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Ocean Data Standards

Volume 5

SeaDataNet Cruise Summary Report
(CSR) metadata model for Cruise
Reporting – XML encoding
(including SeaDataNet CSR metadata
profile of ISO 19115-2 – XML encoding,
V5.2.0)

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Ocean Data Standards

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SeaDataNet Cruise Summary Report (CSR) metadata model for Cruise Reporting – XML encoding

Scope: Proposal to adopt SeaDataNet CSR XML encoding as the reference XML implementation of SeaDataNet CSR metadata model.

The SeaDataNet infrastructure, its standards, services and products started to build since the mid-1990s under the EU MAST Programmes with the precursor EDMED, EURONODIM, MEDATLAS projects and continued with the EU-FP5 SeaSearch project (2002-2005). Under EU-FP6 Programme, the distributed SeaDataNet system was set up (2006-2011) and continued into its second phase under the EU-FP7 SeaDataNet II project (2011-2015). In the EU HORIZON 2020 SeaDataCloud project, the infrastructure is being upgraded and expanded making use of cloud services, High Performance Computing technology and taking into account the European Open Science Cloud (EOSC) challenge.

SeaDataNet CSR XML encoding has been drafted, published and firstly implemented in the context of SeaDataNet, the leading infrastructure in Europe for marine & ocean data management. Its wide implementation, both by data centres within SeaDataNet and by external organizations makes it also a de-facto standard in the Europe region.

The acknowledgement of SeaDataNet CSR XML encoding as a recommended standard by IODE/JCOMM will further favour interoperability between European data centres and outreach to the broader marine community.

Envisaged publication type: The proposal target audience includes all the European bodies, programs, and projects that manage and exchange cruise reports. Besides, the proposed document informs all the international community dealing with marine and oceanographic data about the reference XML implementation of the SeaDataNet CSR metadata model.

Purpose and Justification: Provide details based wherever practicable.

1. Describe the specific aims and reason for this Proposal, with particular emphasis on the aspects of standardization covered, the problems it is expected to solve or the difficulties it is intended to overcome.

By acknowledging SeaDataNet CSR XML encoding as the reference XML implementation for the SeaDataNet CSR metadata model, multiple objectives are sought:

- Wider adoption of SeaDataNet CSR XML encoding by additional marine data centres around European waters. The process will favour further harmonisation and standardisation of European ocean and marine metadata as well as interoperability by reducing the existing metadata formats heterogeneity. Organizations adopting this standard will be able to encode their marine metadata according to a well-known and well specified structure, therefore the data management and exchange of marine and oceanographic information will be eased in many ways (see following point 2).
- Ease interoperability and outreach towards international communities and initiatives. The existence of a recognized standard encoding for SeaDataNet CSR at European level will favour its understanding also at a broader level.

Example given, international marine and oceanographic communities will be able to correctly understand (both syntactically and semantically) the information contained in SeaDataNet CSR documents (e.g. also with the help of appropriate software).

2. <u>Describe how this proposed standard supports data management, exchange or interoperability. When applicable include mention of what data management functions (e.g. date transport, quality control, archive) the proposal supports.</u>

SeaDataNet CSR XML encoding supports data management by providing an implementation based on ISO 19139 XML and containing as well specific SeaDataNet schema extensions (established through the ISO extension methodology). This XML implementation fully enable encoding and validation of the information described by SeaDataNet CSR metadata model.
A set of Schematron rules further enacts validation, assuring compliancy of encoded XML documents to SeaDataNet CSR metadata model, ISO 19115, ISO 19115-2 and European directive INSPIRE (in particular INSPIRE implementing rules have been followed). Interoperability with software tools supporting such international standards and directives (such as catalogs or metadata editors) is thus favoured.
The Schematron rules enable as well validation of vocabulary restricted elements against online code lists published by SeaDataNet following ISO guidelines.

SeaDataNet has established a large European and international network, working closely together with operational oceanography, marine research, and marine environmental monitoring communities as well as with other marine data management infrastructures. The implementation of the CSR by all these different communities leads to improvements of the profile to meet their needs. MIKADO software tool can be used to prepare SeaDataNet CSR XML descriptions files. Metadata information from former ROSCOPs or other cruise descriptions can be imported into MIKADO either manually or automatically by reading information from users' databases and export the CSRs as ISO 19139 XML schema files. In both cases mapping between the input metadata and the SeaDataNet CSR fields and the used vocabularies is required. Concerning the usage of the vocabularies, any user not only those who belong to the SeaDataNet network can require additions of new or changes of the existing terms. The vocabularies content governance is controlled by SeaVoX, a combined SeaDataNet and MarineXML Vocabulary Content Governance Group, moderated by BODC. SeaVox operates by mailing list server and is open to anyone interested in controlled vocabularies for the marine science domain.

3. <u>Describe the main interests benefitting from or affected by the proposed standard, such as industry, consumers, governments, distributors.   Identify any relationships and/or dependencies.</u>

Adoption by IODE/JCOMM of SeaDataNet CSR XML encoding as a metadata standard will give extra momentum to European marine and ocean data centres adopting SeaDataNet CSR. This will also benefit users from all over the world from various sectors. Moreover, it will benefit efforts for global interoperability (as it was done within ODIP and ODIP 2 projects activities) because that process can focus on a limited set of marine metadata profiles, whereby SeaDataNet CSR represents European input.

4. <u>Describe the feasibility of implementing the proposed standard. Include any factors that could hinder the successful establishment or global application of the proposed standard. Are there any associated issues? Identify resource implications resulting from the recommendations.</u>

The feasibility and practicality of implementing the SeaDataNet CSR XML encoding can be, and has already been successfully accomplished at 43 data centres within the SeaDataNet partnership. Moreover another 74 data centres in Europe at present have realized the CSR XML encoding. The results of these activities can be followed at the operational CSR Inventory portal, that can be reached through the SeaDataNet portal (https://www.seadatanet.org/Metadata). The implementation is supported by dedicated Training Workshops which deal with explaining the standards and the associated tools and which provide hands-on training activities to get fully acquainted with the standards and tools. The Training Workshops are supported by the IOC-IODE at the UNESCO/IOC Project Office for IODE in Ostend, Belgium, and the training material (included videos of the presentations) is available at the OceanTeacher Global Academy (OTGA) of IODE. The training material is also documented in Vademecums for study and consultation. The time needed for full implementation at a data centre is approximately 6 months considering the mapping of legacy collections to SeaDataNet CSR and deployment of the associated SeaDataNet CSR tools.

5. Considering the needs of other fields or organizations, indicate the timeliness, target date(s), or if proposing a series of standards, suggest priorities. List any statutory requirement or other driving factors.

There are no statutory requirements for adoption of the SeaDataNet CSR standard as one of the metadata discovery standards. The National Oceanographic Data Centres in Europe are bound to implement the standard within their contractual obligations of several EU projects. The NODCs also motivate other data centres in their countries to adopt it. The IOC recommendation will add to this process.

6. Describe the possible benefits gained by the implementation of the proposed standard. Alternatively, describe the loss or disadvantage(s) if no standard is established within a reasonable time.

The advantage of using the SeaDataNet CSR standard in Europe is described in (2) and (3). There are no anticipated disadvantages to adopting it.

7. Indicate whether the proposed standard is or may become the subject of regulations or may require the harmonization of existing regulations. Describe any impacts of this activity.

The SeaDataNet CSR XML encoding standard is a de-facto standard in Europe and is currently subject of tests for its possible use outside of the European region (e.g. in the context of the ODIP project).

Current Operational Implementations: At present already 43 NODC's and marine data centres within the SeaDataNet consortium have successfully implemented the SeaDataNet CSR XML encoding standard and are maintaining their CSRs at their local centre and submitting them via online Content Management System (CMS) or XML encoded to the CSR central directory of the SeaDataNet infrastructure (see https://www.seadatanet.org). The CSR standard has already been adopted by a number of other European projects raising the total number of contributing data centres to more than 110. These projects are:

- **Up-Grade Black Sea SCENE project (2009-2011)** that involves 6 NODCs and many other data holding institutes from 6 Black Sea countries

- **CASPINFO project (2008-2011)** that involves 12 institutes and the private industry from the Caspian Sea region.

- **Geo-Seas project (2009-2012)** that involves 24 geological and geophysical data centres from 16 European countries (EuroGeoSurveys)

- **EuroFleets, EuroFleets2, EuroFleetsPlus projects (2009-2013, 2013-2017, 2019-2023)** that involves 43 research institutes and data centres from 26 European and no-European countries

- **JERICO, JERICO NEXT projecst (2011-2015, 2015-2019)** that involves 35 institutes from 15 European countries.

- **EMODnet chemistry, hydrography, physics project lots** in which SeaDataNet has qualified itself as leading infrastructure for the EMODnet data management component

- **ODIP (Ocean Data Interoperability Platform) and ODIP 2** in which SeaDataNet and its metadata profiles are the de-facto European standards to the efforts of establishing interoperability solutions between Cruise reporting systems in Europe, US and Australia.

- **POGO (Partnership for Observation of the Global Oceans)** in whichSeaDataNet CSR is in use at the POGO/Research Vessels (RVs) portal. (http://www.pogo-oceancruises.org/).

The results of these activities can be followed at the SeaDataNet Cruise Summary Report inventory, through which data collections related to individual cruises can be searched, evaluated and accessed.

Moreover, different software tools are implementing SeaDataNet CSR, such as the MIKADO metadata editor and the GI-cat discovery broker.

Relevant Documents:

The following document (attached to the current proposal) is the normative specification for the SeaDataNet CSR XML encoding:

- E.Boldrini, S.Nativi. SeaDataNet CSR metadata profile of ISO 19115-2 – XML encoding, Version 5.2.0, April 2020, published at https://www.seadatanet.org/Standards/Metadata-formats/CSR

The following online schemas are normative references for CSR XML encoding:

- CSR profile XML schema definition, Version 5.2.0, April 2020, published at http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN_CSR_ISO19139_5.2.0.xsd
- CSR profile Schematron rules definition, Version 5.2.0, April 2020, published at http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN_CSR_ISO19139_5.2.0.sch

- CSR Extension information, Version 5.2.0, April 2020, published at
  http://schemas.seadatanet.org/Standards-Software/Metadata-formats/csrExtensionInformation.xml

The following document is provided for informative purpose:

- Sample CSR metadata XML document, published at:
  https://www.seadatanet.org/content/download/4535/file/CSR_ISO19139_full_example_v5.2.0.xml

The SeaDataNet CSR homepage represents as well an informative reference for SeaDataNet CSR, containing related standards (e.g. the SeaDataNet CSR metadata model) and useful documentation:

- SeaDataNet CSR metadata profile Homepage, at
  https://www.seadatanet.org/Standards/Metadata-formats/CSR

Cooperation and liaison:

1. **Existing Community**: All the organizations listed in the '***Current Operational Implementations'*** section are using SeaDataNet CSR in an operational environment and represent the SeaDataNet CSR community. In particular MARIS, CNR-IIA and IFREMER have been involved in the drafting and publication of the SeaDataNet CSR XML encoding standard (together with the rest of the SeaDataNet Technical Task Team) and are responsible for the current proposal submission.

2. **Expanded Community:** Firstly, other relevant marine and oceanographic data centres in Europe that are not yet engaged in the NODC national networks and/or any of the EU projects and would like to adopt SeaDataNet CSR as the metadata model for their cruise reports.

   Moreover, other marine and oceanographic data centres worldwide eager to discover, evaluate and access SeaDataNet cruise reports at full. SeaDataNet is maintaining active cooperation and exchange on an international scale with data management initiatives and networks outside Europe (such as ODIP and ODIP 2) where common standards and interoperability solutions were investigated.

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Proposal version: Version 1.0, November 2014, initial submission

Version 2.0, September 2019, incorporating feedback from SeaDataNet. No factual changes where done in the proposal, only the required modifications were included to respond to the reviewer comments which were received on January 2018, as well as the latest version of the CSR metadata profile XML encoding.

List of Acronyms:

- BODC – British Oceanographic Data Centre
- BSH - Federal Maritime and Hydrographic Agency
- CASPINFO – CASPian Environmental and Industrial Data & INFOrmation Service (EU FP7 Project)
- CNR-IIA – National Research Council of Italy – Insitute of Atmospheric Pollution Research
- CSR – SeaDataNet Cruise Summary Reports directory
- EDMED - SeaDataNet European Directory of Marine Environmental Data sets
- EDMERP - SeaDataNet European Directory of Marine Environmental Research Projects
- EDMO – SeaDataNet European Directory of Marine Organisations
- EMODnet – European Marine Observation and Data Network
- EU – European Union
- EuroFleets –Towards an Alliance of European Research Fleets (EU FP7 Project)
- EuroFleets2 – New operational steps towards an alliance of European research fleets (EU FP7 Project)
- EuroFleetsPlus – An alliance of European marine research infrastructure to meet the evolving needs of the research and industrial communities. (EU HORIZON2020 Project)
- Geo-Seas - EU FP7 project for a Pan-European Infrastructure for Marine Geological and Geophysical Data Management
- GI-cat - Geospatial Information Cataloguing
- IFREMER – Institut Francais de recherche pour l'exploitation de la mer
- INSPIRE - Infrastructure for Spatial Information in the Europe Community
- IOC – Intergovernmental Oceanographic Commission
- IODE – International Oceanographic Data and Information Exchange
- ISO – International Organization for Standardization
- JCOMM - Joint Technical Commission for Oceanography and Marine Meteorology
- JERICO - Joint European Research Infrastructure network for Coastal Observatories (EU FP7 Project)
- JERICO NEXT - Joint European Research Infrastructure network for Coastal Observatory – Novel European eXpertise for coastal observaTories (EU HORIZON2020 Project)
- MARIS – Mariene Informatie Service
- MIKADO – SeaDataNet metadata editor software tool
- MSFD - Marine Strategy Framework Directive
- NODC – National Oceanographic Data Center
- ODIP - Ocean Data Interoperability Platform (EU FP7, HORIZON2020 Project)

- ODIP 2 - Extending the Ocean Data Interoperability Platform (EU Horizon2020 Project)
- ODP - Ocean Data Portal
- POGO - Partnership for Observation of the Global Oceans
- SeaDataNet – Pan-European Infrastructure for Marine and Oceanographic Data Management (EU FP6)
- SeaDataNet II – Pan-European Infrastructure for Marine and Oceanographic Data Management (EU FP7)
- SeaDataCloud - Further developing the pan-European infrastructure for marine and ocean data management (EU Horizon2020 Project)
- SeaVoX – mailing list governing the SeaDataNet Common Vocabularies
- Upgrade Black Sea SCENE - Upgrade Black Sea SCiEntific NEtwork (EU FP7 Project)
- XML – Extensible Mark-up Language
- XSD – XML Schema Definition

SeaDataNet CSR metadata profile of ISO 19115-2 – XML encoding

Author: Enrico Boldrini (CNR - Institute of Atmospheric Pollution Research)

Editor: Stefano Nativi (CNR - Institute of Atmospheric Pollution Research)

Date: 2020-04-10

Version: 5.2.0

Document type: specification

Status: Public

Description:

Encoding of the SeaDataNet CSR metadata profile in XML, by means of both XML schema and Schematron rules definitions

Document Version	Date	Status	Author(s)	Description
1.0.0	2013-05-22	Creation	Boldrini, Nativi	First implementation
2.0.0	2013-07-17	Revision	Boldrini	Updated sample (license URL, C19 codelist)
3.0.0	2013-10-18	Revision	Boldrini	Examples, schematron
3.0.1	2017-09-19	Revision	Boldrini, Duthie	Bugfix of CSR Schematron schema, to obtain validation against official ISO Schematron 2006 Relax NG Compact schema used by lxml Python library
4.0.0	2019-01-18	Revision	Boldrini	Updated schemas caused by ISO TC211 schemas relocation. Decision has been made to use schemas from OGC, as suggested by INSPIRE technical guidelines. E.g. previous location: http://www.isotc211.org/schemas/2005/gmd/gmd.xsd -> current location: http://schemas.opengis.net/iso/19139/20060504/gmd/gmd.xsd

Important: this major change affects only the online version of the schemas |
| **4.0.1** | 2019-10-16 | Revision | Iona | Updated SeaDataNet project information |
| **5.0.0** | 2020-01-17 | Revision | Boldrini, Schaap, Tosello | Fixed pointOfContact cardinality in schematron

Fixed geographic extent as mandatory

Fixed referenceSystemInfo cardinality in schematron

Included as mandatory INSPIRE required elements: spatialRepresentationType, useLimitation, referenceSystemInformation.

Modified XML schema location as a workaround for ETF validator.

Updated conformance metadata element required by INSPIRE.

Fixed elements in documentation and schematron: fileIdentifier, hierarchyLevelName, distributor, transferOptions, distributionFormat. |
5.1.0	2020-01-24	Revision	Boldrini, Tosello	Added schematron check on precision of bounding box coordinates (minimum two decimal places required by INSPIRE validator)
5.1.1	2020-02-06	Revision	Boldrini	Fixed schematron check about empty elements
5.2.0	2020-04-10	Revision	Boldrini	Changes to reflect https uptake

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Foreword

This document has been drafted in the context of the EU FP7 SeaDataNet II project and EU H2020 SeaDataCloud project by CNR-IIA. "*ISO/IEC Directives, Part 2: Rules for the structure and drafting of International Standards*" was used as a reference for the drafting.

Introduction

Cruise Summary Reports (CSR = former ROSCOPs) are the usual means in SeaDataNet for reporting on cruises or field experiments at sea. Traditionally, it is the Chief Scientist's obligation to submit a CSR to his/her National Oceanographic Data Centre (NODC) not later than two weeks after the cruise. This provides a first level inventory of measurements and samples collected at sea. Information such as the ship track, objectives of the cruise and principal investigators contacts are also included among other metadata elements tested to be useful in by the marine community practice.

Currently, the Cruise Summary Reports directory covers cruises from 1873 till today from more than 2.000 research vessels: a total of nearly 40.000 cruises, in all European waters and global oceans. This also includes historic CSRs from European countries, that have been loaded from the ICES database from 1960 onwards.

The Reports have been compiled over time and encoded using a XML schema derived from ISO 19115 DTD. Nowadays the ISO 19139 Schema is mature and widely adopted; it is as well part of the EU INSPIRE Directive Implementing Rules. Therefore an analysis for upgrading the CSR metadata profile and its encoding to ensure ISO and INSPIRE compliance is currently being performed by CNR, with support of MARIS, IFREMER, BODC. The experience acquired for the drafting of the CDI metadata profile is being used as a solid guidance. As a result of the standardization, interoperability with international initiatives and communities, such as OGC, INSPIRE and GEOSS is foreseen, as well as a wider, international outreach of SeaDataNet products.

Products of the CSR standardization effort include a new (ISO 19115-2 based) metadata profile documentation for the CSR data model (adding also a number of missing elements and corrections to the legacy CSR model) and a new encoding documentation which defines and details the XML encoding implementation for this metadata profile, based on the XML schema defined in ISO 19139:2006 TS plus additional definitions and Schematron rules.

The document SeaDataNet metadata profile of ISO 19115 (of which this document constitutes a part), defines the SeaDataNet metadata profile, according to the ISO 19115 international metadata standard.

Scope

This document defines a ISO 19139:2006 TS compliant encoding for the SeaDataNet CSR metadata profile. The encoding is based on the XML Schema implementation defined in ISO 19139, plus newly defined extensions. Schematron rules were

also defined to express XML constraints not enforceable by the schema.

XML encoding definition

This document conforms to the Annex A of the ISO/TS 19139:2006, Geographic information – Metadata – XML schema implementation (Conformance Requirements). The XML schema used is exactly the one defined in ISO/TS 19139, plus specific extensions/restrictions. In particular the nine new codelists elements defined in the SeaDataNet profile document have been implemented in the XML schema.

Additionally, a set of Schematron rules have been defined. They are used to enforce the following constraints, as well as extensions/restrictions:

- Restricted obligation (e.g. optional elements that change to mandatory in the SeaDataNet profile)
- Restricted cardinality (e.g. elements that change cardinality from 1…N to 1…1 in the SeaDataNet profile)
- Restricted domain (e.g. elements that change from a free text domain to a controlled vocabulary domain)
  - Codelists validation (as a subcase, validation of codelists is conveniently checked against the linked online codelist catalogue)
- Enforce a correct use of null elements (these are not permitted, unless in case of optional elements along with a nilReason or xlink pointers)
- Conformance Rules from Table A.1, ISO/TS 19139:2006 (a set of constraints not enforced by the ISO 19139 XML schema)
- Additional ISO/TS 19139:2006 constraints not enforced by the ISO 19139 XML schema and not listed in Table A.1 (i.e. on bounding box values)
- Additional INSPIRE constraints from the implementing rules (not enforced by any of the previous constraint types)
- Additional SeaDataNet constraints (not enforced by any of the previous constraint types)

Xml Schema for the SeaDataNet profile

The XML schema for the SeaDataNet CSR profile is defined in this section. The SeaDatanet *sdn* namespace is presented: it implements the SeaDataNet CSR profile XML schema; it also imports the *gmx* namespace defined in ISO/TS 19139, which implements in turn ISO/TS 19139 XML Schema (see Figure 1 XML Packaging) and *gmi* from the schema implementing the second part of ISO 19115-2. The extended elements (codelists) defined in the SeaDataNet profile are defined in the *sdn* namespace (in compliance with the conformance requirements for extensions, described at point 2 of Annex A.3, ISO/TS 19139).
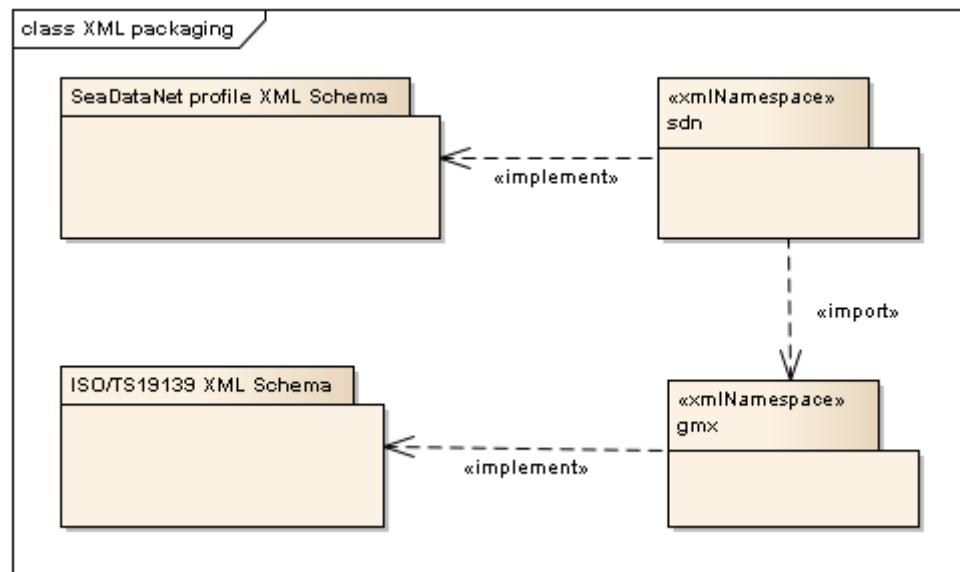
Figure 1 XML Packaging

sdn namespace

The *http://www.seadatanet.org* namespace (prefixed as sdn) contains the extended codelists defined in the SeaDataNet profile document. It also imports the gmx namespace defined in ISO 19139.

sdn.xsd

This XML schema includes all the implemented codelists from the *sdn* namespace:

- SDN_CountryCode
- SDN_CRSCode
- SDN_DeviceCategoryCode
- SDN_EDMERPCode
- SDN_EDMOCode
- SDN_EDMEDCode
- SDN_FormatNameCode
- SDN_HierarchyLevelNameCode
- SDN_MarsdenCode
- SDN_ParameterDiscoveryCode
- SDN_PlatformCode
- SDN_PlatformCategoryCode
- SDN_PortCode
- SDN_CSRUnitCode
- SDN_WaterBodyCode

Moreover, it imports the gmx.xsd and gmi.xsd schema.

Schematron rules for the SeaDataNet profile

A set of Schematron rules has been defined to enforce the different kinds of constraints specified in the SeaDataNet profile document. These constraints are mostly restrictions imposed by the SeaDataNet profile on existing ISO 19115 metadata. In compliance with the conformance requirements for restrictions, described in Annex A.4, ISO/TS 19139, they have been implemented as a set of Schematron rules.

Restricted obligation

Elements that have changed their obligation to mandatory: (e.g. fileIdentifier, language, …).

A rule for each mandatory element checks its presence in the given instance document.

Restricted cardinality

Elements that have changed their cardinality (e.g. hierarchyLevel from N to 1).

A rule for each of these elements checks its presence in the given instance document with the restricted cardinality.

Restricted domain

Elements that have restricted their domain (e.g. characterSet restricts its original domain to 'utf8').

A rule for each of these elements check the values assigned to the element in the given instance document are in the restricted domain.

Different type of restricted domains are checked by the rules. E.g.:

- fileIdentifier: the domain is restricted from free text to a valid URN starting with "urn:SDN:CDI:"
- language, characterSet, hierarchyLevel, topicCategory: these domain of these codelists has been restricted to a subset of the initial values
- hierarchyLevelName, metadataStandardName: the domain is restricted from free text to a fixed string

Correct use of null elements (not allowed, unless for optional elements along with a nilReason or xlink pointers)

Null elements (i.e. elements without content) are not permitted to appear in instance documents of this profile in place of mandatory elements. They have instead an use when documenting a missing optional element. Indeed two methods are available to document a missing optional element:

1. Skip the element entirely
2. Document a null element (element without content) along with a nilReason attribute explaining the reason for the null element. A possible encoding using the ISO 19139 schema is the following: <gmd:alternateTitle gco:nilReason="missing"></gmd:alternateTitle>

A null element is also allowed if containing an xlink pointer to the element actual content. A typical use is to omit from the published metadata record common to different documents or extensive information (e.g. extension information, pubblications): this information is hence linked.

As an example, the following is the use of a xlink pointer, referencing a publication already described in the SeaDataNet citations catalogue.

```
<sdn:additionalDocumentation xlink:href=" http://seadatanet.maris2.nl/isocodelists/sdncodelists/publications-
Codelists.xml#SDN_PUBCode_151" >
</sdin:additionalDocumentation>
```

This rule checks the absence of elements with an empty content, unless they are accompanied with a gco:nilReason or xlink:href attributes.

Conformance Rules from Table A.1, ISO/TS 19139:2006

Table A.1 of ISO/TS 19139:2006 lists a set of co-constraints that the ISO19139 XML Schema is not able to enforce. A rule has been drafted to check each of these constraints (that are not already enforced by other rules).

Additional co-constraints not enforced by the ISO 19139 XML schema and not listed in Table A.1

Additional constraints from ISO 19115 (not included in the previous section) have been identified:

- westBoundLongitude must be in -180; 180 – minimum two decimal places precision is required by INSPIRE
- eastBoundLongitude must be in -180; 180 – minimum two decimal places precision is required by INSPIRE
- southBoundLatitude must be in -90; 90 and less than northBoundLatitude – minimum two decimal places precision is required by INSPIRE
- northBoundLatitude must be in -90; 90 and greater than southBoundLatitude – minimum two decimal places precision is required by INSPIRE

Specific rules have been implemented to perform these checks.

Additional constraints from the INSPIRE implementing rules

The following constraints, imposed by the INSPIRE implementing rules, are checked by specific rules in the SeaDataNet profile (the remaining INSPIRE constraints are already enforced by other rules):

- **SC7**. There shall not be more than one instance of MD_Metadata.identificationInfo[1].MD_Identification.citation.CI_Citation.date declared as a creation date (i.e. CI_Date.dateType having the 'creation' value)
- **SC8**. MD_Metadata.identificationInfo[1].MD_DataIdentification.citation.CI_Citation.identifier is mandatory for metadata sets related to spatial dataset and spatial dataset series;
- **SC10**.There is at least one instance of MD_Metadata.identificationInfo[1].MD_DataIdentification.extent defining the geographic location of the resource as a geographic bounding box (i.e. an instance of EX_GeographicBoundingBox or one of its subclasses).
- **SC16**. The value of MD_Metadata.contact[1].CI_ResponsibleParty.role.CI_RoleCode shall be pointOfContact.
- **SC17**. For datasets and series at least one keyword of GEMET thesaurus shall be documented using MD_Metadata.identificationInfo[1].MD_DataIdentification.descriptiveKeywords.

- There shall be a **conformance result report** against the latest INSPIRE commission regulation about metadata or other relevant regulations. In particular it is required to be present:
  - 1 DQ_DataQuality.report.DQ_ConformanceResult with values:
    - specification.CI_Citation.title.CharacterString = '**COMMISSION REGULATION (EC) No 1205/2008 of 3 December 2008 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata**'
    - specification.CI_Citation.date.CI_Date.date.Date = '2008-12-04'
    - specification.CI_Citation.date.CI_Date.dateType.CI_DateTypeCode.@codeListValue = 'publication'
    - explanation.CharacterString = 'See the referenced specification'
    - pass.Boolean = 'true'
  - 1 DQ_DataQuality.report.DQ_ConformanceResult with values:
    - specification.CI_Citation.title.CharacterString = '**COMMISSION REGULATION (EU) No 1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services**'
    - specification.CI_Citation.date.CI_Date.date.Date = '2010-12-08'
    - specification.CI_Citation.date.CI_Date.dateType.CI_DateTypeCode.@codeListValue = 'publication'
    - explanation.CharacterString = 'See the referenced specification'
    - pass.Boolean = 'true'

SeaDataNet specific constraints

Additional SeaDataNet specific constraints are listed below:

- The reference system identifier (RS_Identifier) should be documented along with the authority.CI_Citation, with values:
  - alternateTitle='L101'
  - identifier. MD_Identifier.code.CharacterString=' http://www.seadatanet.org/urnurl/SDN:L101'
- The thesaurus used for keywords should be correctly referenced. E.g. for code list SDN_ParameterDiscoveryCode:
  - alternateTitle='P021'
  - identifier. MD_Identifier.code.CharacterString=' http://www.seadatanet.org/urnurl/SDN:P021'
- At least one keyword with type 'parameter' should be documented
- At least one keyword with type 'platform_class' should be documented
- A maximum of one associationType.AssociationTypeCode/@codeListValue = 'source' for all aggregationInfo

A rule exists to enforce each of these additional constraints.

Schema location attribute

The schema location attribute is a hint for the XML schema validator, including a pointer to the SeaDataNet schemas. **Please note: to support the latest INSPIRE ETF validator also the ISO 19115 schemas should be referenced, at the end of the schemaLocation attribute**. Example given:

xsi:schemaLocation="http://www.seadatanet.org http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN2_CSR_ISO19139_5.0.0.xsd http://www.isotc211.org/2005/gmd http://schemas.opengis.net/iso/19139/20060504/gmd/gmd.xsd"

Codelists validation

Validation of the codelists present in a given SeaDataNet profile instance document is carried on by a specific Schematron rule. Each codelist is online validated against the linked codelist catalogue.

SDN_CountryCode code list example:

```
<gmd:country>
        <sdn:SDN_CountryCode
                codeList="../schema/resources/Codelist/sdnCodelists.xml#SDN_CountryCode"
                codeListValue="FR"
                codeSpace="SeaDataNet">France</sdn:SDN_CountryCode>
</gmd:country>
```

In this example the SDN_CountryCode code list points to the online catalog referenced by the URL specified by the codeList attribute. This rule query the online catalogue for the available values, and checks if the given codeListValue (in this case "FR") is amongst the allowed values.

New codelists

For each new codelist created in this profile an online catalogue is created and populated.

Expanded codelists

Expanded codelists require the update of online catalogues, by population of the additional values to them.

Annex A (normative) Abstract test suite

This section defines an abstract test suite, providing a validation mechanism for SeaDataNet profile document instances.

Minimum conformance with this Technical Specification requires that geographic metadata instance (XML) documents can be validated without error against:

- the XML schemas described in detail in the document
- the Schematron rules described in detail in the document

Annex B (informative) Implementation example

The following XML instance document is a valid document instance of the SeaDataNet CSR profile.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!-- this file has been created using MIKADO version 3.3 -->
<?xml-model href="http://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN2_CSR_ISO19139_5.0.0.sch" type="application/xml" schematypens="http://purl.oclc.org/dsdl/schematron"?>
<gmi:MI_Metadata xmlns:gmd="http://www.isotc211.org/2005/gmd"
    xmlns:gmi="http://www.isotc211.org/2005/gmi"
xmlns:srv="http://www.isotc211.org/2005/srv"
    xmlns:gco="http://www.isotc211.org/2005/gco"
xmlns:gts="http://www.isotc211.org/2005/gts"
    xmlns:gmx="http://www.isotc211.org/2005/gmx"
xmlns:xlink="http://www.w3.org/1999/xlink"
    xmlns:sdn="http://www.seadatanet.org" xmlns:gml="http://www.opengis.net/gml"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:schemaLocation="http://www.seadatanet.org      ../schema/csr-5.0.0.xsd
http://www.isotc211.org/2005/gmd
http://schemas.opengis.net/iso/19139/20060504/gmd/gmd.xsd">

    <gmd:fileIdentifier>
        <gco:CharacterString>urn:SDN:CSR:LOCAL:FI351994800010</gco:CharacterString>
    </gmd:fileIdentifier>
    <gmd:language>
        <gmd:LanguageCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#LanguageCode" codeListValue="eng" codeSpace="ISOTC211/19115">English</gmd:LanguageCode>
    </gmd:language>
    <gmd:characterSet>
        <gmd:MD_CharacterSetCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_CharacterSetCode" codeListValue="utf8"
codeSpace="ISOTC211/19115">utf8</gmd:MD_CharacterSetCode>
    </gmd:characterSet>
    <gmd:hierarchyLevel>
        <gmd:MD_ScopeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_ScopeCode" codeListValue="series"
codeSpace="ISOTC211/19115">series</gmd:MD_ScopeCode>
    </gmd:hierarchyLevel>
    <gmd:hierarchyLevelName>
        <sdn:SDN_HierarchyLevelNameCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN_HierarchyLevelNameCode" codeListValue="CSR" codeSpace="SeaDataNet">Cruise Summary
record</sdn:SDN_HierarchyLevelNameCode>
    </gmd:hierarchyLevelName>
    <gmd:contact>
        <gmd:CI_ResponsibleParty>
            <gmd:organisationName>
                <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-codelists.xml#SDN_EDMOCode" codeSpace="SeaDataNet" codeListValue="486">IFREMER  /
IDM/SISMER</sdn:SDN_EDMOCode>
```

```xml
                    </gmd:organisationName>
                    <gmd:contactInfo>
                        <gmd:CI_Contact>
                            <gmd:phone>
                                <gmd:CI_Telephone>
                                    <gmd:voice>
                                        <gco:CharacterString>+33
(0)2.98.22.49.16</gco:CharacterString>
                                    </gmd:voice>
                                    <gmd:facsimile>
                                        <gco:CharacterString>+33
(0)2.98.22.46.44</gco:CharacterString>
                                    </gmd:facsimile>
                                </gmd:CI_Telephone>
                            </gmd:phone>
                            <gmd:address>
                                <gmd:CI_Address>
                                    <gmd:deliveryPoint>
                                        <gco:CharacterString>BP 70</gco:CharacterString>
                                    </gmd:deliveryPoint>
                                    <gmd:city>
                                        <gco:CharacterString>PLOUZANE</gco:CharacterString>
                                    </gmd:city>
                                    <gmd:postalCode>
                                        <gco:CharacterString>29280</gco:CharacterString>
                                    </gmd:postalCode>
                                    <gmd:country>
                                        <sdn:SDN_CountryCode                    codeSpace="SeaDataNet"
codeListValue="FR"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">France</sdn:SDN_CountryCode>
                                    </gmd:country>
                                    <gmd:electronicMailAddress>

<gco:CharacterString>sismer@ifremer.fr</gco:CharacterString>
                                    </gmd:electronicMailAddress>
                                </gmd:CI_Address>
                            </gmd:address>
                            <gmd:onlineResource>
                                <gmd:CI_OnlineResource>
                                    <gmd:linkage>
                                        <gmd:URL>http://www.ifremer.fr/sismer/</gmd:URL>
                                    </gmd:linkage>
                                </gmd:CI_OnlineResource>
                            </gmd:onlineResource>
                        </gmd:CI_Contact>
                    </gmd:contactInfo>
                    <gmd:role>
                        <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                          codeListValue="pointOfContact"
codeSpace="ISOTC211/19115">pointOfContact</gmd:CI_RoleCode>
                    </gmd:role>
                </gmd:CI_ResponsibleParty>
            </gmd:contact>
            <gmd:dateStamp>
```

```xml
        <gco:Date>1995-06-26</gco:Date>
    </gmd:dateStamp>
    <gmd:metadataStandardName>
        <gco:CharacterString>ISO 19115/SeaDataNet profile</gco:CharacterString>
    </gmd:metadataStandardName>
    <gmd:metadataStandardVersion>
        <gco:CharacterString>1.0</gco:CharacterString>
    </gmd:metadataStandardVersion>
    <gmd:referenceSystemInfo>
        <gmd:MD_ReferenceSystem>
            <gmd:referenceSystemIdentifier>
                <gmd:RS_Identifier>
                    <gmd:authority>
                        <gmd:CI_Citation>
                            <gmd:title>
                                <gco:CharacterString>SeaDataNet    geographic    co-ordinate
reference frames</gco:CharacterString>
                            </gmd:title>
                            <gmd:alternateTitle>
                                <gco:CharacterString>L10</gco:CharacterString>
                            </gmd:alternateTitle>
                            <gmd:date>
                                <gmd:CI_Date>
                                    <gmd:date>
                                        <gco:Date>2007-02-10</gco:Date>
                                    </gmd:date>
                                    <gmd:dateType>
                                        <gmd:CI_DateTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Da
teTypeCode"                                                    codeListValue="revision"
codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
                                    </gmd:dateType>
                                </gmd:CI_Date>
                            </gmd:date>
                            <gmd:edition>
                                <gco:CharacterString>2</gco:CharacterString>
                            </gmd:edition>
                            <gmd:identifier>
                                <gmd:MD_Identifier>
                                    <gmd:code>

<gco:CharacterString>https://www.seadatanet.org/urnurl/SDN:L10</gco:CharacterString
>
                                    </gmd:code>
                                </gmd:MD_Identifier>
                            </gmd:identifier>
                        </gmd:CI_Citation>
                    </gmd:authority>
                    <gmd:code>
                        <sdn:SDN_CRSCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CRSCode"   codeListValue="4326"   codeSpace="SeaDataNet">World    Geodetic    System
84</sdn:SDN_CRSCode>
                    </gmd:code>
                </gmd:RS_Identifier>
            </gmd:referenceSystemIdentifier>
```

```xml
                </gmd:MD_ReferenceSystem>
            </gmd:referenceSystemInfo>
            <gmd:metadataExtensionInfo
                xlink:href="https://schemas.seadatanet.org/Standards-Software/Metadata-
formats/csrExtensionInformation.xml"/>
            <gmd:identificationInfo>
                <sdn:SDN_DataIdentification gco:isoType="MD_DataIdentification_Type">
                    <gmd:citation>
                        <gmd:CI_Citation>
                            <gmd:title>
                                <gco:CharacterString>CITHER 2 LEG 1</gco:CharacterString>
                            </gmd:title>
                            <gmd:alternateTitle>
                                <gco:CharacterString>FI351994800010</gco:CharacterString>
                            </gmd:alternateTitle>
                            <gmd:date>
                                <gmd:CI_Date>
                                    <gmd:date>
                                        <gco:Date>1996-11-04</gco:Date>
                                    </gmd:date>
                                    <gmd:dateType>
                                        <gmd:CI_DateTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Da
teTypeCode"                                            codeListValue="revision"
codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
                                    </gmd:dateType>
                                </gmd:CI_Date>
                            </gmd:date>
                            <gmd:identifier>
                                <gmd:MD_Identifier>
                                    <gmd:code>

<gco:CharacterString>urn:SDN:CSR:LOCAL:FI351994800010</gco:CharacterString>
                                    </gmd:code>
                                </gmd:MD_Identifier>
                            </gmd:identifier>
                            <gmd:citedResponsibleParty>
                                <gmd:CI_ResponsibleParty>
                                    <gmd:organisationName>
                                        <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode"  codeSpace="SeaDataNet"  codeListValue="494">LABORATORY
of OCEANOGRAPHY and CLIMATE (LOCEAN)</sdn:SDN_EDMOCode>
                                    </gmd:organisationName>
                                    <gmd:contactInfo>
                                        <gmd:CI_Contact>
                                            <gmd:phone>
                                                <gmd:CI_Telephone>
                                                    <gmd:voice>
                                                        <gco:CharacterString>+33    (1)    44    27    32
48</gco:CharacterString>
                                                    </gmd:voice>
                                                    <gmd:facsimile>
                                                        <gco:CharacterString> +33(0)1  44  27  38  05
</gco:CharacterString>
                                                    </gmd:facsimile>
```

```xml
                                    </gmd:CI_Telephone>
                                </gmd:phone>
                                <gmd:address>
                                    <gmd:CI_Address>
                                        <gmd:deliveryPoint>
                                            <gco:CharacterString>Université Pierre et Marie
Curie, Case 100, Tour 45-55, 4ème étage, 4 Place Jussieu</gco:CharacterString>
                                        </gmd:deliveryPoint>
                                        <gmd:city>
                                            <gco:CharacterString>Paris                    Cedex
5</gco:CharacterString>
                                        </gmd:city>
                                        <gmd:postalCode>

<gco:CharacterString>75252</gco:CharacterString>
                                        </gmd:postalCode>
                                        <gmd:country>
                                            <sdn:SDN_CountryCode     codeSpace="SeaDataNet"
codeListValue="FR"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">France</sdn:SDN_CountryCode>
                                        </gmd:country>
                                        <gmd:electronicMailAddress>
                                            <gco:CharacterString>sdn-
userdesk@seadatanet.org</gco:CharacterString>
                                        </gmd:electronicMailAddress>
                                    </gmd:CI_Address>
                                </gmd:address>
                                <gmd:onlineResource>
                                    <gmd:CI_OnlineResource>
                                        <gmd:linkage>
                                            <gmd:URL>http://www.locean-
ipsl.upmc.fr/</gmd:URL>
                                        </gmd:linkage>
                                    </gmd:CI_OnlineResource>
                                </gmd:onlineResource>
                            </gmd:CI_Contact>
                        </gmd:contactInfo>
                        <gmd:role>
                            <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                        codeListValue="originator"
codeSpace="ISOTC211/19115">originator</gmd:CI_RoleCode>
                        </gmd:role>
                    </gmd:CI_ResponsibleParty>
                </gmd:citedResponsibleParty>
                <gmd:citedResponsibleParty>
                    <gmd:CI_ResponsibleParty>
                        <gmd:organisationName>
                            <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode"  codeSpace="SeaDataNet"  codeListValue="487">IFREMER  /
OPS/LPO-LABORATORY of PHYSICAL OCEANOGRAPHY</sdn:SDN_EDMOCode>
                        </gmd:organisationName>
                        <gmd:contactInfo>
                            <gmd:CI_Contact>
```

```xml
                                <gmd:phone>
                                    <gmd:CI_Telephone>
                                        <gmd:voice>
                                            <gco:CharacterString>+33                    (0)2
98.22.42.76</gco:CharacterString>
                                        </gmd:voice>
                                        <gmd:facsimile>
                                            <gco:CharacterString>+33(0)2
98.22.44.96</gco:CharacterString>
                                        </gmd:facsimile>
                                    </gmd:CI_Telephone>
                                </gmd:phone>
                                <gmd:address>
                                    <gmd:CI_Address>
                                        <gmd:deliveryPoint>
                                            <gco:CharacterString>BP70</gco:CharacterString>
                                        </gmd:deliveryPoint>
                                        <gmd:city>

<gco:CharacterString>PLOUZANE</gco:CharacterString>
                                        </gmd:city>
                                        <gmd:postalCode>

<gco:CharacterString>29280</gco:CharacterString>
                                        </gmd:postalCode>
                                        <gmd:country>
                                            <sdn:SDN_CountryCode        codeSpace="SeaDataNet"
codeListValue="FR"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">France</sdn:SDN_CountryCode>
                                        </gmd:country>
                                        <gmd:electronicMailAddress>
                                            <gco:CharacterString>sdn-
userdesk@seadatanet.org</gco:CharacterString>
                                        </gmd:electronicMailAddress>
                                    </gmd:CI_Address>
                                </gmd:address>
                                <gmd:onlineResource>
                                    <gmd:CI_OnlineResource>
                                        <gmd:linkage>
                                            <gmd:URL>http://www.ifremer.fr/lpo/</gmd:URL>
                                        </gmd:linkage>
                                    </gmd:CI_OnlineResource>
                                </gmd:onlineResource>
                            </gmd:CI_Contact>
                        </gmd:contactInfo>
                        <gmd:role>
                            <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                          codeListValue="originator"
codeSpace="ISOTC211/19115">originator</gmd:CI_RoleCode>
                        </gmd:role>
                    </gmd:CI_ResponsibleParty>
                </gmd:citedResponsibleParty>
            </gmd:CI_Citation>
        </gmd:citation>
```

```xml
        <gmd:abstract>
            <gco:CharacterString>This series comprises a set of datasets acquired
during the cruise.</gco:CharacterString>
        </gmd:abstract>
        <gmd:purpose>
            <gco:CharacterString>This is an example provided to describe SeaDataNet
XML V1 for CSR. The included information is provided only to illustrate the XML
structure and all possibilities. </gco:CharacterString>
        </gmd:purpose>
        <gmd:pointOfContact>
            <gmd:CI_ResponsibleParty>
                <gmd:individualName>
                    <gco:CharacterString>Laurent MEMERY</gco:CharacterString>
                </gmd:individualName>
                <gmd:organisationName>
                    <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode" codeSpace="SeaDataNet" codeListValue="1046">LABORATORY
OF SCIENCES OF MARINE ENVIRONMENT (LEMAR)</sdn:SDN_EDMOCode>
                </gmd:organisationName>
                <gmd:contactInfo>
                    <gmd:CI_Contact>
                        <gmd:phone>
                            <gmd:CI_Telephone>
                                <gmd:voice>
                                    <gco:CharacterString>+33    (0)2    98    49    88
97</gco:CharacterString>
                                </gmd:voice>
                            </gmd:CI_Telephone>
                        </gmd:phone>
                        <gmd:address>
                            <gmd:CI_Address>
                                <gmd:deliveryPoint>
                                    <gco:CharacterString>IUEM,Technopole       Brest
Iroise,Place Nicolas Copernic</gco:CharacterString>
                                </gmd:deliveryPoint>
                                <gmd:city>
                                    <gco:CharacterString>PLOUZANE</gco:CharacterString>
                                </gmd:city>
                                <gmd:postalCode>
                                    <gco:CharacterString>29280</gco:CharacterString>
                                </gmd:postalCode>
                                <gmd:country>
                                    <sdn:SDN_CountryCode       codeSpace="SeaDataNet"
codeListValue="FR"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">France</sdn:SDN_CountryCode>
                                </gmd:country>
                                <gmd:electronicMailAddress>
                                    <gco:CharacterString>Laurent.Memery@univ-
brest.fr</gco:CharacterString>
                                </gmd:electronicMailAddress>
                            </gmd:CI_Address>
                        </gmd:address>
                    </gmd:CI_Contact>
                </gmd:contactInfo>
```

```xml
                    <gmd:role>
                        <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                                codeListValue="pointOfContact"
codeSpace="ISOTC211/19115">pointOfContact</gmd:CI_RoleCode>
                    </gmd:role>
                </gmd:CI_ResponsibleParty>
            </gmd:pointOfContact>
            <gmd:graphicOverview>
                <gmd:MD_BrowseGraphic>
                    <gmd:fileName>
                        <gco:CharacterString>FI351994800010.gml</gco:CharacterString>
                    </gmd:fileName>
                    <gmd:fileDescription>
                        <gco:CharacterString>track chart</gco:CharacterString>
                    </gmd:fileDescription>
                    <gmd:fileType>
                        <gco:CharacterString>GML</gco:CharacterString>
                    </gmd:fileType>
                </gmd:MD_BrowseGraphic>
            </gmd:graphicOverview>
            <gmd:descriptiveKeywords>
                <gmd:MD_Keywords>
                    <gmd:keyword>
                        <gco:CharacterString>Oceanographic                          geographical
features</gco:CharacterString>
                    </gmd:keyword>
                    <gmd:type>
                        <gmd:MD_KeywordTypeCode                      codeSpace="SeaDataNet"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Ke
ywordTypeCode" codeListValue="theme">theme</gmd:MD_KeywordTypeCode>
                    </gmd:type>
                    <gmd:thesaurusName>
                        <gmd:CI_Citation>
                            <gmd:title>
                                <gco:CharacterString>GEMET   -   INSPIRE   themes,   version
1.0</gco:CharacterString>
                            </gmd:title>
                            <gmd:date>
                                <gmd:CI_Date>
                                    <gmd:date>
                                        <gco:Date>2008-06-01</gco:Date>
                                    </gmd:date>
                                    <gmd:dateType>
                                        <gmd:CI_DateTypeCode     codeSpace="ISOTC211/19115"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Da
teTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
                                    </gmd:dateType>
                                </gmd:CI_Date>
                            </gmd:date>
                        </gmd:CI_Citation>
                    </gmd:thesaurusName>
                </gmd:MD_Keywords>
            </gmd:descriptiveKeywords>
            <gmd:descriptiveKeywords>
                <gmd:MD_Keywords>
```

```xml
                       <gmd:keyword>
                          <sdn:SDN_PortCode  codeSpace="SeaDataNet"  codeListValue="BSH176"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_PortCode">Recife</sdn:SDN_PortCode>
                       </gmd:keyword>
                       <gmd:type>
                          <gmd:MD_KeywordTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Ke
ywordTypeCode"                                         codeListValue="departure_place"
codeSpace="SeaDataNet">departure_place</gmd:MD_KeywordTypeCode>
                       </gmd:type>
                       <gmd:thesaurusName>
                          <gmd:CI_Citation>
                             <gmd:title>
                                <gco:CharacterString>Ports Gazetteer</gco:CharacterString>
                             </gmd:title>
                             <gmd:alternateTitle>
                                <gco:CharacterString>C38</gco:CharacterString>
                             </gmd:alternateTitle>
                             <gmd:date>
                                <gmd:CI_Date>
                                   <gmd:date>
                                      <gco:Date>2007-09-20</gco:Date>
                                   </gmd:date>
                                   <gmd:dateType>
                                      <gmd:CI_DateTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Da
teTypeCode"                                         codeListValue="revision"
codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
                                   </gmd:dateType>
                                </gmd:CI_Date>
                             </gmd:date>
                             <gmd:edition>
                                <gco:CharacterString>2</gco:CharacterString>
                             </gmd:edition>
                             <gmd:identifier>
                                <gmd:MD_Identifier>
                                   <gmd:code>

<gco:CharacterString>https://www.seadatanet.org/urnurl/SDN:C38</gco:CharacterString
>
                                   </gmd:code>
                                </gmd:MD_Identifier>
                             </gmd:identifier>
                          </gmd:CI_Citation>
                       </gmd:thesaurusName>
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_PortCode">Salvador</sdn:SDN_PortCode>
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                       <gmd:type>
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```xml
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codeSpace="SeaDataNet">arrival_place</gmd:MD_KeywordTypeCode>
                </gmd:type>
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codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
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```xml
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countries</gco:CharacterString>
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codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
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codeSpace="SeaDataNet">arrival_country</gmd:MD_KeywordTypeCode>
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```xml
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codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
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ywordTypeCode"                                         codeListValue="platform"
codeSpace="SeaDataNet">platform</gmd:MD_KeywordTypeCode>
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teTypeCode"                                                    codeListValue="revision"
codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
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```xml
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codelists.xml#SDN_EDMERPCode">WOCE                FRANCE              -           HYDROLOGY
{acronym="WOCE"}</sdn:SDN_EDMERPCode>
              </gmd:keyword>
              <gmd:type>
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codeSpace="SeaDataNet">project</gmd:MD_KeywordTypeCode>
              </gmd:type>
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codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
```

```xml
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ywordTypeCode"                                          codeListValue="place"
codeSpace="SeaDataNet">place</gmd:MD_KeywordTypeCode>
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Areas</gco:CharacterString>
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```xml
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_MarsdenCode">5</sdn:SDN_MarsdenCode>
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                <sdn:SDN_MarsdenCode    codeSpace="SeaDataNet"    codeListValue="375"
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```

```xml
_MarsdenCode">375</sdn:SDN_MarsdenCode>
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_MarsdenCode">376</sdn:SDN_MarsdenCode>
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ywordTypeCode"                                          codeListValue="marsden_square"
codeSpace="SeaDataNet">marsden_square</gmd:MD_KeywordTypeCode>
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Squares</gco:CharacterString>
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codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
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codeListValue="TEMP"
```

```xml
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
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column</sdn:SDN_ParameterDiscoveryCode>
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                <gmd:keyword>
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codeListValue="PSAL"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_ParameterDiscoveryCode">Salinity                     of                     the                     water
column</sdn:SDN_ParameterDiscoveryCode>
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codeListValue="TSED"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_ParameterDiscoveryCode">Concentration  of  suspended  particulate  material  in  the
water column</sdn:SDN_ParameterDiscoveryCode>
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codeSpace="SeaDataNet">parameter</gmd:MD_KeywordTypeCode>
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codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
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```xml
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codeListValue="130"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
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codeListValue="30"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
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codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Ke
ywordTypeCode"                                    codeListValue="instrument"
codeSpace="SeaDataNet">instrument</gmd:MD_KeywordTypeCode>
        </gmd:type>
        <gmd:thesaurusName>
            <gmd:CI_Citation>
                <gmd:title>
                    <gco:CharacterString>SeaDataNet                        device
categories</gco:CharacterString>
                </gmd:title>
                <gmd:alternateTitle>
                    <gco:CharacterString>L05</gco:CharacterString>
                </gmd:alternateTitle>
                <gmd:date>
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                        <gmd:date>
                            <gco:Date>2007-03-01</gco:Date>
                        </gmd:date>
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                            <gmd:CI_DateTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Da
teTypeCode"                                    codeListValue="revision"
codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
                        </gmd:dateType>
                    </gmd:CI_Date>
                </gmd:date>
                <gmd:edition>
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                </gmd:edition>
                <gmd:identifier>
                    <gmd:MD_Identifier>
                        <gmd:code>

<gco:CharacterString>https://www.seadatanet.org/urnurl/SDN:L05</gco:CharacterString
```

```
>
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                           </gmd:identifier>
                       </gmd:CI_Citation>
                    </gmd:thesaurusName>
                 </gmd:MD_Keywords>
           </gmd:descriptiveKeywords>
           <gmd:resourceConstraints>
               <gmd:MD_Constraints>
                   <gmd:useLimitation>
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                   </gmd:useLimitation>
               </gmd:MD_Constraints>
           </gmd:resourceConstraints>
           <gmd:resourceConstraints>
               <gmd:MD_LegalConstraints>
                   <gmd:accessConstraints>
                       <gmd:MD_RestrictionCode        codeListValue="otherRestrictions"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Re
strictionCode">otherRestrictions</gmd:MD_RestrictionCode>
                   </gmd:accessConstraints>
                   <gmd:otherConstraints>
                       <gmx:Anchor
xlink:href="https://www.seadatanet.org/urnurl/SDN:L08::UN">Unrestricted</gmx:Anchor
>
                   </gmd:otherConstraints>
               </gmd:MD_LegalConstraints>
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               <gmd:MD_LegalConstraints>
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codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Re
strictionCode">otherRestrictions</gmd:MD_RestrictionCode>
                   </gmd:accessConstraints>
                   <gmd:otherConstraints>
                       <gmx:Anchor
xlink:href="https://www.seadatanet.org/urnurl/SDN:L08::LS">SeaDataNet
licence</gmx:Anchor>
                   </gmd:otherConstraints>
               </gmd:MD_LegalConstraints>
           </gmd:resourceConstraints>

           <gmd:spatialRepresentationType>
               <gmd:MD_SpatialRepresentationTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Sp
atialRepresentationTypeCode"
codeListValue="vector">vector</gmd:MD_SpatialRepresentationTypeCode>
           </gmd:spatialRepresentationType>
           <gmd:spatialRepresentationType>
               <gmd:MD_SpatialRepresentationTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Sp
atialRepresentationTypeCode"
codeListValue="grid">grid</gmd:MD_SpatialRepresentationTypeCode>
           </gmd:spatialRepresentationType>
```

```xml
        <gmd:language>
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ageCode" codeListValue="eng">English</gmd:LanguageCode>
        </gmd:language>
        <gmd:characterSet>
            <gmd:MD_CharacterSetCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Ch
aracterSetCode"                                          codeListValue="utf8"
codeSpace="ISOTC211/19115">utf8</gmd:MD_CharacterSetCode>
        </gmd:characterSet>
        <gmd:topicCategory>
            <gmd:MD_TopicCategoryCode>oceans</gmd:MD_TopicCategoryCode>
        </gmd:topicCategory>
        <gmd:extent>
            <gmd:EX_Extent>
                <gmd:geographicElement>
                    <gmd:EX_GeographicDescription>
                        <gmd:geographicIdentifier>
                            <gmd:MD_Identifier>
                                <gmd:code>
                                    <gco:CharacterString>South   Atlantic   Ocean,   Brasil
</gco:CharacterString>
                                </gmd:code>
                            </gmd:MD_Identifier>
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                    </gmd:EX_GeographicDescription>
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                    <gmd:EX_GeographicDescription>
                        <gmd:geographicIdentifier>
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tropical Area</gco:CharacterString>
                                </gmd:code>
                            </gmd:MD_Identifier>
                        </gmd:geographicIdentifier>
                    </gmd:EX_GeographicDescription>
                </gmd:geographicElement>
                <gmd:geographicElement>
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                        </gmd:eastBoundLongitude>
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                        </gmd:northBoundLatitude>
                    </gmd:EX_GeographicBoundingBox>
```

```xml
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                    <gmd:geographicElement>
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                            <gmd:polygon>
                                <gml:MultiCurve gml:id="mc01">
                                    <gml:curveMember>
                                        <gml:LineString gml:id="ls01">
                                            <gml:description>This is line 1</gml:description>
                                            <gml:name
codeSpace="https://www.seadatanet.org/urnurl/">line1</gml:name>
                                            <gml:posList>-68.548849    73.889864    -61.408617
72.824456 -58.026401
                                            68.136664    -56.523193    62.38344    -49.007153
59.400296</gml:posList>
                                        </gml:LineString>
                                    </gml:curveMember>
                                    <gml:curveMember>
                                        <gml:LineString gml:id="ls02">
                                            <gml:description>This is line 2</gml:description>
                                            <gml:name
codeSpace="https://www.seadatanet.org/urnurl/">line2</gml:name>
                                            <gml:posList>112.963503    17.636232    114.842479
14.866168 114.842479
                                            11.030688    111.084463    8.473704    106.574831
5.916728</gml:posList>
                                        </gml:LineString>
                                    </gml:curveMember>
                                    <gml:curveMember>
                                        <gml:LineString gml:id="ls03">
                                            <gml:description>This is line 3</gml:description>
                                            <gml:name
codeSpace="https://www.seadatanet.org/urnurl/">line3</gml:name>
                                            <gml:posList>-76.816333  -36.777203  -77.192141  -
43.722611 -80.198605
                                            -47.195299 -78.319565 -50.400867 -74.561741 -
54.674947
                                            -70.052045 -57.079131</gml:posList>
                                        </gml:LineString>
                                    </gml:curveMember>
                                </gml:MultiCurve>
                            </gmd:polygon>
                        </gmd:EX_BoundingPolygon>
                    </gmd:geographicElement>
                    <gmd:temporalElement>
                        <gmd:EX_TemporalExtent>
                            <gmd:extent>
                                <gml:TimePeriod gml:id="d1e1079">
                                    <gml:beginPosition>1994-01-
04T00:00:00Z</gml:beginPosition>
                                    <gml:endPosition>1994-02-13T00:00:00Z</gml:endPosition>
                                </gml:TimePeriod>
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                        </gmd:EX_TemporalExtent>
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                </gmd:EX_Extent>
            </gmd:extent>
```

```xml
        <!-- The referenced publication is described in the SeaDataNet citations
catalogue  -->
        <sdn:additionalDocumentation

xlink:href="http://seadatanet.maris2.nl/isocodelists/sdncodelists/publications-
Codelists.xml#SDN_PUBCode_151"
          > </sdn:additionalDocumentation>
      </sdn:SDN_DataIdentification>
    </gmd:identificationInfo>
    <gmd:distributionInfo>
      <gmd:MD_Distribution>
        <gmd:distributionFormat>
          <gmd:MD_Format>
            <gmd:name>
              <gco:CharacterString>XML</gco:CharacterString>
            </gmd:name>
            <gmd:version>
              <gco:CharacterString>1</gco:CharacterString>
            </gmd:version>
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    </gmd:distributionInfo>
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          <gmd:DQ_Scope>
            <gmd:level>
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codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Sc
opeCode"                                        codeListValue="series"
codeSpace="ISOTC211/19115">series</gmd:MD_ScopeCode>
            </gmd:level>
          </gmd:DQ_Scope>
        </gmd:scope>
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          <gmd:DQ_DomainConsistency>
            <gmd:result>
              <gmd:DQ_ConformanceResult>
                <gmd:specification>
                  <gmd:CI_Citation>
                    <gmd:title>
                      <gco:CharacterString>COMMISSION  REGULATION  (EC)  No
1205/2008  of  3  December  2008  implementing  Directive  2007/2/EC  of  the  European
Parliament  and  of  the  Council  as  regards  metadata</gco:CharacterString>
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                    <gmd:date>
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                          <gco:Date>2008-12-04</gco:Date>
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                        <gmd:dateType>
                          <gmd:CI_DateTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Da
teTypeCode" codeListValue="publication">publication</gmd:CI_DateTypeCode>
                        </gmd:dateType>
```

```xml
                  </gmd:CI_Date>
                </gmd:date>
              </gmd:CI_Citation>
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specification</gco:CharacterString>
            </gmd:explanation>
            <gmd:pass>
              <gco:Boolean>true</gco:Boolean>
            </gmd:pass>
          </gmd:DQ_ConformanceResult>
        </gmd:result>
      </gmd:DQ_DomainConsistency>
  </gmd:report>
  <gmd:report>
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        <gmd:result>
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                <gmd:title>
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1089/2010 of 23 November 2010 implementing Directive 2007/2/EC of the European
Parliament and of the Council as regards interoperability of spatial data sets and
services</gco:CharacterString>
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                    </gmd:dateType>
                  </gmd:CI_Date>
                </gmd:date>
              </gmd:CI_Citation>
            </gmd:specification>
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specification</gco:CharacterString>
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        </gmd:result>
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  </gmd:report>
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      <gmd:LI_Lineage>
        <gmd:statement>
          <gco:CharacterString>The data centres apply standard data quality
```

control procedures on all data that the centres manage. Ask the data centre for details.</gco:CharacterString>
```
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                      <gmd:MD_Identifier>
                          <gmd:code>

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                          </gmd:code>
                      </gmd:MD_Identifier>
                  </gmi:identifier>
                  <gmi:type>
                      <gmi:MI_ObjectiveTypeCode        codeListValue="persistentView"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Obje
ctiveTypeCode">persistentView</gmi:MI_ObjectiveTypeCode>
                  </gmi:type>
                  <gmi:function>
                      <gco:CharacterString>Mooring    on    the    Atlantic    Ridge,   Romanche
Canyon, current meters</gco:CharacterString>
                  </gmi:function>
                  <gmi:extent>
                      <gmd:EX_Extent>
                          <gmd:geographicElement>
                              <gmd:EX_GeographicBoundingBox>
                                  <gmd:westBoundLongitude>
                                      <gco:Decimal>-38.00</gco:Decimal>
                                  </gmd:westBoundLongitude>
                                  <gmd:eastBoundLongitude>
                                      <gco:Decimal>-38.00</gco:Decimal>
                                  </gmd:eastBoundLongitude>
                                  <gmd:southBoundLatitude>
                                      <gco:Decimal>-20.00</gco:Decimal>
                                  </gmd:southBoundLatitude>
                                  <gmd:northBoundLatitude>
                                      <gco:Decimal>-20.00</gco:Decimal>
                                  </gmd:northBoundLatitude>
                              </gmd:EX_GeographicBoundingBox>
                          </gmd:geographicElement>
                      </gmd:EX_Extent>
                  </gmi:extent>
                  <gmi:sensingInstrument>
                      <gmi:MI_Instrument id="D01">
                          <gmi:identifier>
                              <gmd:MD_Identifier>
                                  <gmd:code>
                                      <gco:CharacterString>D01</gco:CharacterString>
```

```xml
                    </gmd:code>
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                </gmi:identifier>
                <gmi:type>
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codeListValue="D01"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_DataCategoryCode">Current meters</sdn:SDN_DataCategoryCode>
                </gmi:type>
                <gmi:mountedOn>
                  <gmi:MI_Platform>
                    <gmi:identifier>
                      <gmd:MD_Identifier>
                        <gmd:code>

<gco:CharacterString>SDN:EDMO::487</gco:CharacterString>
                        </gmd:code>
                      </gmd:MD_Identifier>
                    </gmi:identifier>
                    <gmi:description>
                      <gco:CharacterString>IFREMER / OPS/LPO-LABORATORY of
PHYSICAL OCEANOGRAPHY platform</gco:CharacterString>
                    </gmi:description>
                    <gmi:sponsor>
                      <gmd:CI_ResponsibleParty>
                        <gmd:individualName>
                          <gco:CharacterString>Herlé
MERCIER</gco:CharacterString>
                        </gmd:individualName>
                        <gmd:organisationName>
                          <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode"  codeSpace="SeaDataNet"  codeListValue="487">IFREMER  /
OPS/LPO-LABORATORY of PHYSICAL OCEANOGRAPHY</sdn:SDN_EDMOCode>
                        </gmd:organisationName>
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                          <gmd:CI_Contact>
                            <gmd:phone>
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                                  <gco:CharacterString>+33 (0)2 98 22
42 88</gco:CharacterString>
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```

```xml
                <gco:CharacterString>29280</gco:CharacterString>
                                                    </gmd:postalCode>
                                                    <gmd:country>
                                                        <sdn:SDN_CountryCode
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codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">France</sdn:SDN_CountryCode>
                                                    </gmd:country>
                                                    <gmd:electronicMailAddress>

<gco:CharacterString>Herle.Mercier@ifremer.fr</gco:CharacterString>
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                                                </gmd:CI_Address>
                                            </gmd:address>
                                        </gmd:CI_Contact>
                                    </gmd:contactInfo>
                                    <gmd:role>
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leCode"                                        codeListValue="principalInvestigator"
codeSpace="ISOTC211/19115">principalInvestigator</gmd:CI_RoleCode>
                                    </gmd:role>
                                </gmd:CI_ResponsibleParty>
                            </gmi:sponsor>
                            <gmi:instrument xlink:href="D01"/>
                        </gmi:MI_Platform>
                    </gmi:mountedOn>
                </gmi:MI_Instrument>
            </gmi:sensingInstrument>
            <gmi:objectiveOccurrence>
                <gmi:MI_Event id="urn.SDN.CSR.LOCAL.FI351994800010.event.D01">
                    <gmi:identifier>
                        <gmd:MD_Identifier>
                            <gmd:code>

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g>
                            </gmd:code>
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                    </gmi:identifier>
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                        <gmi:MI_TriggerCode                        codeListValue="manual"
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gerCode">manual</gmi:MI_TriggerCode>
                    </gmi:trigger>
                    <gmi:context>
                        <gmi:MI_ContextCode                codeListValue="acquisition"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">acquisition</gmi:MI_ContextCode>
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enceCode">instantaneous</gmi:MI_SequenceCode>
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```

```xml
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            id="urn.SDN.CSR.LOCAL.FI351994800010.objective.H72">
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                <gmd:MD_Identifier>
                    <gmd:code>

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tring>

                    </gmd:code>
                </gmd:MD_Identifier>
            </gmi:identifier>
            <gmi:type>
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codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Obje
ctiveTypeCode">persistentView</gmi:MI_ObjectiveTypeCode>
            </gmi:type>
            <gmi:function>
                <gco:CharacterString>Mooring  on  the  Atlantic  Ridge,  Romanche
Canyon, thermistor chain</gco:CharacterString>
            </gmi:function>
            <gmi:extent>
                <gmd:EX_Extent>
                    <gmd:geographicElement>
                        <gmd:EX_GeographicBoundingBox>
                            <gmd:westBoundLongitude>
                                <gco:Decimal>-38.00</gco:Decimal>
                            </gmd:westBoundLongitude>
                            <gmd:eastBoundLongitude>
                                <gco:Decimal>-38.00</gco:Decimal>
                            </gmd:eastBoundLongitude>
                            <gmd:southBoundLatitude>
                                <gco:Decimal>-20.00</gco:Decimal>
                            </gmd:southBoundLatitude>
                            <gmd:northBoundLatitude>
                                <gco:Decimal>-20.00</gco:Decimal>
                            </gmd:northBoundLatitude>
                        </gmd:EX_GeographicBoundingBox>
                    </gmd:geographicElement>
                </gmd:EX_Extent>
            </gmi:extent>
            <gmi:sensingInstrument>
                <gmi:MI_Instrument id="H72">
                    <gmi:identifier>
                        <gmd:MD_Identifier>
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                            </gmd:code>
                        </gmd:MD_Identifier>
```

```xml
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codeListValue="H72"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_DataCategoryCode">Thermistor chain</sdn:SDN_DataCategoryCode>
            </gmi:type>
            <gmi:mountedOn>
                <gmi:MI_Platform>
                    <gmi:identifier>
                        <gmd:MD_Identifier>
                            <gmd:code>

<gco:CharacterString>SDN:EDMO::487</gco:CharacterString>
                            </gmd:code>
                        </gmd:MD_Identifier>
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                        <gco:CharacterString>IFREMER / OPS/LPO-LABORATORY of
PHYSICAL OCEANOGRAPHY platform</gco:CharacterString>
                    </gmi:description>
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                        <gmd:CI_ResponsibleParty>
                            <gmd:individualName>
                                <gco:CharacterString>Herlé
MERCIER</gco:CharacterString>
                            </gmd:individualName>
                            <gmd:organisationName>
                                <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode" codeSpace="SeaDataNet" codeListValue="487">IFREMER /
OPS/LPO-LABORATORY of PHYSICAL OCEANOGRAPHY</sdn:SDN_EDMOCode>
                            </gmd:organisationName>
                            <gmd:contactInfo>
                                <gmd:CI_Contact>
                                    <gmd:phone>
                                        <gmd:CI_Telephone>
                                            <gmd:voice>
                                                <gco:CharacterString>+33 (0)2 98 22
42 88</gco:CharacterString>
                                            </gmd:voice>
                                        </gmd:CI_Telephone>
                                    </gmd:phone>
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<gco:CharacterString>29280</gco:CharacterString>
```

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_CountryCode">France</sdn:SDN_CountryCode>
                                                    </gmd:country>
                                                    <gmd:electronicMailAddress>

<gco:CharacterString>Herle.Mercier@ifremer.fr</gco:CharacterString>
                                                    </gmd:electronicMailAddress>
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                                            </gmd:address>
                                        </gmd:CI_Contact>
                                    </gmd:contactInfo>
                                    <gmd:role>
                                        <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                          codeListValue="principalInvestigator"
codeSpace="ISOTC211/19115">principalInvestigator</gmd:CI_RoleCode>
                                    </gmd:role>
                                </gmd:CI_ResponsibleParty>
                            </gmi:sponsor>
                            <gmi:instrument xlink:href="H72"/>
                        </gmi:MI_Platform>
                    </gmi:mountedOn>
                </gmi:MI_Instrument>
            </gmi:sensingInstrument>
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                        <gmd:MD_Identifier>
                            <gmd:code>

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g>
                            </gmd:code>
                        </gmd:MD_Identifier>
                    </gmi:identifier>
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                        <gmi:MI_TriggerCode                          codeListValue="manual"
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gerCode">manual</gmi:MI_TriggerCode>
                    </gmi:trigger>
                    <gmi:context>
                        <gmi:MI_ContextCode                          codeListValue="acquisition"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">acquisition</gmi:MI_ContextCode>
                    </gmi:context>
                    <gmi:sequence>
                        <gmi:MI_SequenceCode                          codeListValue="instantaneous"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
enceCode">instantaneous</gmi:MI_SequenceCode>
                    </gmi:sequence>
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```

```xml
                </gmi:time>
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            </gmi:objectiveOccurrence>
          </sdn:SDN_Objective>
        </gmi:objective>
        <gmi:objective>
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              id="urn.SDN.CSR.LOCAL.FI351994800010.objective.H10">
            <gmi:identifier>
              <gmd:MD_Identifier>
                <gmd:code>

<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.objective.H10</gco:CharacterS
tring>
                </gmd:code>
              </gmd:MD_Identifier>
            </gmi:identifier>
            <gmi:type>
              <gmi:MI_ObjectiveTypeCode codeListValue="instantaneousCollection"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Obje
ctiveTypeCode">instantaneousCollection</gmi:MI_ObjectiveTypeCode>
            </gmi:type>
            <gmi:function>
              <gco:CharacterString>Neil      Brown      CTD      casts,      up      to
6000m</gco:CharacterString>
            </gmi:function>
            <gmi:sensingInstrument>
              <gmi:MI_Instrument id="H10">
                <gmi:identifier>
                  <gmd:MD_Identifier>
                    <gmd:code>
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                    </gmd:code>
                  </gmd:MD_Identifier>
                </gmi:identifier>
                <gmi:type>
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codeListValue="H10"
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_DataCategoryCode">CTD stations</sdn:SDN_DataCategoryCode>
                </gmi:type>
                <gmi:mountedOn>
                  <gmi:MI_Platform>
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                        <gmd:code>

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                      </gmd:MD_Identifier>
                    </gmi:identifier>
                    <gmi:description>
                      <gco:CharacterString>LABORATORY OF SCIENCES OF MARINE
ENVIRONMENT (LEMAR) platform</gco:CharacterString>
                    </gmi:description>
                    <gmi:sponsor>
```

```xml
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                                    <gmd:individualName>
                                        <gco:CharacterString>Laurent
MEMERY</gco:CharacterString>
                                    </gmd:individualName>
                                    <gmd:organisationName>
                                        <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode" codeSpace="SeaDataNet" codeListValue="1046">LABORATORY
OF SCIENCES OF MARINE ENVIRONMENT (LEMAR)</sdn:SDN_EDMOCode>
                                    </gmd:organisationName>
                                    <gmd:contactInfo>
                                        <gmd:CI_Contact>
                                            <gmd:phone>
                                                <gmd:CI_Telephone>
                                                    <gmd:voice>
                                                        <gco:CharacterString>+33 (0)2 98 49
88 97</gco:CharacterString>
                                                    </gmd:voice>
                                                </gmd:CI_Telephone>
                                            </gmd:phone>
                                            <gmd:address>
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<gco:CharacterString>IUEM,Technopole        Brest        Iroise,Place        Nicolas
Copernic</gco:CharacterString>
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<gco:CharacterString>PLOUZANE</gco:CharacterString>
                                                    </gmd:city>
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<gco:CharacterString>29280</gco:CharacterString>
                                                    </gmd:postalCode>
                                                    <gmd:country>
                                                        <sdn:SDN_CountryCode
codeSpace="SeaDataNet"                                        codeListValue="FR"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
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                                                    </gmd:country>
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<gco:CharacterString>Laurent.Memery@univ-brest.fr</gco:CharacterString>
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                                            </gmd:address>
                                        </gmd:CI_Contact>
                                    </gmd:contactInfo>
                                    <gmd:role>
                                        <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                        codeListValue="principalInvestigator"
codeSpace="ISOTC211/19115">principalInvestigator</gmd:CI_RoleCode>
                                    </gmd:role>
```

```xml
                                </gmd:CI_ResponsibleParty>
                            </gmi:sponsor>
                            <gmi:instrument xlink:href="H10"/>
                        </gmi:MI_Platform>
                    </gmi:mountedOn>
                </gmi:MI_Instrument>
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                    <gmi:identifier>
                        <gmd:MD_Identifier>
                            <gmd:code>

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                            </gmd:code>
                        </gmd:MD_Identifier>
                    </gmi:identifier>
                    <gmi:trigger>
                        <gmi:MI_TriggerCode                  codeListValue="manual"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Trig
gerCode">manual</gmi:MI_TriggerCode>
                    </gmi:trigger>
                    <gmi:context>
                        <gmi:MI_ContextCode              codeListValue="acquisition"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">acquisition</gmi:MI_ContextCode>
                    </gmi:context>
                    <gmi:sequence>
                        <gmi:MI_SequenceCode           codeListValue="instantaneous"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
enceCode">instantaneous</gmi:MI_SequenceCode>
                    </gmi:sequence>
                    <gmi:time>
                        <gco:DateTime>1996-11-04T00:00:00Z</gco:DateTime>
                    </gmi:time>
                </gmi:MI_Event>
            </gmi:objectiveOccurrence>
            <sdn:SDN_SamplingActivity>
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codeListValue="CSRU001"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CSRUnitCode">number of stations</sdn:SDN_CSRUnitCode>
                </sdn:unit>
            </sdn:SDN_SamplingActivity>
        </sdn:SDN_Objective>
    </gmi:objective>
    <gmi:objective>
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            id="urn.SDN.CSR.LOCAL.FI351994800010.objective.H09">
            <gmi:identifier>
                <gmd:MD_Identifier>
                    <gmd:code>
```

```xml
<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.objective.H09</gco:CharacterS
tring>
                        </gmd:code>
                    </gmd:MD_Identifier>
                </gmi:identifier>
                <gmi:type>
                    <gmi:MI_ObjectiveTypeCode codeListValue="instantaneousCollection"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Obje
ctiveTypeCode">instantaneousCollection</gmi:MI_ObjectiveTypeCode>
                </gmi:type>
                <gmi:function>
                    <gco:CharacterString>Water     bottle     sampling,     rosette     of     64
bottles</gco:CharacterString>
                </gmi:function>
                <gmi:sensingInstrument>
                    <gmi:MI_Instrument id="H09">
                        <gmi:identifier>
                            <gmd:MD_Identifier>
                                <gmd:code>
                                    <gco:CharacterString>H09</gco:CharacterString>
                                </gmd:code>
                            </gmd:MD_Identifier>
                        </gmi:identifier>
                        <gmi:type>
                            <sdn:SDN_DataCategoryCode              codeSpace="SeaDataNet"
codeListValue="H09"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_DataCategoryCode">Water bottle stations</sdn:SDN_DataCategoryCode>
                        </gmi:type>
                        <gmi:mountedOn>
                            <gmi:MI_Platform>
                                <gmi:identifier>
                                    <gmd:MD_Identifier>
                                        <gmd:code>

<gco:CharacterString>SDN:EDMO::487</gco:CharacterString>
                                        </gmd:code>
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                                </gmi:identifier>
                                <gmi:description>
                                    <gco:CharacterString>IFREMER / OPS/LPO-LABORATORY of
PHYSICAL OCEANOGRAPHY platform</gco:CharacterString>
                                </gmi:description>
                                <gmi:sponsor>
                                    <gmd:CI_ResponsibleParty>
                                        <gmd:individualName>
                                            <gco:CharacterString>Michel
ARHAN</gco:CharacterString>
                                        </gmd:individualName>
                                        <gmd:organisationName>
                                            <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode"  codeSpace="SeaDataNet"  codeListValue="487">IFREMER  /
OPS/LPO-LABORATORY of PHYSICAL OCEANOGRAPHY</sdn:SDN_EDMOCode>
                                        </gmd:organisationName>
                                        <gmd:contactInfo>
```

```xml
                              <gmd:CI_Contact>
                                  <gmd:phone>
                                     <gmd:CI_Telephone>
                                        <gmd:voice>
                                           <gco:CharacterString>+33 (0)2 98 22
42 85</gco:CharacterString>
                                        </gmd:voice>
                                     </gmd:CI_Telephone>
                                  </gmd:phone>
                                  <gmd:address>
                                     <gmd:CI_Address>
                                        <gmd:deliveryPoint>

<gco:CharacterString>BP70</gco:CharacterString>
                                        </gmd:deliveryPoint>
                                        <gmd:city>

<gco:CharacterString>PLOUZANE</gco:CharacterString>
                                        </gmd:city>
                                        <gmd:postalCode>

<gco:CharacterString>29280</gco:CharacterString>
                                        </gmd:postalCode>
                                        <gmd:country>
                                           <sdn:SDN_CountryCode
codeSpace="SeaDataNet"                                  codeListValue="FR"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">France</sdn:SDN_CountryCode>
                                        </gmd:country>
                                        <gmd:electronicMailAddress>

<gco:CharacterString>Michel.Arhan@ifremer.fr</gco:CharacterString>
                                        </gmd:electronicMailAddress>
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                                  </gmd:address>
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                           </gmd:contactInfo>
                           <gmd:role>
                              <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                  codeListValue="principalInvestigator"
codeSpace="ISOTC211/19115">principalInvestigator</gmd:CI_RoleCode>
                           </gmd:role>
                        </gmd:CI_ResponsibleParty>
                     </gmi:sponsor>
                     <gmi:instrument xlink:href="H09"/>
                  </gmi:MI_Platform>
               </gmi:mountedOn>
            </gmi:MI_Instrument>
         </gmi:sensingInstrument>
         <gmi:objectiveOccurrence>
            <gmi:MI_Event id="urn.SDN.CSR.LOCAL.FI351994800010.event.H09">
               <gmi:identifier>
                  <gmd:MD_Identifier>
                     <gmd:code>
```

```xml
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g>
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                        </gmi:identifier>
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                            <gmi:MI_TriggerCode                     codeListValue="manual"
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gerCode">manual</gmi:MI_TriggerCode>
                        </gmi:trigger>
                        <gmi:context>
                            <gmi:MI_ContextCode            codeListValue="acquisition"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">acquisition</gmi:MI_ContextCode>
                        </gmi:context>
                        <gmi:sequence>
                            <gmi:MI_SequenceCode          codeListValue="instantaneous"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
enceCode">instantaneous</gmi:MI_SequenceCode>
                        </gmi:sequence>
                        <gmi:time>
                            <gco:DateTime>1996-11-04T00:00:00Z</gco:DateTime>
                        </gmi:time>
                    </gmi:MI_Event>
                </gmi:objectiveOccurrence>
                <sdn:SDN_SamplingActivity>
                    <sdn:quantity>40</sdn:quantity>
                    <sdn:unit>
                        <sdn:SDN_CSRUnitCode                     codeSpace="SeaDataNet"
codeListValue="CSRU001"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CSRUnitCode">number of stations</sdn:SDN_CSRUnitCode>
                    </sdn:unit>
                </sdn:SDN_SamplingActivity>
            </sdn:SDN_Objective>
        </gmi:objective>
        <gmi:objective>
            <sdn:SDN_Objective gco:isoType="MI_Objective_Type"
                id="urn.SDN.CSR.LOCAL.FI351994800010.objective.G74">
                <gmi:identifier>
                    <gmd:MD_Identifier>
                        <gmd:code>

<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.objective.G74</gco:CharacterS
tring>
                        </gmd:code>
                    </gmd:MD_Identifier>
                </gmi:identifier>
                <gmi:type>
                    <gmi:MI_ObjectiveTypeCode codeListValue="instantaneousCollection"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Obje
ctiveTypeCode">instantaneousCollection</gmi:MI_ObjectiveTypeCode>
                </gmi:type>
                <gmi:function>
                    <gco:CharacterString> 50 NM multibeam</gco:CharacterString>
                </gmi:function>
```

```xml
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    <gmi:MI_Instrument id="G74">
        <gmi:identifier>
            <gmd:MD_Identifier>
                <gmd:code>
                    <gco:CharacterString>G74</gco:CharacterString>
                </gmd:code>
            </gmd:MD_Identifier>
        </gmi:identifier>
        <gmi:type>
            <sdn:SDN_DataCategoryCode                codeSpace="SeaDataNet"
codeListValue="G74"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_DataCategoryCode">Multi-beam echosounding</sdn:SDN_DataCategoryCode>
        </gmi:type>
        <gmi:mountedOn>
            <gmi:MI_Platform>
                <gmi:identifier>
                    <gmd:MD_Identifier>
                        <gmd:code>

<gco:CharacterString>SDN:EDMO::1480</gco:CharacterString>
                        </gmd:code>
                    </gmd:MD_Identifier>
                </gmi:identifier>
                <gmi:description>
                    <gco:CharacterString>FPS Economy, Belgian Continental
Shelf platform</gco:CharacterString>
                </gmi:description>
                <gmi:sponsor>
                    <gmd:CI_ResponsibleParty>
                        <gmd:individualName>
                            <gco:CharacterString>                        Koen
Degrendele</gco:CharacterString>
                        </gmd:individualName>
                        <gmd:organisationName>
                            <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode"    codeSpace="SeaDataNet"    codeListValue="1480">FPS
Economy, Belgian Continental Shelf</sdn:SDN_EDMOCode>
                        </gmd:organisationName>
                        <gmd:contactInfo>
                            <gmd:CI_Contact>
                                <gmd:phone>
                                    <gmd:CI_Telephone>
                                        <gmd:voice>
                                            <gco:CharacterString>+32  (0)2  277
72 53</gco:CharacterString>
                                        </gmd:voice>
                                        <gmd:facsimile>
                                            <gco:CharacterString>+32  (0)2  277
54 13</gco:CharacterString>
                                        </gmd:facsimile>
                                    </gmd:CI_Telephone>
                                </gmd:phone>
                                <gmd:address>
```

```xml
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                                          <gmd:deliveryPoint>
                                             <gco:CharacterString>Boulevard    du
Roi Albert II, 16</gco:CharacterString>
                                          </gmd:deliveryPoint>
                                          <gmd:city>

<gco:CharacterString>Brussels</gco:CharacterString>
                                          </gmd:city>
                                          <gmd:postalCode>
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1000</gco:CharacterString>
                                          </gmd:postalCode>
                                          <gmd:country>
                                             <sdn:SDN_CountryCode
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_CountryCode">Belgium</sdn:SDN_CountryCode>
                                          </gmd:country>
                                          <gmd:electronicMailAddress>

<gco:CharacterString>philippe.degavre@mineco.fgov.be</gco:CharacterString>
                                          </gmd:electronicMailAddress>
                                       </gmd:CI_Address>
                                    </gmd:address>
                                 </gmd:CI_Contact>
                              </gmd:contactInfo>
                              <gmd:role>
                                 <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                codeListValue="principalInvestigator"
codeSpace="ISOTC211/19115">principalInvestigator</gmd:CI_RoleCode>
                              </gmd:role>
                           </gmd:CI_ResponsibleParty>
                        </gmi:sponsor>
                        <gmi:instrument xlink:href="G74"/>
                     </gmi:MI_Platform>
                  </gmi:mountedOn>
               </gmi:MI_Instrument>
            </gmi:sensingInstrument>
            <gmi:objectiveOccurrence>
               <gmi:MI_Event id="urn.SDN.CSR.LOCAL.FI351994800010.event.G74">
                  <gmi:identifier>
                     <gmd:MD_Identifier>
                        <gmd:code>

<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.event.G74</gco:CharacterStrin
g>
                        </gmd:code>
                     </gmd:MD_Identifier>
                  </gmi:identifier>
                  <gmi:trigger>
                     <gmi:MI_TriggerCode                        codeListValue="manual"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Trig
gerCode">manual</gmi:MI_TriggerCode>
                  </gmi:trigger>
```

```xml
                    <gmi:context>
                        <gmi:MI_ContextCode                codeListValue="acquisition"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">acquisition</gmi:MI_ContextCode>
                    </gmi:context>
                    <gmi:sequence>
                        <gmi:MI_SequenceCode          codeListValue="instantaneous"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
enceCode">instantaneous</gmi:MI_SequenceCode>
                    </gmi:sequence>
                    <gmi:time>
                        <gco:DateTime>2011-10-07T00:00:00</gco:DateTime>
                    </gmi:time>
                </gmi:MI_Event>
            </gmi:objectiveOccurrence>
            <sdn:SDN_SamplingActivity>
                <sdn:quantity>18</sdn:quantity>
                <sdn:unit>
                    <sdn:SDN_CSRUnitCode                      codeSpace="SeaDataNet"
codeListValue="CSRU003"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CSRUnitCode">activity duration in hours</sdn:SDN_CSRUnitCode>
                </sdn:unit>
            </sdn:SDN_SamplingActivity>
        </sdn:SDN_Objective>
    </gmi:objective>
    <gmi:objective>
        <sdn:SDN_Objective gco:isoType="MI_Objective_Type"
            id="urn.SDN.CSR.LOCAL.FI351994800010.objective.B90">
            <gmi:identifier>
                <gmd:MD_Identifier>
                    <gmd:code>

<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.objective.B90</gco:CharacterS
tring>
                    </gmd:code>
                </gmd:MD_Identifier>
            </gmi:identifier>
            <gmi:type>
                <gmi:MI_ObjectiveTypeCode codeListValue="instantaneousCollection"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Obje
ctiveTypeCode">instantaneousCollection</gmi:MI_ObjectiveTypeCode>
            </gmi:type>
            <gmi:function>
                <gco:CharacterString>Psetta           maxima              bio-
measurements</gco:CharacterString>
            </gmi:function>
            <gmi:sensingInstrument>
                <gmi:MI_Instrument id="B90">
                    <gmi:identifier>
                        <gmd:MD_Identifier>
                            <gmd:code>
                                <gco:CharacterString>B90</gco:CharacterString>
                            </gmd:code>
                        </gmd:MD_Identifier>
                    </gmi:identifier>
```

```xml
                <gmi:type>
                    <sdn:SDN_DataCategoryCode                codeSpace="SeaDataNet"
codeListValue="B90"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_DataCategoryCode">Other                                      biological/fisheries
measurements</sdn:SDN_DataCategoryCode>
                </gmi:type>
                <gmi:mountedOn>
                    <gmi:MI_Platform>
                        <gmi:identifier>
                            <gmd:MD_Identifier>
                                <gmd:code>

<gco:CharacterString>SDN:EDMO::1478</gco:CharacterString>
                                </gmd:code>
                            </gmd:MD_Identifier>
                        </gmi:identifier>
                        <gmi:description>
                            <gco:CharacterString>Institute  for  Agricultural  and
Fisheries Research, Animal Sciences Unit - Fisheries platform</gco:CharacterString>
                        </gmi:description>
                        <gmi:sponsor>
                            <gmd:CI_ResponsibleParty>
                                <gmd:individualName>
                                    <gco:CharacterString>Dr                  Kris
Hostens</gco:CharacterString>
                                </gmd:individualName>
                                <gmd:organisationName>
                                    <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode"  codeSpace="SeaDataNet"  codeListValue="1478">Institute
for   Agricultural   and   Fisheries   Research,   Animal   Sciences   Unit   -
Fisheries</sdn:SDN_EDMOCode>
                                </gmd:organisationName>
                                <gmd:contactInfo>
                                    <gmd:CI_Contact>
                                        <gmd:phone>
                                            <gmd:CI_Telephone>
                                                <gmd:voice>
                                                    <gco:CharacterString>+32   59   569
848</gco:CharacterString>
                                                </gmd:voice>
                                                <gmd:facsimile>
                                                    <gco:CharacterString>+32  59  33  06
29</gco:CharacterString>
                                                </gmd:facsimile>
                                            </gmd:CI_Telephone>
                                        </gmd:phone>
                                        <gmd:address>
                                            <gmd:CI_Address>
                                                <gmd:deliveryPoint>
                                                    <gco:CharacterString>Ankerstraat 1
</gco:CharacterString>
                                                </gmd:deliveryPoint>
                                                <gmd:city>
```

```xml
<gco:CharacterString>Oostende</gco:CharacterString>
                                        </gmd:city>
                                        <gmd:postalCode>

<gco:CharacterString>8400</gco:CharacterString>
                                        </gmd:postalCode>
                                        <gmd:country>
                                            <sdn:SDN_CountryCode
codeSpace="SeaDataNet"                                        codeListValue="BE"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">Belgium</sdn:SDN_CountryCode>
                                        </gmd:country>
                                        <gmd:electronicMailAddress>

<gco:CharacterString>kris.hostens@ilvo.vlaanderen.be</gco:CharacterString>
                                        </gmd:electronicMailAddress>
                                    </gmd:CI_Address>
                                </gmd:address>
                            </gmd:CI_Contact>
                        </gmd:contactInfo>
                        <gmd:role>
                            <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                        codeListValue="principalInvestigator"
codeSpace="ISOTC211/19115">principalInvestigator</gmd:CI_RoleCode>
                            </gmd:role>
                        </gmd:CI_ResponsibleParty>
                    </gmi:sponsor>
                    <gmi:instrument xlink:href="B90"/>
                </gmi:MI_Platform>
            </gmi:mountedOn>
        </gmi:MI_Instrument>
    </gmi:sensingInstrument>
    <gmi:objectiveOccurrence>
        <gmi:MI_Event id="urn.SDN.CSR.LOCAL.FI351994800010.event.B90">
            <gmi:identifier>
                <gmd:MD_Identifier>
                    <gmd:code>

<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.event.B90</gco:CharacterStrin
g>
                    </gmd:code>
                </gmd:MD_Identifier>
            </gmi:identifier>
            <gmi:trigger>
                <gmi:MI_TriggerCode                         codeListValue="manual"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Trig
gerCode">manual</gmi:MI_TriggerCode>
            </gmi:trigger>
            <gmi:context>
                <gmi:MI_ContextCode                    codeListValue="acquisition"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">acquisition</gmi:MI_ContextCode>
            </gmi:context>
            <gmi:sequence>
                <gmi:MI_SequenceCode                   codeListValue="instantaneous"
```

```xml
    codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
enceCode">instantaneous</gmi:MI_SequenceCode>
                        </gmi:sequence>
                        <gmi:time>
                            <gco:DateTime>2011-10-07T00:00:00</gco:DateTime>
                        </gmi:time>
                    </gmi:MI_Event>
                </gmi:objectiveOccurrence>
                <sdn:SDN_SamplingActivity>
                    <sdn:quantity>7</sdn:quantity>
                    <sdn:unit>
                        <sdn:SDN_CSRUnitCode                      codeSpace="SeaDataNet"
codeListValue="CSRU020"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CSRUnitCode">number of specimens</sdn:SDN_CSRUnitCode>
                    </sdn:unit>
                </sdn:SDN_SamplingActivity>
            </sdn:SDN_Objective>
        </gmi:objective>
        <gmi:objective>
            <sdn:SDN_Objective gco:isoType="MI_Objective_Type"
                id="urn.SDN.CSR.LOCAL.FI351994800010.objective.B18">
                <gmi:identifier>
                    <gmd:MD_Identifier>
                        <gmd:code>

<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.objective.B18</gco:CharacterS
tring>
                        </gmd:code>
                    </gmd:MD_Identifier>
                </gmi:identifier>
                <gmi:type>
                    <gmi:MI_ObjectiveTypeCode codeListValue="instantaneousCollection"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Obje
ctiveTypeCode">instantaneousCollection</gmi:MI_ObjectiveTypeCode>
                </gmi:type>
                <gmi:function>
                    <gco:CharacterString>macrobenthos         -        Van        Veen
grab</gco:CharacterString>
                </gmi:function>
                <gmi:sensingInstrument>
                    <gmi:MI_Instrument id="B18">
                        <gmi:identifier>
                            <gmd:MD_Identifier>
                                <gmd:code>
                                    <gco:CharacterString>B18</gco:CharacterString>
                                </gmd:code>
                            </gmd:MD_Identifier>
                        </gmi:identifier>
                        <gmi:type>
                            <sdn:SDN_DataCategoryCode          codeSpace="SeaDataNet"
codeListValue="B18"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_DataCategoryCode">Zoobenthos</sdn:SDN_DataCategoryCode>
                        </gmi:type>
                        <gmi:mountedOn>
```

```xml
<gmi:MI_Platform>
    <gmi:identifier>
        <gmd:MD_Identifier>
            <gmd:code>
                <gco:CharacterString>SDN:EDMO::1478</gco:CharacterString>
            </gmd:code>
        </gmd:MD_Identifier>
    </gmi:identifier>
    <gmi:description>
        <gco:CharacterString>Institute for Agricultural and
Fisheries Research, Animal Sciences Unit - Fisheries platform</gco:CharacterString>
    </gmi:description>
    <gmi:sponsor>
        <gmd:CI_ResponsibleParty>
            <gmd:individualName>
                <gco:CharacterString>Dr                  Kris
Hostens</gco:CharacterString>
            </gmd:individualName>
            <gmd:organisationName>
                <sdn:SDN_EDMOCode
codeList="https://edmo.seadatanet.org/isocodelists/sdncodelists/edmo-edmerp-
codelists.xml#SDN_EDMOCode" codeSpace="SeaDataNet" codeListValue="1478">Institute
for Agricultural and Fisheries Research, Animal Sciences Unit -
Fisheries</sdn:SDN_EDMOCode>
            </gmd:organisationName>
            <gmd:contactInfo>
                <gmd:CI_Contact>
                    <gmd:phone>
                        <gmd:CI_Telephone>
                            <gmd:voice>
                                <gco:CharacterString>+32  59  569
848</gco:CharacterString>
                            </gmd:voice>
                            <gmd:facsimile>
                                <gco:CharacterString>+32 59 33 06
29</gco:CharacterString>
                            </gmd:facsimile>
                        </gmd:CI_Telephone>
                    </gmd:phone>
                    <gmd:address>
                        <gmd:CI_Address>
                            <gmd:deliveryPoint>
                                <gco:CharacterString>Ankerstraat 1
</gco:CharacterString>
                            </gmd:deliveryPoint>
                            <gmd:city>
                                <gco:CharacterString>Oostende</gco:CharacterString>
                            </gmd:city>
                            <gmd:postalCode>
                                <gco:CharacterString>8400</gco:CharacterString>
                            </gmd:postalCode>
                            <gmd:country>
                                <sdn:SDN_CountryCode
```

```xml
codeSpace="SeaDataNet"                                        codeListValue="BE"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CountryCode">Belgium</sdn:SDN_CountryCode>
                                        </gmd:country>
                                        <gmd:electronicMailAddress>

<gco:CharacterString>kris.hostens@ilvo.vlaanderen.be</gco:CharacterString>
                                        </gmd:electronicMailAddress>
                                    </gmd:CI_Address>
                                </gmd:address>
                            </gmd:CI_Contact>
                        </gmd:contactInfo>
                        <gmd:role>
                            <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Ro
leCode"                                        codeListValue="principalInvestigator"
codeSpace="ISOTC211/19115">principalInvestigator</gmd:CI_RoleCode>
                        </gmd:role>
                    </gmd:CI_ResponsibleParty>
                </gmi:sponsor>
                <gmi:instrument xlink:href="B18"/>
            </gmi:MI_Platform>
        </gmi:mountedOn>
    </gmi:MI_Instrument>
</gmi:sensingInstrument>
<gmi:objectiveOccurrence>
    <gmi:MI_Event id="urn.SDN.CSR.LOCAL.FI351994800010.event.B18">
        <gmi:identifier>
            <gmd:MD_Identifier>
                <gmd:code>

<gco:CharacterString>urn.SDN.CSR.LOCAL.FI351994800010.event.B18</gco:CharacterStrin
g>
                </gmd:code>
            </gmd:MD_Identifier>
        </gmi:identifier>
        <gmi:trigger>
            <gmi:MI_TriggerCode                        codeListValue="manual"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Trig
gerCode">manual</gmi:MI_TriggerCode>
        </gmi:trigger>
        <gmi:context>
            <gmi:MI_ContextCode                        codeListValue="acquisition"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">acquisition</gmi:MI_ContextCode>
        </gmi:context>
        <gmi:sequence>
            <gmi:MI_SequenceCode                        codeListValue="instantaneous"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
enceCode">instantaneous</gmi:MI_SequenceCode>
        </gmi:sequence>
        <gmi:time>
            <gco:DateTime>2011-10-07T00:00:00</gco:DateTime>
        </gmi:time>
    </gmi:MI_Event>
</gmi:objectiveOccurrence>
```

```xml
                    <sdn:SDN_SamplingActivity>
                        <sdn:quantity>349</sdn:quantity>
                        <sdn:unit>
                            <sdn:SDN_CSRUnitCode                     codeSpace="SeaDataNet"
codeListValue="CSRU006"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList.xml#SDN
_CSRUnitCode">number of samples</sdn:SDN_CSRUnitCode>
                        </sdn:unit>
                    </sdn:SDN_SamplingActivity>
                </sdn:SDN_Objective>
            </gmi:objective>
            <gmi:operation>
                <gmi:MI_Operation id="urn.SDN.CSR.LOCAL.FI351994800010">
                    <gmi:description>
                        <gco:CharacterString>This  is  an  example  provided  to  describe
SeaDataNet XML V1 for CSR. The included information is provided only to illustrate
the XML structure and all possibilities. </gco:CharacterString>
                    </gmi:description>
                    <gmi:citation>
                        <gmd:CI_Citation>
                            <gmd:title>
                                <gco:CharacterString>CITHER 2 LEG 1</gco:CharacterString>
                            </gmd:title>
                            <gmd:alternateTitle>
                                <gco:CharacterString>FI351994800010</gco:CharacterString>
                            </gmd:alternateTitle>
                            <gmd:date>
                                <gmd:CI_Date>
                                    <gmd:date>
                                        <gco:Date>1996-11-04</gco:Date>
                                    </gmd:date>
                                    <gmd:dateType>
                                        <gmd:CI_DateTypeCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_Da
teTypeCode"                                      codeListValue="revision"
codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
                                    </gmd:dateType>
                                </gmd:CI_Date>
                            </gmd:date>
                        </gmd:CI_Citation>
                    </gmi:citation>
                    <gmi:status>
                        <gmd:MD_ProgressCode                         codeListValue="completed"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_Pr
ogressCode">completed</gmd:MD_ProgressCode>
                    </gmi:status>
                    <gmi:significantEvent>
                        <gmi:MI_Event>
                            <gmi:identifier>
                                <gmd:MD_Identifier>
                                    <gmd:code>
                                        <gco:CharacterString>cruise-
start</gco:CharacterString>
                                    </gmd:code>
                                </gmd:MD_Identifier>
                            </gmi:identifier>
```

```xml
                    <gmi:trigger>
                        <gmi:MI_TriggerCode                        codeListValue="manual"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Trig
gerCode">manual</gmi:MI_TriggerCode>
                    </gmi:trigger>
                    <gmi:context>
                        <gmi:MI_ContextCode                        codeListValue="wayPoint"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">wayPoint</gmi:MI_ContextCode>
                    </gmi:context>
                    <gmi:sequence>
                        <gmi:MI_SequenceCode                        codeListValue="start"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
enceCode">start</gmi:MI_SequenceCode>
                    </gmi:sequence>
                    <gmi:time>
                        <gco:DateTime>1994-01-04T00:00:00Z</gco:DateTime>
                    </gmi:time>
                </gmi:MI_Event>
            </gmi:significantEvent>
            <gmi:significantEvent
xlink:href="urn.SDN.CSR.LOCAL.FI351994800010.event.D01"/>
            <gmi:significantEvent
xlink:href="urn.SDN.CSR.LOCAL.FI351994800010.event.H72"/>
            <gmi:significantEvent
xlink:href="urn.SDN.CSR.LOCAL.FI351994800010.event.H10"/>
            <gmi:significantEvent
xlink:href="urn.SDN.CSR.LOCAL.FI351994800010.event.H09"/>
            <gmi:significantEvent
xlink:href="urn.SDN.CSR.LOCAL.FI351994800010.event.G74"/>
            <gmi:significantEvent
xlink:href="urn.SDN.CSR.LOCAL.FI351994800010.event.B90"/>
            <gmi:significantEvent
xlink:href="urn.SDN.CSR.LOCAL.FI351994800010.event.B18"/>
            <gmi:significantEvent>
                <gmi:MI_Event>
                    <gmi:identifier>
                        <gmd:MD_Identifier>
                            <gmd:code>
                                <gco:CharacterString>cruise-end</gco:CharacterString>
                            </gmd:code>
                        </gmd:MD_Identifier>
                    </gmi:identifier>
                    <gmi:trigger>
                        <gmi:MI_TriggerCode                        codeListValue="manual"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Trig
gerCode">manual</gmi:MI_TriggerCode>
                    </gmi:trigger>
                    <gmi:context>
                        <gmi:MI_ContextCode                        codeListValue="wayPoint"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Cont
extCode">wayPoint</gmi:MI_ContextCode>
                    </gmi:context>
                    <gmi:sequence>
                        <gmi:MI_SequenceCode                        codeListValue="end"
codeList="https://www.isotc211.org/2005/resources/Codelist/gmiCodelists.xml#MI_Sequ
```

```
enceCode">end</gmi:MI_SequenceCode>
                    </gmi:sequence>
                    <gmi:time>
                        <gco:DateTime>1994-02-13T00:00:00Z</gco:DateTime>
                    </gmi:time>
                </gmi:MI_Event>
            </gmi:significantEvent>
        </gmi:MI_Operation>
    </gmi:operation>
</gmi:MI_AcquisitionInformation>
</gmi:acquisitionInformation>
</gmi:MI_Metadata>
```

Normative references

— ISO/TS 19139:2006, Geographic information – Metadata – XML schema implementation, in particular Annex A.3

— ISO 19115:2003, Geographic information – Metadata

— ISO 19115-2:2009, Geographic information — Metadata — Part 2: Extensions for imagery and gridded data

— ISO 19115:2003/Cor 1:2006, Geographic information – Metadata, Corrigendum

— ISO 19106:2004, Geographic information – Profiles

— INSPIRE Metadata Implementing Rules: Technical Guidelines based on EN ISO 19115 and EN ISO 19119