CLIMATE IMPACTS:
A CHANGING PENNSYLVANIA

Pennsylvania's Carbon Dioxide (CO_2) Emissions
In million metric tons

2017: 233.20 MMT CO_2

262.72 MMT generated
-29.52 MMT absorbed by trees

Trend: 18.7% less than in 2005
Latest data available

2050 goal: 57.36 MMT CO_2

Projected climate impacts were calculated for DEP by the Environmental and Natural Resources Institute at Penn State University.

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Increasing Emissions Mean an Increasingly Different Pennsylvania

Governor Tom Wolf has identified climate change as the most critical environmental threat facing the world. The governor set a statewide goal in 2019 to lower greenhouse gas emissions 80% by 2050, compared to 2005 levels.

Many climate-related changes are projected if we don't reduce our greenhouse gas emissions. The following are some changes we're likely to see.

Understand how increasing emissions are changing Pennsylvania. Learn what you, as a state or local government leader, business owner, community leader, or resident, can do to help slow climate change and lessen the related impacts statewide and in your part of Pennsylvania. Visit **www.dep.pa.gov/climate**.

A Warmer, Wetter Pennsylvania Ahead

Since 1901, Pennsylvania's average temperature has climbed nearly 2° F, and our average annual rainfall has increased about 10%. If emissions continue to increase, all counties will likely get warmer and wetter.

It's projected that statewide average temperature will rise as much as 4.9° F. In urban areas, more days will likely top 100° F. Average rainfall is projected to increase 8-12% by mid-century compared to 2000, and extreme rainfall events will increase. Flooding risk will be substantial for both urban and rural areas.

Our Rising Energy Demand

Overall energy demand will rise, as Pennsylvanians' increasing need for electricity to stay cool in hotter summers will likely outpace any decrease in winter electricity use. In addition, extreme weather events may affect the reliability of energy delivery systems due to high winds and damaged power lines.

Livestock, Crops, and Forests: Stresses and Changes

- **Pennsylvania's poultry livestock inventory could double**, similar to locations in the United States that are as warm today as Pennsylvania will be in the future.

- **Dairy livestock will likely shift from southeast to northwest counties**, as dairy cows require lower temperatures.
- **Increased heat will cause livestock-related impacts** — including lower milk yields, reduced forage quality, and increased cooling and ventilation costs.
- **Crops will be affected by flooding, fungus, and pests** brought on by increased rainfall.
- **Pennsylvania wineries may choose to plant European grape varieties, which tend to perform better in warmer climates than native American grapes do.** As a result, consumers may find Pennsylvania wines more expensive.
- **Tree habitat will shift to higher latitudes and elevations**. Longer growing seasons may increase growth rates for some species and increase mortality for other species. The forestry industry may need to adjust by planting faster-growing species and salvaging dying stands.
- **Forests help reduce climate change by absorbing carbon dioxide.** Since it's difficult to substantially increase hardwood growth rates, the best option will be preventing forest loss.

Increased Water Pollution

In streams and rivers: Increased rainfall and flooding will carry more nutrient (nitrogen and phosphorus) and sediment runoff pollution into streams and rivers from agricultural and urban areas. Stormwater infrastructure such as culverts will be vulnerable to flooding, but increasingly valuable as it helps keep soil and water in local watersheds and promotes agricultural resilience. Wetlands may become less able to absorb water and pollutants.

In coastal zones: Aquatic life is likely to decline in the tidal freshwater region of the Delaware Estuary, because of lowered dissolved oxygen concentration and increased saltwater intrusion from sea level rise. With continued warming, harmful algal blooms may increase in Lake Erie and in lakes and reservoirs in the state.

Infrastructure Stressed by Flooding

Localized intense flooding is projected to stress energy, transportation, and water infrastructures. Large sections of infrastructure are located in areas of Pennsylvania that are susceptible to flooding and landslides. Today, municipalities and utilities vary in the extent of adaptive planning they've done; more coordination is needed for better resilience across the socioeconomic range.

Shifting Outdoor Recreation Preferences

- Snow cover is projected to decline 20-60 percent around Pennsylvania, and the winter outdoor recreation industry isn't expected to survive to mid-century. Coldwater trout fishing is likely to decline, especially in southeast and northwest counties.
- People are also likely to increasingly pursue outdoor recreation in spring and fall, as summer becomes too hot.
- Outdoor recreation also depends on the quality of the recreation resource: working to reduce water pollution will help sustain water recreation and working to improve air quality will help people pursue outdoor recreation in warmer weather.

Tools to Help Pennsylvanians Reduce Climate Change and Its Risks

www.dep.pa.gov/climate

- 2018 Pennsylvania Climate Action Plan – Over 100 actions we all can take.
- Reports detailing projected climate change-related impacts across the state.
- Latest state greenhouse gas emission data.

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