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ECOSYSTEM SCIENCE

Assessing the Vulnerability of Fish Stocks in a Changing Climate

What is the Fish Stock Climate Vulnerability Assessment?

NOAA Fisheries, in collaboration with the NOAA Office of Oceanic and Atmospheric Research - "Earth System Research Laboratory", is finalizing a methodology to rapidly assess the vulnerability of U.S. marine stocks to climate change. The methodology uses existing information on climate and ocean conditions, species distributions, and species life history characteristics to estimate the relative vulnerability of fish stocks to potential changes in climate.

Climate change is already impacting fishery resources and the communities that depend on them. Scientists are linking changes in ocean temperatures to shifting fish stock distributions and abundances in many marine ecosystems, and these impacts are expected to increase in the future.

To prepare for and respond to current and future changes in climate and oceans, fisheries managers and scientists need tools to identify what fishery resources may be most vulnerable in a changing climate and why certain fish stocks are vulnerable. By providing this information, the methodology will be able to help fisheries managers and scientists identify ways to reduce risks and impacts to fisheries resources and the people that depend on them. These kinds of climate change vulnerability assessments are increasingly being used to help assess risks to terrestrial and freshwater natural resources and man-made structures such as buildings and bridges.

What information will the methodology provide?

The methodology will provide fishery managers, scientists, and others with information they can use as they consider what additional scientific information is needed and how to adapt management strategies for those fish stocks. This will include information about which species in the region are most vulnerable or adaptable to environmental impacts of climate change.

The Fish Stock Climate Vulnerability Assessment is specifically designed to help:

- (1) Identify which stocks may be most vulnerable with changing climate and ocean conditions;
- (2) Identify what additional information is needed to understand and address these risks;
- (3) Provide a basis for considering what actions might be taken to reduce fish stock vulnerability;
- (4) Identify where more information is needed to understand, track, and respond to fish stock vulnerability. That information can then be used to help prioritize research, monitoring and modeling efforts.

NOAA Fisheries is planning to run the first application of the assessment methodology in the Northeast in March 2014.

What is the process for developing a Fish Stock Climate Vulnerability Assessment?

The chart below describes the process for developing a fish stock climate vulnerability assessment.



Picture by: Jerry Prezioso, NEFSC/NOAA

Related Links

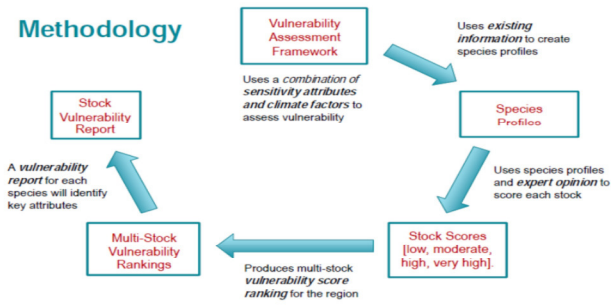
[The Fish Stock Climate Vulnerability Assessment Tool Fact Sheet](#)

[Presentation: Assessing the Vulnerability of Fish Stocks to Climate Change](#)

[NOAA Office of Atmospheric Research - Ocean Climate Change Web Portal](#)

Examples of Other Vulnerability Assessments

- [U.S. EPA's Threatened and Endangered Species Vulnerability Framework](#)
- [U.S. Department of Agriculture: A System for Assessing Vulnerability of Species to Climate Change](#)
- [Climate Change Vulnerability Index for Species in Nevada \(Nature Serve\)](#)
- Chin, A., Kyne, P. M., Walker, T. I. and McAuley, R. B. 2010. An integrated risk assessment for climate change: analyzing the vulnerability of sharks and rays on Australia's Great Barrier Reef. *Global Change Biology*. 16:1936-1953.
- Johnson, J. E., and D. J. Welch. 2010. Marine Fisheries Management in a Changing Climate: A Review of Vulnerability and Future Options. *Reviews in Fisheries Science*. 18:106-124.



Caveats, Restrictions:

NOAA Fisheries will soon provide further background information on the assessment data requirements and implementation details. This methodology is only relevant for fish and invertebrate stocks.

Contact:

For more information on NOAA Fisheries efforts related to the assessment methodology please contact Roger.B.Griffis@noaa.gov, Wendy.Morrison@noaa.gov, or Mark.Nelson@noaa.gov.

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