Sargassum Management in Jamaica: A National Response Strategy

Presenters:

Monique Curtis, Manager – Ecosystems Management Branch

Lisa Kirkland, Manager - Pollution Monitoring and Assessment Branch

National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, air and water

Presentation Outline

- Jamaica Experience
- Development of National Response Strategy
- Communication - Mobilization
- Communication - Public Advisory and Media
- Sargassum Monitoring and Tracking
- Shoreline Cleanup
- Resource Assessments/Surveys and Research
- Exploring the Potential Commercial Uses
- Valorisation Gaps
- Next Steps - Task Force on Management
- Expressions of Interest
- Nutrient Management in Jamaica

Jamaica Experience

Pictures of Sargassum influx occurring around the island; Source: CMS, UWI

Jamaica Experience - Documented Impacts

NEPA probing Hellshire marine kill

Share this Story: X Post

Published: Tuesday | August 24, 2021 | 12:08 AM

Ian Allen/Photographer

Sargassum along the shoreline of the Hellshire Beach in St Catherine on Tuesday, August 17.

The National Environment and Planning Agency (NEPA) is conducting an investigation into an apparent localised marine kill along the shoreline of the Hellshire Fishing Village in St Catherine.

Dead sea cucumbers, juvenile fish, crabs, and lobsters were seen floating in the water and on the beach hours before Tropical Storm Grace brought heavy wind and rain on Tuesday, August 17.

Tourism, Fisheries, Environment, Health - odour

- Anaerobic decomposition produces **H2S gas- toxic/corrosive**.
- Beaches covered with rotting seaweed - unusable
- Impedes fishing activities- entangle lines and engines – leads to overheating
- Rots and reduces oxygen in coastal areas causing death of mangroves and seagrasses – creates dead zones
- Fish kills reported along Hellshire
- Transports plastics with mats

Promotes erosion of beach - swash heavy

Loss of sand/beach damage (compaction) during clean-up activities.

Turtle-nesting beaches affected & turtle strandings/cannot lay eggs

Toxic environment – H_2S and anoxic (low oxygen) beach habitat

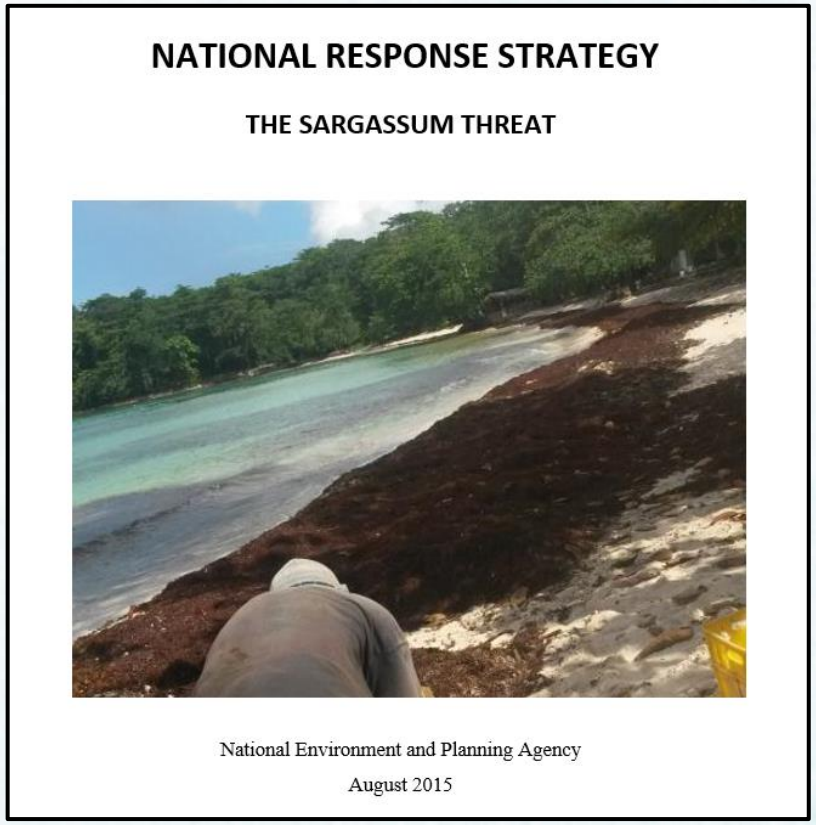
National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, air and water

Development of the “National Response Strategy”

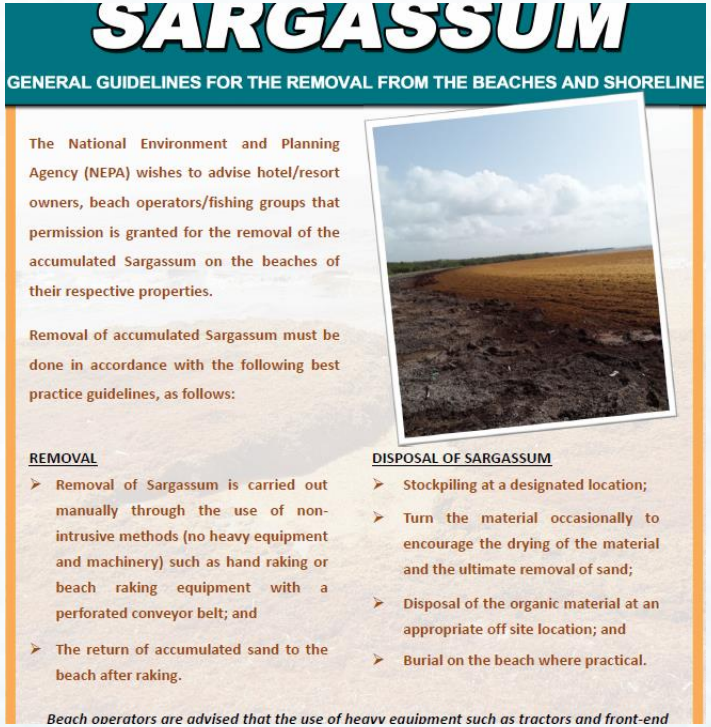
The Government of Jamaica, through its agencies developed the National Sargassum Response Strategy to define measures for Sargassum response:

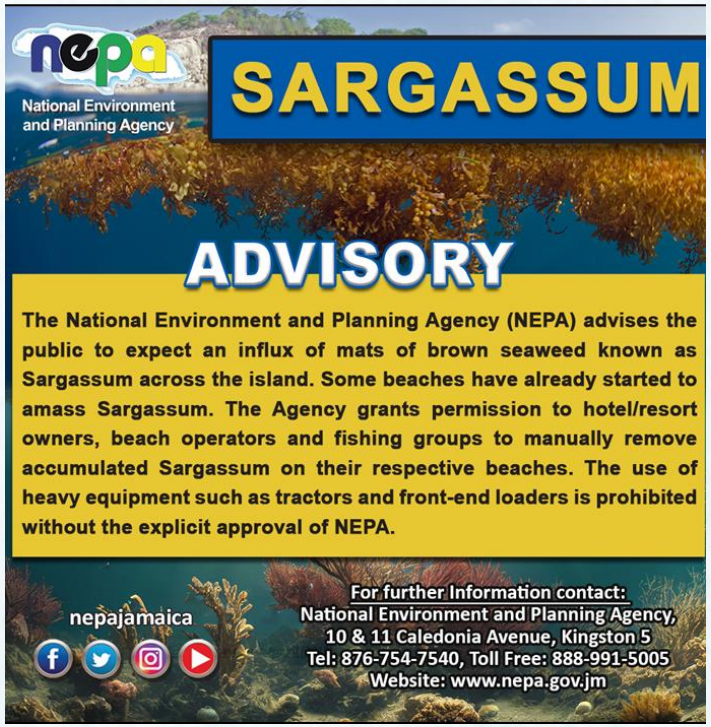
- national public sensitization
- community mobilization for beach and shoreline clean-up
- research and product development



Cover page of NEPA’s National Response Strategy, 2015

Communication - Mobilization of Local Communities and Groups





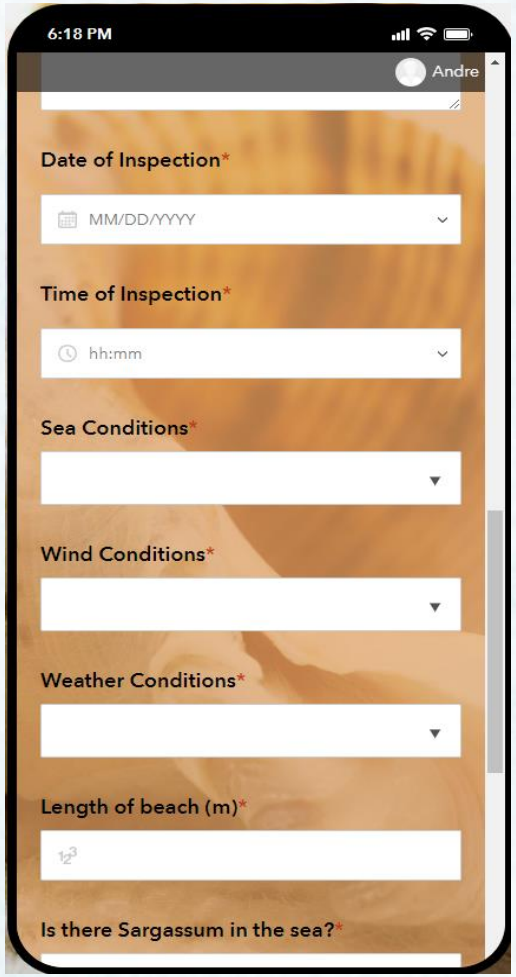
- Development of the General Guidelines for the Manual Removal of Sargassum from Shorelines
  - The Guidelines promote the removal and disposal of accumulated Sargassum (raking, stockpiling, returning sand, disposal of dried material)
  - It also outlines the Agency's position on the use of heavy machinery; and
  - Published in newspapers, NEPA's website and social media

National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, air and water

Sargassum Monitoring and Tracking

- Continuous monitoring of public bathing beaches across Jamaica since 2018
- Annual report prepared on the status and trends across Jamaica



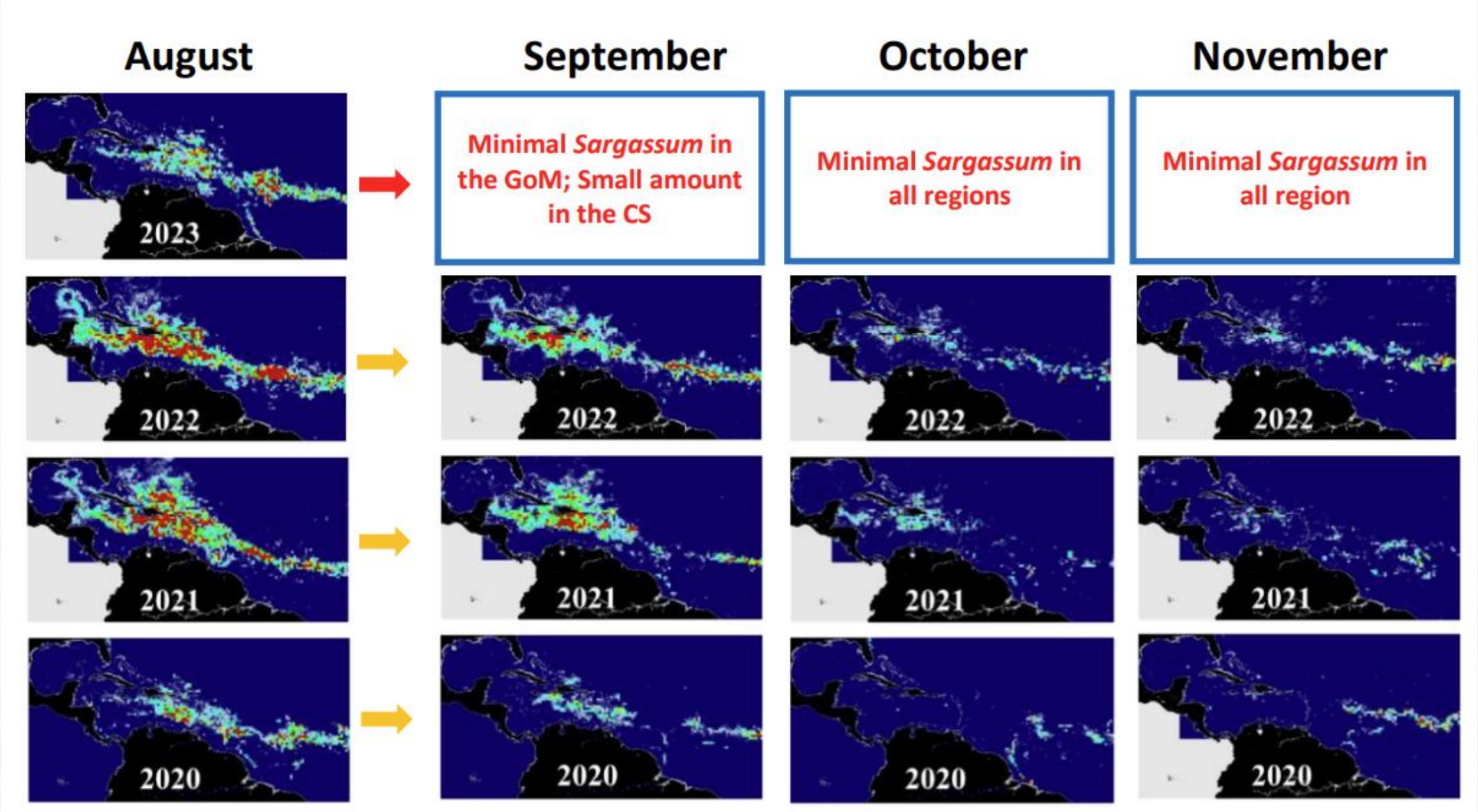
NEPA officers conducting Sargassum monitoring; Source: NEPA

National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, air and water

Sargassum Monitoring and Tracking

The Agency also uses satellite-tracking systems available to the public – such as the University of South Florida's Sargassum Watch System



Outlook of Sargassum bloom in the Caribbean Sea and Gulf of Mexico dated 31 May 2023; Source: University of South Florida Optical Oceanography Lab's website (https://optics.marine.usf.edu/projects/SaWS/pdf/Sargassum_outlook_2023_bulletin5_USF.pdf)

Shoreline Cleanup

The project titled "*The Removal of Sargassum from Jamaica's Beaches*" was launched NEPA implemented the project, with funding support from the Tourism Enhancement Fund.

NEPA to embark on sargassum weed clean-up at Hellshire

Published: Friday | September 10, 2021 | 12:05 AM

File

Sargassum along the shoreline of the Hellshire Beach in St Catherine on Tuesday, August 17.

The National Environment and Planning Agency (NEPA) has embarked on a clean-up of sargussum weed along the Half Moon Bay Fishing Beach in Hellshire, St Catherine. This follows its finding that a recent localised fish kill was due to the impact of dead and decaying sargassum weed last month.

Its analysis of water samples attributed the fish kill to decaying sargassum which caused a reduction in oxygen in this area.

National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, air and water

Resource Assessments/Surveys and Research

NEPA requested partnership for research in 2018 to 2020: UWI/NEPA MoU.

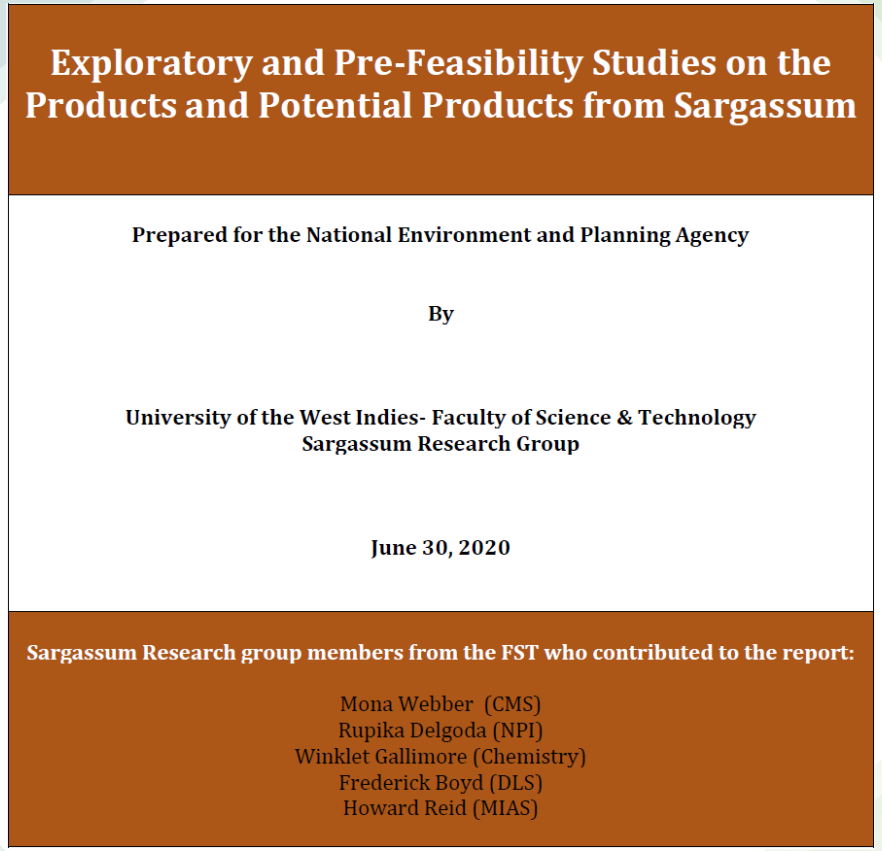
The University of the West Indies (UWI Mona) Faculty of Science and Technology (FST) established a Sargassum group "*Exploring the potential commercial uses of Sargassum*"

- A pre-feasibility study on use of Sargassum products and potential products.
  - Use of Sargassum for soil amelioration (addition of Sargassum compost) for growing crop, plants and mangroves.
  - Use of extracts in biological applications.

Exploring the Potential Commercial Uses of Sargassum

Major findings show:

- High volume/low value:
  - Sargassum can be used for anaerobic digestion, production of methane (biofuel/energy)
  - use of Sargassum in soil amelioration (compost; liquid-biostimulants) - enhance growth of plants while achieving weed & pest control
- High volume/medium value: Sargassum can be used as texturizing agents in a myriad of industrial applications including in the food industry
- Low volume/high value: Sargassum can potentially be used in the production of pharmaceuticals and cosmetics.



National Environment and Planning Agency

ICENS Research on Sargassum in Jamaica

The International Centre for Environmental and Nuclear Sciences (ICENS), based at UWI Mona, found:

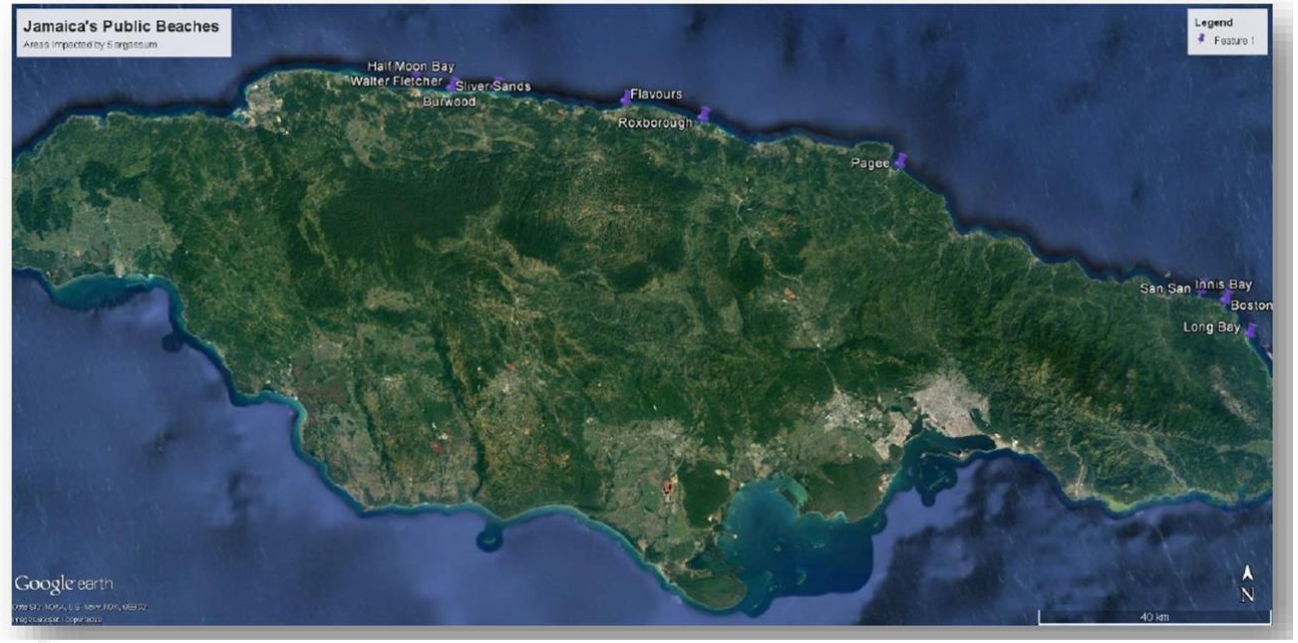
- The average concentration of arsenic in Sargassum found in Jamaica is 60 ppm (60 mg/kg)
- Reducing the arsenic levels to make Sargassum suitable for use in agriculture and other purposes poses a significant challenge

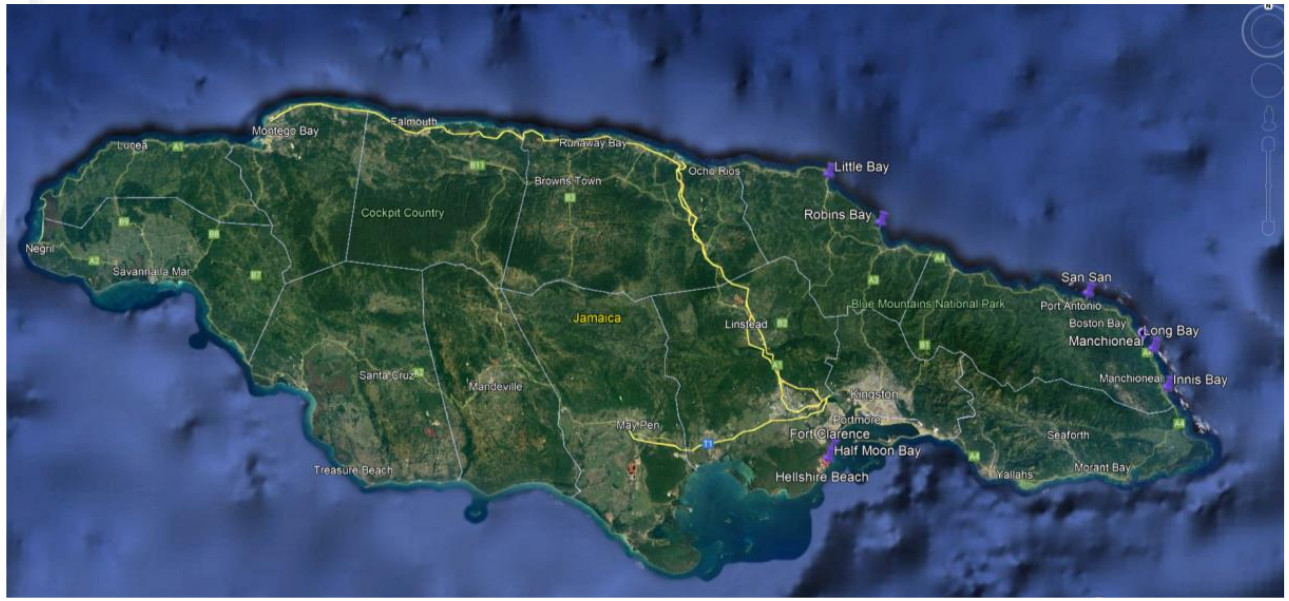
National Environment and Planning Agency

Valorisation Gaps in Jamaica

- **Forecast of Sargassum mats to predict localized landing**

- Jamaica Sargassum Early Advisory System (JSEAS) website was developed by the Mona Mona GeoInformatics Institute (MGI), University of Southampton and partners.
- Monitor, alert, and advise the public on Sargassum offshore presence and beaching.





National Environment and Planning Agency

GLIMR

Geosynchronous Littoral Imaging and Monitoring Radiometer

● FUTURE MISSION

GLIMR will be a space-based instrument that will help scientists observe and monitor ocean biology, chemistry, and ecology throughout the Gulf of Mexico, the southeastern U.S. coastline and Amazon River plume that stretches to the Atlantic Ocean.

TYPE
Instrument

LAUNCH
2026-2027

TARGET
Earth

OBJECTIVE
Study Earth's ocean processes

NASA’s GLIMR ocean colour mission and its applications for realtime Sargassum tracking

NASA's GLIMR ocean colour mission and its applications for realtime Sargassum tracking

What is the data access policy for GLIMR? (Is it open-access, restricted, or subject to a licensing agreement?)

- It will be through the Goddard DAAC from the Ocean Biology Group. The data is open to all. Some restrictions, but it will be just like PACE and many other missions (VIIRS, MODIS)

How can Jamaica obtain real-time or near-real-time access to GLIMR data?

- It will have a lag of several hours. We are working that out now, but perhaps you can access via feed from Goddard

In what formats will GLIMR data be available (e.g., GeoTIFF, NetCDF, IMG, HDF, shapefiles, APIs, etc.)?

- NetCDF

How frequently will GLIMR collect data over Jamaica's coastal waters?

- TBD, but likely 2x day for routine operations. Keep in mind that if there is a sargassum issue, we can program the mission to get much more frequent data.

Will GLIMR data be archived for historical trend analysis? (How long will past data be available, and will there be cloud storage or archive access?)

- Yes, NASA requires this. I'm not sure where right now, but all will have access. (Just like all other US Ocean Color Missions)

Valorisation Gaps in Jamaica

1. **Techniques for the removal of Sargassum and processing for potential commercial use.**
2. The socioeconomic, health and environmental impacts of Sargassum

National Environment and Planning Agency

Expressions of Interest

- EWA Technologies Group (EWA Group)
  - Produces and implements a breakthrough technology enable valorisation of organic material, including sargassum, to clean energies (electricity, syngas, SNG and hydrogen).
  - Plans to integrate our H2life solution for valorization of sargassum, and other type of organic waste, such as biomass, food waste, sludge, plastic, etc. to energy
  - Request of Government of Jamaica - a local strategic ecosystem of partnerships to implement optimized multisectoral waste management technologies.

- Carbonwave
  - **SargaPower** - an agricultural input that is proven to increase yields and reduce abiotic stress factors in a wide variety of crops. (attached are some of our results from testing in Mexico, Brazil, USA and Europe)
  - Seabalance - the worlds' first seaweed based cosmetic emulsifier. Used in a wide variety of cosmetic applications, this raw material allows oil and water to bond, maintaining the final product homogenous.
  - Offer services in Quintana Roo to protect beaches and extract the sargassum before it rots.
  - Continue to develop new products such as Bio-Leathers, 3D printing, and Bioplastics applications for the sargassum which will be released over the coming months and years.

Next Steps - Task Force on Sargassum Management

- The responsibilities of the task force include to:
  - **Assessment**: Monitor Sargassum influxes, impacts, and valorisation potential.
  - **Market Research**: Identify commercial opportunities for Sargassum-based industries.
  - **Valorisation Strategies**: Promote economic uses (e.g., bioproducts, fertilizers, biofuels).
  - **Business Development**: Encourage private sector investment for economic and environmental benefits.
  - **Policy Recommendations**: Advise on policies for sustainable management and utilization.
  - **Collaboration**: Strengthen partnerships among government, communities, industry, and academia.
  - **Management Framework**: Develop an integrated, sustainable Sargassum management plan.
  - **Public Engagement**: Educate on Sargassum's ecological and economic significance.

Members:

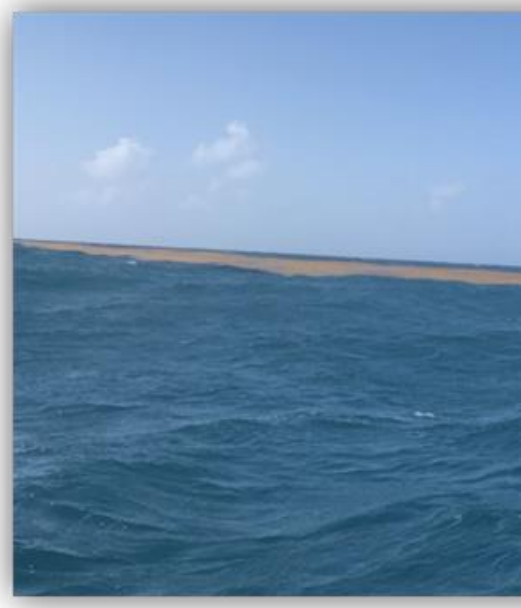
NRCA, TPDCo, Ministry of Tourism, TEF, NFA, NSWMA, NSDMB, UWI Life Sciences, MEGJC, JAMPRO, DBJ, Ministry of Local Government & Community Development.

Nutrient Management in Jamaica

- ✓ Nutrient Management in Jamaica is govern by the Natural Resources Conservation (Wastewater & Sludge) Regulations, 2013 – which is based on the polluters pay principle
- ✓ Draft policy re Wastewater
- ✓ Group established in May 2020 consisting of relevant stakeholders
- ✓ The Regional Nutrient Pollution Reduction Strategy and Action Plan (RNPRSAP) was presented to the Group & adoption made to fit Ja situation
- ✓ Proposal prepared and submitted to the JSIF for funding to upgrade (1) school sanitation system by means of biodigester. Effluent discharged to be used in the school's Agro-forestry Programme (2) The installation of green house to facilitate the production of seedings (Demo) St. Ann
- ✓ Funding made available by the UNEP Cartagena Convention re case studies in Ocho Rios (Ja & Barb) on the efficient use of nutrient
- ✓ NEPA procured equipment and reagent re analysis of chlorophyl α &β- SOCAR

Nutrient Management in Jamaica – Way Forward

- ✓ Engagement of the major provider of sewage service in Jamica to expand network especially in marine areas
- ✓ Continued updating of Draft Wastewater Reuse Policy
- ✓ Continued engagement of Stakeholders Group
- ✓ Continued implementation of aspect of the RNPRSAP based on resource availability
- ✓ Implementation of project to facilitate upgrade of school sanitation and the installation of green house(Demo) St. Ann
- ✓ Phase 2 of the UNEP Cartagena Convention case studies in Ocho Rios
- ✓ The implementation of NRCA Project to prepare guidelines under the WWSR for the reuse of treated wastewater for agricultural crops. This project essentially consists of the engagement of a consultant to prepare guidelines for 5 agricultural crops that can be irrigated with treated effluent.



Thank you!