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RESOURCE

Citizen Science in Hydrology and Water Resources: Opportunities for Knowledge Generation, Ecosystem Service Management, and Sustainable Development

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Description / Abstract

The participation of the general public in the research design, data collection and interpretation process together with scientists is often referred to as citizen science. While citizen science itself has existed since the start of scientific practice, developments in sensing technology, data processing and visualization, and communication of ideas and results, are creating a wide range of new opportunities for public participation in scientific research. This paper reviews the state of citizen science in a hydrological context and explores the potential of citizen science to complement more traditional ways of scientific data collection and knowledge generation for hydrological sciences and water resources management. Although hydrological data collection often involves advanced technology, the advent of robust, cheap, and low-maintenance sensing equipment provides unprecedented opportunities for data collection in a citizen science context. These data have a significant potential to create new hydrological knowledge, especially in relation to the characterization of process heterogeneity, remote regions, and human impacts on the water cycle. However, the nature and quality of data collected in citizen science experiments is potentially very different from those of traditional monitoring networks. This poses challenges in terms of their processing, interpretation, and use, especially with regard to assimilation of traditional knowledge, the quantification of uncertainties, and their role in decision support. It also requires care in designing citizen science projects such that the generated data complement optimally other available knowledge. Lastly, using 4 case studies from remote mountain regions we reflect on the challenges and opportunities in the integration of hydrologically-oriented citizen science in water resources management, the role of scientific knowledge in the decision-making process, and the potential contestation to established community institutions posed by co-generation of new knowledge.

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