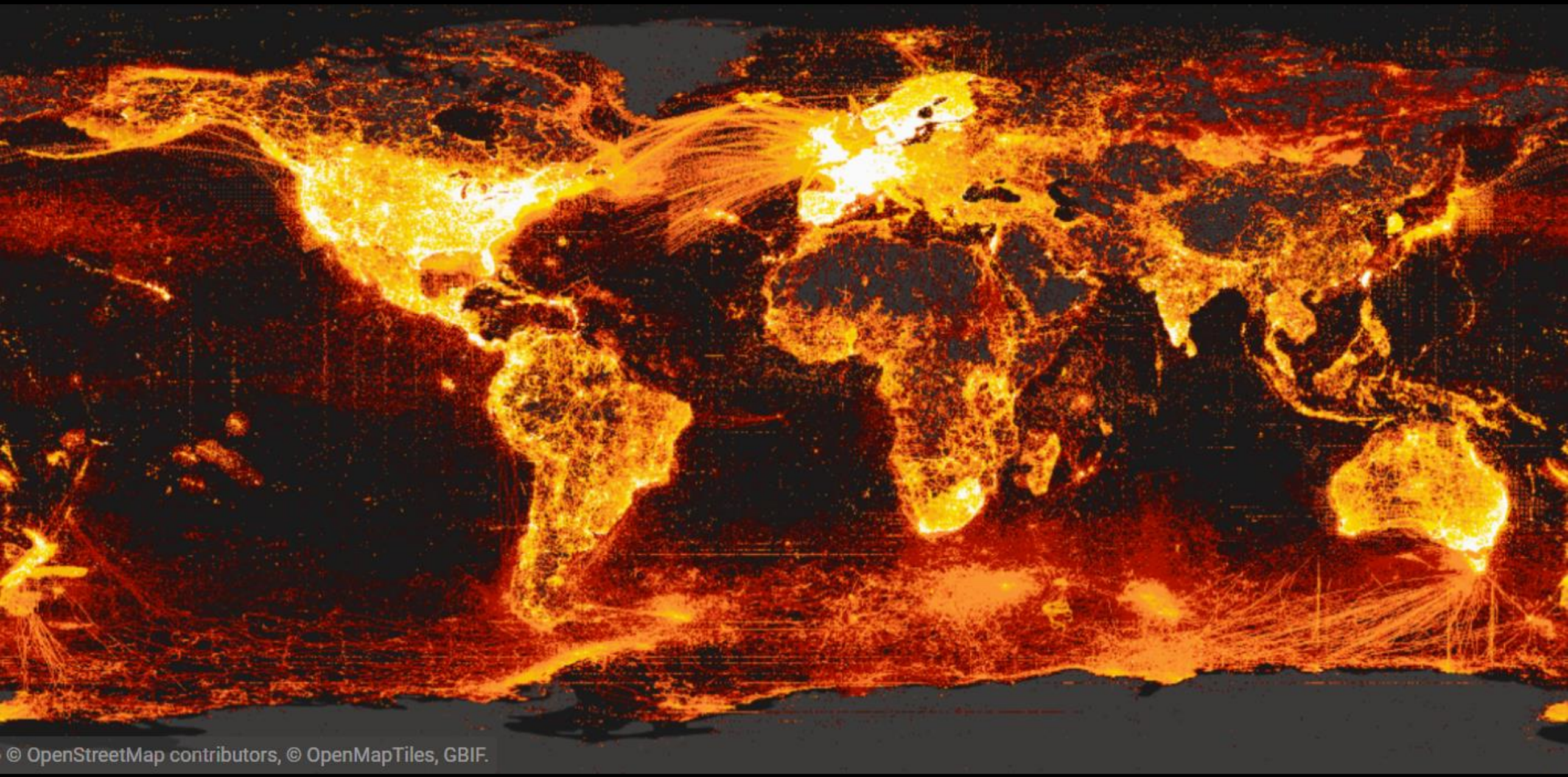

© OpenStreetMap contributors, © OpenMapTiles, GBIF.

Global Biodiversity Information Facility (GBIF)

... for science

Dmitry Schigel | Scientific officer

Biodiversity data in montane and arid Eurasia
Almaty, Kazakhstan

18-19 November 2024

Vision

A world in which the best possible biodiversity data underpins research, policy and decisions.

Mission

To mobilize the data, skills and technologies needed to make comprehensive biodiversity information freely available for science and decisions addressing biodiversity loss and sustainable development

#CiteTheDOI

1 Building the evidence to advance scientific research and understanding of global biodiversity

2 Supporting policy responses and knowledge transfer that address urgent societal challenges around planetary change

2023 - 2027

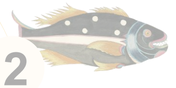
GBIF Strategic Framework

4 Driving innovation to advance biodiversity-related knowledge

3 Enabling the network to meet future needs and challenges

1 Building the evidence to advance scientific research and understanding of global biodiversity

2 Supporting policy responses and knowledge transfer that address urgent societal challenges around planetary change



2023 - 2027

GBIF Strategic Framework

4 Driving innovation to advance biodiversity-related knowledge

3 Enabling the network to meet future needs and challenges

GBIF strategic framework 2023 - 2027

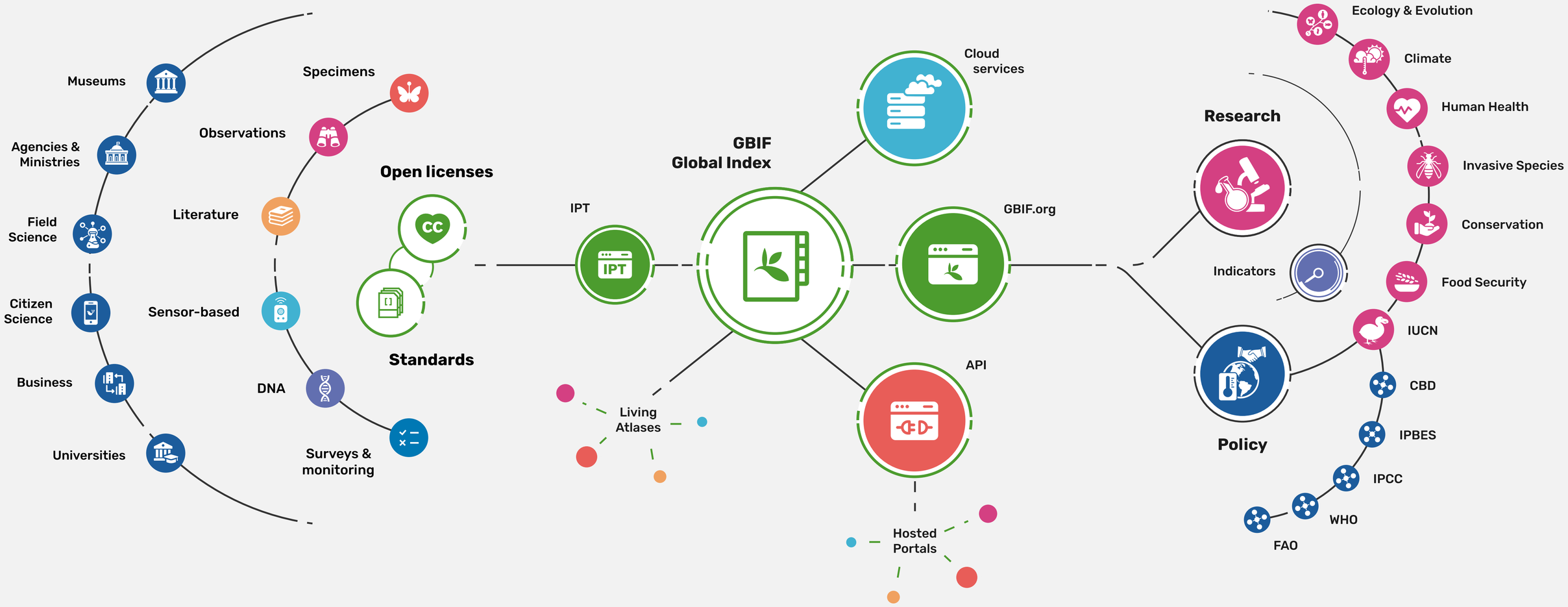
Building the evidence to advance scientific research and understanding of global biodiversity

Objectives

- Reduce knowledge gaps by helping the network to set targets for consolidating data coverage across thematic, taxonomic, phylogenetic, spatial and temporal dimensions.
- Enable, expand and diversify the uptake and application of GBIF-mediated data.
- Support the evolution of fundamental data-driven biodiversity research and its application across methods, scales and disciplines in life and environmental sciences.
- Ensure meaningful data exchange and reuse of data through citations and measurements, promoting and consistently applying accepted standards that adhere to best practices and sustain the highest aspirations in open and data-intensive science.
- Increase GBIF's relevance to research, promote recognition, expand involvement and improve best practices for data in academia and higher education.

https://www.gbif.org/strategic-plan

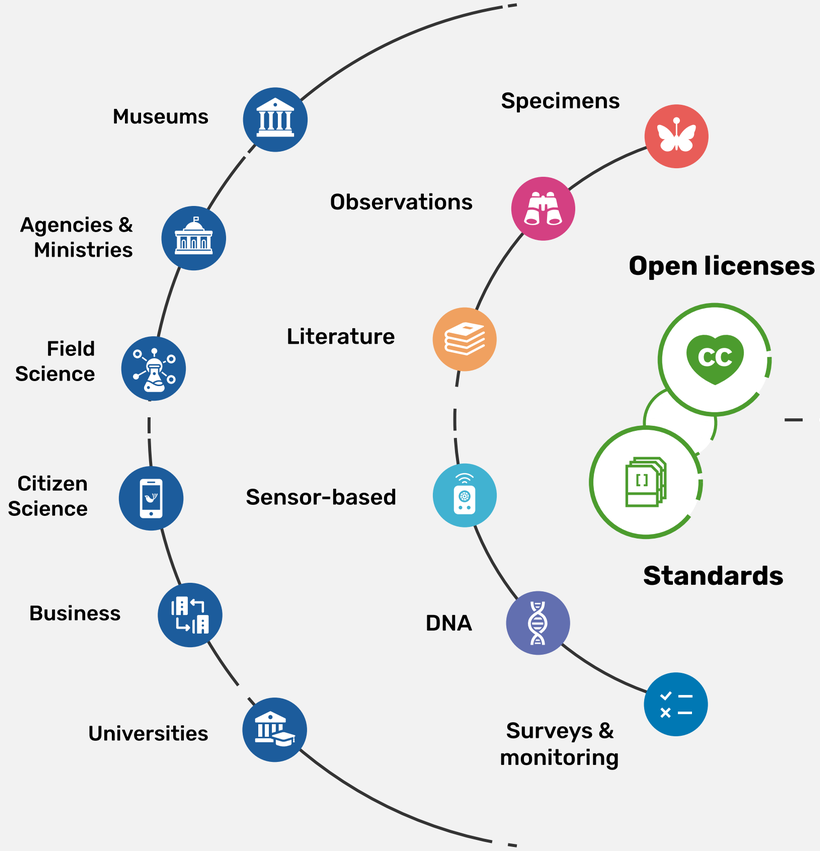
Providing biodiversity evidence for research and policy



Sources of biodiversity evidence

Create

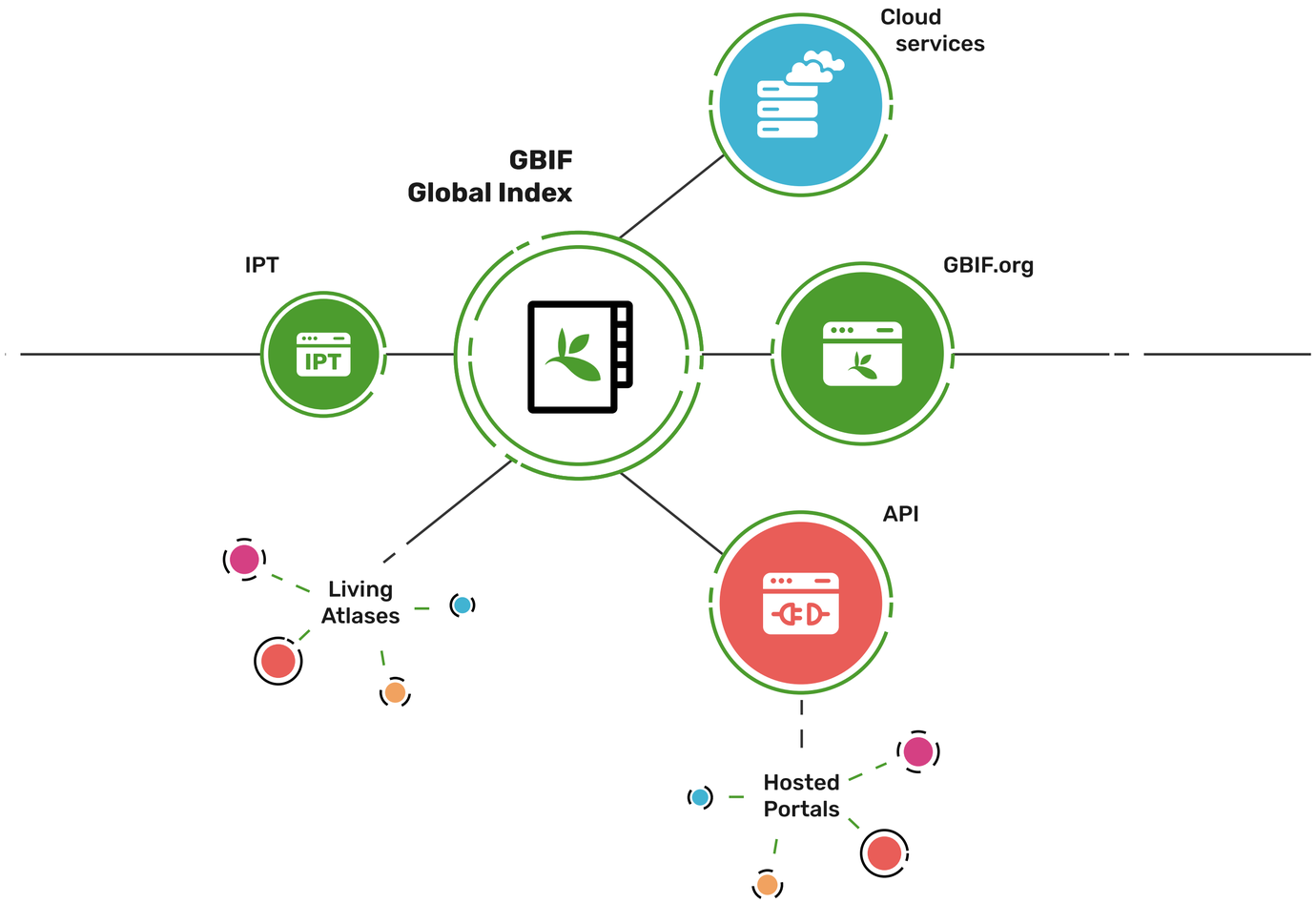
Combine sources of evidence



Access to biodiversity evidence

Share

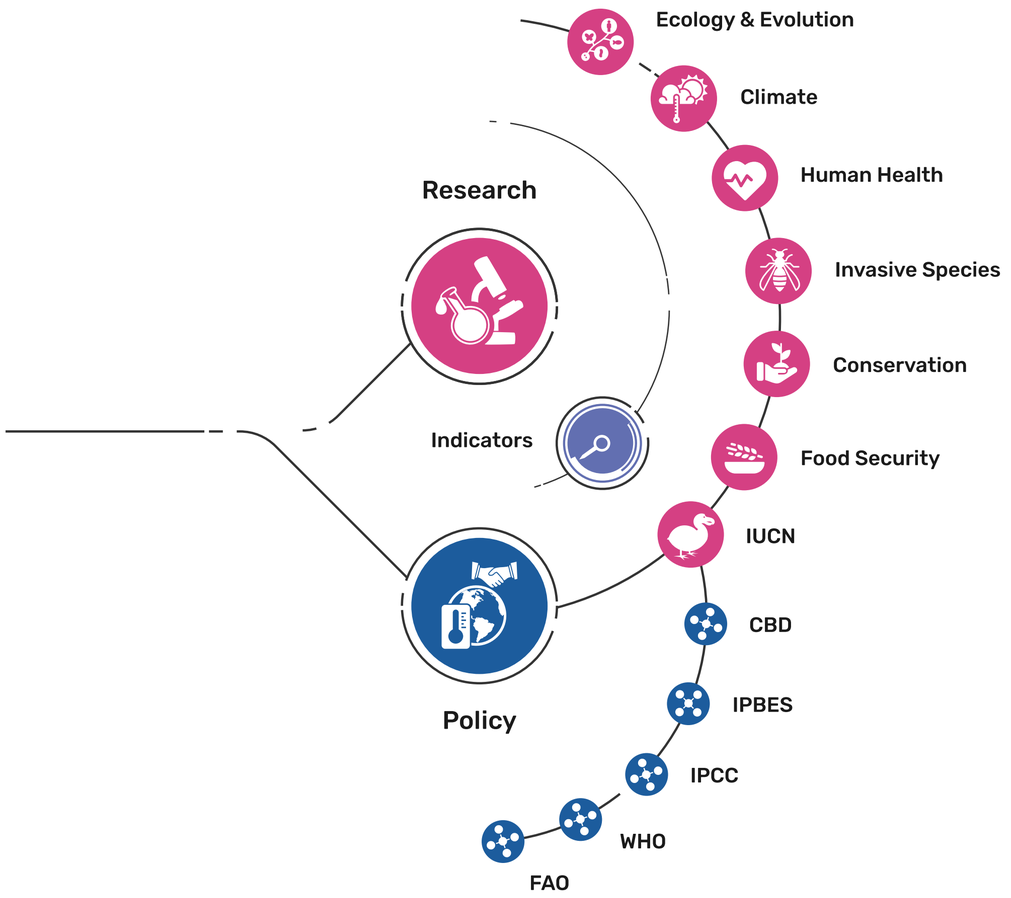
FAIR and open access



Uses of biodiversity evidence

Transform

Apply and use data



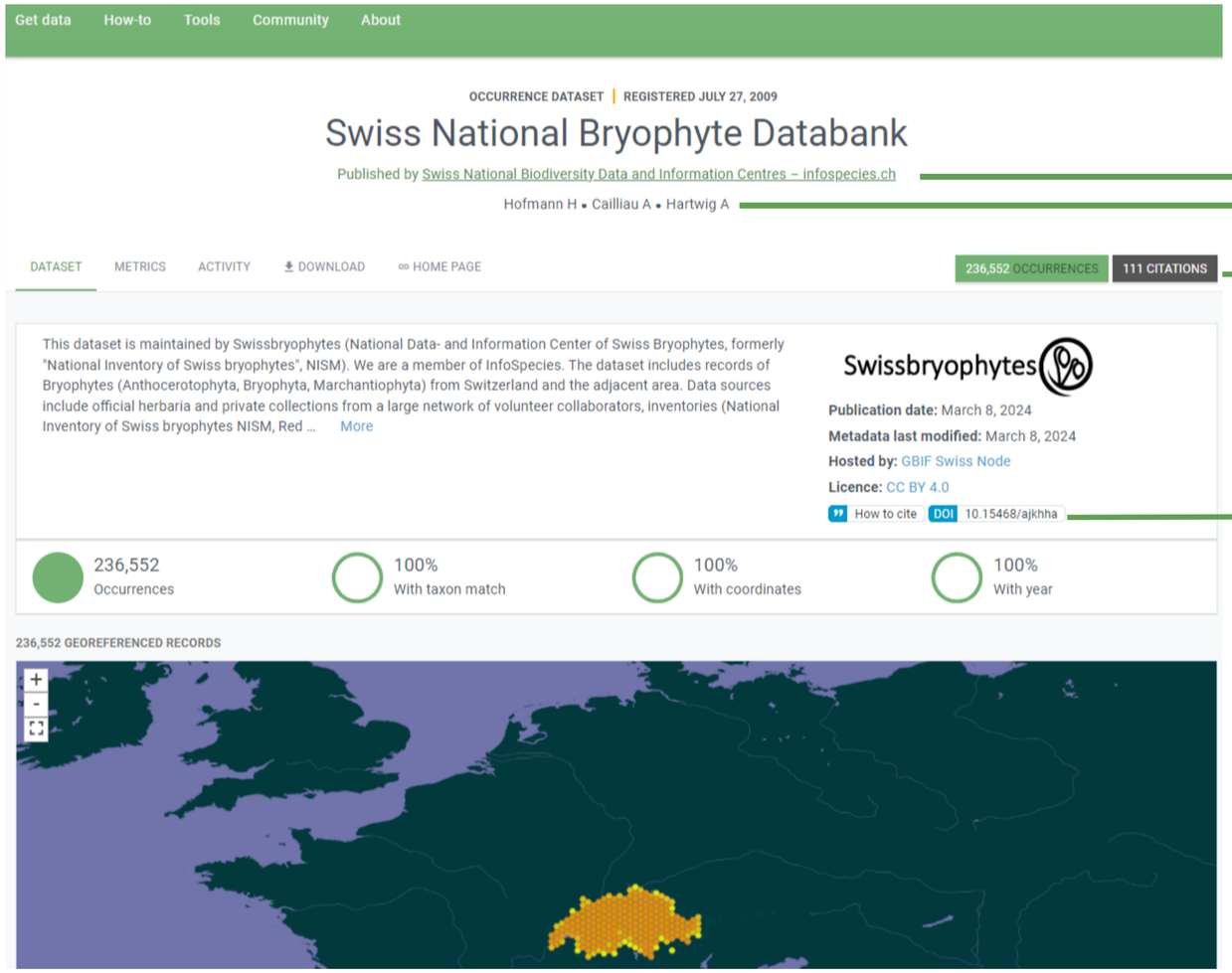
GBIF supporting research

GBIF supporting policy

Science and research

Dmitry Schigel

Data in 108,709 datasets: attribution, credit and affiliation

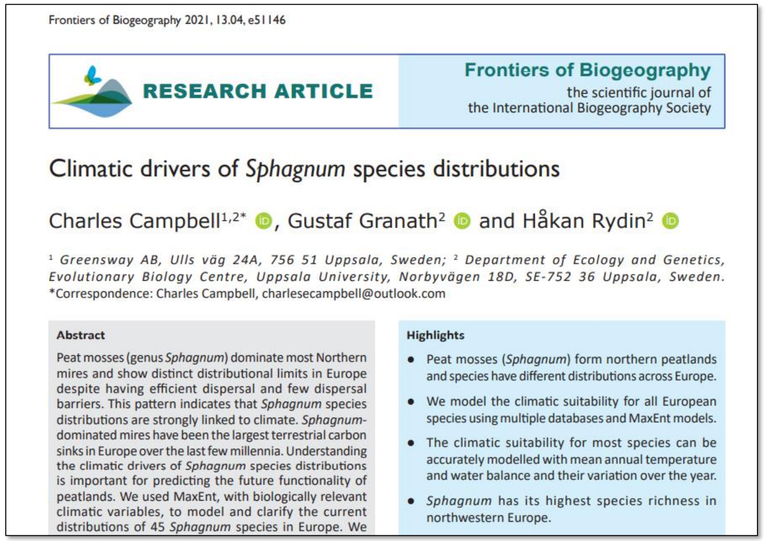


1 **Affiliation**

2 **Authorship**

3 **Data citations**

4 **DOI**



Frontiers of Biogeography 2021, 13.04, e51146

RESEARCH ARTICLE

Frontiers of Biogeography
the scientific journal of
the International Biogeography Society

Climatic drivers of *Sphagnum* species distributions

Charles Campbell[1,2*], Gustaf Granath[2] and Håkan Rydin[2]

[1] *Greensway AB, Ulls väg 24A, 756 51 Uppsala, Sweden;* [2] *Department of Ecology and Genetics, Evolutionary Biology Centre, Uppsala University, Norbyvägen 18D, SE-752 36 Uppsala, Sweden.*
*Correspondence: Charles Campbell, charlesecampbell@outlook.com

Abstract

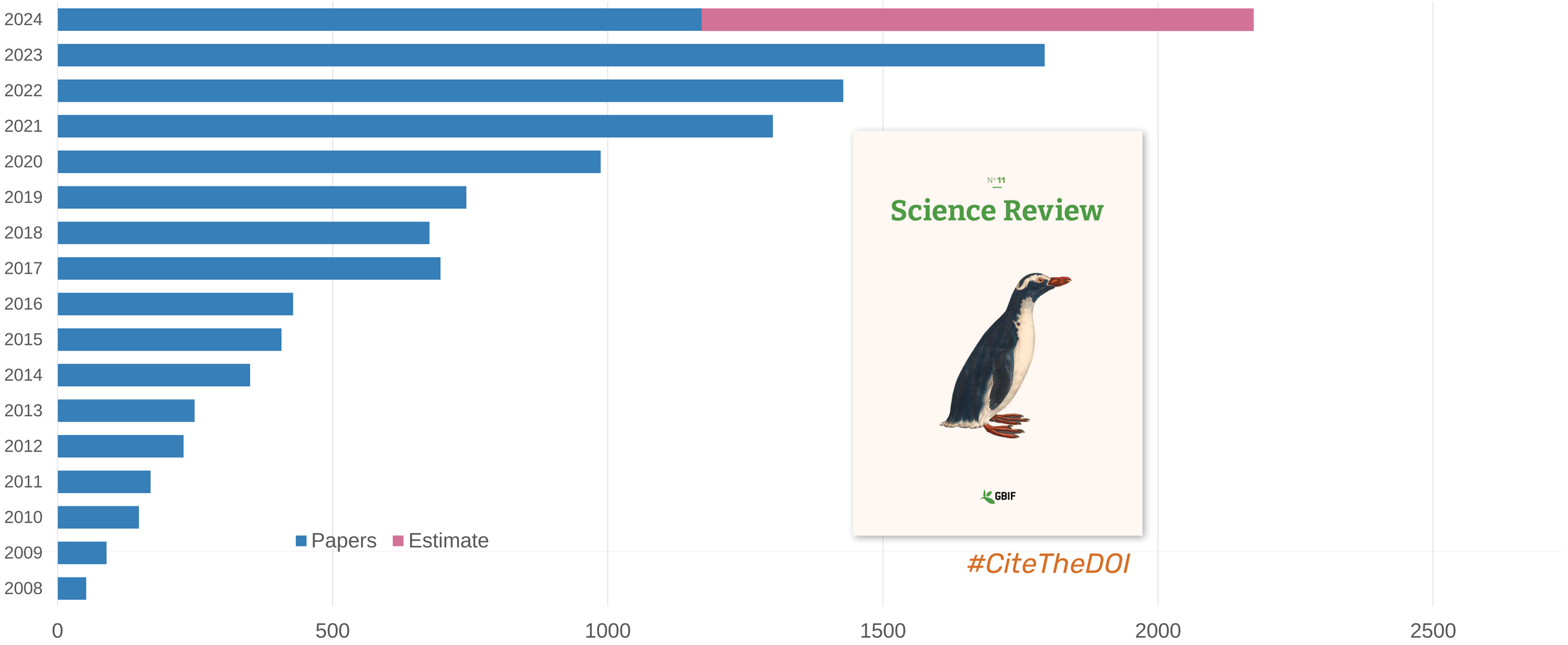
Peat mosses (genus *Sphagnum*) dominate most Northern mires and show distinct distributional limits in Europe despite having efficient dispersal and few dispersal barriers. This pattern indicates that *Sphagnum* species distributions are strongly linked to climate. *Sphagnum*-dominated mires have been the largest terrestrial carbon sinks in Europe over the last few millennia. Understanding the climatic drivers of *Sphagnum* species distributions is important for predicting the future functionality of peatlands. We used MaxEnt, with biologically relevant climatic variables, to model and clarify the current distributions of 45 *Sphagnum* species in Europe. We

Highlights

- Peat mosses (*Sphagnum*) form northern peatlands and species have different distributions across Europe.
- We model the climatic suitability for all European species using multiple databases and MaxEnt models.
- The climatic suitability for most species can be accurately modelled with mean annual temperature and water balance and their variation over the year.
- *Sphagnum* has its highest species richness in northwestern Europe.

Hofmann H, Kiebacher T, Moser T, Meier M (2021). Swiss National Bryophyte Databank. Swiss National Biodiversity Data and Information Centres – infospecies.ch. Occurrence dataset https://doi.org/10.15468/ajkhha accessed via GBIF.org on 2022-04-28.

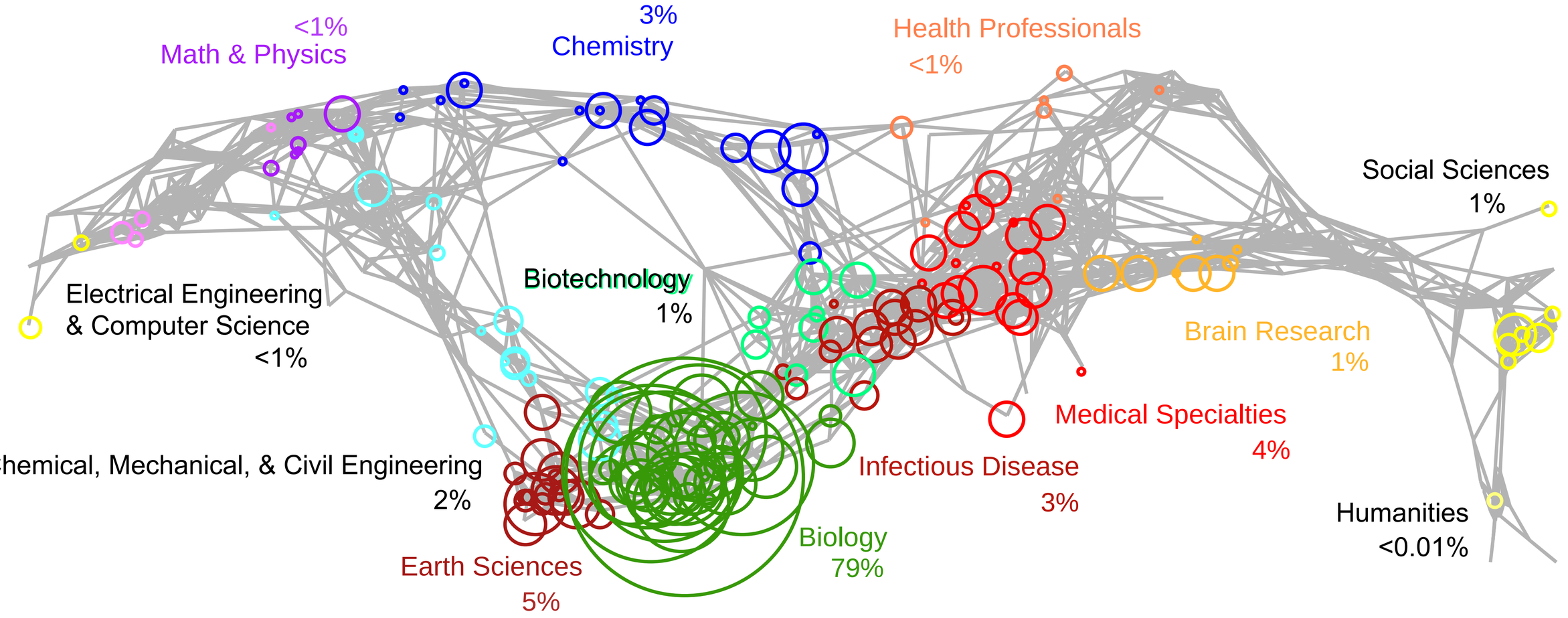
Peer-reviewed publications using GBIF-mediated data



#CiteTheDOI

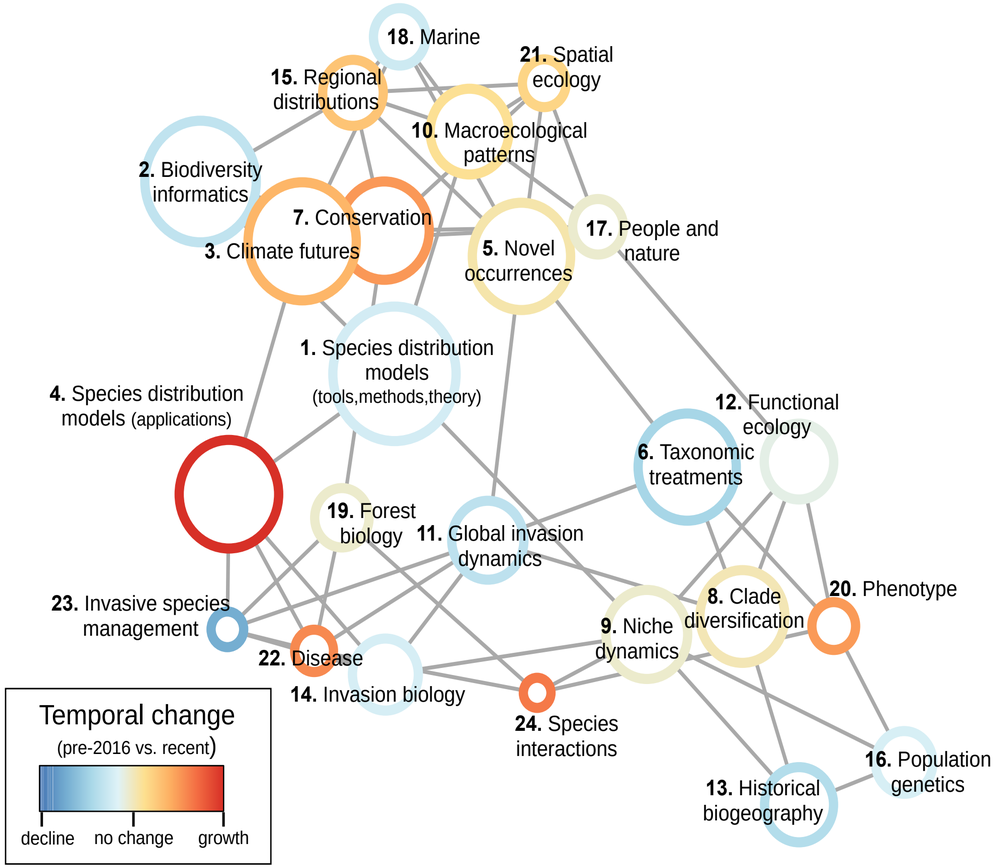
https://www.gbif.org/resource/search?contentType=literature&literatureType=journal&relevance=GBIF_USED&peerReview=true

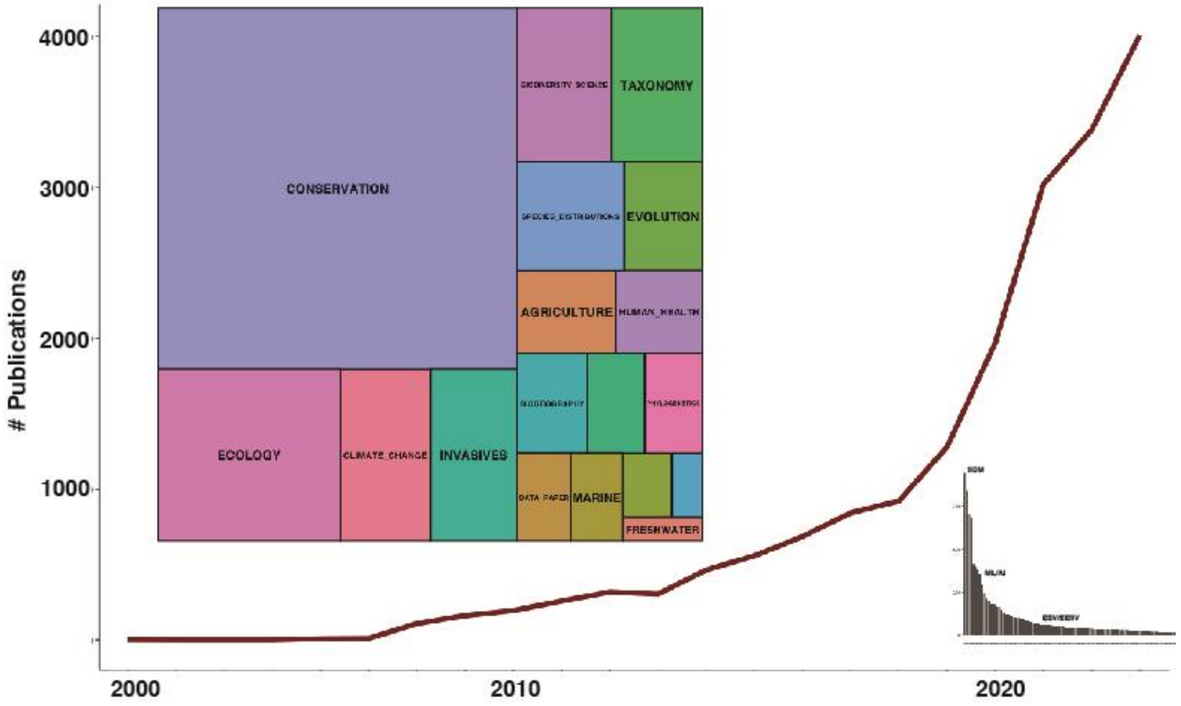
Map of GBIF-enabled science



Heberling JM et al. D (2021) Data integration enables global biodiversity synthesis. PNAS 118(6): e2018093118. https://doi.org/10.1073/pnas.2018093118

Systematic reviews of GBIF-enabled science






Data integration enables global biodiversity synthesis

Heberling et al. 2021

Landscaping study I

2016 – 2019

DOI: 10.1073/pnas.2018093118

Steinke et al. 2025

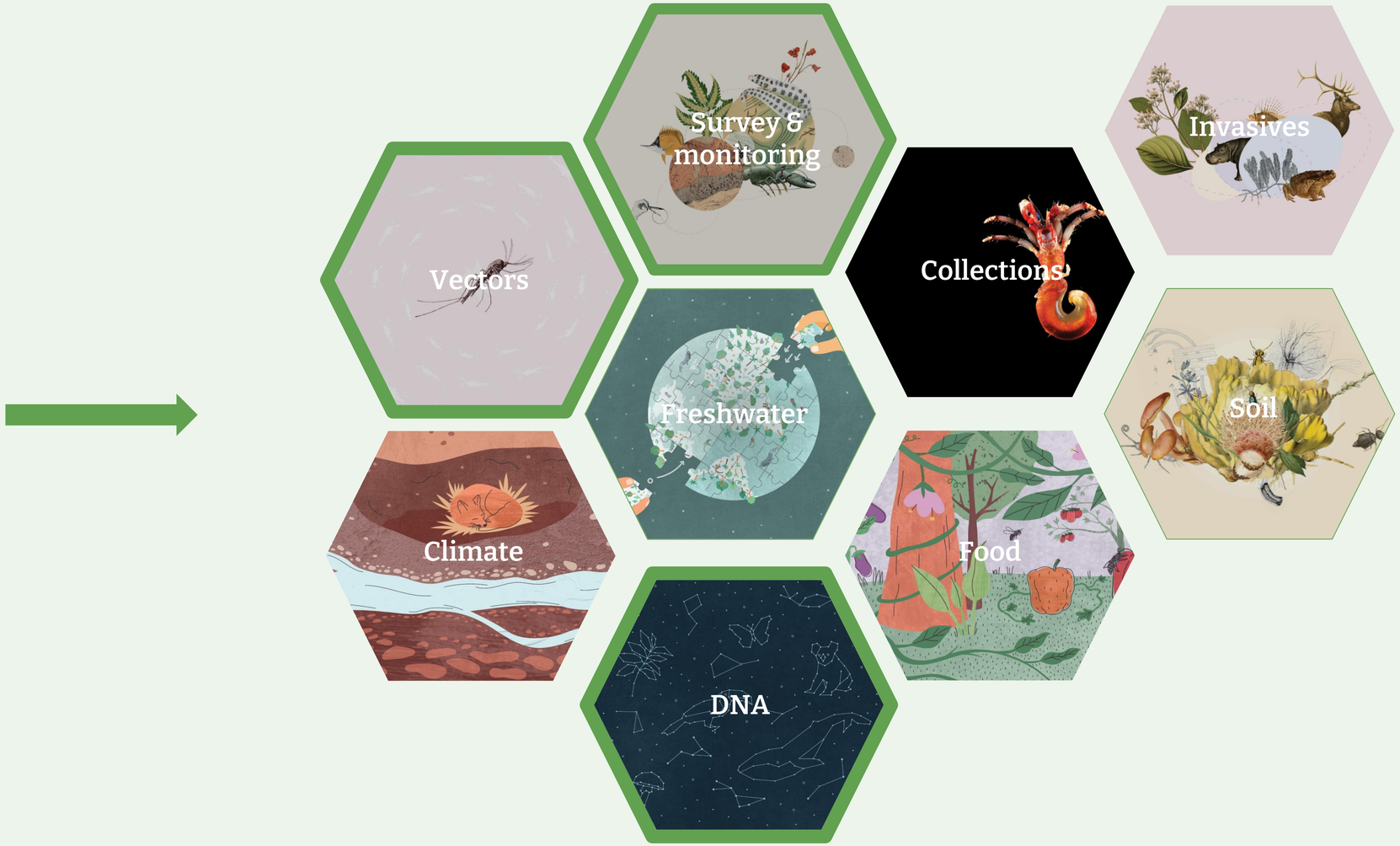
Landscaping study II

2020 – 2024

GBIF thematic priorities

2023 - 2027

GBIF Strategic Framework



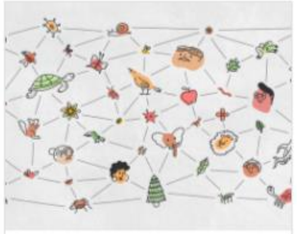
Get data How-to Tools Community About

Thematic communities

Soil

Conservation

Climate change



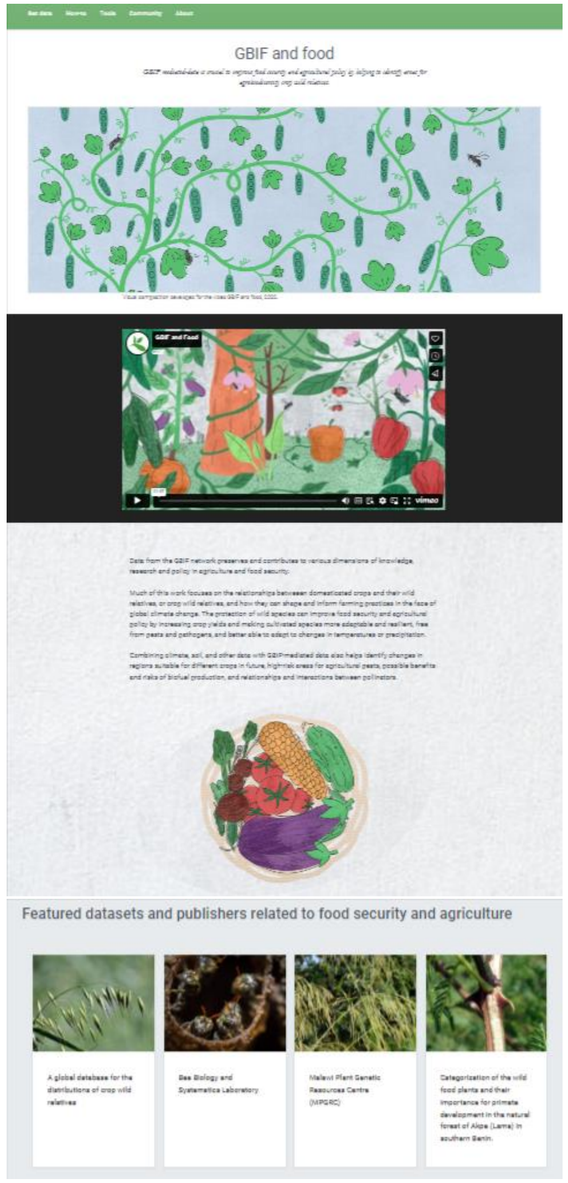
Human health and One Health

DNA barcoding and metagenomics

Agriculture and food security

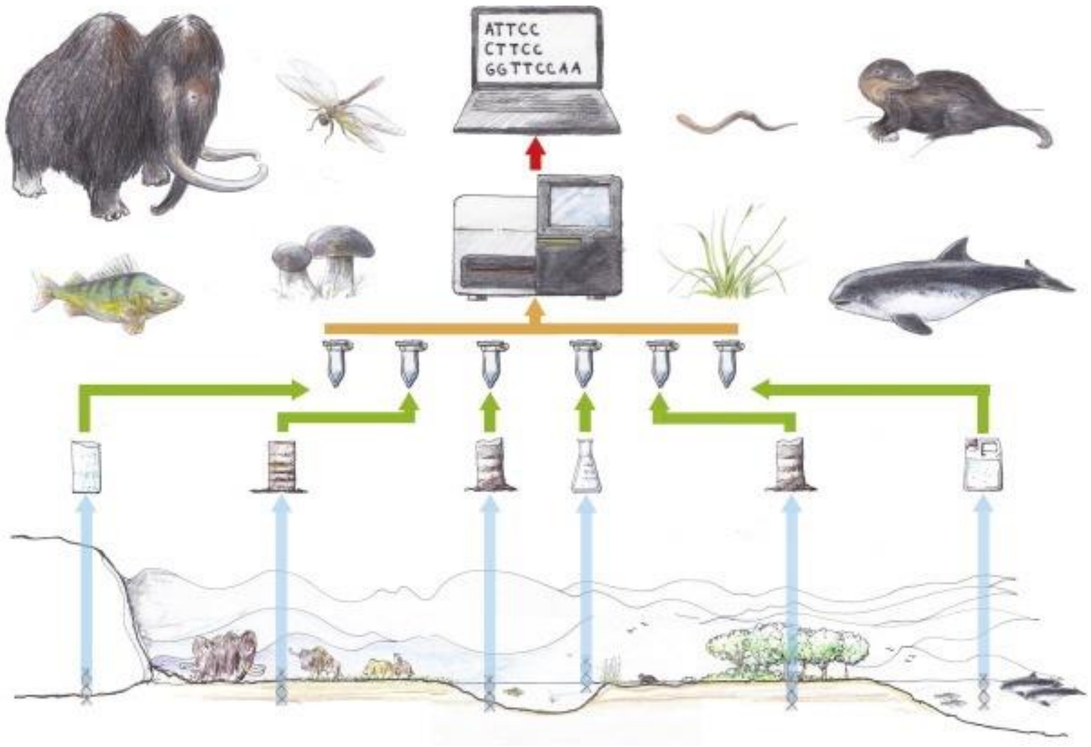
Business sector

Scientific collections



eDNA and metabarcoding

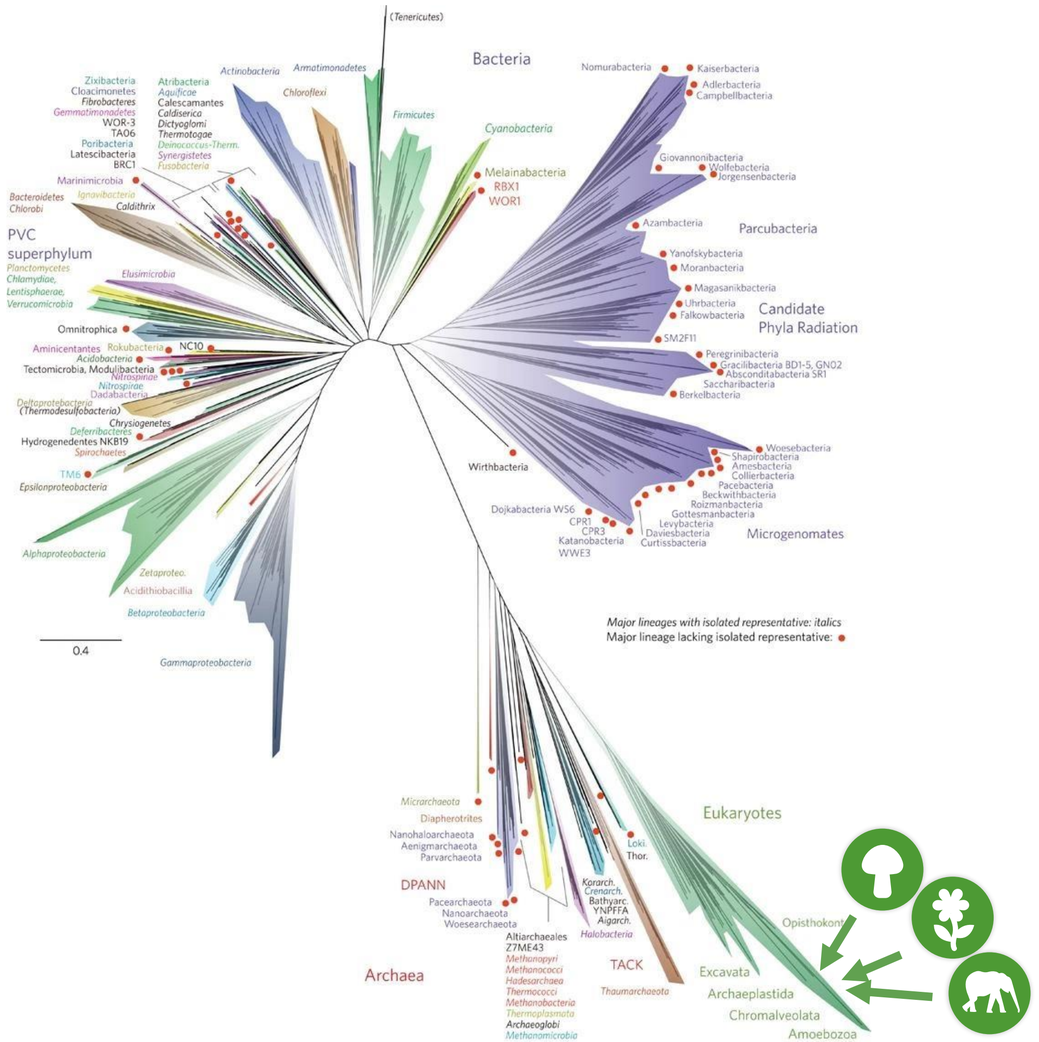
What is eDNA?



Uncovering “invisible footprints” of organisms

Why is eDNA Data Essential?

Filling critical taxonomic and geographic gaps for comprehensive biodiversity data



Hug, L., Baker, B., Anantharaman, K. *et al.* A new view of the tree of life. *Nat Microbiol* **1**, 16048 (2016).

Collaborating for a global eDNA data future

NLM-NCBI

ENA
European Nucleotide Archive

DDBJ
DNA Data Bank of Japan

BOLD SYSTEMS

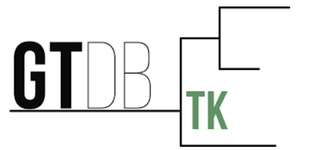
Swedish ASV portal

unite
community

PlutoF

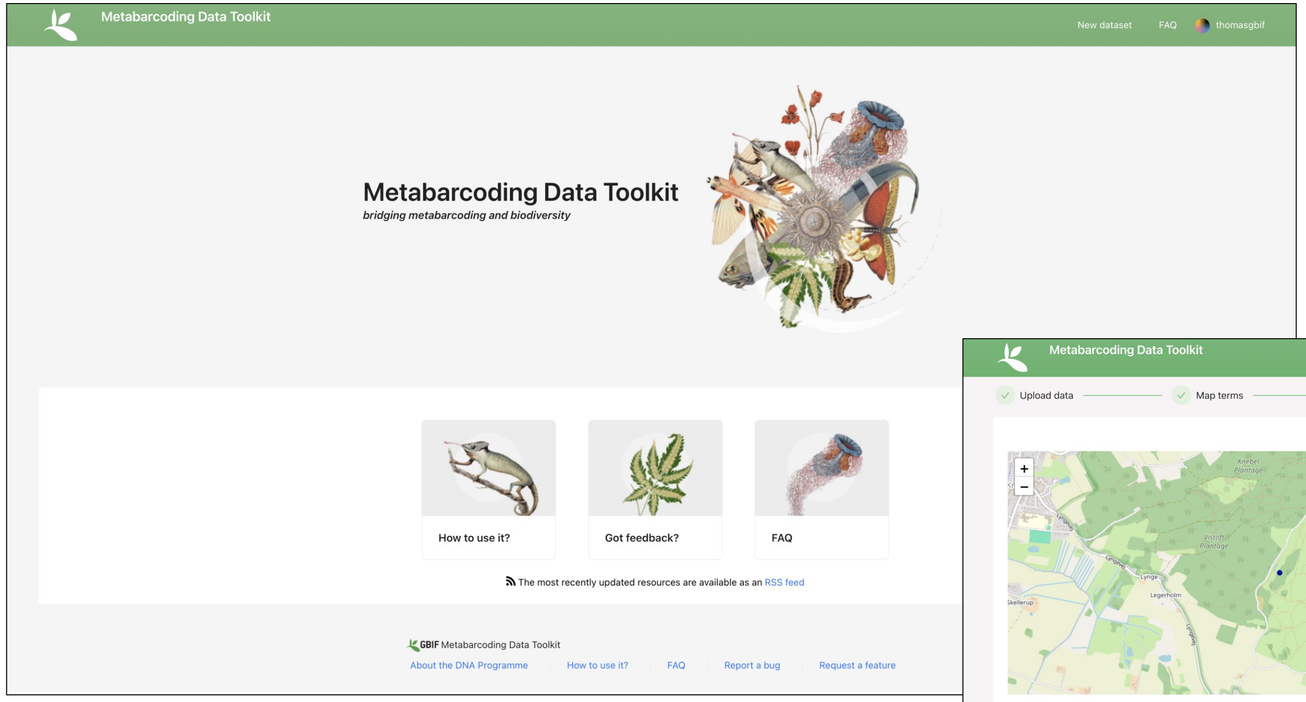
Catalogue of Life

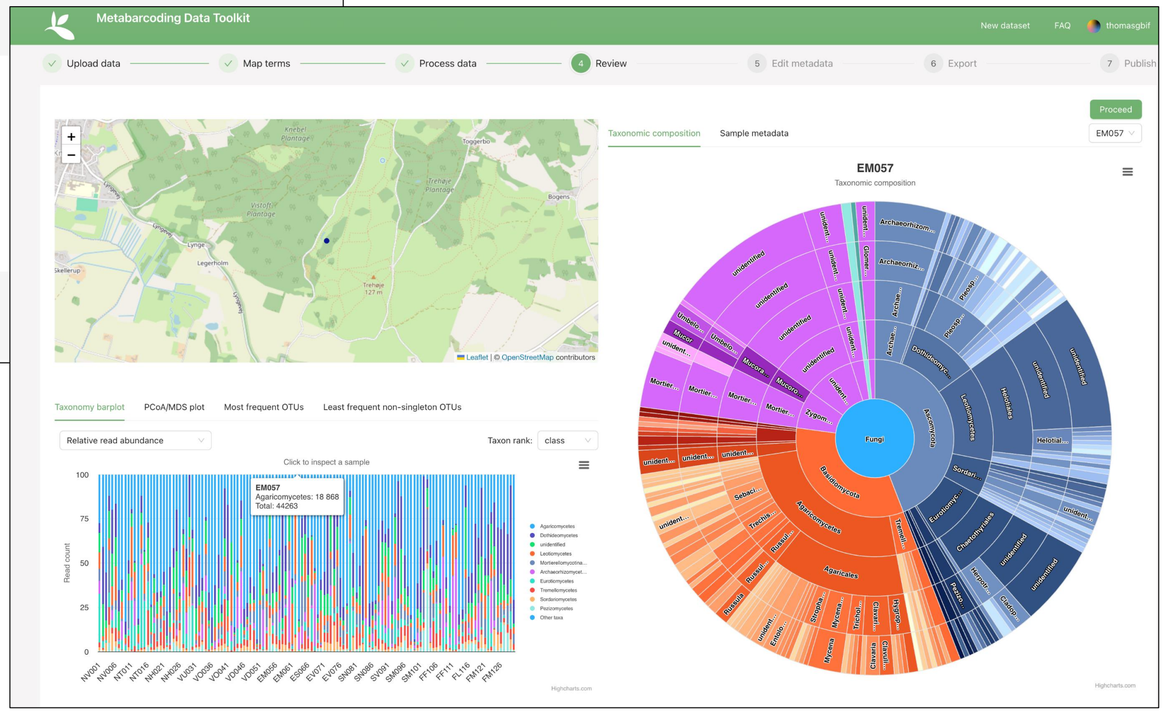
MGnify



WILDERLAB

The Metabarcoding Data Toolkit





Surveys and monitoring

Humboldt extension and data model

What are survey and monitoring data?

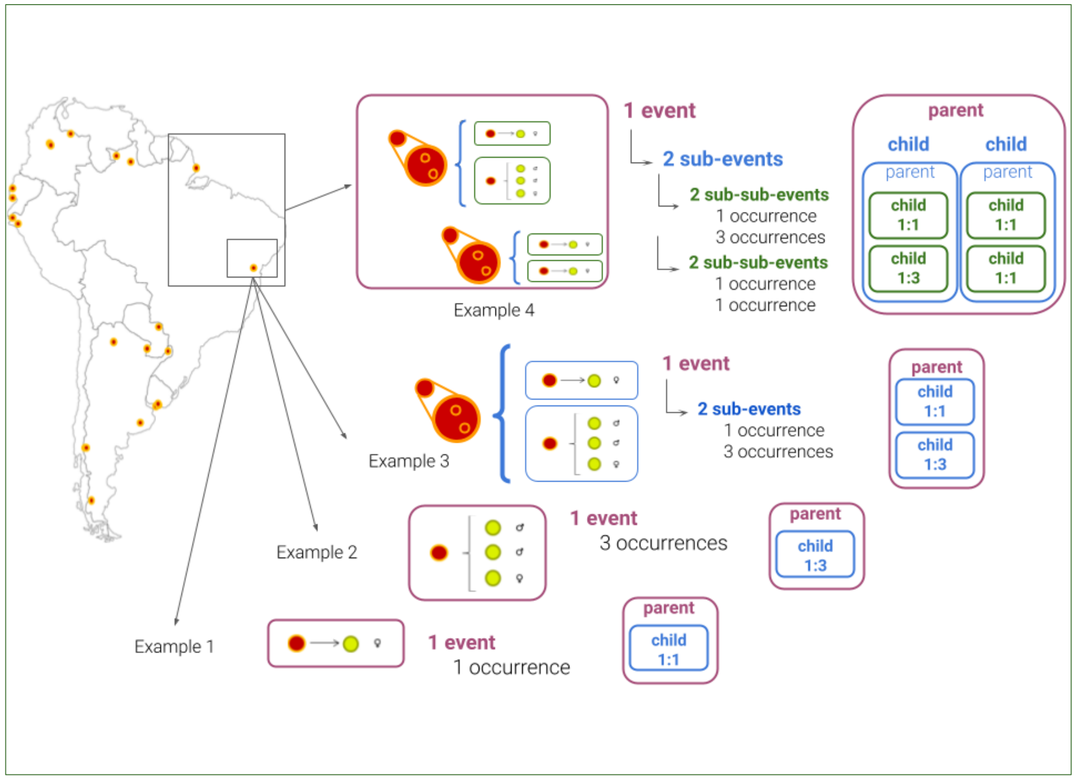


Figure 4, Sica et al. 2023. Humboldt Extension for Ecological Inventories: User Guide w/ Test IPT Instructions. https://tinyurl.com/HEuserguide

- Reported sampling protocol
- Heirarchical w/ variable complexity
- Effort types
  - Bioblitzes, museum expeditions, long-term monitoring initiatives, …

Why are survey and monitoring data important to GBIF?

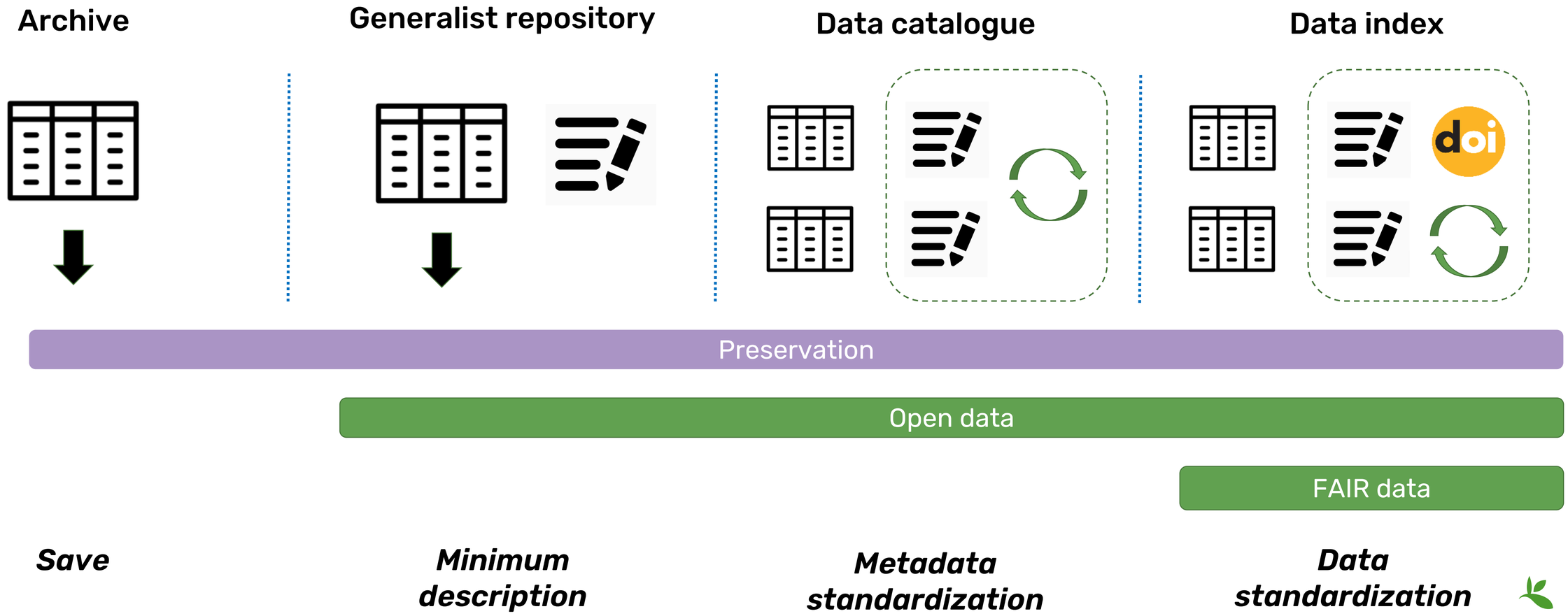
Mission

To mobilize the data, skills and technologies needed to make comprehensive biodiversity information freely available for science and decisions addressing biodiversity loss and sustainable development

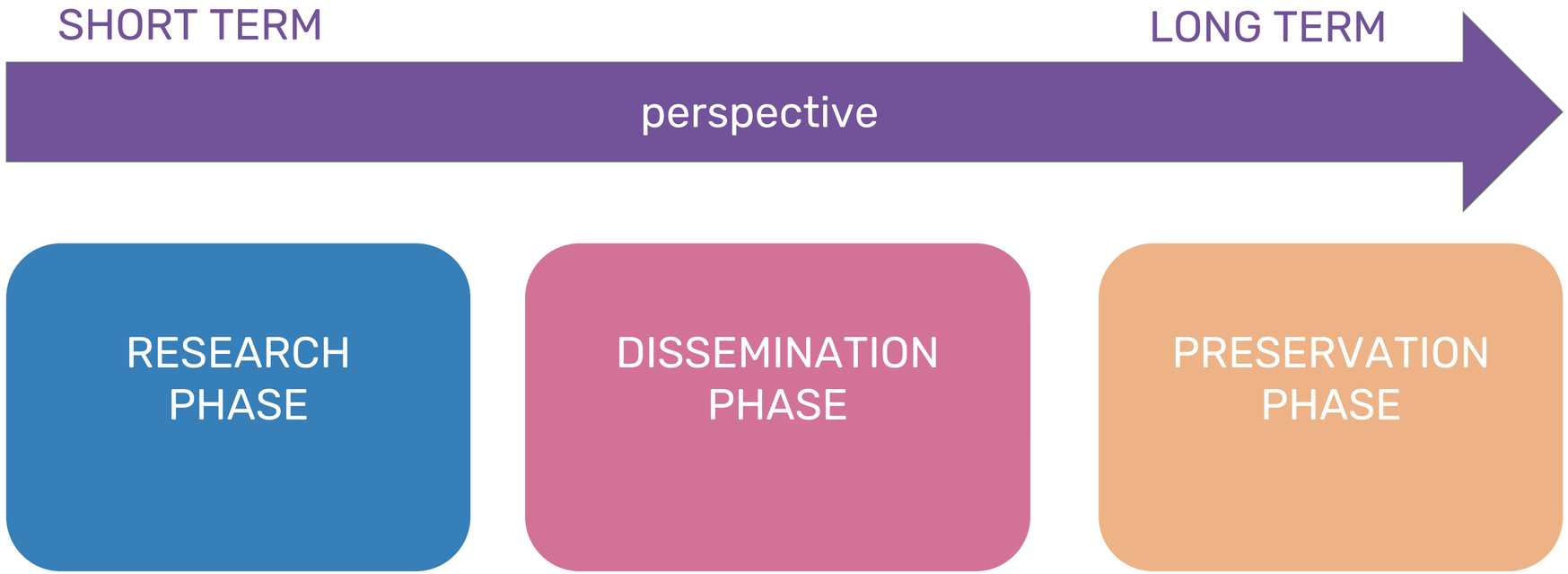
- Assessment of biodiversity trends and rates of change
- Impacts
  - Scientific research
  - Policy and management

GBIF Strategic Framework 2023-2027 (2021) GBIF Secretariat: Copenhagen. https://doi.org/10.35035/doc-0kkq-0t82

Data sharing in science: the WHERE choices



Data sharing in science: the WHEN choices



- file formats
- ownership
- storage
- backups

- share with whom
- embargo
- licensing
- metadata

- repository
- long-term manager

Sophie Kay 2013 (Open Science Training Initiative) CC-BY 3.0.

The research data lifecycle

Generate / **Access**

(re)**Organize**

Modify

Analyze

Archive

Cite

University of Sydney https://library.sydney.edu.au/research/data-management/research-data-management.html

OPEN ACCESS Freely available online

PLoS one

Sharing Detailed Research Data Is Associated with Increased Citation Rate

Heather A. Piwowar*, Roger S. Day, Douglas B. Fridsma

Department of Biomedical Informatics, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, United States of America

Background. **Sharing research data provides benefit to the general scientific community, but the benefit is less obvious for the investigator who makes his or her data available.** ***Principal Findings.*** **We examined the citation history of 85 cancer microarray clinical trial publications with respect to the availability of their data. The 48% of trials with publicly available microarray data received 85% of the aggregate citations. Publicly available data was significantly (p = 0.006) associated with a 69% increase in citations, independently of journal impact factor, date of publication, and author country of origin using linear regression.** ***Significance.*** **This correlation between publicly available data and increased literature impact may further motivate investigators to share their detailed research data.**

Citation: Piwowar HA, Day RS, Fridsma DB (2007) Sharing Detailed Research Data Is Associated with Increased Citation Rate. PLoS ONE 2(3): e308. doi:10.1371/journal.pone.0000308

INTRODUCTION

Sharing information facilitates science. Publicly sharing detailed research data–sample attributes, clinical factors, patient outcomes, DNA sequences, raw mRNA microarray measurements–with other researchers allows these valuable resources to contribute far beyond their original analysis[1]. In addition to being used to confirm original results, raw data can be used to explore related or new hypotheses, particularly when combined with other publicly available data sets. Real data is indispensable when investigating and developing study methods, analysis techniques, and software implementations. The larger scientific community also benefits: sharing data encourages multiple perspectives, helps to identify errors, discourages fraud, is useful for training new researchers, and increases efficient use of funding and patient population resources by avoiding duplicate data collection.

Believing that that these benefits outweigh the costs of sharing research data, many initiatives actively encourage investigators to make their data available. Some journals, including the *PLoS* family, require the submission of detailed biomedical data to publicly available databases as a condition of publication[2–4]. Since 2003, the NIH has required a data sharing plan for all large funding grants. The growing open-access publishing movement will perhaps increase peer pressure to share data.

However, while the general research community benefits from shared data, much of the burden for sharing the data falls to the study investigator. Are there benefits for the investigators themselves?

A currency of value to many investigators is the number of times their publications are cited. Although limited as a proxy for the scientific contribution of a paper[5], citation counts are often used in research funding and promotion decisions and have even been assigned a salary-increase dollar value[6]. Boosting citation rate is thus is a potentially important motivator for publication authors.

In this study, we explored the relationship between the citation rate of a publication and whether its data was made publicly available. Using cancer microarray clinical trials, we addressed the following questions: Do trials which share their microarray data receive more citations? Is this true even within lower profile trials? What other data-sharing variables are associated with an increased citation rate? While this study is not able to investigate causation, quantifying associations is a valuable first step in understanding these relationships. Clinical microarray data provides a useful environment for the investigation: despite being valuable for reuse and extremely costly to collect, is not yet universally shared.

RESULTS

We studied the citations of 85 cancer microarray clinical trials published between January 1999 and April 2003, as identified in a systematic review by Ntzani and Ioannidis[7] and listed in Supplementary Text S1. We found 41 of the 85 clinical trials (48%) made their microarray data publicly available on the internet. Most data sets were located on lab websites (28), with a few found on publisher websites (4), or within public databases (6 in the Stanford Microarray Database (SMD)[8], 6 in Gene Expression Omnibus (GEO)[9], 2 in ArrayExpress[10], 2 in the NCI GeneExpression Data Portal (GEDP)(gedp.nci.nih.gov); some datasets in more than one location). The internet locations of the datasets are listed in Supplementary Text S2. The majority of datasets were made available concurrently with the trial publication, as illustrated within the WayBackMachine internet archives (www.archive.org/web/web.php) for 25 of the datasets and mention of supplementary data within the trial publication itself for 10 of the remaining 16 datasets. As seen in Table 1, trials published in high impact journals, prior to 2001, or with US authors were more likely to share their data.

The cohort of 85 trials was cited an aggregate of 6239 times in 2004–2005 by 3133 distinct articles (median of 1.0 cohort citation per article, range 1–23). The 48% of trials which shared their data received a total of 5334 citations (85% of aggregate), distributed as shown in Figure 1.

Academic Editor: John Ioannidis, University of Ioannina School of Medicine, Greece

Received December 13, 2006; **Accepted** February 26, 2007; **Published** March 21, 2007

Copyright: © 2007 Piwowar et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Funding: HAP was supported by NLM Training Grant Number 5T15-LM007059-19. The NIH had no role in study design, data collection or analysis, writing the paper, or the decision to submit it for publication. The publication contents are solely the responsibility of the authors and do not necessarily represent the official views of the NIH.

Competing Interests: The authors have declared that no competing interests exist.

* **To whom correspondence should be addressed.** E-mail: hpiwowar@cbmi.pitt.edu

Piwowar et al. 2007

GBIF Memorandum of understanding

The signatories to this non-binding Memorandum of Understanding (MOU), being countries, economies, inter-governmental or international organizations, other organizations with an international scope, or entities designated by them, have decided that a co-ordinated international scientific effort is needed to enable users throughout the world to openly share and put to use vast quantities of global biodiversity data, thereby advancing scientific research in many disciplines, promoting technological and sustainable development, facilitating the conservation of biodiversity and the equitable sharing of its benefits, and enhancing the quality of life of members of society. The importance of making biodiversity data openly available to all countries and individuals is underscored by various international agreements.

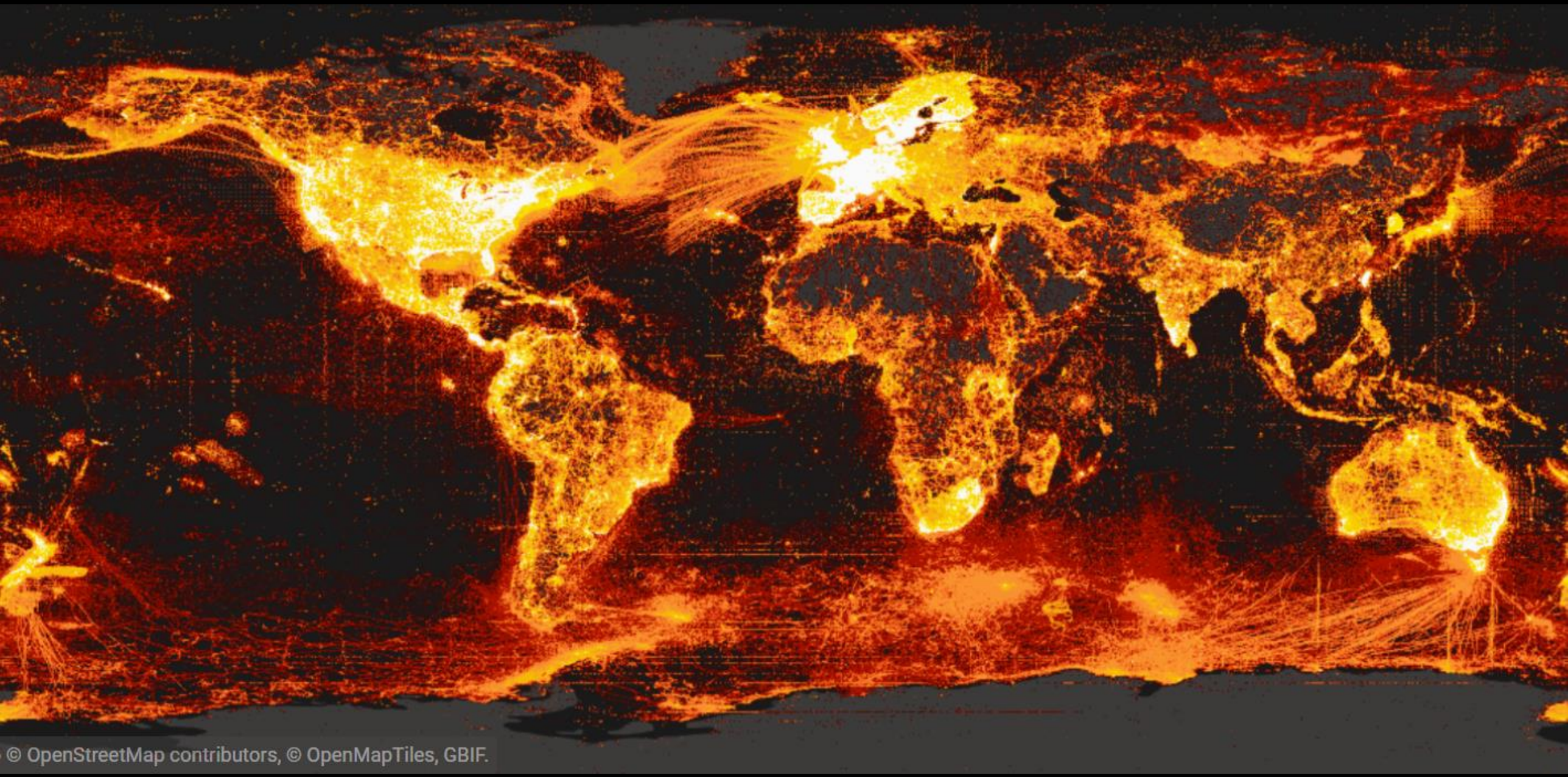
Noting that GBIF was established in March 2001, and that the first and second MOU for GBIF had each a duration of five years (2001-2006/2007-2011), the signatories to this Memorandum of Understanding hereby express their intention either to continue their existing Participation in GBIF or to become new Participants in GBIF as a mechanism of technical and scientific international co-operation.

The Participants intend to encourage co-operation amongst themselves in the implementation of GBIF and in the development of joint work programmes in areas of mutual interest with the Secretariat of the Convention on Biological Diversity and other appropriate bodies and initiatives to avoid duplication and to benefit from existing resources and expertise.

https://www.gbif.org/mou

Dmitry Schigel
dschigel@gbif.org

@dschigel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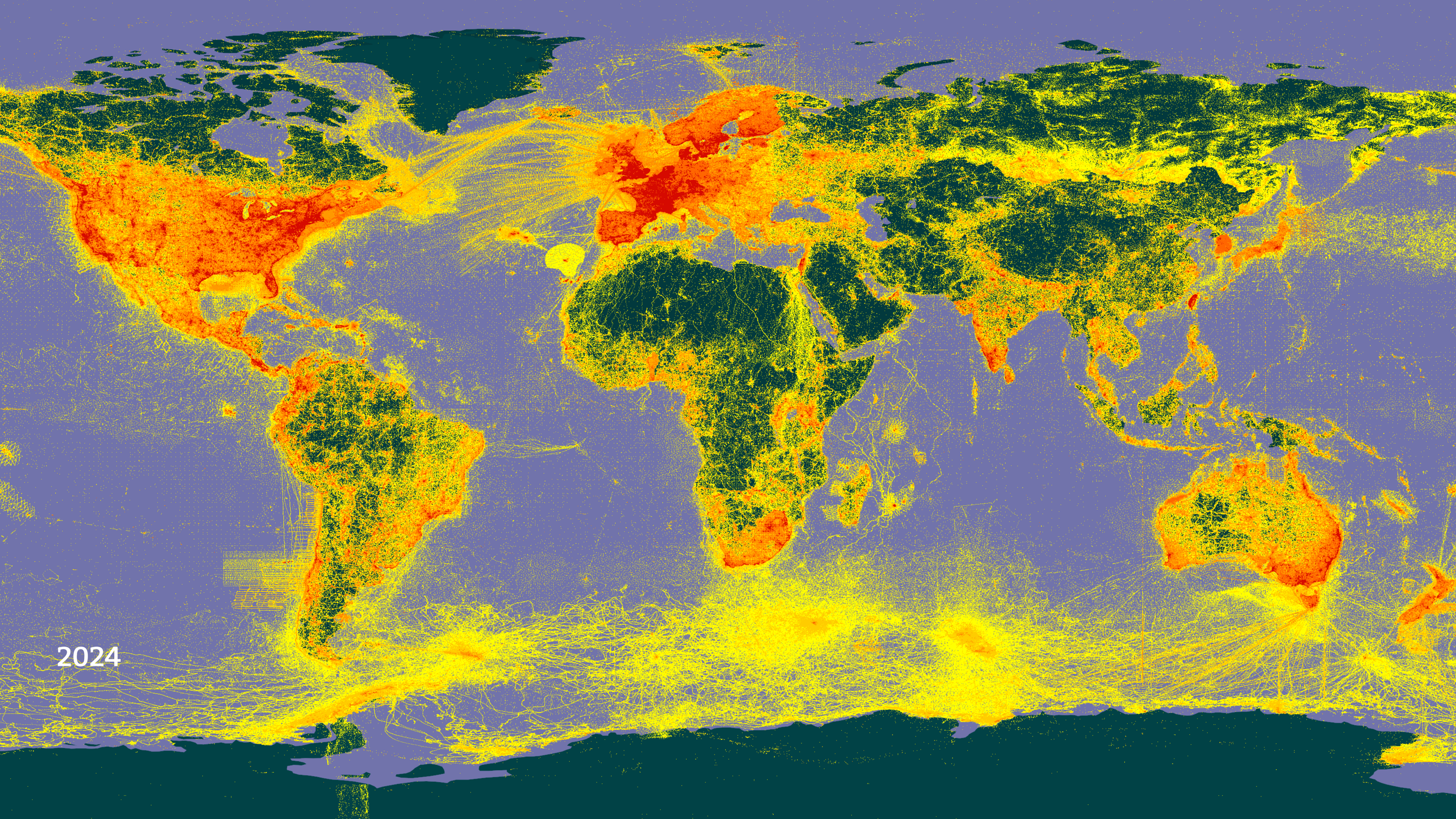
Becoming GBIF participant

Dmitry Schigel | Scientific officer

Biodiversity data in montane and arid Eurasia
Almaty, Kazakhstan

18-19 November 2024


2024

Datasets

108,760

Hosted portals

23

Country Participants

63

Peer-review papers using data

11,103

Organizational Participants

43

Average records downloaded per month (2024)

192.6 billion

Publishers

2,287

Species occurrence records

3,012,759,238

By the numbers | 1 October 2024

www.gbif.org

Species occurrence records with multimedia evidence

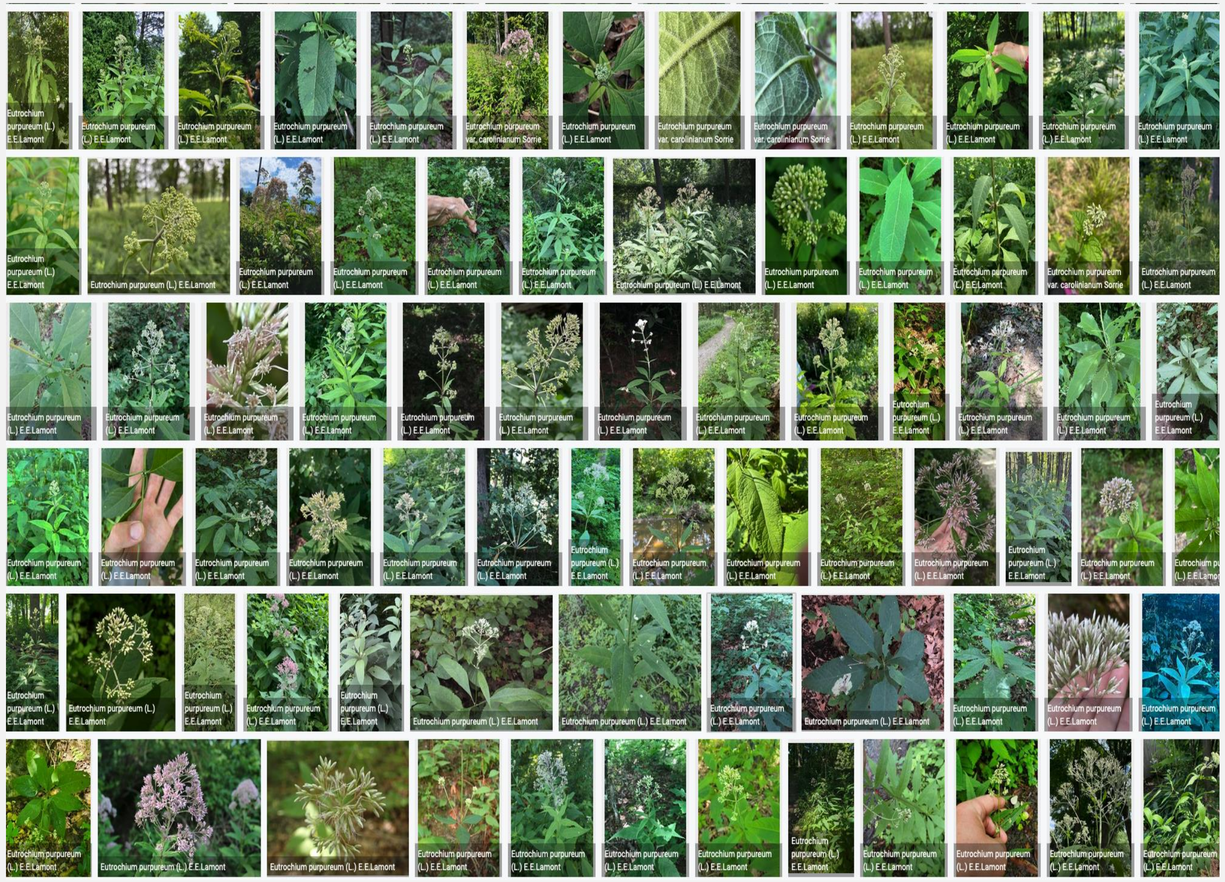
205.6 million records with

taxonomically identified images

- 133.3 million human observations
- 62.7 million specimens
- 7.1 million material samples
- 1.4 million fossil specimens

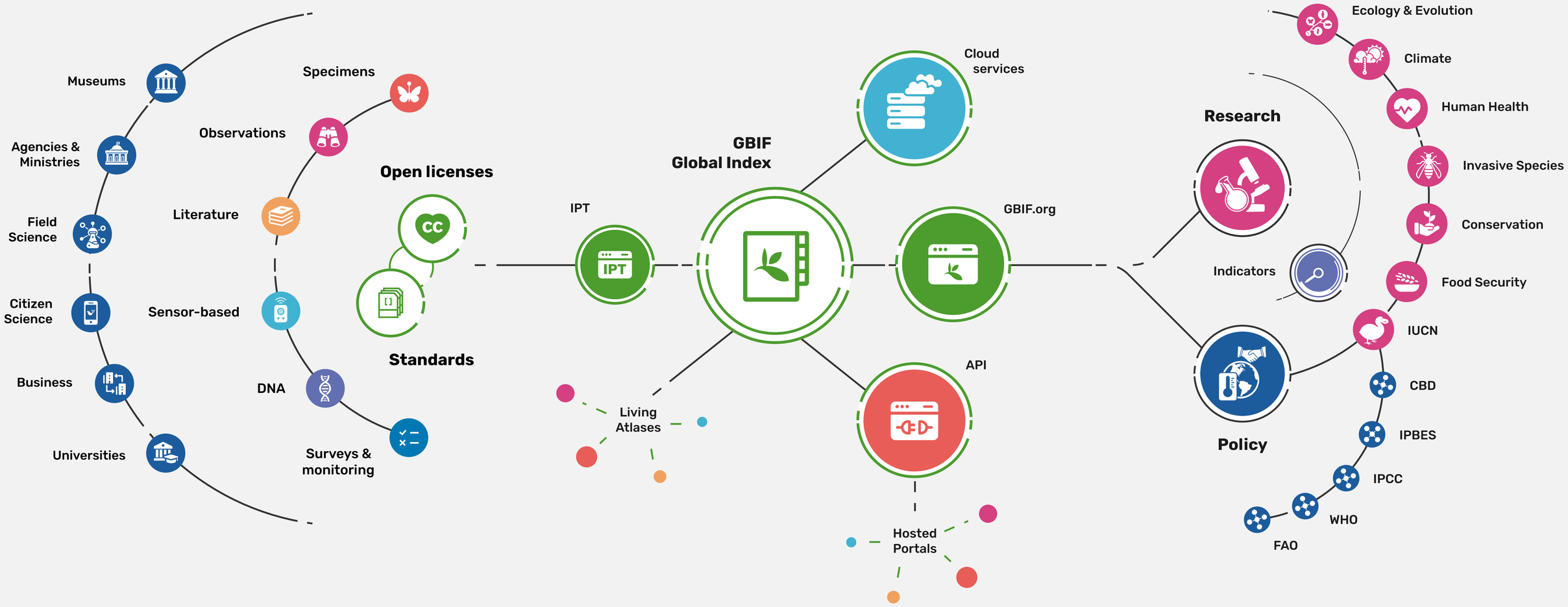
1,492,763 audio files

10, 780 videos



https://www.gbif.org/occurrence/gallery

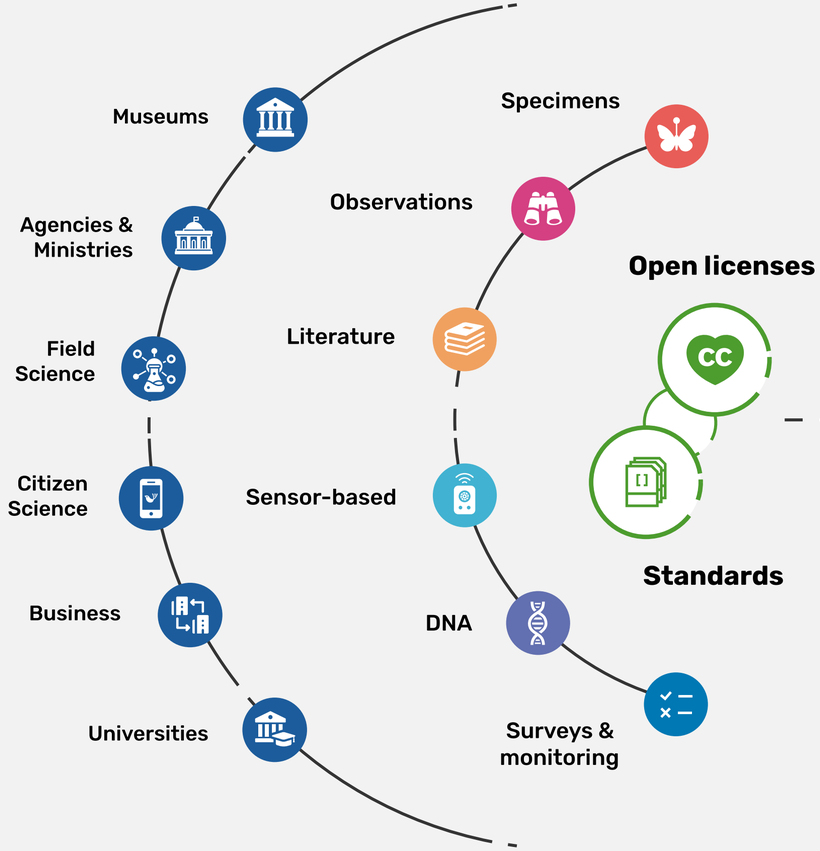
Providing biodiversity evidence for research and policy



Sources of biodiversity evidence

Create

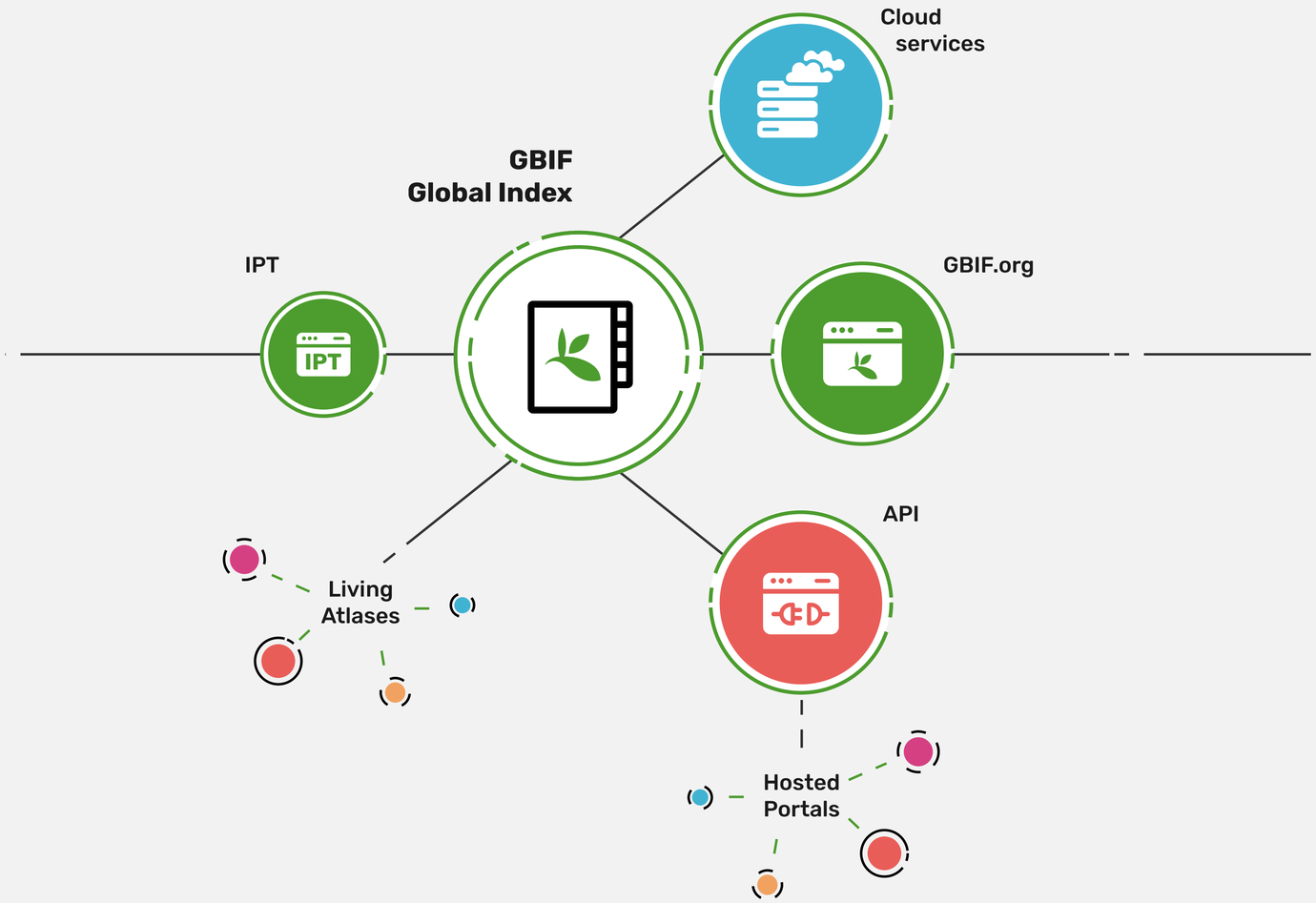
Combine sources of evidence



Access to biodiversity evidence

Share

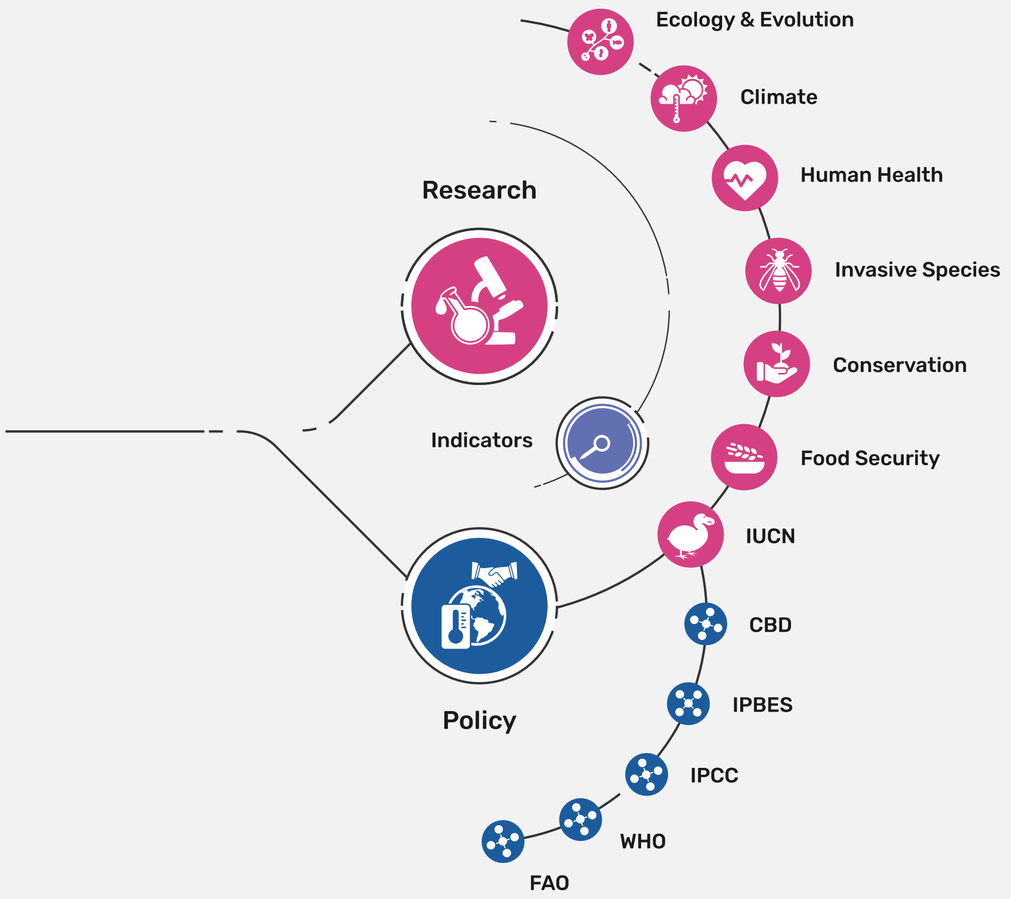
FAIR and open access

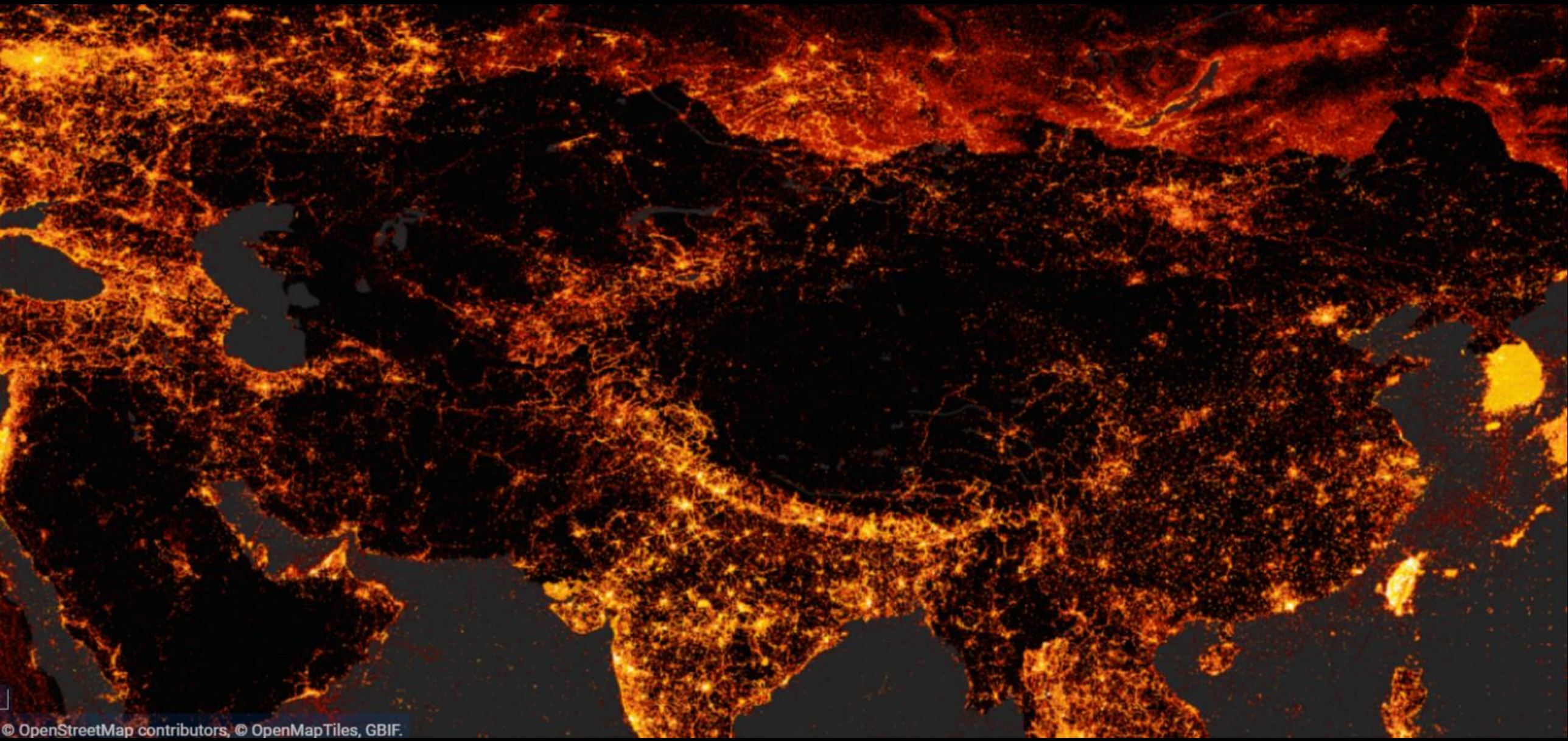


Uses of biodiversity evidence

Transform

Apply and use data

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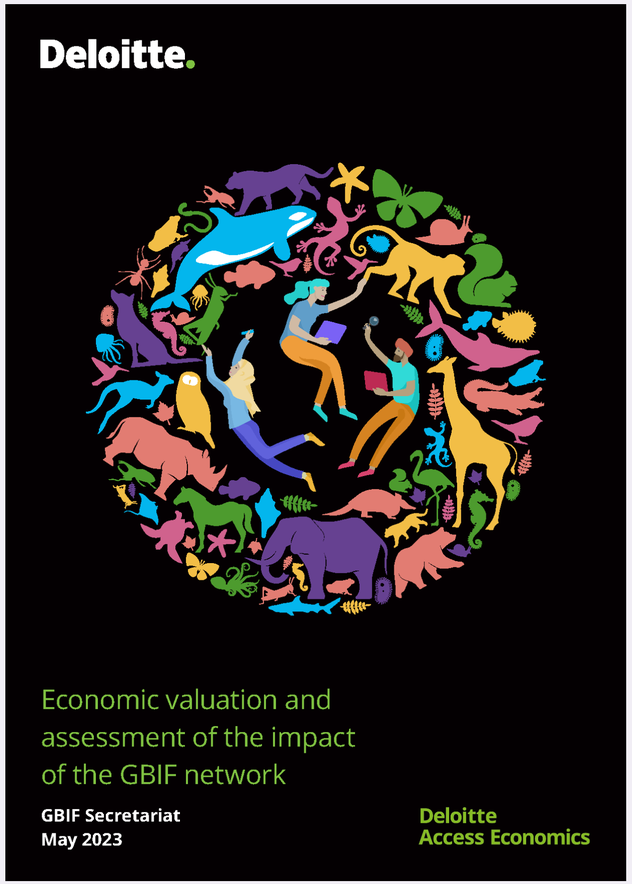
Economic valuation report on the GBIF network

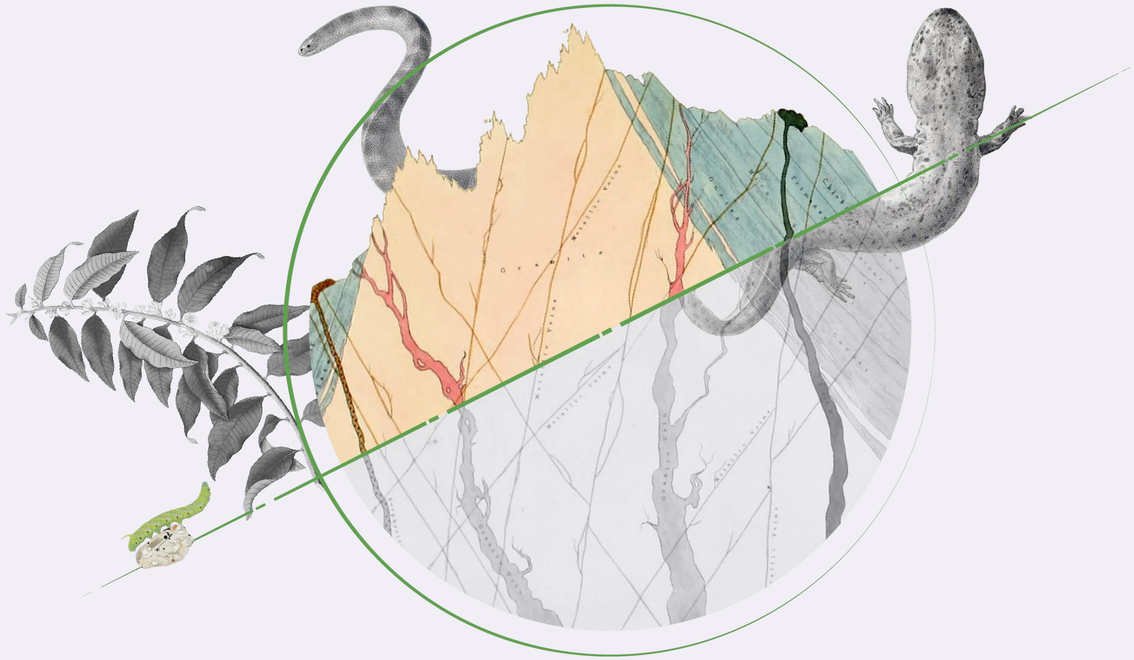
- Commissioned from Canberra-based **Deloitte** Access Economics
- Economic analysts used multiple methods to produce a **quantified estimate of the total economic impact** created by investing in GBIF



https://www.gbif.org/news/5WZThcL928vmPnSvrGhZfE/

GBIF expands the scope of what is possible

Almost **half of GBIF users** report that they would have found it **impossible to achieve** the same outcomes in their work without GBIF



https://www.gbif.org/value

The economic value and impact of the GBIF network

For every **€1 invested** in GBIF,
users receive €3 of benefits
while **society gains up to €12**

https://www.gbif.org/value

Value of benefits to science and society

The most substantial and quantifiable benefit of GBIF is an average estimated time saving of **64 hours per user** over finding data through alternative sources.

—Economic valuation and assessment of the impact of the GBIF network

Investment	€15m
GBIF Secretariat costs	€4.5m
GBIF nodes costs	€10.9m
Access value	€13m
Time-savings value	**€35m**
Impact value	€185m

Downscaling the value of time savings to researchers

GBIF-enabled papers per time period

Average hourly wage for reseacher / data scientist

Average time saved per paper

Value of research time saved by GBIF

What is a GBIF Participant node? What are its roles and functions?

Participants designate teams that **coordinate a network of people and institutions** to support production, management, delivery and use of biodiversity data.

- Support of evidence-based scientific research and policymaking
- Engage and enable data holders to implement a biodiversity data mobilization strategy
- Provide technical guidance and services to improve biodiversity data management
- Meet stakeholders' biodiversity information needs

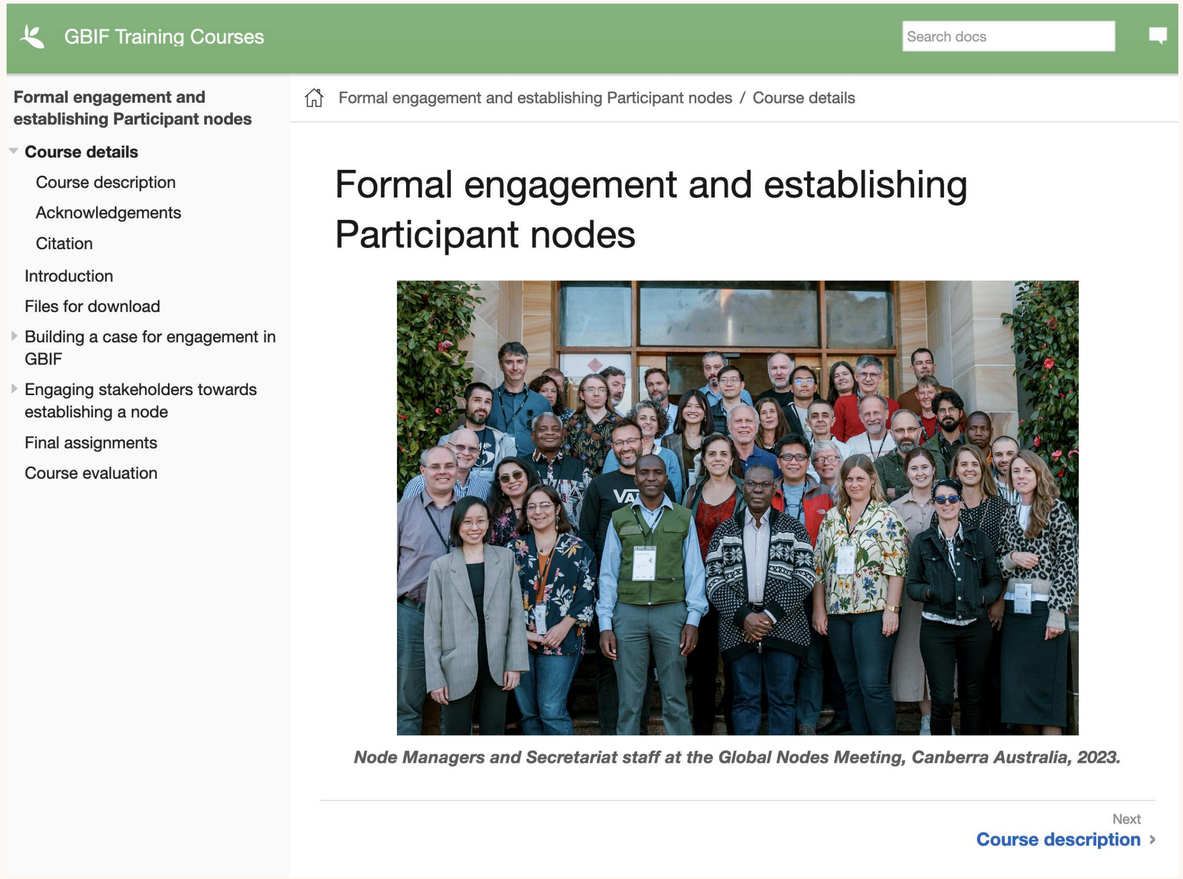
GBIF Secretariat (2019) Establishing an Effective GBIF Participant Node: Concepts and general considerations. https://doi.org/10.15468/doc-z79c-sa53.
Photo: Global Nodes Training, Canberra, Australia, 15 Oct 2023, by Maheva Bagard Laursen | GBIF, CC BY 4.0 https://flic.kr/p/2p9uSHH

What are the benefits of establishing a GBIF node?

- Increase past, current and future **returns on investment** in biodiversity research and data collection
- Coordinate the landscape of biodiversity informatics initiatives to **create partnerships and align efforts**
- **Develop capacity** for using shared biodiversity data resources
- Help **fulfill information requirements** for national and global goals and commitments

GBIF Secretariat (2019) Establishing an Effective GBIF Participant Node: Concepts and general considerations. https://doi.org/10.15468/doc-z79c-sa53.

Training and guidance for establishing a national node



Formal engagement and establishing Participant nodes course, 2nd edition. GBIF Secretariat: Copenhagen. https://doi.org/10.35035/ce-7rbg-bn83

GBIF Secretariat (2019) Establishing an Effective GBIF Participant Node: Concepts and general considerations. https://doi.org/10.15468/doc-z79c-sa53.

Formal Engagement and Establishing Participant Nodes Course

What You'll Learn

- GBIF's relevance to science and policy
- Process for becoming a GBIF Participant
- Benefits of Participation
- How to engage stakeholders
- The Participatory approach

Course Format

- Self-paced online learning
- Virtual sessions via Zoom
- Weekly peer group interactions
- Requires 3-5 hours of study per week
- Certificate upon completion

For full details on the schedule and to register, scan the code by 7 Dec

https://bit.ly/gbif-epn-reg

training@gbif.org

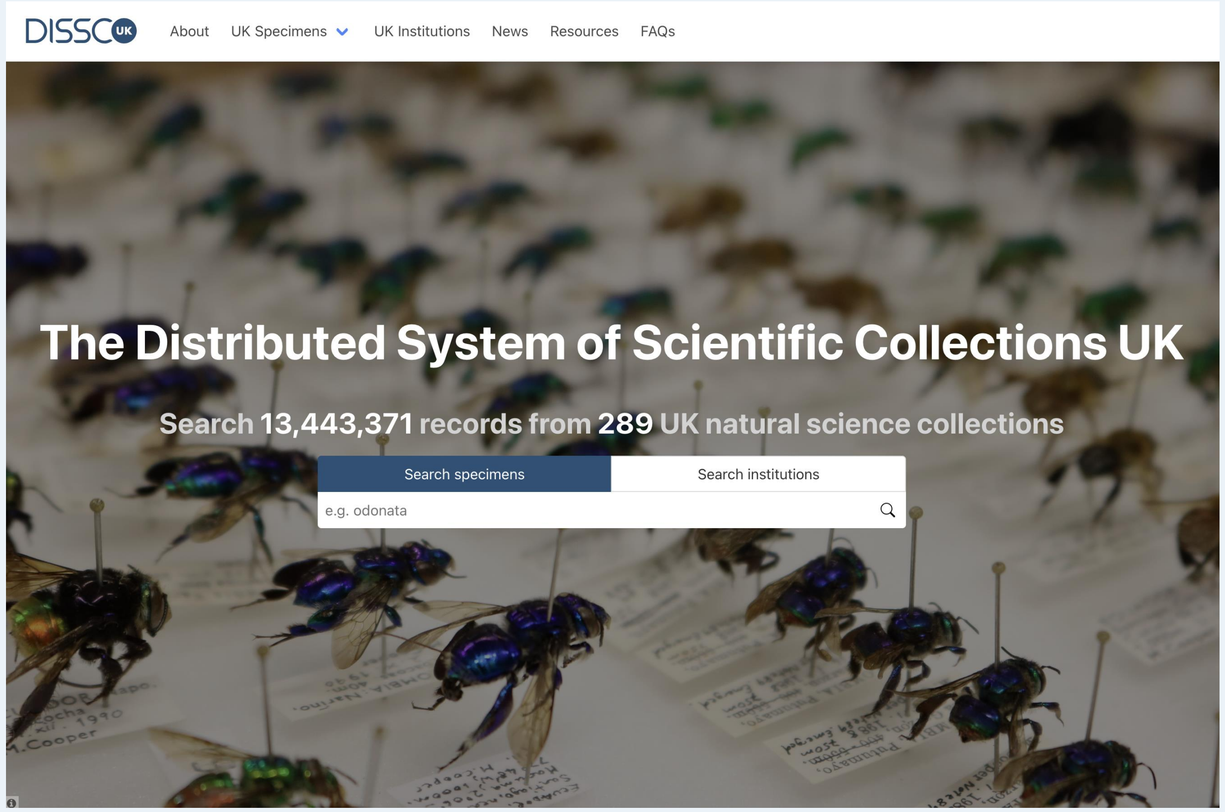
Near-term benefits available through GBIF Participation

- Infrastructure support
- International community of practice
- Access to project funding
- Eligibility for GBIF governance roles
- Integrating national links to European and global initiatives

Infrastructure support

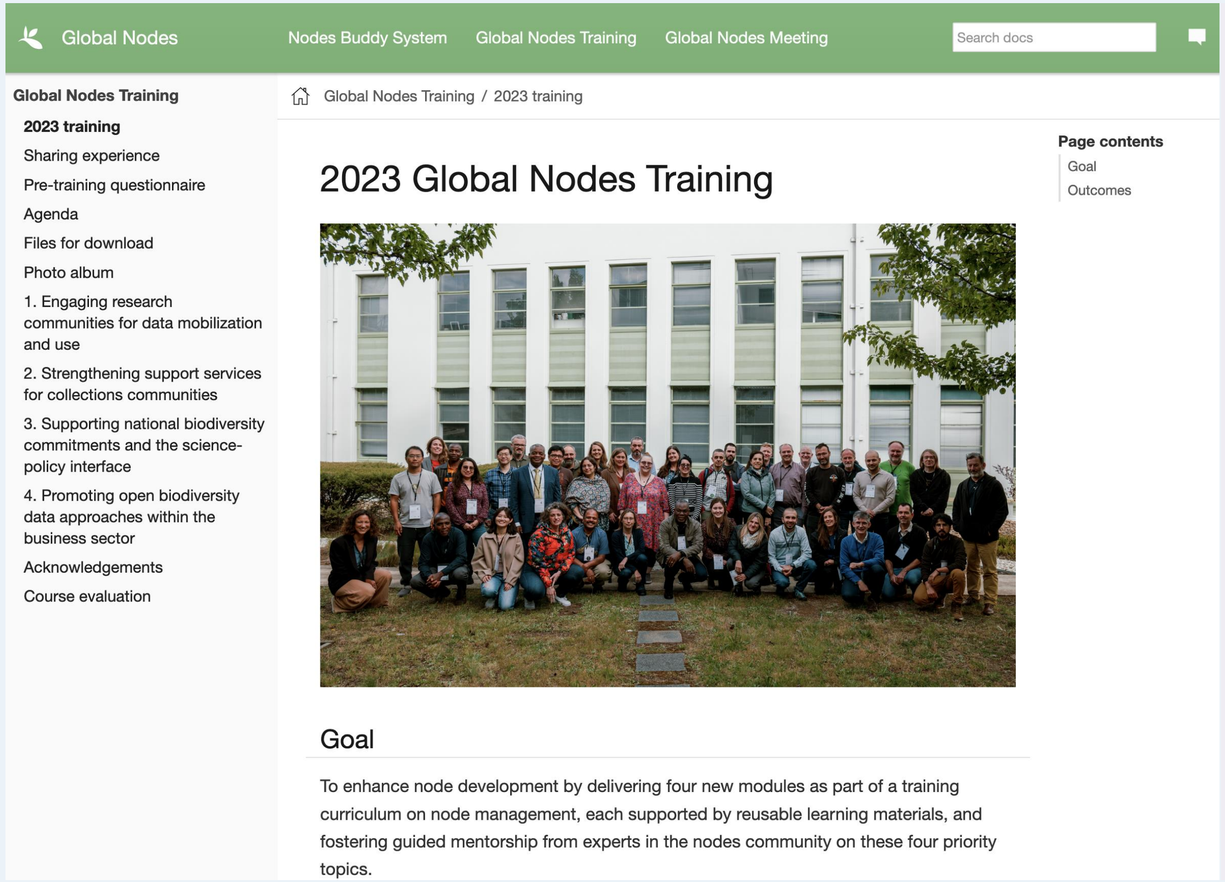
In addition to FAIR- & open-data enabling systems (*community standards, CC licences, PIDs*), Participants receive exclusive access to hosted services for

- GBIF's **Integrated Publishing Toolkit** (IPT): mature, reliable and free open-source software for local repositories
- **Hosted portal**: free, service provides simple, configurable data-access portal with multilingual support (*CollMap 3.0*? *DiSSCo Italy*? *GBIF Italia*?)



https://www.gbif.org/ipt | https://www.gbif.org/hosted-portals

International community of practice

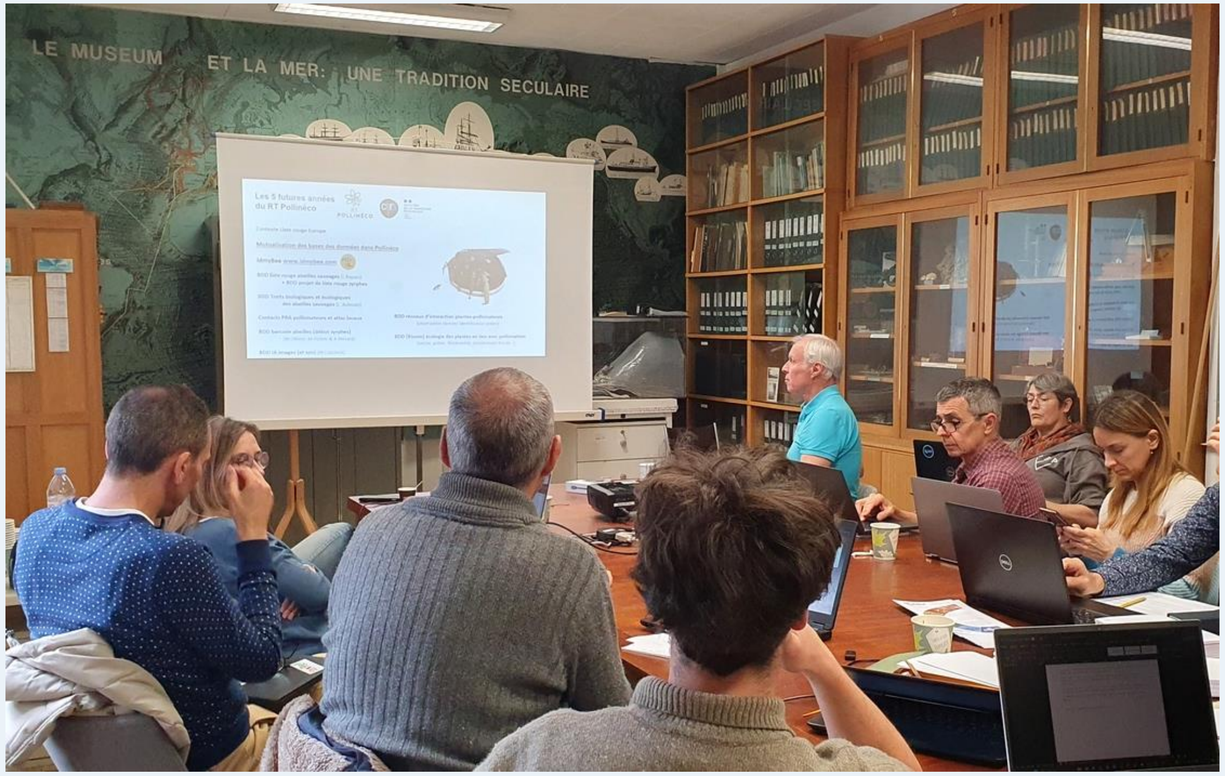


Access to project funding

- **Node-to-node collaborations** through Capacity Enhancement Support Programme (CESP)
- Network-to-network collaboration across **multiple themes**: human health, eDNA, invasive species, marine, scientific collections, agrobiodiversity…
- Possible **matching of overseas development assistance** on international projects
  - *Example*: BID & IACS funding for Mozambican BioNoMo project that involved Sapienza and GBIF South Africa

https://gbif.link/cesp | https://www.gbif.org/project/6QF1fqTDq0GkkkSuwKq024

Eligibility for GBIF governance roles



- Voting Participants **set future strategic priorities** by nominating and serving as members of governance committees
- Elected committee members provide foresight and monitoring that **shape annual work programmes**
- Key input for **aligning national activities with global initiatives**

Photo © 2024 Sophie Pamerlon | GBIF France https://www.flickr.com/gp/44353813@N02/472A4z3P44

Integrating national links to global initiatives

- Partnering broadly to support coordinated efforts to integrate **survey and monitoring data**
- Data from the GBIF network serves as a **foundational layer for multiple indicators** for the Global Biodiversity Framework targets
- Support of other **global conventions, agreements and processes**: IPBES and IUCN Red List assessments, UN Sustainable Development Goals

GBIF & the UN Convention on Biological Diversity

> “Encourages Parties to join relevant biodiversity-related networks, such as the [Global Biodiversity Information Facility], with a view to developing capacities to manage and share data and information, in order to manage and conserve biodiversity effectively.”
>
> *—CBD SBI/4/L.4:2 [in draft]*

GBIF & the Global Environment Facility

- GBIF was recently approved as a **GEF executing agency**
- Infrastructure-related application pending with GEF **Innovation Fund**
- Working with World Bank to prepare support of **data mobilization and capacity development** initiative through GEF Amazonian Sustainable Landscape Integrated Program

How to join GBIF

LETTER OF INTENT
Sent from appropriate authority indicating mode of participation (*template available*)

APPROVAL
Letter of Intent approved by GBIF Executive Committee

SIGNATURE
GBIF MoU signed by designated authority on behalf of government

NOMINATION
Nominate Head of Delegation, Node Manager as lead GBIF contacts

PARTICIPATION
Establish Participant node, begin collaborations

https://www.gbif.org/become-member

GBIF Memorandum of understanding

The signatories to this non-binding Memorandum of Understanding (MOU), being countries, economies, inter-governmental or international organizations, other organizations with an international scope, or entities designated by them, have decided that a co-ordinated international scientific effort is needed to enable users throughout the world to openly share and put to use vast quantities of global biodiversity data, thereby advancing scientific research in many disciplines, promoting technological and sustainable development, facilitating the conservation of biodiversity and the equitable sharing of its benefits, and enhancing the quality of life of members of society. The importance of making biodiversity data openly available to all countries and individuals is underscored by various international agreements.

GBIF | Global Biodiversity Information Facility

https://www.gbif.org/mou

1 Building the evidence to advance scientific research and understanding of global biodiversity

2 Supporting policy responses and knowledge transfer that address urgent societal challenges around planetary change

2023 - 2027

GBIF Strategic Framework

4 Driving innovation to advance biodiversity-related knowledge

3 Enabling the network to meet future needs and challenges

Values

GBIF Strategic Framework 2023 - 2027

Trust and Transparency: Expectations that all decisions and processes are open; that data is properly attributed and of the highest-possible quality; and that infrastructures are robust, documented and persistent

Collaboration and Collective Benefit: A recognition that only through a spirit of cooperation can we fulfil GBIF's mission by sharing skills, data, tools and experiences, avoiding duplication, and growing a global community of practice

Diversity and Inclusiveness: A commitment to engage and welcome people of all nationalities, cultures, genders and backgrounds while recognizing all contributions to our global community

Innovation: An ambition to lead by example in advancing open science and data services and in adopting novel techniques for collaboration and learning, recognizing that simplicity is often the best means of reaching our goals

Integrity: An assurance that professional norms and scientific integrity are respected; and that data-sharing safeguards the rights of indigenous peoples and local communities as well as potential risks to sensitive species

https://www.gbif.org/strategic-plan

Vision

A world in which the best possible biodiversity data underpins research, policy and decisions.

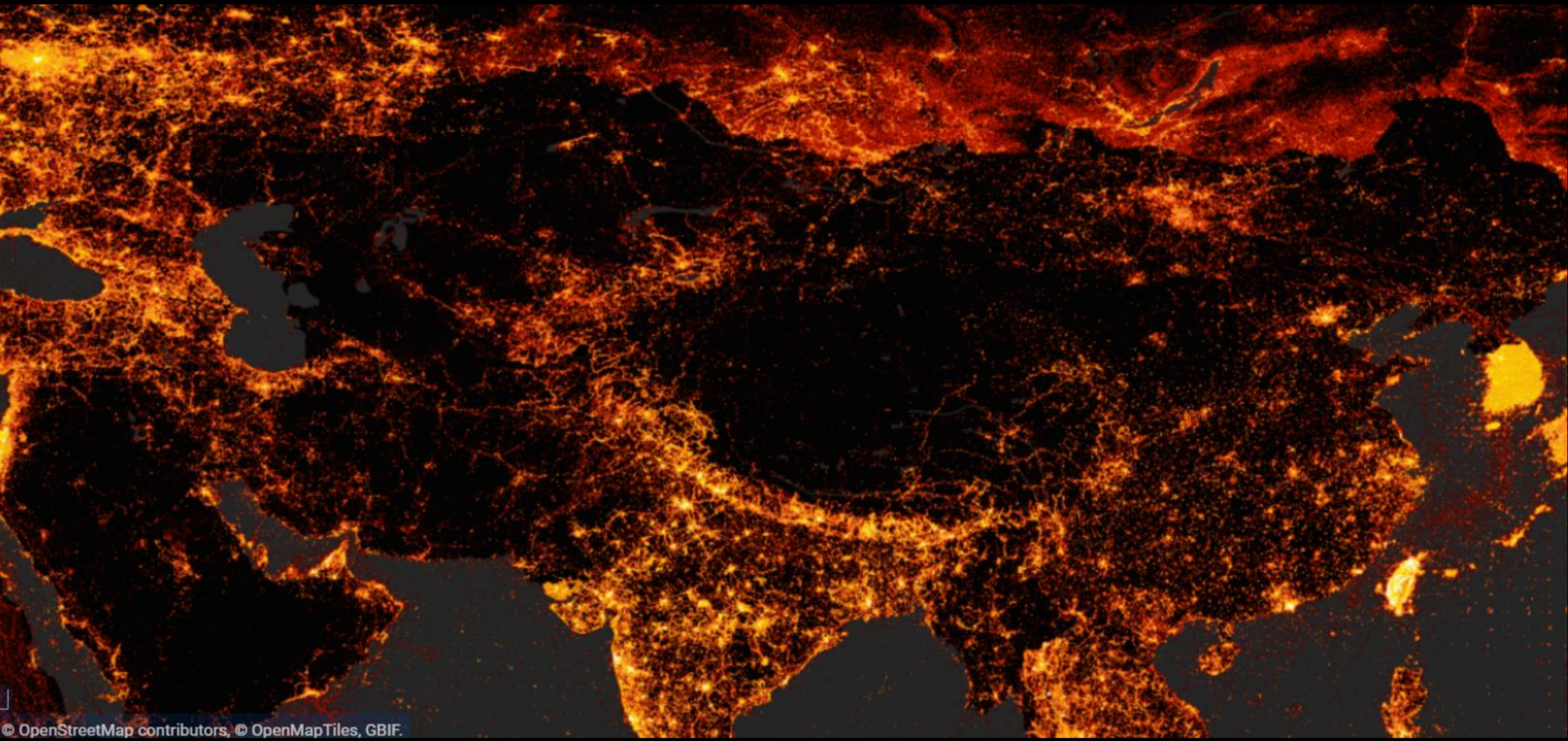
Mission

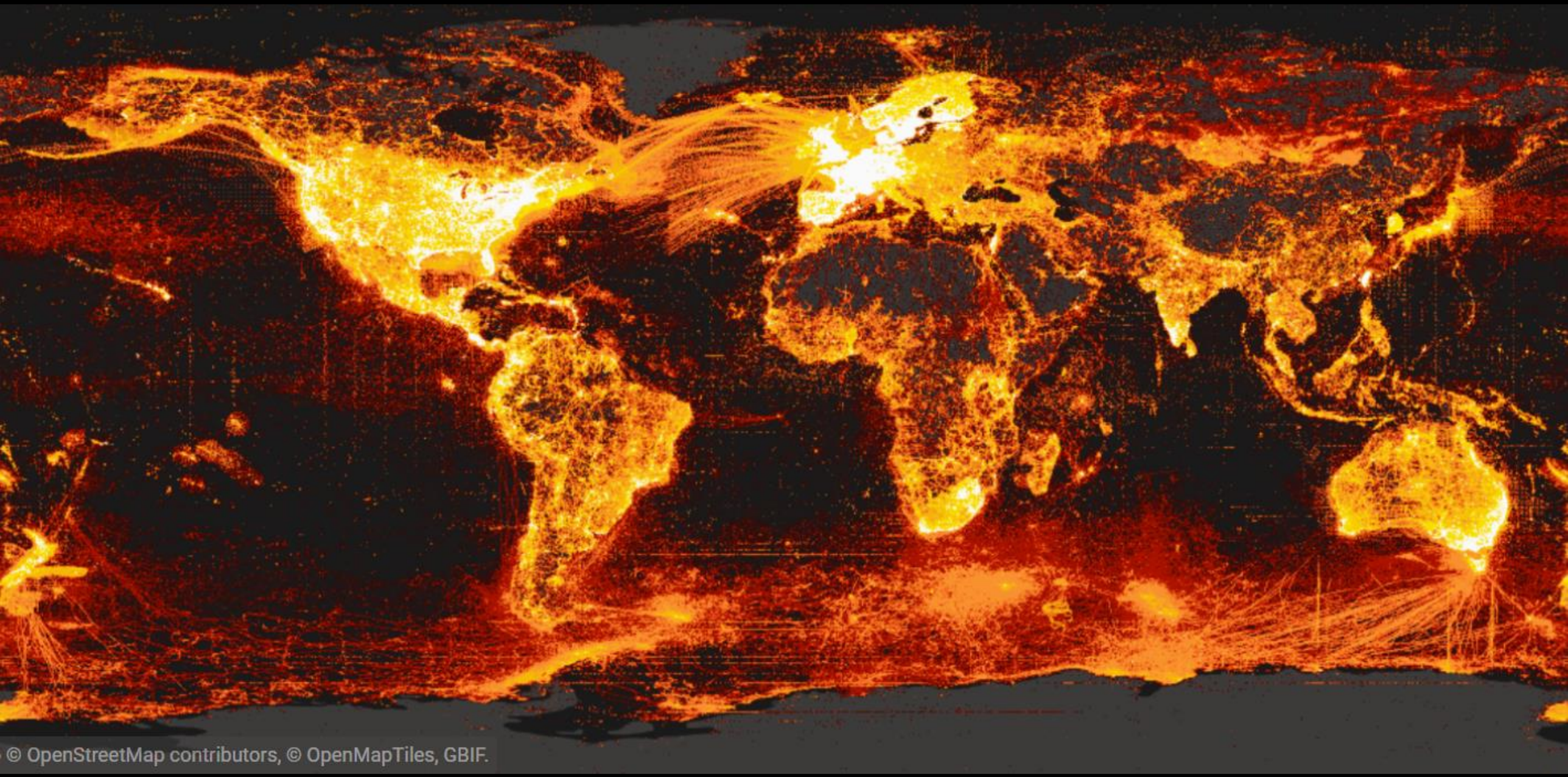
To mobilize the data, skills and technologies needed to make comprehensive biodiversity information freely available for science and decisions addressing biodiversity loss and sustainable development

#CiteTheDOI

Dmitry Schigel
dschigel@gbif.org

@dschigel


© OpenStreetMap contributors, © OpenMapTiles, GBIF.


© OpenStreetMap contributors, © OpenMapTiles, GBIF.

Global Biodiversity Information Facility (GBIF)

... for science

Dmitry Schigel | Scientific officer

Biodiversity data in montane and arid Eurasia
Almaty, Kazakhstan

18-19 November 2024

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GBIF Strategic Framework

4 Driving innovation to advance biodiversity-related knowledge

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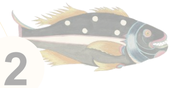


2023 - 2027

GBIF Strategic Framework

4 Driving innovation to advance biodiversity-related knowledge

3 Enabling the network to meet future needs and challenges

GBIF strategic framework 2023 - 2027

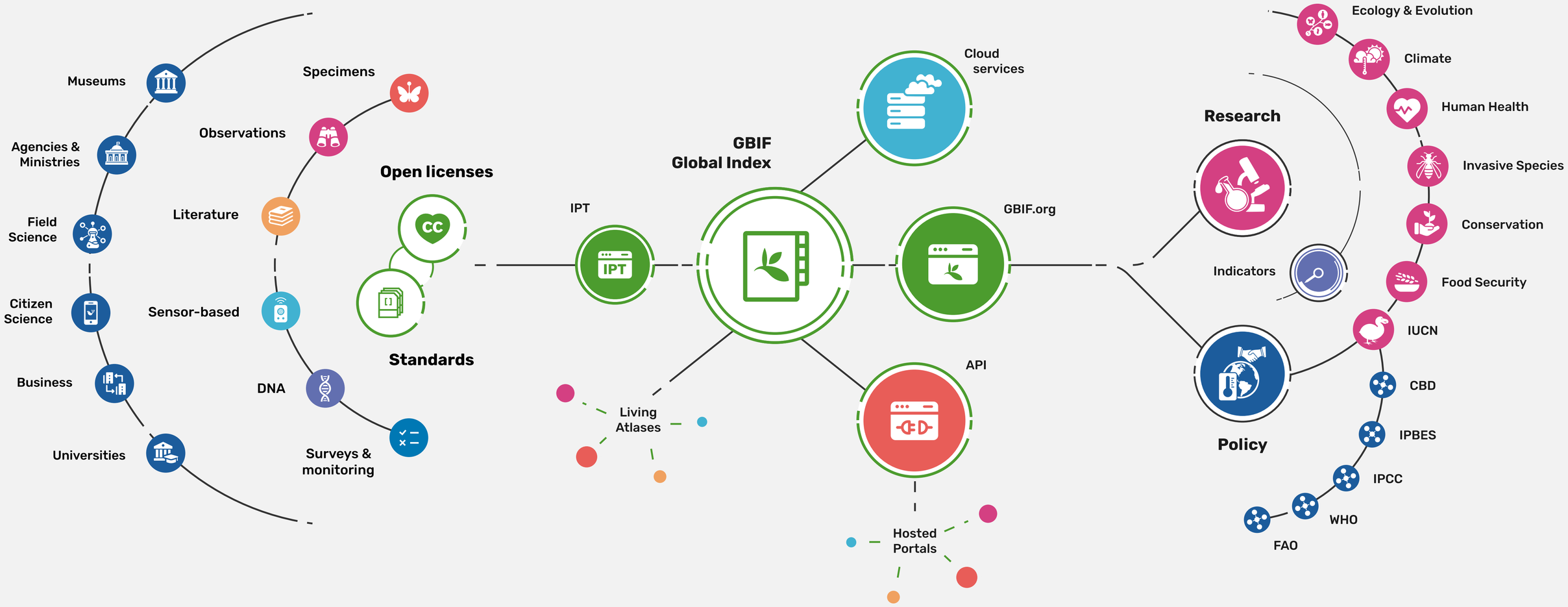
Building the evidence to advance scientific research and understanding of global biodiversity

Objectives

- Reduce knowledge gaps by helping the network to set targets for consolidating data coverage across thematic, taxonomic, phylogenetic, spatial and temporal dimensions.
- Enable, expand and diversify the uptake and application of GBIF-mediated data.
- Support the evolution of fundamental data-driven biodiversity research and its application across methods, scales and disciplines in life and environmental sciences.
- Ensure meaningful data exchange and reuse of data through citations and measurements, promoting and consistently applying accepted standards that adhere to best practices and sustain the highest aspirations in open and data-intensive science.
- Increase GBIF's relevance to research, promote recognition, expand involvement and improve best practices for data in academia and higher education.

https://www.gbif.org/strategic-plan

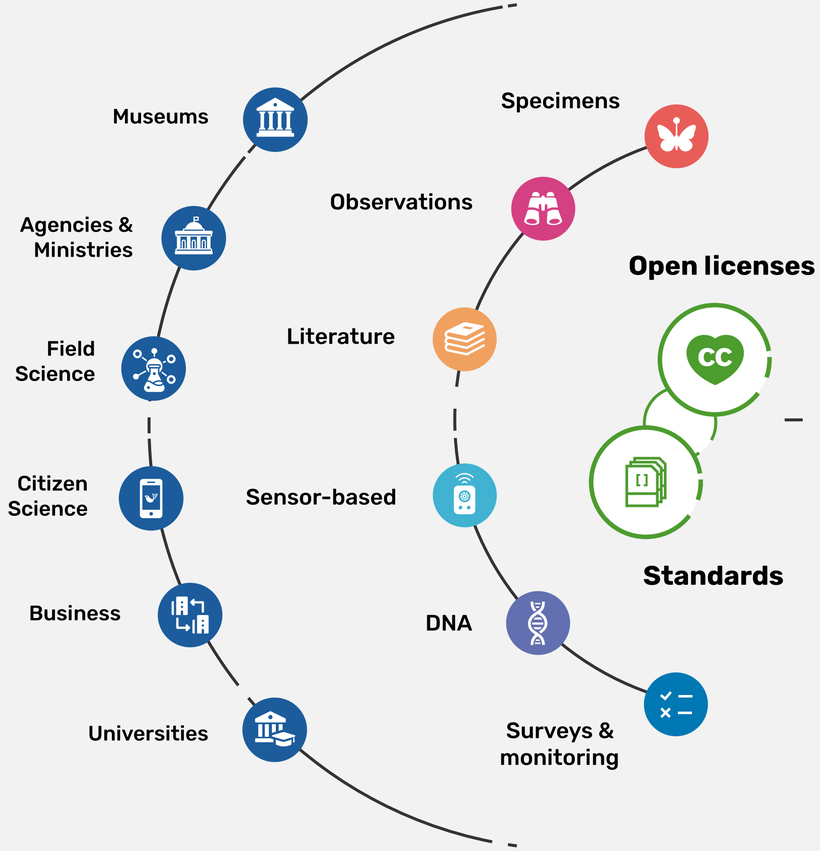
Providing biodiversity evidence for research and policy



Sources of biodiversity evidence

Create

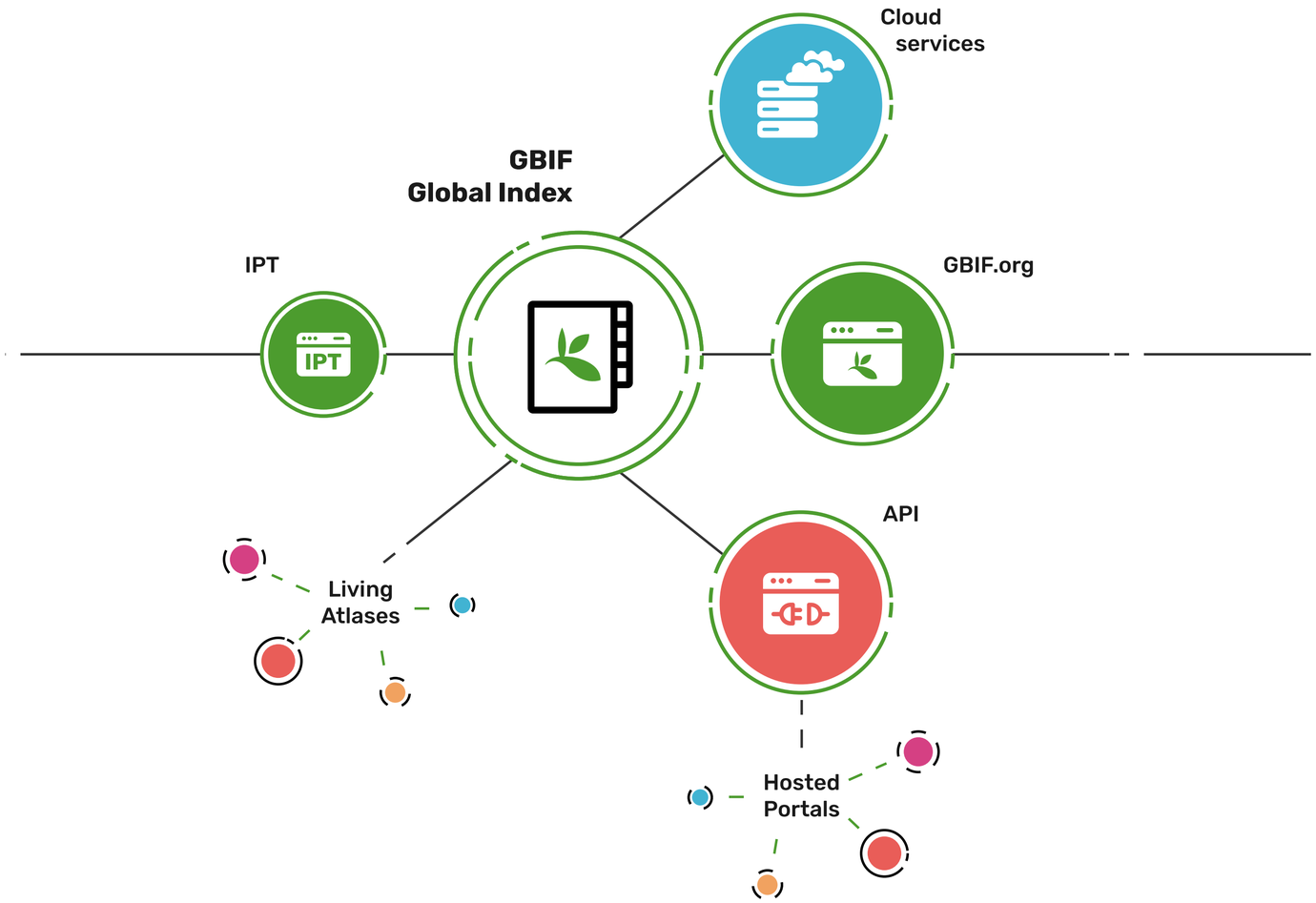
Combine sources of evidence



Access to biodiversity evidence

Share

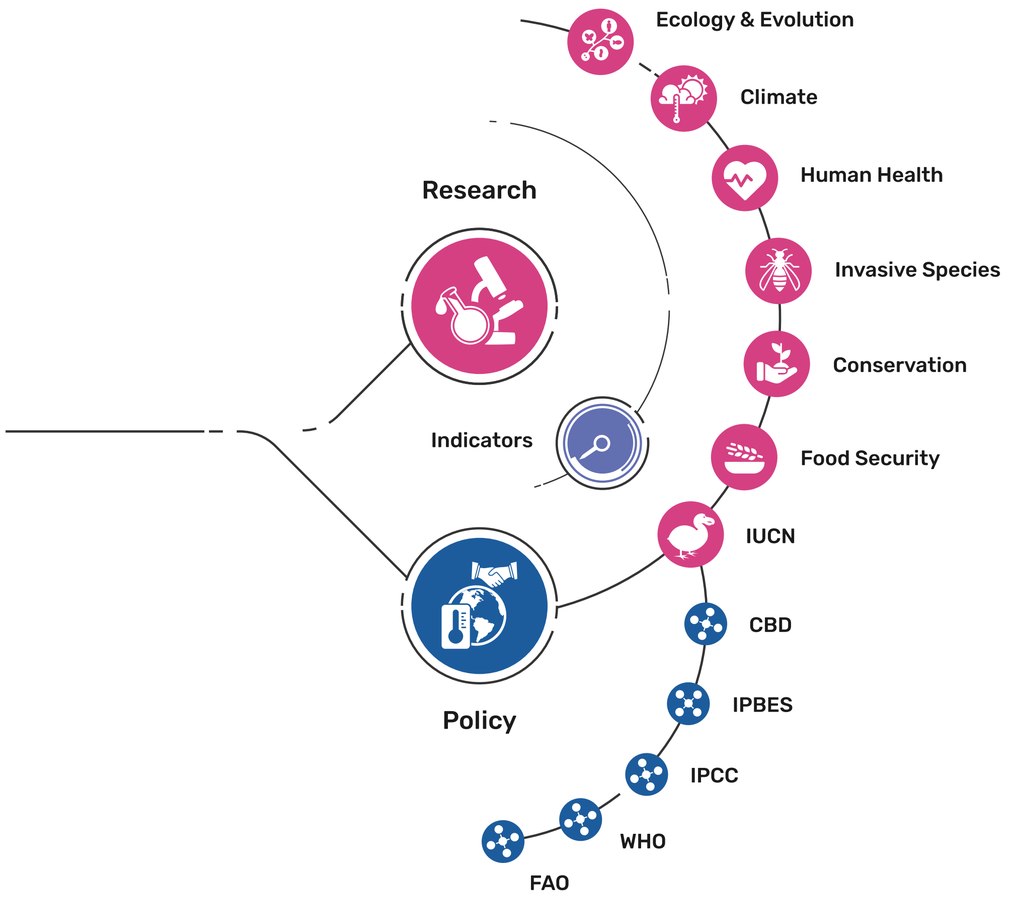
FAIR and open access



Uses of biodiversity evidence

Transform

Apply and use data



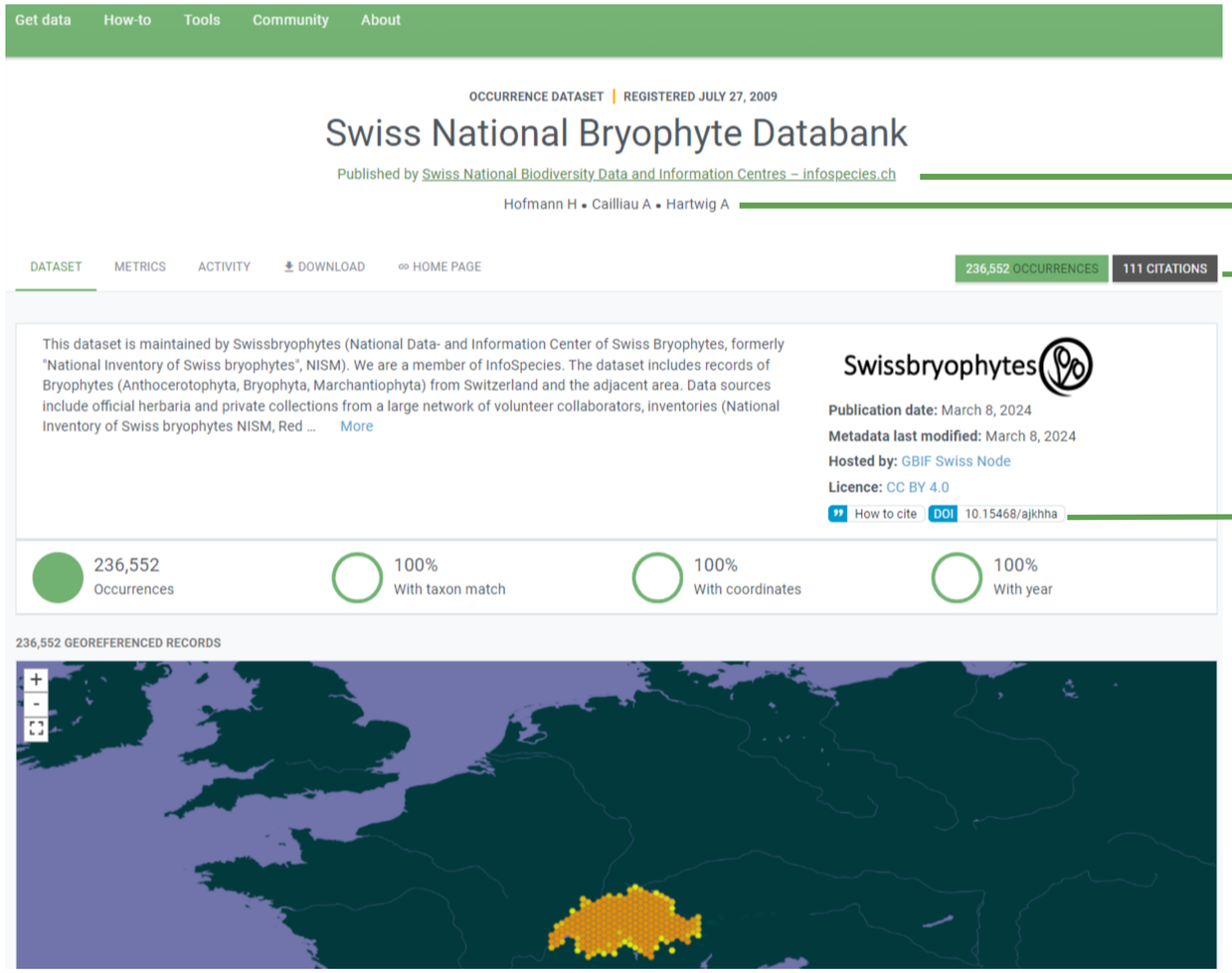
GBIF supporting research

GBIF supporting policy

Science and research

Dmitry Schigel

Data in 108,709 datasets: attribution, credit and affiliation

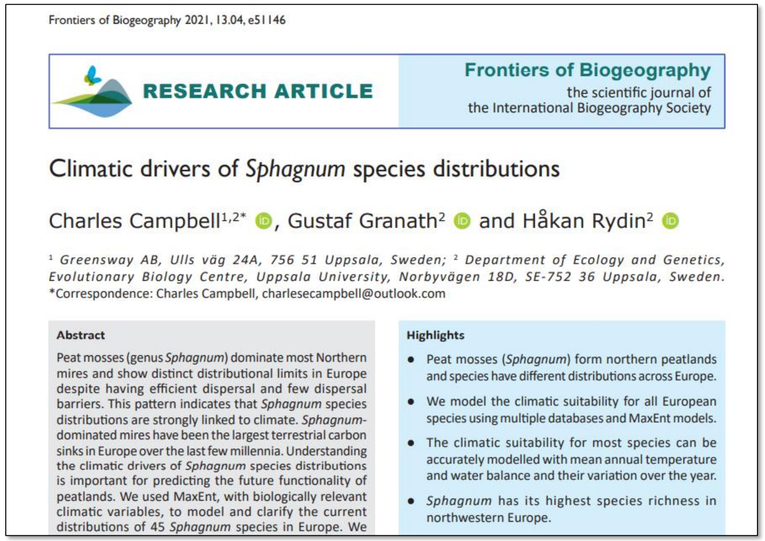


1 **Affiliation**

2 **Authorship**

3 **Data citations**

4 **DOI**



Frontiers of Biogeography 2021, 13.04, e51146

RESEARCH ARTICLE

Frontiers of Biogeography
the scientific journal of
the International Biogeography Society

Climatic drivers of *Sphagnum* species distributions

Charles Campbell[1,2*], Gustaf Granath[2] and Håkan Rydin[2]

[1] *Greensway AB, Ulls väg 24A, 756 51 Uppsala, Sweden;* [2] *Department of Ecology and Genetics, Evolutionary Biology Centre, Uppsala University, Norbyvägen 18D, SE-752 36 Uppsala, Sweden.*
*Correspondence: Charles Campbell, charlesecampbell@outlook.com

Abstract

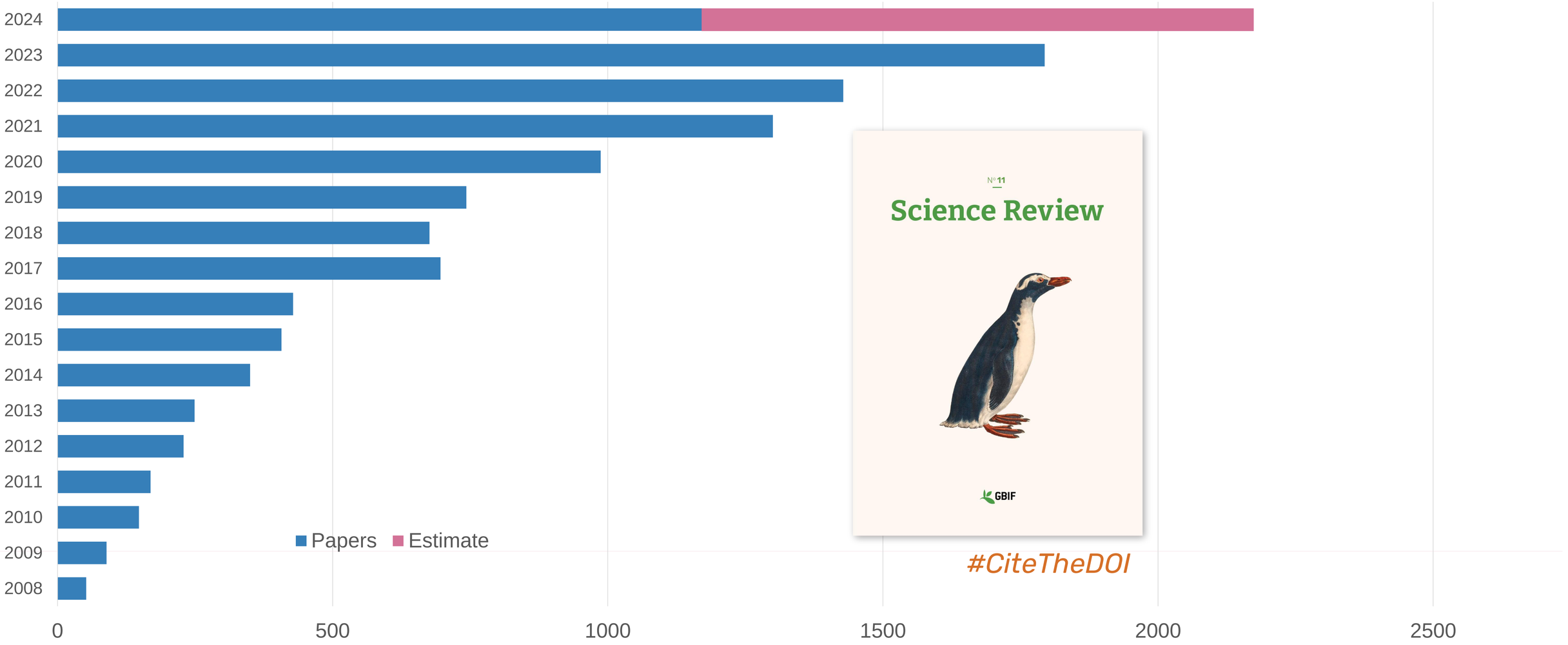
Peat mosses (genus *Sphagnum*) dominate most Northern mires and show distinct distributional limits in Europe despite having efficient dispersal and few dispersal barriers. This pattern indicates that *Sphagnum* species distributions are strongly linked to climate. *Sphagnum*-dominated mires have been the largest terrestrial carbon sinks in Europe over the last few millennia. Understanding the climatic drivers of *Sphagnum* species distributions is important for predicting the future functionality of peatlands. We used MaxEnt, with biologically relevant climatic variables, to model and clarify the current distributions of 45 *Sphagnum* species in Europe. We

Highlights

- Peat mosses (*Sphagnum*) form northern peatlands and species have different distributions across Europe.
- We model the climatic suitability for all European species using multiple databases and MaxEnt models.
- The climatic suitability for most species can be accurately modelled with mean annual temperature and water balance and their variation over the year.
- *Sphagnum* has its highest species richness in northwestern Europe.

Hofmann H, Kiebacher T, Moser T, Meier M (2021). Swiss National Bryophyte Databank. Swiss National Biodiversity Data and Information Centres – infospecies.ch. Occurrence dataset https://doi.org/10.15468/ajkhha accessed via GBIF.org on 2022-04-28.

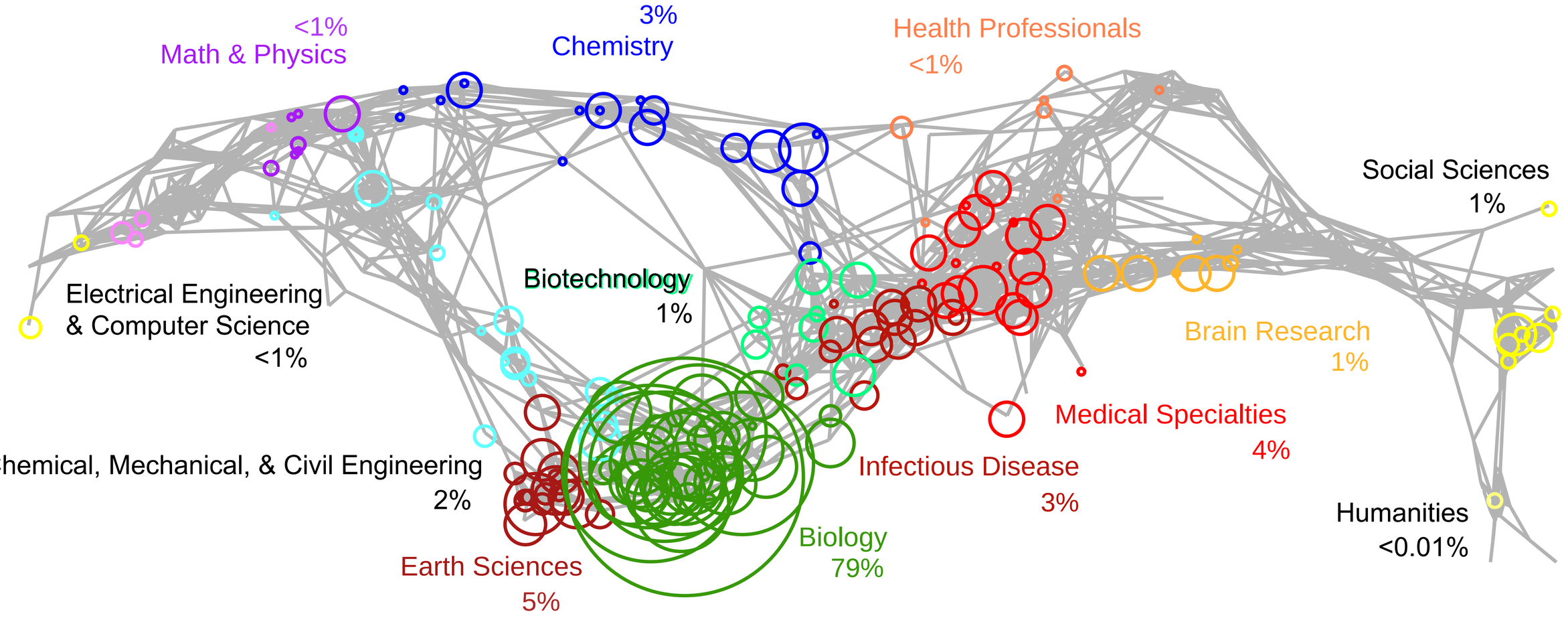
Peer-reviewed publications using GBIF-mediated data



#CiteTheDOI

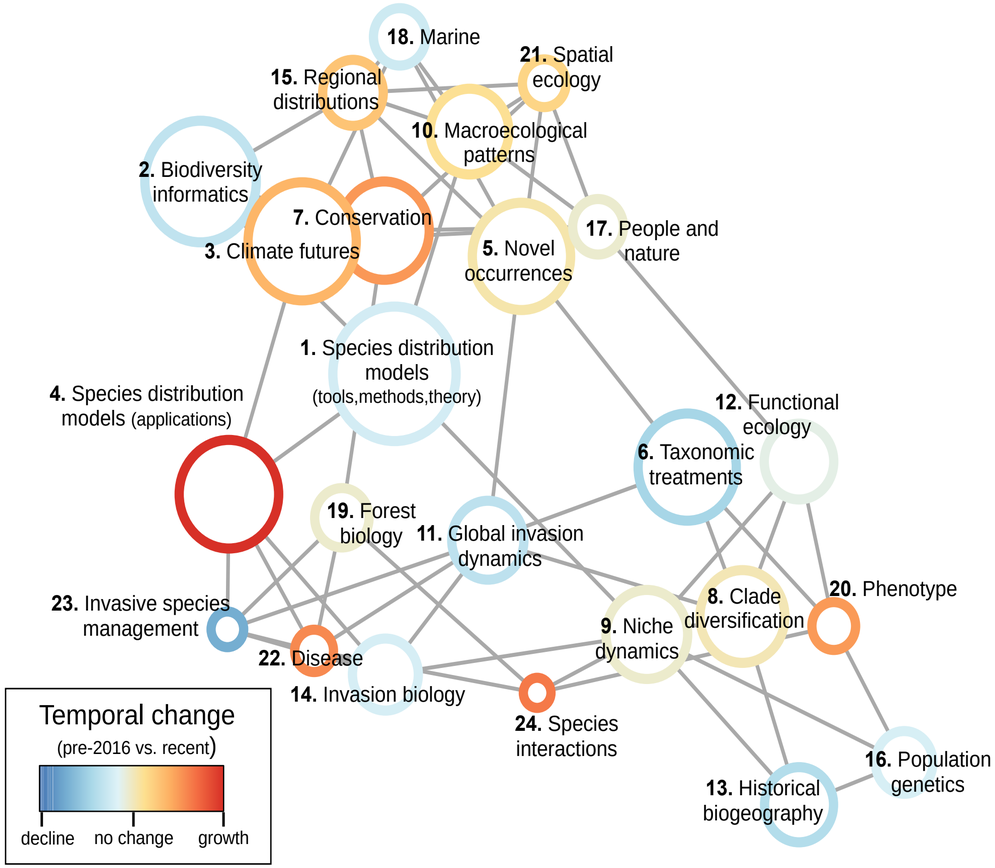
https://www.gbif.org/resource/search?contentType=literature&literatureType=journal&relevance=GBIF_USED&peerReview=true

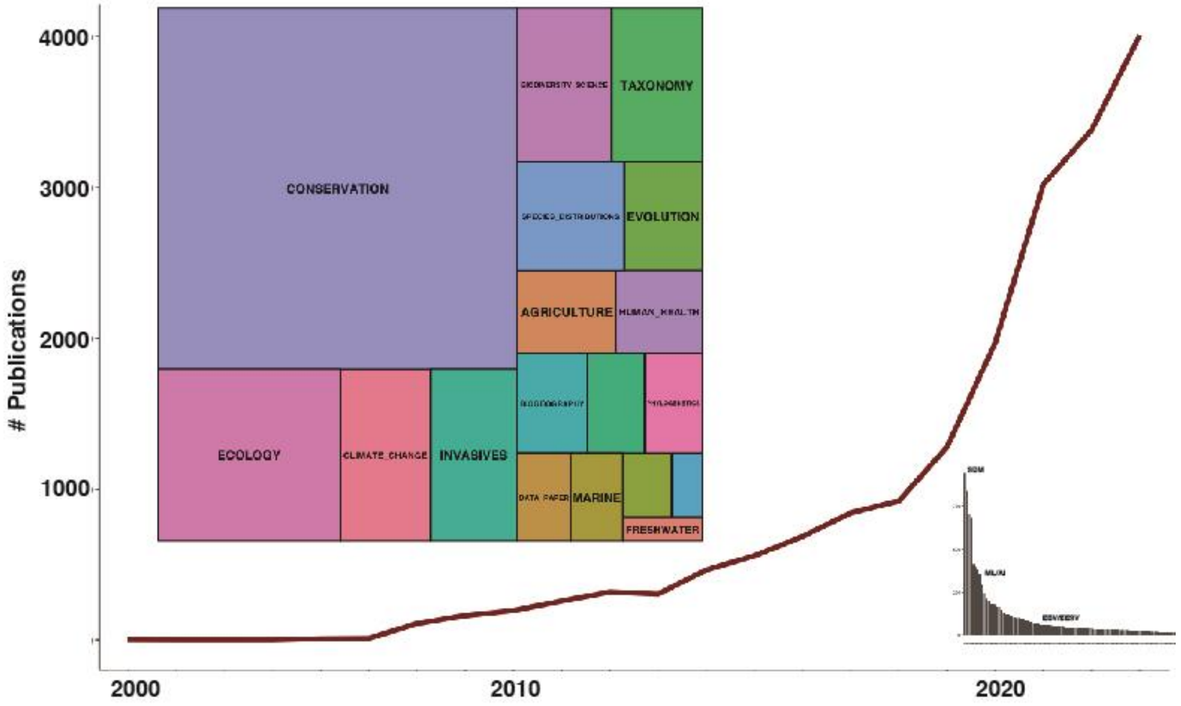
Map of GBIF-enabled science



Heberling JM et al. D (2021) Data integration enables global biodiversity synthesis. PNAS 118(6): e2018093118. https://doi.org/10.1073/pnas.2018093118

Systematic reviews of GBIF-enabled science






Data integration enables global biodiversity synthesis

Heberling et al. 2021

Landscaping study I

2016 – 2019

DOI: 10.1073/pnas.2018093118

Steinke et al. 2025

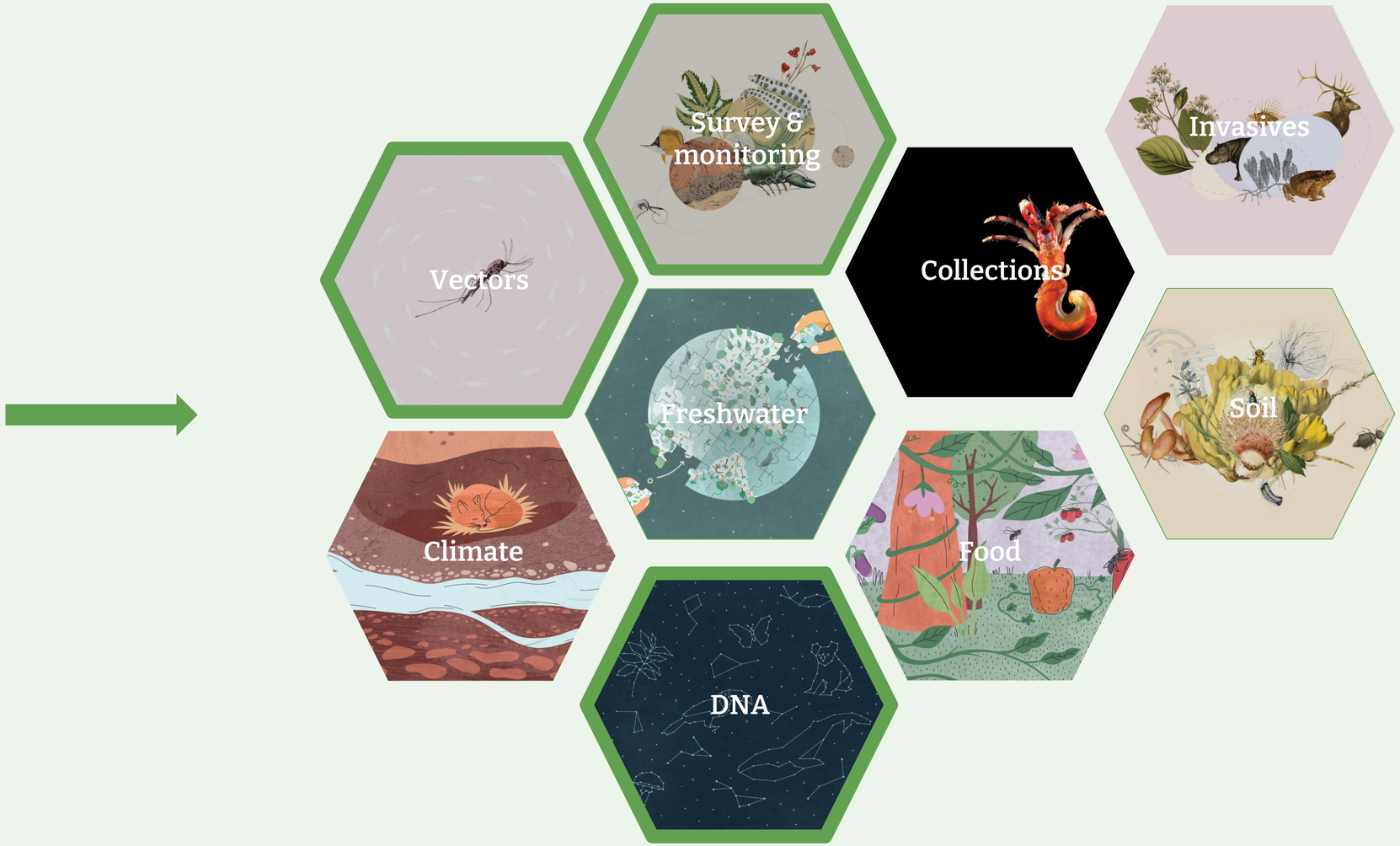
Landscaping study II

2020 – 2024

GBIF thematic priorities

2023 - 2027

GBIF Strategic Framework



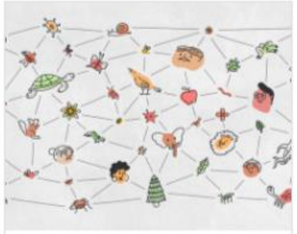
Get data How-to Tools Community About

Thematic communities

Soil

Conservation

Climate change



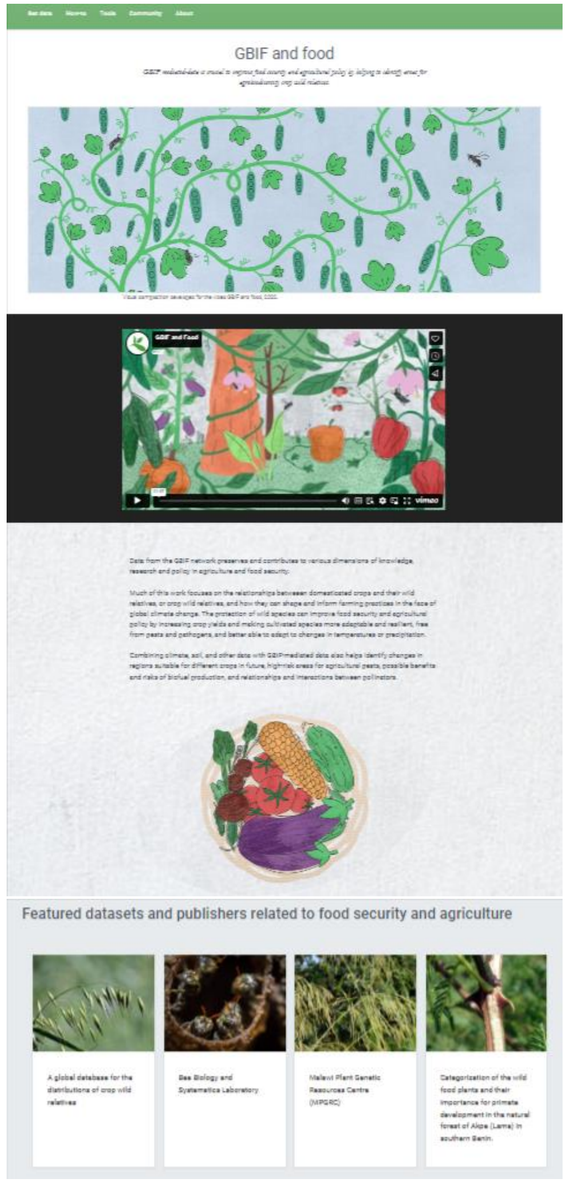
Human health and One Health

DNA barcoding and metagenomics

Agriculture and food security

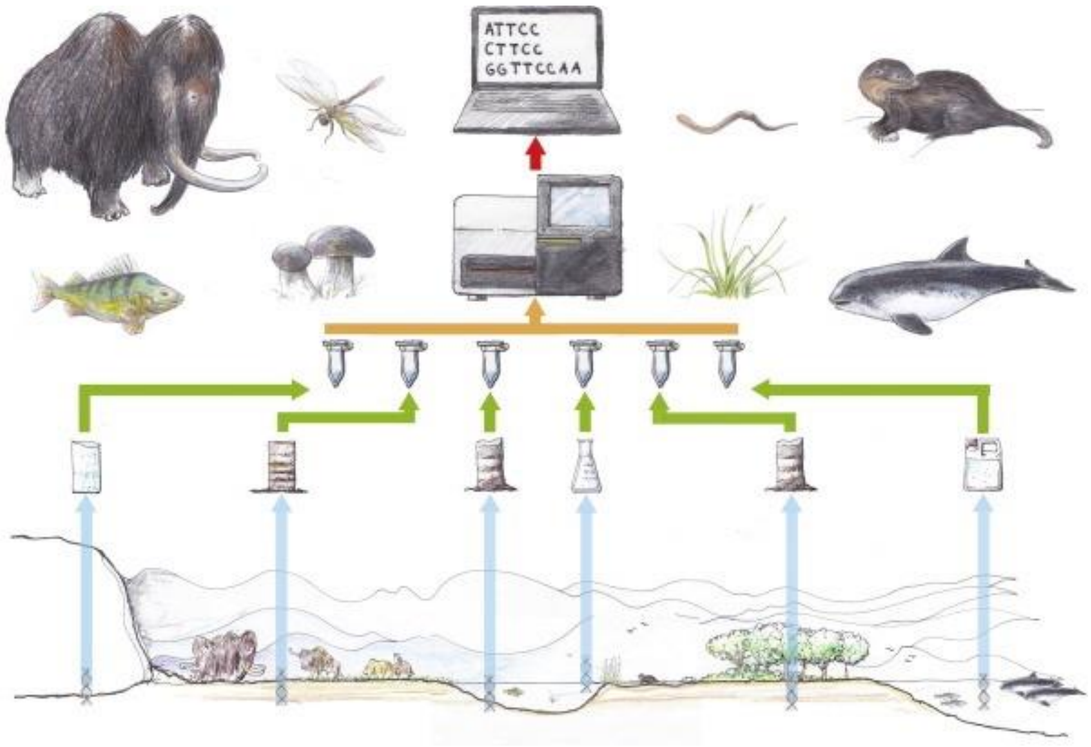
Business sector

Scientific collections



eDNA and metabarcoding

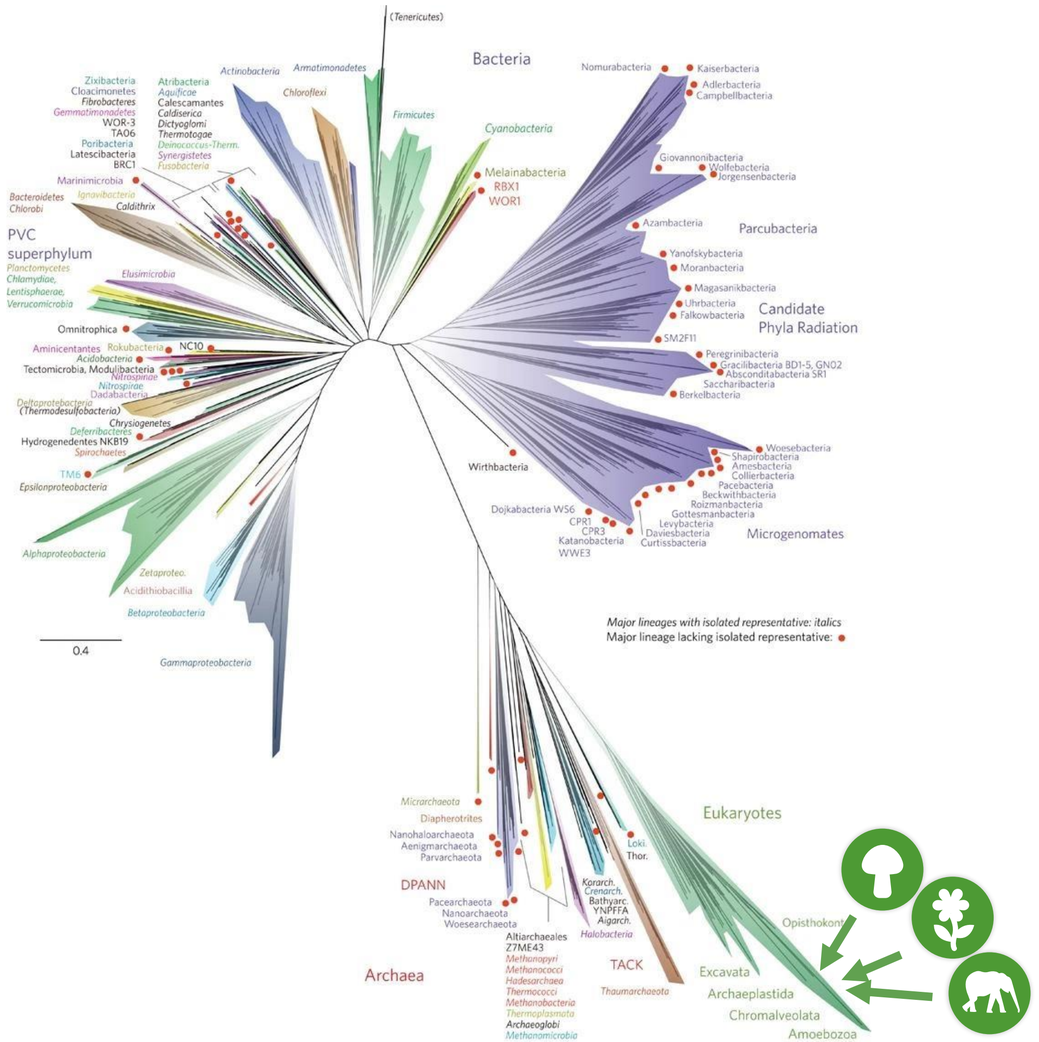
What is eDNA?



Uncovering “invisible footprints” of organisms

Why is eDNA Data Essential?

Filling critical taxonomic and geographic gaps for comprehensive biodiversity data



Hug, L., Baker, B., Anantharaman, K. *et al.* A new view of the tree of life. *Nat Microbiol* **1**, 16048 (2016).

Collaborating for a global eDNA data future

NLM-NCBI

ENA
European Nucleotide Archive

DDBJ
DNA Data Bank of Japan

BOLD SYSTEMS

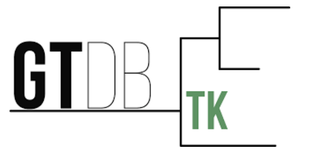
Swedish ASV portal

unite
community

PlutoF

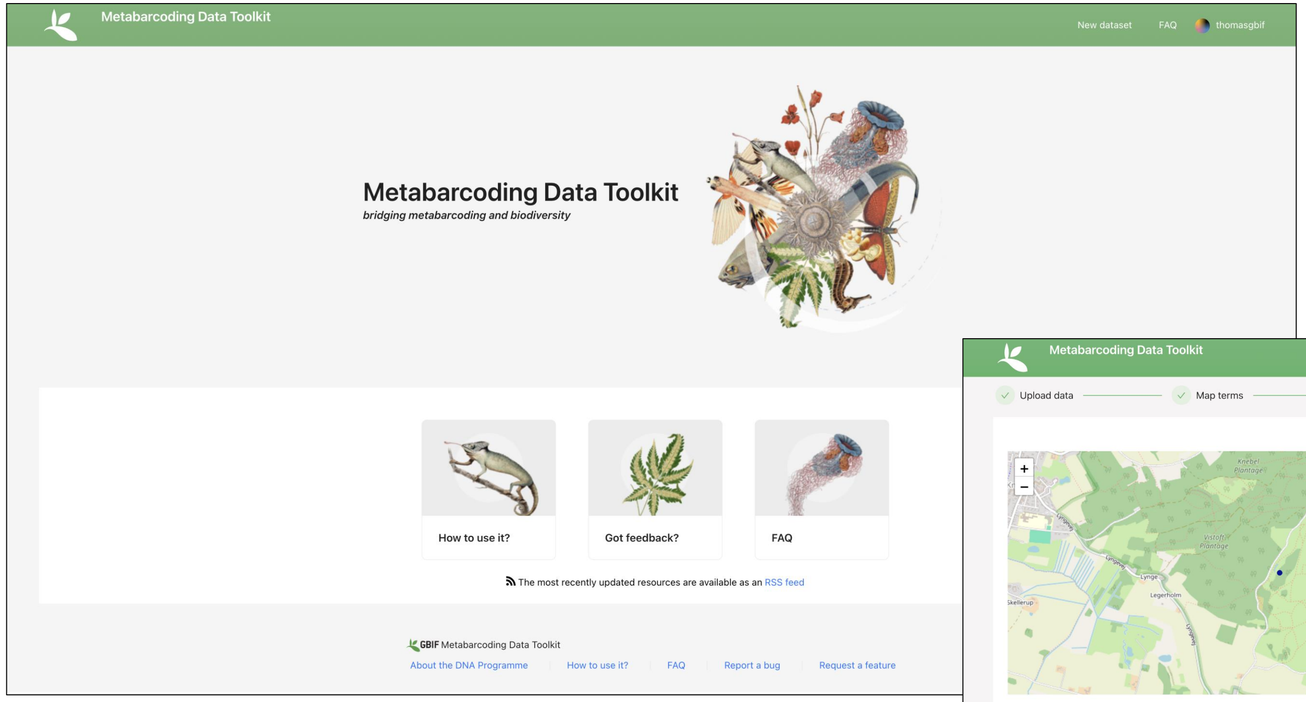
Catalogue of Life

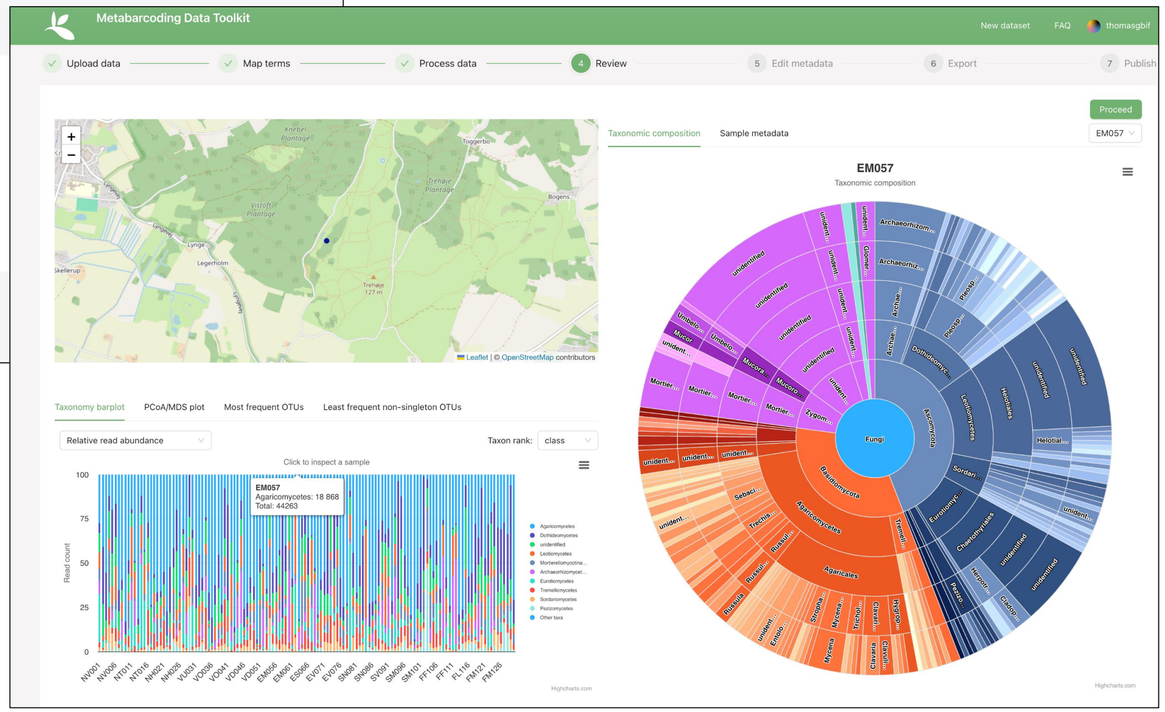
MGnify



WILDERLAB

The Metabarcoding Data Toolkit





Surveys and monitoring

Humboldt extension and data model

What are survey and monitoring data?

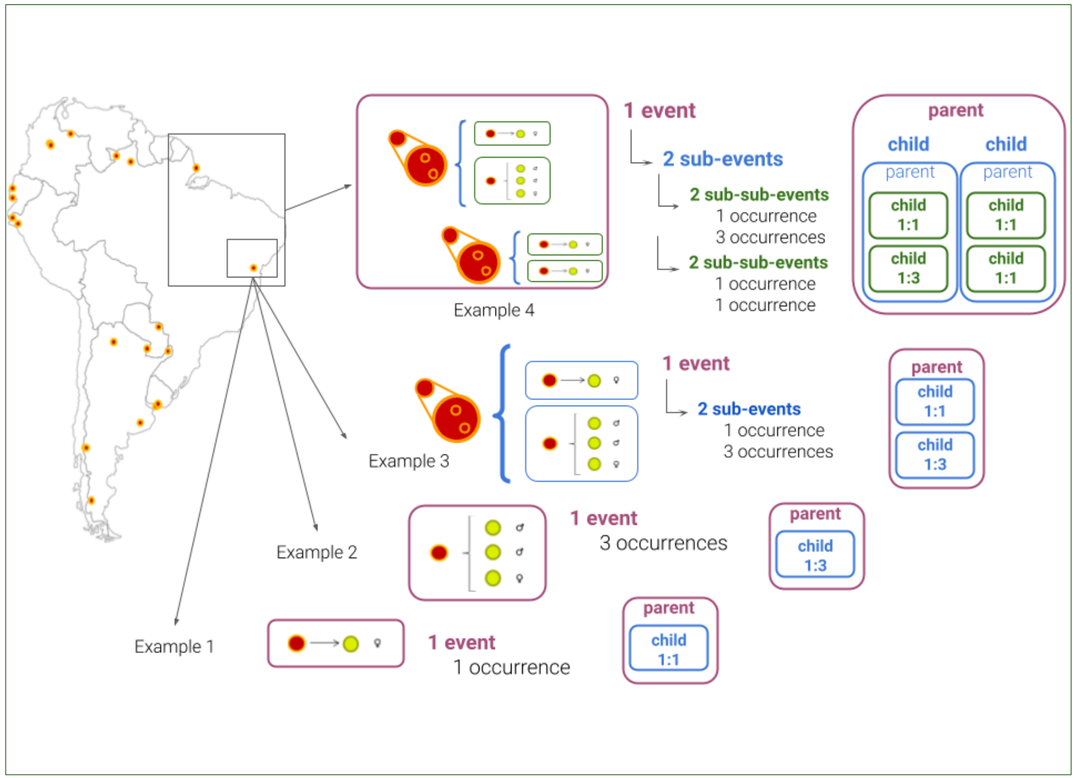


Figure 4, Sica et al. 2023. Humboldt Extension for Ecological Inventories: User Guide w/ Test IPT Instructions. https://tinyurl.com/HEuserguide

- Reported sampling protocol
- Heirarchical w/ variable complexity
- Effort types
  - Bioblitzes, museum expeditions, long-term monitoring initiatives, …

Why are survey and monitoring data important to GBIF?

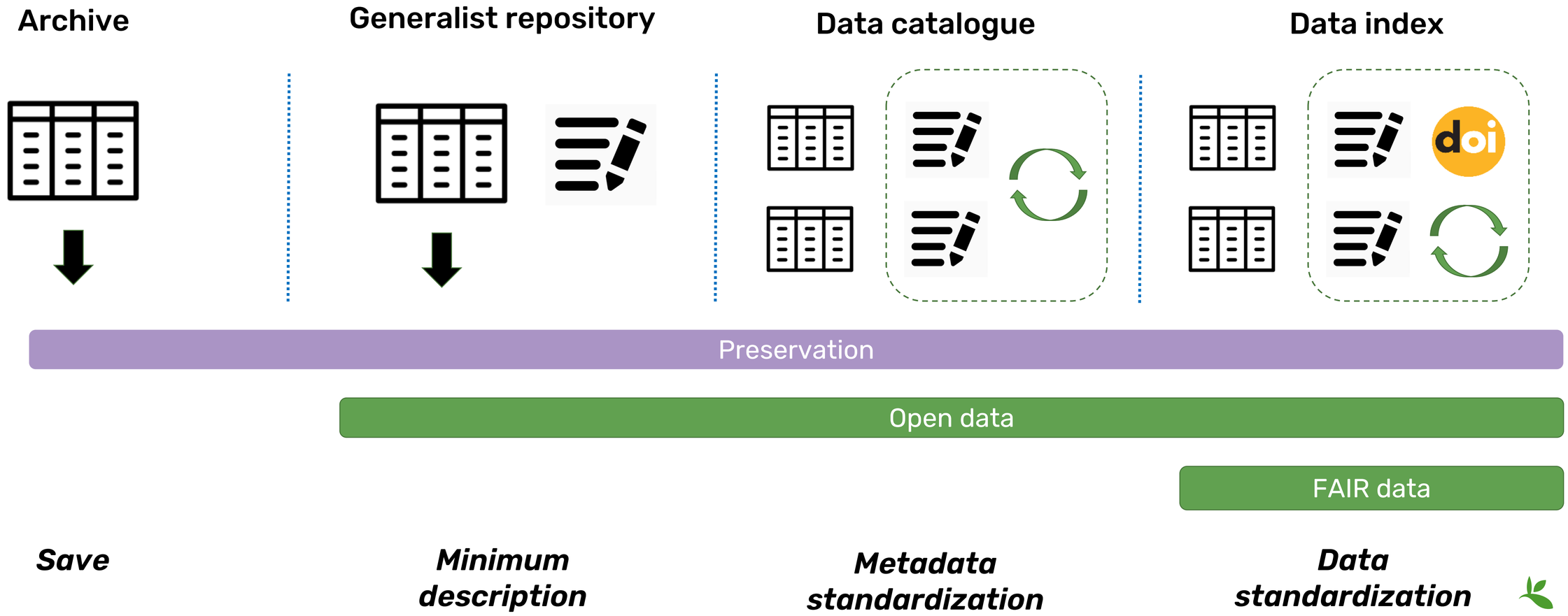
Mission

To mobilize the data, skills and technologies needed to make comprehensive biodiversity information freely available for science and decisions addressing biodiversity loss and sustainable development

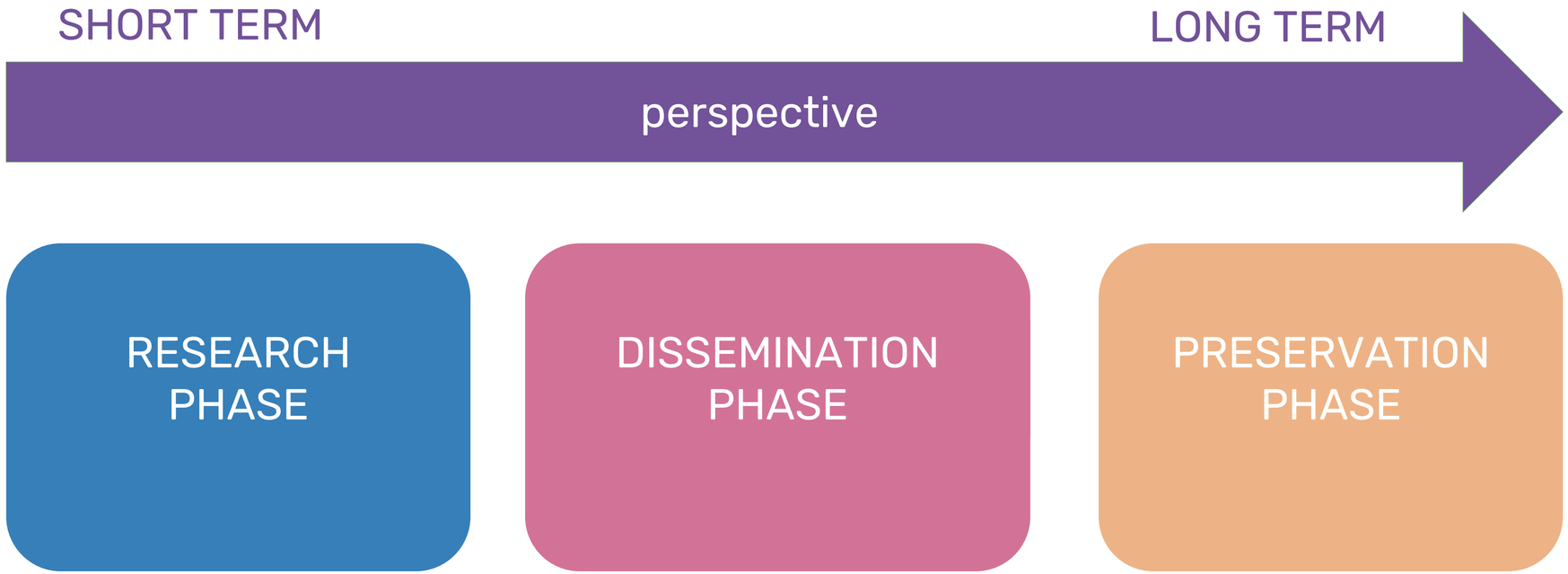
- Assessment of biodiversity trends and rates of change
- Impacts
  - Scientific research
  - Policy and management

GBIF Strategic Framework 2023-2027 (2021) GBIF Secretariat: Copenhagen. https://doi.org/10.35035/doc-0kkq-0t82

Data sharing in science: the WHERE choices



Data sharing in science: the WHEN choices



- file formats
- ownership
- storage
- backups

- share with whom
- embargo
- licensing
- metadata

- repository
- long-term manager

Sophie Kay 2013 (Open Science Training Initiative) CC-BY 3.0.

The research data lifecycle

Generate / **Access**

(re)**Organize**

Modify

Analyze

Archive

Cite

University of Sydney https://library.sydney.edu.au/research/data-management/research-data-management.html

OPEN ACCESS Freely available online

PLoS one

Sharing Detailed Research Data Is Associated with Increased Citation Rate

Heather A. Piwowar*, Roger S. Day, Douglas B. Fridsma

Department of Biomedical Informatics, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, United States of America

Background. **Sharing research data provides benefit to the general scientific community, but the benefit is less obvious for the investigator who makes his or her data available.** ***Principal Findings.*** **We examined the citation history of 85 cancer microarray clinical trial publications with respect to the availability of their data. The 48% of trials with publicly available microarray data received 85% of the aggregate citations. Publicly available data was significantly (p = 0.006) associated with a 69% increase in citations, independently of journal impact factor, date of publication, and author country of origin using linear regression.** ***Significance.*** **This correlation between publicly available data and increased literature impact may further motivate investigators to share their detailed research data.**

Citation: Piwowar HA, Day RS, Fridsma DB (2007) Sharing Detailed Research Data Is Associated with Increased Citation Rate. PLoS ONE 2(3): e308. doi:10.1371/journal.pone.0000308

INTRODUCTION

Sharing information facilitates science. Publicly sharing detailed research data–sample attributes, clinical factors, patient outcomes, DNA sequences, raw mRNA microarray measurements–with other researchers allows these valuable resources to contribute far beyond their original analysis[1]. In addition to being used to confirm original results, raw data can be used to explore related or new hypotheses, particularly when combined with other publicly available data sets. Real data is indispensable when investigating and developing study methods, analysis techniques, and software implementations. The larger scientific community also benefits: sharing data encourages multiple perspectives, helps to identify errors, discourages fraud, is useful for training new researchers, and increases efficient use of funding and patient population resources by avoiding duplicate data collection.

Believing that that these benefits outweigh the costs of sharing research data, many initiatives actively encourage investigators to make their data available. Some journals, including the *PLoS* family, require the submission of detailed biomedical data to publicly available databases as a condition of publication[2–4]. Since 2003, the NIH has required a data sharing plan for all large funding grants. The growing open-access publishing movement will perhaps increase peer pressure to share data.

However, while the general research community benefits from shared data, much of the burden for sharing the data falls to the study investigator. Are there benefits for the investigators themselves?

A currency of value to many investigators is the number of times their publications are cited. Although limited as a proxy for the scientific contribution of a paper[5], citation counts are often used in research funding and promotion decisions and have even been assigned a salary-increase dollar value[6]. Boosting citation rate is thus is a potentially important motivator for publication authors.

In this study, we explored the relationship between the citation rate of a publication and whether its data was made publicly available. Using cancer microarray clinical trials, we addressed the following questions: Do trials which share their microarray data receive more citations? Is this true even within lower profile trials? What other data-sharing variables are associated with an increased citation rate? While this study is not able to investigate causation, quantifying associations is a valuable first step in understanding these relationships. Clinical microarray data provides a useful environment for the investigation: despite being valuable for reuse and extremely costly to collect, is not yet universally shared.

RESULTS

We studied the citations of 85 cancer microarray clinical trials published between January 1999 and April 2003, as identified in a systematic review by Ntzani and Ioannidis[7] and listed in Supplementary Text S1. We found 41 of the 85 clinical trials (48%) made their microarray data publicly available on the internet. Most data sets were located on lab websites (28), with a few found on publisher websites (4), or within public databases (6 in the Stanford Microarray Database (SMD)[8], 6 in Gene Expression Omnibus (GEO)[9], 2 in ArrayExpress[10], 2 in the NCI GeneExpression Data Portal (GEDP)(gedp.nci.nih.gov); some datasets in more than one location). The internet locations of the datasets are listed in Supplementary Text S2. The majority of datasets were made available concurrently with the trial publication, as illustrated within the WayBackMachine internet archives (www.archive.org/web/web.php) for 25 of the datasets and mention of supplementary data within the trial publication itself for 10 of the remaining 16 datasets. As seen in Table 1, trials published in high impact journals, prior to 2001, or with US authors were more likely to share their data.

The cohort of 85 trials was cited an aggregate of 6239 times in 2004–2005 by 3133 distinct articles (median of 1.0 cohort citation per article, range 1–23). The 48% of trials which shared their data received a total of 5334 citations (85% of aggregate), distributed as shown in Figure 1.

Academic Editor: John Ioannidis, University of Ioannina School of Medicine, Greece

Received December 13, 2006; **Accepted** February 26, 2007; **Published** March 21, 2007

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Competing Interests: The authors have declared that no competing interests exist.

* **To whom correspondence should be addressed.** E-mail: hpiwowar@cbmi.pitt.edu

Piwowar et al. 2007

GBIF Memorandum of understanding

The signatories to this non-binding Memorandum of Understanding (MOU), being countries, economies, inter-governmental or international organizations, other organizations with an international scope, or entities designated by them, have decided that a co-ordinated international scientific effort is needed to enable users throughout the world to openly share and put to use vast quantities of global biodiversity data, thereby advancing scientific research in many disciplines, promoting technological and sustainable development, facilitating the conservation of biodiversity and the equitable sharing of its benefits, and enhancing the quality of life of members of society. The importance of making biodiversity data openly available to all countries and individuals is underscored by various international agreements.

Noting that GBIF was established in March 2001, and that the first and second MOU for GBIF had each a duration of five years (2001-2006/2007-2011), the signatories to this Memorandum of Understanding hereby express their intention either to continue their existing Participation in GBIF or to become new Participants in GBIF as a mechanism of technical and scientific international co-operation.

The Participants intend to encourage co-operation amongst themselves in the implementation of GBIF and in the development of joint work programmes in areas of mutual interest with the Secretariat of the Convention on Biological Diversity and other appropriate bodies and initiatives to avoid duplication and to benefit from existing resources and expertise.

https://www.gbif.org/mou

Dmitry Schigel
dschigel@gbif.org

@dschigel

Tajikistan National Report

Samariddin Barotov- Node manager for GBIF in Tajikistan

Almaty 2024

Illustration: GBIF data portal

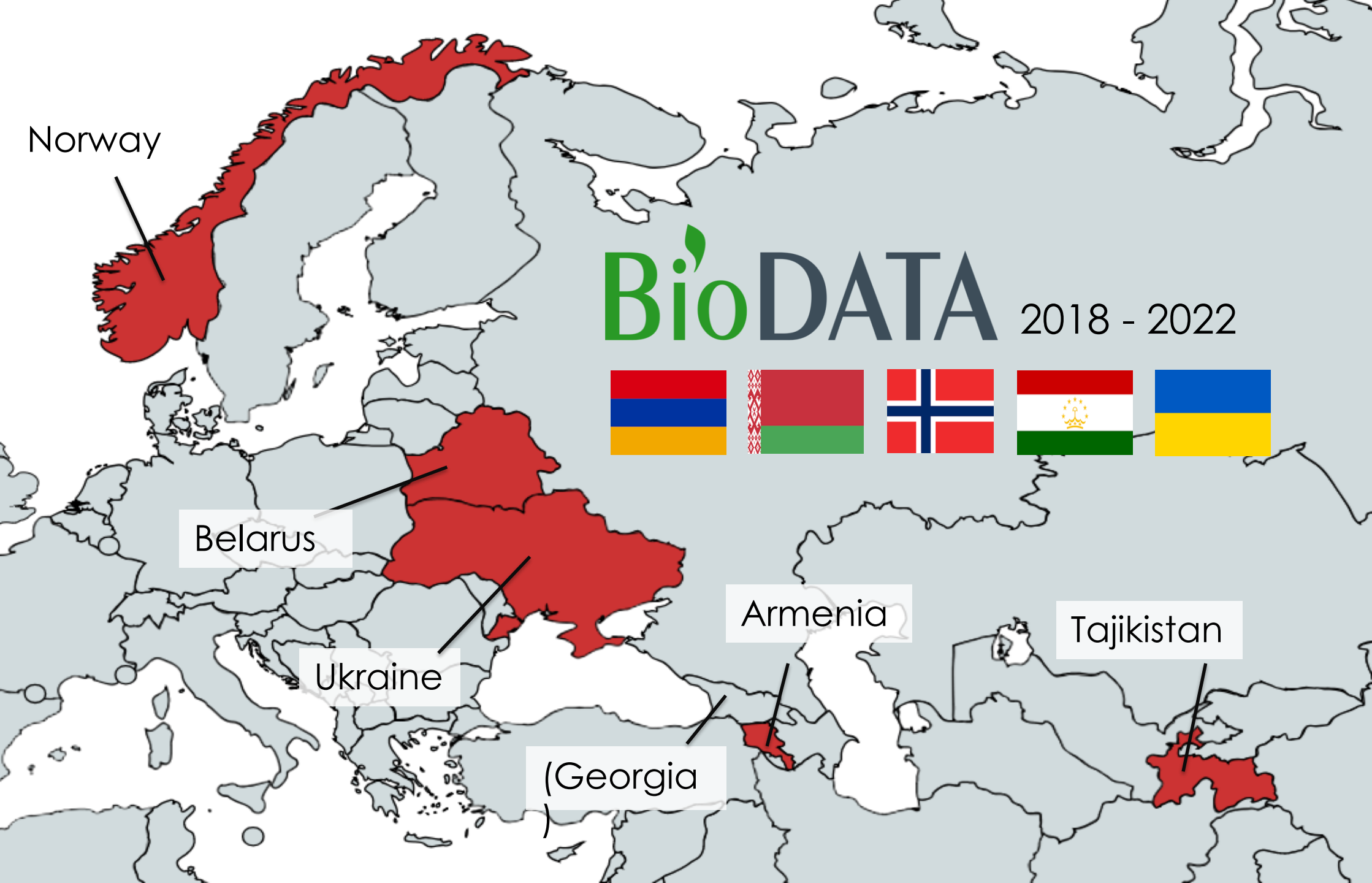
Tajikistan – Country Profile

- **Location -** The Republic of Tajikistan is an inland country located in the south-eastern part of Central Asia.
- **Population -** The population of Tajikistan as of January 1, 2023 is 10 million people.
- **Capital**: Dushanbe
- **Area**: 142,600 sq km
- **Languages**: Tajik, Russian, Uzbek, English and others

The biological diversity of Tajikistan today has more than 23,300 species of flora and fauna, and on average there are more than 164 species per thousand square kilometers of territory, which is ten times more than the world indicator.

Due to anthropogenic and other types of impact on nature, 226 plant species and 162 animal species are included in the Red Data Book of Tajikistan, which have become rare and are under threat of extinction.

The loss of agrobiodiversity in Tajikistan is especially negatively affected by the process of global climate change. Therefore, it is now necessary to take measures to preserve local of biodiversity and increase the adaptive capacity communities to climate change.


Norway
BioDATA
2018 - 2022
Belarus
Ukraine
Armenia
Tajikistan
(Georgia
)

Including additional students from Uzbekistan and Kyrgyzstan

Regional training| June 2019 | Shambari, Tajikistan

GBIF Tajikistan

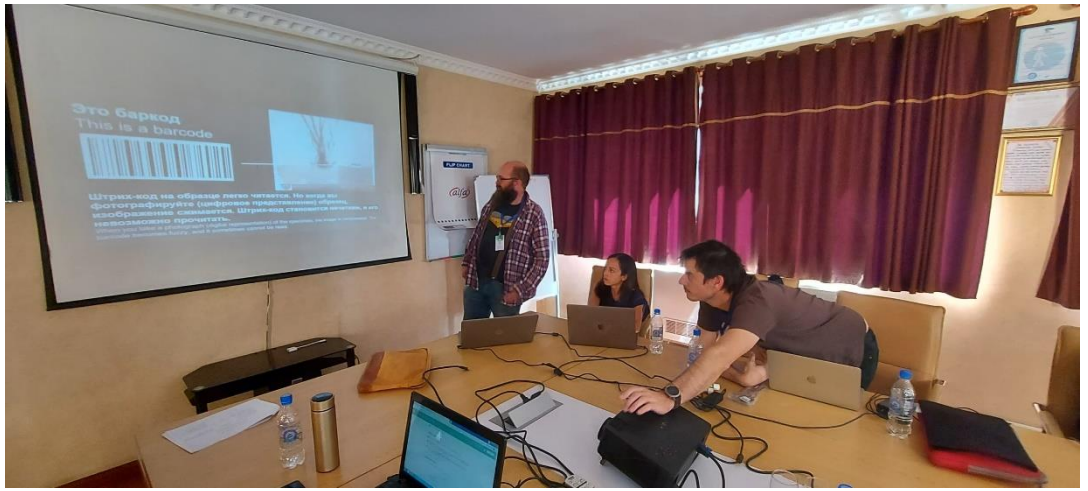
Kick-starting the biodiversity data publication process for Tajikistan ID:CESP2022-001

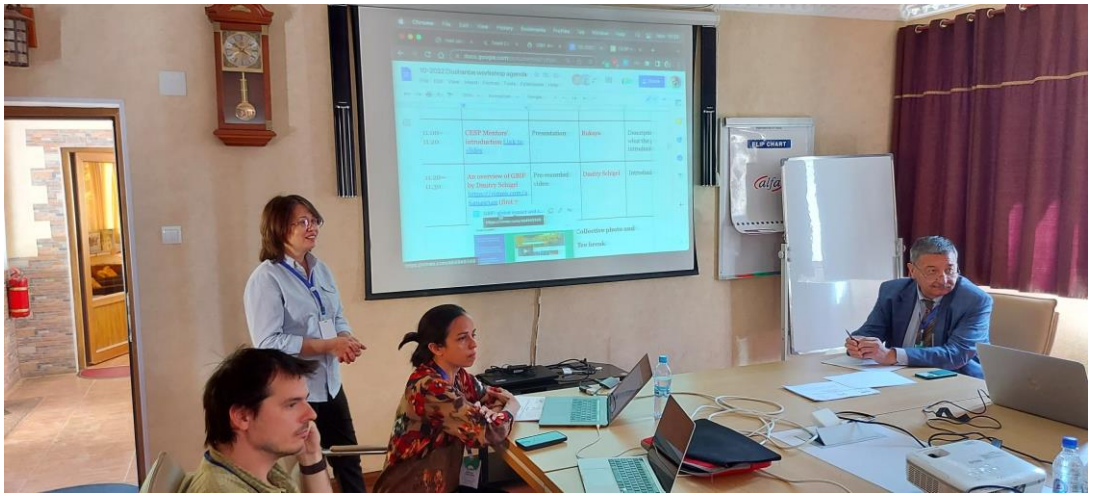
Activity Detail Summary

Activity	Description	Start Date	End Date	Deliverable or Impact
Identifying and inventorying the organizations in Tajikistan that hold specimen collections	A list of potential data publication partners and contact details. All these institutions will be registered into GRSciColl and Wikidata.	1/9/2022	26/9/2022	Impact: This will build communication and support capacity within the Tajikistan GBIF node.
Engaging key regional organizations	COVID -19 restrictions permitting, we plan 1 physical workshop/conference, with optional digital participation	27/9/2022	29/9/2022	Increased awareness of the data publication process in Tajikistan, and data publication support capacity at the Tajik GBIF Node. We can follow that up with an offer of one-on-one digital assistance from GBIF Norway in conjunction with the data publisher and GBIF Tajikistan

Digitization oflegacy biodiversity datasets inTajikistan	A digitisation workflow. This willinclude the setup for technical equipment and specimen imaging	3/10/2022	30/12/2022	Impact: Greater capacity forspecimen digitisation at the Herbarium, and more importantly greater knowledge + capacity at the Tajik node for collection digitisation and data publication”
GBIF data publication	Deliverable: Data publication of approximately 645 records of which some recordings are in a BRAHMS database. Data will be visible on gbif.org and on https://tajik.ipt.gbif.no	3/1/2023	30/6/2023	Impact: Increased coverageof important biodiversityinformation for a region withlimited published data

Training workshop in Tajikistan





PUBLISH FIRST

A novel, rapid digitisation/publishing workflow for herbaria low on staff time and technical resources

26 - 28 SEPT 2022: GBIF CESP WORKSHOP

STEPS – 1: SCAN

2: Upload

BUCKET

MINIO

(See: https://min.io)

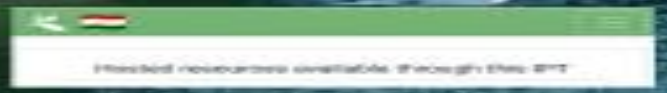
A python app listens to create events on the bucket

Google Vision API

parses handwritten and printed text in image – some mistakes but generally good, even with handwritten cyrillic

Google Translate API for the Russian translation (original and translation are stored verbatim in dwc:dynamicProperties)

A simple parser splits out obvious label information (scientific name, altitude, etc). This is output into a dwc stored on the bucket



IPT set up to publish automatically from source file on bucket

Get data How-to Tools Community About samariddinbarot

Tajikistan

An associate participant from Europe and Central Asia
Names of countries and areas are based on the ISO 3166-1 standard

SUMMARY DATA ABOUT DATA PUBLISHING PARTICIPATION ALIEN SPECIES MORE... ACTIVITY REPORT

DATA FROM TAJIKISTAN

53,160	4	26	5
Published occurrences	Published datasets	Countries and areas covered by data from Tajikistan	Publishers from Tajikistan

Get data How-to Tools Community About samariddinbarot

Tajikistan

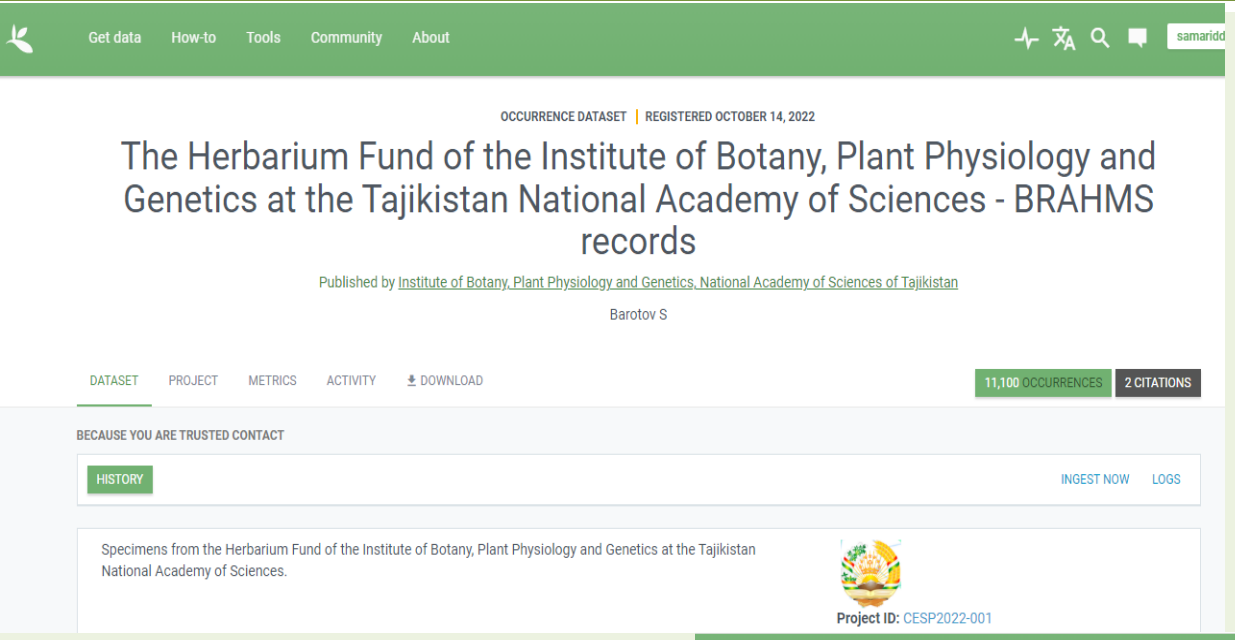
An associate participant from Europe and Central Asia
Names of countries and areas are based on the ISO 3166-1 standard

SUMMARY DATA ABOUT DATA PUBLISHING PARTICIPATION ALIEN SPECIES MORE... ACTIVITY REPORT

DATA ABOUT TAJIKISTAN

126,438	454	35	211
Occurrences	Datasets	Countries and areas contribute data	Publishers

Achievements GBIF Tajikistan



Achievements GBIF Tajikistan

During the implementation project, we organized several virtual meetings about the evaluation and monitoring of the project with our main partners GBIF team Norway. About evaluation and monitoring local organization I personally visited to the Universities. During my 3h lecture, I explained for teachers and student's biological faculty about data publication in the GBIF one more again. From students and teachers were most interest about our project it talks about outputs and deliverables and capacity building young generations. Implementation project is going well efficiency that we connected 4 local organizations. The strength side that in our workshop participated around 27 young specialist from different of regions of Tajikistan.

Achievements GBIF Tajikistan

TNU


Клетка животных
В чем сходство и отличие данных клеток?
1. Сходство строения – единство происхождения.
2. Различия – разные пути эволюции


GBIF

TPU

OCCURRENCES PER KINGDOM

BEFORE

NOW

The Herbarium Fund of the Institute of Botany, Plant Physiology and Genetics at the Tajikistan National Academy of Sciences - BRAHMS records

Occurrence dataset

Specimens from the Herbarium Fund of the Institute of Botany, Plant Physiology and Genetics at the Tajikistan National Academy of Sciences.

Published by Institute of Botany, Plant Physiology and Genetics, National Academy of Sciences of Tajikistan

11 100 occurrences | 12 citations

The Herbarium of Tajik National University

Occurrence dataset

This dataset contains specimens from the herbarium at Tajik National University. Tajik National University was established by the Resolution of the Soviet of Ministries of the USSR 21st of March 1947,...

Published by Tajik National University

259 occurrences | 3 citations

Khatlon Scientific Center

Occurrence dataset

This dataset contains specimens from the herbarium at Khatlon Scientific Center. The specimens were imaged by herbarium staff, and published via an automatic process: 1) OCR text was gathered from th...

Published by Khatlon Scientific Center of the National Academy of Sciences of Tajikistan

140 occurrences | 1 citation

The Herbarium Fund of the Institute of Botany, Plant Physiology and Genetics at the Tajikistan National Academy of Sciences - BRAHMS records

Occurrence dataset

Specimens from the Herbarium Fund of the Institute of Botany, Plant Physiology and Genetics at the Tajikistan National Academy of Sciences.

Published by Institute of Botany, Plant Physiology and Genetics, National Academy of Sciences of Tajikistan

11 100 occurrences | 25 citations

The Herbarium of Tajik National University

Occurrence dataset

This dataset contains specimens from the herbarium at Tajik National University. Tajik National University was established by the Resolution of the Soviet of Ministries of the USSR 21st of March 1947,...

Published by Tajik National University

259 occurrences | 7 citations

Khatlon Scientific Center

Occurrence dataset

This dataset contains specimens from the herbarium at Khatlon Scientific Center. The specimens were imaged by herbarium staff, and published via an automatic process: 1) OCR text was gathered from th...

Published by Khatlon Scientific Center of the National Academy of Sciences of Tajikistan

140 occurrences | 6 citations

Thank you!!
Questions?

Samariddin Barotov GBIF Node Manager for Tajikistan
barotov.ikai@mail.ru
www.gbif.org

中国科学院新疆生态与地理研究所
XINJIANG INSTITUTE OF ECOLOGY AND GEOGRAPHY CHINESE ACADEMY OF SCIENCES

Potential for Participation and Prospects for Membership in GBIF

Prof. Weikang Yang

Xinjiang Institute of Ecology and Geography,

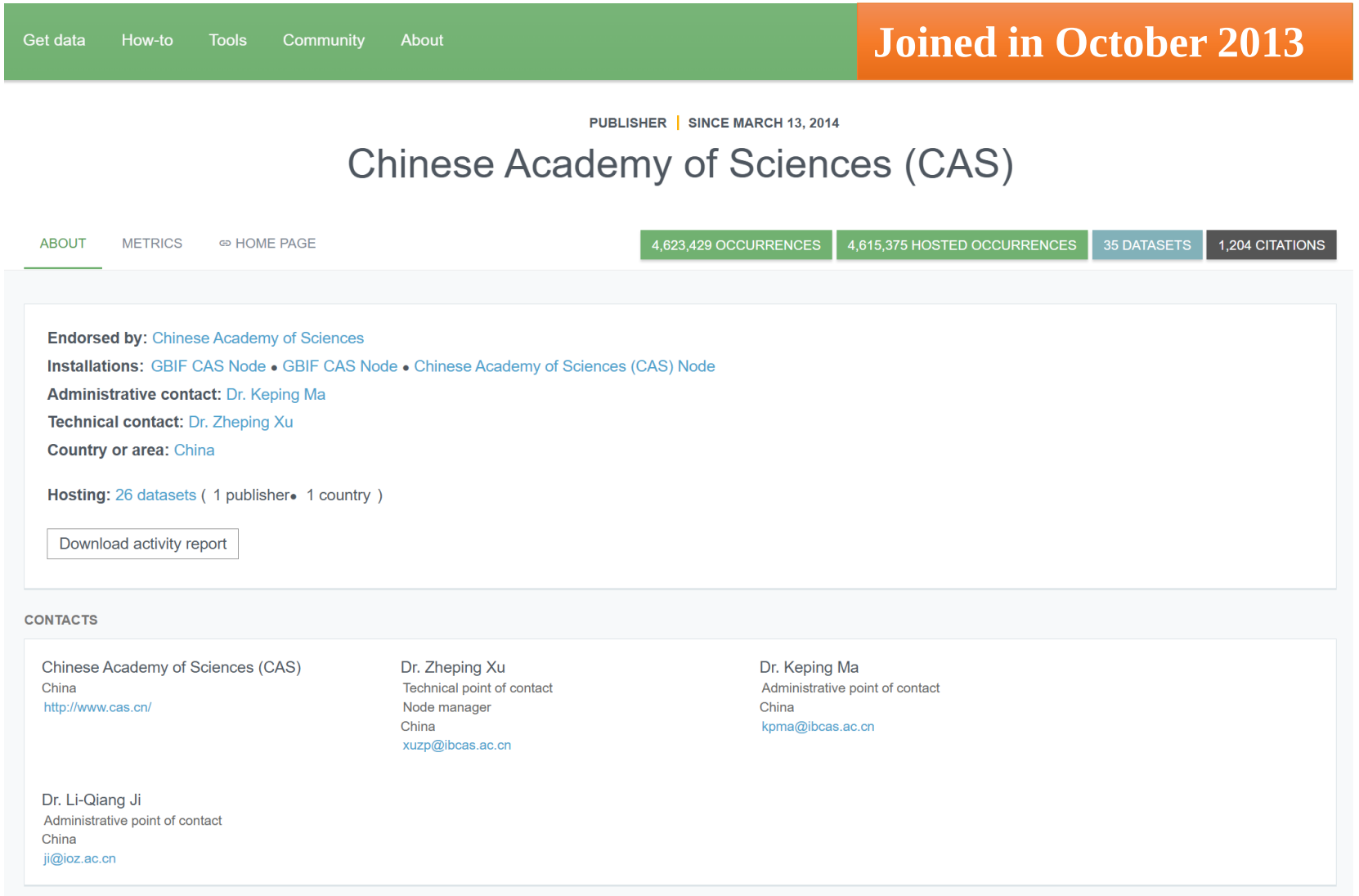
Chinese Academy of Sciences

November, 2024 Almaty

1. Introduction

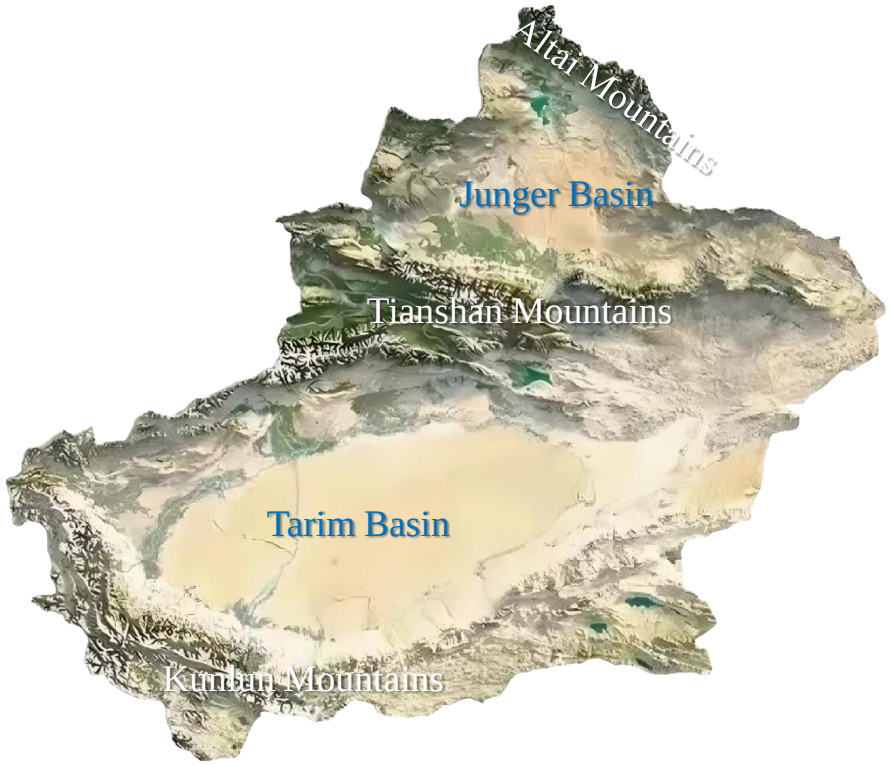
Xinjiang Institute of Ecology and Geography,
Chinese Academy of Sciences

GBIF Chinese Academy of Sciences Node



2. Overview of Biodiversity in Xinjiang, China

Xinjiang Institute of Ecology and Geography,
Chinese Academy of Sciences



Topographic map of Xinjiang, China

Three mountains and two basins

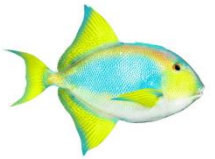
Vascular plants

Lycopods and ferns: 52

Gymnosperms: 22

Angiosperms: 4035

vertebrates



Fish: 92

Amphibian: 8

Reptile: 50

Bird: 498

Mammal: 144

3. Current Status of Data Collection and Sharing in Xinjiang

3.1 Constructing a Digital Herbarium in Xinjiang and Radiating to Central Asia

Theoretical and technical training

Specimen Digitization and Information Extraction

Data specification and technology development

- Xinjiang Digital Herbarium consist of Eight herbaria in Xinjiang, completing the task of digitizing 610,000 specimens.
- First constructed the Chinese-English-Russian multilingual Xinjiang Digital Herbarium 1.0.
- Next step, digitization of specimens from arid areas in Central Asia, start from Uzbekistan and Tajikistan.

Providing comprehensive basic information for biodiversity conservation in Xinjiang, China and Central Asia

3. Current Status of Data Collection and Sharing in Xinjiang

3.2 Constructed the Central Asian Arid Areas Plant Diversity Information Sharing Platform 1.0

Resource statistics:

- **Specimens and observations:**

  246,210

- **Literature Library:**

  50,000

- **Image Library:**

  10,000

- **Directory Library:**

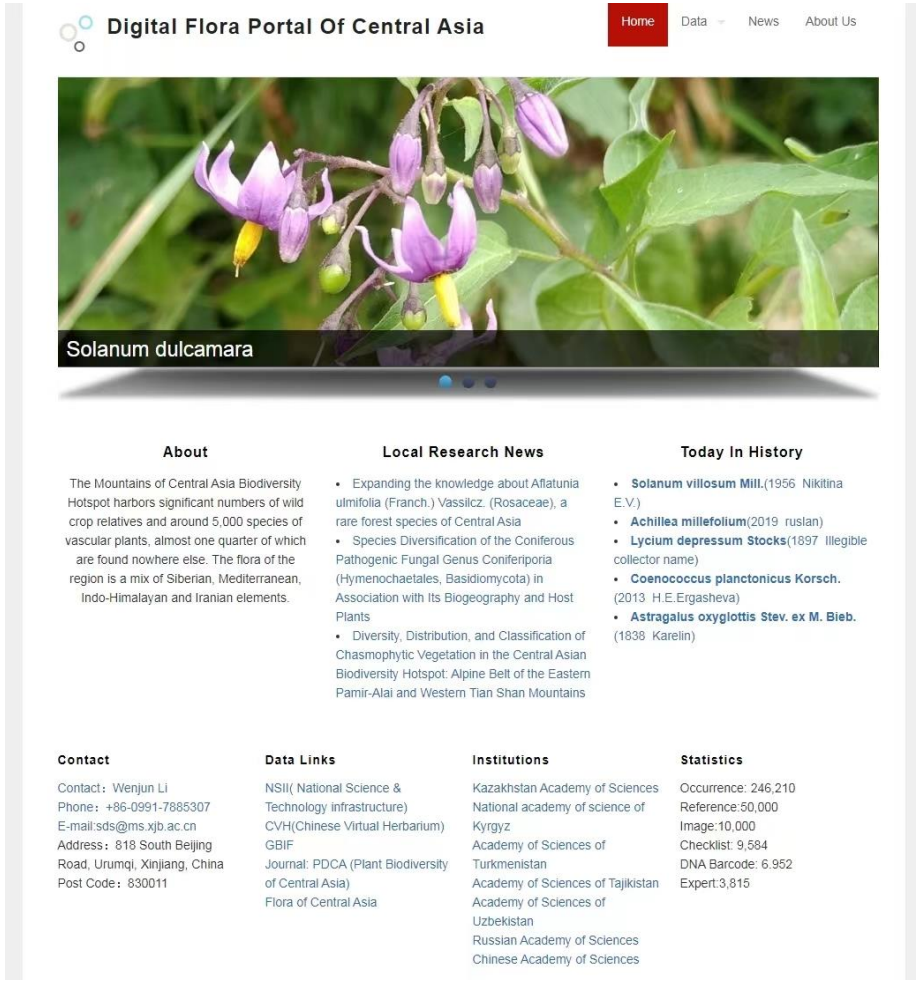
  9,584

- **DNA Barcode Library:**

  6,952

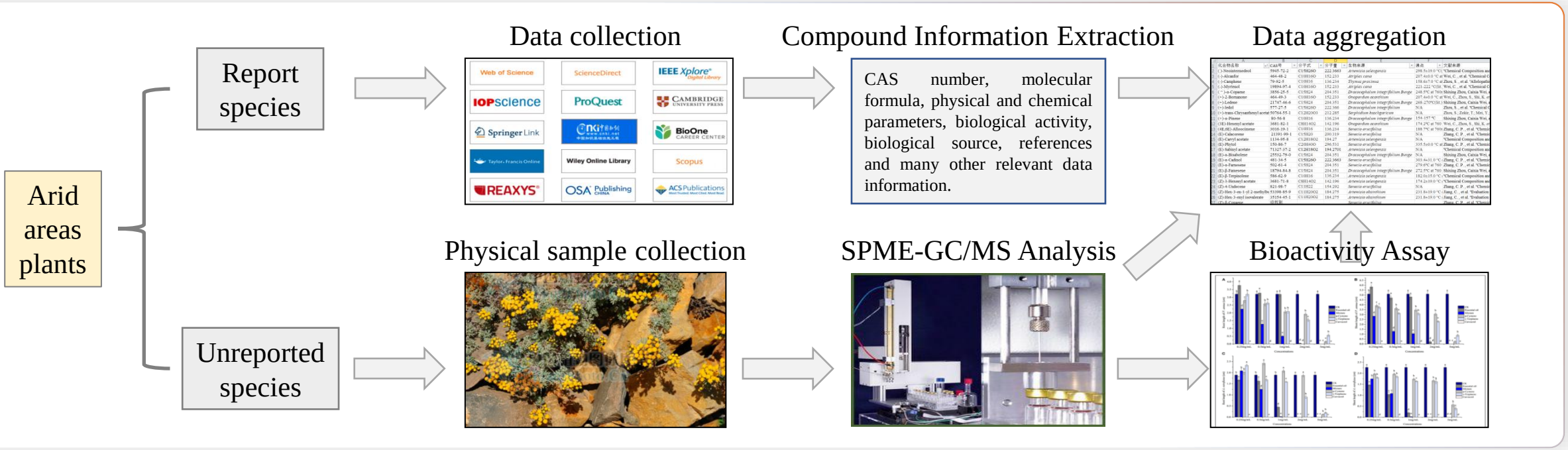
- **expert pool:**

  3,815



3. Current Status of Data Collection and Sharing in Xinjiang

3.3 Completing the Construction of a Database on Secondary Metabolites of Plants in Arid Areas



- completing a database of 2,000 plant secondary metabolites in conjunction with known data.
- Focusing on the secondary metabolites has dramatically improved the efficiency of exploiting plant resources in arid areas.

Construction of secondary metabolite databases creates an information-rich data platform for the development and utilization of plant resources in arid areas

4. Potential Benefits of Joining GBIF

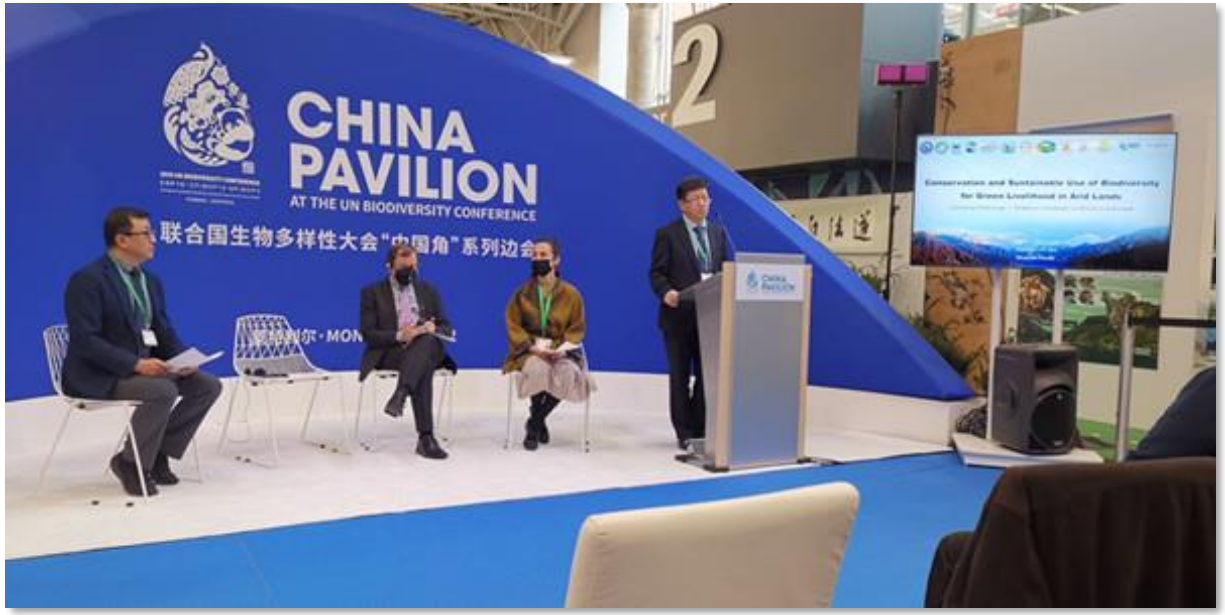
Xinjiang Institute of Ecology and Geography,
Chinese Academy of Sciences

- International Collaboration and Information Sharing.
- Improvement of Scientific Research.
- Enhanced Awareness of Ecological Conservation.

5. Future Prospects

Xinjiang Institute of Ecology and Geography,
Chinese Academy of Sciences

- Establish Data Sharing Mechanisms.
- Strengthen International Cooperation.
- Public Education and Awareness Enhancement.



Xinjiang Institute of Ecology and Geography,
Chinese Academy of Sciences

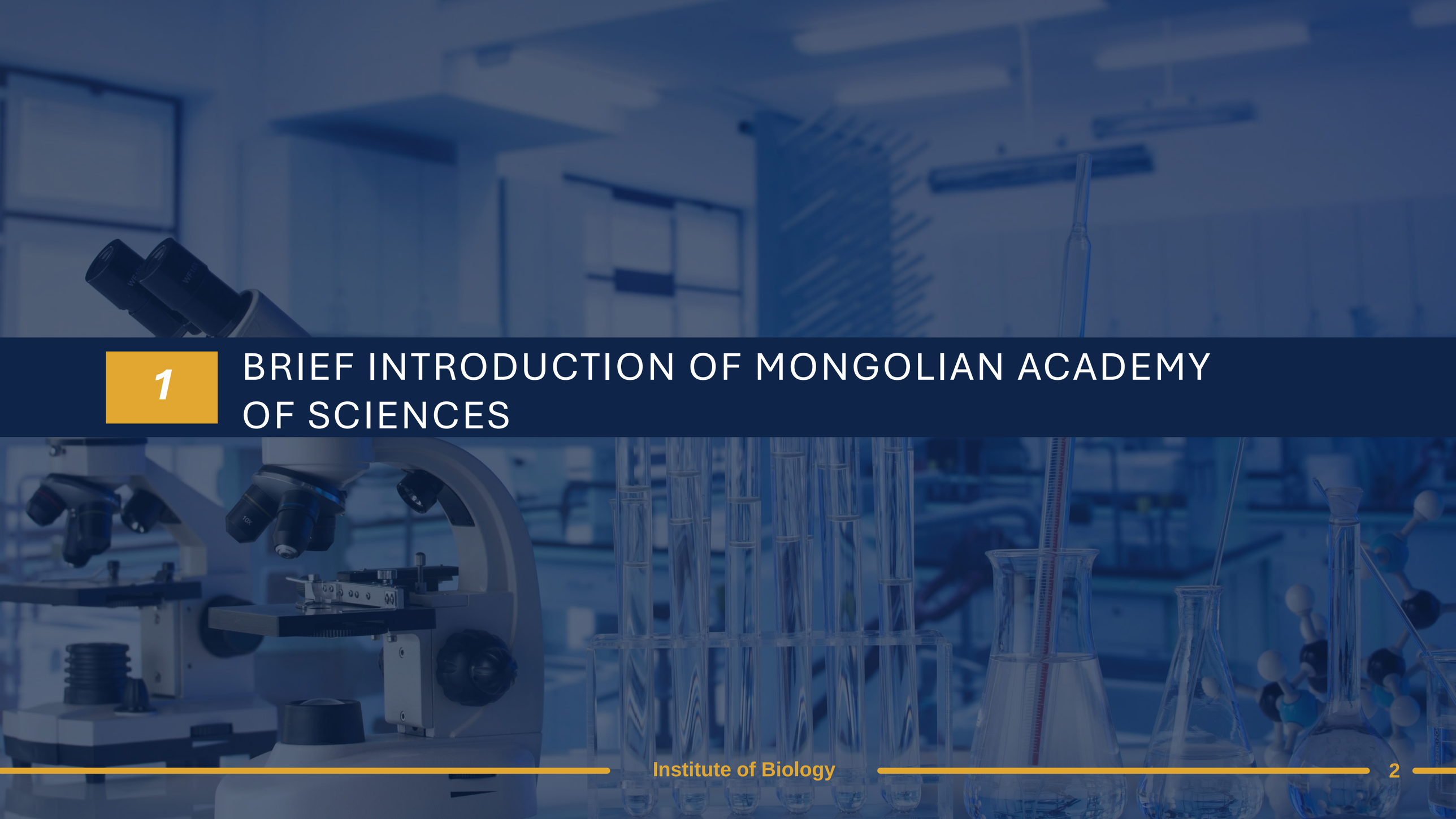
Thanks!

MONGOLIAN ACADEMY OF SCIENCES
INSTITUTE OF BIOLOGY

Potential for Participation and Prospects for Membership in GBIF

Presenter: Dr. Gantulga Davaakhuu
Director of the Institute of Biology, Mongolian Academy of Sciences

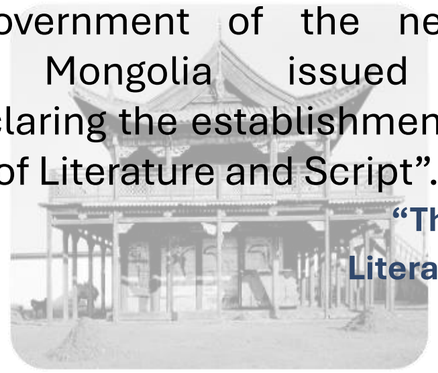
Ulaanbaatar | 2024



1 BRIEF INTRODUCTION OF MONGOLIAN ACADEMY OF SCIENCES

About Mongolian Academy of Sciences

Mongolia’s first Organization of the Modern Sciences was founded in 1921 when the government of the newly independent Mongolia issued a resolution declaring the establishment of “The Institute of Literature and Script”.



By the Decree of the Presidium of the Great People's Khural (Parliament) of the Mongolian People's Republic the State Committee for Science and Higher Education was reorganized to the Mongolian Academy of Sciences.

13 century

The Academy of Scholarly Worthies

The Great Khaan Khubilai established the nation’s called “The Academy of Scholarly Worthies”.

1921

“The Institute of Literature and Script”

1930

"State Committee of Science and Higher education”

This institute have been expanded its function, role and status in 1930 which named the State Committee of Science and Higher education.

1961

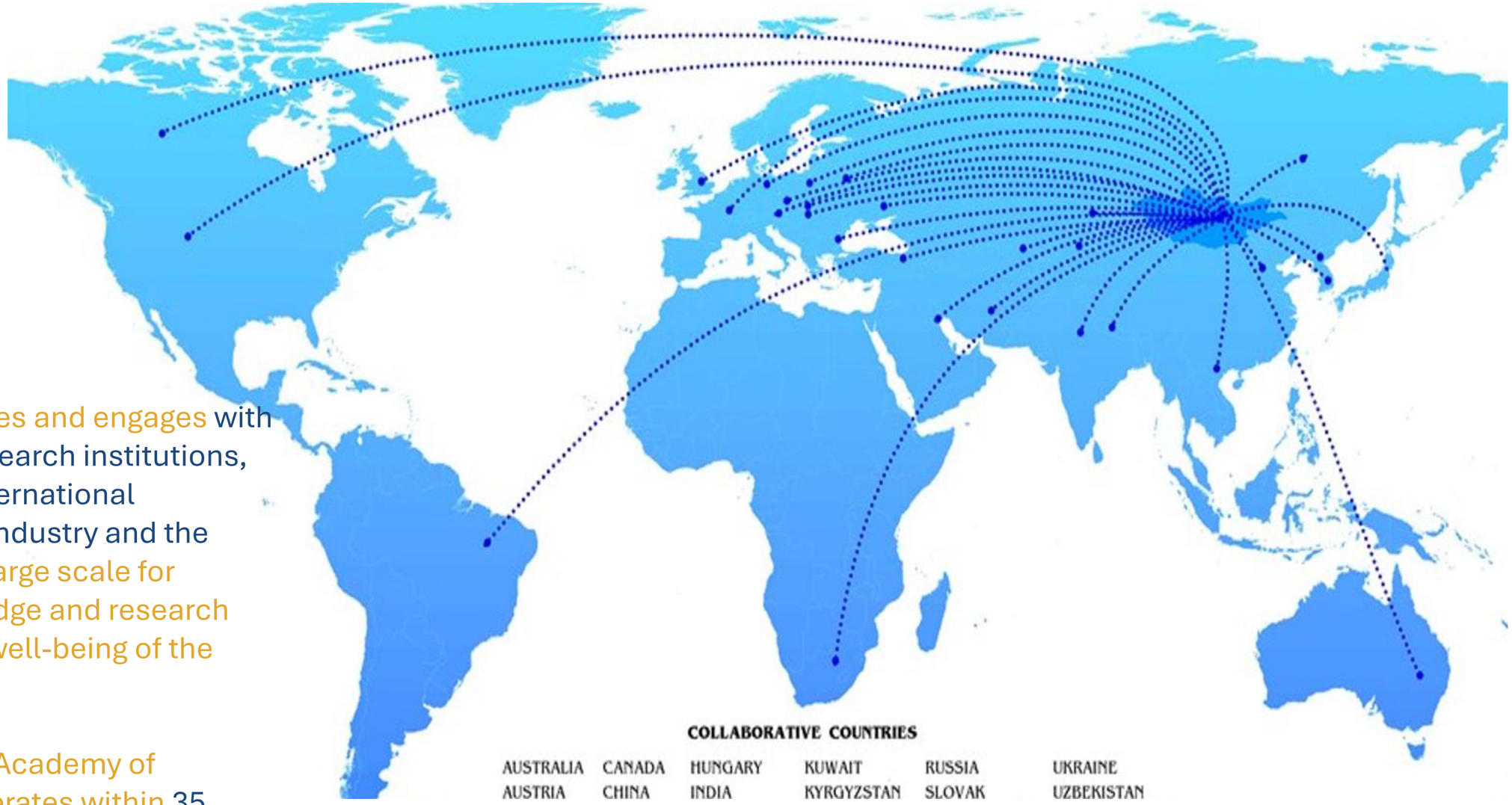
“The Mongolian Academy of Sciences”

2022

“The Mongolian Academy of Sciences”

The current organization and structure of the Mongolian Academy of Sciences was established by the Government of Mongolia in 2022 and currently comprise 16 institutes.

About Mongolian Academy of Sciences

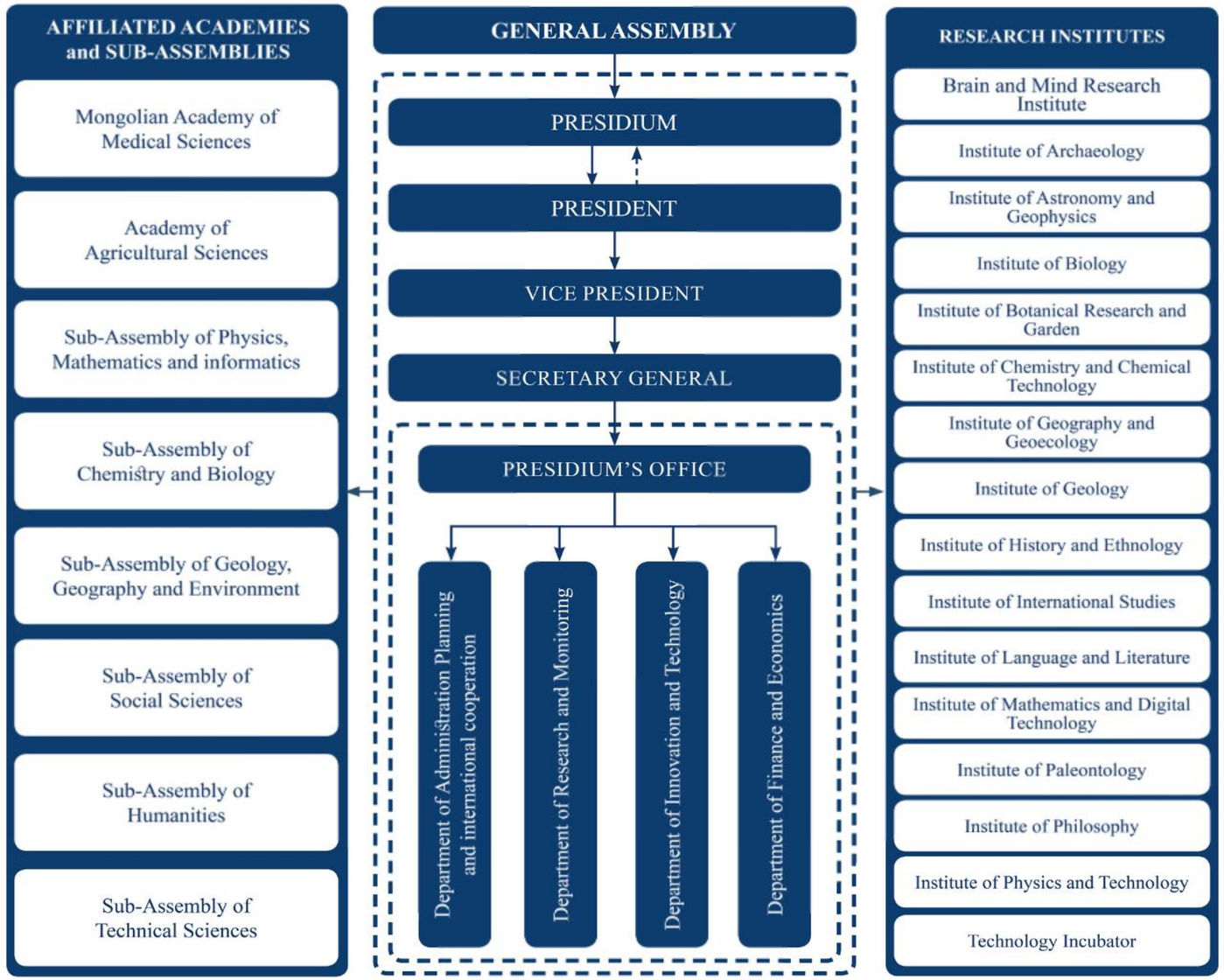


- MAS collaborates and engages with Academies, research institutions, universities, international organizations, industry and the community at large scale for sharing knowledge and research outputs to the well-being of the nation.

- The Mongolian Academy of Sciences cooperates within 35 countries over 138 official documents.

MAS Organization structure

- 49 SCIENTIFIC DIVISION AND DEPARTMENT
- 173 LABORATORY
- 7 INTERNATIONAL AND LOCAL CENTER
- 45 EXPERIMENTAL SITE AND CENTERS
- LIBRARY, OBJECTIVE AREA, AWS SITES ETC



2 BRIEF INTRODUCTION OF INSTITUTE OF BIOLOGY

INSTITUTE OF BIOLOGY

Since it’s establishment in **1965**, the institute aims to preserve the biodiversity of the fauna and flora, and micro-organisms of Mongolia by fostering innovation, new knowledge and excellence through the integration of fundamental and applied research.

8 **LABORATORIES**

1 **RESEARCH CENTER**

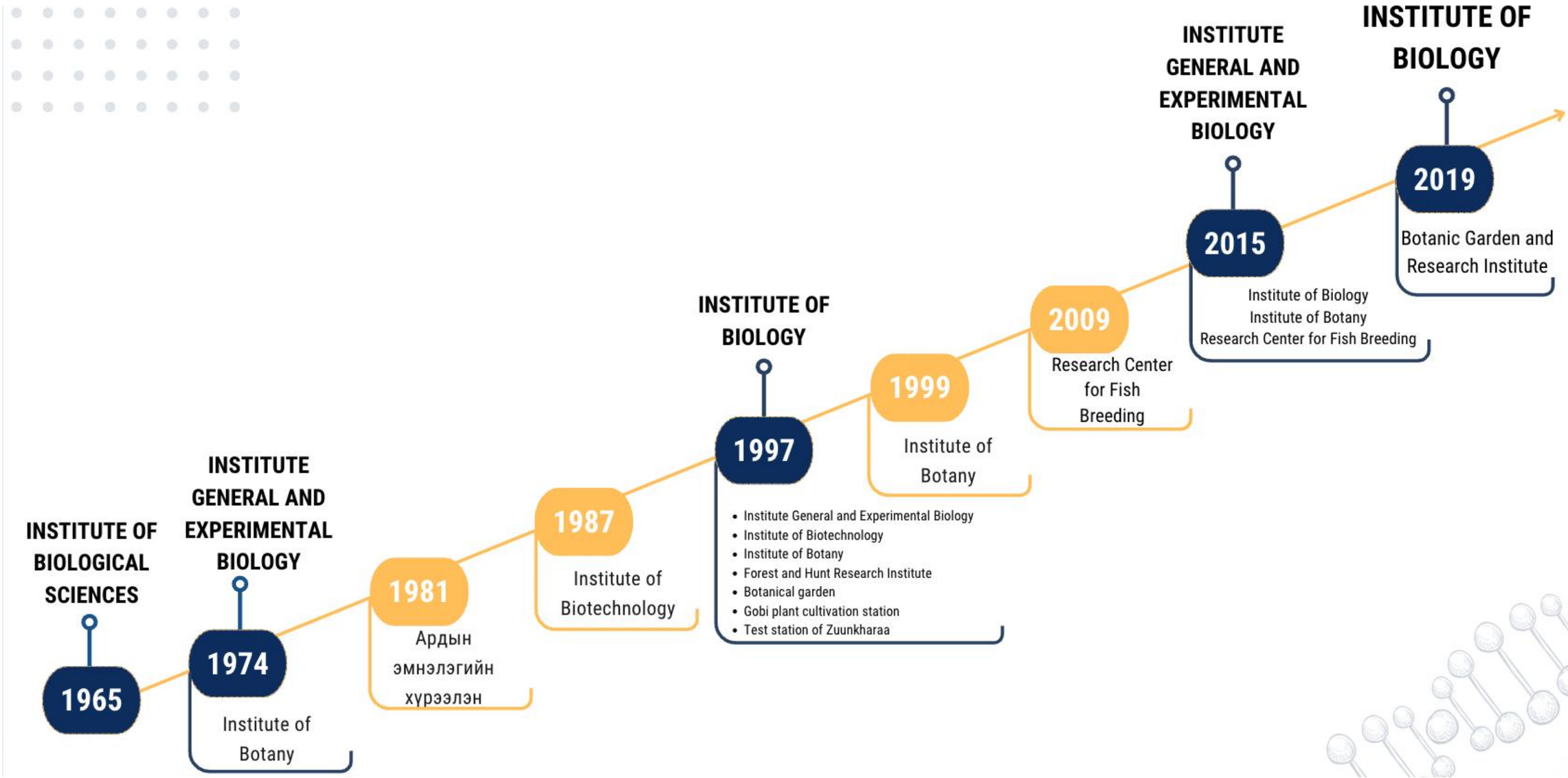
95 **HUMAN RESOURCE**

VISION

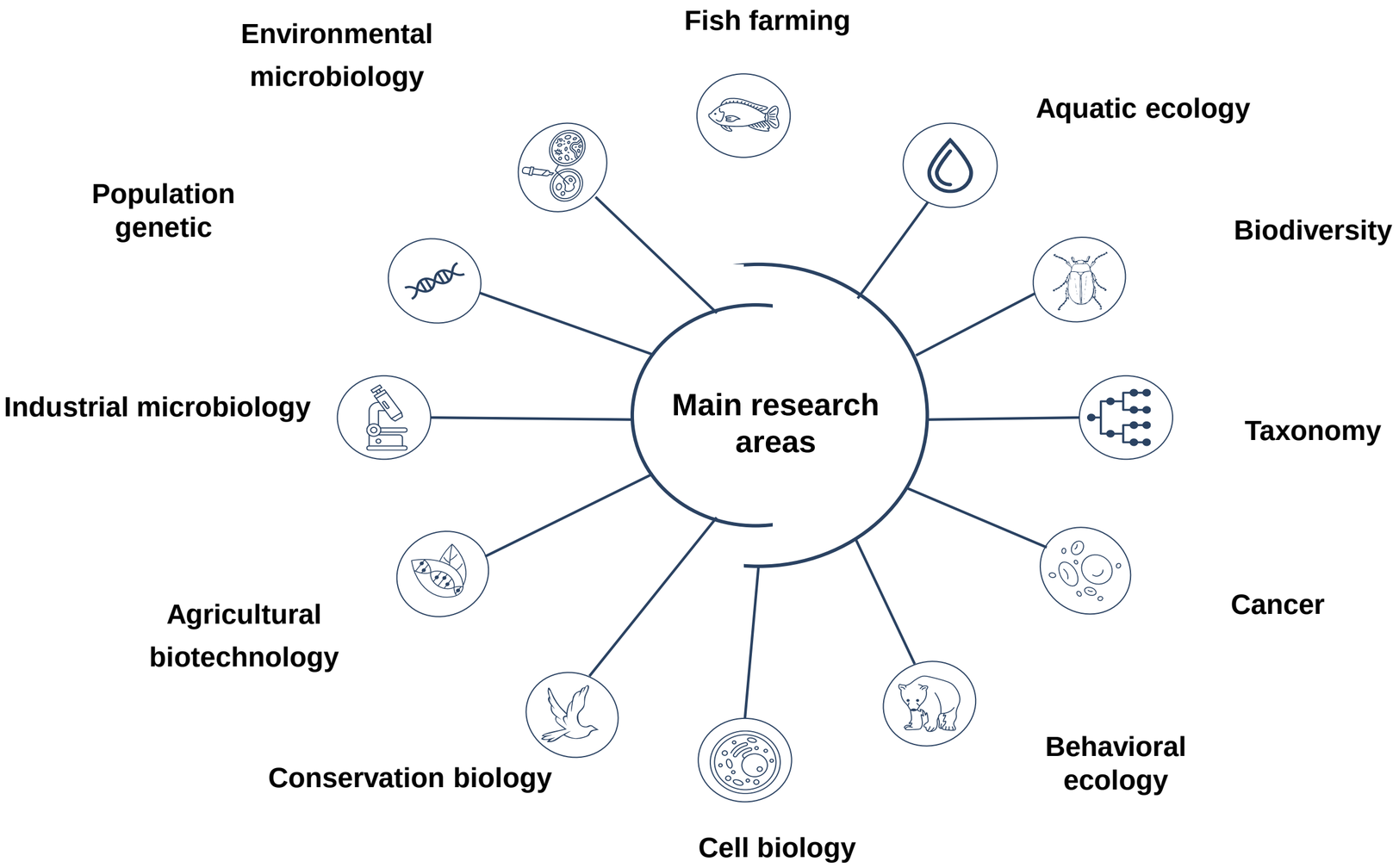
To develop into a competitive and globally renowned research institution.

Contact information
Institute of Biology, MAS, Peace Avenue-54b, Bayanzurkh district, Ulaanbaatar-13330, Mongolia
Phone: (976-11) 45-30-88, (976-11) 45-17-81
Homepage: www.biology.ac.mn
E-mail: biology@mas.ac.mn

Timeline


INSTITUTE OF BIOLOGICAL SCIENCES
1965
INSTITUTE GENERAL AND EXPERIMENTAL BIOLOGY
1974
Institute of Botany
1981
Ардын эмнэлэгийн хүрээлэн
1987
Institute of Biotechnology
INSTITUTE OF BIOLOGY
1997
Institute General and Experimental Biology
Institute of Biotechnology
Institute of Botany
Forest and Hunt Research Institute
Botanical garden
Gobi plant cultivation station
Test station of Zuunkharaa
1999
Institute of Botany
2009
Research Center for Fish Breeding
INSTITUTE GENERAL AND EXPERIMENTAL BIOLOGY
2015
Institute of Biology
Institute of Botany
Research Center for Fish Breeding
INSTITUTE OF BIOLOGY
2019
Botanic Garden and Research Institute

Main research area

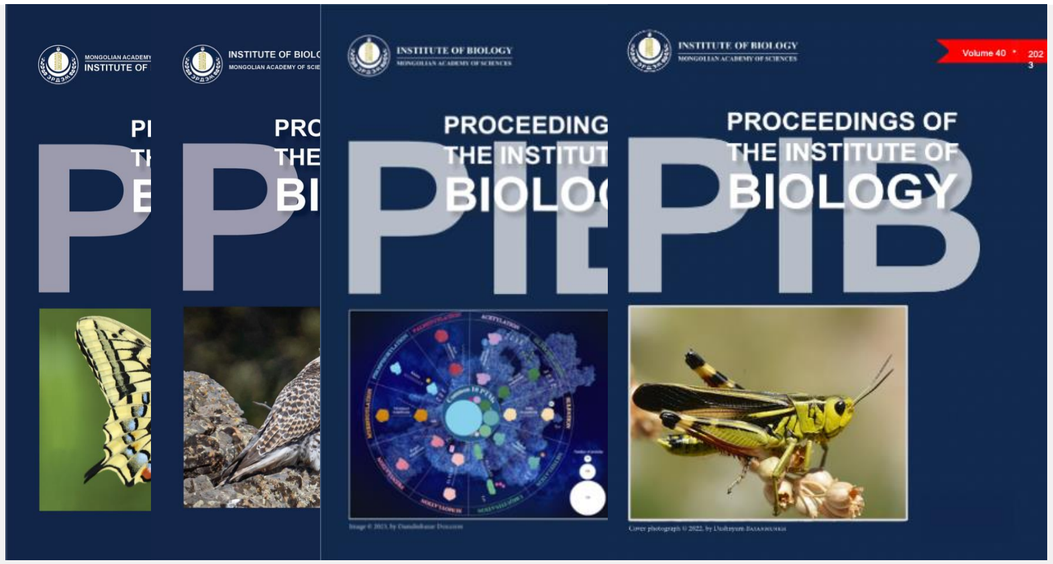


The Institute of Biology was established in 1965.

The institute has since expanded to become one of the most distinguished research institutions with outstanding scientists in the field of Biology in Mongolia.

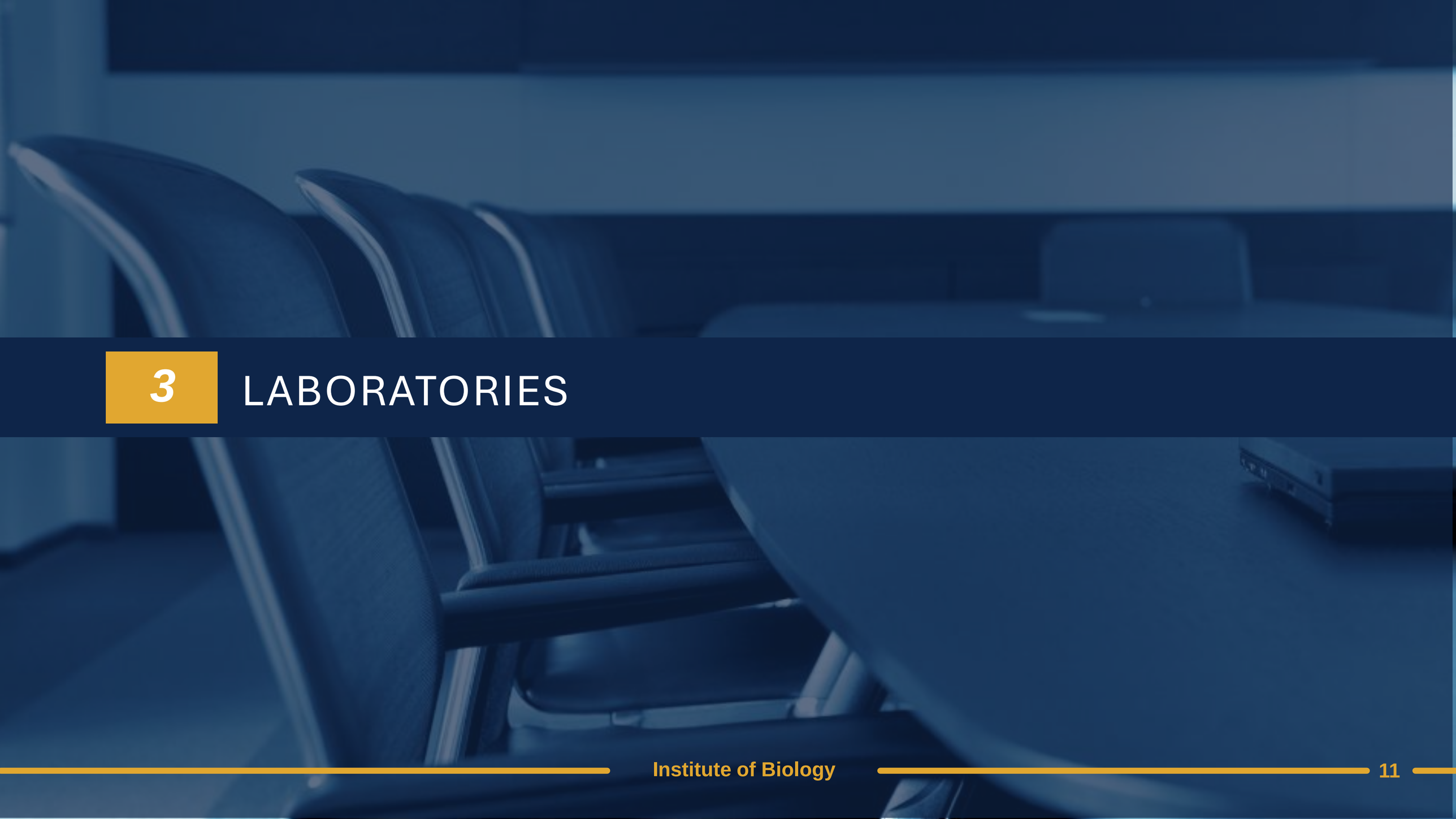
Scientific achievements

>4000	2450	>800	>300
Domestic research publications	International research publications, I.F.	Books and monographs	Intellectual properties



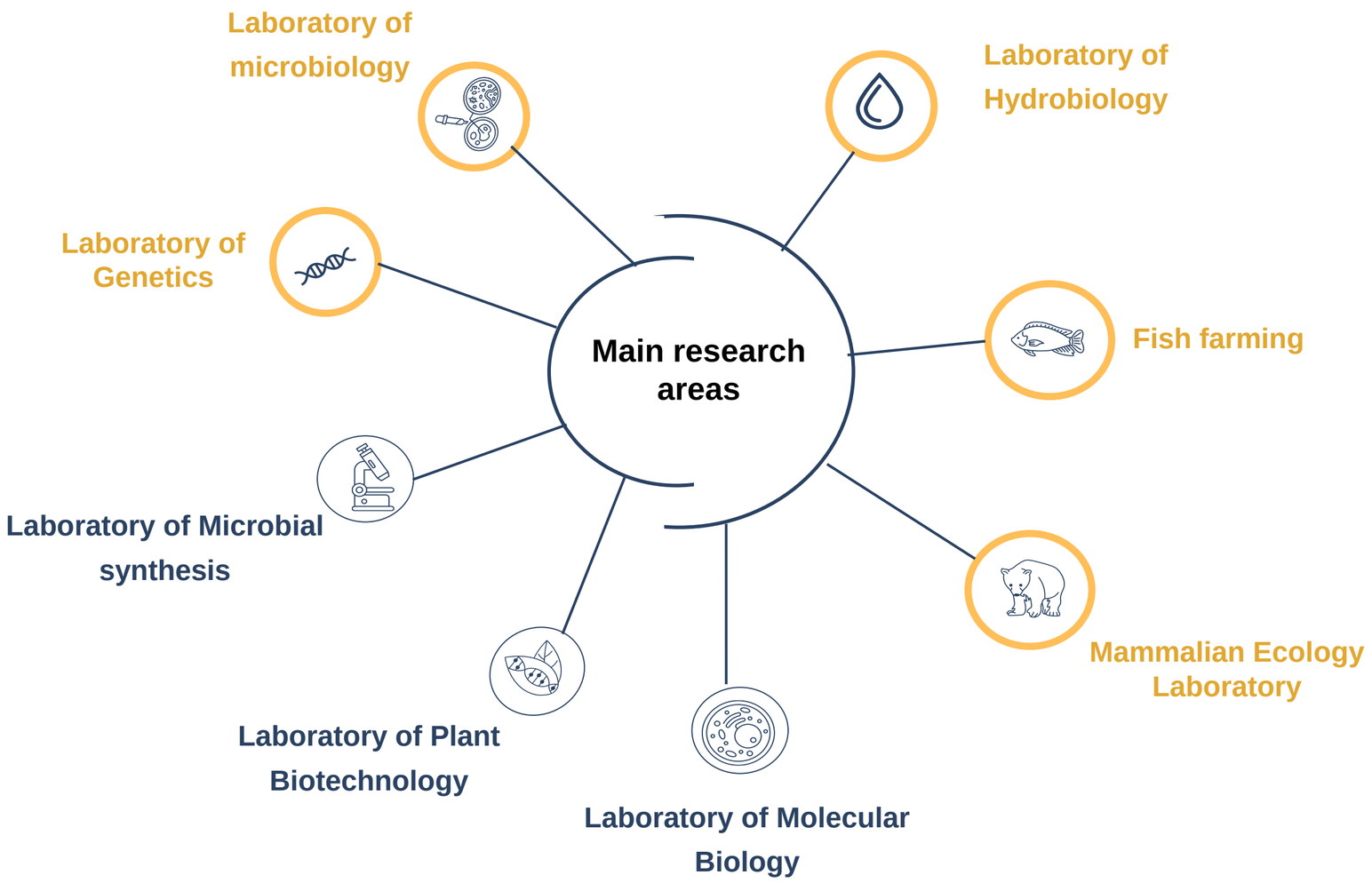
Our own publication “Proceedings of The Institute of Biology” has now become the first journal in Mongolia to publish scientific articles in both English and Mongolian, and it receives scientific articles on a yearly basis.

Scan this QR code to visit the journal website



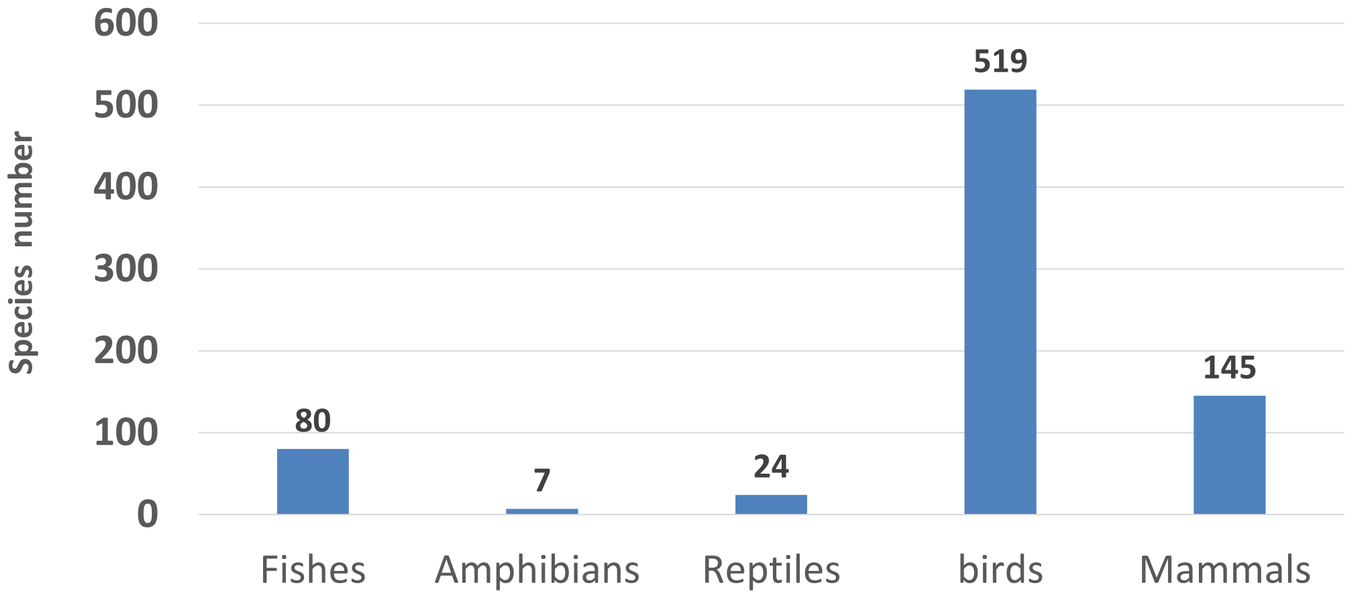
3 LABORATORIES

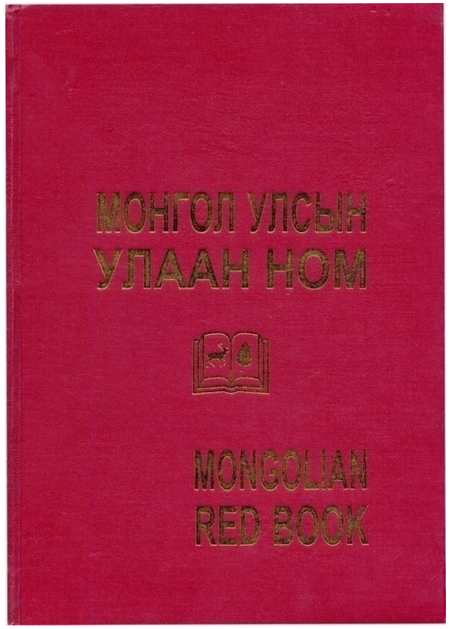
Laboratories



Our institution operates 8 diverse research laboratories, out of which 5 are dedicated to exploring various aspects of biodiversity. These laboratories play a vital role in advancing our understanding of ecosystems, species interactions, and genetic diversity.

Vertebrate diversity of Mongolia





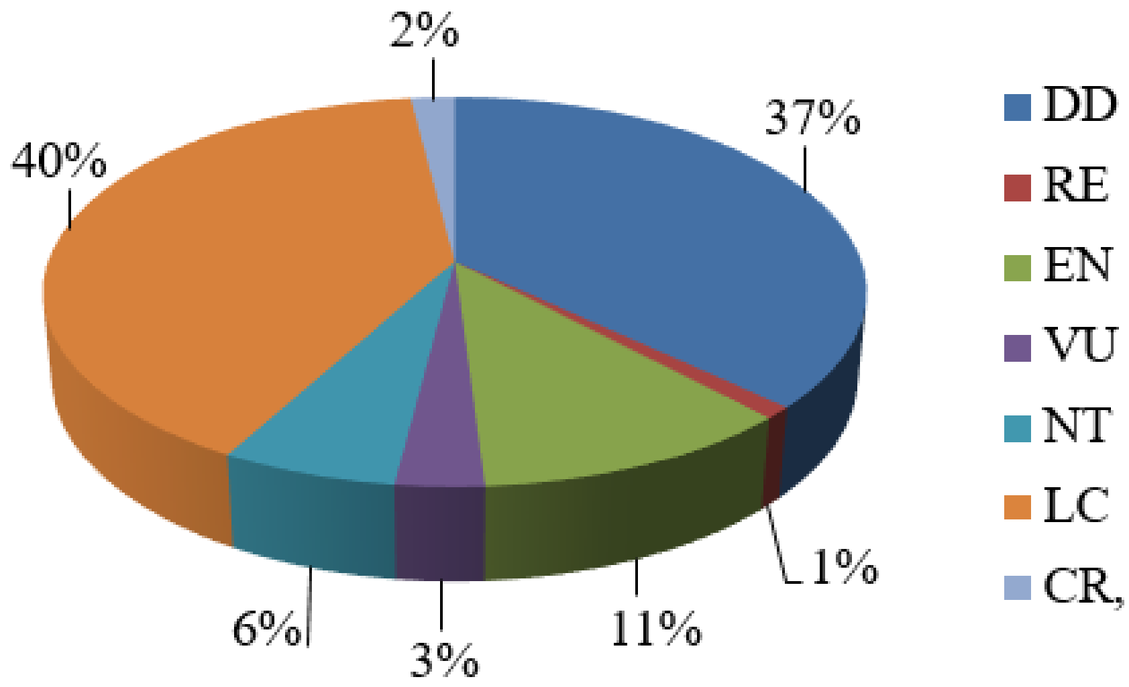
30 species of mammals
30 species of birds
5 species of reptiles
4 species of amphibians
6 species of fishes
1 species of agnathan
19 species of insects
2 species of crustaceans
4 species of mollusks
100 species of vascular plants
4 species of mosses
6 species of algae
12 species of lichens
6 species of fungi

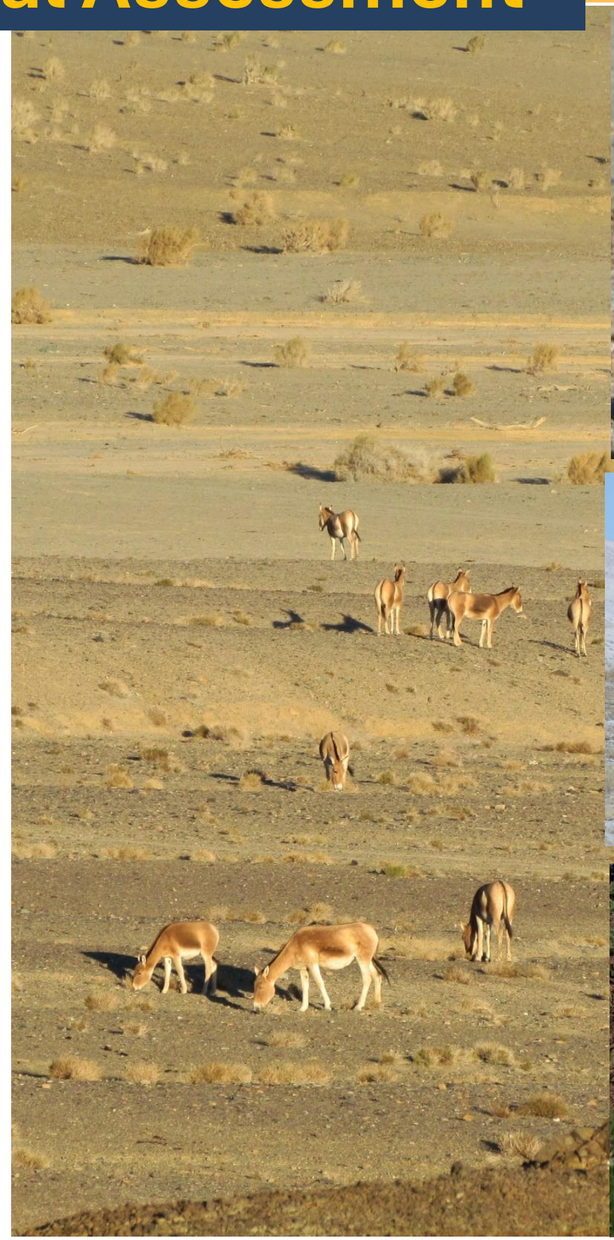
Total 229 species





Regional Mammal Assessment





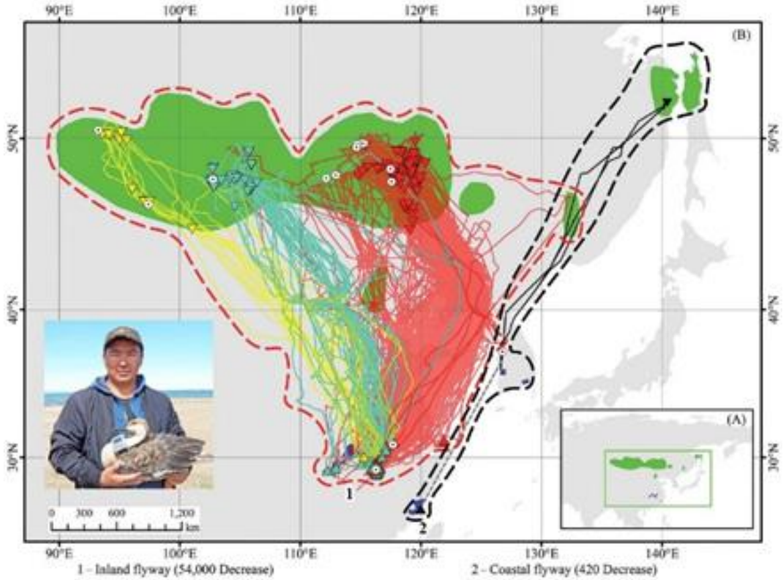
Regional conservation status of the 128 native Mongolian mammals according to the IUCN Red List Categories and Criteria. RE = Regionally Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient.

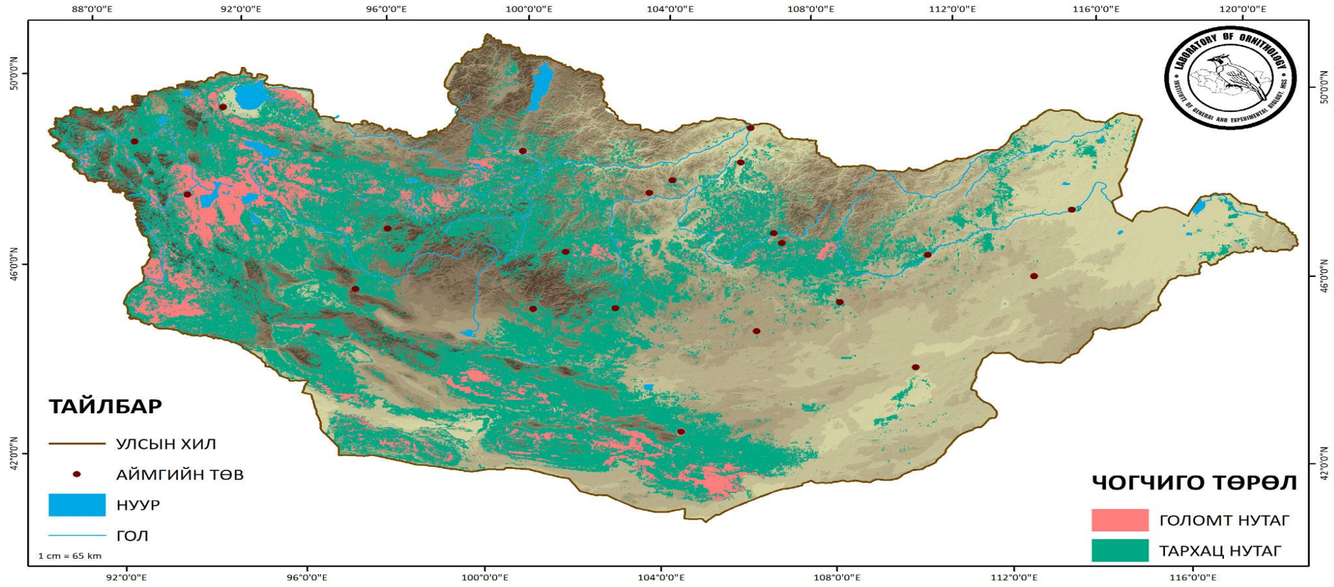
Laboratory of Ornithology

Total of 519 species of birds belonging to 237 genera, 70 families and 23 orders have been registered in Mongolia.

Primary Study Goals

- Composition of species
- Birds biology and ecology
- Migration route
- Conservation issue
- Habitats quality
- Number and
- Distribution





Insect diversity

- To date, approximately 13,000 insect species across 28 orders have been registered in Mongolia, The most endemic species are found in the families Coleoptera (481 species) and Homoptera (208 species)

Number of rare and endangered species of Mongolia

#	Name of orders	# Species		
		Rare	Endangered	Total
1	Odonata	-	6	6
2	Mantoptera	1	-	1
3	Coleoptera	8	55	63
4	Mecoptera	1	-	1
5	Lepidoptera	15	31	46
6	Hymenoptera	-	43	43
7	Diptera	-	104	104
8	Megaloptera	1	-	1

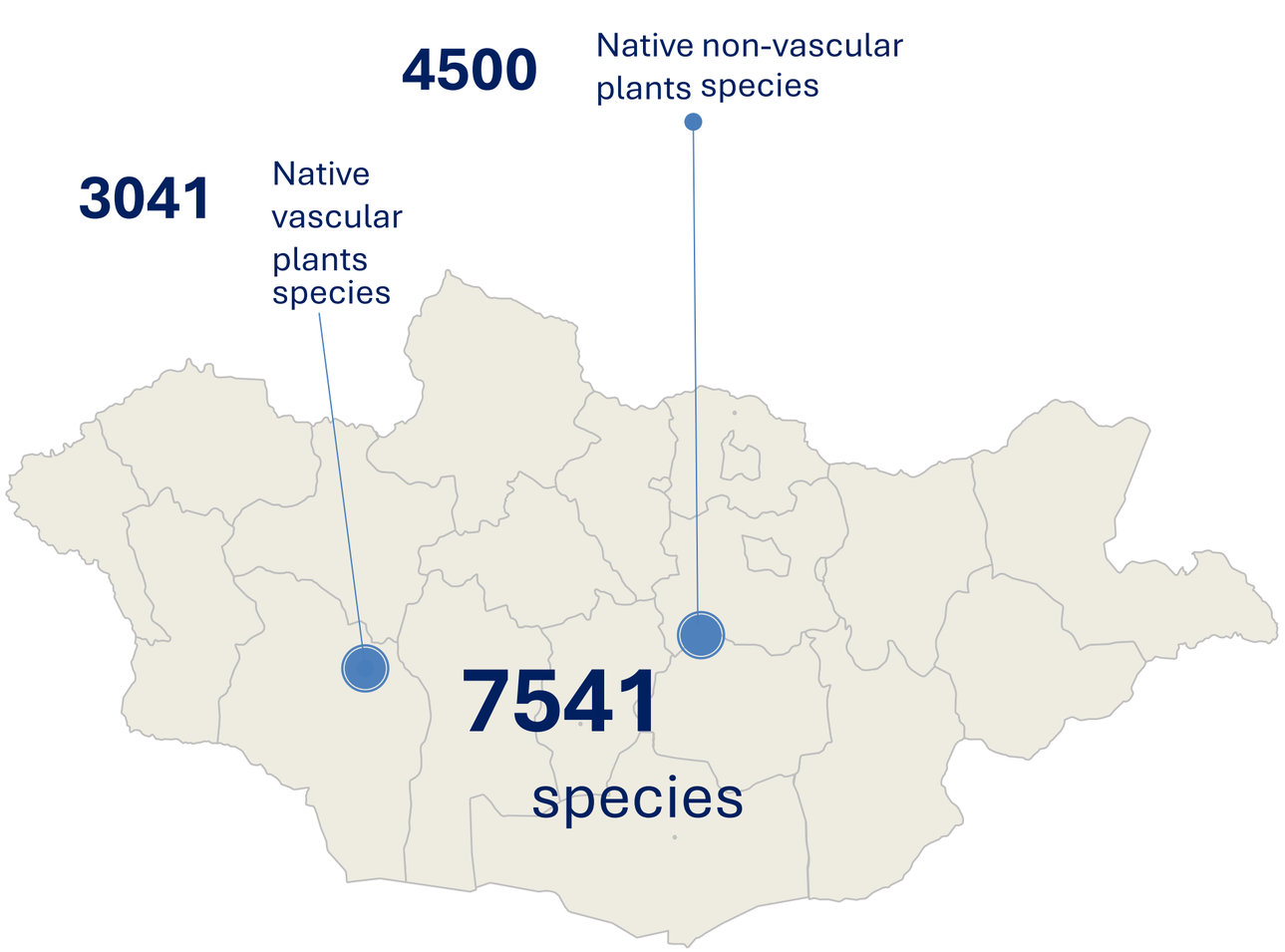
Mongolian ichthyofauna

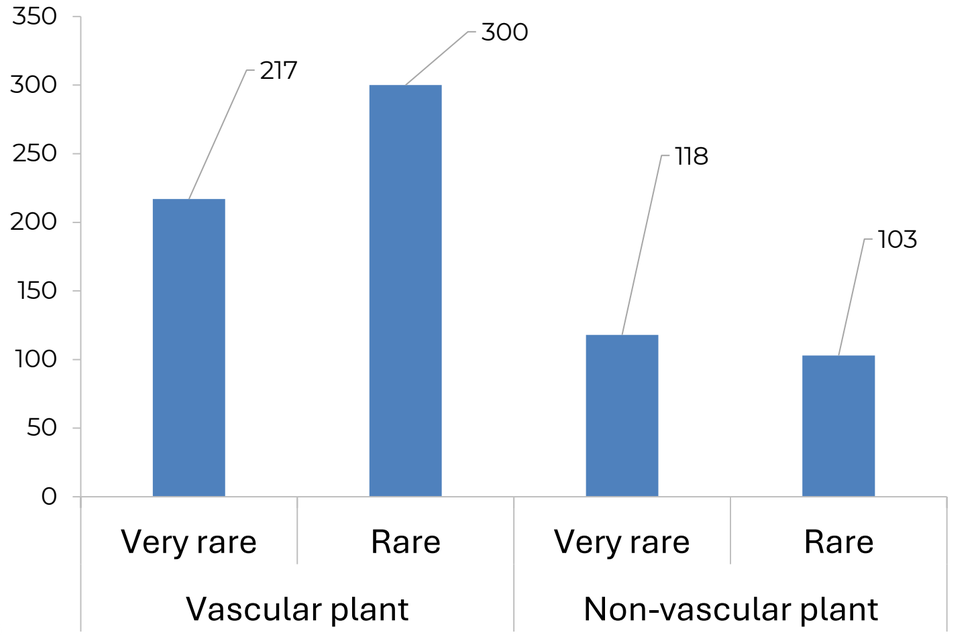
Mongolia has relatively few fish species compared to other neighboring countries due to land-locked geographical location and inland ecosystem, but its ichthyofauna is characterized by own unique elements.

According to the recent taxonomic status of fish, in total two classes, eight orders, eight sub-orders, 18 families, 9 sub-families, 51 genera and 80 species of fish distributed in the Mongolia.

In addition, recent molecular genetic studies have revealed taxonomic differences between species, and new species and new distribution points have been identified.

FLORA OF MONGOLIA





Endemic

102 taxa

Sub-endemic

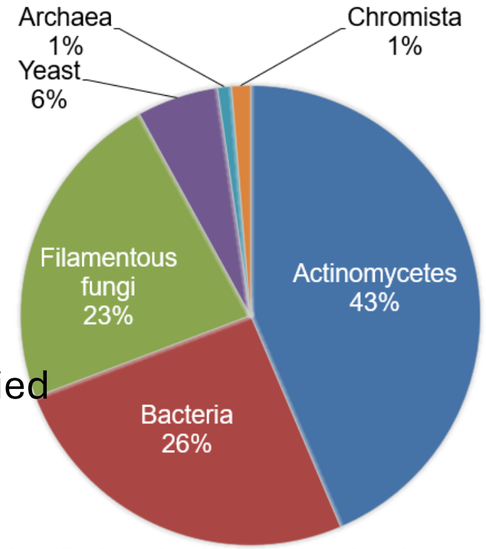
275 taxa

4 INSTITUTE OF BIOLOGY’S COLLECTIONS

Other Museum collection and culture collection

- ✓ 4147 specimens of 333 bird species of Mongolia.
- ✓ 3000 etalon specimens and 100,000 catalogs of insect species of Mongolia.
- ✓ Over 1370 etalon materials of 50 fish species of Mongolia.
- ✓ 4107 collections of 115 Mongolian mammal species including 3249 skulls, 868 pelts, and 1797 taxidermies.

~9000 Microbial Cultures
~8000 isolated - ~5600 Identified

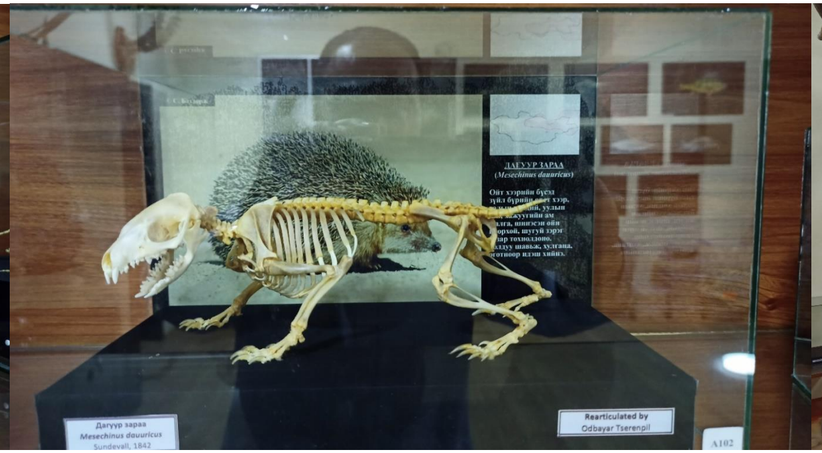


Identified strains by using molecular markers

	Strains	Genera
Actinomycetes	2443	66
Bacteria	1437	81
Filamentous fungi	1275	178
Yeast	321	22
Archaea	55	5
Chromista	55	6
	5604	**358**

Museum collection on mammals skeleton

- We have collections of the skeleton (whole body bones) in amount 307 exhibition of 101 mammals (145 mammalian species registered in Mongolia).



Bird Collection

Mongolia's Largest bird collection

Our collection Data-Base is consisted from three main sources as following:

- 1,643 birds specimens accounting for 39.7% of the total collection was sampled during the survey conducted by zoologists from the Insitute of Biology between1949 and 2015.
- 225 species belongs to 779 specimens representing 18.8% of the total collection was sampled during the “Birds of South and Western Mongolia” survey in 1962 and 1964 conducted by a joint Mongolian-German expedition.
- From 1949 to 1988, Ornithological Researchers from the Joint Russian-Mongolian Complex Biological Expedition sampled 1,725 bird specimens over Mongolian territory, accounting for 41.5% of the overall collection.
- The first bird specimens was the “Rose-coloured Starling” collected by D.Eregdendagva from Baga Bogd Mountain, Uvurkhangai on June 18, 1949.

BOTANIC GARDEN AND RESEARCH INSTITUTE

3041 native vascular plant taxa from 653 genera and 111 families in Mongolia. (Baasanmunkh *et al*., 2021).

01 The herbarium of Botanic Garden and Research Institute of MAS (UBA)

•*Currently holds more than 120,000 individual specimen of wild plants in Mongolia, including vascular plants, algae, mosses, mushrooms and lichens.*

• For higher plants, a total of **75,878** individual specimen from **2,594** species across **681** genera **101** families have been registered and **85.3%** of total **3,041** vascular plant species are represented in our collection.

•The non-vascular plant collection (UBA) contains over **44,085** individual specimen which represents **62.8%** of the **4500** non-vascular plant species, with **2,830** species included.

02 Digital herbarium collection

• Since 2020, efforts have been made to digitize the herbarium collections, and currently about **16,000** specimen from the Plant Collection (UBA) have been digitized.

03 Collection of Mongolia's native plants

• Currently, **12%** of the total **3,041** vascular plant species and **21.5%** of the rare and very rare plant species of Mongolia are conserved and protected ex situ.

04 Seed Gene Bank of Natural Plants

• Seeds of **170** plant species/ 5.6%/ from **116** genera belonging to **47** families of Mongolia's native plants are being preserved.

Public awareness and promotion

In the past, the scientists of the laboratory have published 6 single-theme works, 30 books, and more than 550 scientific articles on the birds of Mongolia, made 45 maps for research and training, and given more than 250 presentations at international and domestic scientific conferences. We are working together with Mongolian National Broadcaster to produce short documentaries about Spotted Capercaillie, White-naped Crane, White-crowned Penduline Tit and other bird species.

MONGOLIAN ACADEMY OF SCIENCES
INSTITUTE OF BIOLOGY

THANK YOU FOR YOUR ATTENTION

GBIF and new opportunities for large-scale knowledge of plant diversity in Central Asia

Institute of Botany, Uzbekistan Academy of Sciences, Tashkent, Uzbekistan

Tojibaev Sh. Komiljon

ktojibaev@mail.ru

Biodiversity data in montane and arid Eurasia
18 - 19 November 2024, Almaty, Kazakhstan






Central Asia (Middle Asia) is a rich in native flora country which comprises two major mountain ranges:
the Pamir-Alay and the Tian- Shan has been recognized as an important global biodiversity hotspot

Myers et al., 2000

Imagery ©2018 NASA, TerraMetrics

Central Asia is important for phytogeography and evolutionary studies!

Why?

- the greatest similarity with its western part of the Irano–Turanian, which stretches from the Anatolian Plateau to the Tian Shan and Pamir Mountains
- the CA as a part of the IT region plays a key role in understanding how current plant diversity in Eurasia changed through space and time
- The CA mountains support around 7000 species of vascular plants, accounting for more than 75% of the total plant diversity in the region
- the vegetation types are mostly semi-desert and steppe ecosystems at both lower and higher altitudes, with a substantial variety of endemics
- the primary source and centre of diversity for the current xerophytes found across Eurasia, the Mediterranean Basin, North Africa, and potentially South Africa
- desert ecosystems are home to a variety of halophytes and are centres of the origin and differentiation of ephemeral plants, containing more than 400 such species
- Its biogeographical relationships with adjacent areas remain poorly understood, especially when compared to neighboring regions (e.g. Mediterranean, South-East Asia)
- The oldest plant domestication sites are located in Central Asia

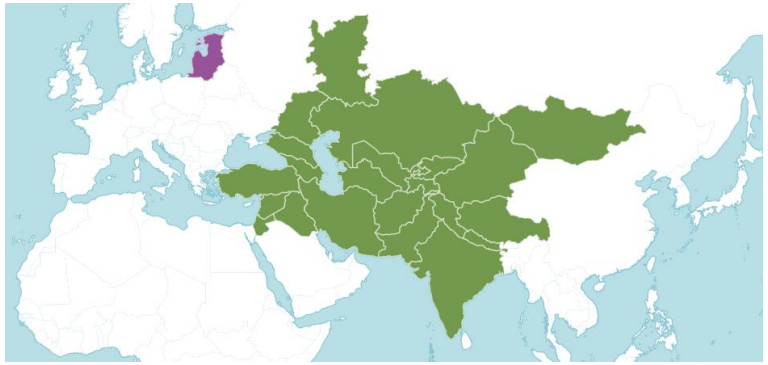
Manafzadeh et al., 2019; Tojibaev et al., 2020; Ma et al., 2024

Characteristic genera of the flora of Central Asia (as part of Irano-Turanian region)

Haplophyllum A.Juss. (Rutaceae)

71 Accepted Species (25 in CA)

Cousinia Cass. (Asteraceae)



670 Accepted Species (255 in CA)

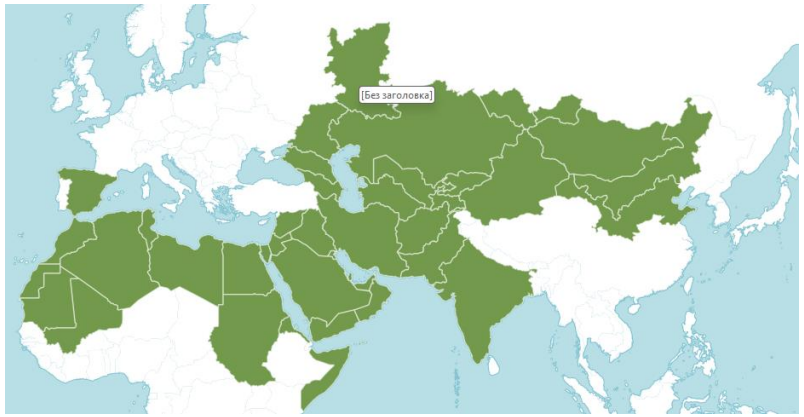
Acantholimon Boiss. (Plumbaginaceae)

321 Accepted Species (89 in CA)

Acanthophyllum C.A.Mey. (Caryophyllaceae)

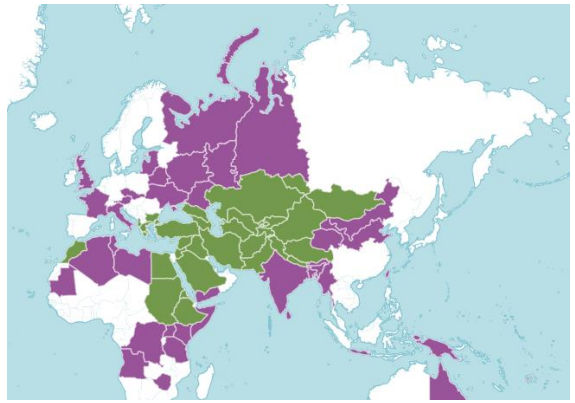
82 Accepted Species (35 in CA)

Anabasis L. (Amaranthaceae)



30 Accepted Species (17 in CA)

Cicer L. (Fabaceae)



46 Accepted Species (18 in CA)

Interesting examples connecting the floras of China and Central Asia

Incarvillea Juss. (Bignoniaceae)

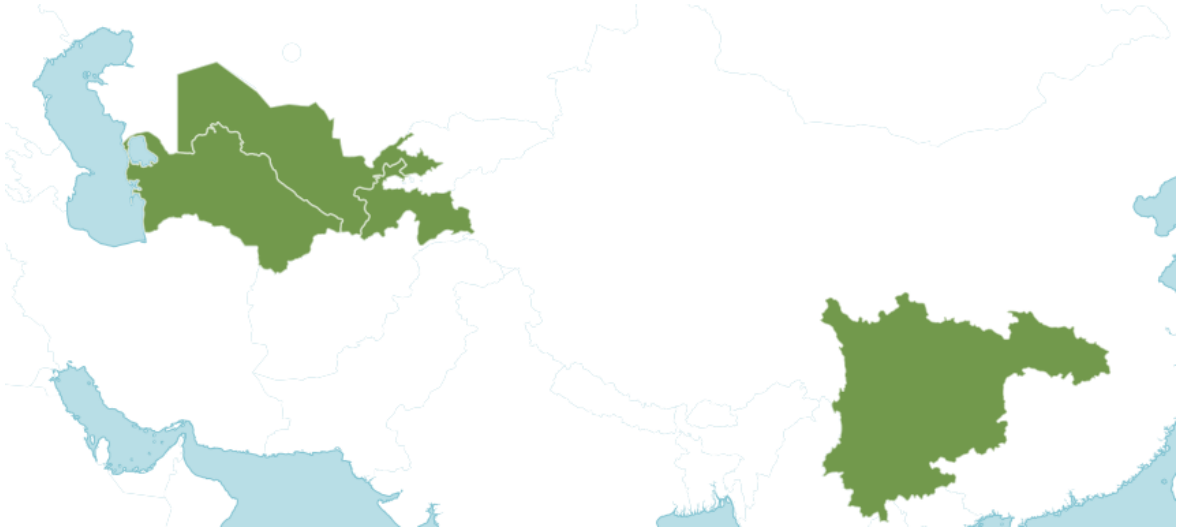
18 Accepted Species

Incarvillea delavayi
Bureau & Franch.

Incarvillea olgae
Regel

Incarvillea uniflora
H.P.Deng & Chang Y.Xia

Triaenophora Soler. (Plantaginaceae)

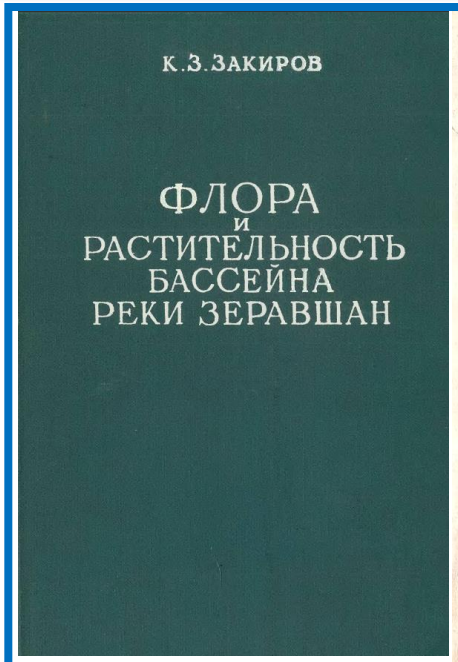


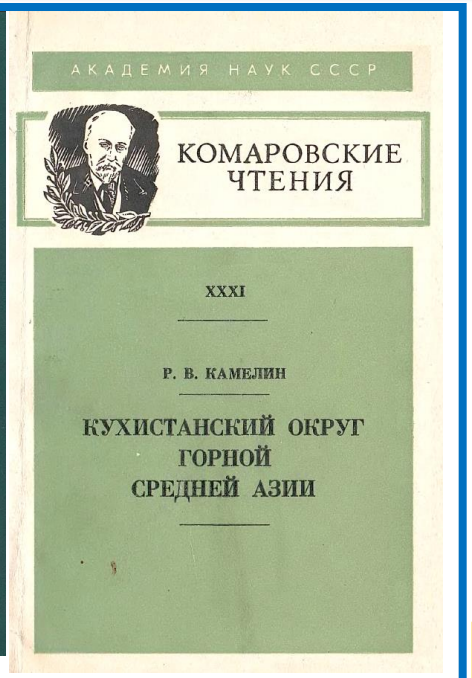
4 Accepted Species

Triaenophora bucharica
B.Fedtsch.

Triaenophora rupestris
(Hemsl.) Soler.

Check-list of vascular plants of the Flora of Tian-Shan Mountains. Central Asian part



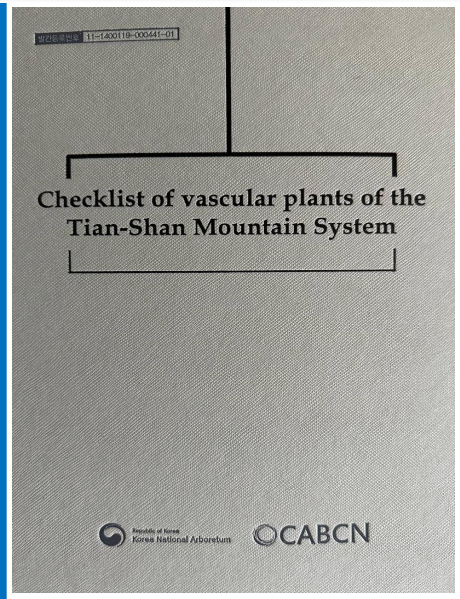


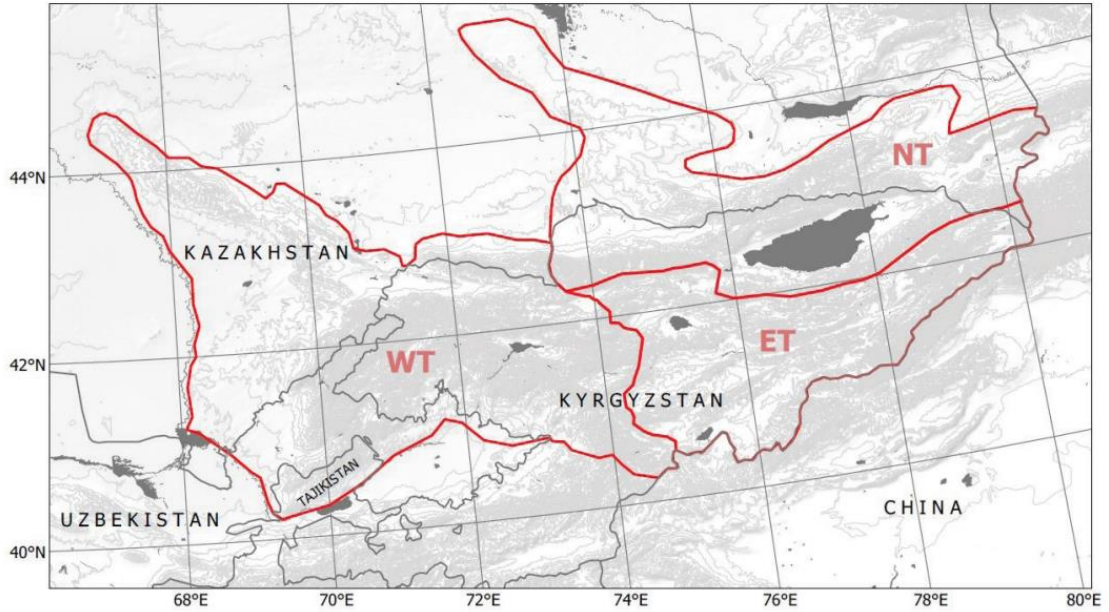
АКАДЕМИЯ НАУК УЗБЕКСКОЙ ССР
ИНСТИТУТ БОТАНИКИ

П. К. ЗАКИРОВ

БОТАНИЧЕСКАЯ
ГЕОГРАФИЯ
НИЗКОГОРИЙ
КЫЗЫЛКУМА
И ХРЕБТА НУРАТАУ

ИЗДАТЕЛЬСТВО «ФАН» УЗБЕКСКОЙ ССР
ТАШКЕНТ-1971





This work is novel for Central Asia as a whole; and it led to major rearrangements in some families and genera, including a number of new nomenclatural combinations (81) and 2 new nothogenera

Species and subspecies — 4283 (4080 are native)
Genera — 835 (759 are native)
Family — 116 (110 are native)

West Tian-Shan — 3440 taxa
North Tian-Shan — 2532 taxa
East Tian-Shan — 1361 taxa

Endemic — 821 taxa (species and subspecies)
Western Tian-Shan — 634 taxa
Northern Tian-Shan — 100 taxa
Eastern Tian-Shan — 27 taxa

Tojibaev K.Sh. & al., 2021

The checklist includes 34 hybrid species, which belong to 18 genera

Central Asia is one of botanically poorly-known part of Asia

Is it accurate to conclude that and the flora of Central Asia remains under-researched?

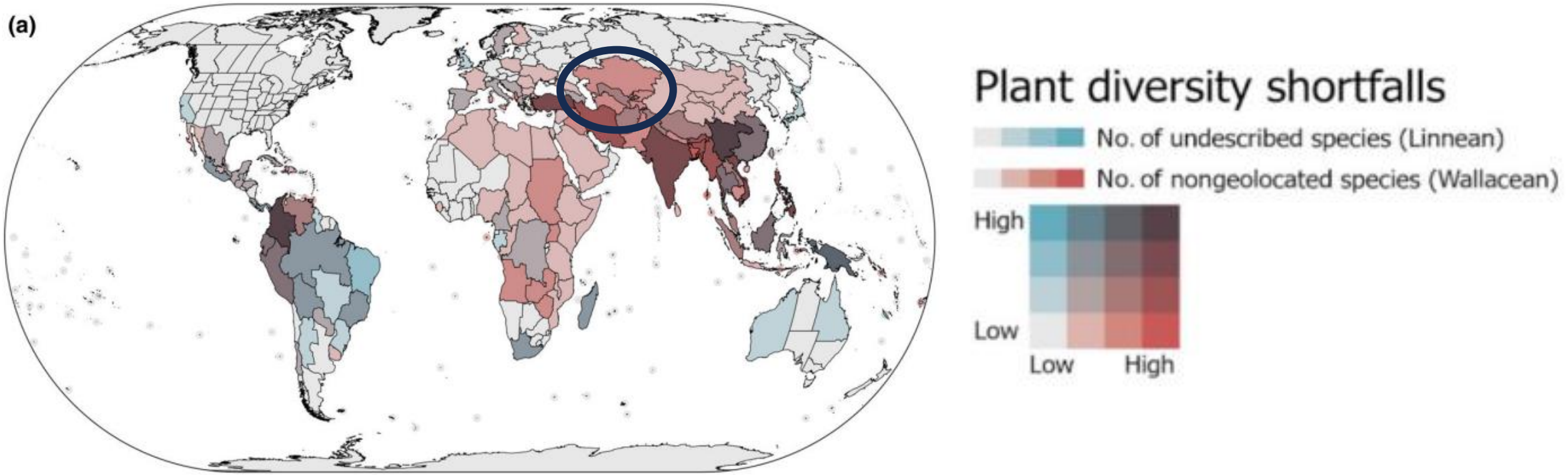
Li et al. 2020; Manafzadeh et al. 2016 and etc.

In an attempt to categories global knowledge limits, seven biodiversity shortfalls have been described

Shortfall	Aspect of biodiversity	Definition
Linnean	Species	Most of the species on Earth have not been described and cataloged (Brown & Lomolino 1998)
Wallacean	Geographic distribution	Knowledge about the geographic distribution of most species is incomplete; it is inadequate at all scales most of the time (Lomolino 2004)
Prestonian	Populations	Data on species abundance and population dynamics in space and time are often scarce (Cardoso et al. 2011)
Darwinian	Evolution	Lack of knowledge about the tree of life and the evolution of species and their traits (Diniz-Filho et al. 2013)
Raunkiæran	Functional traits and ecological functions	Lack of knowledge about species' traits and their ecological functions
Hutchinsonian	Abiotic tolerances	Lack of knowledge about the responses and tolerances of species to abiotic conditions
Eltonian	Ecological interactions	Lack of knowledge on species' interactions and these interactions' effects on individual survival and fitness

Hortal et al., 2015

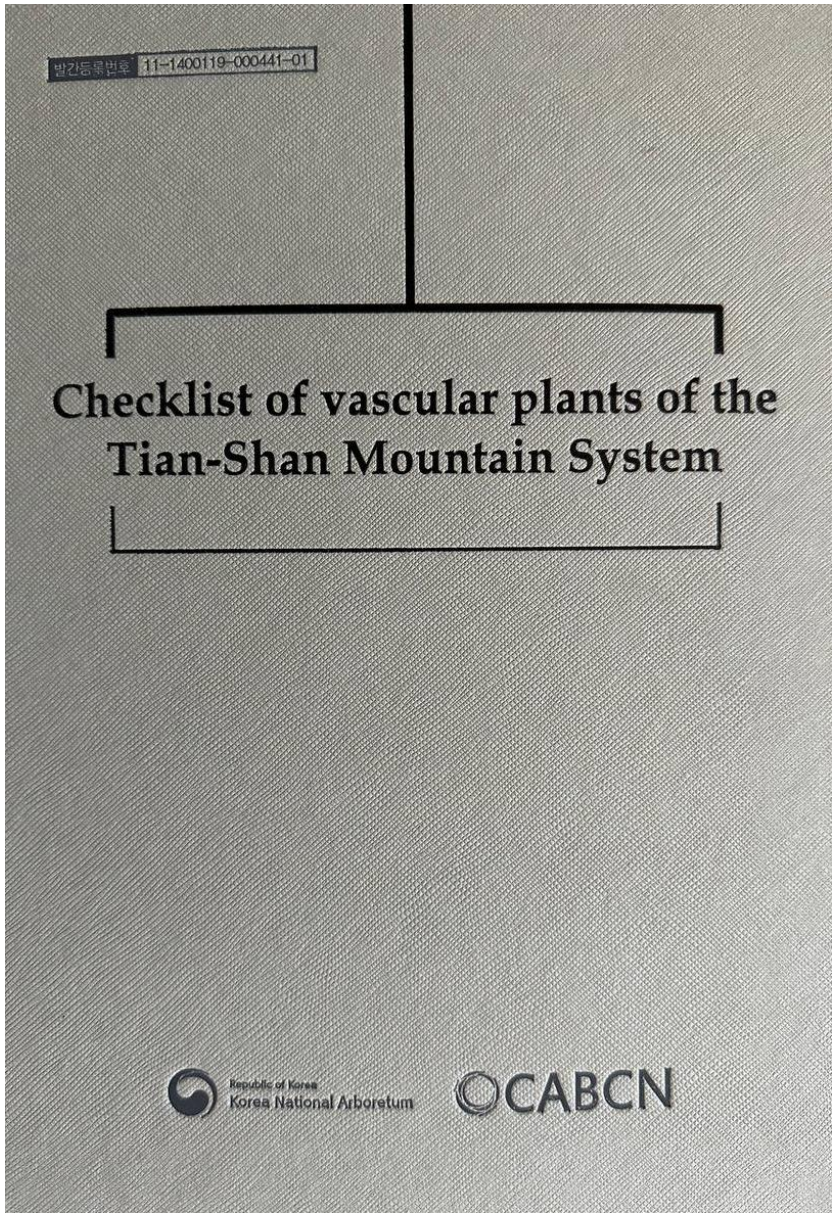
- The Linnean shortfall
- The Wallacean shortfall



The region was estimated to be one of the world's 33 global diversity dark spots

Ondo et al. New Phytologist, 2024

The Linnean shortfall and its solution




CONSPECTUS FLORAE ASIAE MEDIAE

TOMUS XI

Scientficum editor:
R.V. Kamelin

Redactore tomi undecimi
F. O. KHASSANOV

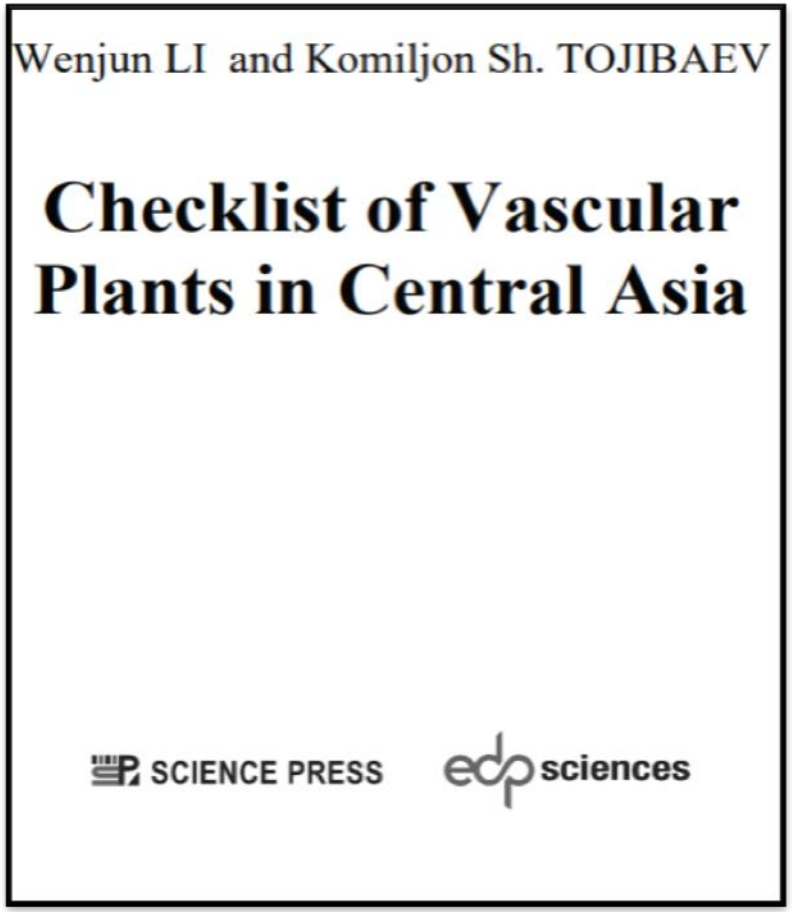
Elaboraverunt:
F.O. Khassanov, U.P. Pratov (Chenopodiaceae), U.E. Kodyrov (Campanulaceae), G. A. Lazkov (Caryophyllaceae), K. Sh. Tojibaev (Tulipa), A.S. Esankulov (Astragalus), H.F. Shomuradov (Calligonum), N.O. Sulejmanov (indeces)

Ductu et consilio A. I. VVEDENSKY inchoatus et R. V. KAMELINIO finitus

Editio Academiae scientiarum Republicae Uzbekistan Tashkent – 2015

by Khassanov, 2015

9341 spec., 1300 gen., 161 fam.



Li and Tojibaev, in press

9640 spec., 1199 gen., 139 fam.

Endemic genera in the flora of Middle Asia (by Khassanov et al., 2024)

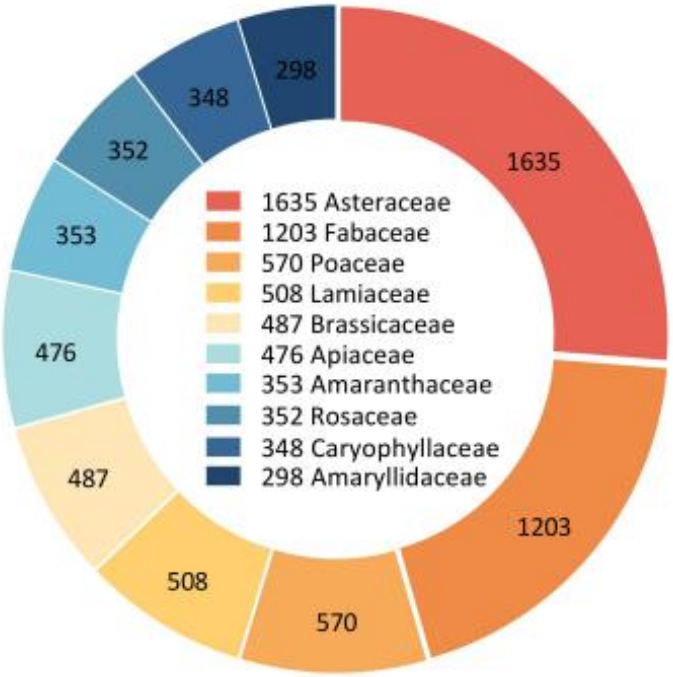
Summary. Flora of Middle Asia (in the ranks of Conspectus Florae Asiae Mediae (Adylov, Tsukerwanik, 1993)) consists at least of 9500 species of vascular plants and 1100 genera. Out of them strongly endemical are 41 genera and 19 can be treated as subendemical ones for this region. 8 blocks of endemical and subendemical genera were revealed: relic Paleogene Afro-Arabian, Neogene Mediterranean, Transhymalayan, autokhtonic Mountainous Middle Asiatic, Kashgar-Ferganean, Xinjang-Dzhungarian-Tien-Shanic, Iranean-Paro[Без заголовка]amiralayan and Turanean. 18 genera having been treated as endemical became synonims.

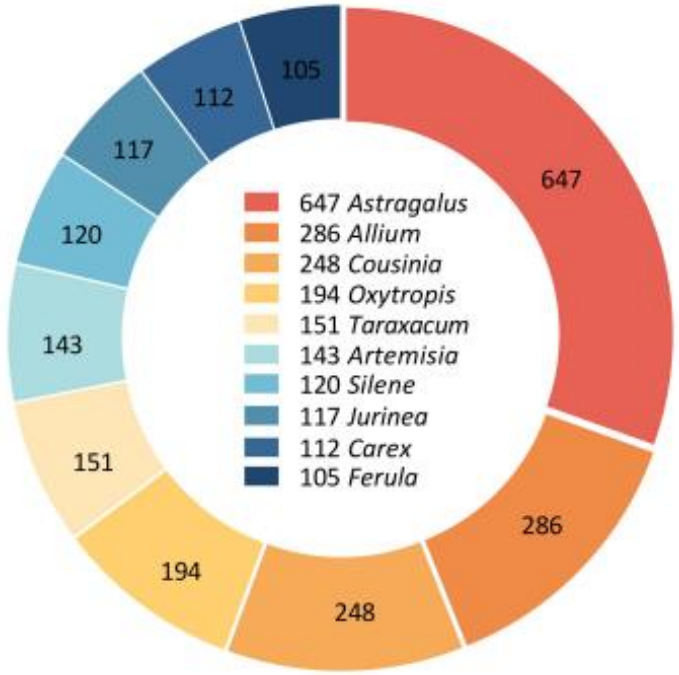
Species richness

Taxonomic composition of the native vascular flora of Central Asia

	Family	Genera	Species and infraspecific taxa
Lycophytes	2	3	6
Ferns	14	25	64
Gymnosperm	3	6	36
Angiosperms:	120	1165	9534
monocots	25	213	1591
dicots	95	952	7943
Total	**139**	**1199**	**9640**

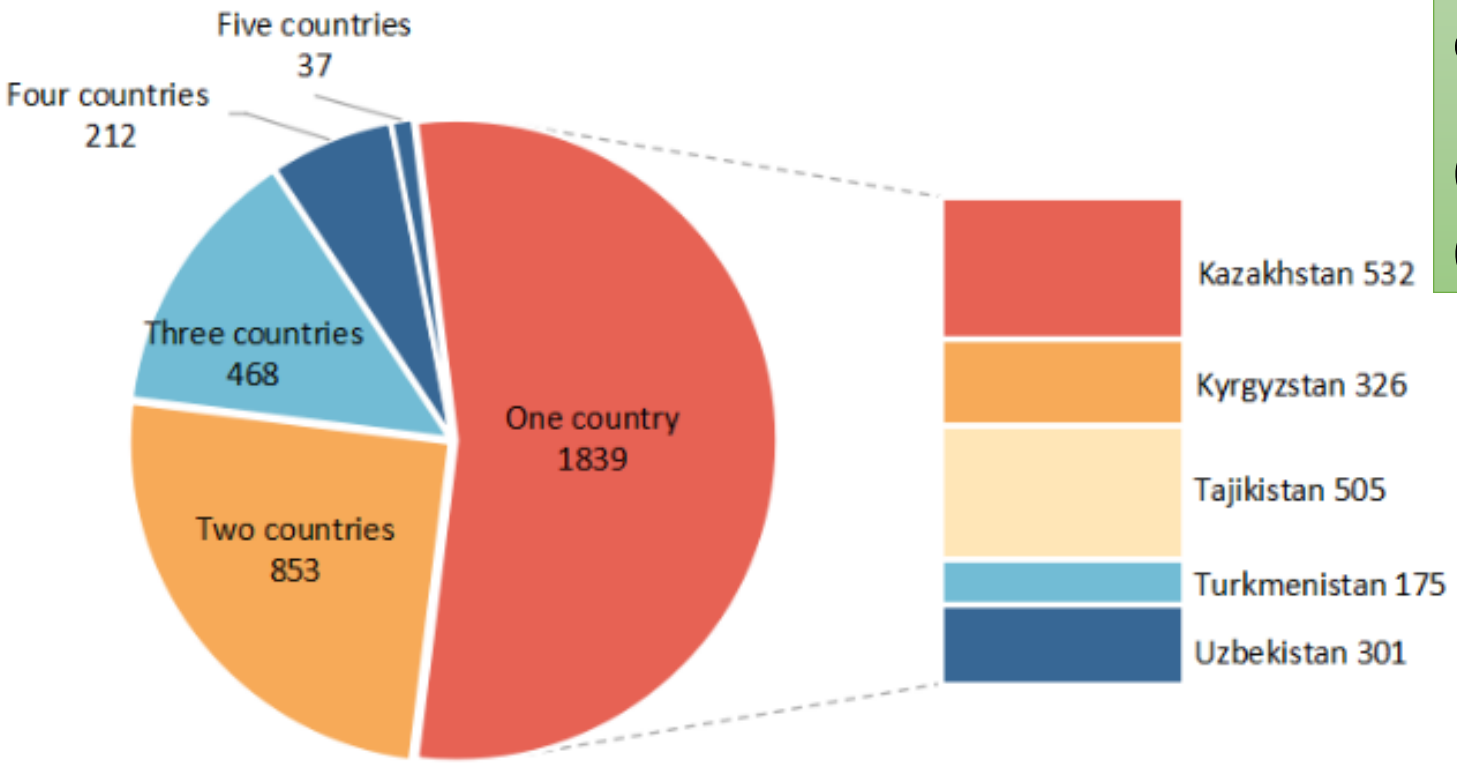
Families	Genera	Species	Source
125	1151	8094	CFAM (1969–1993)
161	**1300**	**9341**	Khassanov (2015)
+36	+149	+1247	





Ma et al., 2024

The endemic taxa in Central Asia from one country to five countries

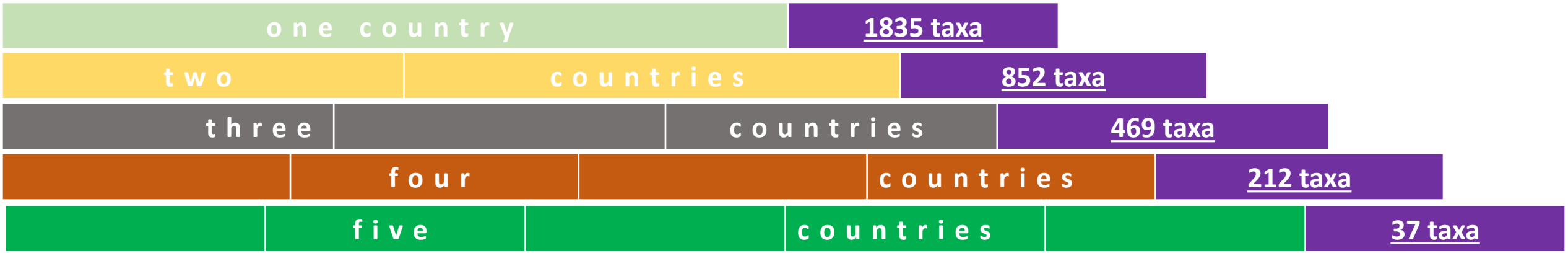


A few number of species with a wide distribution (4 or more countries) shows:

(a) Environmental heterogeneity

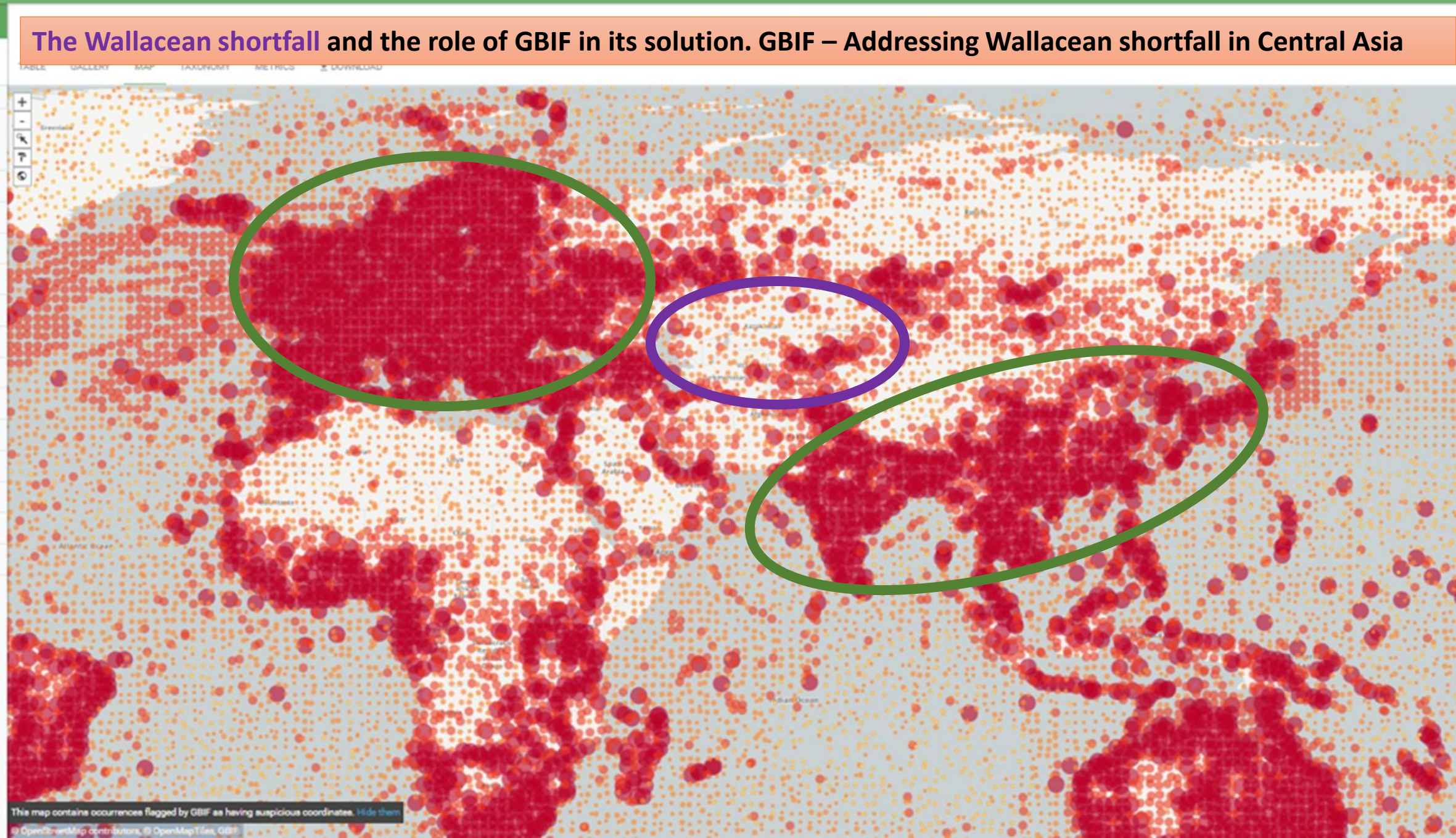
(b) Geographical heterogeneity

(a) Stein et al., 2014
(b) Duarte-Cunha et al., 2015



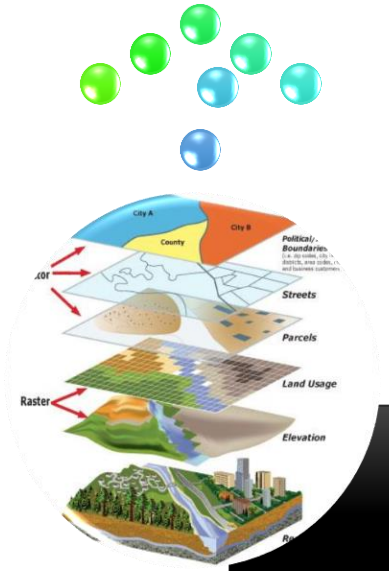
Ma et al., 2024

The Wallacean shortfall and the role of GBIF in its solution. GBIF – Addressing Wallacean shortfall in Central Asia

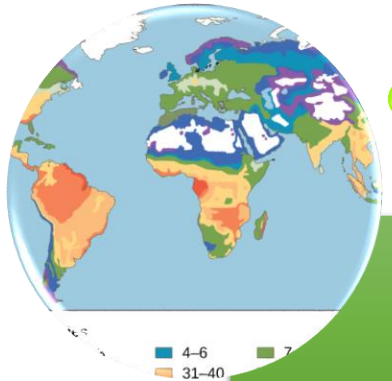


The Wallacean shortfall

geographical distributions of most species are poorly understood and usually contain many gaps (Bini et al., 2006)



Georeference Database



General information about the distribution of species

(old literature data, printed maps, etc.)

Массив текстовой разобщенной информации:

- национальные, региональные флоры (1930–1980)
- определитель растений Средней Азии (1969–1993)
- диссертации, статьи, чеклисты

Карто-схемы, карты растительности (печатные):

- карта растительности СА стран, Средней Азии
- ресурсных, лекарственных видоы
- диссертации, статьи, чеклисты

Карто-схемы, карты растительности (печатные):

- карта растительности СА стран, Средней Азии
- ресурсных, лекарственных видоы
- диссертации, статьи, чеклисты

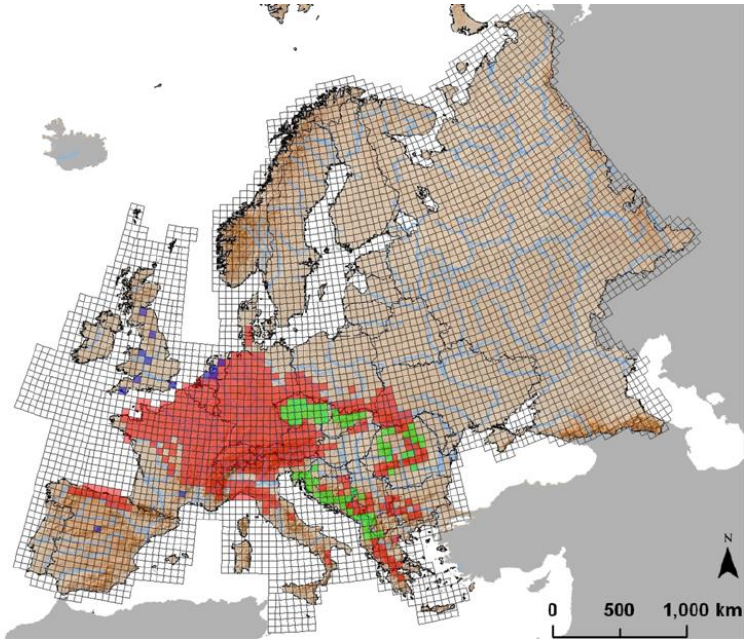
Электронный ресурсы, цифровые платформы или база данных по распространению видов

plantarium.ru

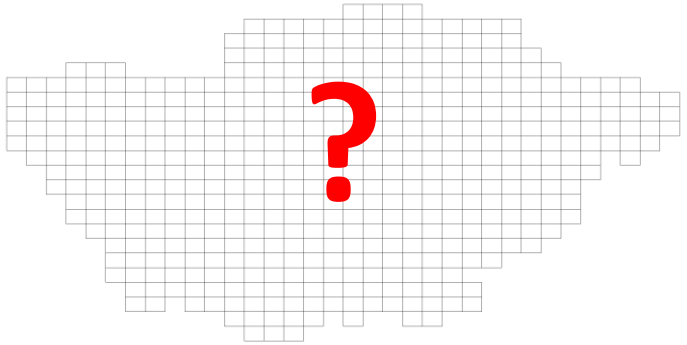
https://www.plantarium.ru

Grid maps were developed as a method not only showing the range of species, but also universalizing the scientific research of several (even several generations) florists, gathering scattered information into one system.

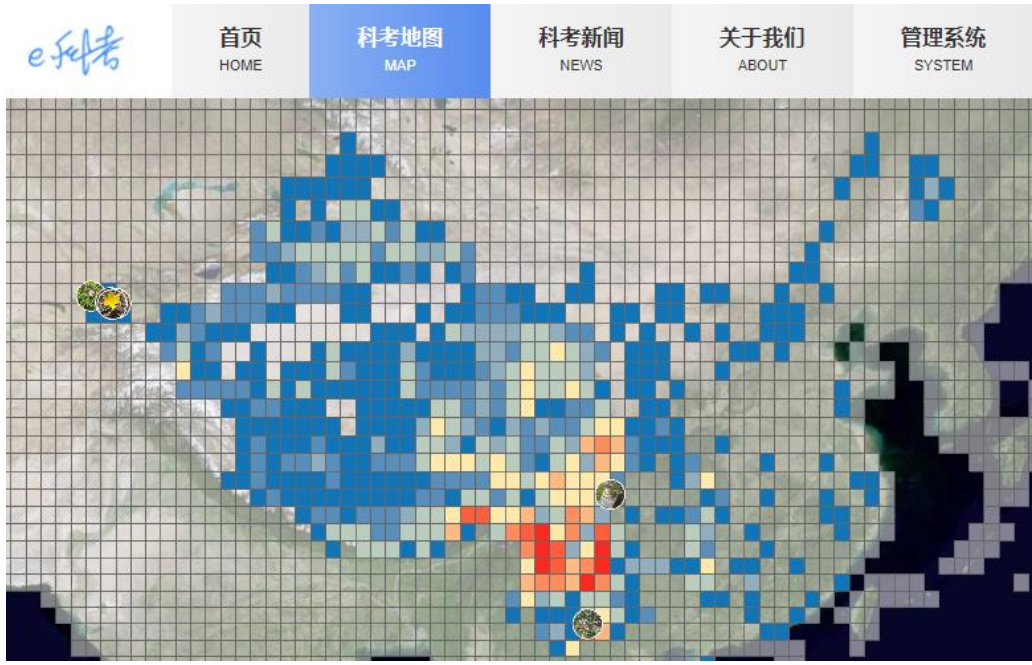
New grid system – Atlas Florae Europaeae



Central Asia



New grid system – China



Mapping the flora of the British Isles (https://bsbi.org/maps-and-data)
Distribution Atlas of Vascular Plants of Austria (https://plantbiogeography.univie.ac.at/research/distribution-atlases/)
Italy (http://dryades.units.it/floritaly/)
France (https://www.nhbs.com/flora-gallica-flore-de-france-book)
China (https://www.ekk.ac.cn)

The next shortfall that Beset Large-Scale Knowledge of Biodiversity in Central Asia

Weak regional cooperation between Central Asian countries

Rudolph Kamelin (1938–2016)

The Kamelinian shortfall

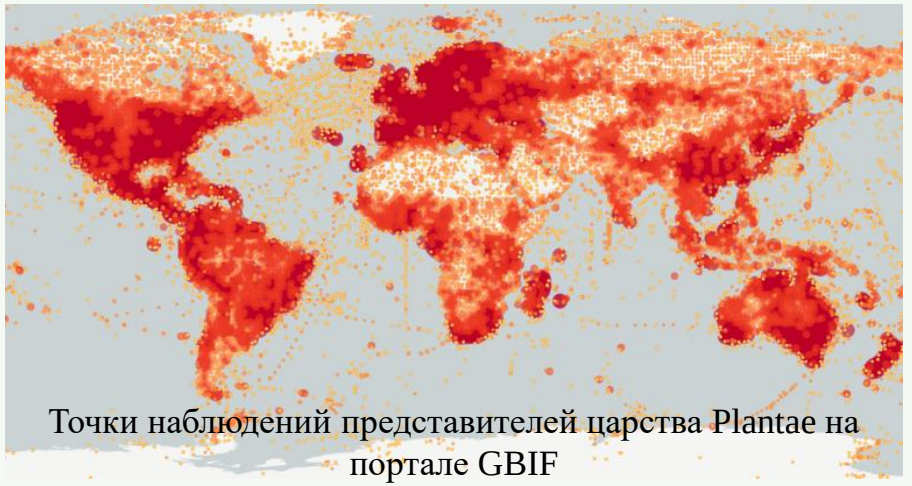
Cooperation

Limited collaboration in the sharing of biodiversity data

Non-digitized herbaria specimens, old (specific) literature data, and research are generally limited to the borders of individual countries

The outstanding taxonomist and tireless researcher of the flora of Central Asia, the editor and author of the ‘Conspectus Florae Asiae Mediae’, and various taxonomic publications, described dozens of new genera and hundreds of new species of vascular plants from Central Asia

GBIF Global Biodiversity Information Facility



Точки наблюдений представителей царства Plantae на портале GBIF

Портал **Global Biodiversity Information Facility** (GBIF, https://www.gbif.org/) был создан в 2001 г. На данный момент содержит более **91 тыс. наборов данных** (datasets) и более **2,5 миллиардов наблюдений** (occurrence records) живых организмов, опубликованных более чем 2,2 тысячами организаций-участников, в том числе более **438,7 млн. наблюдений растений**, включая данные гербариев, живых и иных коллекций, а также наблюдения в природе. GBIF входит в число основных глобальных информационных ресурсов по биоразнообразию (Global Core Biodata Resources).

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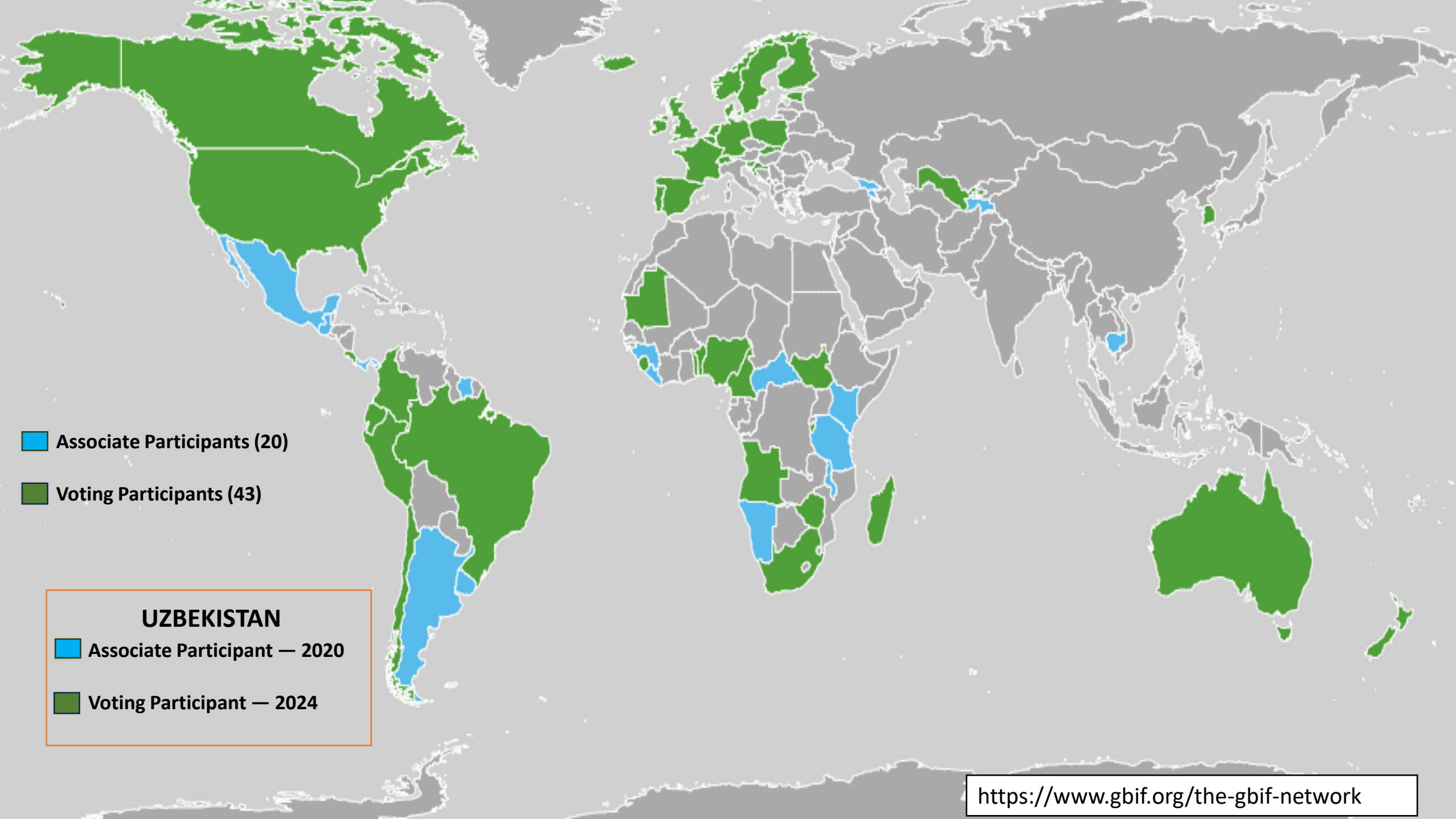
Associate Participants (20)
Voting Participants (43)
UZBEKISTAN
Associate Participant — 2020
Voting Participant — 2024
https://www.gbif.org/the-gbif-network

ФЛОРА УЗБЕКИСТАНА В GBIF

На данный момент на портале GBIF имеется 586 наборов данных, опубликованных 229 организациями из 37 стран, с 118978 наблюдений для территории Узбекистана за период 1809-2023 гг., из них 45 317 относится к растениям (17 566 с геопривязкой), в т.ч. более 11 тыс. – гербарные образцы MW, 2321 – наблюдения iNaturalist. Следует отметить «Global Register of Introduced and Invasive Species – Uzbekistan» (228 натурализовавшихся адвентивных видов растений), опубликованный в 2018 г. (https://www.gbif.org/ru/dataset/498fc188-a018-4133-808c-6302e80c68b9).

Узбекистан стал ассоциированным членом GBIF в 2020 г. Институтом ботаники опубликованы 9 наборов данных, в т.ч. 8 наборов данных с наблюдениями (occurrence records) и 1 таксономический список (checklist).

- Type collection of the National Herbarium of Uzbekistan (TASH) - 3955 гербарных образцов из 10 стран (https://www.gbif.org/ru/dataset/0c1237c3-be8c-498b-bb2d-d5cf3c930dec).
- Monocotyledonous Geophytes of Fergana Valley – 1061 occurrences (https://www.gbif.org/dataset/1962b370-4fd5-4b22-a30e-0adb8570688d)
- Checklist of the flora of the Chatkal State Biosphere Reserve (Uzbekistan) - 771 вид из 71 семейства (https://www.gbif.org/ru/dataset/fb8d42a1-8a07-42d6-967f-c01785d52145)
- Phenology of Liliaceae – 297 occurrences (https://www.gbif.org/dataset/e12e5ea3-86bf-4cb0-9c70-384ee6ef6137)
- Phenology of Crocus – 444 occurrences (https://www.gbif.org/dataset/5c1f02e2-234b-4d0c-8246-2cd5c76db26a)
- Phenology of Iridaceae – 1061 occurrences (https://www.gbif.org/dataset/30d93881-56ca-47dc-8651-42cdc7f2a251)
- Genus Elymus L. in the flora of Uzbekistan – 7 occurrences (https://www.gbif.org/dataset/4c29b045-018c-4f71-81a0-500ca9edf3a9)
- Water reservoir’s algoflora of Fergana valley – 871 occurrences (https://www.gbif.org/dataset/df007302-0f3f-44cc-b474-1ce4bf563e08)
- Aphyllophoroid fungi of Uzbekistan – 692 occurrences (https://www.gbif.org/dataset/f68d4d58-fd61-4e44-be35-a99e1bd99351)

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Uzbekistan

A GBIF Voting participant from Europe and Central Asia

Names of countries and areas are based on the ISO 3166-1 standard

Rating of data delivered in GBIF

(1) National Herbarium of Uzbekistan

(2) Flora of Uzbekistan project

(3) Grid mapping project

(4) State cadaster of plant diversity of administrative units of the Republic of Uzbekistan

(5) Local plant diversity researchers and PhD students

TARGET 2024

300 000 records

(1) National Herbarium of Uzbekistan (since 1920)

The main taxa of monocots have been digitized (Poaceae, Cyperaceae, *Allium*, *Eremurus*, *Gagea*, Juno etc.)

Some polymorphic families have been digitized (Lamiaceae, Amaranthaceae, Polygonaceae, Caryophyllaceae and etc.)

Number of annual new arrivals is ~ 8 000–10 000 (georeferenced specimens)

TASH is the largest collection of Central Asian plants worldwide (more than 1.6 mln. specimens since 1831)

Historical collections of first explorers of the CA flora and prominent botanists of the 20th Century (Popov, Korovin, Vvedensky, Kamelin etc)

Included in the top 30 largest herbaria of the world and 4th in Asia

Over 380,000 specimens in the database; over 180,000 specimens scanned; over 120,000 specimens barcoded

(2) The Flora of Uzbekistan Project (since 2016)

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Article

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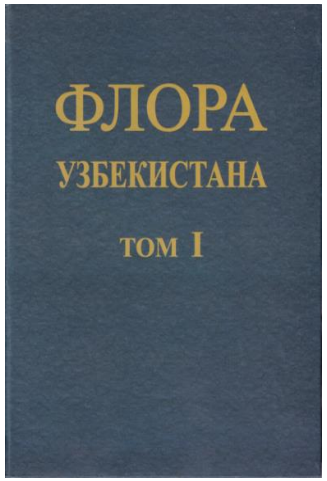
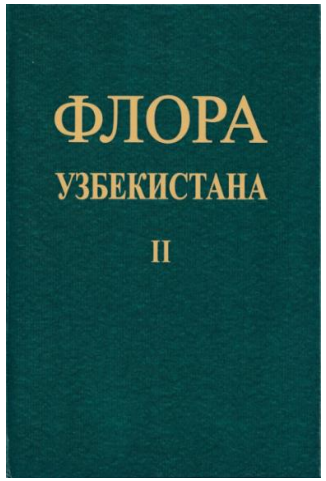
The Flora of Uzbekistan Project

ALEXANDER N. SENNIKOV[1,2,*], KOMILJON SH. TOJIBAEV[3], FURKAT O. KHASSANOV[3] & NATALYA YU. BESHKO[3]

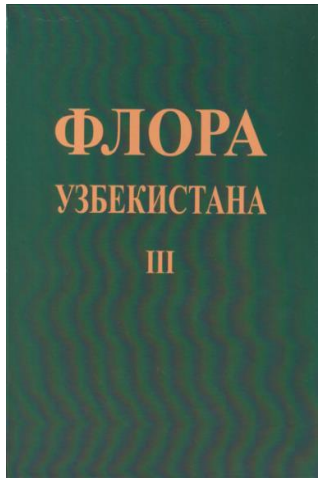
Central Asia's first updated national (Int.) flora project



vol. I
2016

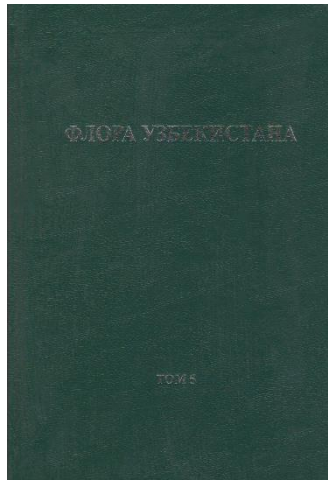


vol. II
2017

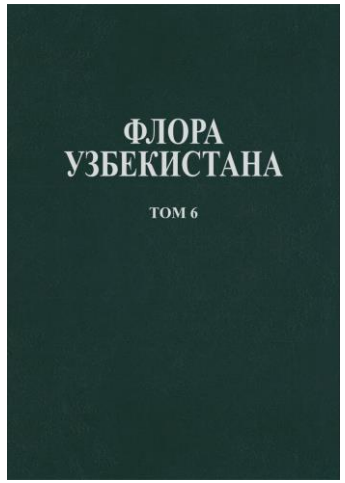


vol. III
2019

vol. IV
2022



vol. V
2022



vol. VI
2023

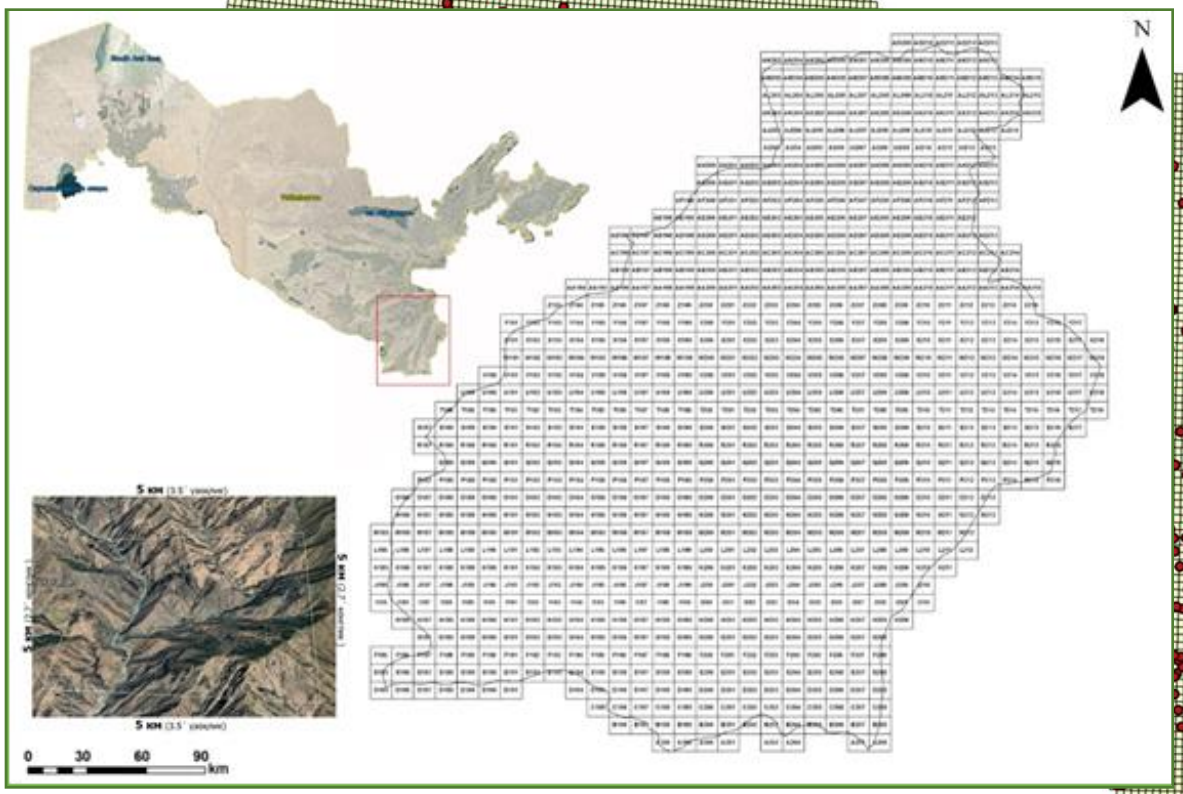
- Institute of Biology NAK
- University of Helsinki
- Kunming Institute of Botany, CAS
- Komarow Botanical Institute
- Botanical Garden of Moscow University
- Korea National Arboretum
- Changwon National University
- Altai State University
- Tomsk State University

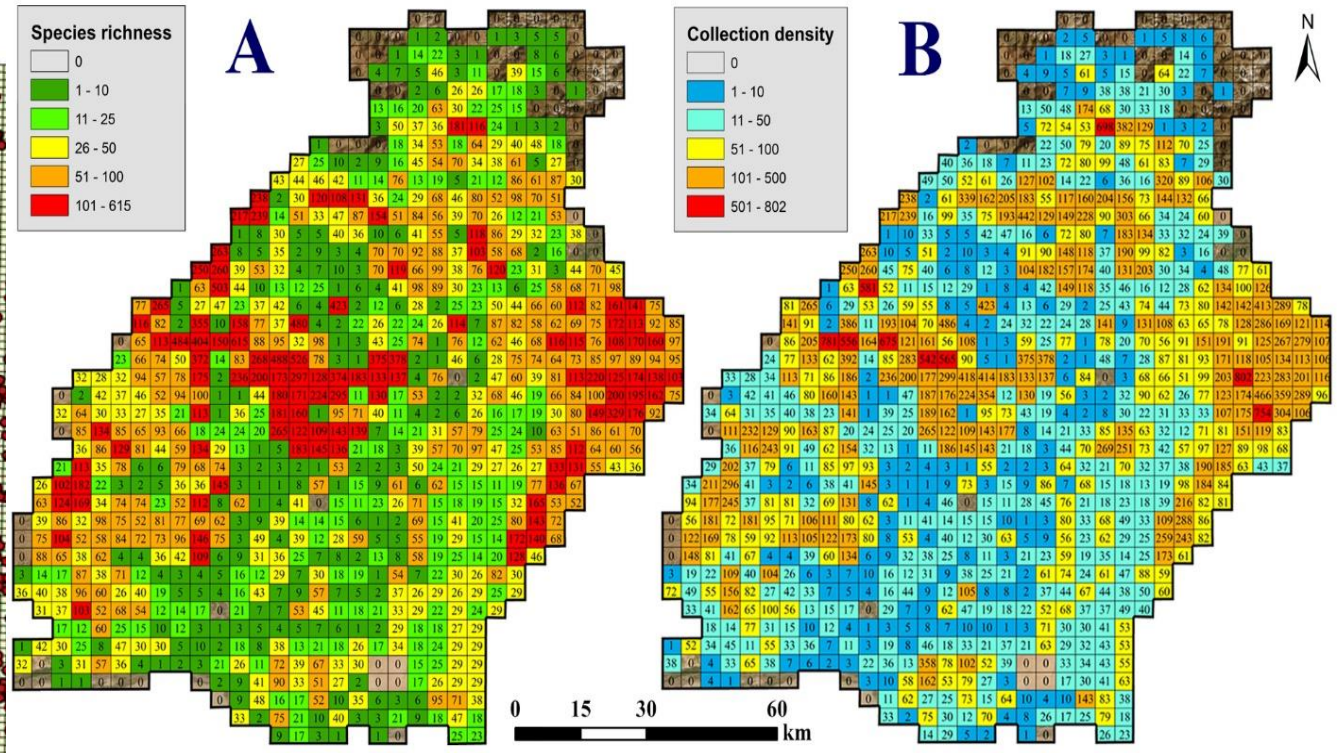
Organizations participating

Family	Genera	Species and subspecies	%	Georeferenced specimens
20	184	820	18.9	

Amaryllidaceae (*Allium*), Primulaceae, Plantaginaceae, Scrophulariaceae, Campanulaceae, Plumbaginaceae, Caprifoliaceae, Gentianaceae, Boraginaceae, Apiaceae and **Brassicaceae**, **Lamiaceae**

(3) Grid mapping project

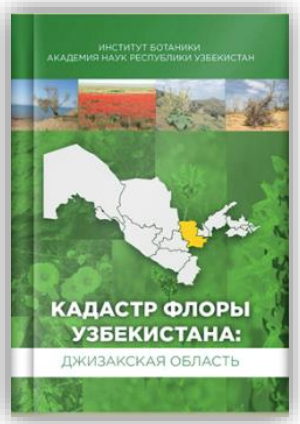


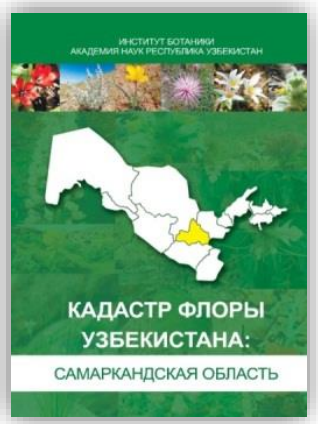


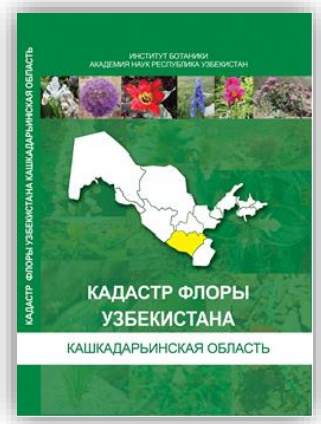
Family — 115
Genera — 819
Species — 3876
Georeferenced data < 200000
The data was collected during the years — 1842–2023

2191 species belong to 614 genera and 98 families is grid mapped; 820 grid cells 5x5 km each (92% of research area); 67,261 georeferenced records

(4) State cadaster of plant diversity of administrative units of the Republic of Uzbekistan







В 2013-2020 гг. Институтом ботаники АН РУз опубликован кадастр флоры 5 административных областей, Джизакской, Кашкадарьинской, Самаркандской, Навоийской и Бухарской. С 2021 г. осуществляется проект по составлению кадастра флоры Ташкентской области.

Область	Площадь, км^2	Место по площади	Семейств / родов / видов	Кол-во Краснокнижных видов	Адвентивных видов
Бухарская	41 831	3	66/339/764	25	89
Джизакская	21 179	5	106/617/1991	50	111
Кашкадарьинская	28 568	4	97/613/2022	88	104
Навоийская	109 481	2	90/534/1561	51	48
Самаркандская	16 772	7	95/573/1687	53	118
Ташкентская	15 150	8	117/663/2313	71	164

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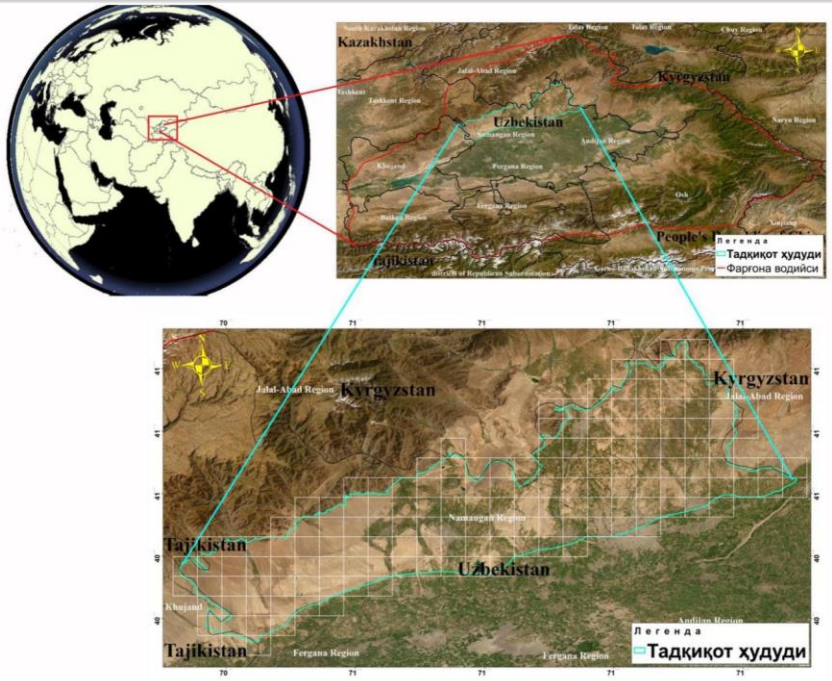
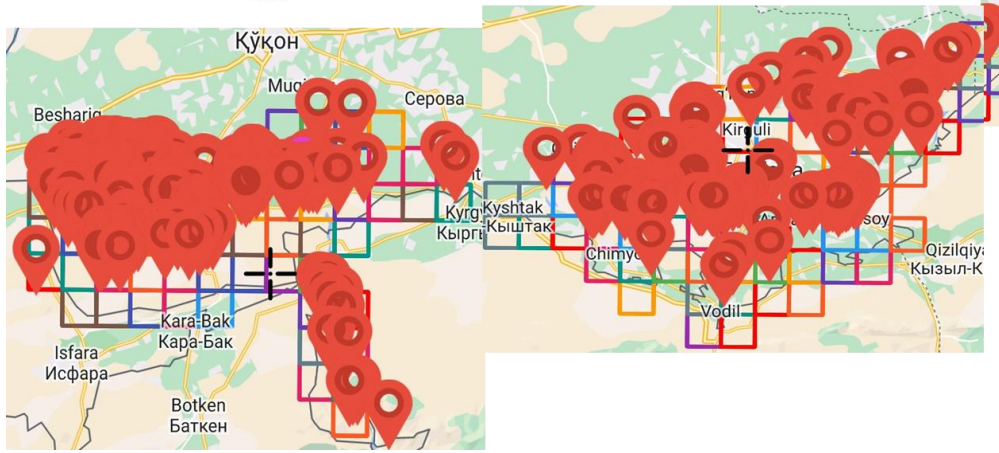
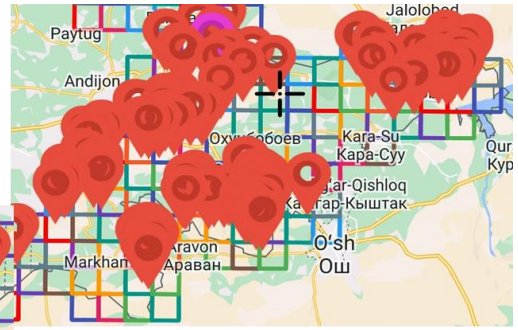
(5) The local plant diversity researchers and PhD students





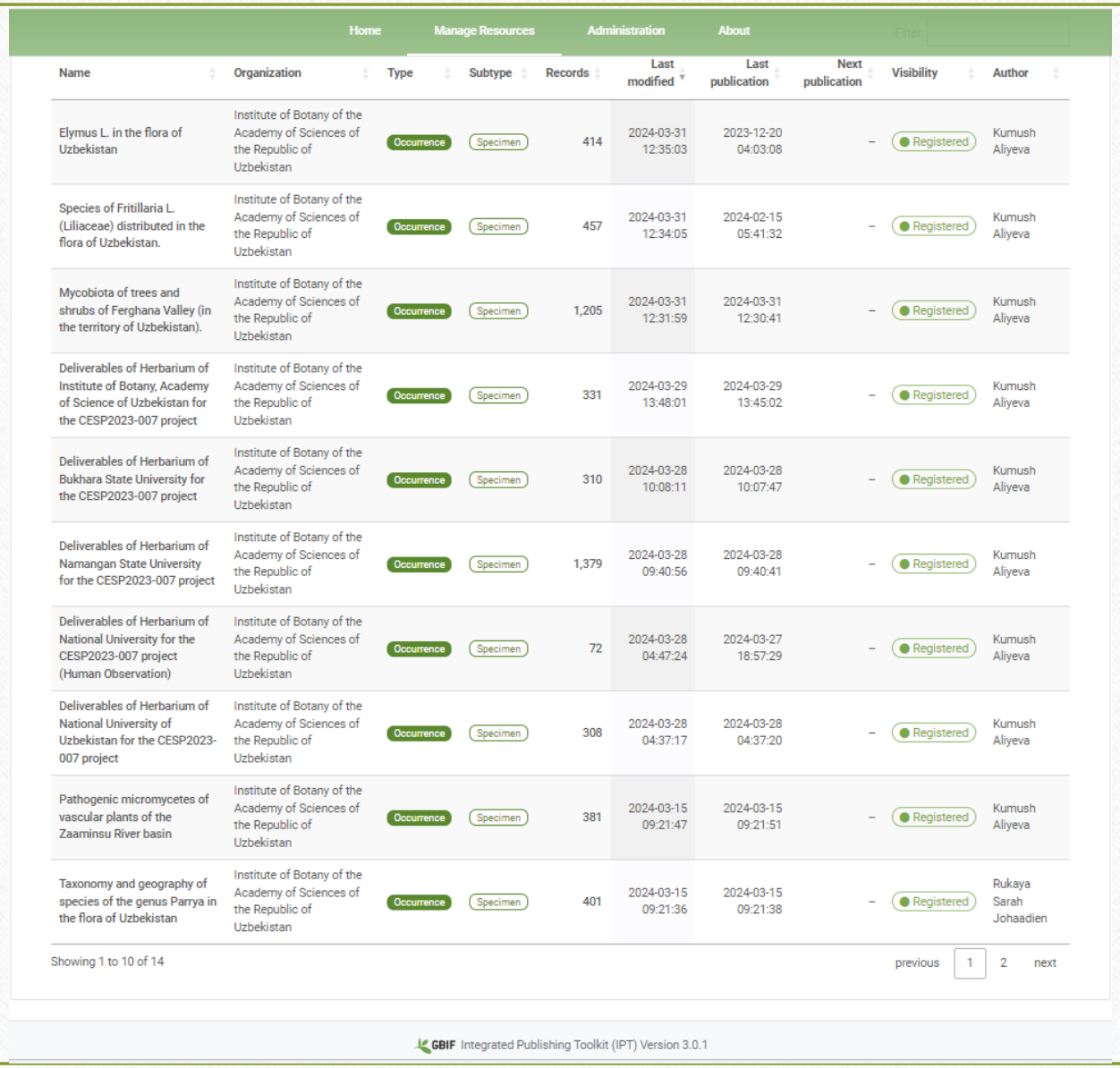


Local floristic research makes a major contribution to the expansion of georeferenced database

More than **20,000** herbarium specimens have been collected from the Fergana Valley in two years (2023–2024)

Uzbekistan IPT

As an integral part of this project, Uzbekistan IPT was established on September **29, 2023**, to publish local information aimed at strengthening the infrastructure of **GBIF** nodes in Uzbekistan. As part of the huge digitization program, **19191** records from the flora of Uzbekistan were digitized and published.



Home | Manage Resources | Administration | About

Name	Organization	Type	Subtype	Records	Last modified	Last publication	Next publication	Visibility	Author
Elymus L. in the flora of Uzbekistan	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	414	2024-03-31 12:35:03	2023-12-20 04:03:08	–	Registered	Kumush Aliyeva
Species of Fritillaria L. (Liliaceae) distributed in the flora of Uzbekistan.	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	457	2024-03-31 12:34:05	2024-02-15 05:41:32	–	Registered	Kumush Aliyeva
Mycobiota of trees and shrubs of Ferghana Valley (in the territory of Uzbekistan).	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	1,205	2024-03-31 12:31:59	2024-03-31 12:30:41	–	Registered	Kumush Aliyeva
Deliverables of Herbarium of Institute of Botany, Academy of Science of Uzbekistan for the CESP2023-007 project	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	331	2024-03-29 13:48:01	2024-03-29 13:45:02	–	Registered	Kumush Aliyeva
Deliverables of Herbarium of Bukhara State University for the CESP2023-007 project	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	310	2024-03-28 10:08:11	2024-03-28 10:07:47	–	Registered	Kumush Aliyeva
Deliverables of Herbarium of Namangan State University for the CESP2023-007 project	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	1,379	2024-03-28 09:40:56	2024-03-28 09:40:41	–	Registered	Kumush Aliyeva
Deliverables of Herbarium of National University for the CESP2023-007 project (Human Observation)	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	72	2024-03-28 04:47:24	2024-03-27 18:57:29	–	Registered	Kumush Aliyeva
Deliverables of Herbarium of National University of Uzbekistan for the CESP2023-007 project	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	308	2024-03-28 04:37:17	2024-03-28 04:37:20	–	Registered	Kumush Aliyeva
Pathogenic micromycetes of vascular plants of the Zaaminsu River basin	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	381	2024-03-15 09:21:47	2024-03-15 09:21:51	–	Registered	Kumush Aliyeva
Taxonomy and geography of species of the genus Parrya in the flora of Uzbekistan	Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan	Occurrence	Specimen	401	2024-03-15 09:21:36	2024-03-15 09:21:38	–	Registered	Rukaya Sarah Johaadien

Showing 1 to 10 of 14 previous 1 2 next

GBIF Integrated Publishing Toolkit (IPT) Version 3.0.1

© K.Alieva

Certificate

Academy of Sciences
of the Republic of Uzbekistan
Institute of Botany
Durmon yuli St., 32
Tashkent 100125
Uzbekistan

28 December 2023

Certificate

On the publication of the results of the dissertation by K.B. Alieva in GBIF.

GBIF– the Global Biodiversity Information Facility – is an international network and data infrastructure funded by the world's governments and aimed at providing anyone, anywhere, with open access to data about all types of life on Earth.

We hereby confirm that Alieva Kumush Bahodir kizi, researcher at the Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan, published the results of the dissertation work "Genus *Elymus* L. in the flora of Uzbekistan" on the Global Biodiversity Information Facility (GBIF, www.gbif.org).

The researcher presented information on the distribution of species of the genus *Elymus* in Uzbekistan. The data is available at https://www.gbif.org/dataset/4c29b045-018c-4f71-81a0-500ca9edf3a9 and https://www.gbif.org/dataset/06201352-8d65-42e0-a971-b8dbf092e7ed. In addition, Kumush Alieva uploaded data about "Taxonomy and geography of species of the genus *Parrya* in the flora of Uzbekistan" - https://www.gbif.org/dataset/751005ce-d8f1-402e-8845-d3eb9b82be80 and "Pathogenic micromycetes of vascular plants of the Zaaminsu River basin" - https://www.gbif.org/dataset/c9ea8c6d-97ad-481a-aa2f-4d40c116f0e3.

The results allowed a global analysis of endemic plant species by geography and phylogeny.

Dmitry Schigel, Scientific officer, GBIF Secretariat

Global Biodiversity Information Facility Secretariat

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DK-2100 Copenhagen Ø
Denmark

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Email: dschigel@gbif.org
Web: www.gbif.org

To whom it may concern

7 February 2024

Certificate

This is to confirm that **Farkhod Karimov** is a Node manager of GBIF Uzbekistan – GBIF National Node hosted by the Institute of Botany, (Academy of Sciences, 100125, Durmon yuli str., 32 Tashkent, Uzbekistan), as listed on the GBIF website at https://www.gbif.org/contact-us/directory?personId=4163&group=nodesCommittee.

Among the functions of the GBIF Node manager are management and coordination, outreach, communications, public relations, and institutional networking (regional, national, or thematic level), fundraising and project writing, administrative work, capacity enhancement, technical support service for data holders, scientific liaison, and promotion of data use in relevant research communities. (more details at https://docs.gbif.org/effective-nodes-guidance/1.0/en/#node-staff-roles).

In the context of these responsibilities, Farhod Karimov, as a Node manager of GBIF Uzbekistan, can certify publication of new datasets from Uzbekistan through GBIF and other necessary confirmation related to GBIF activities in the country,

Tim Hirsch
Deputy Director, GBIF Secretariat

Global Biodiversity Information Facility Secretariat

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Academy of Sciences of the
Republic of Uzbekistan
Institute of Botany
Durmon yuli St., 32 Tashkent
100125 Uzbekistan

05 March 2024 № 002

Certificate

On the publication of the results of the dissertation by G.T. Kurbaniyazova in GBIF.

GBIF– the Global Biodiversity Information Facility – is an international network and data infrastructure funded by the world's governments and aimed at providing anyone, anywhere, with open access to data about all types of life on Earth.

We hereby confirm that Kurbaniyazova Gulsauir Tanirbergen kizi, researcher at the Institute of Botany of the Academy of Sciences of the Republic of Uzbekistan, published the results of the dissertation work "Genus *Gagea* Salisb. of the Southwestern Pamir-Alai within Uzbekistan" on the Global Biodiversity Information Facility (GBIF, www.gbif.org).

The researcher presented information on the distribution of *Gagea* species in Uzbekistan. The data is available at https://www.gbif.org/dataset/c98c96fc-e1dc-41ec-b083-ba92d08323b3.

The results allowed a global analysis of *Gagea* species by geography and phylogeny.

Farkhod Karimov, Node manager of GBIF Uzbekistan

Global Biodiversity Information Facility Secretariat

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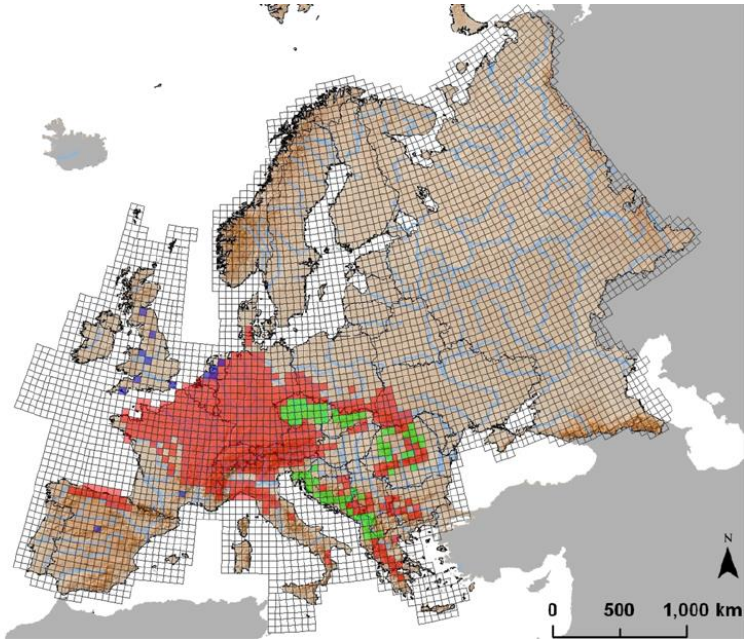
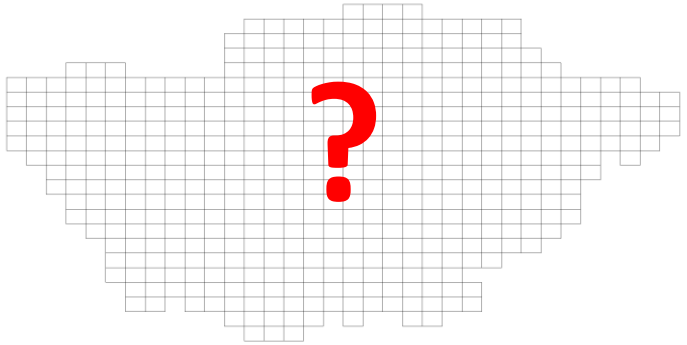
info-botany@academy.uz
Web: www.botany.uz

Grid maps were developed as a method not only showing the range of species, but also universalizing the scientific research of several (even several generations) florists, gathering scattered information into one system.

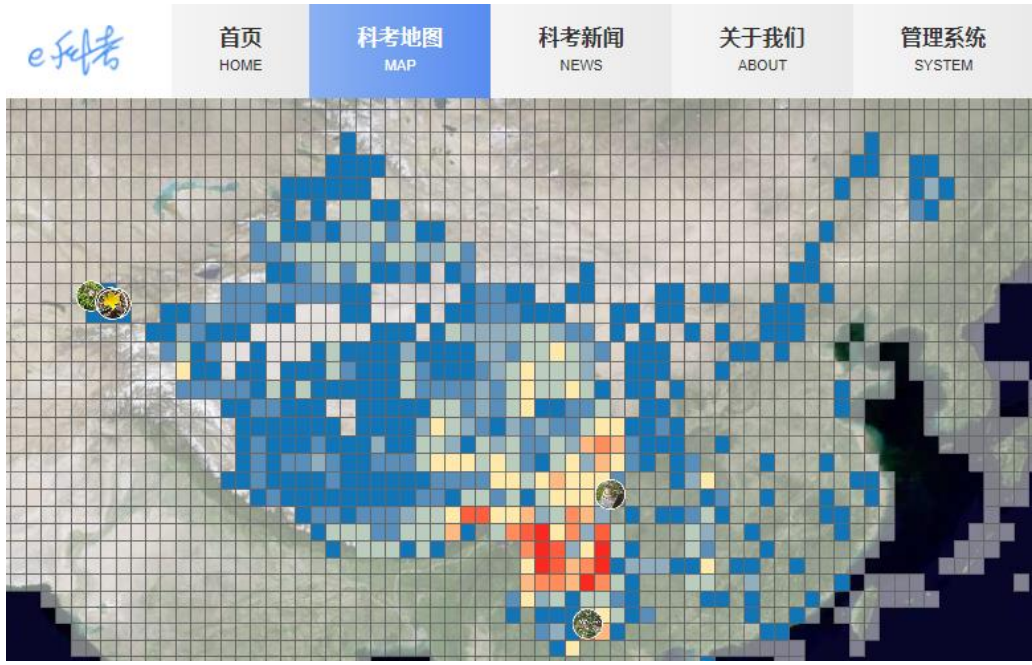
New grid system – Atlas Florae Europaeae



Central Asia



New grid system – China



Mapping the flora of the British Isles (https://bsbi.org/maps-and-data)
Distribution Atlas of Vascular Plants of Austria (https://plantbiogeography.univie.ac.at/research/distribution-atlases/)
Italy (http://dryades.units.it/floritaly/)
France (https://www.nhbs.com/flora-gallica-flore-de-france-book)
China (https://www.ekk.ac.cn)

New regional digital platform for mapping plant diversity

CONCLUSIONS

Despite the results achieved for many decades, Central Asia can still be included in the world's 33 global diversity darkspots. This is largely due to the limited array of geoinformation

Weak regional cooperation between the countries of Central Asia is one of the shortfalls in the knowledge of the flora of Asia's largest subregion

Cooperation with the GBIF, the largest international network and biodiversity data infrastructure:

- **can play a key role in filling these biodiversity shortfalls**
- **strengthen cooperation between Central Asian countries in sharing biodiversity information**
- **strengthen collaboration with other GBIF nodes**
- **serve to improve the level of large-scale knowledge of Central Asian biodiversity**

Thank you for your attention!