

**Modelling potential distribution of jellyfish (Scyphomedusae, Cubomedusae)
in monsoon-influenced coastal waters using citizen science data**

ABSTRACT

Despite the high diversity of jellyfish and the numerous reports about their benefits and impacts in tropical coastal waters, their spatio-temporal distribution is not formally established in these waters, which is necessary in managing their impacts and services. This study examined spatio-temporal distribution of jellyfish (scyphomedusae and cubomedusae) in monsoon-influenced tropical coastal waters of Luzon Island group, Philippines. Potential distribution maps of coastal jellyfish were constructed using GARP distribution modelling, with citizen science jellyfish data from social media and remotely-sensed environmental data as inputs. Results show that Luzon Island group is a potential jellyfish hotspot as it has one of the greatest recorded jellyfish generic diversity in Southeast Asia (18 genera), and for exhibiting moderate (0.4 to 0.5) to very high (0.8 to 0.9) habitat suitability for jellyfish all year round. Based on both models and survey answers, habitat suitability is highest during the pre-summer monsoon season (March, April, and May), the hottest and driest season in the country. From models, 23.3 to 57.7% of the coastal waters of Luzon are suitable habitats. Across marine biogeographic regions, Sulu Sea has the lowest suitability for cubozoans and scyphozoans with only 12.8% and 14.2% of Luzon coastal waters, respectively. These values are nearly half of that in other biogeographic regions. Across taxonomic groups, cubozoans are predicted to be limited to coastal waters up to 3 km from shore, while scyphozoans can reach farther up to 13 km, with embayments as potential hotspots. Several areas have consistently low habitat suitability for all jellyfish groups, such as the small island groups (e.g. Batanes, Lubang, etc.) and the coastline spanning from Palanan, Isabela to Casiguran, Aurora. Findings of this study support the call for better implementation of policies and

strategies for mitigation of jellyfish stings and blooms, such as management of coastal pollution especially on embayments, aquaculture management, climate change mitigation, and sting management.