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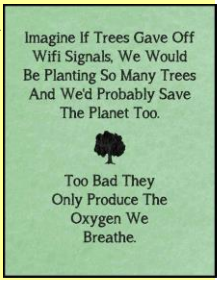
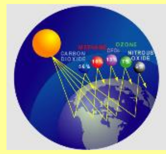
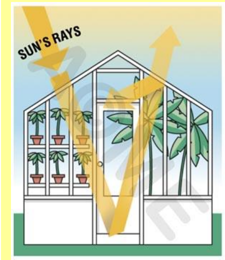


The Greenhouse Effect

- Earth's atmosphere **lets in** insolation but **most** radiation **does not escape**
  - Infrared radiation is absorbed by greenhouse gases (CO_2, Water Vapor, Methane & other gases)





Acts like a heating blanket for the Earth - Without it the average temp would be about 0°F

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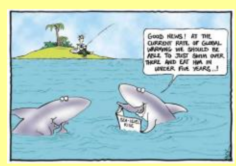
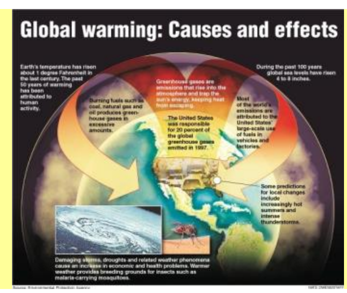
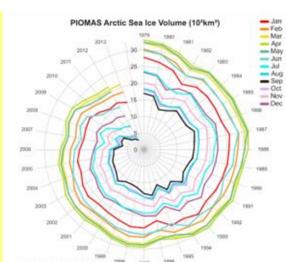
Global Warming

- An increase in the Earth's average temperatures







https://www.youtube.com/watch?v=VbiRNT_gWUQ
http://geology.com/sea-level-rise/new-york.shtml

SEA LEVELS - New York could see a 1- to 5-inch sea level rise by the 2020s, 5 to 12 inches by the 2050s and 8 to 23 inches by the 2080s, compared with a 2000-2004 base period, depending on how much greenhouse gas emissions are limited in the meantime.

That rise would leave low-lying places such as parts of Freeport and Mastic underwater near the end of the century, according to Jay Tanski, a Stony Brook University scientist. Even a moderate nor'easter would bring significant surges because the ocean would already be swollen, ClimAID scientists said.

The rate of sea level rise could be greater -- up to 10 inches by the 2020s, 29 inches by the 2050s and 55 inches by the 2080s -- if there is significant melting of the polar ice sheets -- a phenomenon, the scientist said. Some researchers say that polar phenomenon is under way.

"It could be a whole new geography," said Vivien Gornitz, a sea-level expert at Columbia who helped craft the report.

The East Coast of the United States will experience some of the greatest sea level rise in the world because its land is sinking by about a millimeter per year -- about 3 inches by 2080 -- from both human and natural geologic causes.

Climate Change Could Threaten Long Island By Jo Napolitano
Feb 25 2013 02:08 PM EST

TEMPERATURES - Temperatures across the state are expected to rise 1.5 to 3 degrees Fahrenheit by the 2020s, 3 to 5.5 degrees by the 2050s and 4 to 9 degrees by the 2080s compared with a 1970-1999 base period, ClimAid found.

Those increases will be tempered for New York City and the Island, but not by much. A 3- to 5-degree rise is predicted by the 2050s and 4 to 7.5 degrees by the 2080s.

The mean temperature in Upton, monitored by Brookhaven National Laboratory, was 54.22 degrees Fahrenheit last year, the warmest in 63 years of data collection.

Higher temperatures will bring a spike in pollen, ragweed, poison ivy and Lyme disease, plus more and hotter heat waves, which will increase heat and respiratory-related illnesses, scientists say.

"We are already locked into some additional warming and sea-level rise because of the greenhouse gas we've already emitted," said Radley Horton, associate research scientist at Columbia's Earth Institute.

"We are headed toward a climate cliff," he said. "But we can take our foot off the gas."

Houses with raised foundations on waterfront property in Norfolk, Va. Rising water and sinking land combine to give the region around Norfolk among the highest rates of annual sea level rise on the East Coast. Credit Benjamin Donald Boshart for The New York Times

Miami Beach raised the sea wall and pumped out tidewater during a king tide, the highest predicted tide of the year. Credit Max Reed for The New York Times

Because of beach erosion, officials on Topsail Island, N.C., have had to combat the rising water with large sandbags. Credit Logan R. Cyrus for The New York Times

A flooded neighborhood after a king tide this month in Fort Lauderdale, Fla. Credit Max Reed for The New York Times

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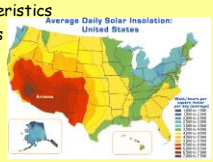
What Factors Affect Insolation?

- Angle of Insolation
- Duration of Insolation
- Surface Characteristics
- Weather – Clouds



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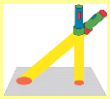
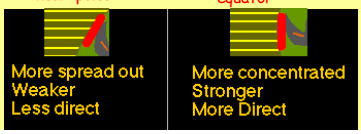
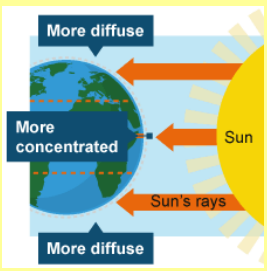
Angle of Insolation



0 degree angle
- minimum intensity
- near poles

90 degree angle
- maximum intensity
- equator





Factors that Affect the Angle and Intensity are…

1. The Shape of the Earth
2. Latitude
3. Seasons
4. Time of Day

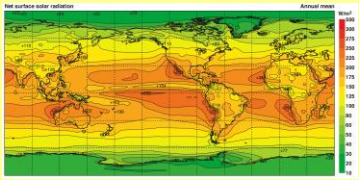
Shape of Earth

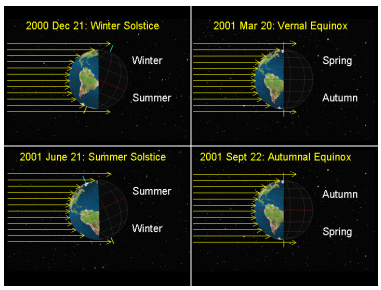
- The Earth is a sphere
  - Only one latitude can have the sun directly overhead on a certain day of the year

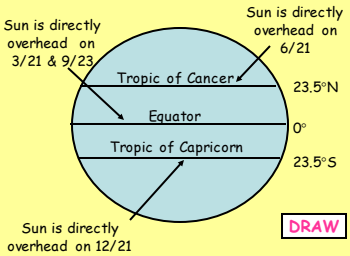
The sun is never directly overhead in New York

Latitude

- As Latitude increases the angle of insolation decreases







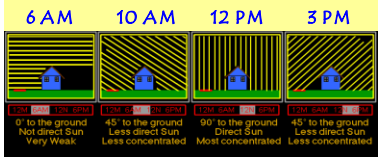
Seasons

- December 21st - the winter solstice
  - vertical ray hits 23.5°S
  - angle of insolation lowest this day in the N. Hemisphere

- June 21st - summer solstice
  - vertical ray is at 23.5°N
  - angle of insolation greatest on this day in N. Hemisphere.

Time of Day

- The sun reaches its highest point in the sky at noon (solar noon) & lowest at sunrise & sunset



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