

Managing uncertainties through citizen science: The case of Fukushima

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What is citizen science?



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What is citizen science?

- Science *for, with, or by* citizens?
 - *Public participation in research* vs. *Scientific citizenship* (Irwin 1995)
- Radiation monitoring by citizens takes on a specific form
 - Emanated after Fukushima
 - But longer tradition of CS in Japan



Citizen science in Japan after the Fukushima disaster

- All across Japan
- DIY technologies, data handling, open data/source ethics
- Displacement (spreading to other places) and extension (e.g. also air pollution monitoring)

More than Safecast!
e.g. Minnano Datasite



Fieldwork Japan (Feb-April 2018)

- 2 workshops with citizen scientists, scholars, members of research and policy institutes
- 10 citizen science groups visited
- Mobile ethnography
- **Semi-structured, in-depth interviews (12):**
 - Organization
 - Worries and uncertainties
 - Prospects
 - Activities
 - Relation with government and experts
 - Citizen science



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Shalom Disaster Support Center (Fukushima city)

litate Farm (litate)

Aizu Radiation Information Center (Aizu Wakamatsu)

The Fortress of Hope in Nasu (Nasu)



Source: <http://www.jaif.or.jp/en/fukushima/>

Small Flower Independent Radiation Measurement Lab (Sendai)

Radiation Measuring Center, Todokedori (Minimi-Soma)

Iwaki Radiation Measuring Center, Tarachine (Iwaki)

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How do citizen scientists respond and adapt to the challenges they face?

→ Uncertainties and how to cope

Living in a contaminated area

- Uncertainties:
 - Lack of information and data tailored to daily life citizens
 - food, health, radiation exposure?

How has citizen science responded?

- Citizen science:
 - Respond to request for measurement (cheap or free)
 - Measure individual cases
 - Means to measure and decide own safety standard
 - Adapt to needs local community



Strachin Kister, volunteer at Fukushima Radiation Measuring Center, Tarachine

Living in a contaminated area

- Uncertainties:
 - Whom can I talk to about radiation?

How has citizen science responded?

- Citizen science:
 - "Place to communicate and to exchange"
「交流の場」 (*kōryū no ba*) (Interview with member of Tanpopo sha, Tokyo, 2018)
 - "Release of feelings of anxiety" 「不安の気持ちの開放」 (*fuan no kimochi no kaihō*) (Interview with member of the Aizu Radiation Information Center, Aizu Wakamatsu, 2018)



Aizu Radiation Information Center, Aizu Wakamatsu city
Source: <http://etsuya.cocolog-nifty.com/blog/2013/06/2013613-7c6e.html>

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Addressing distrust towards government and experts

- Uncertainties:
 - Can I trust governmental data?
 - Can I trust experts?

How has citizen science responded?

- Citizen science:
 - Second, alternative information hub
 - Check and monitor official data
 - Provide analysis for citizens by citizens



The Fortress of Hope in Nasu

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Uncertainties about citizen science

- Citizen radiation measuring center:
 - What is citizen science?
 - Data accuracy?
 - Reputation?
 - Future prospects?
 - Funding?
 - Members?
- “Two sides of the same medal” 「表裏一体」
(*hyōri ittai*) (Interview with member of Aizu Radiation Information Center, Aizu Wakamatsu, 2018)
 - Being confronted with radiation and the accident might also increase uncertainty



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What can citizen scientists contribute? (Fieldwork + literature)

- Fill information gaps
- Highlight discrepancies between expert and lay appreciations of risk
 - e.g. “just good enough data”: broader discussion about what data are for
- Initiate contextual learning about disasters
 - e.g. why Japan? “debunking the safety myth”
- Assist in post-disaster recovery
 - e.g. meeting centers
- Orient science towards meeting societal needs
- Forge new partnerships and approaches
- Move from “predication and control” to living with uncertainty (humility)
 - invites the question, why reduce uncertainty?
 - amplifying uncertainty can give us the truth of lived experience, the truth of emotional and psychological effect, rather than a cool appraisal of fact (R.N. Lebow)
- Inevitably limited: problem-solving capacity is uncertain and undeveloped

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