iNaturalistCL

y los hongos de Chile

Cristian Riquelme

iNaturalist y los hongos de Chile

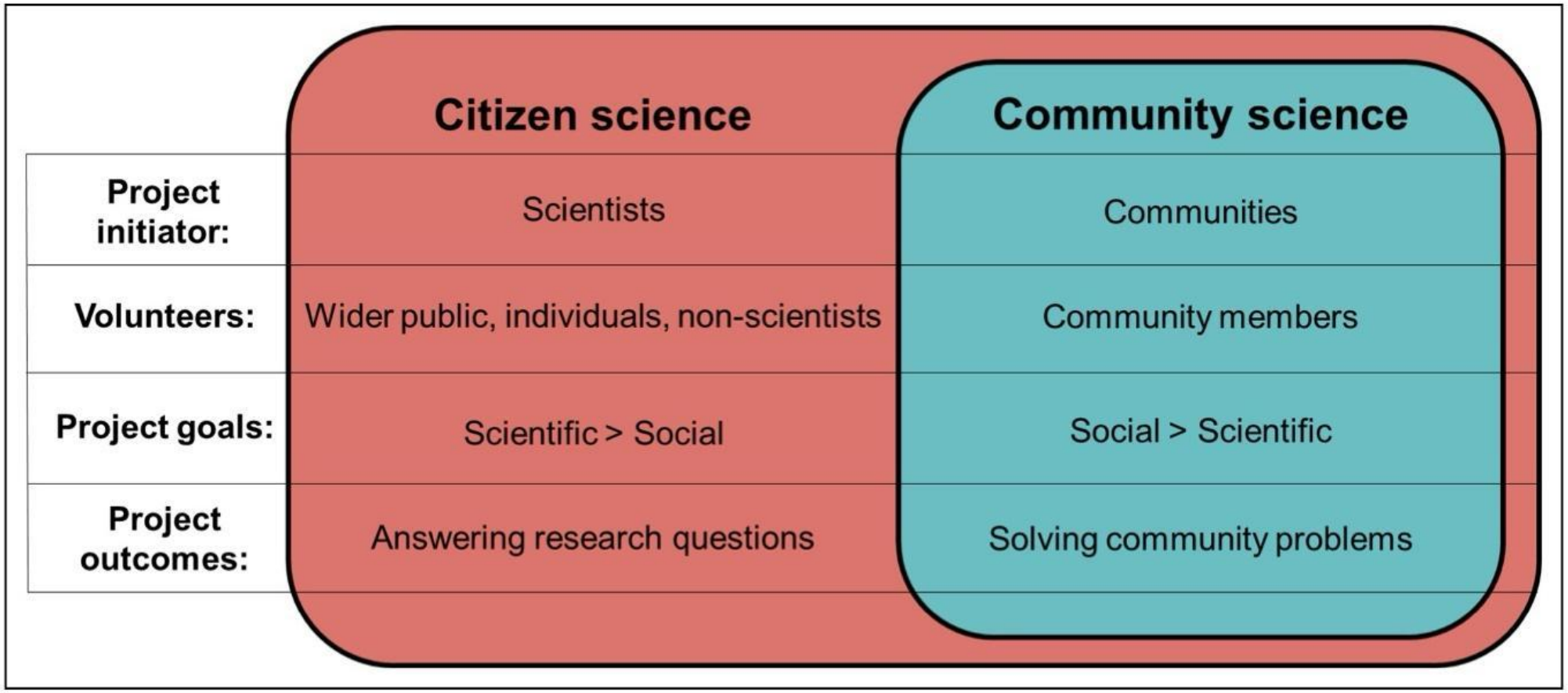
– Ciencia ciudadana (CC)
– Ciencia ciudadana y hongos
– iNaturalist y los hongos de Chile
– Algunas consideraciones sobre CC

Ciencia ciudadana (CC)

“[Citizen science means] public participation in scientific projects…”

Heigl *et al*. (2019)

Ciencia ciudadana o comunitaria *



* Lin Hunter *et al.* (2023)

Principios de ciencia ciudadana *

1. Citizens have a meaningful role in the project.
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 participate in multiple stages of the scientific process.

* ECSA (2015)

Principios de ciencia ciudadana *

5. Citizen scientists receive feedback from the project.
6. 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.
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.

* ECSA (2015)

Datos primarios y secundarios en CC *

1

Primary data

Primary species

Date and time

Location

2

Secondary data

Observer-wildlife interaction

Features of the individual

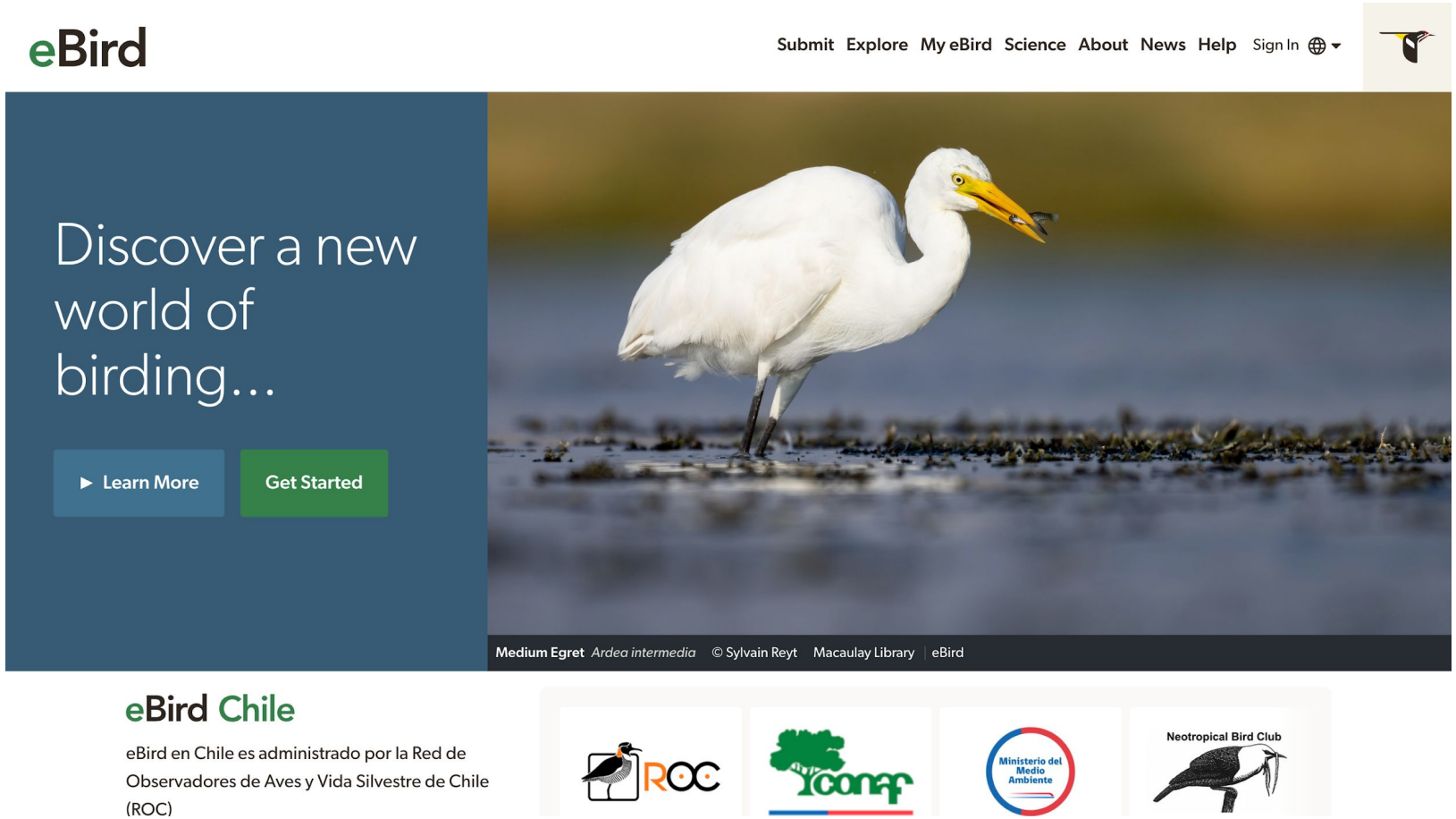
Biotic interactions and co-occurrence

Features of the population and community

Environmental features

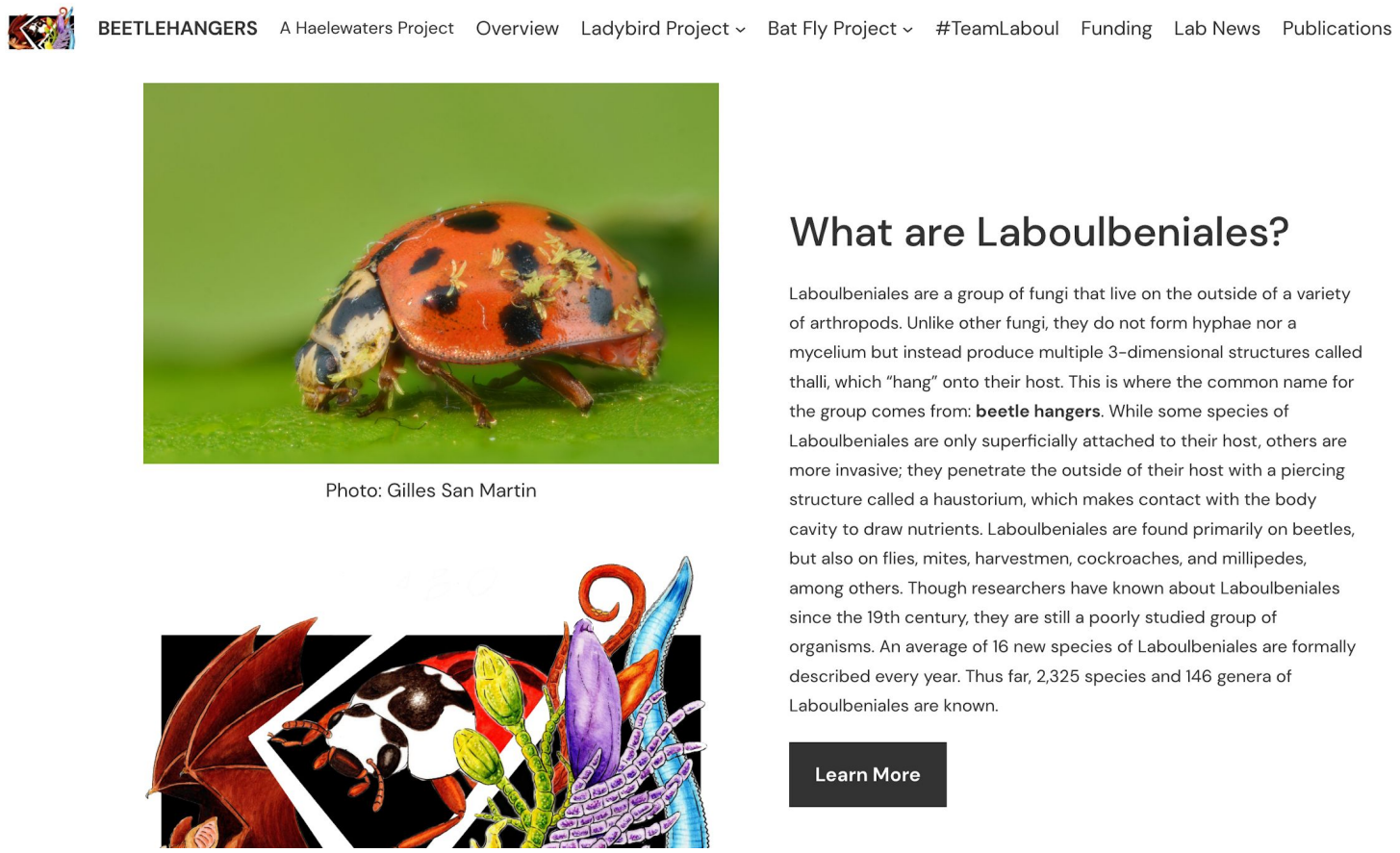
* Pernat *et al.* (2024)

Ejemplos de iniciativas de CC



https://ebird.org/home

Ejemplos de iniciativas de CC



https://beetlehangers.org

Ejemplos de iniciativas de CC

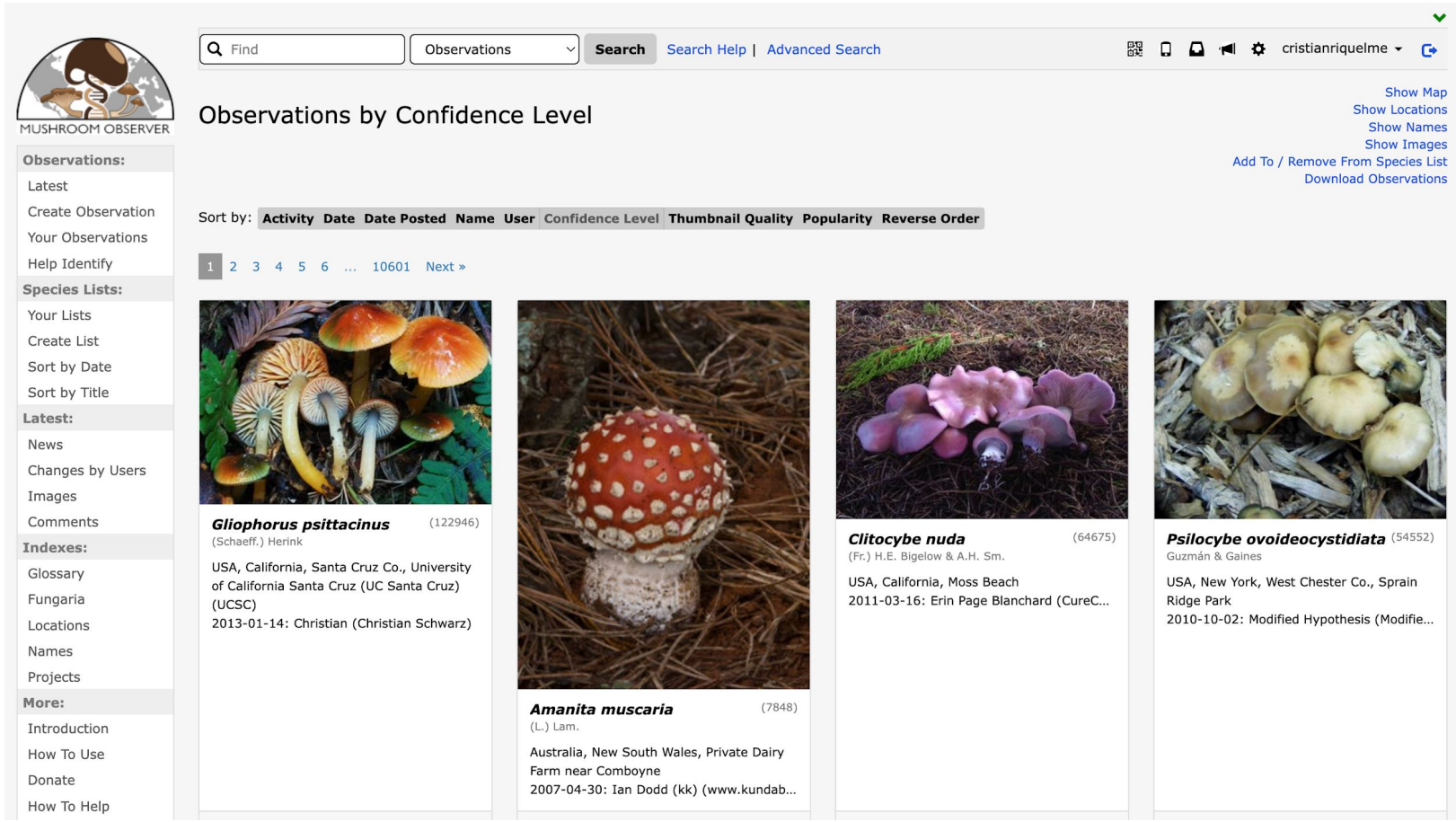
Programa de Ciencia Participativa
Científicos de la Basura

Programa de ciencia participativa que investiga el problema de la basura marina en Latinoamérica y el mundo. Buscamos contribuir a la formación científica y cívica de las comunidades educativas y sociedad civil, a través de la participación activa en investigaciones sobre la basura en el ambiente, fortaleciendo la conciencia y acción pro-ambiental.

https://cientificosdelabasura.ucn.cl

Ciencia ciudadana y hongos

Mushroom Observer

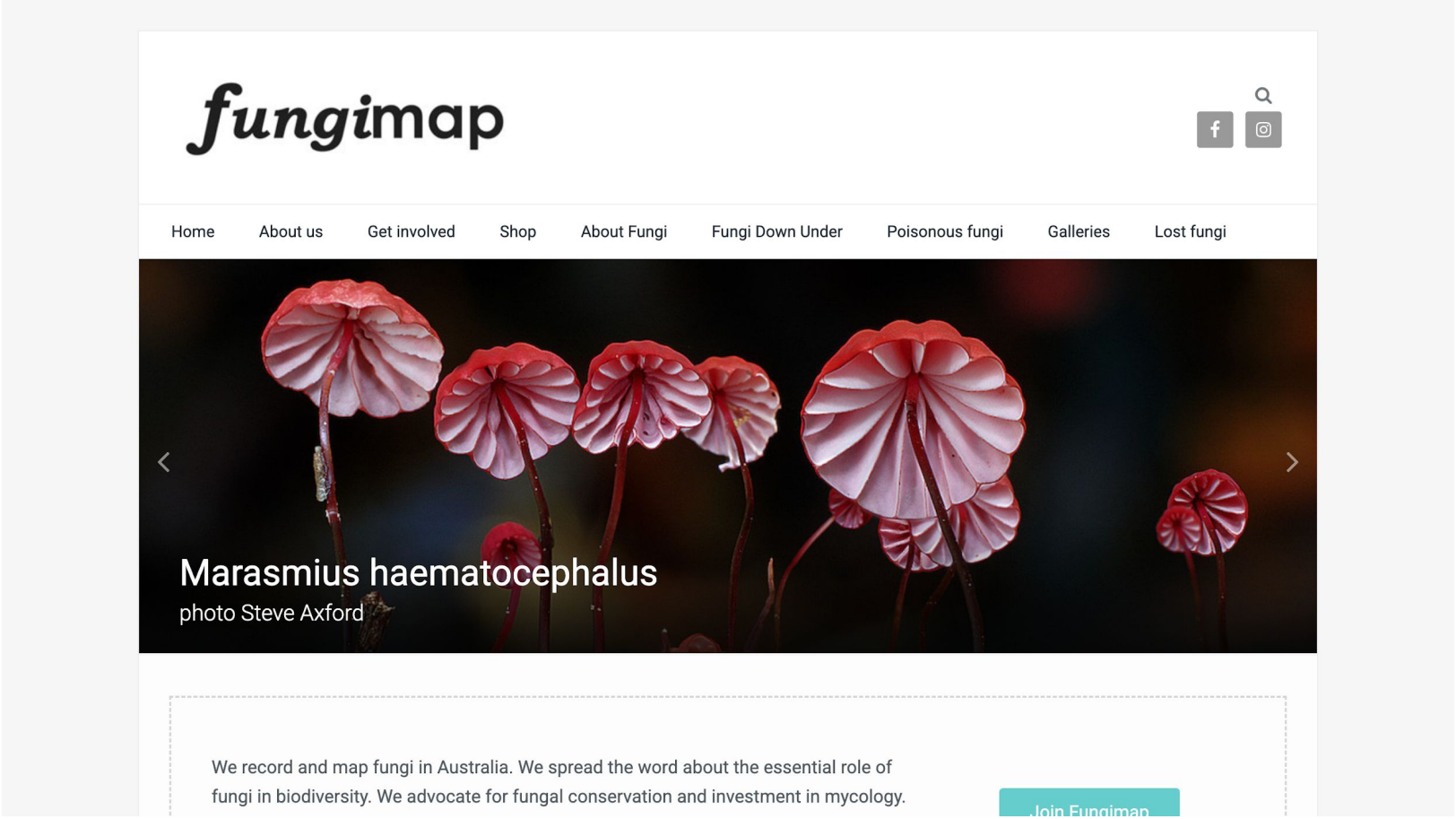


https://mushroomobserver.org

MIND.Funga

https://mindfunga.ufsc.br

Fungimap

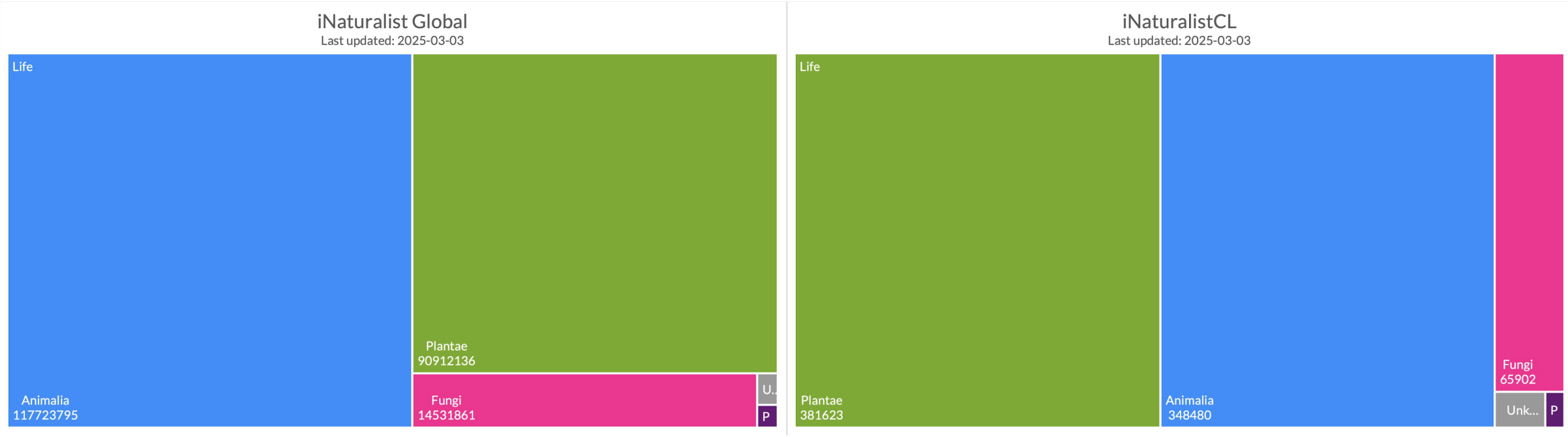


https://fungimap.org.au

iNaturalist y los hongos de Chile

La red global de iNaturalist

Perspectiva general de iNaturalist



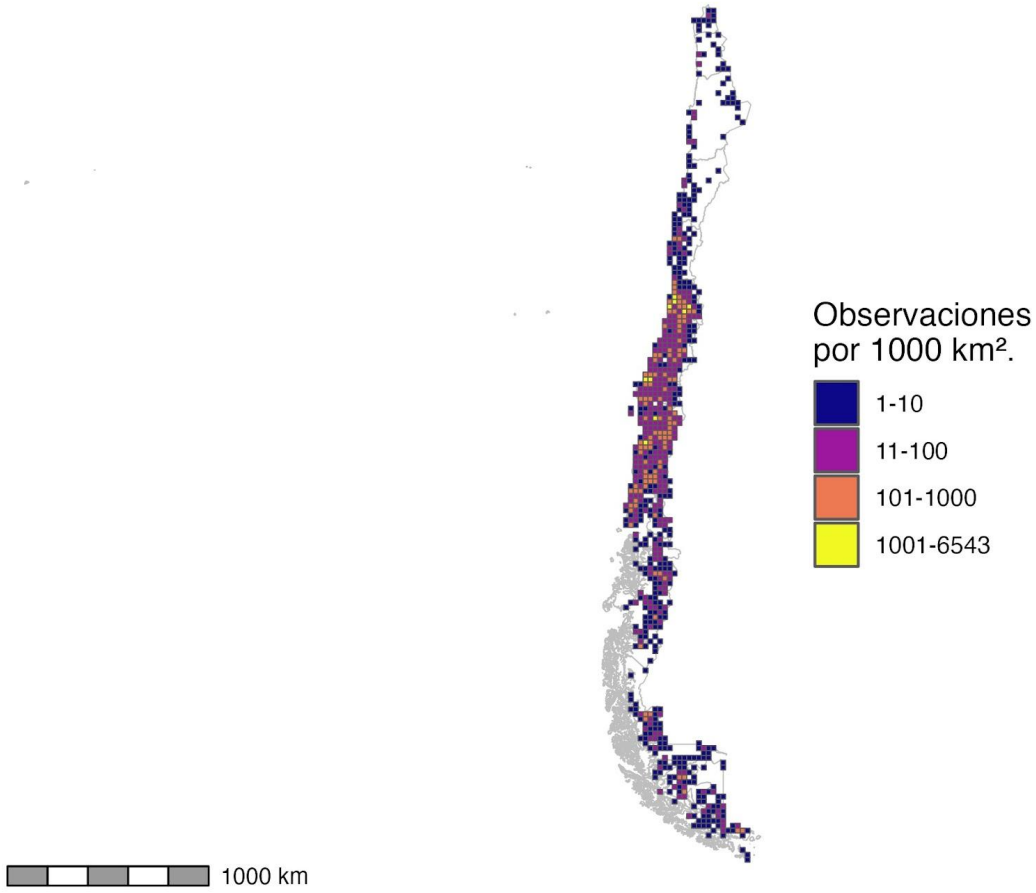
iNaturalistCL y los hongos de Chile *

Principales resultados

Observaciones	63174 observaciones
	14376 Research Grade
	1245 especies
Usuarios	103 usuarios han contribuido con 28077 observaciones
Localización	Entre Valparaíso y Los Lagos

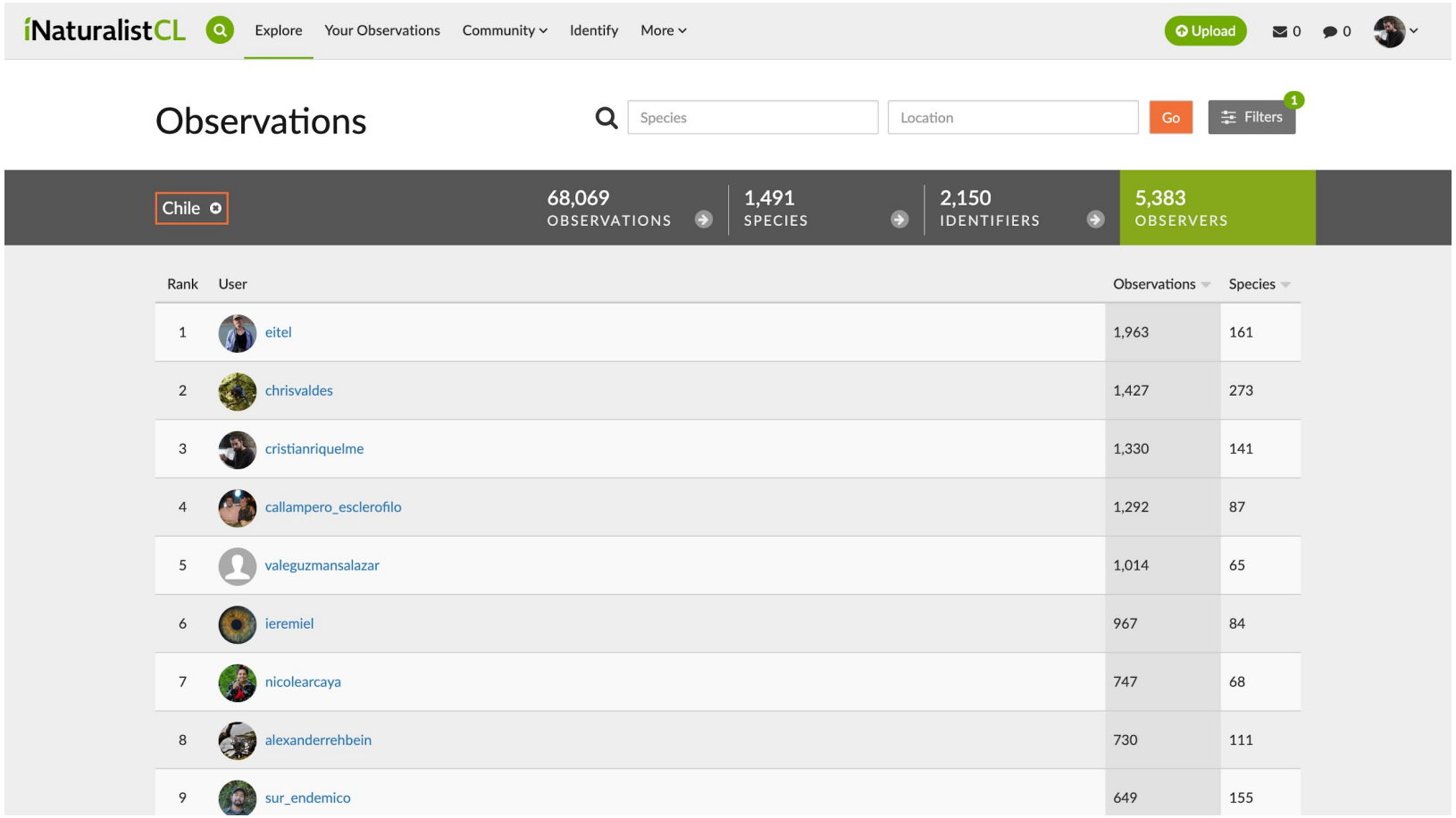
* Riquelme (2025)

iNaturalistCL y los hongos de Chile *



* Riquelme (2025)

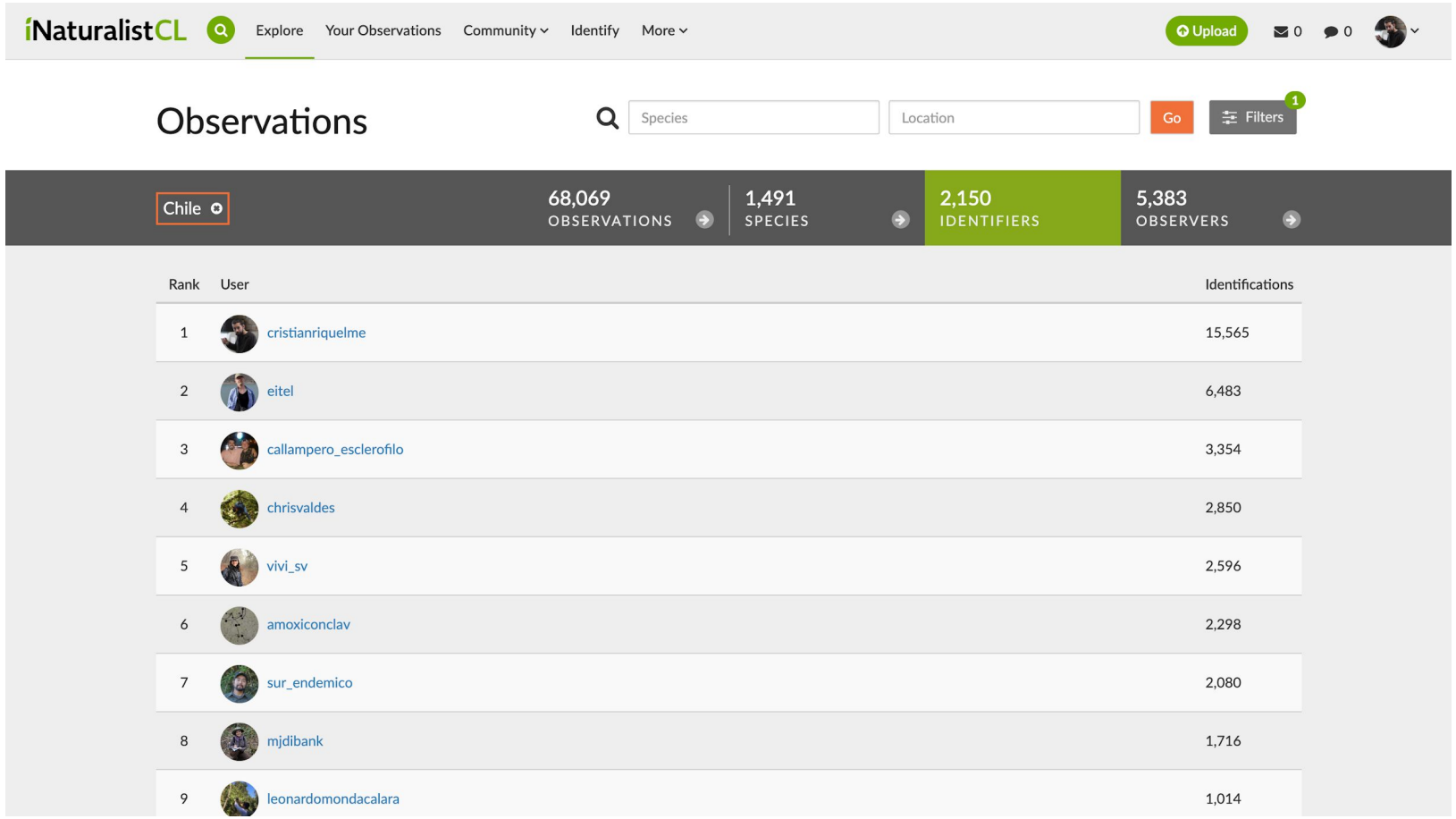
Hall of fame de iNaturalistCL



Rank	User	Observations	Species
1	eitel	1,963	161
2	chrisvaldes	1,427	273
3	cristianriquelme	1,330	141
4	callampero_esclerofilo	1,292	87
5	valeguzmansalazar	1,014	65
6	ieremiel	967	84
7	nicolearcaya	747	68
8	alexanderrehbein	730	111
9	sur_endemico	649	155

https://inaturalist.mma.gob.cl/observations?place_id=7182&view=observers&iconic_taxa=Fungi

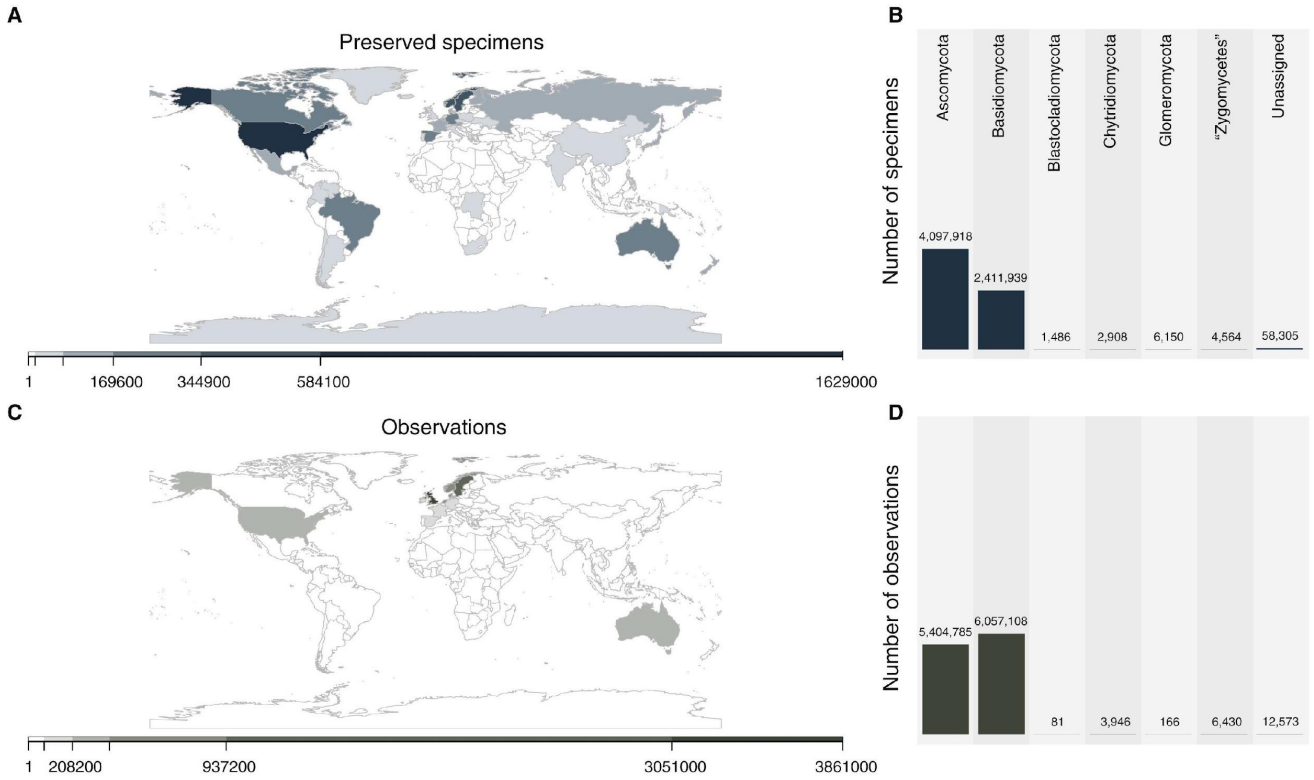
Hall of fame de iNaturalistCL



https://inaturalist.mma.gob.cl/observations?place_id=7182&view=identifiers&iconic_taxa=Fungi

Algunas consideraciones sobre CC

Colecciones biológicas de hongos *

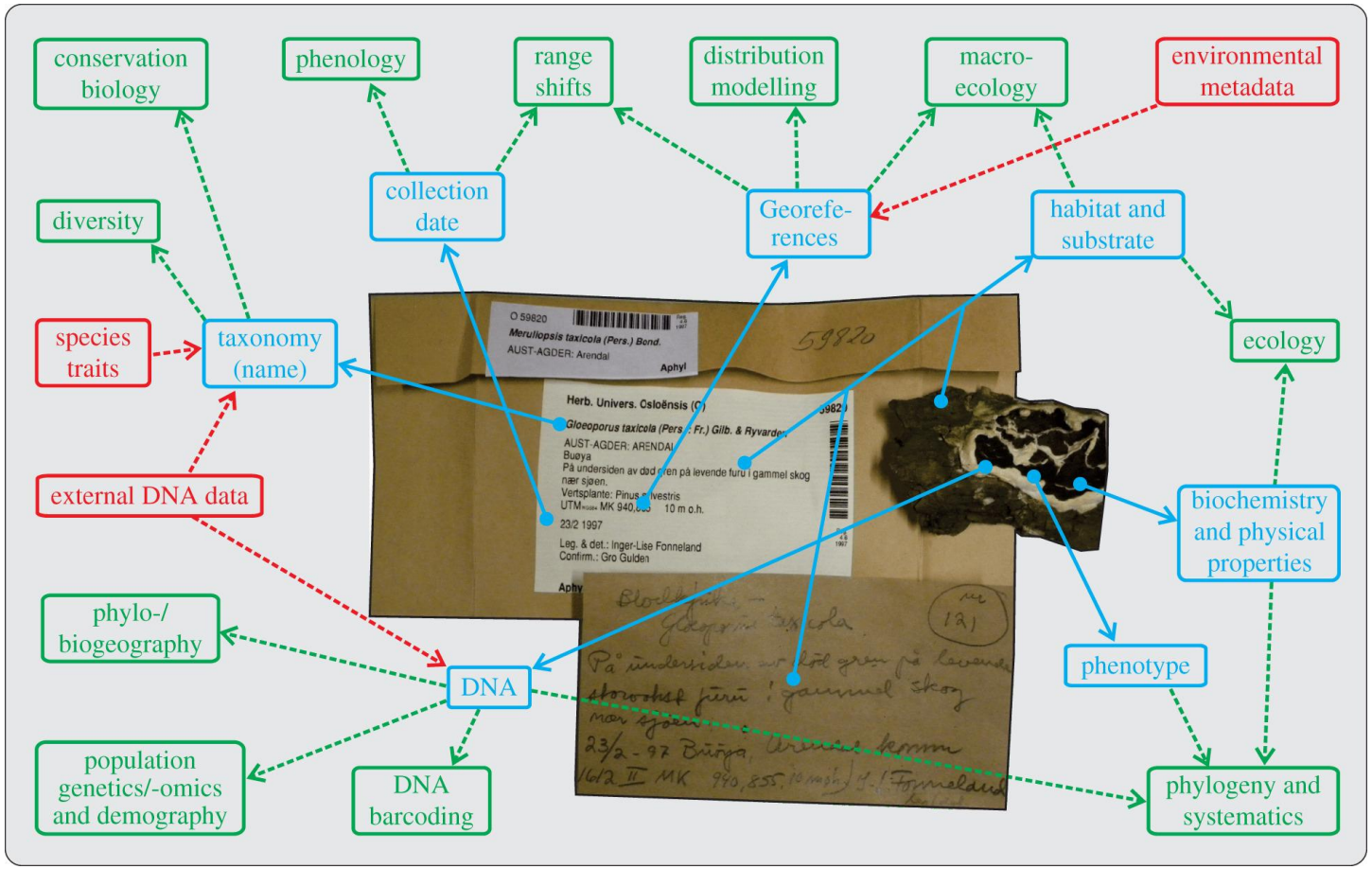


* Lofgren and Stajich (2021)

Kew’s Fungarium

https://www.kew.org/science/collections-and-resources/collections/fungarium

Ejemplo de espécimen de fungario *



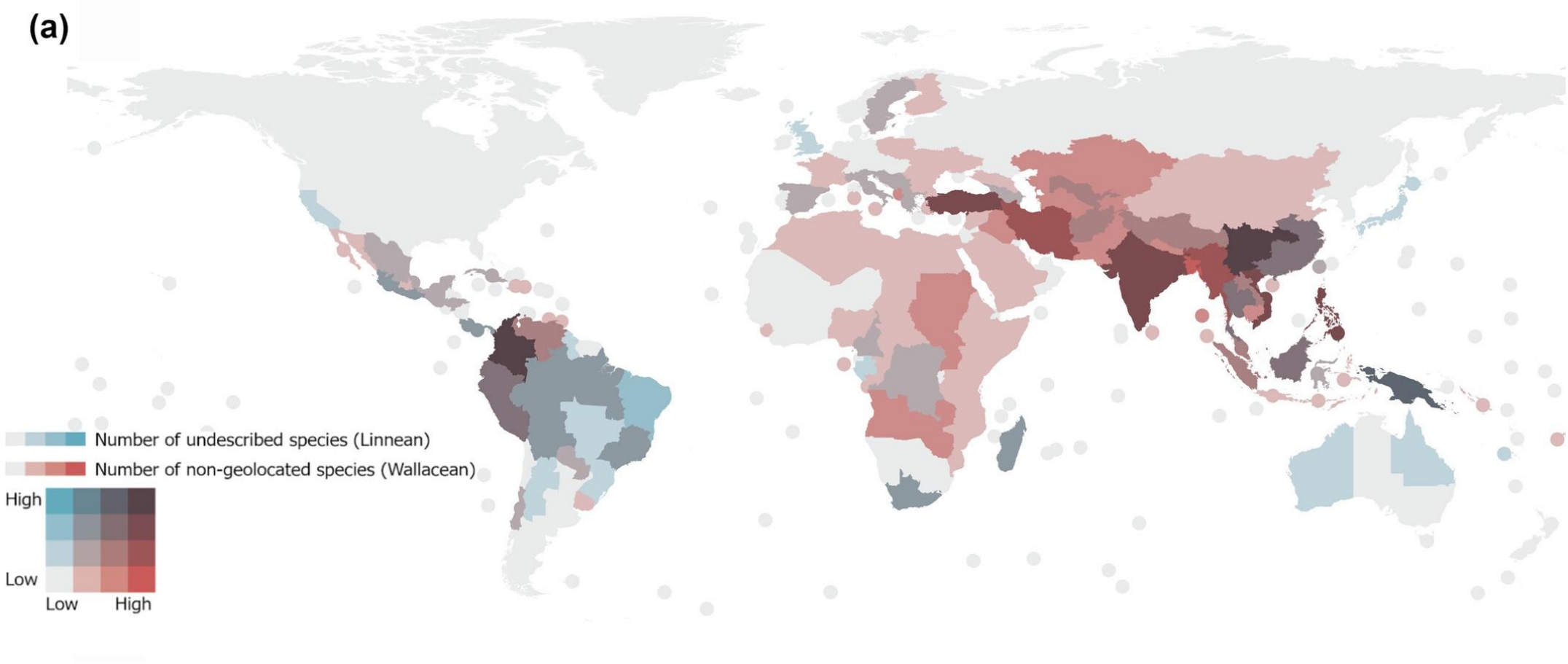
* Andrew *et al.* (2019)

Déficits en biodiversidad *

Biodiversity shortfalls		
	Linnaean	Taxonomy
	Wallacean	Distribution
	Scottian †	Red List coverage
	Prestonian	Abundance and population dynamics
	Darwinian	Phylogeny
	Hutchinsonian	Abiotic tolerances
	Raunkiæran	Functional traits
	Eltonian	Biotic interactions

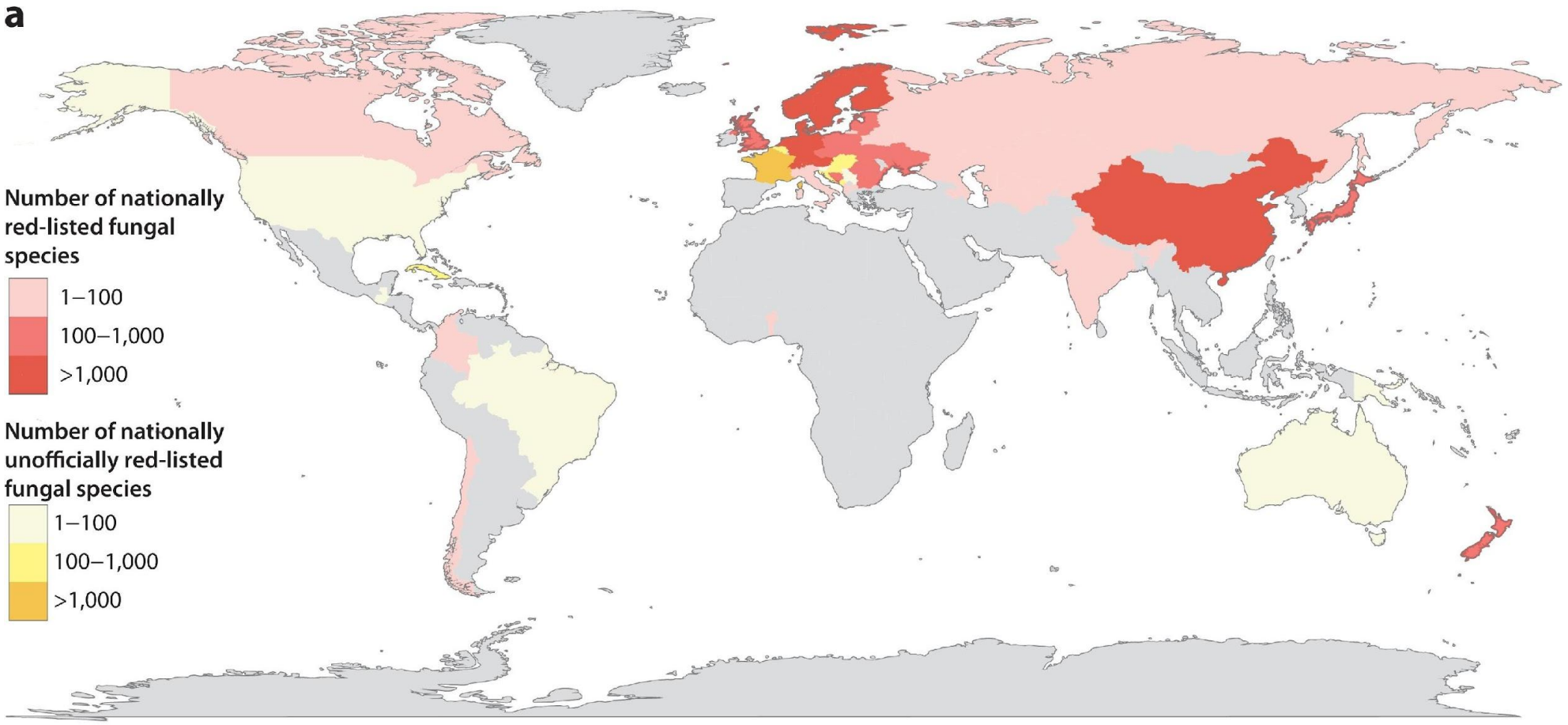
* Turton-Hughes *et al.* (2024); † Haelewaters *et al.*, (2024)

Déficit linneano y wallaceano *



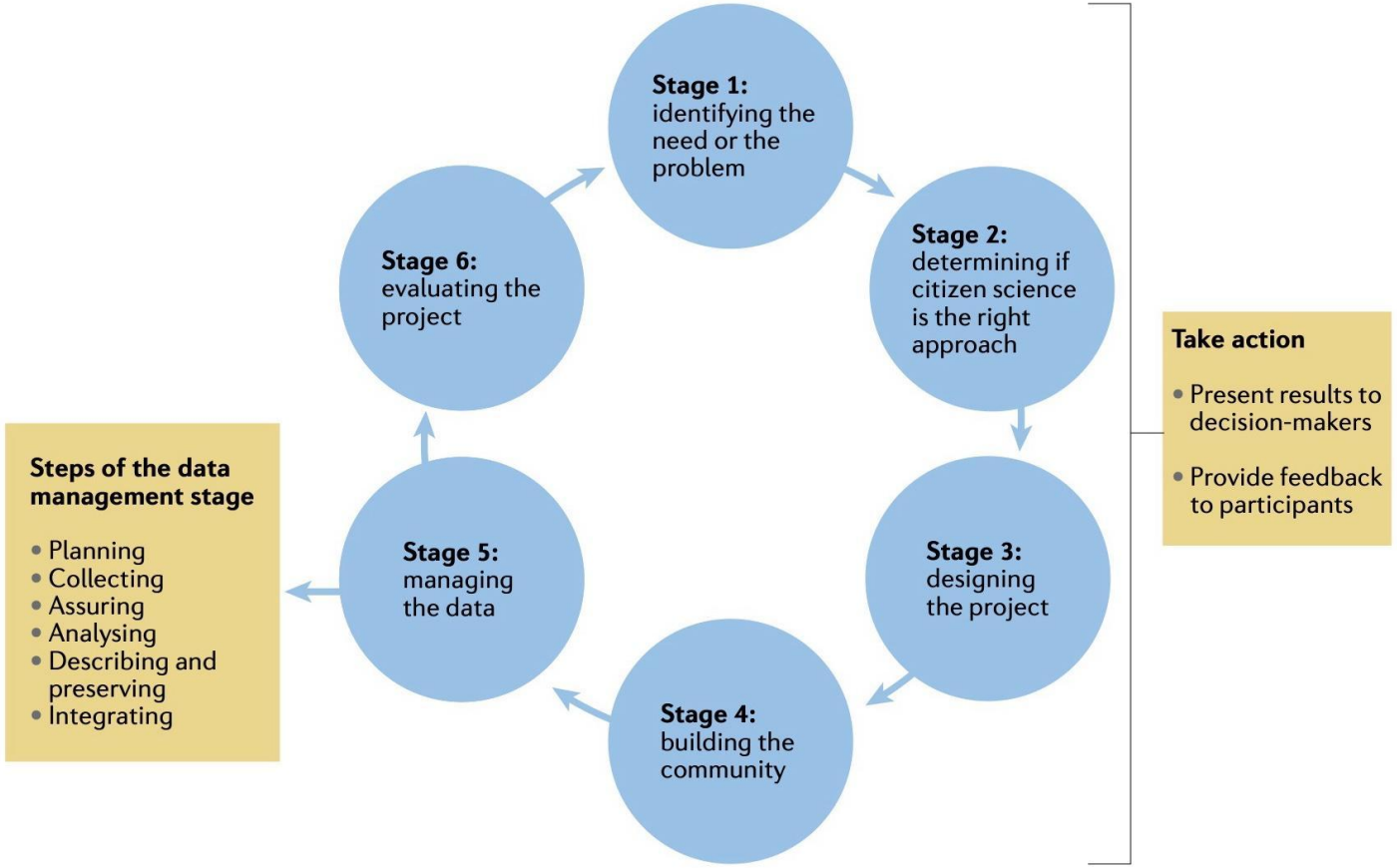
* Antonelli *et al.* (2024)

Déficit scottiano *



* Niskanen *et al.* (2023)

Diseño y ejecución de un proyecto de CC *



* Fraisl *et al.* (2022)

Calidad de los datos de CC *

Table 3 | **Common concerns regarding citizen science data quality and common mitigation procedures**

Concerns related to	Examples of issues and concerns related to data quality	Mitigation procedures
Skills of the participants	Inconsistent application of the protocol, including physical loss of data	Training of participants before and during the project[77,84,226]; adapted guidelines[86]; expert control and filtering of data[96]; community-based validation[90,92]; automatic filtering and big data approaches[98,105,106]; evaluation of participants' skills[101]
	Inconsistent use of technical tools	
	Identification and translation mistakes	
	Observation, identification or systematic sampling bias (for example, cryptic species surveys)	Specific participant training or testing[86,94]; targeted expert validation[55,86,96]
Habits of participants	Unrepresentative sampling effort	Structured protocols with prescribed sampling in space and time[109,110]; data filtering and correction factors[23,107,112,115]; model-based integration[117]
	Bias or lack of neutrality	Mutual checking by professional scientists and participants on possible conflicts of interest[227,228]; triangulation across communities, participants and methods[66]

* Fraisl *et al.* (2022)

Limitaciones en CC *

Table 4 | **Example limitations in citizen science and recommended solutions**

Examples of limitations	Recommendations on how to overcome them	Related design and implementation stage
Required wide range of skills outside the research subject	Establish partnerships with other project teams and stakeholders conducting similar projects and activities; work with participants who have expertise[42]	Stage 3: designing the project Stage 4: building the community
Lack of participant engagement and lack of diversity among participants	Understand participant motivations at the design stage; create tasks that appeal to different motivations; integrate tasks into the existing day-to-day activities of the participants[35]; facilitate participant feedback and exchange throughout the project[62,195,196]; avoid dependency on resources not locally available[35]; integrate co-designed processes depending on the availability of time, resources and implementation experience[62,195,196]	Stage 4: building the community
Bias related to the quality of non-professional contributions, with subsequent risk of citizen science not being recognized as a legitimate source of knowledge in decision-making	Be aware of the potential loss of power and control on the part of conventional-thinking scientists and decision-makers[24,35]	Stage 3: designing the project Stage 5: managing the data (steps related to assuring and analysing)
Bias related to human population density	Examine the literature to identify potential biases and their influence on the project, and take them into account during design and analysis[56,198–204]	Stage 3: designing the project Stage 5: managing the data (steps related to assuring and analysing)
Temporal biases, such as the daytime and weekend bias		
Bias related to the extent of participant contributions		
Bias in the profile of participants		
Quality of sensors used		
Varying data protection laws in different countries	Consider what data are essential for the project at the design stage of a project, keeping in mind, for example, the data minimization principle of the European Union General Data Protection Regulation[161]	Stage 3: designing the project Stage 5: managing the data (steps related to planning, collecting, assuring, analysing, describing and preserving)
Issues related to designing and implementing projects in remote areas	Account for potential issues while designing citizen science projects under such circumstances; ensure high level of participant engagement through co-designed approaches[205]	Stage 3: designing the project Stage 4: building the community Stage 5: managing the data (steps related to planning and collecting)
Risks related to data collection, such as loss of smartphones, visiting locations that are remote or unsafe, political risks, and so on	Clearly communicate the potential risks related to participation along with information on how to avoid them[55]	Stage 3: designing the project Stage 5: managing the data (steps related to planning and collecting)

* Fraisl *et al.* (2022)

Publicación de resultados de CC *

Steps for describing and preserving outputs	Gather outputs	Prepare	Organize and format	Publish under open licence
Citizen scientists  Project organizers 	Data Code Hardware designs Educational and outreach material Other outputs	Sensitive data Private and personal information	Field-specific and citizen science data standards Version control	Environmental and ecological sciences GBIF DRYAD Multidisciplinary zenodo OSF

* Fraisl *et al.* (2022)

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