Climates of NYS

Prof. Anthony Grande

Definitions

Weather and Climate

- Weather the state of the atmosphere at one point in time. The elements of weather are temperature, air pressure, wind and moisture.
- Climate the average of all weather over a very long period (<50 yrs.) of time.

2

Climate Regions of NYS Label Sales Sales

Characteristics of NYS's Climates

- 1. Humid Continental climate with the exception of the SE portion (NYC and LI) where it is Humid Subtropical.
- 2. Generally cool to hot summers and warm to very cold winters.
- 3. Regional temperature and precipitation is influenced by relative location.
- 4. No dry season; snow in winter.
- 5. Predominant wind direction is from the **West**.
- Greatest storm hazard is heavy snow; thunderstorms in summer. Hurricanes and tornados are rare.
- 7. Microclimates develop in valleys and urban areas.

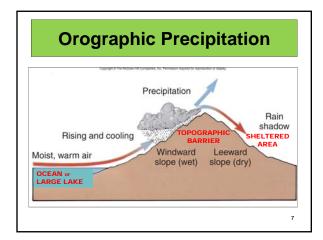
.

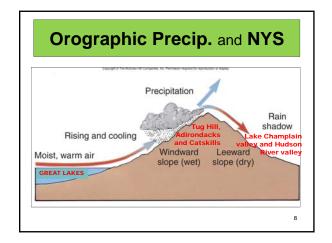
Climate Controls

The development of a climate is influenced by the following factors:

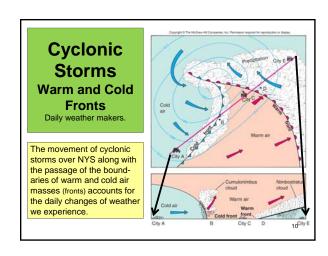
Latitude – amount of solar energy received
Surface (land or water) – heat exchange
Ocean Currents – temperature; flow direction
Wind – direction; characteristics
Topographic Barriers – orientation; height
Elevation – lapse rate (1°F for each 300 ft change in elevation)
Air Masses – source region; characteristics

5





Air Mass Source Regions and their Characteristics



Microclimates

- Microclimates develop locally due to changes in an area's physical characteristics.
- Rural areas local conditions change as an area goes from forest to large farmstead to suburb
- Urban areas artificial conditions
 - Concrete and asphalt surfaces (warmer)
 - Limited soil and vegetation (less humid)
 - Tall buildings (shadows and wind channels)
- Temperature inversions
 - Frequently occurs in valleys (esp. the N-S valleys)
 - Warm air rises until it meets air of equal temperature
 - Warm air "cap" prevents the exchange of air and keeps the air (along with any pollutants) within the valley

CORNELL



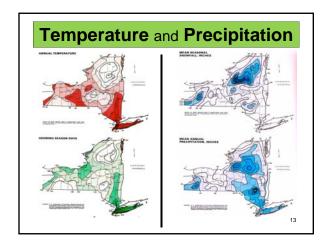


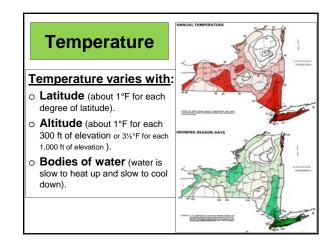
The Office of the NYS Climatologist is based in the Dept. of Earth and Atmospheric Sciences at Cornell University.

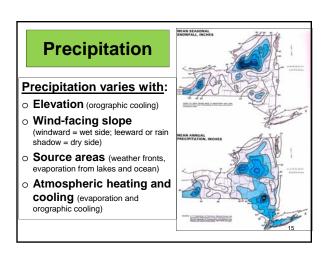
It partners with the National Climatic Data Center (NCDC) and the National Weather Service (NWS) at NOAA.

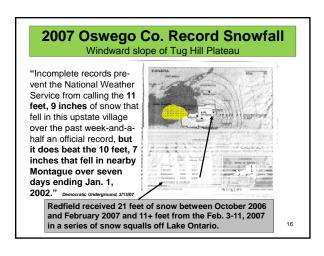
Web address: http://nysc.eas.cornell.edu/

12

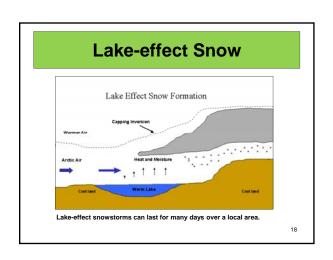


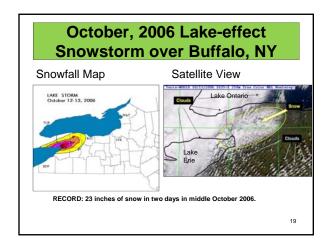












Global Warming and NYS

- As the earth warms, its equivalent earth position will move toward the equator.
- "Southern" flora and fauna will move into NYS. (NYS biomes will exist in southern Canada.)
- Winter storms will increase in number and intensity.
- The number of annual snow storms will increase.



20

Global Warming (cont'd)

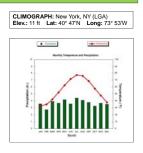
- As sea level rises, areas of SE NYS and the Hudson valley north to Albany will be under water.
- Coastal areas of Long Island and Staten Island will see greater erosion from waves.
- Warm-climate diseases will spread into NYS, especially if winter temperatures do not drop below freezing for extended periods.

21

Climograph

A climograph is a visual representation of the monthly temperature and precipitation characteristics of a climate.

Exercise 7 looks at climate data. It is ready for download.



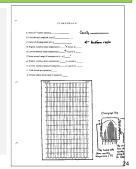
22

Climate Data for Addison in Steuben County 1: hymer of former in the design of the Claim of Steep Ste

Creating a Climograph

Exercise 7

- Fill in the data for each station you selected within your counties.
- Use the numbers in the MEAN column to construct your climate graph.
- Dots and lines show temperature. Bars show precipitation.





Air Quality Issues

- Air quality is relevant to issues of human and environmental health.
- Sources of air pollution originate within and outside NYS.
- Air pollution includes:
 - gaseous emissions: CO2, NO2, ozone, methane
 - particulates: dust, soot (urban, agriculture, mining)
 - acid precipitation: sulfur dioxide + moisture = sulfuric acid

26

Acid Precipitation

- The average pH of precipitation (rain, snow and fog) in NYS ranges from 4 to 4.5 (pH scale of 0-14 with 7 being neutral). This is about 30x more acidic than normal (5.5).
- Acid rain affects aquatic species (alters lake habitats, reproductive cycles); forests (changes ecosystems), and increases corrosion of metals and carbonate-based building stone
- Dry particulates reduce visibility (create haze).

27

Acid Precipitation Diagram O3 Oxidation H₂SO₄ HHNO₃ H⁺ + NO₄ NH₃ + H⁺ = NH₄ Wet Deposition of Gases, Particles and Aerosols Wet Deposition of Dissolved Acids

Cause of Acid Precipitation in NYS Cause of Acid Precipitation In NYS Cause of National Displace and Companies on the Pressure of the Management of the Ma

NYS Division of Air Resources

- The DEC monitors air quality in its nine regions.
- With US EPA it regulates the emission of pollutants.
- This includes urban areas, agricultural practices, manufacturing, and mining activities.
- · Issues an Air Quality Report annually.
- Exercise 8 (extra credit) explores air quality.

30