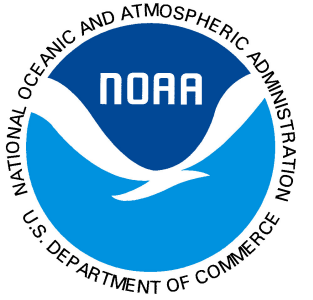
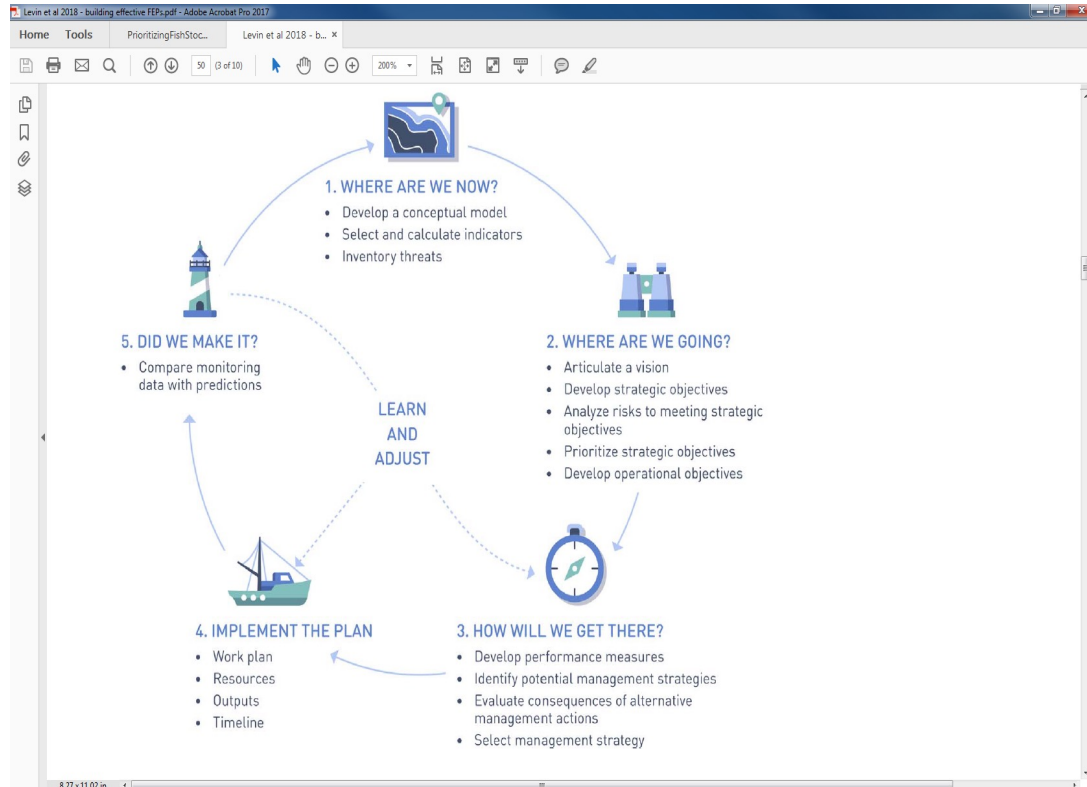




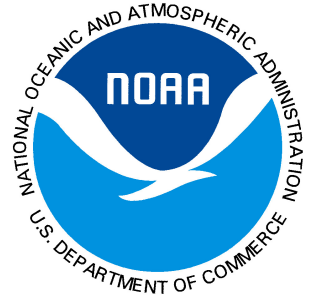
Fishery Ecosystem Plan (FEP) Outreach & Education

FEP-TAP Meeting
March 16-17, 2022

Fishery Ecosystem Plan (FEP)



- Social, cultural and economic aspects.
- Contribute their traditional and local ecological knowledge of the marine ecosystems in the MPA and the historical relationships with the area.
- Identify and promote the community responsibilities for effective MPA management: prohibitions, closed seasons, etc.



Outreach & Education Communication Strategies

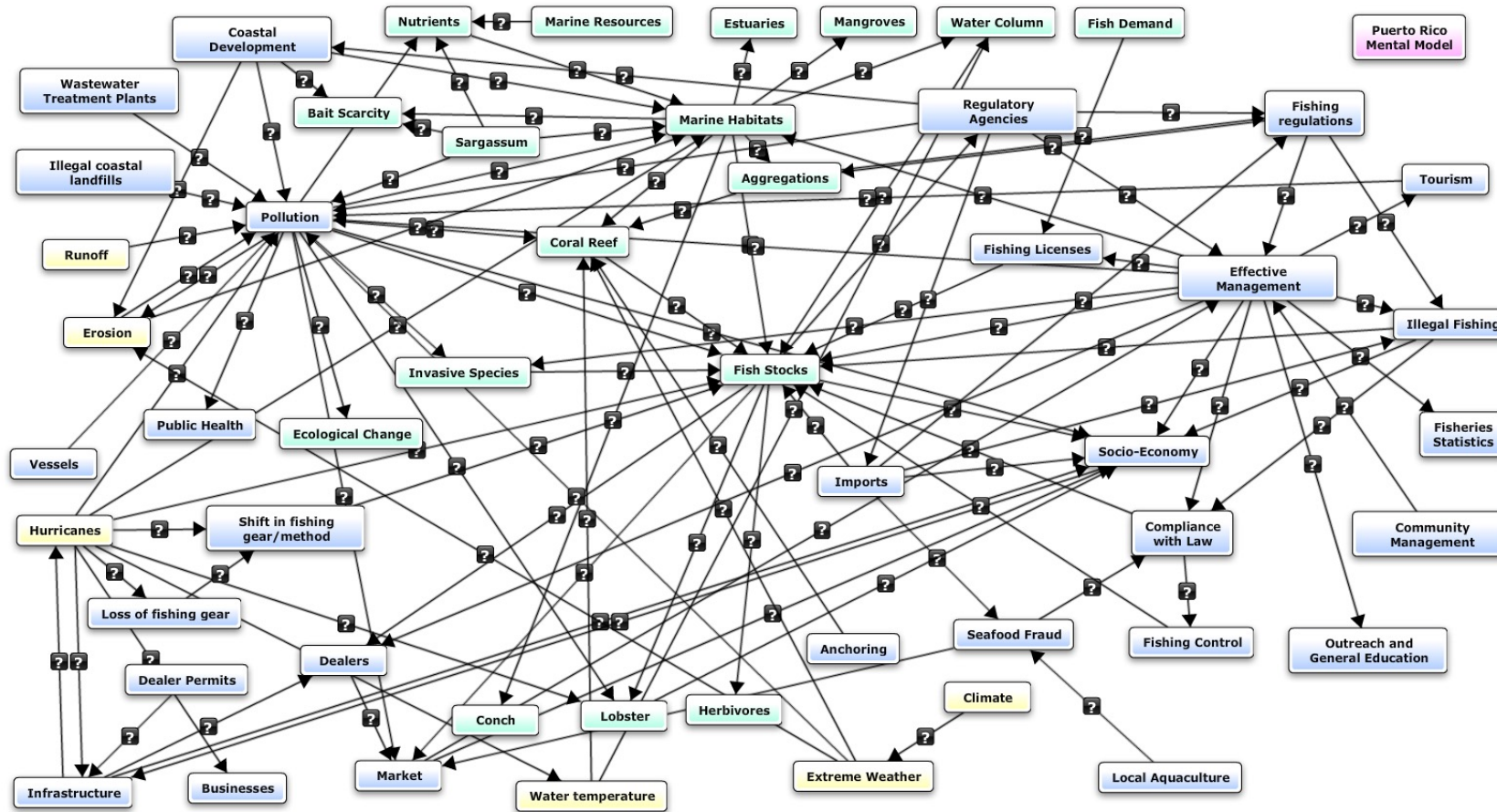


Fishery Ecosystem Plan: Stakeholder engagement process



- DAPs and the SSC engaged in the development of island-based **Conceptual Models** of the fishery ecosystem, and in the **Level 1 Risk Assessment** scoring.
- DAPs and SSC met in March and July with the following objectives:
 - Identify the main ecological and socioeconomic factors affecting the ecosystem and respective fisheries
 - Train participants to express their observations in mechanistic terms
 - Identify most influential ecosystem components
 - Identify where major risks or leverage points in the system lie
 - Identify cross-disciplinary linkages (e.g., between social and biological subsystems)

Modelos Conceptuales



Drivers components with highest scorings across ECMs from DAPs and SSC

Top 10 drivers PR DAP Ecosystem Conceptual Model:

- Effective Management
- Pollution
- Hurricanes
- Marine Habitats
- Fish Stocks
- Imports
- Regulatory Agencies
- Coastal Development
- Sargassum
- Extreme Weather

Top 13 drivers STX DAP Ecosystem Conceptual Model:

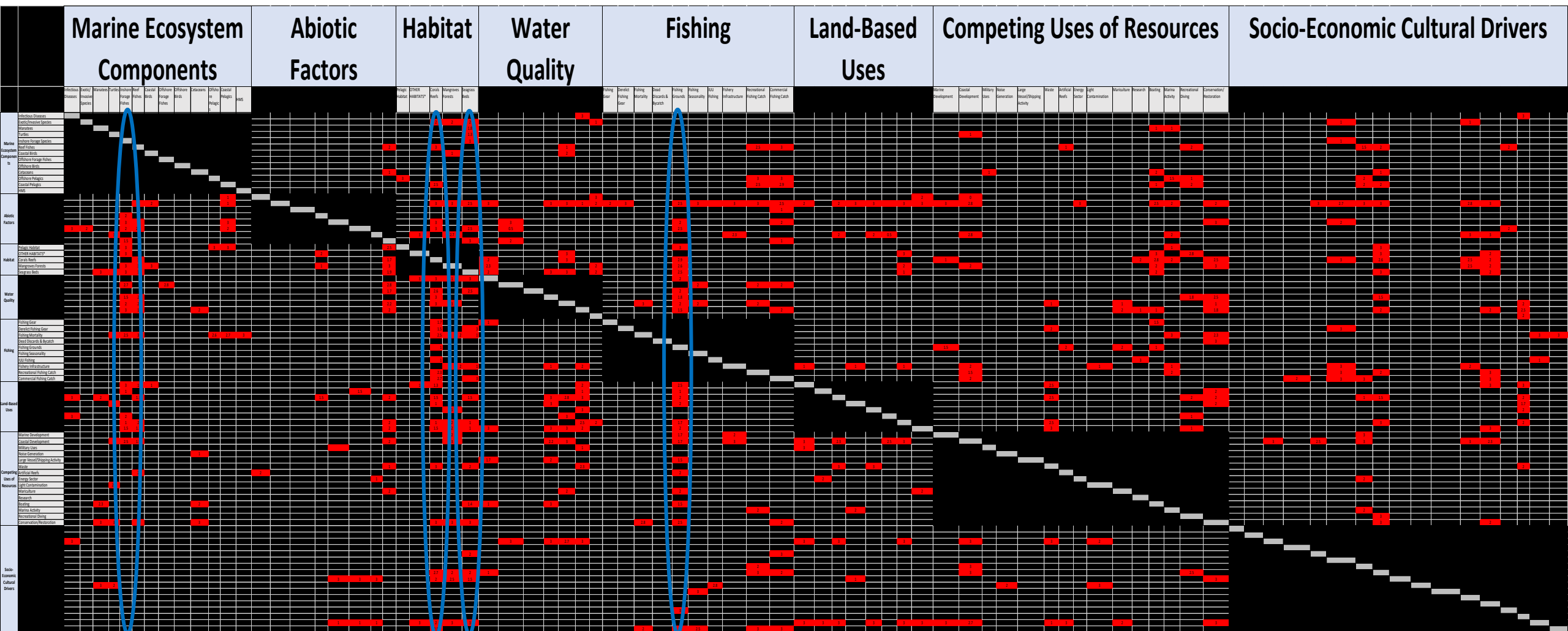
- Development
- Need for Education and Outreach
- Commercial Fishers
- Hurricanes
- Moorings
- Market
- Increased Water Temperature
- Wetland Restoration
- Marine Pathogens
- Discharges (point)
- Fish
- Recreational Fishers
- Management Bias

Top 11 drivers STT/STJ DAP Conceptual Model:

- Enforcement
- Land-based Sources of Pollution
- Essential Fish Habitat
- Coral Disease
- Education and Outreach
- Fisheries Management
- Coastal Management
- Heritage and Culture
- Natural Disaster Response
- Large Vessel Impacts
- Socioeconomic Impacts

Top 8 drivers SSC Conceptual Model:

- Marine Ecosystem Components
 - Reef fishes
 - Coastal Pelagics
- Habitat
 - Coral Reefs
 - Seagrass Beds
- Fishing
 - Commercial Fishing Catch
 - Fishing Mortality
- Competing Uses of Resources
 - Coastal Development
- Socio-Economic Cultural Drivers
 - Market Demand

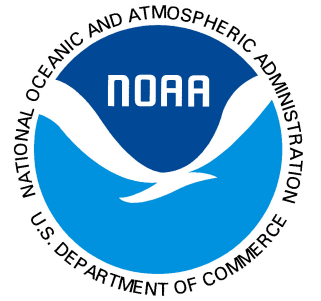


19
Inshore
Forage
Fishes

28 23
Coral Reefs Sea
Grass
Beds

27
Fishing
Grounds

15/3/22



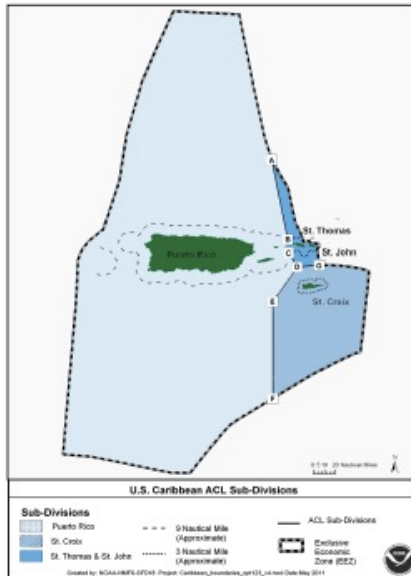
Who are the Stakeholders?

WE ARE ALL STAKEHOLDERS

- ✓ Fishing community
- ✓ Educators
- ✓ Business
- ✓ Consumers
- ✓ Planners
- ✓ Government agencies/Federal - Territorial



Hoja Informativa ¿Qué es el Hábitat Esencial para peces?



Muchas de las especies de peces y mariscos que llegan a nuestra mesa, como los meros, pargos, cotorros, carrucho y langosta, aunque suelen pescarse en aguas profundas, pasan sus etapas juveniles en hábitats de aguas más llanas. En la jurisdicción del Consejo de Administración Pesquera del Caribe (CFMC, por sus siglas en inglés) que incluye Puerto Rico, St. Thomas, St. John y St. Croix, los manglares, las praderas de hierbas marinas, los arrecifes de coral y la columna de agua son considerados hábitats esenciales para las especies que forman las pesquerías.

En estos hábitats los peces y mariscos que forman el recurso pesquero de nuestra región obtienen protección contra los depredadores, alimento en los sedimentos y espacios para reproducción. Para alcanzar la meta de una pesquería sustentable, es necesario proteger estos hábitats por lo cual son elementos importantes en los Planes de Manejo Pesquero desarrollados por el CFMC.

Para más información sobre el Hábitat Esencial para peces acceda a: www.seagrantspr.org

enero 2018



Es importante que los pescadores: comerciales y recreacionales, al igual que todos los consumidores conozcan el valor de estos hábitats y eviten impactos negativos que puedan afectarlos. Esto incluye evitar descargas de aguas usadas y desperdicios sólidos que puedan llegar al agua, y tener cuidado de no impactarlos al navegar, anclar embarcaciones o bucear en esas áreas.

¿Cuáles son los EFH?

manglar



praderas de hierbas marinas



fondos arenosos



arrecifes de coral poco profundos



arrecifes de coral profundos



columna de agua



Para más información sobre el Hábitat Esencial para peces acceda a: www.seagrantspr.org

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Conceptual Models



What is a conceptual model? How is it used?

A **conceptual model** is a way for a group of individuals to capture knowledge about complex social and environmental issues or systems. Conceptual models are a means of representing and sharing different ideas about a system in order to understand assumptions, commonalities, and differences. They are tools used to identify the key components of a system and the relationships among components. The main goal of a conceptual model is to guide management strategies by identifying factors or particular decisions that may impact identified components. This can help improve collaborative problem-solving and decision-making, as well as communication among stakeholders, scientists, and managers.

How is a conceptual model developed?

Development of a conceptual model is not complicated. The first step is to **identify the components** of the system of interest. **Components** are things that can increase or decrease in either quantity or quality (e.g., rainfall, happiness, traffic, jobs, populations). They can be social, biological, cultural, or economic in nature. The next step is to **identify the relationships, or linkages, among components**. Linkages are directional, and are either positive or negative (Figure 1).

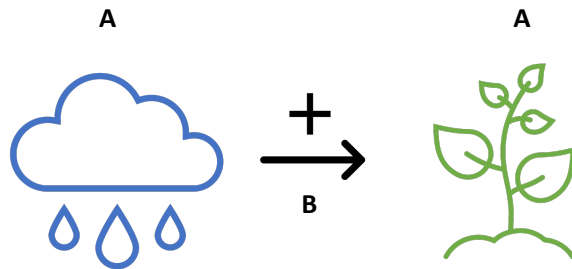


Figure 1: Example illustration of components and impacts. **A** represents two components (rain, a plant) while **B** represents the linkage between the components. The arrow and plus sign show the direction and nature of the impact.

Fishery Ecosystem Plans



The Caribbean Fishery Management Council (Council) is responsible for conserving, restoring, and managing the fishery resources in federal waters of the U.S. Caribbean. As part of the Council's work, they are developing a Fishery Ecosystem Plan (FEP), which is a comprehensive plan that acknowledges the connections among fish and other marine life, the changing ocean environment, and the humans who rely on and use these resources.

What is an ecosystem? What is a fishery? What is a fishery ecosystem plan?

An **ecosystem** is a community or group of living things that interact with one another in a particular environment. There are many types of ecosystems – for example, forest ecosystems, desert ecosystems and coral reef ecosystems. The most important characteristics of an ecosystem are the linkages between living and non-living things.

A **fishery** = fish + people. It consists of a species or group of species and the people who catch those fish. Fisheries can be defined by many characteristics, such as the type of gear used, an area fished, or a user group (e.g. commercial, private angler, charter). Fisheries are systems that have biological, social, cultural, economic, and human components.

A **fishery ecosystem** consists of all the linkages between a fishery (or fisheries) and its components: human (fishermen, processors/dealers, boat mechanics), biological (fish, habitats, predator-prey relationships), social (seafood restaurants, ocean recreation), cultural (fishing-dependent communities), and economic (market demands, costs for fuel, bait, crew, etc.).



A **fishery ecosystem plan** is a road map for a comprehensive management system based on the connections between the biological and human components of fisheries. A fishery ecosystem plan establishes biological, social, cultural, and economic goals for fishery systems. It provides a framework to evaluate the tradeoffs between these components, and indicators to evaluate progress towards the goals. For example, if one goal is to ensure that restaurants have a supply of local, sustainable seafood, one way to evaluate that might be the total number of locally caught species on restaurant menus. Fishery ecosystem plans also allow for consideration of cumulative impacts of multiple activities on a system. This can help managers make more informed decisions.

ECOSYSTEM BASED FISHERY MANAGEMENT

WHAT IS AN ECOSYSTEM?

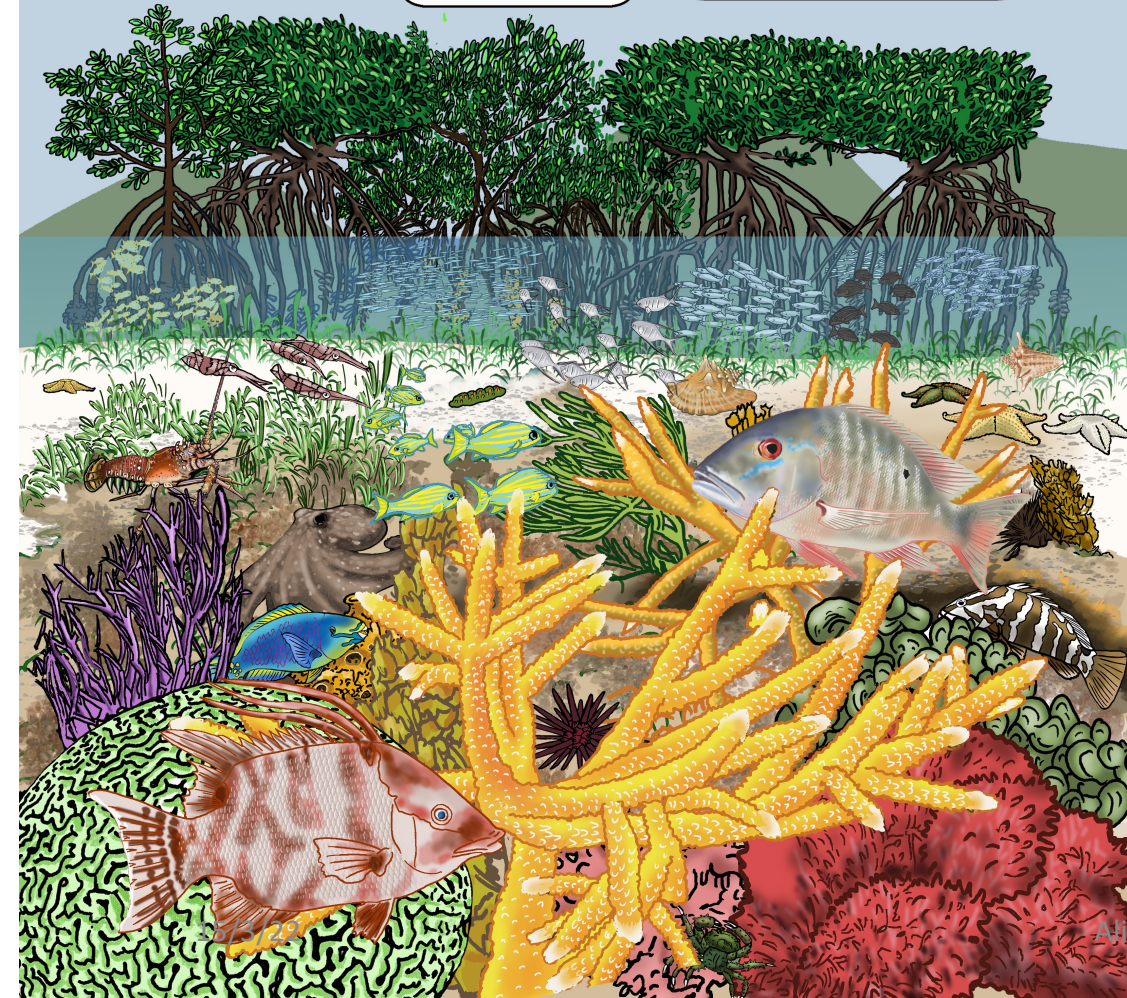
WHAT IS THE MARINE FISHERY ECOSYSTEM?

IS THERE A CONNECTION BETWEEN BIOTIC AND ABIOTIC ELEMENTS OR COMPONENTS IN THE MARINE FISHERY ECOSYSTEM?

IS THE MARINE FISHING ECOSYSTEM JUST THE CORAL REEF AND THE OPEN SEA?

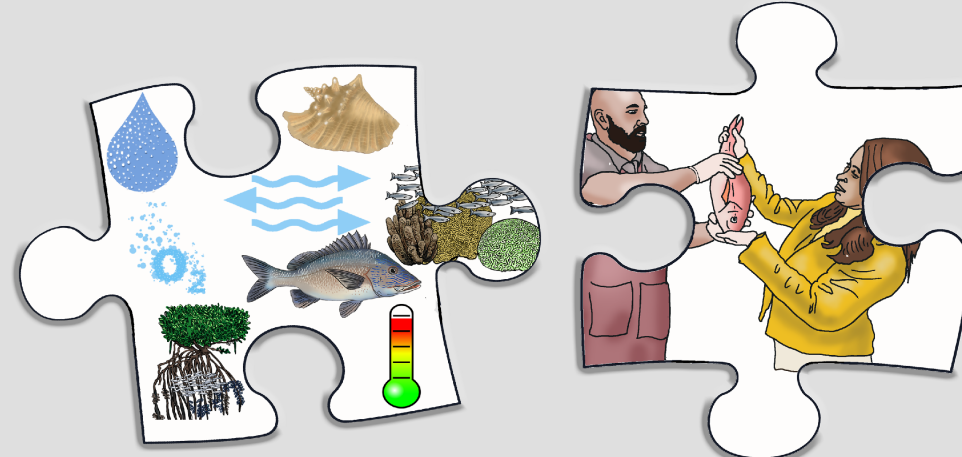
HOW DO HUMAN ACTIVITIES IMPACT THE MARINE FISHING ECOSYSTEM?

WHAT DOES ALL THIS FISHERY ECOSYSTEM HAS TO DO WITH FISHERY MANAGEMENT?



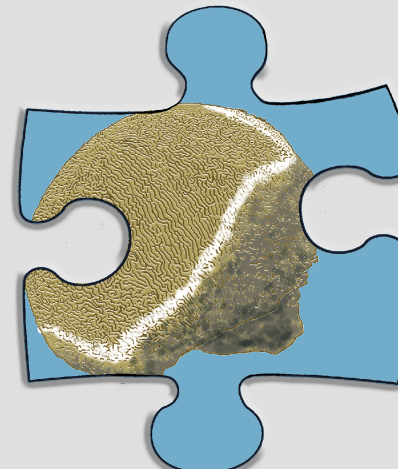
WHAT IS A FISHERY ECOSYSTEM PLAN (FEP)... ANOTHER PLAN?

IT IS NOT ANOTHER PLAN; IT IS THE DOCUMENT THAT CONTAINS THE INFORMATION THAT IS THE BASIS FOR THE FISHERIES MANAGEMENT PLANS DEVELOPED BY THE CARIBBEAN FISHERY MANAGEMENT COUNCIL. FOR ITS DEVELOPMENT, INTERESTED PEOPLE FROM ALL BRANCHES OF LOCAL GOVERNMENT, SCIENTISTS, FISHERS, AND OTHER PEOPLE INTERESTED IN THE FISHERY RESOURCES INHABITING THE MARINE ECOSYSTEMS HAVE BEEN CONSULTED. ITS CREATION HAS THE FOLLOWING OBJECTIVES:

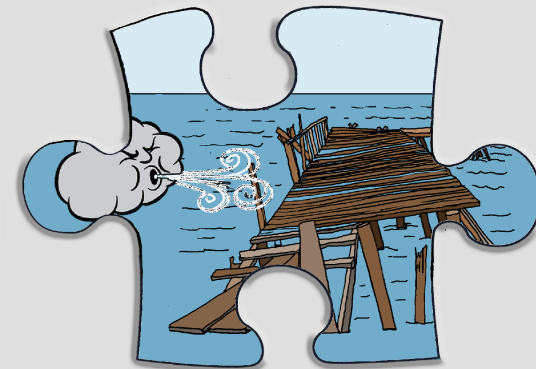


1- IDENTIFY THE MAIN ECOLOGICAL / BIOLOGICAL COMPONENTS OF THE ECOSYSTEM.

2. IDENTIFY THE MAIN SOCIOECONOMIC COMPONENTS OF THE ECOSYSTEM.



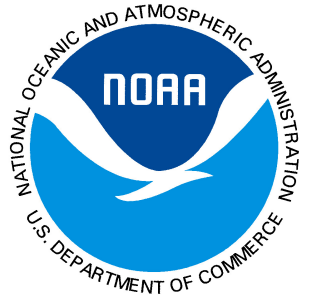
3. IDENTIFY OTHER COMPONENTS OF THE ECOSYSTEM THAT INFLUENCE THE FISHERIES.



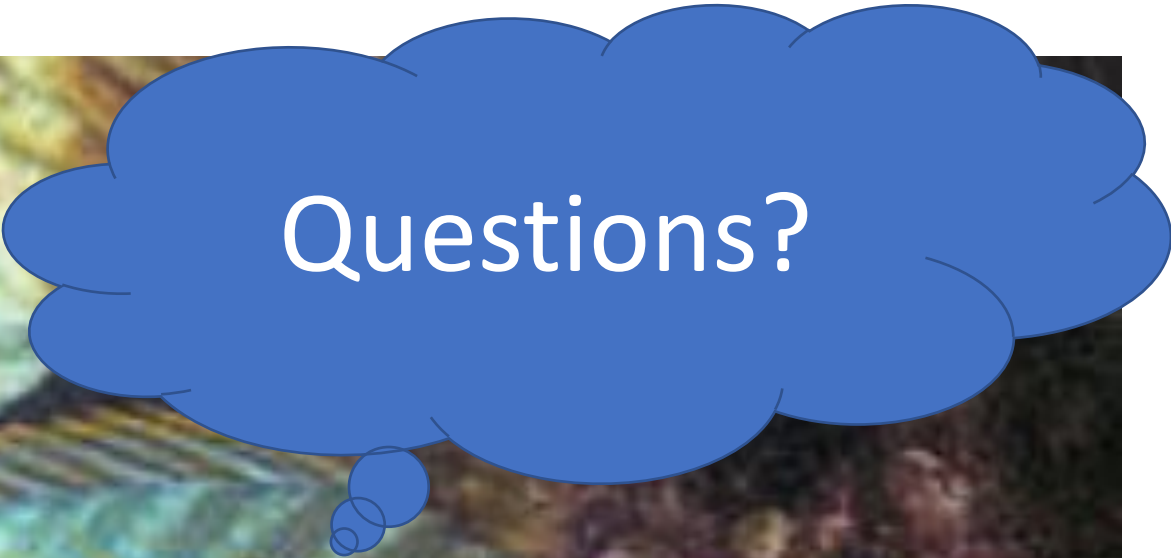
4. ESTABLISH CONNECTIONS BETWEEN COMPONENTS, INCLUDING DIRECTION AND MAGNITUDE OF IMPACT.



Outreach & Education ideas to inform stakeholders about the FEP



- As soon as the FEP is finished and approved, call in a meeting of the OEAP to discuss the document and ask the members of the OEAP and the Liaisons for strategies to present it in their regions.
- Produce infographics to explain Conceptual Model
 - One for the whole concept that includes all DAPs and SSC?
 - One for each DAP?
- Include the final FEP document in the O & E presentations to the fishers during the PEPCO workshops.
- Include the basics of the FEP in the Fact Sheets/ Infographics of the IBFMPs for PR, St. Thomas/St. John and St. Croix that are being prepared.
- Other ideas from the FEP-TAP?



Questions?



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15/3/22

Alida Ortiz Solomayor OEAP

13