



SeaDataNet metadata profile of ISO 19115 – XML encoding

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Date: 2021-09-22

Version: 13.0.0

Document type: specification

Dissemination: public

Description:

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

This document has been drafted in the context of the EU H2020 project SeaDataCloud, grant agreement 730960.



Document Version	Date	Status	Author(s)	Description
1.0.0	2012-03-01	Creation	Boldrini, Nativi	First implementation
2.0.0	2012-05-04	Publication	Boldrini	Added sample XML, comparison with legacy CDI encoding
3.0.0	2012-05-15	Revision	Boldrini	Updated sample
4.0.0	2012-05	Revision	Boldrini, Manzella	Bibliographic information
5.0.0	2012-05-30	Revision	Boldrini, Schaap	Revisions after discussion, including main namespace change
6.0.0	2012-06-21	Revision	Boldrini	Updated codelists pointers
7.0.0	2012-07-30	Revision	Boldrini, Leadbetter, Schaap	Use of xlink, introduction section, official lists publication
8.0.0	2013-03-29	Revision	Boldrini	Updated examples after discussion of publications and spatial/temporal resolutions
9.0.0	2013-05-30	Revision	Boldrini, Loubrieu	Updated samples
10.0.0	2013-09-02	Revision	Boldrini	Updated sample
10.0.1	2017-09-19	Revision	Boldrini, Duthie	Bugfix of CDI Schematron schema, to obtain validation against official ISO Schematron 2006 Relax NG Compact schema used by lxml Python library
11.0.0	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
11.0.1	2019-10-16	Revision	Iona	Updated SeaDataNet project information
12.0.0	2019-12-16	Revision	Boldrini	Included as mandatory INSPIRE required elements: spatialRepresentationType, useLimitation, referenceSystemInfo. Modified XML schema location as a workaround for ETF



validator.

Updated conformance metadata element required by INSPIRE.

Validation against the new INSPIRE ETF validator accomplished.

12.1.0	2020-01-24	Revision	Boldrini, Tosello	Added schematron check on precision of bounding box coordinates (minimum two decimal places required by INSPIRE validator)
12.1.1	2020-02-06	Revision	Boldrini	Fixed schematron check about empty elements
12.2.0	2020-04-10	Revision	Boldrini, Dick, Tosello	Changes to reflect https uptake
13.0.0	2021-09-22	Revision	Boldrini, Kokkinaki, Thijsse, Tosello	Updates to accommodate ENVRIFAIR project requirements: addition of SeaVoxDeviceCatalogue

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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

The SeaDataNet Common Data Index (CDI) Data Discovery and Access Service provides users online unified access via a central portal to distributed marine and oceanographic datasets, managed by data centres that are connected to the SeaDataNet infrastructure.

The Common Data Index (CDI) format, based upon the ISO 19115 standard, and related service is adopted by several projects and programmes funded by the European Commission such as the EMODNet pilots, Geo-Seas, Upgrade Black Sea SCENE, EuroFleets, Jerico, etc. More than 100 NODC’s and marine data centres from more than 35 countries bordering to European seas have successfully implemented the SeaDataNet CDI standard and are maintaining it as part of the CDI Data Discovery and Access service to give overview and access to their data sets. As part of SeaDataCloud and associated projects more data centres are connecting while also the volume and range of types of data sets is expanding.

The operational CDI service this way gives access to a vast and rapidly increasing resource of marine and ocean datasets, managed by an increasing number of distributed data centres, covering physical, geological, chemical, biological and geophysical data, and acquired in European waters and global oceans. The CDI service gives users a highly detailed insight into the availability and geographical spreading of this large variety of marine and ocean data sets. Moreover, it provides a unique interface for requesting access, and if granted, for downloading data sets from these distributed data centres across Europe.

Therefore, the CDI format can be considered a de-facto standard for marine metadata in Europe.

The CDI format is a marine profile of the ISO 19115 metadata content standard. Its XML encoding is based on ISO 19139 Schema, which has also been adopted as part of the EU INSPIRE Directive Implementing Rules. An analysis has been undertaken to ensure present and future INSPIRE compliance, while accommodating all the requirements coming from the SeaDataNet community. The analysis has been performed by CNR with the support of MARIS, IFREMER, STFC, BODC and ENEA.

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 an ISO 19139:2006 TS compliant encoding for the SeaDataNet 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. 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 profile is defined in this section. The new *sdn* namespace is introduced: it implements the SeaDataNet 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). 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).

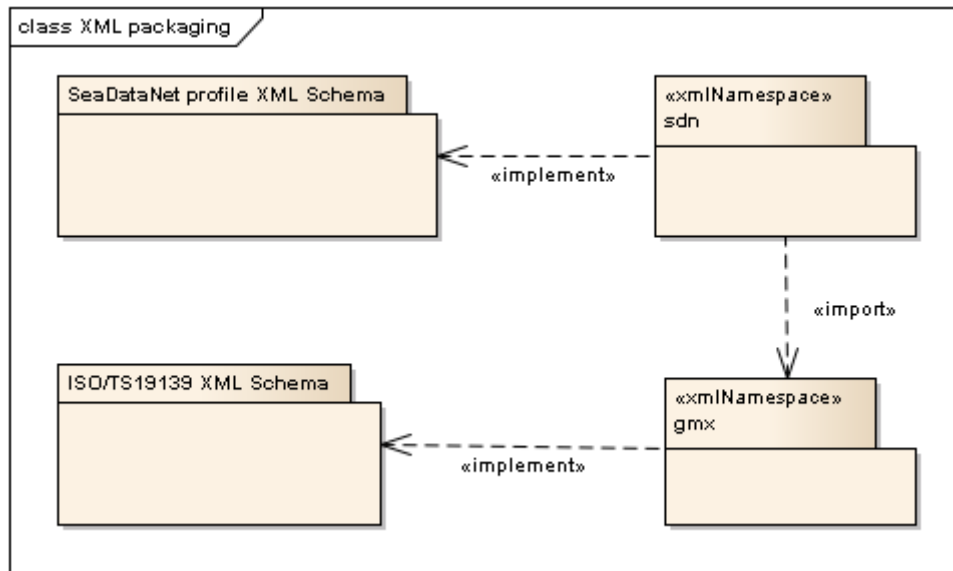


Figure 1 XML Packaging

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_FormatNameCode
- SDN_HierarchyLevelNameCode
- SDN_DeviceCategoryCode
- SDN_SeaVoxDeviceCatalogueCode
- SDN_PlatformCategoryCode
- SDN_ParameterDiscoveryCode
- SDN_EDMERPCode
- SDN_EDMOCCode
- SDN_EDMEDCode
- SDN_CRSCode
- SDN_CountryCode
- SDN_CSRCCode

Moreover, it imports the *gmX.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.

Distinct types 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 a 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 elment. 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, publications): 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='https://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='https://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 https://schemas.seadatanet.org/Standards-Software/Metadata-formats/SDN2_CDI_ISO19139_12.0.0.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) Comparison with the legacy CDI metadata encoding

Following the encoding of (the legacy) CDI metadata format is shown. Almost all the information content stored in this format can be accommodated in the new format subject of this documentation. Left out elements are highlighted in red:

```
<?xml version="1.0" encoding="UTF-8"?>
<Metadata xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xmlns:gml="http://www.opengis.net/gml" xsi:noNamespaceSchemaLocation="cdi_sdn_v1.6_gml_4.53.xsd">
  <mdFileID>SDN:CDI:LOCAL:MARIS-TEST</mdFileID>
  <mdLang>
    <languageCode value="en"/>
  </mdLang>
  <mdChar>
    <CharsetCd value="utf8"/>
  </mdChar>
  <mdHrLv>
    <ScopeCd value="dataset"/>
  </mdHrLv>
  <mdHrLvName SDNIdent="SDN:L231:3:CDI">Common Data Index record</mdHrLvName>
  <mdContact>
    <rpOrgName SDNIdent="SDN:EDMO::1">University of Birmingham, Department of Geological
      Sciences</rpOrgName>
    <rpCntInfo>
      <cntPhone>
        <voiceNum/>
        <faxNum/>
      </cntPhone>
      <cntAddress>
        <delPoint>School of Earth Sciences Edgbaston </delPoint>
        <city>Birmingham</city>
        <adminArea/>
        <postCode>B15 2TT</postCode>
        <country>United Kingdom</country>
        <eMailAdd/>
      </cntAddress>
      <cntOnLineRes>
        <linkage>http://www.bham.ac.uk/EarthSciences/</linkage>
      </cntOnLineRes>
    </rpCntInfo>
    <role>
      <RoleCd value="author"/>
    </role>
  </mdContact>
  <mdDateSt>2010-04-23T16:52:01</mdDateSt>
  <spatRepInfo>
    <VectSpatRep>
      <geometObjs>
        <geoObjTyp>
          <GeoObjTypCd value="curve"/>
        </geoObjTyp>
      </geometObjs>
    </VectSpatRep>
  </spatRepInfo>
</Metadata>
```



```
</VectSpatRep>
</spatRepInfo>
<spatRepInfo>
  <GridSpatRep>
    <axDimProps>
      <Dimen>
        <dimName>time</dimName>
        <dimResol>
          <Distance>
            <value>
              <Decimal>20</Decimal>
            </value>
            <uomName SDNIdent="SDN:P061:37:UTHZ">Hertz</uomName>
          </Distance>
        </dimResol>
      </Dimen>
    </axDimProps>
  </GridSpatRep>
</spatRepInfo>
<spatRepInfo>
  <GridSpatRep>
    <axDimProps>
      <Dimen>
        <dimName>track</dimName>
        <dimResol>
          <Distance>
            <value>
              <Decimal>50</Decimal>
            </value>
            <uomName SDNIdent="SDN:P061:21:ULAA">metres</uomName>
          </Distance>
        </dimResol>
      </Dimen>
    </axDimProps>
  </GridSpatRep>
</spatRepInfo>
<refSysInfo>
  <MdCoRefSys>
    <refSysID>
      <identAuth>
        <resTitle>SeaDataNet geographic co-ordinate reference frames</resTitle>
        <resAltTitle>L101</resAltTitle>
        <resRefDate>
          <refDate>2007-02-10T06:45:02</refDate>
          <refDateType>
            <DateTypCd value="revision"/>
          </refDateType>
        </resRefDate>
        <resEd>2</resEd>
        <citId>https://www.seadatanet.org/urnurl/</citId>
      </identAuth>
      <identCode SDNIdent="SDN:L101:2:4326">World Geodetic System 84</identCode>
    </refSysID>
  </MdCoRefSys>
</refSysInfo>
```




```
</refSysID>
</MdCoRefSys>
</refSysInfo>
<mdExtInfo>
  <extEleInfo>
    <extEleName>SDN:EDMO:</extEleName>
    <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
    <eleDatatype>
      <DatatypeCd value="codelist"/>
    </eleDatatype>
    <extEleParEnt>SeaDataNet</extEleParEnt>
    <extEleSrc>
      <resTitle>European Directory of Marine Organisations</resTitle>
      <resAltTitle>EDMO</resAltTitle>
      <resRefDate>
        <refDate/>
        <refDateType>
          <DateTypCd value="revision"/>
        </refDateType>
      </resRefDate>
      <resEd/>
      <citId>https://www.seadatanet.org/urnurl/</citId>
    </extEleSrc>
  </extEleInfo>
  <extEleInfo>
    <extEleName>SDN:L021:1:</extEleName>
    <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
    <eleDatatype>
      <DatatypeCd value="codelist"/>
    </eleDatatype>
    <extEleParEnt>SeaDataNet</extEleParEnt>
    <extEleSrc>
      <resTitle>SeaDataNet Geospatial Feature Types</resTitle>
      <resAltTitle>L021</resAltTitle>
      <resRefDate>
        <refDate>2007-12-20T02:00:05</refDate>
        <refDateType>
          <DateTypCd value="revision"/>
        </refDateType>
      </resRefDate>
      <resEd>1</resEd>
      <citId>https://www.seadatanet.org/urnurl/</citId>
    </extEleSrc>
  </extEleInfo>
  <extEleInfo>
    <extEleName>SDN:L031:2:</extEleName>
    <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
    <eleDatatype>
      <DatatypeCd value="codelist"/>
    </eleDatatype>
    <extEleParEnt>SeaDataNet</extEleParEnt>
    <extEleSrc>
```

```
<resTitle>SeaDataNet Measurement Periodicity Classes</resTitle>
<resAltTitle>L031</resAltTitle>
<resRefDate>
  <refDate>2006-12-21T06:43:27</refDate>
  <refDateType>
    <DateTypCd value="revision"/>
  </refDateType>
</resRefDate>
<resEd>2</resEd>
<citId>https://www.seadatanet.org/urnurl/</citId>
</extEleSrc>
</extEleInfo>
<extEleInfo>
  <extEleName>SDN:L071:1:</extEleName>
  <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
  <eleDatatype>
    <DatatypeCd value="codelist"/>
  </eleDatatype>
  <extEleParEnt>SeaDataNet</extEleParEnt>
  <extEleSrc>
    <resTitle>SeaDataNet data access mechanisms</resTitle>
    <resAltTitle>L071</resAltTitle>
    <resRefDate>
      <refDate>2007-02-16T16:59:36</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
    <resEd>1</resEd>
    <citId>https://www.seadatanet.org/urnurl/</citId>
  </extEleSrc>
</extEleInfo>
<extEleInfo>
  <extEleName>SDN:L081:2:</extEleName>
  <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
  <eleDatatype>
    <DatatypeCd value="codelist"/>
  </eleDatatype>
  <extEleParEnt>SeaDataNet</extEleParEnt>
  <extEleSrc>
    <resTitle>SeaDataNet Data Access Restriction Policies</resTitle>
    <resAltTitle>L081</resAltTitle>
    <resRefDate>
      <refDate>2008-09-26T01:00:06</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
    <resEd>2</resEd>
    <citId>https://www.seadatanet.org/urnurl/</citId>
  </extEleSrc>
</extEleInfo>
```

```

<extEleInfo>
  <extEleName>SDN:L231:3:</extEleName>
  <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
  <eleDatatype>
    <DatatypeCd value="codelist"/>
  </eleDatatype>
  <extEleParEnt>SeaDataNet</extEleParEnt>
  <extEleSrc>
    <resTitle>SeaDataNet metadata entities</resTitle>
    <resAltTitle>L231</resAltTitle>
    <resRefDate>
      <refDate>2008-06-03T01:00:05</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
    <resEd>3</resEd>
    <citId>https://www.seadatanet.org/urnurl/</citId>
  </extEleSrc>
</extEleInfo>
<extEleInfo>
  <extEleName>SDN:L241:1:</extEleName>
  <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
  <eleDatatype>
    <DatatypeCd value="codelist"/>
  </eleDatatype>
  <extEleParEnt>SeaDataNet</extEleParEnt>
  <extEleSrc>
    <resTitle>SeaDataNet data transport formats</resTitle>
    <resAltTitle>L241</resAltTitle>
    <resRefDate>
      <refDate>2007-09-15T01:00:03</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
    <resEd>1</resEd>
    <citId>https://www.seadatanet.org/urnurl/</citId>
  </extEleSrc>
</extEleInfo>
</mdExtInfo>
<dataIdInfo>
  <idCitation>
    <resTitle>Test record with full coverage</resTitle>
    <resAltTitle>MARIS-TEST</resAltTitle>
    <resRefDate>
      <refDate>2012-04-16T10:38:10</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
    <citRespParty>

```



```
<rpOrgName SDNIdent="SDN:EDMO::18">Scott Polar Research Institute (SPRI)</rpOrgName>
<rpCntInfo>
  <cntPhone>
    <voiceNum/>
    <faxNum/>
  </cntPhone>
  <cntAddress>
    <delPoint>University of Cambridge Lensfield Road</delPoint>
    <city>Cambridge</city>
    <adminArea/>
    <postCode>CB2 1ER</postCode>
    <country>United Kingdom</country>
    <eMailAdd/>
  </cntAddress>
  <cntOnLineRes>
    <linkage>http://www.spri.cam.ac.uk/</linkage>
  </cntOnLineRes>
</rpCntInfo>
<role>
  <RoleCd value="originator"/>
</role>
</citRespParty>
<citRespParty>
  <rpOrgName SDNIdent="SDN:EDMO::70">Midland and Scottish Resources Plc</rpOrgName>
  <rpCntInfo>
    <cntPhone>
      <voiceNum/>
      <faxNum/>
    </cntPhone>
    <cntAddress>
      <delPoint>Crawpeel Road Altens</delPoint>
      <city>Aberdeen</city>
      <adminArea/>
      <postCode>AB12 3LG</postCode>
      <country>United Kingdom</country>
      <eMailAdd/>
    </cntAddress>
    <cntOnLineRes>
      <linkage/>
    </cntOnLineRes>
  </rpCntInfo>
  <role>
    <RoleCd value="originator"/>
  </role>
</citRespParty>
<citRespParty>
  <rpOrgName SDNIdent="SDN:EDMO::181">County Administration of Vasterbotten</rpOrgName>
  <rpCntInfo>
    <cntPhone>
      <voiceNum>+46-(0)90-10 72 56</voiceNum>
      <faxNum>+46-(0)90-10 71 00</faxNum>
    </cntPhone>
```



```
<cntAddress>
  <delPoint>Storgatan 71 B </delPoint>
  <city>Umea</city>
  <adminArea/>
  <postCode>SE-901 86</postCode>
  <country>Sweden</country>
  <eMailAdd>jan.albertsson@ac.lst.se</eMailAdd>
</cntAddress>
<cntOnLineRes>
  <linkage>http://www.ac.lst.se</linkage>
</cntOnLineRes>
</rpCntInfo>
<role>
  <RoleCd value="originator"/>
</role>
</citRespParty>
<citRespParty>
  <rpOrgName SDNIdent="SDN:EDMO::354">Puertos del Estado. Departamento de Clima
  Maritimo</rpOrgName>
  <rpCntInfo>
    <cntPhone>
      <voiceNum>+34 915 245500</voiceNum>
      <faxNum>+34 915 245501</faxNum>
    </cntPhone>
    <cntAddress>
      <delPoint>Av. del Partenon 10</delPoint>
      <city>Madrid</city>
      <adminArea/>
      <postCode>28042</postCode>
      <country>Spain</country>
      <eMailAdd>obdulio@puertos.es</eMailAdd>
    </cntAddress>
    <cntOnLineRes>
      <linkage>http://www.puertos.es/clima</linkage>
    </cntOnLineRes>
  </rpCntInfo>
  <role>
    <RoleCd value="originator"/>
  </role>
</citRespParty>
<citRespParty>
  <rpOrgName SDNIdent="SDN:EDMO::464">Fisheries Laboratory, Faroe Islands</rpOrgName>
  <rpCntInfo>
    <cntPhone>
      <voiceNum>(+298) 35 39 00</voiceNum>
      <faxNum>(+298) 35 39 01</faxNum>
    </cntPhone>
    <cntAddress>
      <delPoint>PO-Box 3051, Nóatún 1</delPoint>
      <city>Torshavn</city>
      <adminArea/>
      <postCode>FO-110</postCode>
    </cntAddress>
  </rpCntInfo>
</citRespParty>
```



```
<country>Denmark</country>
<eMailAdd>fishlab@frs.fo</eMailAdd>
</cntAddress>
<cntOnLineRes>
  <linkage>http://www.frs.fo/default.asp</linkage>
</cntOnLineRes>
</rpCntInfo>
<role>
  <RoleCd value="originator"/>
</role>
</citRespParty>
</idCitation>
<idAbs>This record is meant for test purposes. It contains a value for every field and
multiple values wherever possible.</idAbs>
<idPoC>
<rpOrgName SDNIdent="SDN:EDMO::634">Marine Information Service (MARIS)</rpOrgName>
<rpCntInfo>
  <cntPhone>
    <voiceNum>+31 70 3004710</voiceNum>
    <faxNum>+31 70 3903546</faxNum>
  </cntPhone>
  <cntAddress>
    <delPoint>Koningin Julianalaan 345A</delPoint>
    <city>Voorburg</city>
    <adminArea/>
    <postCode>2273JJ</postCode>
    <country>Netherlands</country>
    <eMailAdd>maris@xs4all.nl</eMailAdd>
  </cntAddress>
  <cntOnLineRes>
    <linkage>http://www.maris.nl</linkage>
  </cntOnLineRes>
</rpCntInfo>
<role>
  <RoleCd value="custodian"/>
</role>
</idPoC>
<descKeys>
<keyword SDNIdent="SDN:P021:41:ATVS">Atmospheric visibility and transparency</keyword>
<keyword SDNIdent="SDN:P021:70:AMON">Ammonium concentration parameters in the water
column</keyword>
<keyword SDNIdent="SDN:P021:70:CHUM">Atmospheric humidity</keyword>
<keyTyp>
  <KeyTypCd value="parameter"/>
</keyTyp>
<thesaName>
  <resTitle>BODC Parameter Discovery Vocabulary</resTitle>
  <resAltTitle>P021</resAltTitle>
  <resRefDate>
    <refDate>2009-06-05T01:00:02</refDate>
    <refDateType>
      <DateTypCd value="revision"/>
    </refDateType>
  </resRefDate>
</thesaName>
</descKeys>
```

```

    </refDateType>
  </resRefDate>
  <resEd>41</resEd>
  <citId>https://www.seadatanet.org/urnurl/</citId>
</thesaName>
</descKeys>
<descKeys>
  <keyword SDNIdent="SDN:L05:4:13">aerosol samplers</keyword>
  <keyword SDNIdent="SDN:L05:4:POS04">Differential Global Positioning System
    receivers</keyword>
  <keyTyp>
    <KeyTypCd value="instrument"/>
  </keyTyp>
  <thesaName>
    <resTitle>SeaDataNet device categories</resTitle>
    <resAltTitle>L05</resAltTitle>
    <resRefDate>
      <refDate>2008-01-11T02:00:04</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
    <resEd>4</resEd>
    <citId>https://www.seadatanet.org/urnurl/</citId>
  </thesaName>
</descKeys>
<descKeys>
  <keyword SDNIdent="SDN:L061:7:75">cetacean</keyword>
  <keyTyp>
    <KeyTypCd value="platform_class"/>
  </keyTyp>
  <thesaName>
    <resTitle>SeaDataNet Platform Classes</resTitle>
    <resAltTitle>L061</resAltTitle>
    <resRefDate>
      <refDate>2008-12-05T02:00:04</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
    <resEd>7</resEd>
    <citId>https://www.seadatanet.org/urnurl/</citId>
  </thesaName>
</descKeys>
<descKeys>
  <keyword SDNIdent="SDN:EDMERP::8857">Integrated Ocean Drilling Program (IODP) - Artic
    expedition (ACEX) {acronym="IODP"; organisation="Natural Environment
    Research Council (NERC)"; country="United Kingdom"}</keyword>
  <keyword SDNIdent="SDN:EDMERP::8889">National Coastal Data Co-ordinator
    {acronym=""; organisation="Department for Environment, Food and Rural
    Affairs (DEFRA)"; country="United Kingdom"}</keyword>
  <keyword SDNIdent="SDN:EDMERP::7576">GEOWARN - Geo-spatial warning system Nisyros volcano

```



(Greece). An emergency case study. {acronym="GEOWARN"
organisation="Hellenic Centre for Marine Research, Institute of Oceanography
(HCMR/IO)"; country="Greece"};</keyword>

```
<keyTyp>
  <KeyTypCd value="project"/>
</keyTyp>
<thesaName>
  <resTitle>European Directory of Marine Environmental Research Projects</resTitle>
  <resAltTitle>EDMERP</resAltTitle>
  <resRefDate>
    <refDate/>
    <refDateType>
      <DateTypCd value="revision"/>
    </refDateType>
  </resRefDate>
  <resEd/>
  <citId>https://www.seadatanet.org/urnurl/</citId>
</thesaName>
</descKeys>
<resConst>
  <LegConsts>
    <accessConsts SDNIdent="SDN:L081:2:LS">SeaDataNet licence</accessConsts>
    <accessConsts SDNIdent="SDN:L081:2:LI">licence</accessConsts>
  </LegConsts>
</resConst>
<aggrInfo>
  <aggrDSName>
    <resTitle>My Cruise</resTitle>
    <resAltTitle>CRUISE01</resAltTitle>
    <resRefDate>
      <refDate>2009-06-01</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
  </aggrDSName>
  <assocType>
    <AscTypeCd value="largerWorkCitation"/>
  </assocType>
  <initType>
    <InitTypCd value="campaign"/>
  </initType>
</aggrInfo>
<aggrInfo>
  <aggrDSName>
    <resTitle>My Station</resTitle>
    <resAltTitle>STATION01</resAltTitle>
    <resRefDate>
      <refDate>2009-05-15</refDate>
      <refDateType>
        <DateTypCd value="revision"/>
      </refDateType>
    </resRefDate>
  </aggrDSName>
  <assocType>
    <AscTypeCd value="largerWorkCitation"/>
  </assocType>
  <initType>
    <InitTypCd value="campaign"/>
  </initType>
</aggrInfo>
```



```
</resRefDate>
</aggrDSName>
<assocType>
  <AscTypeCd value="source"/>
</assocType>
<initType>
  <InitTypCd value="operation"/>
</initType>
</aggrInfo>
<dataScale>
  <scaleDist>
    <value>
      <Decimal>5</Decimal>
    </value>
    <uom>
      <UomTime>
        <uomName SDNIdent="SDN:L031:3:6">week to sub-month</uomName>
        <conversionToISOstandarUnit/>
      </UomTime>
    </uom>
  </scaleDist>
</dataScale>
<dataLang>
  <languageCode value="en"/>
</dataLang>
<tpCat>
  <TopicCatCd value="oceans"/>
</tpCat>
<dataExt>
  <geoEle>
    <GeoBndBox>
      <westBL>-68.548849</westBL>
      <eastBL>-49.007153</eastBL>
      <southBL>59.400296</southBL>
      <northBL>73.889864</northBL>
    </GeoBndBox>
  </geoEle>
  <geoEle>
    <GeoBndBox>
      <westBL>106.574831</westBL>
      <eastBL>114.842479</eastBL>
      <southBL>5.916728</southBL>
      <northBL>17.636232</northBL>
    </GeoBndBox>
  </geoEle>
  <geoEle>
    <GeoBndBox>
      <westBL>-80.198605</westBL>
      <eastBL>-70.052045</eastBL>
      <southBL>-57.079131</southBL>
      <northBL>-36.777203</northBL>
    </GeoBndBox>
  </geoEle>

```




```
<vertMaxVal>100</vertMaxVal>
<vertUoM>
  <uomName>metres</uomName>
  <conversionToISOstandardUnit/>
</vertUoM>
<vertDatum>
  <datumId>
    <identAuth>
      <resTitle>Vertical Co-ordinate Reference System Origins</resTitle>
      <resAltTitle>L111</resAltTitle>
      <resRefDate>
        <refDate>2009-04-29T01:00:03</refDate>
        <refDateType>
          <DateTypCd value="revision"/>
        </refDateType>
      </resRefDate>
      <resEd>6</resEd>
      <citId>https://www.seadatanet.org/urnurl/</citId>
    </identAuth>
    <identCode SDNIdent="SDN:L111:6:D08">sea level</identCode>
  </datumId>
</vertDatum>
<vertLimit>150</vertLimit>
</vertEle>
</dataExt>
</dataIdInfo>
<distInfo>
  <distributor>
    <distorCont>
      <rpOrgName SDNIdent="SDN:EDMO::631">WL/Delft Hydraulics</rpOrgName>
      <rpCntInfo>
        <cntPhone>
          <voiceNum>+31 15 2858585</voiceNum>
          <faxNum>+31 15 2858582</faxNum>
        </cntPhone>
        <cntAddress>
          <delPoint>Rotterdamseweg 185</delPoint>
          <city>Delft</city>
          <adminArea/>
          <postCode>2629 HD</postCode>
          <country>Netherlands</country>
          <eMailAdd>info@wldelft.nl</eMailAdd>
        </cntAddress>
        <cntOnLineRes>
          <linkage>http://www.wldelft.nl</linkage>
        </cntOnLineRes>
      </rpCntInfo>
      <role>
        <RoleCd value="distributor"/>
      </role>
    </distorCont>
  </distributor>
</distInfo>
```

```

<formatName SDNIdent="SDN:L241:1:ODV">Ocean Data View ASCII input</formatName>
<formatVer>0.3</formatVer>
</distorFormat>
<distorFormat>
  <formatName SDNIdent="SDN:L241:1:MEDATLAS">MEDATLAS ASCII</formatName>
  <formatVer>1</formatVer>
</distorFormat>
</distributor>
<distTranOps>
  <transSize>123</transSize>
  <onLineSrc>
    <linkage>http://www.sdn-taskmanager.org/</linkage>
    <protocol>HTTP-DOWNLOAD</protocol>
    <orDesc>DBTEST</orDesc>
    <orFunct>
      <OnFunctCd value="downloadRegistration"/>
    </orFunct>
  </onLineSrc>
</distTranOps>
<distTranOps>
  <onLineSrc>
    <linkage>http://example.com/wms?</linkage>
    <protocol>urn:ogc:serviceType:WebMapService:1.1.1:http</protocol>
    <orDesc>WMS example url</orDesc>
    <orFunct>
      <OnFunctCd value="URL"/>
    </orFunct>
  </onLineSrc>
</distTranOps>
</distInfo>
</Metadata>

```

For each element being left out from the new encoding an explanation is following provided:

References to SDN lists

```

<mdHrLvName SDNIdent="SDN:L231:3:CDI">Common Data Index record</mdHrLvName>

```

SDN list code 231 is lost in the new encoding:

```

<gmd:hierarchyLevelName>
  <sdn:SDN_HierarchyLevelNameCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicsrCodeList#SDN_HierarchyLevelNameCode"
  codeListValue="CDI"
  codeSpace="SeaDataNet">Common Data Index record</sdn:SDN_HierarchyLevelNameCode>
</gmd:hierarchyLevelName>

```

However the new element `SDN_HierarchyLevelNameCode` is used, it points to the new ISO version of the original SDN list.

Other lists codes references are skipped, just like the 231 code above. Among them:

- the SDN EDMO list, replaced by the [SDN_EDMOCODE](#) code list
- the SDN L101 list, replaced by the [SDN_CRSCODE](#) code list
- the SDN P021 list, replaced by the [SDN_ParameterDiscoveryCode](#) code list
- the SDN L05 list, replaced by the [SDN_DeviceCategoryCode](#) code list
- the SDN L22 list, replaced by the [SDN_SeaVoxDeviceCatalogueCode](#) code list
- the SDN L061 list, replaced by the [SDN_PlatformCategoryCode](#) code list
- the SDN EDMERP list, replaced by the [SDN_EDMERPCODE](#) code list
- the SDN EDMED list, replaced by the [SDN_EDMEDCODE](#) code list
- the SDN 241 list, replaced by the [SDN_FormatNameCode](#) code list

Metadata contact role

```
<mdContact>
  <role>
    <RoleCd value="author"/>
  </role>
</mdContact>
```

Metadata 'author' role code is changed to 'pointOfContact' for INSPIRE compliance (As for INSPIRE constraint SC16: The value of MD_Metadata.contact.CI_ResponsibleParty.role.CI_RoleCode shall be pointOfContact.). ISO version:

```
<gmd:role>
  <gmd:CI_RoleCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_RoleCode"
codeListValue="pointOfContact"
codeSpace="ISOTC211/19115">pointOfContact</gmd:CI_RoleCode>
</gmd:role>
```

Time information in date stamps

```
<mdDateSt>2010-04-23T16:52:01</mdDateSt>
```

Time information is lost for the date stamp. ISO version:

```
<gmd:dateStamp>
  <gco:Date>2010-04-23</gco:Date>
</gmd:dateStamp>
```

Also other date references are affected. E.g., :

```
<refDate>2007-02-10T06:45:02</refDate>
```

Dimension resolution unit of measure



```
<Distance>
  <value>
    <Decimal>50</Decimal>
  </value>
  <uomName SDNIdent="SDN:P061:21:ULAA">metres</uomName>
</Distance>
```

"metres" is lost (however the information is implicit in the 'ULAA' code itself). ISO version:

```
<gmd:resolution>
  <gco:Measure uom="https://www.seadatanet.org/urnurl/SDN:P06::ULAA">50</gco:Measure>
</gmd:resolution>
```

Metadata extension information

Metadata extension information is used in the legacy CDI format to encode references to the SDN lists. This information has been completely removed, and replaced by an online pointer to the new profile definitions (including new code lists).

```
<mdExtInfo>
  <extEleInfo>
    <extEleName>SDN:EDMO::</extEleName>
    <extEleDef>https://www.seadatanet.org/urnurl/</extEleDef>
    <eleDatatype>
      <DatatypeCd value="codelist"/>
    </eleDatatype>
    <extEleParEnt>SeaDataNet</extEleParEnt>
    <extEleSrc>
      <resTitle>European Directory of Marine Organisations</resTitle>
      <resAltTitle>EDMO</resAltTitle>
      <resRefDate>
        <refDate/>
        <refDateType>
          <DateTypCd value="revision"/>
        </refDateType>
      </resRefDate>
      <resEd/>
      <citId>https://www.seadatanet.org/urnurl/</citId>
    </extEleSrc>
  </extEleInfo>
```

... et cetera

In the new format we have:

```
<gmd:metadataExtensionInfo>
  <gmd:MD_MetadataExtensionInformation>
    <gmd:extensionOnLineResource>
      <gmd:CI_OnlineResource>
        <gmd:linkage>
          <gmd:URL>http://www.seadatanet.org/Standards-Software/Metadata-formats</gmd:URL>
```

```

</gmd:linkage>
<gmd:name>
  <gco:CharacterString>SeaDataNet ISO 19139 Profile for CDI Metadata</gco:CharacterString>
</gmd:name>
</gmd:CI_OnlineResource>
</gmd:extensionOnLineResource>
...
</gmd:MD_MetadataExtensionInformation>
</gmd:metadataExtensionInfo>

```

Time units list reference

The reference to time units list for the temporal resolution of updates is lost, as well as the discrete temporal resolutions:

```

<UomTime>
  <uomName SDNIdent="SDN:L031:3:6">week to sub-month</uomName>
  <conversionToISOstandarUnit/>
</UomTime>

```

This information can be translated in the new encoding as this:

```

<gmd:spatialResolution>
  <gmd:MD_Resolution>
    <gmd:distance>
      <gco:Distance uom="https://www.seadatanet.org/urnurl/SDN:P06::UTAA">15</gco:Distance>
    </gmd:distance>
  </gmd:MD_Resolution>
</gmd:spatialResolution>

```

A mapping from the original discrete temporal resolutions is as in the table below and can be used to convert from the legacy discrete temporal resolution in case no temporal resolution value is given:

Input (legacy) resolution	Output Value	Output Unit	Output Unit (meaning)
Indeterminate	0	Not applicable	Not applicable
Sub-second	.5	https://www.seadatanet.org/urnurl/SDN:P06::UTBB	Seconds
Year to sub-decade	5	https://www.seadatanet.org/urnurl/SDN:P06::UYRS	Years
Decadal	10	https://www.seadatanet.org/urnurl/SDN:P06::UYRS	Years
Second to sub-minute	30	https://www.seadatanet.org/urnurl/SDN:P06::UTBB	Seconds
Minute to sub-hour	30	https://www.seadatanet.org/urnurl/SDN:P06::UMIN	Minutes
Hour to sub-day	12	https://www.seadatanet.org/urnurl/SDN:P06::UHOR	Hours
Day to sub-week	3.5	https://www.seadatanet.org/urnurl/SDN:P06::UTAA	Days
Week to sub-month	15	https://www.seadatanet.org/urnurl/SDN:P06::UTAA	Days
Month to sub-year	1	https://www.seadatanet.org/urnurl/SDN:P06::UYRS	Years

However, if the legacy discrete temporal resolution included a temporal value, this is to be considered. E.g., Source (legacy) update period:

```

<dataScale>
  <scaleDist>

```

```

<value>
  <Decimal>5</Decimal>
</value>
<uom>
  <UomTime>
    <uomName SDNIdent="SDN:L031:3:6" >week to sub-month</uomName>
    <conversionToISOstandarUnit></conversionToISOstandarUnit>
  </UomTime>
</uom>
</scaleDist>
</dataScale>

```

The above legacy encoding can be translated as:

```

<gmd:MD_Resolution>
  <gmd:distance>
    <gco:Distance uom="https://www.seadatanet.org/urnurl/SDN:P06::UTAA">35</gco:Distance>
  </gmd:distance>
</gmd:MD_Resolution>

```

(5 weeks x 7 days = 35 days)

Vertical datum information

Title, edition and date of revision of the vertical datum thesaurus are lost in the new encoding. The online reference, instead, is maintained.

```

<vertDatum>
  <datumId>
    <identAuth>
      <resTitle>Vertical Co-ordinate Reference System Origins</resTitle>
      <resAltTitle>L111</resAltTitle>
      <resRefDate>
        <refDate>2009-04-29T01:00:03</refDate>
        <refDateType>
          <DateTypCd value="revision" />
        </refDateType>
      </resRefDate>
      <resEd>6</resEd>
      <citId>https://www.seadatanet.org/urnurl/</citId>
    </identAuth>
    <identCode SDNIdent="SDN:L111:6:D08">sea level</identCode>
  </datumId>
</vertDatum>

```


Annex C (informative) Implementation example

The following XML instance document is a valid document instance of the SeaDataNet profile, containing also the additional documentation information, as well as the EDMED reference.

```
<?xml version="1.0" encoding="UTF-8"?>
<?xml-model href="http://schemas.seadatanet.org/Standards-Software/Metadata-
formats/SDN2_CDI_ISO19139_12.0.0.sch" type="application/xml"
schematypens="http://purl.oclc.org/dsdl/schematron"?>
<gmd:MD_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 http://schemas.seadatanet.org/Standards-Software/Metadata-
formats/SDN2_CDI_ISO19139_12.0.0.xsd http://www.isotc211.org/2005/gmd
http://schemas.opengis.net/iso/19139/20060504/gmd/gmd.xsd">
  <gmd:fileIdentifier>
    <gco:CharacterString>urn:SDN:CDI:LOCAL:MARIS-TEST</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
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      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"
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```



```
codeSpace="ISOTC211/19115">dataset</gmd:MD_ScopeCode>
</gmd:hierarchyLevel>
<gmd:hierarchyLevelName>
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codeListValue="CDI"
codeSpace="SeaDataNet">Common Data Index
record</sdn:SDN_HierarchyLevelNameCode>
  </gmd:hierarchyLevelName>
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      <gmd:organisationName>
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codelists.xml#SDN_EDMOCCode"
codeSpace="SeaDataNet"
codeListValue="1">University of Birmingham, Department of Geological
Sciences</sdn:SDN_EDMOCCode>
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          <gmd:country>
            <sdn:SDN_CountryCode codeSpace="SeaDataNet"
codeListValue="GB"
```



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`</gmd:CI_Address>`

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`<gmd:CI_OnlineResource>`

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`</gmd:CI_Contact>`

`</gmd:contactInfo>`

`<gmd:role>`

`<gmd:CI_RoleCode`

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`</gmd:role>`

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            codeListValue="vertical"
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```



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      codeSpace="ISOTC211/19115">time</gmd:MD_DimensionNameTypeCode>
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</gmd:axisDimensionProperties>
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```

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```



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    codeSpace="SeaDataNet">World Geodetic System 84</sdn:SDN_CRSCode>
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<gmd:identificationInfo>
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```



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    codeSpace="ISOTC211/19115">revision</gmd:CI_DateTypeCode>
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edmerp-codelists.xml#SDN_EDMOCCode"
        codeSpace="SeaDataNet"
        codeListValue="18">Scott Polar Research Institute (SPRI)</sdn:SDN_EDMOCCode>
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```




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```

```
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicrCodeList.xml#SDN_CountryCode">United
Kingdom</sdn:SDN_CountryCode>
```

```
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</gmd:address>
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    </gmd:linkage>
  </gmd:CI_OnlineResource>
</gmd:onlineResource>
</gmd:CI_Contact>
</gmd:contactInfo>
<gmd:role>
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```

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  codeSpace="ISOTC211/19115">originator</gmd:CI_RoleCode>
```

```
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```



```
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Kingdom</sdn:SDN_CountryCode>  
          </gmd:country>  
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```



```
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edmerp-codelists.xml#SDN_EDMOCCode"
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            </gmd:facsimile>
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            </gmd:city>
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```



```
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```

```
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  <gco:CharacterString>jan.albertsson@ac.lst.se</gco:CharacterString>  
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</gmd:address>  
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  <gmd:CI_OnlineResource>  
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  </gmd:CI_OnlineResource>  
</gmd:onlineResource>  
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```

```
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```

```
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```



codeSpace="SeaDataNet"

codeListValue="354">Puertos del Estado. Departamento de Clima

Maritimo</sdn:SDN_EDMOCCode>

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<gmd:voice>

<gco:CharacterString>+34 915 245500</gco:CharacterString>

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<gco:CharacterString>+34 915 245501</gco:CharacterString>

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codeSpace="ISOTC211/19115">originator</gmd:CI_RoleCode>

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codeListValue="464">Fisheries Laboratory, Faroe Islands</sdn:SDN_EDMOCCode>

</gmd:organisationName>

</gmd:contactInfo>

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<gmd:CI_Telephone>

<gmd:voice>

<gco:CharacterString>(+298) 35 39 00</gco:CharacterString>



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</gmd:voice>
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</gmd:facsimile>
</gmd:CI_Telephone>
</gmd:phone>
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    </gmd:deliveryPoint>
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    </gmd:city>
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```

```
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  <gmd:CI_OnlineResource>
    <gmd:linkage>
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```



```
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  codeSpace="ISOTC211/19115">originator</gmd:CI_RoleCode>
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</gmd:CI_ResponsibleParty>
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</gmd:citation>
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</gmd:abstract>
<gmd:pointOfContact>
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    <gmd:organisationName>
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        codeListValue="634">Marine Information Service (MARIS)</sdn:SDN_EDMOCCode>
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</gmd:CI_Telephone>

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<gmd:address>

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<gmd:city>

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</gmd:country>

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</gmd:CI_Address>

</gmd:address>

<gmd:onlineResource>

<gmd:CI_OnlineResource>

<gmd:linkage>

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  codeSpace="ISOTC211/19115">custodian</gmd:CI_RoleCode>
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codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#MD_MaintenanceFrequencyCode"
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    <gmd:CI_Citation>
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      </gmd:title>
```



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```
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pheric visibility and transparency</sdn:SDN_ParameterDiscoveryCode>
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      codeListValue="AMON"
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nium concentration parameters in the water column</sdn:SDN_ParameterDiscoveryCode>
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```



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codeSpace="SeaDataNet">parameter</gmd:MD_KeywordTypeCode>

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```

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samplers</sdn:SDN_DeviceCategoryCode>

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Codelists.xml#SDN_EDMERPCCode">Integrated Ocean Drilling Program (IODP) - Artic expedition (ACEX)
{acronym="IODP" organisation="Natural Environment Research Council (NERC)" country="United
Kingdom"}</sdn:SDN_EDMERPCCode>
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Codelists.xml#SDN_EDMERPCCode">National Coastal Data Co-ordinator {acronym="" organisation="Department for
Environment, Food and Rural Affairs (DEFRA)" country="United Kingdom"}</sdn:SDN_EDMERPCCode>
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        codeListValue="7576"
        codeList="http://seadatanet.maris2.nl/isocodelists/sdncodelists/edmo-edmerp-
Codelists.xml#SDN_EDMERPCCode">GEOWARN - Geo-spatial warning system Nisyros volcano (Greece). An emergency
```




case study. {acronym="GEOWARN" organisation="Hellenic Centre for Marine Research, Institute of Oceanography (HCMR/IO)" country="Greece"}</sdn:SDN_EDMERPCode>

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codeSpace="SeaDataNet">project</gmd:MD_KeywordTypeCode>

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```

```

licence</gmx:Anchor>
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    codeSpace="ISOTC211/19115">largerWorkCitation</gmd:DS_AssociationTypeCode>
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codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/edmedCodeList.xml#SDN_EDMEDCode"
codeSpace="SeaDataNet">(CIPS/ICWB) SEA - an extensive multidisciplinary Belgian survey of the eastern half of
Southern Bight of North Sea (1971-75)</sdn:SDN_EDMEDCode>
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codeSpace="ISOTC211/19115">campaign</gmd:DS_InitiativeTypeCode>
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`</gmd:topicCategory>`

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`<gmd:EX_Extent>`

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`</gmd:westBoundLongitude>`

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`</gmd:eastBoundLongitude>`

`<gmd:southBoundLatitude>`



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<gmd:northBoundLatitude>
```




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            <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>
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8.473704 106.574831 5.916728</gml:posList>
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78.319565 -50.400867 -74.561741 -54.674947 -70.052045 -57.079131</gml:posList>
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                <gml:axisDirection codeSpace="">up</gml:axisDirection>
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```



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</gml:VerticalCRS>
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</gmd:verticalElement>
</gmd:EX_Extent>
</gmd:extent>
<!-- 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>
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<gmd:distributionInfo>
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    <gmd:distributionFormat>
      <gmd:MD_Format>
        <gmd:name>
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              codeListValue="ODV"
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicrCodeList.xml#SDN_FormatNameCode">Ocean Data
View ASCII input</sdn:SDN_FormatNameCode>
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        <gmd:version>
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```

```
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/cdicrCodeList.xml#SDN_FormatNameCode">MEDATLAS
ASCII</sdn:SDN_FormatNameCode>
```

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  <gmd:MD_Distributor>
    <gmd:distributorContact>
      <gmd:CI_ResponsibleParty>
        <gmd:organisationName>
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edmerp-codelists.xml#SDN_EDMOCCode"
            codeSpace="SeaDataNet"
            codeListValue="631">WL/Delft Hydraulics</sdn:SDN_EDMOCCode>
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            <gmd:phone>
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                <gmd:voice>
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                </gmd:voice>
              <gmd:facsimile>
                <gco:CharacterString>+31 15 2858582</gco:CharacterString>
```



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</gmd:facsimile>
</gmd:CI_Telephone>
</gmd:phone>
<gmd:address>
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    </gmd:deliveryPoint>
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    </gmd:city>
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    </gmd:postalCode>
    <gmd:country>
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        codeListValue="NL"
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```
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SDN_CountryCode>
```

```
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</gmd:electronicMailAddress>
</gmd:CI_Address>
</gmd:address>
<gmd:onlineResource>
  <gmd:CI_OnlineResource>
    <gmd:linkage>
      <gmd:URL>http://www.wldelft.nl</gmd:URL>
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</gmd:onlineResource>
</gmd:CI_Contact>
</gmd:contactInfo>
```



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    codeSpace="ISOTC211/19115">distributor</gmd:CI_RoleCode>
  </gmd:role>
</gmd:CI_ResponsibleParty>
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</gmd:MD_Distributor>
</gmd:distributor>
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      <gmd:CI_OnlineResource>
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        </gmd:protocol>
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          <gco:CharacterString>DBTEST</gco:CharacterString>
        </gmd:description>
        <gmd:function>
          <gmd:CI_OnLineFunctionCode
codeList="https://vocab.nerc.ac.uk/isoCodelists/sdnCodelists/gmxCodeLists.xml#CI_OnLineFunctionCode"
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            codeSpace="SeaDataNet">>manual interaction with an on-line system by registered
users following successful authentication and authorisation</gmd:CI_OnLineFunctionCode>
          </gmd:function>
        </gmd:CI_OnlineResource>
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```



</gmd:MD_DigitalTransferOptions>

</gmd:transferOptions>

<gmd:transferOptions>

<gmd:MD_DigitalTransferOptions>

<gmd:onLine>

<gmd:CI_OnlineResource>

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</gmd:description>

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<gmd:CI_OnLineFunctionCode

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codeListValue="URL"

codeSpace="SeaDataNet">direct access through the given URL endpoint using a

specific web protocol</gmd:CI_OnLineFunctionCode>

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</gmd:CI_OnlineResource>

</gmd:onLine>

</gmd:MD_DigitalTransferOptions>

</gmd:transferOptions>

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<gmd:dataQualityInfo>

<gmd:DQ_DataQuality>

<gmd:scope>

<gmd:DQ_Scope>

<gmd:level>

<gmd:MD_ScopeCode

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codeSpace="ISOTC211/19115">dataset</gmd:MD_ScopeCode>
</gmd:level>
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<gmd:report>
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<gmd:DQ_ConformanceResult>
<gmd:specification>
<gmd:CI_Citation>
<gmd:title>
<gco: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</gco:CharacterString>
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codeListValue="publication">publication</gmd:CI_DateTypeCode>
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```




```
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implementing Directive 2007/2/EC of the European Parliament and of the Council as regards
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            </gmd:date>
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  <gmd:DQ_DomainConsistency>
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        <gmd:specification>
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<gmd:LI_Lineage>

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</gmd:statement>

</gmd:LI_Lineage>

</gmd:lineage>

</gmd:DQ_DataQuality>

</gmd:dataQualityInfo>

</gmd:MD_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 19115:2003/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