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# Arctic Biodiversity Data Service

## Progress report: 2017-2019

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## 1. What is the Arctic Biodiversity Data Service (ABDS)?

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. Each time a new report or product is released by CAFF the datasets involved are archived and made accessible via the ABDS. This document provides an overview of ABDS and progress during the 2017-19 Arctic Council Ministerial period.

## 2. Architecture

The ABDS is built using open source solutions designed to facilitate sharing of information i.e. GeoServer<sup>1</sup>; GeoNetwork<sup>2</sup>, an Integrated Publishing Toolkit (IPT)<sup>3</sup> and PHP maker<sup>4</sup> to facilitate online data updates. Sitting atop a Postgre SQL PostGIS database<sup>5</sup> 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.

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<sup>1</sup> 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.

<sup>2</sup> 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.

<sup>3</sup> 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

<sup>4</sup> PHPMaker is a tool to generate a full set of PHP from databases such as PostgreSQL

<sup>5</sup> Postgre SQL PostGIS is an object-relational database supporting geographic objects and allowing location queries to be run in SQL.

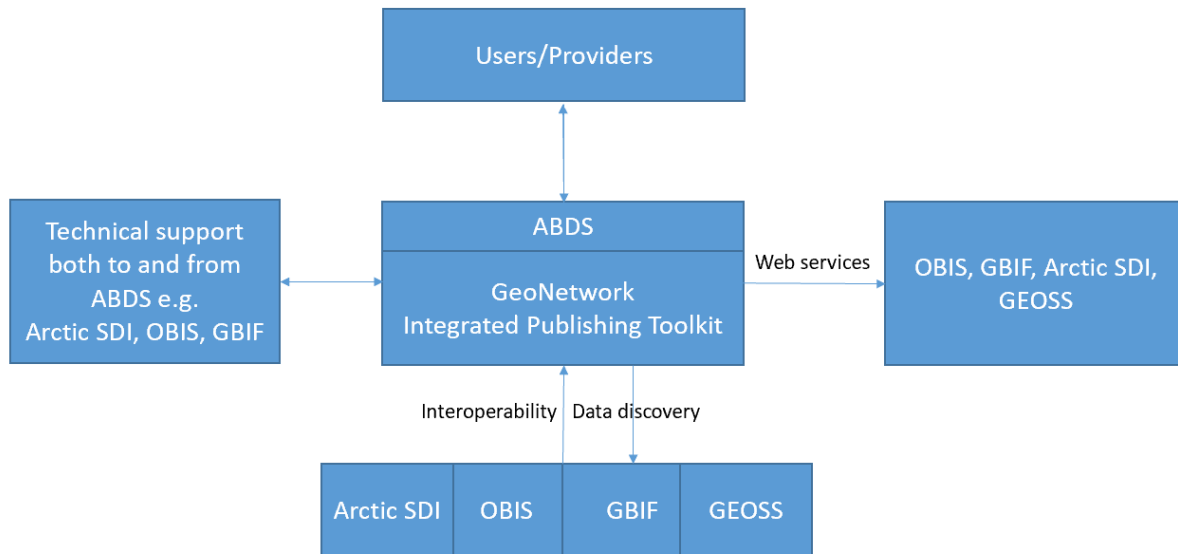


Figure 1: ABDS Architecture

### 3. 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.

### 4. 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<sup>6</sup> (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.

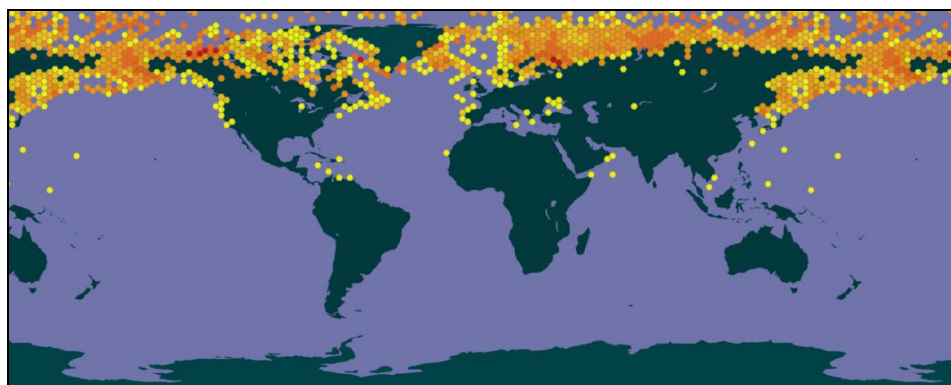


Figure 2: Distribution of ABDS data records in GBIF

<sup>6</sup> 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.

## 5. 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 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 (Fig 3). The jump in records accessible in 2015 reflects when ABDS became Arctic Nodes within GBIF and OBIS.

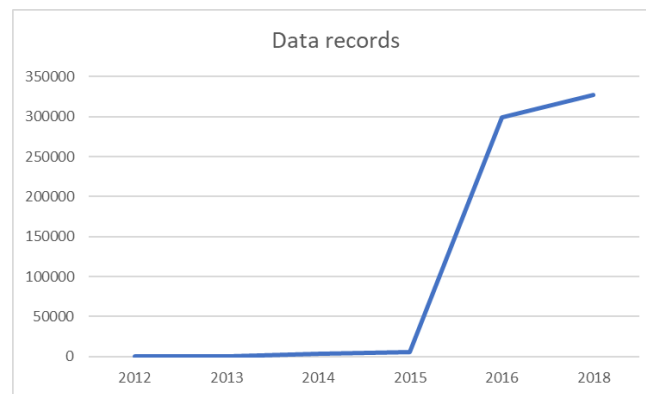


Figure 3: Data records available on the ABDS (January 2019)

## 6. Progress 2017-19

During 2015-2017 key achievements include:

- Allowing data to be harvested from ABDS to partners i.e. GBIF, OBIS and Arctic SDI
- Development of an online data update system for information from CBMP expert networks, e.g. for the SAFBR database and Focal Ecosystem Components from the Marine Mammals and Seabird expert groups.
- Cooperation with Arctic SDI, to improve access to data and continued streaming of data into the Arctic SDI GeoPortal.
- Co-author of white paper *Global Observational Needs for Biodiversity* for the OceanObs'19 conference, which is to be published in a special issue of *Frontiers in Marine Science* in 2019.
- Helping PAME develop the database: Meaningful Engagement of Indigenous and Local peoples in Arctic marine activities (MEMA).
- Development of a data management plan for Arctic monitoring station(s) to manage and deliver data into the ABDS, in cooperation with INTERACT including the Canadian High Arctic Research Station, Zackenberg Research Station and the Icelandic RIF research station.
- ABDS continues to evolve with increased visibility of ABDS and requests for data.

## 7. Next steps 2017-18

Activities during the Arctic Council 2018-2020 ministerial period will include:

- Continuing to facilitate data transfer and publishing from the CBMP monitoring groups and headline indicators;
- Continuing developing ABDS to ensure system integrity, security and interoperability;
- Increase the understanding and profile of the ABDS amongst target audiences and partners;
- Expanding partnerships to ensure integration and interoperability with ABDS;
- Expanding the funding base to ensure sustainability; and
- Increased decision maker support for the ABDS including engagement in identifying partners with complimentary mandates for cost and benefit sharing.