Call for proposals for a systematic review

Fixed-term assignment to carry out a systematic review of research using GBIF-mediated data

Summary

The GBIF Secretariat seeks proposals to carry out a second systematic review of scientific literature using GBIF mediated data in the years 2020-2024. This will involve:

1. Carrying out the **before-and-after analysis** of the landscape of the GBIF use in research by comparing the 2016-2019 and 2020-2024 periods (code and literature from the first review are available)
2. Developing, refining and, in consultation with the GBIF Secretariat and GBIF Science Committee, agreeing on the optimal methodology and additional new **research questions** for the systematic review
3. On this basis, carrying out the **review** of approximately 6,000 to 8,000 titles, provided from the GBIF literature tracking system
4. Preparing a **report** as first author of a submitted or submission-ready manuscript of the review paper, plus a PowerPoint presentation with the key findings and visuals

Background

GBIF—the Global Biodiversity Information Facility—is an international network and research infrastructure funded by the world's governments and aimed at providing anyone, anywhere open access to data about all types of life on Earth. Coordinated through its Secretariat in Copenhagen, the GBIF network of participating countries and organizations, working through participant nodes, provides data-holding institutions around the world with common standards and open-source tools that enable them to share information about where and when species have been recorded. As of February 2024, GBIF has aggregated more than 2.6 billion occurrence records from our network.

This data is used in published research at a rate of nearly five peer-reviewed papers every day. A robust literature tracking programme has built a bibliographic database of GBIF-enabled literature, which in turn supports preparation of an annual GBIF Science Review that highlights individual publications.

The Science Review compiles summaries of GBIF data uses and includes basic analytics on the literature they support, but it must not be confused with the systematic review contracted through this call. This work will offer an opportunity for deeper analyses of the GBIF-enabled research at various levels, including advanced bibliometrics for that provide a better understanding of trends in geography, demography, open access, journal and other spectra, as well as deeper systematic review of methods applied to the GBIF mediated data, data quality practices, use of analytical tools and data combinations.

The study

To guide further user-oriented development of the GBIF network and its tools, the GBIF Secretariat, in collaboration with the GBIF Science Committee, would like to this study to

- Outline the patterns and trends of the scientific data use in the recent research literature
- Identify opportunities for growth and development of data use
- Analyse existing shortcomings identified in the literature

- Summarize opportunities for diversification of the data use portfolio of GBIF in research
- Highlight promising directions for overall growth of usefulness for the GBIF users

GBIF has previously commissioned two similar reviews: Heberling et al. 2021 and Astorga et al. 2023. The latter is a thematic deep-dive into the current and potential relevance of GBIF-mediated data in the field of human health and diseases. The former is a broad landscape study of the use of GBIF-mediated data and the immediate precedent for the study requested here. However, the new systematic review should not merely repeat these analyses; it should instead offer a deeper exploration of patterns in GBIF-enabled research.

The new study commissioned by GBIF will develop and apply a rigid systematic review methodology to carry out analyses to understand the data use space that GBIF supports and how this space relates to the priorities of potential users. The review should identify the dynamics of the scientific subjects where GBIF helps understanding of biodiversity and also investigate individual high-profile studies in relevant research areas that have not cited use of GBIF-mediated data. Such cases may use GBIF indirectly or use alternative sources in which GBIF was either rejected or not considered as a data source.

The study should include an analytical assessment of GBIF's current strengths and weaknesses. This analysis will help GBIF's strategic positioning with current and potential research users and how best to improve or extend data products to increase our overall relevance. To ensure that it supports further engagement of data users and publishers and to guides GBIF's strategic direction, this updated review should build on earlier efforts and make use of formal systematic review protocols to ensure that its analyses are repeatable and to enable effective visualization of its findings (see e.g. Hi-Knowledge).

The study should broaden and deepen analyses of GBIF-enabled literature, exploring new perspectives such as:

- An analysis of the "other ingredients": in some studies, GBIF-mediated data is the only data source behind the findings. In other cases, GBIF-mediated data are complemented with additional data sources. Such studies typically include complementary biodiversity data (e.g., detailed sequence data or vegetation data from remote sensing) along with non-biodiversity data (such as meteorological, chemical, and other environmental data). This review should highlight common additional data "ingredients" used alongside GBIF-mediated data; the sources of dominant streams of complementary data; patterns and trends of data complementarity; and potential areas for enhancing data user experiences through improvements to content and services from GBIF and its partners.
- An analysis of the "cooking methods" that explores the spectrum of analytical approaches applied in GBIF-enabled research and details its current dynamics for key statistical, modeling, and other interpretation techniques. This section is specifically to identify how GBIF-mediated data and GBIF services help improve the scientific certainty and efficiency of increasing the knowledge. Does ordination continue to decline? Do SDM methods maintain the current and historical trend? Which methods remain in use, which are new, and which are declining? Which analytical environments are used in the analysed period (e.g. Python, R, Statistica)? What is the balance between studies that cite downloads from GBIF.org and data accessed through GBIF API? Among studies that cite download DOIs, are large downloads common? How detailed and transparent are descriptions of the postprocessing steps? Is it more common for studies to cite single or multiple download DOIs?

Relevant background information for the contractor includes:

- GBIF Strategic Framework 2023-2027
- GBIF Strategic Plan 2017-2022
- Previous issues of the GBIF Science Review
- CODATA (2020) Twenty-Year Review of GBIF
- Deloitte (2023) Economic valuation and assessment of the impact of the GBIF network

Staff at the GBIF Secretariat are preparing a manuscript for the publication that describes the DOI-based data citation and tracking system. The study commissioned here should not overlap or replicate the findings from these documents. The contracted study is more than just an academic exercise, as its outcomes and findings will inform the direction of GBIF's strategic development and decision-making.

The contractor will finalize the study questions and methods in a project plan by the contractor reviewed and approved by the Secretariat at the early stage of the contract.

The ideal contractor will possess:

- An understanding of the role and mission of GBIF and its research users
- Personal experience of using GBIF-mediated data
- A proven record of bibliographic research, that includes formal systematic reviews and text mining
- Familiarity with biodiversity informatics landscape
- Experience of writing and publishing research and review papers
- Ability to understand, interpret and analyse research carried out by others
- Understand the key analytical methods and approaches in biodiversity data-intensive research

A relevant doctoral degree is advantageous but not required. The requested work is at a postdoc level, consisting of strictly time-limited analytical and writing tasks, which may also be suitable for a period of sabbatical. The contractor should expect a high level of research independence.

Estimate of effort: the systematic review is based on processing a large body of specialized literature against a set of questions and using the methods identified by the contractor and agreed with GBIF Secretariat in the beginning of the contract. It is important for applicant to realistically estimate the effort needed to achieve the goals and to deliver the review within the set financial and time limits.

For more information on the GBIF-enabled literature, see:

- Peer-reviewed data uses published from 2020 to the present
- GBIF Science Review

Project schedule

Duration of the contract	Est. 9-10 months
Deadline for proposal submission	2 April 2024
Expected start of contract	1 July 2024
Delivery of first draft	15 Sept 2024
Delivery of second draft	15 Dec 2024
Estimated manuscript submission	March-April 2025

Location

The selected candidate shall carry out the work at their home base.

Fee

The GBIF Secretariat will pay the contractor a fixed total fee of €20,000 in four installments. This fee will cover all costs, including insurance and any other costs related to the contract.

GBIF Secretariat will pay the application processing charge for the resulting open access publication separately.

Proposal procedure and deadline

Proposals for the contract must be submitted in English and should include the following materials:

1. A summary of the research approach, including a potential outline for the report (two (2) pages maximum, including possible visuals)
2. A full CV or similar, including list of publications
3. Up to three (3) examples addressing relevant experience and qualifications that you led or actively participated in the past five years

Proposals must be emailed to info@gbif.org by 2 April 2024. Please indicate where you learned about this advertisement.

Send enquiries concerning the contract to Dmitry Schigel, GBIF Scientific Officer.