Recommendations for Socio-economic Data Needs and Implementation into US Caribbean Fisheries Stock Assessment

Summary

A primary goal of the Southeast Fisheries Science Center's (SEFSC) Caribbean Strategic Planning project is to reduce gaps in socio-economic datasets used to inform management. The first step in accomplishing that goal is to identify major socio-economic data gaps and information to improve fisheries management decisions in the U.S. Caribbean. A working group was established to identify available data, suggest mechanisms and methods for data acquisition efforts, explore the factors that currently prevent the integration or use of socio-economic data for management decisions in the region, and provide guidance on strategies to overcome roadblocks. This document contains those findings.

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Table of Contents

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Please contact a working group member with changes or suggestions.

Introduction

Participants volunteered to join this strategic planning working group. During the initial meeting of the group, the participants developed their purpose, goals, and ideal outcomes, which are documented in the Team Charter. The group met eight times over the course of a year to accomplish the goals. Section A contains those goals and what was accomplished under each goal. Section B builds on the accomplished goals and contains specific recommendations for systematic social and economic data collection and implementation into management.

A. Goals & Summary of Recommendations to Address Goals:

1. Identify available data.
   - See excel spreadsheet, which contains a list of projects and published documents related to socio-economic data in the U.S. Caribbean, and Tables 1 and 2, which contain a list of U.S. Caribbean socio-economic datasets and a list of socio-economic indicators.
   - SEDAR Documents contain descriptions of qualitative data previously used to inform stock assessment.
   - SSRG Caribbean Research Inventory contains data and research performed by NOAA Fisheries SEFSC Social Science Research Group from 2004-2025.
   - This present effort will be incorporated into other relevant projects to give continuity to data source compilation (e.g., Ecosystem Status Report).

Table 1. U.S. Caribbean socio-economic datasets

Dataset	Geographic Range	Data Points/Year
Fishery Census	U.S. Caribbean	Puerto Rico: 2 (1995/96-2019) USVI: 2 (2004, 2010/11 & 2016)
MCRIMP	U.S. Caribbean	Puerto Rico: 1 (2015) USVI: 1 (2017)
CSVI	U.S. Caribbean	*Social Vulnerability*: 2 (2010 and 2020; except Retiree Migration, 2020 only) *Fishery Indices*: 1 (5-year average 2016-2020)
Commercial Landings	U.S. Caribbean	Annual (since 1970s)
Conceptual Models	U.S. Caribbean	1 (2020-2023)
Gear Costs and Earnings	Puerto Rico	1995/96-2019

Table 2. Socio-economic indicators included in the Caribbean Ecosystem Status Report.

Category	Indicators
Socioeconomic health	percent revenues by species group
Socioeconomic health	number of trips
Socioeconomic health	ocean economy (establishments, employment, wages)
Socioeconomic health	GDP
Socioeconomic health	unemployment

Socioeconomic health	Gini coefficient
Socioeconomic health	Fishing community engagement and reliance
Engagement and participation	recreational landings
Engagement and participation	commercial engagement (CSVI)

2. Prioritize socio-economic data needs for decision-making in the U.S. Caribbean fisheries.
   ● See section B.
3. Suggest mechanisms and methods for data acquisition efforts.
   ● See section B.
4. Explore the factors that currently prevent the integration or use of socio-economic data for management decisions in the region:
   ● Inadequate frequency and resolution of socio-econ data; disparate timeframes.
   ● Lack of appropriate involvement of social scientists in the stock assessment, review, and management advice process.
   ● Lack or poor buy-in and trust from stakeholders – impediment to integration of LEK.
5. Provide guidance on strategies to overcome them:
   ● Support social science data collection efforts continuation and innovation.
   ● Increase involvement of social scientists at different levels of management process (including stock assessment - SEDAR process provides an opportunity/pathway).
   ● Support adequate outreach and communication strategies geared toward increasing engagement and buy-in from stakeholders – this should be participatory and interdisciplinary.

B. Specific Recommendations for Systematic Social and Economic Data Collection and Implementation into Management:

Planning and data integration at the management level:

● Plan the process from data collection, including coordination of groups that collect data, to stock assessment integration e.g., protocol that explains the necessary data and format.
● Use a systematic approach to guide the consideration of ecosystem and socio-economic factors in stock assessment and fisheries management.
● Connect the dots between systematic data collection and implementation into management.
● Use the SEDAR process as a pathway for incorporating socio-economic data into decision-making by including data collection and analysis as integral part of the process (e.g., conceptual modeling and collection of qualitative data prior and in preparation for assessment, development of a social science report to inform reviewers and modelers).
● Work with the local fisheries agencies to create a unified, master database that integrates their fisher registration, fishing gear, and vessel databases with the catch and effort logbook database

Data collection and analysis:

● Build infrastructure for collecting socioeconomic data that is useful for stock assessment.
● Create and maintain a database for community level indicator development and updates.
● Collect data necessary for developing and improving community level indicators.

- Incorporate anecdotal and qualitative information in the stock assessment process (e.g., SEDAR process as suggested above).
- Adopt fishery performance reports by the CFMC to inform scientific advice and management decisions.
- Update conceptual models (see Seara et al. 2024) to allow longitudinal analyses of stakeholder input/perceptions.
- Establish mechanisms for data collection that addresses EBFM and engages stakeholders:
  - Formalize conceptual workshops to further engage fishers in the stock assessment process.
  - Improve communication of stock assessment to a broader audience, including fishers.

Communication between scientists and managers:

- Increase collaborations throughout the process.
  - SSRG/CFB - maintain a proactive approach via a communication timeline.
  - SSRG/Territories - coordinate when conducting interviews and other methods of data collection.
  - Suggest a process/communication timeline for SSRG and stock assessment team.
  - Consider appropriate data collection methods and associated drawbacks, e.g., there is little coordination between agencies (SEFSC and territorial) when conducting interviews.
- Increase and maintain collaboration between the stock assessment team and social scientists.
- Improve communication of stock assessment issues and data gaps to interdisciplinary researchers throughout NOAA and partner institutions to foster necessary research.

Table 3. List of identified data needs/gaps, their respective primary utility to stock assessment, EBFM, and to inform decisions and innovative strategies, and proposed strategies for data collection.

Data Category	Data Need/Gap	Stock Assessment		EBFM		Inform Decisions & Innovative Strategies	Data collection Strategies/Methods/ Proposed efforts
Quantitative and Qualitative-Survey Data	Market and cost information*	✔	*Catch & Selectivity; Understand and predict fisher behavior; HCR*	✔	*Drivers; thresholds; Reference points*	✔	Surveys; Expand Census effort
	Fishing behavior**	✔	*Catch (including unreported and discards) & Selectivity, HCR*	✔	*Drivers; thresholds*	✔	Surveys; Expand Census effort
	Fisher demographics	✔	*Interpretation of trends and risk levels (e.g., P*)*	✔	*Drivers; thresholds*	✔	Survey (e.g., registration); Expand Census effort
	Perceptions and behavior	-		✔	*Drivers; thresholds*	✔	Surveys; Expand Census effort

Quantitative - Indicators	Community/ Fishery level indicators of status and change based on secondary data	-		✔	*Status of Ecosystem Assessments ; Drivers; thresholds; Reference points; FEP*	✔	CSVI; Climate Vulnerability (based on CVA); other performance measures
Qualitative and Stakeholder Driven Data	Perceptions and behavior	✔	*Interpretation of trends and risk levels (e.g., P*)*	✔	*Status of Ecosystem Assessments ; Stakeholder engagement; FEP;*	✔	Stakeholder Driven Conceptual Models: Iterate and expand conceptual model data collection Fishery Performance Reports: Adoption by CFMC (model after other FMCs) SEDAR qualitative data: Summary reports; Formally record/collect information;

*Include considerations for size-specific price, and demand affecting size and landings (e.g., plate size; tourism and recreational demand);

**Include: where fishers fish, how they choose that location, what they target, discards, and bycatch; effects of gear regulation

APPENDIX

Socio-economic indicators included in the SE Region Ecosystem Status Reports:

South Atlantic ESR:

Human population
Coastal and urban land use
Total ocean economy
Social connectedness
Commercial and recreational fishing engagement

Gulf ESR:

Human population
Population density
Coastal urban land use
Total ocean economy
Landings and revenue from commercial fishing
Social connectedness
Commercial and recreational fishing engagement
Recreational fishing effort

Questions for future discussion/research:

1. Based on the stock's value, status, and biology, is there an incentive to expand its assessment to include ecosystem or socioeconomic factors?
2. Is there evidence to suggest that stock or fishery dynamics are tightly coupled with some variable ecosystem or socioeconomic feature?
3. Are data available to model this relationship within the assessment framework?
4. Can ecosystem or socioeconomic dynamics be incorporated in a way that maintains a manageable assessment model?