

From **data** to **decision-making** under conditions of uncertainty

August 26th to 28th, 2025

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Summer
School
2025



Risk Institute
Université Grenoble Alpes

DECODE Project

Decode stands for : DEvelop Compétences DEvoted to the management of uncertainty with creativity and drama tools



Swansea University
Prifysgol Abertawe

From citizen science to citizen data for risk management: an introduction

Céline Cholez

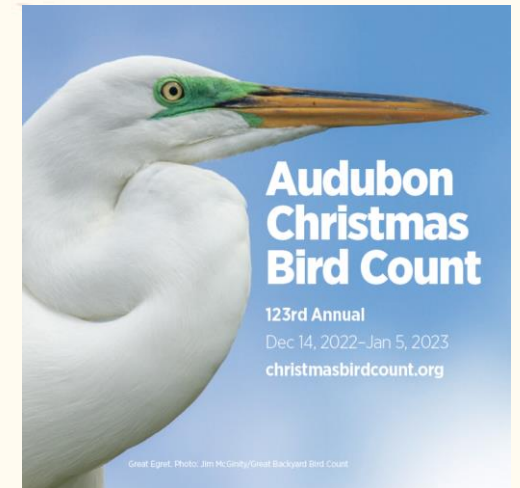


Citizen Data: A New Term, an Old Story

Citizen vigilance:

the activity of producing and communicating traces of observations of the immediate environment, carried out by people **who are not professional data collectors.**

- **XVIII Europe:** physiocrats involved farmers in a network of measurements and experiments.
- **Lisbon, 1755:** the earthquake triggered testimonies from across the Atlantic basin.
- **United States, 1900:** the “Christmas Bird Count.”



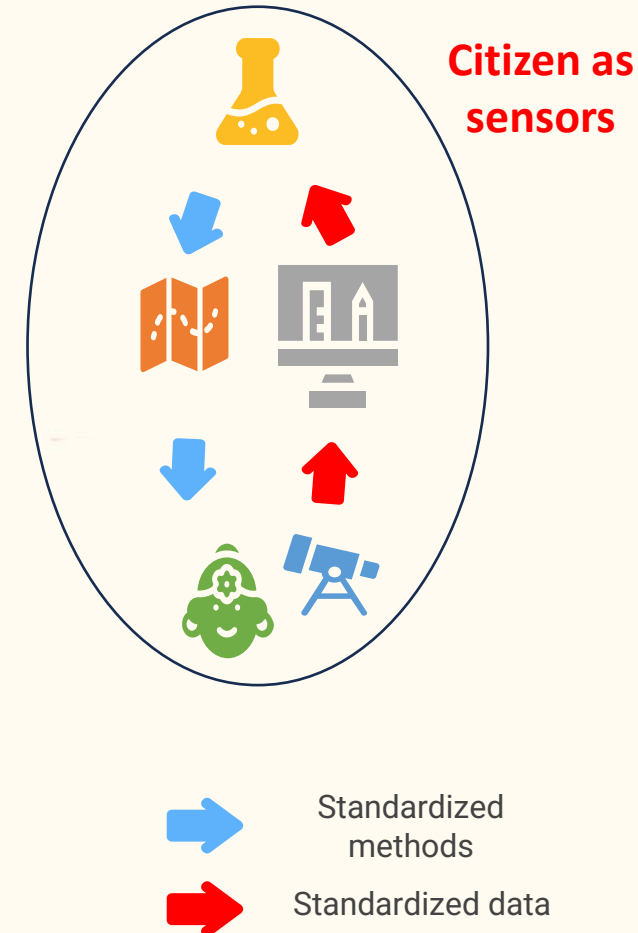
1- “Participatory Research as Functional and Instrumental” (Juan, 2021)

“Citizen Sciences”: From Biodiversity to Pollution

- 288 citizen science projects active in Europe in 2024...
...including 51 on biodiversity and 18 on air quality
(Source: *European Citizen Science Platform*)
- In France, the iNaturalist platform reports: 541 species observed
105,821 observer, 3,252,247 observations.

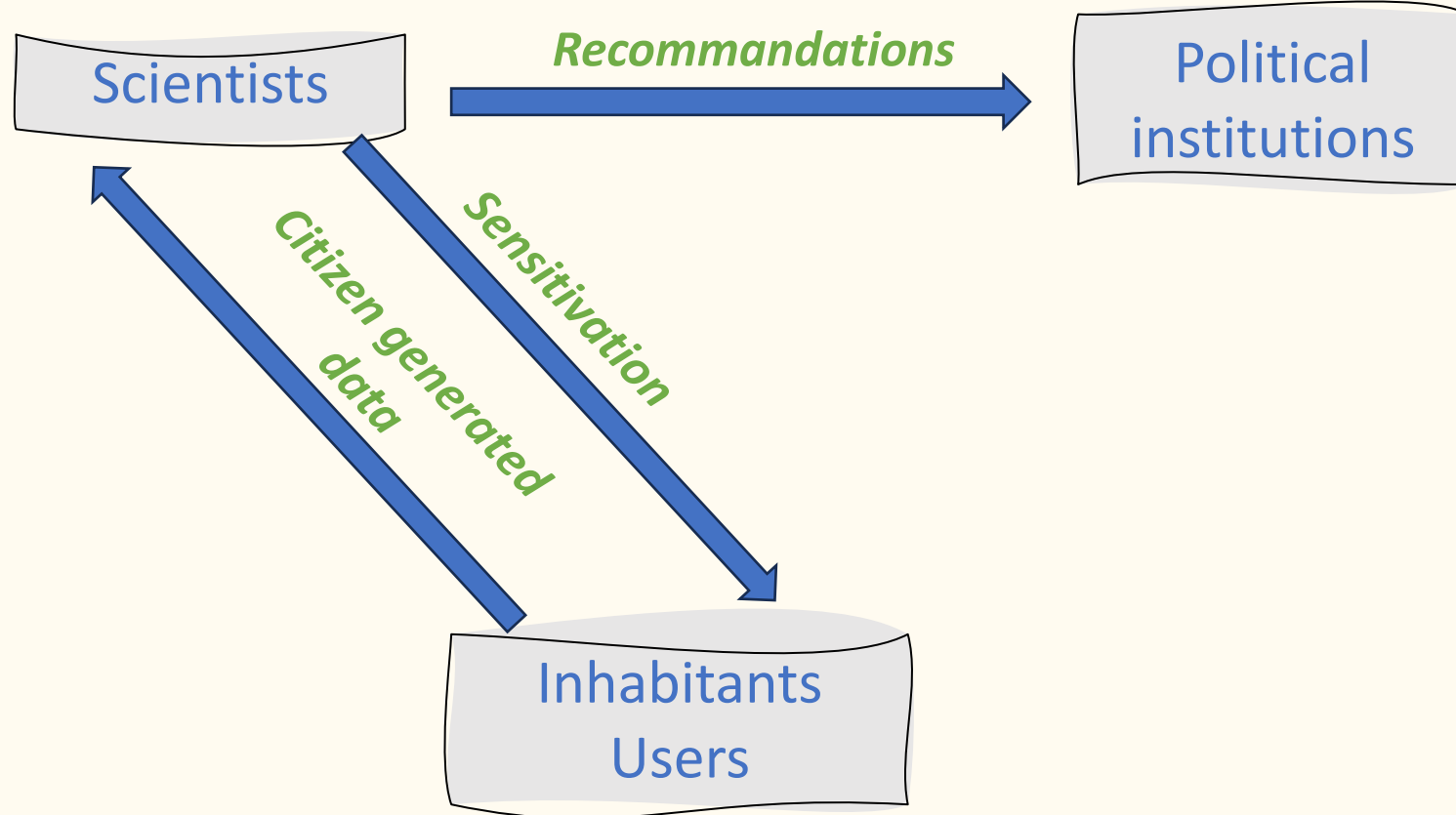
Citizens collecting data for scientific purposes

- Objective: to provide scientific analyses with more continuous data, better distributed across space
- Data collection carried out under protocols based on scientific standards
- Raising citizen awareness: Climate change, air pollution, health...
→ Using data collection to increase risk awareness



Citizen Data for Scientific Purposes

Improving scientific
Knowledge



2- “Radical Participatory Research” (Juan, 2021)

Citizen Mobilizations to Recognize Exposures and Threats

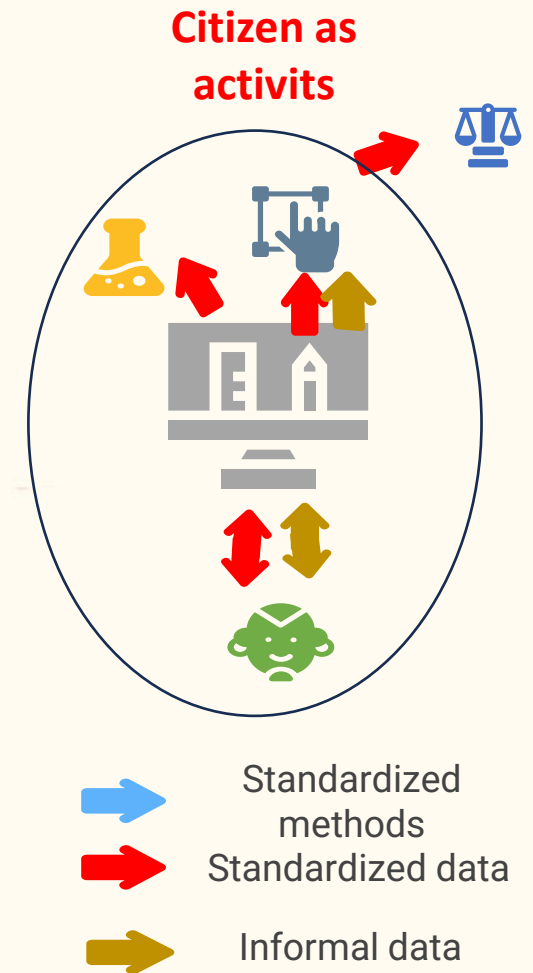
- Local communities organize themselves and engage scientists to learn measurement techniques, develop protocols, and analyze exposure data.
- Objective: to have exposures recognized and to advocate for public protection policies.

RosYama, a platform against corruption in Russia (K. Ermoshina, 2018)

- Share infrastructure failures and generate automated requests
- Track public service actions on maps

Calexico, California: a low-income community fights for its environment (Parisie & Dedieu, 2019)

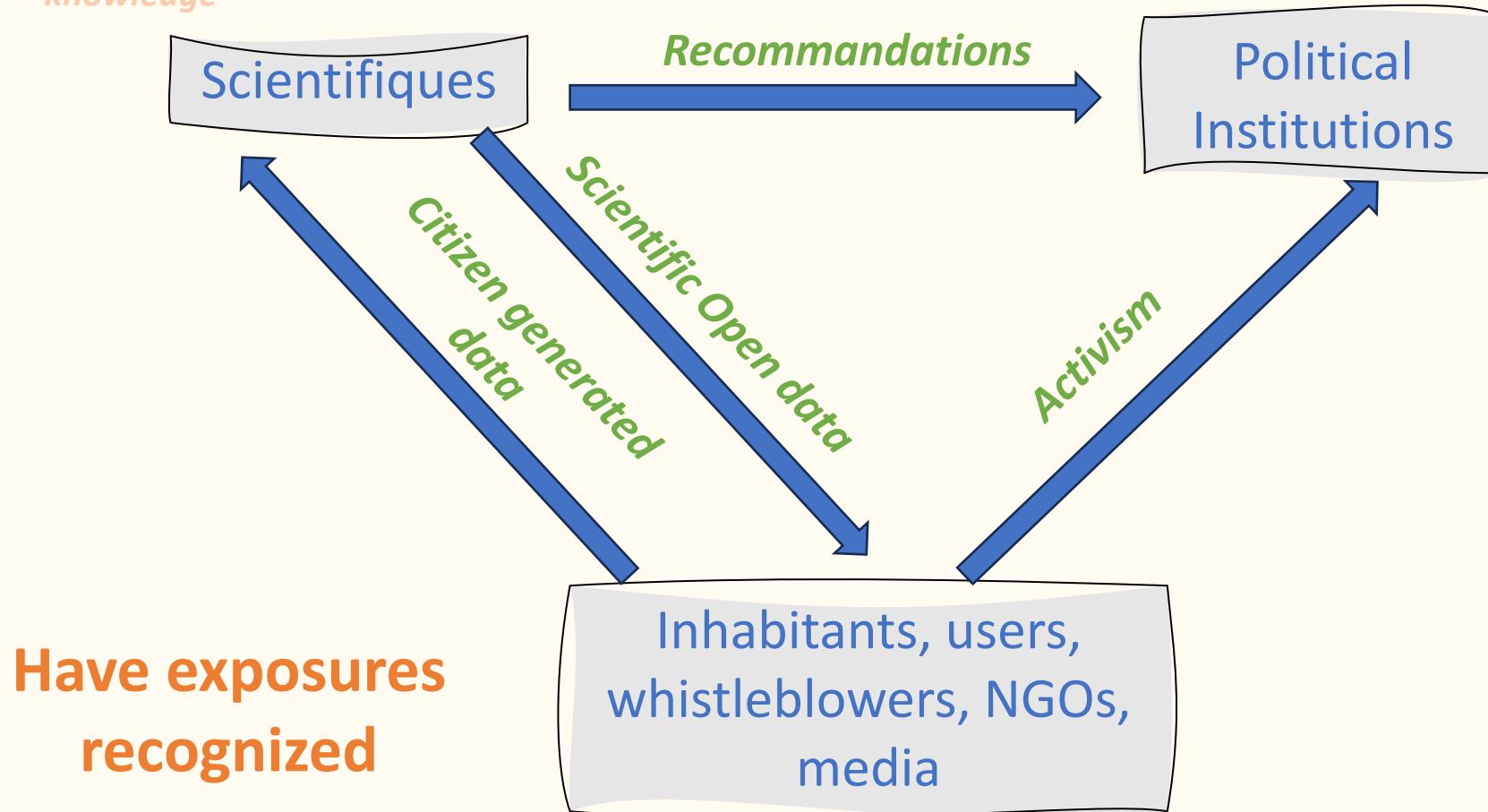
- A heavily polluted desert area
- Activists document “asthma problems” for children
- Increasing scientific publications but limited political impact



Citizen Data for Activism

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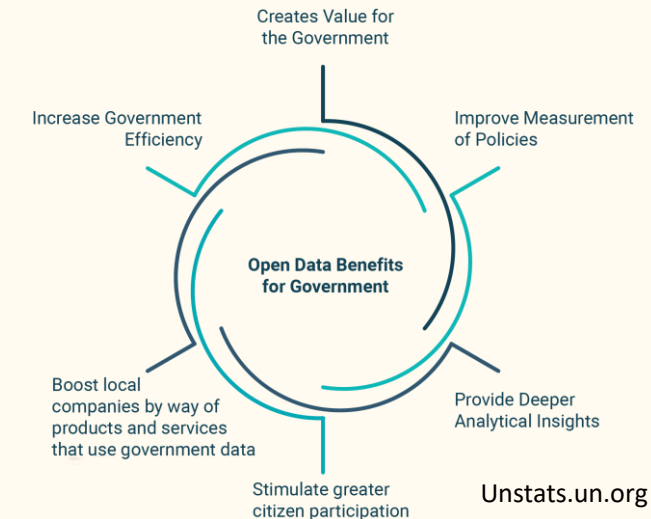
*Improving scientific
knowledge*



3- Administrative Open Data

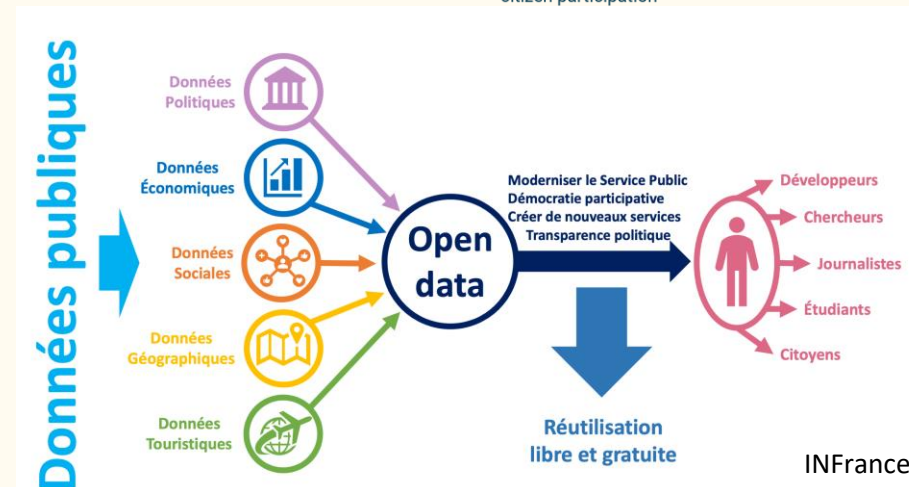
Open Governance, Transparency, and Modernization of Public Life

- Refers to the opening and provision of public data by administrations.
- Objective: Renew citizen trust in administrations and public policies, raise citizen awareness, and promote the use of data for innovation.
- What? Non-personal data produced or held by administrations, local authorities, and public enterprises.
- Main principles: Accessibility; Transparency; Reuse; Interoperability



Main challenges

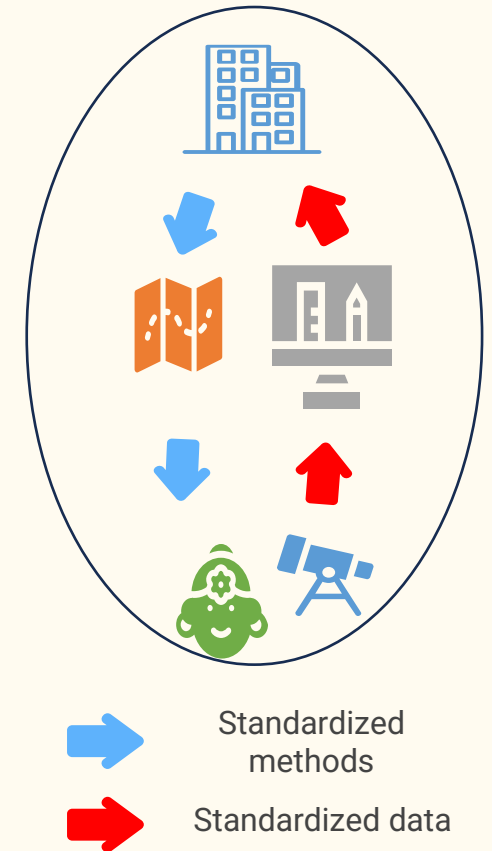
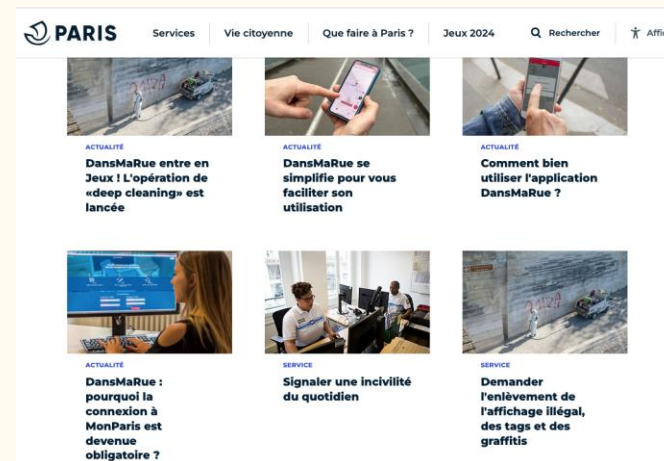
- Respecting privacy: administrations must increase efforts to anonymize data
- Risks of misuse: fraud, disinformation
- Disparities among administrations, competition



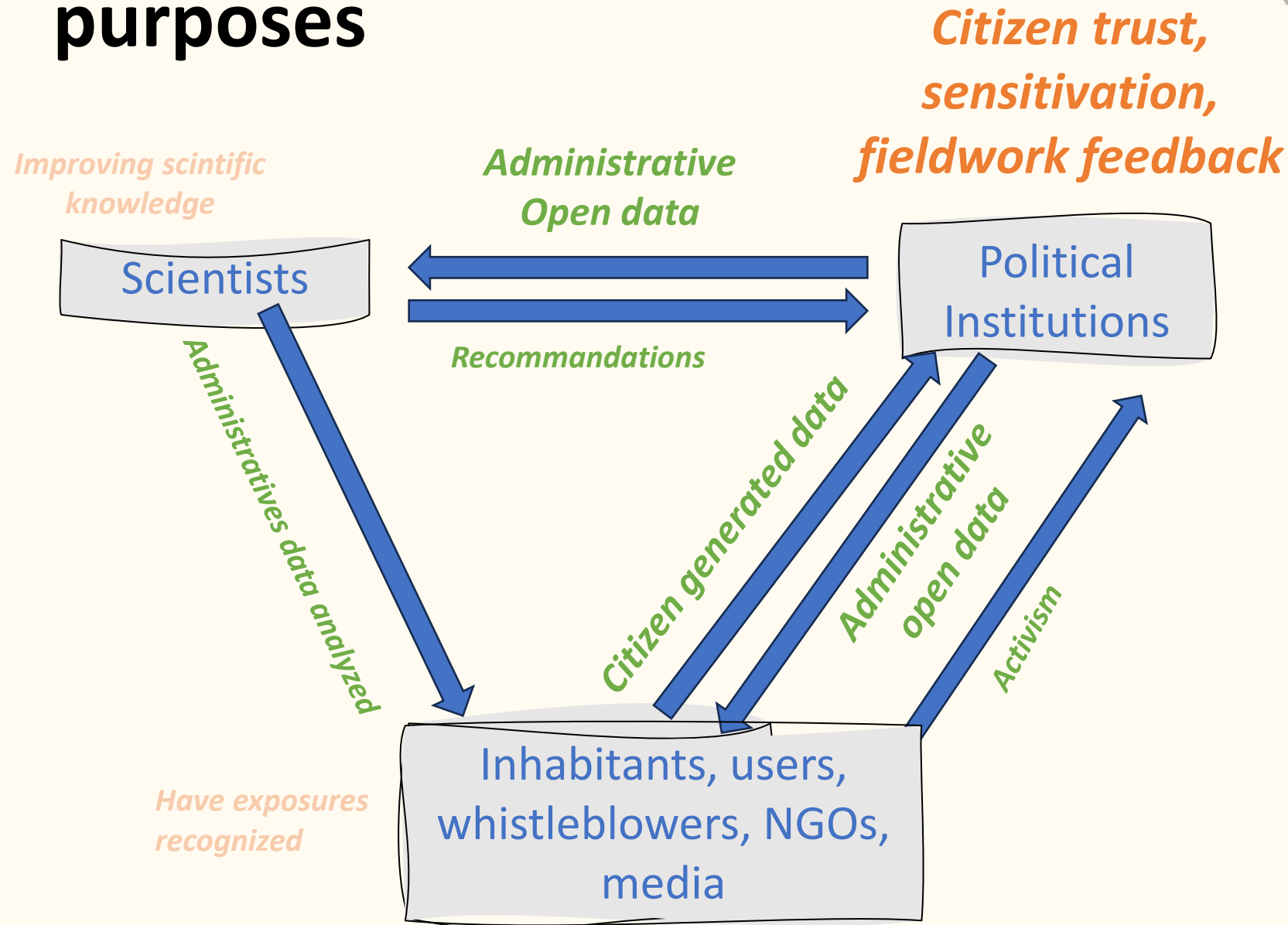
3bis- Public Initiatives: A Renewal of Citizen Participation in Civic Life?” (Ermoshina, 2016)

“AlloMairie” Marseille, “Alerte Voierie” Pau, “Dans ma rue” Paris

- Rethinking existing communication channels between citizens and municipal services
- Objective: “Participate in improving your living environment by reporting problems in public spaces.”
- Effects on public services: increased pressure to act, obligation for cross-departmental coordination



Citizen data for Institutional purposes



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Qualify citizen involvement in data production and analysis

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Objective →	Scientific	Activism	Institutionnal
Data collection ↓			
Made by scientists	Traditional surveys	Academic activism	
Made by citizen	Citizen science	Data Activism	Citizen participation
Made by institutions	Traditional surveys	Data Activism	Open Data



Longstanding Practices Enhanced by New Technologies

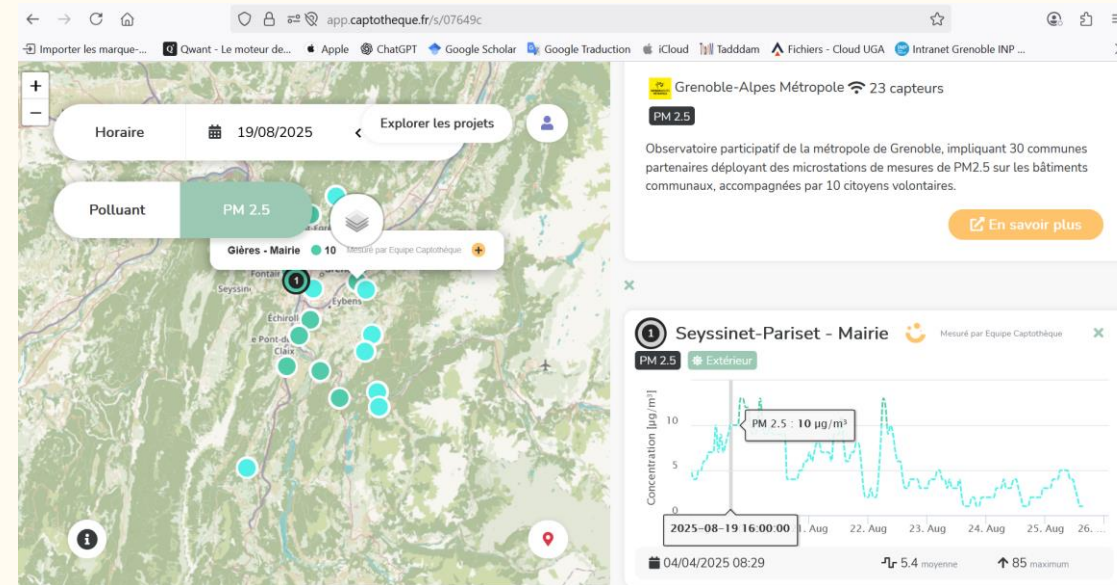
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Technological Drivers of Citizen Data

- Rise of multiple connected, accessible, and easy-to-use devices
- Devices' miniaturisation (portable micro air sensor, shown)
- Cost reduction (low-cost sensors)
- Evolution of smartphones (apps, features, connectivity)
- Improved ergonomics and performance of cloud platforms
- AI in data processing



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Impacts on Knowledge Production

Facilitates data collection

- Recording, storage, processing, and availability in short time: “real-time effect” (Charvolin, 2022)
- Data massification
- Social networks as sources of raw data

“Fascinating” data (Brotcorne et al., 2019)

- Are raw data more authentic?
- Ambivalence of social networks (fake news, misinterpretation...) (Cartier, 2022)

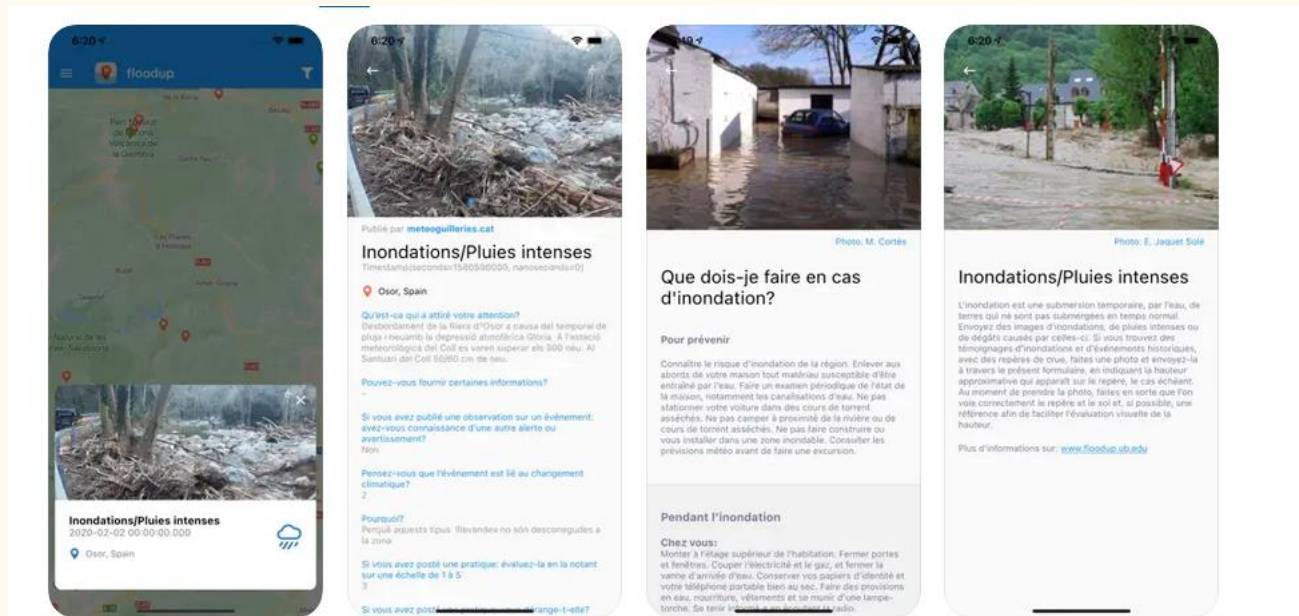


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Citizen data and risk management

The Use of Citizen Data in Risk and Crisis Management is Emerging

- Initially applied to air pollution monitoring
- Growing role in seismology and in identifying early warning signs of floods
- Functions in alerting and disseminating best protection practices



*Application
Floodup
(University of
Barcelona)*



Publier une observation

Choisissez une catégorie

Orages/Foudre/grêle

Date de l'événement/observation

18/9/2024

Localisez l'observation

5 Rue Alfred Gueymard, 38400 Saint-Martin-d'Hères, France

Télécharger des photos (n'oubliez pas que vous ne devez pas vous mettre à risque pour prendre des photos)

Qu'est-ce qui a attiré votre attention?

Pouvez-vous fournir certaines informations?

Publier une observation

22:25

Filtrer par

Inondations/Pluies intenses

Orages/Foudre/grêle

Mouvements de terrain/Éboulements

Tempêtes en mer

Chutes de neige

Niveau des rivières et ressources

Feux de forêt/Sécheresses

Tempêtes de vent/Tornades/Trombes marines

Autres (nuages, brouillard, ...)

Mesures d'adaptation

Mauvaises pratiques

Températures extrêmes

Publier une observation

Si vous avez publié une observation sur un événement: avez-vous connaissance d'une autre alerte ou avertissement?

Oui Non

Pensez-vous que l'événement est lié au changement climatique?

(1 : Aucun lien; 5: Très certainement)

Pourquoi?

Si vous avez posté une pratique: évaluez-la en la notant sur une échelle de 1 à 5

1 : Vous l'enlèveriez, 2 : Pas du tout adaptée, 3 : Très peu adaptée, 4 : Plutôt adaptée, 5 : Très adaptée

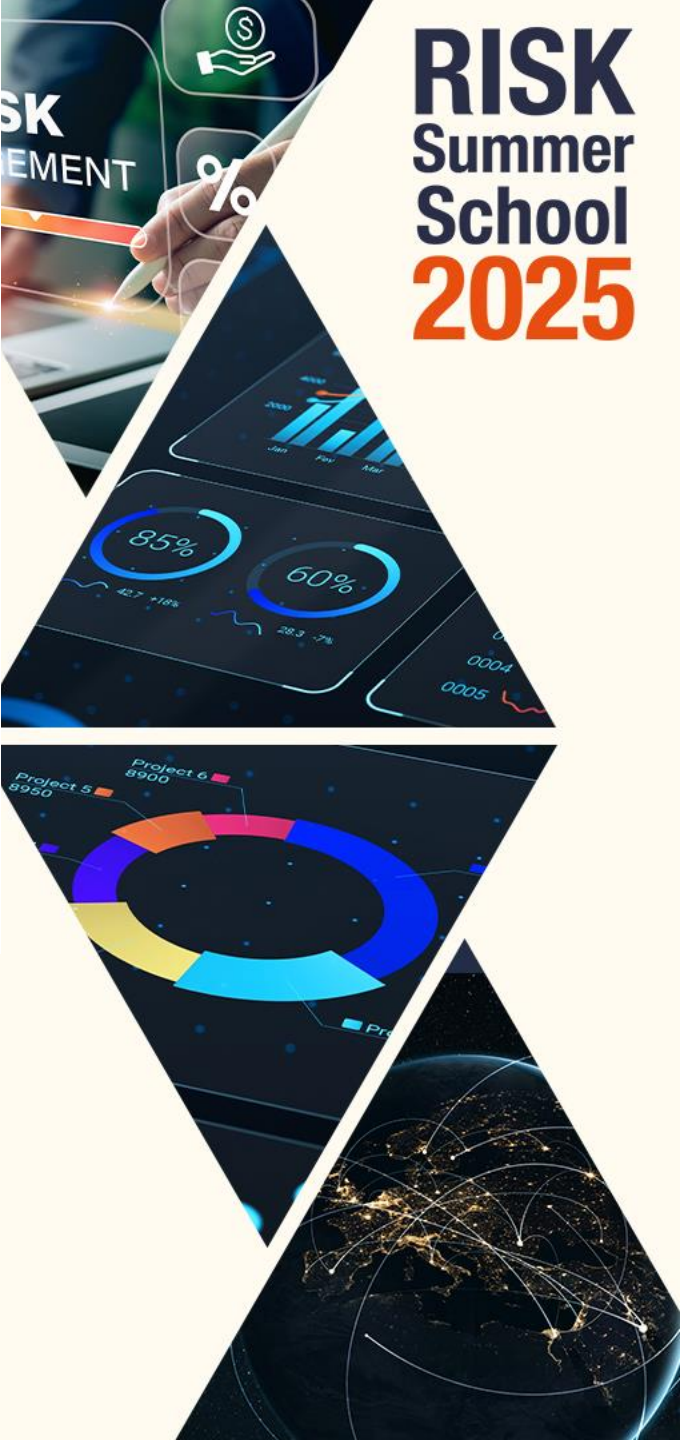
Si vous avez posté une pratique: vous dérange-t-elle?

1 : Pas du tout, 2 : Très peu, 3 : Indifférent, 4 : Plutôt, 5 : Beaucoup

Que puis-je faire de mon côté pour réduire l'impact du changement

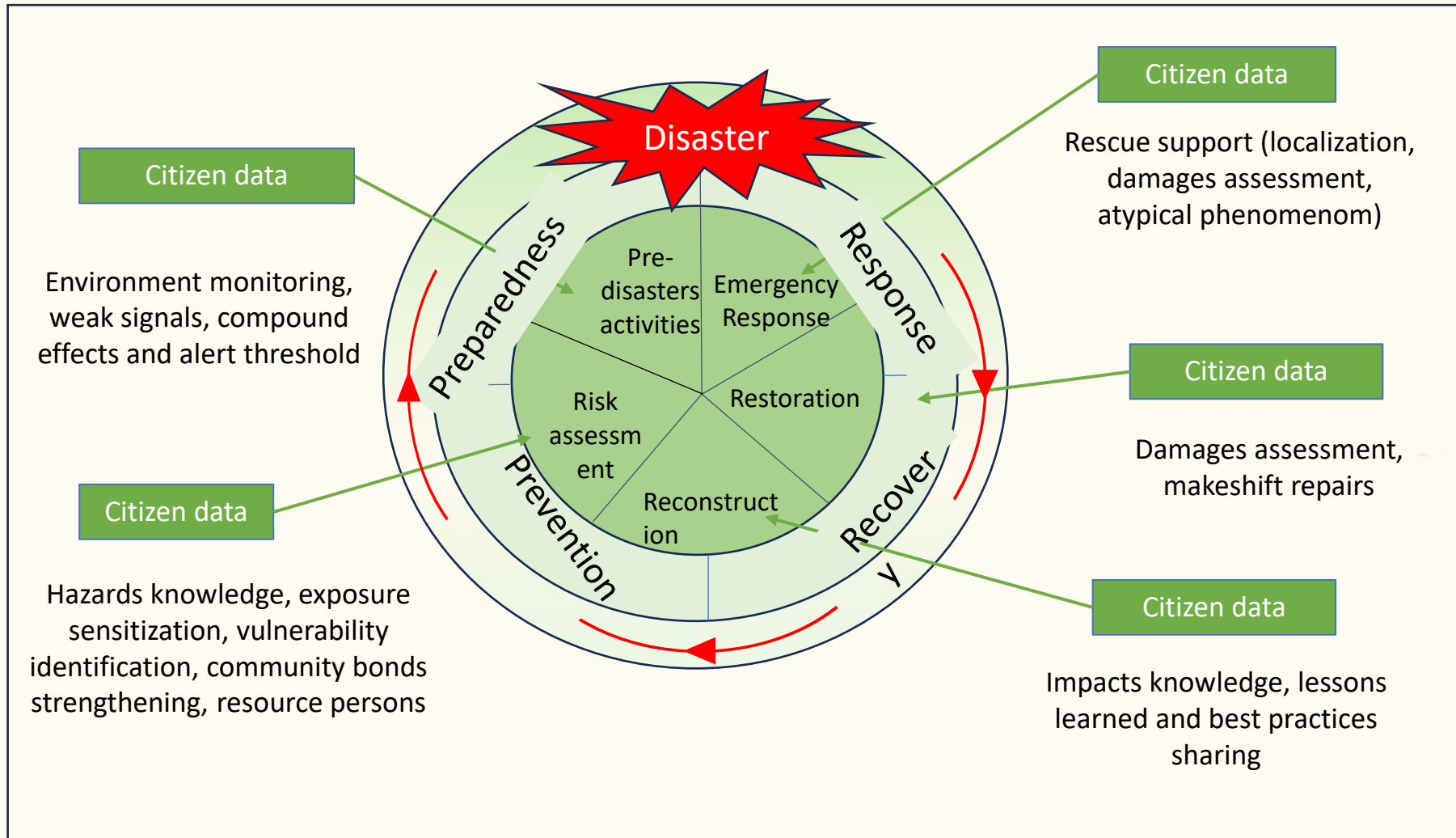
Que puis-je faire de mon côté pour réduire l'impact du changement climatique?

Publier



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Citizen data and risk management



Existing Citizen Risk Observatories in Europe

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A word cloud of citizen risk observatories. The words are arranged in a circular pattern, with 'Mountainnow' at the top and 'Crowdwater' at the bottom. The colors range from light orange to dark red. The words include: Mountainnow, Signalert, NRW, Radar, Spotfire, MAPPERS, Alertcata, Crowdwater, Bloominalgae, Fosiva, Ushaidi, Dryver, Airlimos, and Earthwatch.

Mountainnow
Signalert
NRW
Radar
Spotfire
MAPPERS
Alertcata
Crowdwater
Bloominalgae
Fosiva
Ushaidi
Dryver
Airlimos
Earthwatch

A word cloud of European countries. The words are arranged in a circular pattern, with 'France' at the top and 'Switzerland' at the bottom. The colors range from light orange to dark red. The words include: Europe, Wales, overseas, Czech, Italy, UK, Austria, Greece, France, Republic, Portugal, Spain, Kenya, and Switzerland.

Europe
Wales
overseas
Czech
Italy
UK
Austria
Greece
France
Republic
Portugal
Spain
Kenya
Switzerland

Citizen generated data: some limits

Limited Empowerment and Organizational Constraints

- Mostly already sensitised/concerned, highly-educated citizens or activists (Wieser, 2024; Gonzales-Canada, 2024)
- Difficulties for citizens in understanding and integrating the results into their everyday lives: What connections to existing citizen assessments?
- Individuals versus communities: mobile-based solutions can isolate citizens, limiting collective engagement.
- Conflicts among citizens: stigmatisation? Devaluation?
- What impacts on policies or decision-making processes? Connections with experts in risk management? Debates on shared responsibilities?

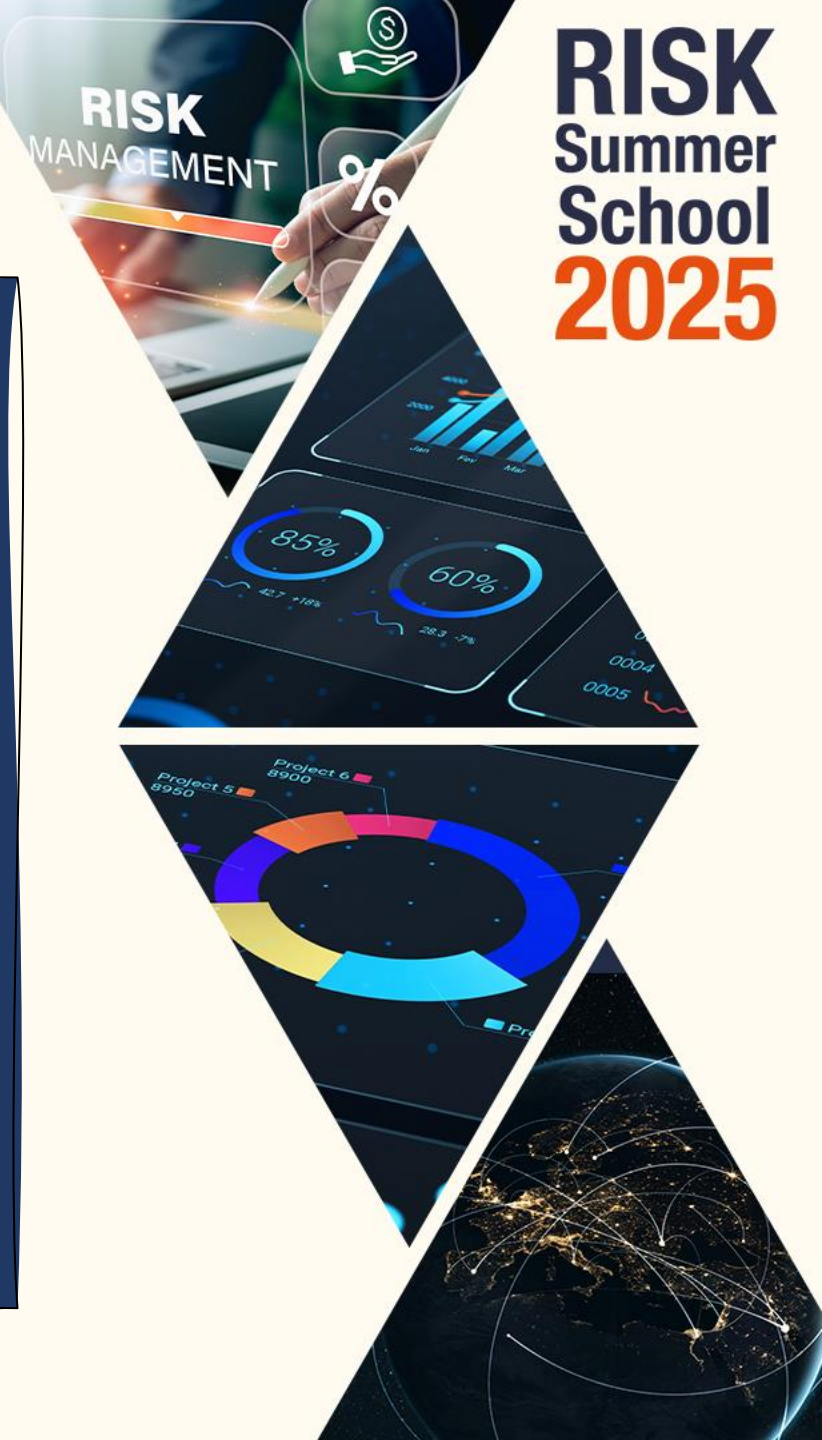
Citizen/science-data projects: what business model?

- A still hazard-centred approach depending on academic knowledge
- Project-oriented initiatives: lack of continuity, human resources

Few questions and challenges

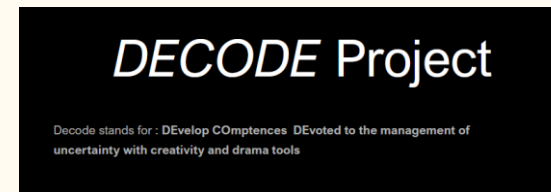
- Who initiates the project?
- What does « citizen » means?
- Who are the citizen involved and can interest be broadened?
- What methodologies are produced and by whom?
- Who are the actors involved? What are the connections to decision-making?
- How should the different responsibilities in risk management be considered?
- What are the real impacts on risk governance?

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Thank you !

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