

Integrating Activities for Advanced Communities



D7.2- DATA MANAGEMENT PLAN FOR THE Rif FIELD STATION

Project No.730938– INTERACT

H2020-INFRAIA-2016-2017/H2020-INFRAIA-2016-1

Start date of project: 2016/10/01

Duration: 48 months

Due date of deliverable: 2018/09/30

Actual Submission date: 2018/10/23

Lead partner for deliverable: CAFF

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Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the Consortium (including the Commission Services)	
CO	Confidential, only for members of the Consortium (including the Commission Services)	

Table of Contents

Publishable Executive Summary	3
1. Data Management Principles and Guidelines	4
1.1 Introduction	4
1.2 Goals and Objectives	4
1.3 Principles of Data Management	5
1.4 Types of Data and Definition	5
1.4.1 Data and Metadata Considerations	5
1.4.2 Definition of Data	5
1.4.3 Definition of Metadata	6
1.4.4 Physical Samples as Research Data	6
1.4.5 Ethically Open Access	6
1.5 Roles and Responsibilities	7
1.5.1 General Responsibilities	7
1.5.2 Responsibilities of RFS	7
1.5.3 Responsibilities of Those Conducting Research and Monitoring Activities at RFS	7
2 Data Handling and Data Products	7
2.1 Research Project Lifecycle	7
2.1.1 Research Project Inception	7
2.1.2 Research Project Consideration, Review, and Subsequent Approval or Rejection	8
2.1.3 Project Initiation	9
2.1.4 Annual Project Update	9
2.1.5 Project Closure	10
2.2 Metadata and Data Standards, Requirements, and Best Practices	10
2.2.1 Detailed Metadata	10
2.2.2 Data standards and requirements	10
2.3 Contact Information	10
Annex A: Rif Field Station (RFS)	11
Annex B: Arctic Biodiversity Data Service	11
Annex C: Participating Organizations	11
Annex D: The list of minimum mandatory elements required for metadata	12
Reference list	13

Publishable Executive Summary

This Document describes the principles and guidelines for management of data and information generated through monitoring and research conducted at RFS. These principals and guidelines support the long-term preservation of and timely access to important Arctic datasets and information. The Document has been developed through a collaboration between Polar Knowledge Canada; Greenland Ecosystem Monitoring and Zackenberg Research Station; The Conservation of Arctic Flora and Fauna and RFS.

This Document is informed by:

- The Management Principles and Guidelines for Polar Research and Monitoring in Canada (POLAR 2017)
- Zackenberg Research Station Data Management Plan (2018)
- The International Arctic Science Committee's (IASC) Statement of Principles and Practices for Arctic Data Management (IASC 2013);
- Management planning for arctic and northern alpine research stations – Examples of good practices (INTERACT 2014);
- The Circumpolar Terrestrial Biodiversity Monitoring Plan (Christensen et al 2013);
- The Circumpolar Freshwater Biodiversity Monitoring Plan (Culp et al 2013); and
- Circumpolar Biodiversity Monitoring Program (CBMP) Strategic Plan 2018-2021 (CAFF 2018).

This Data Management Plan (DMP) will be revised after 1 year to determine if it needs to be revised based upon lessons learned and feedback from users.

1. Data Management Principles and Guidelines

1.1 Introduction

The Rif Field Station (RFS: Annex A) has a responsibility to promote and ensure the proper management of data and information resulting from activities conducted at RFS. Effective data stewardship is essential to ensure that valuable data resources are accessible now, and in the future, to advance our knowledge and understanding, promote public awareness, and support informed decision making. In addition, accurate and retrievable data are an essential component of research and are necessary to verify and defend, when required, the process and outcomes of research.

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This Data Management Plan (DMP) will be revised after 1 year to determine if it needs to be revised based upon lessons learned and feedback from users.

1.2 Goals and Objectives

The goal of this DMP is to ensure that there is comprehensive inventory of the projects conducted at RFS and the data they produce. Metadata records are intended to provide a comprehensive searchable and publicly accessible inventory of these projects and datasets.

This Document serves as a guide to assist RFS and those conducting research at RFS in applying consistent approaches to data management, and to clarify roles and responsibilities of researchers and collaborators.

1.3 Principles of Data Management

RFS seeks to ensure long-term preservation of and access to data through application of the following principles:

- Data are **preserved** by collecting, storing, and retaining data using formats that preserve the data beyond the duration of the original research project;
- Data are **discoverable** by applying commonly accepted standards and reporting protocols in the use of metadata;
- Data are **accessible** by supporting full, free, and open access with minimal delay, using a secure and curated repository or other platforms; and
- Data are **ethically managed** by respecting legal and ethical obligations, including consent, privacy, and confidentiality; secondary use of data; and data linkage.

This Document will be reviewed periodically by RFS to ensure the principles and guidelines herein remain relevant.

1.4 Types of Data and Definition

1.4.1 Data and Metadata Considerations

RFS in collaboration with the international Arctic data management community, seek to promote the highest standards in the stewardship of data and metadata resources resulting from Arctic research and monitoring activities.

1.4.2 Definition of Data

These principles and guidelines take a very broad approach to the concept of data, recognizing that it may take many forms, and, depending on the field of research or monitoring, can mean different things. This includes but is not limited to: survey results, written observations, software, interview transcripts, photographs, automatic measurements, hand-drawn maps, stories and video footage (FAO 2018). Thus, this Document's definition of data incorporates Western/academic and local knowledge.

There are five primary categories or sources of data:

- **Institutional Data:** Data systematically collected or produced as part of baseline monitoring conducted at RFS.
- **Funded Data:** Data collected or produced by funded projects at RFS.
- **External Data:** Data from external repositories or data providers, including existing operational data streams and historical sources, industry, international institutions, or others, as relevant.
- **Rescued Data:** Data retrieved from unpublished sources, e.g., field notebooks, records on outdated storage media, or photographic records, which are often at risk of loss.
- **Local Knowledge (LK):** is the knowledge that people in a given community has developed over time and continue to develop.

1.4.3 Definition of Metadata

Metadata provides the information about a dataset, specifically the *what, where, how, when, by whom* it was collected, its current location, and any access information. Metadata facilitates the understanding, use, and management of data and is a means for networking and collaboration. Standardized metadata records consist of a defined set of information fields that must be completed to allow automatic sharing of records via interoperability between metadata management facilities and data portals. Metadata submitted to RFS should conform to the Darwin core (TDWG 2009).

1.4.4 Physical Samples as Research Data

The products of research and monitoring activities *may* also include physical samples, preserved and living biological specimens including microbiological cultures, and other non-digital material. Researchers are responsible for the preservation, documentation, and ethical use of these physical samples according to existing standards relevant to the type of sample collected.

Researchers are expected to allow scientific sharing and investigation in accordance with relevant standards and other guidance from a museum, research, or other applicable community. Such non-digital holdings should be described in a metadata record submitted to RFS.

1.4.5 Ethically Open Access

In order to support open access practices to maximize the benefit of the efforts put into proper stewardship of data, the RFS, through this Document, requires data contributors to make research and monitoring data available fully, freely, and openly, with minimal delay.

The only exceptions to the requirement of full, free, open, and permanent access are

- Where human subjects are involved or in situations where small sample sizes may compromise anonymity, confidentiality shall be protected as appropriate and guided by the principles of informed consent and the legal rights of affected individuals;
- Where LK is concerned, rights of the knowledge holders shall not be compromised;
- Where data release may cause harm or compromise security or safety, specific aspects of the data may need to be protected (for example, locations of nests of endangered birds);
- Where pre-existing data are subject to access restrictions, access to data or information using this pre-existing data may be partially or completely restricted; and
- Where disclosure of information is not in accordance would be in conflict with the mandate of the organization in question or other unforeseen circumstance which require action from the RFS.

1.5 Roles and Responsibilities

1.5.1 General Responsibilities

The RFS metadata repository (Arctic Biodiversity Data Service (ABDS, Annex B)), data contributors, project sponsors, and external collaborators (Annex C) will work in partnership to implement good practices and meet relevant requirements.

1.5.2 Responsibilities of RFS

- RFS in partnership with ABDS will provide advice to facilitate efficient and accurate metadata and data entry.
- Archiving and access requirements of all metadata records, datasets, or other research products involving LK will be considered on a case-by-case basis.

1.5.3 Responsibilities of Those Conducting Research and Monitoring Activities at RFS

Compliance with the requirements in this Document including:

- Providing metadata that is accurate, complete and reliable;
- Submitting metadata detailing the data products they produce to RFS, as early in the project as possible, typically within the year of collection and ensure any revisions needed so that it accurately describes the final state of the data;
- Ensuring that their data are accessible to the general public, consistent with appropriate ethical, data sharing, and open access principles;
- Providing a persistent locator, for data collected at RFS. If possible provided in the form of a unique digital object identifier (DOI). This recognizes the intellectual work required to create a useful dataset and allows the dataset to be recognized and cited through formal publication activities, including formal publication of the data itself;
- Data creators acknowledge RFS where appropriate, in relevant presentations and publications; and
- Those conducting research and monitoring activities at RFS requiring a repository to archive their data, can contact the ABDS for advice.

2 Data Handling and Data Products

This document details how metadata and data from research conducted at RFS are to be managed and submitted throughout a research project lifecycle (Fig 1).

2.1 Research Project Lifecycle

In order to properly frame the responsibilities of researchers operating in the RFS's extensive and intensive monitoring areas (Fig 2), a common research project lifecycle is presented, and specific responsibilities at each stage are noted.

2.1.1 Research Project Inception

When an individual or organization wishes to conduct research at RFS, an application is made to the RFS. At this time, the applicant is responsible for providing the following:

- Information about the Principal Investigator (PI)

- A description of the project
- An inventory of expected project outcomes and deliverables
- Logistical requirements
- An overview of potential impacts, and plans for impact mitigation
- How many participants expected to travel to RFS

These data are stored as a metadata record in the metadata catalogue, and the application is passed to RFS for consideration.

2.1.2 Research Project Consideration, Review, and Subsequent Approval or Rejection

When an application has been made to the RFS, it undergoes review and is either accepted or rejected:

- If a project is rejected, the applicant will receive an explanation of the justifications resulting in rejection. At this point, the applicant may revise their application and re-submit, however there is no obligation to do so.
- There are no data or metadata responsibilities for either the applicant or RFS at this stage.
- If a project is accepted, the applicant proceeds to the project initiation phase.

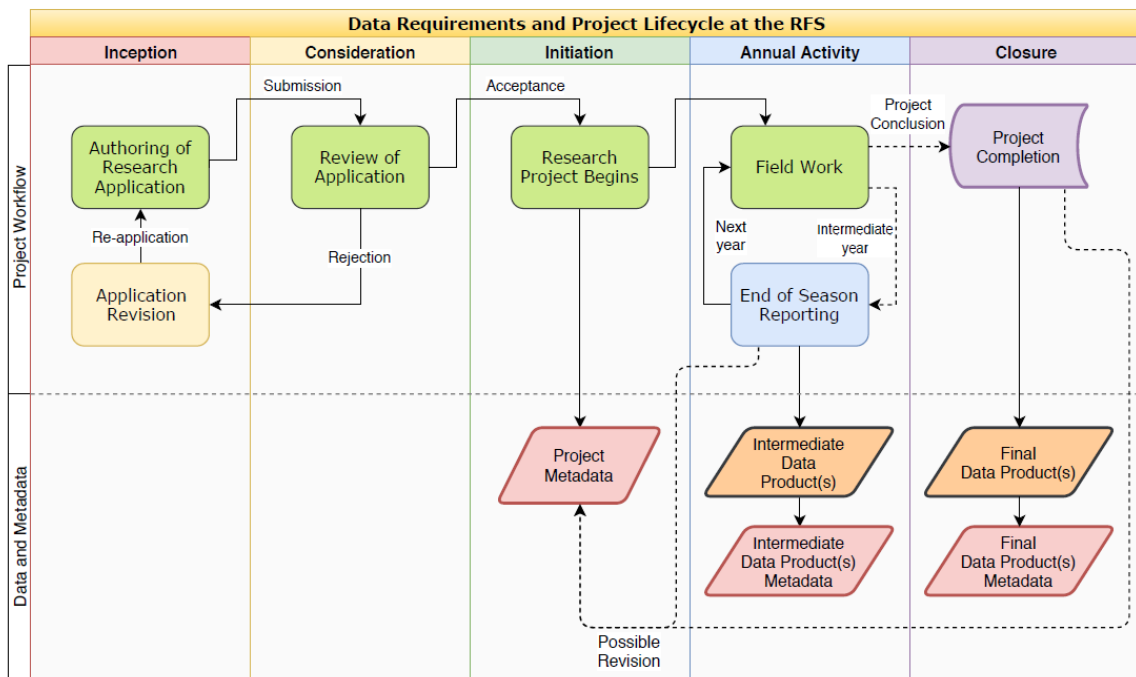


Fig 1: RFS Project lifecycle and data overview

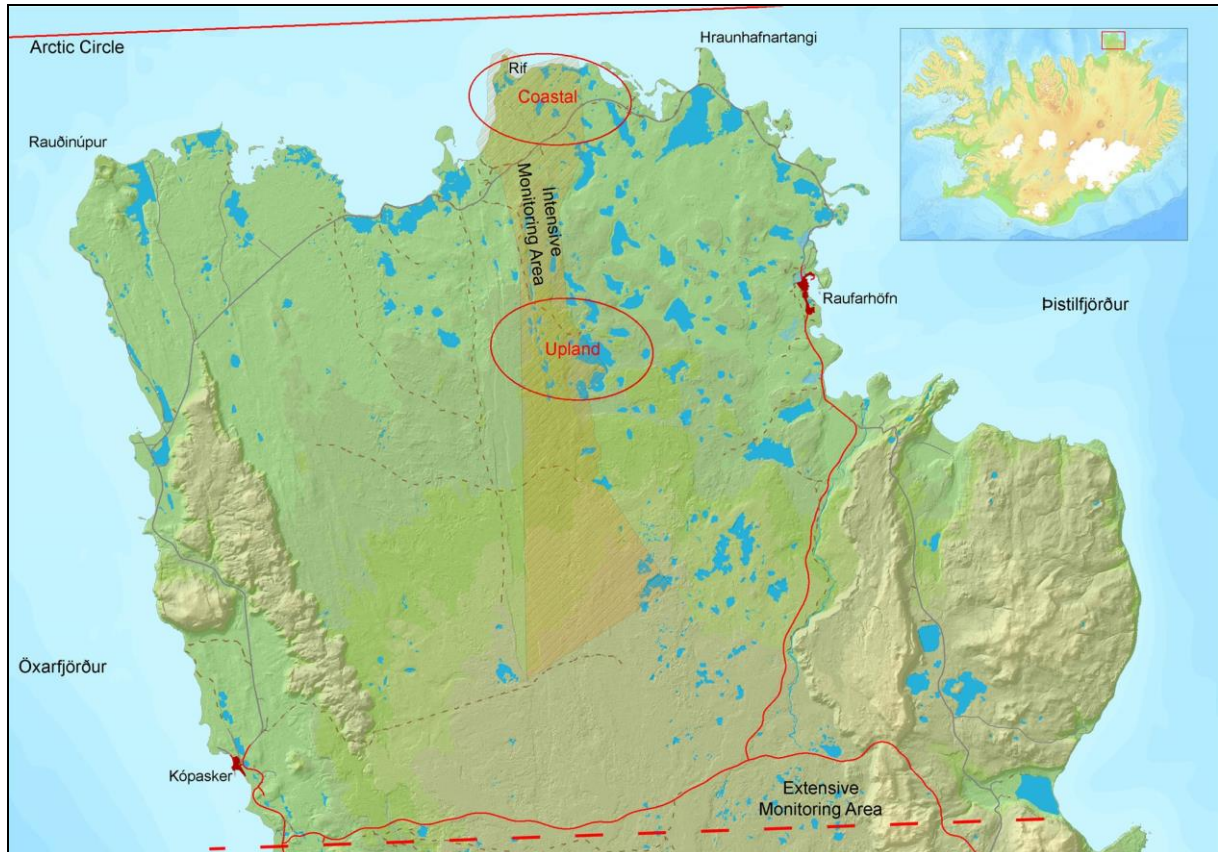


Fig 2: Extensive Monitoring Area and Intensive Monitoring Areas

2.1.3 Project Initiation

When an application is accepted, the RFS will provide the following:

- The RFS Monitoring Plan
- The RFS Data Management Plan
- Field Safety Guides
- Informative background data pertinent to the RFS
- Logistical assistance
- A preliminary metadata record to provide an overview of the project
- The RFS project metadata excel tool

At the same time, the applicant is responsible for understanding and complying with the regulations and conditions described in the DMP and RFS Monitoring plan

2.1.4 Annual Project Update

At the end of each field season of active research, the applicant is responsible for:

- Updating the project metadata to properly represent data in production, or published by the research project;
- Visiting the published, revised (public facing) project metadata to validate the revision; and

- Pushing versioned, intermediate data to a repository if the preliminary data is deemed of immediate value to the scientific community, or if desired by the principal investigator.

2.1.5 Project Closure

At the conclusion of a research project, the applicant is responsible for:

- Updating the project metadata record to properly represent the final data product(s) of the research project;
- Visiting the published, revised (public facing) project metadata to validate the revision; and
- Pushing final quality assured data to a public repository. If a researcher requires a repository to archive datasets, this can be accommodated in the ABDS; and
- Ensuring a separate detailed metadata entry is present for each dataset.

2.2 Metadata and Data Standards, Requirements, and Best Practices

2.2.1 Detailed Metadata

Metadata is essential for users to understand how the data can be used to determine the accuracy and validity of the initiative. To ensure accuracy and accessibility of both project data and metadata, researchers are responsible for ensuring the guidelines below are met when submitting metadata and publishing data:

- Metadata collected should be consistent with metadata requirements as stated in this DMP (See Annex C).
- The metadata must clearly describe the datasets, their contents and all relevant information about the monitoring conducted including methods used, monitoring location and date, monitors and their skill level, etc.
- Best practices in the documentation of data collection procedures should be followed. Methodologies used must be included in the metadata, along with any discrepancies in applied methodologies.

To ensure metadata is accurate, accessible, and ingestible to the Arctic Biodiversity Data Service (ABDS) the metadata is to be provided by completing the RFS detailed metadata form, which is provided by RFS as an Excel document. See Annex D for a list of the minimum mandatory elements required for metadata.

2.2.2 Data standards and requirements

Data recording and data quality standards are the responsibility of the researcher. RFS encourages data generators at RFS to comply with IPY Data Policy on the delivery of free biodiversity data to the public and equivalent legislation in the European Union for spatial information, such as the INSPIRE Directive. Data formats should adhere to the Darwin Core. Acknowledgement is mandatory when publications utilize data collected at RFS.

2.3 Contact Information

Questions arising from this document can be addressed to: Rif Field Station (RFS), +354 856 9500, rif@rifresearch.is

Annex A: Rif Field Station (RFS)

RFS was established in 2014 to promote, increase and enhance ecological research and monitoring in the Melrakkaslétta peninsula in Northeast Iceland. The station aims to collect, keep track of and share information on the area's natural environment and support the local community. The facilities at RFS and good access to the research area provide abundant opportunities for research and monitoring in a low-arctic environment. The station is supported by the Norðurþing municipality and Icelandic research institutions. The main research area lies 15 km northwest of the village Raufarhöfn, RFS's base.

Annex B: Arctic Biodiversity Data Service

The Conservation of Arctic Flora and Fauna (CAFF – www.caff.is) is the biodiversity working group of the [Arctic Council](#) and consists of National Representatives assigned by each of the eight Arctic Council Member States, representatives of Indigenous Peoples' organizations that are Permanent Participants to the Council, and Arctic Council observer countries and organizations.

The Arctic Biodiversity Data Service (ABDS – www.abds.is) is the data-management framework for managing data generated via CAFF and its Circumpolar Biodiversity Monitoring Programme (CBMP – www.cbmp.is). It is an online, interoperable data management system which serves as a focal point and common platform for all CAFF programs and projects as well as a dynamic source for up-to-date circumpolar Arctic biodiversity information and emerging trends. It allows for discovery, archiving and access to data at various spatial, temporal, and taxonomic scales.

Annex C: Participating Organizations

- Icelandic Institute of Natural History, Borgum vid Nordurslod, 600 Akureyri, +354 460 0500, nia@ni.is
- Icelandic Met Office, Bústaðavegi 7- 9, 108 Reykjavík, Phone 522 6000
- Marine and Freshwater Research Institute, Skúlagata 4, 101 Reykjavík, Iceland, +345 575 2000
- Northeast Iceland Nature Research Centre, Hafnarstétt 3, 640 Húsavík, + 354 464 5100, nna@nna.is
- The Agricultural University of Iceland, Hvanneyri - 311 Borgarbyggð, +354 433-5000
- Greenland Ecosystem Monitoring, GEM secretariat, Department of Bioscience Frederiksborgvej 399, DK-4000 Roskilde, Denmark, g-e-m@au.dk
- Conservation of Flora and Fauna (CAFF) International Secretariat, Borgir, Nordurslod 600 Akureyri, Iceland, [+ 354 461-3352](tel:+3544613352) caff@caff.is
- Canadian High Arctic Research Station, Polar Knowledge Canada, +1 613-295-6135

Annex D: The list of minimum mandatory elements required for metadata

RFS Metadata field and description	Example	Equivalent fields from other Comparable metadata standards	
		ISO 19115 Core	INSPIRE
Title	Distribution of Lichens	Dataset title (M)	Part B 1.1 Resource Title
Data set abstract	Locations of lichen samples collected at RFS	Abstract describing the dataset (M)	Part B 1.2 Resource abstract
Responsible party (organisation) with contact information	Icelandic Institute of Natural History	Dataset responsible party (O)	Part B 9 Responsible organisation
Principal investigator	Starri Heiðmarsson	Dataset responsible party (O)	Part B 9 Responsible organisation
Data set theme	Floristics	Dataset topic category (M)	Part B 2.1 Topic Category
Data set extent	RFS monitoring area	Geographic location of the dataset (C) and geolocation keywords	Part B 4.1 Geographic Bounds
Reference date	2017-06-01, 2017-07-01	Dataset reference date (M - start, end, published).	Part B 5 Temporal Reference
Metadata date	2018-08-16	Metadata date stamp (M)	Part B 10.2 Metadata Date
Resolution, reference scale or accuracy (if applicable)	Not applicable	Spatial resolution of the dataset (O)	Part B 6.2 Spatial Resolution
Status (in process, completed)	Completed	Status of data	
Link to dataset	https://doi.org/10.15468/u85y6t	Link to provider	Part B 2.2.4 resource locator
Key words	Lichens, Floristics		

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