

Case study

Data quality in citizen science

SOURCE: Herodotou, C., Scanlon, E., & Sharples, M. (2021). Methods of promoting learning and data quality in citizen and Community Science. *Frontiers in Climate*, 53. <https://doi.org/10.3389/fclim.2021.614567>

"The "Heatwave: Are you coping?" investigation has been designed in collaboration with the Royal Meteorological Society and support from the BBC Weather (see <https://nquire.org.uk/mission/heatwave-are-you-coping/contribute>). The mission was an outcome of a workshop with citizens and organizations interested in weather issues, which was organized by the Open University UK, as part of the UKRI funded project EduCS: EDUcating Citizens and organizations in Citizen Science methodologies. Workshop attendees were asked to brainstorm, vote, and rank ideas for research investigations they would like to design using nQuire. How comfortable people feel in extreme weather conditions was one of the two most popular investigations (alongside the impact of climate change). The investigation with more than 1200 responses, was launched on the 7th of August 2020, during which England experienced a heatwave and was ended in September 2020. The purpose of the mission was to explore how people's experiences of hot weather may differ depending on where they live and work, and how people are able to adapt their routines to heat. Citizens were asked to take their first temperature recording around 3–4 pm, when maximum daily temperatures are normally observed. The rationale behind the mission was to collect data about how different people are affected by extreme weather conditions and how working and living conditions could be improved. Results could, for example, help people plan for heatwaves in the future. In terms of the learning benefits for citizens, the mission was an opportunity to learn about what forecast temperatures mean in practice, how to make and record measurements, and how to increase personal comfort in a heatwave.

Citizen Science temperature measurements have the unique value of providing data about air temperature on scales smaller than those measured by the official meteorological service, and such data could be possibly used in weather monitoring or even forecasting [...]. Yet, the quality of weather data collected is a major challenge and a source of bias, often related to possible overheating of the thermometer by, for example, not being shielded. This was an issue raised and discussed during the workshop, with weather scientists expressing concerns about the quality of data collected and whether amateur scientists could actually offer reliable recordings."

Questions for discussion:

1. What are the challenges for data quality that researchers might face in the case above? What are the reasons for those challenges? What can be done to mitigate these problems? Are similar problems possible in citizen science projects in life sciences and medicine? How to mitigate these problems?

Challenges for ensuring data quality	Recommendations