

Sargassum influx in the Wider Caribbean Region

Context

Brown algae of *Sargassum* genus form dense populations constituting free floating rafts on the ocean surface. These sargassum rafts have been observed for a long time in the northern Caribbean Basin and the Atlantic ocean, and their presence has notably given its name to the Sargasso Sea in the North Atlantic Ocean. However, since 2011, proliferation of sargassum populations have been observed around the Wider Caribbean Region (WCR), including in locations where they were so far absent or extremely rare. The distinctive feature of the two species suspected to be involved in this influx (*Sargassum natans* and *Sargassum fluitans*) is their holopelagic characteristic meaning that they spend their entire life cycle in high seas without any benthic fixing stage. The observed massive landings have not affected the same locations in the Caribbean all year.



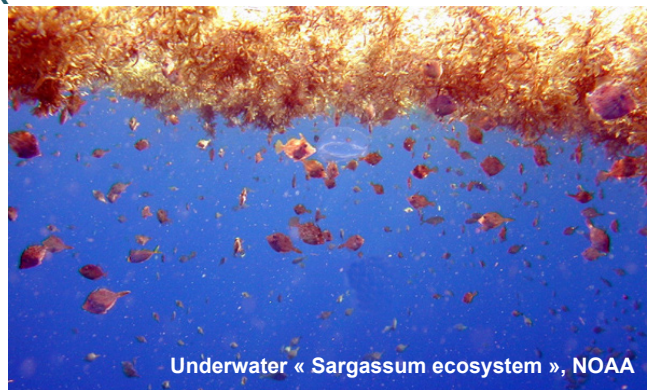
Sargassum landings in Barbados, Hazel Oxenford

As sargassum are transported on currents, the influx progressively touched different locations across the region. The lesser Antilles and their south and east coast have been particularly impacted by this phenomenon since the first episode of 2011. Other similar events of lesser magnitude have been observed over the following years. However, in 2014, the region has been experiencing an intense and strong episode that have been almost continuous until the end of 2015. Within the same period, it has also impacted the Greater Antilles as well as some countries bordering the Caribbean Sea including Mexico and its renowned tourist destination of Cancun.

Importance of the “Sargassum ecosystem” in the WCR

While these algae can be regarded as a nuisance when massive quantities are drafted on the beaches, it is important to note that the sargassum mats are home to many endemic species and provide ‘nurseries’ and cover habitat for a range of species, covering invertebrates, fish (including commercially important fish species) and protected turtles.

There is growing acknowledgement of the crucial role it plays in the wider ecosystem ranging from the Atlantic to the Caribbean and the Gulf of Mexico. It has led to restrictions of sargassum in-water harvesting in some places, including in the USA where its has been designated as an “Essential Fish Habitat” and is managed by a Fishery Management Plan.



Underwater « Sargassum ecosystem », NOAA

Sargassum challenges and impacts in the WCR

Potential impacts identified include economic (tourism, fishery, nautical activities), environmental (perturbation of marine species, beach erosion) and health aspects (decomposition of algae and release of H₂S). From an environmental point of view, more research is needed in order to determine how badly the sargassum influx affects the coastal and marine ecosystems. There is a specific concern about the stagnancy of large amounts of sargassum within the wetlands (mangrove, corals and sea grass) because of the potential anoxia caused to the environment. On the shore, some related events are also observed: for example sea turtles and fish have been found dead in the sargassum landings. The latter may cause erosion of the coast depending on the sargassum amounts on shore but also on the swell. Furthermore, health issues are under monitoring, as, depending on the size of the landings, the coastal population and beach goers may suffer from the release of the hydrogen sulfide from sargassum rotting. Cases of nausea, headaches, skin rash and breathing difficulties have been reported.

Knowing Caribbean territories dependency on their marine and coastal areas, the sargassum landings have led to economic impact around the WCR. The tourism sector for example, has been seriously impacted with reported cancellations in hotels and desertion of restaurants close to landings areas because of the smell. In addition to the clientele decrease, some damages have also been recorded among electronic appliances of coastal hotels (air-conditioning units, TVs, computer) due to the prolonged exposure to high concentrations of hydrogen sulfide. Tarnishing of metals is another effect of the exposure. The same observations and losses have also been noted within the coastal population. Disturbance for the nautical activities such as diving, kite surfing or even windsurfing are also recorded. Fishers expressed difficulties in launching and maneuvering their boats due to sargassum entanglement in the gear. They also reported some changes in the catch composition (i.e. observed decrease of flying fish in Barbados).

Managing sargassum can also constitute an economical challenge as specific equipment and infrastructure are needed to collect, transport and store the seaweed. Although the economic impact of sargassum influx in the WCR has not been quantified so far, different sectors reported a clear effect on their economy. Conducting an in-depth regional assessment of socio-economic impacts and challenges is fundamental to better comprehend the effective and sustainable management of sargassum.

Regional efforts to face the Sargassum landings in the WCR

A critical need for coordination

Since the first massive landings in 2011 and even more since the strong 2014-2015 event, many initiatives related to communication, research and management of the sargassum influx have been observed in the region. This specificity of the Caribbean region is interesting as many ideas have already been explored. However, the management responses of sargassum landings have been reactive rather than proactive and not always sustainable. This observation highlighted a critical need for sharing information and coordination of the responses in the WCR.

Onshore collection for example constitute an important challenge for coordination. The harvesting procedure should be monitored and rules followed to avoid any contribution to coastal erosion and disturbance of marine or coastal organisms, such as turtle nesting. For instance, use of equipments with large and soft low pressure tyres would be recommended instead of heavy tracked vehicles. Furthermore, when possible and permitted, in-water collection would also be an option in calm waters along the shoreline or in semi-enclosed bays, marinas and ports. A specific regulation should be settled for this latter type of harvesting to avoid perturbation of marine organisms in their environment.

Another challenge in terms of sustainable management is the development of value-added uses of sargassum to reduce the loss of this interesting free biomass, to reduce management costs and to take advantage of a new source of income (product development and job creation). For now, different uses have been explored and some interesting possibilities have been revealed (biofuel, biogas, biosorbent for water remediation, etc.). Consumptive purposes (livestock and fish foods, fertilizer, compost, chemical compounds for food supplements) are also considered but will require careful biochemical analysis to determine the local levels of contaminants, given the strong biosorbent properties of the seaweed which could collect heavy metals or other pollutants like pesticides.

On-going collaboration and response

In order to improve coordination and to assist the affected countries facing sargassum landings in the WCR, the Regional Activity Center for the Protocol concerning Specially Protected Areas and Wildlife for the WCR (SPAW-RAC) and the SPAW Secretariat of United Nations Environment Programme – Caribbean Environment Programme have been working together since 2015 to enhance a regional cooperation around the region. This enabled:

- **Sharing of regional data across the region with the launch of an active platform of exchanges:** the “Sargassum on-line forum” providing easy access to information and experiences on awareness, management and research about the sargassum influx.
- **Networking:** coordination of sargassum-related projects and events around the WCR and linking various stakeholders through the “Sargassum on-line forum”: scientists, marine resources managers, policy advisers, representatives of tourism and fisheries sectors, conservation NGOs, etc.
- **Support of research on origins, impacts and ways to control sargassum massive landings:** assistance for researchers to meet their specific challenges, participation in research projects steering committees, organization and hosting of a technical session “Understanding and management of the pelagic sargassum influx in the Caribbean” at the 69th GCFI annual meeting in Grand Cayman, UK in November 2016.

SPAW-RAC and SPAW Secretariat collaboration with other organizations of the region (i.e. the Center for Resource Management and Environmental Studies of the University of the West Indies and the Gulf and Caribbean Fisheries Institute) also recently led the preparation and circulation of a [Sargassum management brief](#) with the aim to assist government officials, coastal managers, beach caretakers and coastal residents by offering guidance on how best to sustainably manage the sargassum, based on lessons learnt to date.

Next steps:

- Setting up regional strategy for communication and awareness for stakeholders and the general public
- Development of summary documents: study of the regional situation (experiences, economic impacts), review of harvesting equipment and recommendations
- Assistance of project development on the understanding of the phenomenon and linkages with global programmes (GEF, UNEP GPA, UNEP Regional Seas)
- Coordination of the setting up of a regional / international forecasting strategy
- Development of an exhaustive guide of best management practices and recommendations with interactive tools and videos.

Support would have to be sought to achieve these specific objectives. Regarding the global scale of the issue, an on-going transatlantic cooperation with UNEP-GPA Global Partnership on Nutrient Management, the Abidjan and the Cartagena Conventions Secretariats and the USAID WABBIC Programme enabled the raising of information on the sargassum influx at the Second Session of the United Nations Environment Assembly (UNEA-2) and would need support to develop concrete and efficient responses at a global scale.

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