Importance of Collections

Digitization of Biological Collections

Biological collections include living and preserved plants, animals, fungi, microbes, tissues, and DNA, as well as images and other associated data that document biodiversity across time and space. They include more than one billion preserved specimens housed in U.S. institutions alone, forming irreplaceable national scientific resources.

What is Digitization?

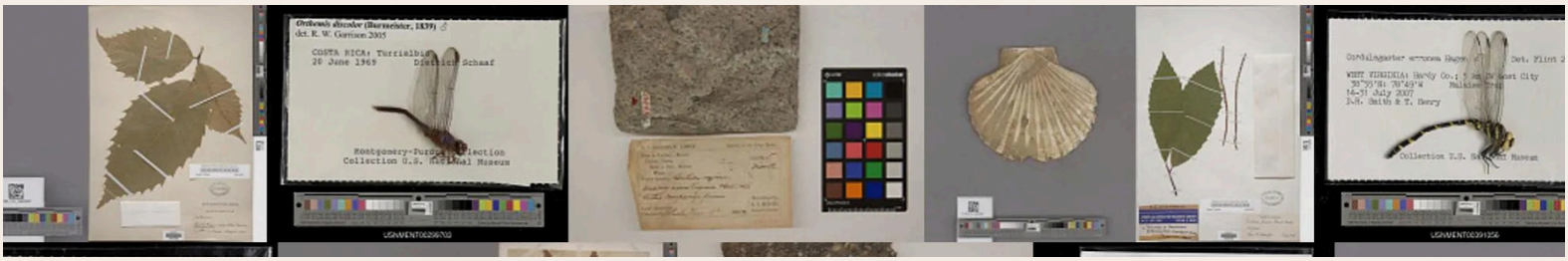
Digitization is defined broadly as adding digital information to physical specimens and includes activities like imaging physical specimens, transcribing specimen-associated data, and georeferencing specimen-collection localities.

Increased Access and Equity

- Removes geographic barriers to collections use.
- Expands participation beyond well-resourced institutions.
- Supports education, policy, and interdisciplinary research.
- Increases lifespan of the specimen.

New Scientific Capabilities

- Large-scale biodiversity and climate analyses.
- Integration with citizen science and monitoring data.
- Rapid synthesis across institutions and regions
- Improved species identifications manually or using artificial intelligence (AI).



Digitizing U.S. Collections

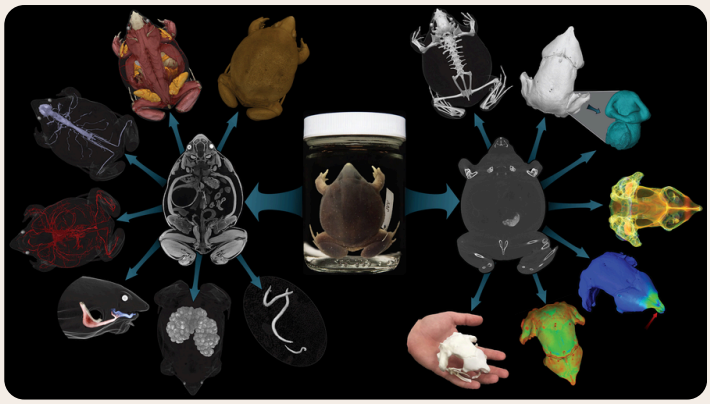
Over the first two decades of the 21st century, a rapid rise in digital data mobilization revolutionized natural history collections and the scientific disciplines they support by extending biodiversity information from physical specimens into globally accessible digital resources. In the United States, this historic transformation was guided by the Network Integrated Biocollections Alliance (NIBA), a community-led strategy to build a unified, open-access digital ecosystem. To fund this vision, the National Science Foundation launched the Advancing Digitization of Biodiversity Collections (ADBC) program, which supported collaborative data-sharing networks across hundreds of institutions. These efforts have been anchored by iDigBio, the national coordinating hub that has successfully aggregated more than 150 million specimen records into a single, searchable public portal, which is now hosted at the Global Biodiversity Information Facility (GBIF). By transforming once-isolated physical artifacts into an interconnected global resource, these initiatives have thrust natural history collections into the forefront of modern scientific research.

Importance of Collections

Digitization in Action

The oVert Project

This massive collaborative project used CT-scanning technology to generate high-resolution, 3D digital skeletons and soft-tissue anatomy for more than 13,000 vertebrate specimens (including frogs, fish, bats, and birds). Middle-schoolers to top-tier researchers can now download a 3D file of a rare shark skeleton and interact with it or 3D-print it.



Notes from Nature

One of the biggest challenges in digitization is reading centuries-old, handwritten specimen labels. Notes from Nature gamifies this process, allowing online volunteers and students to transcribe labels. It transforms dusty, illegible cursive into clean, searchable digital metadata, proving that public engagement can accelerate global science.

The Terrestrial Parasite Tracker

This project focuses on digitizing millions of arthropod specimens like ticks, fleas, and mites, along with their hosts. By mapping where these parasites lived over the last century, public health officials and epidemiologists can use the historical digital data to model and predict the future spread of vector-borne diseases like Lyme or Zika.

Terrestrial Parasite Tracker

Collections are ESSENTIAL!

Citations

Additional One-Pagers

BCoN Website