



**BIODIVERSITY
COLLECTIONS NETWORK**

**Building a More Networked System for
Communicating about Natural History
Collections**

*Report from the Collections Communications
Workshop*

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Executive Summary

Biodiversity collections institutional leaders, scientists, communications and outreach professionals, and scientific society leaders were among the individuals that met at The Field Museum of Natural History in Chicago, Illinois on September 1-2, 2015 to participate in a workshop organized by the Biodiversity Collections Network (BCoN). The *Collections Communications Workshop* was convened to consider and offer recommendations about the following issues: 1) Identify opportunities and barriers to communicating the benefits of natural science collections to decision-makers and the public; 2) Explore the opportunities provided by national digitization initiatives to engage new stakeholders; 3) Identify existing communication resources and assess the need to develop new tools and resources; and, 4) Explore the development of a networked community of communications professionals that could collaborate to deliver a proactive message about biodiversity and biodiversity collections to the public.

The time for business as usual has passed according to the experts gathered in Chicago. The biodiversity collections community must coordinate efforts to enhance its capacity to communicate with policymakers, institutional administrators, other scientists, and the public.

Workshop participants encouraged BCoN to establish a Working Group to sustain the dialogue initiated in Chicago and to evaluate and implement the overarching recommendations from this workshop. BCoN will identify participants from the workshop as well as additional stakeholders to serve on this Working Group.

Seven overarching recommendations for the community emerged from the workshop.

- 1) The community must articulate a compelling and inclusive long-term vision for natural history collections.
- 2) The community should work with an existing community-serving organization with links to administrators, policymakers, and communicators to foster greater coordination of targeted messages.
- 3) The community must engage new stakeholders to increase the sustainability (i.e., new funding, proper institutional support, adequate workforce) of digitization efforts.
- 4) The community must do a better job of communicating outcomes and benefits of digitization efforts to policymakers, administrators, other scientists, and the public.
- 5) The community must develop metrics for assessing the impact of current and new communication tools and practices.
- 6) The community must develop and embrace innovative communication methods and tool kits.
- 7) The community must support and engage in communications training programs that help all biodiversity collections stakeholders, particularly scientists, become more effective spokespeople for natural history collections.

Introduction

Biological diversity collections (also referred to as natural history collections or biodiversity collections) in the United States are the result of nearly 250 years of scientific surveys and investigations of living and fossil species from the United States and around the world. It is estimated that there are more than one billion specimens in at least 1,600 natural history collections throughout the United States. These collections are more than physical specimens; they also include the data associated with each specimen (e.g., field notebooks; audio and visual recordings; x-ray images; labels with species name, date of collection, and location of collection). These specimens and their associated data are also the basis for research, education, and resource management and they serve to inform decision-making (e.g., identification of economically important invasive pests and emerging pathogens). Importantly, these scientific collections are also used to validate species names and genetic information that are routinely used for genomic, proteomic, and medical research.



Biological diversity collection specimens and their associated data are an irreplaceable scientific resource that provides the information society needs to understand the history of life on Earth and the data necessary to develop predictive models and tools useful to decision-makers grappling with complex questions related to environmental stewardship, food safety and security, and public health. These collections are the result of incalculable investments of financial and human capital.

Recognizing the untapped potential of biological diversity collections to inform our understanding of the grandest challenges facing science and society, the biodiversity science community outlined an aggressive, multi-year plan to develop the tools and processes needed to digitally capture images of specimens as well as ancillary data. The strategies for achieving this goal were outlined in 2010 in [*A Strategic Plan*](#)

[*for Establishing a Network Integrated Collections Alliance*](#) and in 2013 in [*An Implementation Plan for a Network Integrated Biocollections Alliance*](#).

A National Commitment

In brief, the strategic and implementation plans articulated a 10-year strategy that could result in the digitization of the nation's biodiversity collections. These plans called for the community to develop the tools, workforce, and practices required to maintain the digitized resources developed and to ensure that future specimens and data are digitized at the time of collection.

Responding to these plans, the U.S. National Science Foundation (NSF) launched the [Advancing Digitization of Biodiversity Collections](#) (ADBC) program – a 10-year, \$100 million commitment to support the development of enabling tools, practices, and the workforce needed to digitize the nation’s non-federal biodiversity collections. To support this effort, NSF established a Cooperative Agreement with [iDigBio](#) (Integrated Digitized Biocollections) – a national resource to foster the digitization of NSF-funded biodiversity collections. Also during this era, the White House Office of Science and Technology Policy directed federal agencies to develop practices to better budget for and manage federal collections (e.g., [Presidential Memorandum, 2015](#)), as well as to increase public access to data ([Presidential Executive Order, 2013](#)). The Smithsonian Institution, in addition to its initiatives to digitize its collections, has contributed significant leadership to assist federal agencies with their efforts to comply with these directives. Thus, the elements needed to build a network of federal and non-federal digitization initiatives have begun to form.

Since the strategic and implementation plans were published, the White House has issued new directives to federal agencies that annually fund at least \$100 million in extramural research to make publications and data available to the public. These directives offer additional opportunities for the biodiversity collections community to obtain support for digitization initiatives, and for the nation to develop a coordinated network of digitized information.

Building a Coordinated, National Community

Individuals or small teams have historically worked in relative isolation to do biological diversity research that may be focused on narrowly defined questions. The evolving nature of research and the magnitude of the research questions facing science today are driving biodiversity researchers into increasingly interdisciplinary teams, more inter-institutional collaborations, and collaborations that are geographically distant.



Digitization is enabling this transition, but also drawing attention to the need for increased coordination and communication within the natural history collections community. This was recognized in the *Implementation Plan for a Network Integrated Biocollections Alliance*. To address this need for increased communication about digitization, the [American](#)

[Institute of Biological Sciences](#) (AIBS), [Natural Science Collections Alliance](#) (NSC Alliance), and the [Society for the Preservation of Natural History Collections](#) (SPNHC)

joined together in 2014 to secure funding from NSF to support a Research Coordination Network, the [Biodiversity Collections Network](#) (BCoN), to foster the development of a more coordinated and sustainable national community. The Biodiversity Collections Network organized the workshop that led to this report.

In 2015, the Biodiversity Collections Network Advisory Council recognized that in addition to increased communication between the individuals actively involved in digitization initiatives, there is a need for increased communication with the public and decision-makers, and with institutional leaders within the natural history collections community. Thus, the Biodiversity Collections Network organized the *Collections Communications Workshop* (Appendix A); which was held at The Field Museum of Natural History in Chicago, Illinois, on September 1-2, 2015, to obtain community input on these issues.

The *Collections Communications Workshop* was convened to consider and offer recommendations about the following issues:

- 1) Identify opportunities and barriers to communicating the benefits of natural science collections to decision-makers and the public.
- 2) Explore the opportunities provided by national digitization initiatives to engage new stakeholders.
- 3) Identify existing communication resources and assess the need to develop new tools and resources.
- 4) Explore the development of a networked community of communications professionals that could collaborate to deliver a proactive message about biodiversity and biodiversity collections to the public.

Workshop Participants and Deliberations

The meeting agenda (Appendix A) was designed to encourage open dialogue and idea exchange. Importantly, the participants represented natural history collection executive leadership, scientific and curatorial staff, and communication and public affairs experts. Participants were drawn from a diversity of institutions, including large, medium, and small natural history museums and botanic gardens; large, medium, and small university-based collections; public and private institutions; national digitization initiatives; and scientific/professional societies.

Workshop participants had productive and crosscutting discussions, both in breakout and general discussion sessions. The workshop attendees agreed that people generally value biodiversity collections, but rarely understand how collections contribute to science, education, and society. Some participants urged the community to be careful not to overpromise the public or decision-makers about what can be accomplished in a short period of time. Similarly, a concern was raised that the community is not moving with the urgency commensurate with the biodiversity crisis facing science and society. Recommendations that range from the immediate to the long-term and strategic were developed.

Discussion

Workshop participants expressed strong and unified support for a number of actions. Chief among these was a call for the natural history collections community to speak with a unified and coordinated voice. To this end, it was recognized that digitization is the current initiative that offers opportunity and benefit to science and society, but that it is also an enabling technology that will provide collections with novel ways to engage new audiences. Thus, there was discussion of the need for articulating a clear, unifying vision statement for the community. This vision would offer an emotional hook to engage new stakeholders and champions of collections-based research and education. It would also be grand enough to provide the community with opportunities to discuss science, funding for digitization, and education and training with the audiences that collections seek to serve, inform, and engage. Importantly, this vision statement would not replace the goals set forth in the strategic and implementation plans for a Network Integrated Biocollections Alliance; rather, it would augment these goals and provide a means to engage new stakeholders in digitization initiatives.



Participants affirmed the need for a reinvigorated natural history collections community. Collaborations between the American Institute of Biological Sciences, Natural Science Collections Alliance, Society for the Preservation of Natural History Collections, and iDigBio have been productive and should continue to be strengthened. The Biodiversity Collections Network offers an additional resource to help cultivate new partnerships and engage new stakeholders. More than 30 institutions from across the nation have already endorsed the Biodiversity Collections Network effort by becoming Supporting Organizations. However, workshop participants expressed the need for individual and institutional members of the community to step forward and invest in the organizations that represent their interests. Some participants argued that members of other scientific disciplines take their obligations to their professional societies more seriously and make the investments necessary to support

sustained national public affairs campaigns. Paraphrasing the suggestion of one attendee, if astronomy can successfully advocate for space research then certainly the biodiversity collections community can put forth a compelling argument for investments that will improve our understanding of life on Earth. Interestingly, some noted that a barrier to this coordinated vision for the biodiversity collections community is the belief that many individuals in this community may have a primary affiliation with a disciplinary research community (e.g., botany, ichthyology, paleontology). Thus, there is a need to support the

development of a culture in which these individuals also see themselves as members of the collections community.

There was a clear recommendation that rather than investing in a new organization to coordinate communications, the community should work with the Natural Science Collections Alliance as an existing national organization with access to institutional leadership, the scientific community, and policymakers. The President of the Natural Science Collections Alliance was present and indicated that the organization would step-up to provide this service, but that guidance and participation from the leadership of the natural history collections community is needed. Additionally, a scope of work, resource assessment, and identification of models for funding this work must be developed.

There was widespread recognition that the natural history collections community must continue to develop effective communication skills, as well as tool kits and resources that may be shared within the community. It was noted that when one institution is effective at communicating the importance and value of natural history collections or digitization, the entire community benefits. Moreover, some institutions have established effective channels for communicating with specific audiences. Exploring partnerships with these institutions to reach these audiences may be more effective than creating new channels to the same audience. Community-wide resources and communication platforms that all members of the community can access are also needed. These resources would be neutrally branded and available for use by the breadth of the community.

The individuals who gathered in Chicago suggest that the community needs to become more sophisticated with its communications. New social media offer low-cost and novel methods for bypassing traditional media to communicate with large audiences. A persistent question, however, is whether we are effectively using these tools to convert audiences to action. Similarly, institutions and individuals must better assess the purpose for different communication tactics. Not all social media tools are equal or valuable. Methods for assessing impact are needed.

The time for business as usual has passed. The community must embrace innovation and new approaches to outreach and engagement. Engaging science communicators early and throughout the course of a project has proven beneficial to those who have begun this practice. Science writers, for example, are skilled at translating science for targeted, non-technical audiences. It is thus wise to engage them in efforts to explain digitization or to share the excitement of biodiversity research findings with the public.

There is a need to develop innovative tools that can help tell the digitization and natural history collections story. Some of these tools might be built out from basic models, such as the one illustrated in Figure 1. This kind of model can be used to help the community frame messages that clearly articulate the contributions of collections to science and society. There is a need to show contributions to solving problems of interest to society; which are seen as only remotely connected, or not connected, to collections data. An example is the control of damage caused by invasive species. Credit for control is given to agency personnel at the local level; however, the data on species identifications, distributions, co-occurring prey and

predators, and life history attributes that are necessary for understanding and controlling invasive species is available only from biodiversity collections. The source of the necessary fundamental information is so removed from the control activities that no connection to collections data is made.

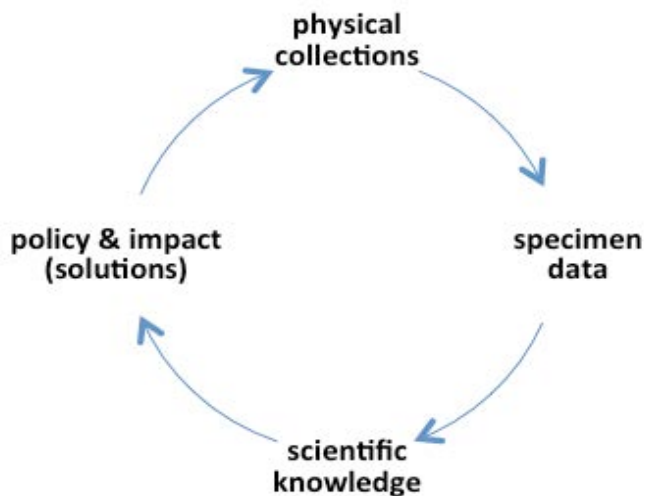


Figure 1: A model demonstrating the cycle by which collections can demonstrate and reinforce the use and value of their data.

Other tools need to be developed by the new coordinating function that the Natural Science Collections Alliance has been identified to provide. These may include talking points that are focused on informing administrators or policymakers at the local, state, regional, national or international level. Compelling videos that can quickly and clearly illustrate how collections are used would be another tool the community should consider developing. iDigBio is currently exploring the development of a series of these types of videos.

Another novel tool that was suggested is a ‘community-wide’ platform that might be modeled after the [Smithsonian Institution’s Transcription Center](#). The center offers an online interface that draws volunteers into Smithsonian programs to transcribe materials in their collections. This kind of resource offers multiple benefits: 1) It is a way to engage a large number of citizen scientists (volunteers) in efforts to digitize collections; 2) It increases the sustainability of these efforts; and, 3) It cultivates a group of ardent advocates for natural history collections (i.e., individuals who participate in these efforts have a deeper appreciation for the value of the collections and can thus help tell the collections story). WeDigBio, is one citizen science initiative that is already engaging with the public to have individuals participate in digitization campaigns. Thus, given these existing platforms, it may not be necessary to establish a new initiative for this purpose.

Recommendations

Seven overarching recommendations emerged from the workshop (Table 1). When implemented these interrelated and synergistic actions will provide the architecture for a more networked and collaborative communications infrastructure, which will most certainly contribute to the development of a more sustainable natural history collections community.

To initiate the process of implementing and further refining the recommendations resulting from this workshop, participants encouraged BCoN to establish a Working Group on Communications. This Working Group will be established in 2016 and will include workshop participants as well as additional stakeholders who can help the community to advance these recommendations.

Table 1: The recommendations included in this table represent overarching and crosscutting actions the natural history collections community should undertake to build and strengthen its capacity for effective and impactful communication.

#	Recommendation	Goal	Actions/Implementation	Relationship to other goals
1	Articulate a compelling and inclusive long-term vision for natural history collections.	Provide a unified statement that all segments of the natural history collections community can use to engage distinct audiences.	Community-serving organizations convene a working group to develop the next long-term (10-20 year) vision statement for natural history collections. The statement would build on NIBA, not replace it.	2, 3, 4, 5, 6
2	NSC Alliance should serve as a national coordinating center for communications.	Support a coordinated communications strategy, including the identification and development of communication resource needs.	NSC Alliance convenes a working group to evaluate needs and to develop a plan for working with the community to serve this function.	1, 3, 4, 5, 6
3	Engage new stakeholders to increase sustainability, including financial, of digitization efforts.	Increase the sustainability of digitization efforts by diversifying the array of stakeholders engaged in digitization efforts.	Identify messages and strategies for communicating the importance and value of digitization to distinct stakeholder audiences. Successful campaigns and initiatives should be shared among institutions, and individuals should be trained and supported such that the total number of individuals able to share these stories is increased.	1, 2, 4, 6
4	Communicate outcomes and benefits of digitization efforts.	Increase public and decision-maker awareness of research, education and societal benefits	Work with communication experts to develop and share with the public and decision-makers compelling stories demonstrating the outcomes of	1, 2, 3, 5, 6

		of digitization.	digitization efforts. BCoN, NSC Alliance, iDigBio, and SPNHC can collaborate to achieve this goal.	
5	Develop metrics for assessing impact of communications.	Improve assessment of impacts of communications.	Engage evaluation experts to develop assessment tools that can be shared with and used by the natural history collections community.	1, 2, 3, 4, 6
6	Develop new communication tools and tool kits for use by the natural history collections community.	Community has access to and the ability to deploy effective messages and communication tools.	NSC Alliance, iDigBio, and BCoN develop a coordinated strategy to work with their communities to develop and actively share these new resources. These should include messages for different audiences (e.g., administrators, policymakers, industry).	1, 2, 3, 4, 5
7	Provide additional on-going communications training to the scientists who work in biodiversity collections.	Improve the ability of biodiversity collections scientists and collection professionals to effectively communicate about their research and collections.	Funding agencies should continue to provide support for training programs, particularly for early career professionals. Scientists should be encouraged to participate in communication training programs, such as those offered by AIBS. Institutions should continue to assess the communication skills of potential employees, but also support professional development activities that will strengthen these skills.	1, 2, 3, 4, 5, 6

Acknowledgements

The Biodiversity Collections Network thanks the many staff members of The Field Museum of Natural History in Chicago, Illinois whose logistical support helped make this workshop a success. We particularly thank Dr. James Croft, Ms. Lynne Livengood, and Ms. Crystal Mann for their help. Ms. Syreeta Jones, CMP, with the American Institute of Biological Sciences provided valuable assistance with managing this workshop. Ms. Julie Palakovich Carr with the American Institute of Biological Sciences provided helpful suggestions, edits, and valuable assistance with the production of this report. Dr. Larry Page, Dr. Christopher Norris and Mr. Günter Waibel provided helpful comments and a careful review of an early draft of this report. Workshop participants shared suggestions and comments on a second draft of this report. iDigBio (NSF ADBC Cooperative Agreement EF-1115210) supported the participation of two workshop participants. The Biodiversity Collections Network, a National Science Foundation Research Coordination Network (NSF DBI 1441785), sponsored this workshop and provided travel support for participants.

Appendices

Appendix A – Workshop Agenda



Agenda
Collections Communications Workshop
Founder's Room, The Field Museum of Natural History
Chicago, Illinois

September 1-2, 2015

The *Collections Communications Workshop* is a meeting of 30 institutional leaders, communication experts, and scientists that will:

- 1) Identify opportunities and barriers to communicating the benefits of natural science collections to decision-makers and the public;
- 2) Explore the opportunities provided by national digitization initiatives to engage new stakeholders;
- 3) Identify existing communication resources and assess the need to develop of new tools and resources; and,
- 4) Explore the development of a networked community of communications professionals that could collaborate to deliver a proactive message about biodiversity and natural science collections to the public.

Outcomes of this meeting will inform whether BCoN establishes a working group and, if it does, what that group might be charged with accomplishing. The findings will be shared with the community, which will have an opportunity to provide comments.

September 1

7:30 – 7:45 Participants staying at the hotel can meet in the lobby to travel to the Field as a group.

8:00 Registration & continental breakfast
Founder's Room

8:30 – 9:00 Welcome, Opening Remarks, and Introductions

- Robert Gropp, Ph.D., Interim Co-Executive Director, American Institute of Biological Sciences, Director of Public Policy, NSC Alliance, PI, BCoN

- Christopher Norris, Ph.D., Past-President, Society for the Preservation of History Collections, BCoN Advisory Council
- Jim Croft, Ph.D., Executive Vice President, The Field Museum of Natural History

The National Landscape

- 9:00 – 9:20 What is BCoN?
Robert Gropp
- 9:20 – 9:40 What are iDigBio and ADBC?
Larry Page, Ph.D., Director, iDigBio

What do we know?

- 9:40 – 10:30 Roundtable discussion and idea exchange: Opportunities and barriers to communicating the benefits of natural science collections to decision-makers and the public

Please think of examples to share that showcase where you've experienced a communication challenge – the message was not getting through. Was this obstacle overcome, how? What messages or issues have you found that resonate? Who were the messengers who had the greatest impact on audience x, y, or z? How were the messages delivered? Do you know of data or assessments that quantify best practices?

- 10:30 – 10:40 Break

Current opportunities

- 10:40 – 12:00 Breakout groups

Given current national initiatives and what we've learned and identified as opportunities and challenges, how can we as a national community leverage digitization initiatives to engage new stakeholders, win new supporters, and increase engagement from administrators, decision-makers, and the public?

- 12:00 – 1:00 Working lunch -- Small group discussions
- 1:00 – 1:30 Breakout sessions report to full group

What do we have?

- 1:30 – 2:30 Resource Assessment

As a community, what do we currently have at our disposal for facilitating communication? Are we using these resources optimally? What can we do better?

2:30 – 2:45 Break

2:45 – 4:30 Breakout sessions

Based on resource and tools discussion, and concepts for effective communication discussed during the morning sessions, what needs to happen?

4:30 – 5:00 Breakout sections report to group

September 2

7:30 – 7:45 Meet in hotel lobby, travel in roving packs to the museum

8:00 – 8:30 Continental breakfast

8:30 – 9:00 Review and synthesis of previous day

Building a Networked Community for Communications

9:00 – 10:15 Breakout sessions

Is this necessary or does it exist? If it exists, is it functioning as well as we would like? What might the ideal collections communications community look like? What are the expectations of the members, participants? Who will participate and how? What is needed?

10:15 – 10:30 Break

10:30 – 11:00 Breakout sessions, continued

11:00 – 11:45 Group reconvenes and breakouts report

11:45 – 12:45 Working lunch -- Small group discussions

12:45 – 1:50 Group Discussion, synthesis

1:50 – 2:00 Break

2:00 – 3:00 Recommendations and next steps

*What does this group recommend to BCoN?
If needed, would you serve on a BCoN Working Group to move these issues and recommendations forward?*

3:00 Adjourn

Appendix B – Participants

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About the Biodiversity Collections Network

The Biodiversity Collections Network (BCoN) is a five-year national initiative funded by the U.S. National Science Foundation (NSF DBI 1441785) to support the development of a new, sustainable community of practice that will ensure that all U.S. biodiversity collections are digitally available for research, education, informed decision-making, and other scholarly and creative activities.

Scientists have amassed, annotated, and curated more than one billion specimens in more than 1600 institutions across the United States. Although these specimens and their associated data are heavily used for research and education, their benefits could be exponentially increased if the data could be accessed and mined online.

BCoN is an outgrowth of recent scientific meetings in which scientists have articulated a need to digitally capture biological specimens and associated data held in natural science collections for use in research, education, and for the public interest. The American Institute of Biological Sciences, the Society for the Preservation of Natural History Collections, and the Natural Science Collections Alliance jointly initiated BCoN.

We invite you to join with us as we, through BCoN and other national efforts, work to build a Network Integrated Biocollections Alliance that we can all embrace and work to sustain.

To become a part of the BCoN community, please visit <https://bcon.aibs.org>.

Suggested Citation

Gropp, R.E. 2016. *Building a More Networked System for Communicating about Natural History Collections: A Report from the Collections Communications Workshop*. Biodiversity Collections Network, Washington, DC. <http://bcon.aibs.org/collections-comm...-workshop-report/>

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