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

- Importance of the Sargasso Sea recognised by ICCAT
- 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

Driving forces
Socio-economic and socio-cultural forces driving human activities that increase pressures on the oceans

Response
How do we respond to the impacts on the ocean?

Response monitoring

Pressures
Pressures on the ocean from human activities, both land- and ocean-based

Impact
What are the impacts of the changing state of the ocean?

State
What is the state of the ocean? - “the assessment”
Driver-Pressure-State-Impact-Response

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

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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!”