



GLOBAL
BIODIVERSITY
INFORMATION
FACILITY

Annual Report **2013**

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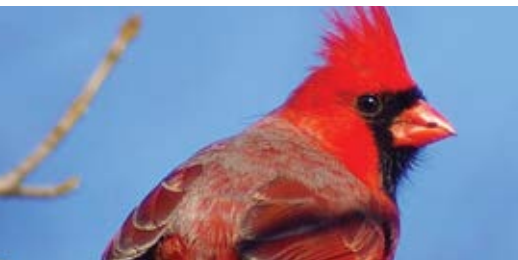
What is GBIF?

The Global Biodiversity Information Facility is a network of governments and international organizations, collaborating with a Secretariat in Copenhagen, Denmark, to provide a vital infrastructure for research and policy. It enables information about all forms of life on Earth, gathered over centuries in all parts of the globe, to be readily accessible by anyone, anywhere. Through the newly integrated GBIF.org, web services and a growing number of national and thematic portals, GBIF users have free access to more than 15,000 datasets published by over 600 institutions, ranging from zoological and botanical collections to observations by citizen scientists and surveys from research expeditions.

GBIF's vision

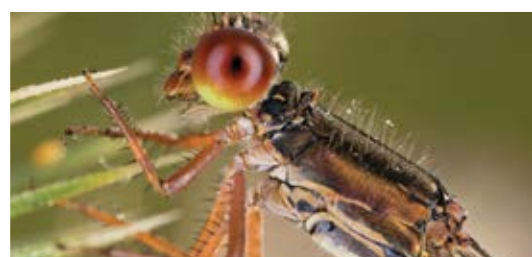
A world in which biodiversity information is freely and universally available for science, society and a sustainable future.

GBIF Annual Report 2013



2013 Highlights

- ▶ Launch of the new GBIF.org, improving access to and understanding of GBIF-mediated data, as well as the network's global activities
- ▶ Near real-time indexing of data enabling access to records soon after being shared by contributing publishers
- ▶ GBIF-mediated data increasingly put to use by researchers and policymakers, in areas including invasive alien species, climate change impacts and human disease modelling
- ▶ Continuing collaboration and support at global and regional levels, enhancing national capacity to mobilize, manage and use biodiversity information
- ▶ New vision for delivering biodiversity knowledge in the digital age, through publication of the Global Biodiversity Informatics Outlook



Foreword



Peter Schalk
Chair of the Governing Board

It's a pleasure to report on GBIF's many achievements in 2013—a truly exciting year, by any measure.

The data mediated by GBIF is steadily increasing, by the end of 2013 approaching nearly 450 million records of 1.4 million species from more than 15,000 datasets published by over 600 publishers. The newly integrated GBIF.org launched at October's GB20 meeting in Berlin, and our users' enthusiastic responses have increased the use and downloads to mega-science scale. Based on GBIF.org's use and its unique place in biodiversity sciences, it's safe to say that GBIF has become an essential part of the world's scientific infrastructure, with freely accessible data facilitating international research and empowering scientific publication.

Another indication of GBIF's reach is its increasing partnerships with international initiatives and projects to share biodiversity information. National governments and regional funding agencies worldwide invest significant funds to advance biodiversity informatics—digitizing information, developing analytical tools, devising re-usable workflows and creating innovative methods for addressing societal challenges—but many activities take form as temporary projects. GBIF is an obvious source of knowledge and expertise to underpin new information services, to recommend data exchange standards, and to work with across scientific communities to help shape future developments and ensure their sustainability.

With a global role as central point of access to a steadily growing mass of biodiversity data, new challenges and new responsibilities for GBIF are appearing on the horizon with potential to impact its (future) identity. Is GBIF still the global mega-science facility for open access biodiversity data, as envisioned at its establishment? How will GBIF preserve data no longer available from original sources? Should our responsibilities now include delivery of applied and authoritative information services to help countries answer primary questions on biodiversity issues? Feedback from our community makes it clear that GBIF must become more than it is now. This future identity calls attention to the need to identify GBIF's core mandate, as well as the funding needs and strategic partnerships that will support it.

In 2013, some countries again struggled to meet their financial contributions. This affects both GBIF's financial position and its work program. But despite the funding issues and necessary delays, the core of the work program has largely progressed as projected. A review of GBIF's funding model, seeking to achieve more equitable contributions according to countries' financial capacities and to reduce GBIF's dependence on a few large contributors, has provided the Budget Committee with a more balanced funding model for future years.

We believe GBIF is on course. Thanks go where thanks are due: to the Governing Board, to the committees, to the national nodes, to those who staff the Secretariat—and most especially to the many thousands of users putting GBIF-mediated data to work. This is your organization. Only with your help and input will GBIF continue to evolve and grow. We offer our most sincere thanks to all who have contributed to helping GBIF achieve its goals in 2013 and beyond.

Peter and Donald

Donald Hobern
Executive Secretary

Contents

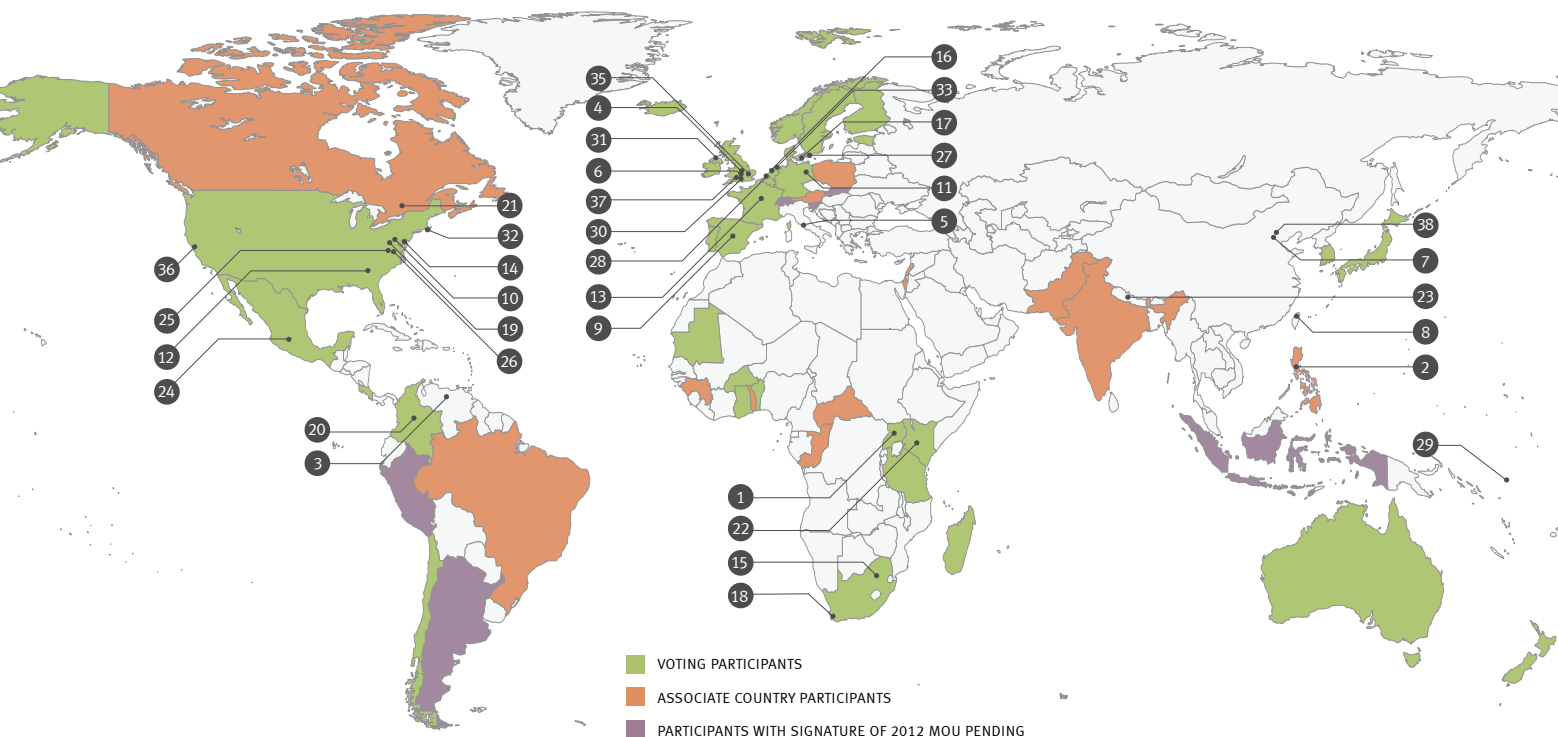
Foreword	2
GBIF at a glance	4
GBIF launches new global web platform	6
Metrics on publication, use and access of data	10
Developments in informatics and data publishing	12
Promoting data publishing and re-use	14
Science year in review	16
Governance	20
Supporting policy and decision making	22
Partnerships and collaborations	24
Building capacity for data sharing	25
GBIF's regional approach	26
GBIF in Africa	28
GBIF in Asia	30
GBIF in Europe	32
GBIF in Latin America	34
GBIF in North America	36
GBIF in Oceania	40
Communications	40
Photo credits	42
End notes	43
Appendices	44



HARLEQUIN LADYBIRD (*HARMONIA AXYRIDIS*)

GBIF at a glance

The charts and map offer a snapshot of activity around the GBIF community in 2013. The map (*below*) shows current Participants of the GBIF network as of year's end. The charts display (*opposite, clockwise from top left*) the top 10 countries publishing species occurrence data through GBIF.org; top 10 countries for data download requests from GBIF.org; top 10 countries with peer-reviewed papers using GBIF as a data source; and top 10 countries by numbers of visits to GBIF.org.



Non-country Participants

- | | | | |
|---|---|---|---|
| 1. ALBERTINE RIFT CONSERVATION SOCIETY | 12. DISCOVER LIFE | 22. INTERNATIONAL CENTRE FOR INSECT PHYSIOLOGY AND ECOLOGY (ICIPE) | 31. SOCIETY FOR THE MANAGEMENT OF ELECTRONIC BIODIVERSITY DATA (SMEBD)* |
| 2. ASEAN CENTRE FOR BIODIVERSITY (ACB) | 13. DIVERSITAS | 23. INTERNATIONAL CENTRE FOR INTEGRATED MOUNTAIN DEVELOPMENT (ICIMOD) | 32. SOCIETY FOR THE PRESERVATION OF NATURAL HISTORY COLLECTIONS (SPNHC) |
| 3. BIONET-ANDINONET | 14. ENCYCLOPEDIA OF LIFE (EOL) | 24. INTERNATIONAL LONG TERM ECOLOGICAL RESEARCH (ILTER)* | 33. SPECIES 2000 |
| 4. BIONET-INTERNATIONAL | 15. ENDANGERED WILDLIFE TRUST (EWT) | 25. NATURAL SCIENCE COLLECTIONS ALLIANCE (NSCA) | 34. TAXONOMIC DATABASES WORKING GROUP (TDWG)* |
| 5. BIODIVERSITY INTERNATIONAL | 16. ETI BIOINFORMATICS | 26. NATURESERVE | 35. UNITED NATIONS ENVIRONMENT PROGRAMME – WORLD CONSERVATION MONITORING CENTRE (UNEP-WCMC) |
| 6. BOTANIC GARDENS CONSERVATION INTERNATIONAL (BGCI) | 17. EUROPEAN ENVIRONMENT AGENCY (EEA) | 27. NORDIC GENETIC RESOURCE CENTER (NORDGEN) | 36. VERTNET |
| 7. CHINESE ACADEMY OF SCIENCES (CAS) | 18. ICLEI - LOCAL GOVERNMENTS FOR SUSTAINABILITY (ICLEI) | 28. OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM (OBIS) | 37. WILDSCREEN |
| 8. CHINESE TAIPEI | 19. INTEGRATED TAXONOMIC INFORMATION SYSTEM (ITIS) | 29. PACIFIC BIODIVERSITY INFORMATION FORUM (PBIIF) | 38. WORLD FEDERATION FOR CULTURE COLLECTIONS (WFCC) |
| 9. CIENCIA Y TECNOLOGÍA PARA EL DESARROLLO (CYTED) | 20. INTER-AMERICAN BIODIVERSITY INFORMATION NETWORK (IABIN) | 30. SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (SCAR) | |
| 10. CONSORTIUM FOR THE BARCODE OF LIFE (CBOL) | 21. INTERNATIONAL BARCODE OF LIFE PROJECT (IBOL) | | |
| 11. CONSORTIUM OF EUROPEAN TAXONOMIC FACILITIES (CETAF) | | | |

* virtual networks with no fixed headquarters

DATA PUBLICATION

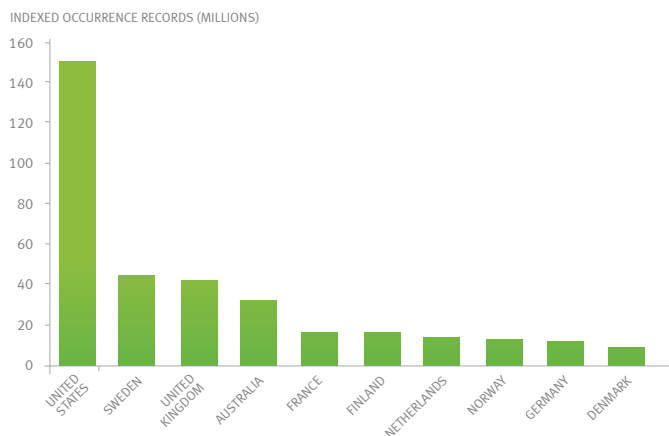


FIGURE 1: TOP 10 COUNTRIES BY TOTAL NUMBER OF SPECIES OCCURRENCE RECORDS PUBLISHED ON GBIF.ORG. MORE INFORMATION ON PP. 10-11

DATA DOWNLOAD REQUESTS

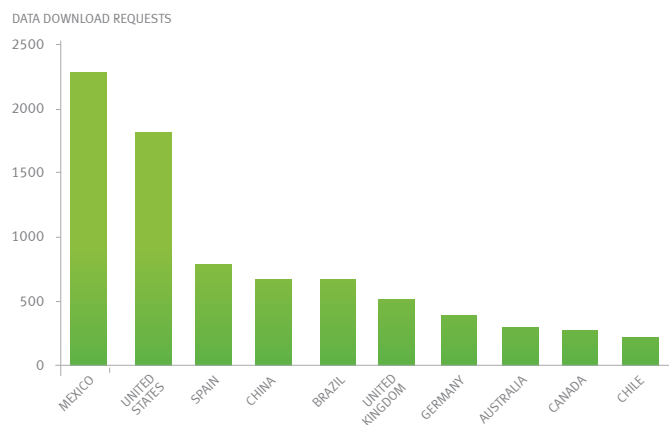


FIGURE 2: TOP 10 COUNTRIES BY NUMBER OF DATA DOWNLOAD REQUESTS FROM GBIF.ORG. STATISTICS START WITH THE LAUNCH OF THE NEW INTEGRATED GBIF.ORG (9 OCT 2013 – 31 DEC 13). MORE INFORMATION ON PP. 6-9

WEB VISITORS

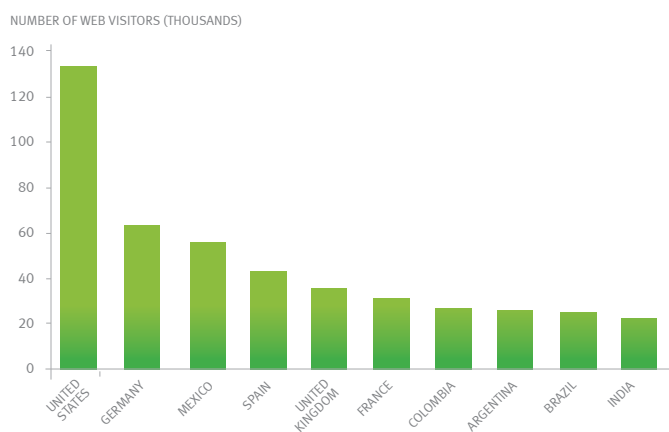


FIGURE 3: TOP 10 COUNTRIES BY VISITS TO GBIF.ORG IN 2013. VISITS REPRESENT COMBINED TOTAL VISITORS TO THE PREVIOUS GBIF DATA PORTAL AND THE NEW GBIF.ORG. MORE INFORMATION ON PP. 6-9

RESEARCH USES IN 2013

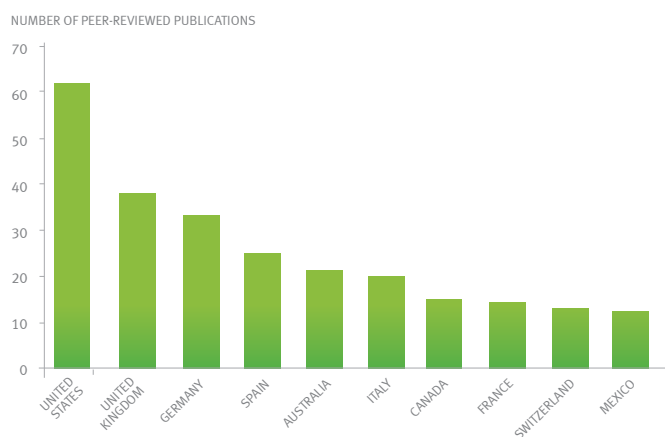


FIGURE 4: TOP 10 COUNTRIES WITH PEER-REVIEWED ARTICLES PUBLISHED IN 2013 THAT CITE THE USE OF GBIF-MEDIATED DATA, RANKED BY LOCATION OF RESEARCHERS' INSTITUTIONS. MORE INFORMATION ON PP. 10-11

GBIF launches new global web platform

Launched in October, GBIF's new website integrates data discovery and communication into a single platform. GBIF.org improves users' access to species occurrence data while providing a single source for Participant information, data publishing, data use, and news and events across the GBIF community.

The new GBIF.org combines information previously contained in two websites: the 'data portal', which shared GBIF-mobilized occurrences, checklists and metadata, and the 'communications portal', which highlighted information about GBIF as an institution and a community. The newly blended site streamlines access to both types of information while offering enhancements specific to each.

Improving access to biodiversity data

GBIF's online resources have long assembled and distributed digitized evidence of species' existence around the world. But as the volume of information in the previous 'data portal' increased in scale, users began to bump up against technical limitations, including restrictions on the number of records they could display and download.

The new GBIF.org represents a greatly improved data access product, one that provides tools and visualizations that allow people to understand the nature of the data prior to performing scientific analyses with them. These enhancements increase efficiency of access, and offer better insight into the data, helping to improve the resulting science.

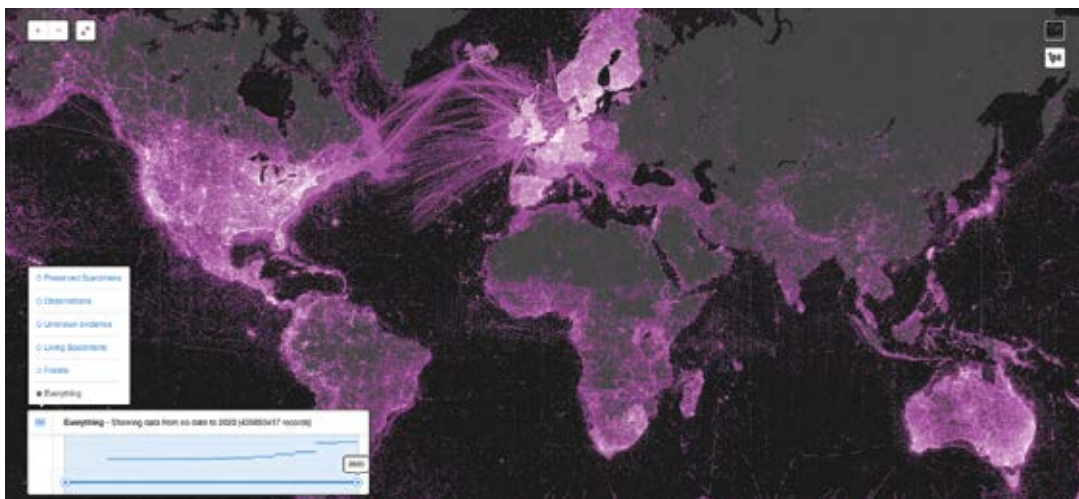
Users can explore details of individual occurrences, or build complex search queries then download and access large customized datasets tailored to their specific interests and without limitations on size. In addition to traditional text searches, map-based



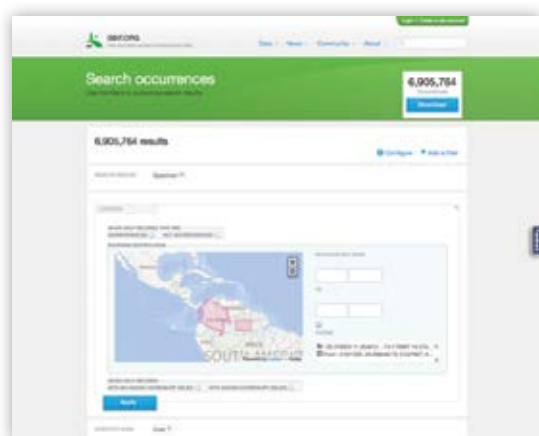
TIM ROBERTSON, THE GBIF SECRETARIAT'S HEAD OF INFORMATICS, PRESENTING THE LAUNCH OF GBIF.ORG IN BERLIN

searches provide a powerful tool for telling stories and visualizing the data. Its highly customizable, full-screen interface lets users explore the resolution and the nature of the data, including the types of records and their time of collection by decade. These features even offer glimpses of any geographic and political biases within the data.

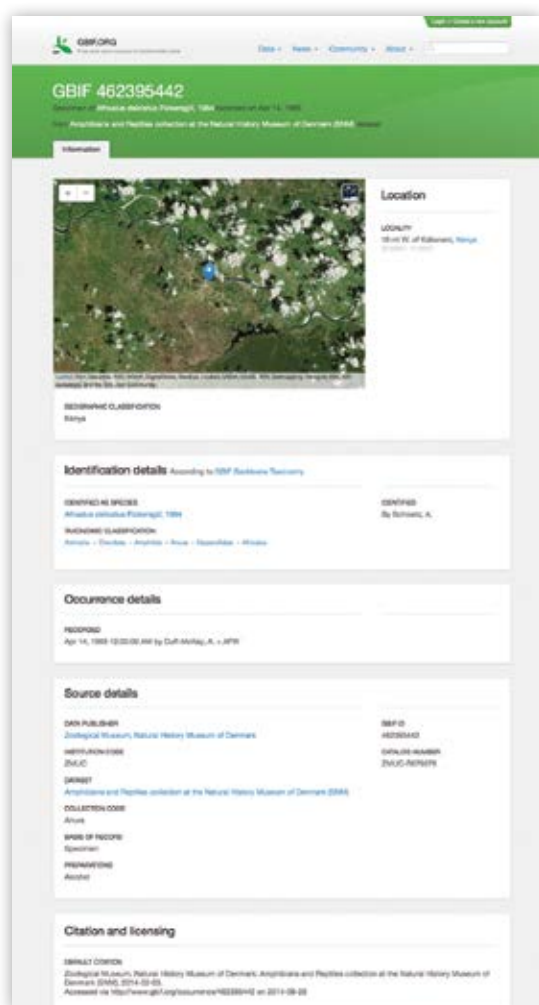
At every scale, GBIF.org compiles broader, more thorough metadata—that is, information about the data. Species and taxon pages compile and display comprehensive information about the data mobilized through GBIF, from basic characteristics like numbers of records to more advanced details like how different checklists treat different taxa. All these features enable users to make more informed use of GBIF-mediated data. These pages also link out to other online resources like Encyclopedia of Life, the Catalogue of Life and the Biodiversity Heritage Library, where users can retrieve useful related information.



GBIF.ORG'S MAP-BASED SEARCH VISUALIZES DATA WHILE PROVIDING TOOLS TO VIEW THE COLLECTIONS BY TIME AND TYPE OF RECORD



USERS CAN SEARCH THROUGH A MAP INTERFACE, DRAWING POLYGONS OR PLOTTING COORDINATES TO FIND THE DATA MOST RELEVANT TO THEM



EACH OCCURRENCE RECORD DISPLAYS SPECIFIC DETAIL ABOUT THE NAMES, LOCATIONS, DATASETS, AND PUBLISHERS OF THE EVIDENCE OF SPECIES' EXISTENCE THROUGHOUT THE WORLD

The website also provides more consistent and systematic access to information about the publishers and datasets represented on GBIF.org. Users can develop targeted searches here as well, filtering on various facets like locations, institutions, characteristics of taxonomy or record types.

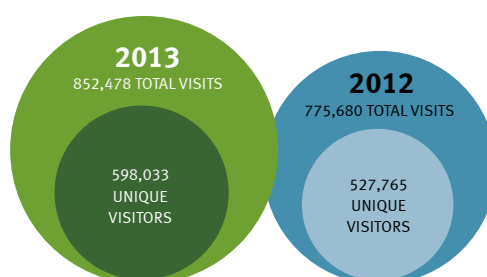


FIGURE 5: YEAR-BY-YEAR COMPARISON OF VISITORS TO GBIF.ORG AND THE OLD DATA PORTAL

A new system for indexing datasets allows GBIF.org to display new data nearly in real time, publishing new records within hours or even minutes after being added. Records in the old data portal only appeared after periodic refreshing of the index, which sometimes caused long delays before datasets became visible. A robust API and associated set of web services provides machine access to GBIF-mediated data, which enables others to build on the network's efforts, amplifying and extending its impact.



NEW PUBLISHER PAGES IMPROVE DATA SEARCH AND DISCOVERY WHILE ENSURING THAT DATA OWNERS AND CUSTODIANS GET THE RECOGNITION THEY DESERVE FOR MAKING DATASETS PUBLIC

Global data, nation by nation

Country pages form the link between the former ‘communications portal’ and GBIF-mediated data. These hubs connect summary views of the number and sources of species data while providing institutional and individual contact information for the national nodes and delegations that formally participate in the GBIF network.

These pages lend two important views of GBIF-mediated data: *data about* species occurring within national boundaries, regardless of the location of the specimen or publishing institution; and *data from* a given nation's institutions, whose original location in nature often lies well beyond the country's borders. This latter data publishing aspect shares a glimpse on how the GBIF infrastructure contributes to 'data repatriation'—the process of providing open access and dissemination of biodiversity data to their countries of origin.

The country pages also host news items and report on uses of GBIF-mediated data, providing both general language summaries of selected peer-reviewed articles and an ongoing bibliography of GBIF-enabled research produced by each country's scientists. The use of thematic and geographic tagging connects related news, events, featured data uses and academic publishing throughout the site.



MAPS ON EACH COUNTRY PAGE HIGHLIGHTS TWO IMPORTANT ASPECTS OF THE WORK OF THE GBIF COMMUNITY: DATA ABOUT THE SPECIES OCCURRING WITH NATIONAL BOUNDARIES, AND DATA FROM EACH NATION'S INSTITUTIONS THAT CONTRIBUTES TO GLOBAL KNOWLEDGE OF BIODIVERSITY



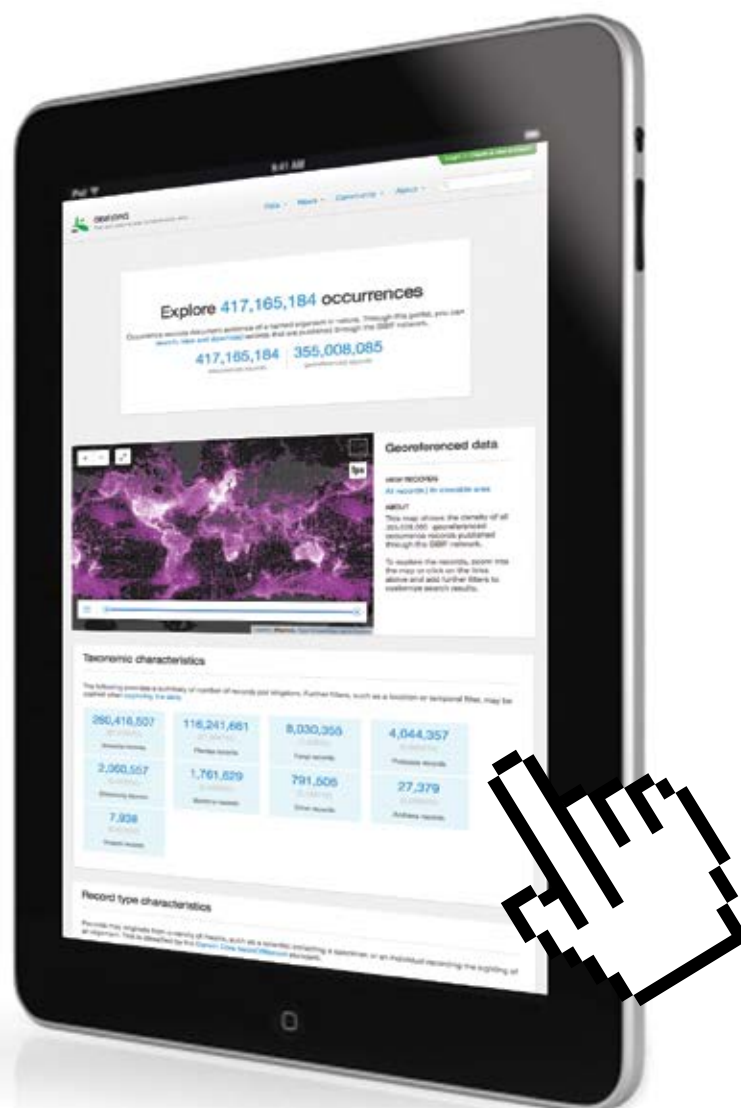
THE NEWSROOM SHARES CLEAR, SUCCINCT SUMMARIES HIGHLIGHTING SCIENTIFIC USES OF THE DATA PUBLISHED THROUGH THE GBIF COMMUNITY

“GBIF.org served 3.67 billion records for download in its first 40 hours”

GBIF.org's country pages reflect the engagement of a team of regional node representatives, who supported Secretariat staff during the site redesign. In addition to providing input that helped prioritize content and features for the country pages, this group also contributed as testers during GBIF.org's development.

GBIF's new online home received an enthusiastic response, handling 10,000 requests for data downloads and registering more than 24,000 user accounts between its launch in October and year's end. In fact, GBIF.org served 3.67 billion records for download in its first 40 hours. Several national nodes also marked the launch, with GBIF France organizing a national event for the occasion and GBIF Spain sharing a series of videos showing the new site's features.

- ▶ **WATCH** Video documenting the launch in Berlin <http://vimeo.com/77782067>



Using models to inform conservation policies

Two studies, based on data from GBIF and other sources, define the distribution of the bearded wood partridge, and help inform conservation policy.

41 records from sources including GBIF



Designing marine protected areas off Mexico

Researchers look at methods to determine the ideal spacing between protected areas in the Gulf of California, ensuring connectivity based on the distances covered by larvae of fish species identified through GBIF.

64 regional fish species identified



Shifting niches and invasive species control

Researchers use data available through GBIF to investigate how species can shift their ecological niches in alien environments – complicating the prediction of invasion risks.

2997 records of presence used

THE NEWSROOM SECTION OF GBIF.ORG HIGHLIGHTS CURRENT RESEARCH USING DATA ACCESSED THROUGH THE NETWORK. THESE WIDE-RANGING STUDIES ILLUSTRATE HOW GBIF ENABLES INVESTIGATIONS ACROSS ISSUES LIKE INVASIVE ALIEN SPECIES, IMPACTS OF CLIMATE CHANGE, CONSERVATION PRIORITIES, AND HUMAN HEALTH AND WELL-BEING. (SEE PP. 16-17)

Metrics on publication, use and access of data

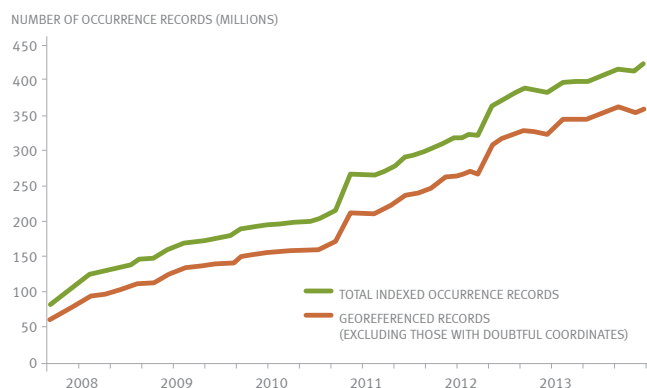


FIGURE 6. THE NUMBER OF DATA RECORDS ACCESSIBLE THROUGH GBIF, FROM SEP 2007 TO DEC 2013

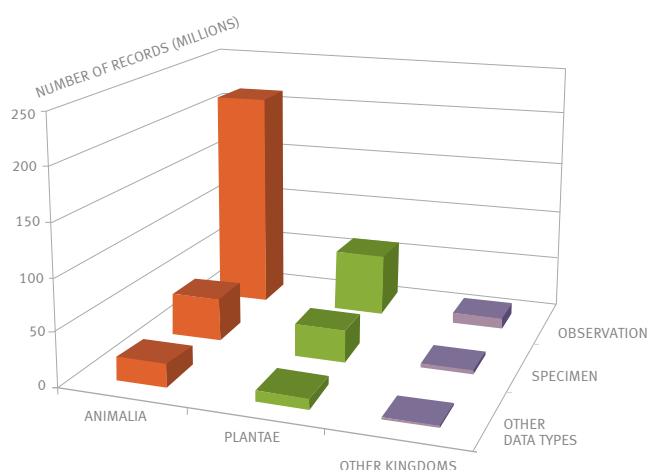


FIGURE 7. PRIMARY BIODIVERSITY RECORDS BY KINGDOM AND RECORD TYPE, AT END 2013

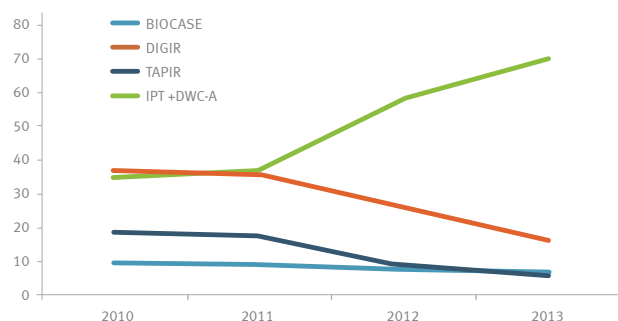


FIGURE 8. USE OF DATA PUBLISHING PROTOCOLS, BY PERCENTAGE OF OCCURRENCE RECORDS

The overall volume of biodiversity records published through GBIF continued to increase during 2013, passing the 400 million mark in July. Occasional declines in these numbers result from data withdrawn by publishers and improved data quality controls for identifying and removing duplicate records.

The breakdown of records by kingdom and record type shows that in terms of sheer numbers, animal observations continue to comprise the majority of records published through GBIF. Taking only specimens, however, plants accounted for more than 40 per cent of records, and animal species made up a little over half.

The proportion of data records published using the GBIF Integrated Publishing Toolkit (IPT) and the associated Darwin Core Archive (DwC-A) format for assembling biodiversity data continued to increase, reaching nearly three-quarters of the total records published by the end of 2013.

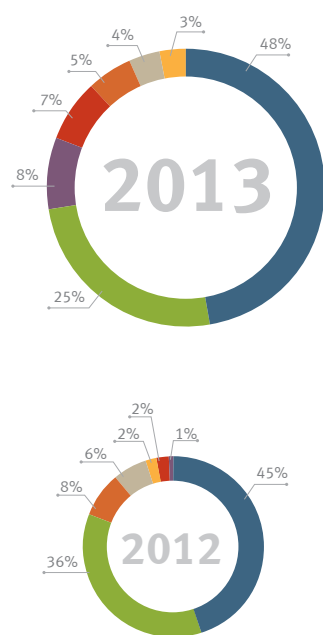
Europe and North America remain the leaders in the number of records made available through GBIF, both in terms of publishers' locations and the location of the species recorded. However, the proportion of records contributed by institutions in other regions is increasing, for example with South and Central America accounting for more than 8% by the end of 2013, compared with just 1% in 2012. Records from Asian publishers also increased substantially from 2% in 2012 to more than 7% in 2013. For specimen records, biodiversity from South and Central America accounted for nearly one-fifth of all data published through GBIF.

Institutions in the United States continued to publish by far the greatest number of records through GBIF, accounting for more than one third of all the data available via the network. However, these records comprise biodiversity observations and specimens collected from 249 countries, islands and territories. During 2013, Sweden surpassed the United Kingdom to become the country with the second-largest number of published records: its institutions published 44 million records by year's end, a single-year increase of more than 40 per cent over the country's 31 million records in 2012.

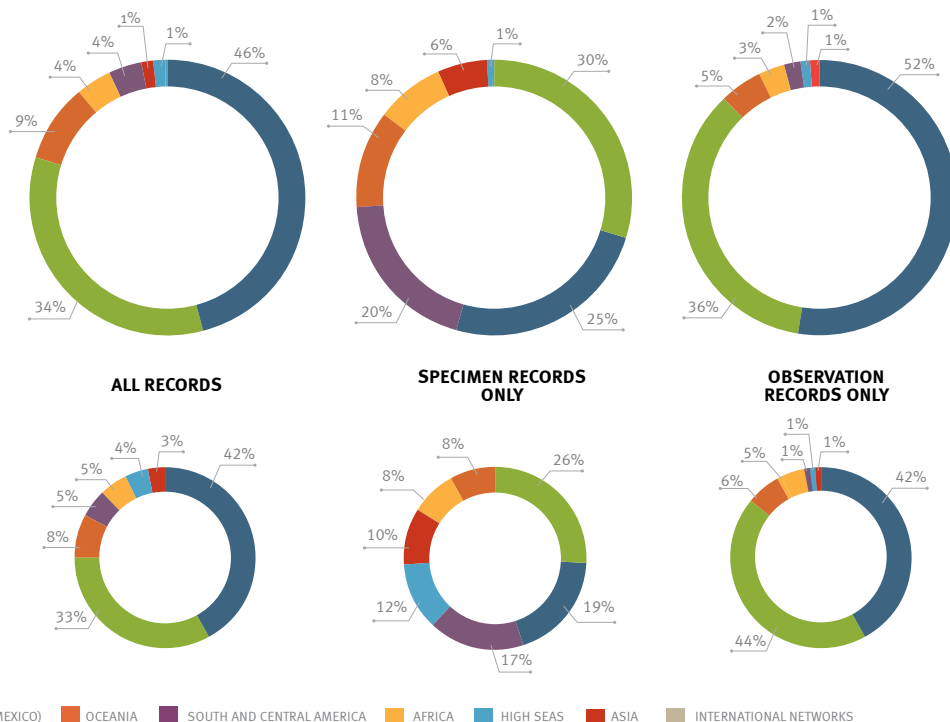
Some countries saw a drop in published records during the year, thanks to recent data-quality and processing improvements that make it easier to identify and remove duplicate records.

DATA RECORDS BREAKDOWN

BY LOCATION OF PUBLISHING INSTITUTION



BY ORIGIN OF BIODIVERSITY



■ EUROPE ■ NORTH AMERICA (INCL. MEXICO) ■ OCEANIA ■ SOUTH AND CENTRAL AMERICA ■ AFRICA ■ HIGH SEAS ■ ASIA ■ INTERNATIONAL NETWORKS

FIGURE 9. GBIF-MEDIATED OCCURRENCES BY LOCATION OF PUBLISHING INSTITUTION AND SPECIES OCCURRENCES. THE COMPARABLE BREAKDOWN FOR 2012 IS SHOWN IN THE LOWER ROW OF CHARTS

DATA BREAKDOWN BY GBIF PARTICIPANT

INDEXED OCCURRENCE RECORDS (MILLIONS)

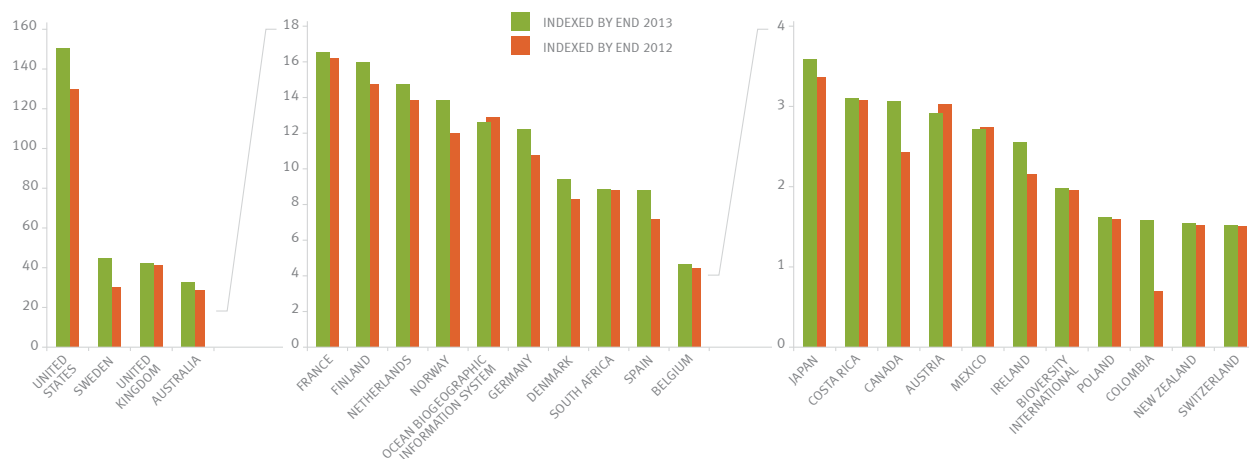


FIGURE 10. TOP 25 MOST RECORDS PUBLISHED ON GBIF.ORG, RANKED BY ENDORSING PARTICIPANT OF DATA PUBLISHERS. NOTE THAT THE TOP FOUR ARE SHOWN ON A DIFFERENT SCALE, FOLLOWED BY THE NEXT 10 AND THE LAST 11 ON DIFFERENT SCALES. FOR A FULL LIST OF DATA RECORDS PUBLISHED BY GBIF PARTICIPANTS, SEE APPENDIX 1

Developments in informatics and data publishing

Adapting the Darwin Core standard for sample data

The GBIF Secretariat convened a three-day workshop-hackathon in May with a team of experts seeking to address the challenge of adapting the Darwin Core standard (DwC) for encoding sample-based data.

GBIF will test the use of the Darwin Core Archives for publishing sample data in an upcoming EU BON project, with the goal of demonstrating that the expanded DwC standard can support the data needs and interoperability of global biodiversity networks — and the policy and decision makers that depend on them.

- **READ MORE** Workshop on sample data <http://www.standardsingenomics.org/index.php/sigen/article/view/signs.4898640>

Core type	Use cases	Extension examples
Occurrence This core includes properties related to Event, Location, Geological Context, Identification and Taxon	<ul style="list-style-type: none"> ► Specimen ► Botanical sampling event ► Bird spotting ► Oak branch with two lichens ► Whale tracking ► Camera trap ► Acoustic survey/telemetry ► Ocean acidification 	<ul style="list-style-type: none"> ► Images ► Identification history ► Sequences ► Related taxa (resource relationship) ► Measurement
Collecting Event The core includes properties related to Event and Location	<ul style="list-style-type: none"> ► Vegetarian plots ► Environmental sample ► Gut sample ► Plankton haul ► Trawl/subsample ► Towed diver survey ► Fisheries species abundance ► Checklist survey ► Fossil assemblage 	<ul style="list-style-type: none"> ► Taxon Occurrence ► Measurement ► Images ► Survey geometry

TWO POSSIBLE MODELS FOR EXPRESSING SAMPLE USE CASES IN DARWIN CORE ARCHIVES, BASED ON EITHER OCCURRENCE CORE OR A COLLECTING EVENT CORE

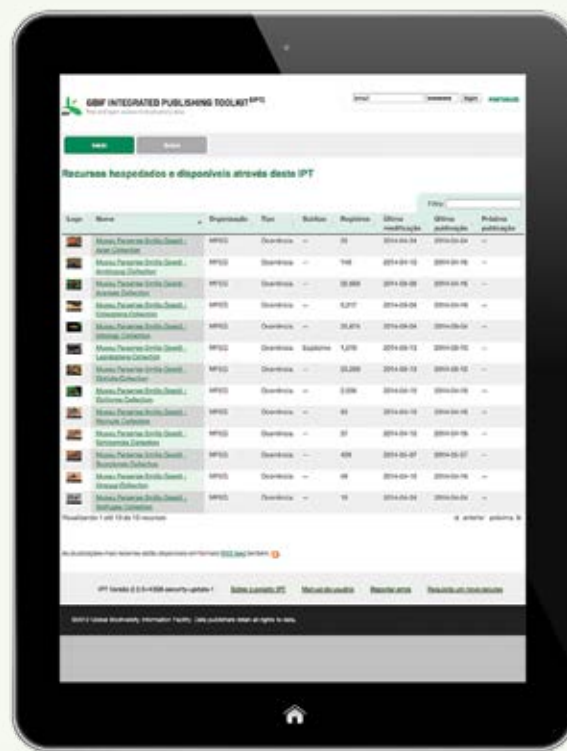
GBIF's Integrated Publishing Toolkit: Responding to user needs

2013 also brought improvements to the Integrated Publishing Toolkit (IPT), a free open-source software tool used by the GBIF network to publish and share biodiversity datasets. Key enhancements include:

- Portuguese language support, which brings the number of languages the IPT supports to five (also including French, Spanish, Traditional Chinese and English)
- interval publishing, which allows automated updates to datasets on a preset schedule
- easier CSS-style customizations of individual IPT installations
- the ability to archive each previous version of the dataset

PARTICIPANT CONTRIBUTIONS

Volunteers from the Research Center on Biodiversity and Computing at Brazil's University of São Paulo made a significant contribution to this version, providing their time and skills to translate the IPT interface into Portuguese.



INTEGRATED PUBLISHING TOOLKIT (IPT) IN PORTUGUESE

Managing and sharing biodiversity vocabularies

The GBIF Secretariat coordinated efforts in 2013 to develop a platform for developing and maintaining vocabularies used by the biodiversity data community. GBIF co-led the Vocabulary Management Task Group (VoMaG) for Biodiversity Information Standards (also known as the Taxonomic Databases Working Group, or TDWG). The group developed a report offering recommendations on topics related to the management of vocabularies and ontologies.



DARWIN CORE VOCABULARY

One recommendation urged TDWG to adopt the Semantic MediaWiki implementation at Biowikifarm and maintain it as the preferred community platform for developing and maintaining TDWG vocabularies, which led to the establishment of the TDWG Terminology Platform

GBIF's leadership extended to convening and coordinating the task group, drawing on work funded through the European Union's Seventh Framework Programme (EU FP7) project Virtual Biodiversity Research and Access Network for Taxonomy (ViBRANT).

► **READ MORE** VoMaG Task Group report
<http://www.gbif.org/resources/2246>

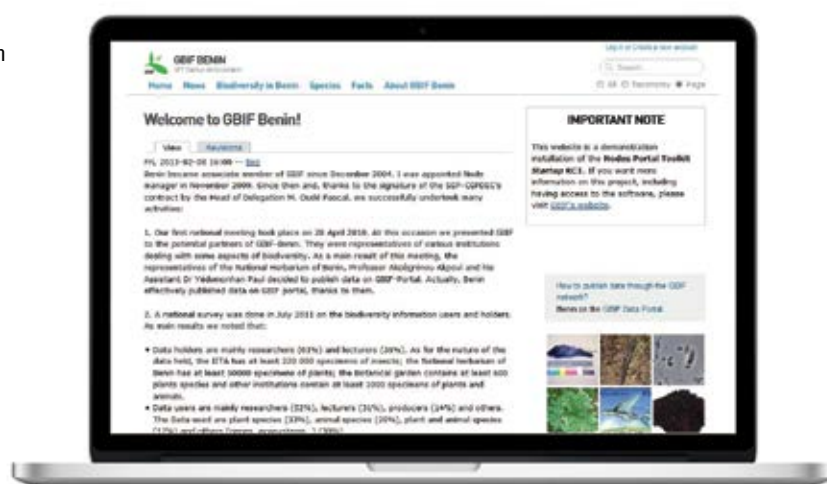
► **READ MORE** TDWG Terminology Platform
<http://terms.tdwg.org>

► **READ MORE** ViBRANT
<http://vbrant.eu>

Startup tool for biodiversity information websites

GBIF Secretariat staff collaborated with a team from the European Union Scratchpads project to develop the Nodes Portal Toolkit (NPT) Startup, a tool that targets GBIF Participants that have a limited online presence. The NPT Startup's open-source technology stack helps GBIF Participants deploy a Drupal-based website, providing rapid discovery of and access to national, regional or thematic biodiversity data.

Following the 2013 delivery of a proof-of-concept prototype, the GBIF community set up an early adoption programme that identified 10 interested GBIF Participants. They and their associated nodes are now serving as users, advisers and developers in the next phases of NPT development. Funding from the JRS Biodiversity Foundation has supported direct collaboration between the National Biodiversity Institute of Costa Rica (INBio) and GBIF Benin and led to the addition of new features to the NPT Startup. Meanwhile, open-source code, tool documentation and a how-to video are helping to transfer the technology and associated knowledge between Participants.



GBIF BENIN – NPT STARTUP DEMONSTRATION

Promoting data publishing and re-use



LARGE RED DAMSELFLY (*PYRRHOSOMA NYMPHULA*)

Encouraging and rewarding data sharing through data papers

Data papers are detailed metadata documents that describe a particular dataset or a group of datasets, published in the form of a peer-reviewed article in a scholarly journal. The primary purpose of data papers is to describe data and the circumstances of their collection, rather than to report hypotheses and conclusions. They provide an important means of bringing recognition to data holders, publicizing datasets' value to the scientific community, and assessing and controlling data quality.

This year the Secretariat directly supported three projects in Spain, Latin America and Asia aimed at encouraging the publication of biodiversity data papers. By year's end, 14 publishers of GBIF-mediated datasets had published such peer-reviewed metadata describing their holdings.¹

For the first, GBIF Spain organized a March workshop in Madrid that gathered 21 representatives from Spanish institutions publishing data through GBIF. Participants gained practical experience by producing a data paper describing the collection of Odonata (dragonflies and damselflies) from the University of Oviedo, subsequently published in the peer-reviewed journal, *ZooKeys*.²



RED DAMSELFLY (*CERAGRION TENELLUM*)



BLUE-TAILED DAMSELFLY (*ISCHNURA ELEGANS*)

TRAVANCORE TORTOISE (*INDOTESTUDO TRAVANCORICA*)

IMPATIENS PARASITICA

The Humboldt Institute is both the host of SiB Colombia, the GBIF national node, and publisher of *Biota Colombiana*, a peer-reviewed journal that seeks to disseminate scientific knowledge on Colombia's biodiversity. With the release of a special issue in late 2013, *Biota Colombiana* became the first Latin American journal to publish biodiversity data papers.³ The journal now maintains guidelines for new data paper authors, and each of the datasets described are available via GBIF.org.



BIOTA COLOMBIANA. PUBLICATION FROM INSTITUTO DE INVESTIGACIÓN DE RECURSOS BIOLÓGICOS ALEXANDER VON HUMBOLDT

The final project to receive support was developed by the Wildlife Institute of India, host of the Indian national node. A workshop with 21 participants from 10 organizations was held in June to stimulate publication of data papers, using training material developed by Spain and Colombia.

GBIF also partnered with Nature Publishing Group to support contributions from biodiversity researchers to the new open-access journal, *Scientific Data*, launching in 2014. The journal introduces a 'data descriptor' format, similar to the data paper concept, aimed at making scientifically valuable datasets more discoverable, interpretable and reusable. The editors of the new journal will work with GBIF to offer guidelines for authors to contribute to the new journal using the standard formats for sharing data and metadata through the GBIF network.

► **READ MORE** Scientific Data
<http://www.nature.com/sdata>

Science year in review

Use of GBIF-mediated data in scientific research

The Secretariat monitors and compiles peer-reviewed research papers that make use of data published through GBIF's global infrastructure. The 2013 Science Review lists more than 250 scientific papers published in 2013 that applied data drawn from across the GBIF network.

This year, GBIF enabled research across a wide range of policy areas and disciplines, such as

- ▶ marine protected area networks
- ▶ management of emerging infectious human diseases
- ▶ effectiveness of current *ex situ* conservation efforts towards wild plants most critical for food security
- ▶ how plants colonized Earth's cold-weather regions

▶ **READ MORE** Science Review 2013; <http://www.gbif.org/resources/3094>

NUMBER OF PEER-REVIEWED PUBLICATIONS

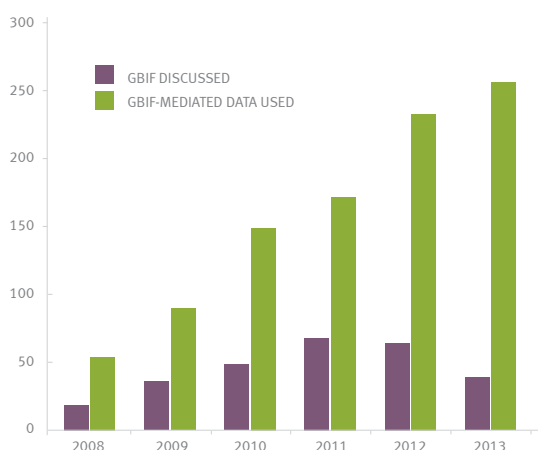


FIGURE 11: ANNUAL TOTALS OF PEER-REVIEWED PUBLICATIONS CITING GBIF AS A SOURCE OF DATA OR DISCUSSING GBIF, 2008-2013

NUMBER OF ARTICLES WITH AT LEAST ONE AUTHOR FROM THE COUNTRY.

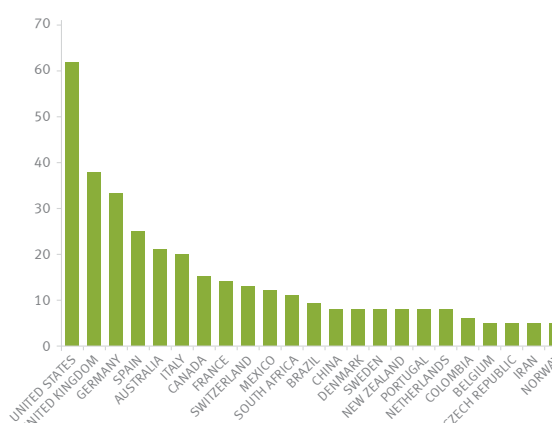


FIGURE 12: NUMBER OF PEER-REVIEWED PUBLICATIONS IN 2013 CITING USE OF GBIF-MEDIATED DATA, RANKED BY COUNTRY ACCORDING TO AFFILIATION OF AUTHORS. TOP 23 COUNTRIES SHOWN

Modelling future climate impacts on today's common species

A paper published in *Nature Climate Change* reviewed nearly 50,000 globally widespread and common species to find that, without limits to greenhouse gas emissions, more than half of the plants and over a third of animal species could lose more than 50 per cent of their range by 2080. However, it further concluded that quick action to mitigate climate change could reduce those losses by 60 per cent and provide species an additional 40 years to adapt to new climatic conditions.

The researchers obtained data through GBIF—approximately 170 million occurrence records of plants, mammals, birds, reptiles and amphibians—published by some 200 different institutions around the world.

The findings expect plants, reptiles and especially amphibians to face the greatest risks from climate change impacts, in part due to particularly unsuitable habitat changes in Sub-Saharan Africa, Central America, Amazonia and Australia. Major losses of plant species are also projected for North Africa, Central Asia and southeastern Europe.

Citation: Warren, R., VanDerWal, J., Price, J., Welbergen, J. A., Atkinson, I., *et al.* (2013). Quantifying the benefit of early climate change mitigation in avoiding biodiversity loss. *Nature Climate Change*, 3(5), 1–5. doi:10.1038/nclimate1887

How diverse are species used in patents?

A team of researchers from the United Kingdom sought to learn whether the species used for human innovation, as reflected in the patent system, truly reflect the diversity of life on Earth.

Using web services from GBIF, the authors sought to match species names mentioned in 11 million patent documents against 6 million known scientific names. These patents ranged in use from pharmaceuticals and traditional medicine to genetic engineering, foods and biocides. The study also used GBIF-mediated occurrence data to map the global distribution of species used in patents by country and taxonomic kingdom.

This analysis identified more than 76,000 species names from 24,000 genera referenced in 767,000 patent documents. The result represents a narrow segment of biodiversity—just four per cent of described species and less than one per cent of all species predicted to exist. The researchers conclude that, based on the principles of equitable sharing of benefits established by the Convention on Biological Diversity (CBD), the interests of humanity warrant opening up a broader spectrum of biodiversity to research and development.

Citation: Oldham, P., Hall, S., & Forero, O. (2013). Biological diversity in the patent system. *PLoS ONE*, 8(11), e78737. doi:10.1371/journal.pone.0078737

Filling data gaps for conservation management

A team of Spanish researchers examined ways in which species data published and accessed through GBIF can supplement other sources of information in the development of conservation strategies. Their study focussed on the network of UNESCO Biosphere Reserves in Mexico, which were created with the aim of reconciling biodiversity conservation with sustainable use of the resources within their boundaries.

After assessing the records of vertebrate species in the management plans for Mexico's 41 Biosphere Reserves, the researchers compared them with vertebrate records for these areas in both GBIF network data and nearly 200 published research papers. The GBIF-mediated data provided nearly 70,000 records for 1,776 vertebrate species occurring within the reserves.

The study found that while the existing management plans recorded over 80 per cent of the species identified from all three sources, the combination of GBIF-mediated data and the published literature filled significant gaps in knowledge. For example, more than 200 species absent both from the management plans and published literature were found only through GBIF. The information gaps for threatened species were even more striking, with 50 per cent of threatened freshwater fishes missing from management plans.

The research findings conclude that consulting alternative resources for species information like GBIF and scientific literature may improve management of Biosphere Reserves.

Citation: Pino-Del-Carpio, A., Ariño, A. H., Villarroya, A., Puig, J., & Miranda, R. (2013). The biodiversity data knowledge gap: assessing information loss in the management of Biosphere Reserves. *Biological Conservation*. doi:10.1016/j.biocon.2013.11.020



HUMMINGBIRD AND HUMMINGBIRD MOTH (*MACROGLOSSUM STELLATARUM*)

GBIF Science Awards in 2013

Ebbe Nielsen Prize honours Miguel Bastos Araújo for research innovation

Since 2001, GBIF's Ebbe Nielsen Prize has recognized innovative and outstanding research that advances the integration of biodiversity science and informatics. Miguel Bastos Araújo, a scientist from Portugal, received the 2013 prize for his design of large-scale experiments that seek to uncover the processes behind patterns of species distribution.

The GBIF Science Committee highlighted the groundbreaking nature of Araújo's research in deploying biodiversity informatics to model and forecast environmental phenomena, particularly the effects of different climate change scenarios on regional and global patterns of biodiversity. The €30,000 prize will support development of an 'Ecotron' experimental facility where Araújo and his research partners can test predictions on the effects of large-scale environmental change on the combination of species found in different locations—an advance especially useful in helping to inform conservation decision-making.

Araújo principally serves as research scientist at the Spanish Research Council's National Museum of Natural Sciences, and also holds visiting professorships at the University of Évora, Portugal, and the University of Copenhagen.



MIGUEL BASTOS ARAÚJO, WINNER OF THE 2013 EBBE NIELSEN PRIZE

Young Researchers Awards

Emma Gomez-Ruiz and Nathan Ranc are the recipients of GBIF's 2013 Young Researchers Awards. Each received €4,000 through the award scheme, which fosters innovative research and discovery by graduate students at universities in countries participating in the GBIF network.



WINNERS OF THE 2013 YOUNG RESEARCHERS AWARD

Gomez-Ruiz, a Mexican PhD student at Texas A&M University in the United States, plans to map the 'nectar corridor'—the migratory path of the endangered Mexican long-nosed bat (*Leptonycteris nivalis*)—using models derived from GBIF-mediated data. The endangered nectar-feeding bats serve as important pollinators for several plant species as they follow the agave blooms from central Mexico to the southern United States during their annual migration. Through her research, Gomez-Ruiz aims to improve understanding of the corridor, highlight the potential effects of climate change, and support efforts to protect the species.

► **READ MORE** *Leptonycteris nivalis* species page
<http://www.gbif.org/species/2433317>

Ranc, a French master's student at Stockholm University in Sweden, assessed biases in GBIF-mediated data by comparing records for 269 mammal species in the Mediterranean region. Leveraging his independently developed database, Ranc is working with La Sapienza University of Rome to design data mobilization strategies that identify data-deficient species and areas.

COMMON BEAN (*PHASEOLUS VULGARIS*)ELEPHANT HAWKMOTH (*DEILEPHILA ELPENOR*)SHENANDOAH SALAMANDER (*PLETHODON SHENANDOAH*)

2013 Science Symposium

In October, GBIF hosted its annual science symposium—entitled ‘GBIF at work – advancing biodiversity science for a sustainable society’—in association with the 20th meeting of its Governing Board in Berlin, Germany (see p.20).

An international line-up of speakers highlighted their use of GBIF-mediated data.

- ▶ Miguel Bastos Araújo (Portugal), winner of the 2013 Ebbe Nielsen Prize (see above), delivered the keynote presentation describing the influence of global climate change on larger patterns of biodiversity.
 - ▶ **WATCH keynote** <http://vimeo.com/78160183>
 - ▶ **VIEW presentation** <http://www.gbif.org/resources/2973>
- ▶ Michael Diepenbroeck (Germany) outlined the International Council of Science’s (ICSU) PANGAEA system for acquiring and serving diverse data from the geosciences.
 - ▶ **VIEW presentation** <http://www.gbif.org/resources/2974>
- ▶ Julián Ramírez-Villegas (Colombia) used large volumes of GBIF-published data to examine conservation strategies under present and future climate regimes for plants, particularly crop wild relatives of domesticated food species.
 - ▶ **VIEW presentation** <http://www.gbif.org/resources/2975>
- ▶ Rosane Collevatti (Brazil) studied tree records from the past 12,000 years to show how species in the savannas of the American tropics retreated into a patchwork distribution, whereas those in seasonally dry forests saw their ranges expand.
 - ▶ **VIEW presentation** <http://www.gbif.org/resources/2976>

- ▶ Lilliana Ballesteros-Mejia (Colombia) spoke about data resolution and knowledge gaps in the distribution of the world’s plant and animal species, such as those based on collections housed in museums and herbaria and mapped from GBIF-enabled records.

▶ **VIEW presentation**
<http://www.gbif.org/resources/2977>

- ▶ Kenneth Feeley (United States) demonstrated that despite their disparate habitats, tropical plant species in the Andes, Costa Rica and the Amazon show climate-driven distributional shifts and warned of rapid rates of biodiversity loss under future scenarios.

▶ **VIEW presentation**
<http://www.gbif.org/resources/2978>



MICHAEL DIEPENBROECK AT GBIF 2013 SCIENCE SYMPOSIUM

Governance

Highlights from the GBIF Governing Board meeting

The Museum für Naturkunde in Berlin, Freie Universität Berlin, and Botanic Garden and Botanical Museum Berlin-Dahlem hosted the 20th meeting of the GBIF Governing Board (GB20) in Berlin, Germany, from 8 to 10 October.

The Governing Board elected Peter Schalk as its new chair. The managing director of the ICT sector at Naturalis Biodiversity Center in Leiden, Netherlands, Schalk is one of the founders of Species 2000, an initiative that generates a validated checklist of the world's species known as the Catalogue of Life. Schalk replaces Joanne Daly, the outgoing chair, who completed her second two-year term.

The Board also named two new committee chairs. Roderic Page, professor of taxonomy at the University of Glasgow, United Kingdom, will lead the Science Committee, while Walter Berendsohn of the Botanical Garden and Botanical Museum Berlin-Dahlem will chair the Budget Committee.

New work programme approved

Under the new work programme agreed at GB20, GBIF will directly address longstanding concerns about the quality of biodiversity data published through the network. The major programme themes include data quality and persistence, an emphasis on mobilizing new data, and improved information resources. The activities outlined for 2014 are part of a three-year work programme aligned with the main imperatives of the 2012-2016 Strategic Plan to advance the content, the informatics and the engagement that underpin GBIF's services to science and society.

Training and meeting to build stronger nodes

The GBIF Nodes Committee held its 12th global meeting and associated activities, prior to GB20. The committee includes representatives from all the Participant nodes, which are responsible for coordinating data mobilization and use within their countries and organizations.

The events kicked off on 4 October with a two-day interactive training course attended by 59 participants from 40 countries and organizations. Using a curriculum based on recommendations received from nodes in 2011 and 2012, the course focussed on node management, promotion of data use and on new tools developed by GBIF.

On 6 October, the Nodes Committee started a two-day meeting that shared experiences on several key topics for nodes: addressing data quality, nodes portal developments, development plans for nodes and a collaborative communication platform.

Feedback from the events indicated satisfaction with the training course's content, methods and interactions while highlighting priority areas for improvement.

A joint meeting between heads of delegation from GBIF Participant countries and node managers from within each region discussed regional strategies and focus areas, the second such meeting organized as part of the Governing Board events.

- **READ MORE** Report on the training course
<http://community.gbif.org/pg/file/read/38195/>
- **READ MORE** Meeting evaluation
<http://community.gbif.org/pg/file/read/39963/evaluation-report-12thglobal-nodes-meeting>

12TH GLOBAL MEETING OF GBIF NODES COMMITTEE, BREAKOUT SESSION



“This step represents Israel’s commitment to global efforts in biodiversity conservation and management.”

– Yehoshua Shkedy, chief scientist, Israel Nature and Parks Authority

Expanding the GBIF community

GBIF welcomed three new Participants in 2013.

The state of Israel joined GBIF as an Associate Participant, with the Israel Nature and Parks Authority (INPA) signing the voluntary Memorandum of Understanding that brings Participants into the GBIF network. Countries joining GBIF as associates undertake to move as quickly as possible, with a maximum of five years, towards voting participation, which involves a financial contribution towards the global infrastructure and confers rights to vote on the priorities and budget of the network.

“This step represents Israel’s commitment to global efforts in biodiversity conservation and management,” commented Yehoshua Shkedy, chief scientist at INPA. Israel has made progress in coordinating its biodiversity data with the development of BioGIS, the Israel Biodiversity Website, which integrates biodiversity data from different institutes. BioGIS also provides advanced tools for querying, analysing, modelling and visualizing patterns of species distributions.

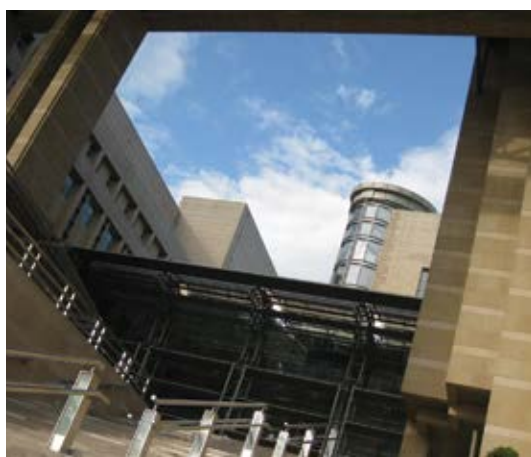
Two Other Associate Participants complete the trio of newcomers. The Chinese Academy of Sciences (CAS), an influential national academy for the natural sciences, is active across many international and regional biodiversity informatics activities, including a role in establishing the Asia Biodiversity Conservation and Database Network (ABCDNet).

VertNet, a network based in the United States and funded by the National Science Foundation, seeks to provide open online access to vertebrate natural history collections and observations. It currently helps to mobilize collections from 38 countries.



NEGUEV, ISRAEL

CHINESE ACADEMY OF SCIENCE LIBRARY, BEIJING, CHINA



GAD NATURE RESERVATION, ISRAEL



Supporting policy and decision-making

The Global Biodiversity Informatics Outlook

The GBIF Secretariat oversaw the October publication of the Global Biodiversity Informatics Outlook (GBIO). This initiative, authored by specialists from 14 institutions around the world, aims to coordinate global efforts and funding to deliver the best possible information about life on Earth, and our impacts upon it.

The GBIO develops ideas and priorities identified at the Global Biodiversity Informatics Conference, held in Copenhagen in 2012 and featured in GBIF's 2012 *Annual Report*. It sets out a framework to harness the immense power of information technology and an open data culture to gather unprecedented volumes of evidence about biodiversity, helping to inform better decisions.



The document and website invite policymakers, funders, researchers and others to unite around four key focus areas where progress is needed:

- **Culture:** promoting practices and infrastructure for sharing data, using common standards and persistent archives, backed up by strong policy incentives and a community of willing specialists
- **Data:** addressing the need to transform all data about species, past and present, into usable and accessible digital formats
- **Evidence:** organizing and assessing data from all sources to provide clear, consistent views giving them context

- **Understanding:** building models from recorded measurements and observations to support data-driven research and evidence-based planning

The GBIO has been picked up by a number of institutions including the Convention on Biological Diversity (see below) as a means of focusing attention on the steps needed to improve delivery of biodiversity information.

► **READ MORE** <http://biodiversityinformatics.org>

Convention on Biological Diversity

During 2013, government experts working through the Convention on Biological Diversity (CBD) placed strong emphasis on the need for more accessible data to achieve the Aichi Biodiversity Targets, agreed in 2010 as part of a global strategic plan to tackle biodiversity loss.

The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA), meeting in Montreal, Canada in October, identified 'more accessible, affordable, comprehensive, reliable and comparable information streams' among the key needs related to the implementation of the Strategic Plan for Biodiversity 2011-20.



PRICKLY PEAR (*OPUNTIA* SP.)



CITRUS ROOT WEEVIL (*DIAPREPES ABBREVIATES*)

“I would like to suggest that we transform this into a framework for a continuous partnership or initiative to help the implementation of Aichi Target 19 [on enhancing and sharing biodiversity knowledge] and benefiting implementation of all the other targets.”

– Braulio Dias Executive Secretary, Convention on Biological Diversity

In its meeting report, SBSTTA called on the CBD Executive Secretary Braulio Dias to work with GBIF and others to build capacity at regional and national levels for mobilization, management and analysis of biodiversity data, information and knowledge.

In his opening statement to the meeting, Dias called for ‘continuous partnership’ to enhance access to biodiversity data, following the framework of the Global Biodiversity Informatics Outlook (GBIO – see previous section).

The CBD also designated GBIF Secretariat as the focal point for the Global Invasive Alien Species Information Partnership. This partnership brings together a number of organizations focused on meeting the information needs of governments to achieve Aichi Biodiversity Target 9, aimed at addressing the threats to biodiversity from invasive alien species.



HUMMINGBIRD (TROCHILIDAE)



RIVER RAT (MYOCASTOR COYPUS)



HARLEQUIN LADYBIRD (HARMONIA AXYRIDIS)

Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)

The new global body aiming to bridge the divide between science and policy on biodiversity and ecosystem services has set out the details of its first five years of work. IPBES held two plenary meetings during 2013, the first in Bonn, Germany in January, and the second in Antalya, Turkey in December.

The 2014-18 work programme will include a number of thematic assessments, including one on pollinators and one on invasive species, as well as regional assessments and a global assessment. Other deliverables include work on capacity building, knowledge generation and policy-relevant tools.

In consultation with its Participants, the GBIF Secretariat contributed a number of proposals for the IPBES work programme. They focussed on the role the GBIF community and infrastructure can play in supporting the data and information needs of the new platform.

In particular, GBIF has offered to provide a supporting role for the IPBES task force on knowledge and data, which among other tasks will be developing a data and information management plan for the platform.

Partnerships and collaborations

GBIF to assist in development of platform for European observation data

GBIF is part of a team creating the European Biodiversity Observation Network (EU BON), a proposed continent-wide component of the Group on Earth Observation's Biodiversity Observation Network (GEO BON). EU BON will offer an efficient means of collecting, analyzing and providing observation data that better informs national and international policymaking and management. The project will result in an integrated European biodiversity portal, a roadmap for handling citizen science data and a framework for open data publishing. GBIF expects to help improve data standards and interoperability, provide a metadata registry and catalogue, and connect GBIF-mediated data via web services.

The Museum für Naturkunde in Berlin is leading the 54-month EU-funded project with support from 30 partners in 18 countries.

GBIF to contribute to portal on marine data

The GBIF Secretariat received funding to support 'biology 2', a project launched by the European Marine Observation and Data Network (EMODNet). The work will focus on developing a marine species traits vocabulary and using GBIF's Integrated Publishing Toolkit (IPT) to mobilize marine data for the Black Sea and Mediterranean regions.

World Flora Online

GBIF is participating in the World Flora Online (WFO) Technical Working Group with partners including the Missouri Botanical Garden, Royal Botanic Gardens Kew, Royal Botanic Garden Edinburgh, and the New York Botanical Garden. The WFO responds to Target 1 of the Convention on Biological Diversity's Global Strategy for Plant Conservation, which calls for "a widely accessible working list of known plant species as a step towards a complete world flora". GBIF will design the WFO's technical infrastructure along with a schema using Darwin Core Archives to publish world floras.

► LEARN MORE

CBD's Global Strategy for Plant Conservation
<https://www.cbd.int/gspc/>



SLENDER PHLOX (*MICROSTERIS GRACILIS*)



FLYING GURNARD (*DACTYLOPTERUS VOLITANS*)

Building capacity for data sharing

GBIF's mentoring programme has helped share expertise and experience between Participants since 2003. Three projects involving eight countries received direct support in 2013 to build capacity for publishing and use of biodiversity information.

2013 Mentoring: Colombia-Brazil

The Information System for Colombian Biodiversity (SiB Colombia), hosted by the Humboldt Institute in Bogotá, hosted a workshop and a series of hands-on sessions on web design, mapping tools and data quality management for its counterpart SiB Brazil, which resides in the National Laboratory for Scientific Computing (LNCC) in Petrópolis, Brazil. Soon afterwards, SiB Brazil installed GBIF's Integrated Publishing Toolkit (IPT) and began developing its own data portal with source code from SiB Colombia.

► LEARN MORE

SIBBr: <http://www.sibbr.gov.br>

SiB Colombia <http://www.sibcolombia.net/>

2013 Mentoring: Belgium-Togo-Mauritania

GBIF Belgium is helping Participant nodes in Togo and Mauritania to improve their data publishing capacity and to deploy biodiversity information websites for both countries. The partners are exploring the use of GBIF's Nodes Portal Toolkit Startup to stand up two new national data portals. 2014 workshops in Lomé, Togo, and Nouakchott, Mauritania, will focus on data publishing and developing national biodiversity information websites.

2013 Mentoring: Spain-France-Portugal

Three European GBIF nodes will exchange their expertise in different areas, for mutual benefit. Planned activities for 2014 include sharing experience on using a crowd-sourced website to digitize botanical specimen labels; implementing e-learning platforms in France and Portugal; providing training on data papers; and collaborating on data visualization and data quality tools.

2012 Mentoring: Japan-Indonesia

GBIF Japan and the Indonesian Institute of Sciences (LIPI), host of the Indonesian GBIF node, have developed a road map establishing a national biodiversity information system and a work programme for the Indonesian Biodiversity Information Facility (InaBIF).

GBIF Japan provided Indonesian government agencies and research centres with staff training in data publishing to assist in establishing a professional network to manage the country's biodiversity information.

2012 Mentoring: Australia-Costa Rica

The Atlas of Living Australia (ALA) has supported the efforts of Costa Rica's CRBio (the national node) to define a national strategy and action plan for publishing biodiversity data. The collaboration has also helped recruit new in-country data holders to CRBio. A training workshop brought in experts from CONABIO (Mexico), the University of São Paulo and GBIF Spain.

The workshop led directly to the registration of two new data publishers—the Costa Rica Bird Observatories and Laboratorio de Recursos Naturales y Vida Silvestre—and also cemented funding from the Costa Rican National Scientific and Technical Research Council (CONICET) for implementing CRBio's data portal.

► LEARN MORE

Costa Rica Bird Observatories

<http://www.gbif.org/publisher/6ae2738e-361d-4cb1-9a57-b6a63defe060>

Laboratorio de Recursos Naturales y Vida Silvestre

<http://www.gbif.org/publisher/7aabc1d3-a2c5-4e57-9082-8a5d5f35e7d2>

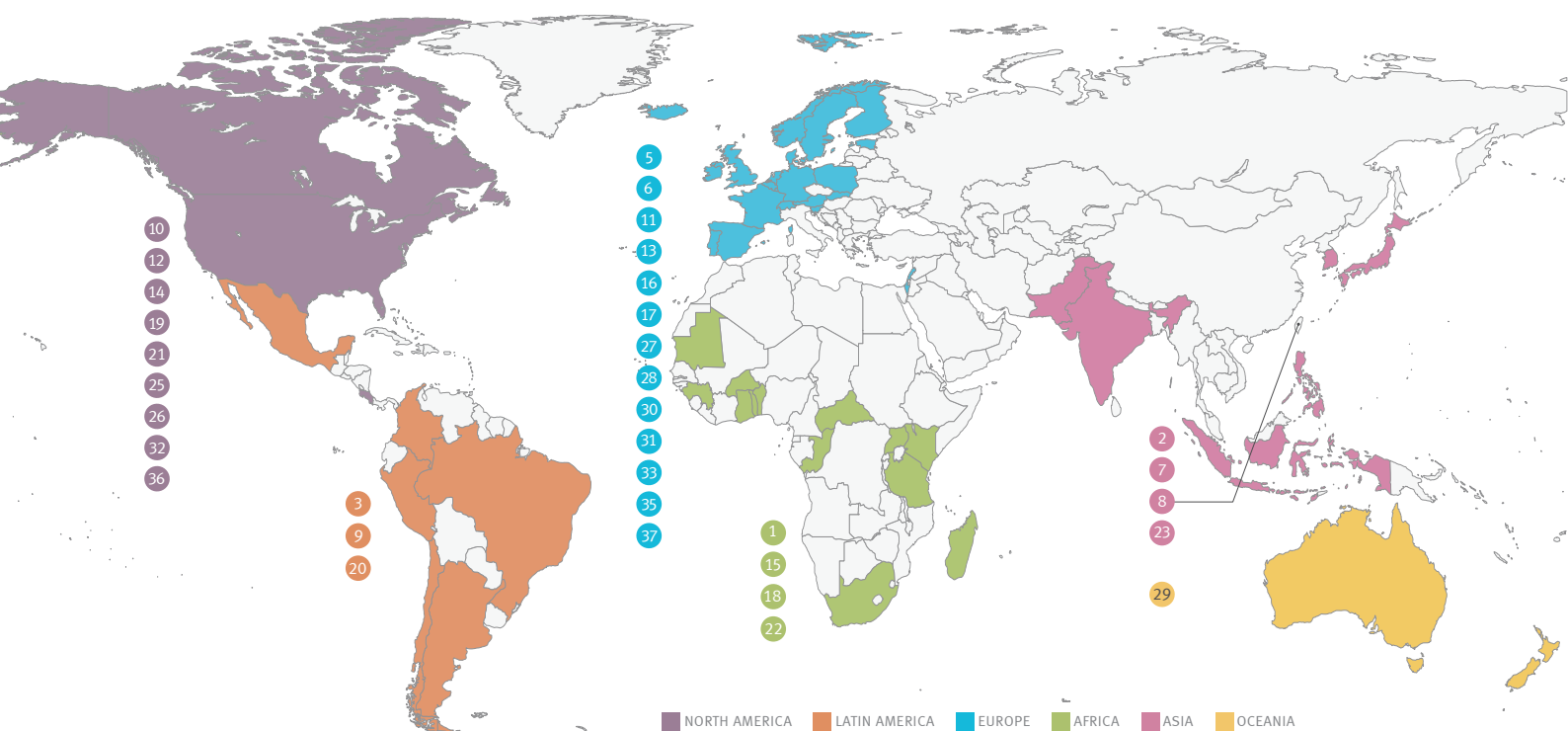
2012 Mentoring: ICLEI-SANBI

With the help of the South African Biodiversity Information Facility (SABIF), ICLEI – Local Governments for Sustainability is now a functional GBIF node, having installed GBIF's Integrated Publishing Toolkit (IPT) to publish its data. In 2013, 24 African biodiversity professionals gathered for training on GBIF tools and infrastructure and presentations on uses of biodiversity data in climate change research at a workshop of the Local Climate Solutions for Africa Congress, held in Dar es Salaam, Tanzania.

GBIF's regional approach

With the growing complexity of the GBIF network, the Secretariat encourages interaction between nodes within each of six administrative regions. Working together, the nodes from each region develop and articulate priorities that are then coordinated through the Nodes Steering Group (NSG). Formally established by the Governing Board in 2010, the NSG consists of six regional nodes representatives and three chairs of the Nodes Committee. Since 2008, GBIF core funds have supported more than 20 formal regional priority- and strategy-development meetings.

GBIF REGIONS: NATIONAL PARTICIPANTS AND ASSOCIATED ORGANIZATIONS



Non-country Participants

- | | | | |
|---|---|---|---|
| 1. ALBERTINE RIFT CONSERVATION SOCIETY | 12. DISCOVER LIFE | 22. INTERNATIONAL CENTRE FOR INSECT PHYSIOLOGY AND ECOLOGY (ICIPE) | 31. SOCIETY FOR THE MANAGEMENT OF ELECTRONIC BIODIVERSITY DATA (SMEBD)* |
| 2. ASEAN CENTRE FOR BIODIVERSITY (ACB) | 13. DIVERSITAS | 23. INTERNATIONAL CENTRE FOR INTEGRATED MOUNTAIN DEVELOPMENT (ICIMOD) | 32. SOCIETY FOR THE PRESERVATION OF NATURAL HISTORY COLLECTIONS (SPNHC) |
| 3. BIONET-ANDINONET | 14. ENCYCLOPEDIA OF LIFE (EOL) | 24. INTERNATIONAL LONG TERM ECOLOGICAL RESEARCH (ILTER)* | 33. SPECIES 2000 |
| 4. BIONET-INTERNATIONAL | 15. ENDANGERED WILDLIFE TRUST (EWT) | 25. NATURAL SCIENCE COLLECTIONS ALLIANCE (NSCA) | 34. TAXONOMIC DATABASES WORKING GROUP (TDWG)* |
| 5. BIODIVERSITY INTERNATIONAL | 16. ETI BIOINFORMATICS | 26. NATURESERVE | 35. UNITED NATIONS ENVIRONMENT PROGRAMME – WORLD CONSERVATION MONITORING CENTRE (UNEP-WCMC) |
| 6. BOTANIC GARDENS CONSERVATION INTERNATIONAL (BGCI) | 17. EUROPEAN ENVIRONMENT AGENCY (EEA) | 27. NORDIC GENETIC RESOURCE CENTER (NORDGEN) | 36. VERTNET |
| 7. CHINESE ACADEMY OF SCIENCES (CAS) | 18. ICLEI - LOCAL GOVERNMENTS FOR SUSTAINABILITY (ICLEI) | 28. OCEAN BIOGEOGRAPHIC INFORMATION SYSTEM (OBIS) | 37. WILDSCREEN |
| 8. CHINESE TAIPEI | 19. INTEGRATED TAXONOMIC INFORMATION SYSTEM (ITIS) | 29. PACIFIC BIODIVERSITY INFORMATION FORUM (PBIF) | 38. WORLD FEDERATION FOR CULTURE COLLECTIONS (WFCC) |
| 9. CIENCIA Y TECNOLOGÍA PARA EL DESARROLLO (CYTED) | 20. INTER-AMERICAN BIODIVERSITY INFORMATION NETWORK (IABIN) | 30. SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH (SCAR) | |
| 10. CONSORTIUM FOR THE BARCODE OF LIFE (CBOL) | 21. INTERNATIONAL BARCODE OF LIFE PROJECT (IBOL) | | |
| 11. CONSORTIUM OF EUROPEAN TAXONOMIC FACILITIES (CETAF) | | | |

* virtual networks with no fixed headquarters

Benefits of GBIF's regional approach include:

- ▶ Maintaining and increasing formal participation by including attendees from countries outside the current GBIF membership
- ▶ Focusing data mobilization, use and application at regional and global scales contributing to broader international and intergovernmental scales such as CBD and IPBES
- ▶ Coordinating and catalysing activity around funding and the development of tools and standards, thereby increasing efficiency and overall benefit



3RD GBIF AFRICA REGIONAL NODES MEETING, JULY 2012, KIGALI, RWANDA

Regional analysis of data

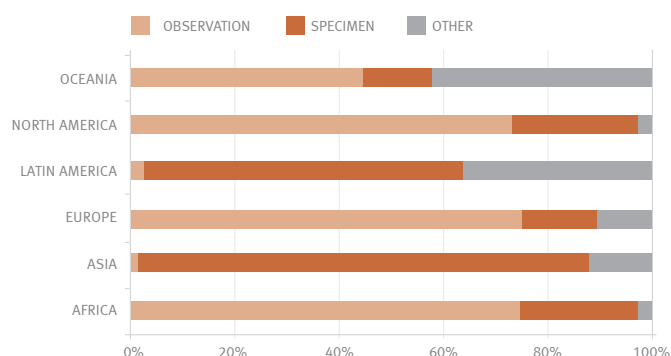


FIGURE 13. OCCURRENCE RECORDS PUBLISHED BY REGIONAL INSTITUTIONS BY BASIS OF RECORD (OBSERVATION, SPECIMEN, AND OTHER)

Analysis of GBIF-mediated data at regional levels shows some interesting and important differences. While data publishing is increasing across all regions, the relative proportion of observation and specimen records (fig.14) varies considerably, indicating regions that could benefit from targeted data mobilization.

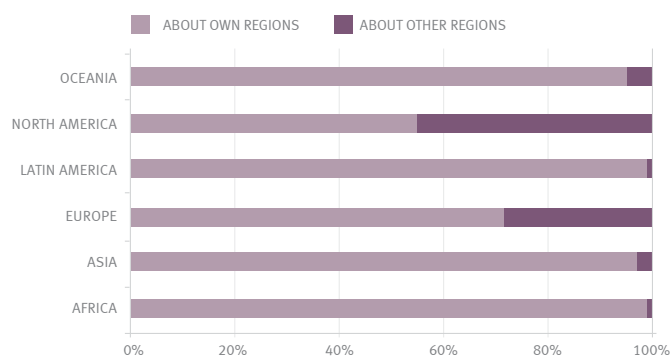


FIGURE 14. DATA PUBLISHED FROM EACH GBIF REGION, WITH PERCENTAGES RELATING TO BIODIVERSITY WITHIN THE REGION, AND TO BIODIVERSITY FROM OUTSIDE THE REGIONS

While the greatest concentrations of biodiversity are found in developing countries, the largest natural history collections are located in developed countries. Figure 15 shows the importance that digitization efforts in North America and Europe have in 'repatriating' data to their countries of origin.

GBIF in Africa



2013 GBIF Africa
Regional Nodes Meeting
16-18 April 2013
Pretoria, South Africa

Regional mission: Through the African Regional Biodiversity Information Coordination Mechanism, the African Nodes strive to become the data-science interface for this mega-diverse continent, in support of the implementation of the Africa's Science and Technology Consolidated Plan of Action of the African Union, particularly the programme cluster I on biodiversity, biotechnology, and indigenous knowledge.

REGIONAL HIGHLIGHTS IN 2013

TRAINING DATA USE NEWS

PRIMARY BIODIVERSITY RECORDS (MILLIONS)

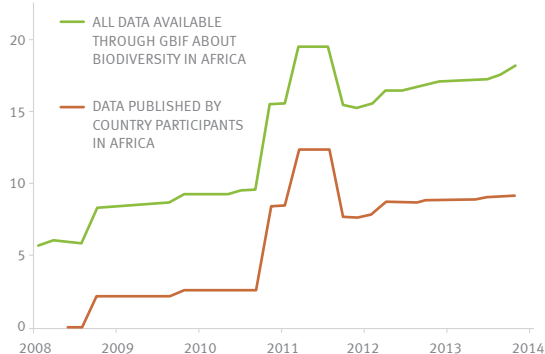


FIGURE 16. TREND IN DATA RELATING TO AFRICA

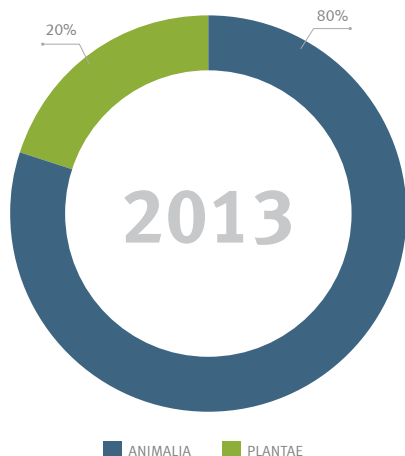


FIGURE 17. DATA PUBLISHED BY GBIF PARTICIPANTS IN AFRICA BY KINGDOM

SENEGAL: Capacity-building workshop for Global Taxonomy Initiative (March)
Location: Dakar
Organizers: CBD, Government of Senegal, Muséum National d'Histoire Naturelle and GBIF
Funder: Government of Japan

CONGO BASIN: Using GBIF-mediated data on 11 mammals implicated as reservoirs of monkeypox virus, researchers modeled potential combined impacts of climate and land-use change on this emerging infectious disease affecting people in tropical Africa.⁴



AFRICAN PORCUPINE FAMILY (*HYSTRIX CRISTATA*)

KENYA: Biodiversity data cleaning and data publishing training course (February)
Location: Nairobi
Organizer: ICIPE
Partners: ARCOS, Kenya, Republic of Congo, South Africa, Tanzania and Uganda
Funder: JRS Biodiversity Foundation

TANZANIA: Training for local government staff as part of the 2013 Local Climate Solutions Congress (October)
Location: Dar es Salaam
Organizer: ICLEI – Local Governments for Sustainability

ALBERTINE RIFT: The Albertine Rift Conservation Society (ARCOS) launched a new regional portal. ARBMIS – the Albertine Rift Biodiversity Monitoring and Information System – combines species and GIS data, publications and multimedia to provide partners and stakeholders with a common information-sharing resource for effective biodiversity monitoring.



MOUNT GAHINGA AND MOUNT MUHABURA, ON THE RWANDA/UGANDA BORDER

MADAGASCAR: Data digitization training (August)
Location: Mahajanga
Organizers: Madagascar Biodiversity Information Facility (MadBIF) and the Madagascar Biodiversity Network (REBIOMA)

SOUTH AFRICA: The South African National Biodiversity Institute (SANBI) signed an MOU with the University of the Western Cape to fund two postdoctoral fellowships intended to kickstart development of a research hub for biodiversity information management. This first step aims to meet a need for research and field skills among African nations making increased efforts to understand and monitor biodiversity.



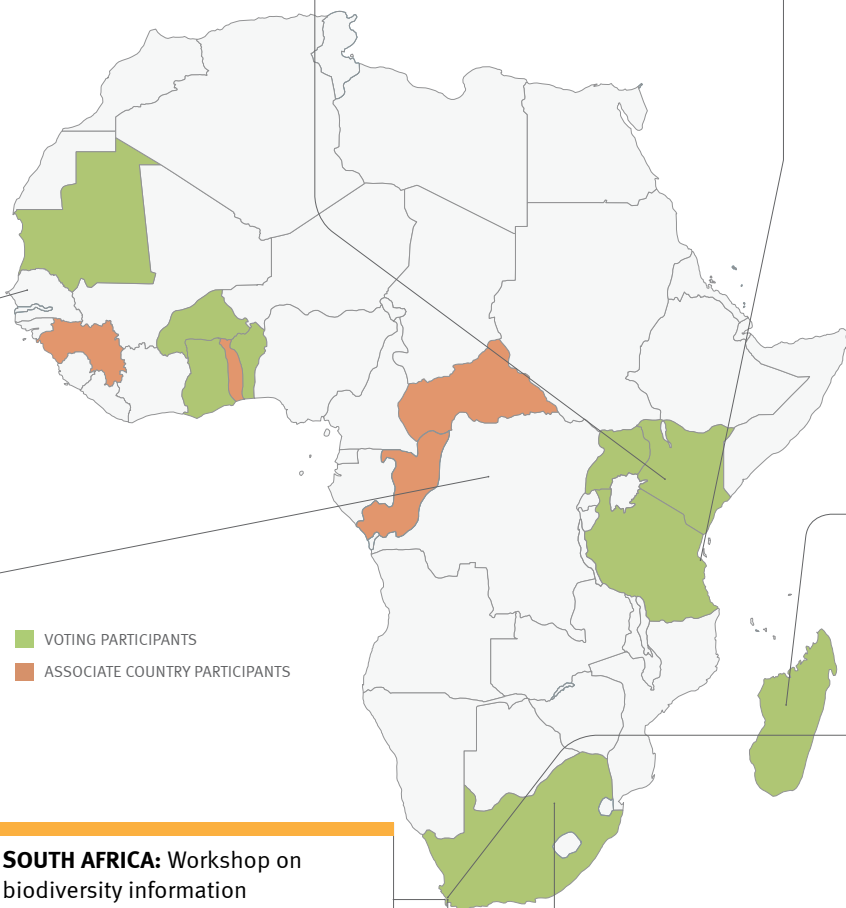
UWC CENTRAL CAMPUS ENTRY

SOUTH AFRICA: Workshop on biodiversity information architecture (February)
Location: Cape Town
Organizer: SANBI

SOUTH AFRICA: Workshop on using R for species distribution modelling (July)
Location: Cape Town
Organizer: SABIF
Funder: JRS Biodiversity Foundation

SOUTH AFRICA: Biodiversity georeferencing training (June)
Location: Pretoria
Organizer: SABIF
Funder: JRS Biodiversity Foundation

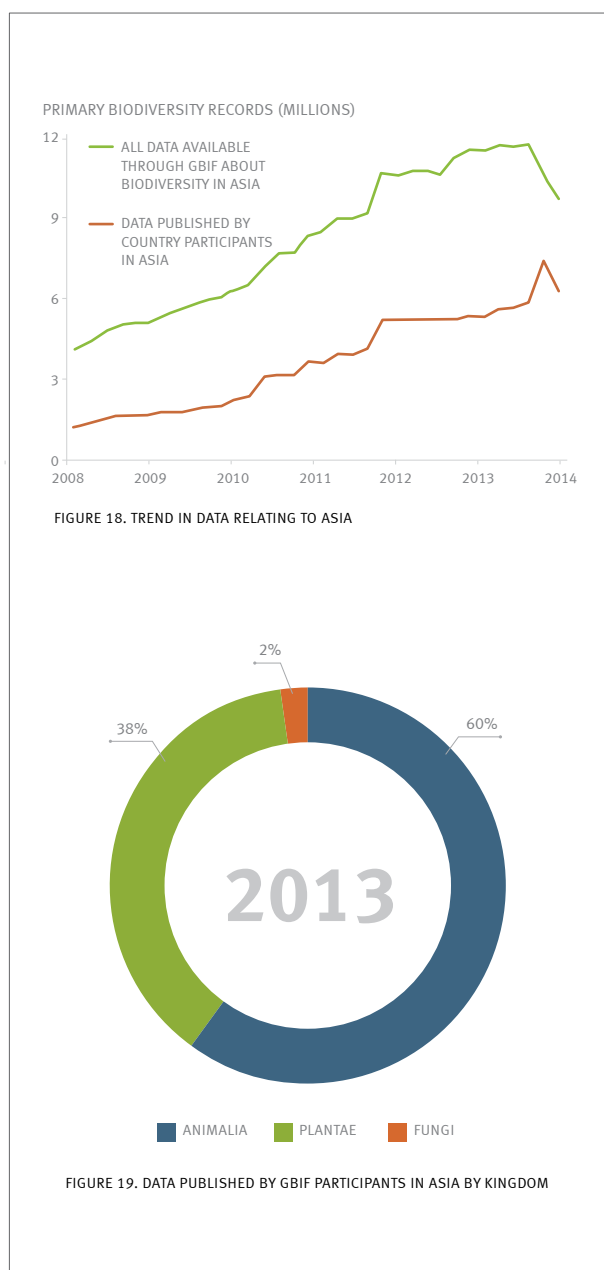
■ VOTING PARTICIPANTS
 ■ ASSOCIATE COUNTRY PARTICIPANTS



GBIF in Asia



Regional mission: There is a lack of readily available biodiversity data within the Asian region, and this hampers the knowledge on biodiversity and ecosystems in the Asian region as well as the reuse of data for advanced research. It is the goal of the GBIF Asian nodes, through a collaborative effort, to increase the amount of biodiversity data in the region to facilitate the work of scientists and policy makers towards informed decisions on critical biodiversity and ecosystem issues.



REGIONAL HIGHLIGHTS IN 2013

TRAINING NEW DATA
DATA USE NEWS

CHINA: Researchers from China used more than 97,000 occurrence records to identify suitable habitats under climate change scenarios for 2050 for two highly invasive species: the curly dock (*Rumex crispus*) and bullrush (*Typha latifolia*).⁵



CURLY DOCK (*RUMEX CRISPUS*)

CHINESE TAIPEI: 11,000 records of moths observed and photographed by citizens and posted to a Facebook group.

Publisher: Taiwan Biodiversity Information Facility (TaiBIF)

INDIA: Workshop on promoting metadata use and publishing data papers (June)

Location: Pune

Organizers: Wildlife Institute of India

Partner: Pensoft Publishers

REPUBLIC OF KOREA: Nearly 1 million new records from more than a dozen publishers, including a dataset on green algae from the Korean Biological Resources Centre, bird and plant data from the Korean Forest Service, and specimen records from the country's largest insect database.



BLUE LEAF BEETLE (*CHRYSOCHUS COBALTINUS*)

JAPAN: 32,600 records of beetles from the database of ground beetles in Japan.

Publishers: National Institute of Genetics

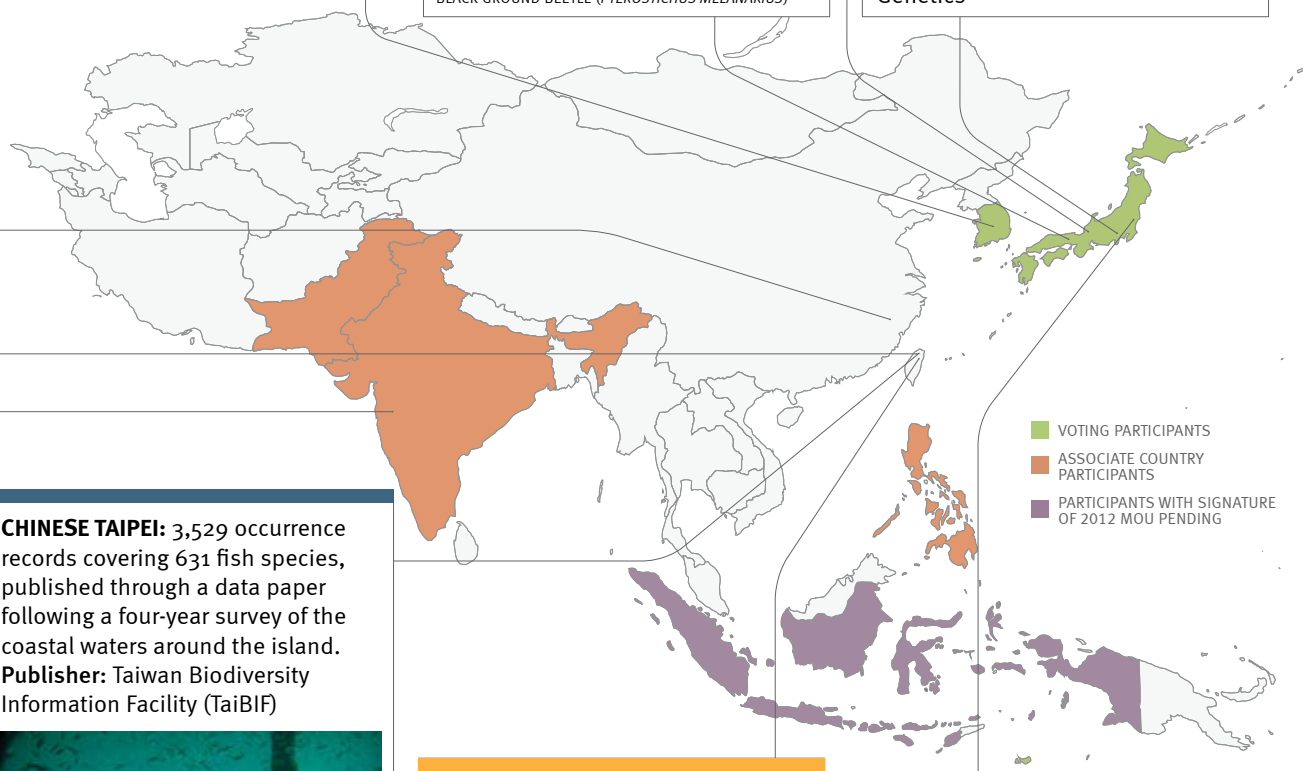


BLACK GROUND BEETLE (*PTEROSTICHUS MELANARIUS*)

JAPAN: GBIF Japan has released a redesigned portal (www.gbif.jp) that improves support for data holders. In addition to an online form for engaging institutions interested in mobilizing their data through GBIF, the revamped site can also validate uploaded data to ensure their compatibility with the Darwin Core standard.

JAPAN: 7,900 records of plants from the Fuji-Hakone-Izu national park. Data collected by volunteers who have been monitoring plants along the park's hiking trails since 2001.

Publisher: National Institute of Genetics



■ VOTING PARTICIPANTS
■ ASSOCIATE COUNTRY PARTICIPANTS
■ PARTICIPANTS WITH SIGNATURE OF 2012 MOU PENDING

CHINESE TAIPEI: 3,529 occurrence records covering 631 fish species, published through a data paper following a four-year survey of the coastal waters around the island.

Publisher: Taiwan Biodiversity Information Facility (TaiBIF)



ANCHOVIES

CHINESE TAIPEI: International Conference on Open Data in Biodiversity and Ecological Research (March)

Location: Taipei

Organizer: TAIBIF

Funder: National Science Council

JAPAN: Regional node managers workshop on Integrated Publishing Toolkit v.2 (March)

Location: Ibaraki

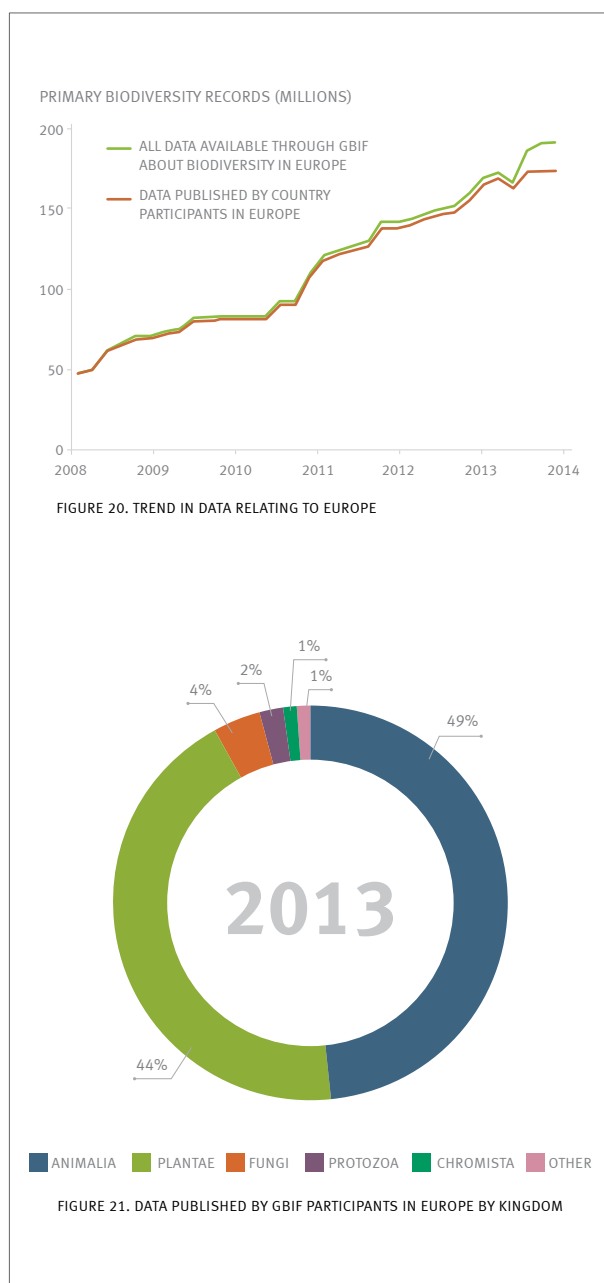
Host: National Museum of Science and Nature

GBIF in Europe



**2013 European
Regional Nodes Meeting**
6-8 March 2013
Joensuu, Finland

Regional mission: The mission of GBIF's European nodes is to communicate clearly how GBIF data, and the GBIF infrastructure can support the complex and diverse range of initiatives, projects and agencies in Europe; to focus on communication and the synchronization of activities; and to demonstrate the benefits and potential of GBIF to serve the scientific community and the general public at national, regional and international levels.



REGIONAL HIGHLIGHTS IN 2013

TRAINING
NEW DATA
DATA USE
NEWS

IRELAND: The National Biodiversity Data Centre organized a friendly 'bioblitz' competition at four locations on the island of Ireland, marking the UN's International Day for Biological Diversity. Volunteers at Colebrooke Estate in County Fermanagh recorded 1,086 species in a single day, earning nationwide broadcast coverage on RTÉ One.

FRANCE: More 30,000 marine species records from the French Mediterranean, Atlantic Ocean, and English Channel.

Publisher: Le Service du Patrimoine Naturel, National Museum of Natural History



SCORPIONFISH

PORTUGAL: 880 records of marine molluscs collected along the Portuguese coast between 1887 and 1939 by Augusto Nobre, former director of the museum.

Partner: Museu de História Natural da Universidade do Porto

DENMARK: 1.1 million vegetation data records from detailed surveys of the country's protected areas.

Publisher: Department of Bioscience, Aarhus University

GREAT BRITAIN & IRELAND:

Researchers from the UK used data from GBIF and other sources to identify the 'dirty dozen' invasive species that pose the greatest risk to British and Irish aquatic biodiversity. An innovation was to include socio-economic factors such as proximity to ports and population centres to assess risks.⁶

NORWAY: More than 250,000 records of Norwegian seabirds gathered as part of SEAPOP, a long-term monitoring and mapping programme established in 2006.

Publisher: Norwegian Institute for Nature Research



ATLANTIC PUFFIN (*FRATERCULA ARCTICA*)

SWEDEN: 150,000 insect and paleontological records, including observations from the Malaise Trap Project, a national insect inventory.

Publisher: The Swedish Museum of Natural History

THE NETHERLANDS: Course on modeling and mapping species distribution (July)

Location: Amsterdam

Organizer: NLBIF

THE NETHERLANDS: Nearly a million records of molluscs, beetles, moths, butterflies, sawflies, wasps, bees and ants from the fifth largest natural history collection in the world.

Publisher: Naturalis Biodiversity Center

BELGIUM: The Belgian Biodiversity Platform has launched a new digital atlas devoted to the country's ant species. Formidabel – FORMIcidaeDatabaseBELgium – provides access to data and maps characterizing more than 27,000 records of 76 native and nine introduced Belgian ants.

ISRAEL: More than 368,000 observations of vascular plants and vertebrates collected from ongoing surveys and field studies.
Publisher: Israel Nature and Parks Authority

GERMANY: The Botanic Garden and Botanical Museum Berlin-Dahlem (BGBM) launched an online resource that enriches the GBIF network's 7.4 million observation and specimen records of 'protists' - algae and protozoa. Such data are critical to environmental monitoring and biological research.

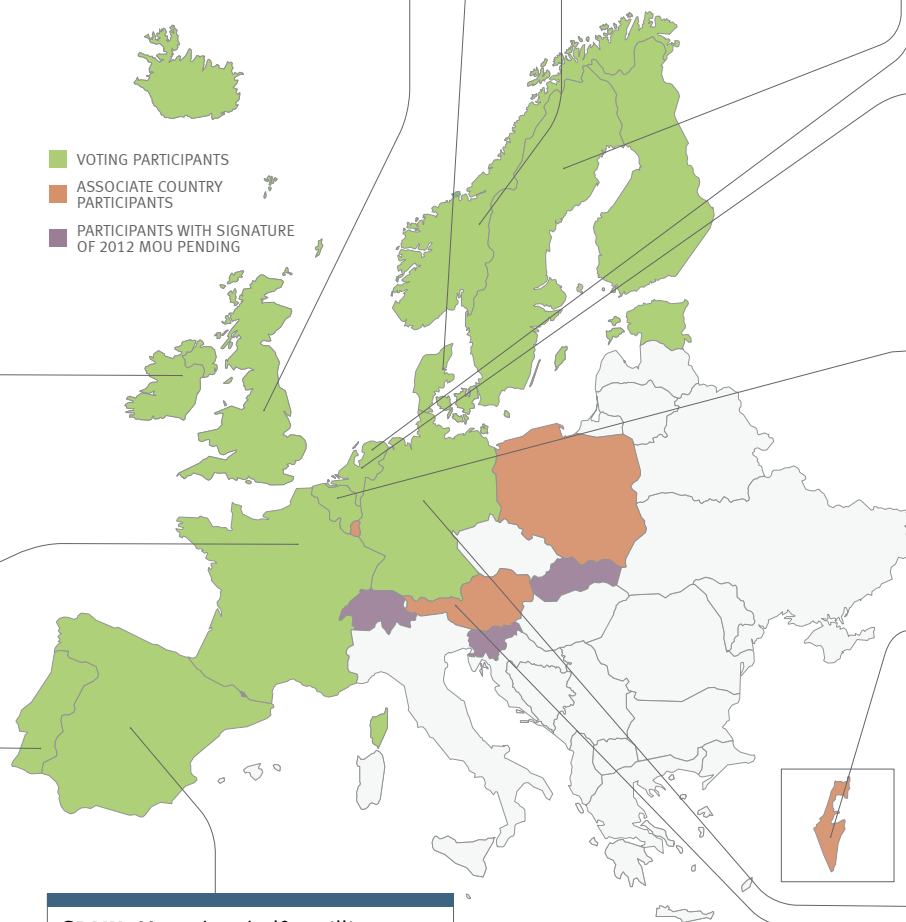
<http://protists.gbif.de/protists>

Funder: German Ministry of Education and Research

AUSTRIA: 100,000 records of moths and butterflies from parts of Austria, Germany, Italy and Slovenia.

Publisher: The Tiroler Landesmuseum Ferdinandeum

- VOTING PARTICIPANTS
- ASSOCIATE COUNTRY PARTICIPANTS
- PARTICIPANTS WITH SIGNATURE OF 2012 MOU PENDING



SPAIN: More than half a million records covering 326 plants gathered during the 3rd National Forest Inventory, in Spain and the Balearic and Canary Islands by the Ministry of Environment, Rural & Marine Affairs.

Publisher: GBIF Spain

SPAIN: Workshop on data paper publication (March)

Location: Madrid

Organizer: GBIF Spain

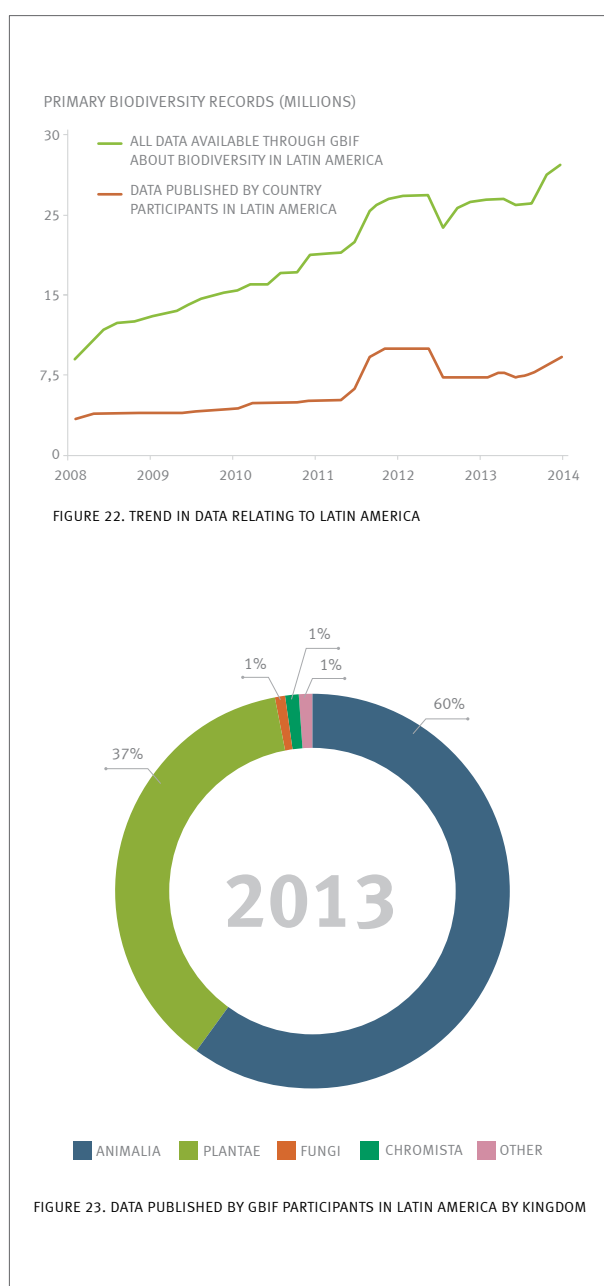
EUROPE: GBIF-mediated and other occurrence records for the American eastern grey squirrel (*Sciurus carolinensis*) indicate that the invasive alien species' niches have shifted in the British Isles and northern Italy, where the rodent has colonized areas very different from its native range.

GBIF in Latin America



2013 Latin American
Regional Nodes Meeting
14-15 March 2013
San José, Costa Rica

Regional mission: The Latin American nodes seek to enhance regional and local capabilities to effectively manage, share, access, and use of biodiversity data. Together, they develop technologies and share best practices and strengths to support the implementation and use of national biodiversity information systems.



REGIONAL HIGHLIGHTS IN 2013

TRAINING NEW DATA
DATA USE NEWS

MEXICO: A study seeking to optimize methods for designing networks of marine protected areas used data from CONABIO and GBIF publishers to identify 64 fish species that occur in the Gulf of California.⁸



LARGE-BANDED BLENNY (*OPHIOBLENNIIUS STEINDACHNERI*)

COSTA RICA: Researchers concluded that tropical forest species are responding to warming temperatures by moving to higher altitudes, based on a review of GBIF-mediated herbarium data for 386 Costa Rican tree species.⁹

VENEZUELA: Data on nearly 1,000 insect species from Central and South America.
Publisher: Universidad Central de Venezuela

COSTA RICA: Workshop on biodiversity information for environmental conservation (April)
Location: Sarapiquí
Organizer: I3B
Funder: Ibero-American Programme for Science, Technology and Development (CYTED)

COSTA RICA: 2nd workshop on tools for the management and sharing of biodiversity data (February)
Location: Cartago
Organizer: The Costa Rican Biodiversity Information Facility (CRBio)



STILT-LEGGED FLY (*SCIOPOUS MICROPEZIDAE* DIPTERA)

NICARAGUA: 126,500 insect records from Central America and around the world.
Publisher: Entomological Museum of León

COLOMBIA: 2,000 records of epiphytes relocated during construction of a pipeline between Arguaney and Banadia in northern Colombia.

Publisher: Oleoducto Bicentenario



EPIPHYTES

COSTA RICA: Citizen scientists marked May 22, the International Day for Biological Diversity, by counting 236 species during a bioblitz at INBioparque in San Jose. The event recorded species from 17 insect families not previously encountered in the park (owned by node hosts INBio), including: seven new families of Coleoptera (beetles), four new families of Diptera (flies and mosquitos), three new families of bedbugs, and one new family each of Lepidoptera (butterflies), Neuroptera (ant lions) and dragonflies.

COLOMBIA: More than 3,000 records of ants associated with orange crops in 38 orchards on the Caribbean coast.

Publisher: Universidad del Valle



ANT (*MESSOR*)

COLOMBIA: Mentoring workshop on software tools for biological collections (June)

Locations: Villa de Leyva and Bogotá

Organizers: Universidad Nacional and SiB Colombia

Funders: Humboldt Institute, JRS Biodiversity Foundation and GBIF Spain

BRAZIL: To explore how climatic conditions affect the complex relationships between bees and their 'plant partners', scientists drew upon GBIF-mediated data from 32 publishers for the bee genus *Centris* and the plants they pollinate.¹⁰

BRAZIL: A major plant collection from the Rio de Janeiro Botanic Garden (JBRJ) Herbarium and founded by the Brazilian emperor Pedro II in the 19th century became the first Brazilian dataset mobilized through GBIF. The collection includes specimens Among more than half a million records in the dataset are specimens collected by important naturalists like Antoine-Laurent Apollinaire Fee, João Geraldo Kuhlmann and Paulo Campos Porto.

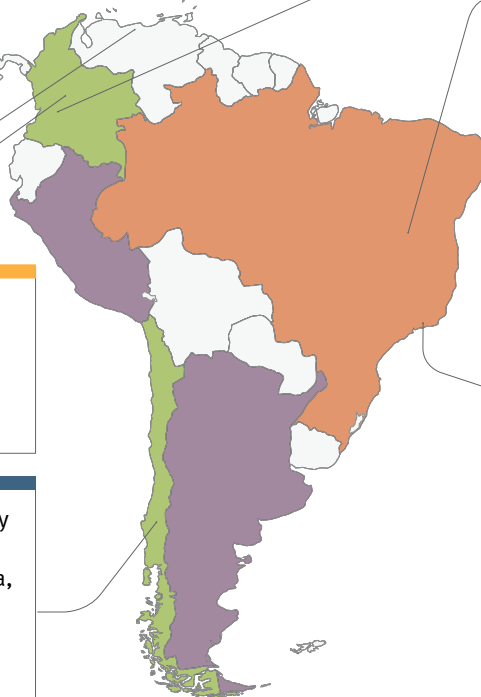


PAU-FERRO (*CAESALPINIA FERREA*)

COLOMBIA: Capacity Building for Conservation conference and workshops (February)
Location: Villa de Leyva
Organizer: Humboldt Institute

ANDES: 15 datasets including nearly 45,000 records from the Páramo ecosystems of Venezuela, Colombia, Peru and Ecuador.
Publisher: Institute for Biodiversity and Ecosystem Dynamics (IBED), University of Amsterdam

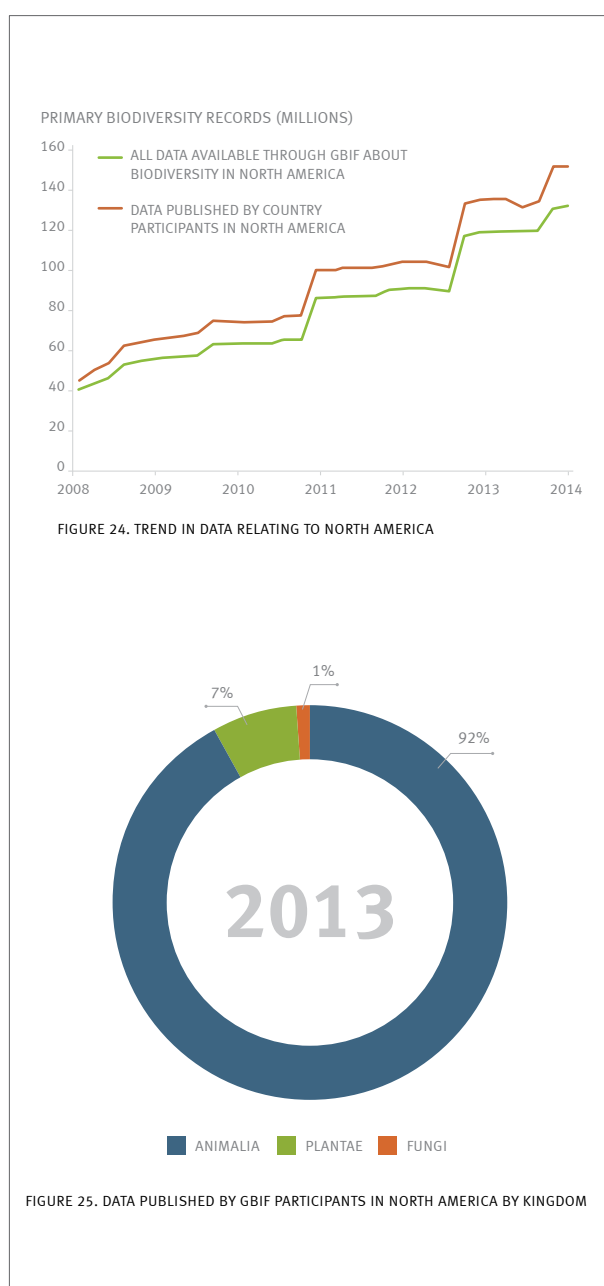
- VOTING PARTICIPANTS
- ASSOCIATE COUNTRY PARTICIPANTS
- PARTICIPANTS WITH SIGNATURE OF 2012 MOU PENDING



GBIF in North America



Regional mission: The North American nodes seek to foster joint collaboration between the GBIF network and regional organizations on informatics development, content mobilization and use, and community engagement by utilizing the region's strengths in genomic and taxonomic expertise, computing infrastructure, scientific analysis and related fields.



REGIONAL HIGHLIGHTS IN 2013

TRAINING
NEW DATA
DATA USE
NEWS

NORTH AMERICA: To predict the future distribution of a parasitic worm commonly found in white-tailed deer across the United States and Canada under different climate scenarios, researchers drew upon for GBIF-mediated data for deer as well as the worm's intermediate gastropod hosts.¹¹



WHITE-TAILED DEER (*ODOCOILEUS VIRGINIANUS*)

UNITED STATES: 2nd training workshop on biodiversity informatics (June)
Location: Boulder, Colorado
Organizer: VertNet

UNITED STATES: The U.S. Geological Survey launched BISON – Biodiversity Information Serving Our Nation – a new web resource that integrates data for more than 100 million records of nearly every species occurring in the country. BISON and its associated web services relies on datasets published through the GBIF global network.



ALEUTIAN FOX, NIKOLSKI BAY, ALASKA

CANADA: More than 300,000 specimen records of birds, amphibians, reptiles and mammals, including the collection of ornithologist James Henry Fleming, once considered the most comprehensive private collection of birds in North America. **Publishers:** Royal Ontario Museum

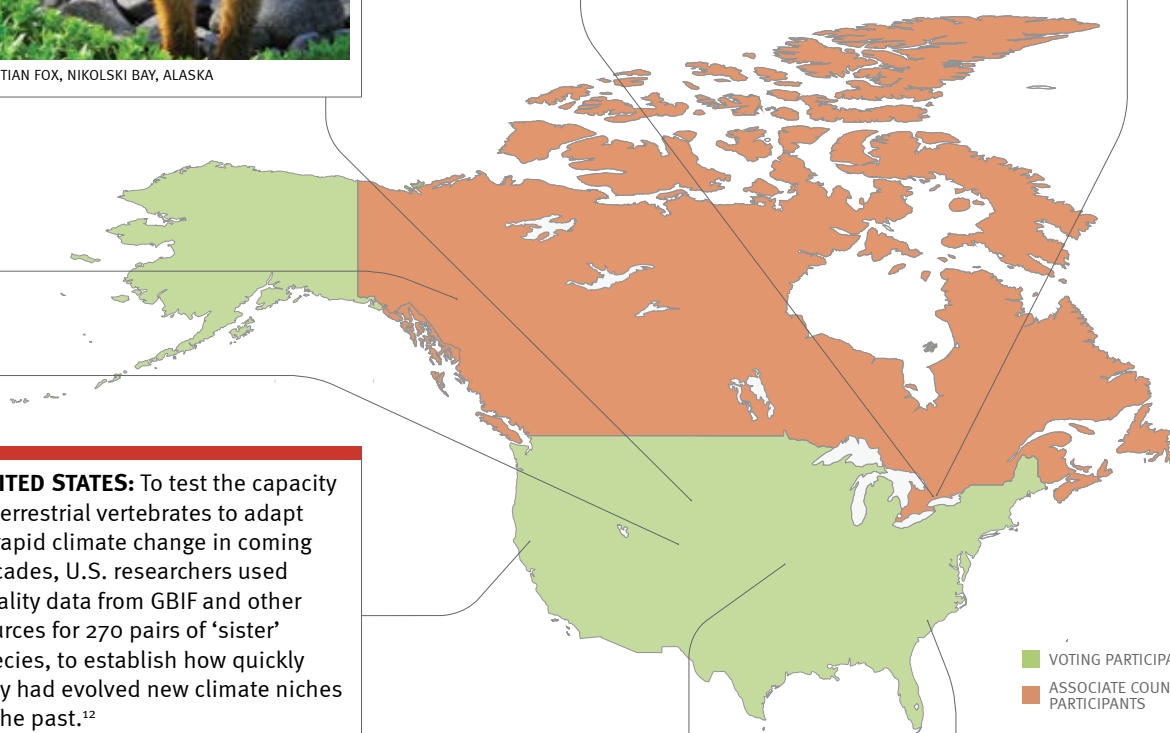


NORTHERN CARDINAL (*CARDINALIS CARDINALIS*)

CANADA: The University of Guelph in Ontario opened a new Centre for Biodiversity Genomics. Focused on discovering, identifying and cataloguing species using DNA barcoding technology, the new centre is triple the size of its former facility and will house the secretariat of the International Barcode of Life (iBOL), a GBIF Associate Participant.



AMERICAN GREEN TREE FROG (*HYLA CINEREA*)



■ VOTING PARTICIPANTS
■ ASSOCIATE COUNTRY PARTICIPANTS

UNITED STATES: To test the capacity of terrestrial vertebrates to adapt to rapid climate change in coming decades, U.S. researchers used locality data from GBIF and other sources for 270 pairs of ‘sister’ species, to establish how quickly they had evolved new climate niches in the past.¹²



SANDHILL CRANE (*GRUS CANADENSIS PRATENSIS*)

UNITED STATES: More than 17,000 specimen records of North American flora from a collection specializing in regional native plants, particularly species associated with the remaining tallgrass prairie in the Flint Hills of southeastern Kansas. **Publisher:** Emporia State University



TALLGRASS PRAIRIE, FLINT HILLS, KANSAS

UNITED STATES: Nearly 25,000 herpetological specimens of the Savannah Science Museum, representing 95 per cent of the reptiles and amphibians of Georgia. **Publisher:** Georgia Southern University

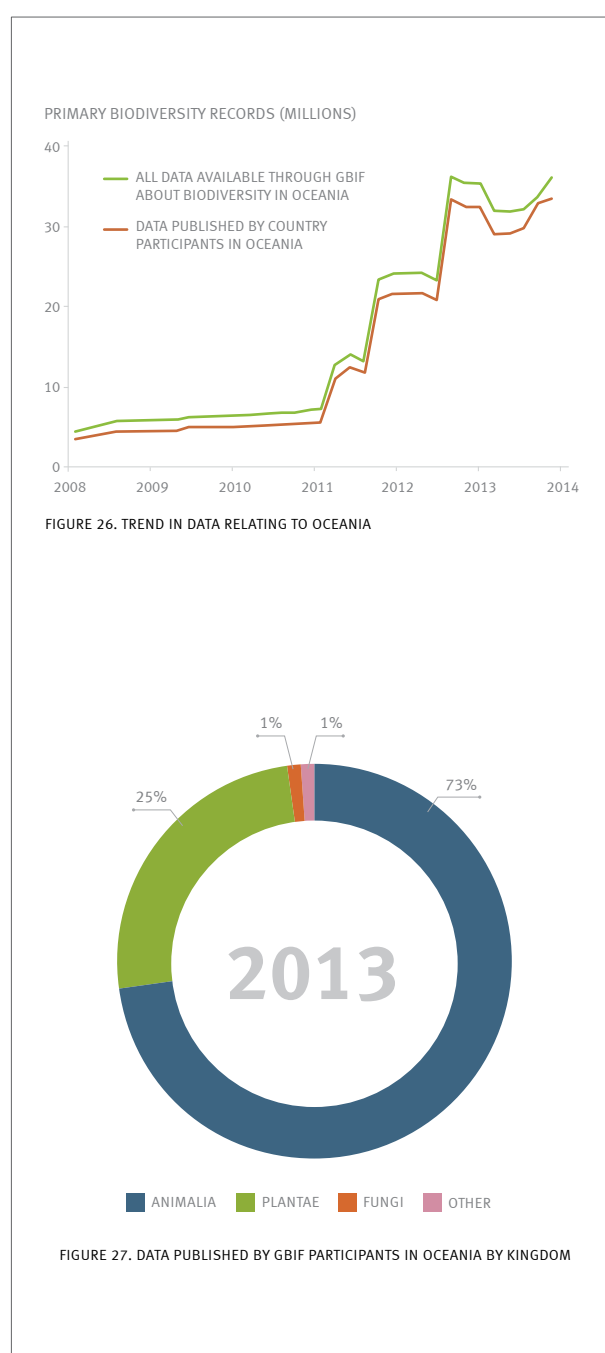


PIGEON MOUNTAIN SALAMANDER (*PLETHODON PETRAEUS*)

GBIF in Oceania



Regional mission: The Oceania nodes work together to share relevant technology and expertise that support the development and use of the region's national biodiversity infrastructure.



REGIONAL HIGHLIGHTS IN 2013

DATA USE

NEWS

AUSTRALIA: To assess the risk of biofuel crops becoming harmful invasive species, scientists drew upon GBIF-mediated data and records from the Australia Virtual Herbarium on the distribution of Indian beech or Pongam oiltree (*Millettia pinnata*, also known as *Pongamia pinnata*).¹³



PONGAM OILTREE (*MILLETTIA PINNATA*)

AUSTRALIA: More than two million GBIF-mediated records contributed to an analysis of how a drying Australia affected bird evolution. This examination of the location of 75 species of honeyeaters tested the ‘niche conservatism’ hypothesis – a theory suggesting that most species remain in climates similar to those tolerated by their ancestors.¹⁴



REGENT HONEYEATER (*XANTHOMYZA PHRYGIA*)

AUSTRALIA: In a joint study on key components for developing a national biodiversity monitoring capability, CSIRO, the Australian Bureau of Meteorology and the Atlas of Living Australia analysed an approach to biodiversity profiling that combines natural history collections with mapping data to describe and infer changes in species’ status in Australia across space and time.



CRADLE MT FROM HANSON'S PEAK, TASMANIA, AUSTRALIA

AUSTRALIA: An international group of taxonomists launched a new website about the nearly 6,000 insect species belonging to more than 800 genera of the Order Thysanoptera — commonly known as thrips, thunderbugs or corn lice. Created with support from Australia’s Department of Agriculture, Fisheries and Forestry, ThripsWiki builds on a checklist compiled in 2005 by Australia’s science agency CSIRO (funded in part by GBIF) to check data from major thrips collections in Frankfurt, London and Washington, D.C.

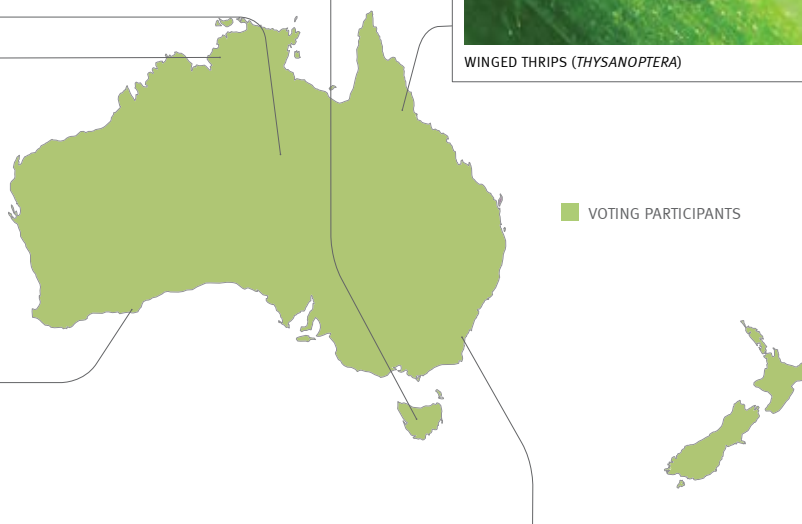


WINGED THRIPS (*THYSANOPTERA*)

AUSTRALIA: In February, the Atlas of Living Australia released FishMap, a free online resource offering detailed information on the country’s marine fish. FishMap lets users view photos and maps of the country’s 4,500 species (including 320 sharks and rays), learn the depths and locations of the waters of they inhabit, and create species lists.



SANDHILL CRANE (*GRUS CANADENSIS PRATENSIS*)



AUSTRALIA: Researchers from the United Kingdom analysed museum artefacts to gain insight into the use of particular plants by Australia’s indigenous peoples in the past. The study used data from GBIF and the Atlas of Living Australia to map distributions of eight species of the genus *Xanthorrhoea*, whose resin is used mainly as adhesives.¹⁵



XANTHORRHOEA JOHNSONII

GBIF in the news

The GBIF network received attention across a variety of media outlets in 2013, from the BBC World Service to HuffingtonPost.com — some headline highlights follow.

John Stewart of the **BBC's 'Science in Action'** programme hosted a conversation with the Secretariat's Tim Hirsch in May. The two discussed the structure of the GBIF network, the use of the data it mobilizes in one large-scale study of the future climate change impacts (Warren *et al.* 2014—see p.12), and the ways in which GBIF serves to repatriate data to their countries of origin.

- **LISTEN** 'Science in Action': BBC World Service Radio, 16 May 2013
<http://www.bbc.co.uk/programmes/p01944nc>



News of Miguel Bastos Araújo's selection as the winner of GBIF's 2013 Ebbe Nielsen Prize merited international coverage in his home country of Portugal and beyond. Stories appeared in the print editions of both ***Jornal de Notícias*** (one of Portugal's oldest daily newspapers) and ***Visão*** (the country's largest weekly news magazine). The country's ***Ciência Hoje*** (Science Daily) and Denmark's ***Altinaet*** also weighed in.

- **READ MORE** ‘Miguel Bastos Araújo recebe Ebbe Nielsen Prize 2013’, *UEline (em Português)*
[http://www.ueline.uevora.pt/Canais/academia/\(item\)/8585](http://www.ueline.uevora.pt/Canais/academia/(item)/8585)

A special feature in the **Financial Times** drew on information from SiB Colombia (the GBIF national node) for an interactive feature in a special report on biodiversity in 'The New Columbia'.

- **READ MORE** 'Columbia's Biodiversity':
Financial Times, 3 June 2013
<http://www.ft.com/intl/cms/s/0/6e8ce78a-cc3c-11e2-bb22-00144feab7de.html#axzz2VEH1iOGQ>



Science writer and **Huffington Post** columnist Mary Ellen Hannibal noted GBIF's role in publishing expert-verified citizen science data from iNaturalist, while finding inspiration in the ability of iNat co-founders Ken-ichi Ueda and Scott Loarie to engage technology and technologists to save biodiversity.

- ▶ **READ MORE** 'The Snake, the Seeker and the Smartphone', *HuffingtonPost.com*
http://www.huffingtonpost.com/mary-ellen-hannibal/the-snake-the-seeker_b_3722218.html
- ▶ **READ MORE** iNaturalist
<http://www.gbif.org/resources/2782>

One of GBIF's Young Researchers Award winners, Emma Gómez Ruiz, attracted interest in the United States and Mexico—the two countries inhabited by the Mexican long-nosed bat on which her work focuses. The independent daily *Reforma* from Mexico City and Texas A&M University's *Agrilife Today* were among those to pick up the story.

► **READ MORE** 'Reconocimiento internacional en biodiversidad a la mexicana Emma Gómez-Ruiz', *Mi Ambiente (en español)*
<http://www.miambiente.com.mx/sustentabilidad/1/reconocimiento-internacional-en-biodiversidad-a-la-mexicana-emma-gomez-ruiz>

► **READ MORE** 'Premio jóvenes investigadores 2013, otorgado a Emma Gómez-Ruiz de México: Conabio', *Periódico El Planeta (en español)*
<http://www.elplaneta.ws/inicio/?p=74750>



POLLEN-COATED MEXICAN LONG-NOSED BAT (*LEPTONYCTERIS NIVALIS*) BEING RETRIEVED FROM MIST NET

Australian collection manager David Britton writes in *The Conversation* that GBIF and 'the world-class, home-grown' Atlas of Living Australia have "opened up natural history collections in a way that would have been inconceivable in recent memory.



► **READ MORE** 'Natural history collections are fine specimens of great value,' *The Conversation*
<http://theconversation.com/natural-history-collections-are-fine-specimens-of-great-value-16353>

► **READ MORE** Atlas of Living Australia
<http://www.ala.org.au>

And circling back to the beginning, GBIF Governing Board chair Joanne Daly and the Secretariat's Donald Hobern and Tim Hirsch kicked off the year with a discussion of biodiversity loss and the role GBIF-mediated data play in understanding and conserving biological resources.

► **READ MORE** *International Innovation – North America*
<http://www.international-innovation-northamerica.com/magazines/NAo8/index.html>

GBIF 'has changed the way biodiversity is studied'. So say Susan McCouch and her co-authors while issuing a call to 'harness the full power of biodiversity to feed the world' a Comment appearing in *Nature* in July.

► **READ MORE** 'Agriculture: Feeding the Future', *Nature*
<http://dx.doi.org/10.1038/499023a>



SEEDS FROM LOCALLY DOMESTICATED FOOD CROPS – ALSO KNOWN AS 'LANDRACES' – ARE HOUSED IN GENE BANKS LIKE THE INTERNATIONAL CENTER FOR TROPICAL AGRICULTURE (CENTRO INTERNACIONAL DE AGRICULTURA TROPICAL, CIAT) IN CALI, COLOMBIA

Photo Credits

- p.3 Harlequin Ladybug (*Harmonia Axyridis*). Fotolia.com © gradnaded
- p.14 Large red damselfly (*Pyrrhosoma nymphula*). Photo 2013 CC BY-NC-ND 2.0, Derek Parker https://www.flickr.com/photos/derek_p/12178734796
Blue-tailed damselfly (*Ischnura elegans*). Photo 2008 CC BY-NC-ND 2.0, Pere Luque https://www.flickr.com/photos/pere_luque/3376773666
- p.15 Travancore tortoise (*Indotestudo travancorica*) © V. Deepak, Wildlife Institute of India. Photo 2006 CC BY-NC-SA 2.0. <https://flic.kr/p/dkHkTP>
Biota Colombiana. Publication from Instituto de Investigación de Recursos Biológicos Alexander von Humboldt. <http://www.humboldt.org.co>
- p.17 Hummingbird and hummingbird moth (*Macroglossum stellatarum*). Photo 2012 CC BY 2.0, Jeffreyw. <https://www.flickr.com/photos/jeffreyww/7761856942>
- p.19 Common bean (*Phaseolus vulgaris*). Photo 2013 CC BY-NC-SA 2.0, Søren Holt. <https://www.flickr.com/photos/10348212@n07/9366907368>
Elephant hawkmoth (*Deilephila elenor*). Photo 2011 CC BY-NC-ND 2.0, Nutmeg66. https://www.flickr.com/photos/rachel_s/5777231449
Shenandoah salamander (*Plethodon shenandoah*). Photo 2013 CC BY 2.0, Matthew Stover, USGS. <https://flic.kr/p/hnadVx>
- p.21 Neguev. Photo 2012 CC BY-NC-SA 2.0, Rodrigo Balan Uriart. <https://www.flickr.com/photos/ruriak/8247617513>
Gad Nature Reservation, Israel, Photo 2007 CC BY-ND 2.0, Tav ect. <https://www.flickr.com/photos/30845197@n00/440803664>
Chinese Academy of Science Library, Beijing, China. Photo 2009 CC BY-NC-SA 2.0, Hi tricia! 王 圣 捷. <https://flic.kr/p/73TgZ>
- p.22 Prickly pear (*Opuntia* sp.). Photo CC BY. <http://giasipartnership.myspecies.info>
Citrus root weevil (*Diaprepes abbreviatus*). Photo CC BY. <http://giasipartnership.myspecies.info>
- p.23 Harlequin ladybird (*Harmonia axyridis*). Photo 2009 CC BY 3.0. <http://commons.wikimedia.org/wiki/File:harmonia.axyridis.1.jpg>
Hummingbird (*Trochilidae*). Photo 2007 CC BY-NC-ND 2.0, Danny Perez photography. <https://www.flickr.com/photos/da10ofotos/465868860>
River rat (*Myocastor coypus*). Photo 2011 CC BY-SA 3.0, Christian Fischer. <http://commons.wikimedia.org/wiki/File:myocastorcoypus.jpg>
- p.24 Slender phlox (*Microsteris gracilis*). Photo 2005 CC BY-SA 2.5, Curtis Clark. http://commons.wikimedia.org/wiki/File:microsteris_gracilis_2005-04-02.jpg
Flying gurnard (*Dactylopterus volitans*). Photo 2006 CC BY-SA 3.0, Beckmannjan. <http://commons.wikimedia.org/wiki/File:flughahn.jpg>
- p.27 3rd GBIF Africa Regional Nodes Meeting, Kigali, Rwanda. Photo © 2012, Fabian Haas.
- p.28 African porcupines (*Hystrix cristata*). Photo 1977 CC BY-NC-SA 2.0, Kibuyu. <https://www.flickr.com/photos/davidbygott/4146573932>
- p.29 Mount Gahinga and Mount Muhabura, on the Rwanda/Uganda border. Photo 2006 CC BY-SA 2.5, Amakuru. <http://commons.wikimedia.org/wiki/File:gahingamuhabura.png>
University of the Western Cape - Central Campus entry. Photo 2008 CC BY-SA 3.0. http://commons.wikimedia.org/wiki/File:University_of_the_Western_Cape_-_Central_Campus_entry.jpg#file
- p.30 Curly dock (*Rumex crispus*). Photo 2009 CC BY-SA 2.0, Frank Mayfield. <https://www.flickr.com/photos/gmayfield10/4684765105>
- p.31 Blue leaf beetle (*Chrysochus cobaltinus*). Photo 2006 CC BY 3.0, Robert. http://commons.wikimedia.org/wiki/File:korea-seoul-blue_insect-01.jpg
Black ground beetle (*Pterostichus melanarius*). Photo 2010 CC BY-SA 2.0 by Dluogs. <https://www.flickr.com/photos/dluogs/8486499236>
Anchovies. Photo 2006 CC BY-NC 2.0, Brian Gratwicke. <https://www.flickr.com/photos/briangratwicke/2179477776>
- p.32 Scorpionfish. Photo 2009 CC SA 3.0, Steven van Tendeloo. <http://commons.wikimedia.org/wiki/File:scorpaenaunkspecies.jpg>
- p.33 Atlantic puffin (*Fratercula arctica*). Photo 2008 CC BY-NC-SA 2.0, Photo Nature. https://www.flickr.com/photos/andrej_chudy/3949729303
- p.34 Large-banded blenny (*Ophioblennius steindachneri*). Photo 2007 CC BY 2.0, Laszlo Ilyes. <https://www.flickr.com/photos/laszlo-photo/2064182828>
- p.35 Stilt-legged fly (*Scipopus micropezidae diptera*). Photo 2011 CC BY 2.0, Gailhampshire. https://www.flickr.com/photos/gails_pictures/8109301674
Epiphytes. Photo 2014 CC BY-NC-ND 2.0, Quimbaya. <https://www.flickr.com/photos/quimbaya/12154889065>
Ant (Messor), Photo 2009 CC BY-NC-ND 2.0, Stavros Markopoulos. <https://www.flickr.com/photos/markop/3209409988>
Pau-ferro (*Caesalpinia ferrea*). Photo 2009 CC BY 2.0, Mauroguanandi. <https://www.flickr.com/photos/mauroguanandi/333538845>
- p.36 White-tailed deer (*Odocoileus virginianus*). photo 2014 CC BY 2.0, Larry Smith. <https://www.flickr.com/photos/lsmith2010/14473938592>
- p.37 Aleutian fox, Nikolski bay, Alaska. Photo 2008 CC BY-NC-ND 2.0, Viewminder. https://www.flickr.com/photos/light_seeker/2828287204
Northern cardinal (*Cardinalis cardinalis*). Photo 2009 CC BY-NC-ND, Jen Goellnitz. <https://www.flickr.com/photos/goellnitz/3163546693>
American green tree frog (*Hyla cinerea*). Photo 2008 CC BY-NC-SA 2.0, Judy Baxter. <https://www.flickr.com/photos/judybaxter/2518225201>
Sandhill crane (*Grus canadensis pratensis*). Photo 2009 CC BY-SA 2.0, Andrea Westmoreland. <https://flic.kr/p/5RRCfb>
Tallgrass prairie, Flint Hills. Photo 2011 CC BY-NC-ND 2.0, Kansas Tourism. <https://www.flickr.com/photos/travelks/551614488>
Pigeon Mountain salamander (*Plethodon petraus*). Photo 2013 CC BY-NC-ND 2.0 John Clare. <https://www.flickr.com/photos/johnclare/9038106693>
- p.38 Pongam oiltree (*Millettia pinnata*). Photo 2007 CC BY-NC-ND 2.0 Dinesh Valke. https://www.flickr.com/photos/dinesh_valke/470269772
- p.39 Regent honeyeater (*Xanthomyza phrygia*). Photo 2006 CC BY NC-SA 2.0, Tim Williams. <https://www.flickr.com/photos/timmythesuk/112760308>
Cradle Mountain from Hanson's Peak, Tasmania, Australia. Photo 2012 CC BY-NC-SA 2.0, Luke Zeme. <https://flic.kr/p/dfj1vR>
Ragged finned lionfish (*Pterois antennata*). Photo 2009 CC BY-ND 2.0, fugm10. <https://www.flickr.com/photos/fugm10/4189181207>
Winged thrips (*Thysanoptera*). Photo 2009 CC BY-NC-SA 2.0, Tony. <https://flic.kr/p/6SUx9p>
Xanthorrhoea johnsonii. Photo 2005 CC BY-SA 3.0, Australian Botanic Gardens via WikiMedia Commons. http://commons.wikimedia.org/wiki/File:xanthorrhoea_johnsonii_01.jpg
- p.41 Pollen-coated Mexican long-nosed bat (*Leptonycteris nivalis*) being retrieved from mist net. Photo © 2012 Emma Gomez-Ruiz. "CIAT genebank (6918499120)" by Luigi Guarino from Rome, Italy - CIAT genebank. Uploaded by Jacopo Werther. Photo cc by - [http://commons.wikimedia.org/wiki/File:CIAT_genebank_\(6918499120\).jpg#mediaviewer/File:CIAT_genebank_\(6918499120\).jpg](http://commons.wikimedia.org/wiki/File:CIAT_genebank_(6918499120).jpg#mediaviewer/File:CIAT_genebank_(6918499120).jpg)

End notes

1. A public library of peer-reviewed research papers that make use of GBIF-mediated data provides a complete list of datapaper citations: <http://www.mendeley.com/groups/1068301/gbif-public-library/papers/added/o/tag/datapaper>. The full library is accessible at <http://www.mendeley.com/groups/1068301/gbif-public-library/papers>
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Appendix 1 – Records published through GBIF, by endorsing Participant node

Node	Total	With coordinates	Publishers	Datasets
Voting Participants				
Andorra	81,816	78,008	1	7
Argentina*	764,837	397,976	13	70
Australia	24,558,014	23,931,381	35	113
Belgium	5,232,821	4,737,860	10	68
Colombia	1,595,639	1,041,783	52	94
Costa Rica	3,176,960	3,118,011	4	8
Denmark	8,188,662	7,999,655	20	59
Estonia	252,964	227,537	4	4
Finland	16,029,628	15,754,992	12	57
France	16,488,983	8,091,079	38	95
Germany	12,008,963	9,190,549	27	10978
Ghana	93,346	51,420	1	2
Iceland	458,705	438,505	1	4
Ireland	2,572,841	2,572,226	1	99
Japan	3,527,422	849,230	3	278
Korea, Republic of	1,246,449	2,445	29	100
Madagascar	18,748	6,285	5	3
Mauritania	178	0	1	1
Mexico	2,728,016	2,384,770	5	390
Netherlands	14,307,649	13,000,959	20	90
New Zealand	1,551,624	959,166	1	6
Norway	13,199,772	13,126,006	5	81
Peru*	65,880	0	5	6
Portugal	157,393	23,669	6	10
Slovakia*	114,454	2,244	1	1
Slovenia*	266,295	61,531	3	5
South Africa	8,973,006	8,063,926	11	22
Spain	8,906,669	6,988,532	73	173
Sweden	44,201,365	41,546,466	8	40
Tanzania	10,034	9,459	18	12
UK	42,299,753	41,148,498	14	498
USA	146,320,083	129,434,906	124	339
Associate Country Participants				
Austria	3,064,884	2,743,938	13	13
Brazil	771,016	347,750	6	9
Cameroon**	23,961	9,913	5	5
Canada	3,634,430	2,614,142	22	116
Guinea	493	468	1	1
India	7,377	5,354	4	5
Israel	433,463	433,463	2	1
Luxembourg	933,343	902,011	1	1
Pakistan	853	176	1	3
Poland	1,625,032	1,317,005	28	97
Switzerland*	1,558,889	1,281,707	13	18
Togo	7,983	7,983	5	2
Other Associate Participants				
Asean Centre for Biodiversity	500	0	4	10
Bioversity International	1,980,963	641,444	2	4
Ciencia y Tecnología para el Desarrollo	131,642	106,011	1	1
Consortium of European Taxonomic Facilities	107,557	0	1	1
Inter American Biodiversity Information Network	27,594	21,497	8	1
International Centre for Insect Physiology and Ecology	3,939	3,909	1	3
NatureServe	1,677,642	0	1	1
Nordic Genetic Resource Center (NORDGEN)	37,641	6,093	2	1
Ocean Biogeographic Information System (OBIS)	12,365,899	11,756,563	8	188
Pacific Biodiversity Information Forum (PBIIF)	2,487	2,382	1	2
Scientific Committee on Antarctic Research (SCAR)	289,665	289,563	4	82
Society for the Management of Electronic Biodiversity Data (SMEBD)	4,702	4,534	3	2
Chinese Taipei	1,181,624	742,212	5	38
VertNet	4,400	3,279	1	1
World Federation for Culture Collections (WFCC)	48,913	0	1	19

* Participants that had yet to sign the 2012 memorandum of understanding

** Moved to Observer status, June 2013

Appendix 2 – New publishers in 2013

Publisher	GBIF Participant Node	Datasets	Number of occurrence records published
Antarctic Biodiversity Information Facility (ANTABIF)	Scientific Committee on Antarctic Research (SCAR)	6	2,014
Asilweb - Atlas der Raubfliegen Deutschlands	Germany	1	14,081
Asociación de Becarios del Casanare – ABC	Colombia	3	668
Asociación para el estudio y conservación de las aves acuáticas en Colombia	Colombia	5	6,883
BeBIF Provider	Belgium	5	27,264
Botanic Garden and Botanical Museum Berlin-Dahlem	Germany	2	760
Centro Nacional Patagónico – CONICET	Argentina	4	5,006
Cheadle Center for Biodiversity and Ecological Restoration	USA	3	24,585
Corantioquia	Colombia	2	13,776
Corporación Autónoma Regional Para la Defensa de la Meseta de Bucaramanga	Colombia	1	6,821
Department of Bioscience, Aarhus University	Denmark	1	1,116,766
Department of Organisms and Systems Biology, University of Oviedo	Spain	1	3,772
Diveboard	France	1	15,669
Ecology Unit, Department of Microbiology and Ecology, University of Valencia	Spain	1	3,509
Emporia State University	USA	2	2,782
Ernst-Moritz-Armdt-Universität	Germany	1	522,470
Essig Museum of Entomology	USA	1	156,492
Ewha Womans University Natural History Museum	Korea, Republic of	1	0
Facultad de Ciencias Naturales y Museo – U.N.L.P.	Argentina	2	768
Federación Nacional de Cafeteros de Colombia	Colombia	3	13,976
Fraunhofer-Institute for Biomedical Engineering IBMT – Group Extremophile Research and Biobank CCCryo	Germany	1	353
Freie Universität Berlin	Germany	1	6,431
Fundación Alma	Colombia	1	221
Fundación Estación Biológica Guayacanal	Colombia	1	45
GBIF-Spain	Spain	10	283,171
Georgia Southern University	USA	1	24,851
Ghana Biodiversity Information Facility (GhaBIF)	Ghana	1	8,069
Herbarium de la Réserve de l'INERA-Luki	Belgium	1	219
Herbarium du CRSN-Lwiro	Belgium	1	640
Instituto Amazónico de Investigaciones Científicas Sinchi	Colombia	1	56,155
Instituto de Investigación de Recursos Biológicos Alexander von Humboldt	Colombia	2	0
Instituto de Investigaciones Ambientales del Pacífico John Von Neumann (IIAP)	Colombia	1	52
Instituto de Pesquisas Jardim Botânico do Rio de Janeiro	Brazil	1	533,558
Jardín Botánico del Quindío	Colombia	1	326
Jeollanamdo Maritime & Fisheries Science Museum	Korea, Republic of	1	1,395
KBRC (Korean Biological Resource Center) – KBIF Node	Korea, Republic of	1	661
Korea Institute of Water and Environment	Korea, Republic of	2	3,467
Korea National Arboretum (Korea Forest Service)	Korea, Republic of	4	968,893
Kunsan Passage Bird Research Institute	Korea, Republic of	1	3,519
McGill University	Canada	1	251,563
Ministerio de Ciencia, Tecnología e Innovación Productiva	Argentina	1	193
MNHN - Museum national d'Histoire naturelle	France	2	0
Museo Entomológico de León – MEL	Ciencia y Tecnología para el Desarrollo (CYTED)	1	130,841
Museum für Naturkunde Berlin	Germany	10	566,637
Museum of Biological Diversity, The Ohio State University	USA	4	20,527
National Biodiversity Data Centre	Ireland	10	351,603
National Institute for Public Health and the Environment (RIVM)	Netherlands	1	0
National Institute of Genetics, ROIS	Japan	3	43,835
National Museum of Nature and Science, Japan	Japan	60	31,397
National Science Museum of Korea	Korea, Republic of	1	3,094
Natural History Museum Maastricht	Netherlands	1	22,852
Natural History Museum Rotterdam	Netherlands	6	163,338
Natural History Museum, University of Oslo	Norway	2	72,813
Naturalis Biodiversity Center	Netherlands	8	984,270
Naturhistorisches Museum Mainz	Germany	2	55,456
Netherlands Biodiversity Information Facility (NLBIF)	Netherlands	2	44
Nijmegen Natural History Museum	Netherlands	1	24,786
Norwegian Institute for Nature Research	Norway	2	294,024
Oceanographic Center of Gijón, Spanish Institute of Oceanography (IEO)	Spain	1	766
Oleoducto Bicentenario	Colombia	3	2,074
Oregon State University	USA	1	14,427

Appendix 2 – continued

Publisher	GBIF Participant Node	Datasets	Number of occurrence records published	
PANGAEA - Publishing Network for Geoscientific and Environmental Data	Germany	992	471,923	
Perot Museum of Nature and Science	USA	1	7,509	
Plazi.org taxonomic treatments database	Germany	2,413	177,242	
Red Nacional de Observadores de Aves (RNOA)	Colombia	1	413,272	
Reptile, Amphibian and Fish Conservation Netherlands (RAVON)	Netherlands	3	3,724	
Research Institute for Nature and Forest (INBO)	Belgium	7	5,860	
Royal Ontario Museum	Canada	7	417,662	
Royal Society for the Protection of Birds	UK	3	0	
Secretaría Distrital de Ambiente	Colombia	1	216	
Senckenberg	Germany	7	61,621	
Sierra Nevada Global Change Observatory. Andalusian Environmental Center, University of Granada, Regional Government of Andalusia	Spain	1	7,920	
Spanish National Museum of Natural Sciences (CSIC)	Spain	1	409	
SPN - Service du Patrimoine naturel, Muséum national d'Histoire naturelle, Paris	France	6	85,055	
Staatliche Naturwissenschaftliche Sammlungen Bayerns	Germany	7	127,541	
Swedish Museum of Natural History	Sweden	1	149,782	
Taiwan Biodiversity Information Facility (TaiBIF)	Chinese Taipei	4	23,802	
Tiroler Landesmuseum Ferdinandeum	Austria	1	99,300	
UK National Biodiversity Network	UK	47	930,769	
Universidad Central de Venezuela	Inter-American Biodiversity Information Network (IABIN)		1	27,594
Universidad de Antioquia	Colombia	2	13,241	
Universidad de La Salle	Colombia	7	18,000	
Universidad de los Andes	Colombia	1	372	
Universidad de Nariño	Colombia	2	1,253	
Universidad del Magdalena	Colombia	1	464	
Universidad del Valle	Colombia	5	14,145	
Universidad Rey Juan Carlos	Spain	1	0	
Université de Montréal Biodiversity Centre	Canada	2	19	
Université de Strasbourg	France	1	3,784	
University of Amsterdam / IBED	Netherlands	15	44,821	
University of Arkansas Collections Facility, UAFMC	USA	1	3,942	
University of British Columbia	Canada	4	35,181	
University of Michigan Museum of Zoology	USA	1	0	
University of Navarra, Museum of Zoology	Spain	1	0	
ZooKeys	Denmark	4	918	
Zoological Museum, Natural History Museum of Denmark	Denmark	1	0	
Zoologische Staatssammlung München/Staatliche Naturwissenschaftliche Sammlungen Bayerns	Germany	1	18,077	

Appendix 3 – GBIF-commissioned publications in 2013

Publication
Best practice guide for compiling, maintaining, disseminating national species checklists
Best practice guidelines in the development and maintenance of regional marine species checklists
Discussion paper: Quality assurance and Intellectual Property Rights in advancing biodiversity data publication
GBIF-ICLÉI best practice guide for biodiversity data publishing by local governments: concise summary
GBIF-ICLÉI best practice guide for biodiversity data publishing by local governments
Guidelines for the capture and management of digital zoological names information
Recommended practices for citation of data published through the GBIF network

NOTE: Users can retrieve these documents and all other GBIF documents at <http://www.gbif.org/resources/summary>

Appendix 4 – GBIF Participants in 2013

Voting Participant	Member as of
Andorra	September 2010
Argentina*	March 2002
Australia	February 2001
Belgium	February 2001
Benin	December 2004
Burkina Faso	January 2007
Chile	December 2009
Colombia	September 2003
Costa Rica	May 2001
Denmark	January 2001
Estonia	September 2003
Finland	April 2001
France	April 2001
Germany	February 2001
Ghana	March 2001
Iceland	June 2001
Ireland	January 2008
Japan	February 2001
Kenya	July 2008
Korea, Republic of	May 2001
Madagascar	January 2003
Mauritania	August 2009
Mexico	March 2001
Netherlands	February 2001
New Zealand	February 2001
Norway	February 2004
Peru*	September 2002
Portugal	June 2001
Slovakia*	August 2001
Slovenia*	February 2001
South Africa	April 2003
Spain	February 2001
Sweden	February 2001
Tanzania	September 2002
Uganda	October 2009
United Kingdom	August 2001
United States	January 2001

* Participants that had yet to sign the 2012 memorandum of understanding

Associate Country Participant	Member as of
Austria	September 2001
Brazil	October 2012
Canada	March 2001
Central African Republic	March 2011
Congo, Republic of	May 2011
Guinea	March 2005
India	July 2003
Indonesia*	October 2004
Israel	April 2013
Luxembourg	April 2008
Pakistan	August 2001
Philippines	March 2005
Poland	March 2001
Switzerland*	February 2001
Togo	October 2009

Other Associate Participants	Acronym	Member as of
Albertine Rift Conservation Society	ARCOS	January 2010
ASEAN Centre for Biodiversity	ACB	August 2009
BioNet-AndinoNet		October 2007
BioNET-INTERNATIONAL		May 2001
Bioversity International		January 2007
Botanic Gardens Conservation International	BGCI	August 2004
Chinese Academy of Science	CAS	September 2013
Chinese Taipei		March 2001
Ciencia y Tecnología para el Desarrollo	CYTED	April 2006
Consortium for the Barcode of Life	CBOL	March 2005
Consortium of European Taxonomic Facilities	CETAF	June 2007
Discover Life		February 2008
DIVERSITAS		May 2007
Encyclopedia of Life	EOL	January 2008
Endangered Wildlife Trust	EWT	July 2008
ETI Bioinformatics		March 2001
European Environment Agency	EEA	September 2010
ICLEI - Local Governments for Sustainability	ICLEI	October 2010
Integrated Taxonomic Information System	ITIS	March 2001
Inter-American Biodiversity Information Network	IABIN	May 2001
International Barcode of Life Project	iBOL	April 2011
International Centre for Insect Physiology and Ecology	ICIPE	March 2004
International Centre for Integrated Mountain Development	ICIMOD	September 2009
International Long Term Ecological Research	ILTER	July 2008
NatureServe		June 2001
Natural Science Collections Alliance	NSCA	December 2004
Nordic Genetic Resource Center	NordGen	March 2004
Ocean Biogeographic Information System	OBIS	June 2001
Pacific Biodiversity Information Forum	PBIF	August 2004
Scientific Committee on Antarctic Research	SCAR	February 2008
Society for the Management of Electronic Biodiversity Data	SMEBD	March 2009
Society for the Preservation of Natural History Collections	SPNHC	January 2007
Species 2000		March 2001
Taxonomic Databases Working Group	TDWG	March 2002
United Nations Environment Programme	UNEP-WCMC	May 2001
World Conservation Monitoring Centre		
VertNet		August 2013
Wildscreen		January 2003
World Federation for Culture Collections	WFCC	October 2002

Appendix 5 – GBIF Executive Committee and Standing Committees 2013

Executive Committee	
Chair	Joanne Daly Peter Schalk (from October 2013)
1st Vice Chair	Jorge Soberon
2nd Vice Chair	Motomi Ito
3rd Vice Chair	Claude-Anne Gauthier
Standing Committee Chairs	
Science Committee	
Budget Committee	
Nodes Committee	
Rules Committee	(until October 2013)
Ex-officio	
Executive Secretary	

Science Committee	
Chair	Leonard Krishtalka (until October 2013) Rod Page (from October 2013)
Vice Chairs	Mark Costello Arturo Ariño Jean Cossi Ganglo
Members	Roderic Page (until October 2013) Elizabeth Arnaud Guy Cochrane (from May 2013) Kathy Willis (from May 2013)
Ex-officio	
Chair Governing Board	
1st Vice Chair Governing Board	
2nd Vice Chair Governing Board	
3rd Vice Chair Governing Board	
Nodes Committee Chair	(until October 2013)
Executive Secretary	

Rules Committee (until October 2013)	
Chair	Christoph Häuser
Vice Chair	Keiichi Matsuura
Ex-officio	
Chair Governing Board	
Executive Secretary	

Node Managers Committee	
Chair	Stephen Wilkinson
1st Vice Chair	Alex Asase
2nd Vice Chair	Manuel Vargas
Members	All Node Managers

Nodes Steering Group	
Chair	Stephen Wilkinson
1st Vice Chair	Alex Asase
2nd Vice Chair	Manuel Vargas
Regional Node Representatives	
Africa	Fatima Parker-Allie (until October 2013) Hulda Gideon (from October 2013)
Asia	Sheila Vergara
Europe	Cees Hof (until October 2013) André Heughebaert (from October 2013)
Latin America	Luiz Gadelha
North America	Robert Hanner
Oceania	Beth Mantle (until October 2013)

Budget Committee	
Chair	Per Backe-Hansen (until October 2013) Walter Berendsohn (from October 2013)
1st Vice Chair	Eli van der Heide
2nd Vice Chair	Walter Berendsohn (until October 2013) Selwyn Willoughby (from October 2013)
Members	Christophe Häuser (until May 2013) Keiichi Matsuura (until June 2013) Ben Wheeler François Guissart (until October 2013) Joanne Daly (from October 2013) Patricia Koleff Osorio (from October 2013)
Ex-officio	
Chair Governing Board	
Executive Secretary	

Appendix 6 – GBIF Affiliations

GBIF affiliations	Status
Biodiversity Indicators Partnership	Partner
Convention on Biological Diversity (CBD)	Observer
Encyclopedia of Life (EOL)	Council member
European Biodiversity Observation Network (EU BON)	Participant
Eye on Earth Biodiversity Special Initiative	Stakeholder
Global Genome Biodiversity Network (GGBN)	Steering committee member
Global Invasive Alien Species Information Partnership	Partner/coordinator
Global Partnership for Plant Conservation (GPPC)	Partner
Group on Earth Observations (GEO)	Principal
Group on Earth Observations Biodiversity Observation Network (GEO BON)	Advisory Board member
Intergovernmental Panel on Climate Change	Observer
Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)	Observer
LifeWatch Policy & Science Board	Member
Trondheim Environmental Conferences	Participant
United Nations Environment Programme (UNEP) Governing council	Member, major groups and stakeholders
United Nations Framework Convention on Climate Change (UNFCCC)	Observer

Appendix 7 – GBIF Task Groups 2013

Task Group on Financial Sustainability	
Chair	Lars Nilsson
Members	Michel Guiraud
	Christoph Häuser
	Fumiko Nakao
	Joann P. Roskoski
	Mark Stevenson
Secretariat	Hugo von Linstow

Appendix 8 – Financial information

Preliminary financial statement 2013 in EUR

GBIF CORE FUNDS	
INCOME STATEMENT	EUROS
Income	
Received basic financial contribution	2,211,464
Received basic financial contribution former years	647,817
Total Income	2,859,281
Expenditure	
Work Programme 2013 - Activities	-186,491
Work Programme 2013 - Implementation	-1,646,246
Governance - Committee costs and awards	-116,157
Staff expenditure	-660,276
Running expenditure	-177,269
Secretariat facilities	-66,807
Total expenditure	-2,853,247
Changes in foreign exchanges rates	17,613
Interest	645
End of the year Result	24,293
BALANCE SHEET	
Assets	
Other receivables and VAT	20,592
Cash and Cash at bank	1,048,714
Total assets	1,069,306
Net Capital and liabilities	
Net Capital (equity)	30,994
Provisions	56,299
Supplementary funds	527,176
Auditor	6,716
Prepayments re. 2014–2016	439,234
Other payables	8,887
Total equity and liabilities	1,069,306
GBIF Supplementary Fund	
Balance at 1 January	347,504
Exchange rate dif. at January 1	0
Income 2013	580,552
Interest income transferred to supplementary funds	6,363
Expenditure	-407,242
Balance at 31 December	527,176

Contributing agencies for 2013

Voting Participants	Financial Contributors
Andorra	Institute d'estudis Andorrans
Argentina	CONICET - Museo Argentino de Ciencias Naturales
Australia	CSIRO Entomology
Belgium*	Belgian Federal Science Policy Office (belspo)
Benin	Laboratoire des Science Forestieres
Chile	Comision Nacional del Medio Ambiente (CONAMA)
Colombia	Instituto de Investigación de Recursos Biológicos
Costa Rica	Asociación Instituto Nacional de Biodiversidad (INBio)
Denmark	The Danish Agency for Science, Technology and Innovation
Estonia	Ministry of Environment
Finland	Finnish Museum of Natural History
France	Direction Générale pour la Recherche et l'Innovation (DGRI)
Germany	Deutsche Forschungsgemeinschaft (DFG) German Aerospace Center, BMBF
Ghana	Council for Scientific and Industrial Research (CSIR)
Iceland	Ministry for the Environment
Ireland	National Parks & Wildlife Service
Japan	Ministry of the Environment of Japan
Madagascar	Centre National de Recherches sur l'Environnement (CNRE)
Mauretania	L'Ecole Normale Supérieure de Nouakchott
Mexico	Consejo Nacional de Ciencia y Tecnología (CONACYT)
Netherlands	Ministry of Education, Culture and Science
New Zealand	Ministry of Research, Science and Technology
Norway	The Research Council of Norway
Portugal	Foundation for Science and Technology
Republic of Korea	Ministry of Education, Science and Technology
Slovak Republic	Ministry of the Environment
Slovenia	Ministry of Higher Education, Science and Technology
South Africa	Department of Science and Technology
Sweden	Swedish Research Council
Tanzania	Tanzania Commission for Science and Technology (COSTECH)
Uganda	Uganda National Council for Science and Technology
United Kingdom	Department for Environment, Food and Rural Affairs (DEFRA) National Environment Research Council (NERC) Royal Botanic Gardens, Kew Natural History Museum, London Joint Nature Conservation Committee
USA*	National Science Foundation Smithsonian Institution U.S. Department of State U.S. Department of Agriculture

* Received in 2014

Externally Received Grants 2013

For supplementary Funds	DKK	EUR
University of Copenhagen (IT Equipment)	170,000	22,787
I4Life	206,754	27,714
Euro-GEOSS	394,339	52,858
OpenUp!	6,257	839
EU Bon	1,792,607	240,283
GIASIP, CBD	247,608	33,190
Emodnet Biology 2	89,327	11,974
VIBRANT	0	0
Total external funding	2,906,892	389,645

Appendix 9 – GBIF Secretariat staff

GBIF Secretariat Staff as of 31 december 2013	
Management group	
Donald Hobern	Executive Secretary/Director
Tim Hirsch	Deputy Director and Head of Participation
Anne Mette Nielsen	Head of Administration
Tim Robertson	Head of Informatics
Andrea Hahn	Programme Manager
Secretariat staff	
Sampreethi Aipanjiguly	Communications Officer
Olaf Bánki	Senior Programme Officer for Participation
Kyle Braak	Developer
Søren Bundgaard-Jensen	Financial Officer
Andrei Cenja	System Administrator
Vishwas Chavan	Senior Programme Officer for Data Mobilisation
Samy Gaiji	Senior Programme Officer for Science and Scientific Liaison
Alberto González-Talaván	Senior Programme Officer for Training
Burke Chi-Jen Ko	Informatics Liaison
Jan Krzysztof Legind	Data Administrator
Federico Mendez Hernandez	Developer
Oliver Meyn	Developer
Éamonn Ó Tuama	Senior Programme Officer for Interoperability
Mélanie Raymond	Nodes Capacity Officer
Susanne Lønstrup Sheldon	HR Manager & PA to the Director
Ciprian Vizitiu	Webmaster and Network Administrator

Staff Departures	
Jose Miguel Cuadra Morales	Programmer (until 31 March)
Lars Francke	Developer (until 28 February)
Bo Thorsteinsson	Financial Officer (until 30 June)
Hugo von Linstow	Deputy Director for Management and International Relations (Until 31 december)



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