

EU-CARIBBEAN WORKSHOP ON MARINE SCIENTIFIC COOPERATION



Marine Regional Research Priorities and Capacity Building Needs

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Caribbean Regional Fisheries Mechanism



www.crfm.int

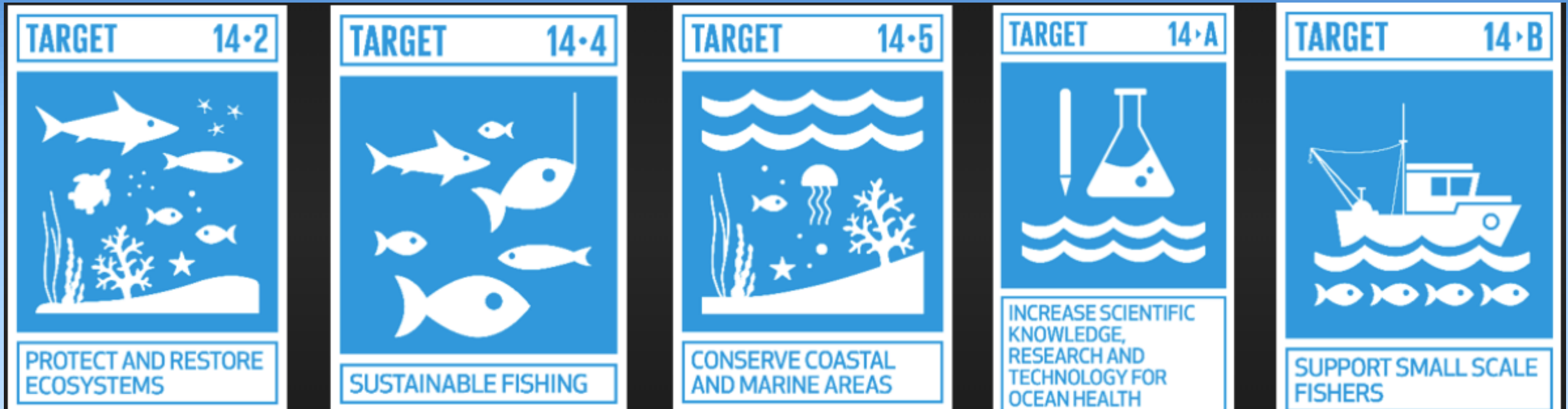
Ocean and Marine Living Resources



- Cover 71% Earth's surface
- Life began in Ocean over 3 billion years ago
- An estimated 50-80% of all life on earth is found in ocean
- 236,878 named marine species - but possibly as many as 25 million (World Register of Marine Species –Jan 2021)
- Less than 10% ocean space has been explored - We know very little about oceans
- Wide variety of living & non-living resources that can be used –
 - Minerals – polymetallic nodules, polymetallic sulphides, oil & gas
 - Mammals, Fish, reptiles, crustaceans, molluscs, marine plants, algae, planktons
- One of most valuable natural resources - -worth at least \$24 trillion (WWF)

RANK	COUNTRY	LAND (KM2)	EEZ (KM2)	SHELF (KM2)	COASTLINE (KM)
1	Bahamas	13,878	654,715	106,323	3,542
2	Jamaica	10,991.00	258,137	9,802	1,022
3	Barbados	432.00	186,898	426	97
4	Turks & Caicos Islands	948.00	153,533	5560	389
5	Guyana	214,969.00	137,765	50,578	459
6	Suriname	163,820.00	127,772	53,631	386
7	Haiti	27,750.00	126,760	6,683	1,771
8	Antigua and Barbuda	442.00	110,089	4,128	289
9	Anguilla	91.00	92,178	2120	61
10	Trinidad and Tobago	5,128.00	74,199	25,284	362
11	Saint Vincent & the Grenadines	389.00	36,302	1,561	264
12	Belize	22,966.00	35,351	13,178	386
13	Dominica	751.00	28,985	659	152
14	Grenada	344.00	27,426	2,237	252
15	Saint Lucia	617.00	15,617	544	158
16	Saint Kitts and Nevis	261.00	9,974	653	135
17	Montserrat	102.00	7,586	168	40
	Total	463,879	2,083,287	283,535	9,765

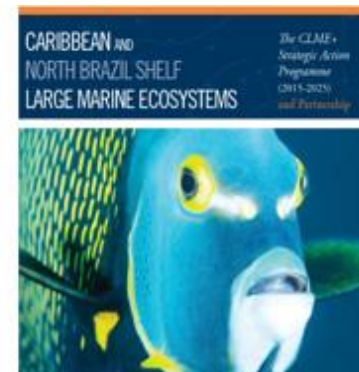
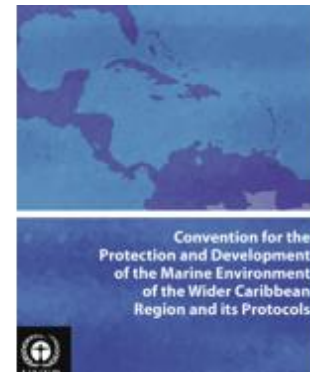
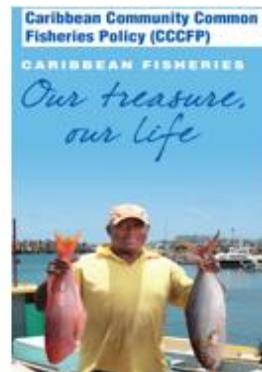
International Framework – and the Sustainable Development Goal 14:



- UNCLOS & Related Treaties – CDB, CITES, UNFCCC
- Sustainable Development Goals (SDGs) aim to transform our world
- A call to action to end poverty & inequality, protect the planet, ensure that all people enjoy health, justice and prosperity, & use renewable natural resources sustainably
- No one left behind
- Goal 14 establishes the framework for sustainable use of oceans & seas

KEY REGIONAL TREATIES & INSTRUMENTS

- 1983 Cartagena Convention & its Protocols (especially SPAW)
- **2002 Revised Treaty of Chaguaramas – Chapt 4, Part 2, Art 60**
- **2002 Agreement Establishing the CRFM**
- 2010 Castries Declaration on IUU Fishing
- 2010 Regional Food and nutrition Security Policy [Env & Natural Resource]
- **2014 Caribbean Community Common Fisheries Policy & its 4 Protocols:**
 - 1) Small-scale fisheries;
 - 2) Climate Change & Disaster Risk Management; and
 - 3) Aquatic Food as a Strategic Resource for food security & nutrition
 - 4) Sustainable Use of the living marine resources
- CLME+ Strategic Action Programme (2015-2025)



Strategic Importance of the Marine Environment in Caribbean

- The marine environment provides a multitude of goods and services that **are critical** for socio-economic development
- The **lifeblood of our economies** - supports tourism, food, jobs from fishing, trade & foreign currency, shipping, energy - oil and gas, water, coastal protection
- Capacity of the marine environment to provide goods and services & sustain healthy biodiversity and fish stocks is threatened by: (a) pollution, b) habitat degradation, (c) unsustainable fisheries, (d) climate change and ocean acidification e) poor governance
- Sustainable Use of the marine resources & ecosystems is critically important



Blue Economic growth – framework for Sustainable Development of countries whose Future depend on the Ocean

- Balancing growth and development
- Balancing **private sector growth** and benefits for local communities
- Promote **equity**, including gender equality, and in particular the generation of inclusive growth and creation of **decent jobs**
- **Economic Diversification** beyond traditional sectors such as tourism, agriculture & fisheries (& traditional species e.g mariculture) – improve resilience & reduce vulnerability to external shocks
- Improve **Food Security** by better managed fisheries and increased aquaculture - ensure a consistent supply of seafood for local consumption
- Aquaculture has been the fastest growing food production sector for several years now supplying about 58 % of global supply

Challenges for Ocean Economy in the Region

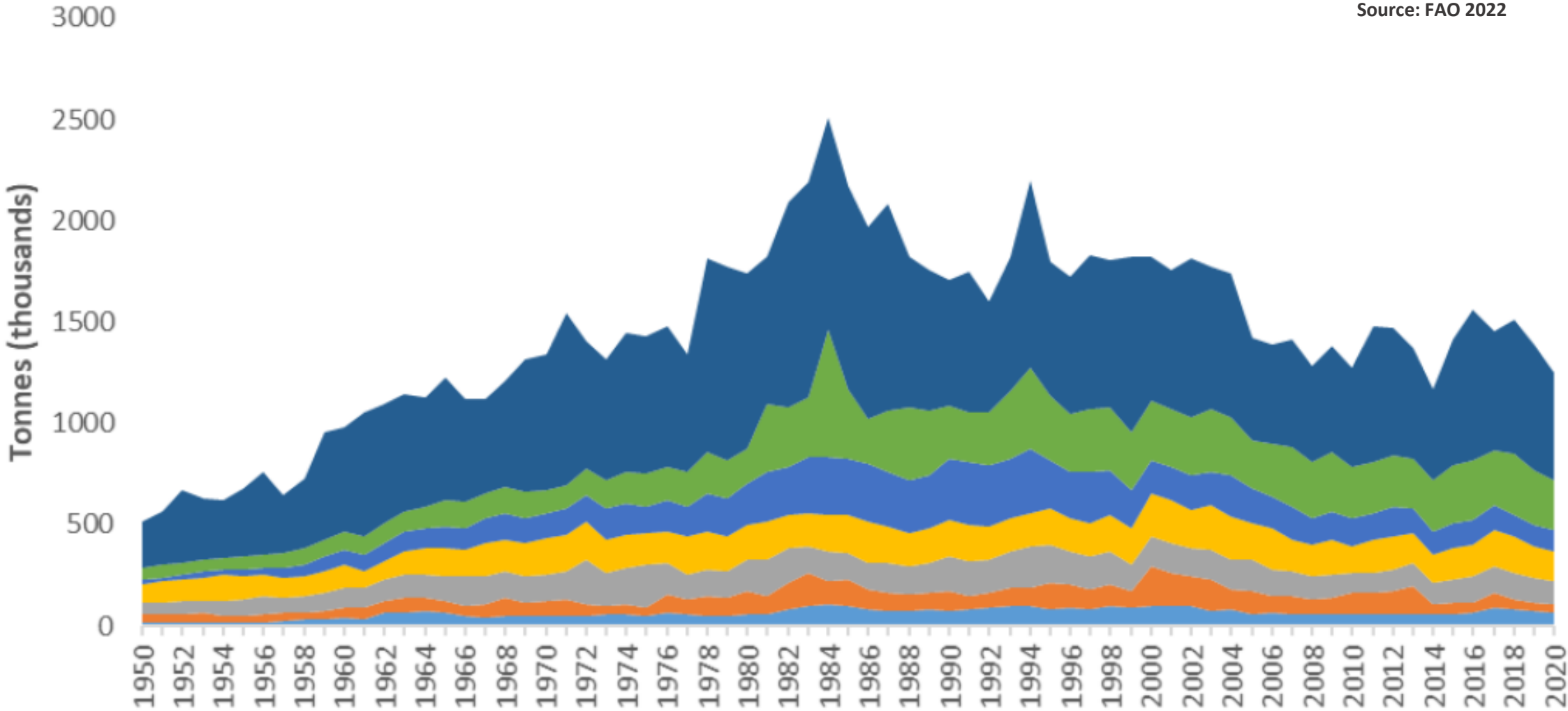
- **Climate Change** , acidification, rising sea levels, warming waters, frequent and severe weather
- **Pollution** including plastic waste, sewage, and nutrient runoff, is degrading marine ecosystems and impacting fisheries - sargassum
- **Unsustainable fishing** practices, overfishing, and IUU fishing undermine long-term viability of marine resources
- Lack of **infrastructure and technology** for effective marine resource use & management, mariculture, renewable energy development, maritime transportation

- **Weak governance** and regulatory frameworks can hinder effective resource management and enforcement
- Inadequate **data and knowledge** of what we have and their status
- **Maritime boundary delimitation** hinder effective management and governance of marine areas,
- **Limited capacity & expertise** in marine resource management, environmental conservation, technology is a challenge
- Ensuring that benefits of blue growth are **equitably distributed** among local communities, women, youth, differently abled
- **Financing & insurance** to make it happen

Importance of Fisheries in Caribbean

- Food Security, nutrition
- High Per capita consumption of fish
- Trade & foreign exchange earning
- Employment & Livelihood opportunities
 - socio-economically disadvantaged
 - Vulnerable youth
 - Women
- Culture
 - flyingfish (Barbados), Queen conch (Bahamas)
 - Aboriginal whaling (St Vincent & Grenadines)
- Recreational fisheries
- Social stability of coastal communities



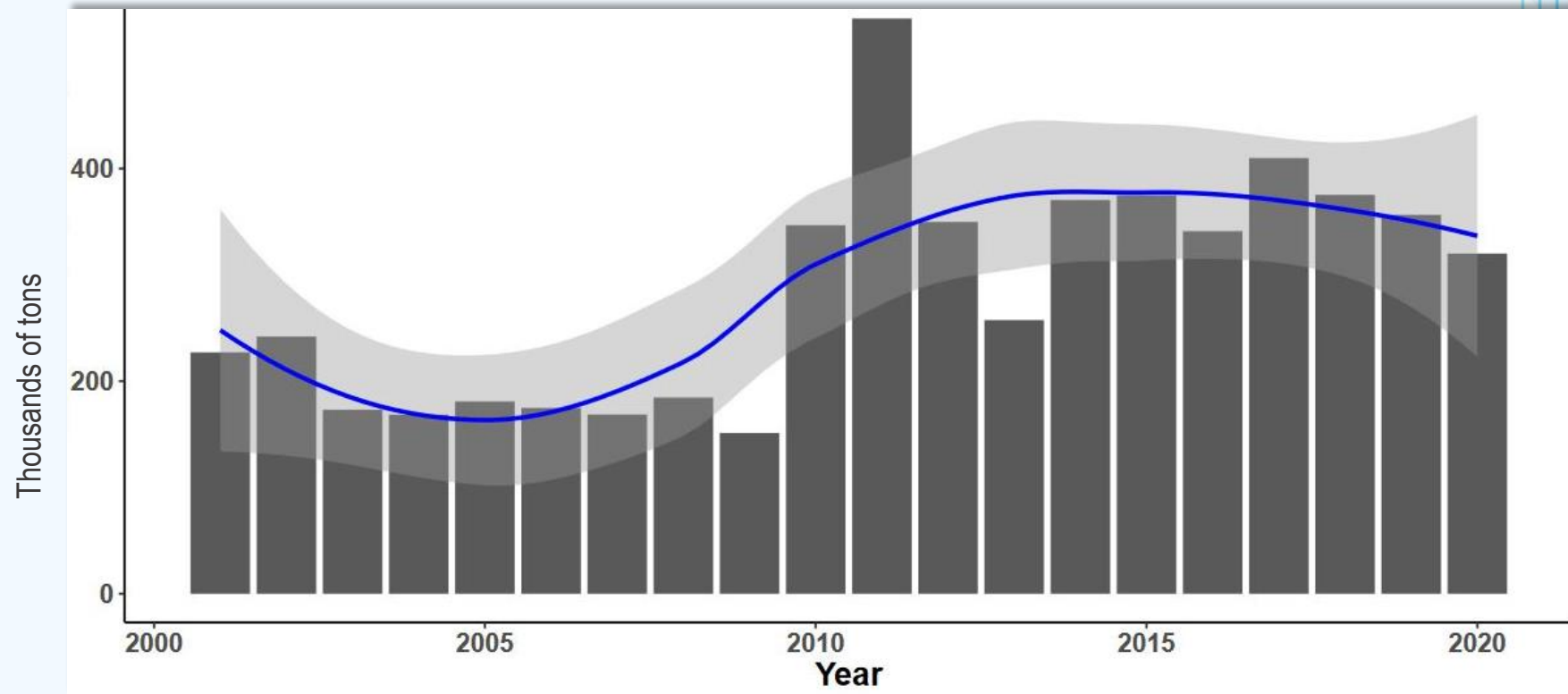


- 36- tunas, bonitos, billfishes
- 53- Oysters
- 33- Miscellaneous coastal fishes
- 45- shrimps, prawns
- 39- Marine fishes nei
- Other ISSCAAP Groups
- 35- Herrings, sardines, anchovies

TRENDS IN CARICOM REGIONAL PRODUCTION

MARINE CAPTURE FISHERIES

2000-2020



Total annual marine capture fish production represents meat weight in tonnes

DATA INCLUDE HIGH SEAS PRODUCTION

IUU Fishing and Fisheries Crime

- Combating IUU Fishing & fish crime is high priority
- IUU fishing is damaging to ecosystems and legitimate fishers
- Major cause of overfishing and loss of opportunities in the sector
- Seafood fraud - e.g. misleading consumers about fish and seafood to increase profits – mislabeling, substituting species
- Extent of intentional mislabeling & substituting other products is massive

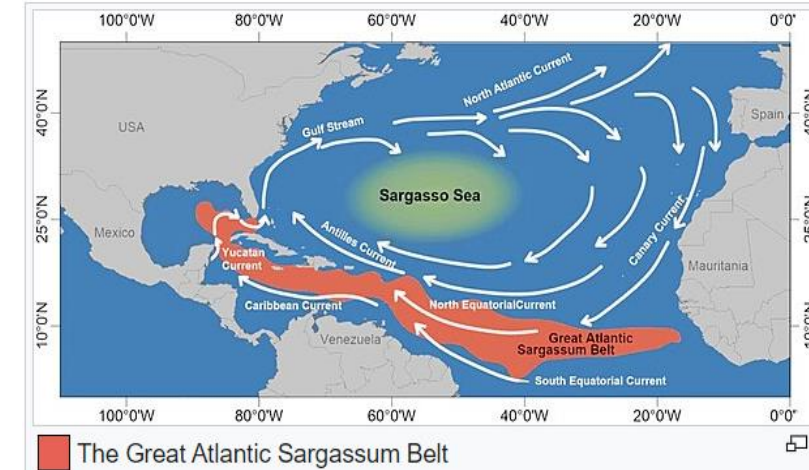


Massive Sargassum Blooms Since 2011

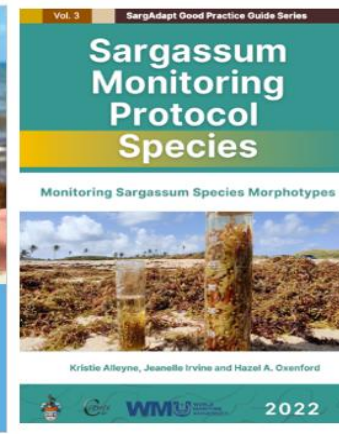
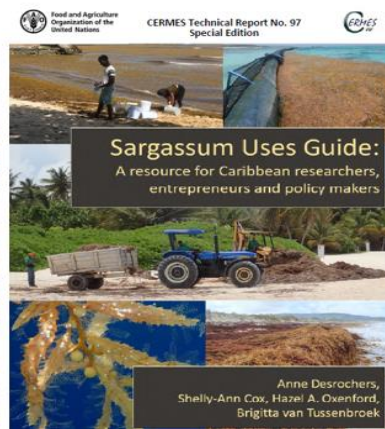
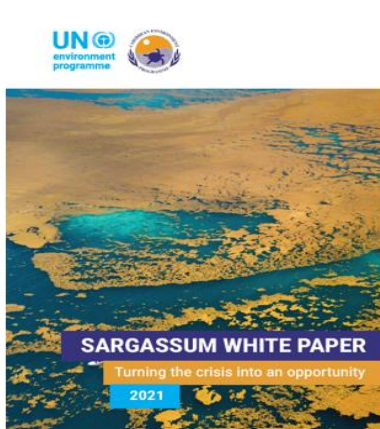
- Recurring blooms & accumulation of Sargassum in coastal waters & on beaches across the Caribbean have cause major disruption to economic activities and livelihoods in region

Causes:

- Climate changes & Nutrification of ocean - agricultural runoff from river systems
- Ocean circulation - currents that transport sargassum to Atlantic & Caribbean coasts – **Great Atlantic Sargassum Belt**
- **Growing Body of Literature – But Significant Gaps**



Source: wikipedia



Impact on Habitat, Ecosystems, Species, Fisheries & Tourism

- Habitat & food for various marine species e.g turtles, fish & birds in ocean
- In coastal waters – smother & kill certain marine species, coral reefs – blocking sun
- Transport large amounts of nutrients from open ocean to the coastal areas, which may affect the ecological balance and processes
- Contaminate beaches & coastal waters by decomposing & releasing toxic gases,
- Alteration of water chemistry from release of toxic hydrogen sulphite, ammonia gasses, which can cause oxygen depletion, increased acidity, eutrophication
- Damage fishing gear, boat engines and other fishing assets, alter fish migration, species composition, availability, fish kills in bays
- Clogging fishing harbours and impede access of fishers to sea
- Disrupt tourism activities – the main economic driver in many countries
- High capacity to absorb & accumulate heavy metals from the sea cadmium, arsenic,



Use to Combat Climate Change & Ocean Acidification by Carbon Sequestration

- Sargassum absorbs carbon dioxide from the ocean surface water and can therefore function as a carbon sink
- Collect from coastal waters, transport to deeper water and sink to 150 - 200 meters
- Sink to deep ocean floor where the carbon would be sequestered for hundreds or thousands of years - geological timescales.
- Reduce greenhouse gases (methane & carbon dioxide) released into atmosphere
- Reduce acidity of ocean
- Can generate carbon credit for Caribbean States and private sector enterprises.
- Carbon credits – source of income, generate employment and livelihood opportunities

Research Priorities For Sustainable Fisheries

Sustainable Aquaculture Development

- Collaborative research aimed at developing sustainable aquaculture / mariculture practices
- Studying the feasibility of aquaculture/mariculture - identifying suitable species, optimizing production methods, and addressing environmental and socio-economic impacts – integrated multi-trophic aquaculture (IMTA)

Stock Assessment and Ecosystem-based Fisheries Management

- Comprehensive fisheries independent survey of the living marine resources & state of environment of the EEZ
- Comprehensive stock assessments for key fish species to determine their population status and health & support harvest control strategy & effective fisheries management measures
- Research on ecosystem-based fisheries management - consider the entire ecosystem and its interconnections, rather than individual species, to ensure sustainable fish stocks and protect the marine environment.

Bycatch Mitigation

- Bycatch of non-target species, including mammals, turtles is a significant concern in some countries
- Research and technologies to reduce bycatch in fishing operations is necessary for sustainable fisheries

Illegal, Unreported, and Unregulated (IUU) Fishing & Fisheries Crime

- Investigate the extent & impacts of IUU fishing, develop strategies to combat these unlawful activities, which undermines sustainable fisheries management, contribute to overfishing & degradation of ecosystems

Research Priorities to Support Biodiversity and Ecosystems Health

Marine Biodiversity Conservation

- Identifying and protecting critical habitats including mangroves for fish & other marine species.
- Studying migration patterns and behaviors of key marine species.
- Assessing the impact of human activities on marine biodiversity
- Evaluate the effectiveness of existing Area-based management systems & identify opportunities for improved effectiveness & expanding the network to safeguard critical habitats and marine species.

Coral Reef & Mangrove Health and Resilience

- Monitoring and assessing the health of coral reefs & mangrove forests.
- Studying factors contributing to coral bleaching and strategies for mitigation.
- Investigating coral & mangrove resilience and restoration techniques and their effectiveness.

Marine Pollution & Plastic Waste

- Studying the sources, extent and effects of pollutants & contaminants in marine environments.
- Monitoring and mitigating the impact of pollution including plastic pollution
- Studying transfer of contaminants from marine environment to marine organisms and humans
- Developing strategies for sustainable waste management.

Research Priorities Climate Change & Ocean Acidification

Climate Change & Ocean Acidification Impacts

- Investigate the effects of climate change including warming waters, sea-level rise, ocean currents & chemistry, increased frequency of extreme weather events on marine ecosystems and species,
- Study the extent and effects of ocean acidification of key species and ecosystems
- Improved understanding of these impacts is essential for developing adaptation strategies

Sargassum

- Understand the ecological and biological factors influencing Sargassum blooms
- Assess the impact of Sargassum influx on coral reefs, seagrass beds, and other marine ecosystems & marine biodiversity, including fish and invertebrate populations
- Evaluate the socio-economic & health risks and impacts of Sargassum on fisheries and coastal communities
- Develop strategies to mitigate the economic and social consequences of Sargassum influx
- Research on uses, product development & valorization of Sargassum –e.g fertilizer, biofuels, bioplastics, building material
- Investigate potential source of carbon sequestration

Socio-economic and Policy Research Priorities for Improved Governance

Economics, Cultural & Socio-Ecological Systems

- Study the economic, social & cultural aspects of fisheries & marine resource use to understand the livelihoods of coastal communities and the interactions between human activities and marine ecosystems

Ocean Governance and Policy Research

- Analyze the effectiveness of existing sustainable use, conservation & management policies and governance structures, and identify areas for improvement to ensure the implementation of sustainable practices
- Study to facilitate improved partnerships and engagement with local communities

Research to Support Deep-Sea Mining and Protection of Biodiversity

Deep-seabed

- Contains a diverse array of marine life as well as significant reserves of minerals - copper, cobalt, nickel, zinc, silver, gold, graphite and rare earth elements
- Some minerals are in high demand as they are essential components of EV batteries, wind turbines, solar panels and other low-carbon technologies & decarbonization initiatives
- Several countries are preparing to start commercial mining of the deep-sea minerals
- Growing concerns about potential impacts on biodiversity & ecosystems
- Research Priority
 - Map baseline and ensure protection of ecosystems
 - Address knowledge gaps regarding deep-sea ecosystems and resources
 - Study potential deep-sea mining impacts on marine species and environments

Capacity Building

Invest in capacity building and training programs for:

- marine researchers, scientists, enforcement officers, Government officials, Policymakers, private sector

Key Areas

- Aquaculture and Fisheries Management and Governance
- Marine Science, Conservation and Biodiversity
- Marine Spatial Planning
- Climate Change Resilience
- Data Collection and Information Management
- Marine policy, law and governance
- Maritime Law Enforcement and Compliance
- Technology and Innovation
- Economic Diversification, Value chain development and Livelihoods

This can involve: building capacity of national and regional research and training institution, exchange programs, workshops, skill-building initiatives hosted by EU institutions and vice versa,

THANK YOU