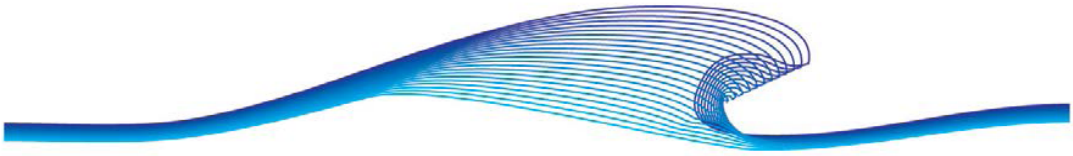


Norwegian Marine Data Centre (NMDC)

Use Cases

18. July 2013

Versions

Version	**Date**	**Comment**	**Responsible**
Version 0.1	2013-01-18	First draft focusing on generic functionality. A consolidated view on the actual services to be offered by NMDC is required before further elaboration.	Øystein Godøy
Version 0.2	2013-07-11	Updated draft after discussions between work package leaders.	Øystein Godøy Torill Hamre
Version 0.3	2013-07-18	Modified use case for automated upload.	Øystein Godøy Egil Støren

Table of Contents

Index of Use Cases

1 Introduction

The national infrastructure, the Norwegian Marine Data Centre (NMDC), will be the focal access point for marine data in Norway. NMDC will evolve from existing institutional data centres in Norway by integrating, merging, coordinating and expanding activities and services. One of these local centres is the Norwegian Marine Data centre (NMD), which has the national responsibility of archiving oceanographic data in addition to acoustic, biological and other data at the Institute of Marine Research (IMR). Other Norwegian institutions do have data management activities, such as METNO, UiT and NIVA.

NMDC as a system will contain a variety of data, ranging from raw data to processed and aggregated data. It will contain point data, trajectory data, profile data, time series, and gridded data. How these various data types are handled depends on the use cases identified and translated into requirements and subsequently to the design.

2 Scope of document

This document describes normal usage of the NMDC through use cases. Use cases are high level representations of the functionality of a software system. They are used to identify the core functionality of the software system. The use case document is used to specify detailed requirements which in turn is used to design the system.

3 Applicable documents

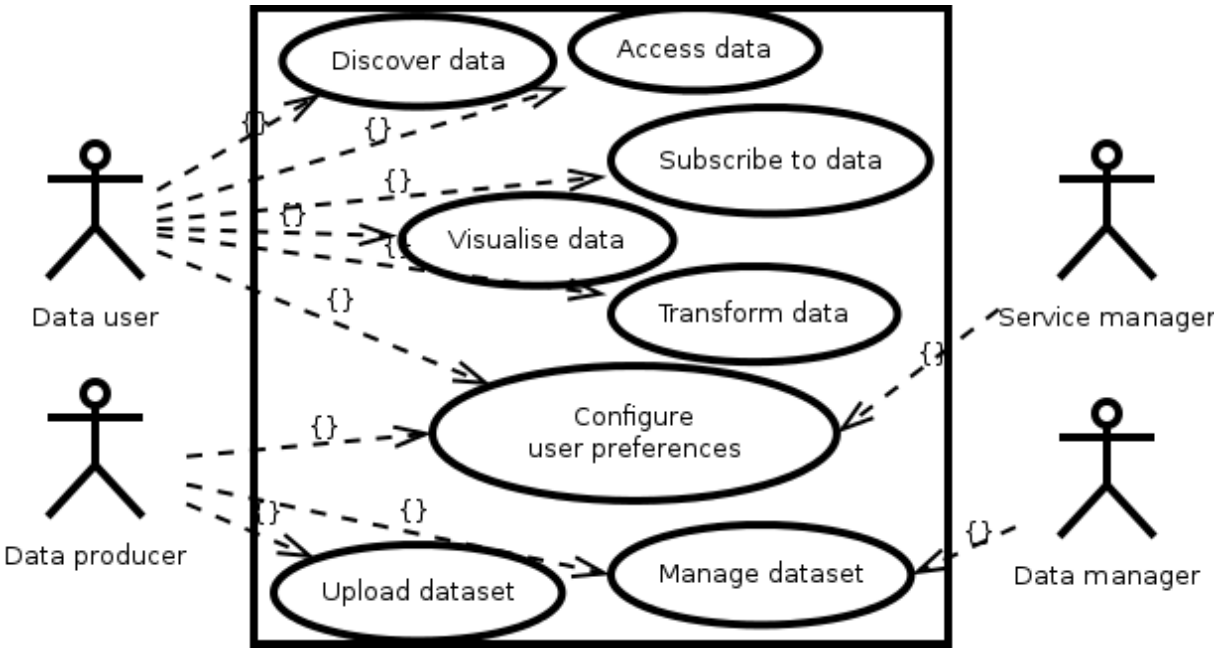
[1] NMDC Acronyms and Concepts Document, Version 0.1

[2] NMDC System Requirements Document, Version 0.3

[3] NMDC Architecture Design Document, Version 0.3

4 Top level use case

A top view on NMDC is shown below.



4.1 Actors

The main actors using the system is shown in the illustration above.

4.1.1 Service manager

The service manager is responsible for maintaining the other actors access to the system and specifies authorisation levels for each other actor.

4.1.2 Data manager

The data manager is responsible for the content of the system and keeping this in a consistent state. The data manager should be able to track datasets and provide extended help (uploading, amending, deleting, ...) to data providers that has trouble managing datasets they are responsible for, as well as being able to generate statistics of e.g. the number of datasets of relevance to a specific project.

4.1.3 Data producer

The data producer is generating datasets managed by the system. Within NMDC data producers are always internal to the consortium. Data producers should be able to maintain datasets they have comitted.

4.1.4 Data user/consumer

The data user may be anybody, internally to the consortium or external, a scientist, employee of a governmental agency or some other external person. This actor is utilising most of the

use cases defined.

5 Use Cases

Table 1: Interactive data discovery.

Use Case Goal	To enable users to interactively find information about relevant data and/or products.
Actors	Data consumer
Pre-Conditions	1. An existing Metadata Catalogue which is accessible for browsing or searching 2. Metadata are synchronised between the contributing nodes.
Post-Conditions	The user receives the information needed to select and download relevant data or products.
Normal Flow	1. The data user compose a search request using concepts like scientific keywords, geographical and temporal constraints etc. 2. The search request is forwarded to the catalogue. 3. The catalogue responds with a ordered list describing the relevant datasets and products including online reference to the datasets.
Notes and Issues	1. Interfaces and vocabularies should be consistent with SeaDataNet, GCMD, WIS and INSPIRE[1].
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

1 When adequately developed.

Table 2: Specifying a personal user profile.

Use Case Goal	To enable a personal version of the system interface.
Actors	1. Data consumer 2. Service manager
Pre-Conditions	1. Data are available and documented in the catalogue. 2. The user is authenticated[2].
Post-Conditions	The user is authorised to access products in accordance with the authorisation level and access these through a personalised interface.
Normal Flow	3. The service manager specifies the service level for the user and the various services the user has access to. 4. The service manager identifies classes of products and separate products the user shall have access to. 5. The user specifies personal details and preferences concerning viewing and access mechanisms.
Notes and Issues	1. The personalised interface is reflected in the products listed and not in the user interface.
Last Updated	2013-05-29
Last Updated By	Torill Hamre

2 Probably required to be able to offer higher order services which require extensive server side handling.

Table 3: Selection basket.

Use Case Goal	To enable users to select multiple datasets for further processing.
Actors	Data consumer.
Pre-Conditions	1. Data are available and documented in the catalogue. 2. The user is authenticated[3].
Post-Conditions	The user has a selection of products available in the basket and can select further services[4] to be applied on these.
Normal Flow	1. The user has found a selection of products using the discovery interface and. 2. Each item of interest in the discovery interface is tagged for addition to the basket. 3. The basket contains a list of products that are prepared for further handling using higher order services within the system.
Notes and Issues	<TRYKK OG SKRIV>
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

3 Probably required to be able to offer higher order services which require extensive server side handling.

4 E.g. visualisation, download, subscription, transformation.

Table 4: Simple interactive data access.

Use Case Goal	To serve users with actual data.
Actors	Data consumer
Pre-Conditions	1. The desired data or product has been identified by the user using a catalogue discovery interface leaving the user with a URL for the requested dataset. 2. The user has been authenticated and authorised to access the requested product[5]. 3. Delivery is achievable through one of the supported data access interfaces.
Post-Conditions	The user has received the data requested.
Normal Flow	1. The user requests a dataset or a product on a one-time basis. 2. Direct access to the product is provided through a standardised interface to the data repository.
Notes and Issues	1. This use case focus on delivering a full product, no subsetting or tailoring of the product to user needs is done. 2. Data are delivered using HTTP, FTP[6], OpeNDAP,OGC WCS[7] and OGC WFS as appropriate. In the current situation OGC technologies are not widely used within the scientific community except for visualization. 3. If restrictions apply to a product, the user is requested to authenticate, otherwise products are freely available and no authentication/authorisation is required..
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

5 Generally products will be freely available.
6 If requested by user community.
7 If requested by user community and mature technology concerning the type of data to be served.

Table 5: Advanced interactive data access.

Use Case Goal	To serve users with actual data that is tailored to the specific needs of the user.
Actors	Data consumer
Pre-Conditions	1. The desired data or product has been identified by the user using a catalogue discovery interface. 2. The user has been authenticated and authorised to access the requested product. 3. Delivery is achievable through one of the supported data access interfaces. 4. A data transformation capability is integrated in the interactive user interface.
Post-Conditions	The user has received the data requested in the form requested and for the subset requested.
Normal Flow	1. The user compose a data request identifying file format, map projection, geographical area, temporal time span, parameter subset, level subset etc. 2. The user requests a dataset or a product on a one-time basis. 3. The data access interface forwards the request to the transformation service which performs the necessary processing. 4. The transformation service returns a transformed dataset fulfilling the requirements or a message on when the dataset will be available and where. 5. The data access interface returns proper information (either dataset or message) to the user. 6. Direct access to the product is provided through a standardised interface to the data repository.
Notes and Issues	1. See relevant notes for UC Table 4: Simple interactive data access.. 2. This feature relates to the Table 10: Transformation. and potentially Table 3: Selection basket..
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

Table 6: Simple subscription.

Use Case Goal	To enable users to receive regular updates of a product.
Actors	Data consumer
Pre-Conditions	1. Data are available and documented in the catalogue. 2. Data are regularly updated. 3. The user is authenticated and authorised for the action. 4. A service level agreement is available for delivery to external computers.
Post-Conditions	Data user have received a personal copy of the requested dataset.
Normal Flow	1. The user identifies products which is requested for regular delivery using the data discovery interface. 2. The user provides delivery information and acknowledge the appropriate service level agreement. 3. The products are scheduled for regular delivery to the user.
Notes and Issues	1. This use case focus on delivering a full product, no subsetting or tailoring of the product to user needs is done. 2. Data should be delivered using both pull and push technology as requested by the user. E.g. the user may receive an email containing a URL to the updated product when a product is available or the user may request the product to be delivered directly to a computer controlled by the user. 3. If data are to be delivered to external computers, clear service level agreements are needed to identify the responsibility of NMDC and the responsibility of the user as well as how delivery failures are handled. 4. This use case may be out of scope for NMDC as NMDC is considered to be a scientific tool.
Last Updated	2013-05-29
Last Updated By	Torill Hamre

Table 7: Advanced subscription.

Use Case Goal	To enable users to receive regular updates of a product in a tailored form.
Actors	Data consumer
Pre-Conditions	1. Data are available and documented in the catalogue. 2. Data are regularly updated. 3. The user is authenticated and authorised for the action. 4. A transformation service is available.
Post-Conditions	1. Data user have received a personal copy of the requested dataset. 2. The product received is tailored to the specific needs of the user, i.e. has the file format, geographical and temporal coverage requested and only the content requested (not a full product). 3. A product subscription is stored in the system to allow the user to get regular updates of the products.
Normal Flow	1. The user identifies products which is requested for regular delivery using the data discovery interface. 2. The user provides delivery information, including full specifications of the form the data is wanted in, and acknowledge the appropriate service level agreement. 3. The products are scheduled for regular delivery to the user.
Notes and Issues	1. This use case focus on delivering a full product, including subsetting or tailoring of the product to user needs. 2. Data should be delivered using both pull and push technology as requested by the user. E.g. the user may receive an email containing a URL to the updated product when a product is available or the user may request the product to be delivered directly to a computer controlled by the user. 3. If data are to be delivered to external computers, clear service level agreements are needed to identify the responsibility of NMDC and the responsibility of the user as well as how delivery failures are handled. 4. This use case may be out of scope for NMDC as NMDC is considered to be a scientific tool.
Last Updated	2013-05-29
Last Updated By	Torill Hamre

Table 8: Simple visualisation.

Use Case Goal	To enable simple visualisation of individual datasets.
Actors	Data consumer.
Pre-Conditions	1. Data are available and documented in the catalogue. 2. A visualisation service is available.
Post-Conditions	The user receives an image representation of the dataset requested within the integrated viewer.
Normal Flow	1. The user has found a product using the discovery interface and wants a graphical representation of the product. 2. Using the result view of the interactive discovery interface the user requests visualisation of a dataset. 3. The user is asked which parameters of the dataset that should be visualised. 4. The product is visualised.
Notes and Issues	1. Products can have any dimension. 2. Map view, time series view and profile view of a single dataset should be supported[8]. 3. This may be considered a simple case of the advanced visualisation, but most likely it is easier to implement a simple visualisation than the advanced visualisation described next resulting in two different approaches. 4. OGC WMS is the preferred backend service for maps and images, for time series, profiles etc the technical solution is open.
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

8 Depending on the type of dataset.

Table 9: Advanced visualisation.

Use Case Goal	To enable advanced visualisation of multiple datasets.
Actors	Data consumer.
Pre-Conditions	1. Data are available and documented in the catalogue. 2. A visualisation service is available.
Post-Conditions	The user receives an image representation of the dataset requested within the integrated viewer.
Normal Flow	1. The user has found a selection of products using the discovery interface and the selection basket and wants a graphical representation of elements from all datasets. 2. Using the selection basket interface the user requests visualisation of elements from multiple datasets. 3. The user is asked which parameters of the datasets that should be visualised and how. 4. The products are visualised in the integrated viewer.
Notes and Issues	1. Products can have any dimension. 2. Map view, time series view and profile view of a single dataset should be supported[9]. 3. The simple visualisation may be a simplification of the advanced visualisation, but it is likely that this is implemented in two steps with at least a temporary solution for simple visualisation until an advanced visualisation is available. 4. OGC WMS is the preferred backend service for maps and images, for time series, profiles etc the technical solution is open.
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

9 Depending on the type of dataset.

Table 10: Transformation.

Use Case Goal	To enable transformation of data upon users request.
Actors	Data consumer.
Pre-Conditions	1. Data are available and documented in the catalogue. 2. Data are available in an online data repository in a format or through an interface supported by the system. 3. The user has found one or more products which are listed within the discovery interface or the product basket.
Post-Conditions	The user receives a transformed product in accordance with the user specifications.
Normal Flow	1. The user selects among the predefined transformations that are allowed. 2. The user supplies sufficient information for the transformation to be undertaken. 3. The system responds to user with information on whether this can be done on the fly or has to be a offline service. 4. The system performs the requested transformation. 5. The user is notified of the result.
Notes and Issues	1. By transformations are understood e.g. the actions FIMEX can perform on a dataset (reformatting, reprojecting, subsetting etc). 2. In NMDC context this would cover collocating various datasets in the same grid as well. 3. The user receives an ordinary dataset, not a service.
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

Table 11: Test dataset for conformance.

Use Case Goal	To test datasets for conformance prior to upload to the system
Actors	Data producer Data manager
Pre-Conditions	
Post-Conditions	The data producer receives a message describing the conformance of the dataset.
Normal Flow	1. A data producer wants to upload a one time dataset to the system. 2. The data producer wants to test conformance prior to upload to avoid problems in the upload process. 3. The data producer identifies the product to be tested and request upload. 4. The system analyse the received dataset and check for compliance with formatting and documentation requirements. 5. The system provides feedback to the data producer whether the dataset is compliant with the system requirements.
Notes and Issues	1. The number of file formats to support is not known, however the most important is NetCDF/CF with possible extensions to ODV, WMO GRIB, WMO BUFR, HDF-EOS2, HDF-EOS5, Shape, etc. Shape is believed to be more widely used within the user community than e.g. GML and KML, but this has to be checked. Preferably Shape is delivered to users through transformation as it is not suitable for long term data preservation. 2. For some formats, discovery metadata and additional information has to be provided in a separate document. 3. Feedback is provided through a HTML form. The feedback form is presented immediately in the browser if possible, else the user receives a message telling that offline test will be performed and notification of the availability of the form is provided through email. 4. Depending on the solution selected for NMDC, this may be out of context.
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

Table 12: Simple data upload.

Use Case Goal	To upload datasets to the system
Actors	Data producer Data manager
Pre-Conditions	1. The data producer is authenticated and authorised to perform the actions requested.
Post-Conditions	The new dataset is available in the catalogue and in the data repository.
Normal Flow	1. A data producer wants to upload a one time dataset to the system. 2. The data producer identifies the product to be uploaded and request upload. 3. The system analyse the received dataset and check for compliance with formatting and documentation requirements. 4. The system provides feedback to the data producer whether the dataset was accepted or rejected. 5. If accepted, the dataset is handled automatically and discovery metadata extracted are inserted in the catalogue, access restrictions are properly set and the dataset is scheduled for backup.
Notes and Issues	1. The number of file formats to support is not known, however the most important is NetCDF/CF with possible extensions to ODV, WMO GRIB, WMO BUFR, HDF-EOS2, HDF-EOS5, Shape, etc. Shape is believed to be more widely used within the user community than e.g. GML and KML, but this has to be checked. See notes on Shape for the previous use case. 2. For some formats, discovery metadata and additional information has to be provided in a separate document. 3. Depending on the solution selected for NMDC, this may be out of context.
Last Updated	2013-01-18
Last Updated By	Øystein Godøy

Table 13: Advanced data upload.

Use Case Goal	To automate dataset upload for large datasets and regularly updated datasets.
Actors	Data producer Data manager
Pre-Conditions	1. The data producer is authenticated and authorised to perform the actions requested.
Post-Conditions	The new dataset is available in the catalogue and in the data repository.
Normal Flow	1. A data producer wants to automate dataset upload because manual upload will be impractical (the dataset is very large or it is updated on a regular basis). 2. The data producer identifies the product to be uploaded, and specifies additional information as needed (expected update frequency if applicable, needed storage space etc.). 3. The system provides a service level agreement. 4. The system provides a channel, open for the data producer upon proper user authentication, through which the data producer may upload the dataset using whatever automated method she/he deems best. 5. The system analyse the received dataset and check for compliance with formatting and documentation requirements. 6. The system provides feedback to the data producer whether the dataset was accepted or rejected. 7. If accepted, the dataset is handled automatically and discovery metadata extracted are inserted in the catalogue, access restrictions are properly set and the dataset is scheduled for backup. 8. A regular insertion of the dataset is implemented.
Notes and Issues	1. The number of file formats to support is not known, however the most important is NetCDF/CF with possible extensions to ODV,WMO GRIB, WMO BUFR, HDF-EOS2, HDF-EOS5, Shape, etc. Shape is believed to be more widely used within the user community than e.g. GML and KML, but this has to be checked. See notes on Shape in the previous use case. 2. For some formats, discovery metadata and additional information has to be provided in a separate document. 3. Depending on the solution selected for NMDC, this may be out of context.
Last Updated	2013-07-18
Last Updated By	Egil Støren

Table 14: Data management.

Use Case Goal	To manage datasets handled by the system
Actors	Data manager.
Pre-Conditions	1. Data are available and documented in the catalogue. 2. Data are available in the online data repository supported by the system. 3. The data manager is authenticated and authorised to perform the actions requested.
Post-Conditions	The configuration of the dataset is altered accordingly.
Normal Flow	1. The data manager want to change one or more properties of a dataset. 2. The system provides an interface allowing the data manager to operate on single or multiple datasets. 3. The data manager applies the requested changes to the dataset. 4. The catalogue and dataset is updated accordingly.
Notes and Issues	1. Properties that can be changed are e.g distribution restrictions, contact details etc. 2. The data manager should, through the interface, be able to delete, hide or copy datasets. 3. If several copies of a dataset exist, the data manager should be able to determine whether all should be available (in either metadata or as datasets) or if some of them should be hidden, but kept to ensure traceability of the dataset. 4. It may be necessary to implement operations on the catalogue and on the dataset as two separate processes which are linked at a later time. 5. Depending on the solution selected for NMDC, this may be out of context.
Last Updated	2013-01-18
Last Updated By	Øystein Godøy