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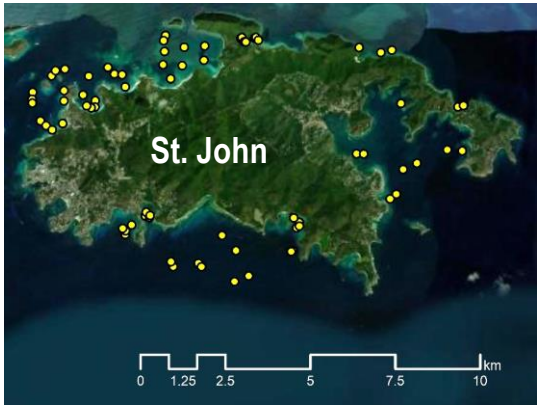
SEFSC Update

April 23, 2024 | CFMC Meeting

U.S. Caribbean Conch Survey Project

U.S. Caribbean Survey Project

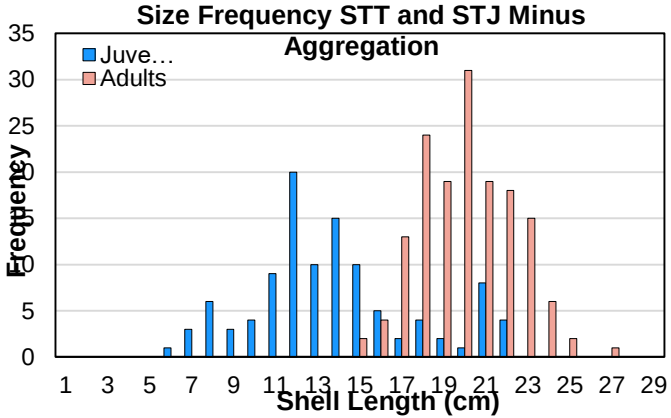
- 1 island group per year
  - STT/STJ 2023
  - STX 2024
  - PR 2025

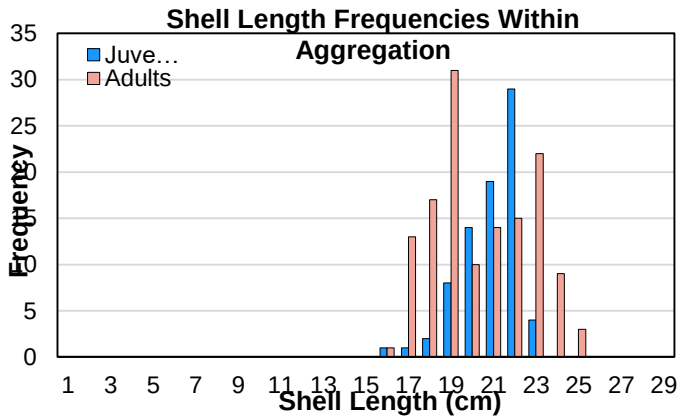


- Randomly stratified by depth (5-m bins) and benthic habitat category
- Aggregation mapping and within aggregation surveys

Results Summary

- 130 radial surveys completed (59 STT, 71 STJ)
  - ➢ Overall densities = 64 conch/ha
  - ➢ By age class = 24 juv/ha and 40 adults/ha
- 4 surveys w/in aggregation (~1 ha area)
  - ➢ Overall density = 1695 conch/ha
  - ➢ By age class = 621 juv/ha and 1074 adults/ha





Southeast Fisheries Science Center | Sustainable Fisheries Division

Caribbean Fisheries Branch

Adyan Carly David Katherine Kevin Matt Rachel Refik Stephanie

Strategic Planning

24 ongoing projects

Improving collaborative data collection to support fisheries management

Enhancing collaborations and workflows

Engaging regional federal, territorial, and university partners and stakeholders

Data Collection

Collaborate with regional partners and local fishers to conduct:

- Port sampling in Puerto Rico and US Virgin Islands
- Cooperative lobster trap surveys in Puerto Rico
- Reef fish life history sampling in Puerto Rico
- Research with regional graduate students

Data Analysis and Provision

Reproducible workflows to support:

- Stock assessments
- Western Central Atlantic Fishery Commission reporting requirements
- Caribbean Fishery Management Council and external requests
- Data storage and automation
- Aquaculture stakeholders
- Management Strategy Evaluation

Stock Assessments

Coordinated by the SouthEast Data and Review Process

2024

Queen Triggerfish
Yellowtail Snapper
Stoplight Parrotfish
Spiny Lobster

2025

Hogfish and Red Hind

Updated: 20240312

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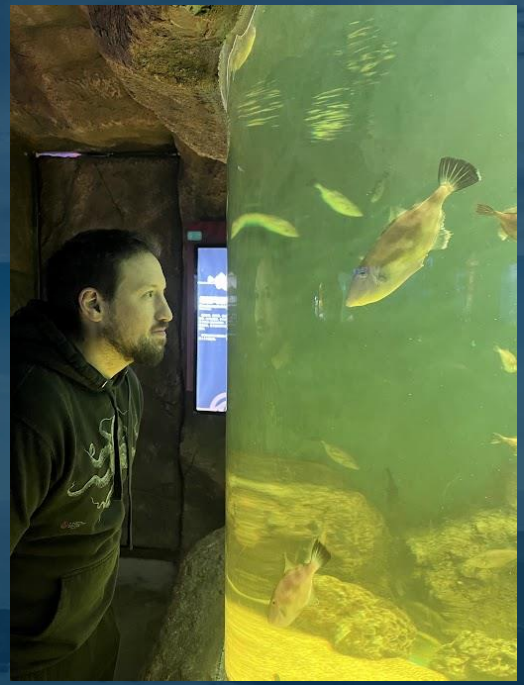
New CFB staff

Matt Damiano

- BS Oregon State University
- MS University of Maryland
- PhD North Carolina State
- Postdoctoral associate - lead analyst for Dolphinfish management strategy evaluation and stock assessment scientist for Atlantic Red Snapper Research program



Matt.damiano@noaa.gov

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Caribbean Fisheries Branch

Strategically leveraging and increasing SEFSC staff time and resources
meaningful impact towards capacity building with collaborators
better communication and interaction with stakeholders

Advancing US Caribbean stock assessments with innovations to better quantify uncertainty, improve data provision efficiency, and automate processes

SEDAR 80 USVI assessments accepted for use in management
applied new grid approach to communicating uncertainty, supporting SSC deliberations

SEDAR 84 data workshop advanced data provisioning/analyses best practices across large numbers of collaborators

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Caribbean Fisheries Branch

Caribbean Strategic Planning project

12 completed projects (SEFSC LPs)

20 in progress projects (SEFSC LPs + regional)

Has led to:

Strengthened collaborative foundation with partners

Increased communications within SEFSC branch and divisions performing work in the US Caribbean and streamlined data analysis processes and workflows

Involves: CFMC, SSC, EBFM-TAP, CIMAS, PR DRNA, USVI DFW, NPS, UPR, UVI, USC-A, SeaGrant, SEAMAP-C, NOAA HQ, NMFS SEFSC (4 divisions, 11 branches, and the directorate)

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Inflation Reduction Act Funding in 2024

Fishery independent survey for reef fishes

To be conducted as cooperative research with US Caribbean commercial fishers

- Extend existing Puerto Rico deep-water reef fish survey into US Virgin Islands
- Extend the existing Puerto Rico survey into shallow water to overlap with NCRMP diver survey
- This survey work will leverage existing Cooperative Research Program funding
- *This work is an outgrowth of key needs identified in the Caribbean Strategic Planning workshop funded through Ecosystem, Climate, and Stock Assessment Improvement.*

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Inflation Reduction Act Funding in 2024

Fishery independent lobster trap survey

- Extend existing Puerto Rico survey into the US Virgin Islands.
- This work will be conducted as cooperative research with US Virgin Islands commercial fishers.
- This extended survey will leverage existing Cooperative Research Program funding for the Puerto Rico survey.
- *This work is an outgrowth of key needs identified in the Caribbean Strategic Planning workshop*.

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Additional CFB work in 2024

Characterize shark and HMS fisheries

Data entry support for DRNA

Port sampler support in US Virgin Islands

Work with stakeholders to better understand management expectations and requirements

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Questions?

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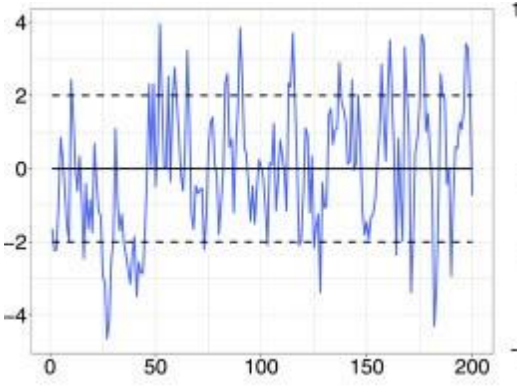
Harvest control rules in a changing environment: lessons for confronting non-stationarity in the U.S. Caribbean

Matt Damiano, Kyle Shertzer

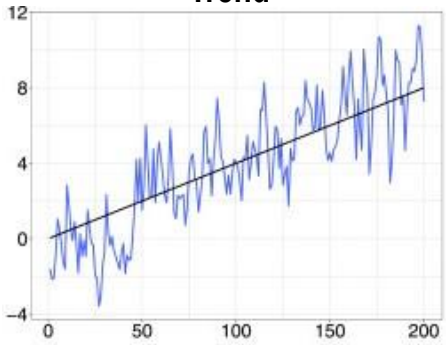
NOAA Fisheries, Southeast Fisheries Science Center

Stationarity

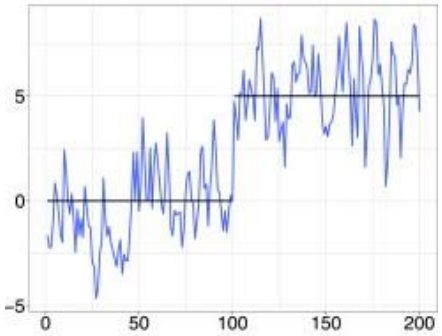


Nonstationarity

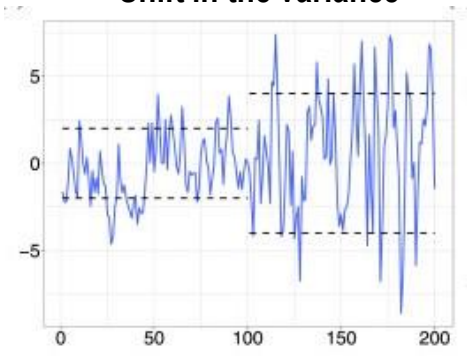
Trend



Shift in the mean

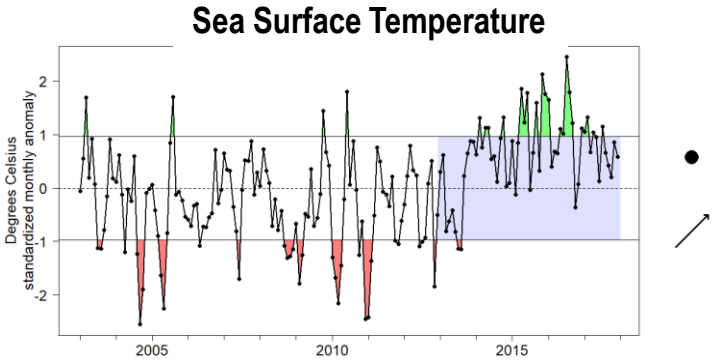


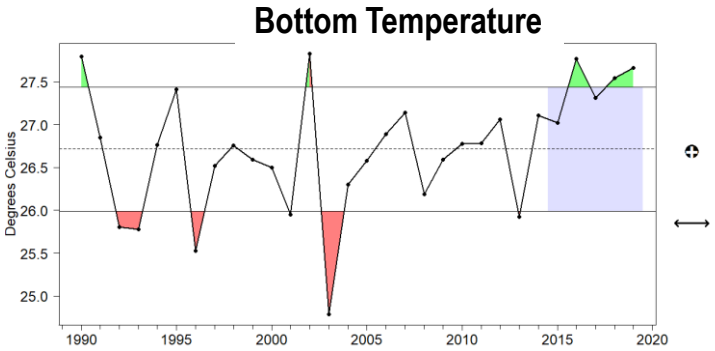
Shift in the variance

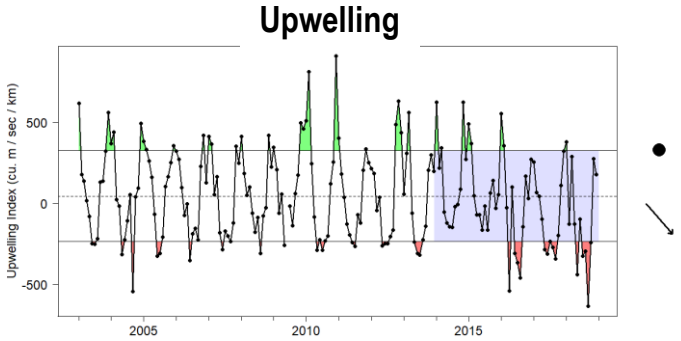


Images from Salles et al. 2019

Examples of environmental nonstationarity in the SA







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Craig et al. 2021

Environmental nonstationarity can affect fish populations

- Spatial distribution
- Growth rates
- Survival rates
- Recruitment … *Maybe in the SA?...*

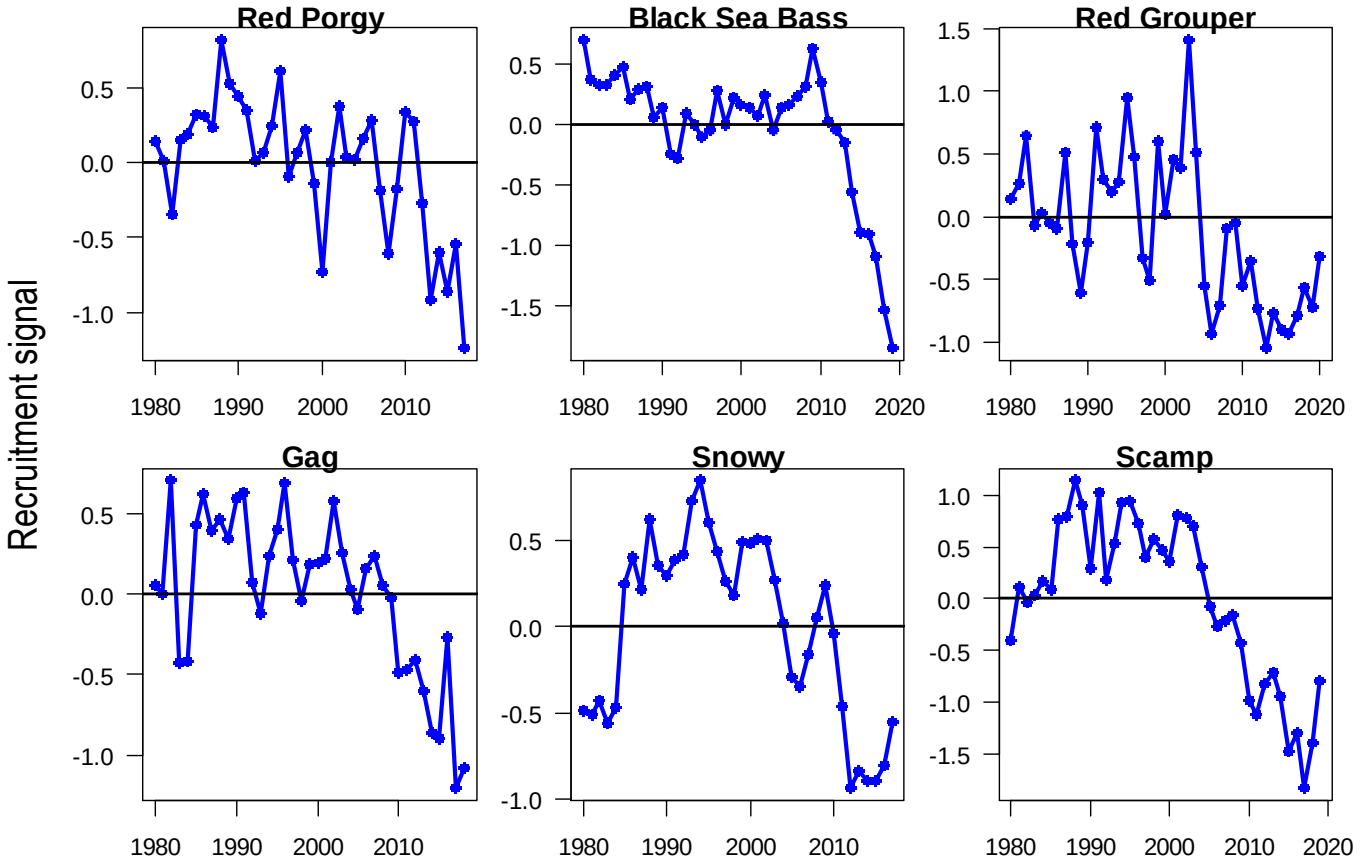
Evidence of recent poor recruitment in the SA

- Stock assessments: black sea bass, gag, scamp, red grouper, red porgy, snowy grouper

- SERFS trends reports: bank sea bass, knobbed porgy, sand perch, scup

- Peer-reviewed publications:
  - Scamp (*Bacheler & Ballenger 2018*)
  - Red porgy (*Bacheler et al. 2023*)
  - Multiple species (Wade et al. 2023)

Estimates of recruitment from stock assessments



Implications of recruitment nonstationarity

- Biomass benchmarks (e.g., B_{MSY}) are dynamic
  - Estimating stock status is challenging, especially in projections
- Rebuilding time frames are highly uncertain
  - Now the goalpost moves in ways we can't predict

The good news

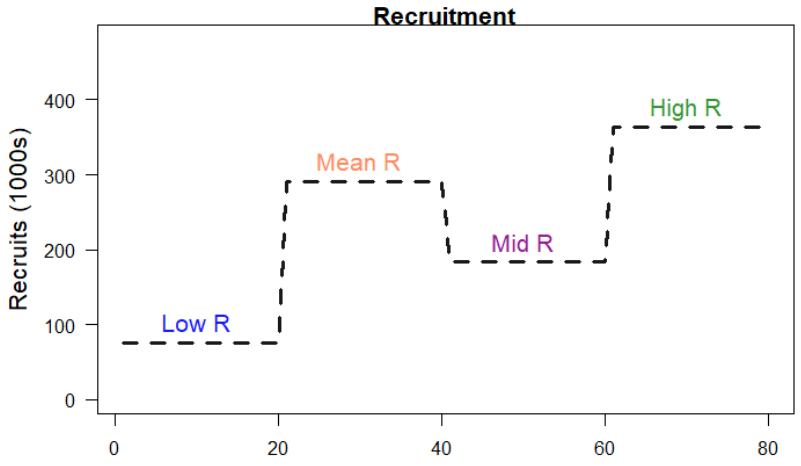
- Fishing benchmarks (e.g., F40%) are robust to recruitment nonstationarity

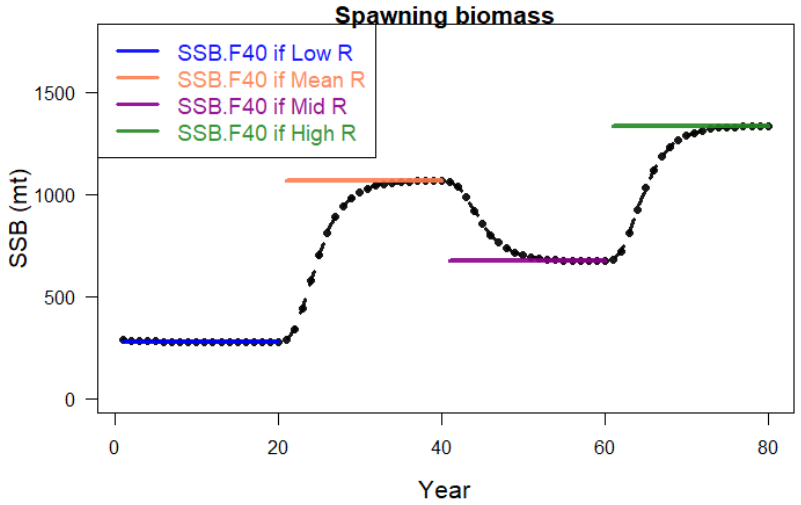
- Short-term catch advice using recent recruitment is reliable
  - ✓The SA SSC takes this approach

- The stock level should tend toward its target level, even if that level is unknown
  - ✓Cartoon simulation using SA scamp, fishing at F=F40…
  - ✓SA black sea bass MSE

Cartoon simulation: SA scamp fished at F=F40

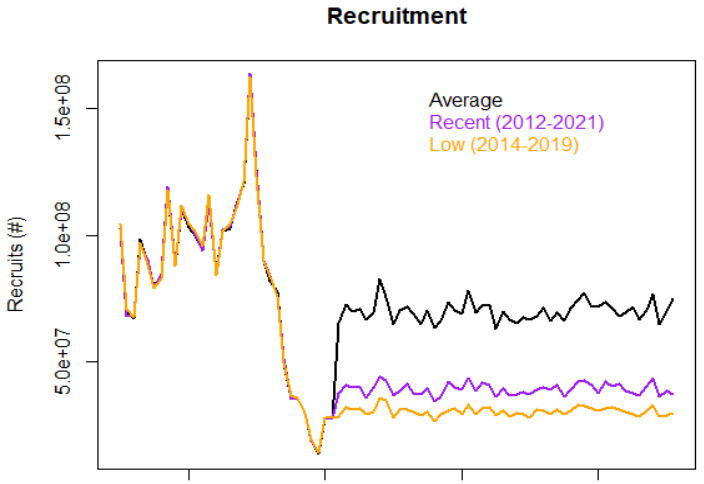
Take home message: you do not need to know SSB to know the effect F40 will have on the stock

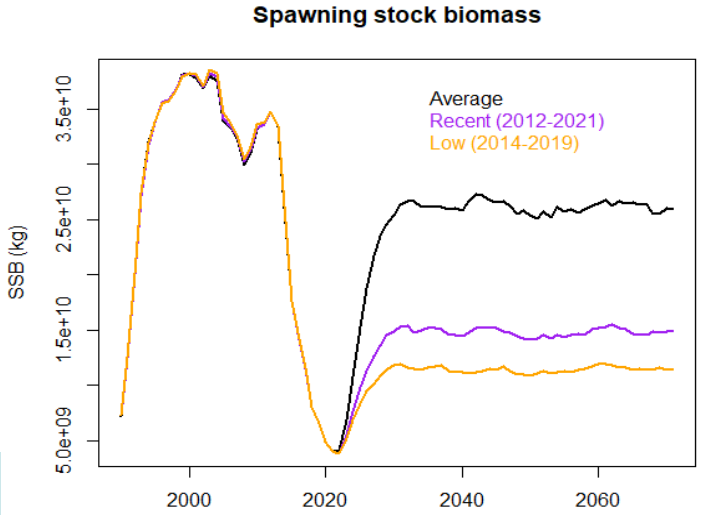




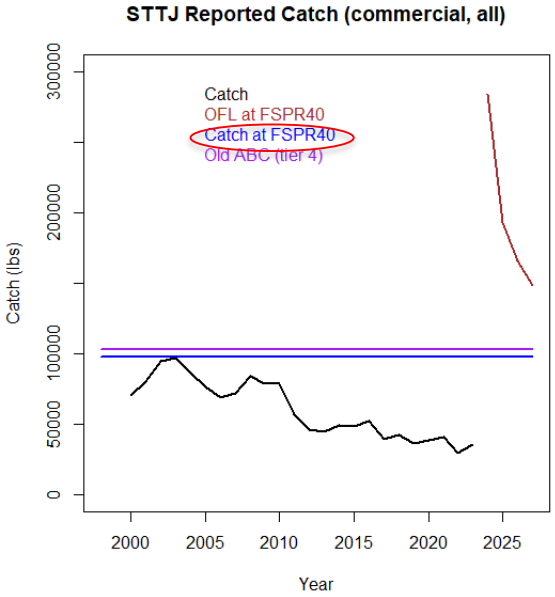
Management strategy evaluation: SA black sea bass fished at F=F40

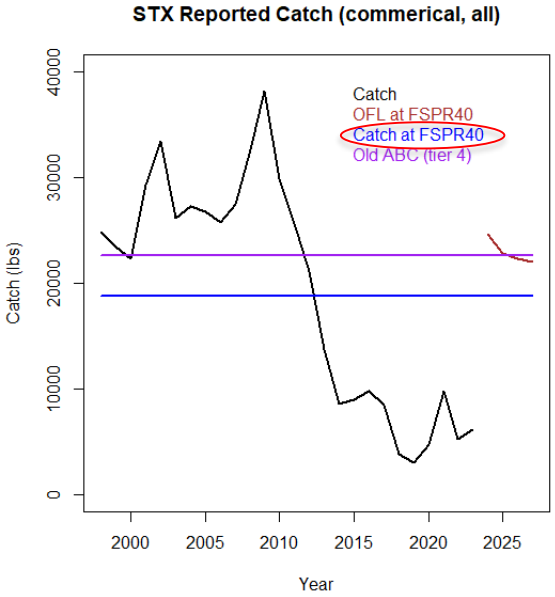
Further demonstrates the same take home message





SSC's ABC recommendation for SEDAR 80



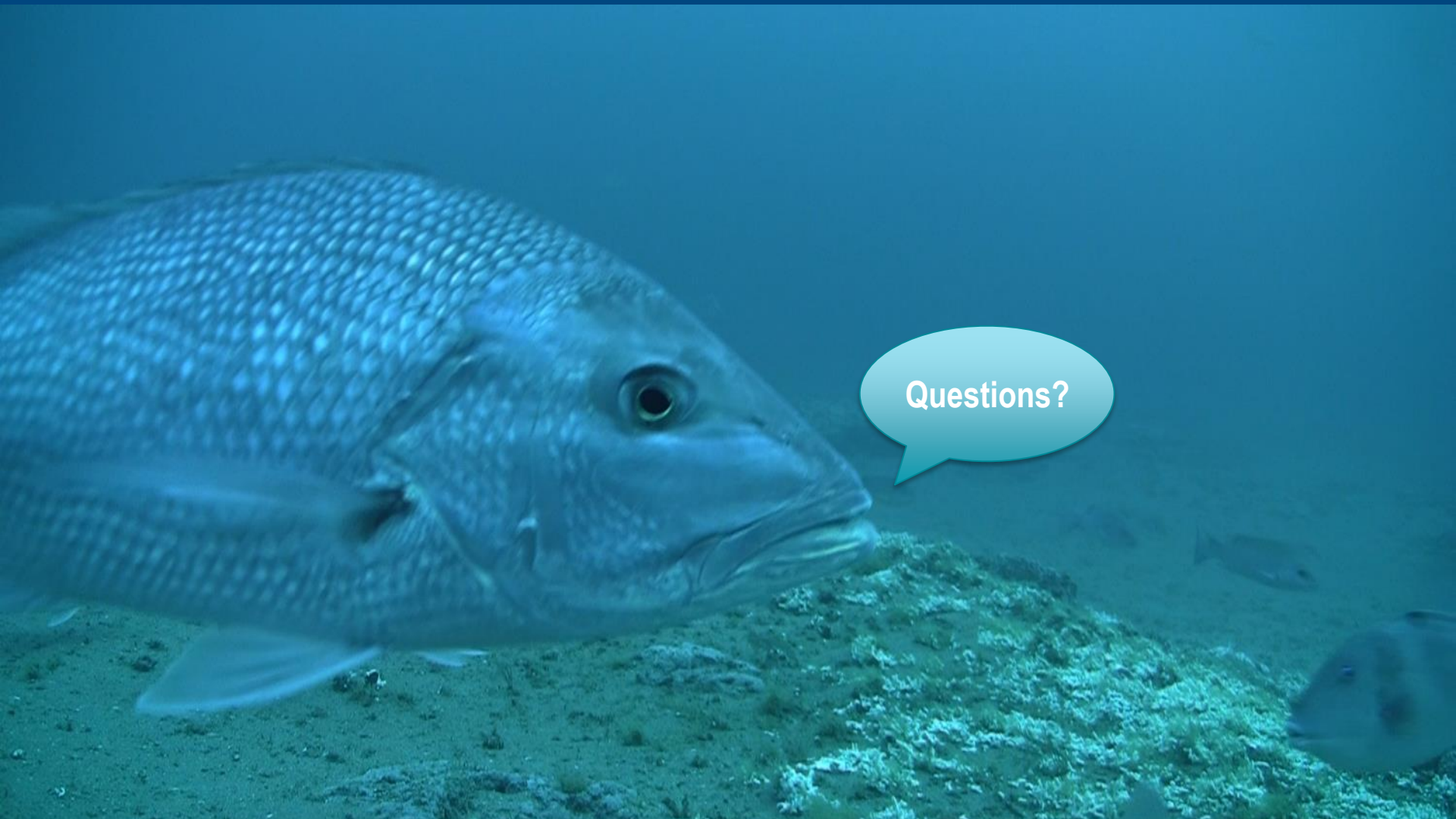


Need for further research

- Increased temperature = distribution shifts? Not always the case, so spatial management may not meet objectives (Cao et al., in press)

- Correlations b/w ecosystem indicators and large-scale oceanographic processes may lend insight (Karnauskas et al. 2015)

- MSE and simulation studies are useful to test an HCR's robustness to non-stationarity in population dynamics, e.g., recruitment (Damiano et al., in review), but also growth, survival, etc.


Questions?