Arctos: Community-Based Collaborative Collection Management for Natural and Cultural History Data

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Arctos (arctosdb.org) is a web-based collaborative collection management system and data portal serving global data on ~4.3 million biodiversity and cultural records from more than 247 collections with nearly 800,000 media objects (images, audio, CT scans, documents). Arctos is a leader in providing museums with community-driven solutions to managing and improving collections data and developing workflows for data cleaning and publication. Pioneered in 1999 and securely hosted since 2012 at the Texas Advanced Computing Center, the portal (arctos.database.museum) provides numerous tools and services to manage museum data and make them publicly available. A web interface supports data entry and editing, with integrated tools for transaction and permit management, geocoding, mapping, citations, object tracking, and automated IPT publishing. Arctos strives for superior data quality through its highly-normalized model, controlled vocabularies, and authorities. Shared standardized data has led to innovative ways of relating objects within or between collections (e.g., predator-prey, host-parasite relationships), promoting data exploration and interdisciplinary research. Arctos also leverages external services to extend capabilities and generate reciprocal links with collaborators, including Barcode of Life, GBIF, GenBank, Global Biotic Interactions, Global Genome Biodiversity Network, Global Names, iDigBio, IsoBank, iNaturalist, MorphoSource, World Register of Marine Species, and VertNet. Furthermore, Arctos is a community of museum professionals who collaborate on best practices and work together to improve data richness and expand functionality. Arctos collections benefit from this community approach, and members share equally in its development through the Arctos Working Group. Arctos connects and integrates biological, earth science, and cultural data and media as well as emerging data types such as environmental DNA and microbiomes. By connecting natural and cultural history collections within a digital ecosystem and promoting high quality data, Arctos enables data access and use to ultimately empower research, education, and conservation.