

A PRACTICAL GUIDE TO CITIZEN SCIENCE

- The Researcher Perspective



AARHUS
UNIVERSITY
DEPARTMENT OF MATHEMATICS - CENTRE FOR SCIENCE STUDIES

A PRACTICAL GUIDE TO CITIZEN SCIENCE
2 NOVEMBER 2021

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POSTDOC



OVERVIEW

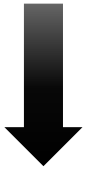
- 1) What is Citizen Science?*
- 2) Motivations for Citizen Science*
- 3) Considerations before / when planning a Citizen Science project*
- 4) Knowledge exchange and helpful links*
- 5) Wrap up*

CITIZEN SCIENCE – THE TERM EMERGES

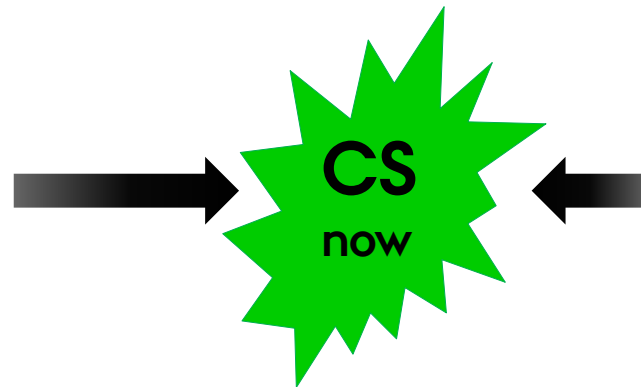
Contribution of observations to science

*Audubon Society (1989) &
Rick Bonney (1996)*

- Citizens collecting and analysing rain samples
- Birdwatchers submitting sightings
- *Participants are instruments*



Biodiversity monitoring



Democratisation of science

Alan Irwin (1995)

- Democratic, participatory science
- Science to address needs and concerns of citizens
- Citizens could develop process of producing reliable knowledge themselves
- *Participants can influence and transform science*



Activist science

Participatory action research

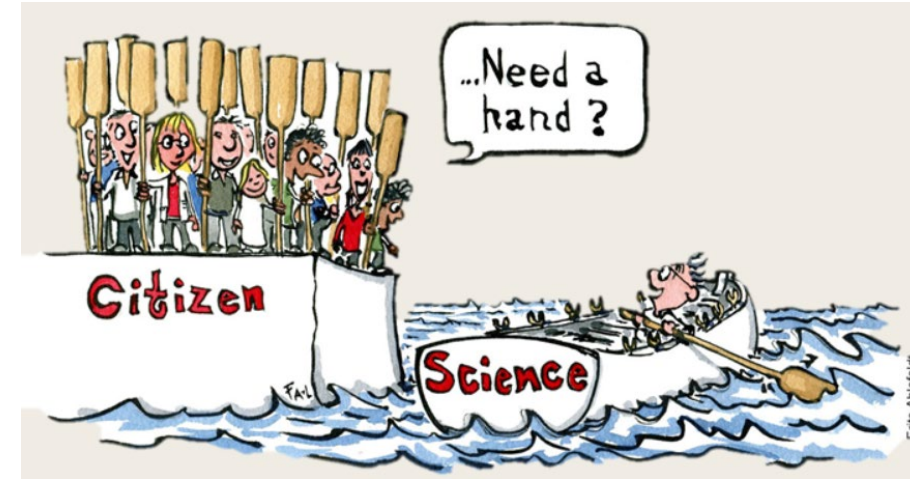
Community-based natural resource management



WHAT IS CITIZEN SCIENCE TODAY?

“Scientific work undertaken by members of the general public, often in collaboration with or under the direction of professional scientists or scientific institutions”

(Oxford English Dictionary)



- Public participation in scientific research
- Participatory research
- Community science
- Community-based monitoring
- Activist science
- Action research

- Wide range of activities
- Within a wide range of scientific fields

WIDE RANGE OF FIELDS



MOTIVATIONS FOR CITIZEN SCIENCE

➤ *More data!*

- Achieve temporal and geographical coverage
- Access to resources
- Produce scientific outputs

*Contribution of
observations to
science*

- Increase awareness of scientific issues
- Increase scientific literacy

- Increase inclusiveness and diversity
- Empowerment of the public

*Democratisation
of science*

MOTIVATIONS FOR CITIZEN SCIENCE?

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 - Increase scientific
-
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*Democratisation
of science*

MOTIVATIONS FOR CITIZEN SCIENCE



Contributory project

Blue: scientists

Orange: participants

CONSIDERATIONS BEFORE CS

The role of the researcher / project leader

➤ Researcher

- Is your research question fit for CS?
- How to ensure data quality and validity?

CS is a methodology!

➤ Theorist, explorer of methodology

- CS is continuously transforming, evolving
- No one-size-fits-all CS methodology

=> Lots of roles,
potentially new roles
requiring new skills

➤ Facilitator and (science) communicator

Identify people with complimentary skills and ask for help

INTERDISCIPLINARITY IS NEEDED IN CS



Other researchers/stakeholders:

- Motivation
- Communication
- Well-being
- Participatory approaches

**Research,
volunteer &
civil society
organisations**

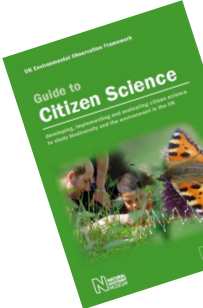
Natural scientists:

- Data
- Monitoring
- Conservation



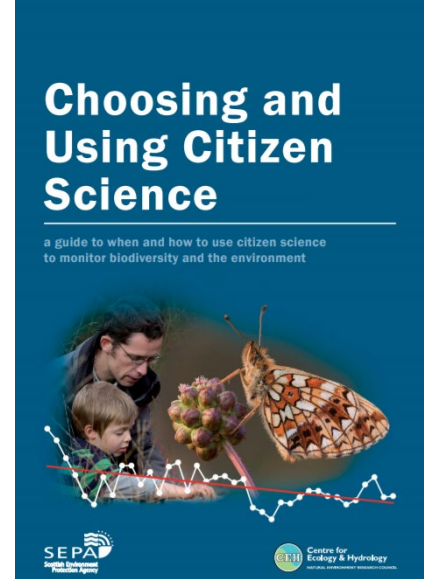
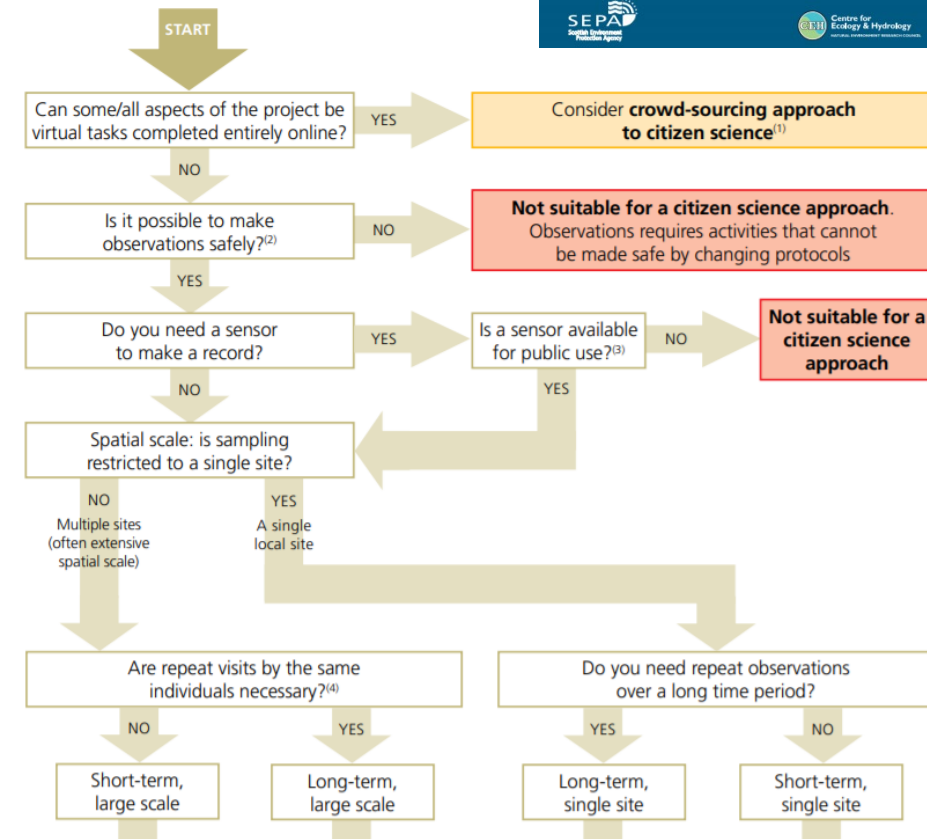
WHERE TO START WITH CS?

- *CS is a method like any other scientific method*
- *– only use when appropriate!*
- Start with the CEH flowchart →
- Planning →
- ‘Free’ labour doesn’t mean ‘without costs’!
- Funding
- Training of volunteers?
- Communication with volunteers?
- Participants will have expectations!



1	Before you start	2
	Is citizen science the best approach?	2
	Choose a citizen science approach	4
	Citizen science flowchart	6
2	First steps	7
	Establish project team	7
	Define project aims	8
	Identify funding and resources	9
	Identify and understand target participants	10
3	Development phase	12
	Design the survey or scheme	12
	Consider data requirements	14
	Consider technological requirements	16
	Develop supporting materials	17
	Test and modify protocols	19
4	Live phase	21
	Promote and publicise the project	21
	Record data and provide rapid feedback	22
5	Analysis and reporting phase	23
	Plan and complete data analysis and interpretation	23
	Report results	24
	Share data and take action in response to data	25
	Evaluate to improve lessons learned	26
	Resources and links	

Part 1 of the decision framework



ECSA's 10 principles of citizen science

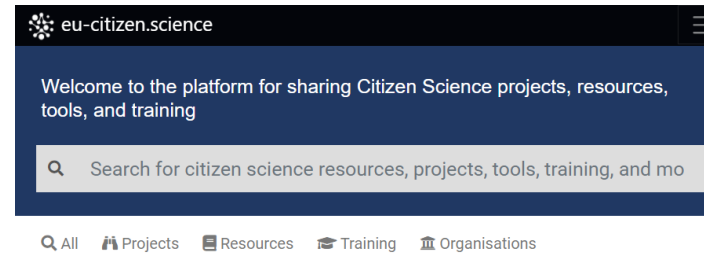
1. **Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding.**
2. Citizen science projects have a **genuine science outcome**.
3. Both the professional scientists and the citizen scientists **benefit** from taking part.
4. Citizen scientists may, if they wish, **participate** in multiple stages of the scientific process.
5. Citizen scientists receive **feedback** from the project.
6. Citizen science is considered **a research approach** like any other, with limitations and biases that should be considered and controlled for.
7. Citizen science project **data and metadata** are made publicly available and where possible, results are published in an open-access format.
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.

[ECSA's Characteristics of Citizen Science](#) (Zenodo) & [Contours of Citizen Science](#) (Royal Society)

RESOURCE HUBS

➤ National CS platforms and networks

➤ [EU-citizen.science](https://eu-citizen.science)



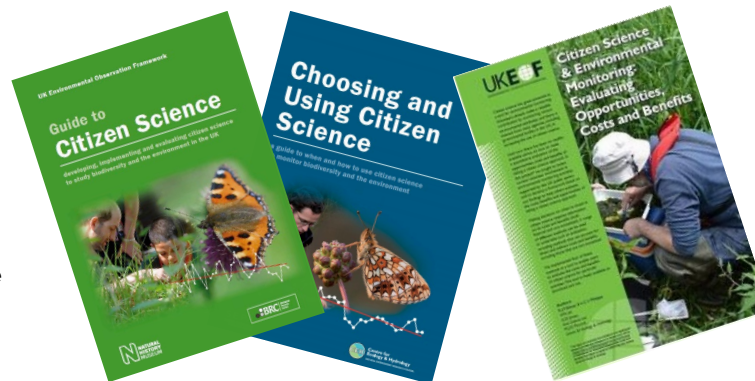
➤ Scientific publications

➤ [Citizen Science: Theory and Practice](#)

➤ Helpful guides

➤ CEH/UKEOF publications

<http://www.ceh.ac.uk/citizen-science-best-practice-guide>



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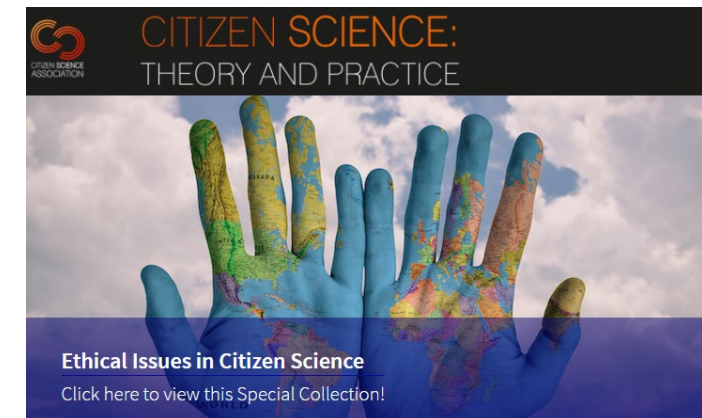
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4) Knowledge exchange and helpful links

National and regional portals [\[edit source \]](#)

Nation or region	Portal
Global	Citizen Science Global Partnership
Global	SciStarter
Global	Zooniverse: People-powered research
Asia	CitizenScience Asia
Australia	Australian Citizen Science Association
Australia	Australian Citizen Science Project Finder
Austria	Österreich Forscht
Austria	Sparkling Science
Belgium (Flanders)	Citizen Science Vlaanderen
Canada	Citizen science portal
Denmark	Citizen Science Portalen
France	Open
Germany	Bürger schaffen Wissen
Ireland	Environmental Protection Agency
Netherlands and Flanders	EOS Wetenschap
Russia	People of Science (Люди науки)
Scotland	Citizen Science with TCV
Spain	Observatorio De La Ciencia Ciudadana
Sweden	Arenas for co-operation through citizen science
Switzerland	Schweiz Forscht
United Kingdom	UK Environment Observation Framework
United States	USA Government Official Website

Source: Wikipedia



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KNOWLEDGE EXCHANGE

➤ Upcoming Conferences:

- AU/Citizen Science Netværket, Engaging Citizen Science Conference: [25-26 Apr 2022](#) (in-person), Aarhus, Denmark
- Citizen Science Association Conference: [24-28 May 2022](#) (probably online?)
- [European Citizen Science Association](#): autumn 2022 (in-person), Berlin, Germany



➤ Regional associations & working groups, e.g. ECSA and CSA

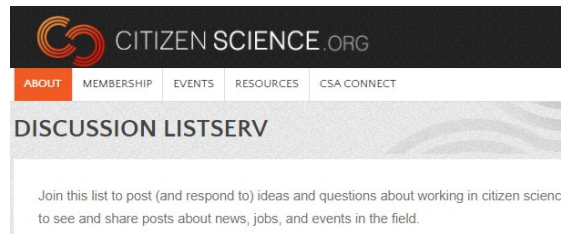


Working Groups

➤ COST Actions, e.g. [Alien CSI](#)



➤ [citsci listserv](#)



WRAP UP

- CS has a long history through different contexts and in different fields
- Two origins of term – contributions and democratisation
 - Now the ideas are coalescing
- CS is a methodology used across scientific disciplines in many different ways
- Understanding motivations of both researchers and volunteers are important for success
- Lots of benefits for researchers when using CS, but also challenges
- Interdisciplinarity is integral to citizen science
- Use available sources of inspiration, practical guides and knowledge exchange

You are not alone 😊



Thank you for your attention 😊



You're welcome to get in touch:

Gitte Kragh - gitte.kragh@css.au.dk