Pennsylvania's Changing Climate

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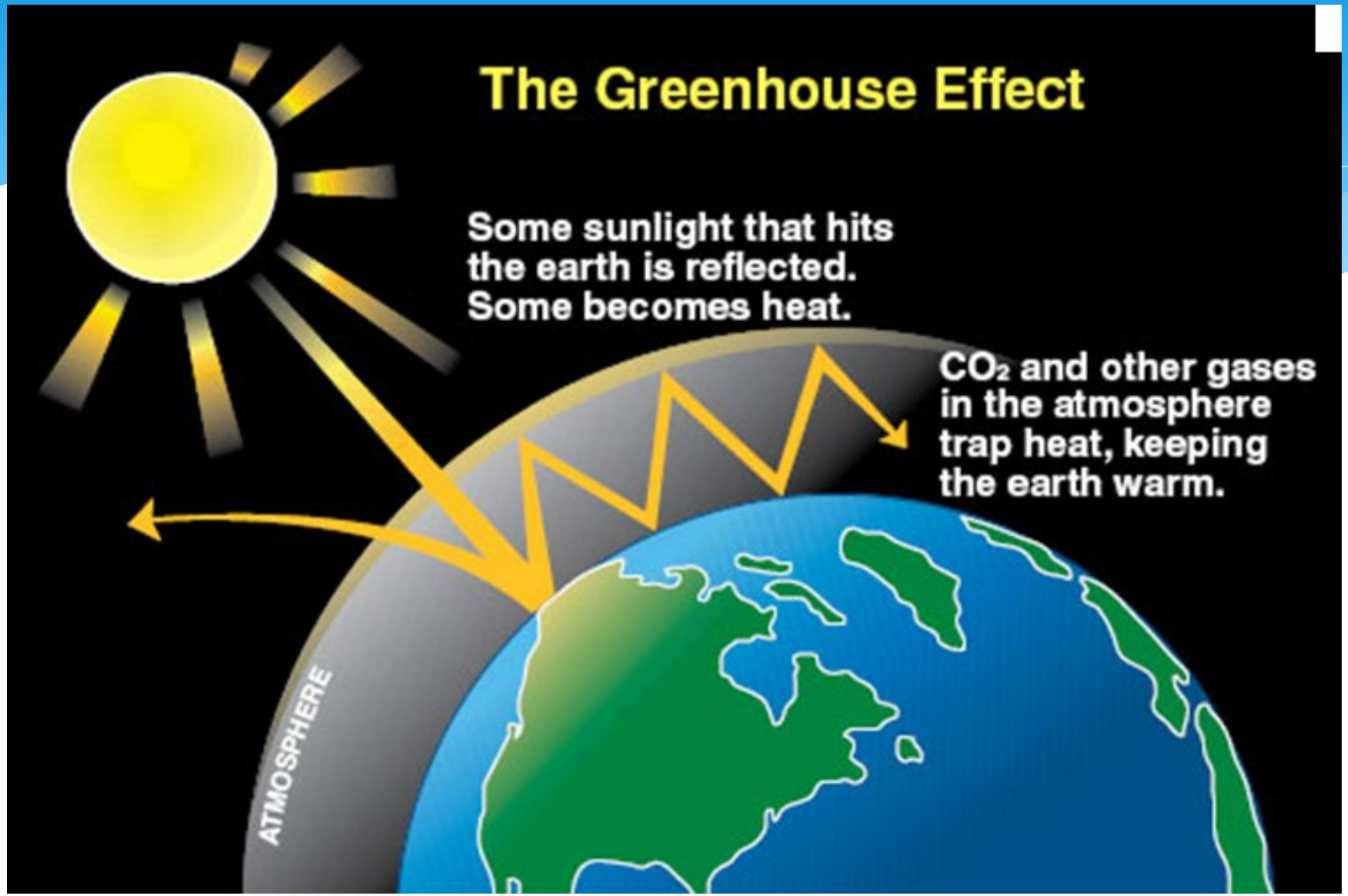
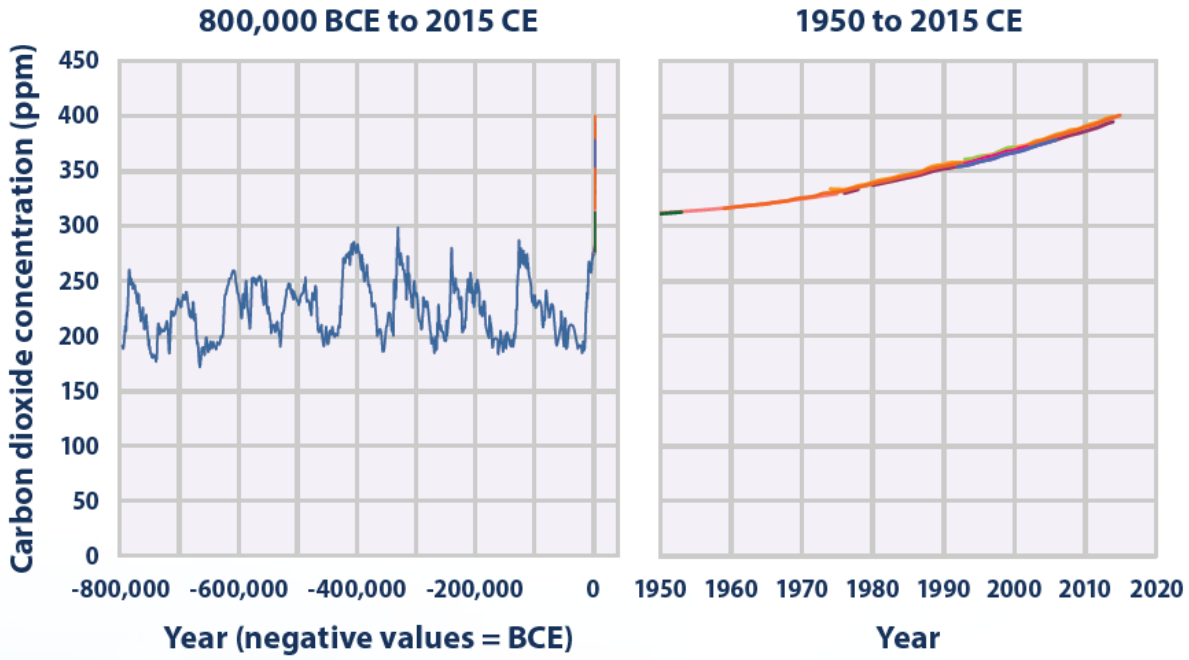
pennsylvania
DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES


The Greenhouse Effect
Some sunlight that hits the earth is reflected. Some becomes heat.
CO_2 and other gases in the atmosphere trap heat, keeping the earth warm.
ATMOSPHERE

WHAT'S HAPPENING

Global Atmospheric Concentrations of Carbon Dioxide Over Time



This figure shows concentrations of carbon dioxide in the atmosphere from hundreds of thousands of years ago through 2015, measured in parts per million (ppm). The data come from a variety of historical ice core studies and recent air monitoring sites around the world. Each line represents a different data source. Data source: Compilation of 10 underlying datasets[6]

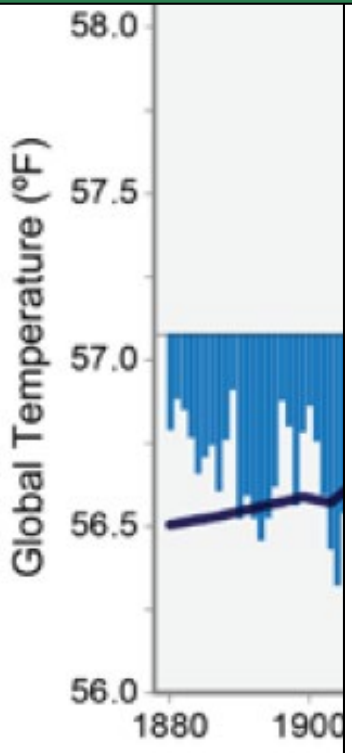
- Global atmospheric concentrations of carbon dioxide have risen significantly over the last few hundred years.
- Historical measurements show that the current global atmospheric concentrations of carbon dioxide are unprecedented compared with the past 800,000 years.
- Since the beginning of the industrial era, concentrations of carbon dioxide have increased from an annual average of 280 ppm in the late 1700s to 401 ppm as measured at Mauna Loa in 2015—a 43-percent increase. This increase is due to human activities.[7]

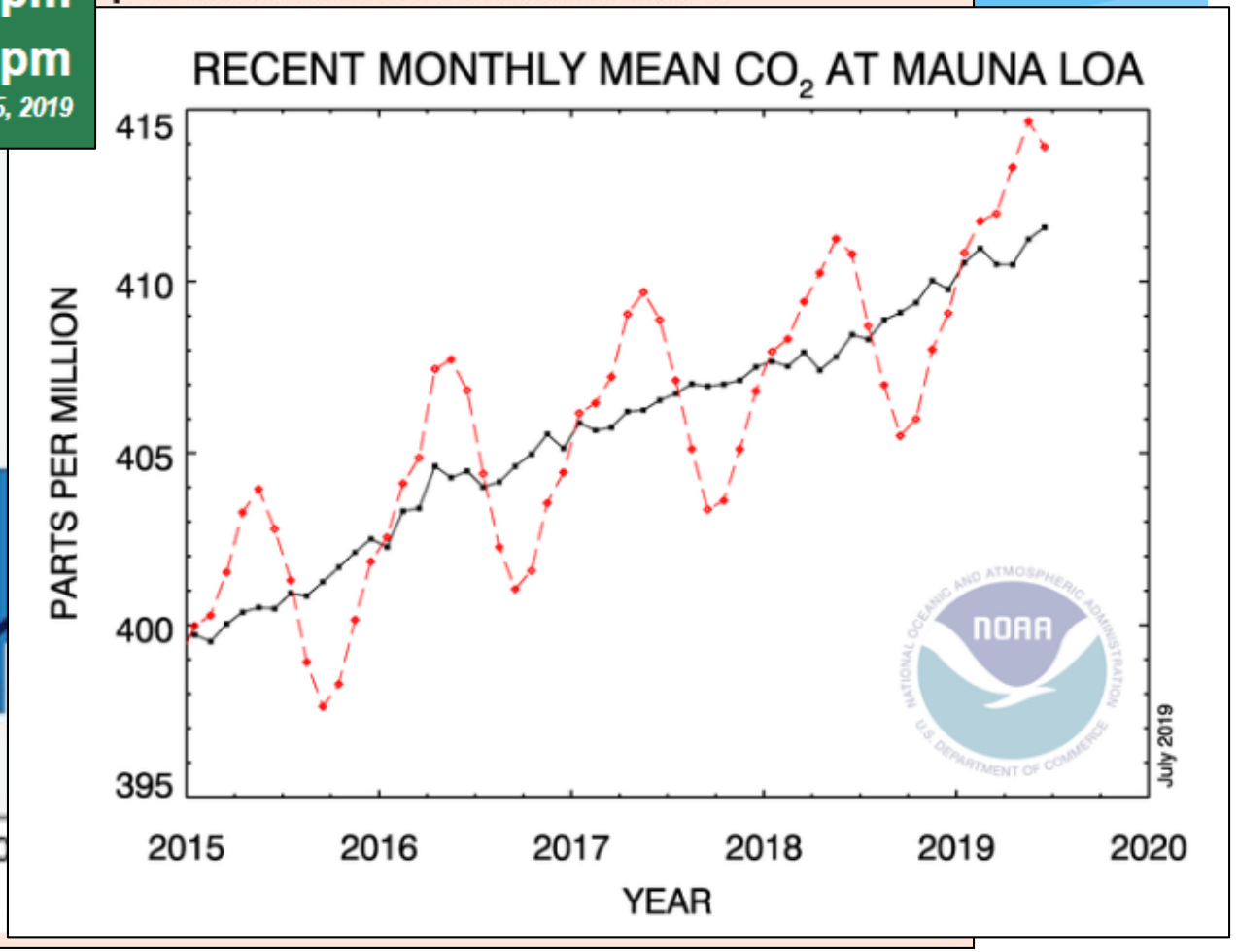
U.S. EPA

Anthropogenic Climate Change

August 2019: 409.95 ppm
August 2018: 406.99 ppm
Last updated: September 5, 2019

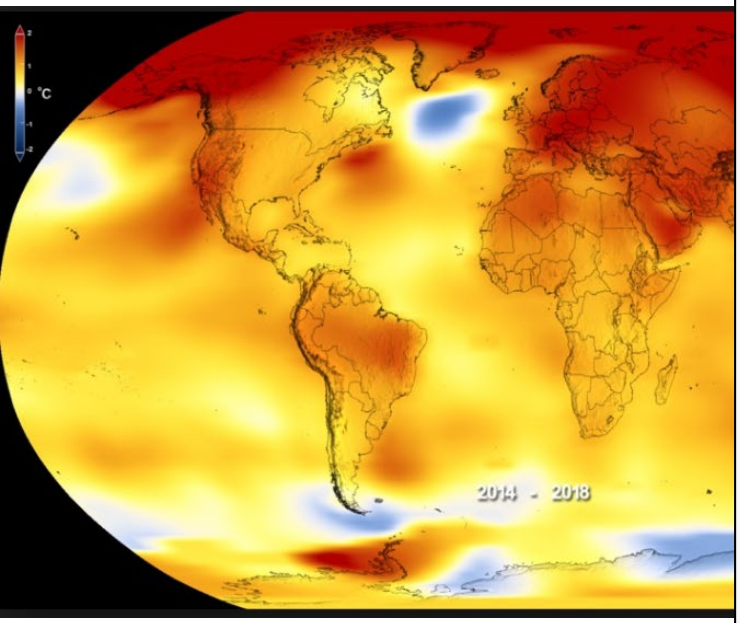
mperature and Carbon Dioxide

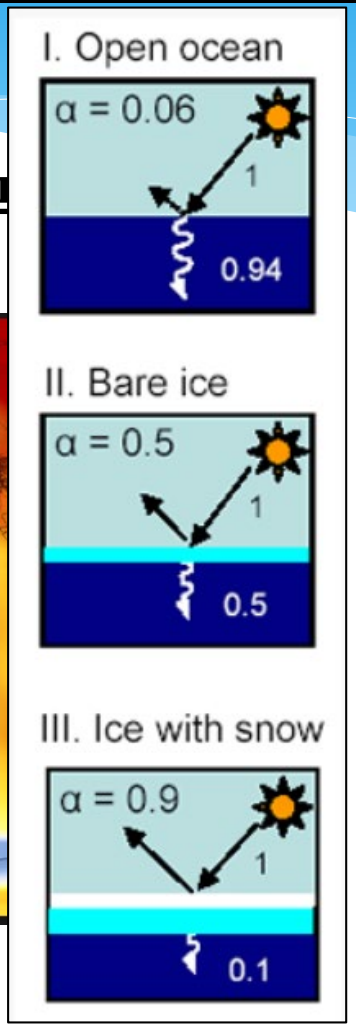


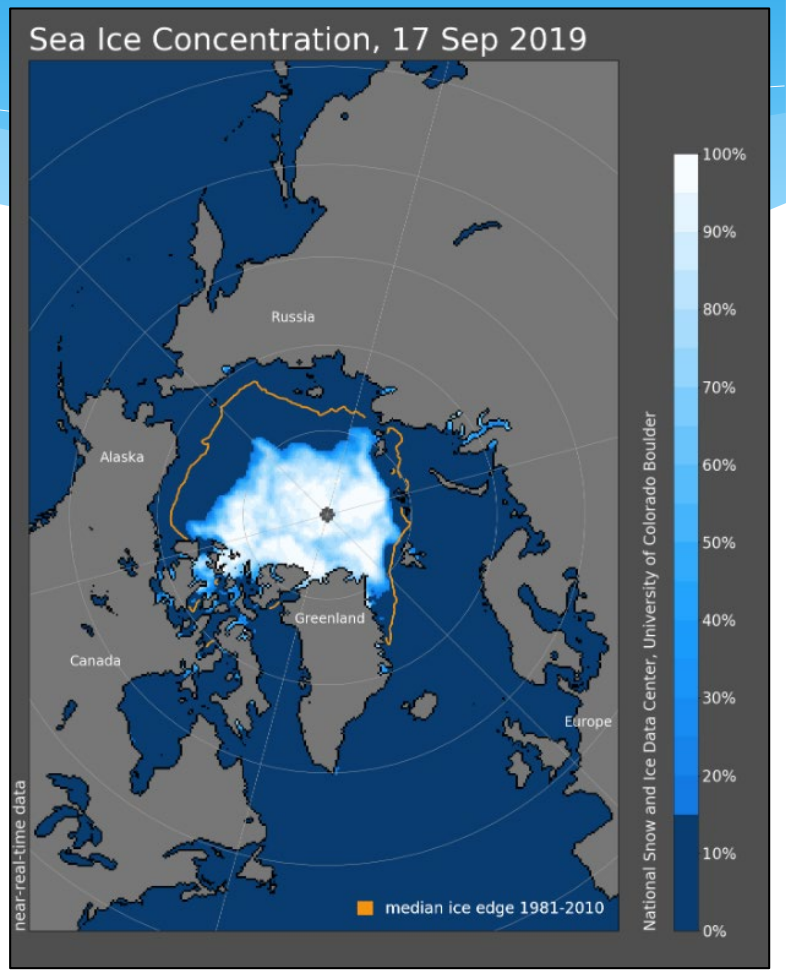


Global Climate Trends

Global Temperature A

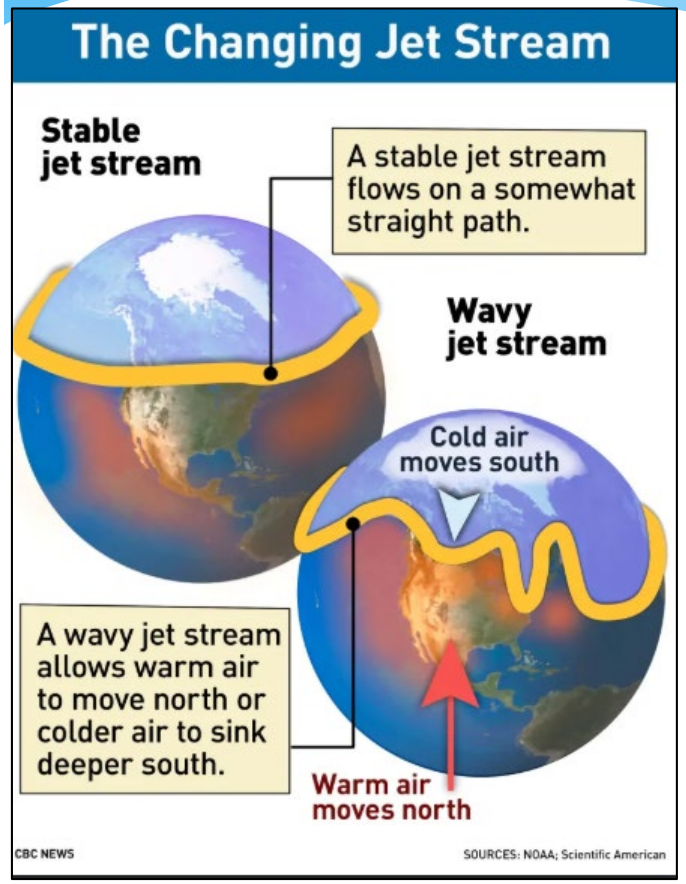


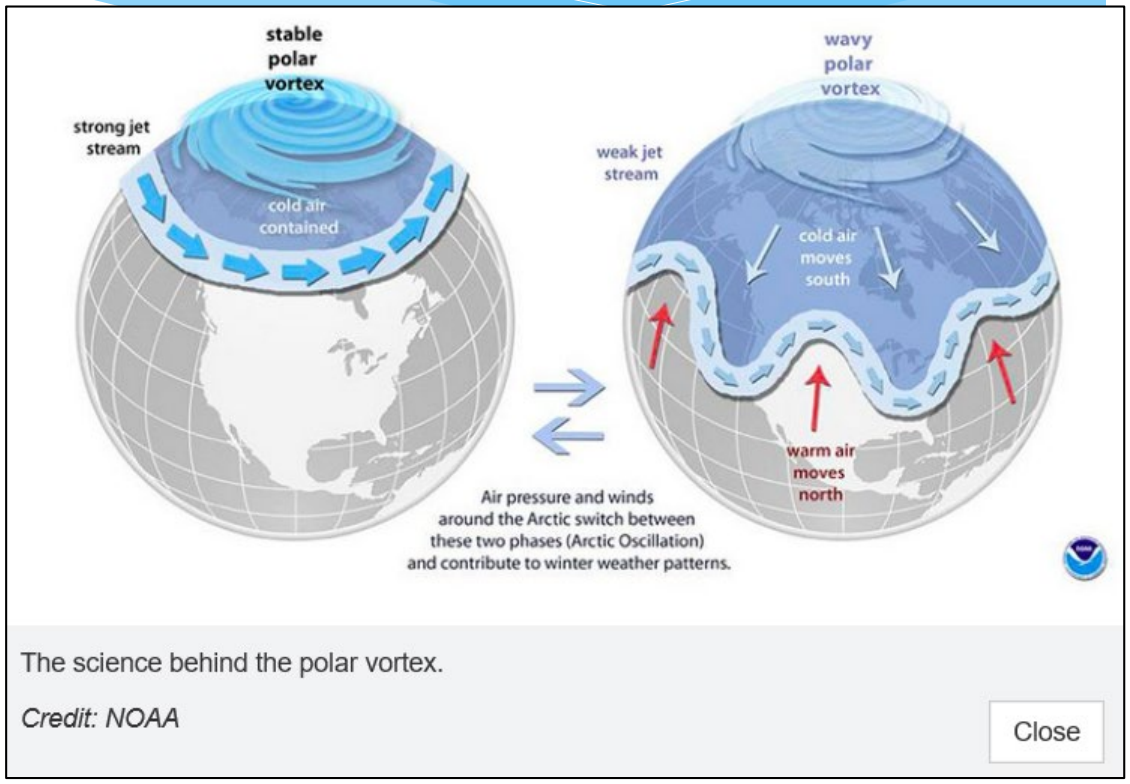




National Snow & Ice Data Center

What Happens in the Arctic Doesn't Stay in the Arctic!



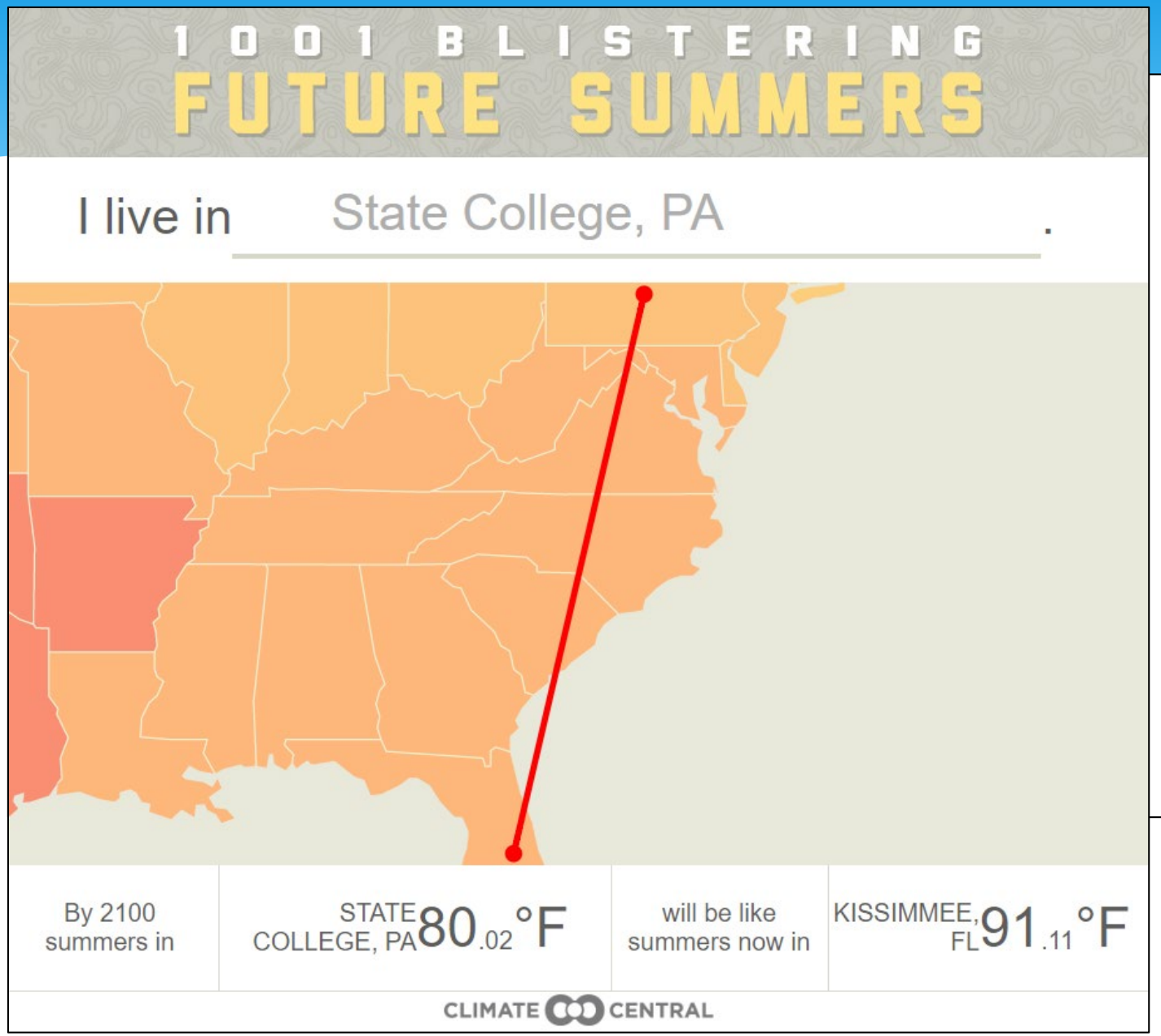


The science behind the polar vortex.

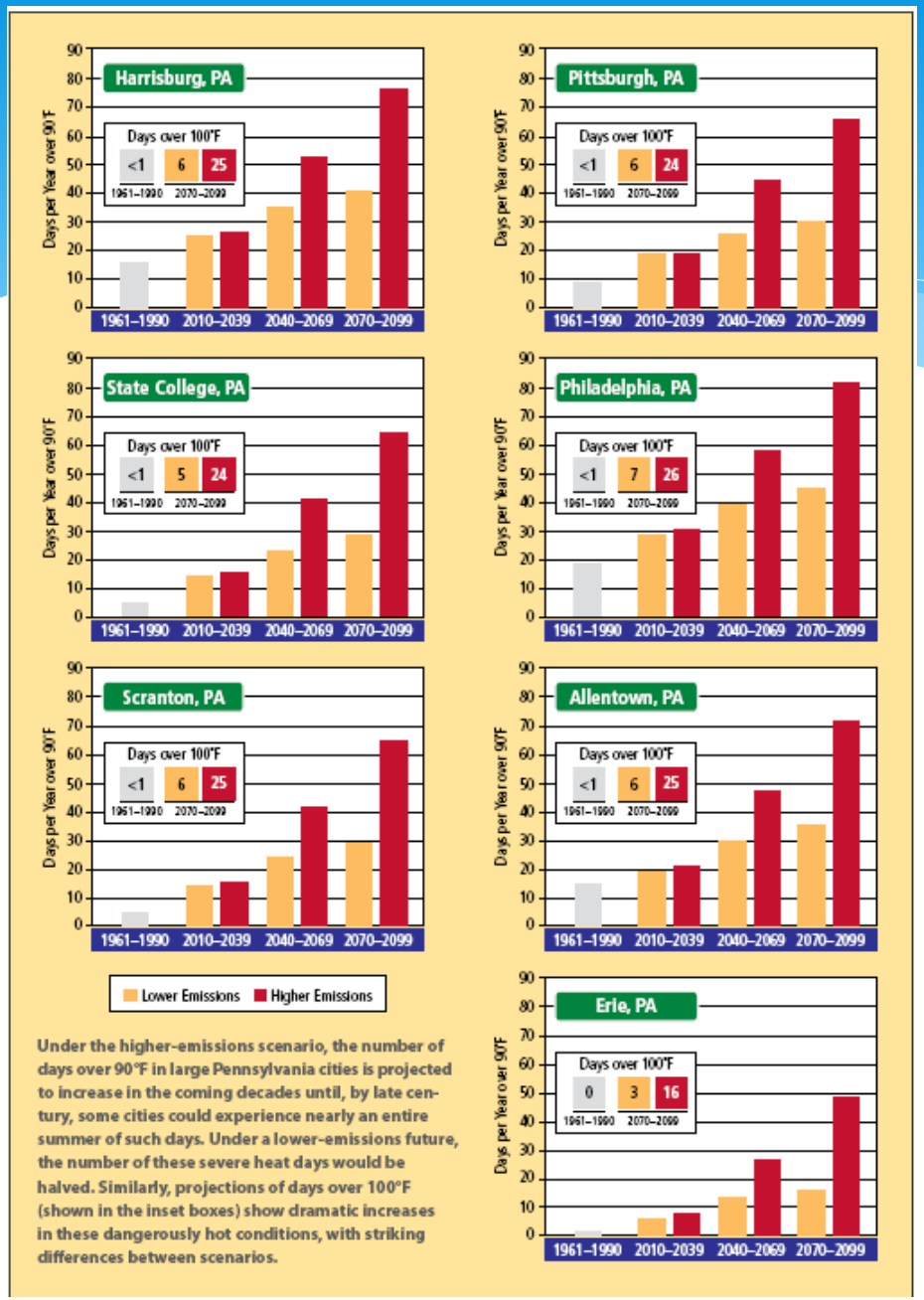
Credit: NOAA

Close

Increasing Temperatures

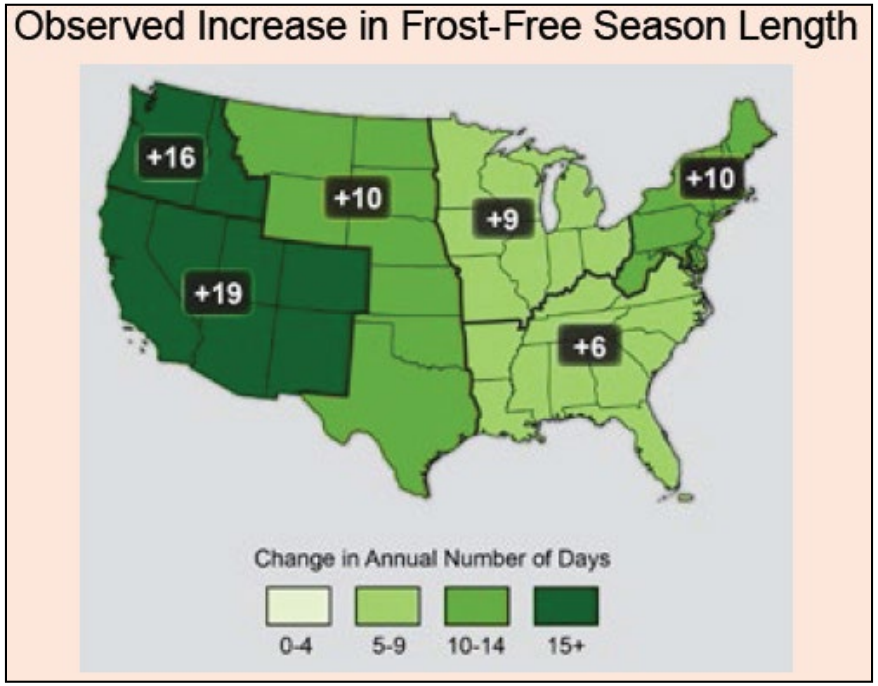


Extreme Heat in PA Cities

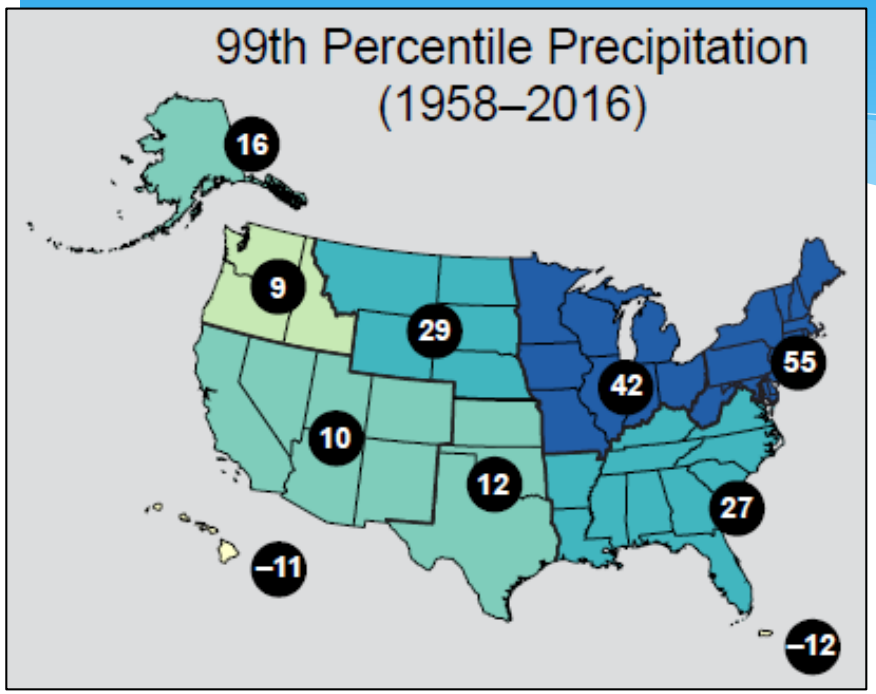


Source: Union of Concerned Scientists

Growing Season



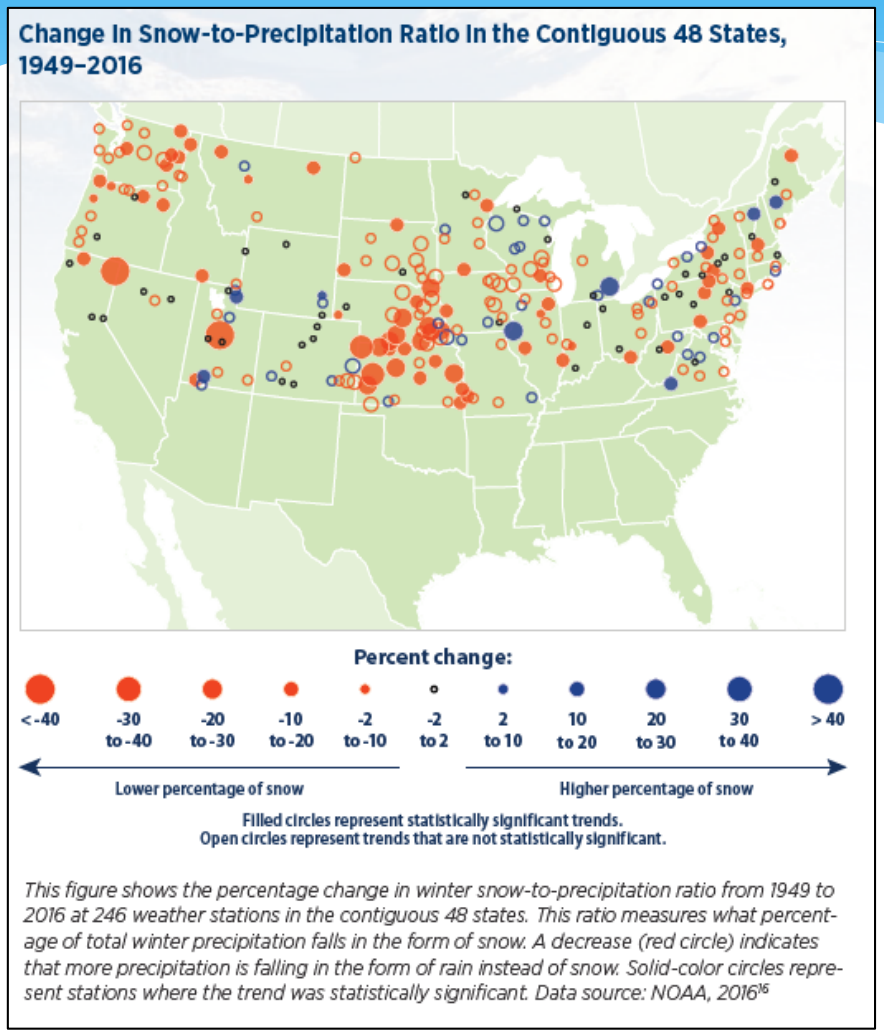
Rainfall



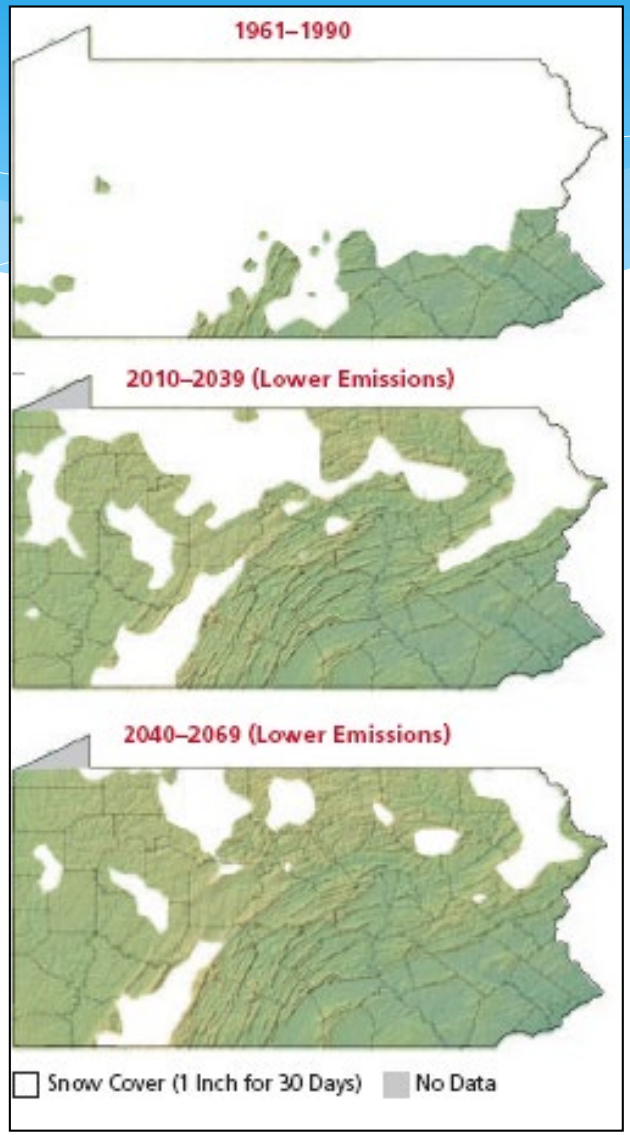
Fourth National Climate Assessment

A view of Route 283. CONTRIBUTED IMAGE/@KURTACEG/TWITTER

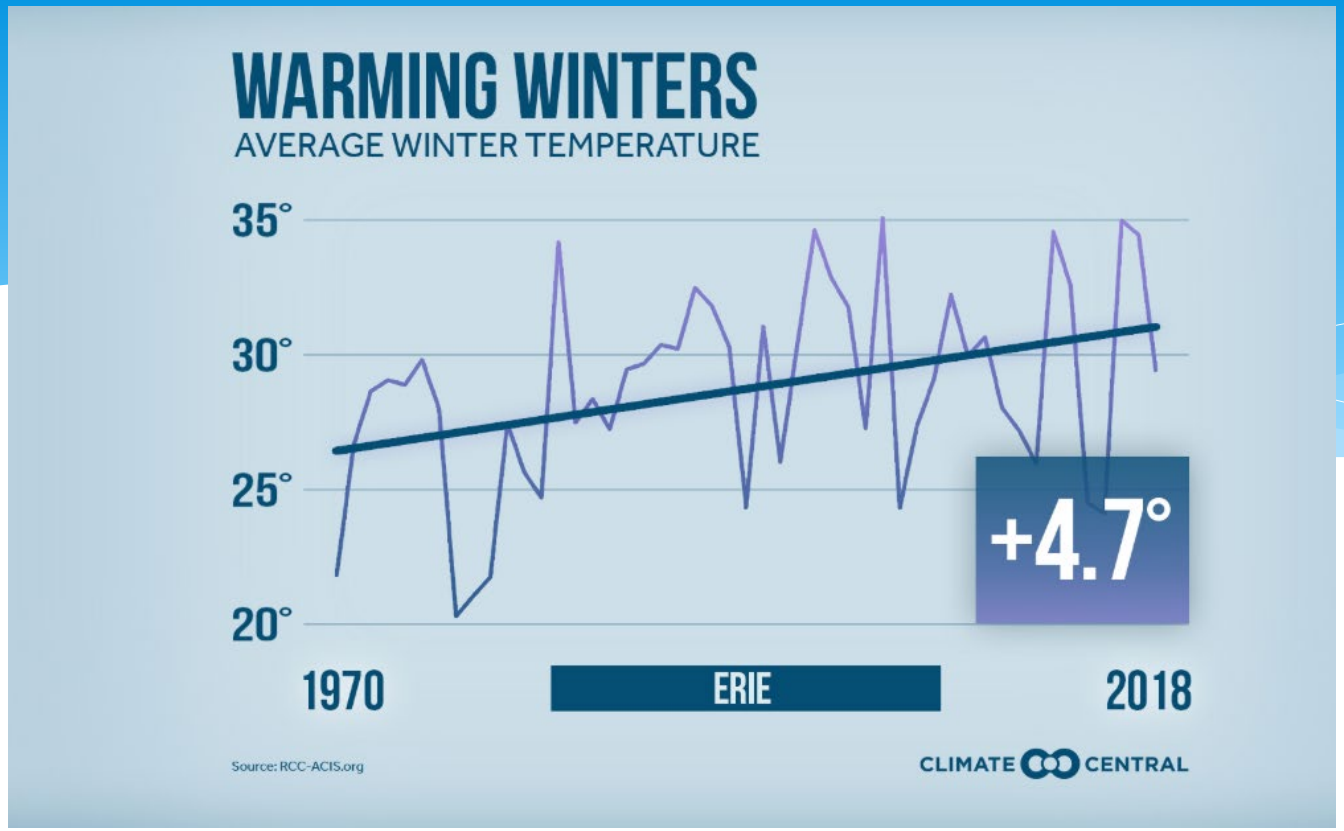
Reduced Snow Cover

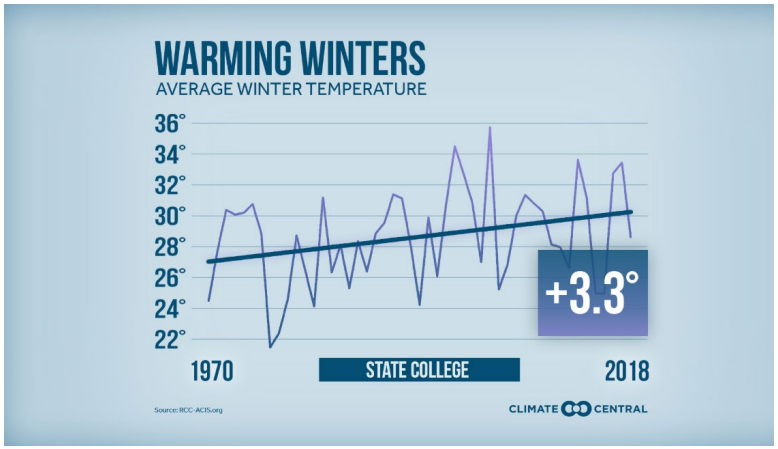


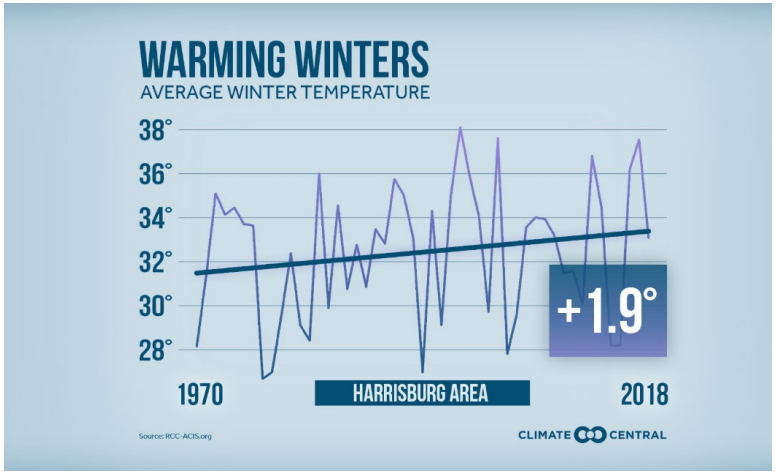
This figure shows the percentage change in winter snow-to-precipitation ratio from 1949 to 2016 at 246 weather stations in the contiguous 48 states. This ratio measures what percentage of total winter precipitation falls in the form of snow. A decrease (red circle) indicates that more precipitation is falling in the form of rain instead of snow. Solid-color circles represent stations where the trend was statistically significant. Data source: NOAA, 2016[16]



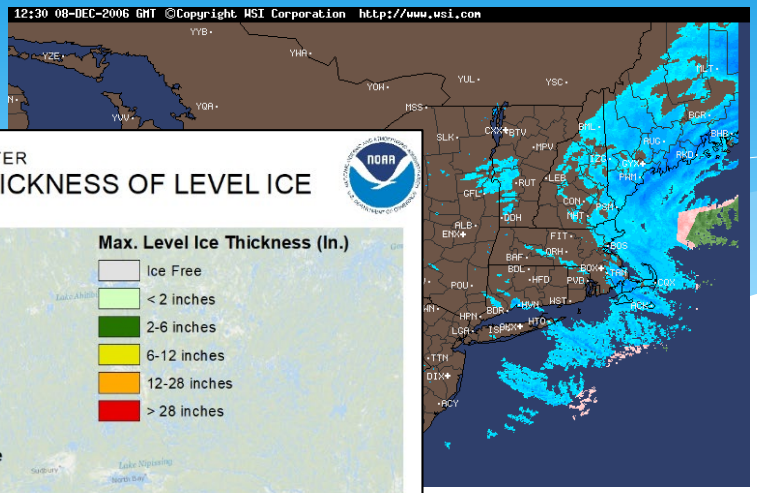
Union of Concerned Scientists

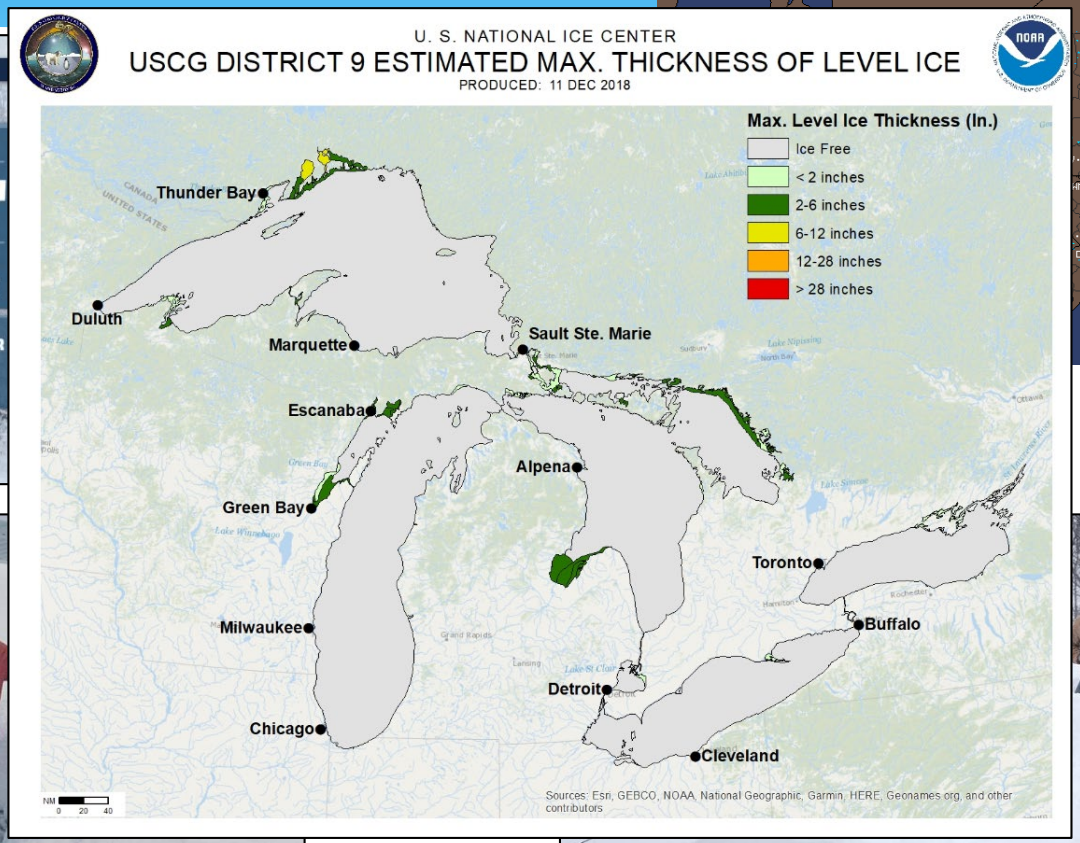

WARMING WINTERS
AVERAGE WINTER TEMPERATURE
35°
30°
25°
20°
+4.7°
1970
ERIE
2018
Source: RCC-ACIS.org
CLIMATE CENTRAL


WARMING WINTERS
AVERAGE WINTER TEMPERATURE
36°
34°
32°
30°
28°
26°
24°
22°
+3.3°
1970
STATE COLLEGE
2018
CLIMATE CENTRAL

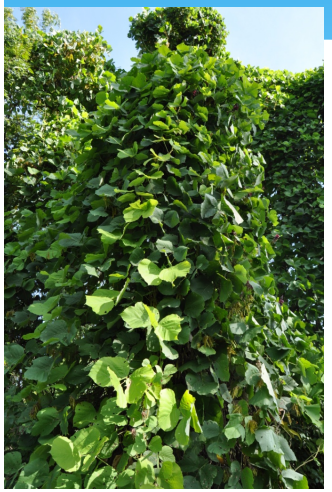

WARMING WINTERS
AVERAGE WINTER TEMPERATURE
38°
36°
34°
32°
30°
28°
+1.9°
1970
HARRISBURG AREA
2018
CLIMATE CENTRAL

Warmer Temperatures = More Lake Effect Snow





Invasive Species & Pests



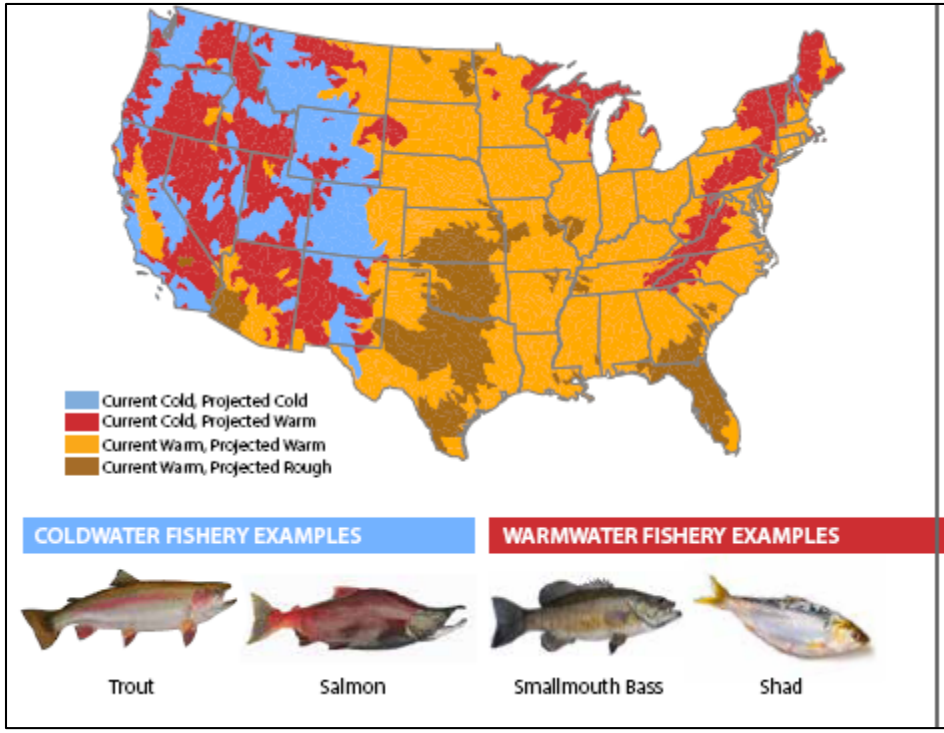
Kudzu is reproducing in Pennsylvania (photo from Lebanon County)

The hemlock wooly adelgid has been spreading north as winters warm

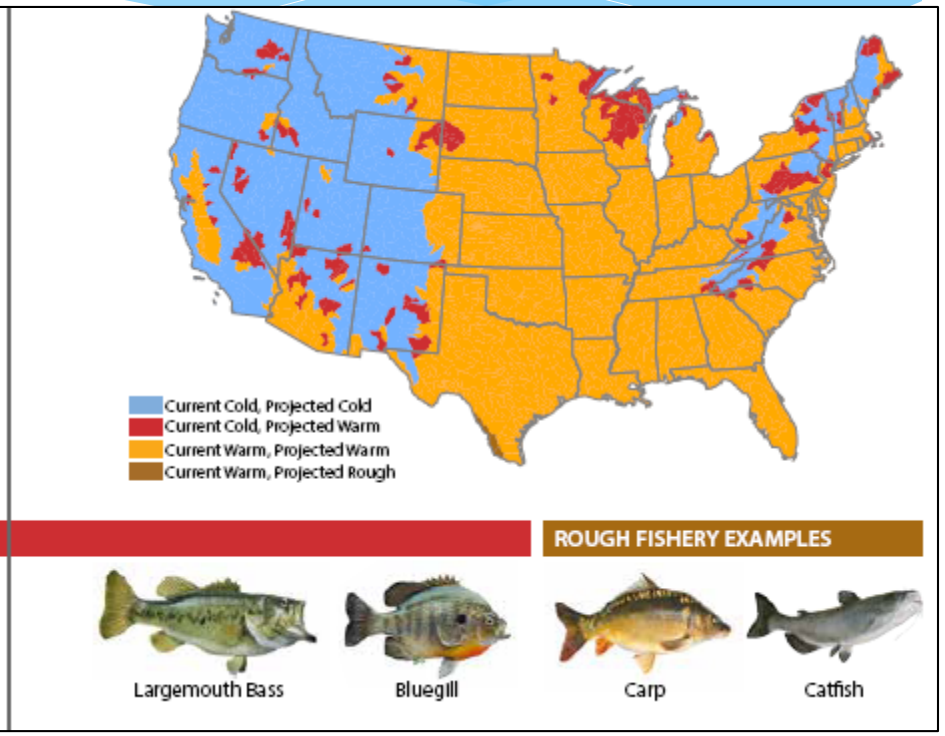
Most invasives spread and thrive in a changing climate.

Projected Changes in Fish Habitat

GHG emissions continue to increase unchecked

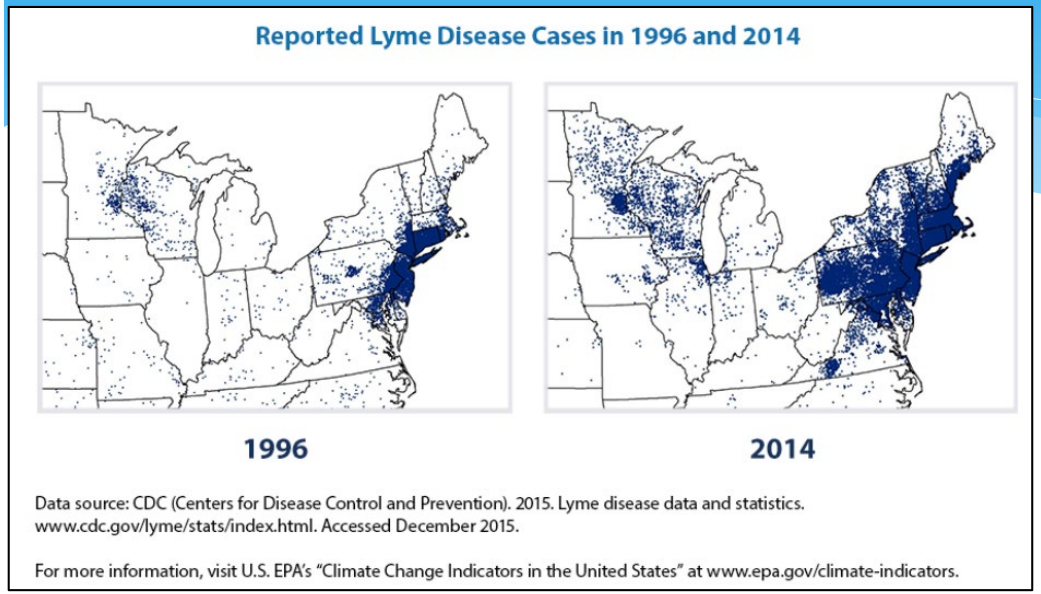


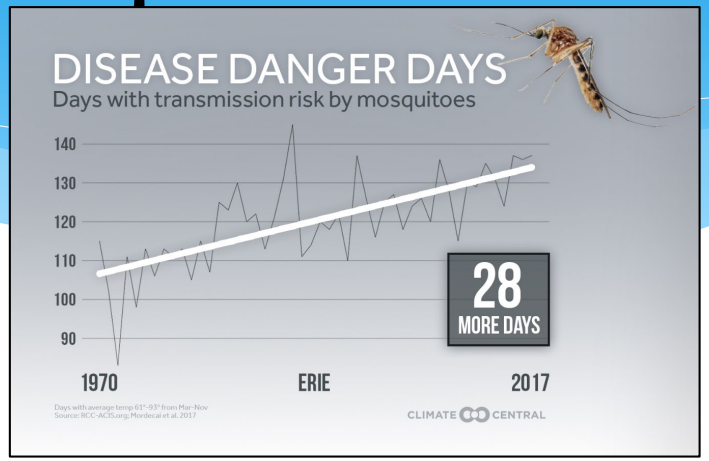
GHG emissions are substantially reduced



Source: U.S. EPA

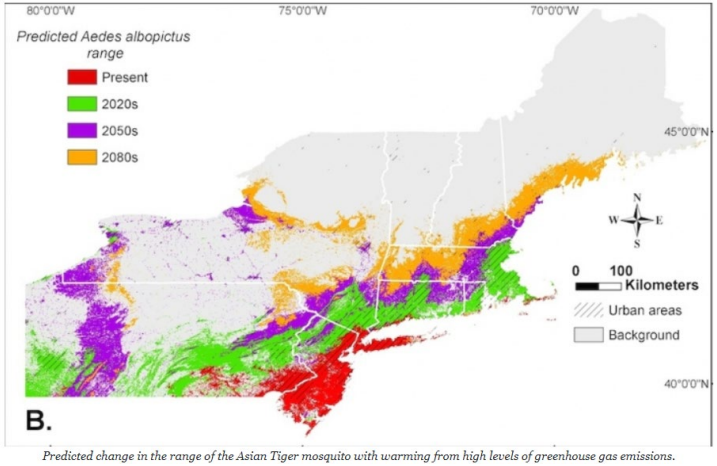
Human Health Impacts





Vector for:

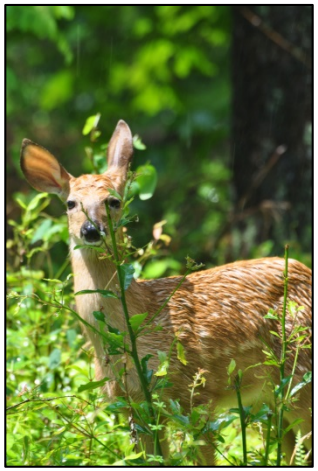
- Zika virus
- Dengue fever
- West Nile virus
- Chikungunya virus



Predicted change in the range of the Asian Tiger mosquito with warming from high levels of greenhouse gas emissions.

How Will Species Respond?

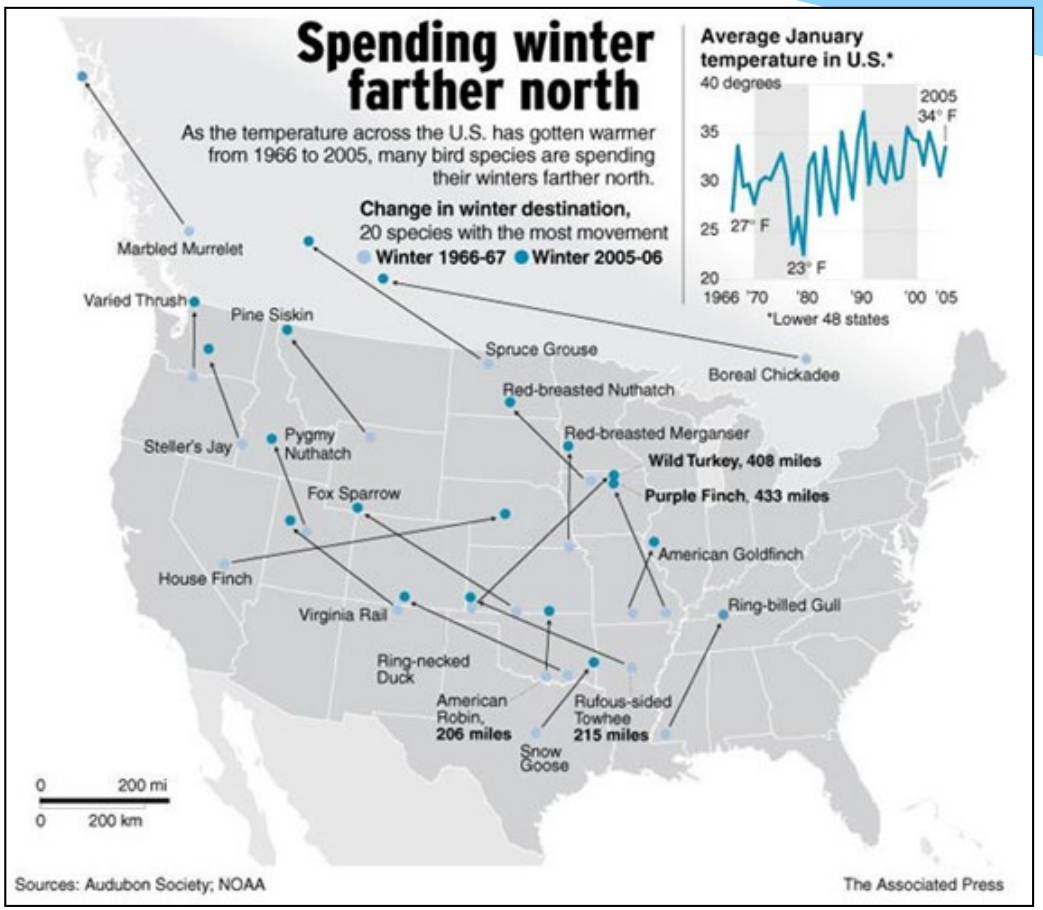
Adapt

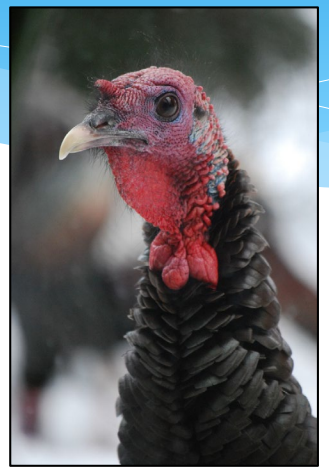


Move

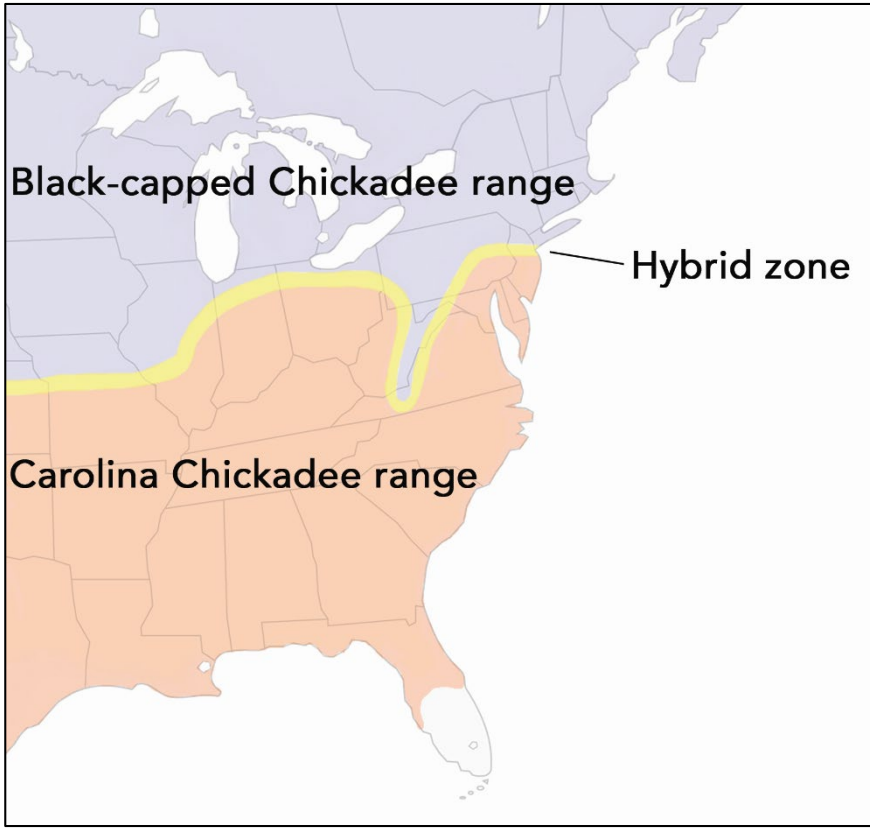
Disappear

Species on the Move





Species on the Move



Allaboutbirds.org

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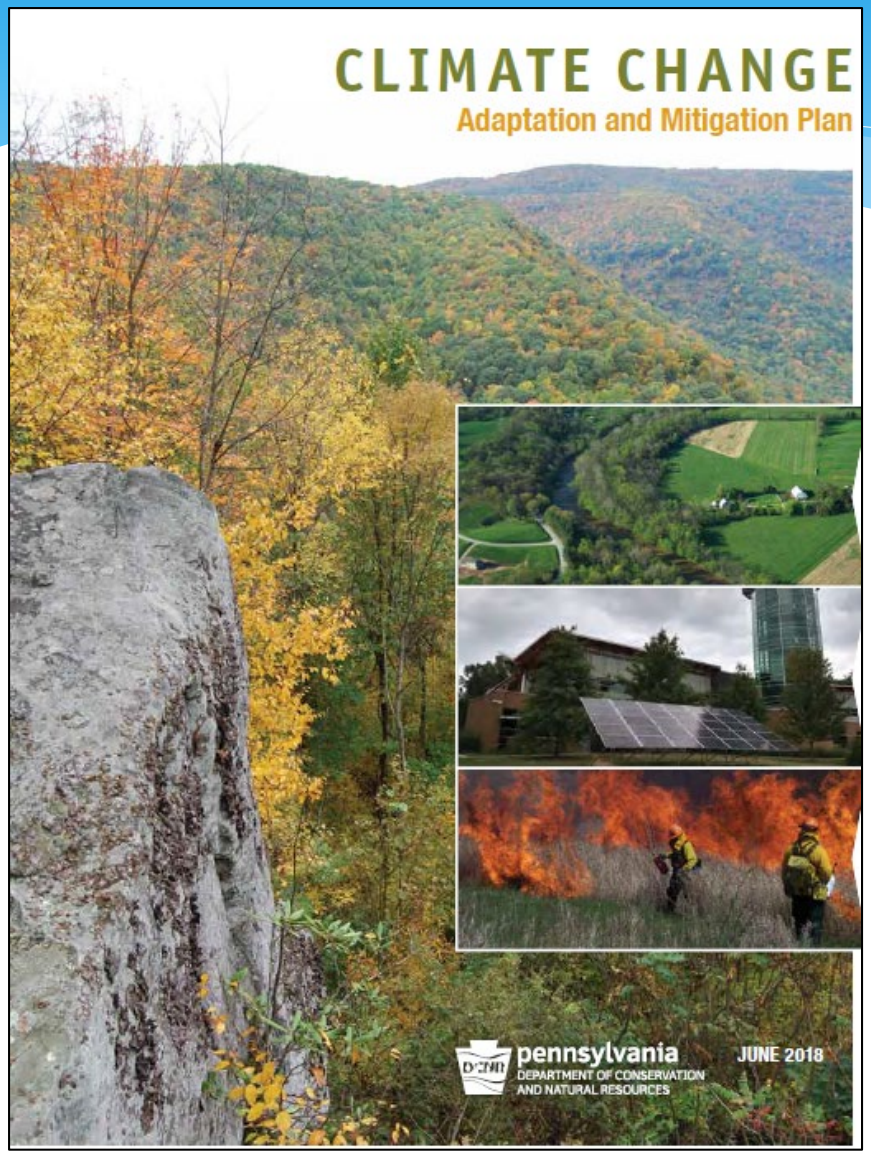

Questions?

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