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Water Quality Targets for the Great Barrier Reef: Can Ecosystem Services Valuation Help?

Key words: Ecosystem Services Valuation; Water Quality; Great Barrier Reef (GBR)

Abstract:

The Great Barrier Reef (GBR) is in critical danger due to various stressors, mostly originating from human activity. Water quality degradation, associated with increased loads of nutrients, sediments and pesticides from agriculture, is one of the greatest threats to the GBR. To reduce the amount of pollutants entering the GBR, improved management practices and water quality targets were set as part of the Reef Plan 2009 and updated later for the Reef Plan 2013. Despite these efforts, results are mixed and meeting these targets remains uncertain.

The causality between water quality degradation, ecosystem health and benefits to society is poorly understood, questioning the relevance of current water quality targets. We argue that ecosystem services valuation may greatly help decision-makers identify the benefits generated by ecosystems and, in turn, help prioritise further investments in water quality improvement.

In this paper, we intend to value the possible loss of benefits resulting from water quality reduction in the GBR. We investigate the influence of sediments, nutrients and pesticides on three important ecosystems that compose the GBR: mangroves, seagrass and coral reefs. Then, we narrow down our analysis to a selection of ecosystem services mostly impacted by water quality reduction.

Reviewing valuation studies conducted in the GBR, we approach the value of marginal changes in benefits attached to modifications in the provision of ecosystem services and explore variations in benefits across the six marine regions of the GBR. Finally, we discuss the implications stemming from these results and acknowledge the limitations of our method.