

Arctos: A Collaborative Collection Management Solution

Emily Braker¹, Mariel Campbell², Carla Cicero³, Andrew Doll⁴, Lindsey Frederick⁵, Michelle S. Koo³, Angela Linn⁶, Dusty McDonald⁷, Elizabeth A. Wommack⁸

¹University of Colorado Museum of Natural History, ²Museum of Southwestern Biology, ³Museum of Vertebrate Zoology, UC Berkeley, ⁴Denver Museum of Nature and Science, ⁵New Mexico Museum of Natural History and Science, ⁶University of Alaska Museum of the North, ⁷Arctos Consortium, ⁸University of Wyoming Museum of Vertebrates

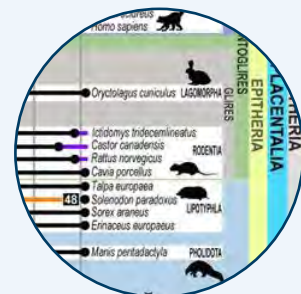
Arctos (arctosdb.org) is a **cost-effective, online collaborative collection management solution** employed by more than 352 collections to **manage and provide access to >5.2M biodiversity, geology, and cultural records** and >1M media objects. It also forms the backbone of Harvard's MCZBase. Arctos leads in providing museums with **community-driven solutions to managing and improving collections data** and developing workflows for data cleaning and publication. Arctos integrates **biological, earth science, cultural and emerging data types** such as **environmental DNA** and **microbiomes** to provide a **nexus for the full suite of object data, data derivatives and products, and their management**. Arctos is used by museum professionals, researchers, educators, students, government agencies, NGOs, and the public.

The Arctos Ecosystem

Arctos strives for superior data quality through its highly-normalized model, controlled vocabularies, and authorities. Standardized data shared among institutions reduces redundancies, allows for precise data queries, and leads to innovative ways of relating objects within or between collections (e.g., predator-prey, host-parasite, same individual as), promoting data exploration and interdisciplinary research.

PROJECTS

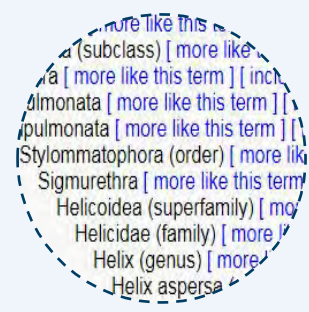
Organize & track specimen usage



- Project Agents (PIs, Students, Sponsors)
- Relevant Permits, Funding Sources
- Resulting Publications • Cited Specimens
- Specimens • Accessions • Loans
- Associated Project Media

TAXONOMY

Shared local sources & remote authorities (WoRMs, GlobalNames) • Cultural terminology & non-Linnaean vocabularies



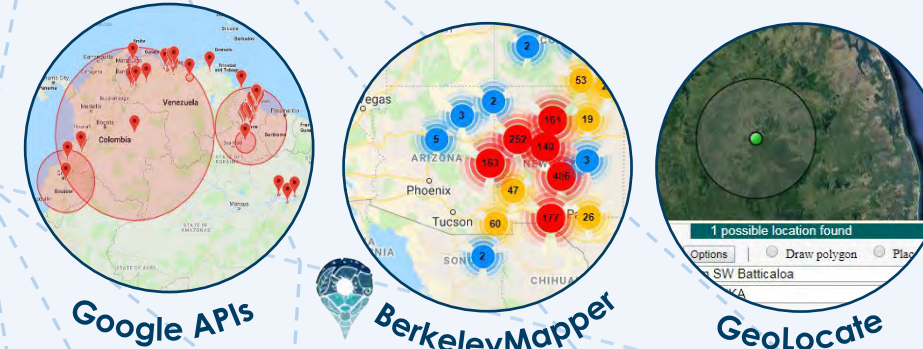
PUBLICATIONS

- Cited Specimens
- Author Agents
- Auto DOI/PMID



LOCALITIES & EVENTS

Shared spatio-temporal stack • Multiple event handling • Map services & semi-automated georeferencing • Geochronology



ENTITIES

Link collection objects in assemblages using persistent identifiers



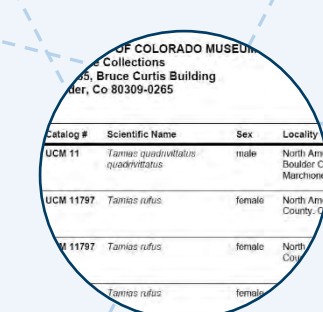
OBJECT TRACKING

Location tracking • Document container type & environment



TRANSACTIONS

ACCESSIONS • BORROWS • LOANS • PERMITS



RELATIONSHIPS

Reciprocally link related objects within and outside of Arctos



Arctos - GenBank - IsoBank autolinks • GenBank sequence discovery tool & data packaging

The Arctos Community

Arctos is a dedicated community of museum professionals who collaborate to improve data richness, expand functionality, and develop best practices. Built and continuously refined by multiple perspectives from diverse disciplines, the Arctos Ecosystem is a synthesis of the Arctos community. Members can actively participate in system developments through the Arctos Working Group.

AGENTS

- ORCID
- Wikidata

Create bio profiles • Link agents to object & media records, publications, and one another



MEDIA

Tag and relate to objects, agents, transactions, taxa, publications, localities & events



Arctos Features

- Both an **online data portal** and **comprehensive CMS**
- 100% **cloud-based** with **secure storage** via TACC
- Global editing** and update capabilities
- Data **quality control** and **error detection**
- Automated data publishing** (IPT)
- Autolinks to GBIF & iDigBio** occurrence records
- Collection **metrics** and **data improvement tools**
- Report generation** - specimen tags, labels, forms
- Extended Specimen** data handling
- Community **mentoring and support**
- Webinars, tutorials, how-to documentation

Arctos Collaborations

Arctos leverages external web services to extend capabilities and generate reciprocal links. Partners include: Barcode of Life • BerkeleyMapper • Crossref • GBIF • GenBank • GeoLocate • Global Genome Biodiversity Network • Global Names Architecture • Google Maps • IsoBank • MorphoSource • NCBI • OpenCitations • ORCID • PubMed • VertNet • World Register of Marine Species
Arctos is powered by the Texas Advanced Computing Center TACC