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Incorporating citizen science in open science: a case study of participatory rainfall measurements in the context of a Technical University

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Citizen science has globally been recognized as a vital part of open science and as a way of doing research that enables new levels of science education and science communication. Due to its high levels of public participation, citizen science can be of great value in bringing society and science closer together. Universities across the world have acknowledged this value and aim to incorporate citizen science in their policies and daily practices as part of their open science practices.

The Delft University of Technology has set the goal to develop an open science program that includes citizen science. However, implementing and incorporating citizen science in an open science program is not a straightforward task and demands knowledge, understanding, and experience of the field as well as the practical implications. What should a university do to support the goals of various citizen science initiatives, within an open science context, and to assist and facilitate researchers to perform effective participatory science? To gain a deeper understanding of what a citizen science project entails within the context of a university, we performed a case-study implementing citizen science methods for hydrological research. The project, called Delft Measures Rain, was developed in collaboration with external partners and several internal departments and their staff, some already having experience with developing and coordinating citizen science projects. Citizens of Delft were encouraged to participate and work together with scientists from the Water Management department to investigate rainfall patterns within the city. In total, 95 citizens collaborated for two months to collect over 1900 individual rainfall measurements spread over the city and taken with home-made rain gauges. We developed tailored recruitment strategies, data collection and validation tools, data visuals, and communication strategies. Overall, the project has delivered valuable results, including reliable rainfall data, involvement and enthusiasm of citizens, and valuable feedback from participants. Additionally, this project has led to more cooperation of relevant institutions and civil society organizations (CSO) across the city and between different departments within the university itself.

This case-study has showcased how various stakeholders (researchers, citizens, civil servants,

CSO's, etc.) can benefit from co-developed participatory research implementing citizen science and open science principles. With this case study, we were able to identify the benefits, drawbacks, and opportunities for all stakeholders involved. Furthermore, we identified key tools and facilitation needs to assist researchers within the university to perform effective participatory science. During the session, we would like to share our methods, successes, challenges, and lessons learned. This project shows that, with the right knowledge and tools, citizen science can deliver what it promises and be of great value to universities and open science in general.