



U.S. Animal Telemetry Network

Data Assembly Center (DAC)

Data Management Policy Guidance

1. Background

The U.S. Animal Telemetry Network (ATN) is a community of scientists whose research focuses on understanding marine animal movement and behavior using attached satellite, acoustic and other multisensory telemetry tags that transmit their locations and, in some cases, gather data about the animal's aquatic environment. These studies are conducted across national and international waters, on a wide variety of animal species, ranging in size from salmon smolt to blue whales. Research efforts are supported by a range of Federal, state and local organizations. The U.S. ATN program has been implemented with funding from the Office of Naval Research (ONR), the Bureau of Ocean Energy Management (BOEM), the National Oceanic and Atmospheric Administration (NOAA)/National Marine Fisheries Service (NMFS), and the U.S. Integrated Ocean Observing System (IOOS).

ATN's data vision is to provide a national community resource that aggregates satellite, acoustic and archival telemetry data from multiple sources, while providing data management support, promoting data standardization, and enabling the display of and access to electronic tag data and data products. The ATN also facilitates permanent data archival at NOAA's National Centers for Environmental Information ([NCEI](#)) and data sharing through the Ocean Biogeographic Information System ([OBIS-USA](#)) and the Data Observation Network for Earth ([DataONE](#), see Section 7).

To achieve this vision, the ATN has established a centralized Data Assembly Center (DAC), which includes a variety of secure data management platforms (i.e., the Research Workspace and the Project Registration App) and a publicly accessible web-based data portal (portal.atn.ioos.us). The ATN DAC and its cyberinfrastructure components are currently managed by Axiom Data Science ([Axiom](#)). The ATN DAC data management capabilities are designed to handle diverse data types and to support telemetry data from both individual researchers and multi-investigator programs. To ensure that data submitted to the ATN DAC are managed according to best practices and are of a known quality to the end user, the ATN DAC data management system follows the Data Management and Communications (DMAC) guidelines

of the U.S. IOOS wherever possible (ioos.noaa.gov/data/data-standards/). Instructions for submitting data to the ATN DAC are available at: atn.ioos.us/help/submit-data (also see Section 5).

2. Scope

This document addresses all data housed within the ATN DAC at the time of the document's release. At this time this includes only the geolocations of and any physical/chemical sensor observations collected via satellite telemetry tags attached to marine animals. This document will be updated as and when required as new protocols are developed and additional telemetry types (e.g., acoustic, GSM, multisensory) are fully integrated into the DAC.

3. Objective

The specific policy guidance outlined below is aimed at ensuring that the data management, accessibility and sharing processes implemented within the DAC effectively satisfy the long-term usability needs of ATN data users. This guidance also ensures that the processes are both consistent with the U.S. Federal Public Access to Research Results (PARR) requirements as well as supportive of the U.S. IOOS mission to deliver data which provides societal benefits to their stakeholders.

4. Data Accessibility/Sharing, Display and Use

The ATN DAC data management system addresses the needs of the U.S. marine animal telemetry community and follows the DMAC guidelines of the U.S. IOOS whenever possible (ioos.noaa.gov/data/data-standards/). In general, this guidance is based on the Global Earth Observing System of Systems (GEOSS) data sharing principles. The basic intent of these principles is to ensure full, free and open exchange of data and metadata with minimum possible delay and restrictions consistent with the FAIR (Findability, Accessibility, Interoperability and Reusability) data use principles.

Outlined below is the specific guidance embraced by the ATN DAC regarding the accessibility, visualization, sharing, and use of data and data products that have been submitted to the DAC by researchers who are: a) funded partially or entirely by NOAA or, b) by other Federal agencies, non-Federal/state agencies and non-governmental organizations (NGO's).

4.1 Data collection funded by NOAA

Data Submitted to the DAC by NOAA Researchers: Data collection funded by NOAA and collected by NOAA researchers or as part of collaborative research between NOAA and an extramural funding recipient, are subject to the NOAA Data Access Directive: nosc.noaa.gov/EDMC/PD.DA.php.

Data Submitted to the DAC by Non-NOAA Researchers: Data collection funded by NOAA but collected by non-NOAA researchers are subject to the NOAA [Data Sharing Directive for NOAA Grants, Cooperative Agreements, and Contracts](#) that was developed in response to the February 2015 NOAA Plan for increasing PARR compliance. The data accessibility requirements of this NOAA Directive apply to new data created by extramural (to NOAA) funding recipients.

In accordance with this Directive, ATN interpretes data sharing to mean making data publicly accessible in a timely manner at no cost (or no more than the cost of reproduction), in a format which is machine-readable and based on open standards, and includes any/all metadata necessary to find and properly use these data. Machine readable means these data are stored on a computer in a digital format whose structure is well described and which can be read without the aid of a human (as opposed, for example, to data on paper in filing cabinets, or scanned images of handwritten numbers). For satellite telemetry datasets, timely means no later than publication of a peer-reviewed article based on these data, or two years after these data are collected and verified, or two years after the original end date of the grant (not including any extensions or follow-on funding), whichever is soonest, unless a delay has been authorized by the NOAA funding program. This two-year period of data inaccessibility is called the data embargo period. See Section 4.3 below for a description of the ATN DAC data embargo mechanism.

4.2 Data collection funded by other Federal and non-Federal/State Agencies and NGOs

For researchers submitting data to the ATN DAC who are funded in this category, the ATN DAC will observe the policies/requirements of their relevant funding sources if they are outside the scope of NOAA's directives. If none exists, then ATN DAC will follow the guidance in section 4.1 above for "Data collection funded by NOAA".

4.3 Data Display and Accessibility

Both near real-time and non-real-time data submitted to the DAC are displayed in the same web-based data portal (portal.atn.ioos.us) as soon as they are received. Visualization of, but not access to, these data are typically available shortly after the data are submitted to the DAC and thus much earlier than the funding agency's timeline requirements for the data sharing and public accessibility described above. These data visualization displays include basic project (e.g., title, abstract, contacts) and deployment-level (e.g., species, tag manufacturer) documentation supplied by the principal investigator (PI) or data manager (DM) to the DAC via the ATN Project Registration App or the Research Workspace (see Section 5).

Although visualized/displayed in the portal, none of these data are accessible directly from the data portal map. Accessing/downloading of these data is possible only from within the data portal catalog or from links embedded into individual project pages, and is possible only after a project's and/or deployment's embargo period has ended, and the data have been archived at a national data center and the dataset DOI minted (see Sections 6 & 7).

The DAC applied data embargo period, which can be waived by the PI/DM, is the implementation in the DAC of the NOAA Data Sharing Directive requirement (described above in Section 4.1) for timely data accessibility. The embargo period is the time during which data that has been submitted to the DAC remains inaccessible to the public, and is typically 2 years from the date of the last data received from a satellite transmitting or archival tag. While data are under embargo within the DAC, the PI who owns these data (the originator) has the option and ability to securely share them with specific colleagues should they wish to do so. Secure data sharing can be provided via either the Project Registration App or the Research Workspace depending on the method of data upload to the DAC (see Section 5).

5. Submitting Data to the ATN DAC

Any Federal or non-Federal data contributors who choose to submit data to the ATN DAC will do so in accordance with the Standard Operating Procedures for data submission (atn.ioos.us/help/submit-data).

For near real-time data, the data contributors (project PI or DM) shall provide the ATN DAC Data Coordinator (DC) with any information necessary to identify and retrieve data from Argos or the tag manufacturer data portals. These data contributors will also register new projects, provide project-level metadata (e.g., title, abstract, purpose) and generate deployment records for near real-time transmitting tags within the Project Registration App. If near real-time data portal feeds cannot be auto-ingested, data from completed deployments must be provided to the DAC via manual upload to their project's file folder directory within the Research Workspace.

For non-real-time data (e.g., "archival" tags), these same project and deployment-level metadata shall also be provided to the DAC either via the ATN Registration App or by manual upload to the Research Workspace. Then, the non-real time data shall be provided directly to the DAC upon deployment completion and/or after post-processing either via upload to the Research Workspace by the PI/DM or by data retrieval from the tag manufacturer, when available (e.g., WC GPE3 files).

For more detailed instructions and information regarding minimum metadata and data requirements, contact the ATN DAC DC (Dr. Megan McKinzie, mmckinzie@mbari.org, 831-775-1791).

6. Data Security, Access, Use

6.1 Security

The ATN DAC is designed, implemented and maintained by Axiom at their data center, which is collocated with the Pittock Internet Exchange in Portland, Oregon, part of the West Coast U.S. internet backbone. There, the Axiom data center, and thus the DAC, benefits from the low-latency, high-bandwidth internet connection, as well as network and power reliability. All data center resources are protected by several levels of onsite redundancy and with offsite backup through Amazon Glacier. This design ensures that data, metadata and data management software are backed up to multiple locations. Several layers of physical hardware (enterprise-level firewalls) and system monitoring software (NAGIOS) are in place to provide hardened cyber security.

6.2 Access

The ATN DAC serves animal telemetry data resources via a free, publicly-accessible data portal (portal.atn.ioos.us), with datasets originating from researchers at Federal and state agencies, local municipalities, academic institutions, research organizations, private companies, and nonprofit entities. Any data served by the ATN data portal carries with it the permission to view and access these data, and carries no privacy or ethical restrictions. Data access is defined here as being permitted to download

data through the ATN data portal and is only permissible after a project's embargo period has ended (see Section 4.3 above).

Occasionally, a data sharing agreement between ATN and a data provider may identify the existence of intellectual property rights (IPR) to the data. As a courtesy to the data provider, IPRs may dictate a specific hold-period for data being transferred through the ATN DAC prior to making the specified data publicly accessible on the ATN data portal. However, IPRs do not restrict access to any of the data already served through the ATN data portal system. It is an unwritten expectation as well as a best practice that, as with all data used by someone other than the originator, clear credit is given to the data source (the originator) and data provider (in this case ATN) in any work or publications that emanate from using data accessed via the ATN portal or one of its national archives.

6.3 Use

All individuals who use ATN data in a publication, product, or commercial application shall provide proper attribution to all providers of those data and/or the ATN, and shall inform the ATN of any publications, products, or commercial applications that make use of ATN data, as specified in the metadata. Users of ATN data are responsible for investigating and understanding the limitations of ATN data. Digital Object Identifiers (www.doi.org) and dataset citations will be created for all datasets that are permanently archived. (See Section 7 below).

7. Data Retention and Long-Term Archival

The ATN DAC is backed up by an enterprise storage system (managed by Axiom) that contains over 15 petabytes of storage capacity. All embargoed and non-embargoed data stored within the system will be retained through the lifetime of ATN. If ATN were to be terminated, arrangements would be made for long-term data storage as one of its ending responsibilities.

In coordination with the researcher and in accordance with NOAA's data sharing Directive (described in Section 4 above), the ATN DAC shall submit non-embargoed data to NOAA's NCEI (National Centers for Environmental Information) for long-term archival. When this pathway is operational, NCEI shall provide the infrastructure to mint dataset DOIs for data which has been archived. A Darwin-Core version of these data shall also be shared with OBIS-USA for inclusion in biodiversity platforms, OBIS international and GBIF (Global Biodiversity Information Facility).

At the time of this writing (January 2022) the data pathway between the DAC and NCEI as well as the DAC and OBIS are still under development. In the interim, non-embargoed datasets and metadata shall be shared and made publicly available through DataONE (Data Observation Network for Earth). DOIs for these datasets shall be minted by Axiom.

When the archiving pathway between the DAC and NCEI becomes operational a revised version of this document with updated information will be published.