The Arctic Biodiversity Data Service (ABDS) – ensuring archiving and access to biodiversity data

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Abstract

The ABDS is the online, interoperable data management system for biodiversity data generated via the Conservation of Arctic Flora and Fauna (CAFF), the Arctic Council's biodiversity working group. Its goal is to facilitate access, integration, analysis and display of biodiversity information for scientists, practitioners, managers, policy makers and others working to understand, conserve and manage the Arctic's wildlife and ecosystems.

The ABDS ensures that biodiversity data provided to CAFF are organized to guarantee a lasting legacy in a manner that facilitates data discovery; increased understanding; more informed and rapid decision-making; and ongoing research.

This white paper provides an overview of the ABDS, its interoperability and relations to other regional and global biodiversity data frameworks. This white paper relates to sub-theme 4 (Data Interoperability and Federated Search) and also to sub-theme 1 (Design, Optimization and Implementation of the Observing System) and sub-theme 4 (Data Interoperability and Federated Search).

What is the Arctic Biodiversity Data Service (ABDS)?

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The ABDS ensures that biodiversity data provided to CAFF are organized to guarantee a lasting legacy in a manner that facilitates data discovery; increased understanding; more informed and rapid decision-making; and ongoing research. Each time a new report or product is released by CAFF the datasets involved are archived and made accessible via the ABDS.

Architecture

The ABDS is built using open source solutions designed to facilitate sharing of information i.e. GeoServer[1]; GeoNetwork[2], an Integrated Publishing Toolkit (IPT)[3] and PHP maker[4] to facilitate online data updates.

[1] GeoServer is a Java-based software server that allows users to view and edit geospatial data. Using open standards set forth by the Open Geospatial Consortium (OGC), GeoServer allows for great flexibility in map creation and data sharing.

Sitting atop a Postgre SQL PostGIS database[5] this framework (Figure 2) provides an web interface to search geospatial data across multiple catalogues, combine distributed map services, publish geospatial data and schedule metadata harvesting from other catalogues.

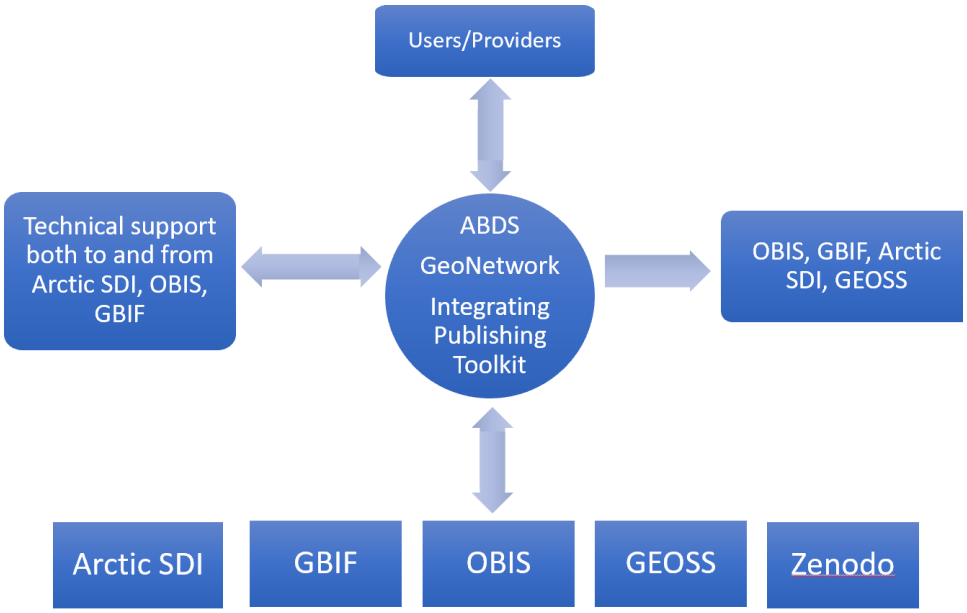

Figure 1: ABDS Architecture

Data management

Key data management services include supporting network data management; assigning metadata; establishing interoperable links via the ABDS with relevant data portals; hosting relevant datasets that are not accessible elsewhere; rescuing datasets and working to ensure that appropriate standards are applied e.g. Darwin Core.

The ABDS data policy is, where possible, in accordance with the Conservation Commons and the International Polar Year (IPY) data policies. This entails free and open access to data, information and knowledge for conservation and management purposes will be promoted. In some cases, compelling reasons exist for restricting data availability, such as revealing sensitive sites of endangered species, and such cases will require the application of appropriate safeguards. The ABDS adopts a flexible approach towards data rights and responsibilities which allows it to embrace all options from free public data to strict data control.

[2] GeoNetwork is a catalog application to manage spatially referenced resources. It provides powerful metadata editing and search functions as well as an embedded interactive web map viewer. It is currently used in numerous Spatial Data Infrastructure initiatives across the world.

[3] The Integrated Publishing Toolkit (IPT) is a free open source software tool written in Java that is used to publish and share biodiversity datasets through the GBIF

[4] PHPMaker is a tool to generate a full set of PHP from databases such as PostgreSQL

[5] Postgre SQL PostGIS is an object-relational database supporting geographic objects and allowing location queries to be run in SQL.

Ownership of data rests with the originators of that data and requirements they place on its use. Unless requested otherwise, the data collector (or the representative of the organization that is the property owner) is acknowledged as owner of the intellectual property of the data. CAFF may act as custodian for individual data collectors, holders and publishers, but this does not automatically confer any rights to those data. The responsibility for and ownership of the data will always remain with the data collector, publisher and/or holder.

Partners

CAFF works with a range of partners to further develop cooperation, access to and management of biodiversity data. Partners include the Arctic Spatial Data Infrastructure[6] (Arctic SDI); Global Biodiversity Information Facility (GBIF); Ocean Biogeographic Information System (OBIS); Group on Earth Observations Biodiversity Observation Network (GEOBON), Michigan Tech Research Institute (MTRI), Michigan Technological University, International Network for Terrestrial Research and Monitoring in the Arctic (INTERACT), Protection of the Arctic Marine Environment (PAME) Arctic Council working group and NatureServe. See Fig 2 for a representation of how data from the ABDS is represented in GBIF.

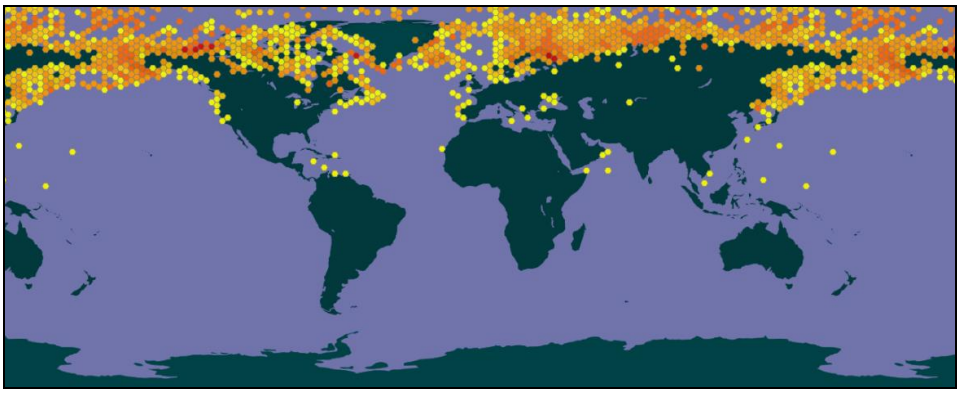

Figure 2: Distribution of ABDS data records in GBIF

Data

The ABDS contains datasets from CAFF's monitoring and assessment activities with new data being regularly added. Key data sources include data generated by CAFF's Circumpolar Biodiversity Monitoring Programme (CBMP). Examples of recently added datasets include data generated by the *State of the Arctic Freshwater Biodiversity Report* (CAFF 2019), the *Global audit of the status and trends of Arctic and Northern Hemisphere goose population* (CAFF 2019) and the Land Cover Change Index Phase 2.

The SAFBR uniquely in Arctic Council assessments provides not just science and policy reports but also an integrated database upon which the SAFBR is based. This database is a **key outcome** from the SAFBR process as it provides a means to keep our knowledge on the status of Arctic freshwater biodiversity easily updated, used, accessed, applied to answer questions and conduct further assessments. External

[6] The Arctic SDI is led by the National Mapping Agencies of Arctic Council member states to share spatial data across organizations, working groups and countries. CAFF facilitates the initiative within the Arctic Council.

parties are also welcome, to make their data available via the ABDS. As of January 2019, 326.878 data records are accessible on the ABDS.