

The potential of Citizen Science for Natural Capital and Ecosystem Services assessment in agri-environmental systems

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What is Citizen Science?



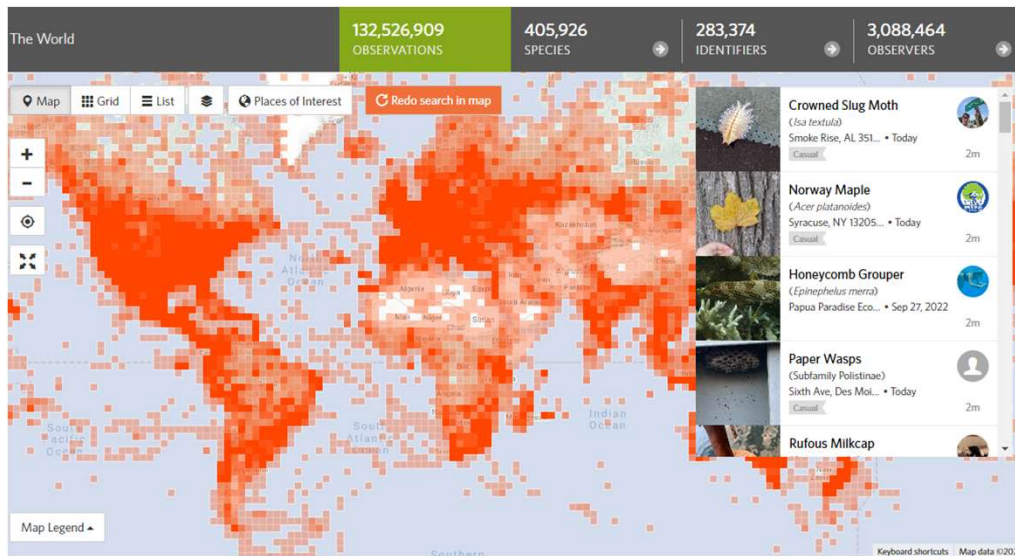
<https://hiking.org/portfolio/giving-a-hand-to-science/>

What is Citizen Science?

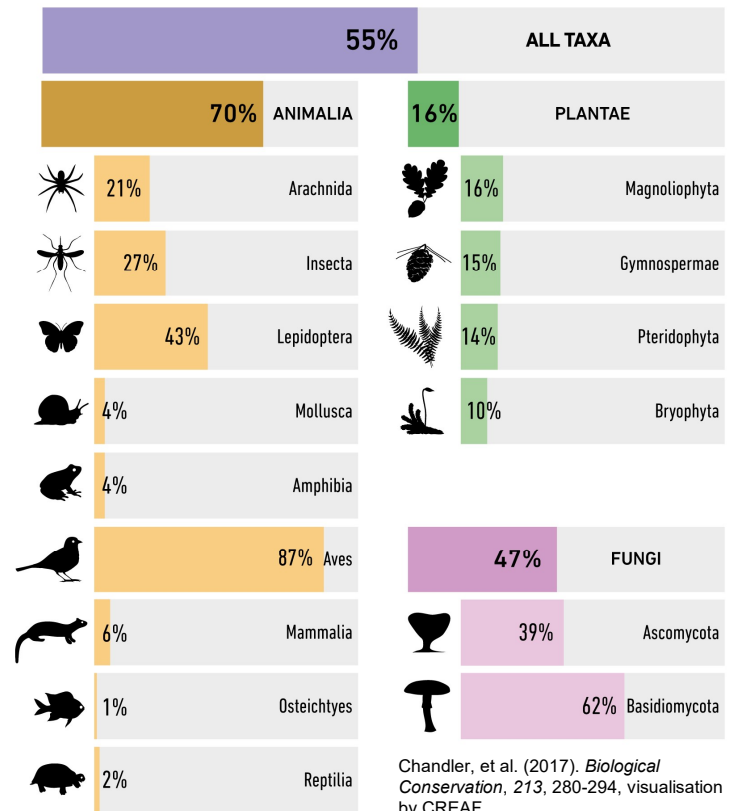
Millions of participants globally

> 50% of biodiversity data from CS

~33% of SDG indicators



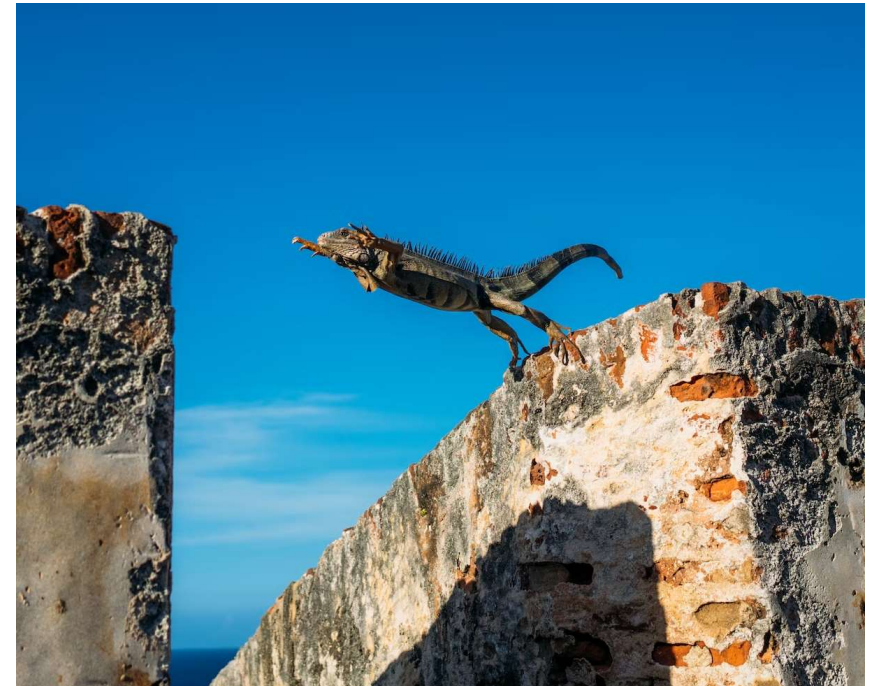
CS contributions to GBIF across taxa



Chandler, et al. (2017). *Biological Conservation*, 213, 280-294, visualisation by CREAM

ES and NC challenges, needs and gaps

- Multitude of conceptualisations of Natural Capital and ES
- Various evaluation frameworks and related methodological approaches
- **Existing data gaps**
- **Lack of monitoring capacity**
- **Assessment frameworks not fully formulated or operational in practice**
- **Stakeholder and citizen awareness of natural asset issues and actions/behaviour change**
- **Policy buy-in**
- Indicator suitability and harmonisation



Denny Luan, unsplash.com

Schröter et al. 2017, Seymour et al. 2022, Bishop et al. 2021

Linking Citizen Science with ES and NC

Science and research. CS research since early 2000s under explicit ES framing.

- **Provisioning ES** (e.g., honey production, game hunting for consumption)
- **Regulating ES** (e.g., pollination and pest control, soil moisture/water infiltration, genetic resilience through genetic diversity), field data to improve or validate ES models and maps (e.g., flood risk)
- **Cultural ES** (e.g., iconic species or plant community monitoring providing the basis for physical experience, aesthetic appreciation and existence value, e.g., barn owls, traditional wildflower meadows etc.)

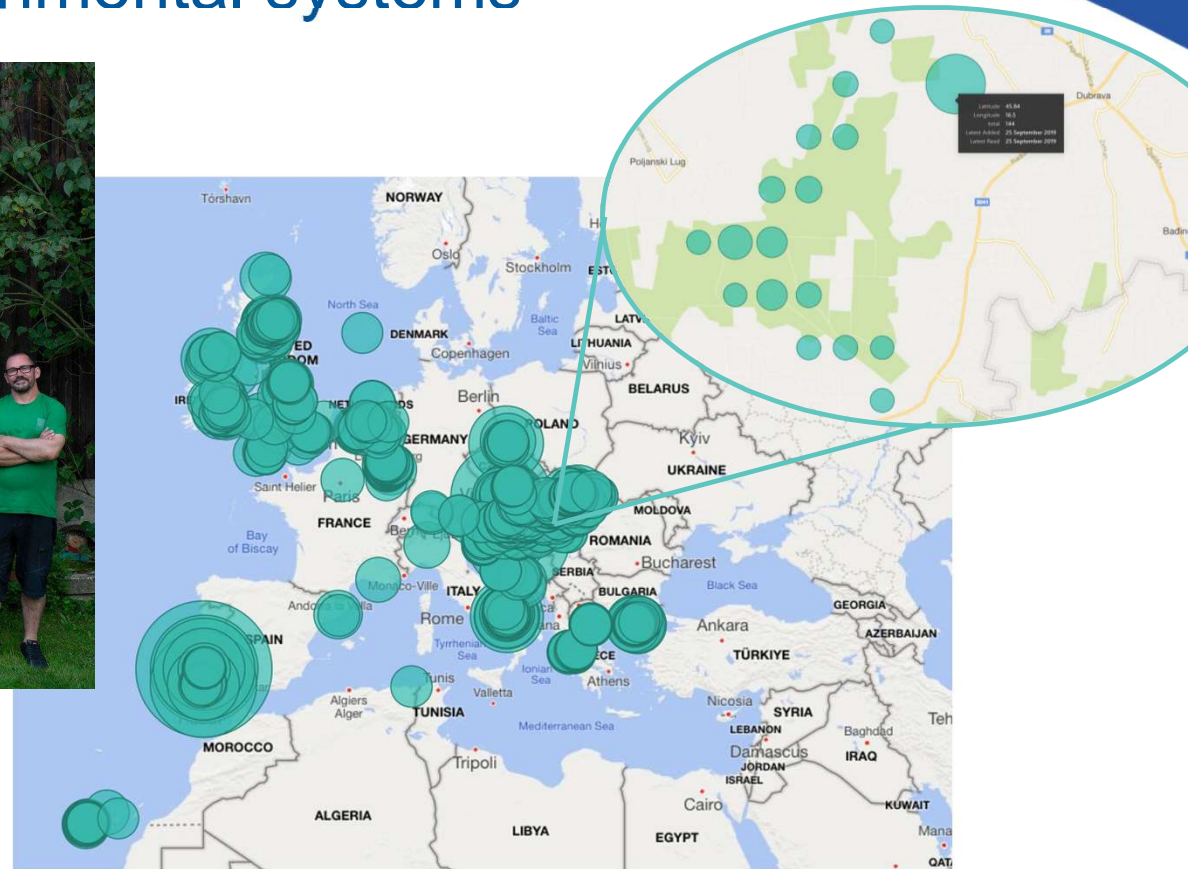


Localised action. Community-based NC/ES monitoring and management approaches.

Use cases from agri-environmental systems



GROW
OBSERVATORY



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Use cases from agri-environmental systems



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Linking Citizen Science with ES and NC

Public policy. Authoritative indicator frameworks to assess progress towards policy plans and targets.

National to global

- Defra's Natural Capital and Ecosystem Assessment (NCEA), 25 Year Environment Plan > recognise CS as one important building block for ***data collection and implementation***
- UN System of Environmental-Economic Accounting Ecosystem Accounting (SEEA EA) > link with SDG system
- CBD: decision-making on natural resources should be based on both local knowledge and scientist's monitoring



Convention on
Biological Diversity

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Insights from linking CS with the SDG framework

SDG indicator level

- **CS data are already contributing or could contribute** to the monitoring of around **33% of the SDG indicators**.
- CS data have the **greatest potential for input to the environmental** SDG indicators.
- Tier I-II: higher temporal and spatial frequencies; Tier III: help in devising suitable methodologies.
- At least **5 indicators** are already monitored using CS data.
- **Ghana was the first country to report on SDG 14.1.1b, marine plastic debris, and first country to use CS data to do so.**
- CS methodology taken up in official, recommended 14.1.1b indicator methodology. Fraisl et al., 2020

Target	Indicator ID	Indicator	Operational Status	How to align with selected SEEA Accounts (Generated using SEEA indicator)	Input / Output	Possibilities for Alignment under this Project (Full, Partial, None)
SDG Target 14.1 - By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution	SDG 14.1.1	14.1.1 - Index of coastal eutrophication and floating plastic debris density	Tier III	This provides an input indicator for ecosystem condition	Input	Full

Requirements for success

Purpose. Activities linking CS with NC and ES actions have a clear, agreed and mutually understood purpose, including NC/ES framing.

Commitment. All parties build an enabling environment for a citizen-based approach together.

Reciprocity. Citizens and local communities experience a clear benefit from getting involved and taking action.



Quino AI, unsplash.com

Thank you

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