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The Good, the Bad, and the Algae: Perceiving Ecosystem Services and Disservices Generated by Zebra and Quagga Mussels

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ABSTRACT

Dreissenid (zebra and quagga) mussels are widely recognized as having strong, adverse ecological and economic impacts, e.g., biofouling and loss of water column primary production. We assessed perceptions and values associated with two less often considered ecological outcomes of dreissenid mussel influences on coastal ecosystems along Lake Ontario and the western St. Lawrence River in New York State. One, the generation of water clarity through filtration, we define as an ecosystem service; the other, the production of large amounts of nuisance algae (e.g., *Cladophora* and *Microcystis*) is defined as an ecosystem disservice. Surveys of business owners and homeowners quantified their preferences and the formation of values regarding these products of zebra mussel influence. Water clarity increased greatly, particularly in the eastern portion of Lake Ontario, and algal problems increased throughout. Businesses attributed increases and decreases in revenues associated with water clarity and algae; homeowners reported analogous changes in property values. Water clarity was positively associated, and algae negatively associated, with changes in revenues and property values. Threshold responses of costs as functions of filamentous algae were evident. Given the likely continued influx of invasive species due to human activities, further development of the ecosystem service concept should consider potential “goods” and “bads” of invasives and their influence on ecosystem and social system resiliency.

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