

The Delaware estuary: tracking changes to assess human impacts and the effects of climate change

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The Delaware River is a living, working river providing a corridor for commerce and vital living resources. The Partnership for the Delaware Estuary recently released the "State of the Estuary 2008" report which tracks the progress made in implementing the long-term "Delaware Estuary Comprehensive Conservation and Management Plan". The report provides environmental indicators with a status rating and a trend. Usually five years of data are evaluated to establish trends, and if longer term data are available, they are considered in 5-year increments. Recommendations are provided in the form of "Actions and Needs". Some of the indicators are: population, water use patterns, land use, water quality health, natural resources, tidal wetlands and salinity. There has been little recent trend in overall water quality, but there are improvements in oxygen and nutrients. One of the unique features of the Estuary is the freshwater tidal marshes. Although less than 5% of the freshwater tidal marshes remain, they are an ecologically significant feature of the urban corridor. Some living resources such as bald eagles and blue crabs have upward trends, while others are declining, such as Atlantic sturgeon. The possible effects of climate change are included. Accelerating sea level rise, combined with natural subsidence are already threatening the tidal marshes of the Estuary. The upward trend in extreme weather events could have significant impacts as well. Although some potential indicators of climate are expected to change gradually, some biological and ecological responses could be sudden if critical thresholds are passed. An ecosystem-based monitoring approach, predictive modeling and regional coordination are necessary for future sustainability of crucial ecosystem goods and services in the Delaware Estuary.