

# Climate Ready Fish Managers Guide to Climate Change

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*Working Group Summary Report  
National Adaptation Forum  
April 3, 2013 Denver, Colorado*

## **Overview**

Supporting sustainable U.S. fisheries management is important to ecosystem health and human and economic well being. These fisheries (commercial, recreational, and subsistence) include both wild capture and farmed (aquaculture), and provide important contributions to the world and U.S. economy. Marine fish are an important source of protein providing food to over 1.5 billion people generating 43.5 million jobs worldwide. In the U.S., fisheries contribute 1.3 million to the economy, \$200 billion in sales and are responsible for 60% gross domestic product (GDP) in coastal economies. In 2011, commercial fisheries landings totaled 9.9 billion pounds valued at \$5.4 billion. A 2006 survey of U.S. anglers found that the recreational industry generated \$82 billion in sales and \$24 billion in income. In 2008, the North American aquaculture industry generated approximately \$1.6 billion.

Climate change, in addition to other localized and regional impacts, such as pollution and overfishing, is having and will continue to have cascading effects on all aspects of fisheries, including fish production, fish stocks, essential fish habitats, fishing-dependent communities, and resource managers (hereafter collectively referred to as “fisheries”). Globally, there is now strong awareness of the vulnerability of fisheries to changes in climate, and growing concern about the implications of climate variability and change for fisheries sustainability and food security. Climate-driven changes in ocean conditions are already affecting marine ecosystems, fish stocks and the communities and economies that depend on them worldwide. These impacts are expected to increase with continued changes in the planet’s climate system causing much risk domestically and internationally in food supply, jobs, revenue, human health, security, and heritage.

## **Objectives and Intended Outcomes**

The goal of the working group was to gather fisheries experts, industry leaders, and scientist along with climate adaptation scientist to discuss and recommend a feasible guidance for fish managers in a changing climate.

## **Working Group Discussion**

The discussion portion of the working group focused on getting to a climate savvy fisheries management and how we provide guidance and tools for support. Discussion included:

- 1) Need for a fish managers guide to climate change and guidance criteria
- 2) Review of draft guidance outline

*Need for a fish managers guide to climate change*

Working group discussed whether there was an immediate need for a fish managers guide to climate change. It was stated that currently, decision makers are being asked to review stock assessment to develop plans with little guidance on how to manage with a changing climate- thus such guidance would benefit both fisheries and both public and private investments . A fish manager's guide modeled after "A Reef Manager's Guide to Coral Bleaching" would be a good tool if developed in combination with an online tool and targeted training. Much of the discussion was centered on the scope of the guidance- whether marine and freshwater should be worked on separately or should be part of one guidance. The group reached general consensus that it would be of better develop a guidance including freshwater and marine fish managers to ensure changes in estuaries in one document. The group also discussed whether the guidance would target only managers or if it should also target fishers. After some discussion, majority thought that the guidance would most likely target fish managers as a first step, but would engage other stakeholders in the development.

General comments:

- Needs to include freshwater, estuarine, and marine fish
- Ensure to collaborate with other efforts such as TNC's RRR tools
- Use the Coral Triangle Initiative Ecosystem Approach to Fisheries Management as a model
- Make sure to bring corporations to the table since they are also interested in how fisheries will be impacted by climate change and they can be good contributors and a possible funding mechanism
- Ensure to integrate with USGS National Fish Habitat Action Plan
- Look into integrating into fish certification programs- to inform on climate smart fisheries

#### Review of draft guidance outline

Working group discussed the draft concept note on the scope and outline of the proposed guidance.

*Updated Guidance Outline (red text were recommended additions- and blue strikes were recommended deletions)*

#### **1. Introduction- Climate Change Impacts to Fish and Fish Stocks**

- Why we need information about fish stocks, fisheries, and climate change?
- Direct and indirect effects; interactions between climate change and other stressors
- **Impacts to fisheries communities-how can people adapt with a changing climate**
- **Subsistence, traditional users- individual hunting and fishing**
- Introduce idea of costs and benefits of action/inaction, opportunities, and benefits of early action (even if you can't remove vulnerability, competitive advantage in being first to adapt)

#### **2. Section 1: How is Climate Change (and related changes) affecting fisheries**

- Overview of impacts to fishery type and biome and management system (commercial versus subsistence, and industrial versus traditional)
- Critical roles of observations, observation systems, long term monitoring, assessments, etc...
- **Livelihoods and community involvement**

#### **3. Intermission 1: How to integrate climate change vulnerability assessment into your work; is my fishery vulnerable?**

4. **Section 2: Assessing vulnerability of fish stocks and fisheries in changing climate**
  - Review of vulnerability and risk assessments
  - Overview of vulnerabilities on population dynamics, community structure, distribution, range shifts, and spawning aggregations
  - Review of vulnerabilities of current fisheries management practices including **essential fish habitat**, marine reserves, aquaculture/hatcheries, fisheries closures, and individual fishing quotas.
5. **Intermission 2: How to integrate adaptation into your work, can my fishery adapt?**
6. **Section 3: Climate Ready Fisheries Management?**
  - Scenario planning, tools, and examples
  - **Addressing changes in processes- hydrology, sediment logy, and geomorphology**
  - Managing for ongoing change including range shifts, changing fecundity, recruitment, survival, life history, and changing carrying capacity.
  - Managing for episodic stresses such as anoxia, upwelling shut down, disease outbreak, and **HABs** harmful algal blooms
  - **Managing for non-stationary fisheries**
  - **Linking stock assessment to environmental change**
  - Managing for specific changes; ocean acidification and invasive species
  - Managing aquaculture needs
7. **Section 4: Monitoring**
  - **How to build rapid response to long term monitoring and observations**
  - **Trigger points and indicators- when these change what is recommended**
8. **Section 5: US Caribbean and Pacific Islands**

General comments and discussion:

- Seems to be lacking information decision tool such as reef watch that has made is successful
- Stay away from acronyms since it can mean different things in different regions
- Guidance should be holistic and include guidance from State to Federal government
- Look into any other developing guidance for adding climate change into existing fisheries planning and management process
- Provide decision-making tools
- Need to also focus on habitat
- Need to add enabling conditions- opportunities and constraints to make it happen
- Include community resilience as it related to fishing
- Needs more on assessing adaptation
- Focus on management flexibility
- Be aware that the goal in addressing climate change in regards to fisheries might mean very different things to different people
- Ensure to engage state fisheries managers
- Make sure to acknowledge who is your targeted audience and define regional scale
- Ensure to make it agency neutral and do not use language such as EFH
- Link to Australia's new efforts of linking adaptation to habitat refugia
- Query fisherman and ask them what they want- get Gary Whelan's information

- Consider cross boundary issues
- Need to address interface between harvest levels- scenario planning for future shifting stocks- use the New England Sea Bass case study
- Need to address fish that can move (marine) versus fish that cannot move- some freshwater
- Include climate velocity concept
- Include restoration as an adaptation strategy since it is mandated in the Magnusson-Stevenson Act
- Look into ecosystem based management fisheries
- Look into ESA legislation
- Add something about catastrophic events and emergency situations
- Remove climate smart from outline and discussion and change it to managing for a changing world
- Should include habitat restoration even though it is not under fisheries jurisdiction

### Next Steps

The working group discussed the next steps. Organizers are waiting for possible grant approval to get the process started. One grant for the fresh water guidance was not funded but we are looking at other opportunities. During the next months we will develop a formal working group and look into other meeting opportunities to start fleshing out sections and assigning roles.

General comments:

- Would be good to have discussions during the "Managing Our Nation's Fisheries Conference" in May if possible
- Ensure to incorporate ecosystem based management
- Ensure to add new direction from Europe and Australia
- Will query participants on others that should be involved in the guidance development

## Working Group Agenda

### ***Getting to Climate Savvy Fisheries Management: Fish Managers Guide to Climate Change***

**1:30-5:00**

**Room:** Matchless

**Organizers:** Lara Hansen, Alex Score, and Roger Griffis

#### **Agenda:**

**1:30 Introductions-** Why we are all here (Lara Hansen)

**1:45 Overview presentation** (Roger Griffis)

- History (and present) of reef managers guide
- Need for fish managers guide
- Examples of needs, how they were met, what is still needed

**2:00 Discussion of the need for a fish managers guide to climate change**

**3:00-3:30 Break**

**3:30 Concept note introduction and discussion** (Alex Score)

- What is it missing?
- Structure
- Discussion of the product ideas

**4:30 Next steps**

- Discussion of process
- Other meeting opportunities

**5:00 Adjourn**

## Working Group Participants

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