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ADAPTATION TO CLIMATE CHANGE

TRAINING PROGRAMME - How to carry out stakeholder and citizen engagement in practice

Session 8: Citizen Science

February - July 2024

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Training programme - 8 sessions

PROGRAMME

Session #1: Designing an engagement strategy - 6 Feb (repeated 29 Feb)
Session #2: Climate citizens' assemblies - 14 Feb (repeated 4 Mar)
Session #3: Climate adaptation workshops - 22 Feb (repeated 12 Mar)
Session #4: Awareness raising campaigns - 19 Mar (repeated 9 Apr)
Session #5: Communities of Practice – 2 Apr
Session #6: Green Participatory Budgets – 23 Apr
Session #7: Creative citizens' engagement – 21 May
Session #8: Citizen Science - 11 June

Repetitions after session #5 will be postponed after the summer. New dates available soon!

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Today's agenda

Time	Session
13:30 - 13:35	Welcome & Agenda of the day- ***Marianne Wehbe***
13:35 - 13:38	3' for ice-breaker question
13:38 - 13:48	Understanding citizen science - ***Francois Jost***
13:48 - 14:08	Experience sharing: Citizens' climate observatory in Venice (including Q&A) - EUCLIPA - ***Luciana Favaro***
14:08 - 14:28	Experience sharing: AGORA project (including Q&A) - ***Anna Verones***
14:28 - 15:13	Practical exercise - Questions
15:13 - 15:20	Resources, tools and overview of available platforms - ***Francois Jost***
15:20 - 15:30	Wrap-up and feedback in slido ***Marianne Wehbe / Sara Ros Cardoso***

Citizen Science

Public participation in scientific research -> contributing to data collection, analysis, dissemination of research findings, in collaboration with scientists.

Key aspects:

- **Community involvement:** Engages communities in local and global scientific challenges, leading to more informed, empowered and active citizenry and stakeholders.
- **Contribution to science:** Provides valuable scientific data and insights.
- **Data collection:** Citizens help gather context relevant data.
- Enhances **public understanding** of science and increases **awareness of scientific issues.**
- Leverages technology (apps, platforms etc.) to facilitate data collection, communication.

Ice-breaker question

- **How familiar are you with ‘Citizen Science’ (CS)?**

  👋 → Very familiar with citizen science
  👍 → A bit familiar with citizen science
  🎉 → Getting started with citizen science
  😮 → Unfamiliar with citizen science

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Ice-breaker question

- **Has anyone of you participated in a ‘Citizen Science’ activity or project?**

Please give a 👍 with the reaction button if you have
Please summarize your activity/project in the chat

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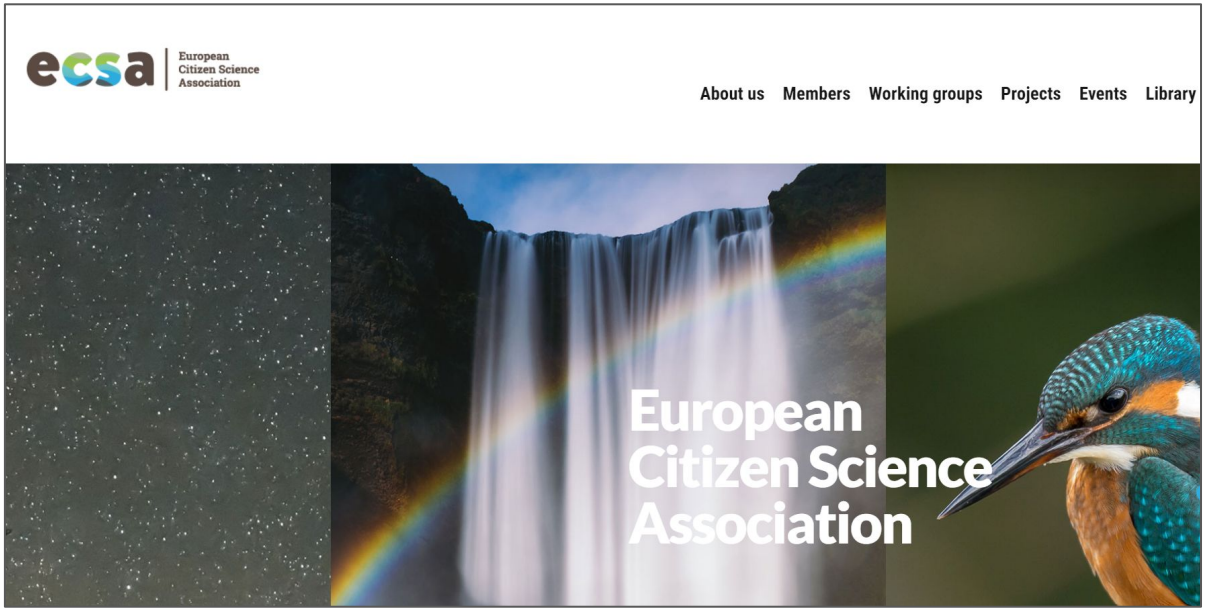
Understanding citizen science - Francois Jost (ECSA)

European Climate Pact Partner



Understanding citizen science

Dr. François Jost
Francois.jost@ecsa.ngo

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Content

- Defining Citizen Science (CS)
- CS trend around the world
- Describing CS projects
- Benefits and key challenges
- Researchers' ethical considerations

Dr. François Jost

Francois.jost@ecsa.ngo

ecsa European Citizen Science Association

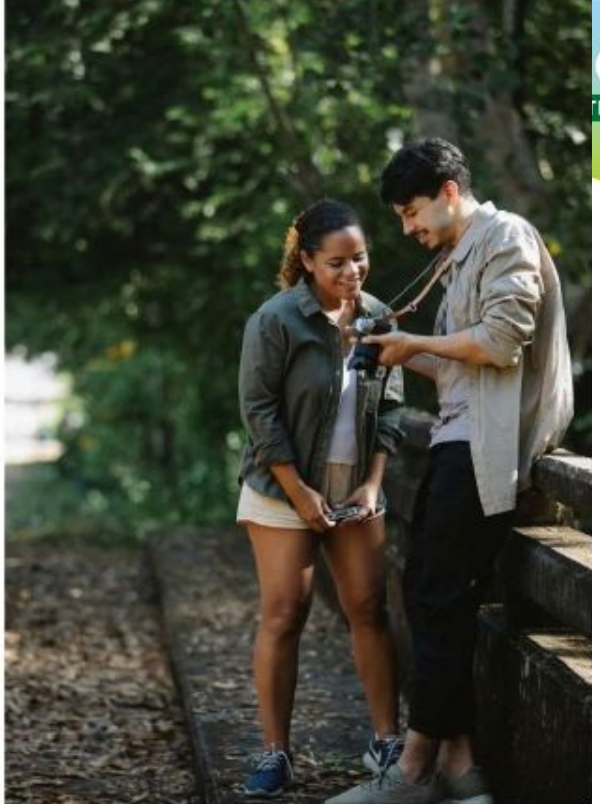
A first Definition

Citizen science is the **term** that is used to describe a wide range of activities, in which people from **all walks of life participate** in a **scientific project** in a **meaningful way.**

It is a collaborative approach to scientific research.

Including:

- identifying research questions
- collecting and analysing data
- Solving complex problems



APPLICATION FAQ DISSEMINATION MATERIAL OUR TELESCOPES TEAM CONTACT US TWITTER FACEBOOK TERMS OF USE

RECENT POSTS

Astronomy

ASTEROID HUNTERS

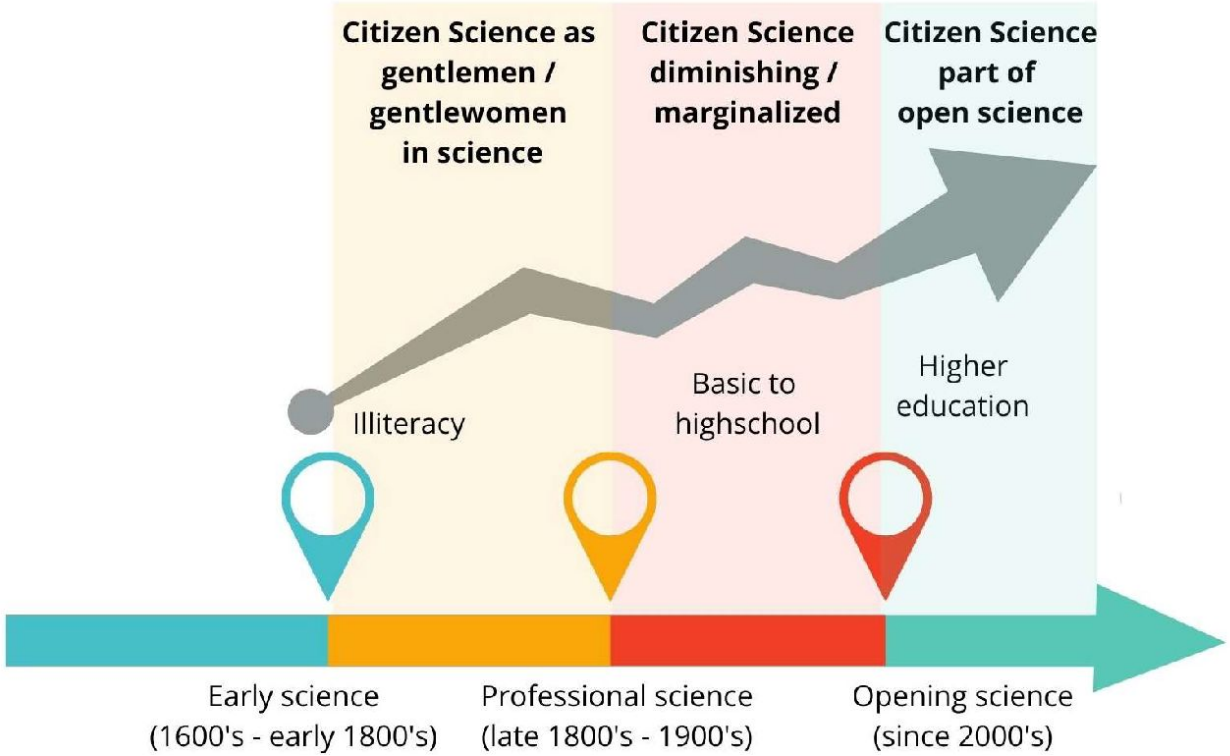
- Asteroid Hunters puts at the disposal of the citizenship a tool to collaborate in the protection of the Earth against the impact of asteroids.
- How to participate: Only a mobile phone is required, to download the app Android or iOS, or even from the computer's browser.
- Needed equipment: Internet

https://eu-citizen.science/project/120#

ASTEROID HUNTERS

- The **user sees** in their mobile a **sequence of images** of the sky and
- They **mark those objects suspected** of being asteroids (they move on the fixed background of stars).
- The detections are first **filtered by the users themselves** – through a voting system.
- Finally a **team of professional astronomers verify** the true nature of the objects detected.
- The application includes **gamification techniques** to make it more attractive to users, rewarding them with points for their actions.

Citizen Science and Science



Adapted frm Muki Haklay, Extreme Citizen Science group
Department of Geography, UCL
Twitter: @mhaklay / @ucl_exciteso

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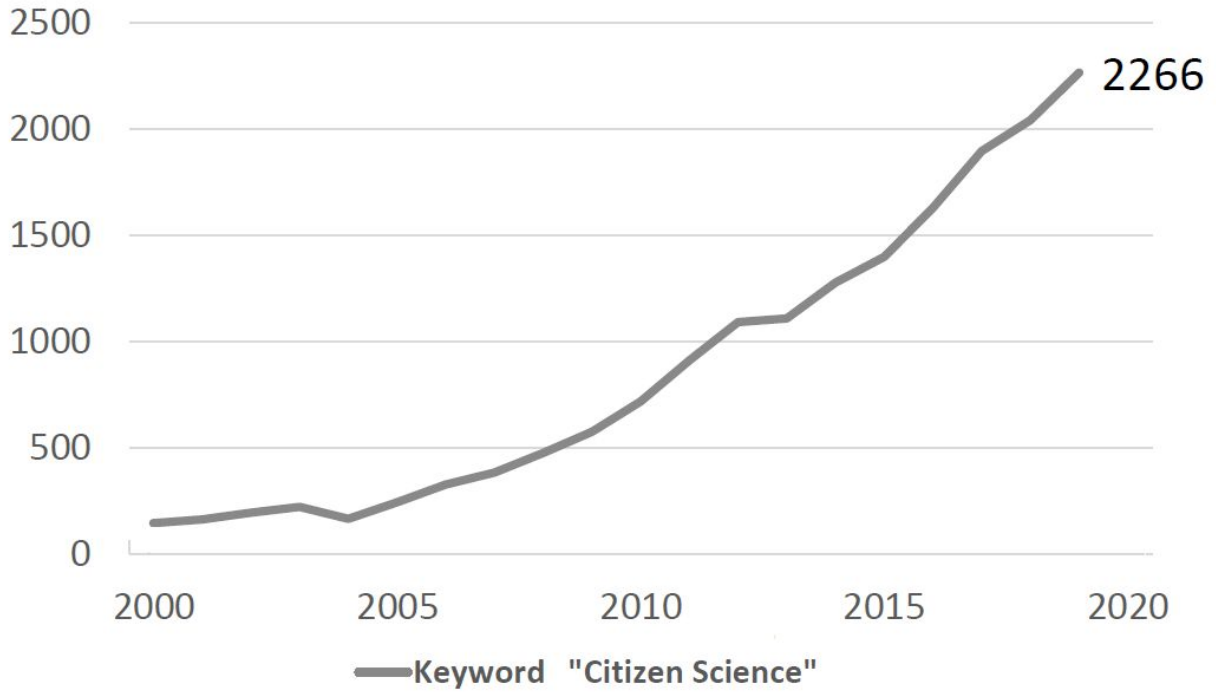
Citizen science in Research

Key word search on SCOPUS shows:

Important increase of CS publications since 2000



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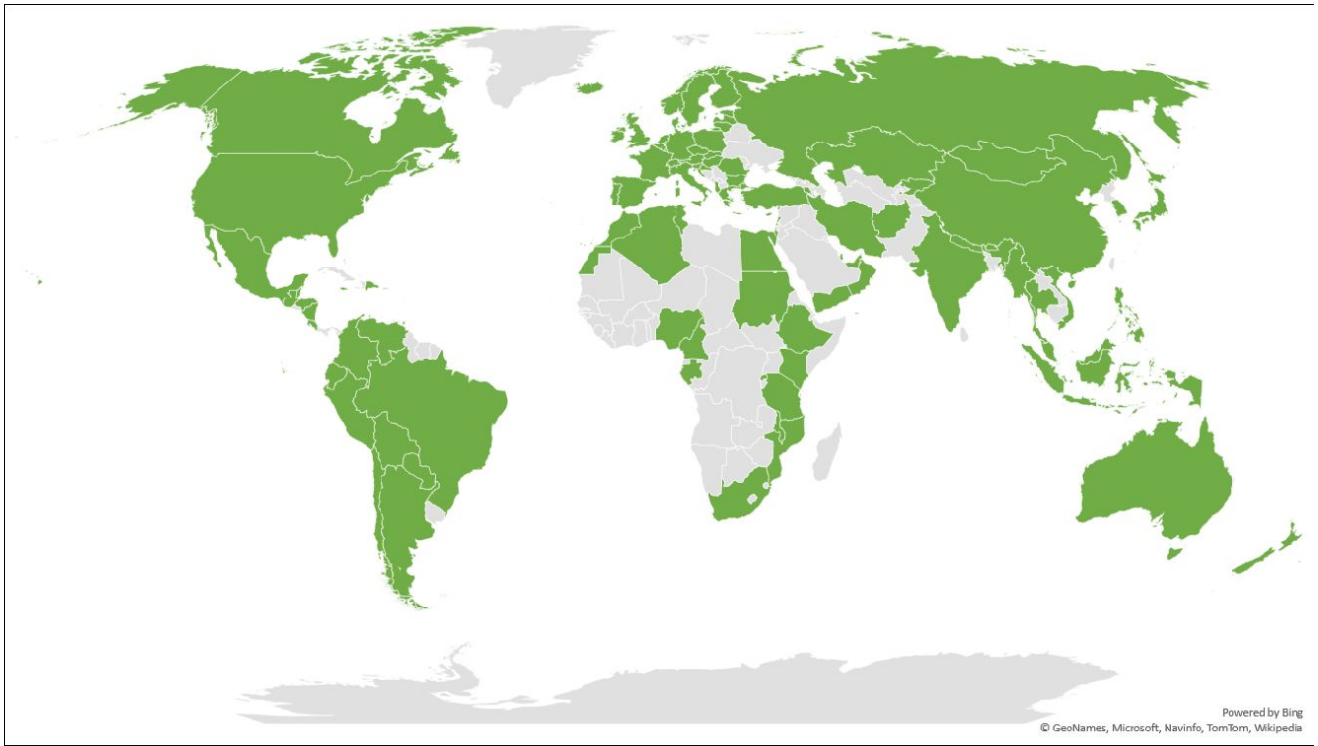
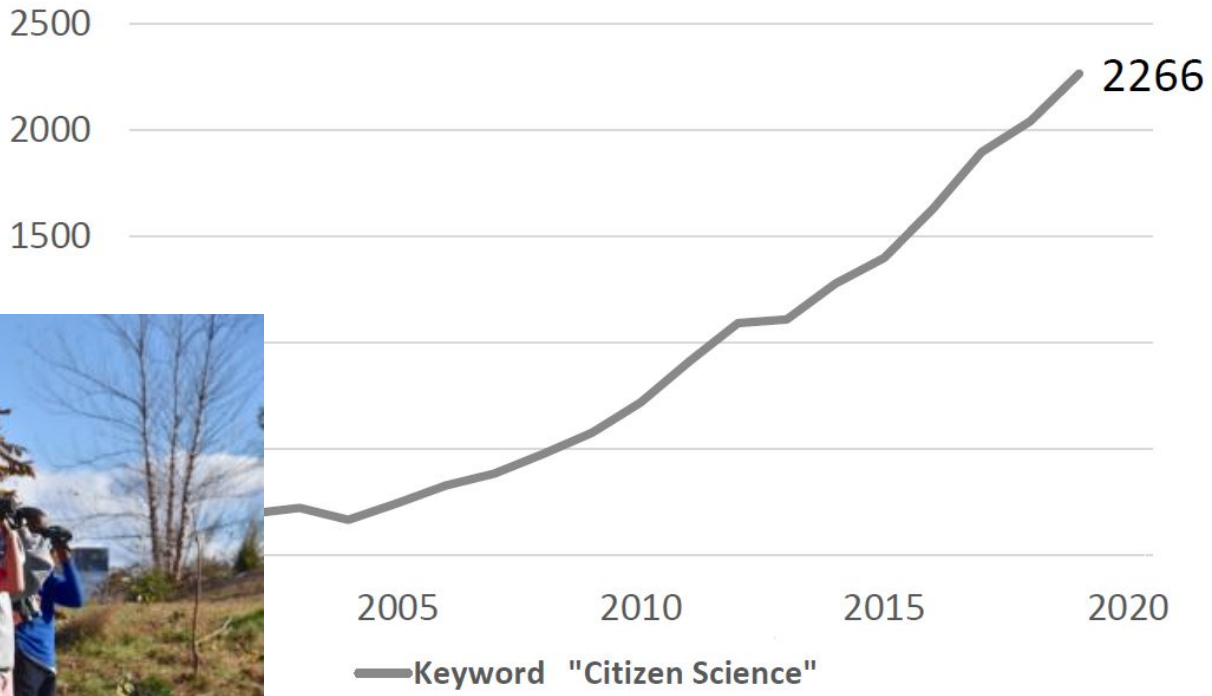
Citizen Science as a global phenomenon

- **449** CS activities
- Related to **196** projects
- Located in **97** countries



But why this sudden trend?



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Factors contributing to increased CS projects (Europe-based)

Societal trends:

- Education and qualifications
- Longevity and healthy ageing
- Leisure time
- Emergence of Open Science

Factors contributing to increased CS projects (Europe-based)

Technological trends:

- Internet access (broadband)
- Mobile devices & Smartphones
- Collaborative Web
- Sensors and location information
- DIY electronics (incl. 3D printers)

Describing CS projects

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Levels of citizen engagement

Where to involve Citizens in **projects?**

Stages of the scientific process

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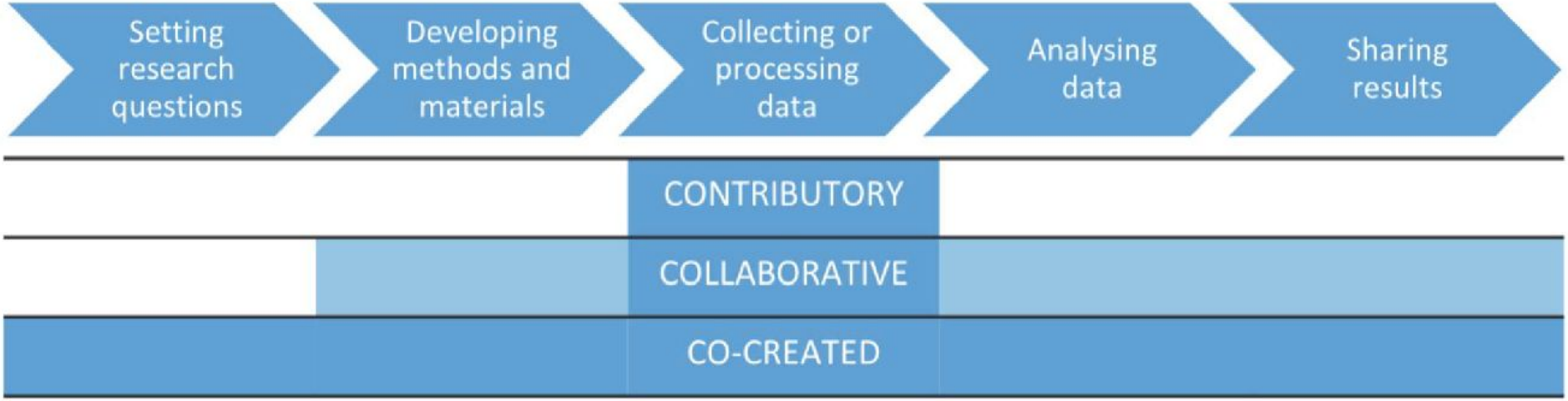
Stages of the scientific process that involve citizens in different types of citizen science projects



Depending on the type of project

SOURCE: Bonney, R., Cooper, C. B., Dickinson, J., Kelling, S., Phillips, T., Rosenberg, K. V. and Shirk, J. (2009). Citizen science: A developing tool for expanding science knowledge and scientific literacy. BioScience, 59(11). 977–84. DOI:10.1525/bio.2009.59.11.9

AS ILLUSTRATED IN: Sarah West and Rachel Pateman (2017). How could citizen science support the Sustainable Development Goals? Policy brief. Stockholm Environment Institute.

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Goals of Project Managers

Data

- Increase in spatial data
- Increase in temporal data
- Providing high quality data
- Cost-effectiveness in data collection

Products

- Knowledge product development

Network building

- for different purposes, e.g., social interaction

Problem solving

- Improving freshwater quality

Citizen Change

- Raising awareness
- Engaging citizens in research and problem solving

Capdevila, S. L. A., Kokimova, A., Sinha Ray, S., Avellán, T., Ki
J., and Kirschke, S. (2020). Success factors for citizen science
projects in water quality monitoring.

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Goals of citizens

Learning

- About nature in general
- About water quality, specifically in local contexts
- About science/ scientific methods

Problem solving

- Improving current environmental conditions
- Responding to a specific local problem

Social interaction/ community involvement

Receiving tokens of appreciation

- Monetary incentives
- Acknowledgement in scientific work

Capdevila, S. L. A., Kokimova, A., Sinha Ray, S., Avellán, T., K
J., and Kirschke, S. (2020). Success factors for citizen scienc
projects in water quality monitoring.

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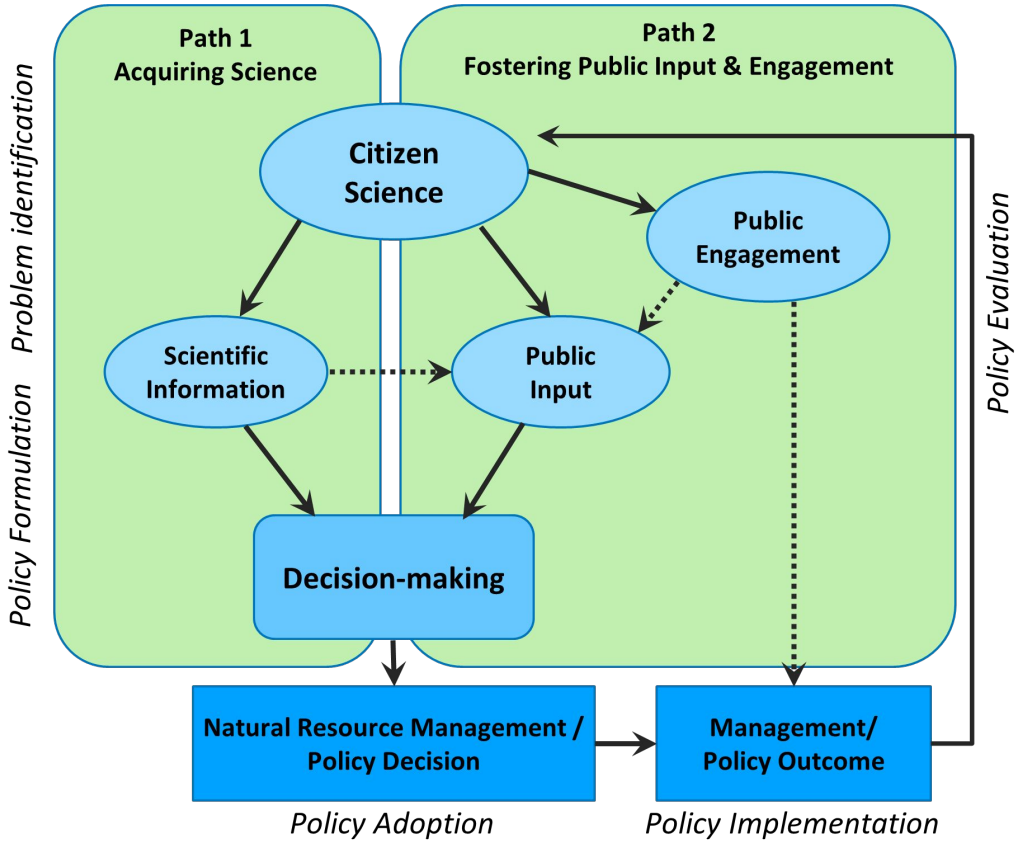
Benefits of CS

building synergies between researchers and stakeholders

Frits Ahlefeldt, Hiking.org

ecsa European Citizen Science Association

Building synergies using CS



CS can take 2 pathways **to inform different stakeholders** on Climate Adaptation:

- Volunteers can **generate scientific information** e.g., for environmental managers, and other decision-makers.
- Volunteers can **provide input into decisions, share information** within their communities, **and motivate others** to get involved in climate adaptation.

Source: DC McKinley et al., 2017

e.g., Climate justice

Efforts **focused on available data** e.g., green spaces in the city (m2/inhabitant) **may reinforce negative effects** on vulnerable population.

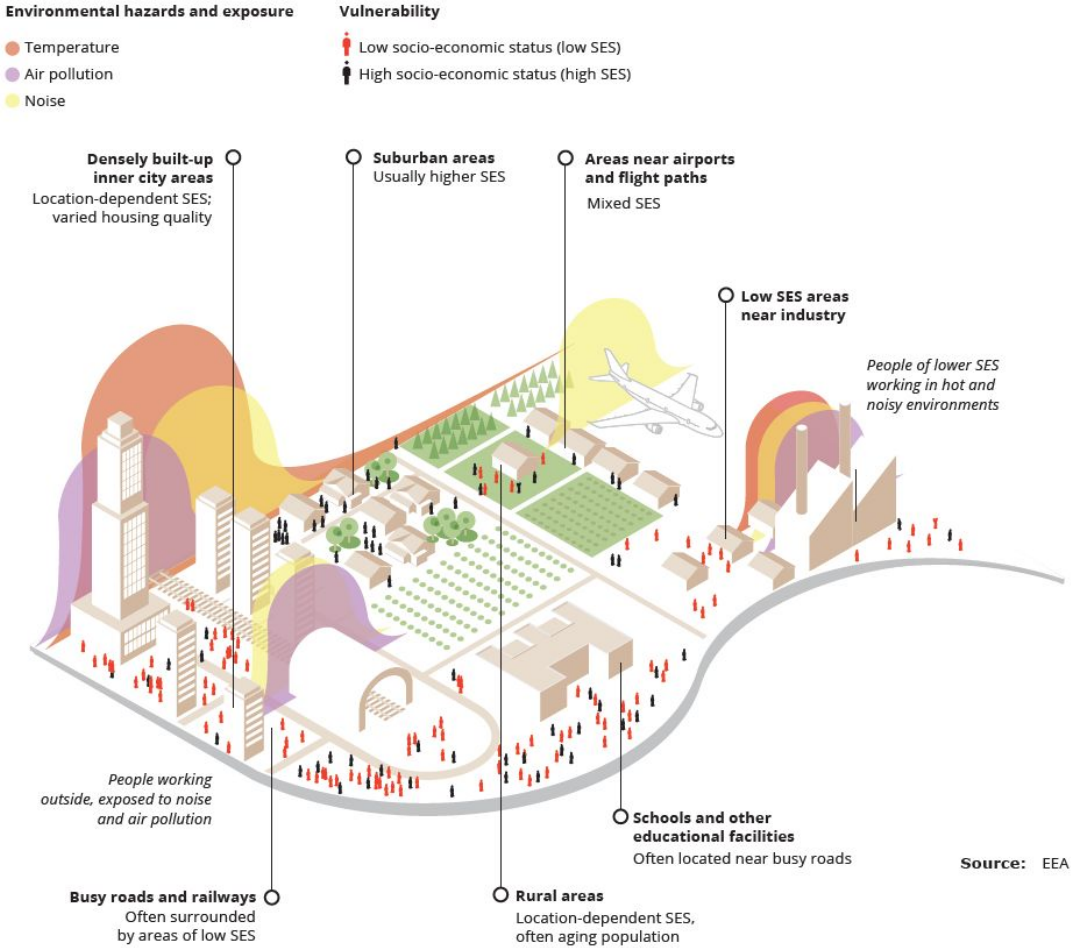
e.g., **projects that** focus on **improving already existing green areas** and their benefits.

- **Leaving aside** population **sectors with larger adaptation needs**.

CS can help **fine tuning these**:

- **Providing more just adaptation** adjusted to very **local needs** and **specific target population**.

Figure 2 **Exposure of vulnerable groups to air pollution, noise and extreme temperatures**



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Challenges of Citizen Science

- **Data quality control**: Ensuring **accurate and reliable** data collection by volunteers.
- Addressing bias in **data** collection and **representation** of (env./econ./social) conditions.
- Providing adequate **training** and capacity building. **Ensuring** they have the **necessary skills and knowledge** to **contribute meaningfully** to research.
- Participant **engagement and retention**: Sustaining motivation and involvement of citizen scientists over time.

Francois.jost@ecsa.ngo

ecsa European Citizen Science Association

Ethical considerations toward citizen scientists

Researchers have a responsibility to:

- Treat citizen scientists as **partners** ➡ **Co-creators of knowledge**, not mere resources, **treat them fairly**
- Ensure **representation and inclusivity** ➡
  - Be aware of **power dynamics**
  - **Inclusive language** is crucial for effective communication
  - **Reduce bias** by **ensuring representation** across demographic groups
- **Provide training** for citizen scientists
- Ethical open **data management**
- **Acknowledge contributions**
  - Provide **fair rewards to CSs** e.g.:
    - Authorship,
    - Recognition,
    - Education, or
    - Financial compensation

Involve CSs effectively: w/ guidelines, user-friendly training materials and workshops, a **channel of communication** for Q&As. ➡ **Reduces data quality issues.**

This project has received funding from the European Union's Horizon 2020 research and innovation programme under GA No 101006430

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Experience sharing: Citizens' climate lab in Venice (including Q&A) - EUCLIPA

Luciana Favaro

European Climate Pact Partner

QUESTIONS / COMMENTS?

More info:
https://www.euclipa.it/osservatori-climatici-territoriali/

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Experience sharing: The AGORA project - An application of citizen science in the field of climate adaptation (including Q&A) - ECSA

Anna Verones

Project Officer

QUESTIONS / COMMENTS?

More info:

https://adaptationagora.eu/newsevents/
https://www.ecsa.ngo/
https://climate-pact.europa.eu/index_en

PRACTICAL EXERCISE

Source: Freepik picture

The role you will have to adopt for the activity will be decided randomly. The different roles (characters / actors) are represented by the colour of the post-it.

Please use the corresponding post-it to represent your character and answer what you think would be their perspective on the following questions, and place your answer in the step you think is related to it.

Sticky note parking lot - ROLES

- Local Government Official
- Community Health Worker
- Climate Scientist
- Local Restaurant Owner
- Citizen scientist
- Others (specify in the post-it)

Access the MIRO exercise via the provided Link

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Available platforms, resources and tools

Francois Jost
Project officer

Available platforms, resources and tools

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About ECSA

We are a non-profit organization, legally established in 2014, that supports and advocates for **public participation in science.**

We have over 200 members in 21 EU countries, as well as Australia, Ecuador, Nigeria, Norway, Serbia, Switzerland, the UK and the USA.

GOALS:

- Empower Citizen Scientists
- Provide tools and training
- Connect the CS Community
- Advocate for citizen science

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EUROPEAN CITIZEN SCIENCE ASSOCIATION

Ten principles of citizen science

Citizen science is a flexible concept which can be adapted and applied within diverse situations and disciplines. The statements below were developed by the *'Sharing best practice and building capacity'* working group of the **European Citizen Science Association**, led by the Natural History Museum London with input from many members of the Association, to set out some of the key principles which as a community we believe underlie good practice in citizen science.

1. **Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding. Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.**
2. **Citizen science projects have a genuine science outcome.** For example, answering a research question or informing conservation action, management decisions or environmental policy.
3. **Both the professional scientists and the citizen scientists benefit from taking part.** Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific evidence e.g. to address local, national and international issues, and through that, the potential to influence policy.
4. **Citizen scientists may, if they wish, participate in multiple stages of the scientific process.** This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.
5. **Citizen scientists receive feedback from the project.** For example, how their data are being used and what the research, policy or societal outcomes are.
6. **Citizen science is considered a research approach like any other, with limitations and biases that should be considered and controlled for.** However unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.
7. **Citizen science project data and meta-data are made publicly available and where possible, results are published in an open access format.** Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.
8. **Citizen scientists are acknowledged in project results and publications.**
9. **Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.**
10. **The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.**

September 2015, London

ecsa | European Citizen Science Association

Version 1, April 2020

ECSA's characteristics of citizen science

Introduction

Citizen science is a common name for a wide range of activities and practices. It is possible to understand it by considering the characteristics of those activities and practices, which are described in this document. These are found in different scientific disciplines – from the natural sciences to the social sciences and the humanities – and within each discipline, the interpretation of citizen science can be slightly different. Yet despite these differences, citizen science is an emerging area of research and practice, with evolving standards on which different stakeholders are developing methodologies, theories and techniques. It is, therefore, useful to establish some level of shared understanding, across disciplines and practices, as to what to expect from an activity or a project that is set out to be a citizen science one.

There is little doubt that a project with an open call to a wide range of volunteers to take part in either data collection or data analysis of a clearly defined research hypothesis will be recognised as citizen science. However, this is only one type within a large set of activities, practices and forms of participation, resulting in diverging views about what is – and isn't – citizen science. Because of these differences in disciplinary and cultural contexts, attempting to define a universal set of rules for exclusion or inclusion is difficult, and might even limit the advancement of the field.

Instead, this document attempts to represent a wide range of opinions in an inclusive way, to allow for different types of projects and programmes, where context-specific criteria can be set. The characteristics outlined below are based on views expressed by researchers, practitioners, public officials and the wider public. Our aim is to identify the characteristics that should be considered when setting such criteria (e.g. a funding scheme), and we call upon readers to determine which subset of these characteristics is relevant to their own specific context and aims.

These characteristics build on (and refer to) the ECSA 10 principles of citizen science[1] ("the 10 principles") as a summary of best practice – and projects are expected to engage meaningfully with them. Where it is especially pertinent, we refer to them in the characteristics below.

The rest of the document covers the characteristics of citizen science under five sections: (1) core concepts; (2) disciplinary aspects; (3) leadership and participation; (4) financial aspects; and (5) data and knowledge. Further explanation and background are provided in the 'ECSA's characteristics of citizen science: explanation notes' document. Note that we use the terms 'scientific research' and 'research' interchangeably – and we explain these terms from the perspective of citizen science practices.

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ECSA ten principles of citizen science

Involvement

Outcome

Benefits

Participation

Feedback

Democratisation

Open access

Acknowledgment

Impact

Ethics

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Share, initiate and learn citizen science in Europe

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ECS platform

For sharing knowledge, tools, training and resources for CS – **by the community, for the community**.

- **Search for keywords**
- **Direct links** to projects, resources, training

eu-citizen.science Search Blog Events Moocs Forum FAQ About

- **Search for users**

ECS has received funding from the European Union's Horizon Europe Framework Programme for Research and Innovation under grant agreement No. 101058509.

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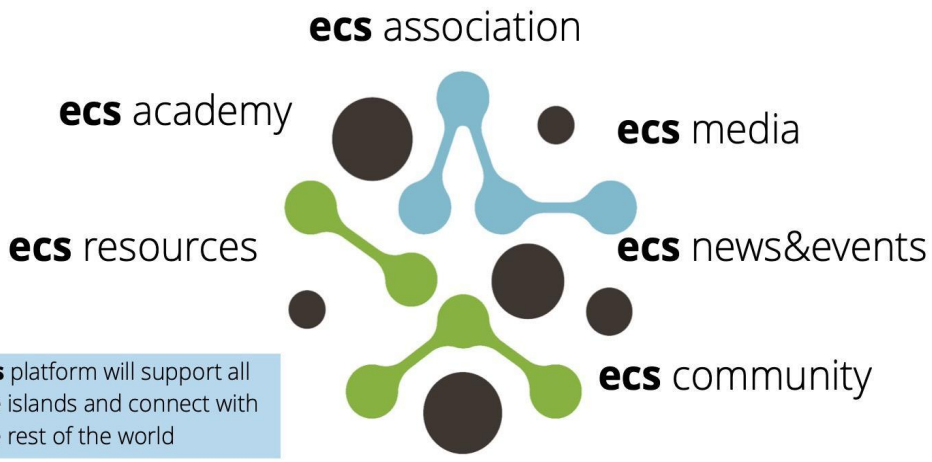
The **ecs** archipelago



On the **ECS platform, sailors** (CS practitioners, citizen scientists, general public, researchers, educators, policy makers, funding bodies, decision makers, the press, etc.) **will find the map** of the archipelago:

Access to all available resources and **opportunities to connect** with the community.

ECS has received funding from the European Union's Horizon Europe Framework Programme for Research and Innovation under grant agreement No. 101058509.

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ECS Platform Vision:

To **serve as a Knowledge Hub** and to become the **European reference point for CS** in aid of its mainstreaming.

what can you find here?

332
Projects
That are engaging the public in research via citizen science activities.

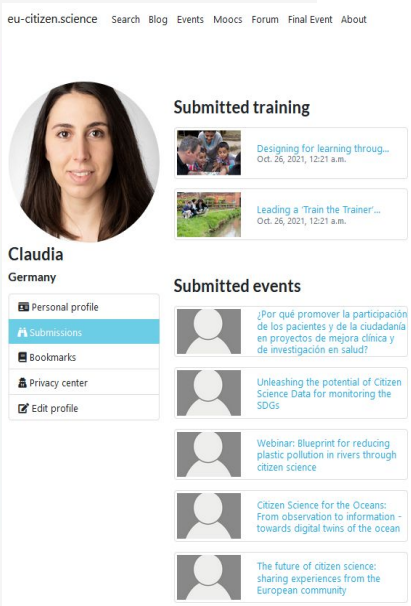
241
Resources
Useful for planning and running citizen science projects.

75
Training Resources
About the practice of citizen science.

324
Organisations
Involved in citizen science projects and research.

28
Platforms
To get an overview of further developments in citizen science.

Personal area



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Additional Resources

European Citizen Science Platform
10 Principles of CS
Characteristics of CS

CS Toolkits & roadmaps:

- CS roadmap and benefits for local governments
- CS Toolkit: principles, benefits, challenges
- CS Starter Kit: Training Materials
- CS Navigator

Additional adaptation EU-projects working with CS:

- ScienceUs
- EU Sparks for Climate
- AGORA


Thank
you!

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Satisfaction survey

Participants can join at slido.com
with **#2310736**
(11 June) or anytime at this link

Next Training programme session

Summer Break

Find **Session 8 recording** in the following YouTube Link