



# The Delaware Estuary Climate Ready Pilot Study



Fact Sheet  
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**What is the Climate Ready Estuary Initiative?** Natural resources in the Delaware Estuary will be impacted by climate change. The Partnership for the Delaware Estuary (PDE) has partnered with U.S. EPA to begin developing a climate adaptation strategy, as one of six national pilots taking part in the Climate Ready Estuaries Initiative. PDE will work with collaborators in the watershed to start evaluating the vulnerability of example resources that are likely to be most at risk. The climate adaptation strategy will also furnish recommendations about how to prioritize what can and should be done to monitor, protect or otherwise safeguard the most valuable and vulnerable features. This effort will provide new guidance on monitoring and management actions and policies that may help sustain maximum “natural capital” for life-sustaining natural resources in the Delaware Estuary.

**How will the Climate Adaptation Project proceed?** PDE will work with partners to first assess the vulnerability and adaptation needs for up to three critical “case study” resources in the Estuary: tidal wetlands, drinking water and bivalve shellfish. For each case study, activities may include:

- Inventorying potential climate impacts to the case study resources,
- Performing data gap analyses and risk assessment for case study resources,
- Prioritizing concerns relative to the degree of potential risk,
- Outlining an “early detection” monitoring framework to watch for warning signs of key response variables and thresholds, and
- Identifying management actions to help mitigate for potential climate impacts.

**Why were drinking water, tidal wetlands and shellfish selected as case studies?** These natural resources were selected because they are important for the vitality of both people and the environment and because current scientific judgment suggests that they may be particularly at risk from climate because of threats imposed by increased salinity and sea levels. More information on these cases studies follows.

- 1) **Tidal Wetlands** (Habitat Case Study). Extensive tidal marshes line much of the Delaware Estuary where they play a pivotal role in preserving water quality, preventing flooding, and supporting fish and wildlife species. Currently, the health of these tidal marshes appears to be compromised over much of the region. Tidal marsh extent and condition are affected by sea level, salinity, temperature, freshwater inputs, sediment supply, tidal flooding, and the physical characteristics of the landscape. Climate change is expected to lead to increased storm energy, increased rates of sea level and salinity rise, decreased sediment supply, and increased erosion. Hence, the loss and deteriorating health of this hallmark feature of the Delaware Estuary is a major concern of PDE our partners.



- 2) **Drinking Water** (Human Impacts Case Study). The Delaware Estuary and its watersheds provide drinking water for about 16 million people. Much of this is derived from water intakes from the tidal freshwater portion of the Delaware River where sea level and salinity rise from climate change, combined with other potential shifts in freshwater-seawater balance in the watershed, may pose a threat. Population growth, development, land subsidence, freshwater diversions, channel deepening and salt water intrusion into aquifers may also affect drinking water more broadly across the region. The vulnerability of drinking water supplies to various combinations of these factors is not well known.
- 3) **Bivalve Shellfish** (Living Resource Case Study). Freshwater and estuarine bivalves represent some of our best sentinel indicators of ecosystem conditions. Where they are still abundant they also furnish important ecosystem services by forming complex habitats, stabilizing the bottom, and filtering water. A few species are commercially (and historically) important, most notably oysters which still support a multi-million dollar industry despite being depleted in numbers. Hence, bivalve shellfish are living resources having high natural capital value in the Delaware Estuary. Increased salinity and temperature, altered water quality, increased storm intensity and altered weather patterns may all affect these resources in various ways, including indirect factors such as disease and non-native species introductions.

**Where is Climate Ready Estuaries being implemented?** The geographic scope will include the Delaware Estuary and its watershed, focusing on the lower half that includes the Schuylkill Valley and lower mainstem Delaware River.

**Who is involved?** Collaborators are still being identified, but examples include representatives from: the Academy of Natural Sciences, Delaware River Basin Commission, Drexel University, Pennsylvania State University, Philadelphia Water Department, Rutgers University, U.S. EPA, U.S. Geological Survey and University of Delaware. A Climate Change Workgroup is being formed affiliated with the PDE Science and Technical Advisory Committee.

**What will the final product of the Climate Ready Estuaries Initiative look like?** A Climate Adaptation Report will be developed by PDE summarizing the vulnerability, monitoring needs, and potential actions that can be taken to sustain the “natural capital” associated with the three case studies. Risk assessments will include various types of values associated with these resources, the potential risk of loss of value due to climate change, and the approximate cost of monitoring or management actions that might be warranted to track and potentially mitigate for forecast climate change effects. Maps will be generated to show the locations of the vulnerable resources.

**How do I get more Information?** If you are interested in becoming involved with this project or would like to learn more, please check out our website or contact the Partnership, [OManager@DelawareEstuary.org](mailto:OManager@DelawareEstuary.org), or by phone at (800) 445-4935.



*The Partnership for the Delaware Estuary, a National Estuary Program based in Wilmington, leads collaborative and creative efforts to protect and enhance the Delaware Estuary, and its tributaries for current and future generations. We envision everyone working together to make the Delaware Estuary the most inviting, prosperous and healthy natural recourse of its kind in the nation*