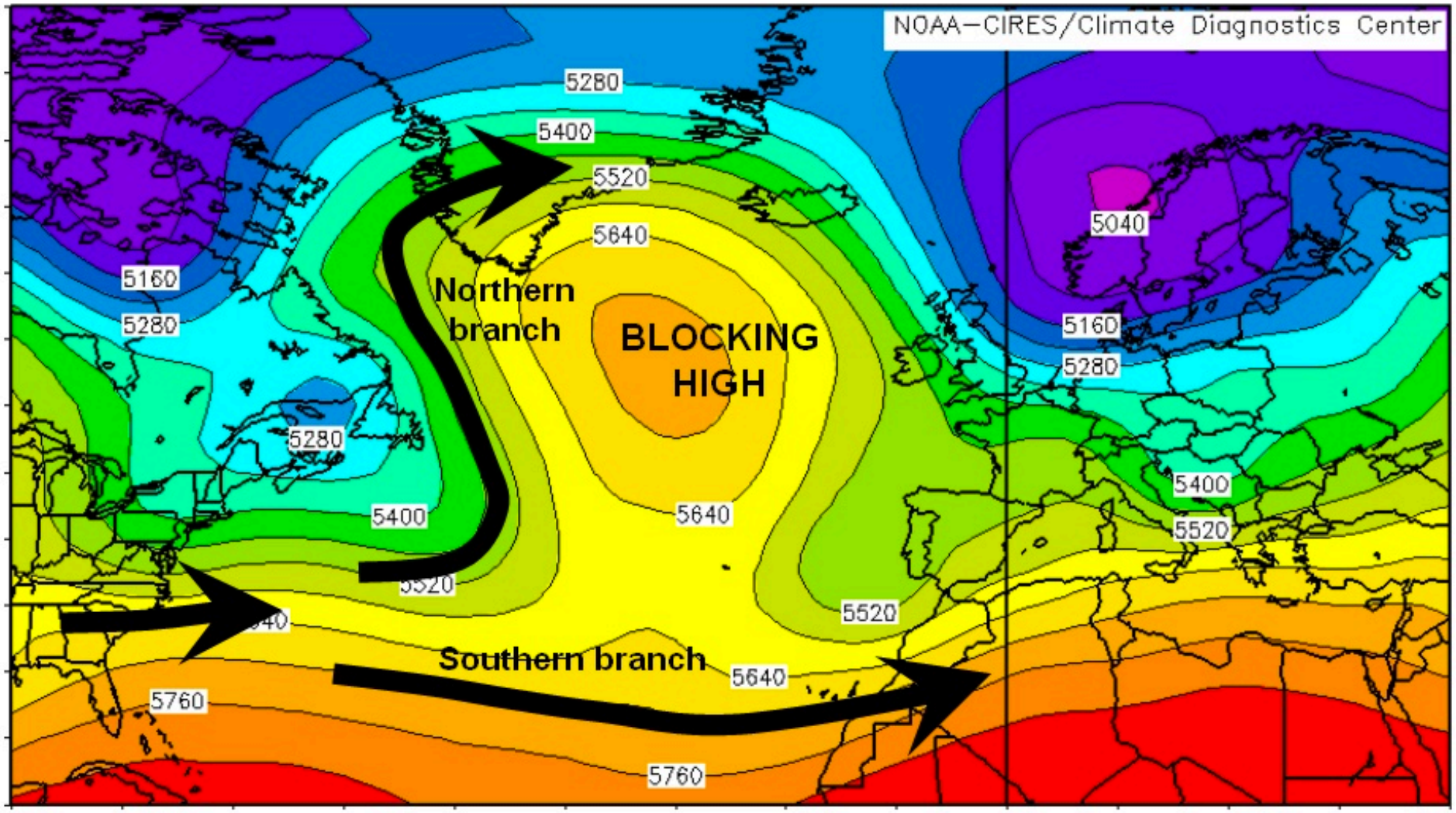
Blocks and Caps

Gary White

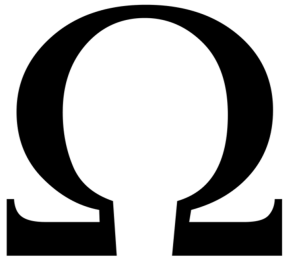


Why Do We Care?

- These Features Are Easy to Find
- Give Clues Regarding:
  - Persistent Weather (Blocks)
  - Forecasting Beyond 24-48 hours
  - Diurnal or Daily Effects (Caps)
  - Upper Air Winds and Turbulence
- Aviators Rarely Taught or Discussed These Except
  - Weather Channel
  - Area Forecast Discussion
  - International Pilots
  - Commercial Dispatchers
- Sometimes Numerical Programs Discount or Overestimate These Blocks and Caps

Blocks

- Two Common Mid Latitude Types
  - Omega
  - Rex

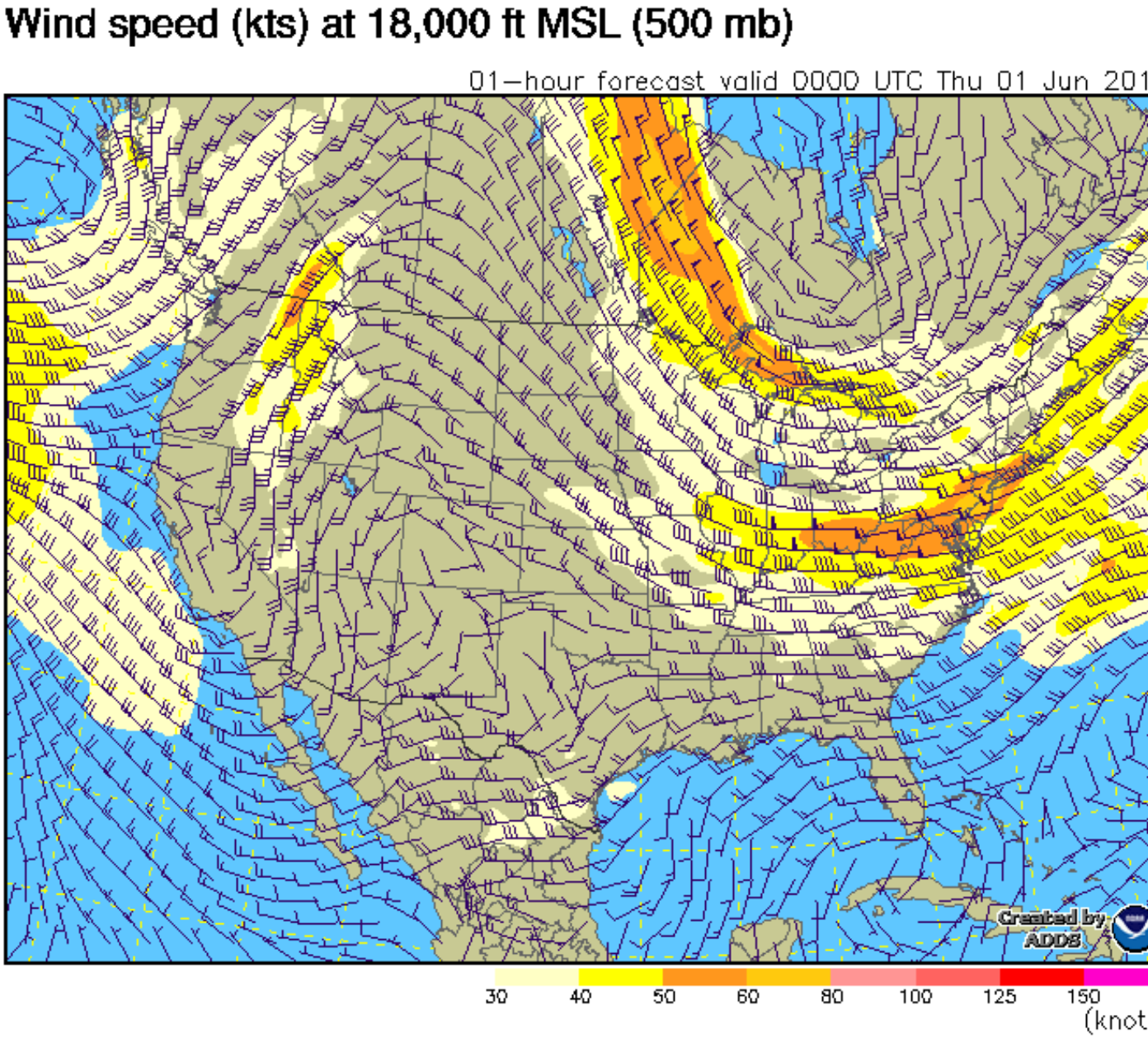


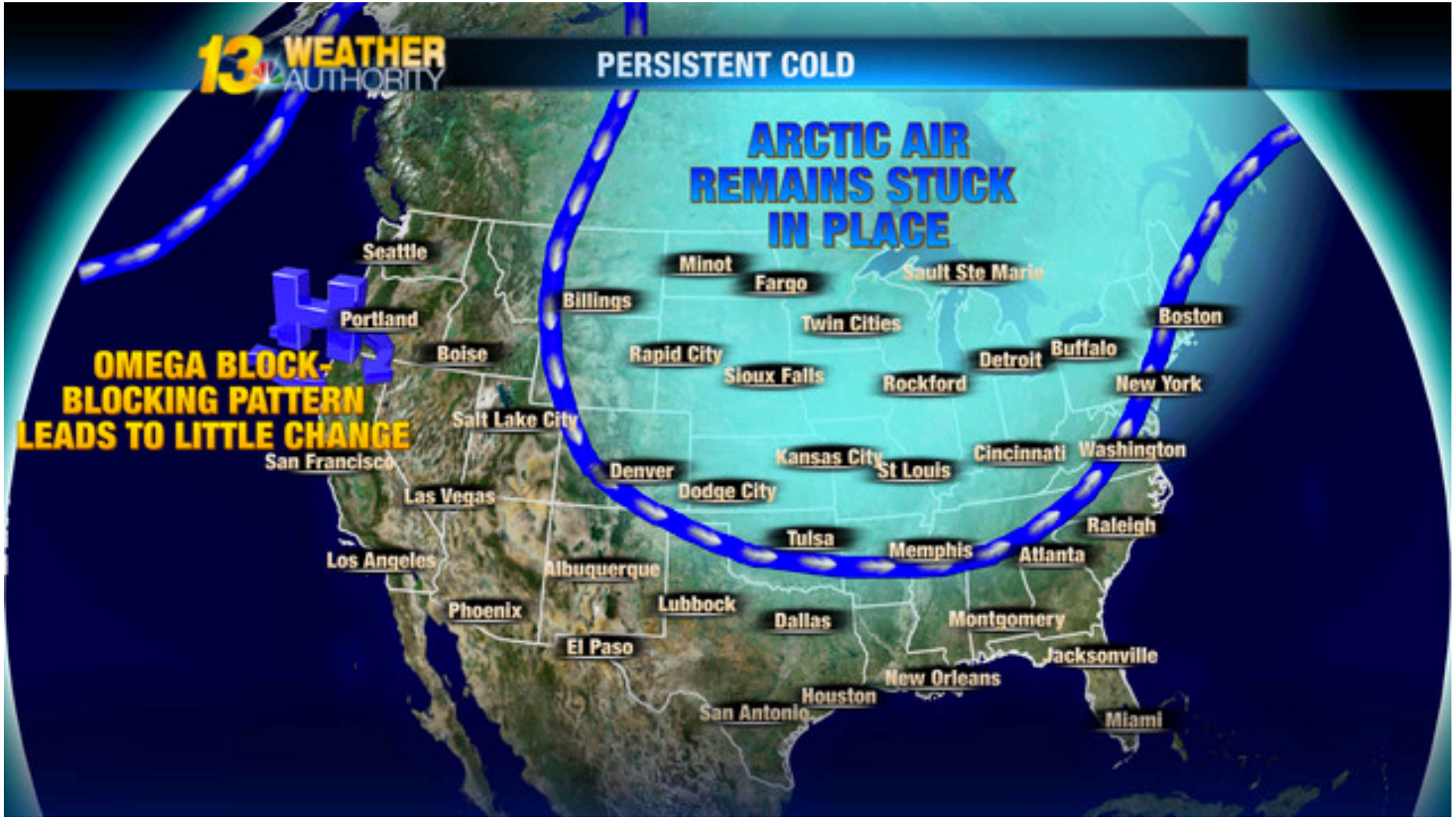
- Omega Block Forms a Greek Letter Omega
- The Rex Block was Discovered/Analyzed in 1950
  - Named After Commander Daniel Rex, USN

Omega Block

- Two Lows With High Between
- Typically Cut-Off Lows and High

- Stagnate High Pressure Ridge
- Found Easily on 500mb
- Prevents or Resists West to East Movement at Lower Layers
- **Results in Persistent Weather Lasting Several Days**

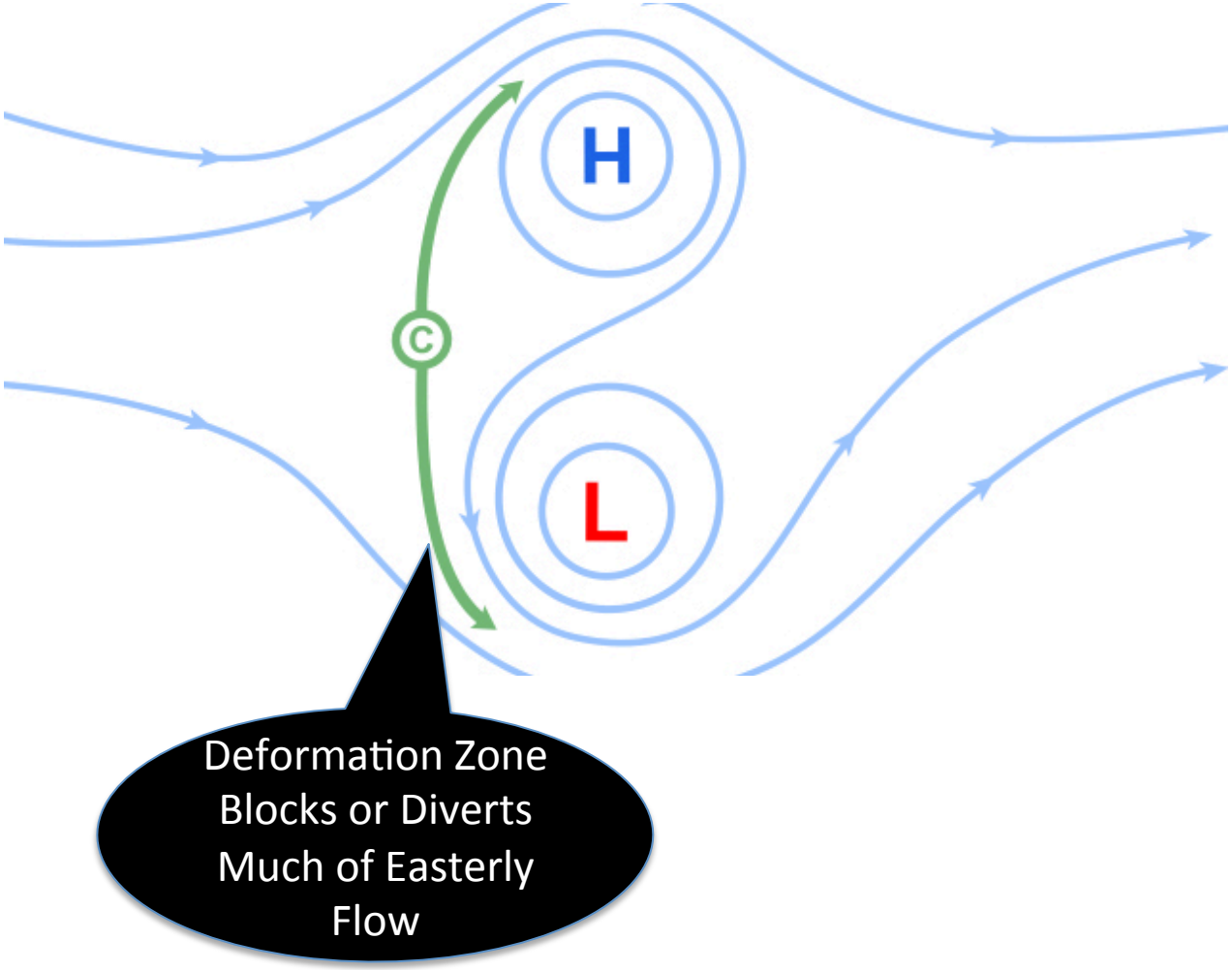


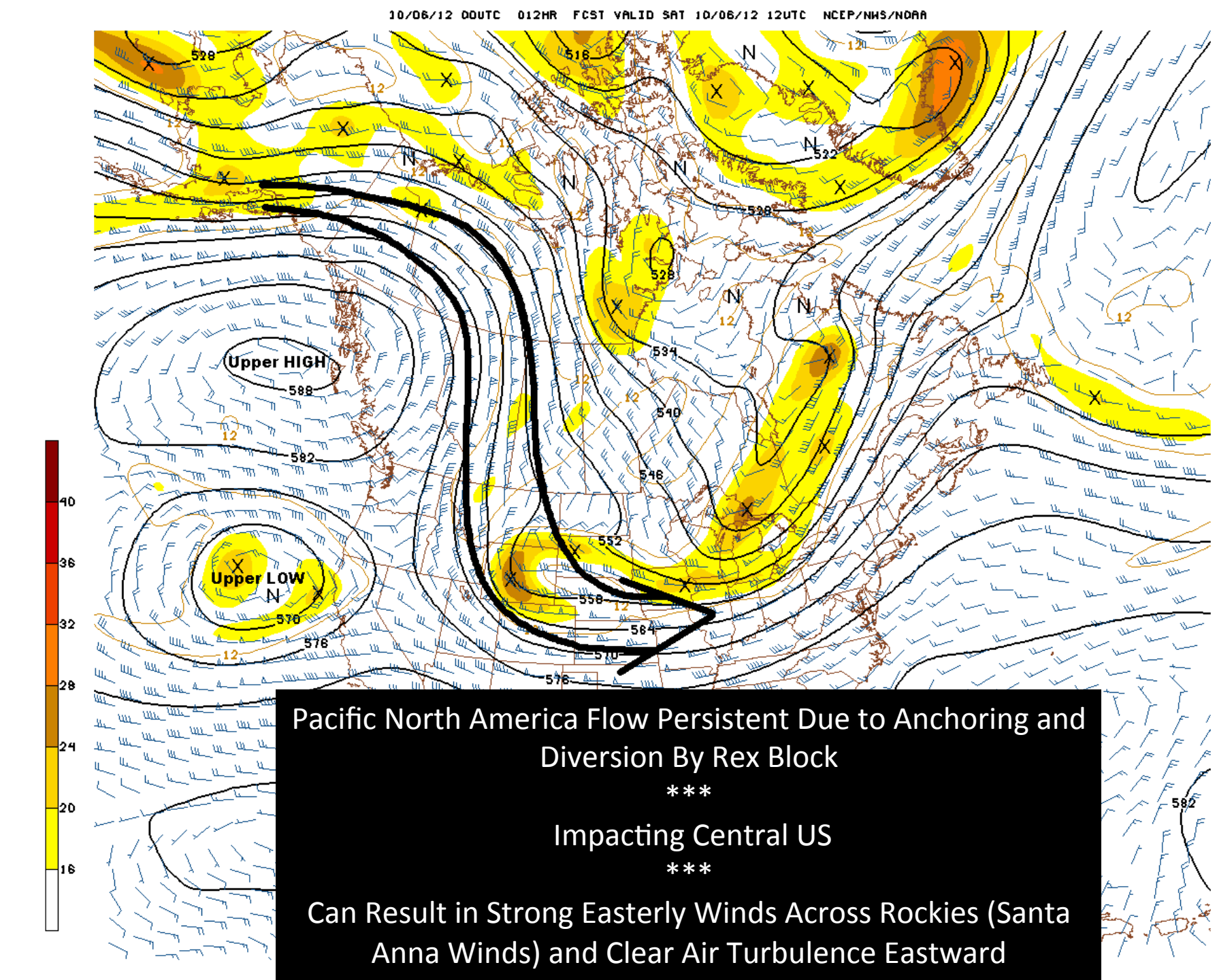

13 WEATHER AUTHORITY
PERSISTENT COLD
ARCTIC AIR REMAINS STUCK IN PLACE
OMEGA BLOCK- BLOCKING PATTERN LEADS TO LITTLE CHANGE
Seattle
Portland
Boise
Salt Lake City
San Francisco
Las Vegas
Los Angeles
Albuquerque
Phoenix
El Paso
Lubbock
Dallas
San Antonio
Houston
New Orleans
Montgomery
Jacksonville
Miami
Atlanta
Raleigh
Memphis
Tulsa
Kansas City
St Louis
Denver
Dodge City
Billings
Minot
Fargo
Sault Ste Marie
Twin Cities
Rapid City
Sioux Falls
Rockford
Detroit
Buffalo
Boston
New York
Cincinnati
Washington

Rex Block

Rex Block

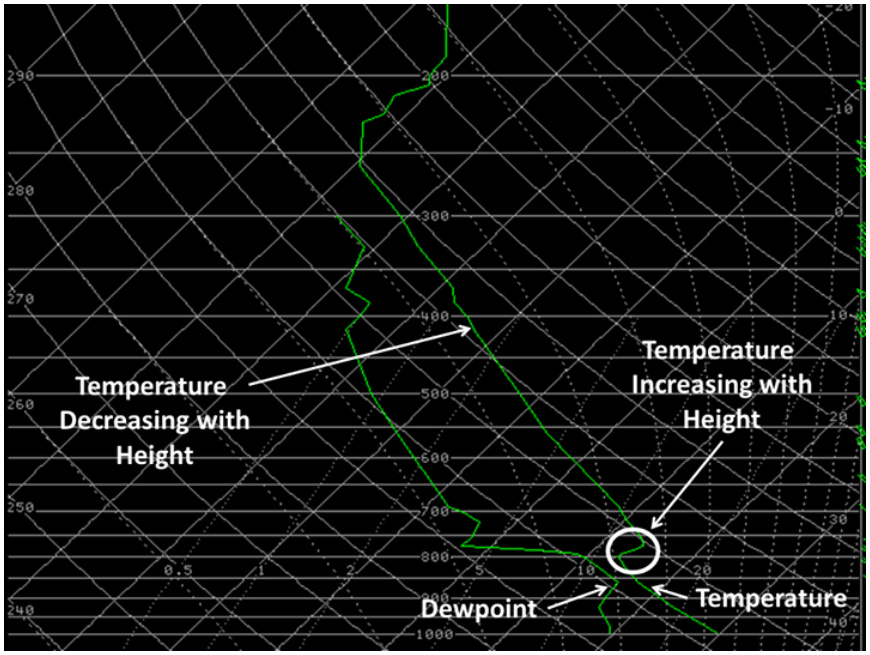
- High Above Low
- Blocks Jet Stream
- Mostly North and South Movement
- Systems Eastward See Little Movement
- Common on West Coast
- Best Analyzed on 700-400 mb Constant Pressure Charts
- Common West of CA




10/06/12 00UTC 012HR FCST VALID SAT 10/06/12 12UTC NCEP/NWS/NOAA
Upper HIGH
Upper LOW
Pacific North America Flow Persistent Due to Anchoring and Diversion By Rex Block
***
Impacting Central US
***
Can Result in Strong Easterly Winds Across Rockies (Santa Anna Winds) and Clear Air Turbulence Eastward

Caps

- Generally Two Types
  - Upper Layer Inversion
  - Stable Atmosphere
- Diagram at Right
  - Inversion Layer at 065
  - Resists Lifting
  - Note Absence of Moisture Above Inversion

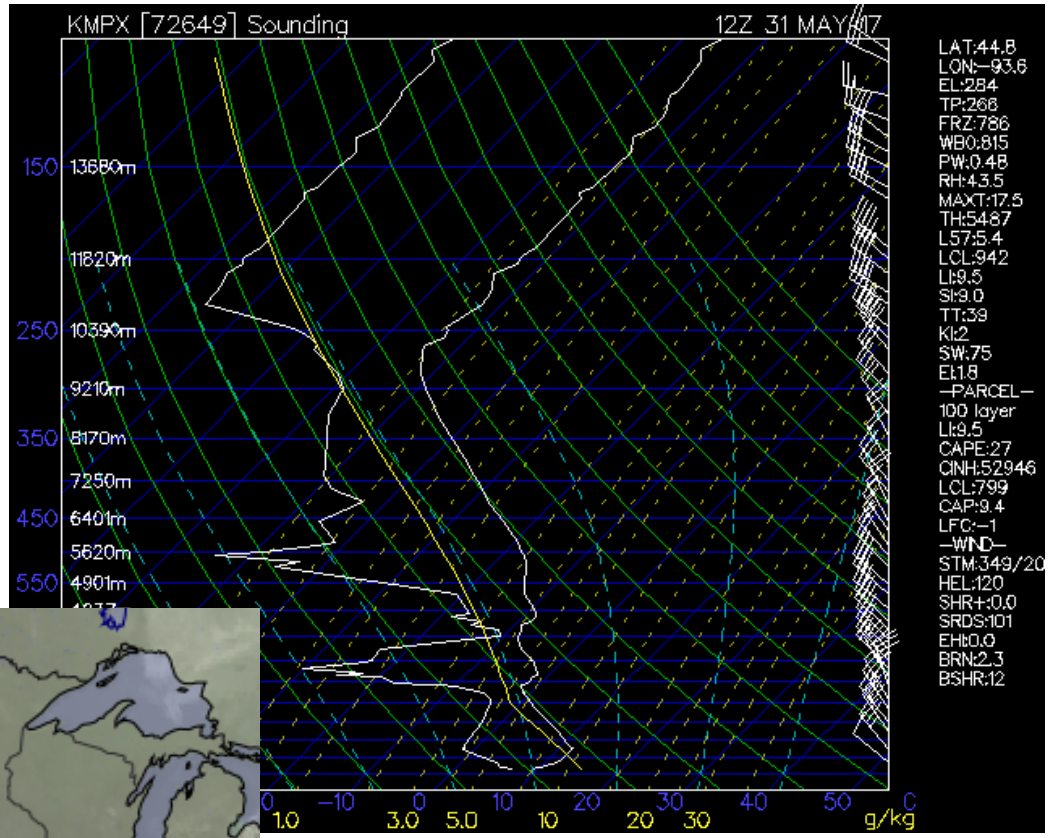


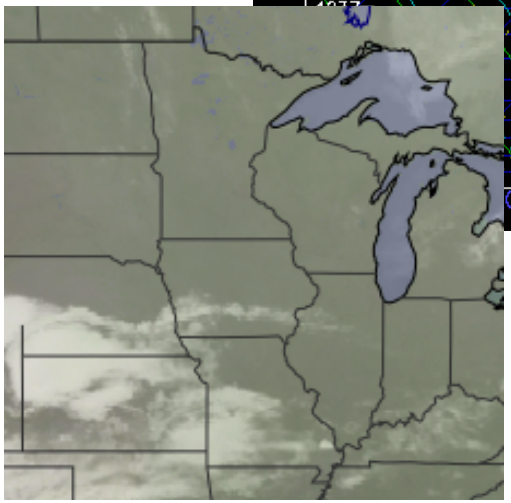
Inversion Caps

- Dry Usually Stable Air Above Inversion
- Under High Pressure or Ridge
  - Subsiding or Downward and Outward Motion of Air
- Caps Can Be Broken
  - Diurnal Heating and Lifting, or
  - Latent Heat (As Clouds Form), or
  - Advection, or
  - Orographic, or
  - Converging Low Pressure, or
  - Upper Level Trough, or
  - A Combination of Above

Stable Caps

- Very Stable Atmosphere at KMPX
- Some Inversions Add to Resistance of Lifting
- Little Moisture In Lower and Middle Altitudes
- Very Warm Upper Atmosphere – See IR Satellite View





Blocks and Caps Summary

- Stable Atmospheric Caps Can Be Broken Similar to Inversion Caps
- Both Cap Types Impede or Retard Convection Process
- Used With Analysis of Blocks and Other Analysis Can Offer Insight Into
  - Degree of Activity
  - Diurnal Timing
- Blocks Usually Last Several Days Resulting in Persistent WX Under High and Easterly Low