

# **Is it secret? Is it safe?:**

## **Ethical Dimensions of Citizen Science Hazard Data**

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#### **ABSTRACT**

Citizen science is a growing field that evolved from pre-digital times to utilize technology to monitor the environment. Streams of data from citizens can provide information on hazards at massive scales. Citizen science expanded in recent years beyond scientists partnering with the public. Now, citizens are actively involved in crowdsourcing real-time data on environmental hazards. However, unlike traditional research projects involving human participants, citizen science data collection does not typically undergo ethical review unless the project is affiliated with an institution. Citizen science now expands beyond the reaches of institutional ethical review boards that are in place to protect human participants from psychological or physical harm.

Citizen-led projects without institutional involvement likely have no oversight or ethical review. Two case studies are used to reflect on ethical issues in citizen-led monitoring of environmental hazards: 1) The citizen-led collection of contributed radiation data to monitor the release of radioactive particles from the Fukushima Nuclear Power Plant, and 2) The crowdsourcing of flood-related observations, images, and rescue during recent U.S. hurricanes. Personal information submitted to citizen-led projects is generally at the discretion of the organizers. User information might not be as secret as participants might assume and geolocational information can lead to breaches of locational privacy that reveal personal information. In addition, when organizers who are citizens themselves encourage volunteers monitor their environment, who is responsible for the safety of individuals acting on behalf of citizen-led projects? Participants might even be introduced to greater exposure to environmental hazards on behalf of a citizen-led project. Volunteers could intentionally seek out areas of elevated radiation level or a flooding hazard that might cause undue harm. Citizen organizations collecting data on environmental hazards should evaluate practices on data privacy and volunteer safety, especially in relation to monitoring hazards.

Further ethical guidance is needed for data collection and analysis when activities occur outside of institutional review boards and governmental policies. It is important for the community to develop clear ethical guidelines for volunteer engagement in environmental monitoring, especially when hazards are involved. An ethical framework should be developed to protect personal data, ensure informed consent to participate in light of an understanding of risk implications, provide approaches for the assessment of the risk to individuals, and form a plan of communication with volunteers that discourages risky behaviour. Ongoing evaluation of ethical issues can evolve into partnerships for knowledge sharing and could help to foster a critical consideration of ethical dimensions in the field.