



Planning for the unknown: the Climate and Communities Initiative and climate change scenario planning process

Pacific Fishery Management Council



CMOD 2022

Presenter: Corey Ridings

Member, PFMC



Why?

Climate change

- Impacts on fish stocks and habitat
- Impacts on stock assessment science
- Emerging science
- Stakeholder concerns
- Identified by advisory bodies

Scenario planning

- (Mostly) proven tool
- Way to start

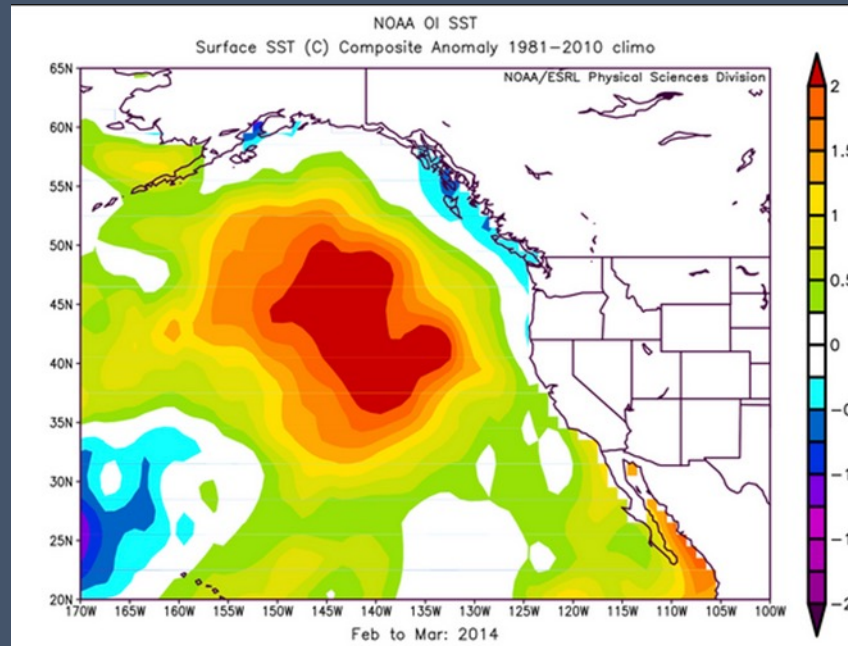




Why?

Climate change

- Impacts on fish stocks and habitat



Distributional changes of west coast species and impacts of climate change on species and species groups

Elliott Hazen¹
Ole Shelton²
Eric Ward²

¹NOAA Southwest Fisheries Science Center
²NOAA Northwest Fisheries Science Center

Species Distributions and Climate Change | February 22, 2018





Why?

Climate change

- Impacts on stock assessment science
- Emerging science
- Stakeholder interest

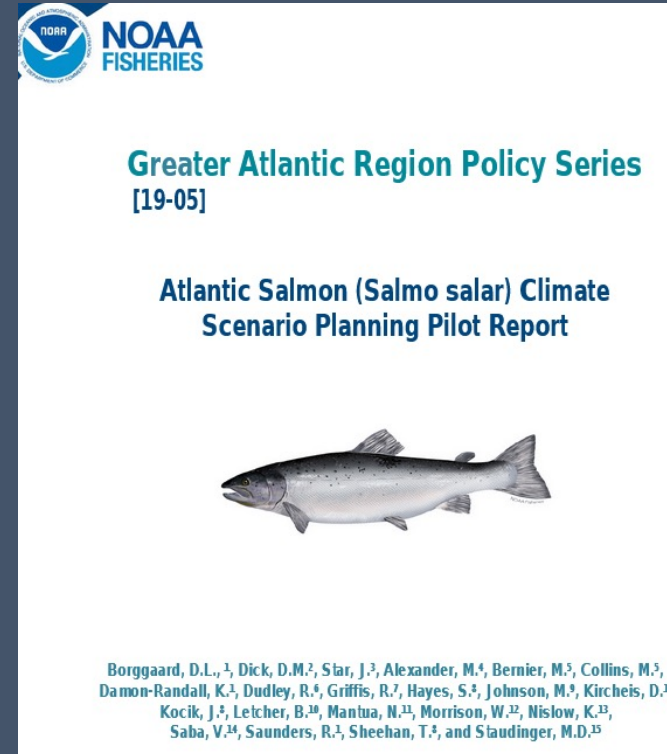




Why?

Scenario planning

- (Mostly) proven tool
- Way to start



The goal of a cross-FMP Climate and Communities Initiative is to consider, develop, and implement strategies for improving the flexibility and responsiveness of our management actions to near-term climate shift and long-term climate change, and strategies for increasing the resiliency of our managed stocks and fisheries to those changes. This approach should better support West Coast fishing communities that depend on marine fishery resources.



Scenario Planning process

- Formation of the Climate and Communities Core Team (CCCT)



Agenda Item E.2.a
EWG Report 1
March 2019

ECOSYSTEM WORKGROUP REPORT ON THE CLIMATE & COMMUNITIES INITIATIVE

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Draft scenario planning schedule (same as above, but in table format)

	March 2019	Spring - Summer	Sept 2019	Fall - Winter	March 2020
Council makes recommendations on core team and process and selects a topic					
Council leadership, staff and core team ID personnel to supplement the EWG on the Core Team					
Core team ID necessary background information and experts					
Core team meets to review background material and ID drivers of change					
Core team to host webinar to inform MTs and ABs on materials and process					
Council to review materials and process and schedule for Sept - March					
Core team shares workshop materials with participants and the public					
Core team to host workshop					
Core team reports on workshop to Council					

Ecosystem Management

Climate and Communities Initiative Update

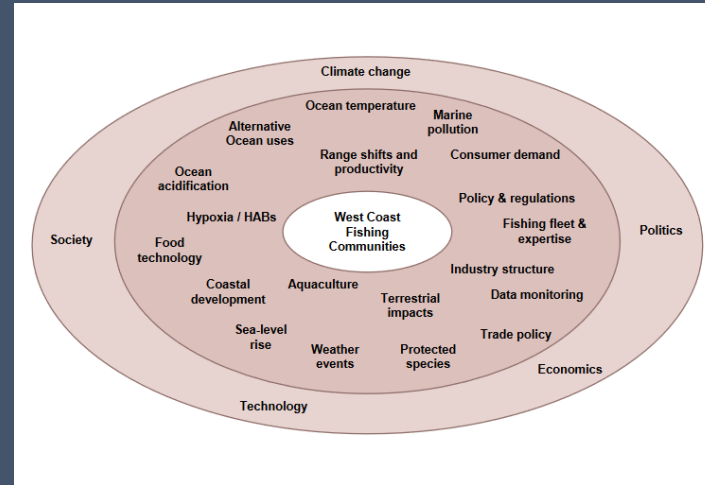
The Council adopted *shifting stock availability (including shifting distribution) across species, FMPs, and communities across the west coast* as the topic for a climate change scenario planning exercise.

The Council wants this scenario planning process to result in the definition of tools, products, and processes necessary to react to potential future ecosystem states resulting from climate variability and climate change.



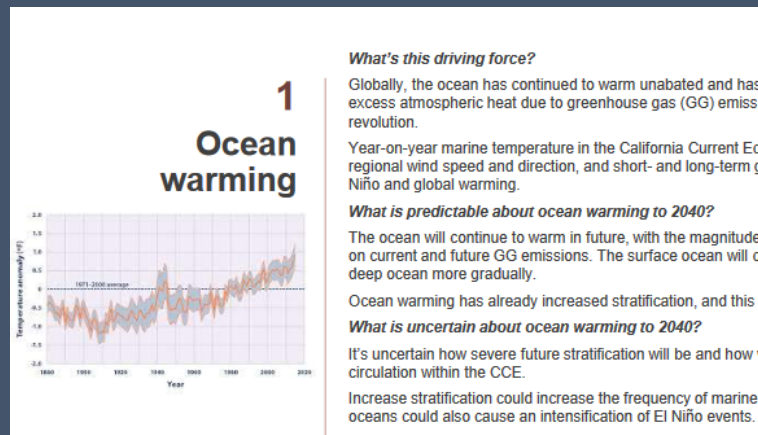
Scenario Planning process

Driving forces document



Factors Shaping West Coast Fishing Communities to 2040

1. Ocean warming
2. Ocean acidification
3. Sea-level Rise
4. Hypoxia / HABs
5. Range shifts and productivity
6. Ecological surprises
7. Terrestrial climate impacts
8. Marine pollution
9. Alternative ocean uses
10. Aquaculture
11. Societal values
12. Consumer demand
13. Global trade / industry policy
14. Regulation and environmental policy
15. Protected species status
16. Food technology
17. Data and monitoring technology
18. Fishing industry structure
19. Aging of fleet and expertise
20. Coastal community development
21. Range shifts and productivity





Scenario Planning process

Development of the scenarios

Science workshop January 2020 → scenario framework

80 people:

- Scientists from NOAA, NMFS
- Key speakers
- CCCT and others



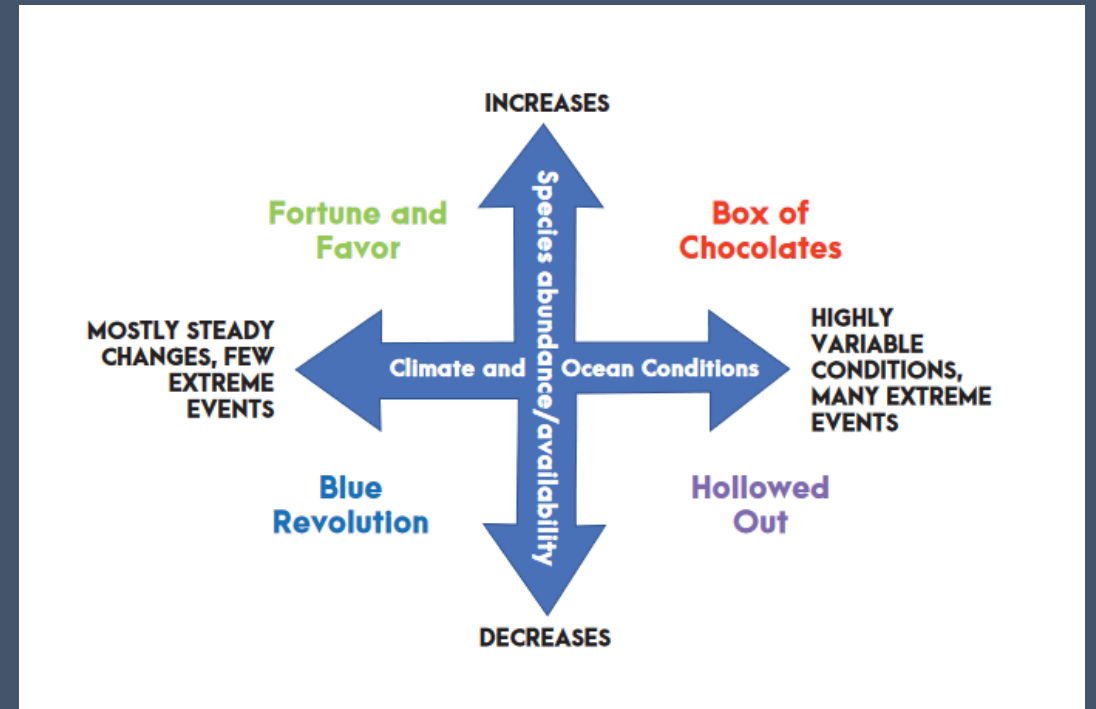


Scenario Planning process

Development of the scenarios

Four stakeholder workshops winter 2020/21 → scenario “deepening”

- Virtual





Scenario Reporting



2040 Scenarios for West Coast Fisheries

Climate and Communities Initiative
Pacific Fishery Management Council's Climate and Communities Initiative
August, 2020



17, 2020, Southern California
4, 2021, Northern California

Agenda Item I.2
Attachment 1
March 2021

Report on Regional Workshops focusing on the Implications of Climate Change for West Coast Fisheries and Fishing Communities

Introduction

Over the past year and a half, the Pacific Fishery Management Council (Council) has been conducting a climate change scenario planning exercise as part of the Fishery Ecosystem Plan (FEP) Climate and Communities Initiative (CCI). In 2020 four climate change scenarios, depicting possible futures for the California current ecosystem in 2040 were developed and described. [\(A written description and short video describing the scenarios may be found on the Council's website.\)](#) This output was informed by an initial workshop and a series of 'scenario deepening' online sessions.

In recent weeks, these scenarios have been used as a resource for a series of four online "implications" workshops held from mid-December 2020 to early February 2021. The purpose of this series was to use the scenarios as a platform for idea generation. *As we face into an uncertain future characterized by climate change, what should various stakeholders do now to prepare for the future?*

Although held online, each workshop had a regional focus as follows:



Scenario Reporting



2040 Scenarios for West Coast Fisheries:

Blue Revolution

This is a world of gradual warming, with climate less variable year to year. Familiar stocks decline, but new subtropical stocks appear. Open, globalized commerce encourages alternative uses of ocean resources. Aquaculture and offshore energy put pressure on commercial fishing.

Decreases in species abundance and availability

Mostly steady ocean and climate changes and few extreme events

On Southern California, Bluefin Tuna ranches compete with fishing boats for space and markets

With strong public support and policies, sensitive offshore energy facilities are installed

Wild salmonids face challenging ocean conditions, but improved hatchery practices and technology will benefit hatchery stocks.

Marine mammal populations mostly decline, though sea turtle populations stabilize.

Some Highly Migratory Species decline, though Bluefin Tuna populations likely persist.

The Northern Anchovy population shifts northward and expands, as the Pacific Sardine stock contracts.

New subtropical and tropical species appear in the southern California Current Ecosystem (CCE).

Black Rockfish may become locally depleted and may be subject to increasing fishing pressure from recreational fisheries.

Adapted From: Pacific Fishery Management Council/Climate and Communities Coe Team. (2020). 2040 Scenarios for West Coast Fisheries (Agenda Item F1, Attachment 1, September 2020).

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Using Scenario Planning to plan

CCCT Recommendations for Potential Council Action

Below, the CCCT identifies a range of potential actions or activities that flow from the findings of the Climate and Communities Initiative, grouped into three broad categories focused on science, ongoing management, and collaboration with authorities outside the Council process. Some of these items could be further developed as candidate initiatives for consideration in March 2022 while others may be implemented through other Council processes.

This collection is not definitive and the CCCT encourages Council advisory bodies to make recommendations on additional activities consistent with the goal of the CCI.

1. The Council could initiate **science-focused activities** to provision the Council with actionable information:
 - a. The Council could task the EWG and EAS to work with NOAA Fisheries scientists to
 - i. Develop a report for Council consideration that specifies processes to address the following science concerns: Incorporating climate variability

where this could be integrated? What are the cost implications?

2. The Council could implement revisions to **ongoing management processes**, including actions to be undertaken through FMPs:
 - a. The Council could task advisory bodies to explore activities to increase flexibility, responsiveness, and adaptability within the Council process:
 - i. The Council could define flexibility and adaptability in the context of shifting West Coast stocks and identify appropriate considerations, based on the

Planning Report(s) in the FMP as an example of potential impacts of climate change.

3. The Council could continue **its collaboration** with partner agencies and stakeholder groups and seek to engage new partners as appropriate:
 - a. The Council could ask that NOAA Fisheries provide a report to the Council on the West Coast fisheries' disaster determinations made in response to events that could





Using Scenario Planning to plan and act

- Future Fishery Ecosystem Plan initiatives
 - *Ecosystem and Climate Information for Species, Fisheries, and FMPs*
- FMP-specific “routine” management work
- FMP-specific climate-related improvements
- Annual Ecosystem Status Report
- Science prioritization (including research and data needs)
- Habitat priorities and Marine Planning
- Increased climate-related “fluency” among Council members and family





Resources:

Final report from the CCCT: <https://www.pcouncil.org/documents/2021/08/h-2-a-ccct-report-1.pdf/>

Driving forces slide deck: <https://www.pcouncil.org/documents/2020/02/cci-workshop-driving-forces-summary.pdf/>

Scenarios landing page: <https://www.pcouncil.org/materials-for-online-workshops-on-the-implications-of-climate-change-in-the-california-current-ecosystem/>

Climate and Communities overview: <https://www.pcouncil.org/actions/climate-and-communities-initiative/>

Ecosystem and Climate Information for Species, Fisheries, and FMPs Initiative:
<https://www.pcouncil.org/actions/ecosystem-and-climate-information-for-species-fisheries-and-fmps/>

