

# Sargassum in the US Caribbean: Impacts on EFHs and Management Implications



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# Sargassum Influxes are Impacting EFHs

Comprehensive Fishery  
Management Plan for  
the Puerto Rico  
Exclusive Economic  
Zone

Comprehensive Fishery  
Management Plan for  
the St. Thomas/St. John  
Exclusive Economic  
Zone

Comprehensive Fishery  
Management Plan for  
the St. Croix Exclusive  
Economic Zone

## Managed species:

- Fish:
  - reef fish
  - pelagic fish
  - rays (only in PR)
- Spiny lobster
- Queen conch
- Coral Reef Resources
  - sea urchins
  - sea cucumbers
  - corals

## Essential Fish Habitats (EFH) include:

- Mangrove, seagrass, coral reef, hard bottom, sand, mud, and algal plain substrates
- All waters from mean high water to the outer boundary of the U.S. Caribbean EEZ

# Important Habitat in the Open Ocean

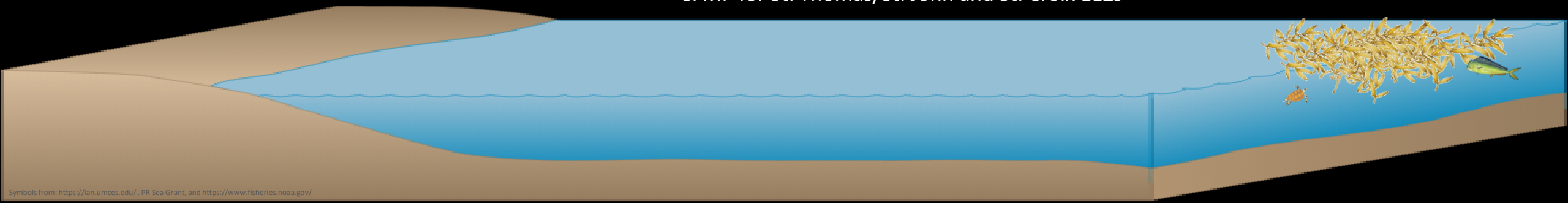
## Essential Fish Habitat

- Gray triggerfish – *Balistes capriscus*
- Little tunny – *Euthynnus alleteratus*
- Blackfin tuna – *Thunnus atlanticus*
- King mackerel – *Scomberomus cavalla*
- Cero mackerel – *Scomberomus regalis*
- Wahoo – *Acanthocybium solandri* \*
- Dolphin – *Coryphaena hippurus* \*
- Pompano dolphin – *Coryphaena equiselis*
- Great barracuda – *Sphyraena barracuda*
- Tripletail – *Lobotes surinamensis*

## ESA-listed species

- Green sea turtle - *Chelonia mydas*
- Loggerhead sea turtle - *Caretta caretta*
- Hawksbill sea turtle - *Eretmochelys imbricata*

\* CFMP for St. Thomas/St. John and St. Croix EEZs

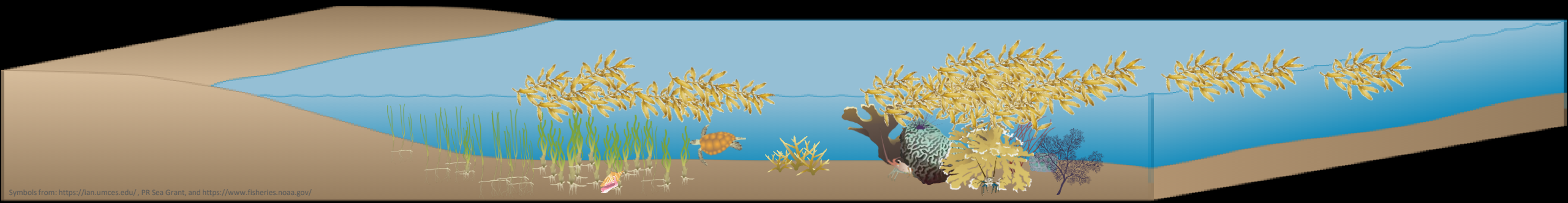


# Impacts in the Coastal Area

- Blocks sunlight reaching corals and seagrass
- Smother corals and seagrass in shallow areas or keys

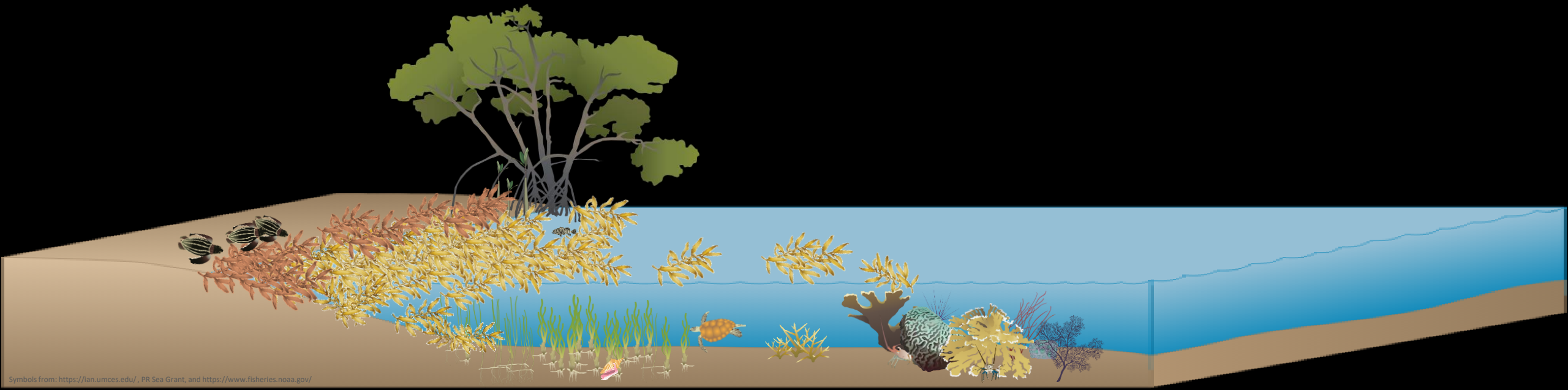


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# Impacts of Sargassum Accumulations

- Smother mangrove roots and seagrass beds
- Deposition of sargassum on benthic habitats
- Physical obstruction to nesting sea turtles and hatchlings



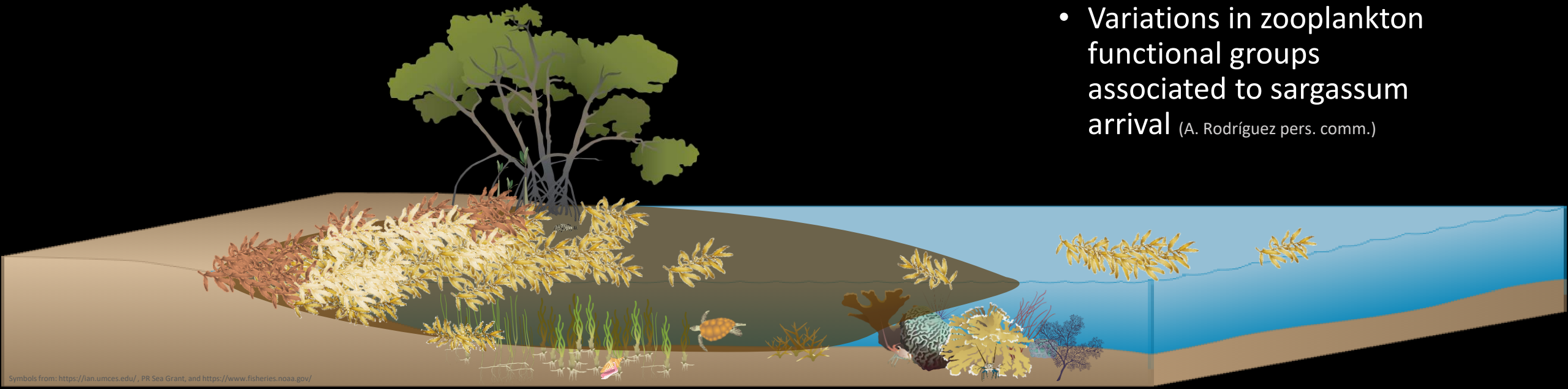
# Sargassum Decay Process

## Sargassum-brown tide (Sbt) (van Tussenbroek et al. 2017)

- Colored dissolved organic matter created by sargassum decay
  - Reduction in oxygen (hypoxia and anoxia)
  - Reduction in light (increased turbidity)
  - Reduction in pH
  - Increased nutrient loads (eutrophication of coastal waters)
  - Sulfur water (E. Otero pers. comm.)

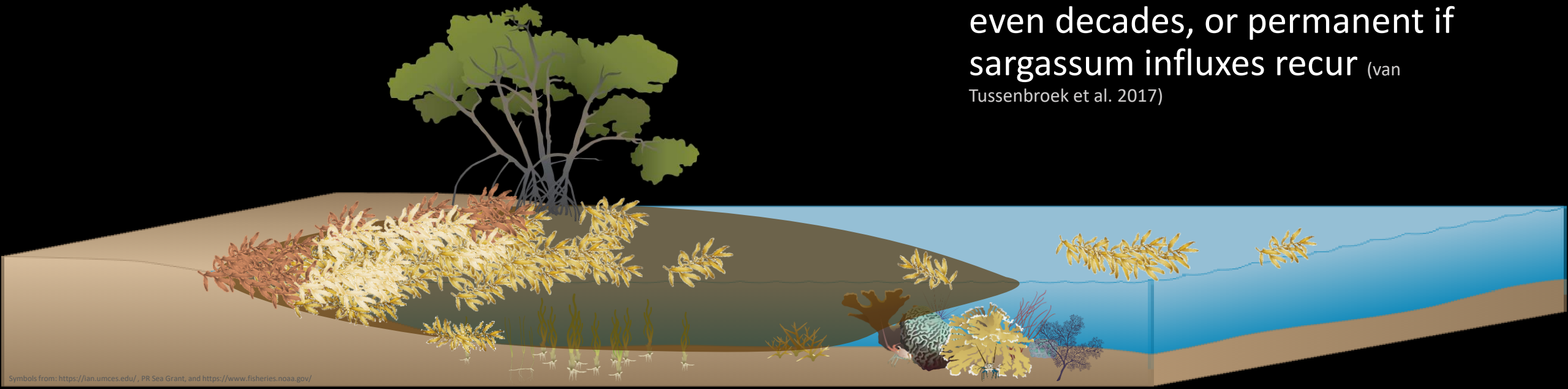


- Mortality of seagrasses, associated fauna, and corals
- Variations in zooplankton functional groups associated to sargassum arrival (A. Rodríguez pers. comm.)



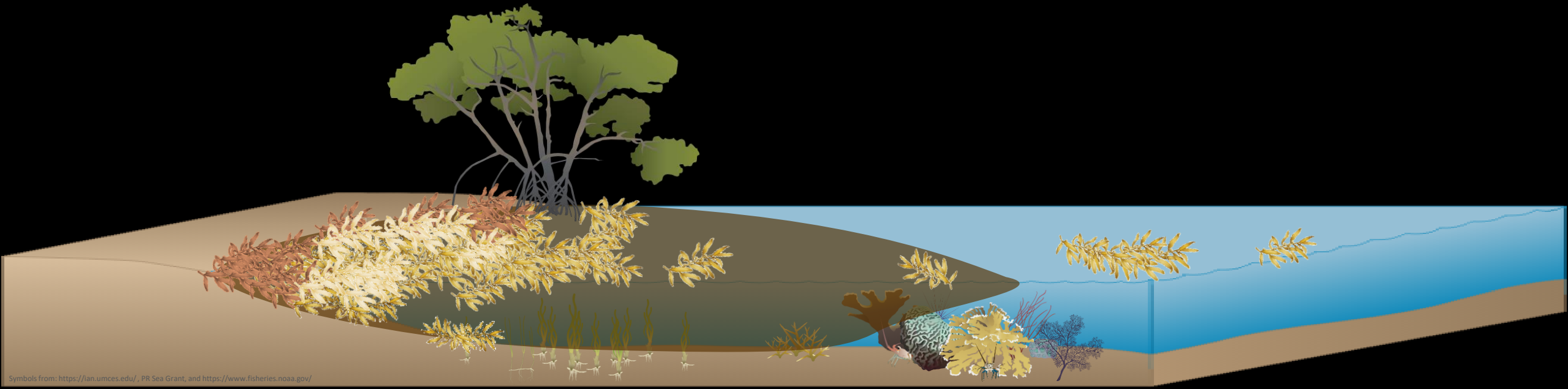
# Sbt Long-Term Effects

- A 6.5 years time series at La Parguera, Puerto Rico (León-Pérez et al. 2023)
  - Sargassum was present every month either as fresh and decomposing, or as Sbt
  - Sbt persisted for periods of >7 months per year
- Mangroves within sargassum accumulation sites had the lowest litterfall production and presented mortality (Pérez-Pérez 2022)
- Recovery of affected seagrass meadows may take years or even decades, or permanent if sargassum influxes recur (van Tussenbroek et al. 2017)



# Scientific Gaps

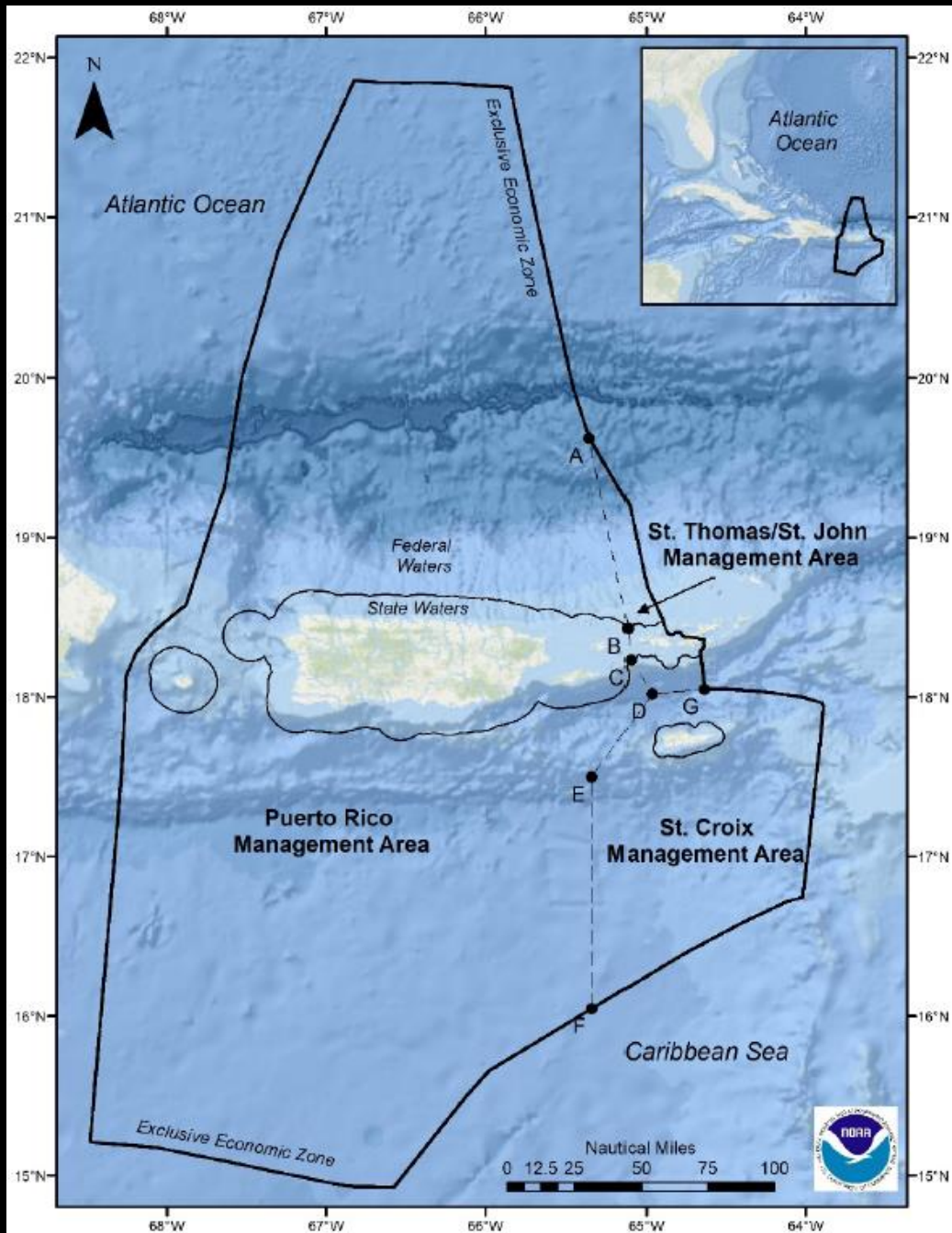
- How does this degradation of EFHs directly impact the life stages of managed species in the U.S. Caribbean?
- How do management interventions contribute to the recovery of impacted habitats and long-term sustainability of these ecosystems?





# Management Implications

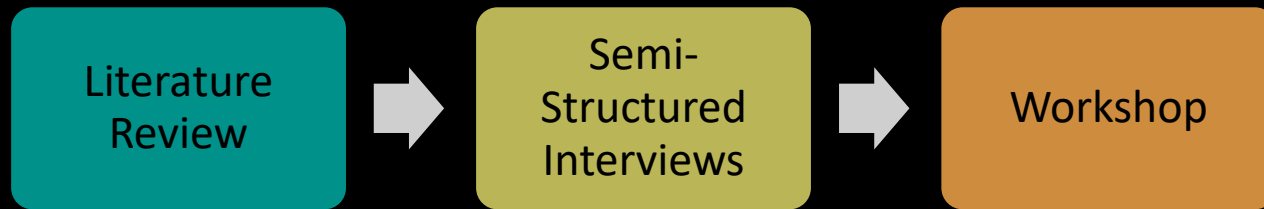
How to support the benefits of sargassum as an EFH while reducing its impacts in the coast?



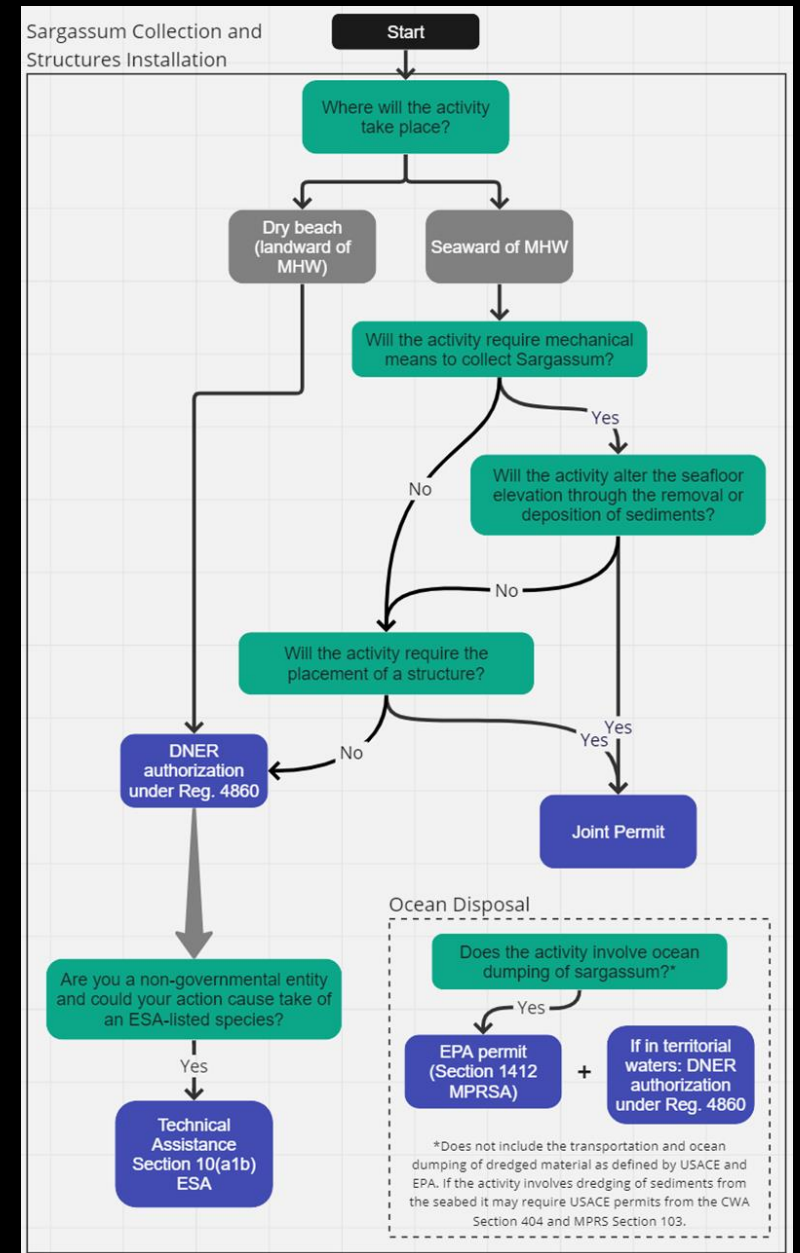
# U.S. Caribbean Law and Policy

- Unincorporated territories of the USA
- Joint responsibility between local and US federal governments
- 2022 – Stafford Act: USVI declared a state of emergency due to unprecedented influx of sargassum affecting the territory's water supply
- Need to implement long-term sustainable solutions

# Sargassum Permits Flowchart



León-Pérez M.C., McLaughlin R.J., Gibeaut J.C., Carrubba L., Colón-Rivera R.J., and Esteves R. (under review). Legal considerations for sargassum removal and ocean disposal in Puerto Rico. Marine Policy.



# Obstacles Between Agencies' Processes and Relevant Groups' Needs

Lack of knowledge of permits needed

Discrepancies between agencies' understanding of the permits and processes that apply

Time lag between urgency of relevant group's need and development of government policies

## Participants' Main Recommendations

Create a territory-wide plan to respond to sargassum influxes

Develop plans and permits application packages for priority areas where sargassum is a recurrent issue

Conduct workshops and round tables with agencies to further clarify the sargassum legal regime in Puerto Rico



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