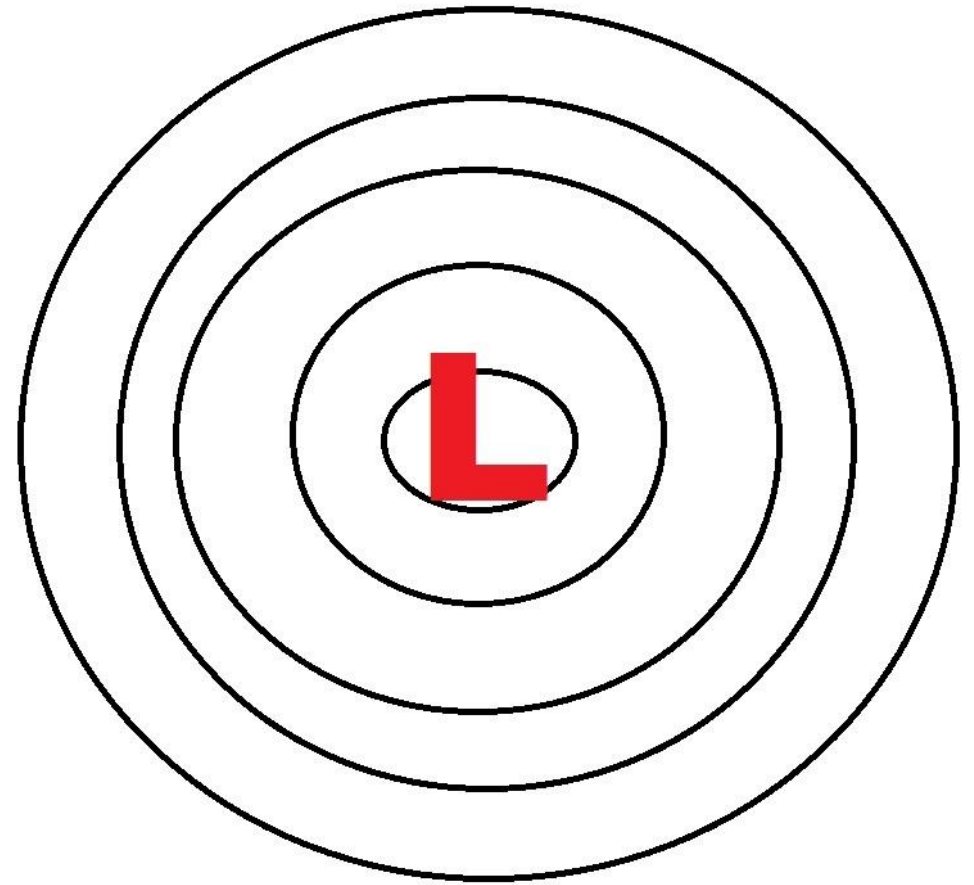
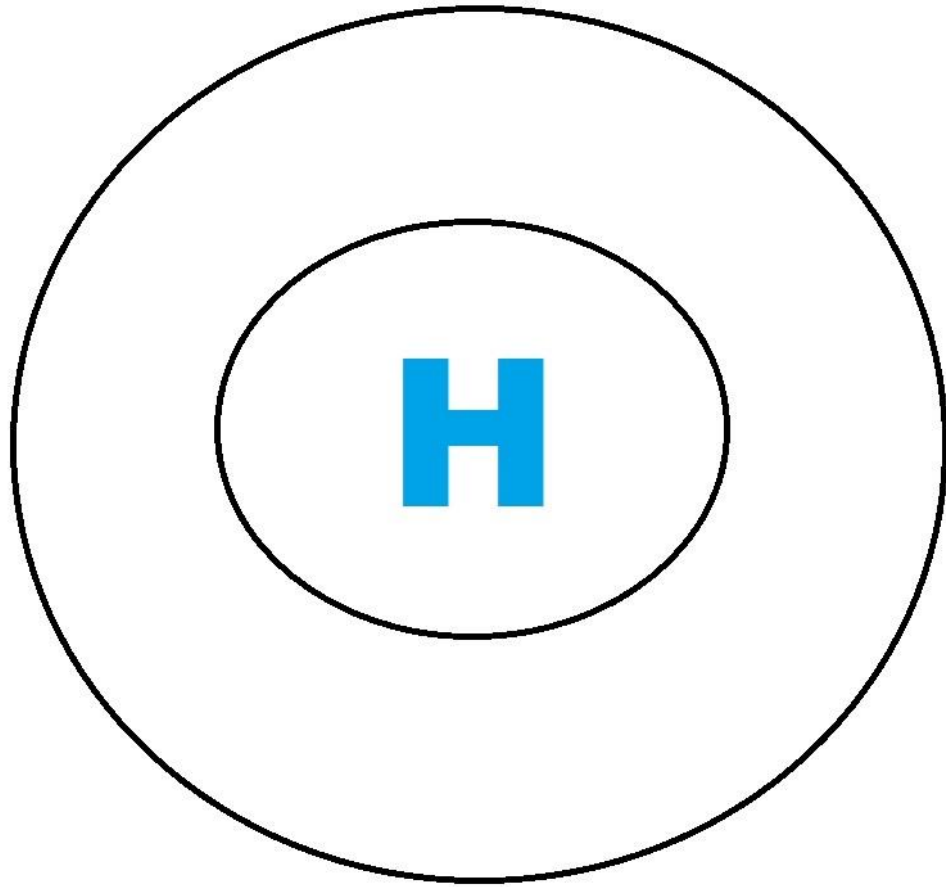
High Pressure

- **Associated with sunshine & stability**
- **Air sinks and spreads out from the center**
- **Spins clockwise**

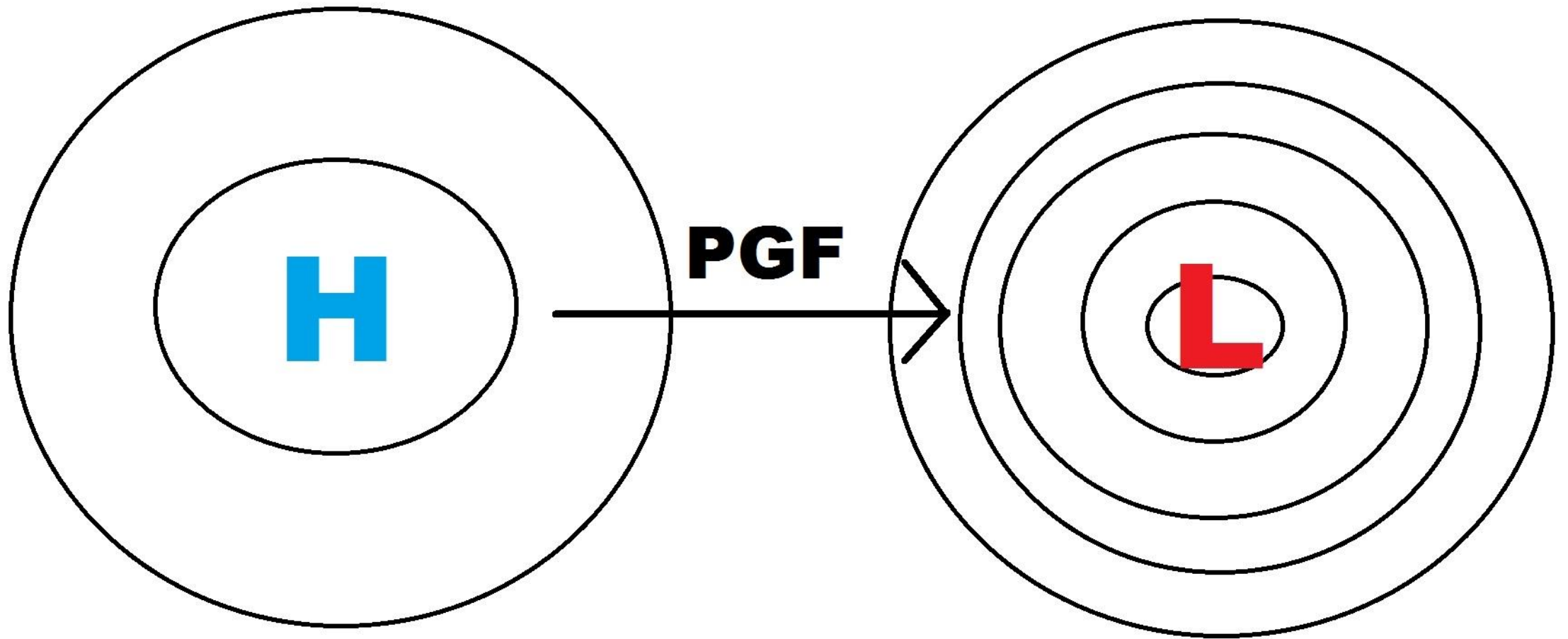
Low Pressure

- **Associated with clouds, precipitation, & instability**
- **Air rises and converges inward towards the center**
- **Spins counterclockwise**

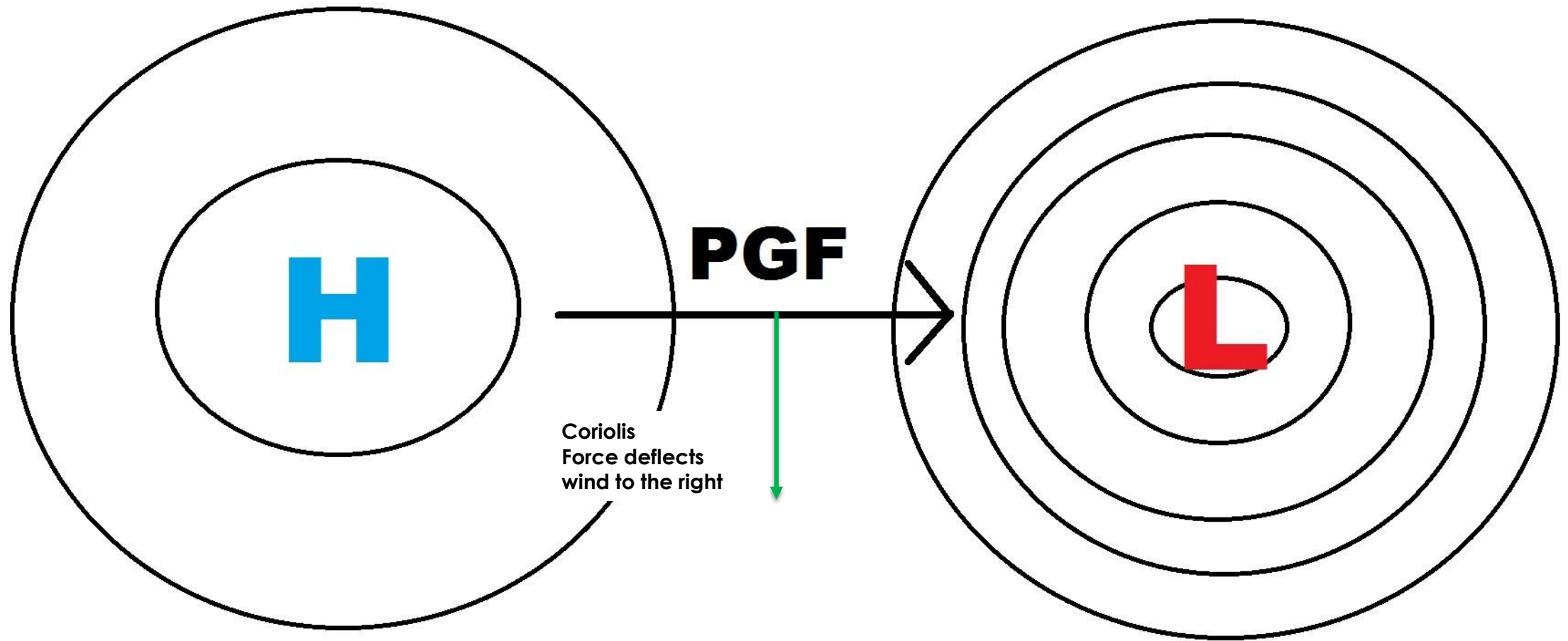
Pressure Systems



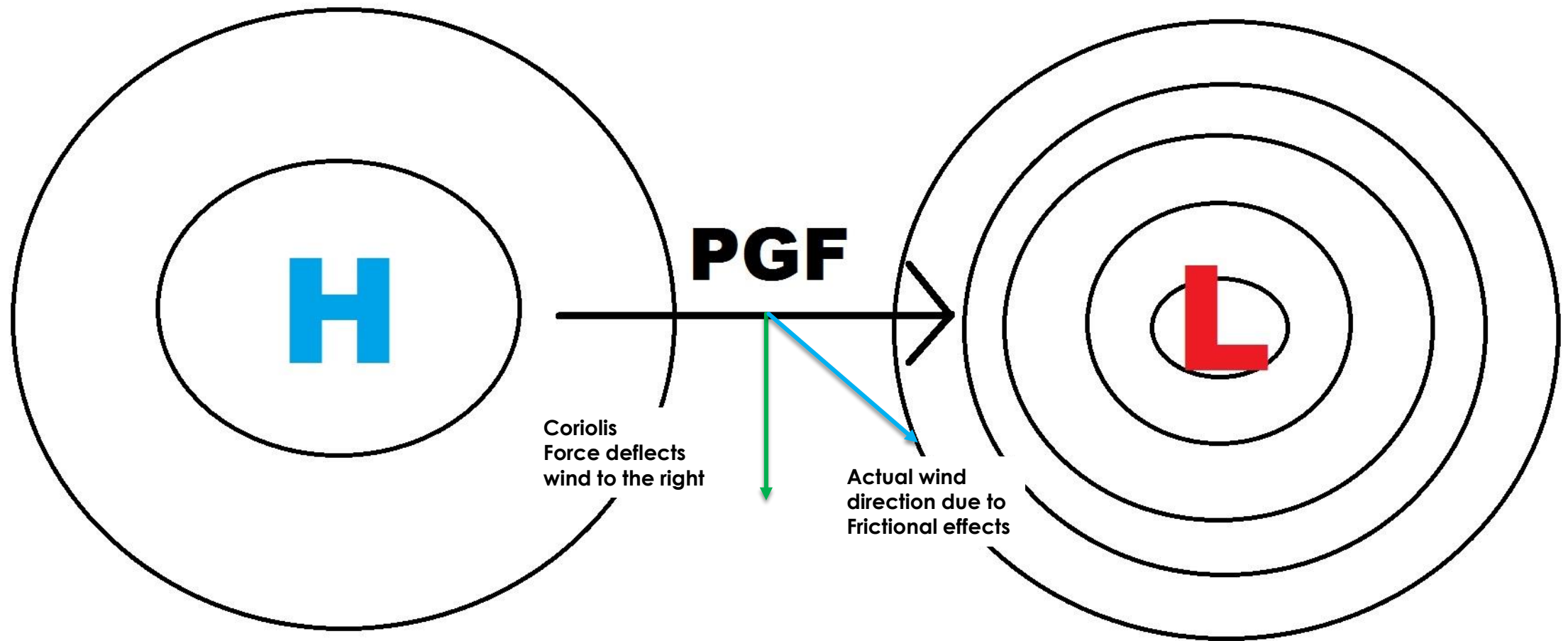
Pressure Systems



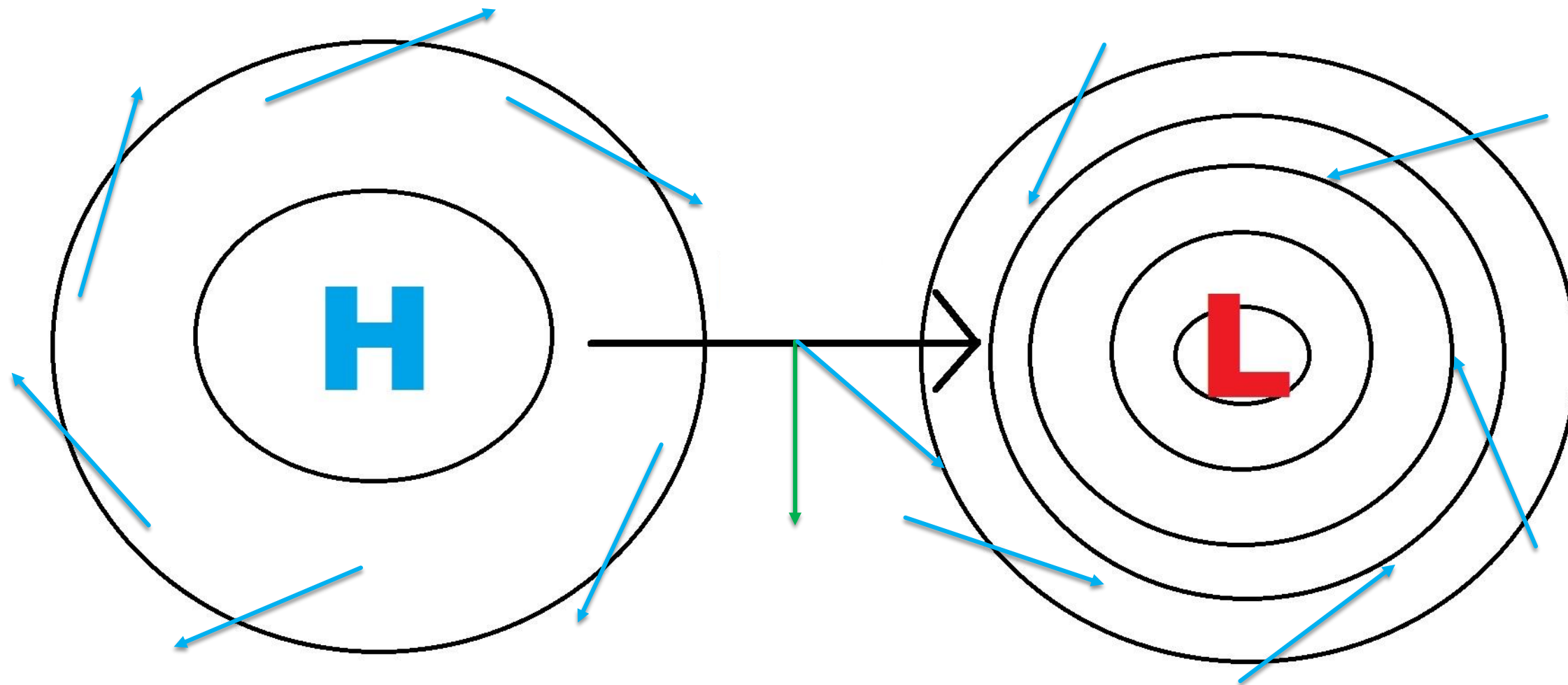
Pressure Systems



Pressure Systems



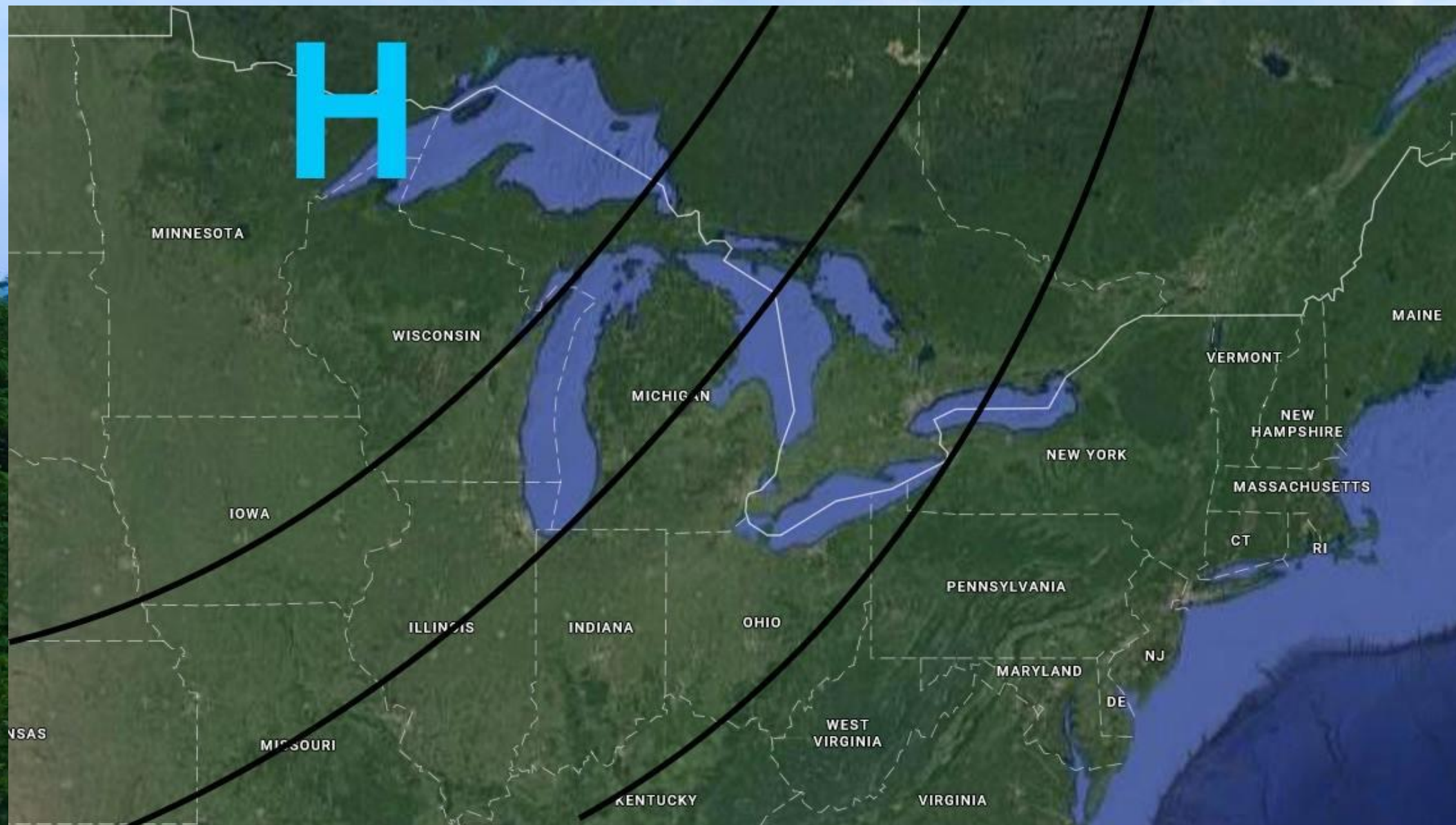
Pressure Systems



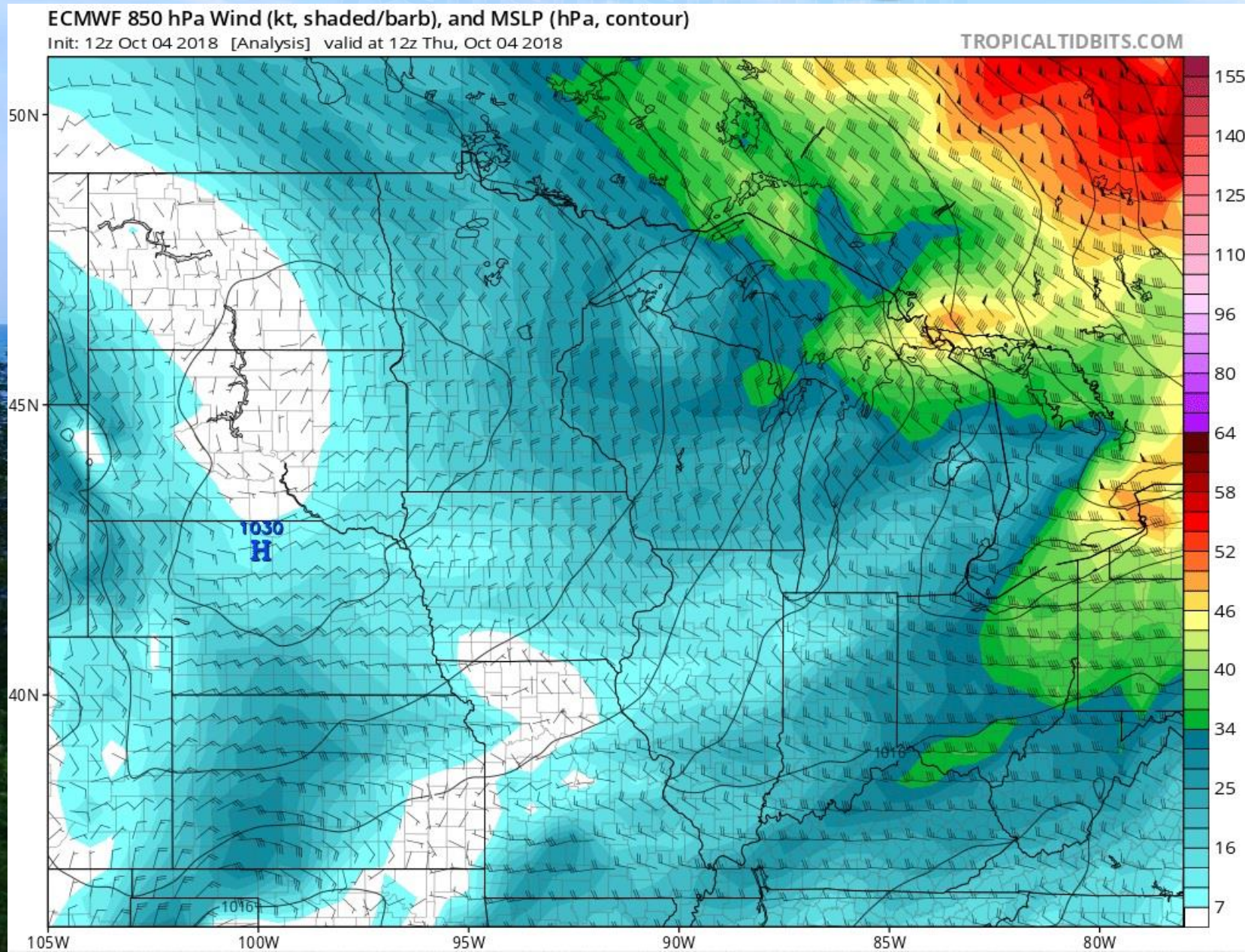
Weather Setups

- **Canadian High**
- **Great Lakes 'Bomb'**
- **Ohio Valley Low**
- **Clipper System**
- **Nor'easter**

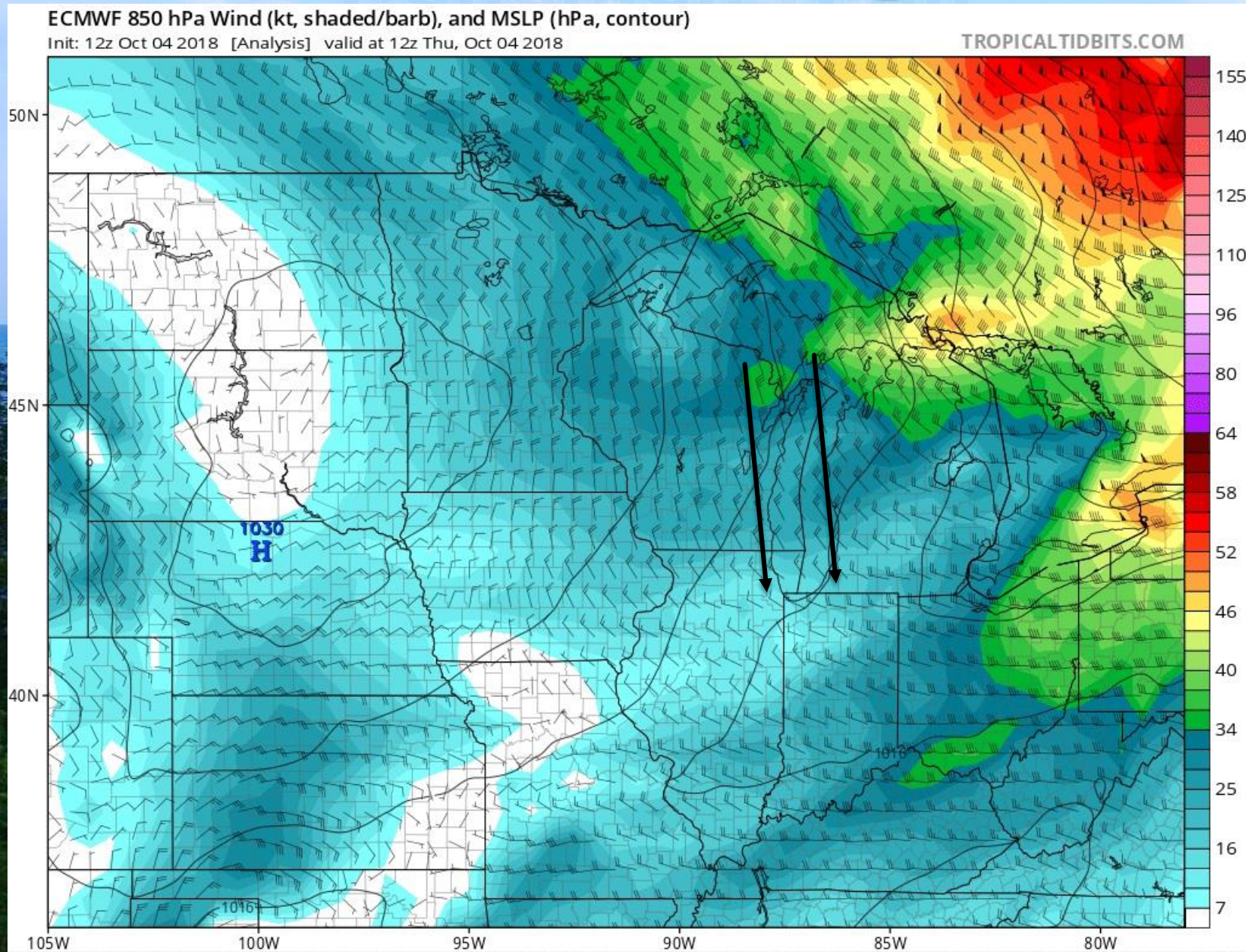
Canadian High



Canadian High



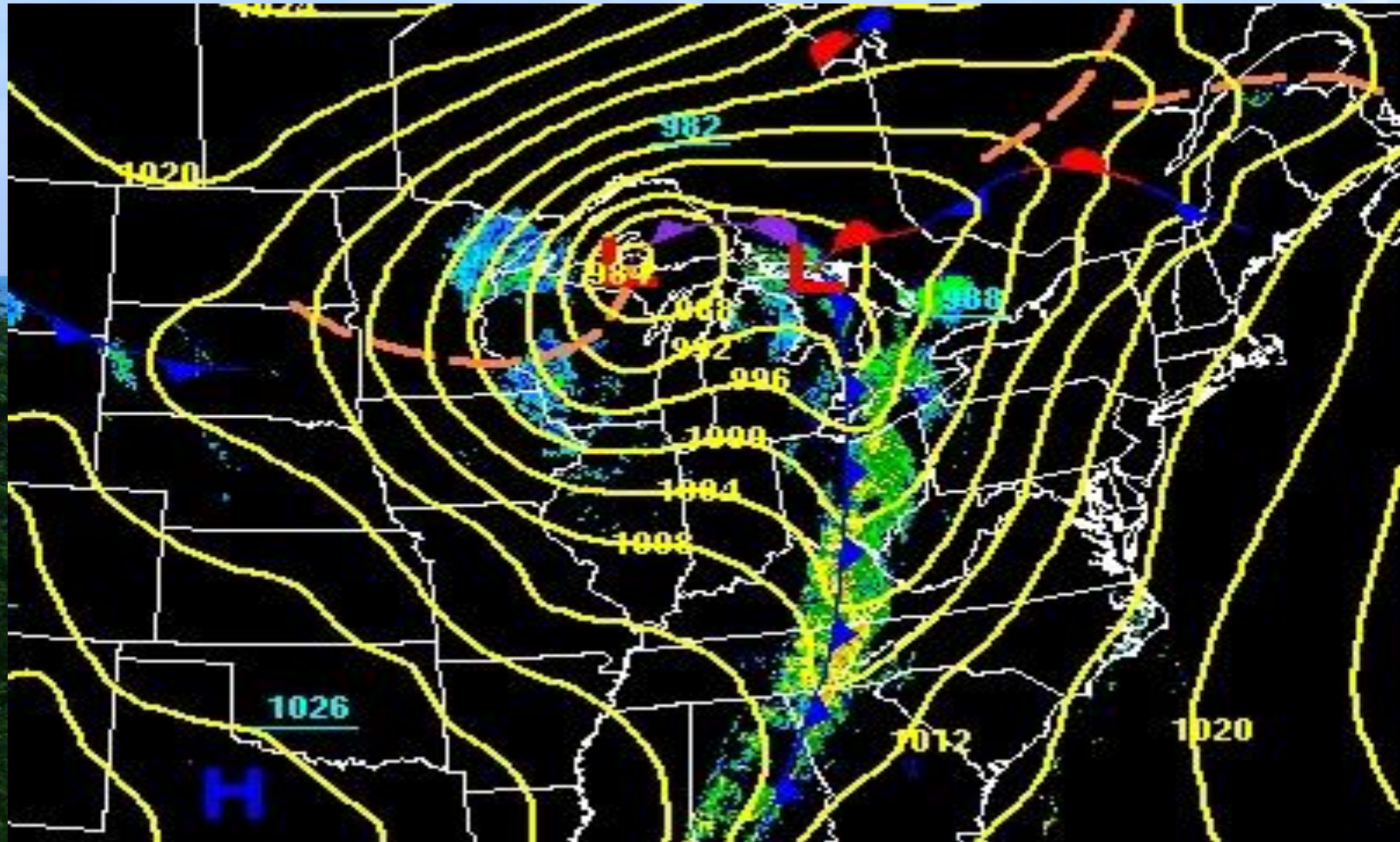
Canadian High



Great Lakes 'Bomb'



April 17th-19th Event

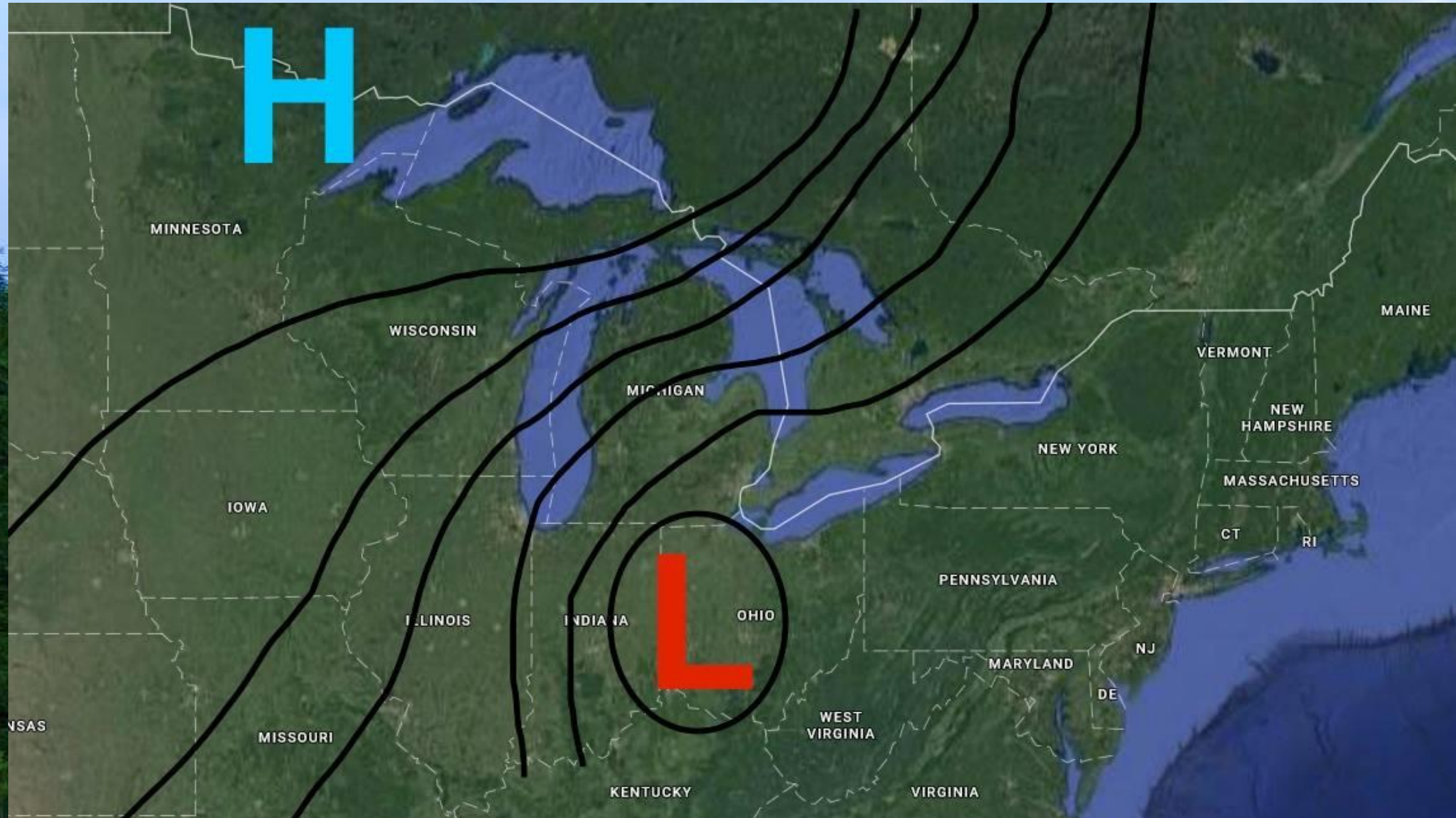


April 17th-19th Event

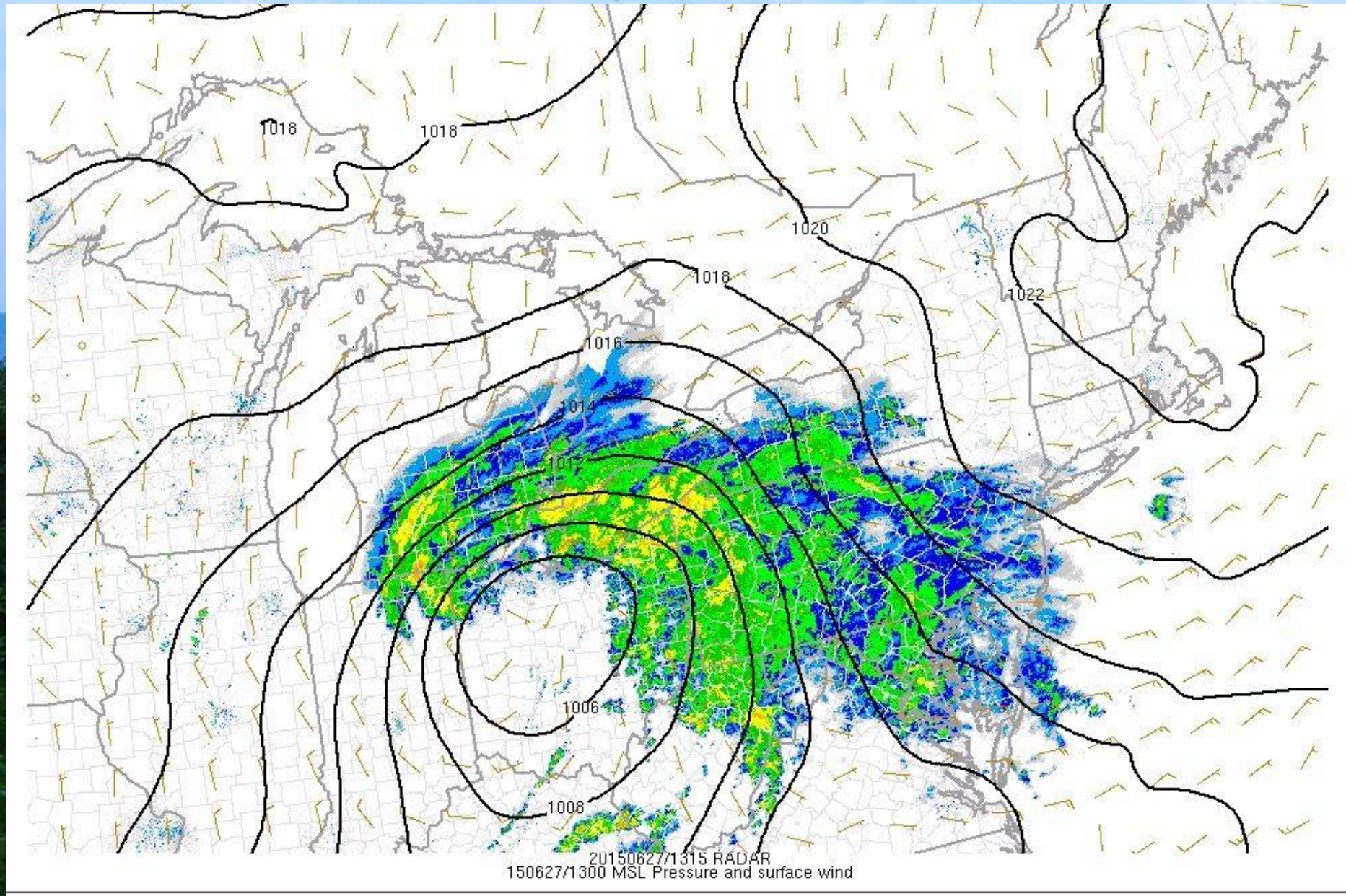
<https://www.youtube.com/watch?v=czK6hgEsifk>



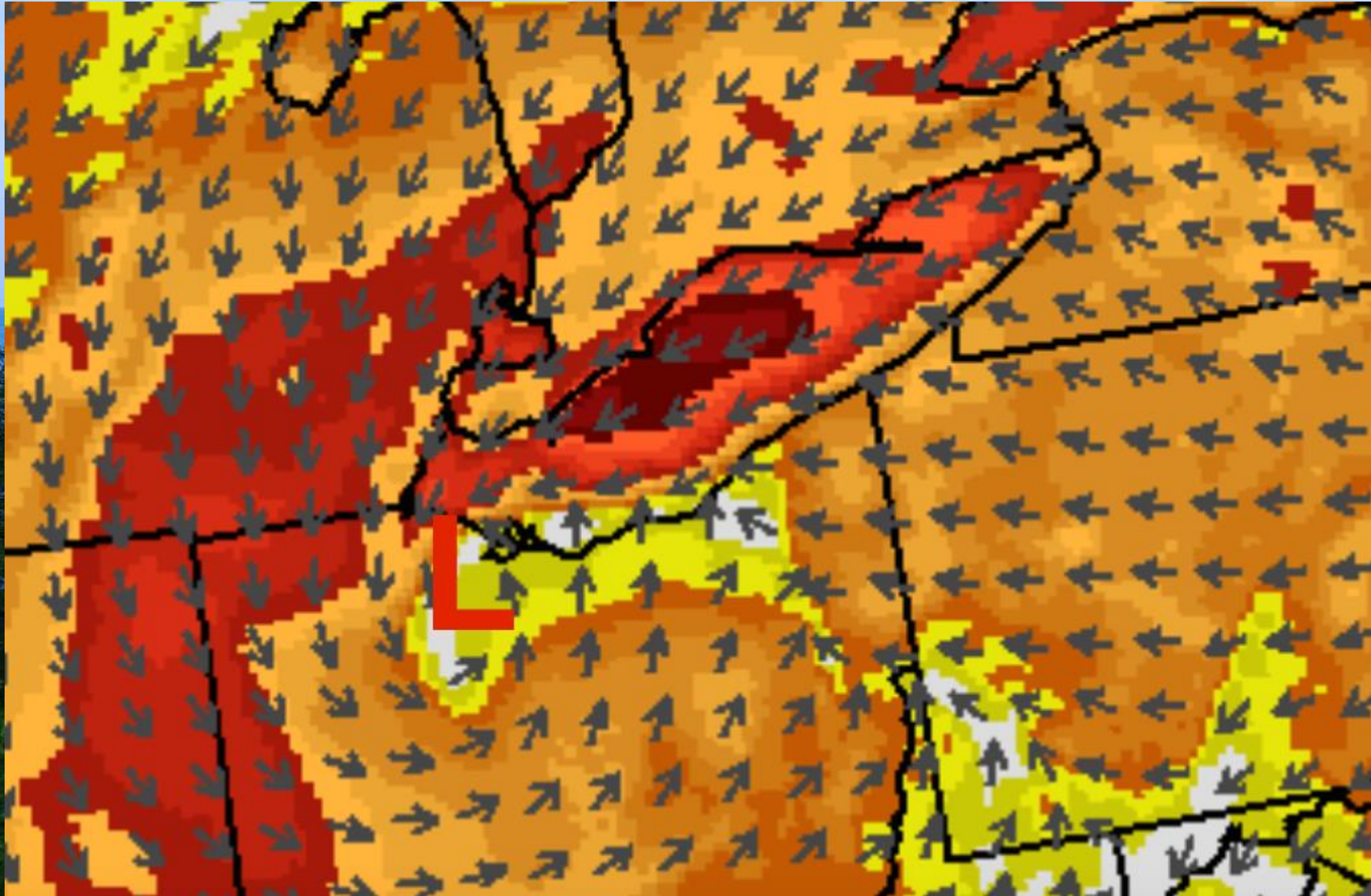
Ohio Valley Low



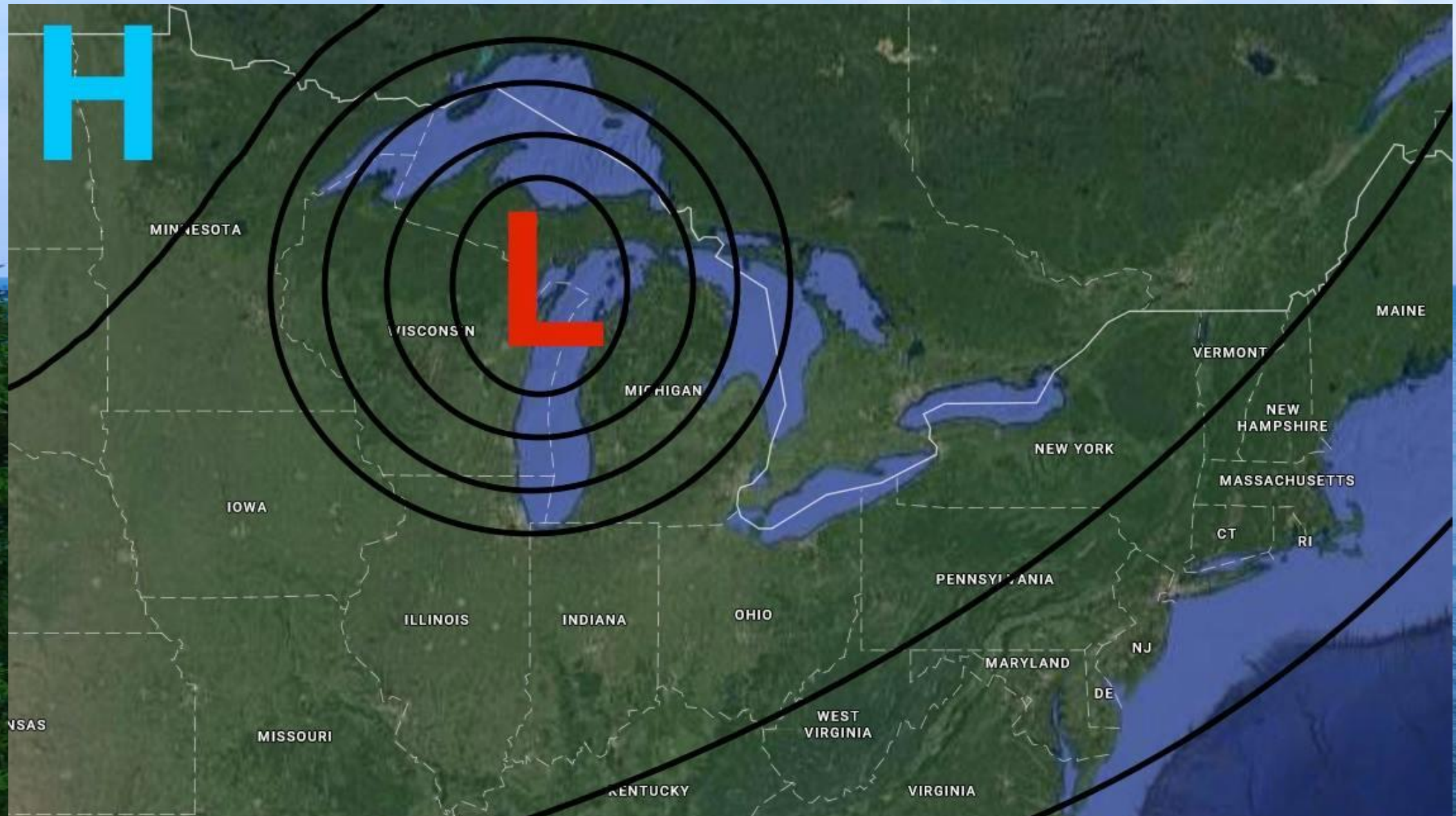
June 15th, 2015 Event



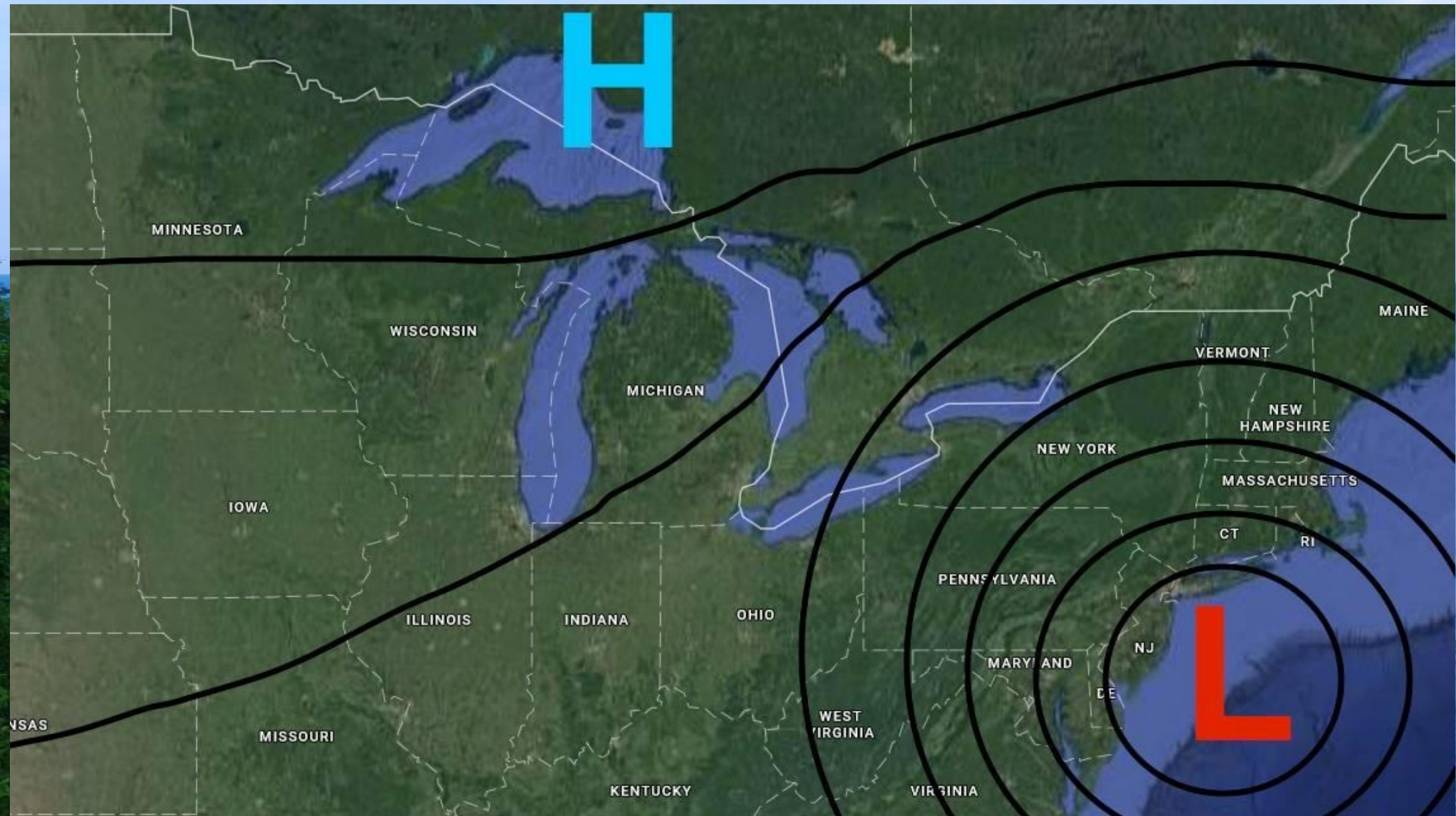
June 15th, 2015 Event



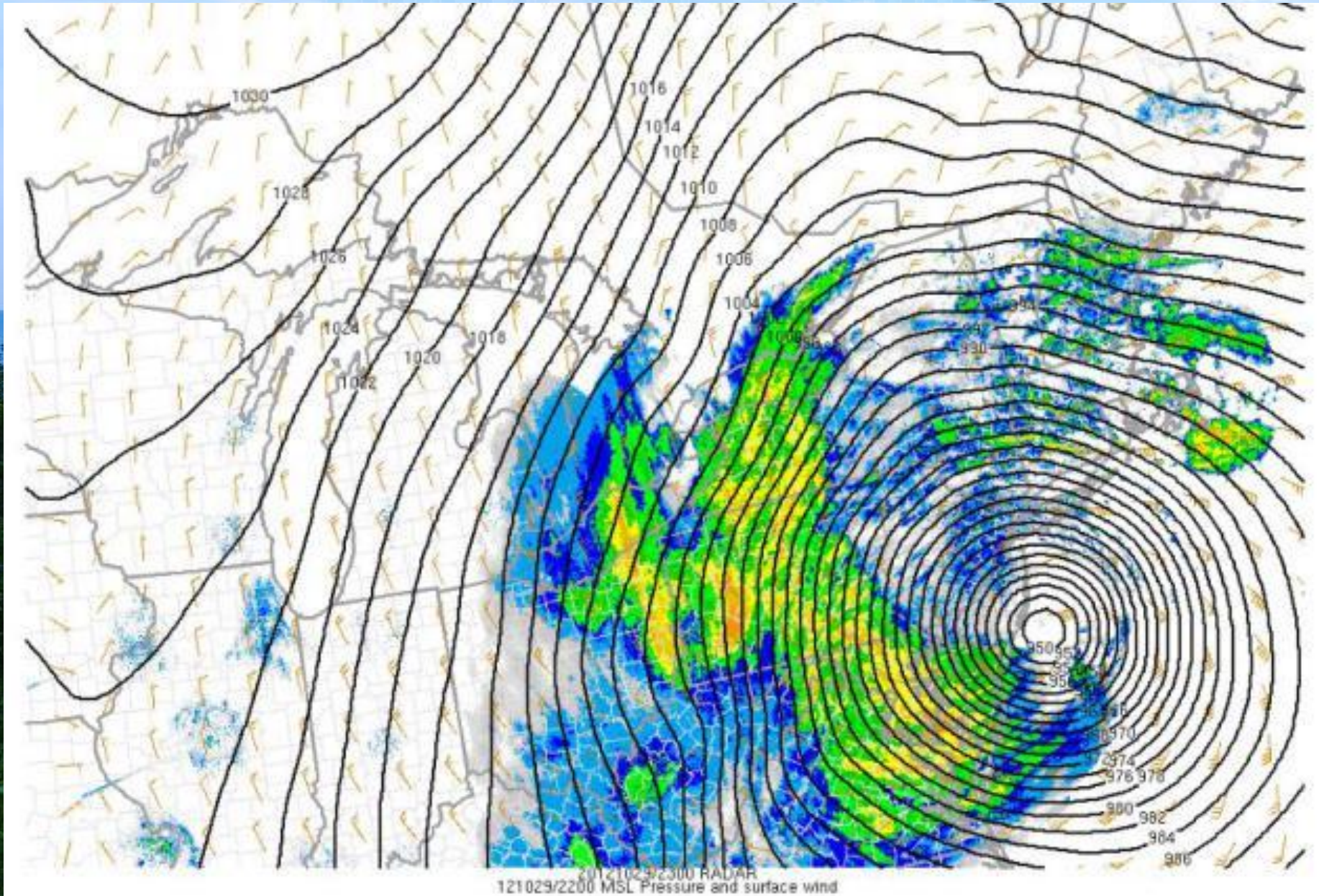
Clipper System



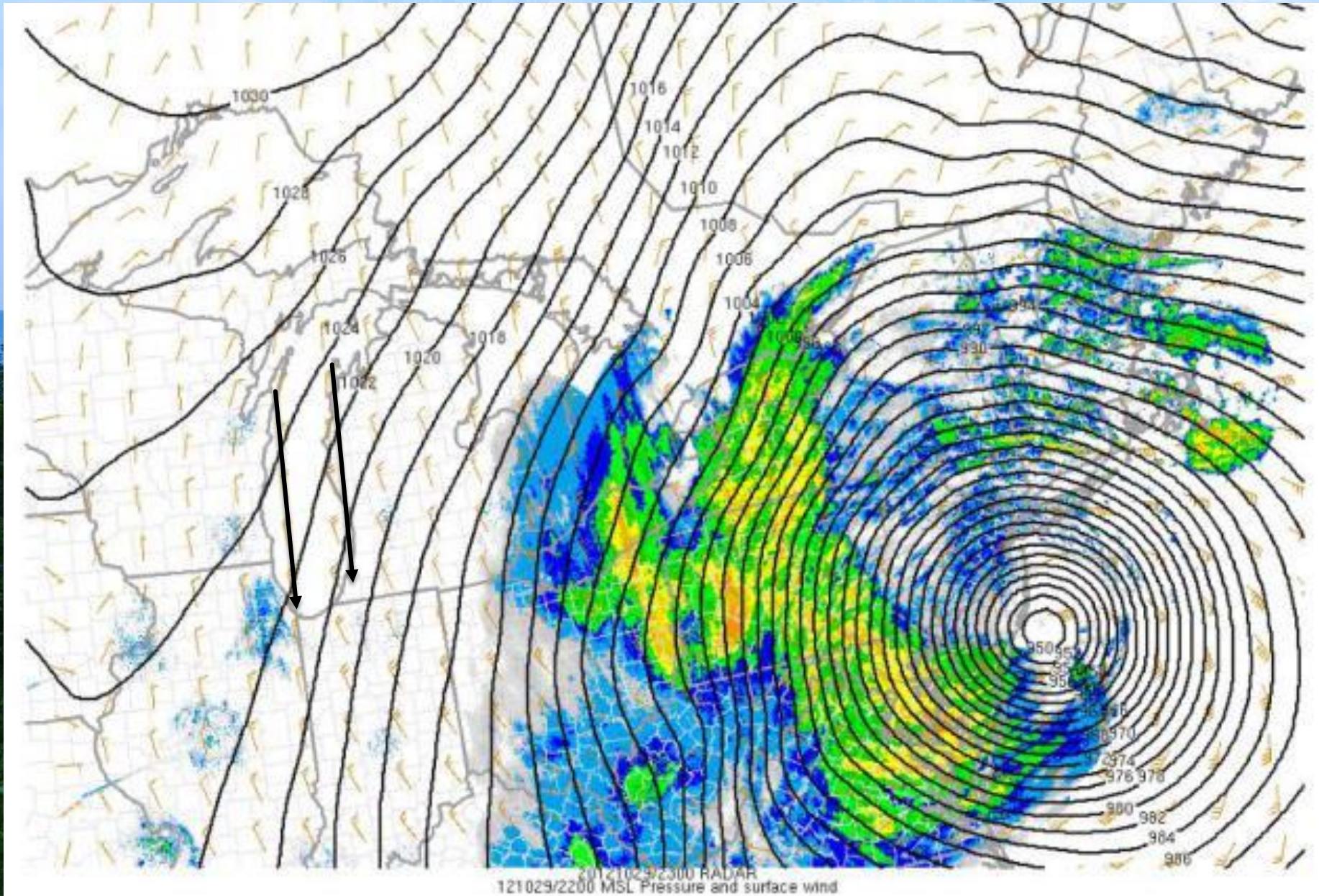
Nor'easter



Hurricane Sandy



Hurricane Sandy



Reading Buoys



ID	Location	Owner	Time (EDT)	Water (°F)	Wind (kts/°)	Waves (ft)
Lake Michigan						
45002	North Lake Michigan	NOAA-NDBC	5:30 PM	58.5	13.6 ESE	NA
45007	South Lake Michigan	NOAA-NDBC	4:50 PM	63.0	11.7 S	2.6
45013	Milwaukee Atwater Park	UW-Milwaukee	Data older than 6 hours			
45014	South Green Bay	UW-Milwaukee	6:00 PM	59.1	11.1 E	NA

Reading Buoys

Cook Nuclear Plant (45026)
5:40 PM EDT Fri, Oct 5

**COOK
NUCLEAR
PLANT**



LimnoTech

 Wind Speed	7.4 kts
 Wind Gust	9.1 kts
 Wind Direction	S (187°)
 Water Temp	63.7°F
 Wave Height	1.1 ft
 Maximum Wave Height	1.9 ft
 Wave Period	2.0 s
 Wave Direction	WSW (239°)
 Current Speed	0.45 kts
 Current Direction	S (171°)
 Air Temp	63.5°F
 Air Pressure	1014.3 mBar
 Dew Point	58.9°F
 Battery Voltage	13.1 volts

Online Resources

Weather Models: www.tropicaltidbits.com

Buoy Data: <https://www.ndbc.noaa.gov/>

Buoy Data: <https://glbuoys.glos.us/>

Wave Models:

<http://polar.ncep.noaa.gov/waves/viewer.shtml?-glwu-latest-hs-atlantic->

Wave Models: <https://www.glerl.noaa.gov/>

Wave Forecasts: <https://www.thirdcoastsurfshop.com/>