

## ***Sargassum* Influx to the Shores of San Andrés Island, Southwestern Caribbean**

### **Afluencia de *Sargassum* a las Costas de la Isla de San Andrés, Sudoeste del Caribe**

### **Afflux de *Sargassum* sur les Rives de l'Île de San Andrés, Sud-ouest des Caraïbes**

JULIÁN PRATO VALDERRAMA<sup>1\*</sup>, BRIGGITE GAVIO<sup>2</sup>, DIANA CASTAÑO<sup>1</sup>,  
HUMBERTO CASTRO<sup>1</sup>, and ADRIANA SANTOS-MARTÍNEZ<sup>1</sup>

<sup>1</sup>Universidad Nacional de Colombia Sede Caribe — Marine Ecosystems Solutions,  
Carr. circuly. San Luis Feetown #52-44  
Edificio Universidad Nacional 5.730148622e+11,  
San Andrés, Departamento Archipiélago de San Andrés, Providencia y Santa Catalina 880008 Colombia.  
[\\*jprato@unal.edu.co](mailto:*jprato@unal.edu.co)

<sup>2</sup>Universidad Nacional de Colombia Sede Bogotá  
Carrera 45 N° 26-85 –  
Edificio Uriel Gutiérrez +57 300 4391584  
Bogotá, 110231 Colombia.

#### **EXTENDED ABSTRACT**

Pelagic *Sargassum* spp. constitutes important habitat and nutrient source for marine biodiversity in the oligotrophic waters of the Atlantic Ocean and Caribbean Sea. Influx of floating *Sargassum* to the Gulf of Mexico and the Caribbean Sea have been historically influenced by trade winds, and have reached coasts and beaches of the Caribbean islands and Central America. However, since 2011 exceptional biomass of floating *Sargassum* have been reported along the Caribbean coast, including Mexico and West Indies (Franks et al. 2011, Cruz-Rivera et al. 2015). These abnormal events have affected biodiversity (p.e. sea turtles, fishes and dolphins) and economic sectors such as fisheries and tourism. Negative effects of these influxes might be higher at insular contexts such as the Archipelago of San Andrés, Providence and Santa Catalina Islands, because human population wellbeing depends more on the quality of marine ecosystems that are the basis of economic activities as tourism and fishery.

In Colombia, occasional influxes of *Sargassum* have been reported for 2014 and 2015 at San Andres Island (Gavio et al. 2015), as well as at Serranilla Island by 2017 where it was suggested that *Sargassum* influxes can cause negative effects on newborn sea turtles (Gavio and Santos-Martínez 2017). This year 2018, influx events were observed in San Andres Island, mainly during April and beginning of May.

In order to provide quantitative information about the magnitude of these influxes and to start taking measurements of that in San Andres island, an experimental sampling methodology was developed as a starting point to call for local stake holder's attention and look forward on keep improving a feasible, low cost and replicable method. To achieve this objective, average width extension of *Sargassum*'s bands covered area were determined on affected beaches by taking several measurements on field to obtain a mean width of *Sargassum* covered area for each beach. Randomly distributed 1 m<sup>2</sup> quadrats were sampled to collect *Sargassum* biomass at different levels of the bands across each beach. Collected biomass samples from each beach was sunlight dried by 3 days separately, once it was well dried, biomass samples were energetically shaken on a small holed fabric (synthetic clothe used for shading on agricultural purposes) in order to take out the most sand possible. Samples for each beach were weighted, dry average biomasses per area (kg/m<sup>2</sup>) were calculated. Length of each beach and also the length of the entire East coast of San Andrés Island were measured using free GIS tools available, lengths were multiplied by the estimated mean width covered by *Sargassum* for each beach, to estimate areas covered by *Sargassum*. With areas calculated and dry weight per m<sup>2</sup>, we estimated that around 188.000 kg of *Sargassum* humid biomass arrived at the island's beaches by influxes events on April - May, and around 618.000 kg per each of the main influx event along the entire east coast of the island. According with mean Carbon and Nitrogen contents on *Sargassum* spp. (*S. fluitans* and *S. natans*) reported by Milledge and Harvey (2016), an estimated load around 22.806 kg of Carbon and 22.806 kg of Nitrogen could be getting into the system. Effects of these events on nutrient input to seawater could be positive for productivity, but also bring some negative effects on shallow seagrass meadows and nearby coral reefs, as well for economic activities like tourism or fisheries. More local and regional research should continue to be assessed. A standardized, quantitative and low cost methodology is suggested to be achieved with cooperation of researchers around the entire Caribbean-Atlantic Region, in order to implement an effective and replicable way to quantify, report and monitoring of *Sargassum* influxes that could be comparable at a Regional scale. More research is needed to understand causes and effects of these events at San Andrés and the entire Caribbean region, stake holders are encouraged to keep doing efforts on *Sargassum* influxes studies and effective management strategies development.

**KEYWORDS:** *Sargassum*, methods, dry biomass, nutrient input, Colombian insular Caribbean

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