



2022 NATIONAL SALTWATER RECREATIONAL FISHERIES SUMMIT



NOAA
FISHERIES



March 29, 2022

Session 1: Climate Resilient Fisheries



**NOAA
FISHERIES**

Climate Resilient Fisheries

Jon Hare, NOAA Fisheries

National Saltwater Recreational Fisheries
Summit - March 29-30, 2022

Climate Resilient Fisheries

My role is to help set the stage

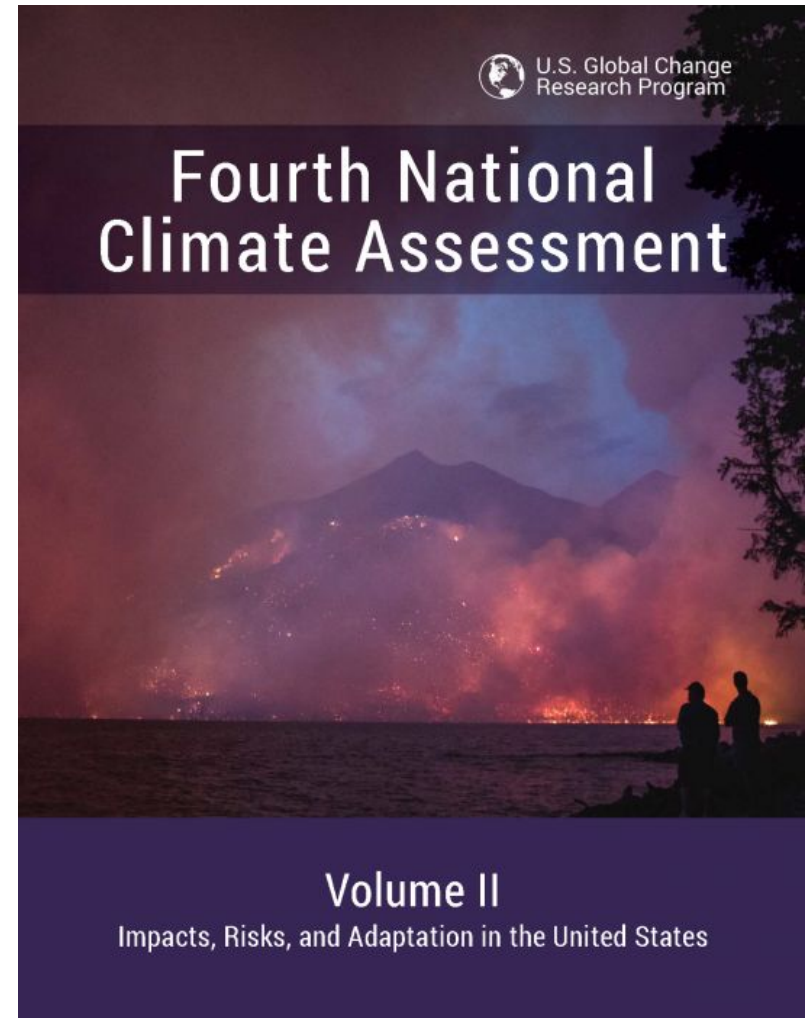
- Climate Change
- Fisheries
- Opportunities and Challenges



<https://mcdreamiemusings.com/blog/2019/1/4/setting-the-stage-the-pre-brief>

Climate Change

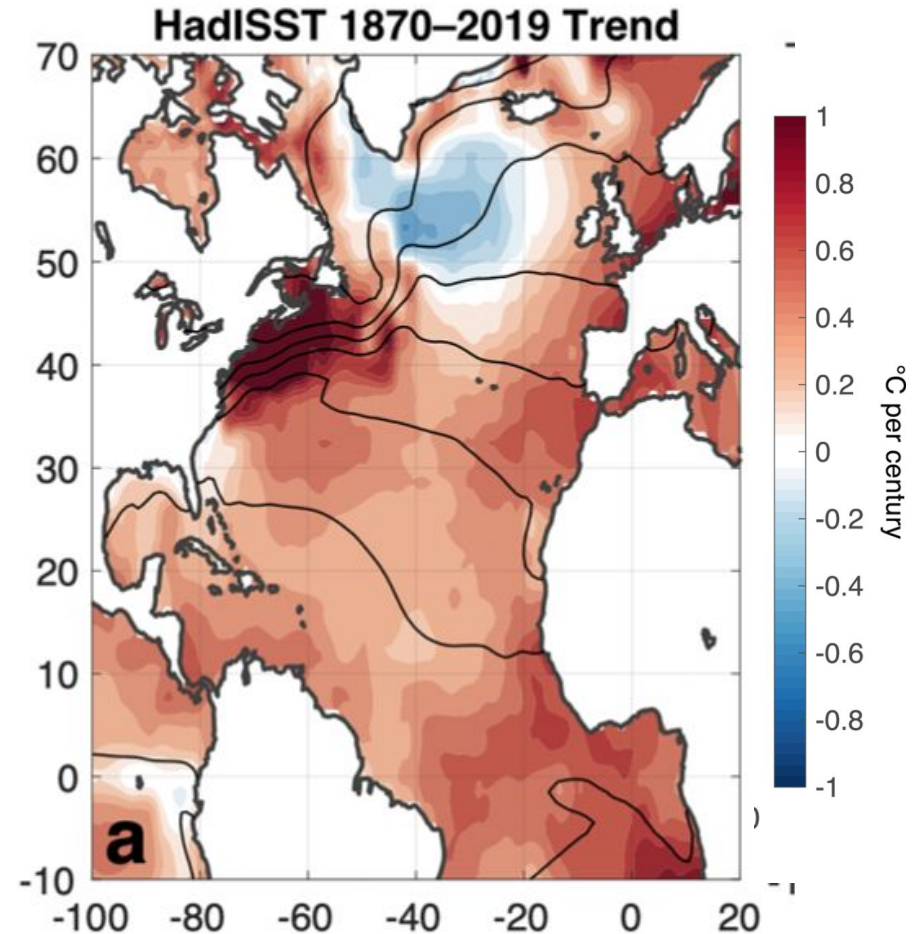
- warming seas
- ocean acidification
- deoxygenation
- ocean circulation
- precipitation
- sea-level rise
- extreme events



<https://www.globalchange.gov/nca4>

Climate Change

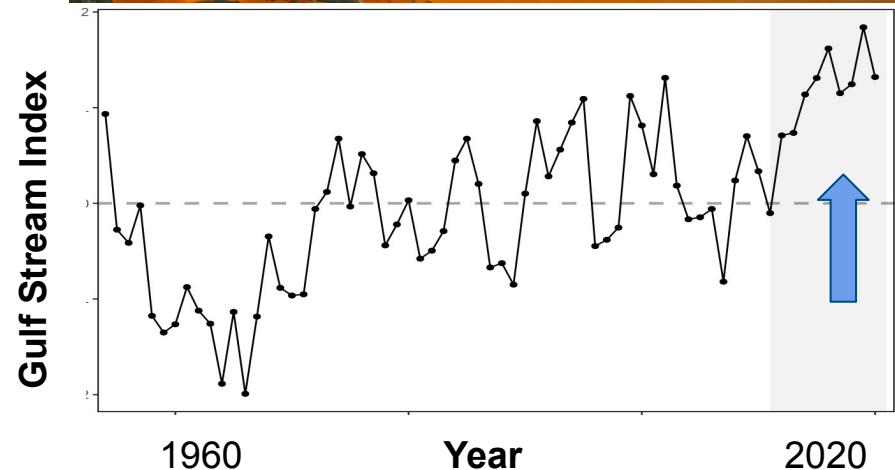
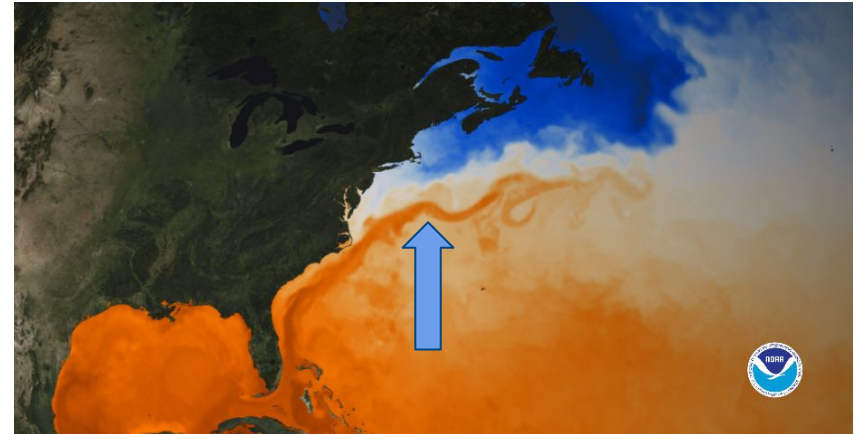
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- sea-level rise
- extreme events



[Karnauskas et al. 2021 Geophysical Research Letters](#)

Climate Change

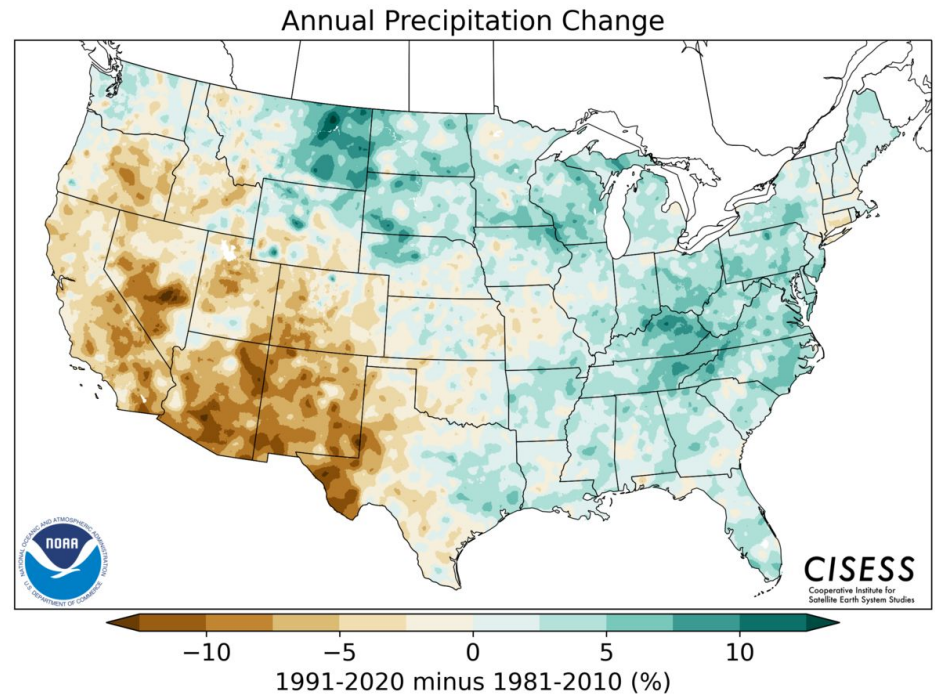
- warming seas
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- precipitation
- sea-level rise
- extreme events



<https://noaa-edab.github.io/tech-doc/gulf-stream-index.html>
<https://www.ncei.noaa.gov/news/gulf-stream-resilience>

Climate Change

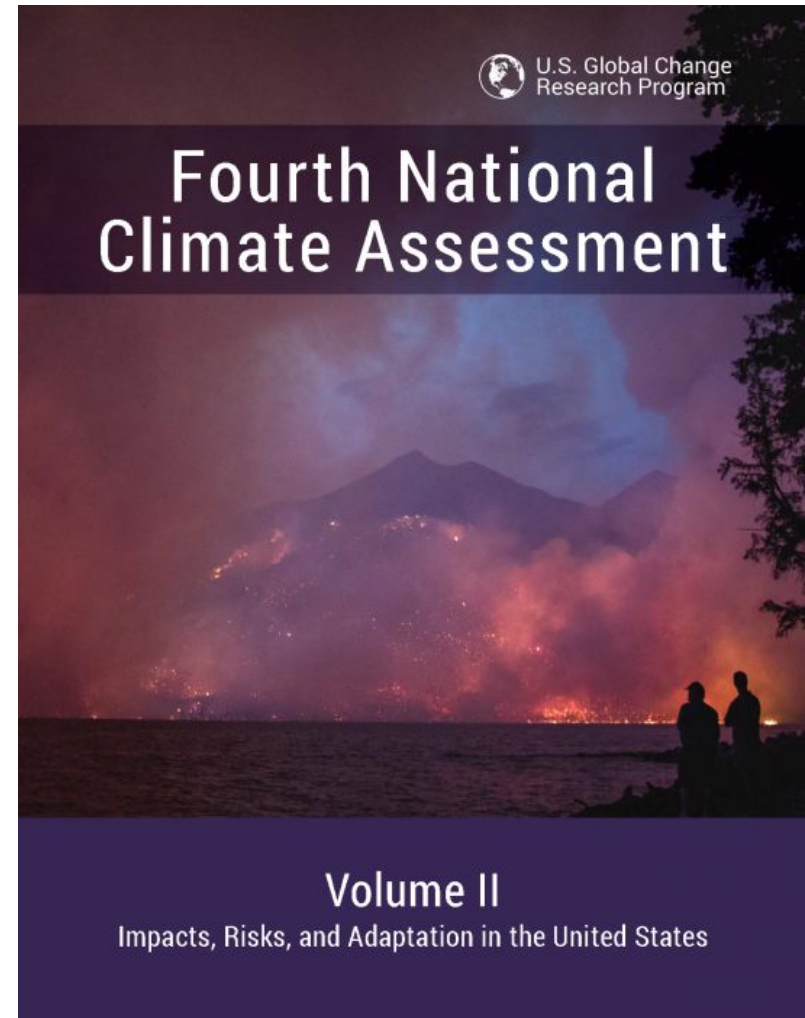
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<https://www.ncei.noaa.gov/products/land-based-station/us-climate-normals>

Climate Change

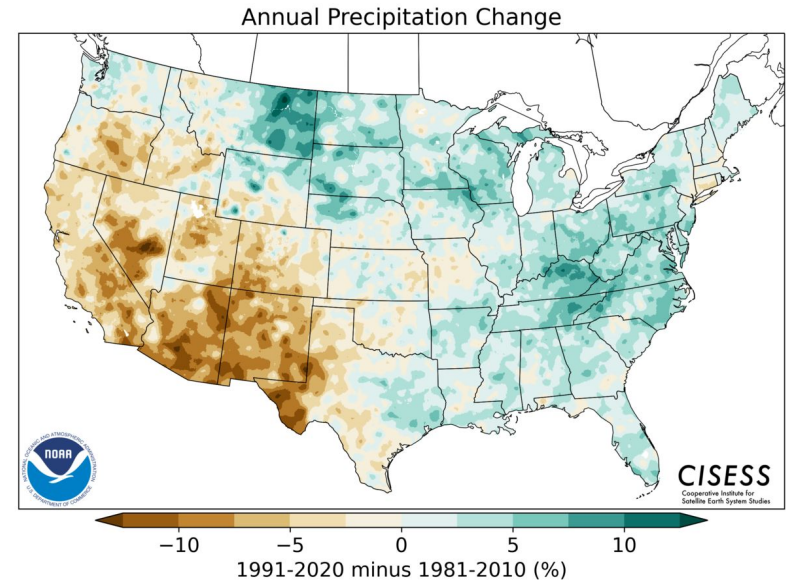
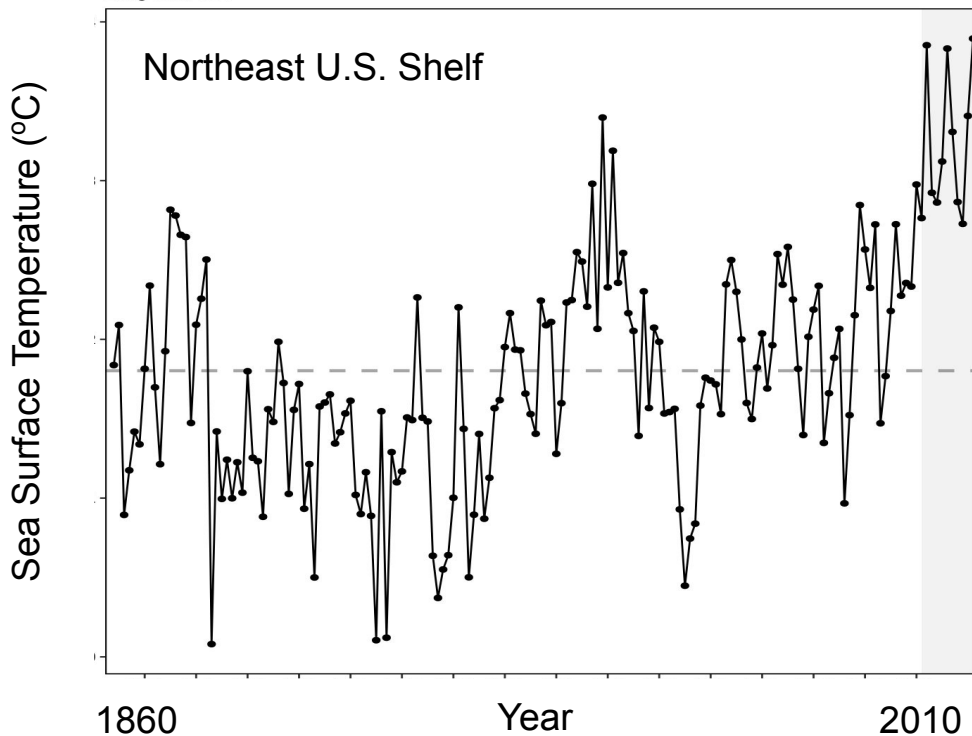
- **warming seas**
- **ocean acidification**
- **deoxygenation**
- **ocean circulation**
- **precipitation**
- **sea-level rise**
- **extreme events**



<https://www.globalchange.gov/nca4>

Climate Change

- Regional differences
- Variability AND change



<https://www.ncei.noaa.gov/products/land-based-station/us-climate-normals>

<https://noaa-edab.github.io/tech-doc/long-term-sea-surface-temperature.html>

Fisheries

In the Northeast

- catches of king mackerel and mahi mahi
- striped bass overwintering in RI
- decreases in winter flounder productivity

Climate Change Effects on
Recreational Fishing and Boating

2022



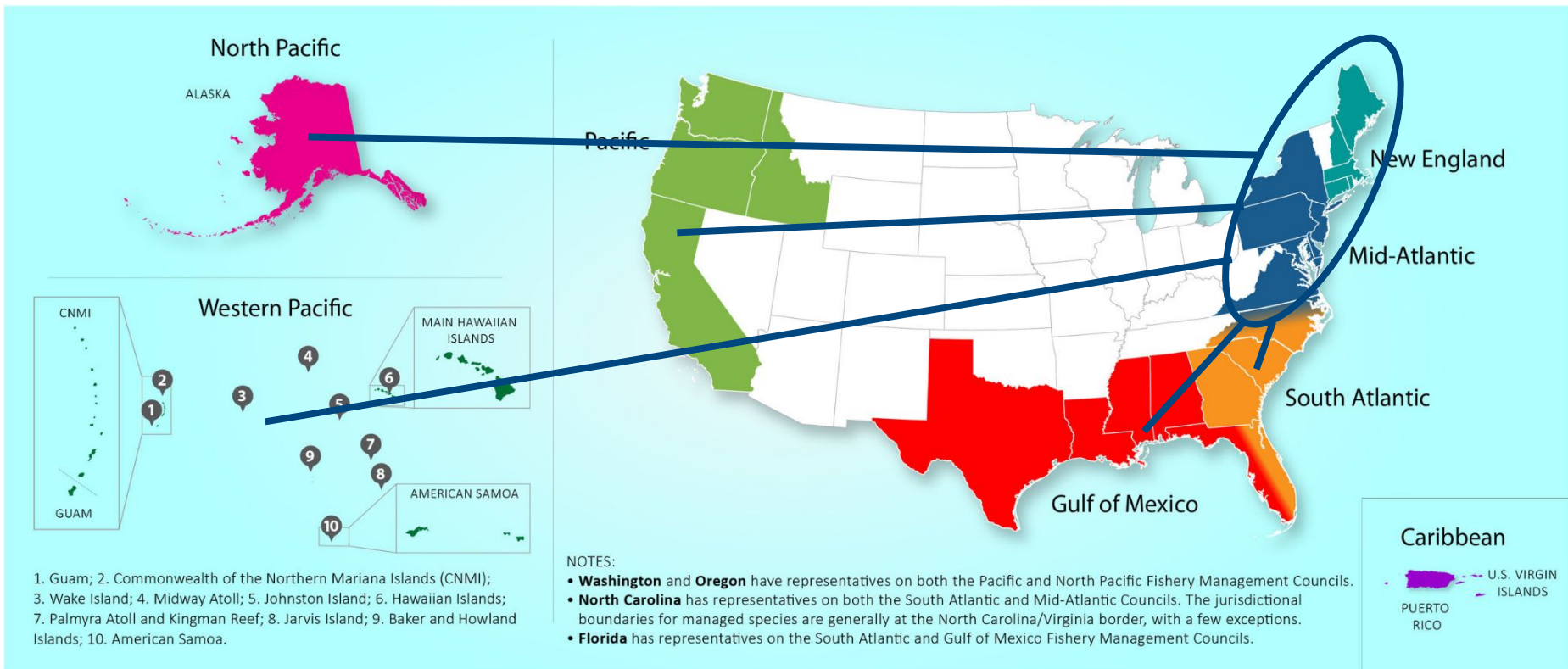
BAIRD
SYMPOSIUM
Ronald C. Baird Sea Grant Science Symposium

Sea Grant
Rhode Island

next session April 13 6:30-8:00 PM

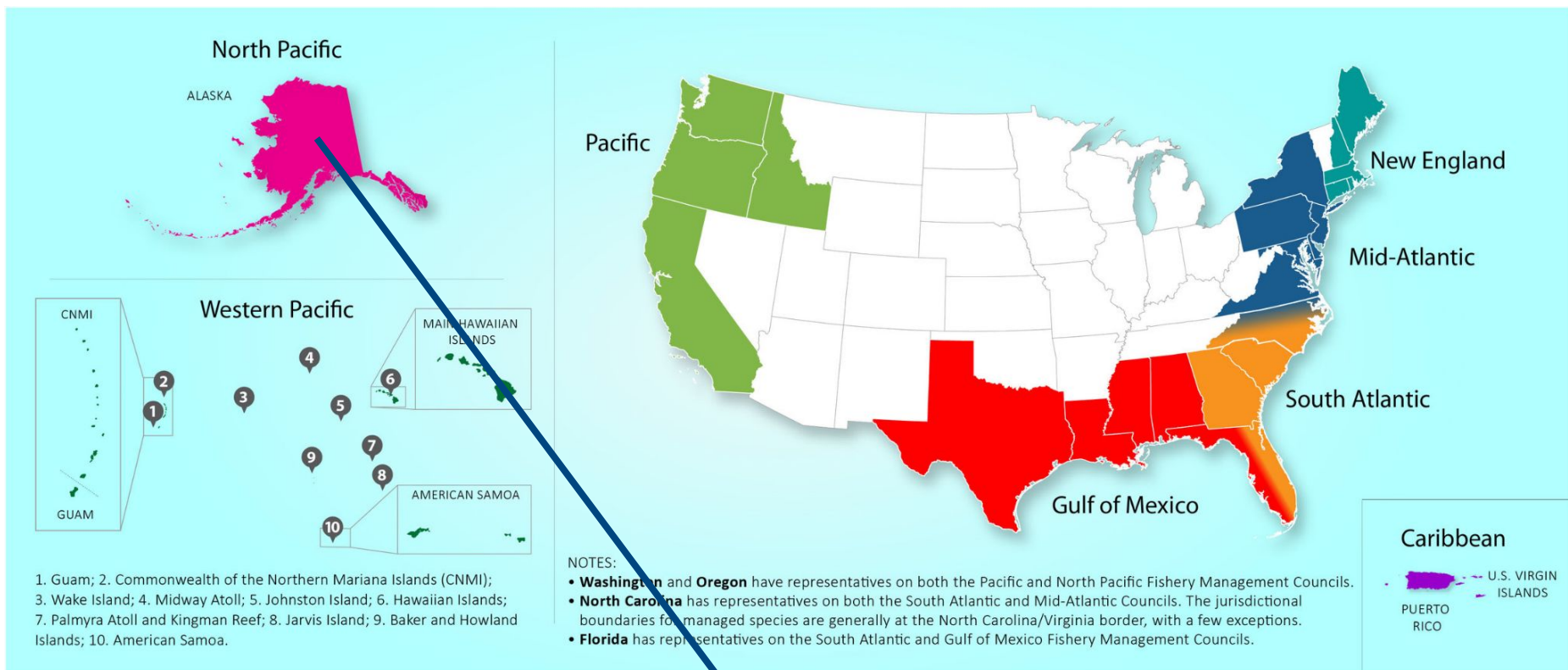
<https://seagrants.gso.uri.edu/special-programs/baird/>

Fisheries



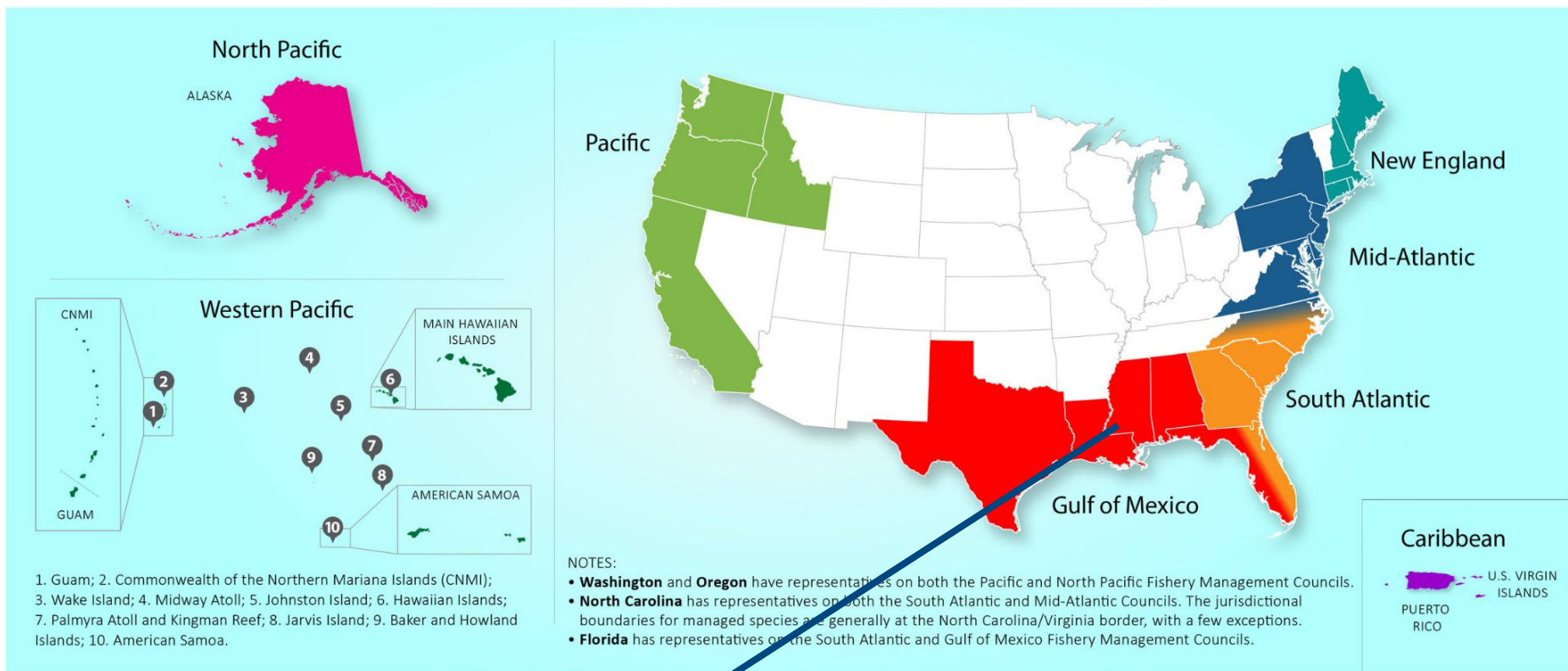
email a friend

Fisheries



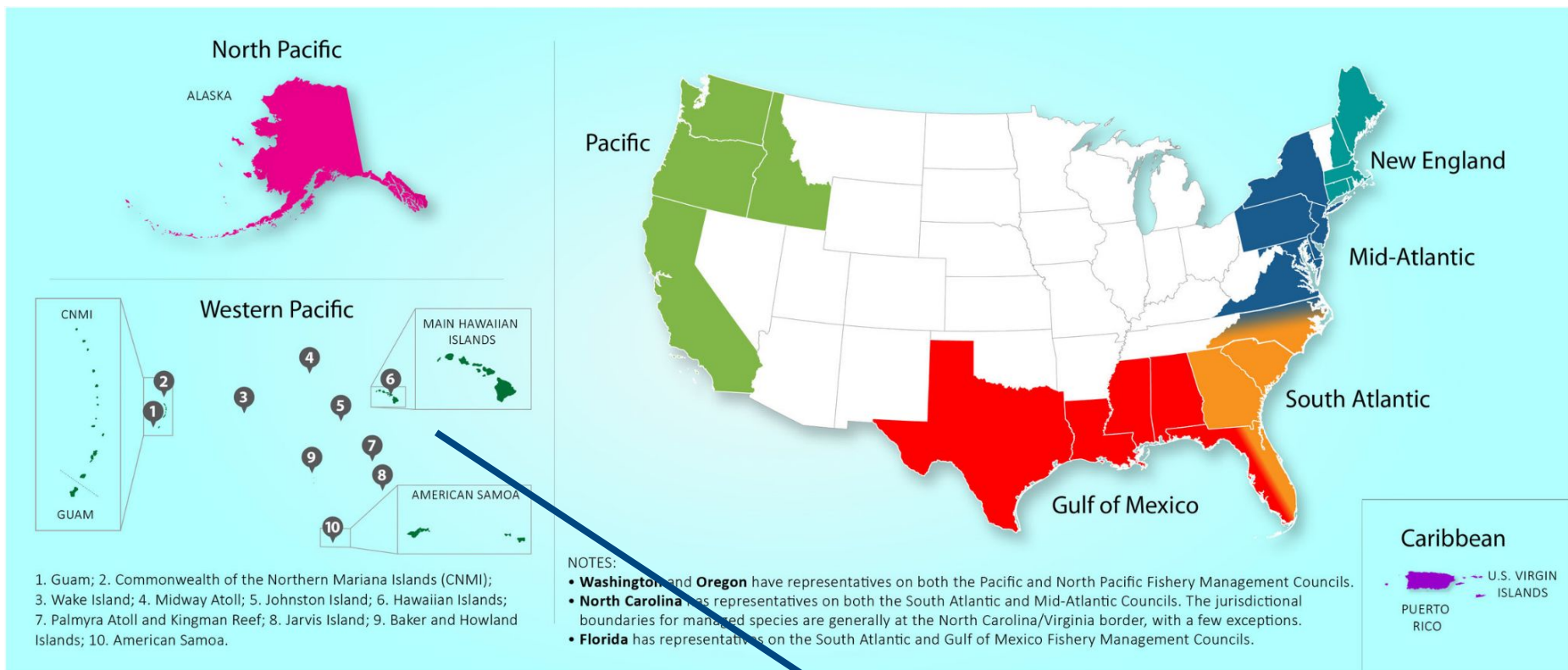
salmon distribution and productivity, halibut productivity

Fisheries



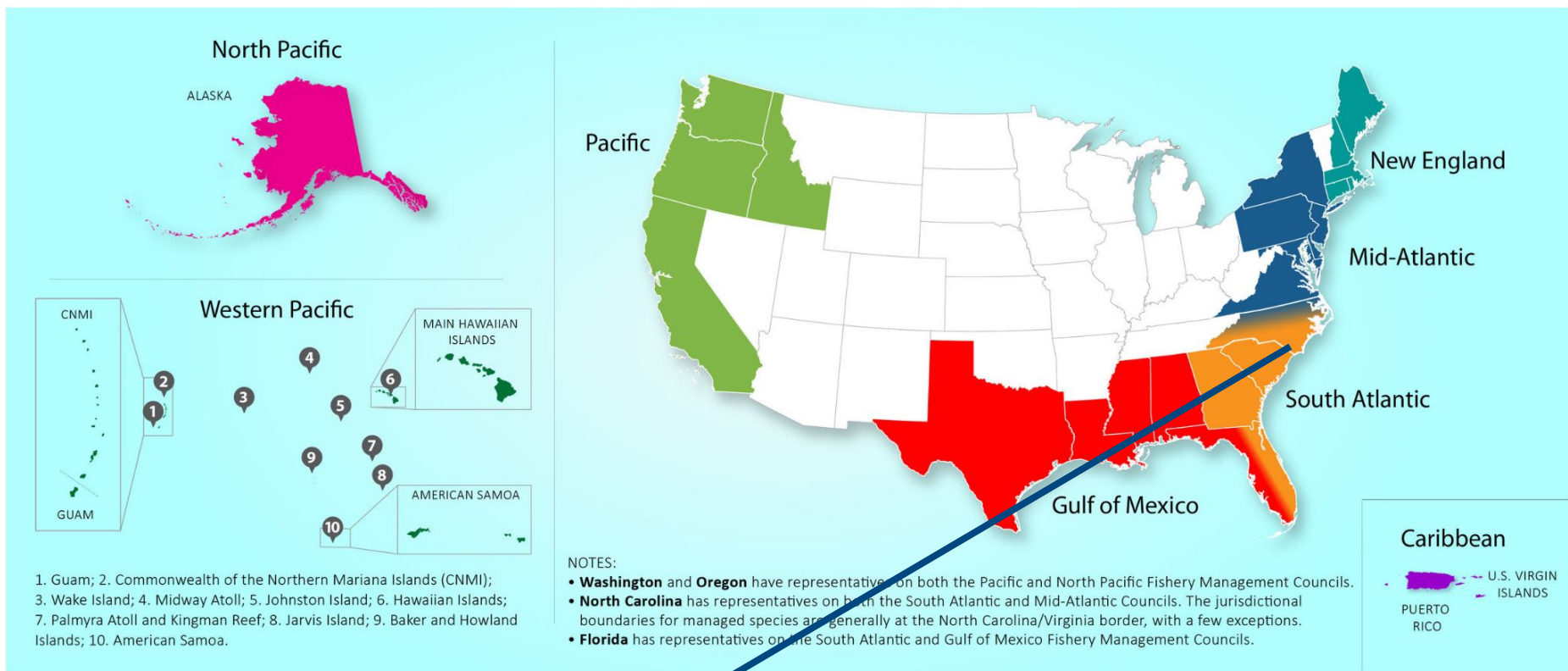
snook distribution, southern flounder productivity, Florida Bay ecosystem

Fisheries



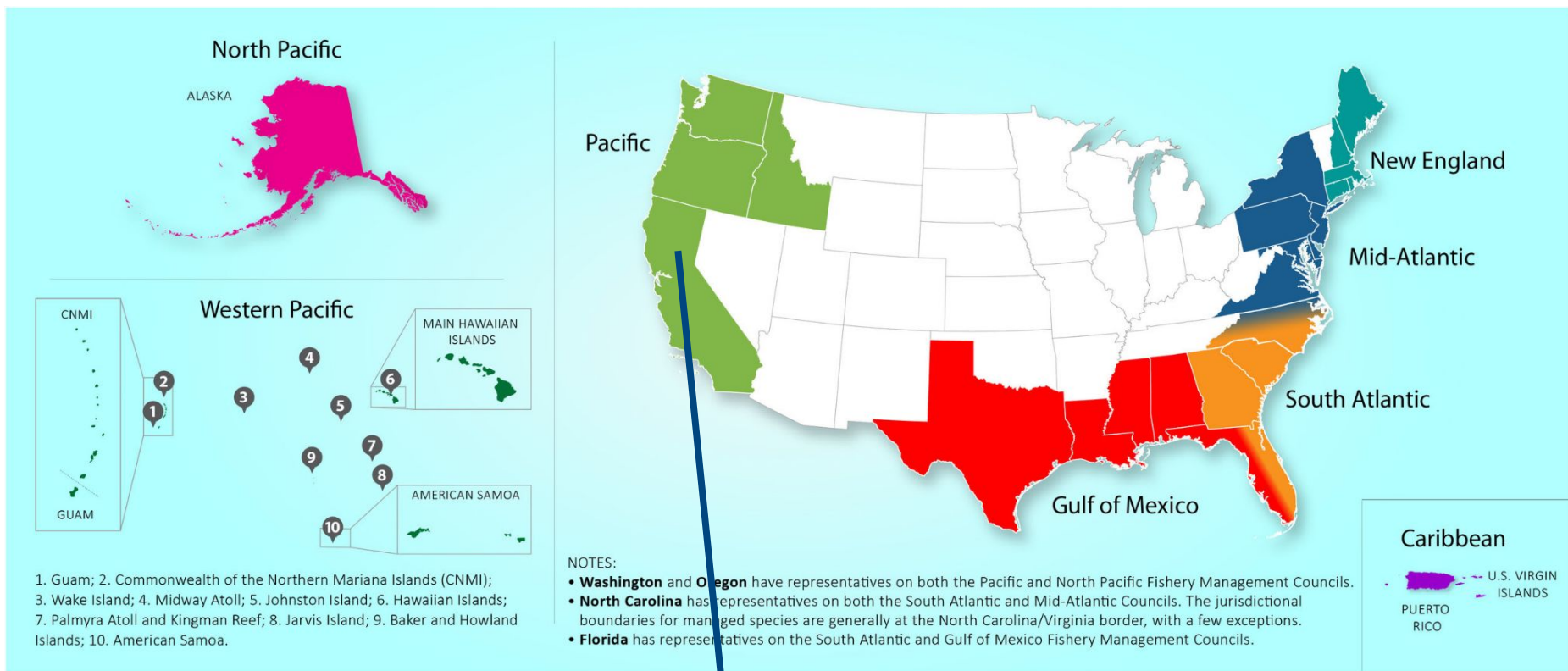
tuna and billfish distribution and productivity;
shoreline constriction and coral bioerosion

Fisheries



alewife run timing, pink shrimp productivity

Fisheries



salmon productivity, rockfish productivity

Fisheries

Climate change affecting:

- distribution
- timing
- productivity
- species interactions
- habitat

36 Pound Cobia Breaks Rhode Island Record

by OTW Staff August 20, 2014



<https://www.onthewater.com/news/2014/08/20/36-pound-cobia-breaks-rhode-island-record>

Challenges & Opportunities

Catching fish is fun;
managing fisheries ...

- catch limits
- by-catch / discards
- allocation
- availability
- infrastructure

The screenshot shows the NOAA Fisheries website. At the top left is the Mid-Atlantic Fishery Management Council logo. Below it is a navigation menu with links for Home, About, People & Groups, and Fishery Management Plans. To the right is a 'LATEST NEWS' section with the headline 'Council Revises Black Sea Bass Commercial State Allocation Recommendations'. Below this is a search bar and a navigation bar with links for Find A Species, Fishing & Seafood, Protecting Marine Life, Environment, Regions, Resources & Services, and About Us. The main content area features an article titled 'Extinction Risk of Chinook Salmon Due to Climate Change' under the 'CLIMATE' category. Below this is a large featured article titled 'RISING TIDES SINKING FUTURE' with the sub-headline '‘There’s going to be no fishing.’ Can Mississippi marshes be saved from sea level rise?'. The featured article is by Anita Lee and was updated on October 25, 2021 at 8:26 AM. Social media sharing icons for Twitter, Facebook, Email, and a general share icon are visible at the bottom right of the featured article.

<https://www.mafmc.org/newsfeed/2021/council-revises-black-sea-bass-commercial-state-allocation-recommendations>

<https://www.fisheries.noaa.gov/west-coast/climate/extinction-risk-chinook-salmon-due-climate-change>

<https://www.newsobserver.com/news/weather-news/article254873102.html>



Challenges & Opportunities

Catching fish is fun;
managing fisheries ...

- catch limits
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ABOUT US

WHAT WE DO

WHERE WE WORK

SUPPORT US

Events News Cor

New Fish On The Block: The Expanding Range Of Black Sea Bass In The Gulf Of Maine



National Fisherman Since 1946

January 10, 2022

Glaciers' retreat could open new Alaska salmon habitat

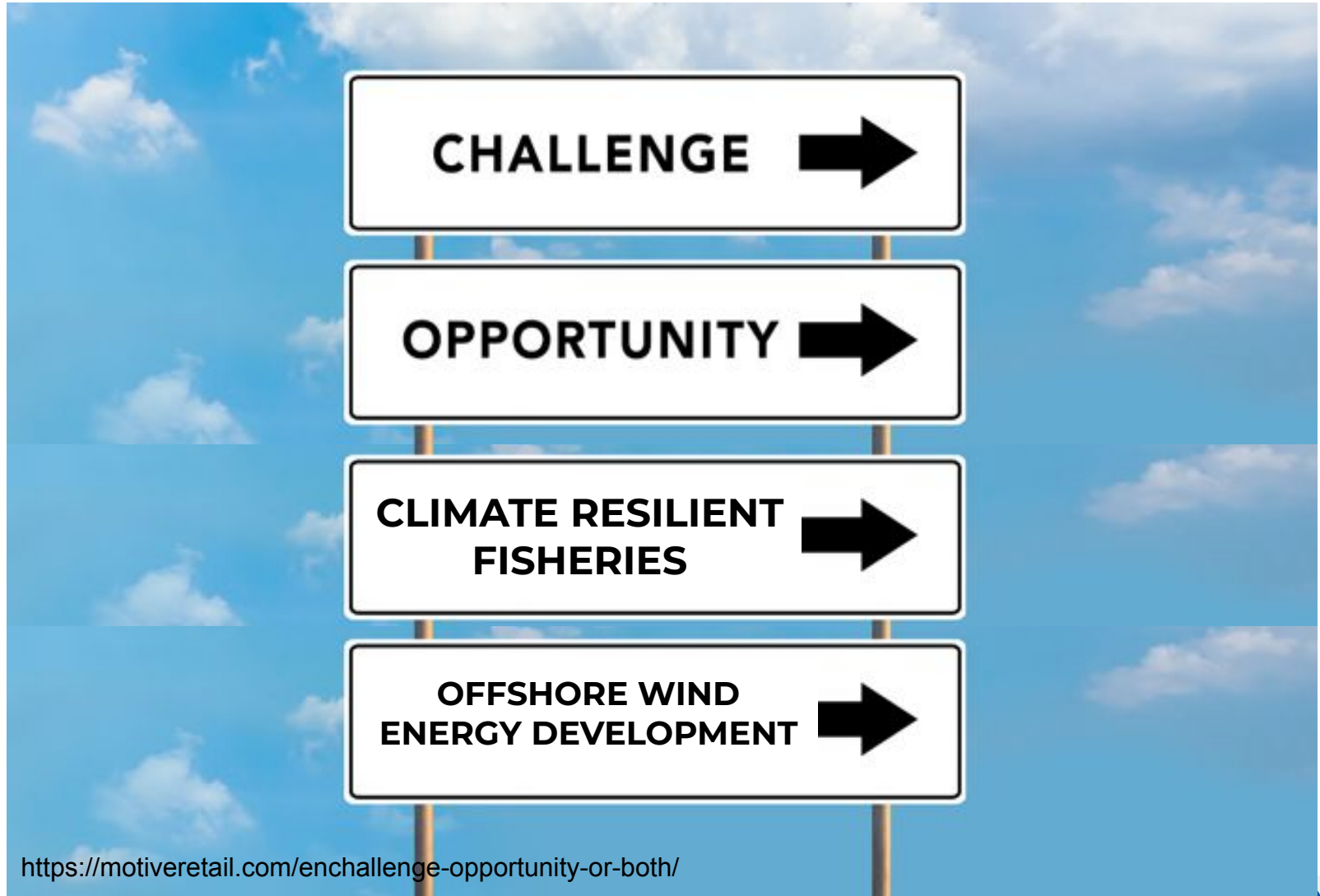


by Kirk Moore in Alaska, West Coast & Pacific, News

<https://www.nationalfisherman.com/alaska/glaciers-retreat-could-open-new-alaska-salmon-habitat>
<https://www.manomet.org/event/new-fish-on-the-block-the-expanding-range-of-black-sea-bass-in-the-gulf-of-maine/>



Grand Challenges and Opportunities



Port of Brookings-Harbor





Chinook Salmon



Coho Salmon

Salmon
Distribution,
CWT



Shasta Reservoir 171 Feet below full elevation



Shasta Reservoir currently at 25% capacity



Ling Cod and Black Rockfish



Copper and Quillback Rockfish



Albacore Tuna



Pyrosomes
Colonial Tunicate



**BEACH
CLOSED TO
RAZOR CLAM
DIGGING**



**END
OF
COUNTY
ROAD**

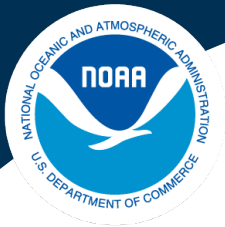
**NO
OPEN
BURNING**

**EMERGENCY
CLOSURE**

**SHELLFISH ARE UNSAFE TO EAT.
THIS BEACH IS UNDER AN
EMERGENCY CLOSURE
BY THE
DEPARTMENT**







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Tools and Investments: Importance of Habitat for Climate Resilient Fisheries

Conserve habitat to sustain fisheries, recover endangered species, and maintain resilient coastal ecosystems and communities

Carrie Selberg Robinson, Director
Office of Habitat Conservation, NOAA Fisheries

30+ Years of Habitat Restoration

Since our creation in 1991, we have:



Collaborated
with over
3,000
partners.



Supported
more than
3,500
projects.

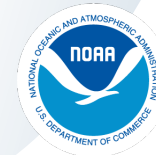


Restored over
159,000
acres of
habitat.



Opened over
5,700 miles
of streams to
access by fish.

- Invested more than \$2 billion for restoration activities across the country.
- **Bipartisan Infrastructure Bill:** NOAA Fisheries will be investing another almost \$1B in restoration over the next 5 years!



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Robinson Preserve Wetlands Restoration



Upland islands designed for sea level rise



All pictures courtesy of: Manatee County



Ongoing Studies at Robinson Preserve

- Monitoring fish habitat use with seine sampling and sportfish tagging projects
- Conducting visitor surveys and economic analysis to study recreational and community value of the Preserve



Earthen sill and mangroves to exclude predators from the fish nursery habitats will be studied.

Courtesy of: FWC & P. Caldentey, Mote Marine Laboratory



Snook & Permit



Snook



Black Drum



Red Drum

Fish caught in Robinson Feb. '22 and PIT tagged for movement study.



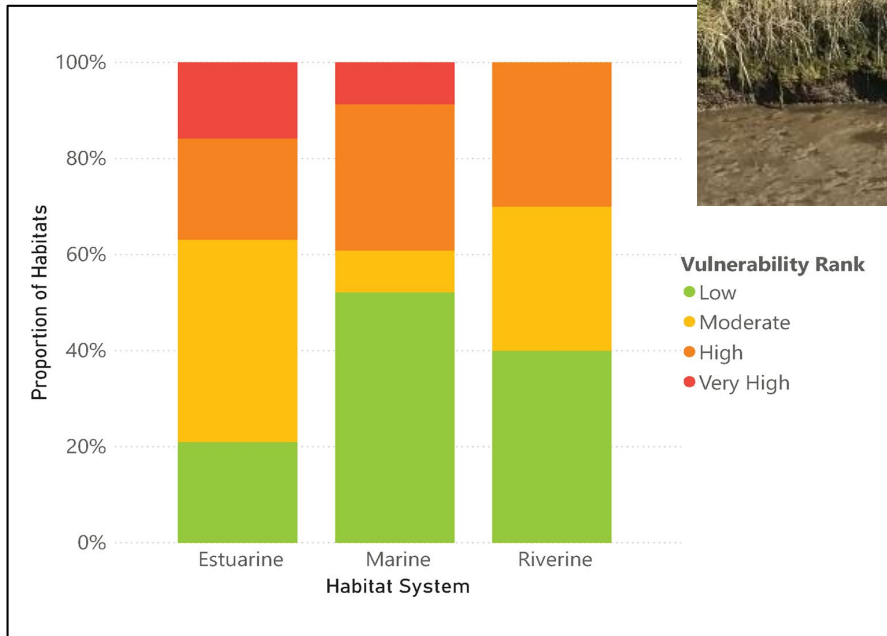
NOAA
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Tools to Help Conserve Habitat for Fish



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Habitat Climate Vulnerability Results



NOAA
FISHERIES



Thank you!



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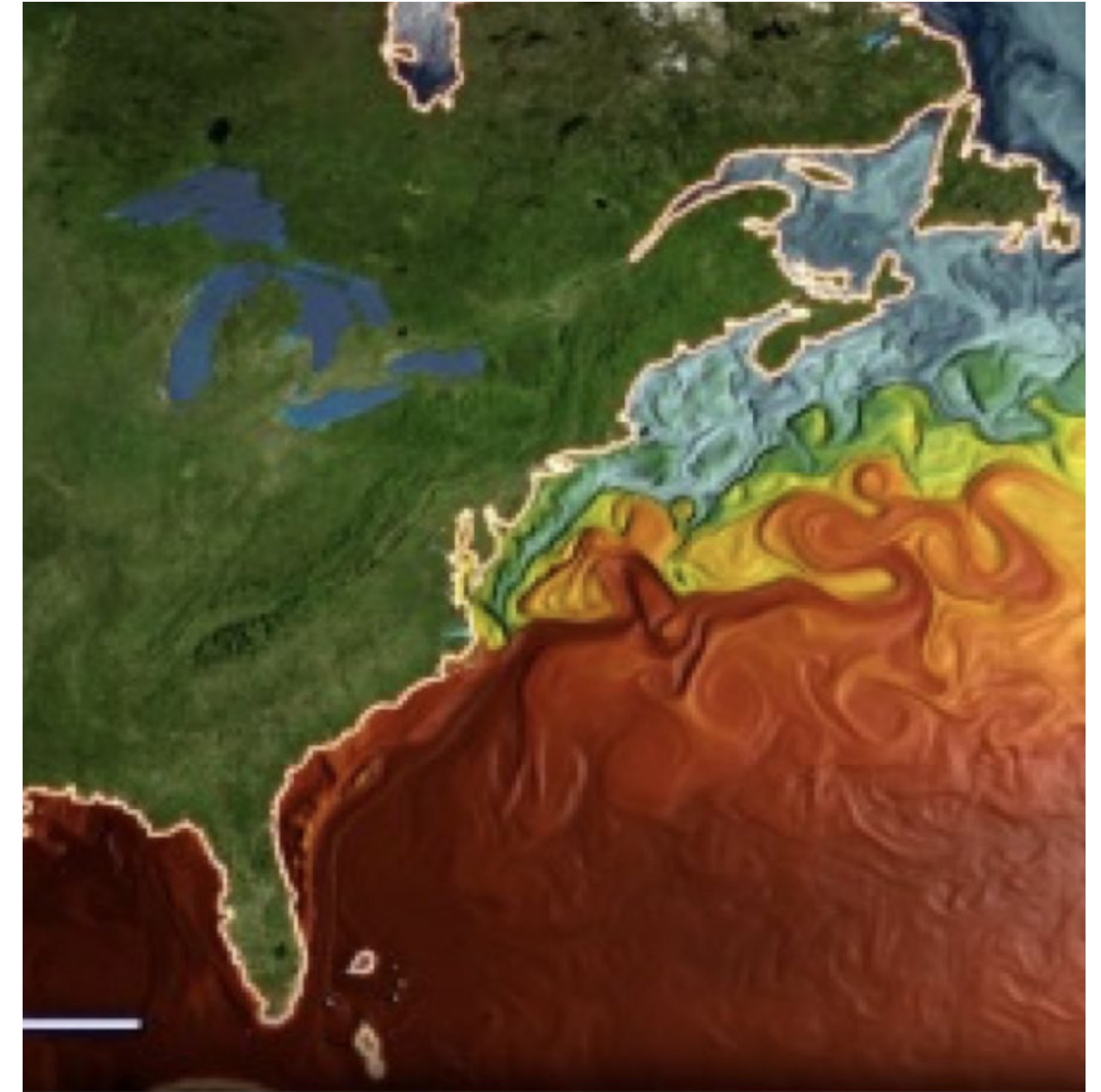
EAST COAST CLIMATE CHANGE SCENARIO PLANNING

Kiley Dancy, Mid-Atlantic Fishery Management Council
National Saltwater Recreational Fisheries Summit
March 29, 2022



Initiative Objectives

1. Explore how East Coast fishery governance and management issues will be affected by climate driven change in fisheries, particularly changing stock availability and distributions.
2. Advance a set of tools and processes that provide flexible and robust fishery management strategies, which continue to promote fishery conservation and resilient fishing communities, and address uncertainty in an era of climate change.



What is Scenario Planning?

- A tool for planning and action in the context of an uncertain future
- If we knew that certain conditions would occur in the future, what would we do now to prepare?

What if...

- *Species distribution changes accelerate?*
- *The Gulf Stream continues to move/weaken?*
- *The frequency and intensity of extreme weather events increases?*
- *Recreational fishing effort increases or decreases substantially?*
- *Consumer seafood preferences and demand change substantially?*

What is Scenario Planning?

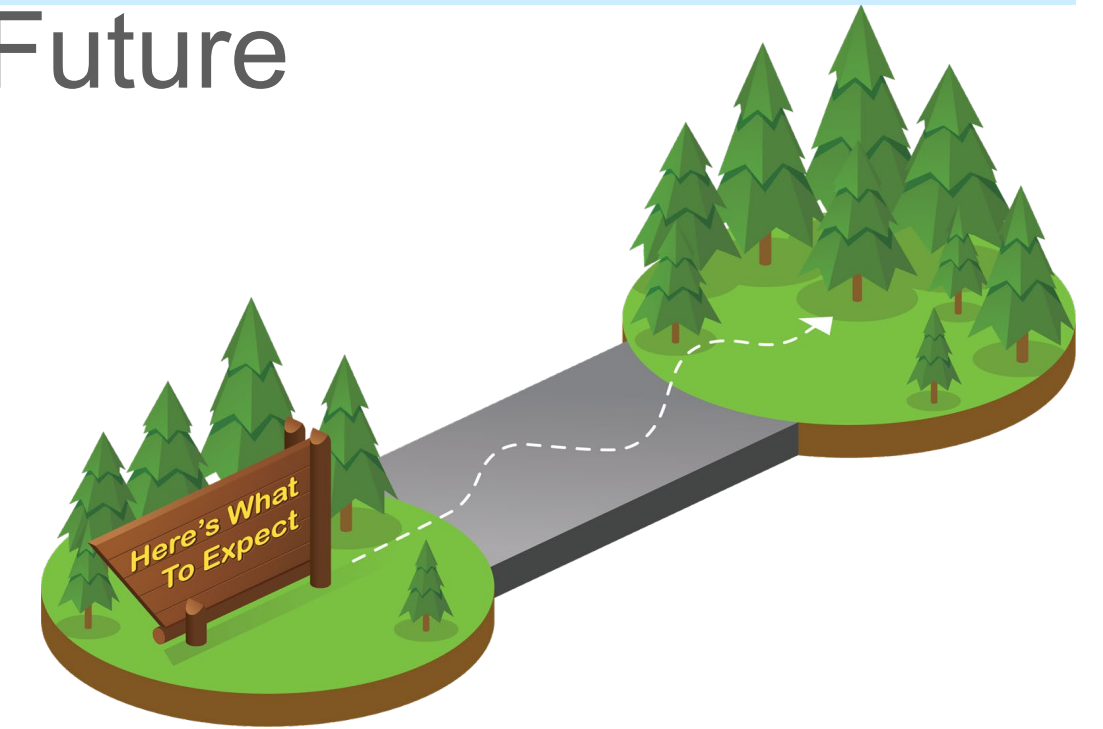
- Under different assumptions of future conditions:
 - Which management actions and governance strategies are **likely to be beneficial** under a range of future conditions?
 - Which management actions and governance strategies **should be avoided** due to reduced flexibility or increased difficulty of adapting to future conditions?



What is Scenario Planning?

- Not a prediction or forecast – a framework for allowing explicit consideration of uncertainty in future conditions
- Stimulates creative, innovative thinking
- Avoids focus on narrow view of the future

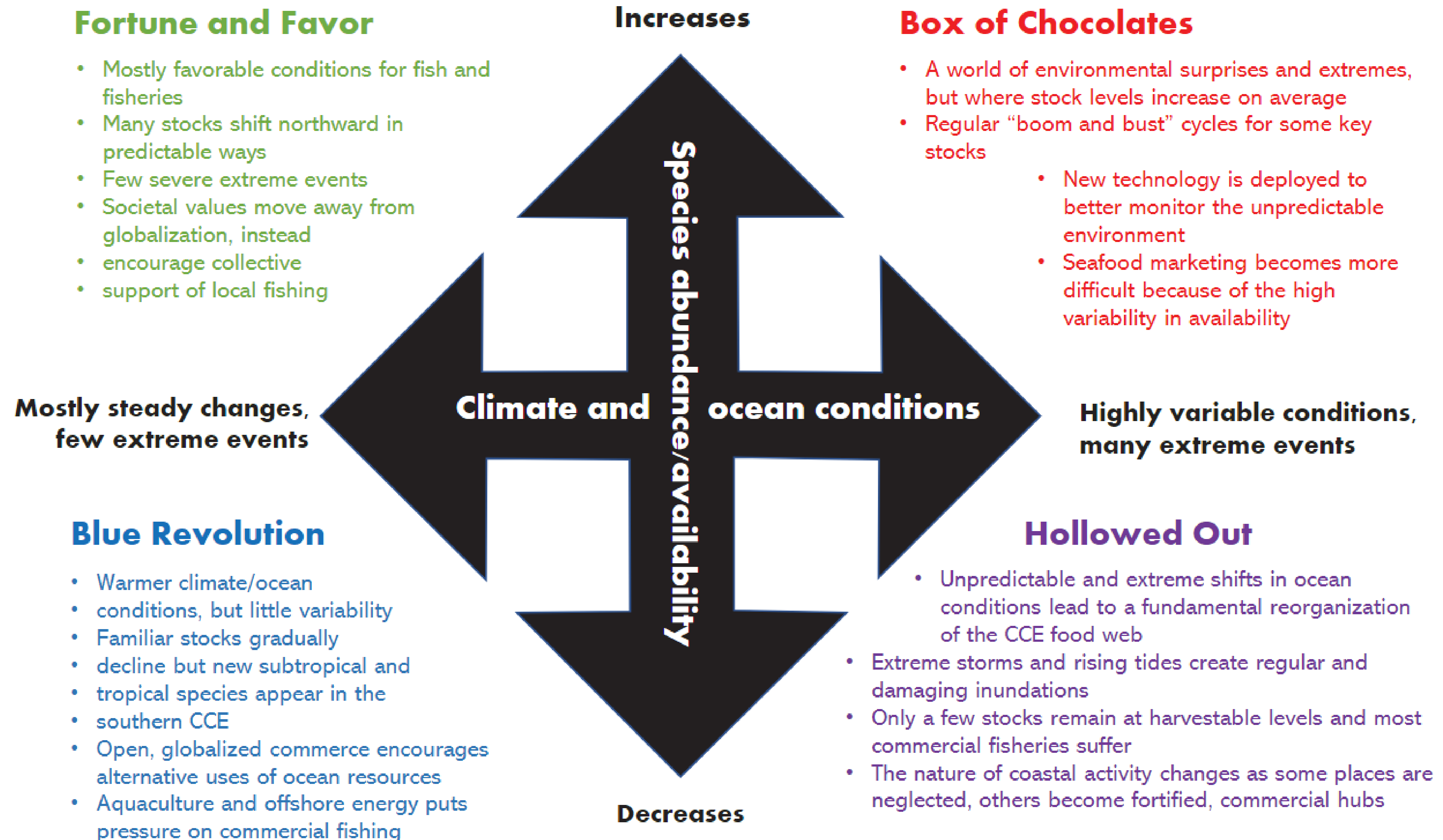
Planning for One Future



Planning for a Range of Futures

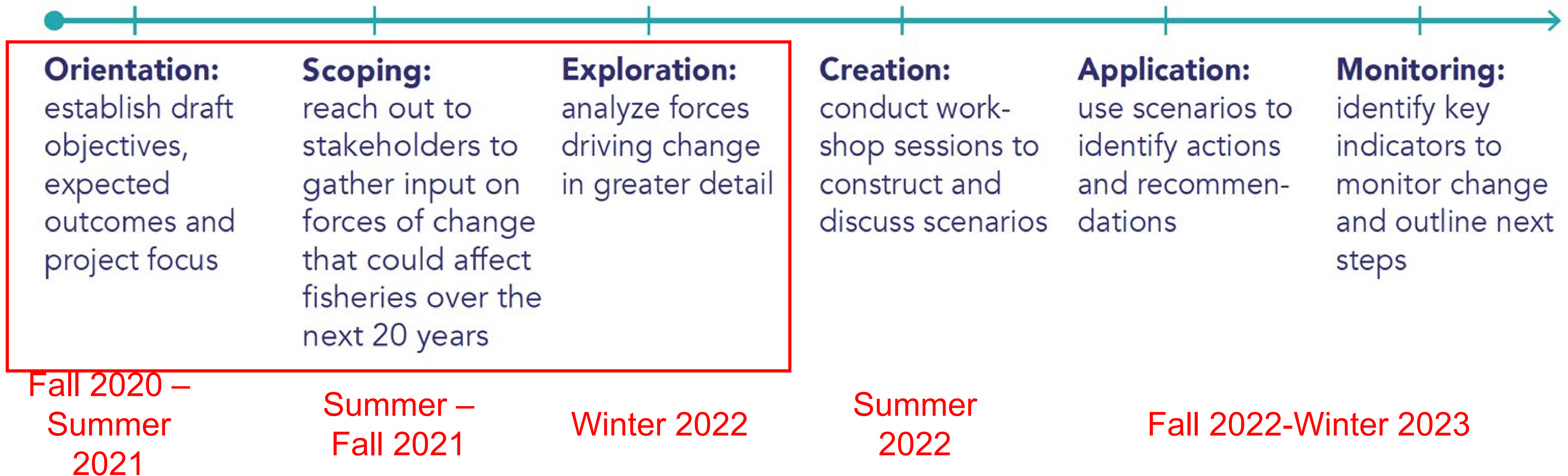


Example: Pacific Fishery Management Council Scenarios (2020)



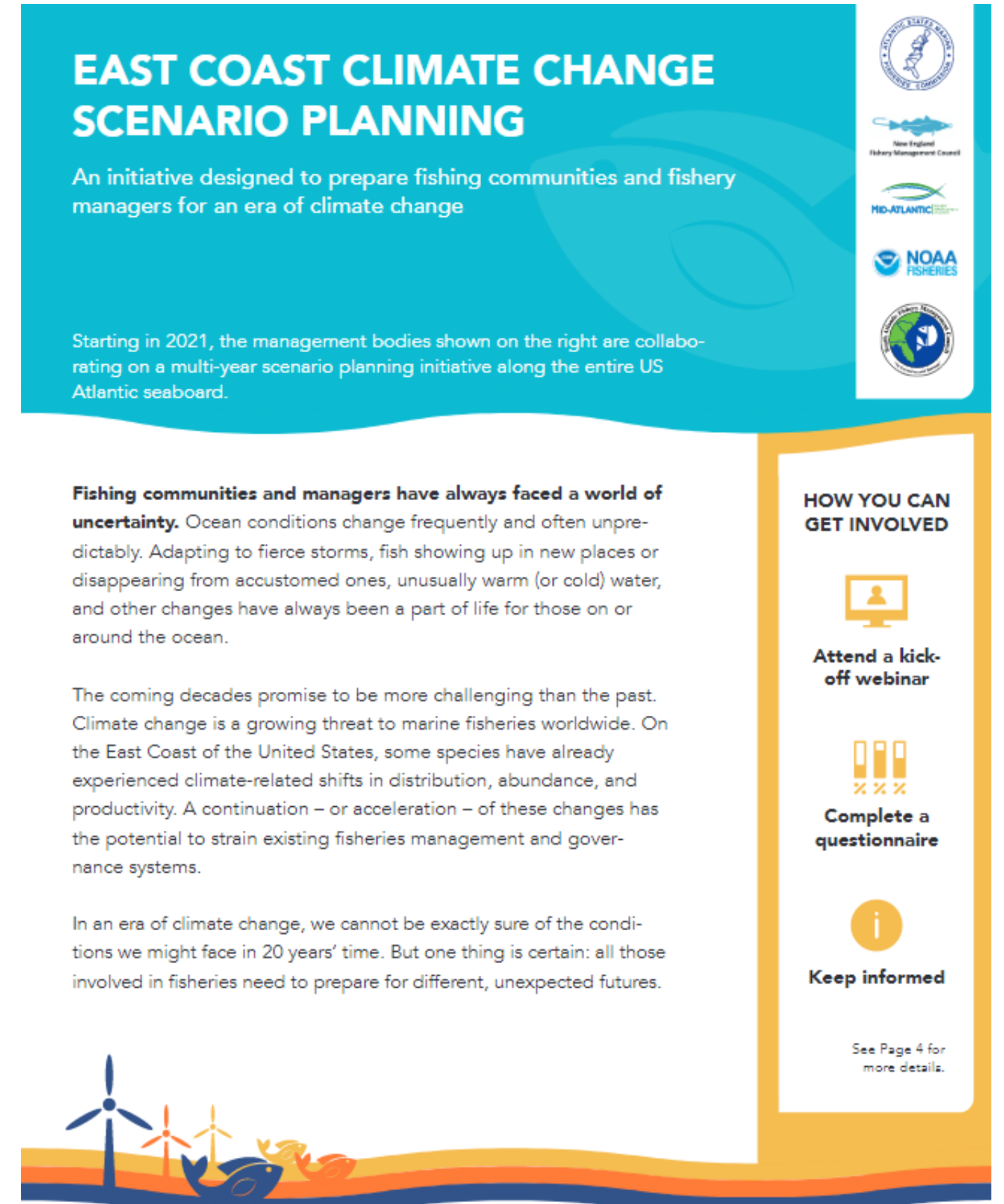
East Coast Scenario Planning Initiative

Steps in this Multi-Year Initiative



Scoping Highlights (Summer-Fall 2021)

- Scoping activities :
 - Introductory materials (website, brochures, videos)
 - 3 introductory webinars (over 250 attendees)
 - Online questionnaire (383 responses)



EAST COAST CLIMATE CHANGE SCENARIO PLANNING

An initiative designed to prepare fishing communities and fishery managers for an era of climate change

Starting in 2021, the management bodies shown on the right are collaborating on a multi-year scenario planning initiative along the entire US Atlantic seaboard.

Fishing communities and managers have always faced a world of uncertainty. Ocean conditions change frequently and often unpredictably. Adapting to fierce storms, fish showing up in new places or disappearing from accustomed ones, unusually warm (or cold) water, and other changes have always been a part of life for those on or around the ocean.

The coming decades promise to be more challenging than the past. Climate change is a growing threat to marine fisheries worldwide. On the East Coast of the United States, some species have already experienced climate-related shifts in distribution, abundance, and productivity. A continuation – or acceleration – of these changes has the potential to strain existing fisheries management and governance systems.

In an era of climate change, we cannot be exactly sure of the conditions we might face in 20 years' time. But one thing is certain: all those involved in fisheries need to prepare for different, unexpected futures.

HOW YOU CAN GET INVOLVED

- Attend a kick-off webinar
- Complete a questionnaire
- Keep informed

See Page 4 for more details.

Logos: New England Fishery Management Council, MD-ATLANTIC, NOAA FISHERIES, and the US Atlantic Seaboard.

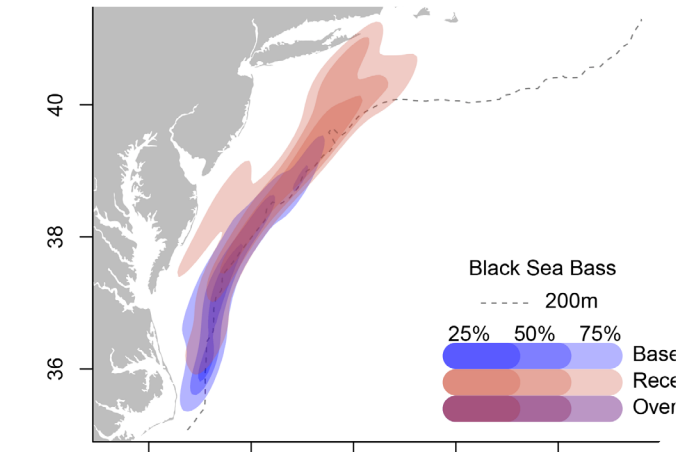
Illustration: Wind turbines, a fish, and a crab on a wavy background.

Scoping Highlights (Summer-Fall 2021)

- Some insights:
 - High level of interest in these issues
 - Stakeholders **already seeing effects of climate change**
 - Identified range of oceanographic, biological, social & economic **drivers of change** over next 20 years



Florida species shifting north



Some species moving North/East



Changes in productivity and fish size



Shifts in timing or frequency of spawning



Estuarine habitat loss



New food web dynamics



Realigning businesses to adapt to new species



Sea level rise impacting boat access

Exploration Phase: Drivers of Change

Oceanographic Drivers of Change

February 14, 2022

1. Ocean temperature
2. Currents
3. Long term cycles
4. Cold pool
5. Water chemistry
6. Primary production
7. Extreme weather
8. Sea level rise

Biological Drivers of Change

February 23, 2022

7. Distribution changes
8. Productivity changes
9. Seasonal timing
10. Habitat vulnerability
11. Disease & Harmful Algal Blooms

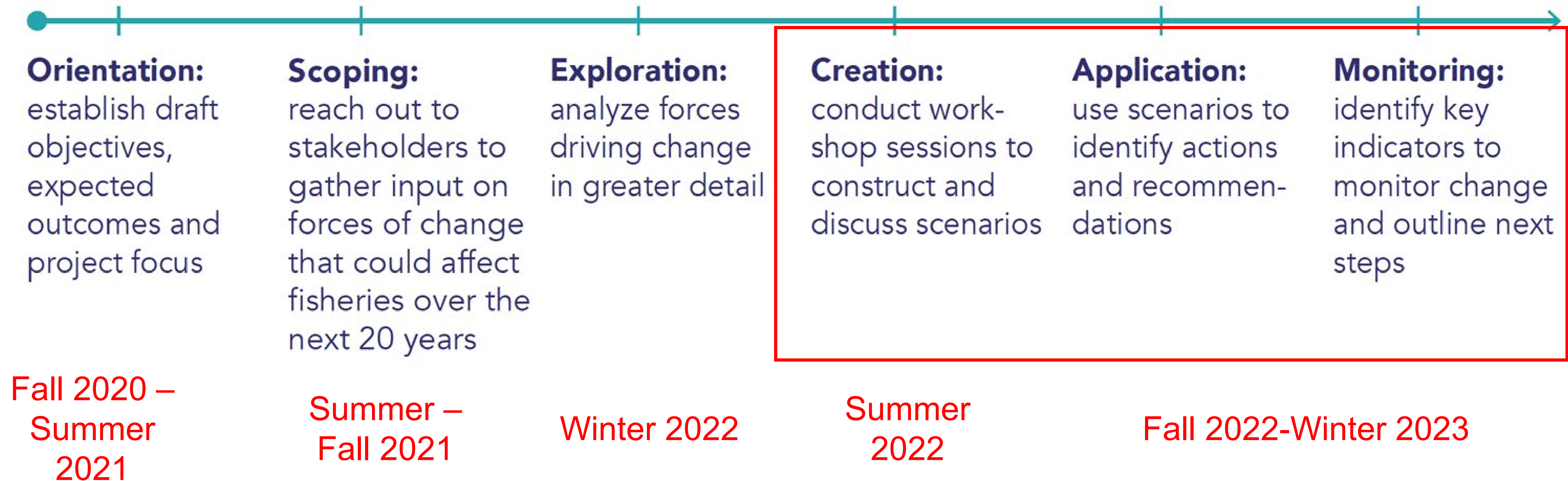
Social & Economic Drivers of Change

March 2, 2022

12. Population growth & demographics
13. External cost factors
14. Infrastructure and working waterfronts
15. Consumer demand and market dynamics
16. Technological change
17. Competing ocean uses
18. Social vulnerability & environmental justice

Next Phases: Scenario Creation, Applications,

Steps in this Multi-Year Initiative



Scenario Creation Workshop: June 2022

- Create 3-5 different scenarios to consider how climate change might affect East Coast fisheries in the next 20 years
- Different possible combinations of oceanographic, biological, and socioeconomic conditions
- Plausible, challenging, relevant, memorable stories that describe what we **might** face over the next 20 years



Scenario Creation Workshop: June 2022

- 2.5 day in person workshop
- Approximately 75 participants to be selected based on responses to **online application - available soon** at <https://www.mafmc.org/climate-change-scenario-planning>
- Strive for balance across stakeholder groups, regions, involvement in current process & new voices
- Partial webinar streaming (plenary discussions only)



Following the Workshop: Scenario “Deepening”: Late Summer

- A series of ‘scenario deepening’ webinars: seek comment on scenarios created at the workshop, adding details so that the storylines are fleshed out and as relevant as possible
- **Opportunity for involvement** for those unable to attend the workshop

Application Phase: Fall 2022-Winter 2023

Use scenarios as a **platform** to discuss future fishery governance and management issues:

- How well would our current systems work if these new scenario conditions were to occur?
- What would need to change to better prepare for these scenario possibilities?
- What are the tools and processes that need to be advanced now to ensure that fisheries are governed and managed effectively in an era of climate change?



Project Outputs

- ❑ A set of scenarios a few stories that describe – in qualitative terms – different ways in which a changing climate might affect the future of East Coast fisheries
- ❑ A better understanding of the challenges and opportunities facing fishery management in the future
- ❑ A set of near-term and long-term management priorities that help achieve fishery management objectives under a range of different future conditions
- ❑ Policy recommendations for broader governance changes that improve our ability to adapt to future scenarios
- ❑ A list of data gaps, research needs, and monitoring needs for changing conditions
- ❑ A framework for ongoing conversation and idea generation for all stakeholders to use

For Additional Information

- <https://www.mafmc.org/climate-change-scenario-planning>

- kdancy@mafmc.org

- Core Team:

Organization	Representative
MAFMC	Kiley Dancy
ASMFC	Toni Kerns
NMFS GARFO	Travis Ford
NEFMC	Deirdre Boelke
NMFS NEFSC	Sean Lucey
SAFMC	Roger Pugliese
NMFS SERO	Karla Gore
NMFS HQ	Wendy Morrison
Process Facilitator	Jonathan Star, Scenario Insight