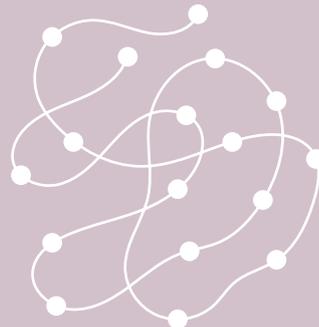
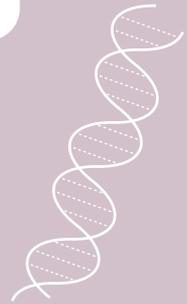
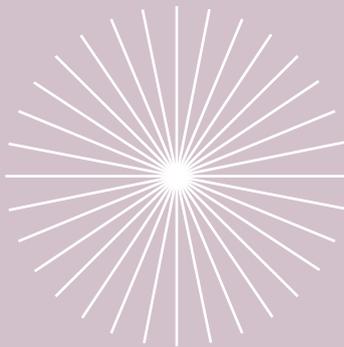


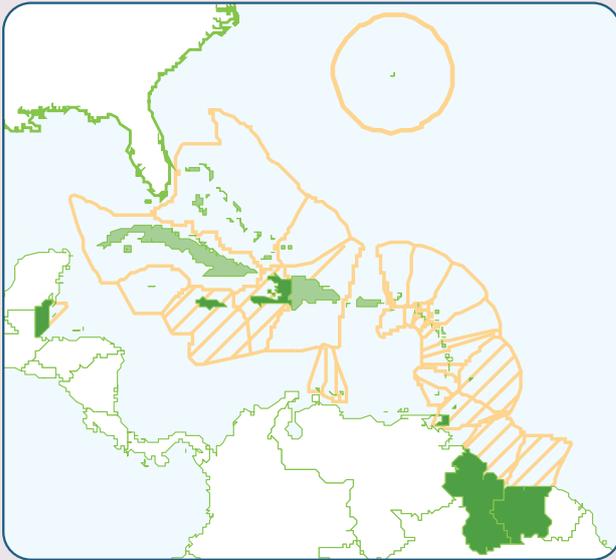
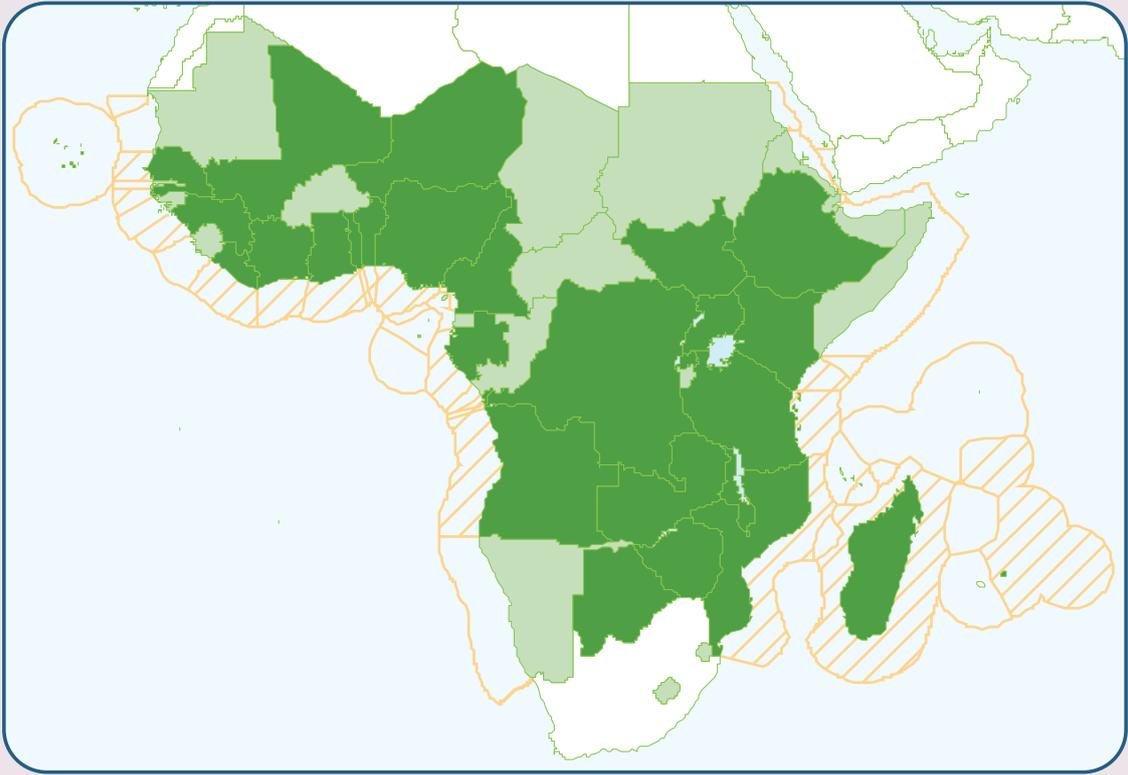
IMPACT SUMMARY



BID

Biodiversity Information
for Development

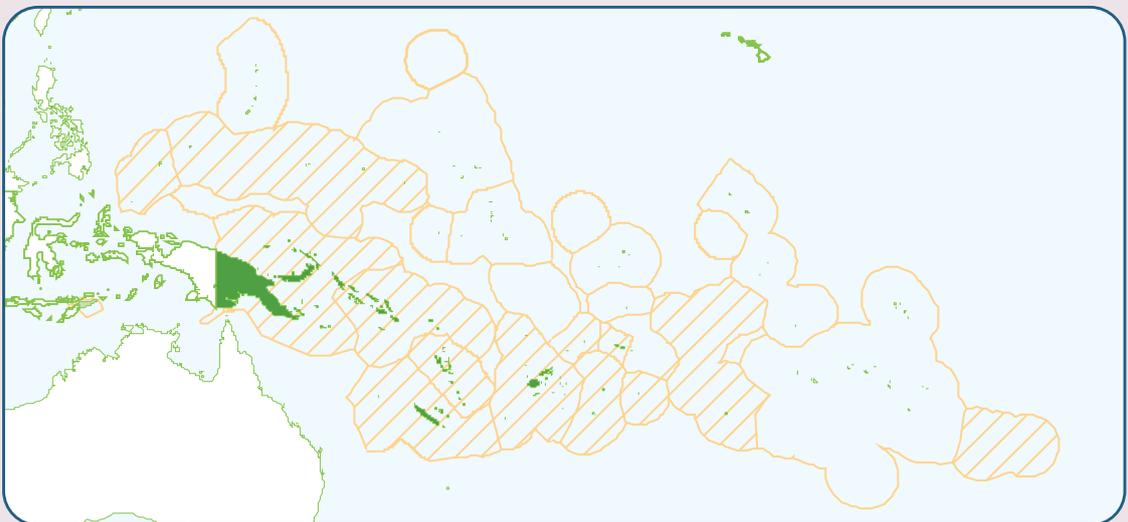




BID programme areas in sub-Saharan Africa (above), the Caribbean (left) and the Pacific (below).

EEZ boundary information licensed under CC BY-NC-SA from Flanders Marine Institute (2018) Maritime Boundaries Geodatabase: Maritime Boundaries and Exclusive Economic Zones (200NM), version 10 <https://doi.org/10.14284/312>

-  BID-funded country (with EEZ)
-  BID-eligible country (with EEZ)



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FOREWORD

While progress in sharing, transferring and applying scientific knowledge about the world's biodiversity is steadily improving, gaps in information about the distribution of the world's biodiversity still impede effective policymaking decisions.

Such deficiencies are acutely felt in species conservation, protected areas planning and resource management, but the data also underpin biodiversity-related intergovernmental processes like the UN Convention on Biological Diversity (CBD), the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and the Intergovernmental Panel on Climate Change (IPCC), as well as all dimensions of sustainable development.

GBIF—the Global Biodiversity Information Facility—is an international network and research infrastructure aimed at providing anyone, anywhere access to data about all types of life on Earth. Starting in 2015, the GBIF network began addressing geographic gaps in knowledge through the **Biodiversity Information for Development**, or **BID** programme. Supported by a €3.9 million grant from the Directorate-General for International Cooperation and Development (DEVCO, or EuropeAid) of the European Union, BID has boosted biodiversity informatics across sub-Saharan Africa, the Caribbean and the Pacific (ACP).

Between 2015 and 2017, GBIF issued four calls for project proposals through BID, resulting in 63 funded projects across the three regions: 50 in Africa, 8 in the Caribbean and 5 in the Pacific. These projects have increased the availability of biodiversity data for use in policy while implementing an effective and transformative approach to capacity enhancement that has firmly placed new regional communities of practice within GBIF's international network.

—**Philippe Mayaux**

Head of Sector
Biodiversity and ecosystem services
DEVCO/EuropeAid

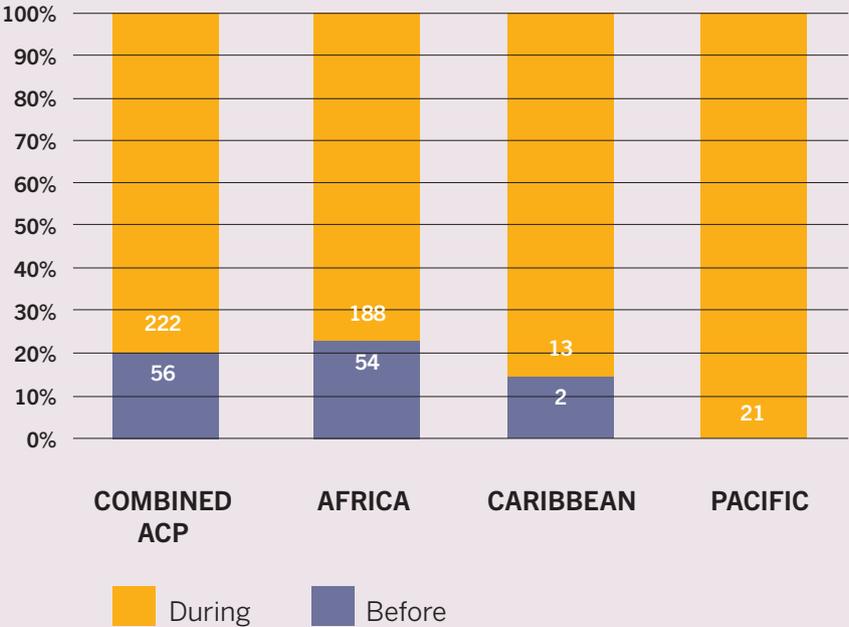


DATA MOBILIZATION

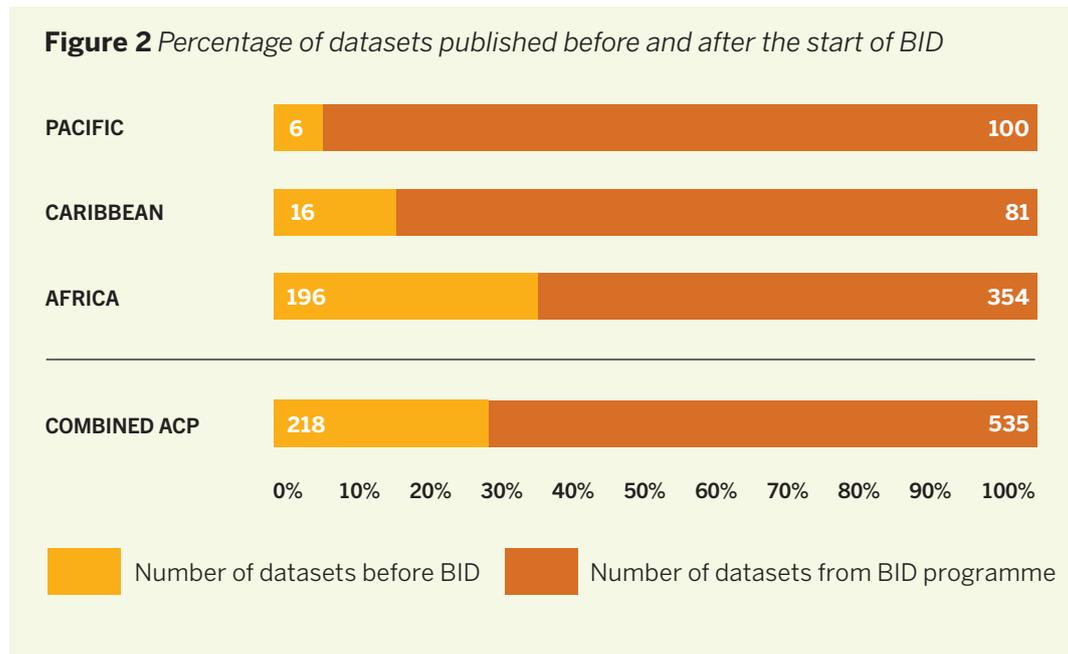
When the BID programme launched, its target regions of sub-Saharan Africa, the Caribbean and the Pacific (ACP) each represented areas with significant gaps in biodiversity information. By building local capacity, BID aimed to deliver greater amounts of biodiversity information through the publication of additional data from the region's institutions. By nearly any measure, the programme has achieved the goals set out for it at the beginning.

The majority of institutions from the ACP countries that now publish data into GBIF began doing so after the start of the BID programme, providing one measure of increased institutional capacity. The total number of registered publishers from the three regions increased from 56 to 222 during BID's implementation and includes every data publisher registered from the Pacific Islands.

Figure 1 Growth in the number of institutions registered as a result of the BID programme



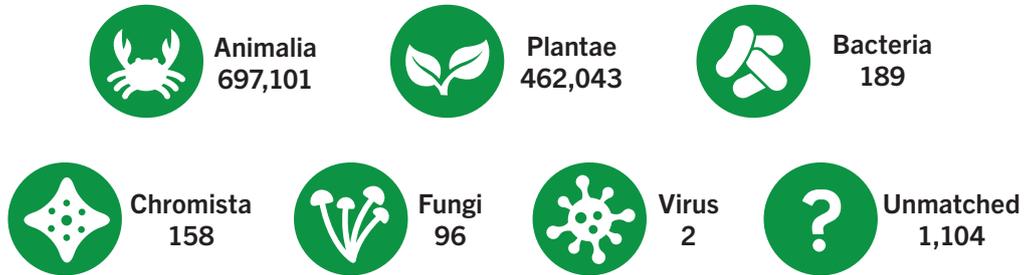
Between April 2016 and April 2019, the number of datasets published by institutions from ACP nations and overseas territories grew from 63 to 743—an increase of nearly 1,200 per cent. Each region saw large increases in the amount of data published as a result of the BID programme. Seventy-two per cent of all publishers from the ACP region shared datasets with GBIF as deliverables for the BID programme.



GBIF supports four classes of datasets—metadata-only, checklists, occurrences and sampling-event—moving from simplest to most structured and complex. The most prominent of these are species occurrences, which provide evidence of a named organism being observed or collected at a given time and place. The 396 occurrence datasets published by BID-funded projects represented 74 per cent of the 535 new datasets mobilized through the programme, comprising a total of 1,305,401 records, with 86.3 per cent of them (1,058,757) carrying georeferenced locations.

Taxonomically, most of the data from BID projects records the occurrence of either animals (58.1 per cent) or plants (41.7 per cent). The records comprise 39,797 taxonomic names found within the GBIF taxonomic backbone across all kingdoms, and 43 per cent of the BID-mobilized data represent the first record in at least one country. In addition, the data published by BID grantees added the first records for 2,392 taxonomic names—species and higher-level taxa for which there were no occurrence records in GBIF.org prior to BID.

Figure 3 Number of occurrence records shared in BID datasets, by kingdom



Finally, BID datasets mobilized data for 1,194 species assessed to be globally threatened (Critically Endangered, Endangered or Vulnerable) under the IUCN Red List—22 of which had no occurrence records in GBIF before BID.

Figure 4 Number of global threatened species with new records from BID

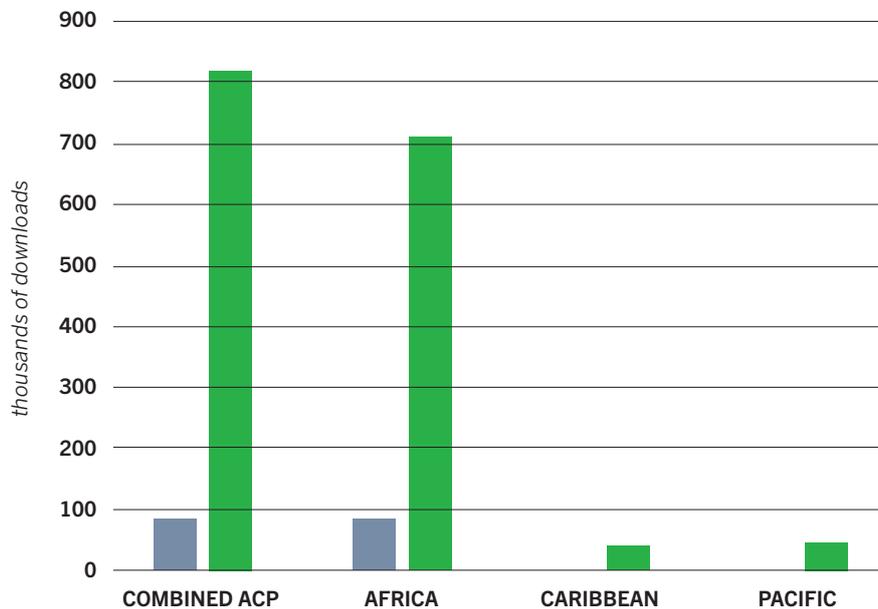
| IUCN Threat Category | Kingdom | Number of species included in BID occurrence datasets | Number of species with first occurrence records in GBIF |
|---|---------|---|---|
| CR CRITICALLY ENDANGERED | Animals | 99 | 2 |
| | Plants | 44 | 0 |
| EN ENDANGERED | Animals | 153 | 2 |
| | Plants | 188 | 8 |
| VU VULNERABLE | Animals | 300 | 4 |
| | Plants | 410 | 6 |
| Total | | 1,194 | 22 |

DATA USE

The primary goal of the BID programme is to increase the availability of biodiversity data for use in scientific research and policymaking. The results thus far are encouraging.

From the programme's start to December 2018, users of GBIF.org requested a total of 816,479 downloads that contained data from publishers in the ACP regions. During this period the number of downloads containing data from institutions in the BID-eligible countries of Africa increased by nearly an order of magnitude, rising from 84,523 to 735,332 downloads, and all downloads from users in the Caribbean and Pacific have come since BID's start. The proportion of data from BID datasets varied from region to region: 33.1 per cent in Africa; 99.5 per cent in the Caribbean; and 94.3 per cent in the Pacific.

Figure 5 Number of downloads containing data from ACP publishers before and after BID implementation



| | | | | |
|--|---------|---------|--------|--------|
| Before BID | 84,523 | 84,523 | 0 | 0 |
| During BID | 816,479 | 735,332 | 36,019 | 45,128 |
| Percentage of downloads containing data from BID | 42.7% | 33.1% | 99.5% | 94.3% |

The demand for data from users within the ACP regions has increased considerably, suggesting that greater availability of data has increased the demand for it. The growth rate in the number of downloads of data from ACP regions by users in ACP regions considerably exceeded global trends during the same time period.

Initial research uses of BID-mobilized data are promising, given the latency that typically exists between data mobilization and use. To date, 63 peer-reviewed publications have cited 187 datasets from BID projects at least once in papers covering a range of topics, including conservation, ecology, taxonomy, agriculture and climate change (see **Table 1** below). Seventeen datasets have already received more than 20 individual citations. The inclusion of citations from non-peer reviewed publications like reports, web pages, and media articles increases the total number citations of BID datasets to 202.

The greater time lag between data mobilization and research-based policy makes measuring the integration of BID-mobilized data into decision-making during the programme's initial implementation period more difficult. However, several projects that have been successful in integrating data made available by the BID programme for national-level activities like reporting, spatial planning decision tools and biodiversity monitoring systems are highlighted in the companion guide, Best practices for mobilizing policy-relevant data.

BID-mobilized data has also been used extensively in a range of other publications, training and outreach activities. Most projects (56 per cent) stated in interviews that they had used the mobilized data to create new materials for educational and training purposes.

Table 1 *BID datasets with more than 20 research citations (November 2019)*

- Census of medicinal plants of Benin
<https://doi.org/10.15468/p4cwmb>
- Census of medicinal and agroforestry plants of Benin
<https://doi.org/10.15468/y8jm57>
- Diversité et distribution des plantes envahissantes au Bénin
<https://doi.org/10.15468/bdv8ee>
- Threatened species recorded in protected areas and riparian land in Sudano-guinean and Sudanian agroecological zones
<https://doi.org/10.15468/szhrfq>
- Census of the threatened species of Benin
<https://doi.org/10.15468/fbbbf1>
- Distribution de quelques espèces de plantes agroforestières et médicinales au Bénin
<https://doi.org/10.15468/kpwam2>
- List of the specimens of the Vanuatu National Herbarium
<https://doi.org/10.15468/rwy7qc>
- Herbier National de Guinée
<https://doi.org/10.15468/vnatbk>
- Inventory of Bonou, Kilibo and Lama forests (South and centre Benin)
<https://doi.org/10.15468/yucybm>
- Inventory of natural and agroforestry stands characterized by *Xylopia aethiopica* (Dunal) A. Rich. (south-Benin)
<https://doi.org/10.15468/exwp2m>
- Species composition in twelve (12) *Azelia africana* Sm & Pers populations in Benin
<https://doi.org/10.15468/9wycdn>
- Agroforestry plant species found in protected areas and riparian lands in Sudano-guinean and Sudanian agroecological zones
<https://doi.org/10.15468/lcbrct>
- Forest inventory for above ground carbon estimation in Biosphere Reserve of W
<https://doi.org/10.15468/looi3y>
- Census of secondary forest of Itchède-Toffo (Southern Benin)
<https://doi.org/10.15468/mqurnm>
- Répertoire des Forêts sacrées dans les Départements de l'Ouémé t du Plateau
<https://doi.org/10.15468/iozuua>
- Medicinal plant species found in protected areas and riparian lands in Sudano-guinean and Sudanian agroecological zones
<https://doi.org/10.15468/qbb7sg>
- Elaboration du tarif de cubage multispécifique
<https://doi.org/10.15468/lzrybq>

CAPACITY ENHANCEMENT



Developing human capital is an essential element for achieving BID's goals for data mobilization and use. Rigorous training curricula have improved biodiversity data skills for local professionals while empowering them to give back, share and mentor their peers and protégés. The result is a resilient biodiversity informatics community of practice growing at local, regional and global scales.

At the start and end of project activities, projects completed a capacity self-assessment that provides a simple scoring system for evaluating strengths and weaknesses across individual, institutional and external enabling dimensions. This step helps grantees' project planning, providing a structure for identifying the most critical capacity gaps to address at the project's outset while setting a baseline for measuring and monitoring capacity-related outcomes.

Training is a critical component of the BID programme. The GBIF community developed training courses on data mobilization, data use for decision-making and establishing a GBIF participant node. The design of the courses, which include both on-site and online components, responded to the findings of the projects' needs assessments and aimed to increase the capacity of participants within each target region to share and use GBIF-mediated data to produce policy-relevant information products.

The Secretariat staff who led the training relied heavily on the support of experts drawn from across GBIF's international network (www.gbif.org/mentors) to build and expand new regional communities of practice. Their service both as project mentors and volunteer trainers directly supported 120 grantees, who brought a broad range of scientific, managerial and policymaking backgrounds to their participation in a series of regional workshops.

Workshop photos (above, right to left)

Cape Town, CC BY 2018 GBIF Secretariat | Maheva Bagard Laursen ([flic.kr/p/GpbQtn](https://www.flickr.com/photos/maheva/2488888888/))

St. Augustine, Trinidad, CC BY 2018 GBIF Secretariat | Maheva Bagard Laursen ([flic.kr/p/2gkk15e](https://www.flickr.com/photos/maheva/2488888888/))

Auckland, New Zealand, CC BY 2018 GBIF Secretariat | Mélianie Raymond ([flic.kr/p/LZg8wg](https://www.flickr.com/photos/maheva/2488888888/))

The volunteer pool likewise represents diverse geographic locations and types of experience, fulfilling needs in various parts of the world. This community of practice also built up expertise from within the BID programme, with nearly 50 per cent (67) of the 136 GBIF mentors now coming from BID-funded countries: 60 from Africa, 4 from the Caribbean and three from the Pacific. These experts, whether newly trained or long proficient, provided key points of contact to support less experienced project teams and bring them into within the wider biodiversity informatics community.



Project representatives who completed the training courses received digital badges, attaining either basic or advanced levels based on their performance.

Ninety-eight BID participants took the courses offered in the regional data mobilization workshops: 75 from Africa, 9 from the Caribbean and 14 from the Pacific regions, along side an additional 22 others from non-ACP countries. The regional data use workshops trained 85 participants in total: 50 from Africa, 12 from the Caribbean, 11 from the Pacific, and another 12 from non-ACP countries.

Fifty-three per cent of the students who took the data mobilization course received badges: 39 per cent (26) earned basic certification and 37 per cent (25) advanced. For the data use workshops, 26 per cent (19) of the students earned at badges, with African participants receiving the majority (74 per cent). Eighteen per cent of participants obtained advanced badges, with the rest receiving basic badges.

OUTLINE CURRICULA OF THE BID TRAINING COURSES

Data Mobilization

Enhancing the capacity of the project teams to plan and implement biodiversity data digitization efforts effectively and according to GBIF standards

Data Use for Decision-Making

Enhancing the capacity of the project teams to analyse and communicate the results of data sharing activities effectively to support and influence policymaking decisions

Biodiversity Informatics Foundation

Understanding the basic theoretical concepts of biodiversity informatics.

Planning a Digitization Project

Understanding the different stages of planning a digitization project, and how to adapt them to a specific situation.

Biodiversity Data Digitization

How to best digitize relevant information using best practices and existing tools and techniques.

Data Curation, Formatting and Transformation

Basic tools and concepts used for data validation and cleaning, and how data can be converted into Darwin Core.

Data Publishing Using IPT

Publishing data online using the GBIF tool: the Integrated Publishing Toolkit (IPT).

Biodiversity Data Mainstreaming

Integrating data information products within the prevailing policy landscape

Data Processing

How to prepare a “fit-for-purpose” dataset from GBIF-mediated data

Species Distribution Mapping Standards and Protocols

Standards and protocols for mapping species distributions

Ecological Niche Modelling

Using probabilistic methods for developing ecological niche models for varying environmental scenarios.

Assessing the Conservation Status of a Species

Using GBIF occurrence data to assess the conservation status of a species using the IUCN Red List Threatened Species Categories and Criteria.

SUSTAINABILITY

Establishing a flow of data, engaging potential users and providing hands-on training are necessary to achieving the goals of a programme like BID, but such activities are not sufficient for sustaining the outcomes once the funding period is over. To cement BID's achievements, GBIF is seeking to link the emerging regional communities of practice into broader initiatives.

The engagement of partners across the regions offered networking opportunities with related initiatives, including the JRS Biodiversity Foundation's African Biodiversity Challenge, coordinated by the South African National Biodiversity Institute (SANBI) ; and the Connect project coordinated by UN Environment World Conservation Monitoring Centre and funded by the Global Environment Facility (GEF). Collaboration with these partners provided efficiencies by pooling training materials, trainers and mentors as well as shared workshop hosting—and multiplied the investment of each programme.

Trainees were strongly encouraged to transfer the skills that they gained in BID training courses by replicating workshops in their own countries and institutions. To date, they have organized 73 follow-on workshops and hosted at least 1,497 more students, extending the cadre of individuals and institutions capable of supporting and engaging in ongoing data mobilization and use activities in each of the ACP regions.

In addition, six BID-funded projects have indicated that they received co-funding from other sources to continue the work of developing or maintaining thematic, national, or regional biodiversity data networks.

Additions to the distributed technical infrastructure needed to support data networks in the three regions offer another indication of more lasting impacts of the BID programme. Seven new installations of GBIF's Integrated Publishing Toolkit (IPT) were created for or by BID participants, while another seven inactive IPTs were restored and now serve datasets published through the BID programme. Many of these installations were carried out in collaboration with partner GBIF nodes in countries outside the target regions (such as France, Belgium and United States), reinforcing the benefits of making long-standing experience available to new grantees. In other cases, higher-capacity institutions in the ACP regions chose to host datasets using their own IT facilities, providing additional options for future data publication and access in the target regions.

The BID programme also increased both the engagement and the number of GBIF member countries and organizations (formally known as Participants). Ten of GBIF's existing national Participants in Africa participated in the BID programme, and another ten African governments have joined GBIF as formal members since the start of the BID programme:

- **Democratic Republic of Congo** (2015)
- **Malawi** (2015)
- **Niger** (2016)
- **Nigeria** (2016)
- **Mali** (2017)
- **Cameroon** (2018)
- **South Sudan** (2018)
- **Zimbabwe** (2018)
- **Liberia** (2018)
- **Angola** (2019)

Prior to the BID programme, GBIF had no formal Participants in the Pacific Islands region. As a direct result of the BID investment, the GBIF network gained a permanent presence in the region with the addition of the Secretariat of the Pacific Regional Environment Programme (SPREP) in 2017 and Tonga in 2019.

BID's impact has also extended beyond its target regions. Course materials and curricula have been translated and reused in programmes covering Asia and Eastern Europe. Through other collaborations, GBIF has adapted the training courses to support the crosslinking of molecular data, for example, teaching data publishing skills alongside training in DNA barcoding data management.

As the programme's first phase concludes, GBIF is now seeking to build on the success of the programme and work with other multilateral and bilateral funding agencies to extend BID's tested approach into new thematic and geographic priority areas.



To view the full range of projects
funded by the BID programme, visit:

www.gbif.org/bid