

Integrating local environmental data and information from non-driven citizen science to estimate jellyfish abundance in Costa del Sol (southern Spain)

Gutiérrez-Estrada, J.C.
Pulido-Calvo, I.
Peregrín, A.
García-Gálvez, A.
Báez, J.C.
Bellido, J.J.
Souviron-Priego, L.
Sánchez-Laulhé, J.M.
López, J.A.

Abstract

Tourism, fishing and aquaculture are key economic sectors of Costa del Sol (southern Iberian Peninsula). The management of these activities is sometimes disturbed by the onshore arrival and stranding of jellyfish swarms. In the absence data on the occurrence of these organisms, it may be interesting to explore data from non-driven systems, such as social networks. The present study show how data in text format from a mobile app called Infomedusa can be processed and used to model the relationship between estimated abundance of jellyfish on the beaches and local environmental conditions. The data retrieved from this app using artificial intelligence procedures (transition network or TN algorithm), were used as input for GAM models to estimate the abundance of jellyfish based on wind speed and direction. The analysis of data provided by Infomedusa indicated that only 30.39% of messages provided by the users had information about absence/presence of jellyfishes in the beaches. On the other hand, the TN processing capacity showed an accuracy level to discriminate messages with information on absence/presence of jellyfish slightly higher than 80%. GAM models considering the wind direction and speed of previous day explained between 37% and 77% of the variance of jellyfish abundance estimate from Infomedusa data. In conclusion, this approach may contribute to the development of a system for predicting the onshore arrival of jellyfish in the Costa del Sol.

Author keywords

Alborán sea
Artificial intelligence
Gelatinous organisms
Transition networks
Transport