Which Months do New Yorkers Need an Umbrella in the City?

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Project Objective

- Examine the annual cycle of precipitation and precipitation extremes in the greater region of NYC
  - Average and extreme rain rates
  - Relationship between temperature and precipitation

- Learn some coding techniques
- Understand atmospheric physics and statistics

Methodology

- Write computer code using **MATLAB** to analyze precipitation data
  - Create climatology of precipitation values

- Weather station data and satellite data will be used to examine precipitation and its variability over the course of the year
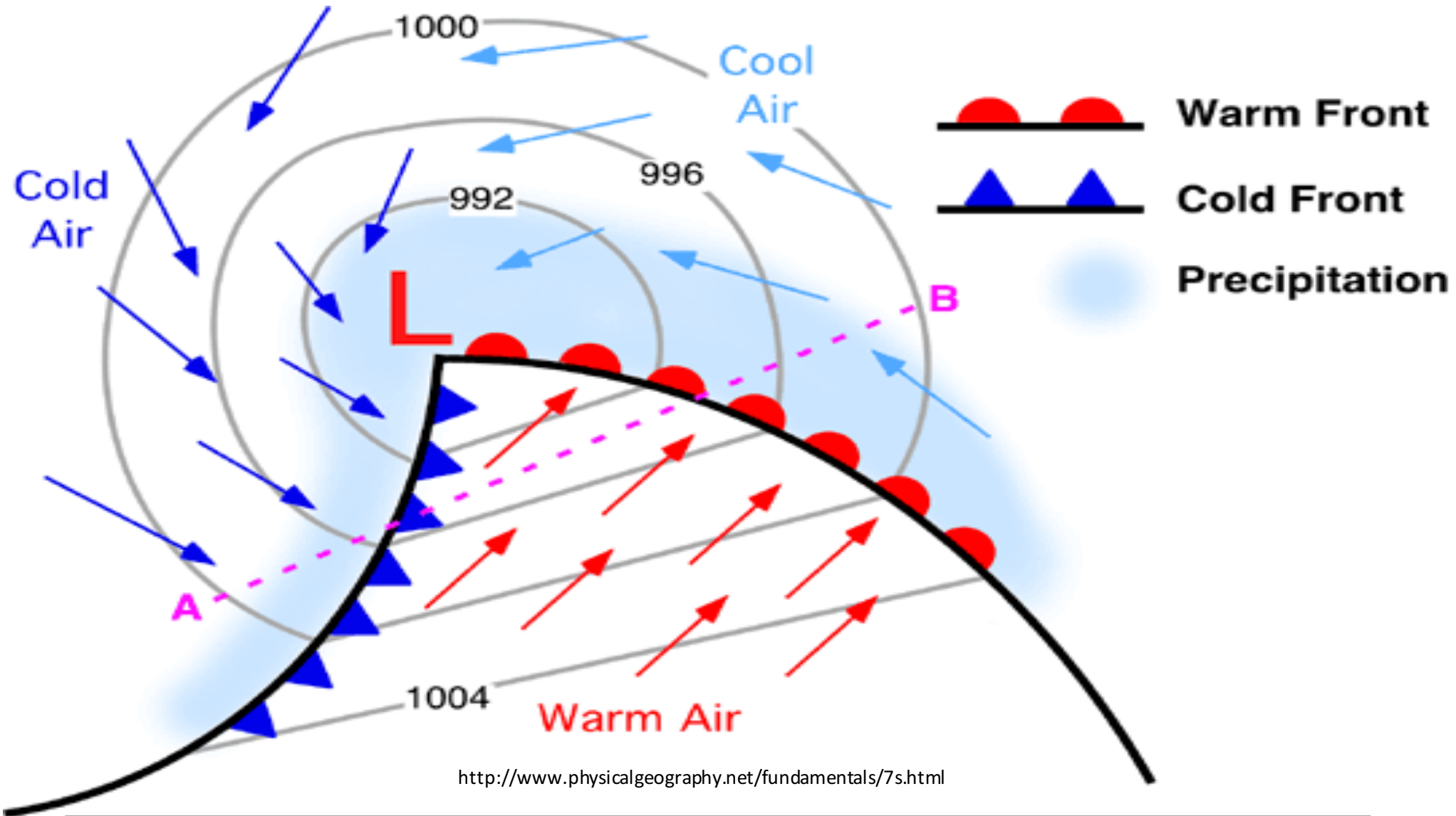
Storm Types

- Precipitation structure and intensity varies based on type of storm, time of year, etc…

- Three main types:
  - Hurricanes
  - Extratropical cyclones
 - Quasi-linear convective systems

HURRICANES

http://www.nasa.gov/mission_pages/hurricanes/archives/2011/h2011_Irene.html
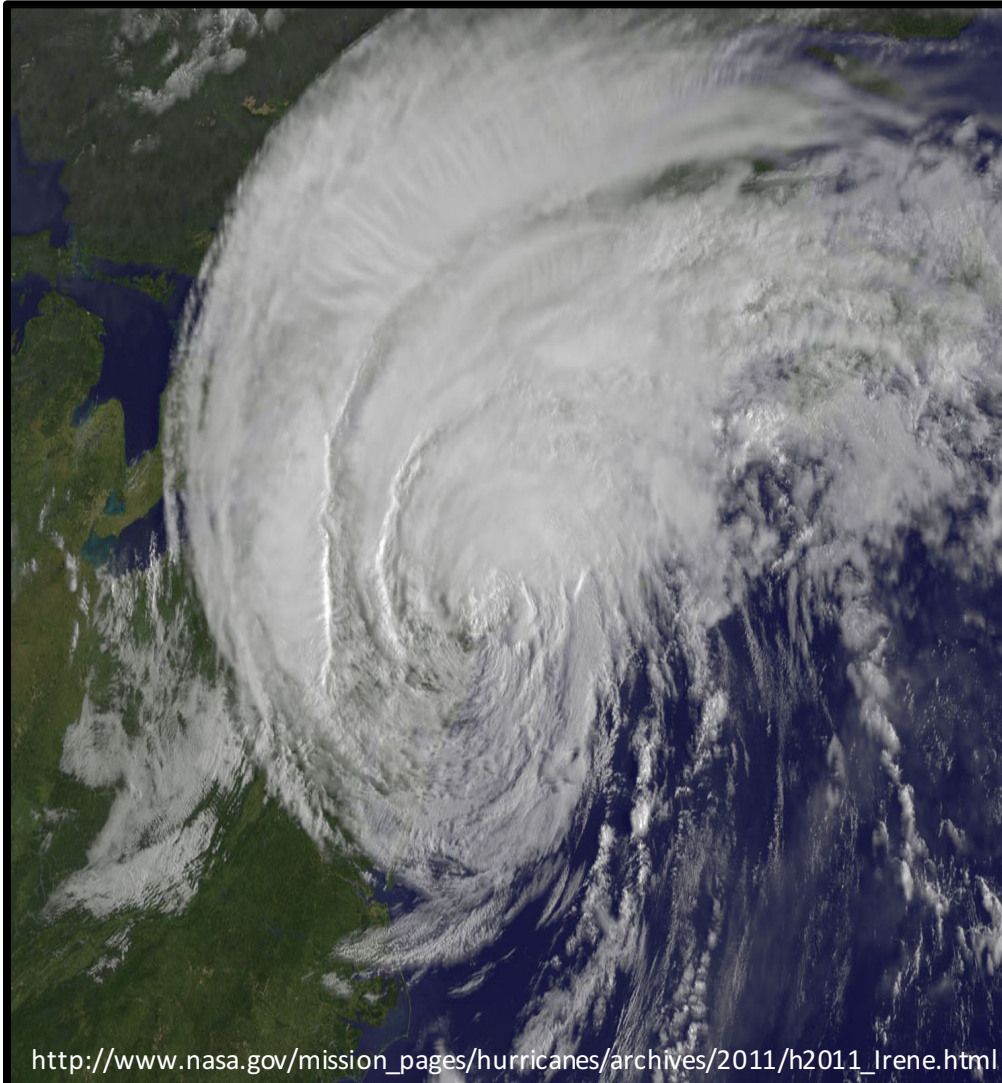
What generates the precipitation: **convection** (vertical transport of heat and moisture)

EXTRATROPICAL CYCLONES

1000
Cool
Air
Cold
Air
996
992
L
B
A
1004
Warm Air

Warm Front
Cold Front
Precipitation

http://www.physicalgeography.net/fundamentals/7s.html

What generates the precipitation: **equator to poleward temperature difference**
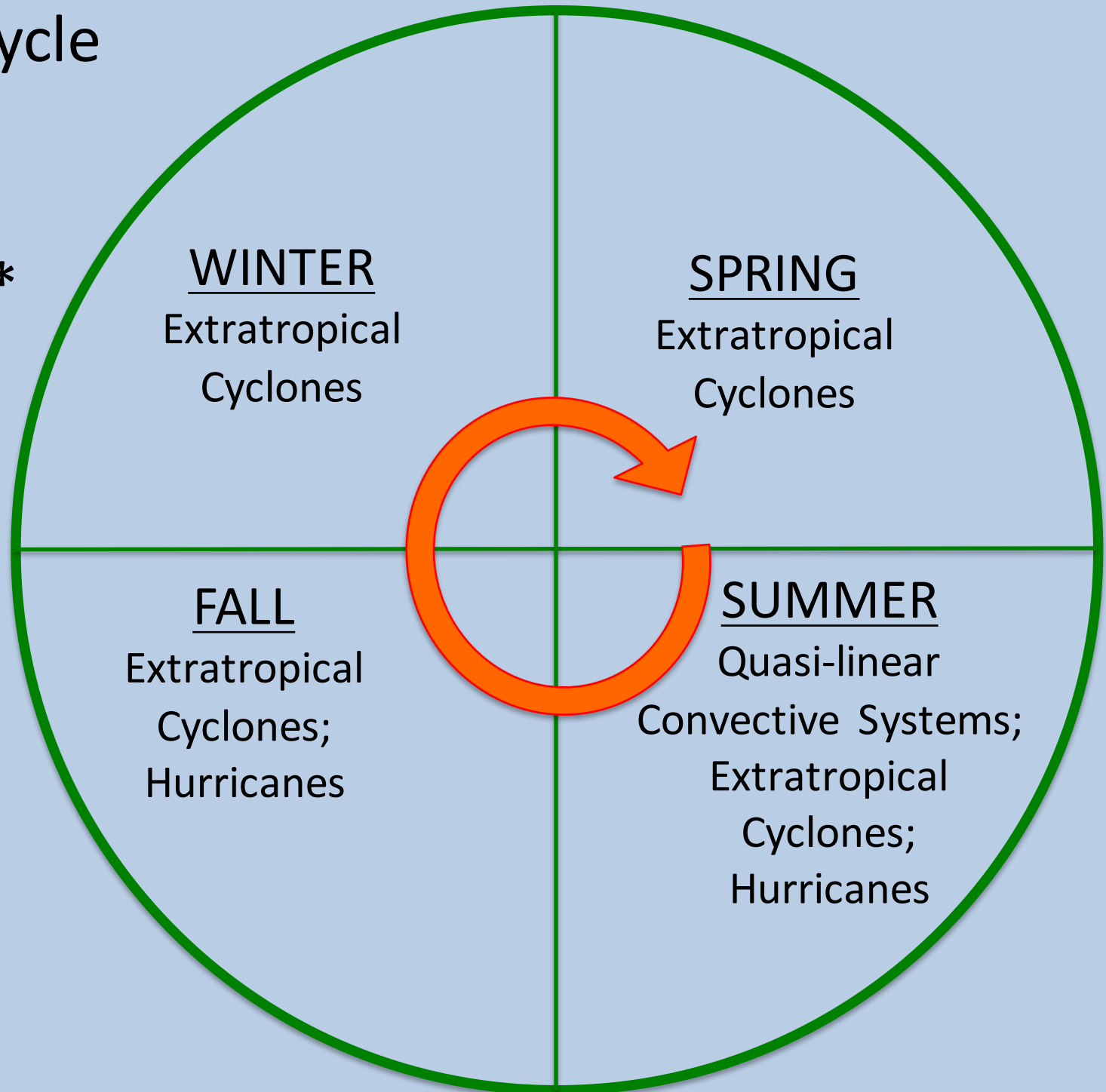
QUASI-LINEAR CONVECTIVE SYSTEMS

020723/1600 WSI NOWRAD 2 KM US MOSAIC
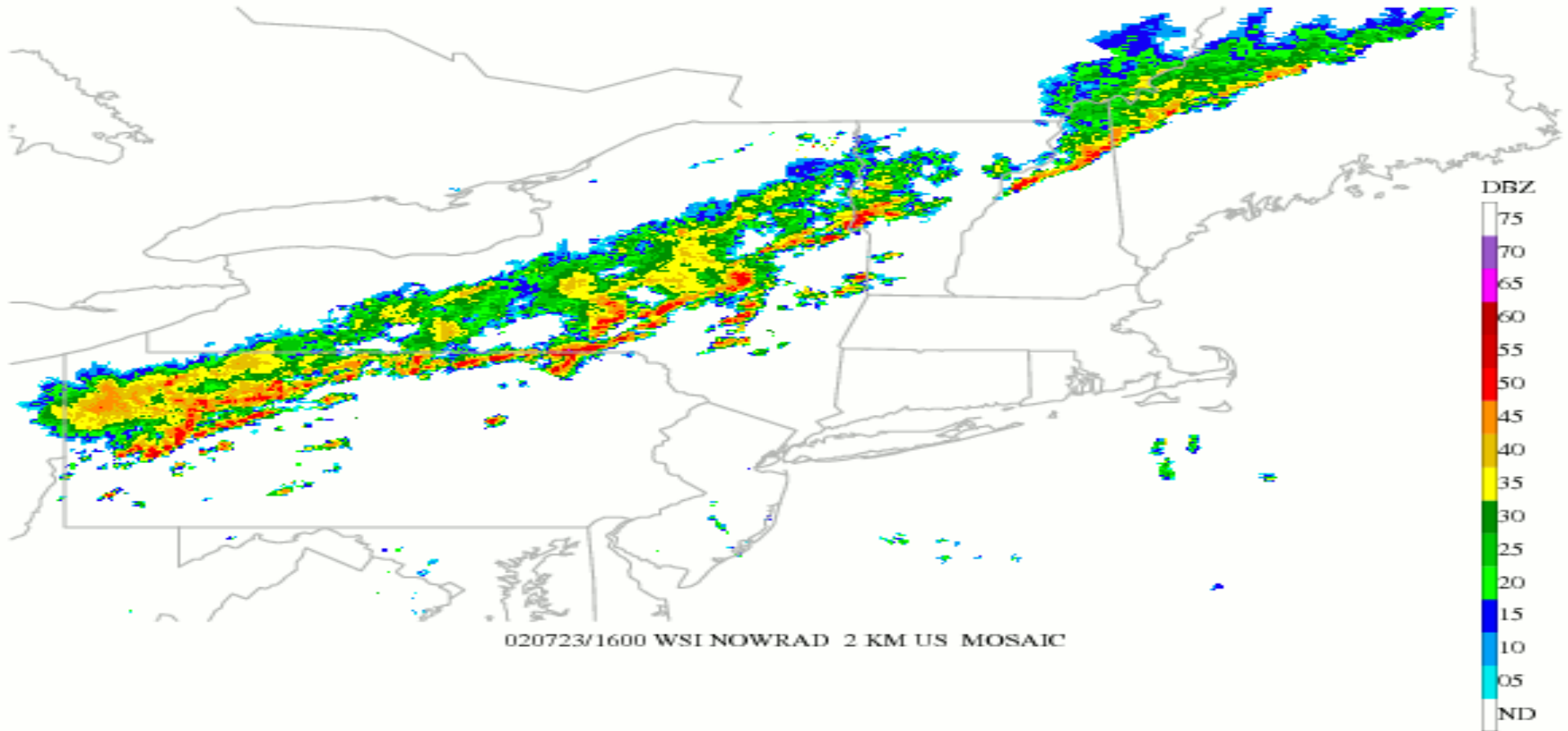
Source: Nexrad Mosaic Radar Data. courtesy
Kelly Lombardo, University of Connecticut

What generates the precipitation: **convection** (vertical transport of heat and moisture)

The Annual Cycle
for NYC
Weather
Disturbances*

WINTER
Extratropical
Cyclones

SPRING
Extratropical
Cyclones

FALL
Extratropical
Cyclones;
Hurricanes

SUMMER
Quasi-linear
Convective Systems;
Extratropical
Cyclones;
Hurricanes

*not including
heat waves