



Big Ten Academic Alliance Geospatial Information Network (BTAA-GIN):

A Collaborative Foundation for the Future of SDI

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From Concept to Community Infrastructure

The Big Ten Academic Alliance Geospatial Information Network (BTAA-GIN) offers a model for NSDI modernization, combining technical infrastructure with a durable framework for governance and collaboration. For over a decade, BTAA-GIN has coordinated a multi-institutional Geoportal that aggregates metadata from hundreds of sources, supporting discovery and access across thirteen states. Our submission highlights both operational and emerging components: a shared metadata platform built on GeoBlacklight, a community-developed metadata profile, a new geodata collection initiative to preserve at-risk digital assets, and a transition to a modular, API-based architecture designed for interoperability and sustainability. Together, our technical infrastructure and collaborative governance model demonstrate how a regional academic consortium can build and sustain a shared SDI that supports data stewardship through discovery, reuse, and preservation.

Governance has been central to the BTAA-GIN's long-term success. The network—comprising seventeen member universities—is an established program with a clear mission, shared values, and a sustainable operating model. Founded on collaboration, the operating structure features three standing committees coordinated by a central Coordination Committee: Technology guides application development and metadata workflows; Community Engagement supports Geoportal visibility, education, and outreach; and Knowledge leads research coordination, publishing, and agenda-setting for geospatial librarianship. This structure reflects a commitment to shared governance to ensure the technical systems and the professional community behind them are developed and maintained in tandem.

People have always been at the center of the BTAA-GIN. With an average of two representatives from each participating university, the network maintains continuity and capacity to set shared standards while executing strategic projects. The group fosters a culture of innovation and peer mentorship among geospatial librarians, metadata specialists, and developers, who collaborate regularly to advance the network's goals. Public-facing programs such as the annual Big Ten GIS Conference demonstrate the BTAA-GIN's commitment to engagement and capacity building across academic, government, and library sectors. In 2025, the conference drew its highest participation ever—664 registrants from over 100 institutions. That same spring, BTAA-GIN launched a quarterly newsletter (~700 subscribers) to promote collaboration, highlight best practices, and sustain connections across the network. The network is currently refreshing a series of online video tutorials for using the Geoportal and has plans to publish a guide to data citations.

The BTAA Geoportal itself was designed to solve a persistent challenge for researchers and educators: geospatial datasets are often difficult to locate unless users already know which agency created or hosts the data. Today, it includes over 100,000 resources and represents one of the largest academic geospatial metadata catalogs in North America. By aggregating metadata from over 200 sources, the Geoportal enables users to search by *what*, *where*, and *when*—without needing to know *who*. It serves a broad academic audience that includes researchers, students, faculty, librarians, GIS professionals, and the public. Ongoing usability testing ensures that improvements to the interface and search experience are informed by actual user needs and that the site continues to meet a high standard for accessibility. These efforts serve both the library professionals who curate and contribute to the Geoportal, and the broader academic community of researchers, students, instructors, and analysts who rely on it to efficiently locate trusted geospatial data.

The BTAA Geoportal uses a shared metadata application profile, **OpenGeoMetadata Aardvark**. This profile was collaboratively developed by metadata, GIS, and map specialists. It incorporates elements from DCAT,

GeoDCAT, and custom fields to support geospatial-enabled searches. The OpenGeoMetadata project currently includes contributions from over 20 institutions, enabling metadata reuse in other GeoBlacklight instances.

Emerging Initiative: BTAA-GIN Geodata Collection

To support long-term access and reuse of public geospatial information, the BTAA-GIN has launched a new initiative to systematically **collect and preserve** born-digital geospatial data. We are archiving original versions of datasets, documenting them using the OpenGeoMetadata profile, and enhancing them with data dictionaries and modern visualization formats such as PMTiles and Cloud-Optimized GeoTIFFs. Much of this public data is ephemeral, as it is frequently updated or overwritten without retaining prior versions. The absence of preserved versions limits the ability to study changes over time and hinders efforts to ensure reproducibility. While libraries have traditionally preserved printed maps, most have not yet updated their collection policies to include digital public data, resulting in temporal gaps in the historical geospatial record.

This initiative is aligned with the FGDC NSDI Strategic Plan 2025-2035, which emphasizes the importance of preserving spatial data for future reuse and promoting adherence to the FAIR (Findable, Accessible, Interoperable, and Reusable) principles. By proactively collecting and stewarding these datasets today, we are investing in their long-term value as historical resources.

Planned Initiative: Technology Stack Transition

The BTAA Geoportal is part of a broader community of academic discovery platforms built on the open-source GeoBlacklight software, which streamlines how users find and view geospatial data. However, as web technology continues to evolve and the demand for scalable, sustainable solutions grows, GeoBlacklight's Ruby on Rails architecture has become increasingly outdated. Its complexity also presents barriers for smaller institutions that lack the technical infrastructure or resources to implement and maintain it.

In response, the BTAA-GIN is developing a forward-looking, modular technology stack that emphasizes stability, accessibility, and adaptability. This new stack is designed not only to support current needs but also to accommodate future advancements, including the integration of AI tools and new frontiers in GIS. Metadata will be shared via an open API, ensuring long-term accessibility even if the platform's discovery and management tools change.

This transition presents exciting opportunities. The modular architecture allows individual components to be updated or replaced independently, supporting long-term growth and adaptability. The open metadata API also expands possibilities for reuse: institutions can build lightweight discovery tools drawn from our shared catalog, and we are developing a QGIS plugin that will enable users to access datasets directly within the desktop application. Finally, by moving to more commonly used Python-based frameworks, we broaden our base of collaborators and strengthen long-term sustainability.

Contributing to the Future of NSDI

The BTAA-GIN demonstrates how sustained collaboration and shared governance can drive innovation in SDIs. We welcome the opportunity to contribute our community governance model, metadata application profile, technology strategy, and preservation approach to the future of the NSDI.

Appendix: Links and Graphics

- Big Ten Academic Alliance Geospatial Information Network: <https://gin.btaa.org>
 - GeoBTAA Metadata Handbook: <https://gin.btaa.org/metadata/>
 - Big Ten GIS Conference 2025: <https://gin.btaa.org/conference/2025/>
 - BTAA-GIN Geodata Collection Plan <https://gin.btaa.org/library/geodata-collection-strategic-plan/>
 - BTAA-GIN Technology Plan (2025-26): <https://gin.btaa.org/technology/tech-plan-2025/>
- BTAA Geoportal: <https://geo.btaa.org>
- OpenGeoMetadata: <https://opengeometadata.org>
- GeoBlacklight: <https://geoblacklight.org>

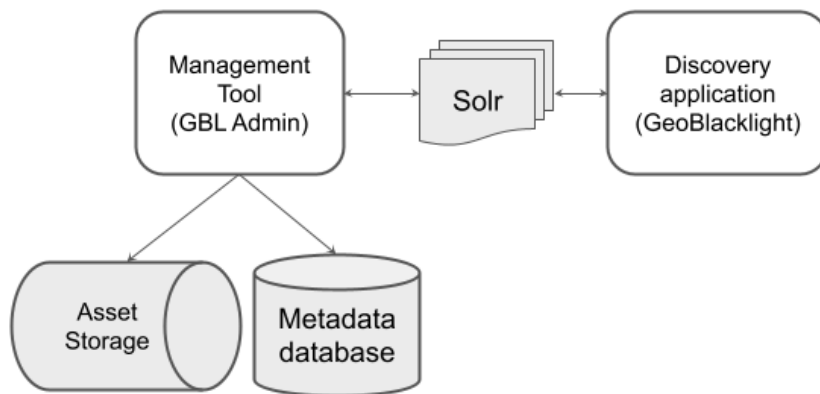


image: Current architecture framework for the BTAA Geoportal

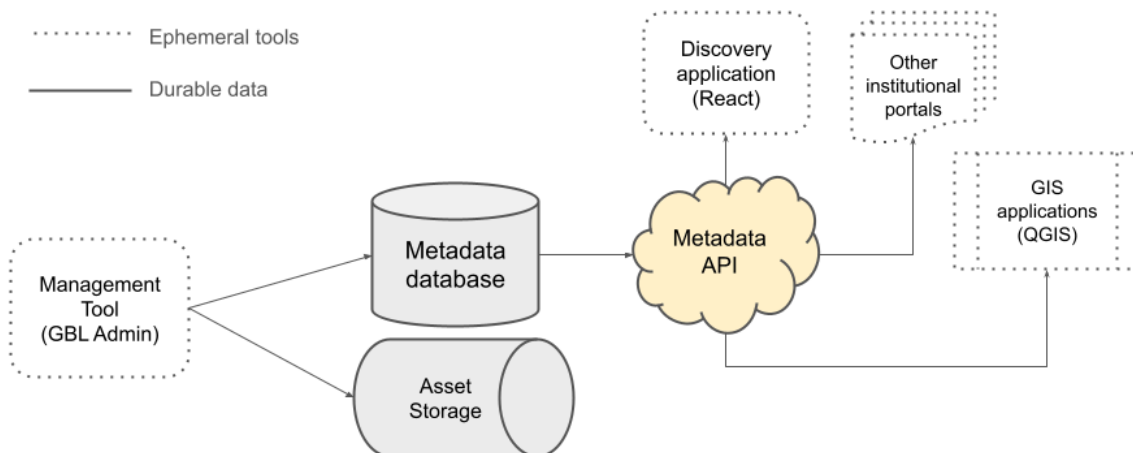


image: Technology Stack in development