Synergies and tradeoffs in how managers, scientists, and fishers value coral reef ecosystem services

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Abstract

Managing ecosystems in a changing environment faces the challenge of balancing diverse competing perspectives on which ecosystem services – nature’s benefits – to prioritize. Consequently, we measured and compared how different stakeholders (managers, scientists and fishers) prioritize specific coral reef ecosystem services. Managers’ priorities were more aligned with scientists’ priorities but all stakeholder groups agreed that fishery, education, and habitat were high priorities. However, stakeholder groups differed in the extent to which they prioritized certain services. Fishers tended to assign greater estimates to fishery and education, managers to culture, and scientists to coastal protection. Furthermore, using network analysis to map the interactions between stakeholders’ priorities, we found distinct synergies and trade-offs in how ecosystem services were prioritized, representing areas of agreement and conflict. In the fishers’ network, trade-offs emerged between two services, both of a higher priority, such as fishery and habitat. Conversely, in the scientists’ network, trade-offs emerged between services of a higher and lower priority, such as habitat and culture. The trade-offs and synergies that emerged in the managers’ network overlap with both fishers’ and scientists’ suggesting a potential brokering role that managers can play in balancing both priorities and conflicts. We suggest that measuring ecosystem service priorities can highlight key areas of agreement and conflict, both within and across stakeholder groups, to be addressed when communicating and prioritizing decisions.

Keywords: Decision, making, Ecosystem services, Dialog, Interdisciplinary, Multiple perspectives, Network, Ways of knowing, Synergies, Trade-offs

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