

DIVERSIMAR PROJECT: MARINE CITIZEN SCIENCE IN THE NORTH AND NORTHWEST IBERIAN COAST

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Abstract:

Marine citizen science can play an important role in understanding the ocean responses to global change and other pressures to marine systems. Citizen science projects guide public participation combining research with environmental education and science divulgation [1, 4]. The DIVERSIMAR project (<https://diversimar.cesga.es/>) aims to register biodiversity data of the North and Northwest Iberian coast and is a way for science and society to interact and collaborate [3]. A system to integrate both the available scientific information (on distribution, biology and ecology of marine species) and the new information provided by volunteers has been designed. In a first step, volunteers contact directly the scientists providing photos, videos and any other information about their findings. Technological innovations such as smartphone devices equipped with cameras become a powerful tool for data collection because the images have associated metadata such as date and position [2]. In a second step, these records are verified, validated and stored in the project GIS database that can be consulted in the DIVERSIMAR Map Viewer (<https://diversimar.cesga.es/visor/index.php>).

Different stakeholders, from scientists to citizens, and from fishermen to marine environmental organisations, can get involved in this citizen project. The wide-ranging observations on coastal flora and fauna (such as the occurrence and regularity of jellyfish blooms, the sporadic report of species that have never been observed in a region before, the apparition of invasive species, the presence of kelp forests or the sighting of protected species) allow to increase the temporal and spatial data acquisition and play an important role in monitoring the coastline and the intertidal zones. The information gathered by mapping habitats and by determination of abundance and distribution of native and invasive species demonstrate the scientific value of citizen monitoring to help managers to develop management plans and conservation strategies such as EU Marine Strategy framework Directive.

Key words: Marine citizen science, Biodiversity, GIS

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References:

- [1] Dickinson, J. L., Shirk, J., Bonter, D., Bonney, R., Crain, R.L., Martin, J., Phillips, T. and Purcell, K. (2012). The current state of citizen science as a tool for ecological research and public engagement. *Frontiers in ecology and the environment*; 10(6): 291–297, doi:10.1890/110236
- [2] Newman, G., Wiggins, A., Crall, A., Graham, E., Newman, S. and Crowston, K., (2012). The future of citizen science: emerging technologies and shifting paradigms. *Frontiers in ecology and the environment*, 10(6):298-304. <https://doi.org/10.1890/110294>
- [3] Pocock, M.J.O., Chandler, M., Bonney, R., Thornhill, I., Albin, A., August, T., Bachman, S., Brown, P.M.J., Cunha, D.G.F., Grez, A., Jackson, C., Peters, M., Rabarijaonkk, N.R., Roy, H.E., Zaviero, T. and Danielsen, F. (2018). A Vision for Global Biodiversity Monitoring with Citizen Science. *Advances in Ecological Research*, 59: 169-223. <https://doi.org/10.1016/bs.aecr.2018.06.003>
- [4] Vohland, K., Land-Zandstra, A., Ceccaroni, L., Lemmens, R., Perelló, J., Ponti, M., Samson, R. and Wagenknecht, K. (eds.) (2021). *The Science of Citizen Science*. Springer, <https://doi.org/10.1007/978-3-030-58278-4>