



Citizen Science? What?



Citizen Science is the **involvement** of volunteers and scientists in **collaborative research** activities to produce **new knowledge** based upon **scientific evidences**.



The level of involvement and the tasks which can be given to volunteer depends on the skills of each participant.



In some cases volunteers can perform practically all the tasks which are required in a scientific research, other than “simply” collecting data.

Levels of Citizen Science

Level 4 'Extreme'

- Collaborative Science – problem definition, data collection and analysis

Level 3 'Participatory science'

- Participation in problem definition and data collection

Level 2 'Distributed Intelligence'

- Citizens as basic interpreters

Level 1 'Crowdsourcing'

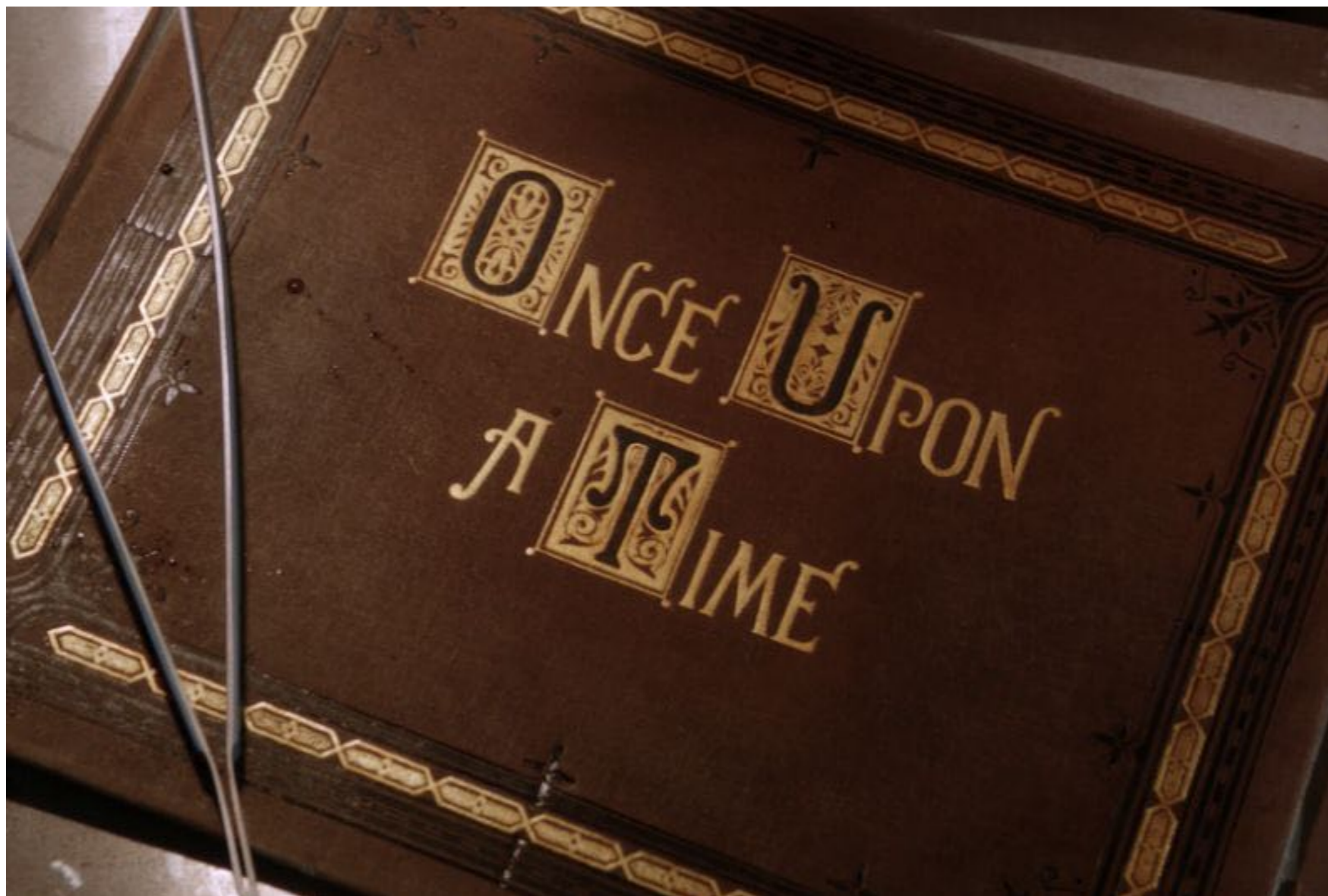
- Citizens as sensors

A bottom up project: **GERT**, Brescia, Italy.

Ca. 12500 observations in 8 years

Thanks to the involvement of ca. 150 volunteers.






ONCE UPON
A TIME

A group of people, mostly young adults, are gathered outdoors in a park-like setting with bare trees. They are wearing winter clothing like jackets and hats, and many are looking upwards, suggesting they are participating in a bird-watching activity. The scene is brightly lit, likely by sunlight filtering through the trees.

Audubon

[Take Action](#)[Join](#)[Renew](#)[Donate Now](#)[News](#) | [Features](#) | [Birds](#) | [Get Outside](#) | [Conservation](#) | [About Us](#) | 

Christmas Bird Count

The nation's longest-running citizen science bird project fuels Audubon science throughout the year.

From the web pages of the Audubon Society:

Prior to the turn of the 20th century, hunters engaged in a holiday tradition known as the Christmas "Side Hunt." They would choose sides and go afield with their guns—whoever brought in the biggest pile of feathered (and furred) quarry won.

Conservation was in its beginning stages in that era, and many observers and scientists were becoming concerned about declining bird populations.

Beginning on Christmas Day 1900, ornithologist Frank M. Chapman, an early officer in the then-nascent Audubon Society, proposed a new holiday tradition—a "Christmas Bird Census" that would count birds during the holidays rather than hunt them.

So began the Christmas Bird Count. Thanks to the inspiration of Chapman and the enthusiasm of 27 dedicated birders, 25 Christmas Bird Counts were held that day. The locations ranged from Toronto, Ontario to Pacific Grove, California with most counts in or near the population centers of northeastern North America. Those original 27 Christmas Bird Counters tallied around 90 species on all the counts combined.



Before the *Christmas Bird Count*, tuttavia, however, there were several other experiences, one of which are well documented.

One of these initiatives was organised by the American Ornithologists' Union, which involved lighthouse guardians in reporting the birds which crashed on the lighthouses themselves.

In this case, the experimental plan was not so solid, and the results were dramatically heterogeneous data, but at the very end they continued collecting data for decades.



A successful activity was developed by Prof. Wells Cook in 1880.

He enrolled volunteers in collecting data on migratory birds.

Data to be collected were relatively simple: the day birds arrived, the day of the maximum presence, and the day they left.

This activity was incredibly successful, and ended only in the 70s of the last century.

6 million records were collected, and they were also used recently for analysing the effect of global changes on migratory birds.





More recently, an interesting experiment was carried on in the British Isles in 1974.

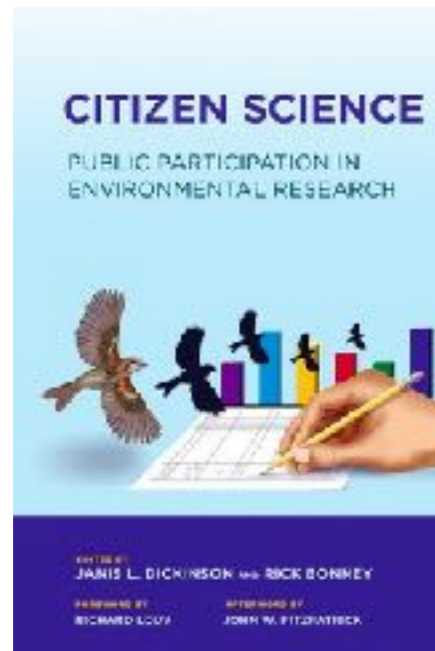
Ca. 1000 students 13-14 years old were involved in monitoring epiphytic lichen biodiversity as a proxy of air quality. They did the job by following an extremely simplified protocol, and often identifying the species only at group or genus level. Furthermore, their error rate in identification was averagely around 30-40%.

The result, however, was so good, that the Institute for Terrestrial Ecology of the National Environment Research Council wrote, in a report of 1977 entitled "Plants as ecological indicators of air pollution" states that the map of air quality produced by students' data *showed no significant discrepancies from that produced by the much more sophisticated methods used by Hawkeworth and Rose (1976) and their collaborators.*

Citizen Science is today mainstream in several countries, especially in North Europe and in the USA.

This happens since:

- Citizen Science actions contribute to increase the awareness of citizen on many relevant issues, especially related to climate change
- Citizen science contributes to the production of the so called **big data** in relatively short time



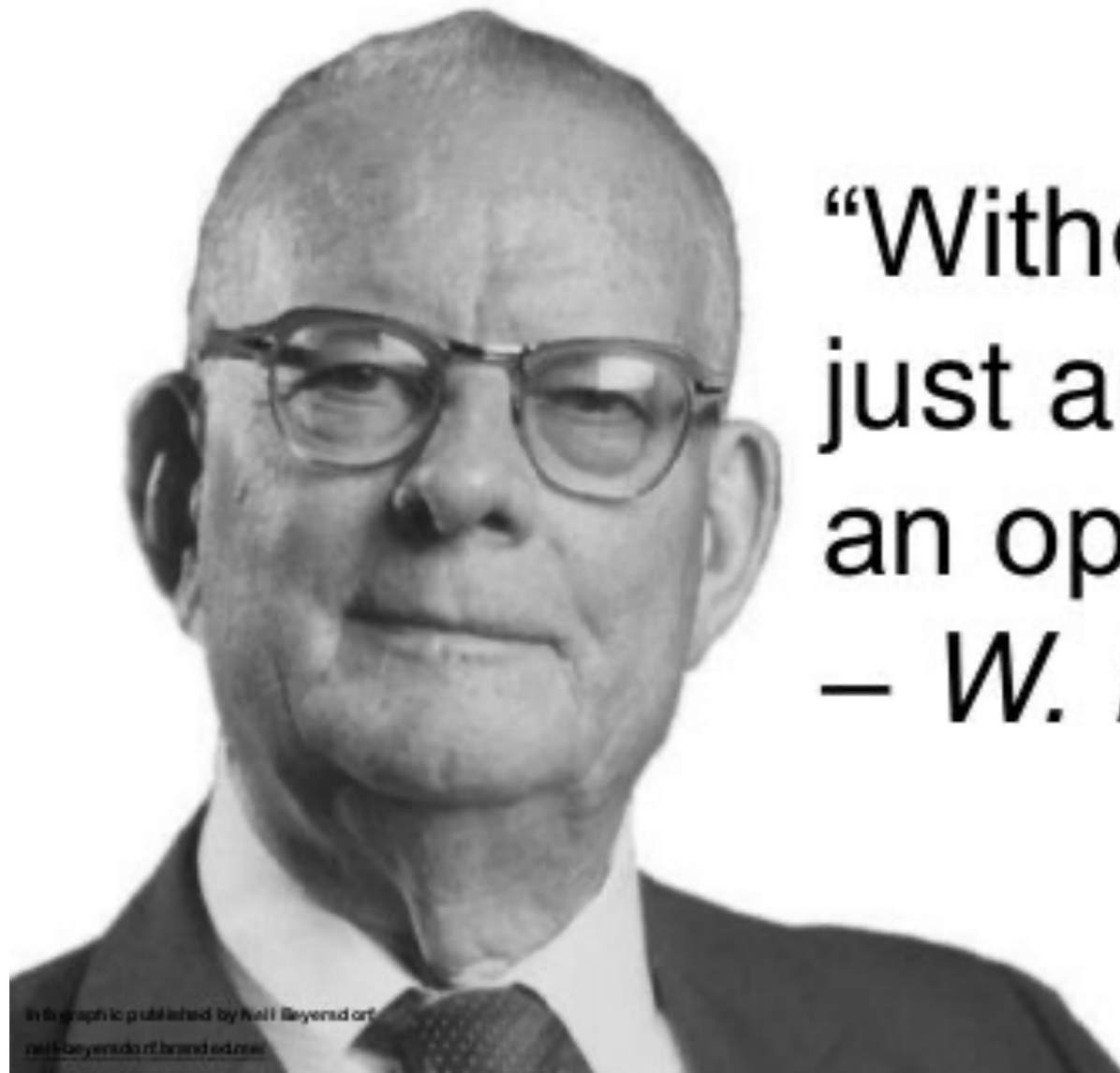
Reuntable

Citizen Science: A Developing Tool for Expanding Science Knowledge and Scientific Literacy

RICK BONNEY, GAFEN B. DOOPER, JANIS DICKINSON, STEVE KELLING, TINA PHILLIPS, KENNETH V. ROSENBERG, AND JENNIFER SHIRK

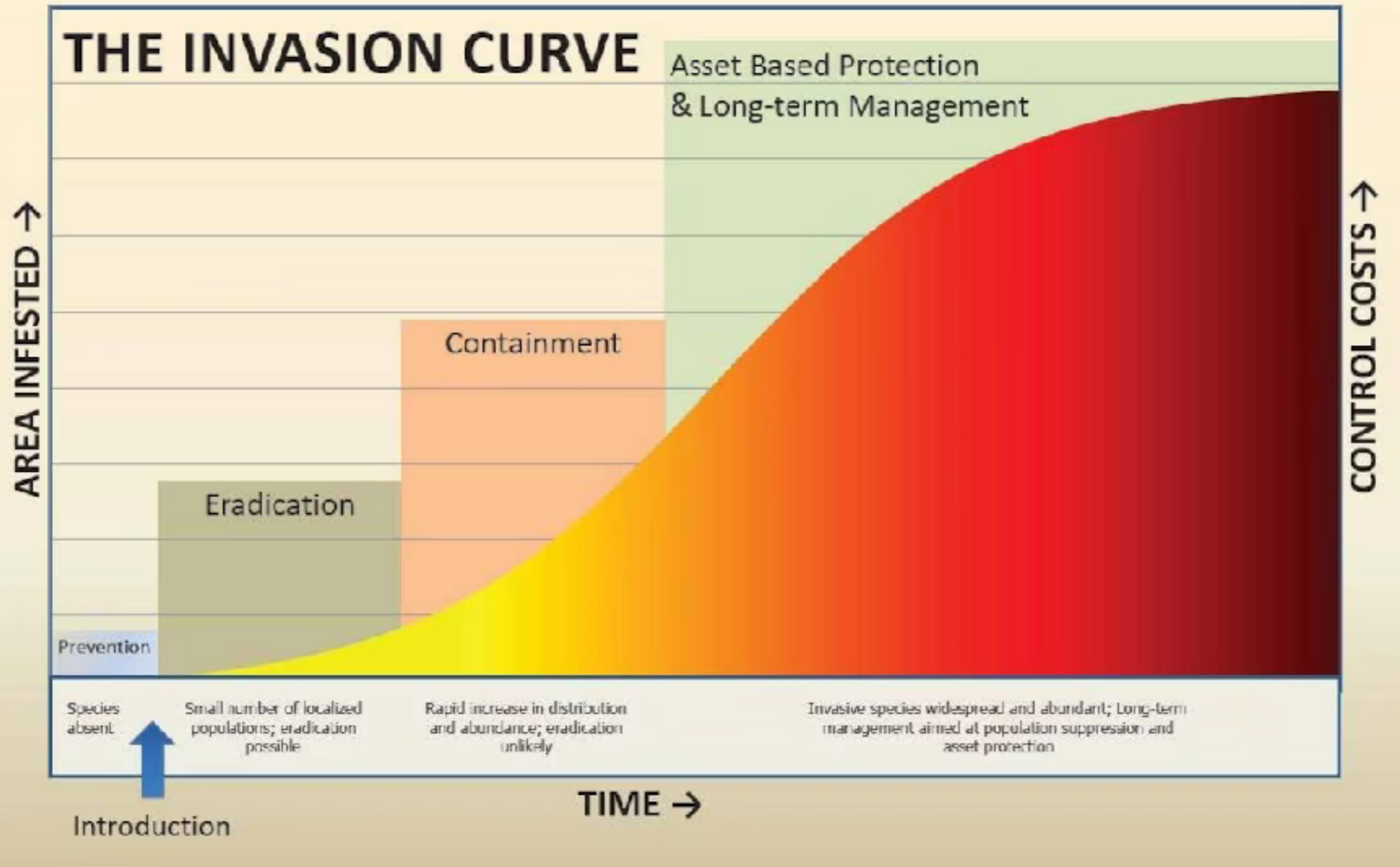
Citizen science enables the public to collect large quantities of data across an array of habitats and locations over long spans of time. Citizen science projects have been remarkably successful in advancing scientific knowledge, and contributions from citizen scientists now provide a vast quantity of data about species occurrence and distribution around the world. Most citizen science projects also strive to help participants learn about the questions they are observing and to experience the process by which scientific investigations are conducted. Developing and implementing public data-collection projects that yield both scientific and educational outcomes requires significant effort. This article describes the model for building and operating citizen science projects that has evolved at the Cornell Lab of Ornithology over the past two decades. We hope that our model will inform the fields of biodiversity monitoring, biological research, and science education while providing a window into the culture of citizen science.

Keywords: citizen science, public participation in research, public scientific literacy



“Without data you’re
just another person with
an opinion.”
– *W. Edwards Deming*

THE INVASION CURVE





European Citizen Science Association

[About us](#)

[Contact us](#)





Ma funziona? Davvero?



Fig. 1. *Ochyrotica taiwanica*, n. sp., holotype.



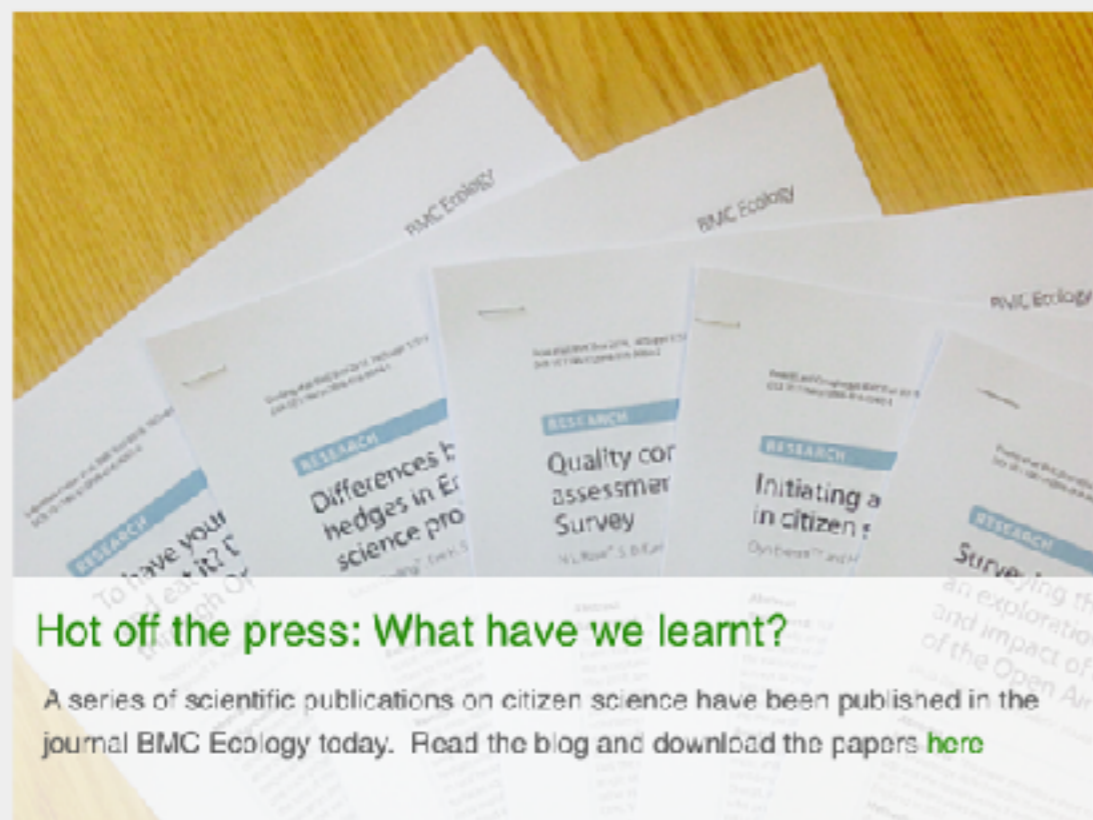


EXPLORE NATURE

Sign in | Register | Why register? Search


Home About OPAL News Regions Surveys ID guides Learning Kids Zone Societies

Open Air Laboratories gets you close to nature with national surveys and our community scientist network



Hot off the press: What have we learnt?

A series of scientific publications on citizen science have been published in the journal BMC Ecology today. Read the blog and download the papers [here](#)

Subscribe to the OPAL newsletter

Latest news

- Nature in Mind: Nature in Focus
- The birds, the bees and the bands: OPAL hits Glastonbury
- Work Experience with OPAL
- Calling all gardeners! Help OPAL survey for the New Zealand Flatworm
- OPAL Survey in focus: Ashley Primary School

[More](#)

Twitter



Learn how to use Artportalen

Get started

Artportalen basic principles

Read more

Create account

Login

Today's nature

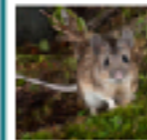
Articles from SLU Swedish Species Information Centre (in Swedish)



Känner du igen en gnagare?

PUBLICERAD: 2022-11-30

Har du hittat en död mus och undrar vad det kan vara för art? Eller kanske bara en skalle eller underkäke av något som skulle kunna vara en gnagare? Då kan du nu få hjälp med artbestämningen!



Känner du igen en gnagare?

PUBLICERAD: 2022-11-30



Lär känna våra svenska tapetserar- och sidenbin

PUBLICERAD: 2022-11-17



Spärroxbär - invasiv på Ölands och Gotlands alvarmarker

PUBLICERAD: 2022-11-14



Bojar mot ankringsskador - en aktiv naturvårdsinsats för havets ängar

PUBLICERAD: 2022-09-28



Pluggskivling - en omvärderad matsvamp och dess släktingar

Today's sightings

TODAY/YESTERDAY

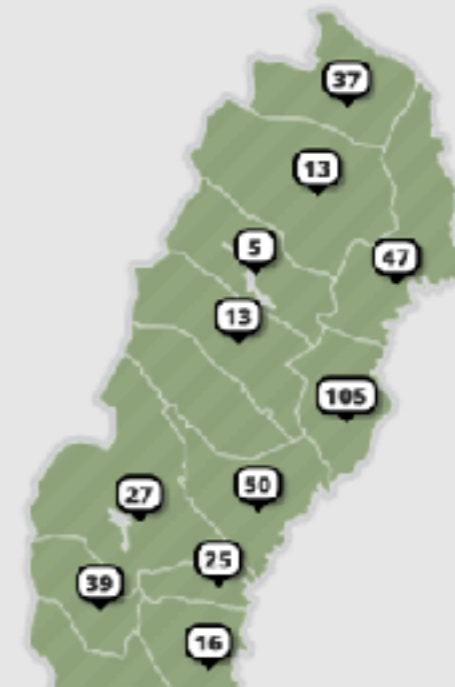
Today

5451 Sightings

304 Species

SPECIES GROUP

All



Oltre 96 milioni di record, e oltre 1,3 milioni solo nei primi due mesi del 2023



OCCHIO ALLA MEDUSA

URDIFANTE **LEGGERMENTE URDIFANTE** **NON URDIFANTE**

Il vostro aiuto è prezioso !

Se vedete queste specie mandate la vostra segnalazione a <http://www.focus.it/meduse/> oppure a boero@unisalento.it

Mandate un messaggio (preferibilmente con foto digitale) con queste informazioni :

NOME DELLA SPECIE: indicare la specie se presente nel posto o indicare specie nuova con foto

ABBONDANZA: meno di 10, 10-100, 100-500, 500-1000, più di 1000

LOCALITÀ: (nome e/o coordinate geografiche) acque costiere, al largo, spiaggia

DISTANZA TRA GLI INDIVIDUI: 10 cm, meno di 1m, 1-5m, 5-10m, 10-20m, più di 20m

NUMERO DI INDIVIDUI PER METRO QUADRATO: meno di 10, 10-100, 100-500, più di 500

CONSERVAZIONE FATE DURANTE: pesca, navigazione, immersione, scuba, cammino largo costa

FOCUS - FOCUS ON BEACH - S.P. SPINALE BARONDI - SCIENTIFIC TABLE TABLE

THERIO.IT ARCHIVIO SEGNALAZIONI **ATLANTE MAMMIFERI D'ITALIA** Login

19 Segnalazioni

Cos'è Therio.it?

Esplora le varie specie di mammiferi presenti in Therio.it. Visualizza tutti i mammiferi presenti su mappa georeferenziata con google maps. Eseguì una ricerca filtrata per visualizzare tutte le segnalazioni appartenenti ad una singola specie.

Hai visitato un mammifero? Invia la tua segnalazione. Aiutaci far conoscere la nostra fauna itica, basta una semplice segnalazione.

Esplora le specie Invia dati Contatti

Home Info Progetto Divulgazione Segnalazioni Le specie Staff

MIPP LIFE11 NALIT 000232 MIP

MIPP anche tu!

Partecipa ed invia le tue segnalazioni

TUTTE LE SEGNALAZIONI

COME SEGNALARE

CONOSCI TESCO?

SEGNALA

LE SPECIE

Benvenuti nel progetto MIPP

LA NATURA SEI TU.



Diventa Citizen Scientist e tutela la biodiversità.

Partner

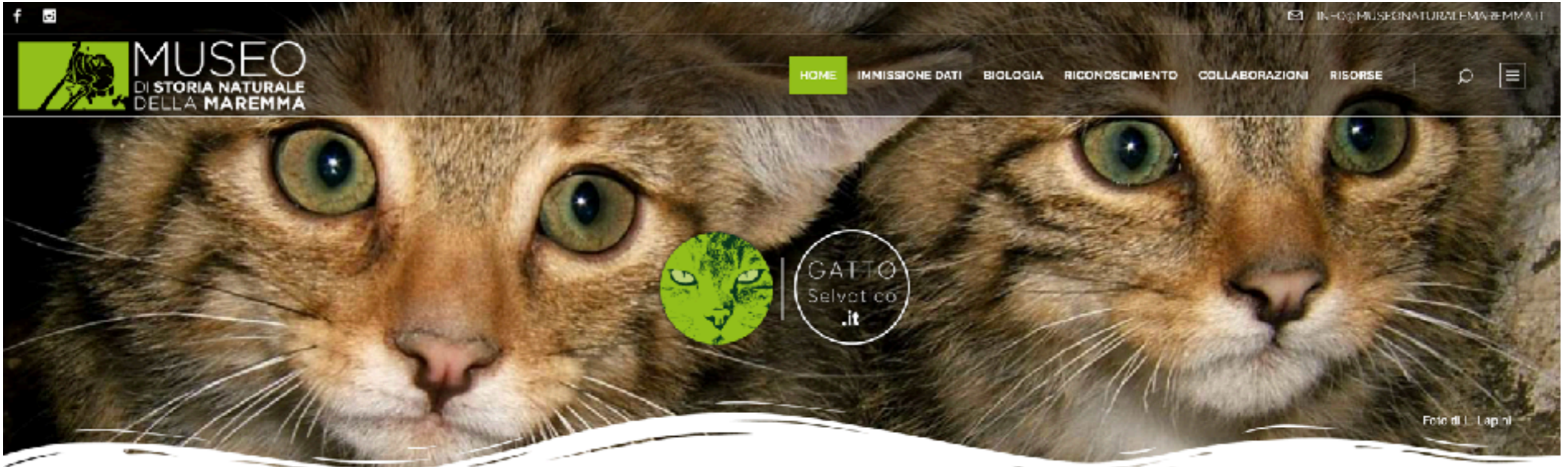


DIPARTIMENTO
DI BIOLOGIA AMBIENTALE



CIHEAM
BARI





Progetto Nazionale



BIOLOGIA

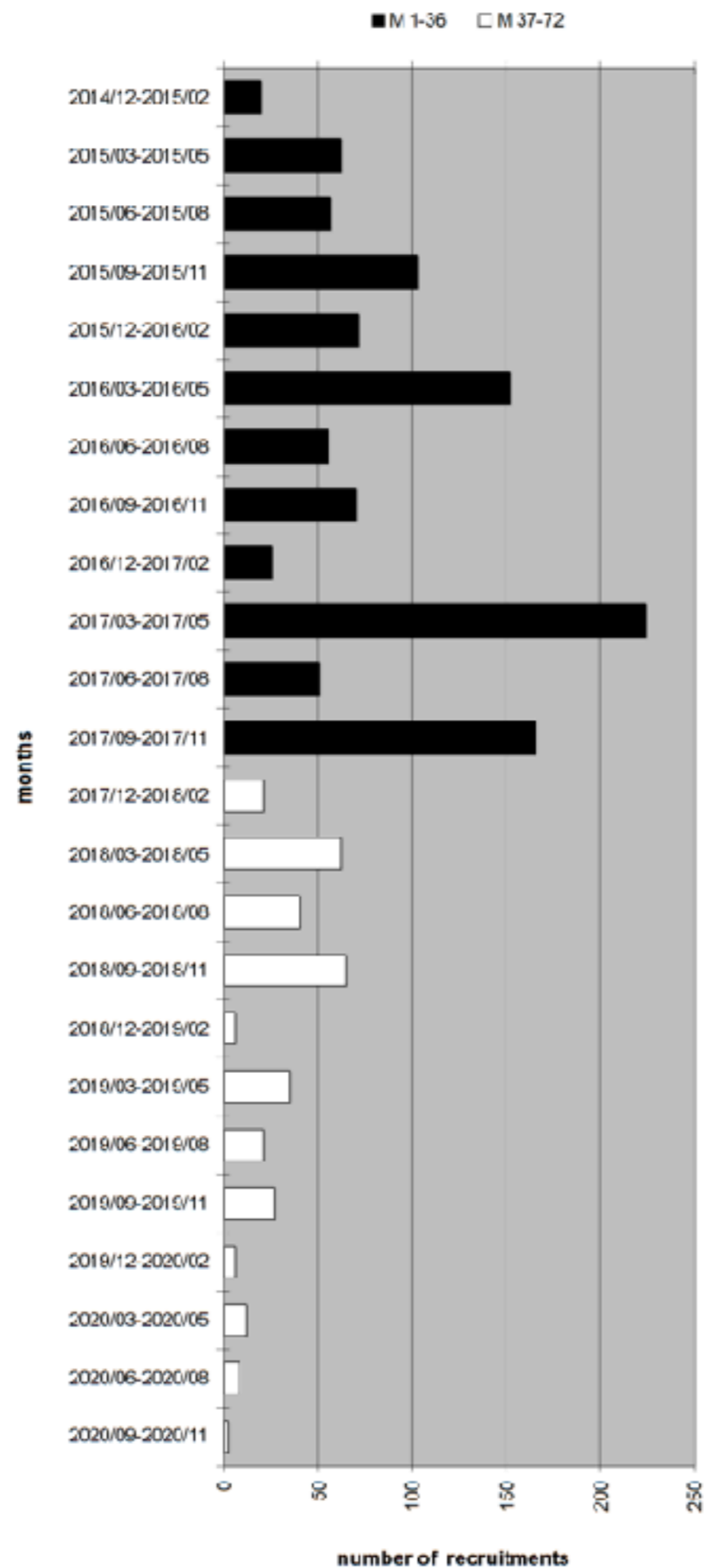
Gattoselvatico.it è il portale italiano dedicato al gatto selvatico. Contiene notizie sulla specie, approfondimenti, pubblicazioni, oltre alla mappa di distribuzione della specie aggiornata in tempo reale, con dati storici, recenti e nuove acquisizioni. Chiunque può contribuire, inviando foto o link a filmati (anche da fototrappole), con data e località. Un team di specialisti validerà le segnalazioni che, con la conferma, entreranno nella

A speech bubble with a black outline and rounded corners. Inside the bubble, the text "Yes, BUT..." is written. "Yes," is in black, "BUT" is in red, and there are three black dots following "BUT".

Yes, BUT...

Comunicazione e coinvolgimento





10 minutes on *Geo&Geo*

5 minutes on *Linea Blu*

A BioBlitz with wide media coverage on national newspaper and television (*Canale 5*)

A “*Sport & Natura*” event, with wide coverage on national newspaper (*Gazzetta dello Sport* as well!) and on television (*Rai Scuola*)

First Edition of the Urban Nature event, in cooperation with the Italian WWF

City Nature Challenge

Second Edition of the Urban Nature event, in cooperation with the Italian WWF



One of the most relevant issues in Citizen Science is the need for a continuous, bilateral **feedback** between researchers and volunteer, which is the only way to maintain a high ***retention rate*** of participants.



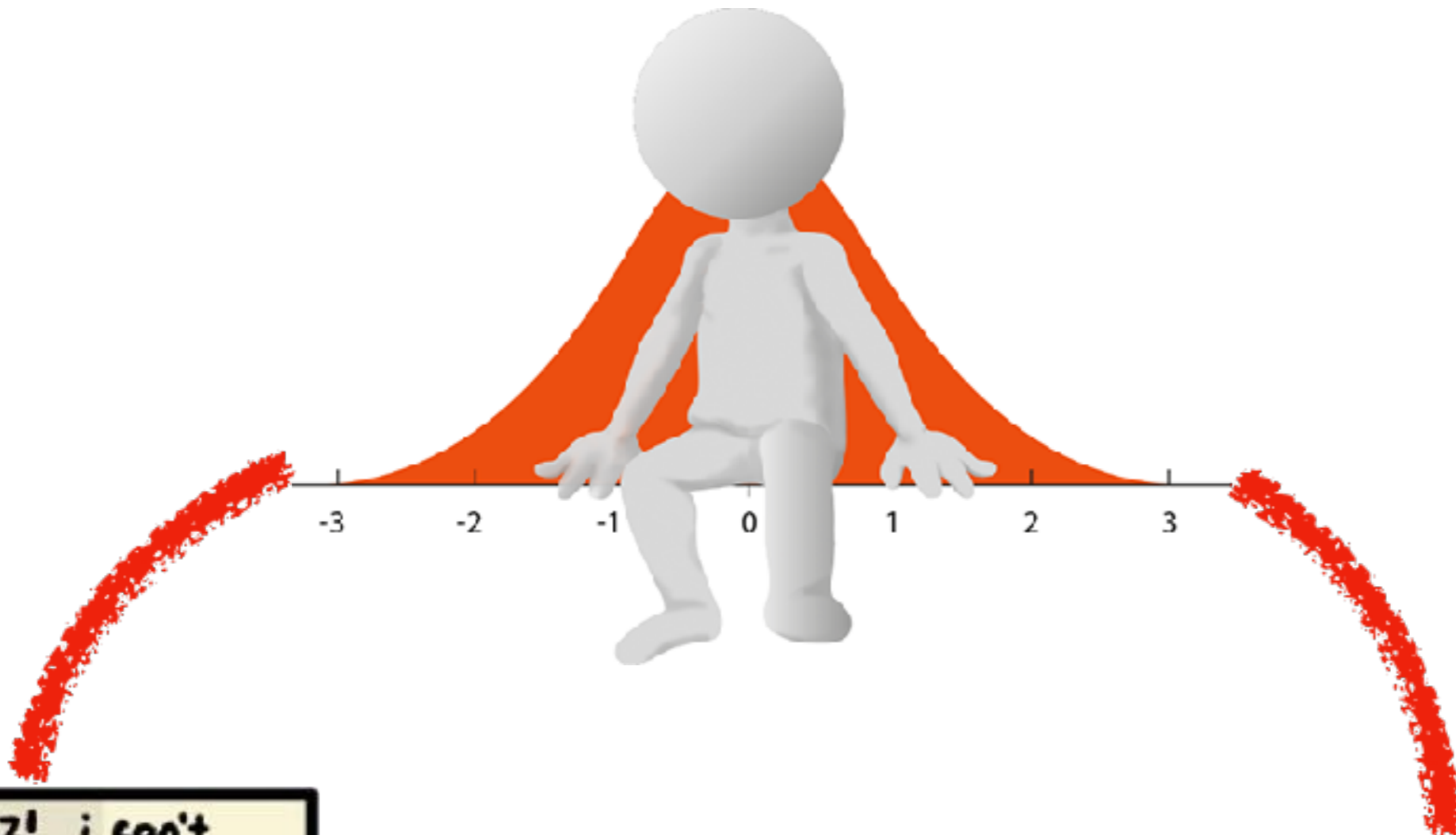
Age Classes	% of Correct Observations			Increase of Observations in M 37-72 (%)	Volunteers Retained from M 1-36 (%)	Increase of Volunteers in M 37-72 (%)
	M 1-36	M 37-72	Overall			
<=1950	86.63	97.99	96.74	724.42	31.25	62.50
1951-1960	89.58	98.96	94.82	121.07	6.59	24.44
1961-1970	88.97	85.09	88.04	36.66	11.18	31.58
1971-1980	74.56	82.30	76.56	34.34	4.57	35.53
1981-1990	85.77	91.15	86.95	27.63	10.00	26.15
1991-2000	78.77	86.30	81.22	46.89	4.05	18.47
2001-2008	63.56	77.75	65.69	17.69	2.51	33.05
<i>p</i>	<0.001	<0.001				

Age classes based on the year of birth. M 1-36: project activity period; M 37-72: follow-up period. The significance of the diversity in the ratio correct/wrong observations per project period in the different age classes was tested by mean of a Pearson's Chi-squared test.

Retention Groups	% of Correct Observations
1	70.53
2-5	74.97
6-10	87.95
11-20	90.14
21-30	92.20
>30	96.70

Retention groups are based on the number of months in which each volunteer contributed to the project. Retention groups are 1 month, 2-5 months, 6-10 months, 11-20 months, 21-30 months, and >30 months.





Data Quality





Opportunistic citizen science data of animal species produce reliable estimates of distribution trends if analysed with occupancy models

Arco J. van Strien^{1,2*}, Chris A.M. van Swaay³ and Tim Termaat³

¹Statistics Netherlands, P.O. Box 24500, 2490 HA The Hague, The Netherlands; ²Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, Science Park 904, 1098 XH Amsterdam, The Netherlands; and

³Dutch Butterfly Conservation, P.O. Box 506, 6700 AM Wageningen, The Netherlands

Summary

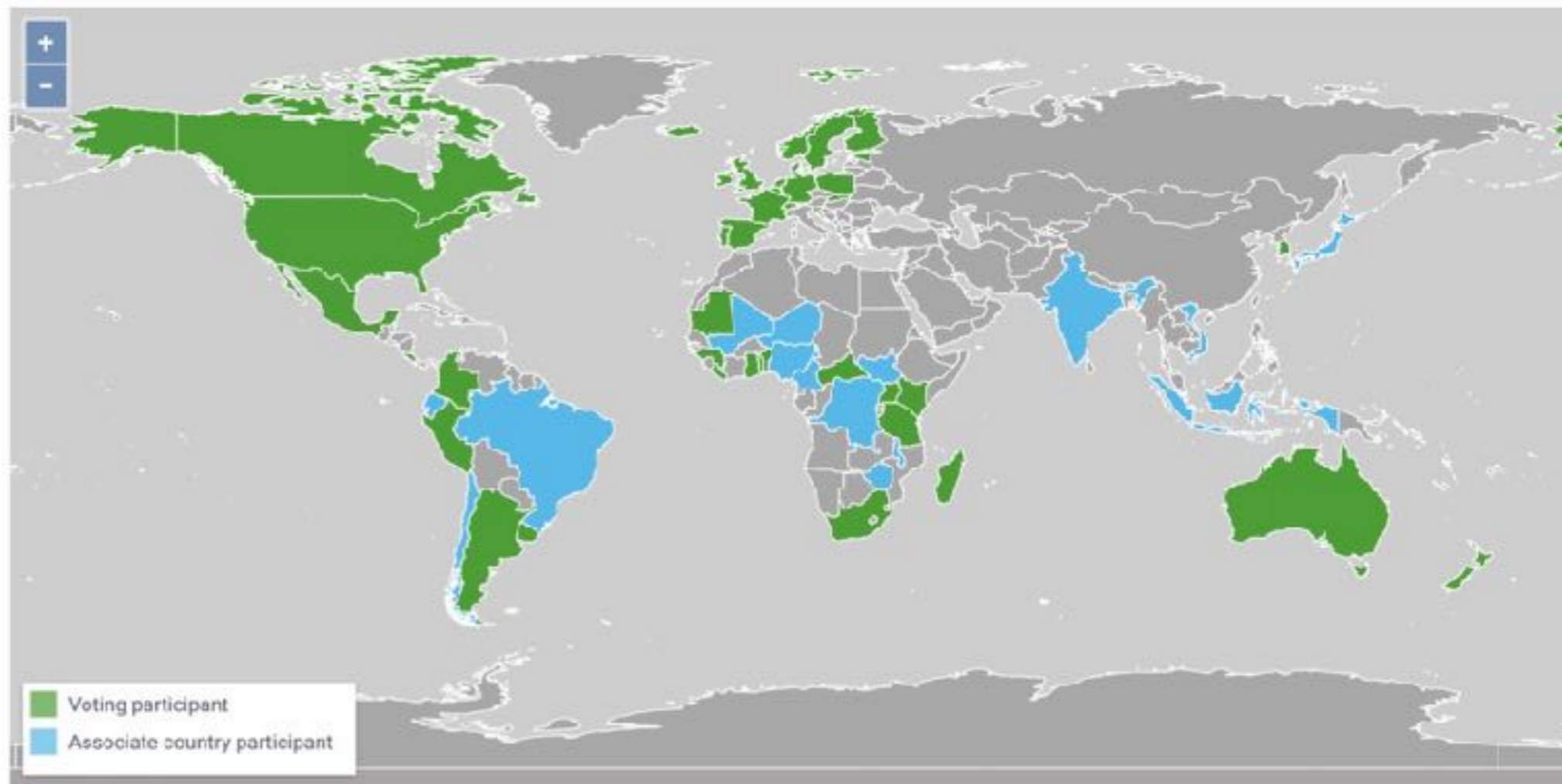
1. Many publications documenting large-scale trends in the distribution of species make use of opportunistic citizen data, that is, observations of species collected without standardized field protocol and without explicit sampling design. It is a challenge to achieve reliable estimates of distribution trends from them, because opportunistic citizen science data may suffer from changes in field efforts over time (observation bias), from incomplete and selective recording by observers (reporting bias) and from geographical bias. These, in addition to detection bias, may lead to spurious trends.

2. We investigated whether occupancy models can correct for the observation, reporting and detection biases in opportunistic data. Occupancy models use detection/nondetection data and yield estimates of the percentage of occupied sites (occupancy) per year. These models take the imperfect detection of species into account. By correcting for detection bias, they may simultaneously correct for observation and reporting bias as well. We compared trends in occupancy (or distribution) of butterfly and dragonfly species derived from opportunistic data with those derived from standardized monitoring data. All data came from the same



The GBIF Network

[GLOBAL](#) [AFRICA](#) [ASIA](#) [EUROPE](#) [LATIN AMERICA AND THE CARIBBEAN](#) [NORTH AMERICA](#) [OCEANIA](#) [PARTICIPANT ORGANISATIONS](#) [GBIF AFFILIATES](#)

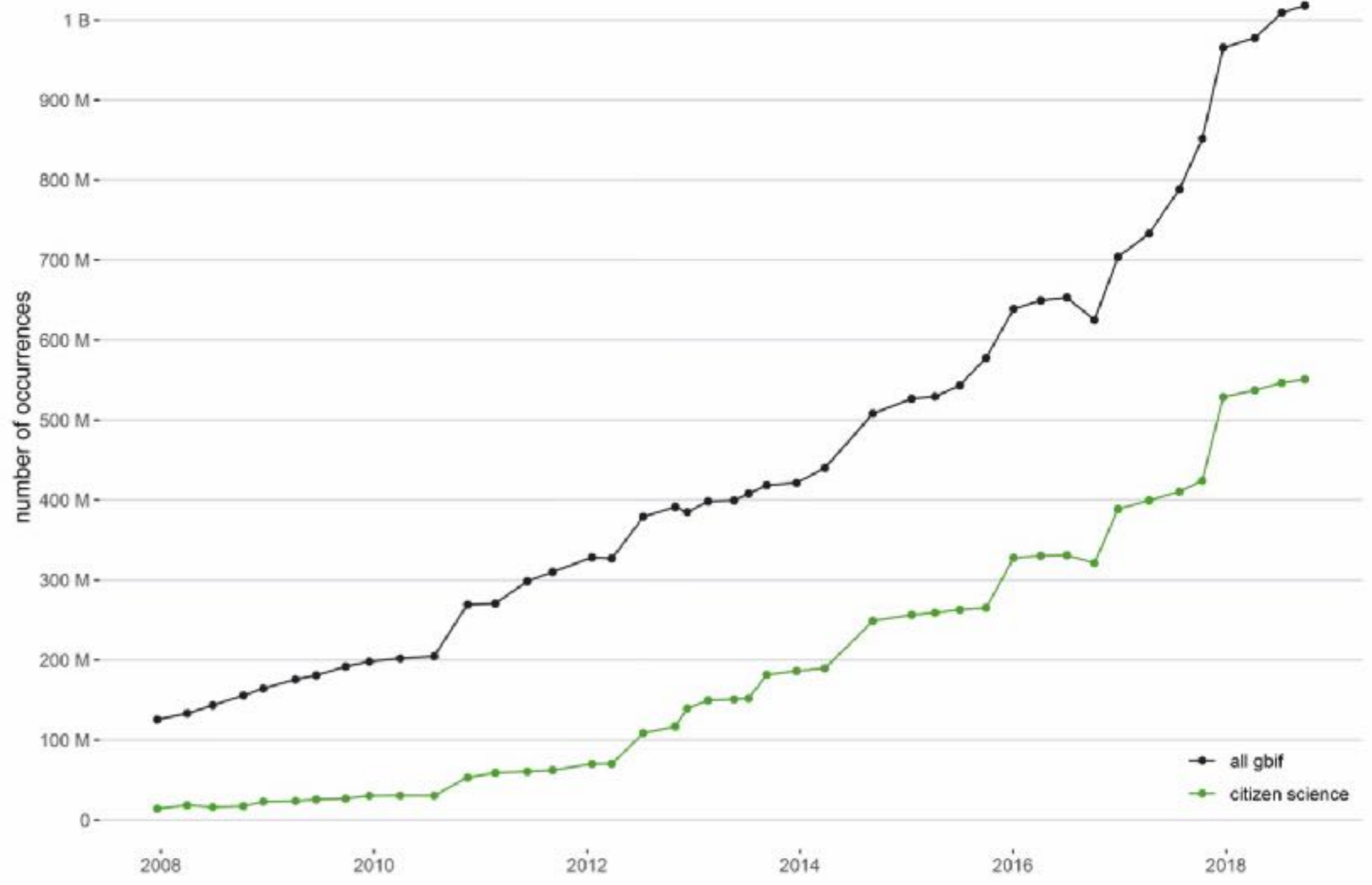


43 VOTING PARTICIPANTS

16 ASSOCIATE COUNTRY PARTICIPANTS

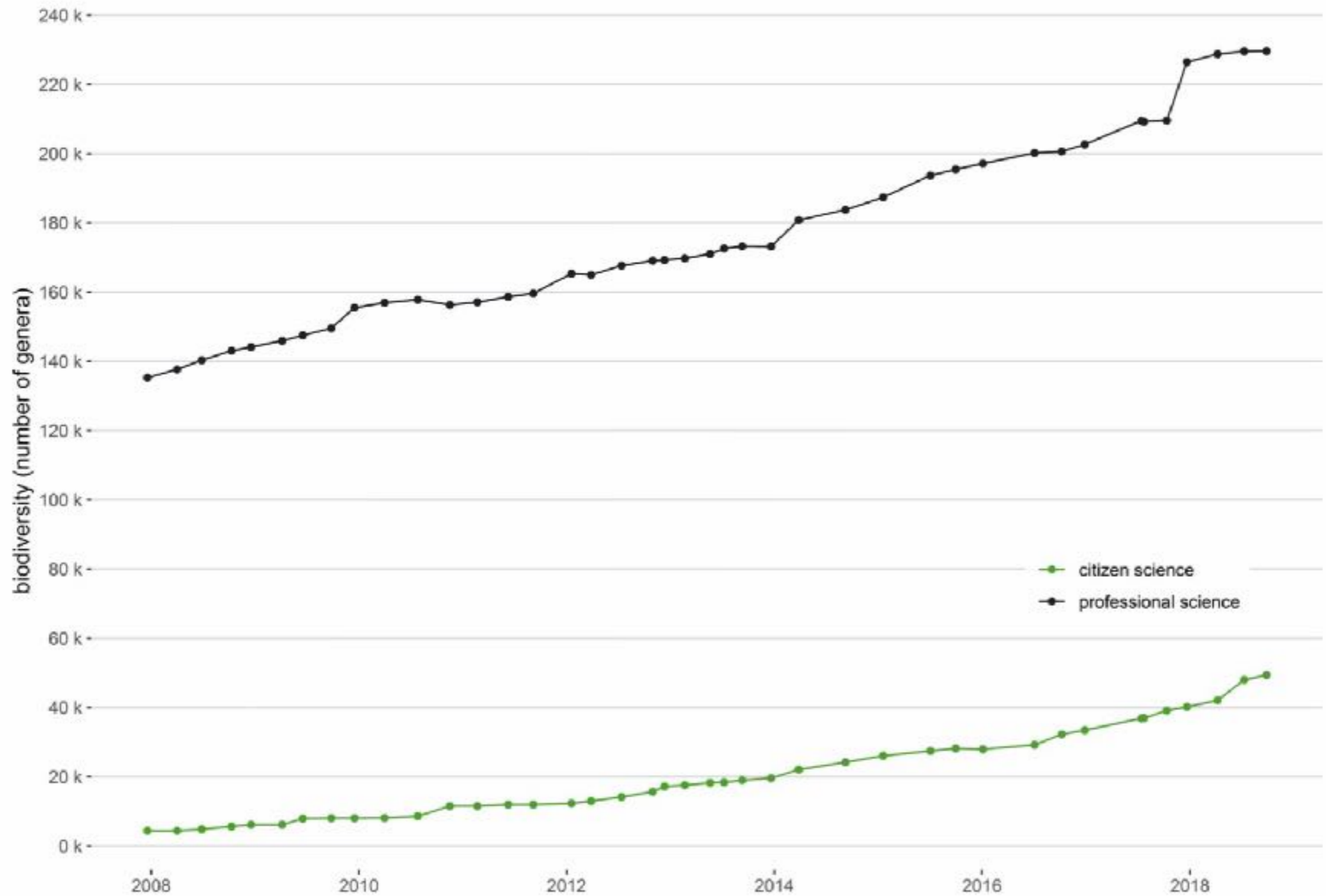
38 OTHER ASSOCIATE PARTICIPANTS

1,293 PUBLISHERS





However....



There are > 8 000 000 seagull occurrence records



Larus argentatus subsp. argenteus by G.Droege via Botanic Garden and Botanical Museum Berlin-Dahlem. Photo licensed under [CC BY-SA 3.0](#)

Top insect is the red admiral butterfly 200k records



Vanessa atalanta by W.-H. Kusber via BoBO - Botanic Garden and Botanical Museum Berlin-Dahlem Observations. Photo licensed under [CC BY-SA 4.0](#)

Top mammal is the roe deer 140k records



Capreolus capreolus by Trine Brevig via the Norwegian Species Observation Service. Photo licensed under [CC BY 4.0](#)

Top plant is the common nettle 100k records



Urtica dioica subsp. dioica by Peter de Lange via iNaturalist. No copyright.

Data validation and verification





Pagina iniziale ornitho.it

Benvenuti su www.ornitho.it

Le Associazioni di ornitho.it:

Sponsor

▼ Consultare

Le osservazioni

- Fotografie e suoni

El Dati e analisi

- Sida 2016

- Rondine montana 16-17

- Balistrucchio 2017

- Rondine 2017

- Geo comune 2016

- Iul fresium 16-17

- Gru 2016

- Volpe 2016

- Sciellulo comune europeo 2016

- Sciottolo grigio 16-17

- Averla maggiore 2016

- Vanessa atalanta 16-17

- Vanessa atalanta 16-17

- A sacidum egyptium 2016

- Istrice 14-17

- Cimice asarica 14-17

- Nutria 15-17

- Zigolo galorosso 15-17

La mia e-mail: memorizzare la password

La mia password:

[\[Desidero iscrivermi\]](#) [\[o perso la mia password\]](#)

Ornitho.it è la piattaforma comune d'informazione di ornitologi e birdwatchers italiani e di molte associazioni ornitologiche nazionali e regionali che hanno come obiettivo lo studio, la conservazione degli uccelli, il birdwatching e la loro promozione. Una parte delle osservazioni, specialmente le più recenti, potrebbero essere non ancora verificate. Ornitho.it si sta rivelando un prezioso strumento di lavoro per la realizzazione dell'Atlante degli uccelli nidificanti in Italia e per quello degli Uccelli in inverno. Dal **Ottobre 2014** la piattaforma è utilizzata anche per Rettili, Anfibi (in accordo con SHI), Libellule (in accordo con odonata.it) e Mammiferi terrestri, Mammiferi marini, Chiroterri (in accordo con ATB).



Le ultime novità

domenica 26 febbraio 2017

[cibocow3](#)

Secondo Atlante degli uccelli nidificanti in Europa EDNA?



Negli scorsi mesi è stato iniziato all'EBCC il terzo ciclo di dati di prova, aggregati al 50x50km, per mettere a punto gli algoritmi e le procedure che porteranno...

mercoledì 30 novembre 2016

[tipnews](#)

Atenti alla Cimice asiatica (o marmorizzata) *Halyomorpha halys*

Agli
martedì 28 febbraio 2017
 Luna crescente (2 giorni)
 sorge alle 8h13 e tramonta alle 20h32

Sole: sorge alle 07h07 e tramonta alle 18h15
 Giorni: alba alle 06:07 e crepuscolo alle 17h44

Ultimo dato aggiunto in questo minuto.
 Attualmente sul sito ci sono 53 visitatori

Le osservazioni recenti: [XML](#)

lunedì 27 febbraio 2017

- Grado [33N 331 / 5067]
 - 1 [Oca facciabianca](#)
- Isola della Cona
 - 1 [Oca facciabianca](#)
- Vercurago [32N 532 / 5073]
 - 1 [Moretta codone](#)
- Bocca di Sereno
 - 10 [Strolaghe minori](#)
- Marignac [33N 323 / 5109]
 - 10 [Gabbiani reali pontici](#)
- Deimo-Aurisina [33N 352 / 5086]
 - 2 [Fregate](#)
- Venezia [33N 237 / 5039]
 - 3 [Morette codone](#)
- Legheto del Frassinò (zona umida IWC)
 - 1 [Moretta codone](#)
 - 1 [Gabbiano reale pontico](#)

domenica 26 febbraio 2017

- Cologno al Serio [32N 566 / 5016]
 - 1 [Cavaria](#)
- Garda - Porto Galazzi
 - 2 [Svassi comuni](#)
- Garda - Porto Sirmione2
 - 1 [Gabbiano reale pontico](#)
- Casalmaggiore [32N 612 / 4980]
 - 1 [Gabbiano reale pontico](#)
- Isola della Cona
 - 1 [Oca facciabianca](#)
 - 2 [Oche colorosso](#)
- Montalcorno [32N 385 / 5070]
 - 1 [Svassi comuni](#)
- Lego di Gardole (zona umida IWC)
 - 1 [Moretta codone](#)
- Bagnolo San Vito [32N 645 / 4995]
 - 1 [Mignattolo](#)
- Mirandola [32N 671 / 4974]
 - 1 [Mignattolo](#)
- Valli di Monteziano e San Martino in Scivo (zona



Learn how to use Artportalen

Get started

Artportalen basic principles

Read more

Create account

Login

Today's nature

Articles from SLU Swedish Species Information Centre (in Swedish)



Känner du igen en gnagare?

PUBLICERAD: 2022-11-30

Har du hittat en död mus och undrar vad det kan vara för art? Eller kanske bara en skalle eller underkäke av något som skulle kunna vara en gnagare? Då kan du nu få hjälp med artbestämningen!



Känner du igen en gnagare?

PUBLICERAD: 2022-11-30



Lär känna våra svenska tapetserar- och sidenbin

PUBLICERAD: 2022-11-17



Spärroxbär - invasiv på Ölands och Gotlands alvarmarker

PUBLICERAD: 2022-11-14



Bojar mot ankringsskador - en aktiv naturvårdsinsats för havets ängar

PUBLICERAD: 2022-09-28



Pluggskivling - en omvärderad matsvamp och dess släktingar

Todays sightings

TODAY/YESTERDAY

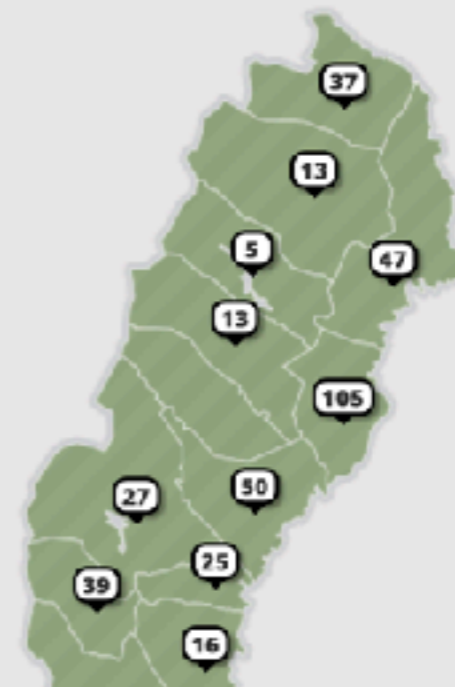
Today

5451 Sightings

304 Species

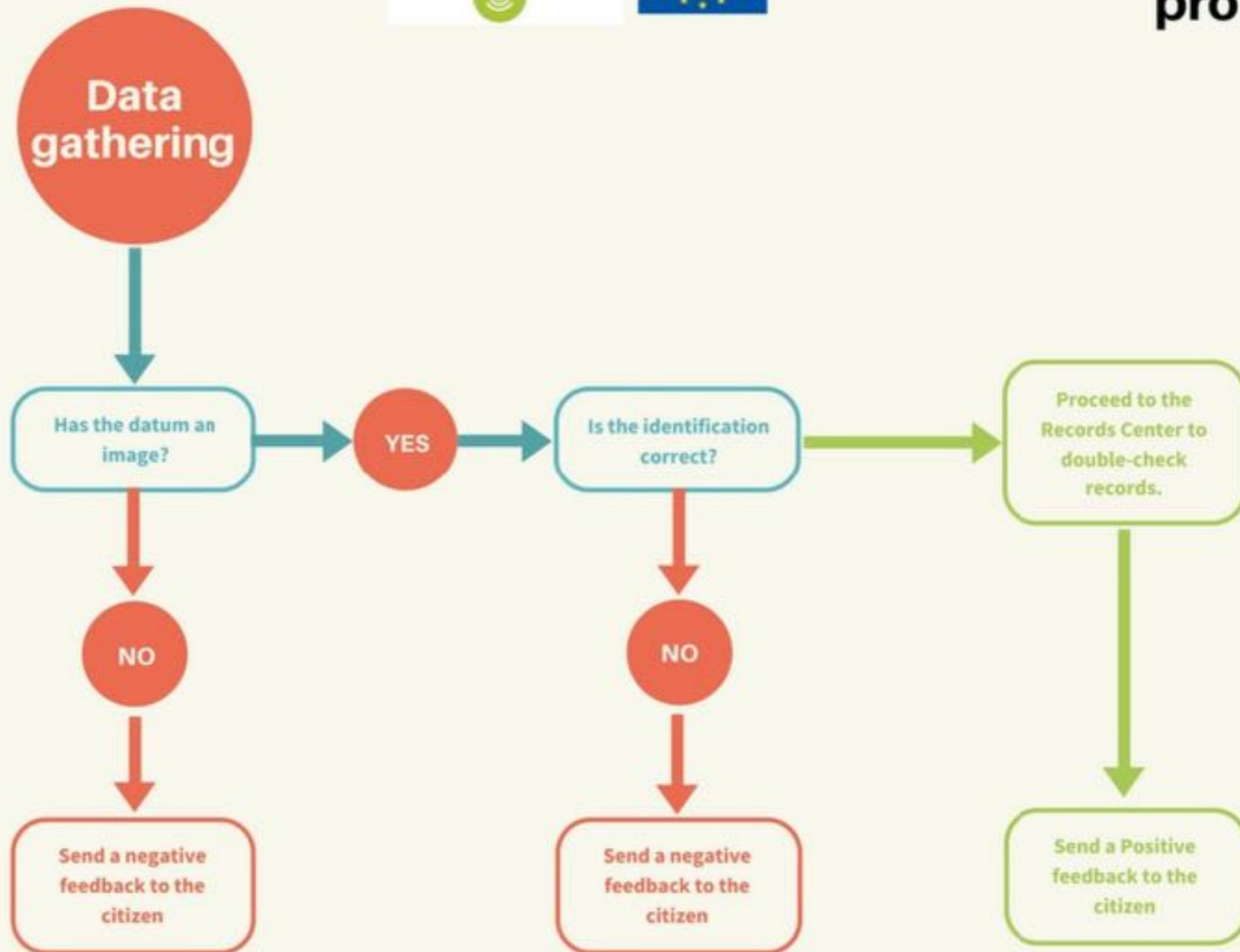
SPECIES GROUP

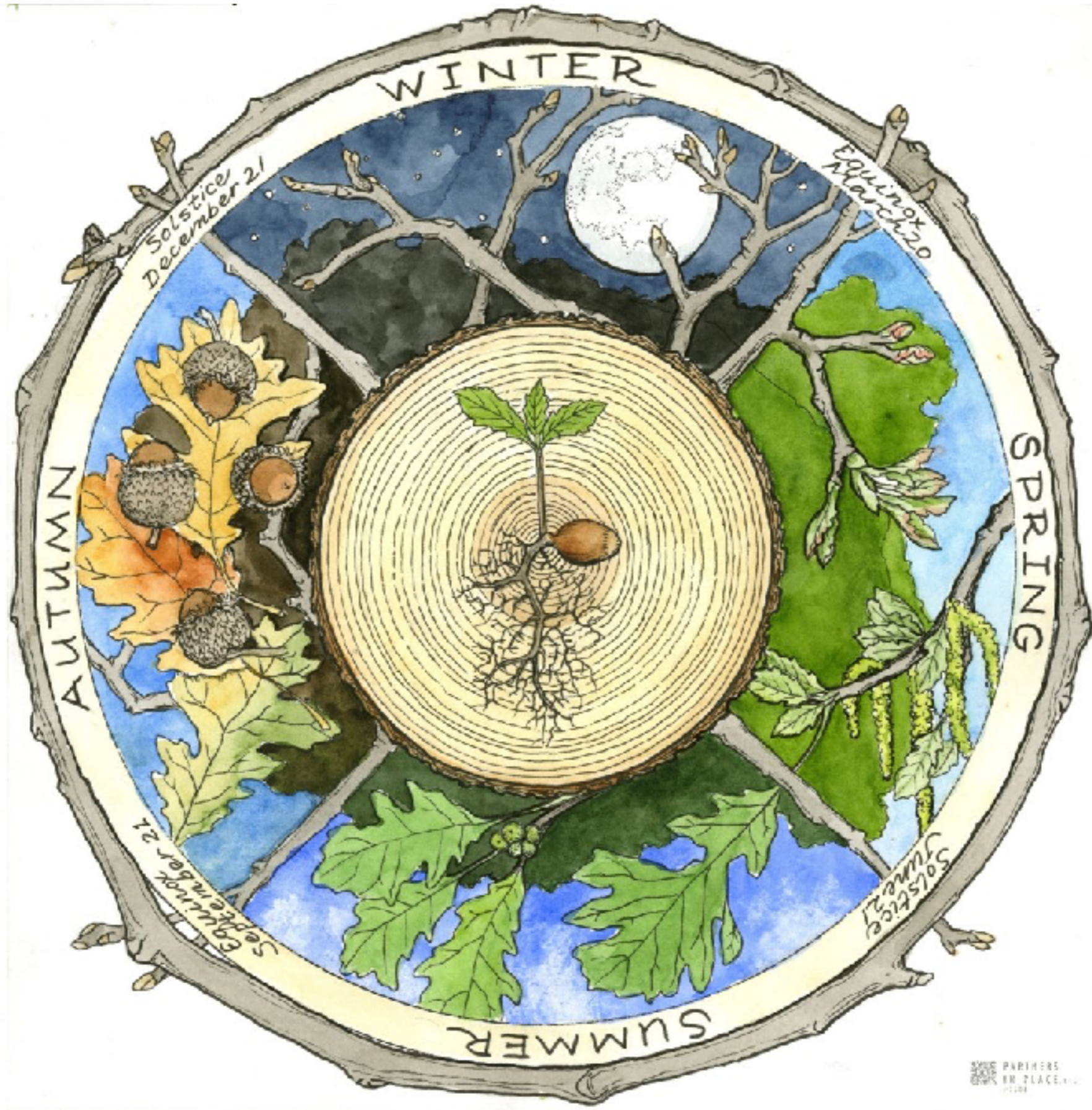
All





Expert quality control protocol





WINTER

Solstice
December 21

Equinox
March 20

SPRING

AUTUMN

Equinox
September 21

Solstice
June 21

SUMMER



Contents lists available at ScienceDirect

Agricultural and Forest Meteorology

journal homepage: www.elsevier.com/locate/agrformet



Citizen science helps predictions of climate change impact on flowering phenology: A study on *Anemone nemorosa*

Radosław Puchalka^{a,b,*}, Marcin Klisz^c, Serhii Koniakin^d, Patryk Czortek^e, Łukasz Dylewski^f,
Sonia Paż-Dyderska^g, Michaela Vítková^h, Jiří Sádlo^h, Valerijus Rašomavičiusⁱ, Andraž Čarni^{h,k},
Michele De Sanctis^l, Marcin K. Dyderski^g

Received: 17 December 2021 | Accepted: 20 April 2022

DOI: 10.1111/1365-2745.13926

RESEARCH ARTICLE




Journal of Ecology



Citizen science across two centuries reveals phenological change among plant species and functional groups in the Northeastern US

Kerissa Fuccillo Battle^{1,2} | Anna Duhon³ | Conrad R. Vispo³ |
Theresa M. Crimmins⁴ | Todd N. Rosenstiel¹ | Lilas L. Armstrong-Davies² |
Catherine E. de Rivera¹

iPhenology: Using open-access citizen science photos to track phenology at continental scale

Yves P. Klinger¹  | R. Lutz Eckstein²  | Till Kleinebecker¹ 

¹Division of Landscape Ecology and Landscape Planning, Justus Liebig University Gießen, Gießen, Germany

²Department of Environmental and Life Sciences, Biology, Karlstad University, Karlstad, Sweden

Correspondence

Yves P. Klinger



Email: yves.p.klinger@umwelt.uni-giessen.de

Handling Editor: Hooman Latifi

Abstract

1. Photo observations are a highly valuable but rarely used source of citizen science (CS) data. Recently, the number of publicly available photo observations has increased strongly, for example, due to the use of smartphone applications for species identification. This has enabled the raising of ecological insights in poorly studied subjects. One of the fields with the highest potential to benefit from the use of photo observations is phenology.
2. We propose a workflow for iPhenology, the use of publicly available photo observations to track phenological events at large scales. The workflow comprises data acquisition, cleaning of observations, phenological classification and modelling spatiotemporal patterns of phenology. We explore the suitability of iPhenology to observe key phenological stages in the plant reproductive cycle of a model species and discuss limitations and future prospects of the approach using the example of an invasive species in Europe.
3. We show that iPhenology is suitable to track key phenological events of widespread species. However, the number and quality of available observations may differ among species and phenological stages.
4. Overall, publicly available CS photo observations are suitable to track key phenological events and can thus significantly advance the knowledge on the timing and drivers of plant phenology. In future, integrating the workflow with automated image processing and analysis may enable real-time tracking of plant phenology.




Environmental drivers of tropical forest snake phenology: Insights from citizen science

Letícia M. G. Jesus^{1,2} | Jhonny J. M. Guedes³  | Mario R. Moura^{4,5}  | Renato N. Feio¹ | Henrique C. Costa^{2,6}



doi: 10.1111/ibi.13317

Using citizen science image analysis to measure seabird phenology

ALICE J. EDNEY,^{*1}  JÓHANNIS DANIELSEN,² SÉBASTIEN DESCAMPS,³ JÓN EINAR JÓNSSON,⁴
ELLIE OWEN,⁵ FLEMMING MERKEL,^{6,7} RÓBERT A. STEFÁNSSON,⁸ MATT J. WOOD,⁹ 
MARK J. JESSOPP^{10,11}  & TOM HART¹²

FINAL THOUGHTS









