What is an Extended Specimen?

An extended specimen is a museum specimen connected to all of its related information. Under this concept, a record of a digitized specimen is augmented to include its associations to genotypic, phenotypic and environmental data types. These data include any media that was collected with the specimen, content further describing the collection beyond what is on the collection label, and any other connected data from publications or other sources.

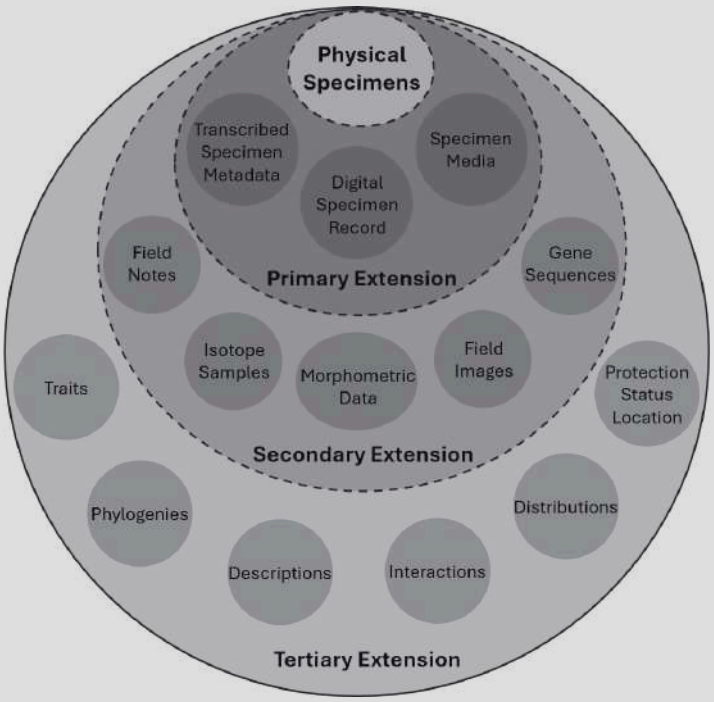
Components of the Extended Specimen

Physical Specimens: Approximately 1 billion physical specimens reside in U.S. museums, including derivative collections such as tissue samples.

Primary Extension: The digitized version of the specimen metadata in the form of a digital specimen record, as well as data and images, audio and video files, are maintained by institutions that hold physical specimens and also contribute to the national and international aggregated databases.

Secondary Extension: Data that reside in private collections, institutional repositories, and national/ international repositories, often disconnected physically and digitally from the original specimen, which may link to individual specimens.

Tertiary Extension: Data about associations (e.g., host/ parasite, symbioses) that link to taxonomic names applied to specimens or collection events (e.g., collector, collections location).



Extending the Extended Specimen

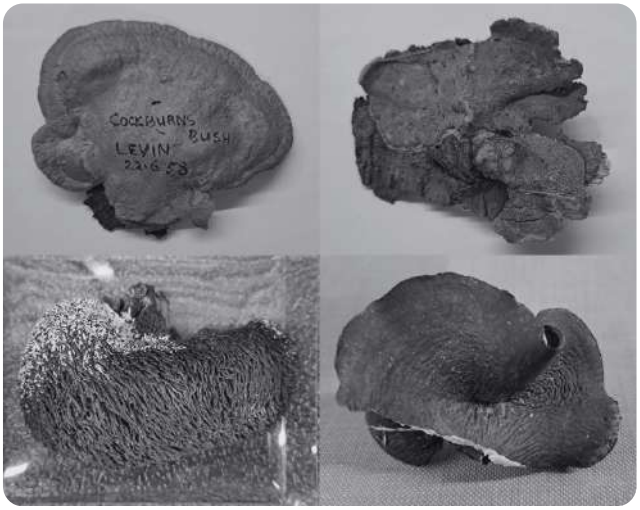
Extended Specimen Network

The Extended Specimen Network, first described in BCoN's report on Extending U.S. Biodiversity Collections to Promote Research and Education, represents the breadth and depth of biodiversity specimens and the cloud of integrated data associated with all specimens in U.S. collections. The ultimate goal of this effort is to enhance the capacity for researchers to explore questions across taxonomic, temporal and spatial scales.

Digital Extended Specimen

The Digital Extended Specimen expands on the Extended Specimen Network by taking a global focus of the extended specimen. This concept is defined as the "collective representation on the internet of all digital assets in reference to a physical specimen that meets FAIR data principles and is distinguished and linked using globally unique persistent and resolvable identifiers to create an extensive online network of knowledge regarding life and related natural science objects."

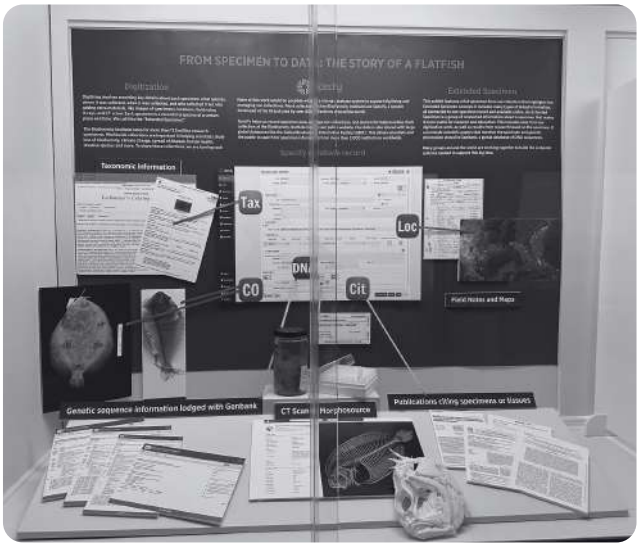
The Extended Specimen in Action



Humanities researchers are using digitized collections data to track collaborations and networks of researchers through history. For example, researchers in the UK and New Zealand used digitized herbarium records to track the records of mycologist Greta Stevenson, her collaborators (amateur and professional), and identify new people for whom histories could be obtained. They were also able to track gender and profession distributions of people who submitted herbarium records during that time period.

A long-running collection of snakes from the Global South, housed in Argentina's INALI collection, has yielded crucial biodiversity research for this understudied region. Despite ongoing financial hardship and aging research infrastructure, the curators' efforts to maintain a digital copy of the collection have provided the opportunity for these specimens to reach a broader community of researchers and community scientists interested in collecting morphological and genetic information.





At the Kansas University Biodiversity Institute and Natural History Museum, members of the public can learn about the extended specimen concept using the Gulf of Mexico oscillated flounder (Ancylopsetta ommata). This specimen has a robust digital footprint. In addition to standard collection information, database users can also access 2D and 3D images of the specimen, its DNA sequence, and all of the databases and papers which have referenced this specimen to date.

Collections are ESSENTIAL!

Citations

Additional One-Pagers

BCoN Website