



Crowdsourcing for *Sargassum* Monitoring Along the Beaches in Quintana Roo

Javier Arellano-Verdejo¹(✉)  and Hugo E. Lazcano-Hernandez² 

¹ El Colegio de la Frontera Sur, Chetumal, Quintana Roo, Mexico
javier.arellano@ecosur.mx

² Cátedras CONACYT-El Colegio de la Frontera Sur,
Chetumal, Quintana Roo, Mexico
hlazcanoh@ecosur.mx

Abstract. In recent years, the unusual arrival of *Sargassum* to the coasts of the Caribbean Sea has caused considerable damage, both economic and ecological. The monitoring of this macroalgae is a major challenge for researchers. Historically, satellite remote-sensing has been used for this purpose; however, limitations in the temporal and spatial resolution of available satellite platforms do not allow for the monitoring of *Sargassum* on beach coastlines. The increase in the capacity of communication and the decrease in the costs of technology have enhanced users' access to intelligent mobile devices. Crowdsourcing has proven to be successful in combining informational technology with a collaborative solution to complex problems. This study demonstrates how crowdsourcing and the new technologies, can be used to monitor *Sargassum* on the beaches in Quintana Roo, complementing satellite monitoring.

Keywords: Citizen science · Learning from crowds · Observing network · Coordinated observing system

1 Introduction

Sargassum belongs to the group of brown algae Phaeophyta that inhabit the seas around the world. The pelagic *Sargassum* subgroup, that is, the one that floats freely in the ocean, is composed of two species: *S. natans* and *S. fluitans*, the former being the most abundant in the Atlantic ocean. These species, belonging to the Phaeophyta Division, are typically pale brown-yellowish in color and can measure between 20 and 80 cm in diameter [1]. They have numerous nematocysts, which are small vesicles less than 1 cm in diameter that can float because of their gas composition [2]. Under optimal conditions of light, temperature, and salinity, *Sargassum* can double its mass in only 10 days, especially *S. fluitans* [3]. The recent arrival of *Sargassum* from 2018 to date on the Atlantic coast has quickly become both an environmental and a socio-economical challenge, with multi-factorial causes and leading to several unanswered questions.

Remote-sensing through satellite sensors is considered a powerful tool, it has demonstrated to have been important for Earth observation, and it has