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Dimensions and dynamics of citizen observatories: The case of online amateur weather networks

Mohammad Gharesifard (1), Uta Wehn (1), Pieter van der Zaag (1,2)

(1) UNESCO-IHE, Institute for Water Education, Department of Integrated Water Systems and Governance, Delft, the Netherlands (m.gharesifard@unesco-ihe.org), (2) Delft University of Technology, Department of Water Resources, Delft, the Netherlands

ABSTRACT

Crowd-sourced environmental observations are being increasingly considered as having the potential to enhance the spatial and temporal resolution of current data streams from terrestrial and areal sensors. The rapid diffusion of ICTs during the past decades has facilitated the process of data collection and sharing by the general public (so-called citizen science) and has resulted in the formation of various online environmental citizen observatory networks. Online amateur weather networks are a particular example of such ICT-mediated citizen observatories as one of the oldest and most widely practiced citizen science activities. The objective of this paper is to introduce a conceptual framework that enables a systematic review of different dimensions of these mushrooming/expanding networks. These dimensions include the geographic scope and types of network participants; the network's establishment mechanism, revenue stream(s) and existing communication paradigm; efforts required by citizens and support offered by platform providers; and issues such as data accessibility, availability and quality. An in-depth understanding of these dimensions helps to analyze various dynamics such as interactions between different stakeholders, motivations to run these networks, sustainability of the platforms, data ownership and level of transparency of each network. This framework is then utilized to perform a critical and normative review of six existing online amateur weather networks based on publicly available data. The main findings of this analysis suggest that: (1) There are several key stakeholders such as emergency services and local authorities that are not (yet) engaged in these networks. (2) The revenue stream(s) of online amateur weather networks is one of the least discussed but most important dimensions that is crucial for the sustainability of these networks. (3) Although all of the networks included in this study have one or more explicit pattern of two-way communications, there is no sign (yet) of interactive information exchange among the triangle of weather observers, data aggregators and policy makers.

KEYWORDS

Citizen Science, Citizen Observatories, ICT-enabled citizen participation, online amateur weather networks