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The Economic Case for Restoring Coastal Ecosystems

By Michael Conathan, Jeffrey Buchanan, and Shiva Polefka April 2014

Introduction and summary

As America's coastal cities expanded throughout the 19th century, the wetlands were often considered a nuisance that stood in the way of progress and development. Marshy areas seemed little more than endless founts of pesky insects or quagmires blocking access between drier uplands and navigable waters. As cities outgrew their dry land footprints and sought additional space to grow, the obvious answer was to simply turn the wet places into dry places. Today, these regions—from Boston's Back Bay to New York's Wall Street to Miami's South Beach—comprise some of the most valuable real estate in the world.

We are increasingly learning the cost of losing landscapes once thought to be valueless. The wetlands ecosystem provided numerous services to society that we now are beginning to sorely miss. Sea levels continue to rise and the increasing frequency of extreme weather threatens our shores.¹ Many of our commercial and recreational fisheries are struggling to rebuild to sustainable levels.² Population growth continues to generate more pollution, including carbon dioxide. Coastal wetlands are perhaps nature's most effective solution to these problems.

The loss of wetlands is a human-caused problem, and we have the capacity to reverse this trend with smart, targeted investments. In addition to obvious environmental benefits, these investments provide economic returns in two categories. First, coastal restoration investments create jobs and stimulate spending. Second—but less studied—healthy, restored ocean and coastal wetlands ecosystems provide enhanced economic value.

On the issue of employment, for example, economists with the National Oceanic and Atmospheric Administration, or NOAA, have found that \$1 million invested in coastal restoration creates 17.1 jobs on average.³ This compares to job growth from industrial coastal activities, such as oil and gas development, in which \$1 million of investment creates an average of just 8.9 jobs.⁴

The economic contribution of these activities, however, does not stop when workers lay down their shovels. In this report, the Center for American Progress and Oxfam America delve into the second economic metric—the ongoing economic contributions provided by healthy, restored coastal ecosystems such as wetlands, seagrass beds, and oyster reefs. An analysis of three federally funded projects reveals that investing in well-designed coastal restoration can be highly cost effective, returning significantly more than the cost of the restoration project. Averaging the benefit-cost ratios across the three restoration projects studied, each dollar invested by taxpayers returns more than \$15 in net economic benefits.

These benefits include buffering storm surges; safeguarding coastal homes and businesses; sequestering carbon and other pollutants; creating nursery habitat for commercially and recreationally important fish species; and restoring open space and wildlife that support recreation, tourism, and the culture of coastal communities. The benefits are not simply environmental; they are economic and social as well. They are particularly salient in lower-income communities, where individuals frequently rely on fisheries for employment and sustenance and lack the resources to construct costly—and frequently less effective—manmade flood barriers or water treatment facilities.

In order to determine just how valuable these benefits might be, the Center for American Progress and Oxfam America collaborated with a research team at Abt Associates—a consulting firm based in Cambridge, Massachusetts—to identify and analyze 3 coastal restoration sites of the 50 that NOAA funded through the American Recovery and Reinvestment Act of 2009, or ARRA. Abt produced a detailed economic analysis⁵ of three sites on three different coasts that could exemplify the potential economic benefits of coastal restoration. They are an oyster reef and sea grass restoration project in the Seaside Bays of Virginia, an oyster reef project in Mobile Bay, Alabama, and salt marsh restoration in San Francisco Bay, California.

In two of the sites—the San Francisco Bay Salt Ponds and Virginia Seaside Bays—the ecosystem restoration showed highly positive returns in ecosystem-service-related benefits relative to each project’s cost at levels well above the economic output and job creation stimulated by project spending. The third site, an experimental oyster reef recovery project in Mobile Bay, did not produce sufficient data to soundly estimate the value of the ecosystem services.⁶

The reasons for this lack of data include the scarcity of sufficient long-term research into this form of restoration, as well as the disastrous BP Deepwater Horizon oil spill and other environmental factors, which set back oyster recruitment in the project’s artificial reef structures. Although this study is unable to fully assess Mobile Bay’s ecosystem services contributions, the project’s implementation created high employment for the amount of money invested, yielding jobs that were accessible to low-income, natural-resource-dependent workers. As a result, the project provided valuable return on investment above the project’s cost, in a region hit hard by both the financial crisis of 2009 and the BP Deepwater Horizon oil spill of 2010.

Overall, the CAP and Oxfam analysis found that the combined economic output from project spending and the long-term ecosystem service benefits in these three locations outweigh the cost of investment by more than 15 to 1.

TABLE 1
Economic benefits of coastal ecosystem restoration at three sites

	NOAA Recovery Act Investment project cost*	Total economic output from spending on project**	Lifetime value of benefits provided by restored ecosystem	Benefit-cost ratio
San Francisco Bay Salt Ponds	\$8.27 million	\$8.07 million	\$68.9–\$220M	18.45
Virginia Seaside Bays	\$2.35 million	\$2.57 million	\$34.9–\$84.8M	26.56
Mobile Bay, Alabama	\$3.18 million	\$3.46 million	Insufficient data	1.08
				Average: 15.36

Note: All values in 2013 U.S. dollars. Lifetime value of benefits provided by restored ecosystem excludes economic output from project spending. In the benefit-cost ratio, benefits equal output plus midpoint of ecosystem benefits. The Mobile Bay study produced an estimate of \$0.2-0.3 million in ecosystem service benefits, but given the insufficient monitoring time, the limited number of other valuation studies for some of ecological benefits involved, and to be conservative in our valuations we counted this value as \$0 for the sake of determining our summary benefit-cost ratio.

Source: *National Oceanic and Atmospheric Administration, "Restoration Atlas: Marine and Coastal Habitat Restoration Projects Funded Under the American Recovery and Reinvestment Act," available at http://www.nmfs.noaa.gov/habitat/restoration/restorationatlas/recovery_map.html (last accessed March 2014). Values adjusted to 2013 U.S. dollars via Bureau of Labor Statistics' CPI Inflation Calculator; **C. Coyle, "Job Creation through Coastal Restoration: An analysis of projects funded under the American Recovery and Reinvestment Act of 2009." Unpublished IMPLAN analysis (2012); Lifetime value of benefits are the total present value, or TPV, estimates calculated assuming a 40-year project lifespan.

Of course, the economic benefits of coastal restoration enumerated in Abt’s final report have one disadvantage: They do not fit neatly into categories on the balance sheet of any one particular industry, corporation, or individual. Because of this, they have not been accounted for in coastal resource management decisions to date. Hopefully, the data discussed in this report will convince resource managers in federal, state, and local governments, as well as private-sector entities, to consider additional investments in coastal ecosystem restoration. This report and others have shown that these investments have clear benefits to communities and coastally dependent industries.

The following sections of this report will describe what coastal restoration projects entail and the methodology behind the findings about these three case studies. It will then move to an overall summary of the economic benefits of coastal restoration and a brief description of existing knowledge about the jobs created by NOAA's use of ARRA funds and the potential for additional employment benefits from the nearly 800 shovel-ready projects that could get underway tomorrow if adequate investment became available.

Finally, the report concludes with the following recommendations for future action:

- Federal, regional, and private-sector entities should increase their investment in coastal ecosystem restoration projects and fund ongoing monitoring of previously restored areas.
- Congress should enact and fund the National Endowment for the Oceans.⁷
- The state and federal agencies planning the use of funds from BP's fines resulting from the Deepwater Horizon disaster should focus on investing in ecosystem restoration projects that create employment for communities that were adversely affected by the disaster and support long-term ecosystem recovery.
- Federal, regional, state, and local coastal planners should give greater weight to natural solutions such as coastal wetlands restoration to protect at-risk developed areas.
- The Environmental Protection Agency, or EPA; U.S. Department of the Interior, or DOI; and NOAA should work with the Economic Development Administration and the U.S. Department of Labor, or DOL, to develop new pathways into ecosystem restoration careers in craft trades and science, technology, education, and math.
- NOAA or other partner organizations should seek funding to apply the evaluation techniques used in this report to the 47 other coastal restoration projects funded by the ARRA to broaden the scope of this analysis and provide a stronger foundation for future decisions.

President George H. W. Bush, recognizing these benefits, implemented a federal policy mandating there would be “no net loss” of coastal wetlands in the United States in 1989.⁸ Every president since has upheld this policy. But we are failing to achieve even this status-quo target. NOAA released a major report on the “Status and Trends of Wetlands in the Coastal Watersheds of the Conterminous United States” in 2004. That report found that 16 years after President Bush’s implemented this policy, the United States was losing its wetlands at the staggering rate of more than 59,000 acres per year.⁹

When NOAA released the updated version of this report covering the years 2004 to 2009 in February, the rate of coastal wetland loss in the United States had accelerated to more than 80,000 acres of coastal wetlands annually—equivalent to seven football fields disappearing every hour of every day.¹⁰ The aggregate result is that the United States lost an area of wetlands larger than the state of Rhode Island between 1998 and 2009.¹¹

Investing in coastal restoration is good policy. It is not just the right thing to do for the environment; it is the right thing to do for coastal communities, vulnerable coastal populations, and the U.S. economy. In the words of former NOAA Chief Economist Dr. Linwood Pendleton, “restoring degraded marine and coastal habitat is critical if America’s coasts and oceans are to reach their economic and ecological potential.”¹²

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