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How to monitor the Danube Delta through citizens' campaigns: Sontea-Fortuna case study

Thaine H. Assumpção (1,2), Neela Mathre (1), Borjana Bogatinoska (3), Andreja Jonoski (1), Ioana Popescu (1), Cristian Trifanov (4), and Kinga Cimpan (5)

(1) Department of Integrated Water Systems and Governance, IHE Delft Institute for Water Education, Delft, Netherlands (t.hermanassumpcao@un-ihe.org), (2) Water Resources Section, Delft University of Technology, Delft, The Netherlands, (3) Faculty of Civil Engineering, University of Ss. Cyril and Methodius, Skopje, Macedonia, (4) Danube Delta National Institute for Research and Development, Tulcea, Romania, (5) Societatea Ornitologica Romana, Bucharest, Romania

Understanding and representing wetland hydrodynamic processes can be challenging: they are dynamic, requiring representation in space and time; and they are natural, with difficult access and sparse monitoring networks. Citizen observatories is an alternative data source that has been thoroughly studied in other fields (e.g. water quality in a catchment), however, its application in delta areas is incipient. Therefore, the objective of this study is to present the approach used to implement a citizen observatory in the Danube Delta in Romania. The Danube Delta is a freshwater driven system, in which waters from the Danube River overflow from three mains distributaries and circulate through the wetland during a wet period, while during a dry period water returns to the distributaries and is discharged into the Black Sea. The goal is to characterize the intricate flood patterns (variations in flood depth, velocity and inundation) formed by its dense network of channels and lakes. The observatory is organized by thematic campaigns, land cover/use-driven or water depth/velocity-driven, and each thematic campaign is organized for a dry and a wet period. The data is collected through a dedicated mobile application (Scent Explore), an augmented reality game. Each campaign organization generally follows three steps: to engage participants; to define when and the duration; and to define points of interest and pathways (boat routes). The latter step encompasses the interests of local stakeholders (data users) and the characteristics of the area. The approach was tested in the Sontea-Fortuna area, one of the hydrographic units of the Danube Delta, for both thematic campaigns during the dry period (August and October). One of the positive results was that targeting a certain group of volunteers, in this case, members of a bird watching organization, proved successful. Conversely, it was also noted that the weather played a negative role in the experience, reducing the engagement of participants. In conclusion, the approach showed that it is possible to apply a citizen observatory strategy in a delta area. It is to be studied how effective it is as a data gathering activity. More importantly, further work lies in unlocking the integrative potential of such initiative, as citizen observatories can be used for monitoring multiple aspects of environmental protection and can constitute a bridge for participatory decision making.