

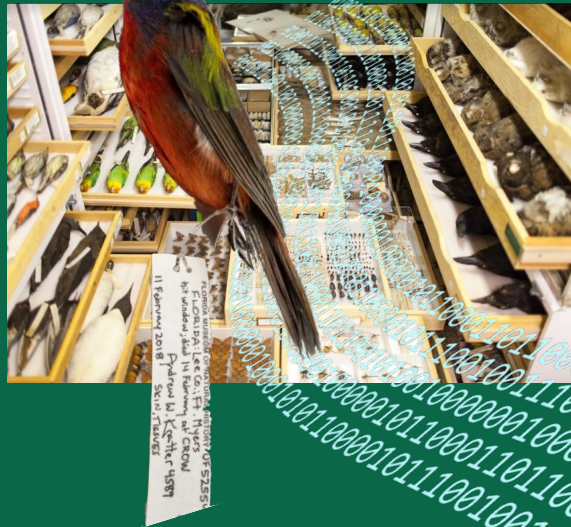
The Role of Biodiversity Informatics In the Global Biodiversity Information Facility

Dag Endresen | GBIF Node Manager for Norway

Global Biodiversity Information Facility (GBIF)



GBIF PROVIDES A BIODIVERSITY DATA INFRASTRUCTURE



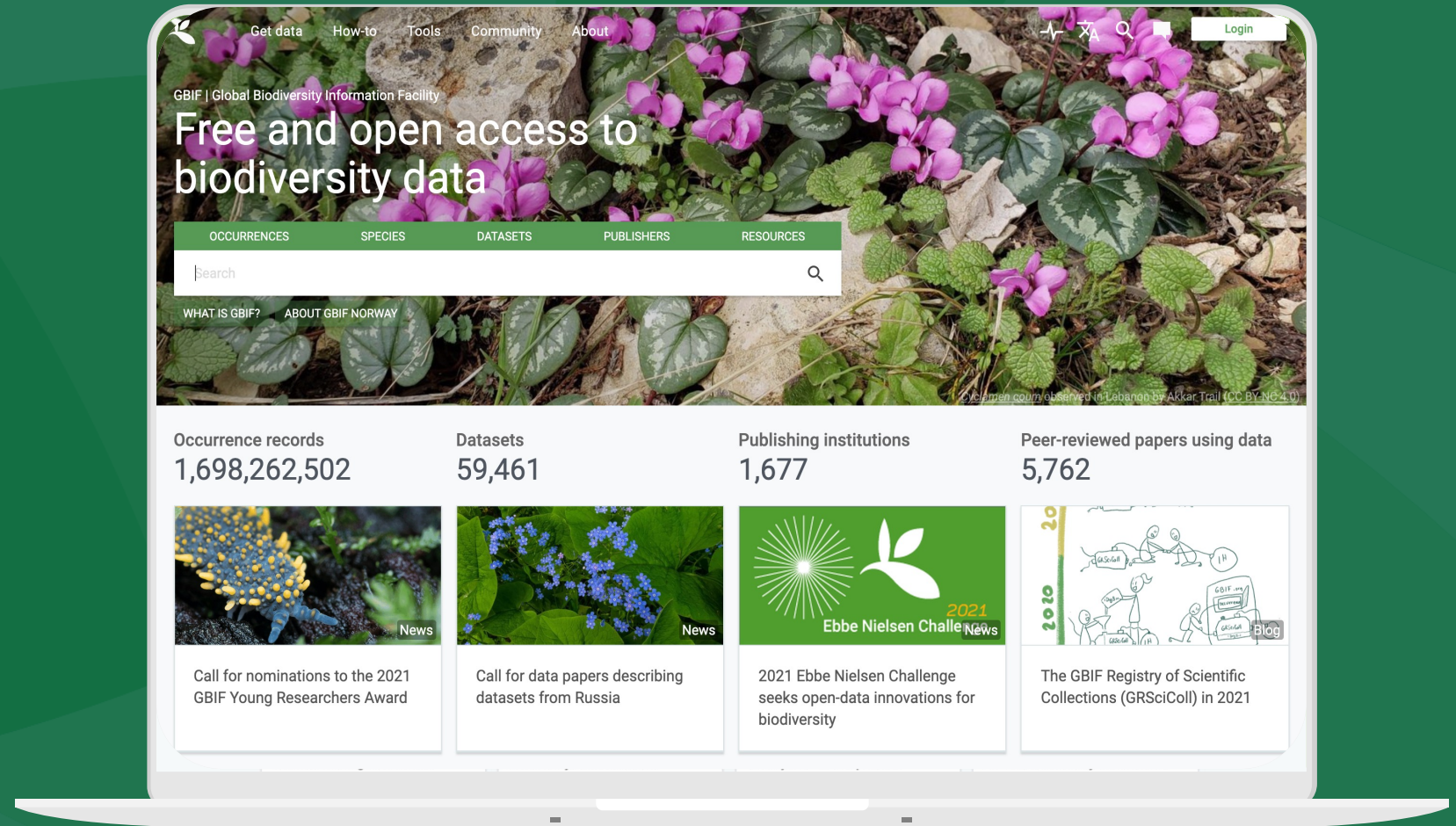
WHAT IS GBIF?

Intergovernmental network and research infrastructure

Provides anyone, anywhere, **free and open access to data** about all types of life on Earth

Voluntary collaboration through Memorandum of Understanding (MoU)

Participant nodes, Secretariat in Copenhagen, Denmark



Get data How-to Tools Community About Login

GBIF | Global Biodiversity Information Facility

Free and open access to biodiversity data

OCCURRENCES SPECIES DATASETS PUBLISHERS RESOURCES

Search

WHAT IS GBIF? ABOUT GBIF NORWAY

Occurrence records 1,698,262,502	Datasets 59,461	Publishing institutions 1,677	Peer-reviewed papers using data 5,762
--------------------------------------------	---------------------------	-----------------------------------------	-------------------------------------------------

Call for nominations to the 2021 GBIF Young Researchers Award

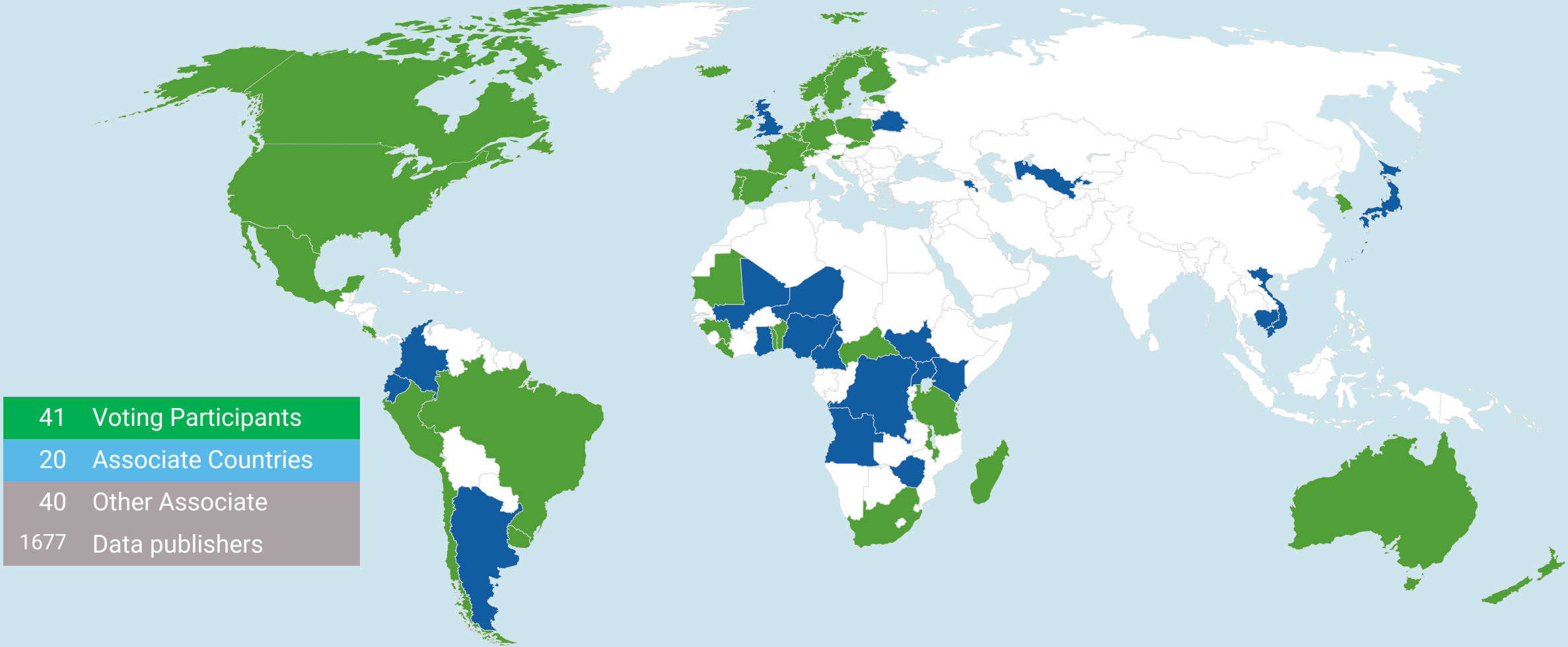
Call for data papers describing datasets from Russia

2021 Ebbe Nielsen Challenge seeks open-data innovations for biodiversity

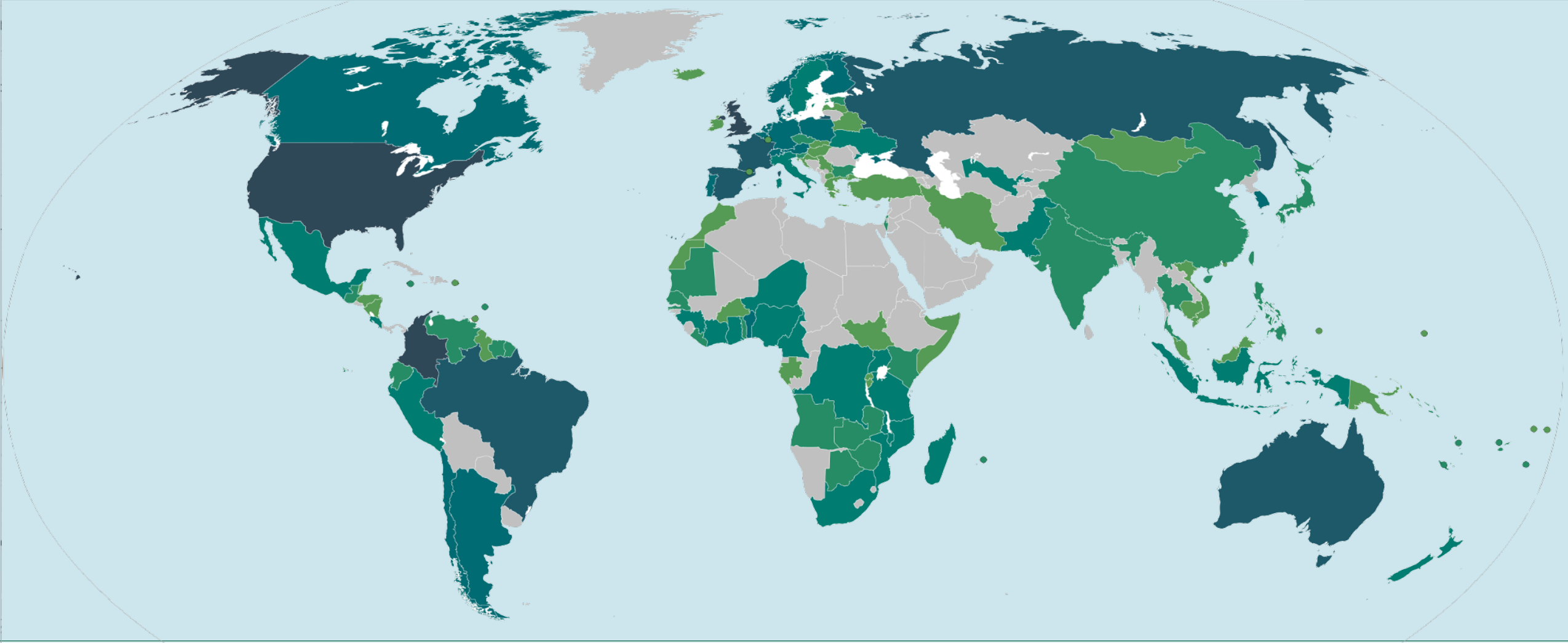
The GBIF Registry of Scientific Collections (GRSciColl) in 2021

<https://www.gbif.org>

GBIF PARTICIPANT COUNTRIES

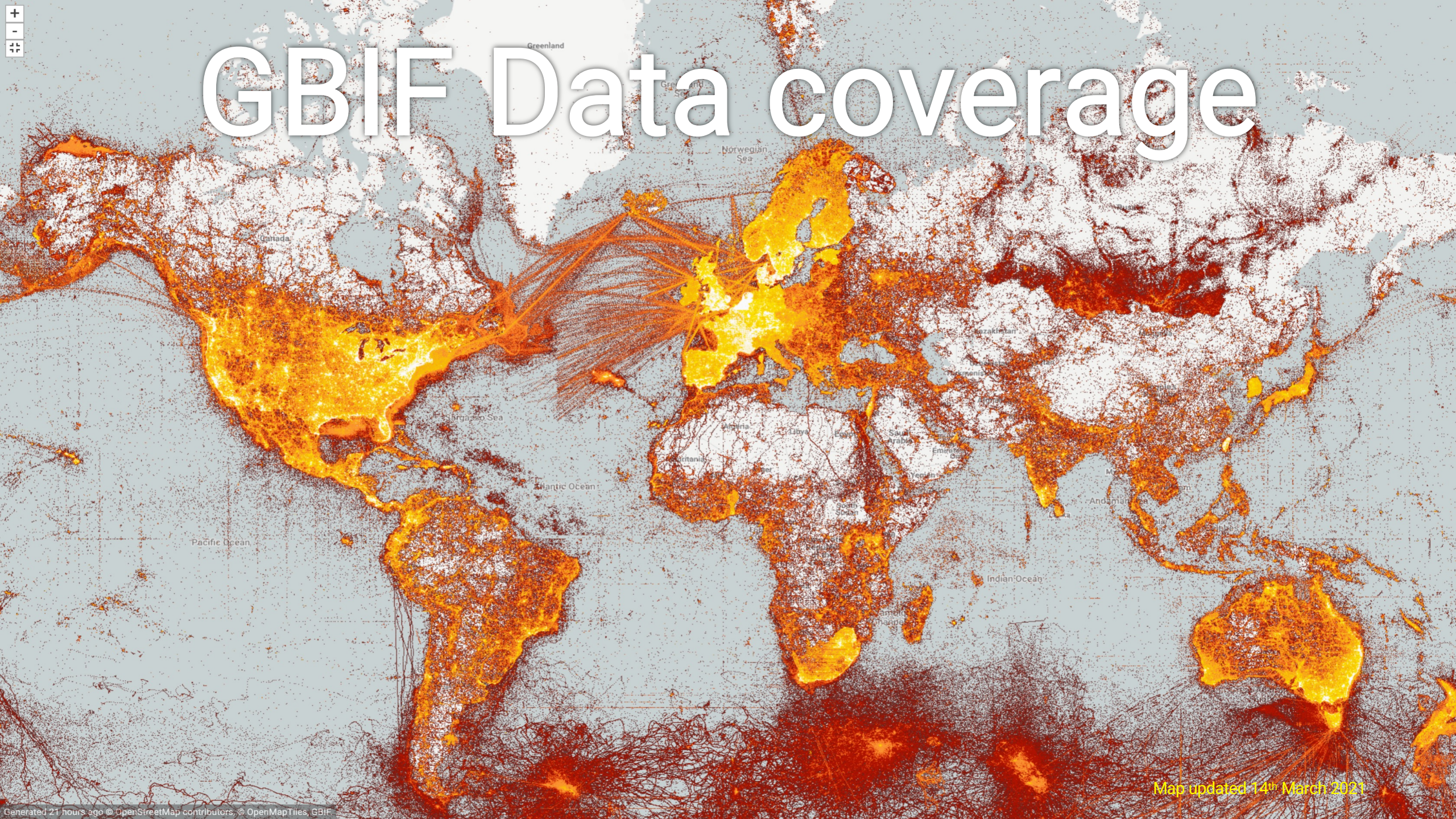


THE GBIF DATA PUBLISHER NETWORK



1677 data publishers; <https://www.gbif.org/publisher/search>

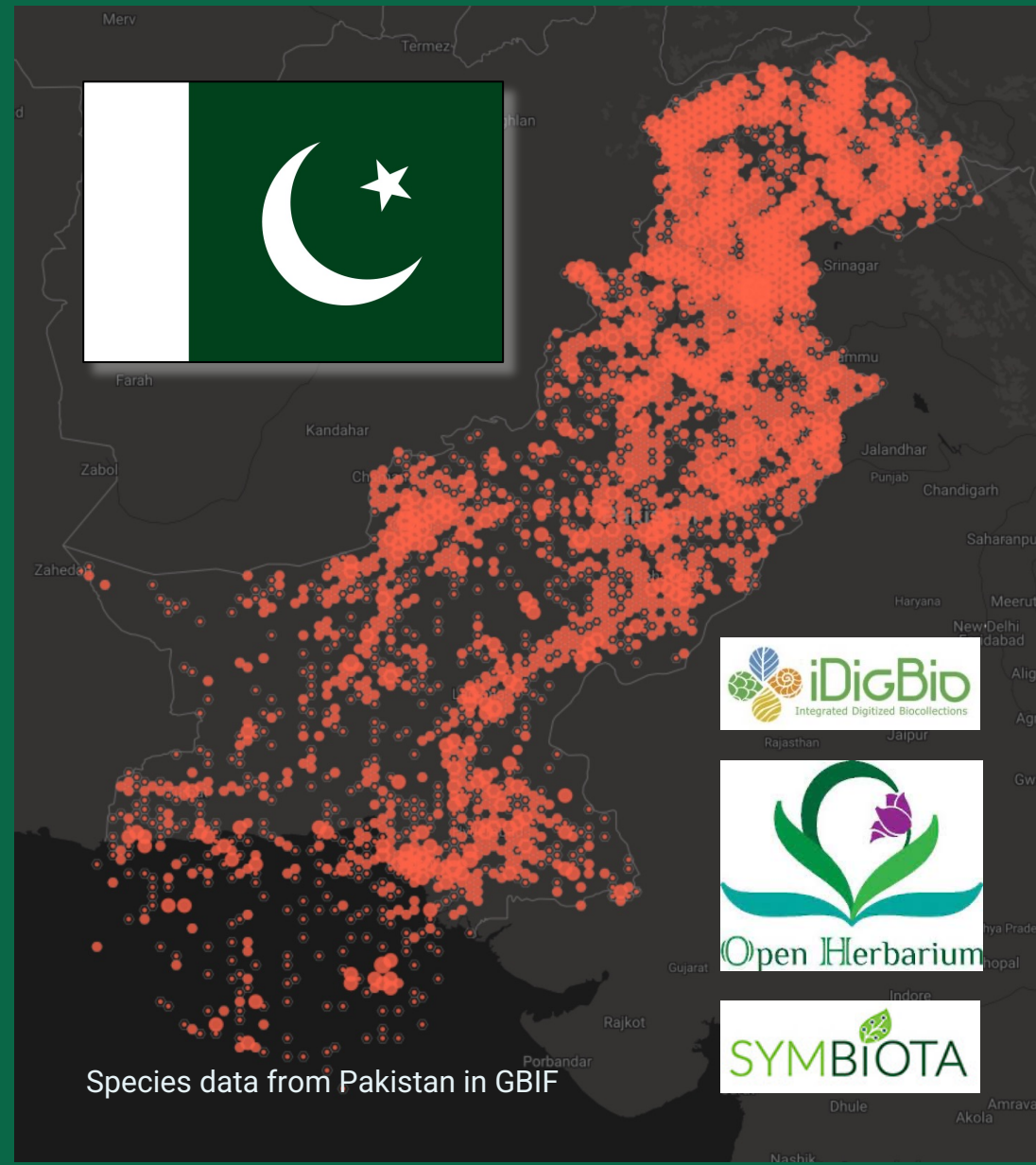
GBIF Data coverage



Map updated 14th March 2021

MILESTONES - PAKISTAN AND GBIF

- Pakistan was an **associate member of GBIF** from **August 2001 to 2017**.
- March **2006** a GBIF mentor project between Pakistan and **Australia** – installed the **DiGIR** data publishing toolkit, hosted by the Pakistan Museum of Natural History in Islamabad (2 datasets), and the **BioLink** digitisation and collection management database.
- Recent capacity development projects between Pakistan and **USA** (Mary Barkeworth) with datasets hosted from the **OpenHerbarium** (US GBIF node iDigBio) and **Symbiota** collection digitisation and management database (8 datasets). The BIFA program is funded by the Government of **Japan**.



digitization of collections





Very few museum specimens are digitized

Natural history museum collections worldwide conserve an estimated

1.2 - 3 billion specimens.

(Ariño 2010; Duckworth *et al.* 1993)

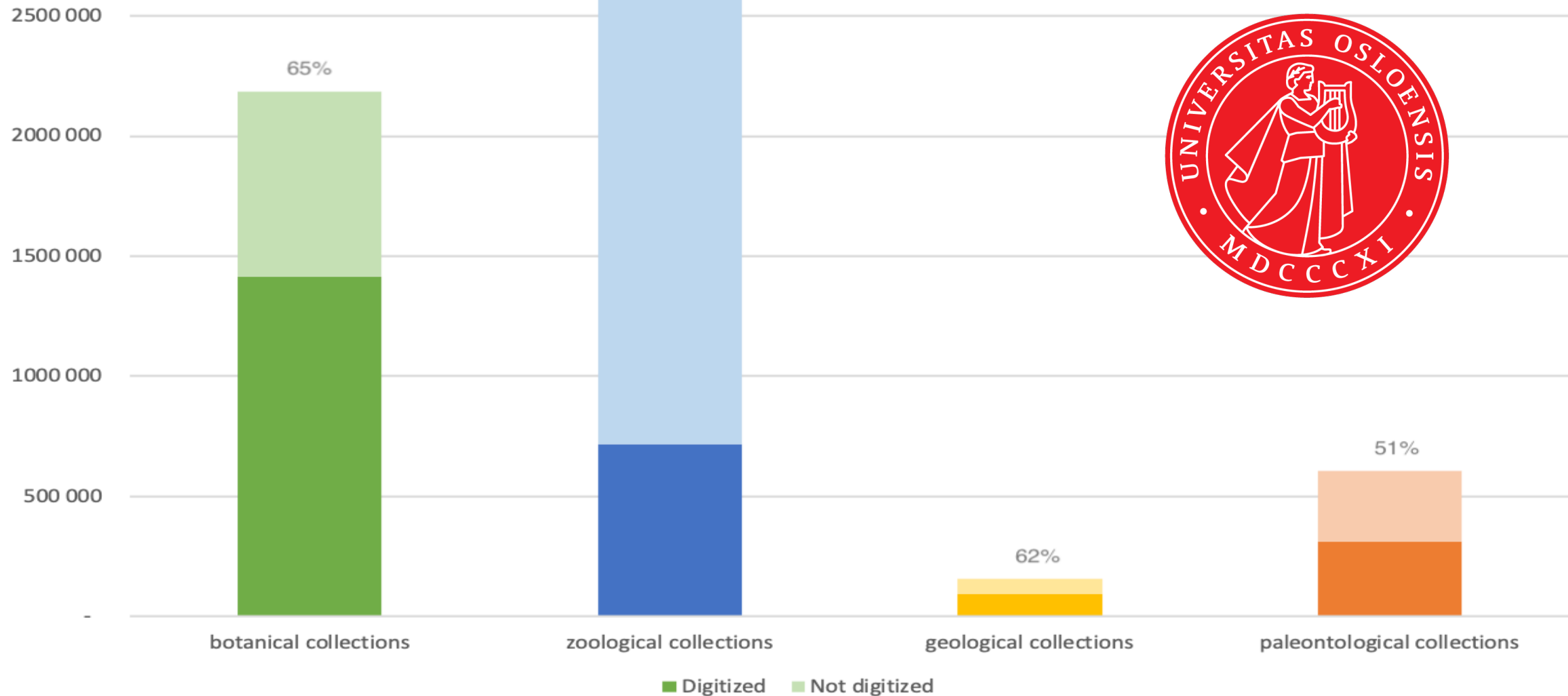
GBIF publishes 1,7 billion records – including **233 million specimens.**

approx. 10% coverage??

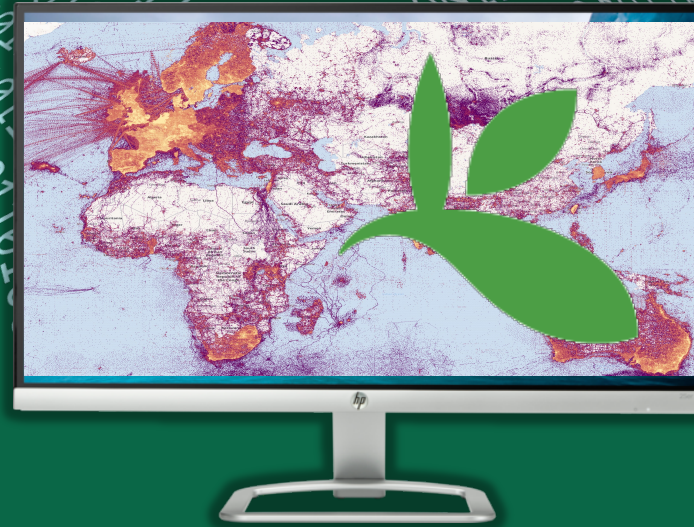
Photo: Botany Collection, Algae, Smithsonian National Museum of Natural History Museum, by Chip Clark.

DIGITIZED SPECIMENS AT THE UNIVERSITY OF OSLO (APPROX. 47%)

<https://wiki.uio.no/nhm/skf/best-practices/index.php/Samlingstall>



DIGITISATION OF MUSEUM COLLECTIONS AND HERBARIA



Catalog number: O-L-000014

Identifier: urn:uuid:41d9cbb4-4590-4265-8079-ca44d46d27c3

human-friendly

machine-friendly

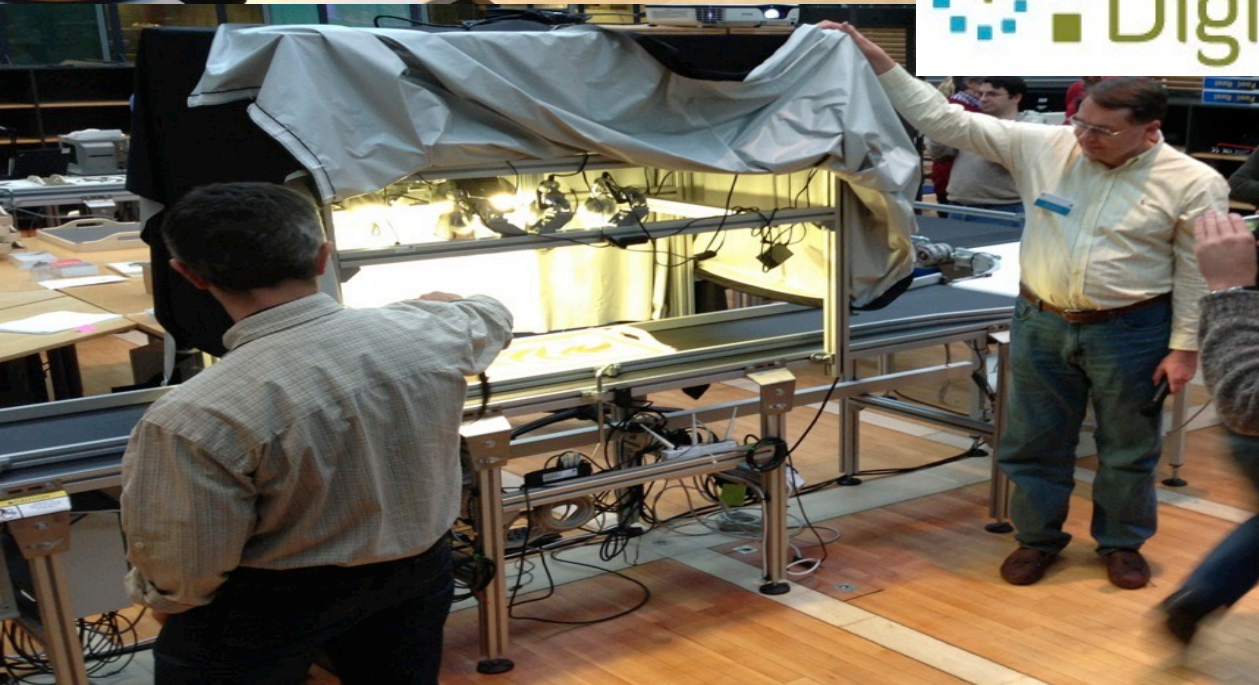
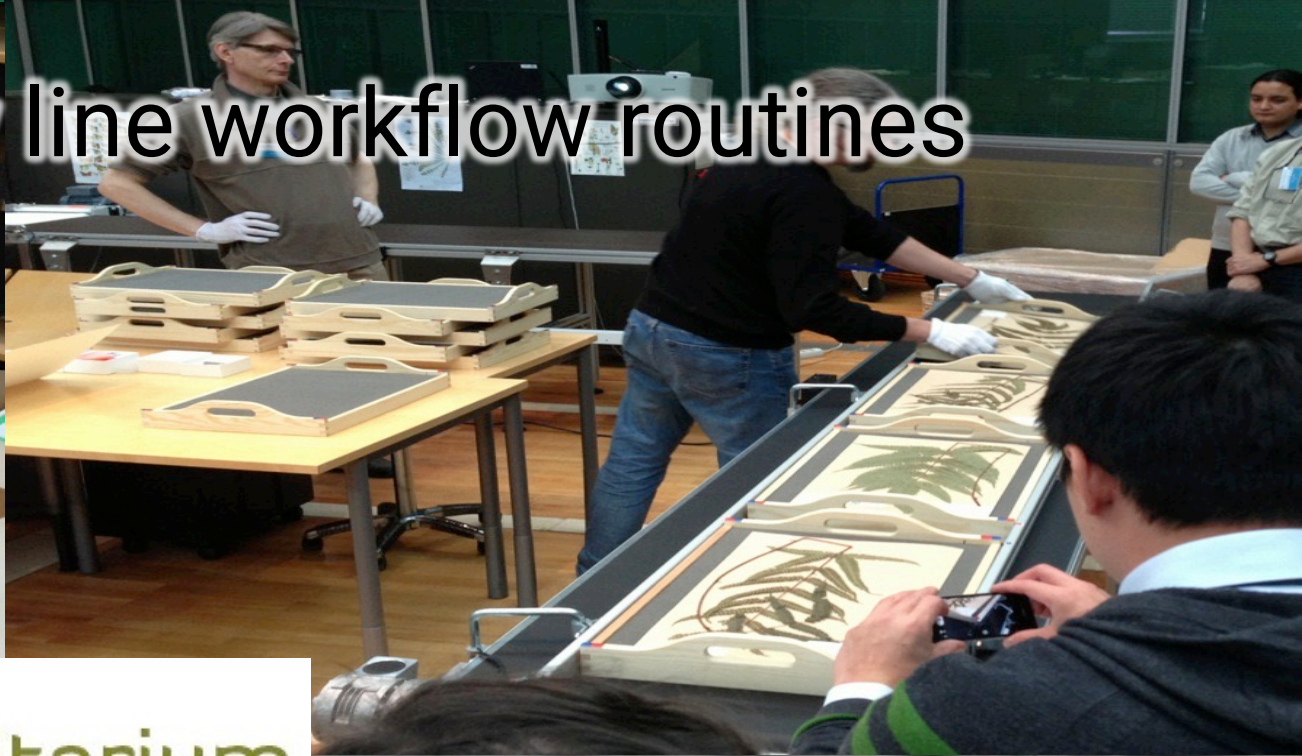


Transcription of labels UiO Lichen herbarium (2012)



GBIF.no

"Industrial" assembly line workflow routines



http://gbif.no/dugnad/



HERBARIUM O

Herb. Univers. Osloensis
Heterodermia diademata (Tayl.) Awas.

KENYA

Rift Valley Prov. Uasin Gishu Distr.

5 km NW of Timboroa summit, on
moist brush by lake, and fence posts.

0-04 N 35-32 E 2650 m

2/1973 2K19/138 Hildur Krog

O-L-185347

[Sign up](#) or [Sign in!](#)
(4 transcriptions)

Scientific name:

Country:

Province:

District:

Locality:

Habitat:

Position:
[Show map...](#)

Elevation:

Collector:

Collector no:

Date: Day

[Skip this record...](#) [Next record...](#)

[Show help...](#)

TLC (..../.):

zeorin

atranorin

Hildur Krog 19



open data

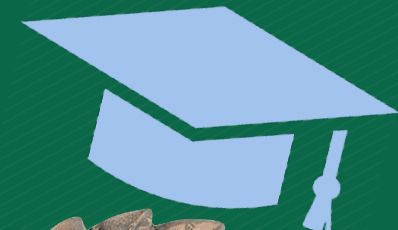
WHY SHOULD STUDENTS LEARN OPEN SCIENCE?

00001000001010
11111001011101010100010010
1010110001000110111111101000101010
1110101101010101001001010100010101000001
1000001001101001010010001001000010010010010
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111010001000101100010000010101110
11011010101001011111100101110101010
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WHY SHOULD MUSEUMS CARE ABOUT OPEN SCIENCE?

00001000001010
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111010110101010101001001010100010101000001
1000001001101001010010001001000010010010010
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11011010101001011111100101110101010
0101001110000101011000100011011111
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0010010010001000000100110100101001000
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01011100101110100010001011010010110001
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10100110001000001010101011100101110100010110001001000
1011110101110101010100010010000011011010101001011101010
0100100001101111111101000101010101001110001000110111111
01001000101010010010101000101010000010111111101011010101010
101011101101001000100100100100100000100110100101001000100100



WHY TEACH STUDENTS OPEN SCIENCE?

- ❖ We are in the middle of an ongoing **paradigm shift** in scientific practice (and impact metrics).
- ❖ The open science wave is moving **fast**!
- ❖ Young scientists will need **different skills**, than was needed previously to succeed in academia.
- ❖ Researchers will need to develop **different approaches**, than they needed in the past – to remain relevant.
- ❖ Society is quickly gaining Big Data maturity and will **expect** new services from biodiversity information and research.



DATA CITATION AS A NEW CURRENCY OF SCIENCE

- **Peer-reviewed scholarly papers** in high impact journals maintain considerable weight for impact metrics.
- A movement is under way to **build similar status for** open data, open metadata, open material samples, and other **open scientific research products...**

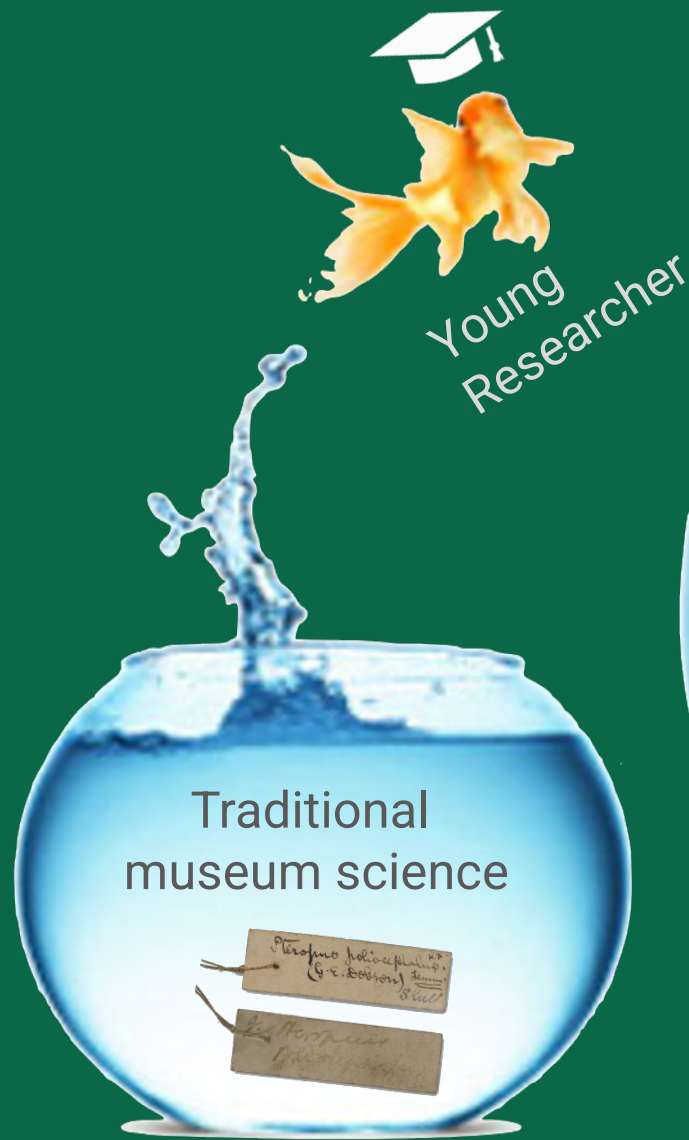


DECLARATION ON RESEARCH ASSESSMENT



- DORA recognizes **the need to improve how** the outputs of scholarly **research are evaluated**.
- DORA's vision is to advance practical and robust approaches to **research assessment** globally and across all scholarly disciplines.
 - The Declaration on Research Assessment (DORA) was developed in San Francisco in 2012.
 - It has become a **worldwide initiative** covering all scholarly disciplines and key stakeholders.
 - Covering funders, publishers, professional societies, institutions, and researchers.
 - To date (2021-03-14), 17 085 individuals & 2 169 organizations in **145 countries** have signed DORA.
 - Including 12 universities and research institutions from Pakistan

new possibilities for novel curiosity-driven research



Young
Researcher

Traditional
museum science



Biodiversity Informatics
Open science



Global Biodiversity Information Facility





CAREER OPPORTUNITIES

- Skills for open research and open data are in **increasing demand!**
- Bring **benefits for your career** as a (young) researcher.
- Add **research datasets** to your CV and online researcher profiles.



OPPORTUNITIES

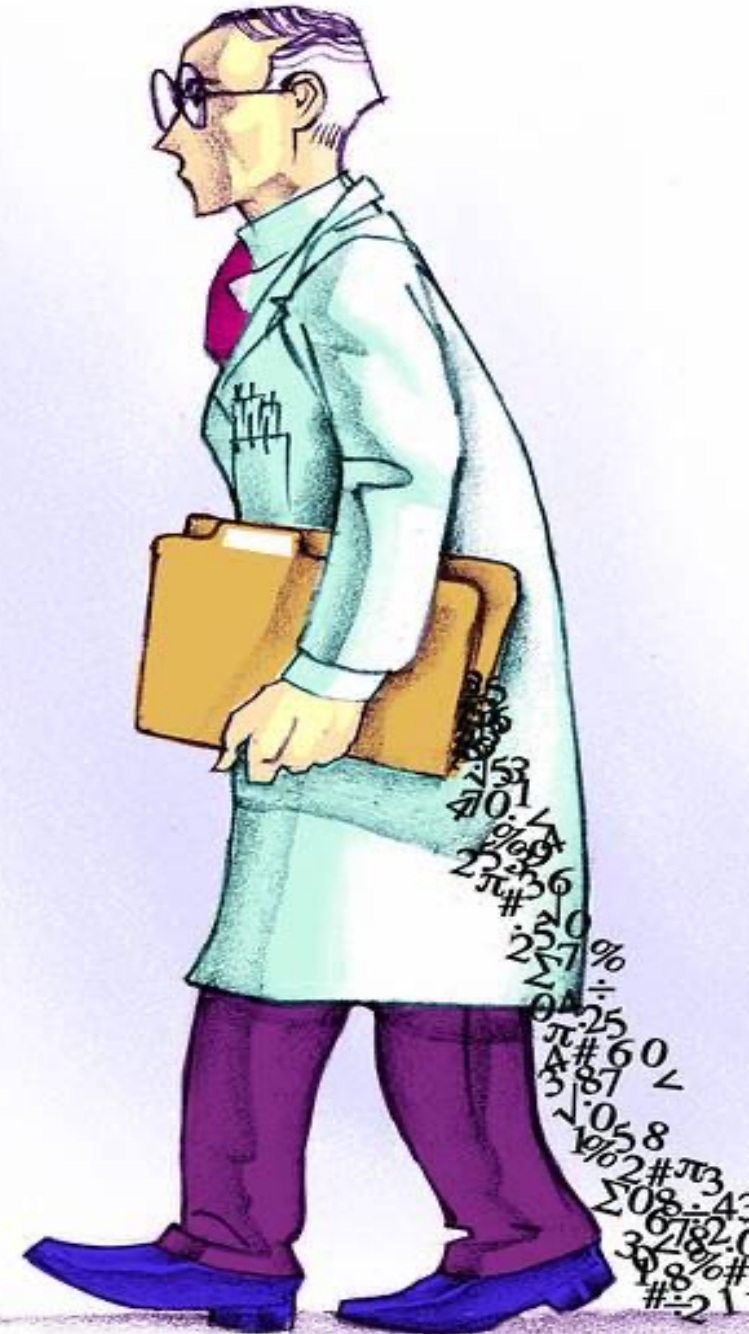
- Enables **new research methodologies** that were not possible before.
- Scientific **citation metrics** for collections and specimen data.
- **Funding** opportunities.



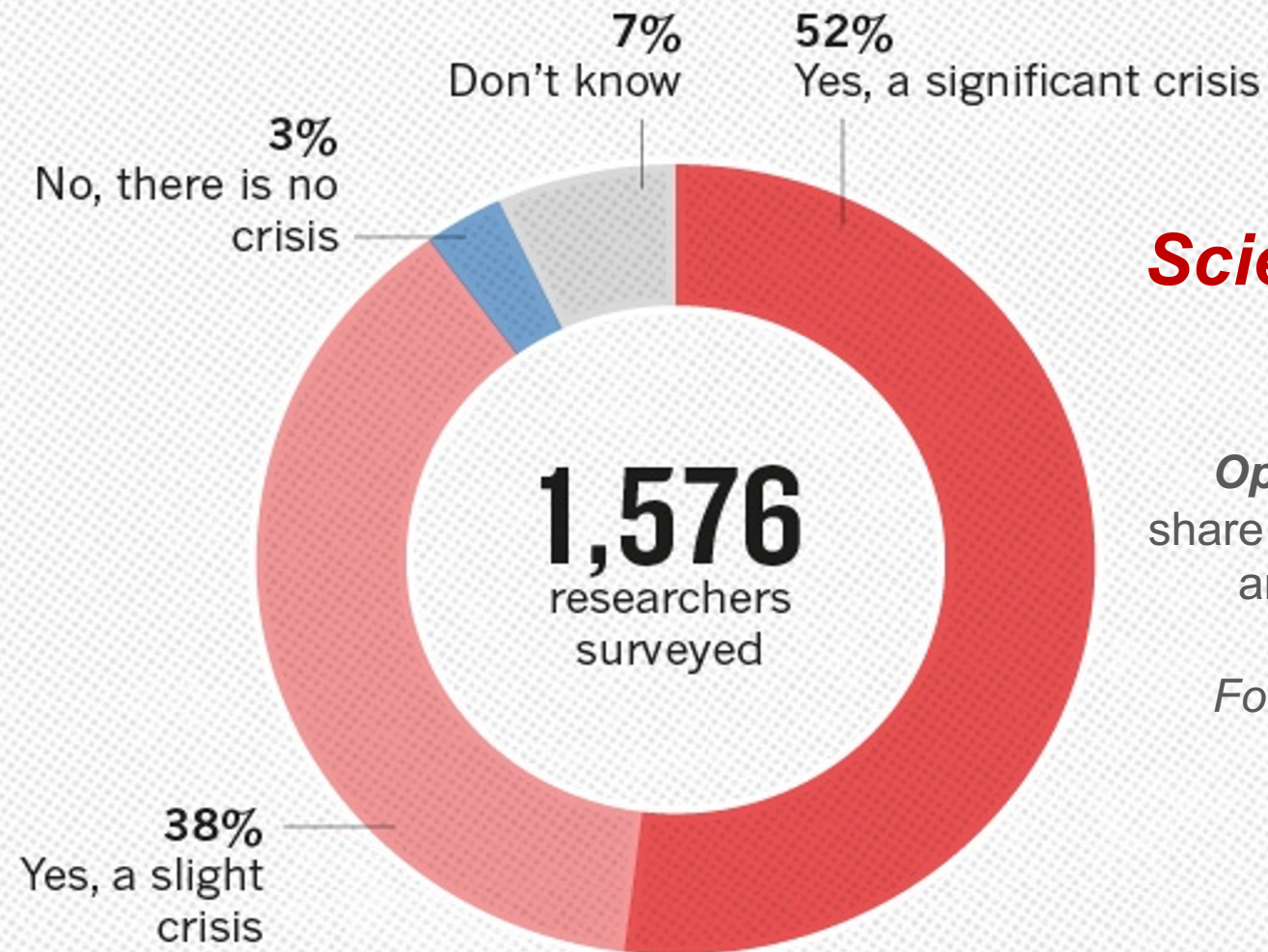
the dark side

REPRODUCIBILITY CRISIS

"Scientific irreproducibility — the inability to repeat others' experiments and reach the same conclusion" (Nature 2016)



IS THERE A REPRODUCIBILITY CRISIS?



Scientific irreproducibility is a growing concern.

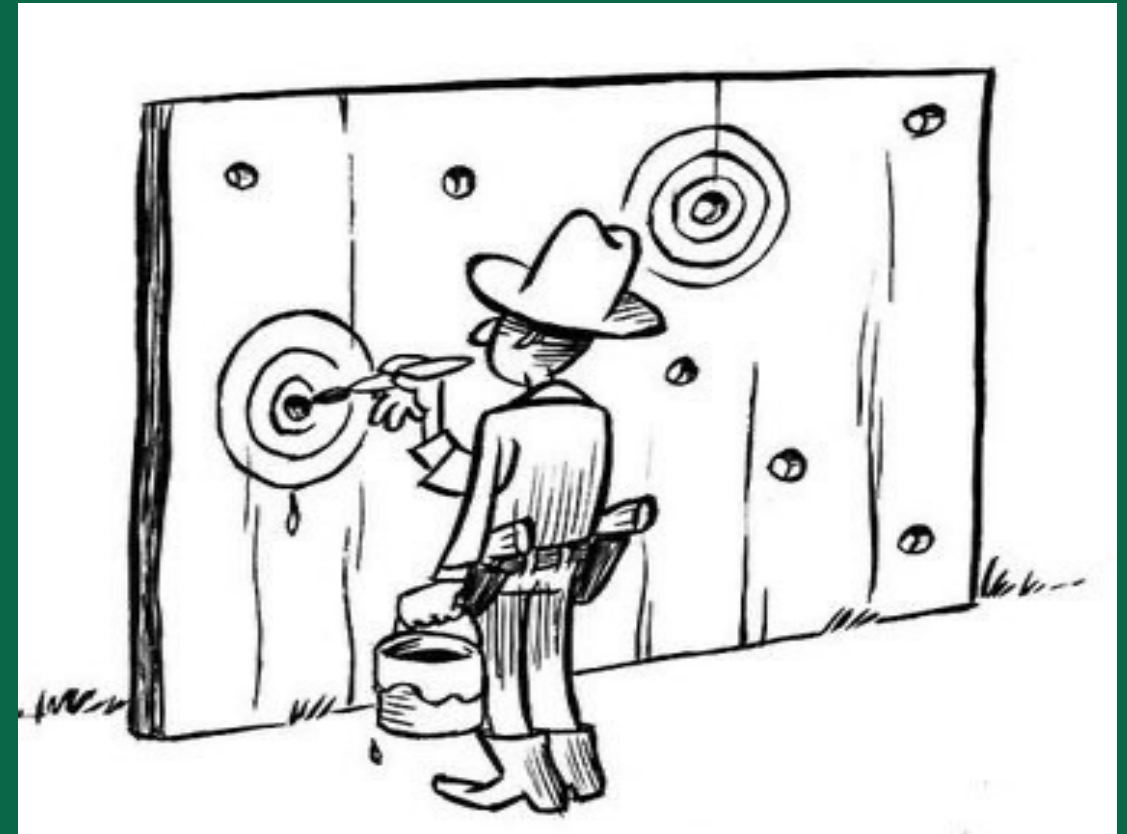
Open Science solution: researchers to share their **methods, data, computer code** and results in central data repositories.

*For physical real-world samples we also need herbarium **specimen** and bio-repositories (museums).*

©nature

WILL ANYBODY TRUST CLOSED SCIENCE AGAIN?

- Studies (1,2) indicates that **p-hacking** is a significant problem – sometimes even without the scientist even being aware of doing so.
- **Pre-registered (open) data** provides a good insurance against suspicion of both data dredging (and plain data falsification).
- “**p-hacking**” = occurs when researchers collect or select data or statistical analyses until nonsignificant results become significant (*data fishing, ...*)



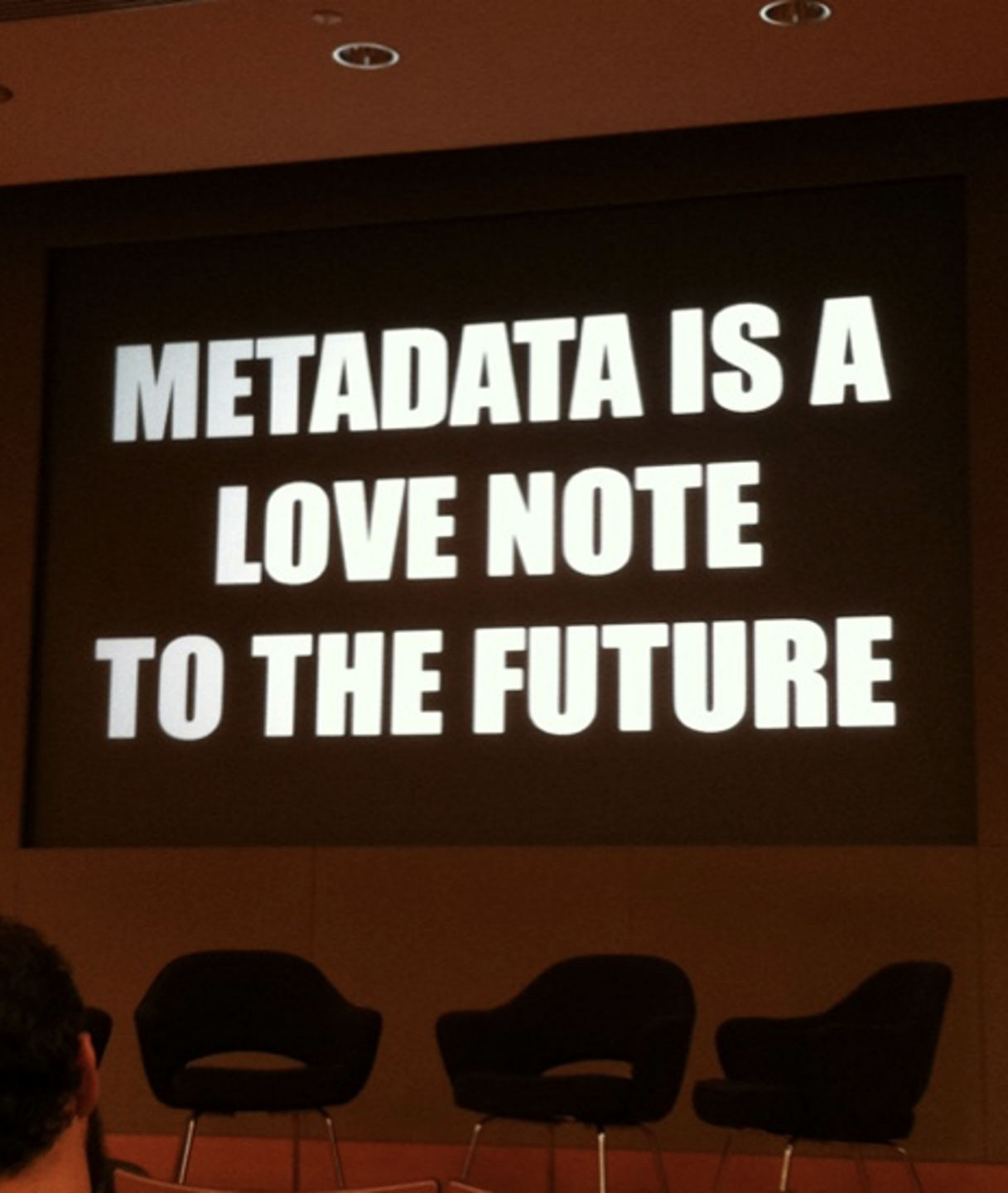
(1) Head *et al.* (2015) The Extent and Consequences of P-Hacking in Science . PLoS Biol. doi:10.1371/journal.pbio.1002106
(2) Ioannidis (2005). "Why Most Published Research Findings Are False". PLoS Medicine. doi:10.1371/journal.pmed.0020124.

reuse of
research data



WHAT IS METADATA?

- Metadata, literally means ***“data about data”***.
 - Identify & discover its existence
 - Learn how to access or acquire data
 - Understand its **fitness-for-use**



**METADATA IS A
LOVE NOTE
TO THE FUTURE**

DATA MANAGEMENT PLAN (DMP)

- A **formal document** that describes how research data will be handled during a research project, and after the project is completed.
- Plan data management **before** the project begins.
- Including **costs** of data management & archiving.
- Reduce the **loss** of data.
- DMP **saves time** in the long run
- Promotes data **fitness for reuse**.
- Reduce **duplication** of existing scientific studies.



Illustration CC BY Jørgen Stamp

WHAT IS A DATA PAPER?

- A **data paper** is a peer reviewed document describing a dataset, published in a peer reviewed journal.
- It takes effort to prepare, curate and describe data.
 - Data papers provide recognition for this effort by means of a **scholarly article**.
 - Recognition for improving the fitness for reuse for **your own datasets**.
 - Recognition for making **legacy research data** available for reuse.



F
Findable



A
Accessible



I
Interoperable



R
Reusable

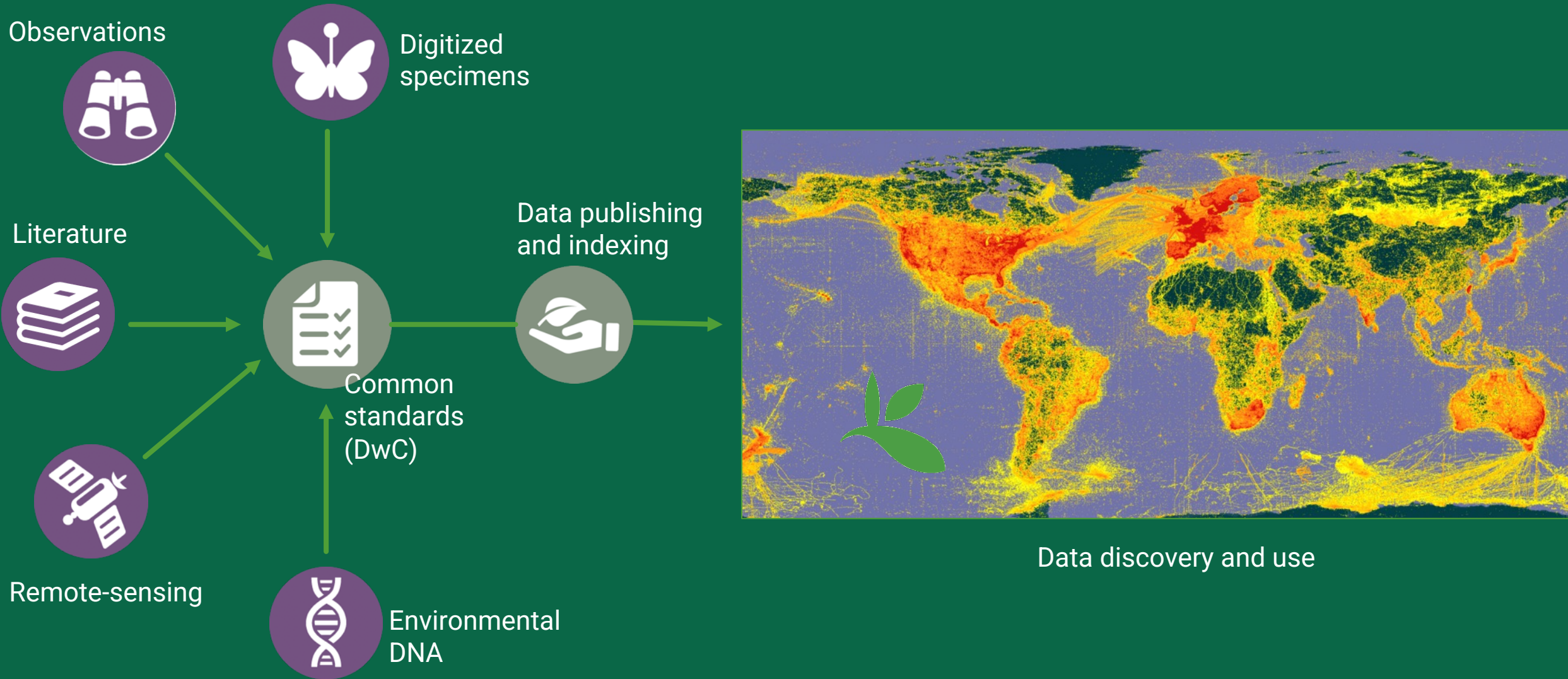


*... researchers need to do more than simply post their data on the web for it to be **re-usable**.*

FAIR data is about **machine-readable** data



A WINDOW ON EVIDENCE ABOUT WHERE SPECIES HAVE LIVED, AND WHEN



Species occurrence records

1 698 262 502



Datasets

59 461



Country
Participants

61

Organizational
Participants

40



Peer-review papers
using data

5 762



Average records downloaded per month
(2020)

23.6 billion

Publishers

1 677



BY THE NUMBERS | 15 MAY 2021 - PAKISTAN



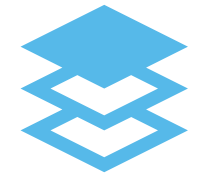
Species occurrence records (*published from*)

78 976



Datasets (*published from*)

10



Peer-review papers
using data (co-author
from Pakistan)

18

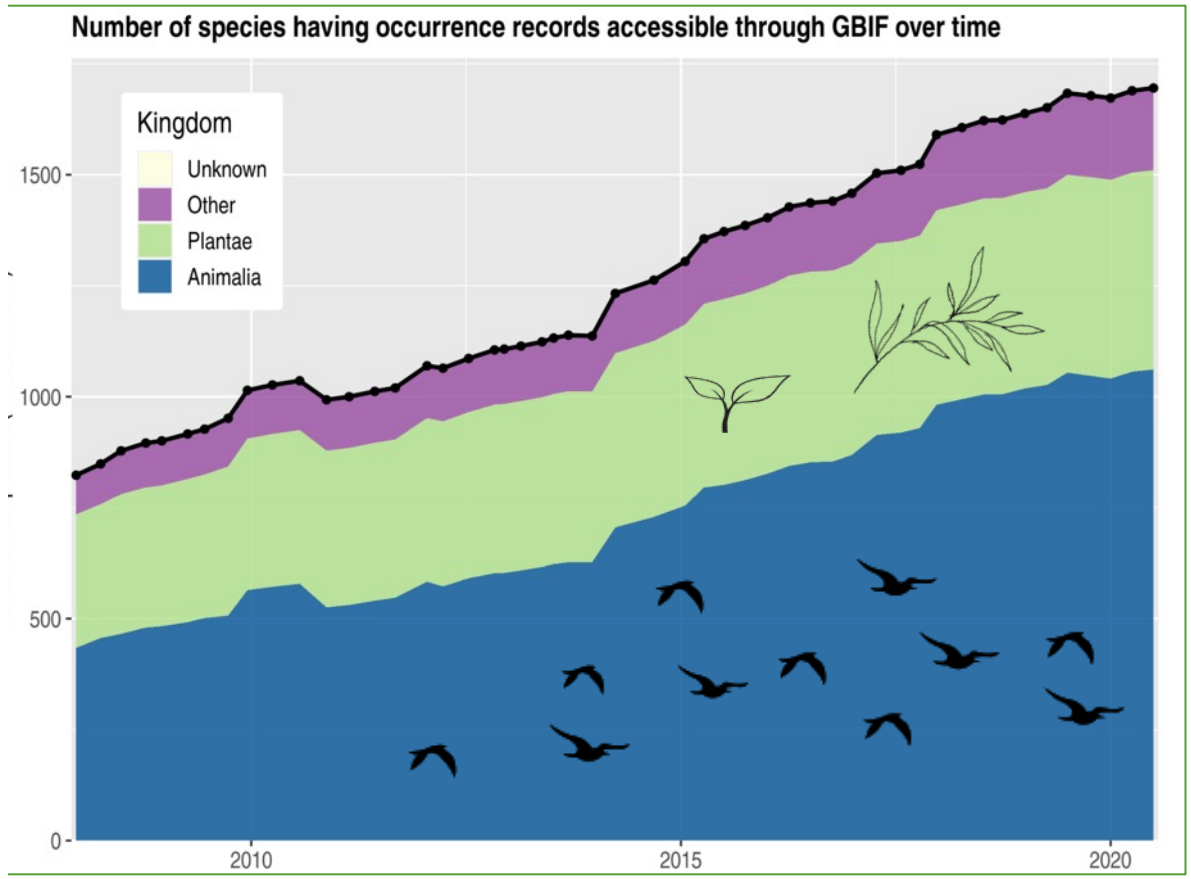
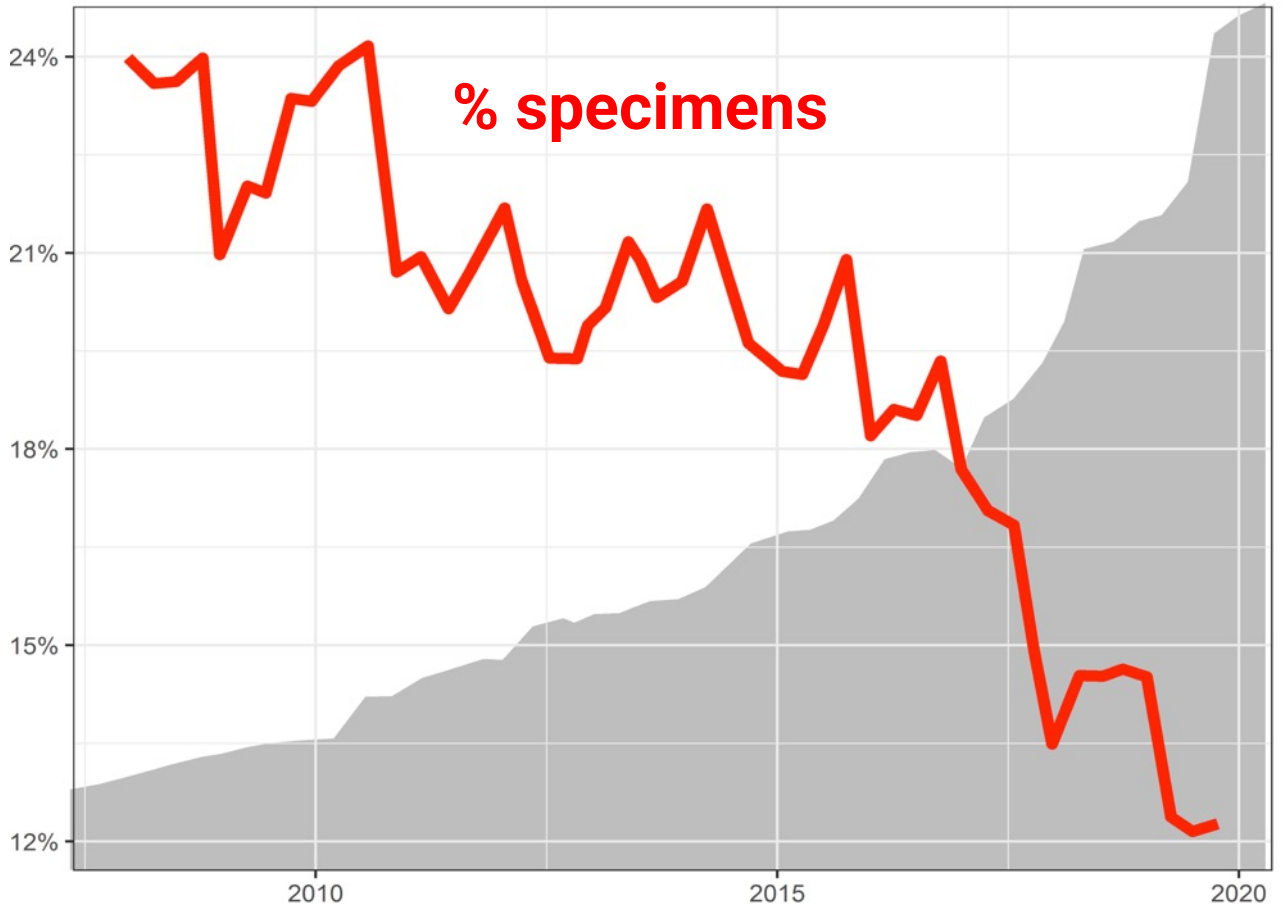


Publishers
(from Pakistan)

9



DATA TRENDS ON GBIF.org



DATA RICHNESS LEVELS
SUPPORTED BY GBIF

FULL TITLE
BOS Arthropod Collection of University of Oviedo (S

*Dataset description,
taxonomic/geographic/temporal scope*



Dataset metadata

FLORA EUROPAEA FLORA EUROPAEA FLORA

*List of taxa
regional or thematic (e.g. invasive, medicinal)*



Species checklists

*Species occurrences
dates, coordinates, basis of record*



Occurrence-only data

*Species occurrences and sampling events
dates, coordinates, sampling effort / protocol, abundance*



Sampling-event data

SPECIES OCCURRENCE RECORDS WITH MULTIMEDIA EVIDENCE

Status 15th May 2021



80 million records with taxonomically identified images

- 200 million specimens
- 1 411 million human observations
- 34 million material samples

724 177 audio files

2 845 video files



SOURCES OF DATA IN GBIF: CITIZEN SCIENCE OBSERVATIONS

eBird

EOD - eBird Observation Dataset
Published by Cornell Lab of Ornithology
Tim Leatich • Shawn Ligocki • Jeff Gerbracht

705,008,469 Occurrences
100% With taxon match
99.9% With coordinates
100% With year

704,979,091 GEOREFERENCED RECORDS

Description
eBird is a collective enterprise that takes a novel approach to citizen science by developing cooperative partnerships among experts in a wide range of fields: population ecologists, conservation biologists, quantitative ecologists, statisticians, computer scientists, GIS and informatics specialists, application developers, and data administrators. Managed by the Cornell Lab of Ornithology eBird's goal is to increase data quantity through participant recruitment and engagement globally, but also to quantify and control for data quality issues such as observer variability, imperfect detection of species, and both spatial and temporal bias in data collection. eBird data are openly available and used by a broad spectrum of students, teachers, scientists, NGOs, government agencies, land managers, and policy makers. The result is that eBird has become a major source of biodiversity data, increasing our knowledge of the dynamics of species distributions, and having a direct impact on the conservation of birds and their habitats.

iNaturalist

iNaturalist Search Explore Your Observations Community

Places > Asia (Continent) > Find a place Search

Pakistan Country

1042 of 2103 confirmed

All life
Life
Animals
Arthropods
Chelicerates
Arachnids
Hexapods
Insects
Chordates
Vertebrates
Ray-finned fishes
Amphibians
Birds
Mammals
Reptiles

Serinus pusillus (Fire-fronted Serin)
Carpodacus erythrinus (Rosenfink)
Emberiza cia (Rock Bunting)

Carpodacus rhodochlamys (Red-mantled Rosefinch)
Aythya ferina (Taffeland)
Anas platyrhynchos (Stokkand)

ARTSDATABANKEN

Norwegian Species Observation Service
Published by The Norwegian Biodiversity Information Centre (NBIC)
The Norwegian Biodiversity Information Centre

23,674,790 Occurrences
99.9% With coordinates
99.9% With year

23,674,776 GEOREFERENCED RECORDS

National crowdsourcing portals

860,229 OCCURRENCES WITH IMAGES

SOURCES OF DATA IN GBIF: DIGITIZED SPECIMENS FROM MUSEUM COLLECTIONS

OCCURRENCE DATASET | REGISTERED AUGUST 7, 2018

Quaid-i-Azam University Herbarium

Published by [Herbarium of Pakistan \(ISL\) - QAU](#)

DATASET METRICS ACTIVITY DOWNLOAD

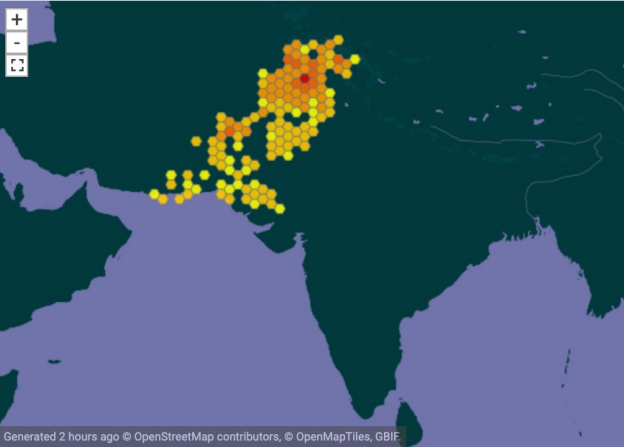
36,175 OCCURRENCES 44 CITATIONS

ISL was established in 1974. It is now the largest herbarium in Pakistan having over 180,000 specimens, collected from throughout Pakistan. The oldest specimens were collected over 50 years ago. The herbarium supports and promotes research on a wide range of environmental and biodiversity issues. Its holdings include many important endangered, rare and vulnerable plant species. Currently, the herbarium is being used by projects in taxonomy, molecular systematics, revisions, palynology, diversity... [More](#)

Project ID: [BIFA3_47](#)
Publication date: November 30, 2020
Metadata last modified: November 30, 2020
Hosted by: [iDigBio](#)
License: [CC0 1.0](#)

36,175 Occurrences 100% With taxon match


24,284 GEOREFERENCED RECORDS



Generated 2 hours ago © OpenStreetMap contributors, © OpenMapTiles, GBIF

Any year 1862 - 2018

3 OCCURRENCES WITH IMAGES



OCCURRENCE | 10 JULY 2009

Coenochilus hervillardi Estienne, 2011

Collected in Pakistan

Animalia > Arthropoda > Insecta > Coleoptera > Cetoniidae > *Coenochilus*




DETAILS

Species: *Coenochilus hervillardi* Estienne, 2011
Location: Pakistan
Basis of record: Preserved specimen
Specimen type: Holotype

Dataset: The Coleoptera collection (EC) of the Muséum national d'Histoire naturelle (MNHN...)
Publisher: MNHN - Muséum national d'Histoire naturelle
Issues: Occurrence status inferred from individual count

Coordinates missing
This record is published without coordinates, but it includes a textual description of its location.

Location: Pakistan
Locality: Balochistan, forêt du parc national de Ziarat



Creator: Antoine Mantilleri
Record license: <http://creativecommons.org/licenses/by-nc-nd/4.0/>
Identifier: <http://mediaphoto.10ysod78Pvnpk.jyWH>

SOURCES OF DATA IN GBIF: TAXONOMIC LITERATURE, OLD AND NEW

OCCURRENCE DATASET | REGISTERED SEPTEMBER 18, 2014


All observations extracted from the Flora of Northumberland and Durham 1831

Published by [Botanic Garden Meise](#)
Quentin Groom • Quentin Groom

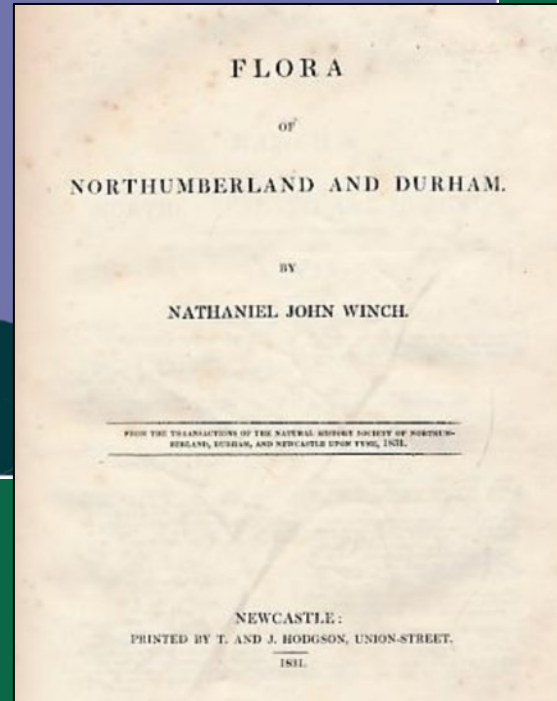
DATASET METRICS ACTIVITY DOWNLOAD HOME PAGE

5,583 OCCURRENCES 62 CITATIONS

5,583 GEOREFERENCED RECORDS



Generated 2 hours ago © OpenStreetMap contributors, © OpenMapTiles, GBIF.



Get data How-to Tools Community About

TREATMENT ARTICLE | REGISTERED APRIL 2, 2018

Review of the Palearctic species of Ismaridae Thomson, 1858 (Hymenoptera: Diapriidae)

Mediated by [Plazi.org taxonomic treatments database](#)
Chang-Jun Kim • David G. Notton • Frode Ødegaard • Jong-Wook Lee • plazi • Guido Sautter

DATASET TAXONOMY METRICS ACTIVITY DOWNLOAD HOME PAGE

162 MATERIALS EXAMINED 15 RECORDS 6 CITATIONS

This dataset contains the digitized treatments in Plazi based on the original journal article Kim, Chang-Jun, Notton, David G., Ødegaard, Frode, Lee, Jong-Wook (2018): Review of the Palearctic species of Ismaridae Thomson, 1858 (Hymenoptera: Diapriidae), European Journal of Taxonomy 417: 1-38, DOI: <https://doi.org/10.5852/ejt.2018.417>

Metadata last modified: October 29, 2019
Hosted by: [Plazi.org taxonomic treatments database](#)
License: [CC0 1.0](#)
How to cite: [DOI](#) 10.5852/ejt.2018.417

162 Occurrences	100% With taxon match	39% With coordinates	95% With year
15 Accepted names	0 Synonyms	100% Overlap with GBIF Backbone	23% Overlap with Catalogue of Life

63 GEOREFERENCED RECORDS



Generated an hour ago © OpenStreetMap contributors, © OpenMapTiles

Any year 1918 - 2016

EXPLORE

PLAZI
TAKING CARE OF FREEDOM
Data liberation



SOURCES OF DATA IN GBIF: DNA SEQUENCE-DERIVED OCCURRENCE DATA

Get data | How-to | Tools | Community | About

SAMPLING EVENT | REGISTERED MARCH 7, 2019

Atlantic salmon microbiota

Published by [MGnify](#)

DATASET | METRICS | ACTIVITY | DOWNLOAD

4,702 OCCURRENCES | 4 CITATIONS

Atlantic salmon skin mucus and surrounding water have been sampled at production facilities both in freshwater and after transfer to seawater. Extracted DNA is sequenced using barcoded 16S primers using PacBio SCC.

Metadata last modified: March 13, 2019
Hosted by: GBIF Secretariat
License: CC BY 4.0
How to cite | DOI: 10.15468/ox86z5

4,702 Occurrences | 94% With taxon match | 100% With coordinates | 100% With year

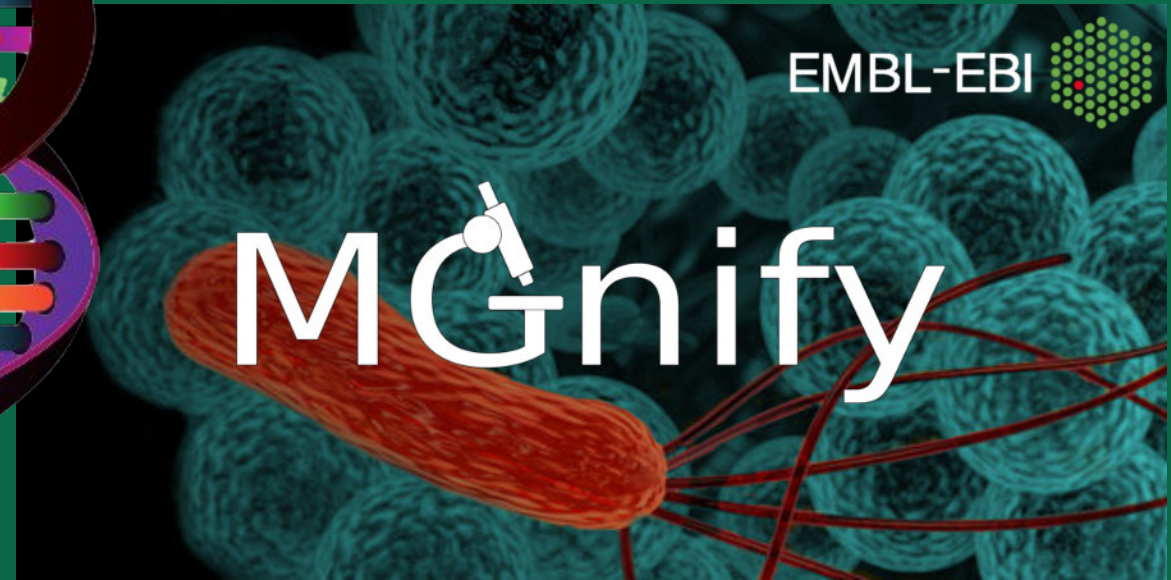
4,702 GEOREFERENCED RECORDS

Generated 2 hours ago © OpenStreetMap contributors, © OpenMapTiles, GBIF.

Year 2017 | EXPLORE AREA

66 EVENTS

Event ID	Event date	Sampling protocol	Occurrence count
mgya00210126	1 January 2017		297
mgya00210073	1 January 2017		209
mgya00210106	1 January 2017		203



GLOBAL BIODIVERSITY VS. DIGITALLY AVAILABLE DATA



1200 mill.
animals



300 m
plants



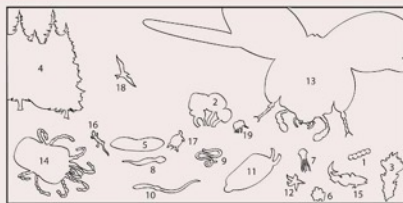
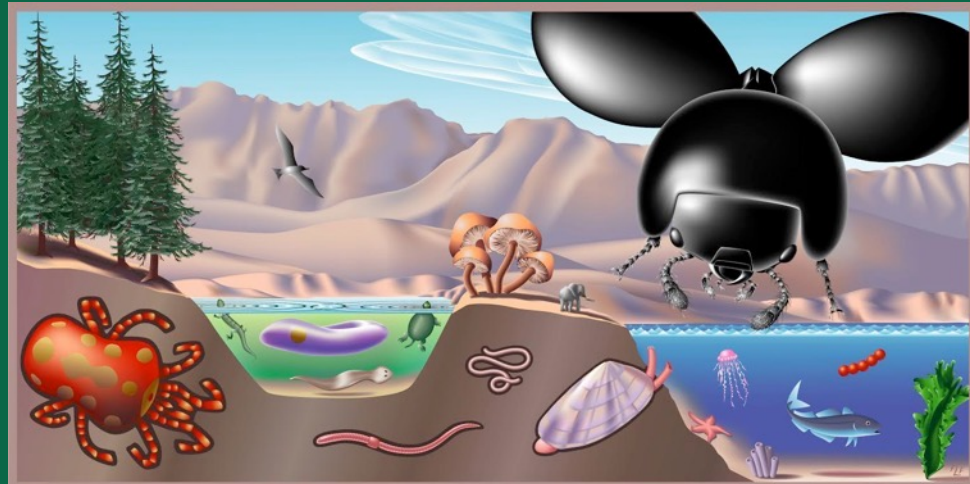
20 m
fungi



16 m
bacteria



0,04 m
virus



Size of individual organisms represents number of described species in major taxon.
Unit Area: □ = approximately 1,000 described species.

Taxon	No. of Described Species	Taxon	No. of Described Species
1 Monera (Bacteria, Blue-green Algae)	4,760	11 Mollusca (Mollusks)	50,000
2 Fungi	46,983	12 Echinodermata (Starfish etc.)	6,100
3 Algae	26,900	13 Insecta	751,000
4 Plantae (Multicellular Plants)	248,428	14 Non-insect Arthropoda (Mites, Spiders, Crustaceans etc.)	123,161
5 Protozoa	30,800	15 Pisces (Fish)	19,058
6 Porifera (Sponges)	5,000	16 Amphibia (Amphibians)	4,181
7 Coelenterata (Jellyfish, Corals, Comb Jellies)	9,000	17 Reptilia (Reptiles)	6,300
8 Platyhelminthes (Flatworms)	12,200	18 Aves (Birds)	9,040
9 Nematoda (Roundworms)	12,000	19 Mammalia (Mammals)	4,000
10 Annelida (Earthworms etc.)	12,000		

Illustration by Frances L. Fawcett. From Q. D. Wheeler. 1990. Ann. Entomol. Soc. Am. 83:1031-1047.

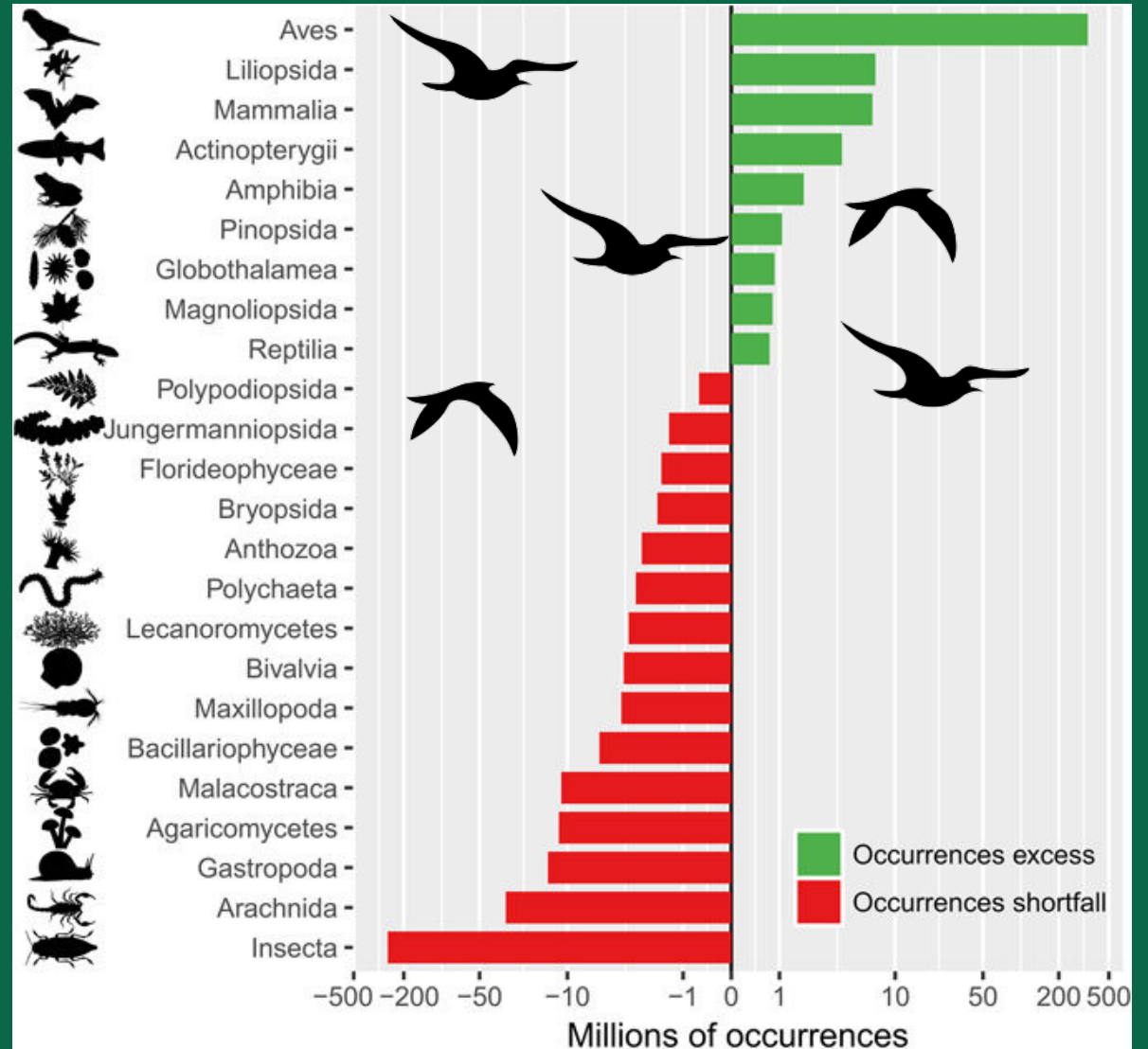


Image: FL Fawcett in Wheller Ann. Entomol. Soc. Am. 1990

Troudet et al. Nature Scientific Reports 2017



GBIF

data publishing



PUBLISH YOUR DATASETS WITH GBIF

- *Step 1:* digitize collections & herbaria
- *Step 2:* register for endorsement in GBIF
- *Step 3:* convert to Darwin Core format
- *Step 4:* publish from national GBIF node

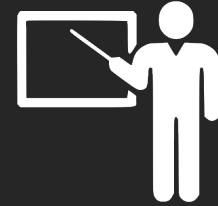
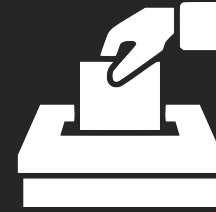
- *Alternative:* publish from regional GBIF cloud data repository - cloud.gbif.org/eca
- *Alternative:* Many citizen science data platforms publish data in GBIF



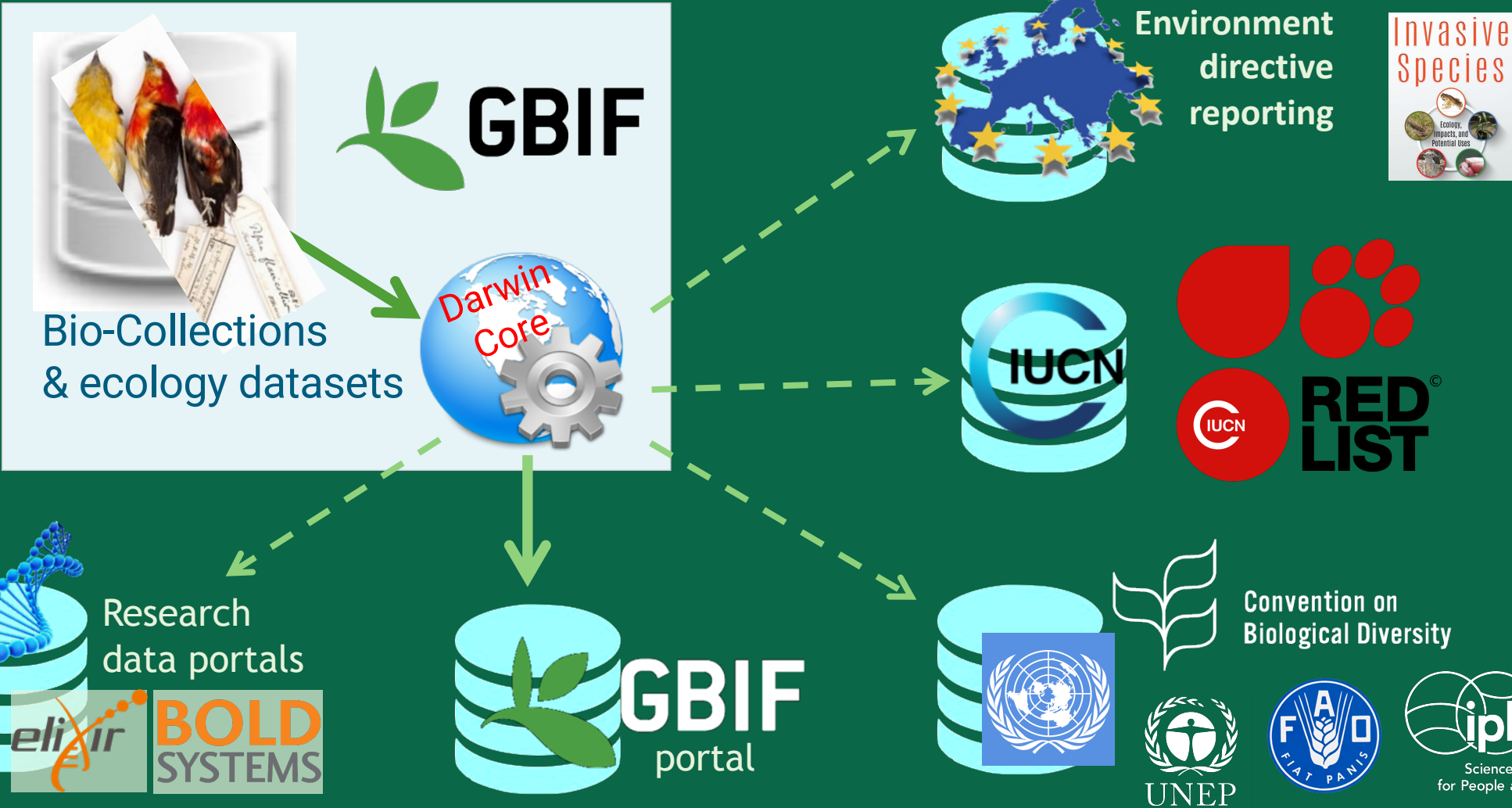


GBIF

data use



GBIF: MULTIPLE-PURPOSE DATA PUBLISHING SERVICES



POLICY LINKS



Convention on
Biological Diversity



SUSTAINABLE
DEVELOPMENT
GOALS

COUNTRY PROFILES

Pakistan



Pakistan

Convention

Party since: 1994-10-24

By: Ratification

Cartagena Protocol

Party since: 2009-05-31

By: Ratification

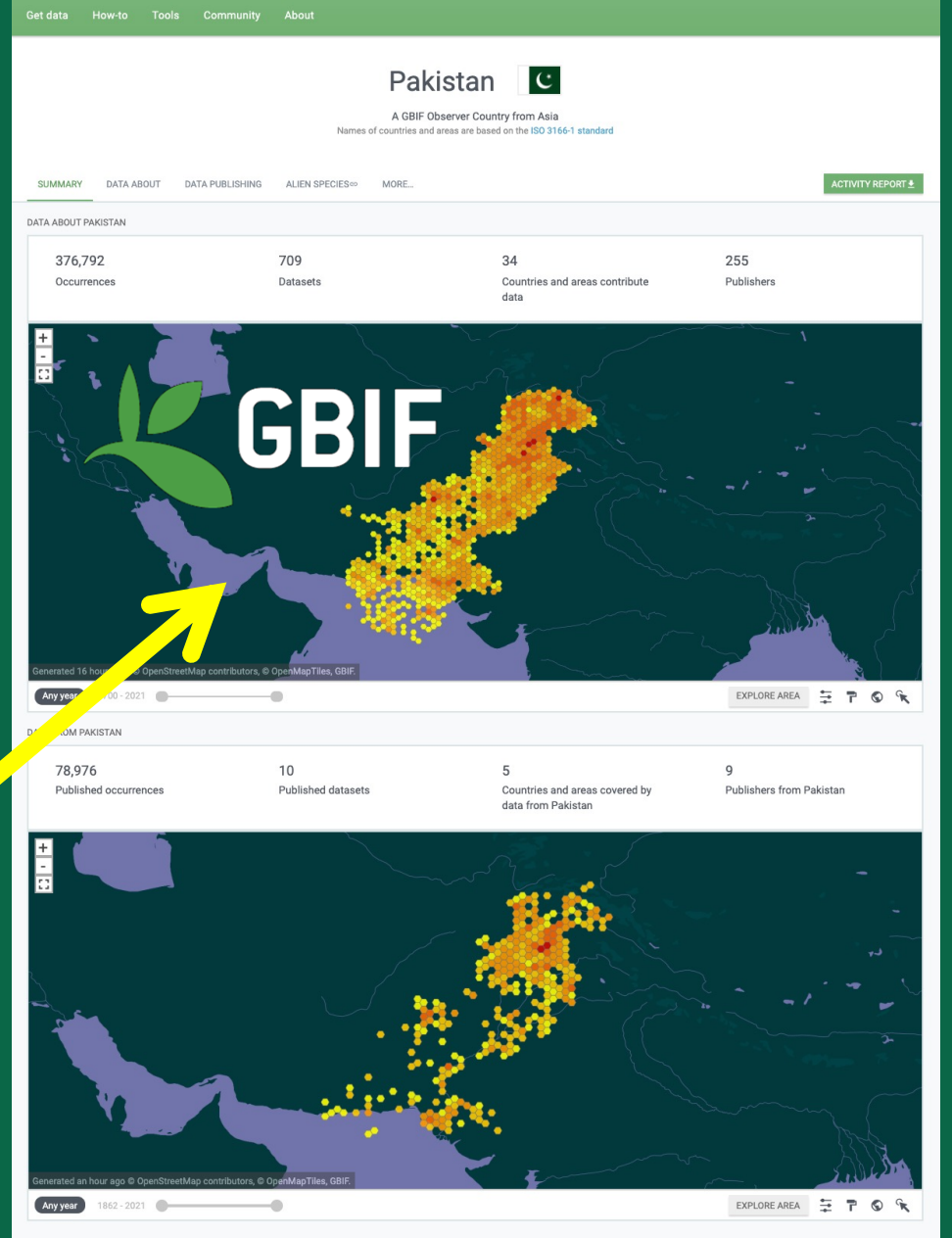
Nagoya Protocol on Access and Benefit-sharing

Party since: 2016-02-21

By: Accession

Further Information

- > InforMEA Profile
- > UNFCCC Profile
- > World Heritage Sites
- > GBIF Data
- > WTO Statistics



POLICY LINKS: AICHI TARGETS



- Trend in invasive alien species introductions (through Global Register of Introduced and Invasive Species)



- Species Protection Index
- Protected Area Representativeness Index

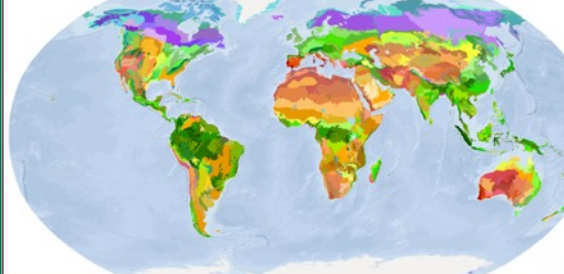


- Comprehensiveness of conservation of socioeconomically/culturally valuable species
- Agrobiodiversity Index
- Crop Wild Relative Index



- Growth in species occurrence records accessible through GBIF
- Species Status Information Index

A DATA RESOURCE TO SUPPORT RESEARCH AND SUSTAINABLE DEVELOPMENT



SERVED AS THE BASIS OF THE STATISTICAL ANALYSIS IN SMITH ET AL. 2018, THE LATEST EXPERT-LED REFINEMENT OF A GLOBAL MAP OF ECOREGIONS DEVELOPED AS PART OF THE PROPOSED GLOBAL DEAL FOR NATURE HAD ITS APPROACH VALIDATED BY THE RESEARCH. FIGURE FROM DINERSTEIN ET AL. (2017) <https://doi.org/10.1093/biosci/bix014> [CC BY 4.0]

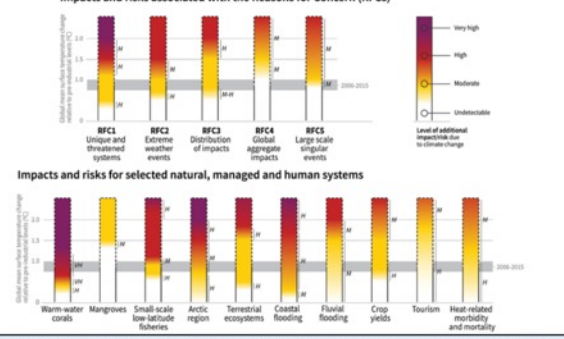
DATA STORY USING SPECIES OCCURRENCE DATA AS EVIDENCE TO TEST RECEIVED BIOGEOGRAPHIC WISDOM

DATA USED: 200 MILLION SPECIES OCCURRENCES



COFFEA LIBERICA BY DINESH VALKE https://www.flickr.com/photos/dinesh_valke/5597839545 [CC BY-SA 2.0]

DATA STORY DEVELOPING AN INDICATOR FOR SUSTAINABLE DEVELOPMENT GOALS & BIODIVERSITY TARGETS USING OPEN DATA



Impacts and risks associated with the reasons for concern (RFCs)

Impacts and risks for selected natural, managed and human systems

IMPLICATIONS OF GLOBAL WARMING FOR PEOPLE, ECONOMIES AND ECOSYSTEMS. CROPPED FROM FIGURE IN IPCC SR1.5: SUMMARY FOR POLICYMAKERS*

DATA STORY DATA FROM THE GBIF NETWORK UNDERPINS BIODIVERSITY-RELATED FINDINGS IN LATEST IPCC REPORT



PTEROPUS GIGANTEUS BY HEMANT KUMAR <https://www.gbif.org/occurrence/1092888502> [CC BY-NC 4.0]

DATA STORY FLYING FOXES PREDICT NIPAH VIRUS TRANSMISSION RISK

DATA USED: 47,942 SPECIES OCCURRENCES

Conservation

- Protected areas
- Threatened species
- Invasive species risk

Food Security

- Crop wild relatives
- *In situ, ex situ* conservation of genetic diversity
- Fisheries planning

Climate change

- Modelling impacts on species ranges
- Adaptation strategies
- Mitigation benefits, risks

Human health

- Disease risk based on occurrence of vectors, hosts, reservoirs
- Medicinal plants
- Hazards e.g. snakebite

CREDIT FOR DATA REUSE

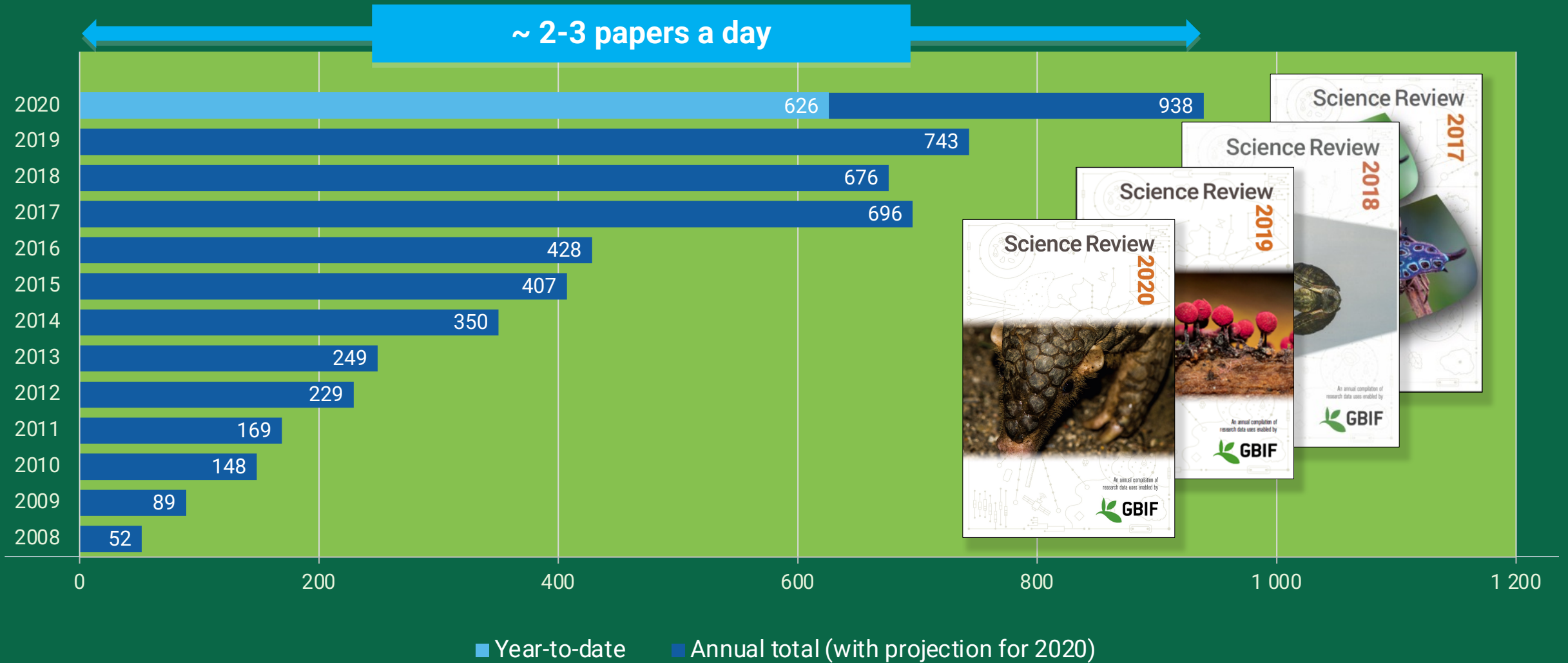
To incentivize the sharing of useful data, the scientific enterprise needs a well-defined **system that links individuals with reuse of data sets they generate**

Pierce *et al.* Credit data generators for data reuse, *Nature* 6 June 2019



PEER-REVIEWED PUBLICATIONS USING GBIF-MEDIATED DATA

September 2020



HOW TO CITE DATA MEDIATED BY GBIF

1. **Download data** from GBIF.org
2. and receive recommended citation with a **download DOI**
3. **Cite the DOI** in published research or other work

Example: GBIF.org (12 October 2020) GBIF Occurrence Download <https://doi.org/10.15468/dl.xxxxxx>

WHY CITE DATA?

- **Good academic practice** for transparent and reproducible research
- **Credit institutions** who shared data and supported your research
- Help data publishing institutions to **demonstrate value** of digitization and data publication through research
- Correct citation **encourages data sharing**
- Data accessed through GBIF is free for all – but not free of obligations: see the **user agreement**



THE RESEARCH DATA LIFECYCLE

GBIF | Global Biodiversity Information Facility

Free and open access to biodiversity data

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WHAT IS GBIF? | ABOUT GBIF NORWAY

Occurrence records 1,698,262,502	Datasets 59,461	Publishing institutions 1,677	Peer-reviewed papers using data 5,762
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News items:

- Call for nominations to the 2021 GBIF Young Researchers Award
- Call for data papers describing datasets from Russia
- 2021 Ebbe Nielsen Challenge seeks open-data innovations for biodiversity
- The GBIF Registry of Scientific Collections (GRSciColl) in 2021

GBIF.org

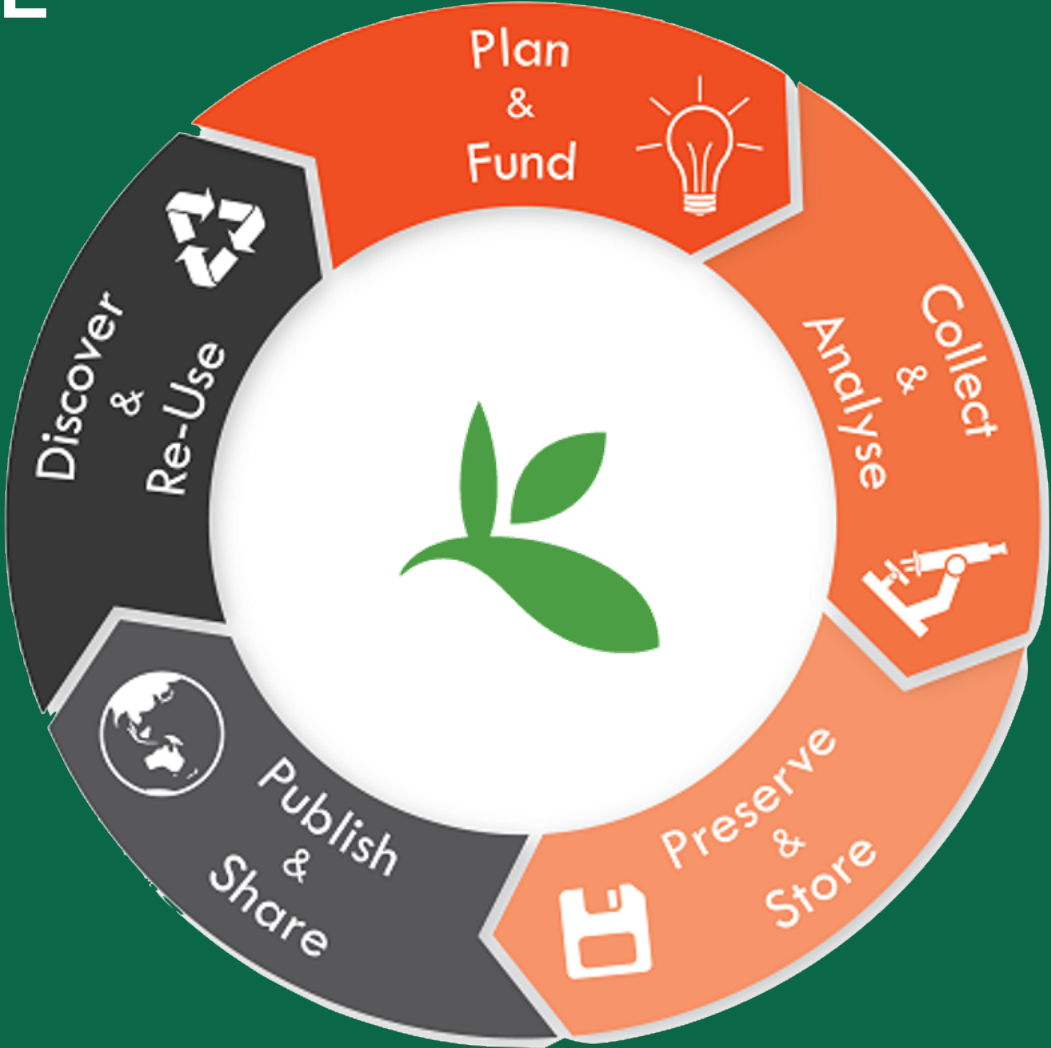


Illustration image credit: Sydney University

THANK YOU

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www.gbif.org

