

Regional Cooperation to Face *Sargassum* Influx Around the Wider Caribbean

Cooperación Regional para Hacer Frente a la Afluencia de *Sargassum* por el Gran Caribe

Coopération Régionale pour Faire Face à L'arrivée Massive de Sargasses dans la Grande Région Caraïbe

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EXTENDED ABSTRACT

Brown algae (class *Phaeophyceae*) from *Sargassum* genus form dense populations constituting free floating rafts on the ocean surface. Since 2011, proliferation of these holopelagic algae (*Sargassum fluitans* (Børgesen) Børgesen and *Sargassum natans* (Linnaeus) Gaillon) originally off the Sargasso sea, have been observed around the Caribbean region, including in locations where they were not previously found.

Several issues have been reported when *Sargassum* wash onto the shores, especially in the massive quantities reported through to 2015. From an environmental perspective, different impacts have been observed: mortality of marine species including fish and invertebrates, potential disturbance to sea turtles (Maurer et al. 2015), degradation of sea grass ecosystems due to anoxia (Impact Mer 2011), etc. *Sargassum* arrivals may also affect human life quality: the decomposition of the algae releases hydrogen sulfide gas (H₂S) which, in addition to a perceptible smell of rotten eggs, is suspected to cause health impacts with reports of irritation of eyes and airways and also fainting episodes within affected coastal populations. Tarnishing of some materials such as PVC and metal (Doyle and Franks 2015) and damage to electronic devices, such as televisions or air conditioners following exposure to the hydrogen sulfide gas have also been recorded in the Antilles (Guadeloupe, Martinique, Grenada, etc.). In some critical cases, these factors have directly contributed to migration of families from the coast.

Landings of *Sargassum* can also constitute an economic issue as they affect fisheries and tourism. Further studies would be necessary to understand the actual economic impact on fisheries, but fisher interests have highlighted navigation difficulties and loss of fish traps. They have also suggested that the *Sargassum* rafts concentrate fish and modify species richness and relative abundance of the pelagic community. The tourism industry has also been affected by a potential decrease in tourism interest due to the perceived reduction in beach quality. Many cancellations were reported in 2015 by hoteliers from several Caribbean territories.

While the algae can be regarded as a nuisance, it is important to note that, in the open ocean, the *Sargassum* mats provide 'nurseries' and constitute a natural habitat for a range of species, including invertebrates, fish and protected species like sea turtles. There is an emerging recognition of the crucial role it plays in the wider ecosystem ranging from the Atlantic to the Caribbean and the Gulf of Mexico by institutions such as the Sargasso Sea Commission (Laffoley et al. 2011).

The SPAW-RAC is the Regional Activity Centre aimed at implementing the protocol concerning Specially Protected Areas and Wildlife in the Caribbean region (SPAW). This Centre gives technical and scientific support to the Regional Coordination Unit for the United Nations Environment Programme's Caribbean Environment Programme (UNEP-CEP), located in Kingston. During the Eighth Meeting of Conference of Parties to the SPAW Protocol, it was agreed that an activity related to *Sargassum* influx would be added to the 2015 - 2016 Work Plan. In response, the SPAW-RAC in early 2015 began to identify regional initiatives on the topic to encourage collaboration and group discussions.

Although the region began to be affected in 2011, we observed that the concern for the issue started to grow in 2014 due to a massive and continuous period of *Sargassum* influx and this has been translated into an increase in communication on the topic in various media. The year 2015 was marked by many initiatives in the region and beyond. The *Sargassum* influx was discussed in several scientific and management events in the Caribbean. Two *Sargassum* Symposia were held, in Galveston (USA) and in Barbados, and two dedicated sessions were organized during the Latin America and Caribbean Large Marine Ecosystems Symposium and the Gulf and Caribbean Fisheries Institute (GCFI) annual meeting. This issue was also discussed during two Caribbean regional inter-governmental meetings (Organization of Eastern Caribbean States and Association of Caribbean States).

In addition, as the *Sargassum* influx has also been affecting West Africa since 2011, the Secretariat of the Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central, and Southern Africa Region (Abidjan Convention in short) organised the first Regional Expert meeting group on *Sargassum* influx in Sierra Leone in November 2015.

These different events highlighted the need for sharing information and development of coordination. The SPAW-RAC has been collaborating with different actors of the region (academic sector, international organizations, NGO, associations, governments) with the aim to enhance regional cooperation on the *Sargassum* issue by focusing on understanding of the phenomenon, impact assessments, methods of collection and potential uses of brown algae from *Sargassum* genus. To this end, a regional on-line forum was launched in August 2015 with the objectives to gather stakeholders involved in communication, management or research on the phenomenon, to provide and share information, experiences, lessons learned and best practices in the different territories impacted, to share links to other relevant partners and to promote discussion on specific issues (Management and Impacts, Research). More than 200 members are registered globally on the SPAW-RAC regional *Sargassum* on-line forum and contribute to the exchanges.

While building on those initial accomplishments and developing relevant actions in the Caribbean with the relevant intergovernmental organizations, the SPAW-RAC also intends to strengthen the cooperation with West Africa and to develop concrete collaboration between the two regions. We will also continue to help researchers to find collaboration and funding for the development of research projects in view to answer to the critical lack of knowledge on the *Sargassum* influx.

LITERATURE CITED

- Doyle, E. and J. Franks. 2015. Sargassum Fact Sheet. Gulf and Caribbean Fisheries Institute, Mar athon, Florida USA. 4 pp.
- Impact Mer. 2011. Echouage de sargasses pélagiques sur les côtes martiniquaises et impacts sur les écosystèmes littoraux: Poissons associés à la sargasse et impact sur les mangroves et herbiers. Rapport pour la DEAL Martinique, 49 pp.
- Laffoley, D.d'A. Roe, H.S.J., Angel, M.V., Ardron, J., Bates, N.R., Boyd, I.L., Brooke, S., Buck, K.N., Carlson, C.A., Causey, B., Conte, M.H., Christiansen, S., Cleary, J., Donnelly, J., Earle, S.A., Edwards, R., Gjerde, K.M., Giovannoni, S.J., Gulick, S., Gollock, M., Hallett, J., Halpin, P., Hanel, R., Hemphill, A., Johnson, R.J., Knap, A.H., Lomas, M.W., McKenna, S.A., Miller, M.J., Miller, P.I., Ming, F.W., Moffitt, R., Nelson, N.B., Parson, L., Peters, A.J., Pitt, J., Rouja, P., Roberts, J., Roberts, J., Seigel, D.A., Siuda, A.N.S., Steinberg, D.K., Stevenson, A., Sumaila, V.R., Swartz, W., Thorrold, S., Trott, T.M., and V.Vatsl 2011. *The Protection and Management of the Sargasso Sea: The Golden Floating Rainforest of the Atlantic Ocean. Summary Science and Supporting Evidence Case*. Sargasso Sea Alliance. 44 pp.
- Maurer, A.S., E. De Neef, and S. Stapleton. 2015. Sargassum accumulation may spell trouble for nesting sea turtles. *Frontiers in Ecology and the Environment* 13(7): 394-395.