

EUROGEO WORKSHOP 2023



Citizen Science in Urban Studies

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BOLZANO 2-4 OCTOBER 2023





Citizen Science

Various methodologies that encourage and support the **contributions of the public** to the advancement of research and monitoring in ways that may include:

- co-identifying research questions
- co-designing/conducting investigations
- co-designing/building/testing low-cost sensors
- **co-collecting and analysing data**
- co-developing data applications
- collaboratively solving complex problems





Citizen Observatories

Community-based environmental monitoring and information systems. COs **involve citizens** using modern mobile and web technologies and/or **sensors** to **collect and share data**, which **enhance Earth observation systems** and official data sources by filling in gaps and adding detail.

COs support the flow of data and information between citizens, scientists and decision-makers, and typically have a distinct focus on **influencing decision-making, policy change and/or environmental governance outcomes**.



<https://www.weobserve.eu/>

Involving citizens in collecting data

But also much more!

Scientific & policy contribution

Areas where CS & CO are commonly applied

- Environmental and Climate science
- Oceanography and Marine science
- Seismology, Earth Science and Geography
- Biology and Wildlife Conservation
- Astronomy and Space Exploration
- Health and Medicine
- Archaeology and Anthropology
- Citizen Social Science





Greater temporal and spatial availability of citizen observations complementing official observations systems at local, national and EU level for policy and research

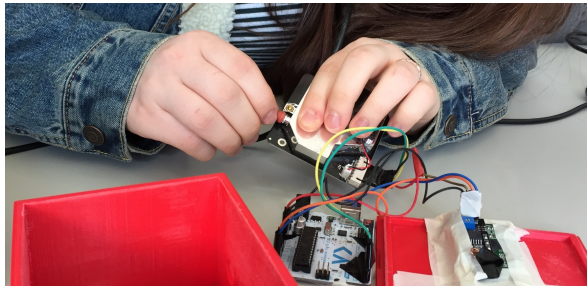


Citizen science opportunities in urban studies

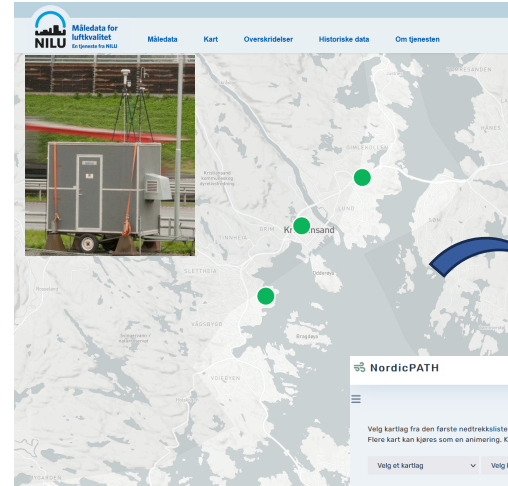


Air quality

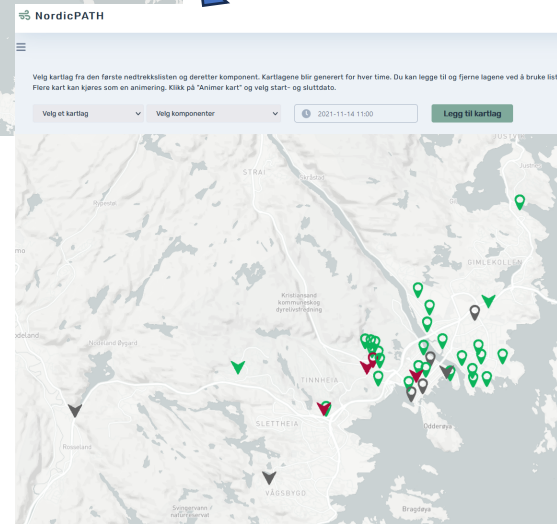
Sensor systems



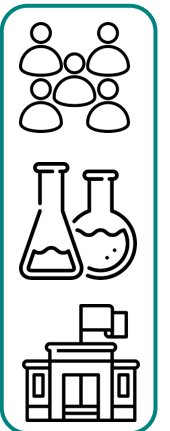
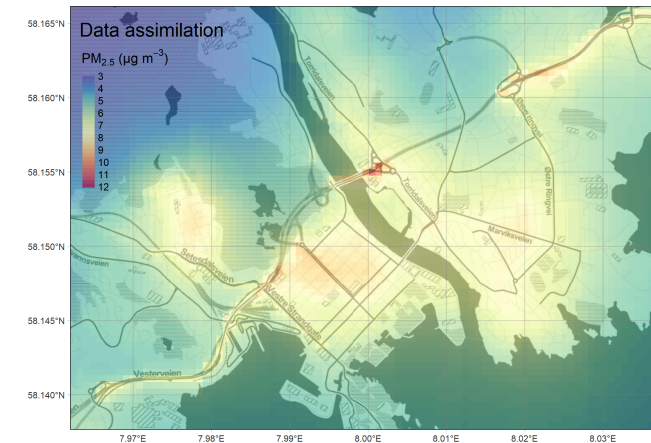
Official monitoring



Sensor networks



High-resolution maps





Urban greenspaces

Nature-based solutions can provide cooling effects, decrease air pollution, improve mental health and help reach our common goal of creating greener, more just and resilient cities.

Citizen Science approaches include:

- Studying the **thermal comfort and perception of people around greenspaces** and comparing this with built-up areas
- Creating **citizen-powered tree registries to complement existing data streams** to support policies and pledges (i.e. Green City Accord, European Green Deal)



<https://urbanreleaf.eu/>



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Sustainable mobility

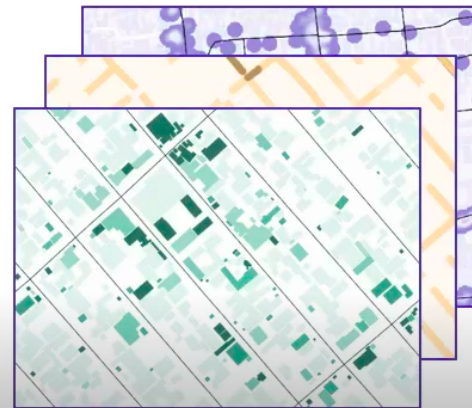
Distributed acquisition
of large street-level
imagery



Feature extraction
from individual
scenes



Information layer
generation from
extracted features



Geo-spatial visualisation
through interactive web-
platform



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GREENGAGE

ENGAGING CITIZENS - MOBILIZING TECHNOLOGY - DELIVERING GREEN DEAL

<https://greengage-project.eu/>



Challenges in Citizen Science

Uptake of sensor data for policy and research is hindered by:

- lack of metadata
- open and standard data quality processing techniques
- interoperability and accessibility of COs data stored in multiple databases
- lack of common semantics for the integration of COs data in larger comprehensive datasets.

Citizen Science often have **lower participation amongst women, vulnerable communities, minorities and marginalized groups**, which reinforces inequities, inequalities, and epistemic monocultures in urban environmental observations



Contributions to GEO

- Extended spatial and temporal coverage of in-situ data
- Validated data that **complements traditional monitoring systems**
- Build **local capacity for data collection** in communities around the world
- Increase **public awareness and engagement** that contributes to increased use and support for GEOSS initiatives and environmental policies
- **Foster collaboration** between public, scientific organizations, and government agencies, promoting a more integrated approach to environmental monitoring and protection



Conclusions

- CS & COs have the potential to become a **strong additional source of environmental information** thanks to the wider participation of citizens in monitoring and the advancements in sensor technologies.
- Increased **interoperability and accessibility** of CS & COs data stored in multiple databases is crucial for the integration of data in larger comprehensive datasets.
- Leveraging the power of citizen science is required for **urban resilience**

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