Boston Harbor cleanup was economically justifiable, finds new study

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A first-of-its-kind retrospective study concludes that environmental cleanup projects can provide high value to society, making them economically viable alternatives to coastal development projects. The analysis of Boston Harbor suggests the capitalized value of restored ecosystem services now stands at between $30 and $100 billion—far outweighing the $5 billion cleanup cost. Published in *Frontiers in Marine Science*, the study demonstrates that the post-cleanup value of healthy ecosystems and their associated benefits should be considered when evaluating options for coastal areas.

"The Boston Harbor cleanup led to a significant increase in private investment, and economic growth along the waterfront has outpaced the city's overall rate of increase," says Dr. Di Jin, lead author of the study from the Woods Hole Oceanographic Institution, USA. "This shows that we need to give more consideration to ecosystem service benefits when evaluating policy options."

Boston Harbor was infamous as 'the dirtiest harbor in America.' By the 1980s, heavy pollution from raw sewage and wastewater discharges had severely constrained recreational activity, affected marine habitat and left water quality poor. Following a court-ordered re-vamp in 1986, a new treatment plant was constructed and various cleanup projects were undertaken—which turned the filthy harbor into the 'Great American jewel' it is known as today.

The cleanup—which was never expected to be cost-effective—gave researchers a rare opportunity to retrospectively analyze the profitability of a completed environmental restoration.

"Most environmental cleanup cost-benefit analyses are for proposed future projects, using projected benefits rather than known outcomes," says Jin. "Decision makers consider the value of an area at the time of proposal, when the area is most polluted, rather than the value an unpolluted area could have post-cleanup."

By assuming polluted coastal areas offer little value to society, such analyses often lead to industrial or residential developments being favored over environmental cleanup projects.

Dr. Jin and colleagues wanted to demonstrate the importance of considering the environmental value of an area post-cleanup rather than pre-cleanup.

They studied the healthy ecosystem that Boston Harbor is today, compared to how it was at its most polluted when the original cost-benefit analyses were conducted.

To do so, the researchers developed an economic evaluation model based on the value of services that healthy ecosystems can provide to society. It works by considering each type of land cover in a study area—such as beaches, salt marshes and oyster beds in the case of Boston Harbor—and estimating the overall value that each ecosystem in the area can have. For example, the value of clean water includes being able to support fish stocks as well as coastal recreational activities.

Using the model, the researchers estimated the current ecosystem value of Boston Harbor at between $30 and $100 billion dollars.

"The costly project used almost 5 billion dollars of taxpayers' money," says Jin. "Yet this represents just 5%-16% of the total capitalized value of the ecosystem."

The authors hope their work highlights the potential benefits of environmental cleanup and ecosystem restoration.

"Pollution control and cleanup is a common challenge facing many urban harbors around the world," says Jin. "We hope that our study will provide useful information to decision makers and

the public facing similar decisions on the viability of ecosystem restoration projects."

More information: *Frontiers in Marine Science*, DOI: 10.3389/fmars.2018.00478 , https://www.frontiersin.org/articles/10.3389/fmars.2018.00478/full

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