

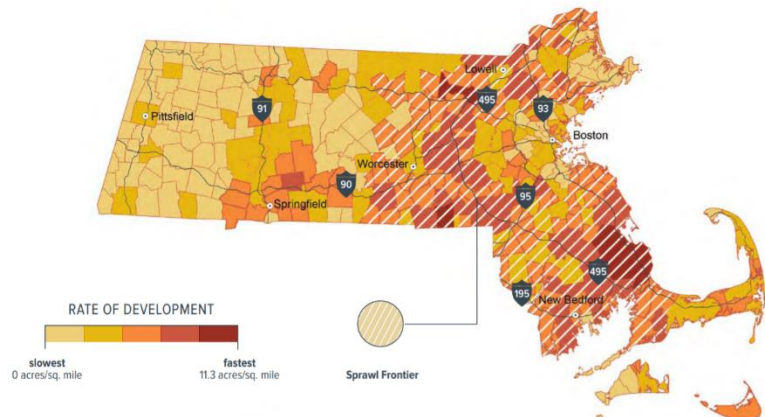
# INTEGRATING ECOSYSTEM SERVICES into LAND-USE DECISION MAKING in the NARRAGANSETT BAY WATERSHED

## What Are Ecosystem Services—and Why Should We Care?

Ecosystem services are the human benefits that nature provides, like clean air and water, flood protection, and opportunities for recreation.

Mass Audubon's *Losing Ground* report emphasizes that as of 2017, over half of the land in Massachusetts has not

yet been either protected or developed. The dual threats of sprawling development and climate change also present opportunities to take a proactive approach to land use planning in our local communities, working towards a strong economy and a safe, healthy environment.



## The Narragansett Bay Watershed

Home to almost 2 million people and providing valuable ecosystem services, the 1,705 square-mile Narragansett Bay Watershed defines the identity of Rhode Island, and 60% of the watershed is located in Massachusetts. The Narragansett Bay Estuary Program's 2017 *State of the Narragansett Bay and its Watershed* report found that in recent decades, successful investments in wastewater treatment have cut nutrient pollution in the Bay in half. Now the challenges lie in addressing other pollution sources (primarily runoff from paved surfaces), protecting natural lands, and adapting to climate change.

## What We're Doing

The ecosystem services of the Narragansett Bay Watershed contribute both to the economy and to human wellbeing. Ecosystem services underpin key economic sectors in the Watershed such as tourism, fishing, and shellfishing; support water quality in the Bay; provide climate regulation; and protect local communities from floods and droughts.



Map by The Narragansett Bay Estuary Program (NBEP)

This collaborative project has several components.

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## 1. Quantify the economic impact of key industries in the Watershed and assess how future land development and climate change may impact them.

The Narragansett Bay Watershed Economy project conducted by the University of Rhode Island's Coastal Institute has compiled data on 13 key industries in the Narragansett Bay Watershed. The tourism industry is the single largest contributor to the economy and employment in the region, and healthy ecosystems are fundamental to its continuing success.



13 key industries



\$14+ billion in revenue and expenditure



97,000+ full and part-time jobs

## 2. Create scenarios to illustrate how future land use choices affect ecosystem services, particularly in terms of water quality in the Bay.

Harvard Forest's New England Landscape Futures Explorer models four potential development scenarios, including "Connected Communities" and "Growing Globally," with 46% and 22% of forest cover across the Watershed in 2060, respectively. Under these scenarios, the Natural Capital Project at Stanford University modeled the pollution retention benefits of lands in the Narragansett Bay Watershed for their impact on water quality, using a tool called InVEST.

The Natural Capital Project also evaluated the willingness of people in the Watershed to pay for the improvement in water quality to the level achieved by the recent wastewater treatment plant upgrades. It was estimated that on average, a household was willing to contribute between \$45 and \$60/year, for a total value between \$38 and \$51 million.

**Under the "Growing Globally" scenario, the gains in water pollution that have been achieved in the Narragansett Bay in recent years could be put at risk. The model predicted that without large investments in new wastewater treatment infrastructure, water quality would decline under that scenario due to a significant increase in bacteria levels.**

## 3. Ecosystem Services values

Our set of five fact sheets highlights the value of services provided by Forests, Coastal areas, Wetlands & Waterways, Grasslands & Farmland, and Urban Green Space. We also gathered information from dozens of technical articles on ecosystem services values relevant to New England.

## Project Applications

A key challenge for the Narragansett Bay Watershed is to sustain a vibrant economy while protecting the environment and the free benefits nature provides. This project is providing community leaders in Massachusetts and Rhode Island with information and tools necessary to implement targeted conservation and development.

Learn more at [massaudubon.org/valueofnature](http://massaudubon.org/valueofnature)



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