

Status of global fisheries: action brainstorming

Below is a list of ideas from NTRES 6940 class participants on how to get involved in conservation and management of global ocean fishery resources¹.

Knowledge gaps

1. Improve life history information collection for harvested species in order to better inform population dynamics understanding and improve stock assessment.
2. To date, marine ecology and fisheries science has focused on overfishing as an ocean ecosystem stressor in isolation—improve understanding of what are the nature of ecosystem impacts from cross-stressor interactions between overfishing and other anthropogenic stressors?
3. Identify means to measure marine ecosystem state and use this information to improve understanding about ecosystem dynamics, in particular threshold-based ecosystem state changes.
4. Develop estimates of effective population size (N_e) and improve understanding about the relationship between N_e and potential for fishing-induced genetic changes on harvested stocks.
5. Explore technologies which can improve monitoring catch and fishing activity on the high-seas (i.e. areas outside of countries' exclusive economic zones).
6. Explore the efficacy of marine closures as a management tool in developing nations' fisheries resources where regulatory agency and monitoring resources are low. Identify relevant policy needs to utilize marine closures in such cases as a management tool.
7. Conduct research to improve understanding about the feedback between consumer preferences, fishery certification programs, and the resulting outcomes on fishery management practices.
8. Improve understanding of the relationship between seafood provenance labeling, consumer behavior, and the resulting feedback on fishing practices attributable to consumer choice.
9. Much of the research exploring the relationship between biodiversity and ecosystem resilience (e.g. in provisioning ecosystem services) has involved work in terrestrial systems. Is this work generalizable to ocean ecosystems? What is the relationship between biodiversity and ecosystem resilience in marine systems?
10. Improve understanding of fishery product pricing dynamics, and the relationship between economic extinction and biological extinction.

Policy needs and management recommendations

1. Illegal, unreported, and unregulated catch are a significant component of global ocean fisheries mortality, yet information on IUU catch is nascent. Promote creation of policies within nations' fisheries management regulations to improve monitoring and reporting of IUU catches.
2. Restrict harvest to those species life histories which support sustainable harvest; for example, slow maturing and low reproductive output life histories may not support long term sustainable harvest.
3. Establish policies which incentive research on substitute protein sources to address continued growth in global demand for aquatic and marine derived protein, such as wild capture fisheries.
4. Operate at upper government levels for countries with strong central planning governments to enact policies to improve catch accounting, and catch reporting to the global community.
5. Improve international coordination of high seas (i.e. areas outside of countries' exclusive economic zones) fishery governance.
6. Rebalance available global fisheries management resources to target developing nations, many of which have under-developed fisheries management regulatory agencies and which lack fishery management plans.
7. Ensure marine closures explicitly consider fishery production as one of several societal objectives, and design marine closure policies to incorporate regular evaluation and monitoring to ensure objectives are met or to allow adaptation of closures to achieve objectives as needed.

¹Action items represent class participant input as paraphrased by S.A.S.

8. Develop policies to promote seafood provenance labeling to provide adequate information to enable consumer choice.
9. Global ocean resource problems require global collaboration. Promote inter-governmental agreements to sponsor top down efforts to improve monitoring and management of global fishery resources.

Education efforts

1. Organize a conference with global fisheries experts to transfer knowledge about the impacts of overfishing on ecosystems and identify solutions to improve management of fisheries in Colombia. This transfer of current fisheries science and marine ecology knowledge may help improve local fisheries management.
2. Use the global ocean fisheries status scientific debate for instruction to incoming undergraduate students in environmental/natural resource science to emphasize that solutions to real-world natural resource problems are multifaceted and complex.
3. Foster cross-disciplinary exposure for graduate students across economics and other social sciences, ecology, and policy to train next generation scientists and managers with appreciation of the dual social-ecological facets of ocean resource management.
4. Promote as ocean resource management best practices both cross-disciplinary collaborative approaches (e.g. ecology and social science), as well as cross-stakeholder inclusion of resources users with researchers and managers in evaluating, designing, and implementing management systems.