

ID: W2783934012

TITLE: Quantifying Economic Value of Coastal Ecosystem Services: A Review

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ABSTRACT:

The complexity of quantifying ecosystem services in monetary terms has long been a challenging issue for economists and ecologists. Many case specific valuation studies have been carried out in various parts of the World. Yet, a coherent review on the valuation of coastal ecosystem services (CES), which systematically describes fundamental concepts, analyzes reported applications, and addresses the issue of climate change (CC) impacts on the monetary value of CES is still lacking. Here, we take a step towards addressing this knowledge gap by pursuing a coherent review that aims to provide policy makers and researchers in multidisciplinary teams with a summary of the state-of-the-art and a guideline on the process of economic valuation of CES and potential changes in these values due to CC impacts. The article highlights the main concepts of CES valuation studies and offers a systematic analysis of the best practices by analyzing two global scale and 30 selected local and regional case studies, in which different CES have been valued. Our analysis shows that coral reefs and mangroves are among the most frequently valued ecosystems, while sea-grass beds are the least considered ones. Currently, tourism and recreation services as well as storm protection are two of the most considered services representing higher estimated value than other CES. In terms of the valuation techniques used, avoided damage, replacement and substitute cost method as well as stated preference method are among the most commonly used valuation techniques. Following the above analysis, we propose a methodological framework that provides step-wise guidance and better insight into the linkages between climate change impacts and the monetary value of CES. This highlights two main types of CC impacts on CES: one being the climate regulation services of coastal ecosystems, and the other being the monetary value of services, which is subject to substantial uncertainty. Finally, a systematic four-step approach is proposed to effectively monetize potential CC driven variations in the value of CES.

SOURCE: Journal of marine science and engineering

PDF URL: <https://www.mdpi.com/2077-1312/6/1/5/pdf?version=1515515257>

CITED BY COUNT: 116

PUBLICATION YEAR: 2018

TYPE: review

CONCEPTS: ['Ecosystem services', 'Valuation (finance)', 'Recreation', 'Tourism', 'Environmental resource management', 'Ecosystem valuation', 'Multidisciplinary approach', 'Ecosystem', 'Business', 'Economics', 'Geography', 'Ecology', 'Political science', 'Ecosystem health', 'Biology', 'Archaeology', 'Finance', 'Law']