ECOSYSTEM BASED TECHNICAL ADVISORY PANEL (EBFM TAP)

REPORT

Caribbean Fishery Management Council (CFMC) 182nd General Meeting

August 16, 2023

Sennai Habtes

EBFM TAP Chair

Bureau Chief, Fisheries

VI DPNR – Division of Fish & Wildlife

EBFM TAP Purpose

The EBFM TAP Charter - Objectives

- The EBFM TAP shall provide the Council ongoing scientific advice on ecosystem-based fishery management for fishery management decisions, including recommendations for habitat status, social and economic impacts of management measures, and ecosystem-based impacts (stressors) on sustainability of fishing practices

The EBFM TAP Charter - Process

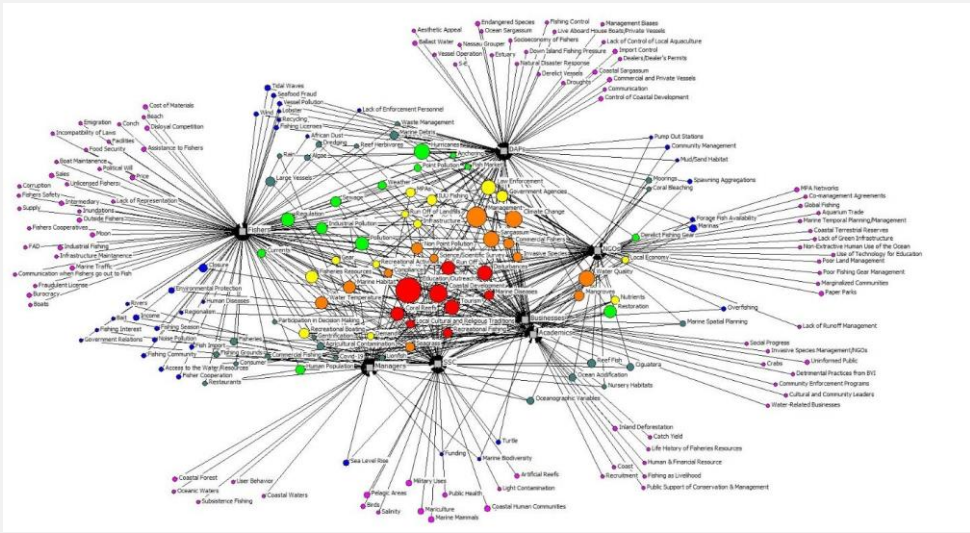
- Develop a Fisheries Ecosystem Plan – FEP
  - Framework by which the Council can maintain marine ecosystems and the fisheries resources dependent upon those ecosystems
- Infrastructure for CFMC to implement EBFM in US Caribbean

UPDATES

- *Joint SSC & EBFM TAP Meeting – May 1-5, 2023*
  - *Presentations:*
    - *Stakeholder Perceptions of Env. & Climate Change – T. Seara (U. New Haven)*
    - *Community Social Vulnerabilty Indicators in the US Caribbean – T. Seara (U. New Haven)*
    - *Use of EBFM in Stock Assessment and Advice Process – S. Gaichas (NOAA NFSC)*
  - *EBFM Research Priorities – provided to SSC*
- *Working Groups:*
  - *Conceptual Models, Ecosystem Indicators, Risk Assessment – met*
  - *Data Repository - TBD*
- *Technical Writer – Draft FEP developed*
- *Additional funding towards developing a Risk Assessment Framework for CFMC*
  - *Tauna Rankin & Council Staff – MSA - Sustainable Fisheries internal funding*
    - ***Use the main drivers from the conceptual models as risk factors to evaluate risk using quantitative indicators from the NOAA ESR and Lenfest project.***

WORKING GROUPS

Conceptual Models Melding	Members: JJ Cruz Mota, T. Seara, O. Tzadik, M. Duval, S. Stephenson, L. Rivera, R. Appledorn (?), T. Rankin Outputs: Indicators & Gaps, Model Framework, Appendix of CM's, Comparative model analysis, Indicator Rankings
Ecosystem Indicators	Members: K. Montenero, S. Regan, JJ Cruz Mota, S. Williams, T. Seara, O. Tzadik, S. Habtes, T. Rankin Outputs: Suite of ESR Indicators, Data Repository, CM & Quantitative indicators, Process of indicator prioritization, List of ESR & CM indicators
Risk Assessment	Members: S. Habtes, O. Tzadik, K. Montenero, T. Rankin, L. Rivera Garcia, R. Appledorn (?), S. Stephenson Outputs: Define indicators from the master indicator list, identify drivers and receivers as ecosystem components to develop strategic objectives to inform the council
Data Repository	Members: S. Habtes, O. Tzadik, E. Cruz-Rivera, K. McCarthy, S. Williams, S. Stephenson, CariCOOS (guest speakers) Outputs: Strategy for developing data management and coordination policies and infrastructure necessary for EBFM operational management in the US Caribbean through CFMC.
Drafting FEP	TBD



RESEARCH PRIORITIES

- 1. Develop Species and Habitat Climate Vulnerability Indices for the US Caribbean
- 2. Develop EBFM Reference Points for use in the fisheries management decision support system in the US Caribbean
- 3. Increase Research on Bycatch and Discards for the US Caribbean
- 4. Develop Reference Points and measurements for ecosystem restoration and mariculture capacity development
- 5. Asses Ecological sustainability of managing herbivores on ecosystems within the US Caribbean and identify important ecosystem indicators for those species and associated habitat.
- 6. Quantify positive and negative effects of Sargassum as critical habitat and effects of inundations on local fisheries
- 7. Research to guide strategies for adaptive fisheries management in the US Caribbean
- 8. Identify socio-economic factors to design surveys to systematically collect data to inform social impact assessments in the context of management strategies and system stressors (e.g., hurricanes, sargassum, etc…)
- Recommendation to set specific actionable priorities associated with these that can be integrated into RFP's directed to the US Caribbean
- Identify clear structure or process for council to help influence or present clear needs for research funding within the Caribbean on a regular basis

FEP DEVELOPMENT – USE OF TECHNICAL WRITERS

- Technical Writer – Katherine Tzadik
  - funded by PEW Charitable Trusts
  - Writing support of draft FEP for EBFM TAP
    - Intro/background
    - Interface between Fishery and Ecosystem Management
    - Environmental Setting
    - Conceptual Models/FEP Management Framework
  - Action to support EBFM TAP
    - Final working product will be used at the discretion of EBFM TAP
- Additional Technical Writing Support may be necessary towards drafting other components of FEP
  - Council currently looking to hire contractor to assist Risk Assessment WG with developing Risk Assessment Framework, draft Risk Assessment Section of FEP, & conduct Risk Assessment
  - Funding from NOAA Sustainable Fisheries to T. Rankin and CFMC

WORKING GROUPS

Conceptual Models Melding	Members: **T. Seara**, JJ Cruz Mota, O. Tzadik, S. Stephenson, T. Rankin, S. Habtes, L. Rivera, S. Williams Outputs: Indicators & Gaps, Model Framework, Appendix of CM's, Comparative model analysis, Indicator Rankings
Ecosystem Indicators	Members: **O. Tzadik**, M. Karnuskas, JJ Cruz Mota, S. Williams, T. Seara, T. Rankin, K. McCarthy/A. Rios, A. Ortiz, E. Cruz-Rivera Outputs: Suite of ESR Indicators, Data Repository, CM & Quantitative indicators, Process of indicator prioritization, List of ESR & CM indicators
Risk Assessment	Members: **T. Rankin**, S. Habtes, O. Tzadik, K.,, L. Rivera Garcia, M. Lopez-Mercer, A. Rios, T. Seara Outputs: Define indicators from the master indicator list, identify drivers and receivers as ecosystem components to develop strategic objectives to inform the council
Data Repository	Members: **S. Habtes**, O. Tzadik, E. Cruz-Rivera, K. McCarthy/R. Eckley, S. Williams, S. Stephenson, CariCOOS (guest speakers) Outputs: Strategy for developing data management and coordination policies and infrastructure necessary for EBFM operational management in the US Caribbean through CFMC.
Drafting FEP	Members: S. Habtes, O. Tzadik, Technical writers (TBD), L. Rivera, G. Garcia-Moliner Output: Draft FEP

CONCEPTUAL MODELS/FEP FRAMEWORK

Components with highest number of connections by stakeholder group.

Stakeholder Group	Top Component
Businesses	Coral Reefs
DAPs	Fishery Resources
NGOs	Water Quality
Academics	Water Quality
Fishers	Commercial Fishers
Managers	Marine Habitat
SSC	Coastal Development

- Tasks:
  - 1: Come up with common terms between models before melding & crosswalk.
  - 2: Build CM for e/stakeholder (7 stakeholders)
    - 2a: See spatial variability between each model
  - 3 Validate step #2 with the stakeholders
  - 4: Compare across groups of stakeholders
    - 4a: Test all models (SSC TBD) against the DAPs
  - 5: Combine melded model
    - 5a: Meld if similarity is high (high is not defined)
    - 5b: Test different models with data if similarity is low (low is not defined)
- Outputs
  - Indicators and gaps
  - Model framework
  - Appendix with all CMs
  - Comparative analysis within and among model types
  - Indicator rankings

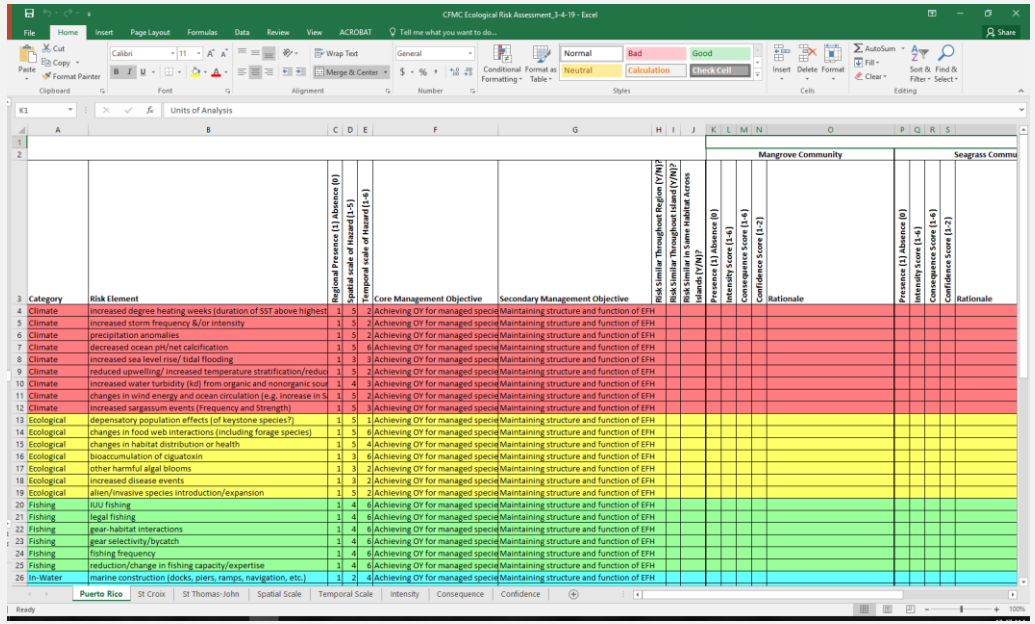
ECOSYSTEM INDICATORS

Threat Categories	Threats	Major Components Affected
Pollution	Run Off	Coral Reefs, Marine Habitat, Water Quality
	Non-Point Pollution	Marine Habitat, Water Quality
	Nutrients	Water Quality
	Point Pollution	Water Quality
	Pollution	Fishery Resources
	Marine Debris	Commercial Fishers
Climate Change Impacts	Climate Change	Coral Reefs, Marine Habitat, Water Quality
	Water Temperature	Coral Reefs
	Hurricanes	Coral Reefs, Commercial Fishers
Fisheries	Commercial Fishers	Fishery Resources
	Recreational Fishing	Fishery Resources
	Fisheries	Fishery Resources
	IUU Fishing	Commercial Fishers
Other Environmental Impacts	Marine Diseases	Coral Reefs, Fishery Resources
	Invasive Species	Coral Reefs, Fishery Resources
	Sargassum	Commercial Fishers, Tourism
Other Anthropogenic Impacts	Tourism	Marine Habitat, Education/Outreach
	Coastal Development	Marine Habitat
	Disturbances	Marine Habitat
	Anchoring	Marine Habitat
	Erosion	Water Quality
Human/Societal	Covid-19	Commercial Fishers

- Tasks:

1. ESR Indicators –suite of indicators tentatively completed – NOAA SEFSC??
2. Repository of data
3. CM and quantitative indicators
    1. Qualitative indicators related to the CM
    2. Indicators extracted from the quantitative models
4. Process to prioritize combined indicators identified
5. Combine list of ESR and CM indicators to create a master list of indicators

RISK ASSESSMENT



- Tasks:
- Goal: Define indicators from the master indicator list into drivers and receivers (Gaichas et al., 2018) as component to develop strategic objectives via risk assessment process to inform the DSS for the Council.
  - Steps:
    - Form working group –Aug 2022
    - Adopt approach –Dec 2022
    - Define measurable and quantifiable indicators to be used as drivers –Apr 2023
    - Identify thresholds –June 2023
    - Draft results –Aug-Sep 2023
    - Assess/evaluate the strategic objective –Dec 2023

DATA REPOSITORY NEEDS

- Goal: Draft a strategy for developing data management and coordination policies and infrastructure necessary for EBFM operational management in the US Caribbean through the CFMC.
- Regular working group meetings
- Justification of need to Council
- Identify similar system in region

COMPLIMENTARY PROJECTS - OUTSIDE CFMC

NOAA Fisheries – Habitat Conservation –CRCP & CFMC
T. Rankin

Goal

Use the main drivers from the conceptual models as risk factors to evaluate risk using quantitative indicators from the NOAA ESR and Lenfest project.

LENFEST
JJ WILLIAMS SEARA PROPOSAL

GOAL

To guide the development of a Fishery Ecosystem Plan for the U.S. Caribbean by defining management objectives and developing models that describe these marine ecosystems and help identify threats and factors that influence change across the region.

OBJECTIVES

1) To develop both a conceptual and quantitative model that describes the Caribbean ecosystem within a fisheries context based on stakeholder perceptions and data collected, respectively;
2) To select and estimate indicators of the performance of the model under different conditions (threats, impacts, human activities, etc.);
3) For a final product, we will work with stakeholders by integrating results from both models to identify the main indicators and threats potentially affecting the fisheries systems.

SEFSC
KARNAUSKAS, Arnold PROPOSAL

GOAL

Identification of quantitative indicators, conduct additional indicator synthesis work (multivariate analyses, threshold detection analysis) to understand overall trends in the ecosystem, and begin to develop hypotheses and an understanding of relationships between ecosystem components.

OBJECTIVE

Identify, acquire, compile, and conduct spatial and temporal analyses of pertinent data needed for development of an ecosystem status report for the U.S. Caribbean region

NEXT STEPS

Activity	Expected Date of Completion
Revise and draft EBFM TAP goals and objectives	December 2020
Draft FEP goals and objectives	April 2021
Continue to collect and analyze existing data sets from Lenfest, SeaMap, ESR, etc… • Expected products = a centralized repository of data (e.g., MBON, Caricoos, etc..); summary analyses of pertinent datasets; potentially peer-reviewed publications	April - December 2021
Complete all conceptual models	June 2022
Meld conceptual models to create island-specific conceptual models	December 2022
Use the conceptual models & additional products to create island-specific risk assessments for consideration by the SSC, that will be used to inform approaches that will be presented in the FEP.	December 2023
Use the conceptual models and other products produced by the ESR, EBFM TAP, and by the Lenfest FEP project to identify ecosystem indicators that should be monitored. In addition to inclusion in the FEP.	December 2023

NEXT STEPS

Activity	Expected Date of Completion
Develop strategic objectives, prioritize the objectives, and outline a vision for the use of the FEP for consideration in the CFMC processes.	Aug 2023
Develop operational objectives with concrete action items to be presented in the FEP, for consideration by the CFMC.	Aug 2023
Develop performance measures and draft a management strategy that can be used situationally during CFMC decision making, to be presented in the FEP, for consideration by the CFMC.	Aug 2023
Develop a feedback mechanism for adaptive management to be presented in the FEP, for consideration by the CFMC.	July 2023
Develop a draft FEP document	Dec 2023
Submit FEP for council approval	Mar 2023