Research Brief

Marine Ecosystem Services and Climate Change

FARALLON INSTITUTE

What can we expect for the future in terms of the effect of climate change on ocean ecosystems?
Past and current greenhouse gas emissions guarantee that the planet will continue to undergo a certain level of climate change despite combined efforts by today's scientists and some policymakers to mitigate these changes. Atmospheric CO_2 concentrations are expected to continue increasing, which will affect the world's oceans by increasing ocean acidification and raising sea levels. This could have devastating effects on coastal communities in addition to throwing off the balance of ecosystem dynamics.

What are marine ecosystem services?
Mankind is highly dependent on the environment for a suite of services, including but not limited to food provision, recreation, and living space. Perhaps the most important of marine ecosystem services are fisheries and aquaculture. Around the world, these resources provide people with nourishment as well as communities with economic stability. Global climate change will undoubtedly have a huge impact on such services, so it is necessary to study these potential effects.

What are some possible ways to mitigate these problems?
Policymakers must decide whether to focus action on the most crucial marine services (i.e., food provision) or create strategies to direct efforts toward a wide range of services and groups. There are several methods for regulating fisheries and coastal risks to create a more resilient marine ecosystem:

- *Ecosystem-based adaptation*, which involves restoring marine habitats to their original states, making it easier for ecosystems to deal with climate change stressors.
- *Fisheries management*, which refers to the regulation of catch location and size allotted to individual fishermen as well as fishing companies, thus increasing species resilience over time.
- *Aquaculture practices*, which would help with the decrease in healthy fish populations for human consumption, but could potentially have unforeseen harmful effects on the natural environment.
- *Market-based incentives*, which have been used infrequently, but somewhat successfully.
- *Relocation of coastal communities*

Why is this study important?
The goal of this study is to provide accurate information on the extent of climate change impacts on the marine services that society values most so it can be possible to prioritize mitigation efforts. Consequences of climate change are often perceived to be distant, and so it is easy to ignore them; immediate issues seem more pressing. However, it is necessary to consider the potential long-term effects of anthropogenic change in order to adapt.

-Brief by Marie M. Sydeman

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