seasons of change

CLIMATE CHANGE IN YOUR BACKYARD

A Project of the
STATE OF THE **ENVIRONMENT** in Berks Program

BERKS CONSERVANCY

What is Climate Change?

Climate change refers to any significant change in the measures of climate lasting for an extended period of time. Climate change is not the same thing as global warming. Global warming is causing climate patterns to change; however, global warming itself represents only one aspect of climate change. Climate change includes major changes in temperature, precipitation, or wind patterns, among other effects, that occur over several decades.

Climate change is happening.

Our Earth is warming. Earth's average temperature has risen by 1.4°F over the past century, and is projected to rise another 2 to 11.5°F over the next hundred years. Small changes in the average temperature of the planet can translate to large and potentially dangerous shifts in climate and weather.

The evidence is clear. Rising global temperatures have been accompanied by changes in weather and climate. Many places have seen changes in rainfall, resulting in more floods, droughts, or intense rain, as well as more frequent and severe heat waves. The planet's oceans and glaciers have also experienced some big changes - oceans are warming and becoming more acidic, ice caps are melting, and sea levels are rising. As these and other changes become more pronounced in the coming decades, they will likely present challenges to our society and our environment.

Source: US Environmental Protection Agency

Why does the Berks Conservancy care about climate change? The scientific facts do not deny that our climate is changing. This affects numerous aspects of our natural world. Recent extreme weather events both locally and worldwide call for us to be aware and to be prepared for the effects of this change. As an environmental and conservation organization we believe that nature is essential to our quality of life. Our State of the Environment reports have always sought to provide factual data for our community to understand and take action.

Some people deny that climate change is happening. They disagree with the often politicized reasons as to why the climate is warming or what we can do to mitigate global warming and climate change. We do not seek to explore at this time all of the suggested causes or solutions to climate change, but to indicate what changes are occurring and what that means for us locally.

STATE OF THE
ENVIRONMENT
• BERKS COUNTY, PA •

The State of the Environment Program is an ongoing project of the Berks Conservancy intended to raise awareness and appreciation of our exceptional natural resources in Berks, and to stimulate action and discussion to protect these resources. We invite you to learn something new, consider changing some of your behaviors as a result, and become engaged in our conservation work – the health of our community depends on it.

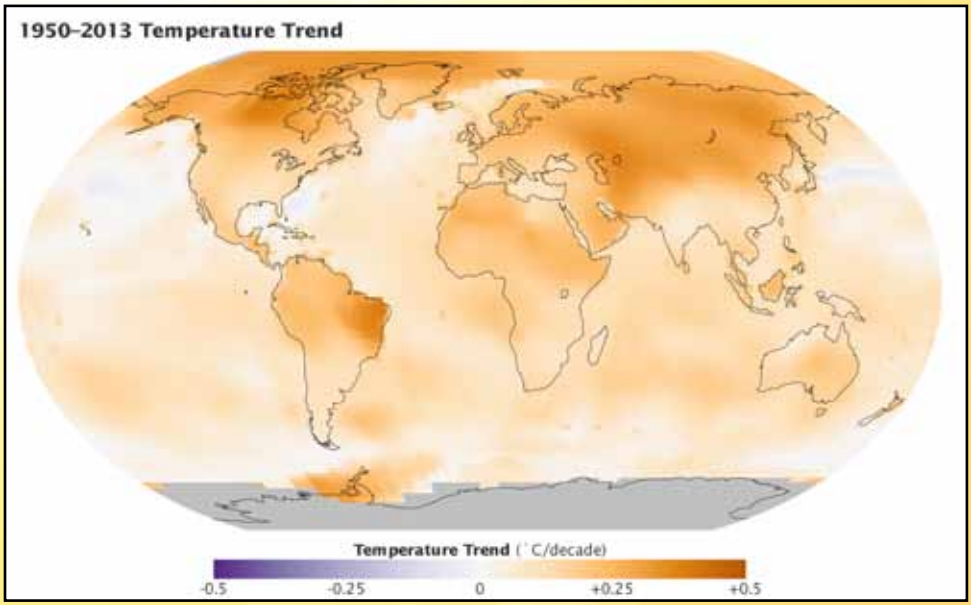
Energy

Climate change will affect how much energy we need and when we need it. As temperatures rise, more people will need to keep cool by using air conditioning, which uses a lot of electricity. However, some people might need less energy to heat buildings in the winter because it may not get as cold as it used to be.

PA Facts:

Warming in Pennsylvania is likely to increase the demand for electricity for cooling in the summertime, and can be expected to decrease demand for heating fuels in Pennsylvania, the primary fuels used for heating are natural gas, fuel oil and electricity. The increase in cooling demand is likely to outweigh the decline in heating demand, implying that electricity consumption is likely to increase as a result of climate change.

Source: Pennsylvania Climate Impacts Assessment Update, Penn State University



How can you help?

Plant trees near offices and homes to provide shade and keep them cool naturally. You can also use fans instead of air conditioners when it's not too hot. When air conditioning is needed, you can save energy by setting the thermostat a few degrees warmer. When buying a new air conditioner, choose energy–efficient models.

An analysis of global temperatures by NASA scientists shows that 2013 was the seventh warmest year since 1880 (tied with 2006 and 2009). Nine of the 10 warmest years on record all have occurred since 2000, with 2010 and 2005 ranking as the warmest.

NASA Goddard Institute for Space Studies.

Temperature trends in motion! Scan to view NASA video.

Agriculture & Horticulture

The crops that we grow for food need specific conditions to thrive, including the right temperature and enough water. A changing climate could have both positive and negative effects on crops. For example, the northern parts of the United States have generally cool temperatures, so warmer weather could help certain crops grow. In southern areas where temperatures are already hot, even more heat could hurt crop growth.

PA Facts:

Moderate climate change may raise Pennsylvania yields of hay, corn, and soybeans, but it may also raise yields elsewhere in the U.S. and around the world – increasing global production and pushing down prices received by Pennsylvania farmers.

Yields of cool-temperature adapted fruits and vegetables such as potatoes and apples are likely to decline as a result of climate change, while yields of fruits and vegetables better suited to a warmer climate such as sweet corn are likely to rise.

In the dairy industry, heat stress and a decline in feed quality are likely to drive milk yields downward and increase production costs. For operations that rely on grazing and on-farm production such as dairy and beef herds, changes in pasture yields and feed quality will impact production costs.

For the state's hog and poultry producers, while climate control costs are likely to increase with warmer summer months, this same effect in southern states may make Pennsylvania more attractive to these industries and could induce a northward shift in production operations.

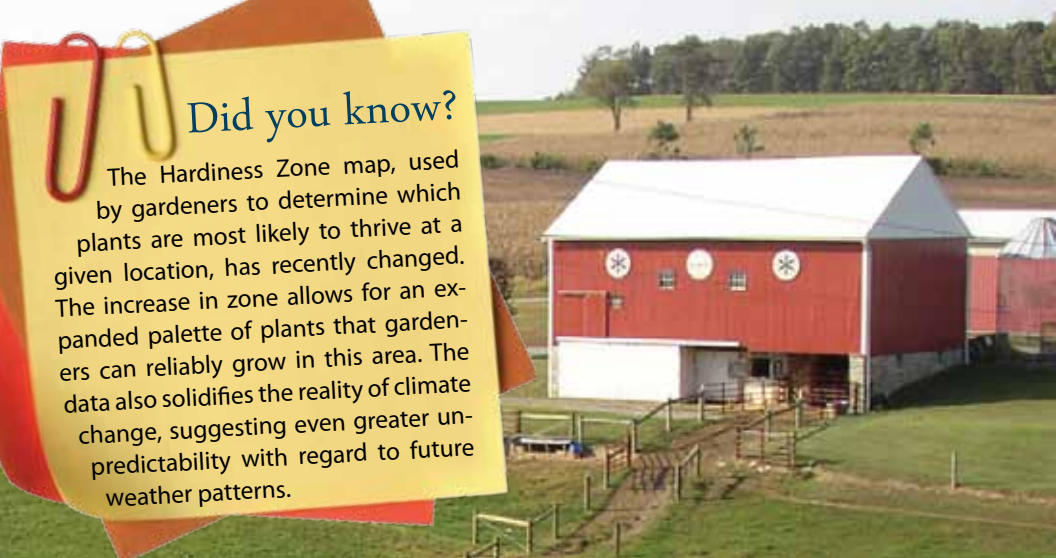
Source: Pennsylvania Climate Impacts Assessment Update, Penn State University

What does this mean to YOU?

Changing climatic conditions, in particular the decline in water availability, are forcing farmers to continually adapt their agricultural production. Changes in the availability and quality of land, soil, and water resources, for example, are reflected in crop performance, which causes food prices to rise.

Did you know?

The Hardiness Zone map, used by gardeners to determine which plants are most likely to thrive at a given location, has recently changed. The increase in zone allows for an expanded palette of plants that gardeners can reliably grow in this area. The data also solidifies the reality of climate change, suggesting even greater unpredictability with regard to future weather patterns.



Forests

Anticipated changes in the climate of Pennsylvania are likely to alter forest ecosystems.

A general northward shift of species' ranges will occur, species also will likely shift upslope to higher elevations. For example, birch and aspen trees are likely to decrease as they shift northward. On the other hand, oaks, hickories and silver maple will find more suitable conditions and increase in abundance.

Climate change also alters the life cycles of plants and animals. For example, as temperatures get warmer, many plants are starting to grow and bloom earlier in the spring and survive longer into the fall. Some animals are waking from hibernation sooner or migrating at different times, too.

The warming climate will cause certain species to become increasingly stressed. The number of trees dying will increase.

The state's forest products industry will need to adjust to a changing forest resource. The industry could benefit from planting faster-growing species and from salvaging dying stands of trees. Substantial investments in artificial regeneration may be needed if large areas of forests begin to die back due to climate-related stress.

Source: Pennsylvania Climate Impacts Assessment Update, Penn State University

What can you do?

Just like people, plants and animals will have to adapt to climate change. Many types of birds in North America are already migrating further north as the temperature warms. People can help these animals adapt by protecting and preserving their habitats with native plants.

Water Resources

Climate change is affecting where, when, and how much water is available for people to use. Many parts of the world already have very little water and an increasing population, and climate change could make this problem worse. Rising temperatures, changing precipitation patterns, and increasing droughts will affect the amount of water in lakes, rivers, and streams, as well as the amount of water that seeps into the ground to replenish ground water.

PA Projections:

Precipitation
Increase in winter precipitation. Small to no increase in summer precipitation. Potential increase in heavy precipitation events.

Snow pack
Substantial decrease in snow cover extend and duration.

Runoff
Overall increase, but mainly due to higher winter runoff.

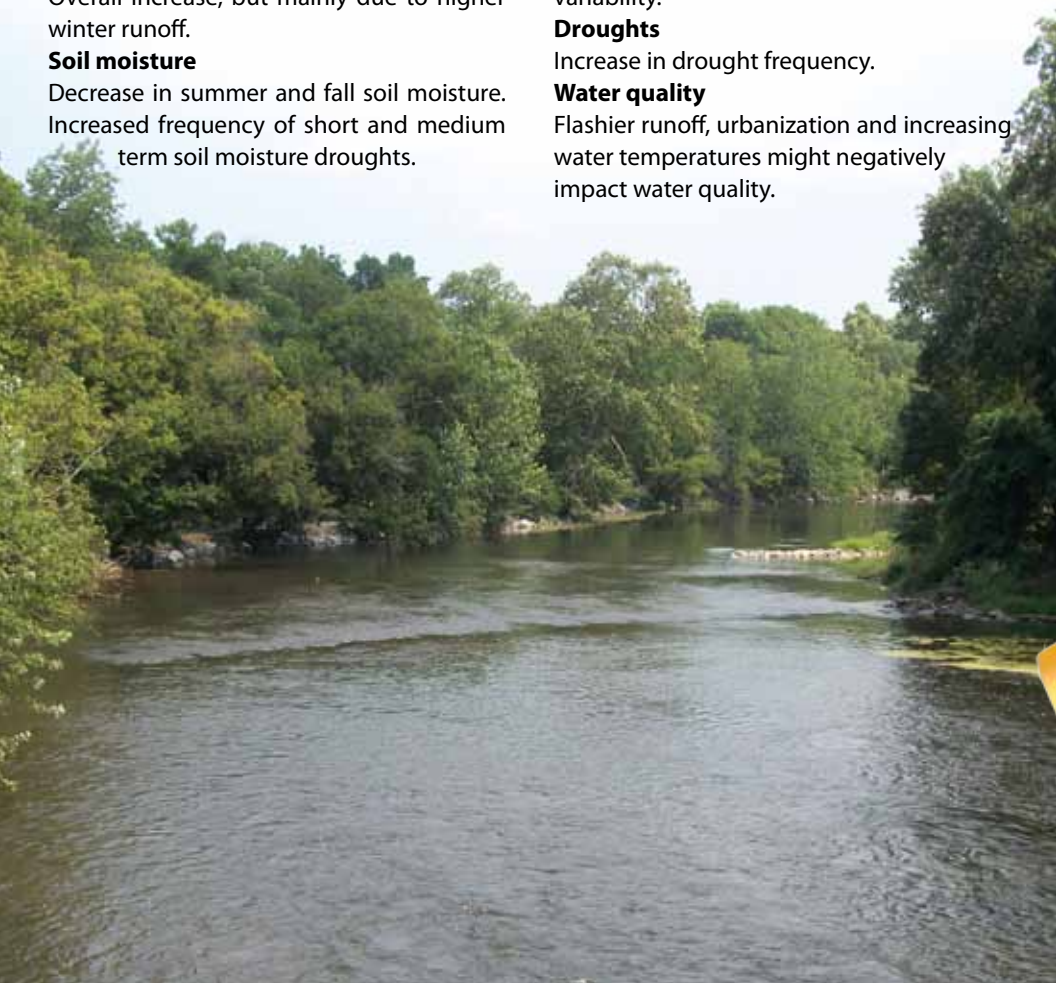
Soil moisture
Decrease in summer and fall soil moisture. Increased frequency of short and medium term soil moisture droughts.

Groundwater
Potential increase in recharge due to reduced frozen soil and higher winter precipitation when plants are not active and evapotranspiration is low.

Floods
Potential decrease of rain on snow events, but more summer floods and higher flow variability.

Droughts
Increase in drought frequency.

Water quality
Flashier runoff, urbanization and increasing water temperatures might negatively impact water quality.



Air Quality

Certain kinds of air pollutants, like ozone, can make asthma and other lung conditions worse. Ozone found high in the atmosphere is called "good ozone" because it protects life on Earth from the sun's harmful ultraviolet rays. Ozone can also be found close to the surface of the Earth, where it is considered "bad ozone" because it's the main ingredient of smog and is harmful for people to breathe. Bad ozone forms during warm weather when pollution from vehicles, power plants and other sources heats up, making it hard for some people to breathe.

Particulate matter is the term for solid or liquid particles found in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Because particles originate from a variety of mobile and stationary sources (diesel trucks, woodstoves, power plants, etc.), particulate matter can be directly emitted or can be formed in the atmosphere when gaseous pollutants such as sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) react to form fine particles.

Climate change could increase the amount of bad ozone and particulate matter in the air because more ozone is created when the temperature is warm.

PA Facts:

Research on the impact of climate change on ozone and particulate concentrations is ambiguous. Warmer summer temperatures favor ozone and particulate creation. However, pollution concentrations depend on other factors as well, such as cloud cover, precipitation, and air mixing. New regulations about emissions such as the Clean Air Act, the reduction of coal power plants, and the increase of natural gas usage all cause a reduction of pollution.

Source: Pennsylvania Climate Impacts Assessment Update, Penn State University

In the News... 7/5/12

69 News/Associated Press

Pennsylvania DEP issues air pollution alert for Berks County

An air pollution alert is in effect for Berks County... Young children, the elderly and those with respiratory problems such as asthma should limit outdoor activities.

What does this mean to YOU?

Check the daily air quality forecast by looking in the newspaper, on TV, or on weather websites. Air quality alerts can also be found at www.airnow.gov. When ozone levels are high, you should be careful about exercising or working outdoors.

Wildlife & Habitat

According to the US Forest Service, there are a number of ways that climate change is beginning to impact wildlife. Temperature increases and changes in precipitation can directly affect species depending on their physiology and tolerance of environmental changes. Climate change can also alter a species' food supply or its reproductive timing, indirectly affecting its fitness. Understanding these interactions is an important step in developing management strategies to help species survive the changing climate.

Birds

Long-term changes in North American bird distributions show clear evidence of latitudinal shifts, with many species shifting their geographic distributions northwards over the past few decades.

Amphibians

Amphibian species with narrow tolerances for temperature and moisture regimes may be at heightened risk. Amphibians that rely on certain habitat types may be at most risk, for example those found in ephemeral ponds and streams which may dry before the annual reproductive cycle is complete.

Mammals

Some mammals have very specific climatic adaptations, such as requirements for snow, sea ice, or temperatures within a narrow range for hibernation. Most mammals will not be able to avoid the effects of climate change. They need places to hide, eat, drink, and breed, and in many cases these places are distinct and may change seasonally.

US Forest Service Climate Change Resource Center

Vector-borne Disease

Climate change might allow some infectious diseases to spread. As winter temperatures increase, ticks and mosquitoes that carry diseases can survive longer throughout the year and expand their ranges, putting more people at risk.

PA Facts:

Two vector-borne diseases of particular concern in Pennsylvania are Lyme disease and West Nile virus caused by the blacklegged deer tick and mosquito respectively. Recent research demonstrates that the distribution, prevalence and severity of outcomes associated with vector-borne disease can be influenced by climate, but that other factors play a larger role. Such factors include alteration and fragmentation of habitat, residential construction in the urban/wildland fringe that increases exposure of humans to vectors, and human influence on the availability of mosquito breeding sites play a larger role.

Source: Pennsylvania Climate Impacts Assessment Update, Penn State University

What does this mean to YOU?

Persons at greater risk for Lyme disease and West Nile disease are those who spend more time outdoors in areas where they can come into contact with ticks and/or mosquitos. Check yourself for ticks after spending time outdoors. Use insect repellents when you go outdoors. Take extra care during peak mosquito biting hours. Don't leave standing water around your house which is a breeding ground for mosquitos.

Visit the Berks County Conservation District's website for more about the West Nile Virus program in Berks County.

Prepare for Climate Change

Plants, Animals, and Ecosystems

Changes in climate can affect the types of plants that can grow in an area. Animals' food supplies, water, life cycles, breeding habits, and ranges will be affected, too.

Preserve Habitats

You can provide wildlife in your very own backyard with food, water, cover, and shelter for raising their young. t doesn't matter whether your "backyard" is an apartment balcony or a grassy meadow.

Severe Weather

Heavy storms are expected to become stronger with climate change. Heavy storms and flooding also affect people who live in floodplains near rivers.

Severe Storms and Hurricanes

Build houses that can withstand strong storms. Don't build in areas that are likely to flood.

Flooding

Plant flood–resistant crops and preserve wetlands and other places that can store water

Droughts

Plant crops and grasses that can handle drought. Landscape your yard with native plants can adapt to the changing climate. Use water–efficient appliances and fixtures in your home.

Health

Heat Waves

Set up warning systems to alert people about heat emergencies. Make cities "cooler" by planting more trees and creating more parks.

Diseases

Make sure you get proper health care and vaccines. Know the symptoms of diseases like Lyme disease, and seek immediate medical attention if you suspect a problem.

Air Pollution and Allergens

Check the daily air quality forecast in the newspaper, on TV, or at www.airnow.gov. Limit outdoor exercise when air pollution is high.

What You Can Do?

Green your commute.

Transportation causes alot of greenhouse gas emissions, so walk, cycle or take transit whenever you can. You'll save money and get into better shape! If you can't go car-free, try carpooling or car sharing, and use the smallest, most fuel-efficient vehicle possible.

Be energy efficient. Change light bulbs to LEDs. Unplug computers, TVs and other electronics when not in use. Wash clothes in cold or warm (not hot) water. Dryers are energy hogs, so hang dry when you can. Install a programmable thermostat. Look for the Energy Star® label when buying new appliances.

Trim your waste. Garbage buried in landfills produces methane, a potent greenhouse gas. Keep stuff out of landfills by composting kitchen scraps and garden trimmings, and recycling paper, plastic, metal and glass. Let store managers and manufacturers know you want products with minimal or recyclable packaging.

Use Less Heat and Air Conditioning. Adding insulation to your walls and attic, and installing weather stripping or caulking around doors and windows can lower your heating costs more than 25 percent, by reducing the amount of energy you need to heat and cool your home.

Plant a Tree. If you have the means to plant a tree, start digging. During photosynthesis, trees and other plants absorb carbon dioxide and give off oxygen. They are an integral part of the natural atmospheric exchange cycle here on Earth, but there are too few of them to fully counter the increases in carbon dioxide caused by automobile traffic, manufacturing and other human activities. A single tree will absorb approximately one ton of carbon dioxide during its lifetime.

Buy locally grown and produced foods. The average meal in the United States travels 1,200 miles from the farm to your plate. Buying locally will save fuel and keep money in your community.

Keep your car tuned up. Regular maintenance helps improve fuel efficiency and reduces emissions. Check your tires to make sure they're properly inflated.

Want to get more involved?

Become a member of Berks Conservancy at www.berks-conservancy.org.
Sign up for e-news at www.berks-conservancy.org. Join us on Facebook!

STATE OF THE **ENVIRONMENT** ADDENDUM

BERKS CONSERVANCY

25 North 11th Street
Reading, PA 19601
Phone 610-372-4992
Fax 610-372-2917
info@berks-conservancy.org
www.berks-conservancy.org

Download the series of State of the Environment publications at www.greenberks.com.