

BOSCORF Data Management Policy

The aim of the BOSCORF Data Management Policy (DMP) is twofold: (i) to ensure that the large volumes of data generated by the facility's analytical instruments are properly managed throughout the data life cycle in agreement with the NERC data policy and (ii) to ensure robust data management approaches are applied to the Marine Sediments Collection Management System (MSCMS). The BOSCORF DMP defines the roles and responsibilities of those involved in the generation and management of analytical and curatorial data within the facility and provides an outline of the facility's approach to data and metadata management.

1. Roles and responsibilities

BOSCORF - responsible for the management of curatorial data and sample metadata to support the BOSCORF MSCMS. In addition, BOSCORF is responsible for the management of all data collected by the facility's analytical instruments.

The role of BOSCORF includes:

- (i) Implementing robust curatorial data management practices as are outlined in the MSCMS.
- (ii) Collecting data from analytical instruments, performing basic data processing and quality control.
- (iii) Defining standards for metadata and data.
- (iv) Managing analytical data generated by the BOSCORF instruments.
- (v) Providing guidance to facility users to ensure that data are collected, processed and quality controlled to a high standard.
- (vi) Liaising with project principal scientist and project participants regarding data collection, processing protocols and metadata documentation.

BOSCORF users - responsible for providing contextual information and metadata for samples to allow BOSCORF to produce and maintain appropriate documentation to support data archiving. Inexperienced facility users will receive guidance from BOSCORF staff regarding data collection, processing, and quality control.

Users are also responsible for submitting processed analytical data to the most appropriate NERC data centre and/or for making these data accessible on international data hosting platforms. Users must supply BOSCORF with a reprint of any publication resulting from work on its cores and make a suitable acknowledgement to BOSCORF in any publication resulting from the study of these samples.

NERC Project Principal Investigator (PI) - responsible for documenting and supplying contextual information about the sediment core samples (e.g., geographic, operational, and technical information). Where materials or data are under moratorium, the project PI is responsible for approving data collection activities and data sharing. In these cases, the project PI will liaise closely with BOSCORF regarding long-term data management. For data generated through NERC supported activities, the PI will cooperate with BOSCORF to ensure long-term data archiving and stewardship.

British Oceanographic Data Centre – will support BOSCORF with online discovery and dissemination of sample metadata to the scientific community and the UK public.

2. Curatorial data

BOSCORF manages curatorial data in accordance with the MSCMS. Curatorial data include inventories of the collections and collection metadata. It also includes records of primary and

secondary sampling of cores, sample loans and sample accessioning, deaccessioning, transfer, and disposal. BOSCORF staff are responsible for metadata capture, sample identification, and collection inventorying. In addition, BOSCORF staff are responsible for monitoring secondary sampling activities and tracking samples. BOSCORF users must provide comprehensive details of all sampling activities.

3. Analytical data

BOSCORF operates a suite of non-destructive core analysis systems for community use. Core logging instruments include:

- (i) a Cox Analytical Systems ITRAX micro-XRF Core Scanner used for the acquisition continuous downcore high resolution elemental data and radiographic images.
- (ii) a Geotek Multi-Sensor Core Logging (MSCL) Standard system for the acquisition of a range of physical properties, including gamma ray attenuation, magnetic susceptibility, compressional wave velocity, and electrical resistivity.
- (iii) a Geotek MSCL XYZ system fitted with a magnetic susceptibility point sensor, a Konika Minolta spectrophotometer, and an Olympus Vanta Handheld XRF analyser.
- (iv) a Geotek MSCL Core Imaging System for acquisition of high-resolution linescan images.
- (v) a Geotek ScoutXcan multi-angle digital 2D X-ray System.
- (vi) a Hitachi TM4000Plus Tabletop Scanning Electron Microscope with an Oxford Instruments Energy Dispersive Spectroscopy (EDS) analyser.

4. Analytical data management approach

Prior to data generation on analytical instruments, BOSCORF will liaise with project PIs and facility users to establish suitable protocols for the management of the data in the short term (e.g., during project lifetime and moratorium period) and the long term (e.g., data archiving and preservation for future use). For analytical data generated from BOSCORF-held samples, data will be stored on a secure server managed by the National Oceanography Centre and ingested into the iPoint data management software which is managed by BOSCORF. Data produced from analysis of external samples will be stored on a secure server for archival purposes only (i.e., these data will not be disseminated). Records of metadata for external samples will also be kept on file when these are provided to BOSCORF.

5. Metadata and documentation

Metadata are a crucial part of the BOSCORF data archive as they ensure that data can be made discoverable and understood beyond the project lifetime. All data collected on BOSCORF analytical instruments should be accompanied by suitable sample metadata. BOSCORF will work with facility users and project PIs to ensure metadata are provided. Appropriate metadata documentation will then be produced and maintained by BOSCORF for the lifetime of the data.

Metadata should comprise of contextual information about the material being analysed and the analytical details. Contextual metadata about the material should include geographic information (e.g., location and depth of the sediment core site), operational information (e.g., platform, equipment, and operator details), name of the PI responsible for cores, project, and funding details, etc.

Metadata associated with the analytical data should include details about **how** the data was collected (i.e., with which instrument and/or technique), **when** and **where** the data were collected, by **whom** (including the affiliation and contact details of the instrument operator), and information about **which** research project or framework the data were collected in.

Sample holdings will be listed on the Index to Marine and Lacustrine Geological Samples (IMLGS) operated by the National Oceanic and Atmospheric Administration's National Centers for Environmental Information. Data. Sample metadata submitted to IMLGS are standardised according to ISO 19115-2:2009.

6. Data quality

BOSCORG aims to produce and archive data of the highest possible quality. Data quality is limited by the type and condition of the materials being analysed and the ability of the instrument to extract meaningful data. BOSCORG will discuss these issues with facility users and project PIs to ensure that the best possible quality of data is extracted from each sample according to the specific needs of each study or project.

Data collected on BOSCORG instruments are quality assured by the operator using standard procedures. BOSCORG will provide appropriate levels of guidance and support regarding data processing and data quality control to ensure that all data generated at the facility are of a high quality.

Where issues are identified with data they should be edited and/or flagged and clearly documented. All relevant processing steps, edits and unit conversions applied to the data should also be fully described and included in the corresponding metadata document. The level of processing applied to each dataset archived at BOSCORG should allow the data to be directly analysed without the need for significant further processing by the user, although this is not always possible if the material analysed is in suboptimal condition.