

# Narragansett Bay Watershed

## THE VALUE OF AN ECOSYSTEM

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**OUR NATURAL SYSTEMS PROVIDE MYRIAD GOODS** and services, but we often don't think about exactly how valuable those goods and services are to our economy and society.

We instinctively recognize cleaner water to play in, better fishing, and less flooding as contributions to well-being. Yet one challenge embedded in valuing the benefits from our natural systems is putting a price on these benefits—while some benefits are market based (for instance, the economic contribution from fisheries), other non-market benefits are more difficult to monetize because they aren't bought in a store and don't have a clear price (such as the habitat protection from wetlands). When we don't understand the values of the benefits of natural systems, we give them a de facto value of zero because we simply leave them out of the equation.

Rhode Island is a small state if evaluated by square miles or population, yet not if measured by natural assets. One perfect illustration is the Narragansett Bay watershed, a vibrant ecological system that provides many benefits to the surrounding communities and their residents and visitors alike. Ecologists and economists frequently use the term “ecosystem services” to refer to the benefits that natural systems provide; this

definition, at its core, links the underlying ecological processes of nature with economic and social well-being. These benefits include provision of food (fish and shellfish), protection of coastal areas from natural hazards, regulation of waste and improved water quality, habitat for countless species, and a place for recreation and relaxation. Some of these benefits are easier to capture than others. For instance, according to the National Oceanic and Atmospheric Administration, saltwater recreational fishing contributes \$300 million to the state's economy. Other non-market benefits are harder to value and require further study to understand the implications of management decisions.

At the same time, estuaries (like other natural systems) around the country face ongoing stressors—namely increased populations, associated development pressure, and complications from a changing climate. Community well-being is directly tied to the health of natural systems, and a feedback loop exists where increased pressure on these natural systems may decrease the very thing that communities value in the first place. We've witnessed these phenomena up and down the East Coast as excess nutrients, such as nitrogen from wastewater, have wreaked havoc on our coastal systems, decreasing home values and collapsing once-thriving fisheries from Cape Cod to Long Island. This calls for thoughtful decision making and policy that account for economic trade-offs. For example, when policymakers recognize that economic gains from additional coastal development may be offset by economic losses from decreased fishery revenues, they may choose to limit or prohibit that development or require compensation for fishermen.

It is important for us to understand these impacts in Rhode Island. There are a number of large-scale and national studies that evaluate the importance of ecosystem services, but it is important to undertake ongoing local research. For instance, when pur-

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chasing a house, buyers look at comparable homes with similar characteristics in the same neighborhood that would influence the offer price. If you are looking to buy a home in Rhode Island, you are unlikely to look at a comparably sized home in Cape Cod or around the Chesapeake Bay to determine a reasonable offer price. Characteristics of the geography and surrounding communities matter. National averages provide useful information to highlight trends; however, nothing substitutes for local numbers when making local decisions and choosing investments.

Given the importance of ecosystem services to economic and social well-being, we need to understand the values of our natural systems and integrate them into local decisions and policies.

To that end, a new study has been launched by an interdisciplinary team of researchers at the University of Rhode Island and Clark and Stanford universities to provide new information for decision makers to enhance their ability to take into account the value of a wide range of benefits from the Narragansett Bay watershed and its neighboring estuaries.

The study has three specific objectives: to identify and quantify the economic impacts of the Narragansett Bay watershed and their importance to sustained economic development; to estimate the value of ecosystem services that the bay and its watershed provide using an economic framework and methods; and to simulate the impact of future policy scenarios on ecosystem benefits and services and present recommendations of effective investments to maintain and enhance those benefits.

In 2015, the Office of Management and Budget directed federal agencies to “include ecosystem services into planning and decision making.” This new study, along with the work of Rhode Island researchers and decision makers who have extensively studied the Narragansett Bay watershed and its natural systems, may well provide data to federal agencies whose work and regulations impact the bay. These experts may “communicate up” to those agencies about the importance of protecting this vital resource and improving its future health and that of the municipalities and economy that rely on it.