



GLOBAL  
BIODIVERSITY  
INFORMATION  
FACILITY

*free and open access to biodiversity data*

## GBIF 21<sup>st</sup> Governing Board Meeting



First day of Governing Board. Photo: GBIF Secretariat

Delegates to GBIF's Governing Board gathered in the India Habitat Centre, New Delhi, from 16-18 September for its 21st meeting (GB21), hosted by the Ministry of Environment and Forests, and the Wildlife Institute of India. 89 participants representing 32 countries attended the meeting, which approved GBIF's budget and work programme update, endorsed a new approach to licencing of data published through GBIF, and discussed some of the successes and challenges of setting up biodiversity information facilities. The event also included meetings of GBIF's advisory committees and a public symposium that highlighted GBIF's recent achievements and upcoming plans, examples of national-scale tools and services, and research using GBIF-mediated data to support sustainable development.



# GBits

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## GB21 HIGHLIGHTS

**The Indian Minister for Environment, Forests and Climate Change, Prakash Javadekar** opened the meeting with praise for the GBIF community's leadership in developing capacity in biodiversity



Prakash Javadekar, Indian Minister for Environment, Forests and Climate Change, opens GB21. © 2014, Rupa Bhardwaj / WII

informatics. Stating his commitment to developing a robust national infrastructure for biodiversity data, he told delegates India would negotiate to become a full Voting Participant of GBIF. The country has been an Associate Participant since 2003.

► [READ MORE News release](#)

**The executive secretary of the Convention on Biological Diversity (CBD), Braulio Dias,** delivered a message to GB21, read to delegates by the Governing Board chair, Peter Schalk. In his statement, Dias called upon both GBIF Participants and the CBD constituency "to recognize the benefits of a viable, active and strong GBIF, primarily to benefit countries in having access to information to guide their own sustainable development agenda."

► [DOWNLOAD Letter from Braulio Dias](#)

Following extensive consultations, the Governing Board approved **new approaches to licencing and endorsement of data published through GBIF**.

In future, all species occurrence datasets within the network will be associated with one of three machine-readable licences equivalent to Creative Commons CCo, CC-BY and CC-BY-NC. GBIF will encourage publishers to adopt the most open license possible. Secretariat staff will guide the preparation of new guidelines to help GBIF nodes

evaluate and endorse prospective data publishers, and data holders with no links to current GBIF nodes will have new options for sharing their data through the network.

► [READ MORE News release](#)

Staff from the GBIF Secretariat kicked off the **Public Symposium 2014**, sharing background about recent developments to enrich the data accessible through GBIF.org; plans to attach Digital Object Identifiers (DOI) to all datasets, which will help strengthen attribution and citation of data accessed through GBIF; new developments in GBIF's capacity enhancement programme; and the network's contribution to global processes such as the CBD. GBIF national Participants from Ireland, Benin, the United Kingdom and Australia related examples showing how informatics investment and collaboration support national priorities on biodiversity.



Tony Rees, 2014 Ebbe Nielsen Prize winner. Photo: GBIF Secretariat

Ebbe Nielsen Prize winner Tony Rees started the afternoon session off with an [overview of four innovative biodiversity informatics tools](#) recognized by the award. Following a brief video update on 2013 Young Researchers Award winner Emma Gomez, attendees heard about 2014 YRA recipients Caoimhe Marshall and Vijay Barve. Science committee chair Rod Page then introduced the [Ebbe Nielsen Challenge](#), which will seek to spark innovative uses of GBIF-mobilized data (more details to follow soon).

The symposium concluded with experts from [Spain](#), the [United Kingdom](#), the [United States](#) and [India](#) presenting on their uses of data accessed through GBIF to support conservation, food security, public health, invasive species control, and human innovation.



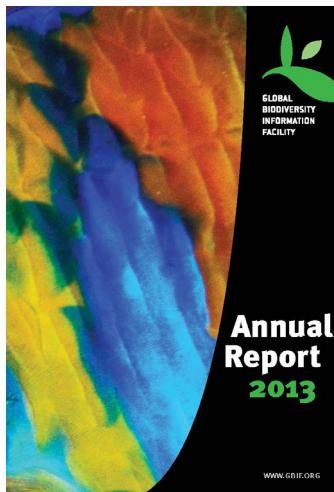
Videos of each speaker are available on-demand on GBIF.org along with their presentations, and users can also watch the complete video playlist on both Vimeo and YouTube.

- ▶ **LEARN MORE** [Videos and presentations](#)
- [Public Symposium 2014 brochure](#)
- ▶ **WATCH** [Public Symposium on Vimeo](#)
- [Public Symposium on YouTube](#)

## GOVERNANCE

### GBIF releases *Annual Report 2013*

GBIF has published its annual report for 2013, summarizing activities across the network. Among the year's highlights were the launch of GBIF.org, the introduction of real-time data indexing and publication of the Global Biodiversity Informatics Outlook.



The report illustrates numerous collaborative projects, profiles data publication and use in the GBIF's six regions, and presents a wide range of metrics about access and use GBIF-mediated data through GBIF.org.

- ▶ **DOWNLOAD** [Annual Report 2013](#)

## GBIF NETWORK

### Uruguay joins as Voting Participant

Uruguay has joined the GBIF network as a full Voting Participant, becoming the eighth Participant from GBIF's Latin American region and the 38th national government with full representation in GBIF.

Gabriel Aintablian, director of Dirección de Innovación, Ciencia y Tecnología para el Desarrollo (DICYT), signed the MOU with the GBIF Secretariat on behalf of the country's Ministry of Education and Culture.

- ▶ **READ MORE** [News release](#)

## Biodiversity Heritage Library, Naturalis and Canadensys now GBIF Participants

GBIF has welcomed three new organizations as Associate Participants. These signatories to the GBIF Memorandum of Understanding participate in various ways in the network's activities and have non-voting representation on the GBIF Governing Board.

**The Biodiversity Heritage Library (BHL)** is a consortium of biodiversity-related libraries that provides open access to biodiversity information through web based tools and services. BHL has digitized millions of pages of taxonomic literature, representing over 100,000 volumes that include information on more than 150 million species names. GBIF users can already access literature references in BHL through links on the taxon pages on GBIF.org.

**Naturalis Biodiversity Center**, based in Leiden, The Netherlands, holds a biological collection of more than 37 million specimens. In 2013 it merged with ETI Bioinformatics which has been an Associate Participant since 2001.

**Canadensys**, based at the Université de Montréal, provides access to biodiversity information held in biological collections across Canada and repatriates data from over 200 countries. It has developed a range of tools and resources for publishing data associated with use of the GBIF Integrated Publishing Toolkit (IPT).

- ▶ **READ MORE** [BHL announcement](#)
- [Naturalis and Canadensys announcement](#)

## DATA PUBLISHING

### New partnership with DataONE targets data persistence

The GBIF Secretariat and the Data Observation Network for Earth (DataONE) have signed a memorandum of cooperation to design a pilot repository that archives datasets shared through GBIF. The partnership will also support DataONE's efforts to improve its own data indexing services by building on GBIF's solution for handling large-scale tabular data.

Other areas addressed by the agreement include finding efficient ways to exchange ecological data, using the GBIF network to connect additional members to DataONE, and informing further development of GBIF's work to produce efficient tools for working with very large quantities of occurrence data.

This partnership will open up new possibilities for improving GBIF's services. For example, GBIF could offer a repository for new datasets derived from GBIF-mediated data after cleaning. Improving the retrieval and traceability of data used in prior research will enable subsequent researchers both to replicate published studies and to benefit from 'reference datasets' with higher quality assurance.

► [READ MORE News release](#)

## CAPACITY ENHANCEMENT

### GBIF announces 2014 capacity enhancement grant recipients

The GBIF Secretariat has announced the award of capacity enhancement grants to five projects across its international network. In total, the projects will engage 31 partners from 29 countries and two international organizations, range across five of GBIF's six regions, and leverage €40,000 of funding with an additional €70,000.

"With their focus on data digitization, data quality, data standards, technology development and invasive alien species, these projects provide for broad engagement and exchange across topics of shared interest for the GBIF network," said Donald Hobern, executive secretary of the GBIF Secretariat. Funded projects include:

- A Latin American initiative led by [SiB Colombia](#) to introduce systematic improvements to the quality of biodiversity data published through the GBIF network
- A second Latin American effort headed by [CYTED](#) (The Iberoamerican Programme for Science and Technology for Development) to expand capacity for digitizing and publishing data from scientific literature, images and multimedia
- Mentoring led by Mexico's [CONABIO](#) to use the Plinian Core Standard for species information to increase the quality and interoperability of GBIF-mediated data
- Bilingual training and exchange to establish coordinated early warning and response

network for invasive alien species across sub-Saharan Africa, guided by [GBIF Mauritania](#)

- An intensive open-source 'hackathon' organized by [Species 2000](#) targeted at enhancing the skills and capacity of GBIF's European Participants to produce national species checklists

► [READ MORE 2014 capacity enhancement projects](#)

### Mentoring project update Belgium, Mauritania and Togo

The GBIF national nodes from Mauritania, Togo and Belgium co-organized a data publication workshop at the École Normale Supérieure de Nouakchott on 2-4 September 2014. About 15 participants from various academic and government institutions learned about GBIF, data publishing and use, with a particular focus on how to prepare, clean and publish data through the GBIF Integrated Publishing Toolkit.



Workshop in Nouakchott, Mauritania © Koudjou, GBIF Togo

Participants published five [Mauritanian datasets](#) (occurrence data for the National Herbarium of Mauritania and crocodiles, and checklists for plants of the Banc d'Arguin National Park, Fabaceae, and reptiles); and two [Togolese datasets](#) (checklists on Algae and Fabaceae). MrBIF is also preparing a data publication convention to facilitate data sharing between all country institutions and GBIF.

► [READ MORE Workshop materials](#)

[IPT Togo](#)

[IPT Mauritania](#)

### Colombia and Brazil

In August, Brazil hosted the fourth and final mentoring meeting at the National Laboratory for Scientific Computing (LNCC), in Petrópolis, Rio de

Janeiro state. Christian Gendreau from Canadensys was invited to participate in developers' discussions and share his experience.

During the week-long programme, participants discussed how to improve cooperation and developed the WingLongitude concept: a neutral [code repository](#) where teams can share software, thus facilitating its use and contribution by others.



*Fourth Colombia and Brazil mentoring meeting © 2014, Pedro Guimaraes, SiBBr*

They also decided to intensify the common use and improvement of their respective biodiversity data management software. The biodiversity information community is also invited to participate and contribute to this open software platform.

Through this mentoring Project, the [Information System for Colombian Biodiversity](#) (SiB Colombia) helped [SiB Brazil](#) to install a platform to publish data from Brazil using the GBIF Integrated Publishing Toolkit, and to develop their own data portal using the GBIF source code. It also took advantage of the LNCC's expertise on high performance computing to execute species' distribution models in large scale.

► [READ MORE WingLongitude](#)

## NEW DATA

### eBird

The annual update of the [eBird Observational Dataset](#) (EOD) has pushed the number of occurrence records published through GBIF past half a billion.

[eBird](#), run by the [Cornell Lab of Ornithology](#) and the [National Audubon Society](#), is a vast collection of high-quality observations collected by professional ornithologists, recreational birders and citizen scientists alike.

► [READ MORE News release](#)

## Belgium

The [Research Institute for Nature and Forest \(INBO\)](#), has published the [GPS tracking of lesser black-backed gull and herring gull breeding at the Belgian coast](#). This dataset contains over 440,000 occurrences recorded in 2013 by 27 GPS trackers mounted on 22 lesser black-backed gulls (*Larus fuscus*) and five herring gulls (*Larus argentatus*) breeding on the Belgian coast. These data were recorded as part of INBO's terrestrial observatory for [LifeWatch](#), in collaboration with [Uva-BiT](#)s and the [Flanders Marine Institute \(VLIZ\)](#). The use of GPS trackers enhances study of the migration patterns and habitat use of the gulls, removing bias towards locations where observers can see the birds. The dataset demonstrated how use of individual ID codes when publishing to GBIF enables users to track movement of individual animals over time.



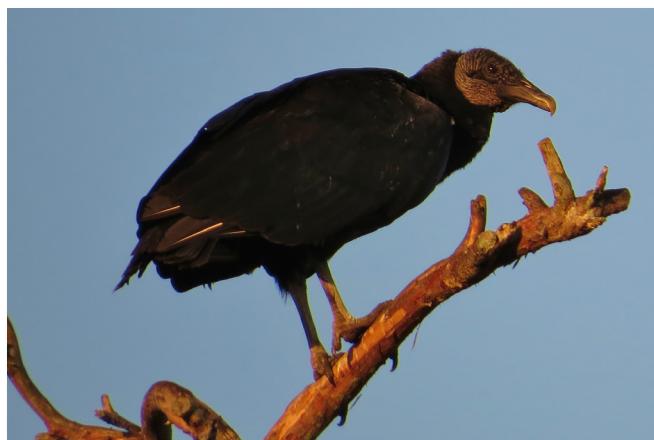
*Lesser Black-backed Gull (*Larus fuscus*). Photo CC BY-NC-SA 2.0 <https://flic.kr/p/7UqCuV>*

The Belgium Biodiversity Information Facility (BeBIF) digitized and published 5,583 observation records of plants and fungi derived from [The Flora of Northumberland and Durham \(N.J. Winch 1831\)](#). Dr. Q. Groom of the Botanic Garden Meise initiated the digitization of this historic literature reference by providing a semantically enhanced XML file, from which academic publishers Pensoft created a semantically enhanced HTML re-publication.

This enriched online re-publication of the *Flora* marries the details of the original book with the advantages brought by digitization, such as data extraction and collation, distribution and scientific use and application of the content. This publication aims to support ongoing research on the botany of north-eastern England.

## Chile

[GBIF Chile](#) has mobilized six national datasets for publication through GBIF.org from the [Chilean environment ministry](#)—the first datasets from the country to be published via GBIF and the result of a mentoring project with partners in Costa Rica.



Black vulture (*Coragyps atratus*). Photo CC BY-NC-SA 2.0  
<https://flic.kr/p/e9cXxr>

The occurrence datasets comprise 15,541 records and include collections of [herpetological specimens](#), [flatworms](#) (*Platyhelminthes*), [crustaceans](#) and [algae](#) from Chile's Museum National of Natural History; and [wildlife observations](#) by Charif Tala, GBIF national Node manager and head of department of Chile Ministry of Environment.

## Czech Republic

The [National Museum in Prague](#) has published its first data through GBIF.org. Seven datasets consisting of over 55,000 species occurrences from the museum's paleontological [fauna](#) and [flora](#), [botanical](#), [entomological](#), [mycological](#) and [zoological](#) collections can now be accessed through GBIF.org. The museum also published a [literary description of Iranian lizards](#), comprising 8,525 georeferenced records covering 41% of Iran. This particular dataset is described by a [data paper](#) presenting a comprehensive summary of the distribution of the lizards of Iran. Because the Czech Republic is not yet a national Participant in GBIF, the [Consortium of European Taxonomic Facilities](#) (CETAF), a GBIF Associate Participant, endorsed the museum as a new publisher.

## Norway and India

As part of a pilot project to demonstrate capacity building for the Intergovernmental Platform for Biodiversity and Ecosystem Services (IPBES), the

[Natural History Museum of Oslo](#) (NHM-UiO) has published four datasets following a Norwegian collaboration with the [Wildlife Institute of India](#) (the GBIF national node for India). These datasets includes specimens originating in India now located in the natural history collections at the University Museum of the Norwegian University of Science and Technology (NTNU), the University Museum of the University of Bergen (UiB) and Natural History Museum at the University of Oslo (NHM-UiO).

The same project yielded an Indian dataset of [305 camera-trap occurrences of tiger \(\*Panthera tigris tigris\*\)](#) from Rajaji National Park in Uttarakhand state and a [guide for publishing camera trap data](#) produced by the GBIF Secretariat with Indian and Norwegian partners.

## Russia

The [Moscow University Herbarium](#) (MW), a new GBIF data publisher, made available a grid-based dataset on [vascular plant distribution on the Meshchera National Park, Vladimir Oblast, Russia](#). As the second largest herbarium of Russia, MW Herbarium has a wide expertise in vascular plants and Eurasian bryophytes.

This dataset is based on grid scheme and contains over 22,600 records of unique occurrences of 812 species of vascular plants from the Meshchera National Park. This initial publication of data through GBIF.org will be enriched with about 100,000 additional records from MW Herbarium.

Because Russia is not yet a GBIF national Participant, [GBIF Finland](#) (a Voting Participant) endorsed Moscow University Herbarium as a new data publisher.

## Thailand

The [Princess Maha Chakri Sirindhorn Natural History Museum](#) (PSU Museum) published the first occurrence dataset from a Thai institution via GBIF.org. The museum used an [IPT installation](#) to share its [amphibian collection](#), comprising 600 species occurrence records, 90 per cent of which relate to specimens collected from the Thailand peninsula, one of Southeast Asia's biodiversity hotspots.

The PSU Museum expects to share specimen data from a variety of natural history collections, including macro-algae, plankton, invertebrates, vertebrates and fossils. Once published, the museum anticipates ongoing updates to the data from these active collections.



Common Tree Frog (*polypedates leucomystax*). Photo CC BY-NC-SA 2.0  
<https://flic.kr/p/bfmmQK>

Because Thailand is not yet a GBIF national Participant, the ASEAN Centre for Biodiversity (a GBIF Associate Participant) endorsed the museum as a new data publisher.

## United Kingdom

The [European Molecular Biology Laboratory](#) (EMBL) has published a dataset comprised of [more than 4.6 million geographically tagged genetic sequences](#), piloting the publication of genomic data through GBIF.

## AROUND THE NETWORK

### GBIF in Latin America

Six participants from Latin America and one observer from Uruguay attended the fourth GBIF Latin American Nodes meeting in Petrópolis, Brazil, on September 1-3, on the heels of a week-long mentoring programme between Colombia and Brazil (see project update above).

After presenting ongoing project and initiatives, the attendees discussed how to improve regional and international collaboration and outlined a regional work plan. The participating nodes identified collaborative development of biodiversity data portals, capacity enhancement and engagement of new member as areas of priority. Core activities around capacity enhancement will focus on data quality, digital documentation and Plinian Core species information.

The work plan also made specific mention of development of biodiversity data portals through regional initiatives like the mentoring project between Brazil and Colombia, and the international collaboration with the Atlas of Living Australia (ALA) working group.

### GBIF contributes to biodiversity conference in China

Over 300 scientists and experts attended the 11th National Conference on Biodiversity Science and Conservation in Shenyang, China, in August, organized by the Chinese Academy of Sciences (CAS). Dr. Ma Keping, Secretary General of the Chinese National Committee of DIVERSITAS, and head of the CAS delegation to GBIF, chaired the opening ceremony.

The mission of the biennial conference is to promote academic research and collaboration in the fields of biodiversity and conservation. This year's conference included a thematic session on biodiversity informatics.



Burke Chih-Jen Ko from GBIF Secretariat leads the workshop on biodiversity informatics © 2014, CNC-DIVERSITAS

The GBIF Secretariat helped to organize a workshop alongside this session led by Burke Chih-Jen Ko, which included a demonstration of geo-referencing and data publishing using the GBIF Integrated Publishing Toolkit (IPT). The workshop helped increase knowledge of the GBIF data publishing workflow in China, while enhancing practical data management skills among scientists.

### Mass digitization of pinned insects from Finland

Digitarium, the digitization centre of the Finnish Museum of Natural History and University of Eastern Finland, has released a high-performance system for digitizing pinned insects.

As its first test, Digitarium digitized the beetle collection of Gunnar Blomqvist of Joutseno for the Finnish Museum of Natural History, in two months. This beetle collection has 15,000 specimens and comprises about two thirds of all Coleopteran species found in Finland, including some 100 threatened species.

## I<sub>3</sub>B workshop focuses on species distribution models

The Iberoamerican Infrastructure for Biodiversity Information (I<sub>3</sub>B) has held the third of its four planned regional training and experience exchange activities.

The June workshop in Tepoztlán, Mexico, focused on the fundamentals and the future of ecological niche modeling. Attendees included 30 graduate students and young researchers in the fields of biogeography and conservation biology along with biodiversity conservation planning professionals from nine I<sub>3</sub>B network members in nine countries: Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Uruguay and Spain.



I<sub>3</sub>B workshop © 2014, Cristina Villaverde / GBIF.ES

The general objective of the workshop was to offer theoretical and practical overviews of ecological niche modeling applications and limitations along with recent developments in the field. Attendees committed to implementing and disseminating the contents learned in the workshop within their countries while seeking to make biological information relating to their areas of study readily available.

Mexico's CONABIO and GBIF Spain (GBIF.ES) co-organized the workshop, which was sponsored by GBIF Associate Participant CYTED.

- ▶ **LEARN MORE** [Training resources](#)
- ▶ [Results of the first two workshops](#)
- ▶ **WATCH** [Workshop videos](#)

## BIODIVERSITY DATA IN USE

*The Secretariat maintains a programme to monitor use of GBIF-mediated data in scientific literature. The following peer-reviewed articles represent some recent highlights.*

Amirkia, V., et al. 2014. [Alkaloids as drug leads – A predictive structural and biodiversity-based analysis](#). Phytochemistry Letters.

Are alkaloids underrepresented in modern medicine? The authors used GBIF-mediated occurrence records for known plant sources of alkaloids, in part, to examine potential reasons for a steep drop in the number of new alkaloid-based medicines despite their 4,000-year history of human healing.

Candela, L., et al. 2014. [An infrastructure-oriented approach for supporting biodiversity research](#).

Ecological Informatics.

The authors introduce a set of tools developed by the D4Science Data Infrastructure to support acquisition and preparation of species occurrence data from GBIF, OBIS and other sources, seeking to reduce the time researchers spend in data quality assessment and curation.

Crafton, R. E. 2014. [Modeling invasion risk for coastal marine species utilizing environmental and transport vector data](#). Hydrobiologia.

To identify coastal marine areas at risk of invasion by five coastal marine crab species, the author relied on GBIF-mediated data to generate a model that combines where they are both likely to arrive and able to survive. While assessments could adapt this focus on introduction likelihood and environmental suitability to other marine and non-marine species, they hinge on having occurrence data that represent the complete range of conditions under which a species can survive.



Asian shore crab (*Hemigrapsus sanguineus*). Photo CC bY-NC-SA 2.0  
<https://www.flickr.com/photos/21933510@N07/10929759593>



Faulkner, K., et al. 2014. [A simple, rapid methodology for developing invasive species watch lists](#). Biological Conservation.

To help develop biosecurity schemes for resource-poor regions, the authors proposed a rapid, cost-effective method of creating watch lists for invasive alien species (IAS). With the help of GBIF-mediated data on 419 invasive species, the technique uses consistent predictors of IAS success—past precedents, environmental suitability and introduction effort—to produce an initial assessment of key threats.



Bitou Bush flowers and fruits (*Chrysanthemoides monilifera*).  
Photo CC bY-NC-ND2.o <https://flic.kr/p/6UGDf1>

Gasc, A., et al. 2014. [Biodiversity Sampling Using a Global Acoustic Approach: Contrasting Sites with Microendemics in New Caledonia](#). PLoS ONE.

The researchers' proposed acoustical method for rapid biodiversity assessment in New Caledonia responds to the Pacific island's unique spatial structure and the microendemic distribution of many of its species. Existing inventory, phylogenetic and GBIF-mediated data helped guide the selection of three mountain sites for validating the test of the methods for broad spatial and temporal scales elsewhere.

Harsch, M. A., et al. 2014. [Species distributions shift downward across western North America](#). Global Change Biology.

Drawing upon GBIF.org and other sources for occurrence data on 296 plant species from western North America, researchers explored how moisture stress and other direct physiological shifts may contribute to distributions for 63% of the plants shifting towards lower elevations despite consistent warming across the study area.

Higgins, S. I., et al. 2014. [Invasive plants have broader physiological niches](#). Proceeding of the National Academy of Sciences of the United States of America.

Species tolerant of a broader range of environmental conditions are likelier to become invasive, report the authors, who compared their physiologically based species distribution model with GBIF-mediated data on exotic occurrences of 749 Australian acacia and eucalypt tree species over the past century.

Hjarding, A., et al. 2014. [Red List assessments of East African chameleons: a case study of why we need experts](#). Oryx.

After comparing GBIF-mediated data on geographical distribution of 35 species of chameleons endemic to East Africa with data compiled by a taxonomic expert, the authors conclude that online databases are not alone adequate to assess the threatened status of species.

Ikeda, D. H., et al. 2014. [Incorporating Climate Change and Exotic Species into Forecasts of Riparian Forest Distribution](#). Plos ONE.

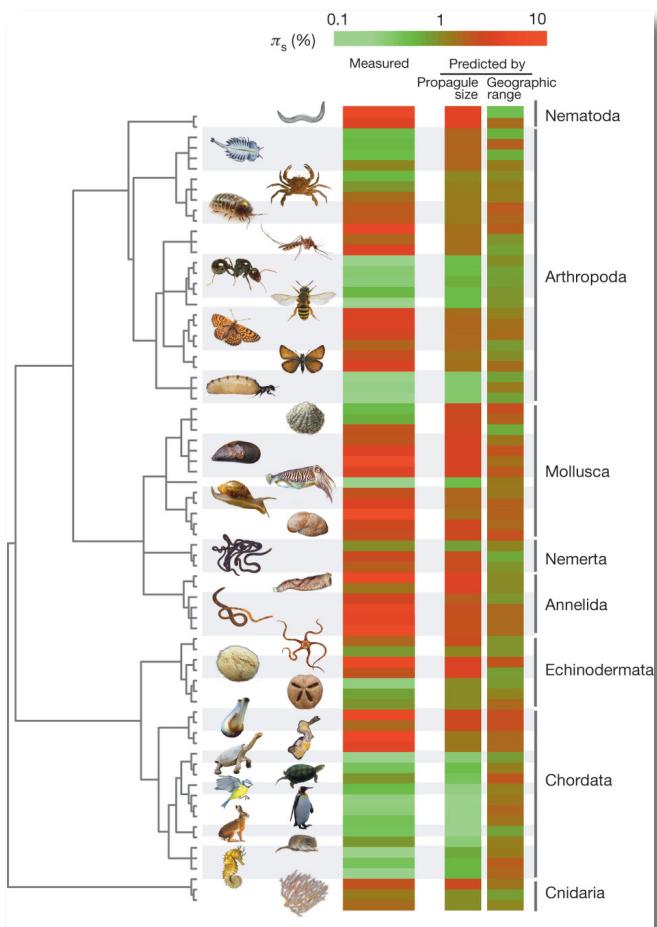
The authors applied GBIF-mediated data to their examination of potential climate change impacts on suitable habitat across arid portions of the western United States for four riparian species, three natives (*Populus fremontii*, *Salix gooddingii* and *Salix exigua*) and Tamarix, a now-widespread exotic. While results suggest that *P. fremontii* could unexpectedly see the greatest range increase, Tamarix' effect on distributions of all three natives highlight the need to account for both direct and indirect climate change effects.

Pigott, D. M., et al. 2014. [Mapping the zoonotic niche of Ebola virus disease in Africa](#). eLife.

Researchers mapped the areas of Africa potentially at risk from outbreaks of Ebola virus disease, based on the environmental niche of three bat species believed to act as reservoir hosts of the disease. While human outbreaks such as the one currently affecting West Africa have been rare, the study used GBIF-mediated bat occurrence data to identify at-risk areas with a combined human population of 22 million across 22 countries in Central and West Africa.

Pinkernell, S., et al. 2014. [Potential effects of climate change on the distribution range of the main silicate sinker of the Southern Ocean](#). Ecology and Evolution.

Using GBIF-mediated data to build a species distribution model for *Fragilaropsis kerguelensis*—a dominant diatom species throughout the Antarctic Circumpolar Current—the authors established important pilot for this rarely modeled group and explored anticipated effects of climate change on a main driver of the biological silicate pump.



*Genome-wide genetic diversity across the metazoan tree of life*  
© 2014, authors c/o Nature Publishing Group.

Romiguier, J., et al. 2014. [Comparative population genomics in animals uncovers the determinants of genetic diversity](#). Nature.

Genetic diversity measures the variation observed between DNA sequences from distinct individuals of a given species. Supported by GBIF-mediated species occurrence data, researchers investigated genetic diversity for 76 animals and found that crucial trait to be parental investment: short-lived and highly fecund species are more genetically diverse than long-lived or low-fecundity species with brooding ability.

Schulp, C. J. E., et al. 2014. [Wild food in Europe: A synthesis of knowledge and data of terrestrial wild food as an ecosystem service](#). Ecological Economics.

While collecting and consuming wild food is recognized as an important cultural ecosystem service, quantitative measures of these provisions have been harder to come by. The authors synthesized data for wild food species through GBIF and other sources, seeking to use the density of occurrences to quantify and map the value of the wild game and plants consumed throughout Europe.

Singh, G., et al. 2014. [Spatial Extent Models for Natural Language Phrases Involving Directional Containment](#). Transactions in GIS.

The presence of millions of non-geocoded records mediated by GBIF sparked the authors to explore how to assign spatial extents to gazetteer-style names like ‘central northern California’. Using the two-volume *Ornithological Gazetteer of Brazil* (Paynter and Taylor 1991), they compared and tested spatial interpretations of multiple natural language phrases in hope of deriving consistent, recommended approaches.

Shabani, F., et al. 2014. [Distribution of date palms in the Middle East based on future climate scenarios](#). Experimental Agriculture

With its specific adaptations to hot, arid desert oases, date palm (*Phoenix dactylifera* L.) could face dramatic effects from climate change. Using occurrence data drawn from GBIF, other data sources and scientific literature, the authors found that Saudi Arabia, Iraq and Iran may see the greatest impacts on the distribution of this important and profitable crop, while Israel, Jordan and western Syria may increase in suitability.

Tingley, R., et al. 2014. [Realized niche shift during a global biological invasion](#). Proceedings of the National Academy of Sciences of the United States of America.

Using occurrence data for the cane toad (*Rhinella marina*) accessed through GBIF and several other sources, the authors sought to improve forecasting accuracy of the spread of invasive alien species. This investigation combines a physiologically mechanistic model of evolved environmental tolerances, or fundamental niche shifts, with correlative models based biotic and abiotic conditions in the invaded range (realized niche shifts).



Robertson, T., et al. 2014. [The GBIF Integrated Publishing Toolkit: Facilitating the Efficient Publishing of Biodiversity Data on the Internet.](#) PLoS ONE.

Working with partners from VertNET in the United States and INBO in Belgium, developers at the GBIF Secretariat described the features and functions of the Integrated Publishing Toolkit software. The discussion outlines the impetus and creation of the IPT, its continuing evolution, and its impact on the biodiversity research community and data publishing.

## EVENTS

### Meetings and conferences

[COP 12: Conference of the Parties to the CBD](#)

6-17 October 2014, Pyeongchang, Republic of Korea

[African Mountains Regional Forum, 2014](#)

22-24 October 2014, Arusha, Tanzania

[2014 TDWG Conference](#)

27-31 October 2014, Jönköping, Sweden

[IUCN World Parks Congress](#)

12-19 November 2014, Sydney, Australia

[2nd International Ocean Research Conference](#)

17-21 November 2014, Barcelona, Spain

[Arctic Biodiversity Congress](#)

2-4 December 2014, Trondheim, Norway



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

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