



Climate Change Adaptation Program

Frequently Asked Questions

March 2018

1. What climate change impacts are anticipated for Philadelphia?

Anticipated impacts from climate change in Philadelphia include more rain, extreme storms, higher air temperatures, rising sea levels, and possibly increased drought. Philadelphia is already experiencing many of these impacts and scientists expect these changes to increase in severity and magnitude within the coming century.

To learn more about the specific impacts Philadelphia may see due to climate change, check out these two reports from the Philadelphia Office of Sustainability:

[Useful Climate Information for Philadelphia: Past and Future](#)
[Growing Stronger: Towards a Climate-Ready Philadelphia](#)

2. How will rising sea levels affect Philadelphia?

Philadelphia is not as close to the Atlantic Ocean as other Northeastern US cities such as New York and Boston. However, the Schuylkill River below Fairmount Dam and the Delaware River along the Philadelphia border are tidal. Increasing sea level in the Atlantic Ocean is likely to increase sea level in the Delaware Bay and ultimately increase the elevations of high tide and low tide in the tidal Schuylkill River and the Delaware River that borders Philadelphia.

3. How may anticipated climate change impacts affect the drinking water, wastewater and stormwater services provided by the Philadelphia Water Department?

Philadelphia Water Department (PWD) provides clean, safe drinking water, wastewater treatment and stormwater management to all residents and businesses within Philadelphia County. All of the services PWD provides are anticipated to be impacted by climate change in one or more ways. A few examples of these impacts are listed below and more information can be found online: [PWD Statement on Climate Change](#).

- **Higher air temperatures** – Increased air temperatures naturally raise the temperature of water bodies, which can accelerate bacteria growth and deplete the oxygen supply for aquatic life. Warmer surface water temperatures can also have implications for the drinking water treatment process.
- **Sea level rise** - As sea level rises, the mixing zone between freshwater from the Delaware River and saltwater from the Delaware Bay could move upstream towards the PWD drinking water intake,

challenging the drinking water treatment process. Sea level rise coupled with extreme storms are expected to increase flooding and coastal erosion.

- **Increased Rain and Extreme Storms** – Increased rain and storm intensity leads to more stormwater runoff which affects the quality of the drinking water supply, stresses the drainage system and erodes streambanks. Severe weather may also lead to increased flooding; threatening aging infrastructure, critical facilities and private property.

4. What is PWD doing to reduce carbon emissions and mitigate the impacts of climate change?

In addition to planning for climate change impacts, PWD is working to reduce carbon emissions and mitigate (lessen) the impacts of climate change by improving energy efficiency through its Energy Strategy. Providing drinking water, wastewater and stormwater services is energy intensive. The PWD Energy Strategy is designed to make our infrastructure more resilient, increase energy independence, and reduce costs while supporting the City of Philadelphia's [Municipal Energy Master Plan](#). By increasing efficiency, recovering resources typically thought of as waste and harvesting energy from renewable resources, PWD will play a large role in achieving Philadelphia's citywide goal of reducing greenhouse gas emissions 80 percent by 2050. [Learn more on the Energy and Resource Recovery webpage](#).

5. How is PWD planning for climate change impacts?

PWD created the Climate Change Adaptation Program (CCAP) in 2014 to better understand the impacts that climate change will have on the drinking water, waste water and stormwater systems. The goal of the program is to reduce the exposure to and associated expenses from climate change impacts by identifying and implementing effective, achievable adaptation strategies. The CCAP is using a risk assessment process based on the best available science to identify vulnerabilities and develop adaptation strategies that will be integrated into existing programs, inform major investments and guide operational and design standards.

6. What else does PWD plan for?

PWD has dedicated teams of engineers and scientists committed to planning initiatives that increase the short and long-term resilience of the drinking water, wastewater and stormwater systems. Effective planning requires an understanding of historical and existing conditions in order to anticipate future needs. PWD engages in planning to protect the region's water resources and ensure the functioning and reliability of our infrastructure systems while providing the highest level of service to our customers. Examples of existing planning efforts include the following:

- **Source Water Protection Program (SWPP):** The SWPP takes a holistic approach to developing a thorough understanding of Philadelphia's water supply characteristics. SWPP employs a wide range of tools including research projects, regional partnerships, outreach and education and on-the-ground implementation and monitoring to achieve, if not exceed, source water protection goals.
- **Innovative Stormwater Management:** The Green City, Clean waters program is PWD's 25-year plan to transform the health of the City's creeks and rivers through land-based approaches. By

implementing green stormwater infrastructure projects such as rain gardens and stormwater planters, the City can reduce water pollution impacts while improving essential natural resources and making neighborhoods more beautiful.

- **Infrastructure Planning:** Long-term plans for the aging water and wastewater infrastructure evaluate the need for rehabilitation and replacement of assets. These efforts also anticipate potential future conditions, including environmental, policy and regulatory changes that will inform the planning and design of critical infrastructure.
- **Strategic Energy Planning:** Through the Energy Management Program, PWD is planning for and implementing projects to reduce energy consumption and generate renewable energy at PWD wastewater treatment plants.
- **Capital Planning:** The ongoing planning and budgeting of major infrastructure projects is a core component of PWD's planning efforts. PWD has an established capital planning process that provides a framework for submitting project proposals, evaluating project alternatives and ultimately recommending projects for design.

7. How is climate change adaptation planning a function of infrastructure planning?

Providing safe drinking water, treating wastewater and managing stormwater requires a considerable amount of infrastructure. PWD has over 3,000 miles of water mains, over 3,500 miles of sewer pipes, over 75,000 stormwater inlets, over 20 pumping stations, 12 finished water reservoirs and storage facilities, three wastewater treatment plants, three drinking water treatment plants and more! Maintaining, upgrading and replacing city water infrastructure is paramount to everything we do. PWD infrastructure is designed to last a long time so considering the long-term impacts of climate change when designing projects is extremely important.

The CCAP is currently determining approaches to work within existing frameworks to ensure that climate change impacts are considered during the planning and design of infrastructure projects.

8. Why does PWD invest in long-term planning efforts?

PWD invests in long-term planning efforts to ensure carrying out the mission to provide high levels of service—clean, safe drinking water and environmentally progressive wastewater and stormwater services—to current customers and future generations. Planning for future environmental conditions has been, and will continue to be, a focus of PWD water resource planning efforts. As previously mentioned, PWD assets provide critical services and are built to last a long time. PWD is committed to using the smartest, most responsible way of investing in long-term planning for critical assets.

9. Is planning for climate change required by our state and/or local government?

Climate change planning is not required at the state or local level. However, Philadelphia's government recognizes that climate change poses risks to the city, and officials have already prioritized the need for climate change planning to mitigate these risks. The Office of Sustainability (OOS) is leading climate change planning in Philadelphia, with multiple reports already published to address the issue.

Philadelphia's first climate change adaptation plan, [*Growing Stronger: Toward a Climate Ready Philadelphia*](#), was released in November 2015.

The OOS also runs the the Greenworks program, which serves as the City of Philadelphia's sustainability plan, first launched in 2009. Its initial phase concluded in 2015. To view Greenworks reports released between 2009 and 2015, visit [*Greenworks Progress Reports*](#). In 2016, the Office of Sustainability conducted public outreach and research in cooperation with local residents, government, and business partners. The resulting [*Greenworks Vision*](#) document refreshes the goals of the City's long-term sustainability plan and has eight visions; vision number four is "All Philadelphians are prepared for climate change and reduce carbon pollution." In February 2018, the OOS published the [*Greenworks Review*](#) (2018), a magazine style report highlighting Philadelphia's progress towards the Greenworks visions and an accompanying [*Greenworks Initiatives Update*](#).

PWD is committed to working with the OOS, other city agencies, partners, stakeholders, scientists, industry experts and officials from all levels of government to further climate change planning efforts. Additionally, there are many aspects of PWD services that are regulated by state and/or federal governments and that may be impacted by climate change moving forward. For example, the quality of drinking water in Philadelphia meets or exceeds what is required by the Pennsylvania Department of Environmental Protection and the Environmental Protection Agency. PWD complies with the Safe Drinking Water Act, Clean Water Act and other regulations that work together to ensure that PWD services remain of the highest quality. Climate change has the potential to make it more challenging for PWD to meet these regulatory requirements, which is why ongoing PWD planning initiatives and development of adaptation strategies are critical programs.

10. Are we worried about the current political environment in our country?

PWD's mission - to plan for, operate and maintain the infrastructure and organization necessary to supply high quality drinking water and to sustain and enhance the region's watersheds and quality of life by managing wastewater and stormwater effectively – is not a political one. In order to carry out this mission, PWD relies on the best available science and engineering to effectively operate and manage risks on a daily basis. Climate change poses a set of risks that need to be managed just like any other.

11. What metrics are we using to measure the impacts of climate change?

PWD regularly incorporates decades of historical data into decision-making and takes into consideration observed data trends to inform planning, engineering and technology decisions. To measure the impacts from climate change, PWD will continue to closely monitor environmental factors that influence and inform operations and management strategies. As an example, over time Philadelphia residents may be able to observe sea level rise along the Delaware River. In addition to tracking Delaware River water elevations, PWD will also be tracking streamflow, groundwater, precipitation, water and air temperature data that are collected at multiple locations in the region. The regional monitoring and data networks are extensive and are critical tools that PWD, partner utilities and agencies utilize to make informed day-to-day operating decisions, as well as observe the climate in Philadelphia and Southeastern Pennsylvania.

11. How does PWD's Green city, Clean Waters Program relate to climate change adaptation?

Green City, Clean Waters is a 25-year multi-billion-dollar program, to implement green stormwater infrastructure and improve water quality in the many tributaries in Philadelphia. Green stormwater infrastructure captures and infiltrates stormwater runoff, which improves the health of Philadelphia tributaries and rivers. The use of plants, trees, soils and natural processes to capture and absorb stormwater runoff helps cities adapt and build resiliency to climate change by:

- Reducing the urban heat island effect by adding trees and plants to our neighborhoods
- Recharging groundwater reserves
- Absorbing carbon dioxide, a greenhouse gas which contributes to climate change, from the atmosphere
- Naturally filtering and cleaning stormwater runoff that would have entered our sewer system to be cleaned at a wastewater treatment plant

More information about *Green City, Clean Waters* may be found online at www.phila.gov/water.