

Driver-Pressure-State-Impact-Response

How To Implement Ecosystem-Based Fisheries Management In Areas Beyond National Jurisdiction?



ICCAT

- Importance of the Sargasso Sea recognised by **ICCAT**
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- The Sargasso Sea has been adopted as a case study to help Operationalise
-
- **Ecosystem Based Fisheries Management**

Ecosystem-Based Management

- A strategy to manage human activities that have an impact on ecosystems



ICCAT Ecosystem Report Card

- Main tool for evaluation of ecosystems by ICCAT is the *Ecosystem Report Card* which reports on
 - ~ Retained and Assessed species
 - ~ Retained and Not Assessed Species
 - ~ By-catch Species: Sharks, Turtles, Seabirds, Mammals
 - ~ Fishing Pressure
 - ~ Environmental Pressure
 - ~ Habitat
 - ~ Ecology - Community & Diversity
 - ~ Trophic Structure
 - ~ Social & Economic factors

How to Operationalise EBFM?

- First steps
 - Indicators to assess state, set management and monitor response
 - Management **objectives**
 - **Reference points** to define targets, limits, cautionary zones and/or thresholds
 - Proxies for ecosystem **attributes** or **pressures**
 - Indicators should not be few, complementary and non-redundant
 - **Validation** of indicators is essential
 - Need to be **screened** using appropriate selection criteria

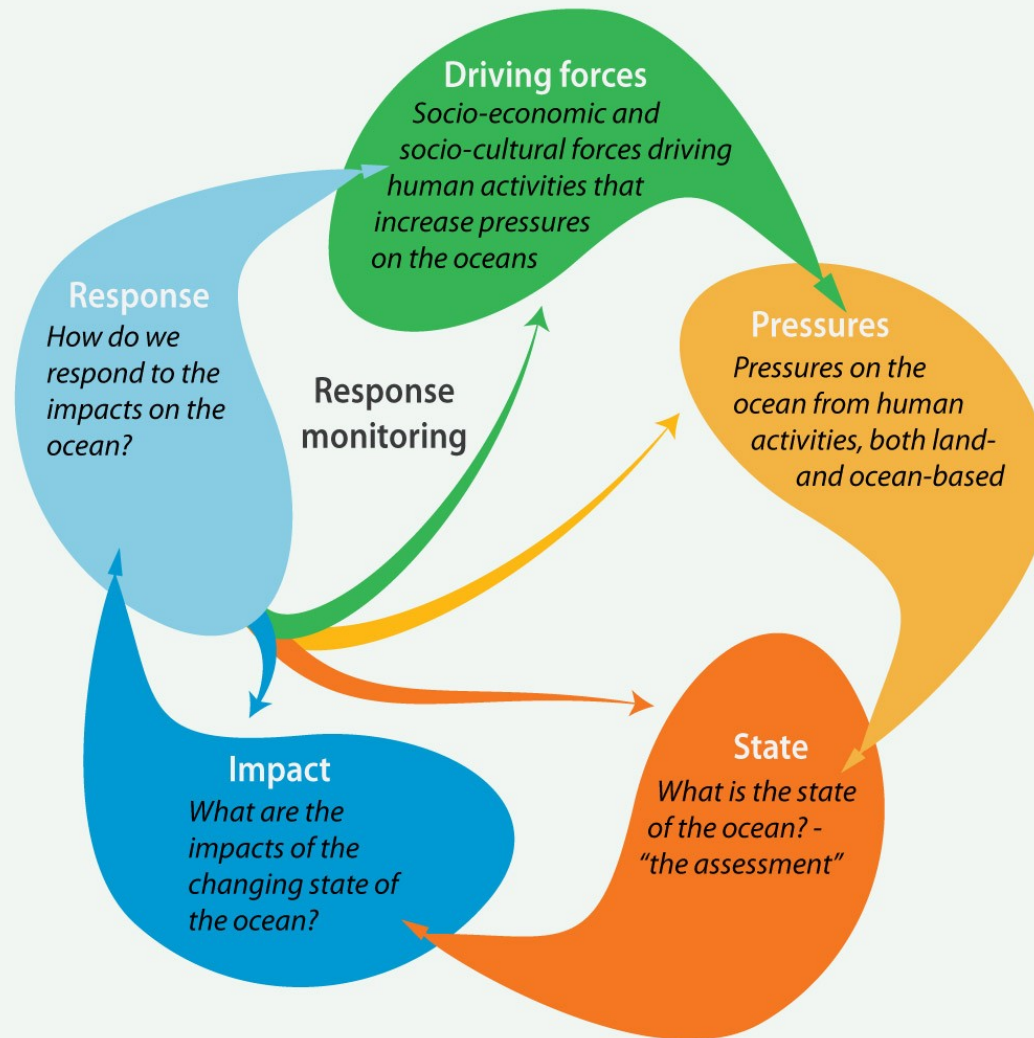
Driver-Pressure-State-Impact-Response

- *Ecosystem Report Card* was developed following a exercise based on a Driver-Pressure-State-Ecosystem Services-Response framework

Driver-Pressure-State-Impact-Response

The levels of DPSIR framework

- Driving forces - Pressures - State (of the oceans) - Impacts - Responses



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- Therefore a **DPSIR** analysis was conducted for the Sargasso Sea to ensure consistency with ICCAT
- For ICCAT we concentrated on *Fishing* and *Climate Change*

Threats

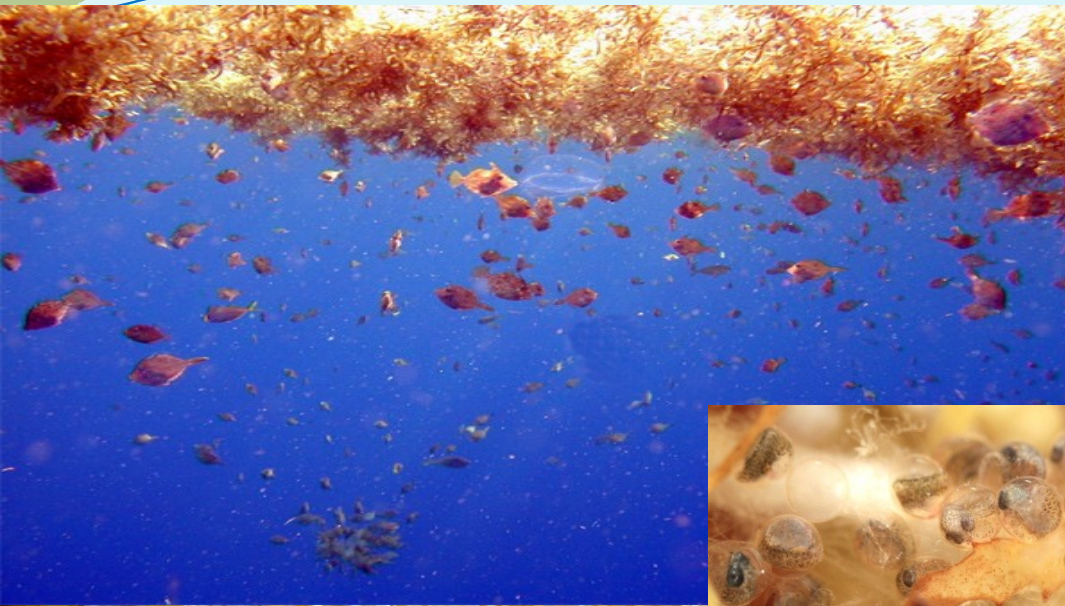
- Fishing and its adverse impacts
- Garbage and plastics
- Pollution, discharges, spills
- Climate change and ocean acidification
- Underwater noise
- *Sargassum* harvesting
- Exotic species introduction from ballast waters ?
- Deep sea Mining?
- Underwater cables?
- Tourism?



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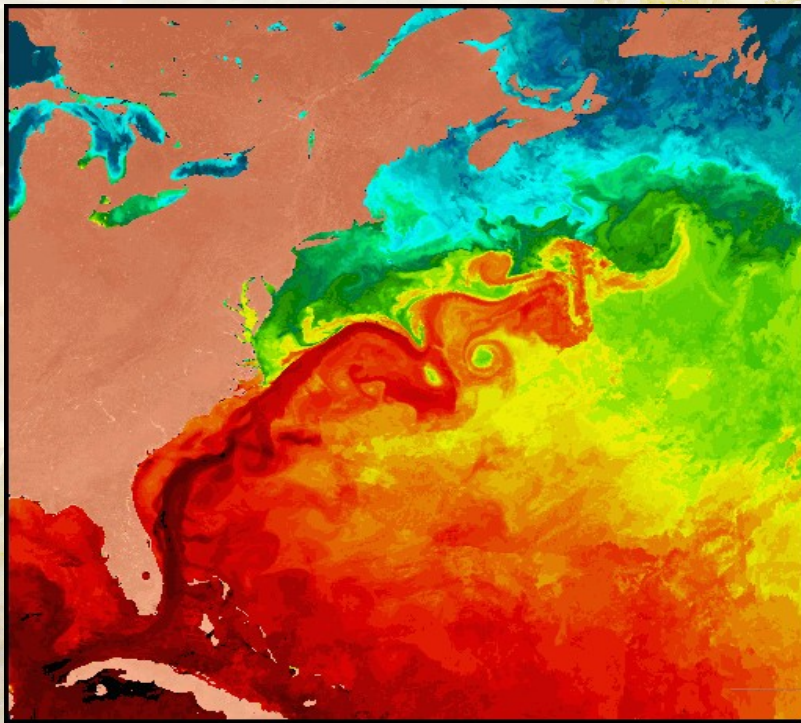
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- Therefore a **DPSIR** analysis was conducted for the Sargasso Sea to ensure consistency with ICCAT
- For ICCAT we concentrated on ***Fishing*** and ***Climate Change***
- Showed how the approach could be extended to include more ***Drivers*** and ***Stakeholder***, e.g.
 - Biodiversity, Shipping, Mining, Undersea Cables,...

Nursery/feeding area; eggs/juveniles of > 80 spp of fish occur in *Sargassum*

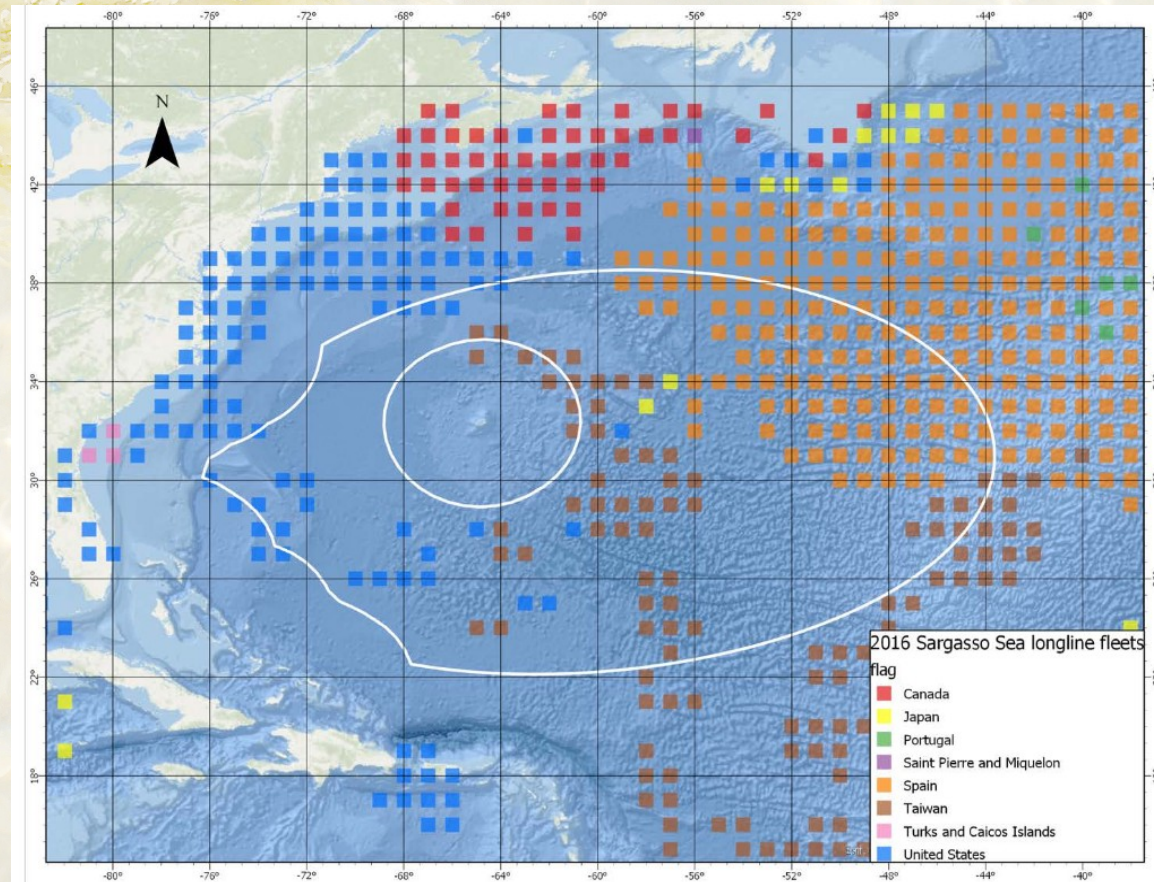


Fishing Pressure & Oceanography

Sea Surface Temperature –
Gulf Stream and eddies



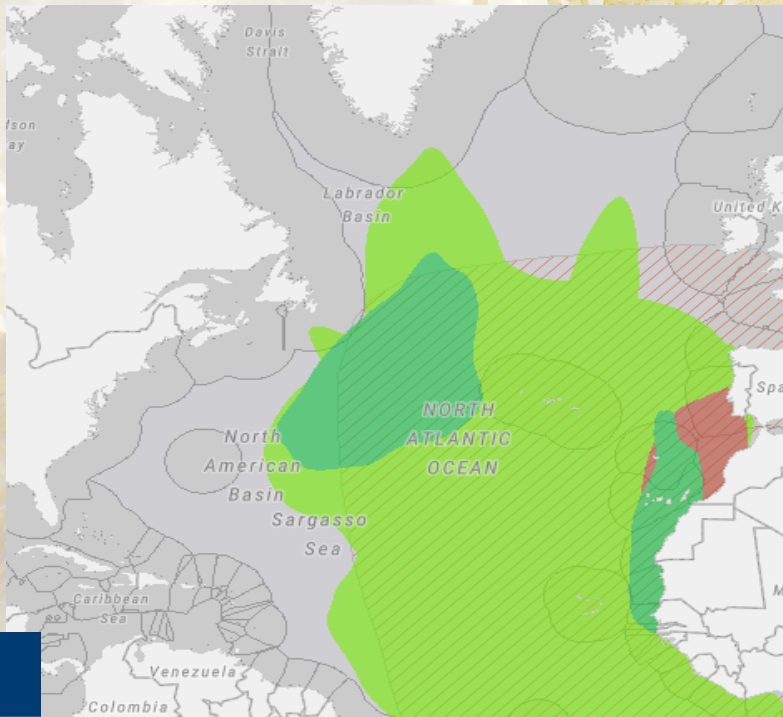
Forecast Longline Fishing Effort based
on AIS and *Environmental Predictors*



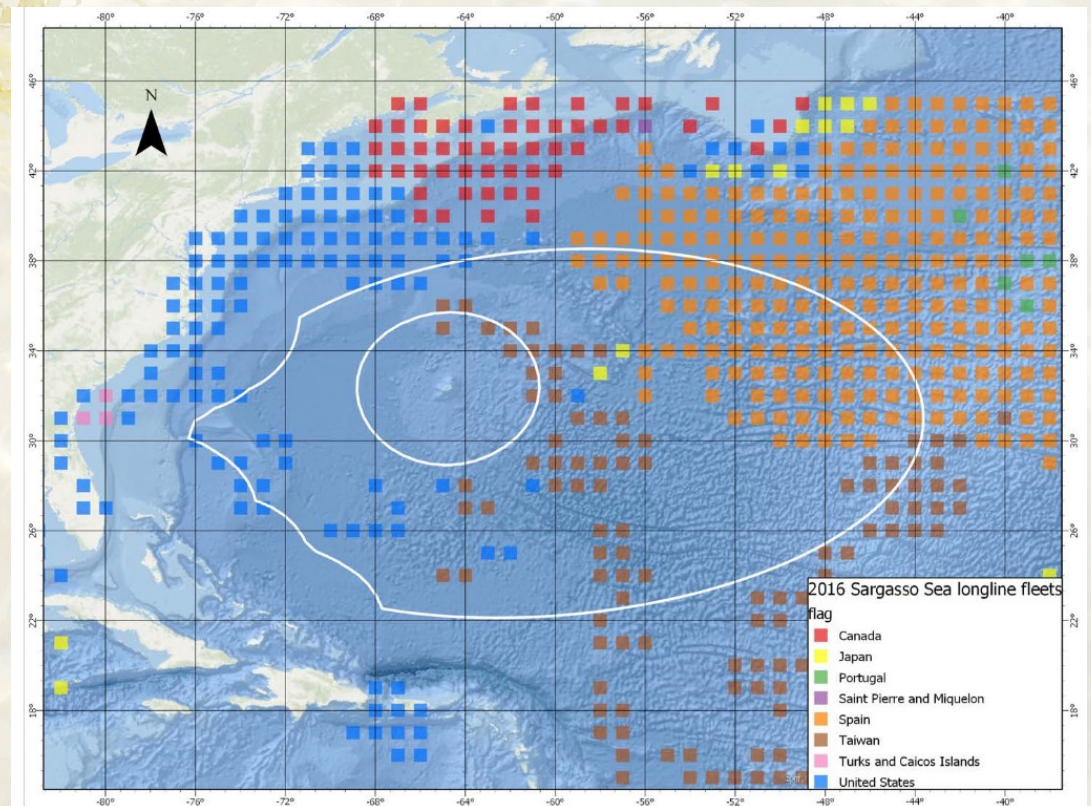
Fishing Pressure & Habitat

Sea bird vulnerability as longline by-catch

Cory's Shearwater – Range



Forecast Effort based on
AIS and *Environmental Predictors*



DPSIR – Feedback from initial Elicitation exercise

- *“No framework leads to a single answer, rather all frameworks provide the information and knowledge to facilitate exploring the space for decision making and policy development”*
- *“DPSIR focused on Pressures and Impacts rather than goods and services, so ended up saying what is bad and not what is good.”*
- *“Importance of co-production of knowledge, ways of working together across disciplines to create user-led, people-centred systems”*
- *“ICCAT currently focused on by-catch and has limited capacity to look at ecosystem, so SSC an example for others to follow.”*
- *“Implementing EBFM is a marathon, not a sprint, need to manage expectations, NAFO a good example”*
- *“Need for data, prognosis and cloud based tools”*
- *“Stop talking and do something!”*



