



Addressing Data Integration and Interoperability

The Biodiversity Collections Network (BCoN) is a national initiative working to help support the development of a sustainable community of practice that ensures U.S. biodiversity collections are digitally available for research, education, and informed decision-making.

Scientists have amassed, annotated, and curated more than one billion specimens in more than 1,600 institutions across the United States. Although these specimens and their associated data are heavily used for taxonomic research and education, their use in additional research fields and educational endeavors will increase when the images and associated data are more available for online access, data mining, and other uses.

Recent Accomplishments

During its first three years, BCoN worked with the community to identify tools and resources needed to improve the community's capacity to communicate about biodiversity collections. As a result, the American Institute of Biological Sciences launched a new communication-training program. BCoN worked with the Natural Science Collections Alliance and isotopic scientists to inform a new initiative to develop an IsoBank – a database that will link isotopic data with biodiversity data, and other genetic and environmental data, both within the U.S. and internationally. BCoN also planned or participated in three meetings that explored data and informatics education or workforce training needs. A new national initiative, Biodiversity Literacy in Undergraduate Education (BLUE), has emerged from BCoN and has now been funded by the National Science Foundation.

In 2017, BCoN convened a meeting of experts to assess community progress toward the goals and objectives outlined in the implementation plan for a National Integrated Biocollections Alliance. As a result of this meeting, a second workshop with early career researchers will explore novel research uses for digitized collections and associated data.

Forthcoming Efforts

In 2017, the BCoN Advisory Council met to consider the findings from the progress assessment and how the project might offer the community the greatest benefit. This review identified a pressing need to propose solutions for eliminating barriers to the integration of biodiversity data, and to ensure continued access to these data in the most usable way. Workshops are being planned for 2018-2019 to tackle these issues.

Data Integration and Attribution Workshop

Building on discussions held at iDigBio's inaugural Digital Data in Research meeting in June 2017, discussions during the 2017 TDWG meeting, and the 2017 iDigBio Summit, this workshop will focus on a needs assessment and identification of the challenges remaining for the development of a seamless data pipeline. The products of this workshop will inform further discussions during the 2nd Digital Data in Research meeting. Focused working groups may be established following these meetings to tackle specific objectives that are identified.

Planning the Future of Collections and Data

The sustainability of collections and their associated data requires understanding the long-term costs of equipment, software, and personnel. BCoN is organizing a working group to assess and document the resources needed to maintain research-quality collections and data, and to incorporate improvements to them as they are used for research. Following an initial workshop in 2018, additional work will be conducted via online meetings and from gathering public comment on draft documents. BCoN plans to release a final report during the 2019 Society for the Preservation of Natural History Collections meeting.

Legal Issues Related to Digitized Collections: The Nagoya Protocol as Case Study

As biodiversity collections are increasingly available online, they will be under greater scrutiny. The Nagoya Protocol – a supplementary agreement to the Convention on Biological Diversity – has important implications for the conduct of U.S. biological collections, especially those whose data are available digitally. Knowledge of the protocol is not widespread among researchers or institutions. This workshop will address legal concerns associated with digitized collections and mitigating these issues using digital means. Compliance with the Nagoya Protocol will be a test case to evaluate how institutions must respond to requirements for increased transparency and digital tracking.

Broadening Participation in Biodiversity Science

As biodiversity data are increasingly mobilized, a highly skilled and diverse scientific workforce is required to use and manage these data for the benefit of science and society. There is a pressing need to identify strategies and best practices for increasing the human diversity within the biodiversity sciences. A working group is being established to: 1) address broadening participation in biodiversity science; 2) plan a webinar series to engage the broader biodiversity community in efforts to broaden participation; and 3) to aggregate existing resources, and develop a toolkit for broadening participation in biodiversity science. Additional information will be available in early 2018.

Small Collections and Biodiversity Digitization

Of the 592 herbaria accessed in Index Herbariorum 83% have less than 100,000 specimens, and 73% have less than 50,000 specimens. Collectively, these collections house 12.5% of the nation's plant biodiversity data. Although not as well documented, mammal collections reportedly have similar numbers of small collections. These collections are often deemed "insignificant" or "regional", but they have the potential to significantly expand our knowledge of landscape-level biogeography, and the sheer number of small collections suggests a great potential to contribute to the education of future scientists. A working group is being developed to: 1) propose best practices for recruitment of small collections into the broader collections community; 2) identify strategies for involving small collections in ongoing digitization efforts; and 3) develop materials to help small collections strategically promote themselves within their home institutions.

For more information on these and other BCoN activities, workshops and reports – including how you can volunteer and contribute to these efforts – please visit our website at <http://bcon.aibs.org>.

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