

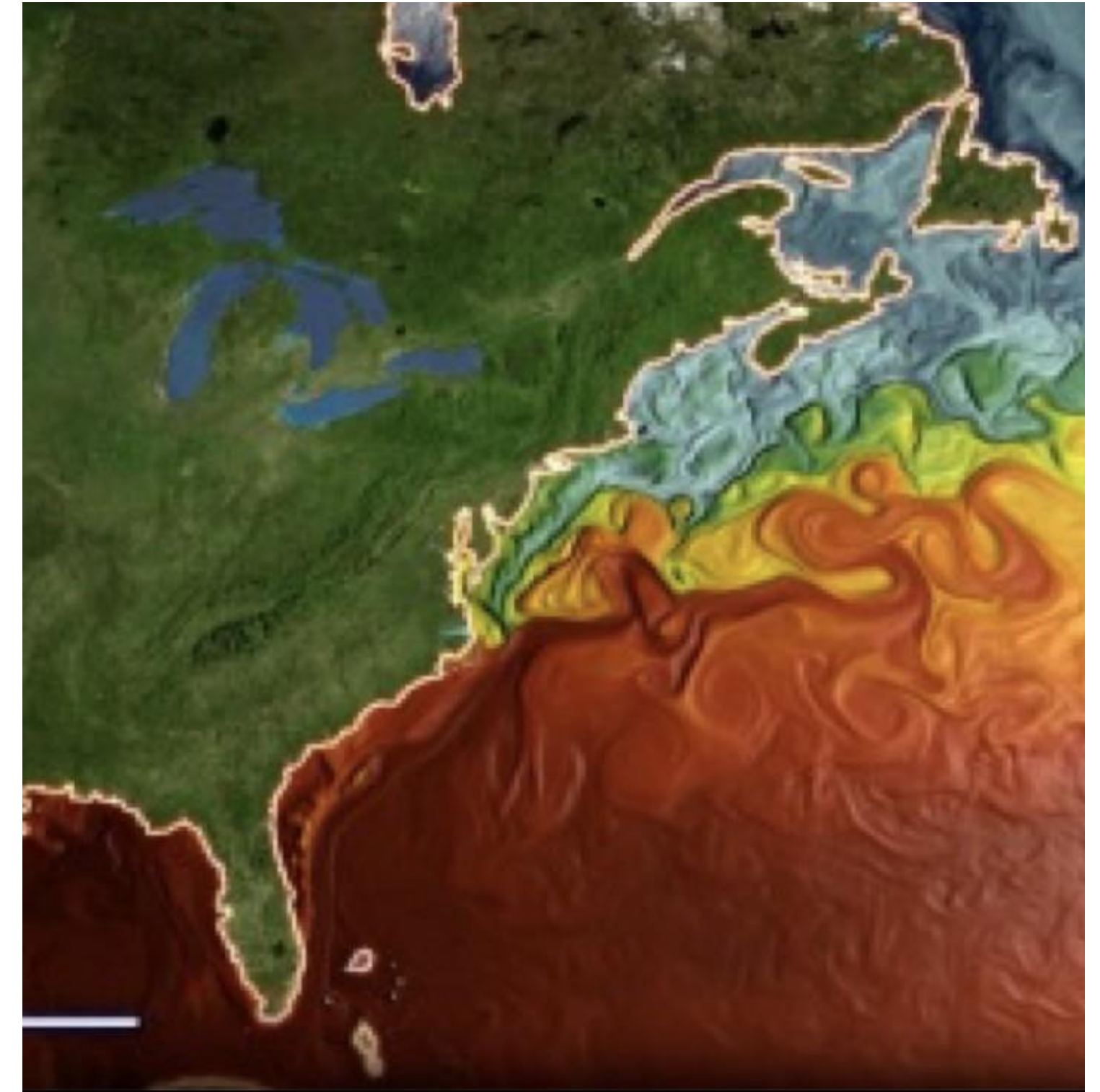
EAST COAST CLIMATE CHANGE SCENARIO PLANNING UPDATE

**SAFMC Habitat Protection and Ecosystem
Based Management AP**
Roger Pugliese
November 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.



East Coast Scenario Planning Initiative Timeline

Steps in this Multi-Year Initiative



Scenario Creation Workshop

- June 21-23 in Arlington VA
- Attended by approximately 75 stakeholders & staff
- Productive 2.5-day workshop with highly engaged participants



Scenario Framework Construction

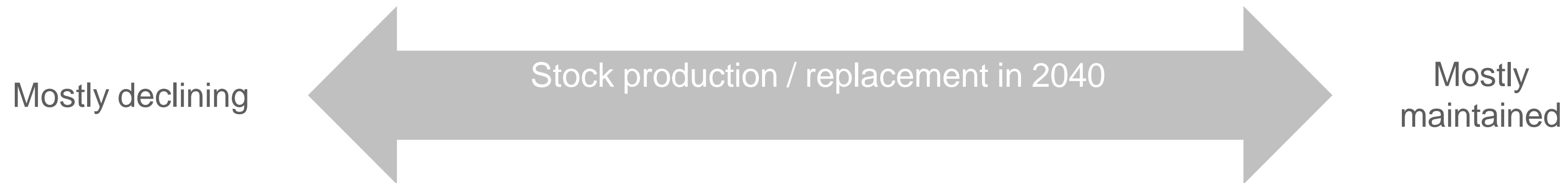
- At workshop, combined 2 different critical uncertainties,



Scenario Framework Construction

The scenario framework is constructed by combining two “critical uncertainties” – important factors that are likely to shape the future but could develop in unpredictable ways.

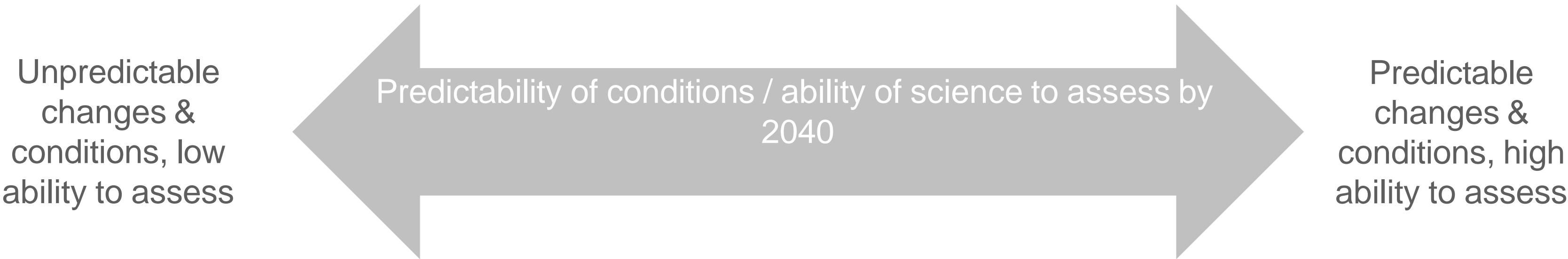
1. What happens to stock production / species productivity as climate change continues out to 2040? Does it result in declining productivity (alongside worsening habitat, and low rates of species replacement), or is productivity mostly maintained (with adequate habitat and sufficient levels of species replacement)?



Scenario Framework Construction

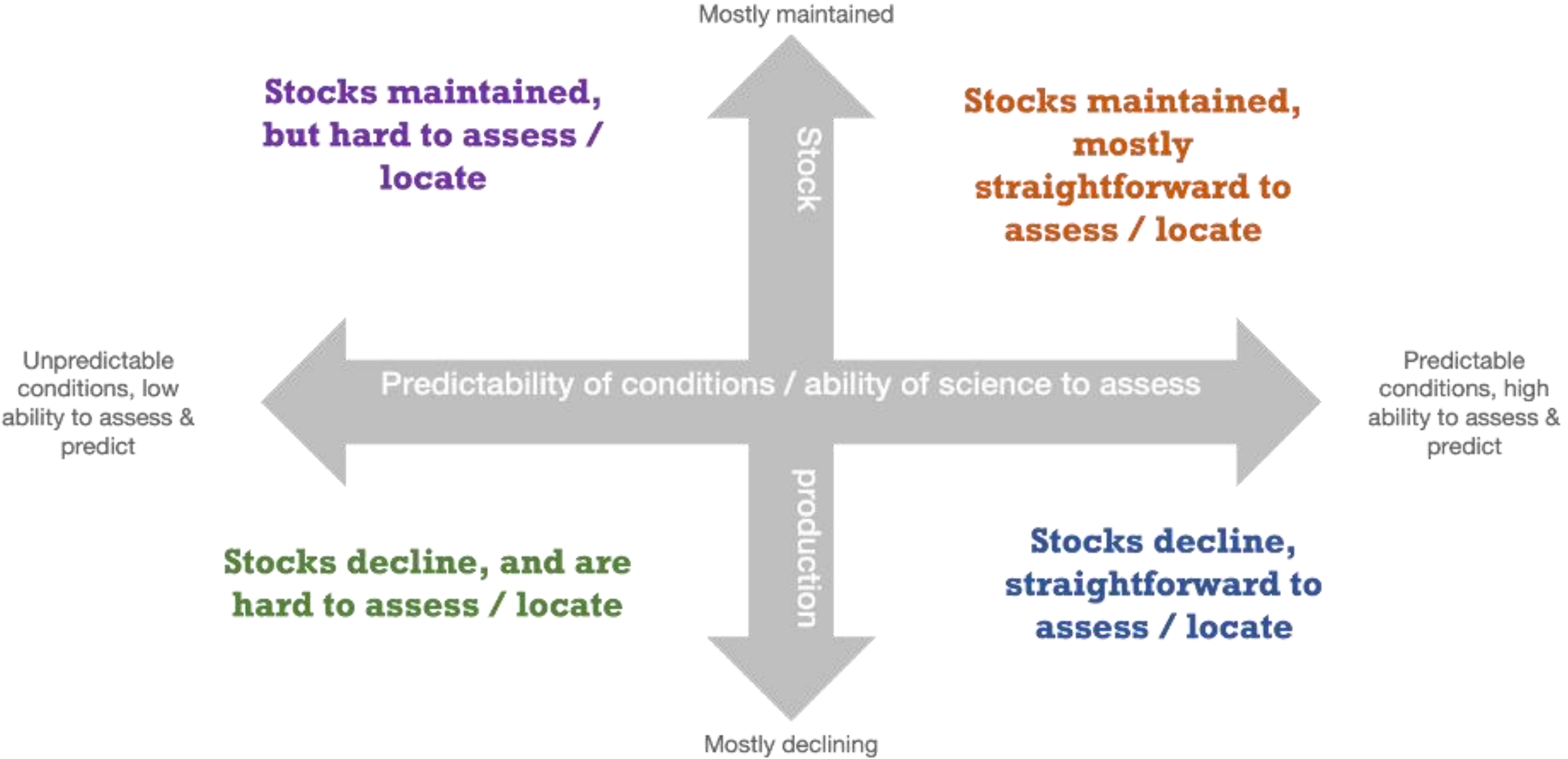
The scenario framework is constructed by combining two “critical uncertainties” – important factors that are likely to shape the future but could develop in unpredictable ways.

2. How unpredictable are ocean conditions, and how well is science able to assess and predict stock levels and locations by 2040? Do conditions become far more unpredictable, where existing science is clearly unable to provide much useful information, or are conditions sufficiently predictable to allow science to provide mostly accurate information about stocks and location?

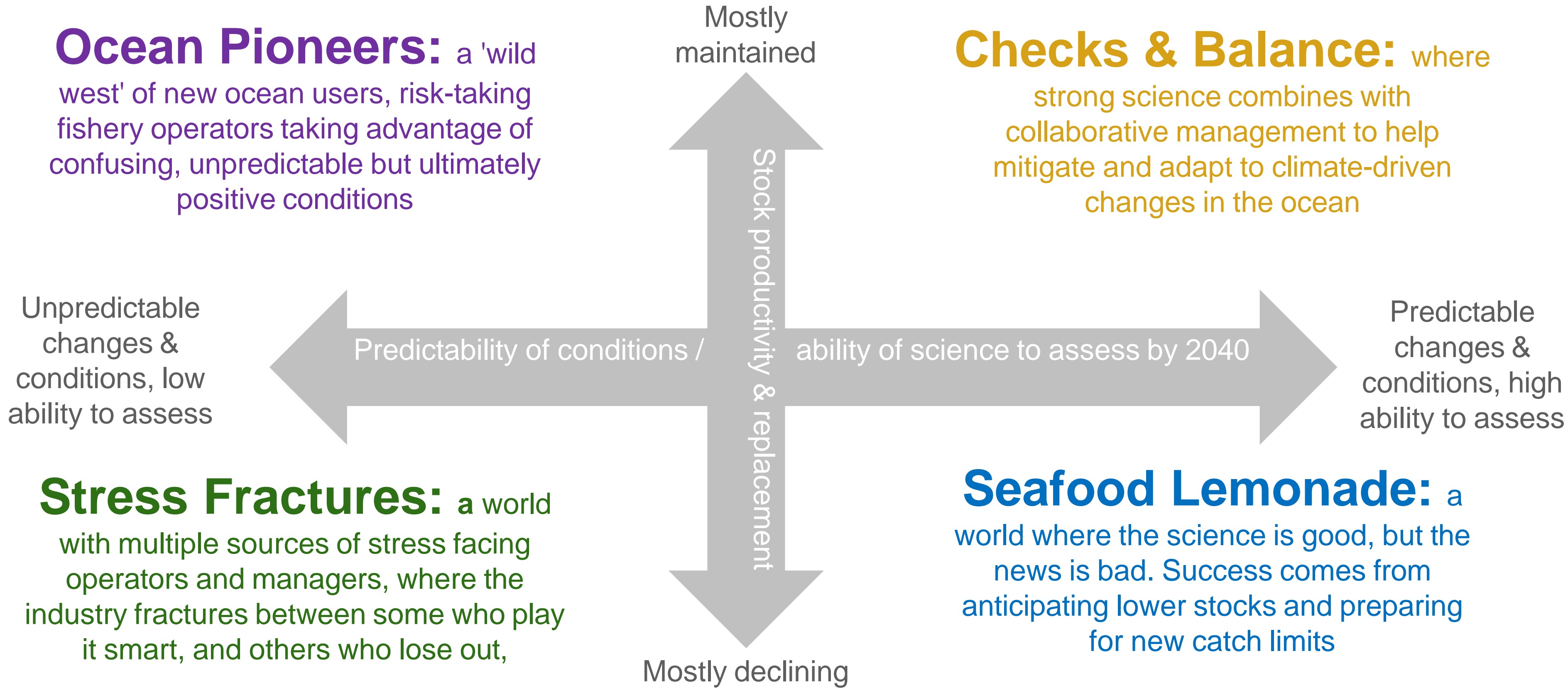


Scenario Framework: East Coast Fisheries in 2040

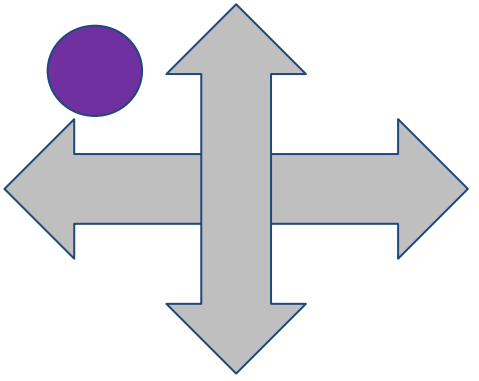
Combining the uncertainties results in a matrix that creates four different stories of the future



Scenario Framework: East Coast Fisheries in 2040



Ocean Pioneers: stocks maintained, hard to assess / predict

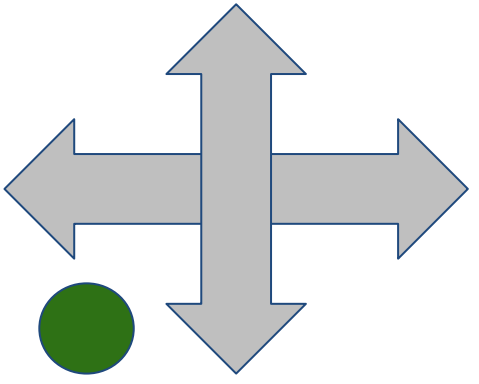


- Crazy ocean conditions & weird weather: pendulum swings, boom & busts
- Ocean is resilient –stocks are maintained (in aggregate) with no damaging climate tipping points
- Seasons and locations of traditional fisheries change unpredictably, leading to (e.g.) changes in interactions with protected species
- Traditional stock assessments are less reliable; real-time data from vessels and other users is more valuable than traditional science
- New assessment approaches generate questions over data rights and data aggregation
- Extreme weather often creates dangerous fishing conditions
- Ocean activity (i.e. fishing, aquaculture and offshore wind) dominated by entrepreneurs, technology, pioneers
- Winners typically have deep pockets, sharp elbows, new technology and a willingness to take risks
- Uncertainty about how long “abundant” stocks can keep delivering

Features of Each Scenario: East Coast Fisheries in 2040

Stress Fractures: stocks declining, hard to assess / predict

- Unpredictable conditions create climate tipping points with negative impacts to diverse harvest, forage and marine wildlife species
- Storms and population growth create more pollution, reducing the quantity and quality of estuaries and other nearshore habitat
- Diseases are prevalent – several marine heatwaves lead to die-offs
- High stress on fishing operators: costs rise and harvest opportunities are reduced due to low abundance of traditional stocks and new area closures to protect endangered species
- Science appears unable to help the fishery management community adapt; stock assessments rely on insufficient data and constant lawsuits drain management capacity
- Stocks experiencing range shifts are incorrectly classified as overfished; these mistakes undermine the management process
- Low levels of trust between several different stakeholder groups
- Conditions require operators to shift effort to lower trophic level species
- Government steps in to save some domestic fisheries, but only a few select fisheries get assistance
- Fishing no longer the dominant activity in the ocean, competing with other industries for space and attention



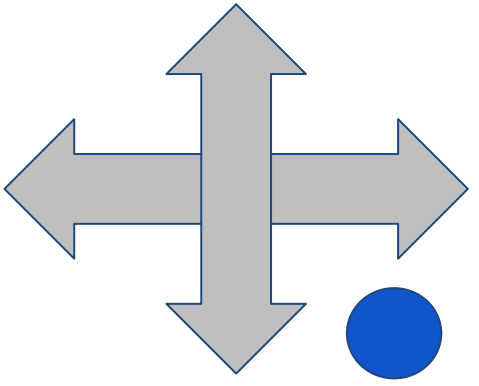
Seafood Lemonade: stocks decline, straightforward to assess / locate

- “Science is good, but the news is bad”
- Declining productivity and abundance for many species including harvest mainstays, choke species, and diverse marine wildlife; maximum fish size is smaller
- The cold pool continues to shrink in size and duration, negatively impacting diverse species that depend on this pelagic habitat
- Range shifts as species move N and E, but not much range expansion

- In some regions, management puts limits on newly arriving species, allowing establishment of new reproducing populations; marine wildlife interaction/bycatch challenges are addressed through improved forecasts and fishing community innovation
- Successful small-scale fishermen adapt to reduced catch limits and new stocks, supplying limited but lucrative markets

- Unsuccessful regions struggle to develop effective responses to challenges like shifting stocks and new marine mammal interactions, leading to fleet consolidation, loss of markets to artificially cheap seafood imports, and the permanent decline of historic fishing communities.

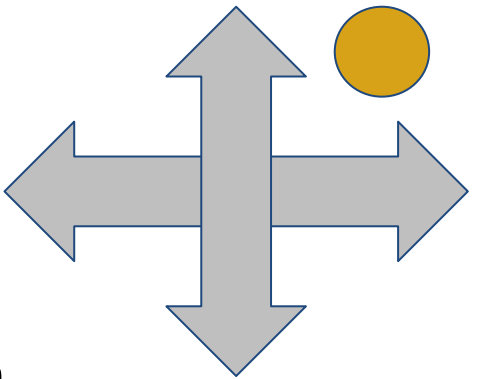
- Aquaculture becomes prevalent as a mass source of seafood



Features of Each Scenario: East Coast Fisheries in 2040

Checks and Balance: stocks maintained, straightforward to assess / locate

- Predictable changes and tolerable conditions; sea levels rise gradually
- Range expansion as stocks move predictably north & east
- Climate mitigation efforts reduce greenhouse gas emissions, with little effect on ocean conditions in the short-term; however, better pollution reduction, habitat protection and restoration reverse a great deal of habitat damage and loss
- Science capacity booms, delivering effective ocean monitoring, real-time catch reporting, food web/population monitoring and bycatch avoidance
- Species composition has changed, but widespread data means that management can provide for a full and flexible balanced use of available fish stocks
- Investment in other ocean/coastal uses leads to competition (e.g. aquaculture) and collaboration (e.g. fisheries science is boosted by wind energy installations)
- Recreational sector is healthy thanks to stable productivity and increased coastal wealth, but gentrification creates concerns over accessibility



Scenario Deepening and Applications: Next Steps

Scenario Deepening Webinars: August 2022

Two 2-hour webinars were held on the following dates, and the scenarios are currently being refined to take account of comments and feedback:

- **Wednesday, August 17, 3-5 pm**
- **Tuesday, August 23, 10 am-12 pm**

Applications Phase Fishery Manager Brainstorming Sessions: September 2022 (new)

Purpose: Identify the issues, ideas, and options that should be discussed at scenario planning conversations at Council & Commission fall

Summit Meeting: Tentatively February 2023

The summit meeting will discuss input from management body sessions, with the goal of developing a final set of governance, management, and monitoring recommendations from the scenario planning process

