
Marine Community Profile Manual

Release 1.4

Marine Community Profile Governance Committee

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This manual describes v1.4 of the Marine Community Profile of ISO19115/19139

This document is in HTML. A PDF version of this document is also available

Preface

1.1 About the Marine Community Profile (MCP)

This document provides information on the Marine Community *Profile* (hereafter MCP) of *ISO19115*.

The MCP was first devised by members of the Technical Committee of the [Australian Oceanographic Data Centre Joint Facility \(AODCJF\)](#) in 2006.

Versions 1.0 to 1.2 of the MCP were based on an *XML* implementation of *ISO19115* devised by Scott Bainbridge at the [Australian Institute of Marine Science](#). Versions 1.3 (and higher - from 2007 onwards) are based on the XML implementation of *ISO19115* set out in the *ISO19139* standard.

One of the first implementations of the MCP using the *GeoNetwork* Opensource software was done as part of the [Australian marine science data network \(BlueNet\)](#) project which was funded by the Department of Education, Science and Training (DEST) of the Australian Government. Since then, the MCP usually implemented in GeoNetwork, is used by other members of the AODCJF, including:

- [Australian Bureau of Meteorology](#)
- [Australian Antarctic Division](#)
- [Australian Institute of Marine Science](#)
- [CSIRO - Commonwealth Scientific and Industrial Research Organisation](#)
- [Royal Australian Navy Meteorology and Oceanography](#)

The MCP is also used by:

- [Integrated Marine Observing Network \(IMOS\)](#)
- [Australian Oceanographic Data Network \(AODN\)](#)

1.2 MCP Governance Committee

Development of the MCP is done through the [MCP Governance Committee](#). The terms of reference, current membership and minutes of previous meetings can all be found on the [MCP Governance Committee wiki site \(Registration Required\)](#).

1.3 How to read this document

To make the process of updating the MCP documentation easier, this document will not reproduce information from ISO19115 or ISO19139. Instead, references will be made to sections of these standards as required. The intention is that this document will be read with those standards. The specific versions of these standards to which this document will refer are:

- AS/NZS ISO19115:2005, **Australian/New Zealand Standard, Geographic Information-Metadata**, 27th April 2005, Standards Australia and Standards New Zealand, ISBN - 0 7337 6653 6
- ISO/TS 19139:2007(E), **Geographic Information-Metadata-XML schema implementation**, 15th April 2007, ISO

Unfortunately, these documents must be purchased - they are not freely available or open source! They can be purchased from various organisations that are licensed to sell these documents eg. SAI Global.

1.4 Documentation License

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The document is written in reStructuredText format for consistency and portability. You can download the source reStructuredText for this documentation from the git repository at <https://github.com/mcpgovernance/mcp-profile-docs>.

1.5 Author and Reference Information

This documentation was written by the Marine Community Profile Governance Committee and other community members. The main references are:

- the legacy MCP documentation at <http://www.aodc.gov.au/files/MarineCommunityProfilev1.4.pdf> (Note that that document does not describe version 1.4 of the MCP!)
- AS/NZS ISO19115:2005, **Australian/New Zealand Standard, Geographic Information-Metadata**, *27th April 2005*, Standards Australia and Standards New Zealand, ISBN - 0 7337 6653 6
- ISO/TS 19139:2007(E), **Geographic Information-Metadata-XML schema implementation**, *15th April 2007*, ISO
- structural elements and ideas from the [WMO Core Metadata Profile v1-2 Manual](#) by Jeremy Tandy.

The basis for the reStructuredText based documentation used for this document is work done by the [GeoServer](#) project and the [Sphinx](#) framework.

If you have questions or enhancements, please contact the MCP governance committee members at <http://www.aodn.org.au/mcp-governance>.

Introduction

The MCP is a *type 2* profile of *ISO19115* implemented in *XML* using *ISO19139*. This means that:

1. Any element of ISO19115 can be used in the MCP
2. New elements have been added using the approved extension procedures for ISO19115 and the XML implementation of ISO19139
3. Controlled vocabularies for certain metadata elements (also known as code lists) and rules for validating metadata records from ISO19115 have been extended and new controlled vocabularies and rules for checking validity have been added

Type 1 profiles of *ISO19115* are simpler than *type 2* profiles because they do not add new elements. Examples of *type 1* profiles are the ANZLIC Metadata profile and the WMO (World Meteorological Organisation) profile version 1.2.

2.1 XML Fragments

This manual uses fragments of XML to describe the MCP. Some familiarity with the following XML concepts is required:

- namespaces
- elements and attributes
- schemas

The basic concepts and ideas behind XML can be found at <http://www.w3schools.com/xml> and other places on the internet.

For brevity and to help understanding, fragments of XML will be written as follows:

- using a different font and background
- indented where possible to help reading
- where an XML element, including the start tag, end tag and content, is too long to show on a single line, it shall break across more than one line automatically
- content not relevant to the purpose of the fragment will be replaced by an ellipsis (...)

2.2 XML Conventions

These conventions reuse and extend the conventions set out in the [WMO Core Metadata Profile v1-2 Manual](#) by Jeremy Tandy. The conventions are as follows:

- The schema documents (see [XSD](#)) and codelists for the Marine Community Profile extend those used for ISO19139 and ISO19136. They are available online at <http://bluenet3.antcrc.utas.edu.au/mcp-1.4>.
- The schema documents for ISO19139 are included with the MCP schema documents. They are also available from the [ISO TC211 website](#) (see also [ISO TC211](#)).
- A number of different namespaces are used to separate metadata elements into packages for easier management or to include XML implementations of other standards such as GML. The result is that an MCP metadata record will incorporate multiple namespaces as follows:
 - The namespace identifier for mcp shall be: <http://bluenet3.antcrc.utas.edu.au/mcp>.
 - The namespace identifier for gmd shall be: <http://www.isotc211.org/2005/gmd>
 - The namespace identifier for gco shall be: <http://www.isotc211.org/2005/gco>
 - The namespace identifier for gmx shall be: <http://www.isotc211.org/2005/gmx>
 - The namespace identifier for gml shall be: <http://www.opengis.net/gml>
 - The namespace identifier for xlink shall be: <http://www.w3.org/1999/xlink>
 - The namespace identifier for xsi shall be: <http://www.w3.org/2001/XMLSchema-instance>
 - The root element when shown shall be mcp:MD_Metadata
 - The root element should have an attribute called xsi:schemaLocation which contains a value or set of values hinting at the physical location of schemas which may be used for validation. Since this attribute provides only a hint validating parsers are allowed to ignore it and use other means of locating the relevant schemas.
- An example of the complete namespace declaration for an MCP metadata record is:

```
<mcp:MD_Metadata
xmlns:mcp="http://bluenet3.antcrc.utas.edu.au/mcp"
xmlns:gmd="http://www.isotc211.org/2005/gmd"
xmlns:gco="http://www.isotc211.org/2005/gco"
xmlns:gml="http://www.opengis.net/gml"
xmlns:gmx="http://www.isotc211.org/2005/gmx"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xlink="http://www.w3.org/1999/xlink"
gco:isoType="gmd:MD_Metadata"
xsi:schemaLocation="
  http://bluenet3.antcrc.utas.edu.au/mcp
  http://bluenet3.antcrc.utas.edu.au/mcp-1.4/schema.xsd
  http://www.isotc211.org/2005/gmx
  http://www.isotc211.org/2005/gmx/gmx.xsd">
  (...)
</mcp:MD_Metadata>
```

Example of complete namespace declaration for an MCP metadata record

Note: The example of the complete namespace declaration of an MCP metadata record shown above has explicit namespace prefixes for each namespace used in the document. This is the recommended and preferred practice for MCP metadata records.

- Schemas that use the mcp namespace identifier <http://bluenet3.antcrc.utas.edu.au/mcp> are expected to be backwards compatible. MCP schemas with version numbers 1.3, 1.4 and 1.5-experimental all use this namespace and are backwards compatible. This means that a metadata record that validates against MCP schema version 1.3 (for example) should also validate against MCP schema version 1.4.

2.3 MCP XML Schemas (XSDs)

The schema documents (see *XSD*) and codelists for the Marine Community Profile are available online at <http://bluenet3.antcrc.utas.edu.au/mcp-1.4>.

As the MCP is under development and contributing organisations develop and change metadata elements, code lists and content rules, an experimental version of the MCP exists at <http://bluenet3.antcrc.utas.edu.au/mcp-1.5-experimental>.

2.4 MCP Implementations

Version 1.4 of the MCP (described by this document) and the experimental 1.5 version of the MCP have been implemented as plugin metadata schemas for version 2.8 of GeoNetwork opensource (see *GeoNetwork*).

You can obtain a complete release of GeoNetwork version 2.8 with the MCP configured and ready to use in the ANZMEST package of GeoNetwork 2.8 for AU/NZ users at <http://anzlicmet.bluenet.utas.edu.au>.

Mandatory, Conditional and Optional Elements for Marine Geographic Datasets

Mandatory metadata elements are elements that must appear in any MCP metadata record.

Conditional metadata elements are elements that are mandatory if a certain condition exists. For example, it is mandatory to have a metadata language element if the language encoding is not one of the common ISO10646-1/Unicode character sets such as UTF-8.

Optional metadata elements are elements that don't need to be present but are recommended to maximize interoperability.

3.1 Mandatory Metadata Elements for Marine Geographic Datasets

About the Dataset:

No.	Name	XPath
D1	Citation Title	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:citation/gmd:CI_Citation/gmd:title
D2	Citation Date	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:citation/gmd:CI_Citation/gmd:date
D3	Abstract	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:abstract
D5	Language	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:language
D6	Topic Category	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:topicCategory
D7	Bounding Box	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:extent/gmd:EX_Extent/gmd:geographicElement/gmd:EX_GeographicBoundingBox
D8	Temporal Extent	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:extent/gmd:EX_Extent/gmd:geographicElement/mcp:EX_TemporalExtent

Rationale for making D7 and D8 mandatory: In earlier versions of the MCP documentation (eg. <http://www.aodc.gov.au/files/MarineCommunityProfilev1.4.pdf>), D7 and D8 were made conditional on the hierarchyLevel being set to 'dataset'. However the subject (and the title of this section) in previous documentation has always been about 'Metadata Elements for Marine Geographic *Datasets*'. Given that we are referring to 'datasets', this condition would appear to be trivially satisfied and we can safely make elements D7 and D8 mandatory.

About the Metadata record:

No.	Name	XPath
M1	File Identifier	mcp:MD_Metadata/gmd:fileIdentifier
M2	Standard Name	mcp:MD_Metadata/gmd:metadataStandardName
M3	Standard Version	mcp:MD_Metadata/gmd:metadataStandardVersion
M4	Date Stamp	mcp:MD_Metadata/gmd:dateStamp
M5	Revision Date	mcp:MD_Metadata/mcp:revisionDate
M6	Point of Contact	mcp:MD_Metadata/gmd:contact/gmd:CI_ResponsibleParty

Rationale for making M2 and M3 and Mandatory: The MCP is implemented in both a production version and an experimental version. Implementations need to be able to distinguish between these versions of the MCP.

3.2 Conditional Metadata Elements for Marine Geographic Datasets

About the Dataset:

No	Name	XPath	Condition
CD3	Character Set	mcp:MD_Metadata/ gmd:identificationInfo/ mcp:MD_DataIdentification/ gmd:characterSet	Documented if ISO 10646-1/Unicode (eg. UTF-8) not used and not defined by the encoding standard

About the Metadata record:

No.	Name	XPath	Condition
CM1	Character Set	mcp:MD_Metadata/ gmd:characterSet	Documented if ISO 10646-1/Unicode (eg. UTF-8) not used and not defined by the encoding standard
CM2	Language	mcp:MD_Metadata/ gmd:language	Documented if not defined by the encoding standard

3.3 Optional Metadata Elements for Marine Geographic Datasets

All optional elements refer to the dataset.

No.	Name	XPath
OD1	Responsible Party	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:pointOfContact/gmd:CI_ResponsibleParty
OD2	Spatial Resolution	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:spatialResolution/gmd:MD_Resolution/gmd:equivalentScale
OD3	Distribution Format	mcp:MD_Metadata/gmd:distributionInfo/gmd:MD_Distribution/gmd:distributionFormat/gmd:MD_Format
OD4	Online Resource	mcp:MD_Metadata/gmd:distributionInfo/gmd:MD_Distribution/gmd:transferOptions/gmd:MD_DigitalTransferOptions/gmd:onLine/gmd:CI_OnlineResource
OD5	Reference System	mcp:MD_Metadata/gmd:referenceSystemInfo/gmd:MD_ReferenceSystem
OD6	Spatial Representation Type	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:spatialRepresentationType
OD7	Keywords	mcp:MD_Metadata/gmd:identificationInfo/mcp:MD_DataIdentification/gmd:keywords
OD8	Lineage	mcp:MD_Metadata/gmd:dataQualityInfo/gmd:DQ_DataQuality/gmd:lineage/gmd:LI_Lineage/gmd:statement

Extensions to ISO19115

4.1 Data Parameters (mcp:dataParameters)

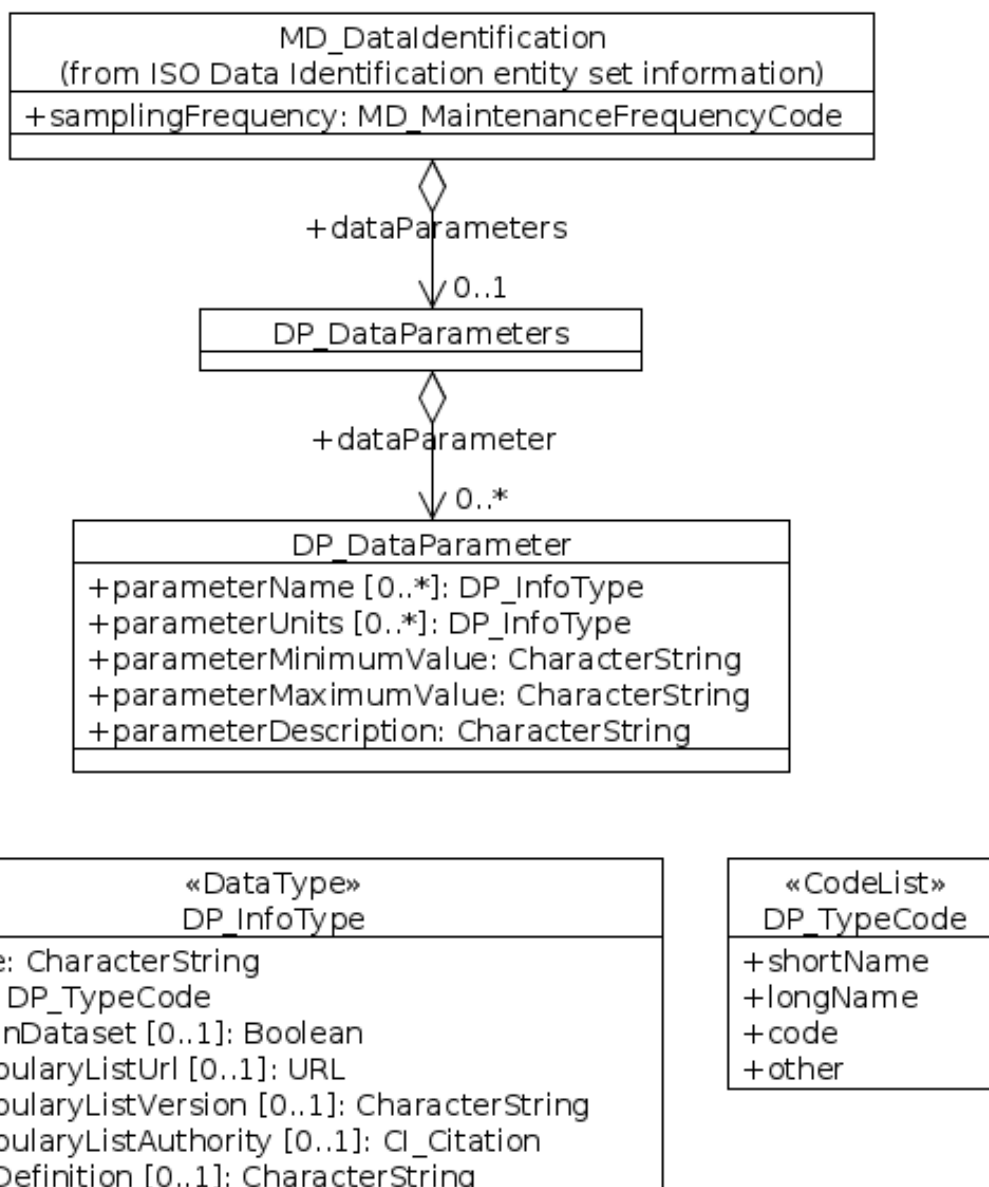
4.1.1 Rationale

ISO19115 has classes for describing the data parameters of coverages (continuously varying data usually represented by grids) and features (usually discrete data represented as points, lines and polygons etc) in the Content Information package (see section A.2.8 of the ISO19115 standard). However, the package does not provide:

- a simple, unified description of data parameters. The metadata author is forced instead to split the description of data parameters between a class for coverages and a separate, related standard for features (ISO19110)
- a simple way of handling the different aliases that often need to be described when entering meta-data about data parameter names
- vocabulary support for looking up data parameter names where these names have been standardized

The intention of this new package is to address the first two shortcomings and provide a basis for the third (vocabulary support) when vocabulary services that provide these parameters are standardized and widely available.

4.1.2 UML



UML Diagram of DataParameters package

4.1.3 Data Dictionary

No.	Name	Definition	Cond/ Oblig	Max. Occ.	Data Type	Do- main
940	DP_DataParameters	Container for description of data set data parameters	Note 1	Note 2	Aggregated Class	Line 68
941	DP_DataParameter	Container for description of a data set parameter	Note 1	Note 2	Class	Lines 942-946
942	parameter-Name	Name of Parameter	M	N	Class	DP_InfoType
943	parameterUnits	Units of Parameter	M	N	Class	DP_InfoType
944	parameterMinimumValue	Minimum Value of Parameter	O	1	CharacterString	Free-Text
945	parameterMaximumValue	Maximum Value of Parameter	O	1	CharacterString	Free-Text
946	parameterDescription	Parameter Description	O	1	CharacterString	Free-Text

Obligation / Condition Key

- **Note 1** - Use obligation from referencing object
- **Note 2** - Use maximum occurrence from referencing object
- **M** - Mandatory
- **O** - Optional
- **C** - Conditional

No.	Name	Definition	Cond/ Oblig	Max. Occ.	Data Type	Do- main
947	DP_InfoType	Parameter Name or Unit Information	Note 1	Note 2	Class	Lines 948-953
948	name	Name of Parameter or Unit (depending on parent)	M	1	Character-String	Free-Text
949	type	Type of Parameter name or Unit name	M	1	CodeList	DP_Type-Code
950	vocabularyListUrl	URL of the parameter/unit vocabulary list/service that includes this name	O	1	Class	URL
951	vocabularyListAuthority	URL of authority regulating or managing vocabulary list specified at 950	O	1	Class	URL
952	vocabularyListVersion	Version of the parameter/unit vocabulary list/service that includes this name	O	1	Character-String	Free-Text
953	localDefinition	Definition of the parameter/unit name if not available from vocabulary list/service	O	1	Character-String	Free-Text

Obligation / Condition Key

- **Note 1** - Use obligation from referencing object
- **Note 2** - Use maximum occurrence from referencing object
- **M** - Mandatory
- **O** - Optional
- **C** - Conditional

4.1.4 XML Example

An XML example of the data parameter package:

```
<mcp:dataParameters>
  <mcp:DP_DataParameters>
    <mcp:dataParameter>
      <mcp:DP_DataParameter>
        <mcp:parameterName>
          <mcp:DP_ParameterName>
            <mcp:name>
              <gco:CharacterString>t</gco:CharacterString>
            </mcp:name>
          <mcp:type>
            <mcp:DP_TypeCode
              codeList="http://bluenet3.antcrc.utas.edu.au/mcp-1.4/resources/Codelist/gmxCodeListValue="shortName">shortName</mcp:DP_TypeCode>
            </mcp:type>
          <mcp:usedInDataset>
            <gco:Boolean>1</gco:Boolean>
          </mcp:usedInDataset>
        </mcp:DP_ParameterName>
      </mcp:DP_DataParameter>
    </mcp:dataParameter>
  </mcp:DP_DataParameters>
</mcp:dataParameters>
```

```

    <mcp:vocabularyListURL>
      <gmd:URL>http://www.imos.org.au/vocabserver?code=temperature&vocab=oceanog
    </mcp:vocabularyListURL>
    <mcp:vocabularyListVersion>
      <gco:CharacterString>3.6</gco:CharacterString>
    </mcp:vocabularyListVersion>
  </mcp:DP_ParameterName>
</mcp:parameterName>
<mcp:parameterUnit>
  <mcp:DP_ParameterUnit>
    <mcp:name>
      <gco:CharacterString>degrees celsius</gco:CharacterString>
    </mcp:name>
    <mcp:type>
      <mcp:DP_TypeCode
codeList="http://bluenet3.antcrc.utas.edu.au/mcp-1.4/resources/Codelist/gmxCo
codeListValue="longName">longName</mcp:DP_TypeCode>
    </mcp:type>
    <mcp:usedInDataset>
      <gco:Boolean>1</gco:Boolean>
    </mcp:usedInDataset>
    <mcp:vocabularyListURL>
      <gmd:URL>http://www.imos.org.au/vocabserver?code=degreescelsius&vocab=uom
    </mcp:vocabularyListURL>
    <mcp:vocabularyListVersion>
      <gco:CharacterString>4.5</gco:CharacterString>
    </mcp:vocabularyListVersion>
  </mcp:DP_ParameterUnit>
</mcp:parameterUnit>
<mcp:parameterMinimumValue>
  <gco:CharacterString>0.1</gco:CharacterString>
</mcp:parameterMinimumValue>
<mcp:parameterMaximumValue>
  <gco:CharacterString>22.5</gco:CharacterString>
</mcp:parameterMaximumValue>
<mcp:parameterDescription>
  <gco:CharacterString>The temperature observed by the CTD on its depth profiles
  </mcp:parameterDescription>
</mcp:DP_DataParameter>
</mcp:dataParameter>
</mcp:DP_DataParameters>
</mcp:dataParameters>

```

4.1.5 Metadata about this package

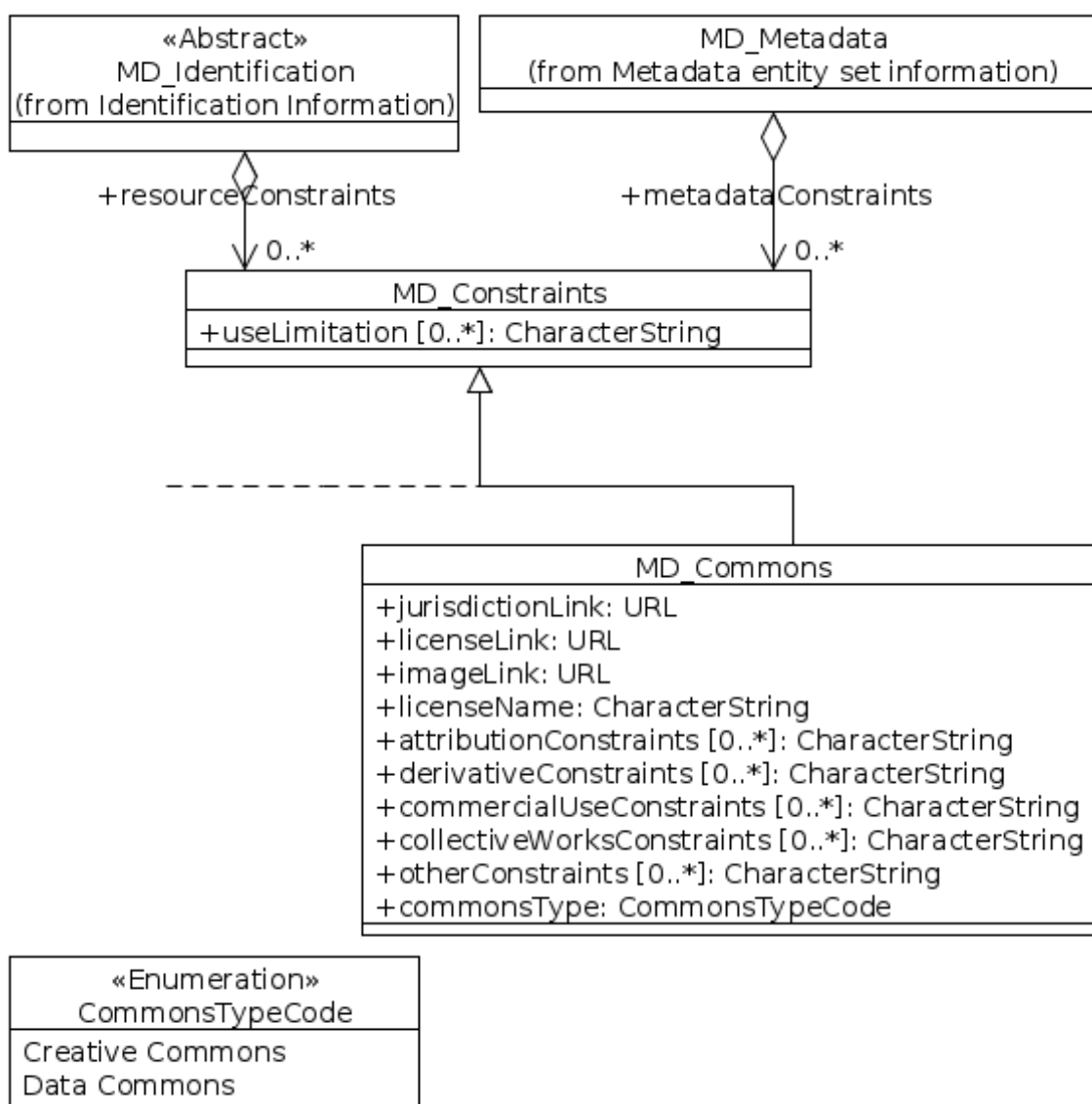
- **Proposer:** BlueNet Project (Kate Roberts)
- **Date proposed:** 2010
- **Date accepted by MCP Governance Committee:** 2010
- **MCP Version:** 1.4 onwards

4.2 Commons Licensing Constraints (mcp:MD_Commons)

4.2.1 Rationale

ISO19115 has a number of constraint classes that can be used to describe rights to information and restrictions on access and use: MD_Security, MD_LegalConstraints (see section A.2.3 of the ISO19115 standard for details). However, the majority of the elements used in these classes are free text and there are no specific elements that can be used to handle licenses that are delivered and described on the internet. The intention of these new classes is to fill this gap by providing purpose built elements that describe both the internet delivered licenses and any additional constraints that the common forms of these licenses may require (eg. attribution constraints).

4.2.2 UML



UML Diagram of MD_Commons class

4.2.3 Data Dictionary

This table makes use of lines 67-68 from table B.2.3 (Constraint information) in the ISO19115 standard. Lines 901 onwards are new elements from the MCP.

No.	Name	Definition	Cond/ Oblig	Max. Occ.	Data Type	Domain
67	MD_ Con- straints	Restrictions on the access and use of a resource or metadata	Note 1	Note 2	Aggregated Class	Line 68
68	useLimita- tion	Limitation affecting fitness for use of the resource or metadata	O	N	Character- String	FreeText
901	MD_ Commons	Commons license restrictions on resource or metadata	Note 1	Note 2	Specified Class (MD_ Constraints)	Lines 902-911 and 68
902	jurisdic- tionLink	Link to licensing jurisdiction information	M	1	Class	URL
903	li- censeLink	Link to licensing information	M	1	Class	URL
904	imageLink	Link to visual license representation (as image)	M	1	Class	URL
905	license- Name	Name of the license	M	1	Character- String	FreeText
906	attribu- tionCon- straints	How, when and who resource or metadata should be attributed to	O	N	Character- String	FreeText
907	derivative- Con- straints	Constraints on products that may be derived from resource or metadata	O	N	Character- String	FreeText
908	commer- cialUseC- onstraints	Constraints on making use of resource or metadata commercially	O	N	Character- String	FreeText
909	collective- WorksCon- straints	Constraints on including this resource or metadata in a collective work	O	N	Character- String	FreeText
910	otherCon- straints	Any other constraint not captured specific constraint fields	O	N	Character- String	FreeText
911	common- sType	Type of commons licensing scheme described	M	1	Enumeration	CommonsType- Code <<Enumera- tion>>

Obligation / Condition Key

- **Note 1** - Use obligation from referencing object
- **Note 2** - Use maximum occurrence from referencing object
- **M** - Mandatory
- **O** - Optional
- **C** - Conditional

4.2.4 XML Example

An XML example of a resource constraint that uses a Creative Commons license.

```
<gmd:resourceConstraints>
  <mcp:MD_Commons mcp:commonsType="Creative Commons" gco:isoType="gmd:MD_Constraints">
    <gmd:useLimitation>
      <gco:CharacterString>The data used to test this vehicle
should not be used for navigation purposes</gco:CharacterString>
    </gmd:useLimitation>
    <mcp:jurisdictionLink>
      <gmd:URL>http://creativecommons.org/international/au/</gmd:URL>
    </mcp:jurisdictionLink>
    <mcp:licenseLink>
      <gmd:URL>http://creativecommons.org/licenses/by-sa/3.0/au/</gmd:URL>
    </mcp:licenseLink>
    <mcp:imageLink>
      <gmd:URL>http://i.creativecommons.org/l/by-sa/3.0/au/88x31.png</gmd:URL>
    </mcp:imageLink>
    <mcp:licenseName>
      <gco:CharacterString>Attribution-ShareAlike 3.0 Australia</gco:CharacterString>
    </mcp:licenseName>
    <mcp:attributionConstraints>
      <gco:CharacterString>Attribute as: Butte J, A horse drawn,
cabbage leaf powered, Marine bicycle, Heath Robinson Monthly,
UK Oceanographics Inc</gco:CharacterString>
    </mcp:attributionConstraints>
    <mcp:otherConstraints>
      <gco:CharacterString>Note attribution and share alike
provisions of CC license</gco:CharacterString>
    </mcp:otherConstraints>
  </mcp:MD_Commons>
</gmd:resourceConstraints>
```

4.2.5 Metadata about this element

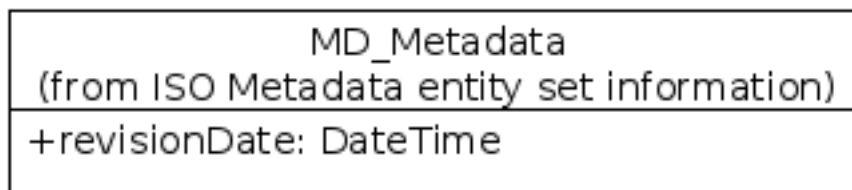
- **Proposer:** BlueNet Project (Kate Roberts)
- **Date proposed:** 2010
- **Date accepted by MCP Governance Committee:** 2010
- **MCP Version:** 1.4 onwards

4.3 Metadata Revision Date (mcp:revisionDate)

4.3.1 Rationale

ISO19115 defines a mandatory dateStamp element (see data dictionary in section B.2.1 of the ISO19115 standard document) as ‘the date that the metadata was created’. There is no element in ISO19115 that can capture the date (and time) of subsequent updates to the metadata. The MCP defines a revisionDate element that can capture this information.

4.3.2 UML



UML Diagram showing extension to ISO Metadata Entity Element to include revisionDate

4.3.3 Data Dictionary

No.	Name/Role Name	Definition	Condition/Obligation	Max. Occurrence	Data Type	Domain
900	revision-Date	date and time that the metadata was revised	M	1	Class	DateTime (ISO19115 B.4.2)

4.3.4 XML Example

```
<mcp:MD_Metadata (...)>
  (...)
  <mcp:revisionDate>
    <gco:Date>2011-05-18</gco:Date>
  </mcp:revisionDate>
</mcp:MD_Metadata>
```

4.3.5 Metadata about this element

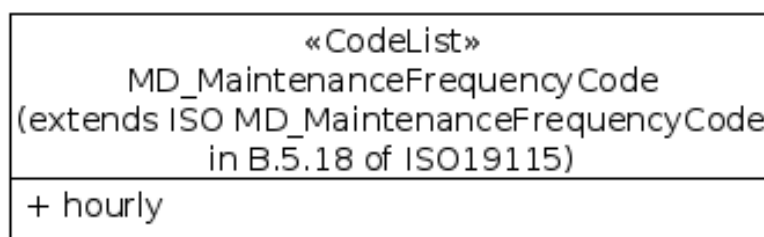
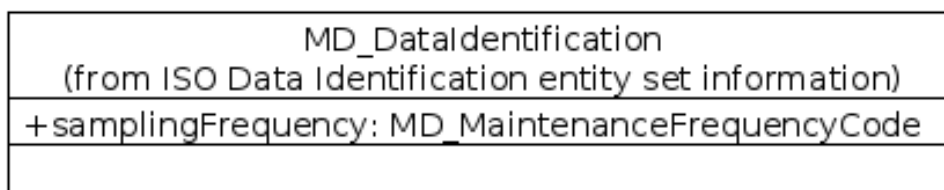
- **Proposer:** AODCJF Technical Committee
- **Date confirmed by MCP Governance Committee:** 2006
- **Included in MCP Version:** 1.2 onwards

4.4 Data Sampling Frequency (mcp:samplingFrequency)

4.4.1 Rationale

ISO19115 has a data identification class that capture metadata about a data set or resource. The class does not include information about the frequency with which a data resource has been sampled. The MCP defines a samplingFrequency element that can capture this information. It is included as an extension of the data identification class and reuses an extension of the controlled vocabulary provided by the MD_MaintenanceFrequency code list (see section B.5.18 in ISO19115 and *MD_MaintenanceFrequencyCode (Annex B.5.18 in ISO19115)*).

4.4.2 UML



UML Diagram showing extension to ISO Identification Information Element to include samplingFrequency

4.4.3 Data Dictionary

No.	Name	Definition	Cond/Oblig	Max. Occurrence	Data Type	Domain
930	samplingFrequency	Describes the frequency with which the resource is sampled	O	1	Class	MD_MaintenanceFrequencyCode (B.5.18)

4.4.4 XML Example

```

<mcp:MD_DataIdentification gco:isoType="gmd:MD_DataIdentification">
  (...)
  <mcp:samplingFrequency>
    <gmd:MD_MaintenanceFrequencyCode
      codeList="http://bluenet3.antcrc.utas.edu.au/mcp-1.4/schema/resources/Codelist/gm
      codeListValue="annually">annually</gmd:MD_MaintenanceFrequencyCode>
    </mcp:samplingFrequency>
  </mcp:MD_DataIdentification>
    
```

4.4.5 Metadata about this element

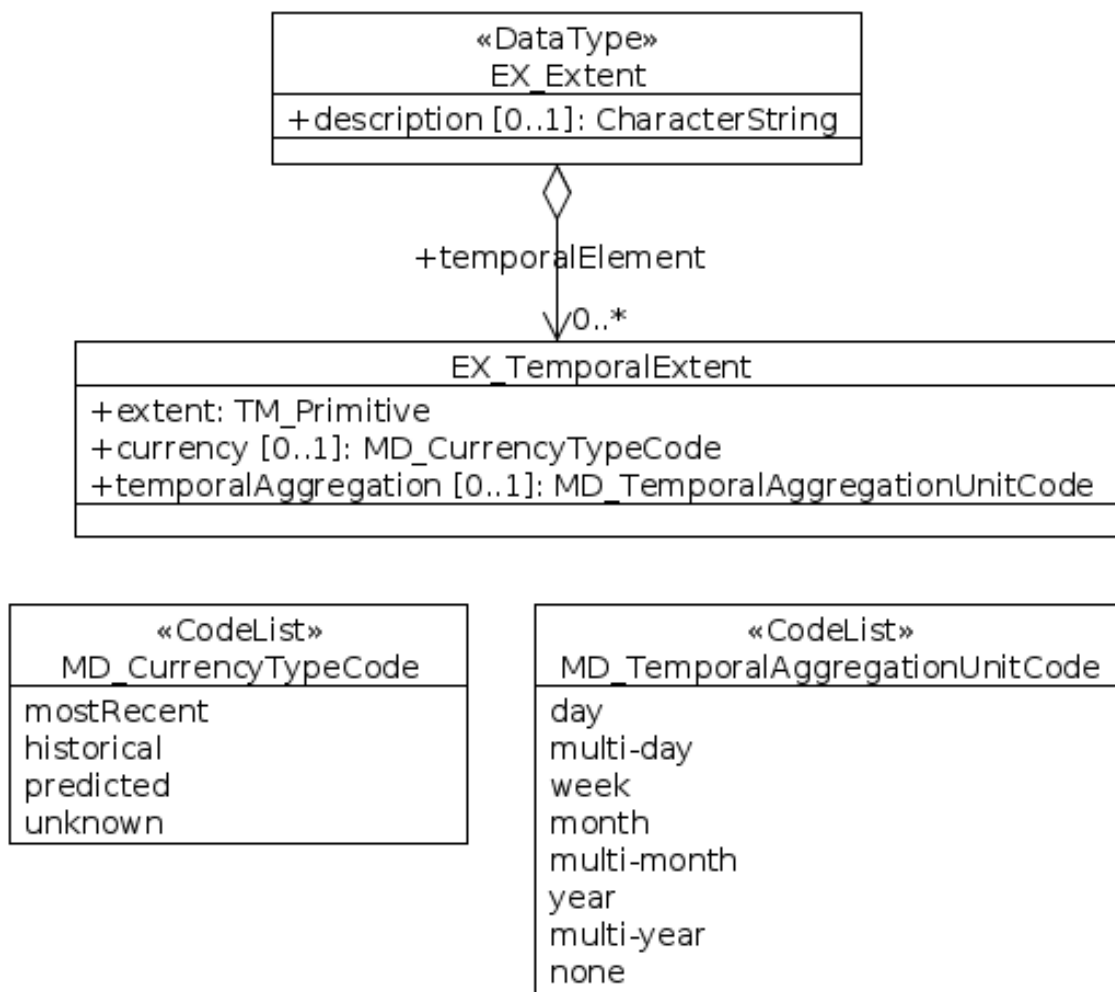
- **Proposer:** AODCJF Technical Committee
- **Date confirmed by MCP Governance Committee:** 2006
- **Included in MCP Version:** 1.2 onwards

4.5 Temporal Extent (mcp:EX_TemporalExtent)

4.5.1 Rationale

ISO19115 has a temporal extent to describe a time period which is most often applied to the resource or subject of the metadata record. However, the temporal extent does not include a description of the temporal currency or aggregation in use. The intention of these new classes is to fill this gap.

4.5.2 UML



UML Diagram of extended EX_TemporalExtent class

4.5.3 Data Dictionary

This table makes use of lines 350-351 from table B.3.1.2 (Temporal extent information) in the ISO19115 standard. Lines 920 onwards are new elements from the MCP.

No.	Name	Definition	Cond/Oblig	Max. Occurrence	Data Type	Domain
350	EX_TemporalExtent	Time period covered by the content of the dataset or metadata subject	Note 1	Note 2	Aggregated Class (EX_Extent)	Lines 351 & 920-921
351	extent	Date and time for the content of the dataset or metadata subject	M	1	Class	TM_Primitive (B.4.5)
920	currency	Temporal currency for the dataset or metadata subject	O	1	Class	<i>MD_CurrencyTypeCode</i> <<CodeList>>
921	temporalAggregation	Temporal aggregation for the dataset or metadata subject	O	1	Class	<i>MD_TemporalAggregationUnitCode</i> <<CodeList>>

Obligation / Condition Key

- **Note 1** - Use obligation from referencing object
- **Note 2** - Use maximum occurrence from referencing object
- **M** - Mandatory
- **O** - Optional
- **C** - Conditional

4.5.4 XML Example

An XML fragment showing an example of the mcp:EX_TemporalExtent element.

```
<gmd:temporalElement>
  <mcp:EX_TemporalExtent gco:isoType="gmd:EX_TemporalExtent">
    <gmd:extent>
      <gml:TimePeriod gml:id="N10315">
        <gml:begin>
          <gml:TimeInstant gml:id="N1031B">
            <gml:timePosition>2012-01-01T00:45:00</gml:timePosition>
          </gml:TimeInstant>
        </gml:begin>
        <gml:end>
          <gml:TimeInstant gml:id="N10326">
            <gml:timePosition>2012-01-28T03:30:00</gml:timePosition>
          </gml:TimeInstant>
        </gml:end>
      </gml:TimePeriod>
    </gmd:extent>
    <mcp:currency>
      <mcp:MD_CurrencyTypeCode
        codeList="http://bluenet3.antcrc.utas.edu.au/mcp-1.4/resources/CodeList/gmxCodeList"
        codeListValue="historical">historical</mcp:MD_CurrencyTypeCode>
    </mcp:currency>
    <mcp:temporalAggregation>
```

```

    <mcp:MD_TemporalAggregationUnitCode
      codeList="http://bluenet3.antcrc.utas.edu.au/mcp-1.4/resources/Codelist/gmxCodeList
      codeListValue="week">week</mcp:MD_TemporalAggregationUnitCode>
  </mcp:temporalAggregation>
</mcp:EX_TemporalExtent>
</gmd:temporalElement>

```

4.5.5 Metadata about this element

- **Proposer:** AODCJF Technical Committee
- **Date proposed:** 2006
- **Date accepted by MCP Governance Committee:** 2010
- **MCP Version:** 1.2 onwards

4.6 Taxonomic Coverage (mcp:taxonomicCoverage)

Warning: This extension is NOT yet approved by the MCP Governance Committee - it is still experimental - if you use it and the specification changes then you will have to adjust your implementation.

4.6.1 Background

Metadata records utilising the MCP which describe biological datasets should ideally be able to encode their taxonomic coverage in a consistent way so as to support predictable metadata and data search, filtering and aggregation operations, and also (where possible) navigation through a consistent hierarchical (tree) structure to find or group metadata records of interest. Currently, neither the base ISO19115 metadata standard or the Marine Community Profile support such a feature, although one such has been proposed as an extension to ISO19115 by the U.S. NBII (National Biological Information Infrastructure), see NODC, 2012. Meanwhile Simon Pigot of CSIRO Marine and Atmospheric Research has independently implemented an experimental extension to the MCP for embedding taxonomic information into MCP records. This extension was developed for the Atlas of Living Australia (ALA) and incorporates information supplied from the ALA-sponsored National Species Lists (NSL) project based at the Australian National Botanic Gardens (see Belbin & Pigot, 2010).

The purpose of this section of the MCP manual is to:

- outline the requirements for taxonomic coverage data in the Marine Community
- briefly examine the current schemas used for taxonomic coverage data
- identify and catalog the relevant services that can deliver this information to the Marine Community
- develop and refine the experimental extension to the MCP so that it can be adopted as part of the MCP

4.6.2 Requirements

The requirement addressed herein is to propose a standardised way for representation of taxonomic coverage of a dataset in a metadata record. It is recognised that such coverage could comprise a single or multiple species names, or possibly names at a higher taxonomic level such as genus, family, or higher taxonomic ranks such as order, class, phylum or kingdom. For example datasets on fishes might comprise multiple fish species (up to 31,000 worldwide, 5,000 in the Australian region) right down to a single species, while for insects (admittedly not marine but in principle should be modelled according to the same approach) the numbers are larger again (maybe 1m global, 62,000 presently known Australian), refer Chapman, 2009. Clearly such large numbers of species would never be separately itemised in a metadata record, but conceivably a dataset comprising tens to possibly hundreds of different species may require to be described where such an approach might be desirable.

In the world of scientific communication the standard currency for species and other ranks is the **scientific name** of the organism, which is either a binomial (genus+species) at species rank (example: “*Homo sapiens*” for humans, “*Physeter macrocephalus*” for the sperm whale), or a uninominal at higher ranks (there are some exceptions such as subgenera but these can be ignored for present purposes) – examples for the sperm whale being the **taxonomic hierarchy** or nested set *Physeter* (genus), Animalia (kingdom) > Chordata (phylum) > Mammalia (class) > Cetacea (order) > *Physeteridae* (family) > *Physeter* (genus) > *Physeter macrocephalus* (species) (note by convention, genus and species names are italicised for reporting purposes, other [higher] ranks are not). Note also that quoted taxonomic hierarchies, for the same name, can differ in some respects between taxonomic data sources: some may insert or drop additional (intermediate) ranks (example: Vertebrata, which is a subphylum), while the naming of ranks or allocation to families, etc. can also differ since these are to some degree a matter of scientific opinion rather than fact. (In practice this means that taking taxonomic information from a limited and controlled number of sources, = vocabularies, is probably a good thing, to limit the possible variation in this regard).

For completeness, each of these names (in particular at genus and species level) should ideally be accompanied by the authority (person and year who originally established the name), which in these examples would be Linnaeus, 1758 for *Homo sapiens* and (coincidentally) the same author for *Physeter macrocephalus*. This is to distinguish between cases (**homonyms**) where different authors have inadvertently used the same name to refer to different taxa (defined groups of organisms at species or other ranks) – a rare but not unknown event at species rank, but quite common at genus level in particular (for examples see <http://www.cmar.csiro.au/datacentre/irmng/homonyms.htm>). As one example, *Ficus variegata* (Röding, 1798) is a mollusc in the genus *Ficus* Röding, 1798, while *Ficus variegata* Blume, 1825 is a species of fig tree in the genus *Ficus* Linnaeus, 1753.

Common names are also available for many taxa (chiefly the larger ones i.e. vertebrates, some easily recognised invertebrates, so-called “higher” plants and a subset only of algae and fungi) but unfortunately are less standardised between countries, languages, or even within countries in different regions, although for some groups (e.g. Australian birds and fishes), “recommended” i.e. locally endorsed standard names are available. Thus the fish species *Hyperoglyphe antarctica* (Carmichael, 1818) now has the Australian standard name “Blue-eye Trevalla” but according to the Australian Faunal Directory has at other times gone under the names Big Eye, Big-eye Trevalla, Blue Eye, Blue-eye, Blue-eye Cod, Blue-nose, Bluenose, Bluenose Warehouse, Bream Trevalla, Deep Sea Trevalla, Deep-sea Trevalla, Deepsea Trevalla, Griffin’s Silverfish, Sea Trevally, Stoney-eye, and Trevalla (see <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/ba90a132-1584-4ec9-8d1c-07c29f6b4895>). By contrast, many minute and otherwise obscure organisms may lack any common name at all.

A supplementary source of confusion regarding common names is the re-use of portions of names in unrelated contexts: thus “whale” is re-used in “whale shark” (a fish, not a whale), “whale lice” (lice that

live on whales, not whales themselves)

Taxonomic hierarchies will be available in some form for all species (as per the example given above for the sperm whale, genus through kingdom) but unfortunately are not necessarily standardised between data sources: for example in many cases, a different hierarchy (either in presence/absence of intermediate levels, choice of genus allocation to family, or even naming/recognition of higher taxa) will vary according to the source consulted (e.g. Australian Faunal Directory vs. World Register of Marine Species vs. Catalogue of Life, etc.). While this lack of consistency is unfortunate at a global level, locally it can be minimised by sourcing as many names as possible from a single provider (in this instance, the NSLs project) and where recourse to other sources is necessary, accepting a degree of uncontrolled variation as something to be lived with at the present time.

Species names and identifiers should ideally be sourced from a single provider as a vocabulary service. Ultimately for the Australian region this is intended to be the NSLs project which has been supported by the ALA to this point, drawing together and possibly supplementing pre-existing data compilations including the Australian Faunal Directory (AFD) (for animals) and the Australian Plant Checklist (APC) and Australian Plant Name Index (APNI) for higher plants. Unfortunately at this time these resources are less than 100% complete (estimate 80% for AFD, unsure for APC/APNI) and also do not as yet include equivalent coverage for fungi, macroalgae, microalgae (=phytoplankton), protists and prokaryotes (Bacteria and Archaea); in addition there will in general be no coverage for species occurring outside strictly Australian waters but which may require to be referenced in metadata. For species not presently covered by NSLs it is proposed that recourse to other lists be supported, in particular the Catalogue of Life, <http://www.catalogueoflife.org/>, which currently claims to cover 70% of global extant species (1.31 million names) and/or WoRMS, the World Register of Marine Species, <http://www.marinespecies.org/> which currently claims to be 89% complete for global extant marine species (215k names). For fossil species or species not on any of these lists, a facility to enter species names as uncontrolled free text without citing an identifier in any of these vocabularies should also be supported. The ability to query these lists via web services is also ideally required, in order to search for a species name and return both this and any other desired information including unique identifier, taxonomic hierarchy, and possibly a preferred common name as desired.

Synonyms are a part of taxonomic information in that they represent a list of alternative or (more commonly) superseded scientific names for any taxon. For example *Physeter macrocephalus*, the sperm whale as cited above, is often also found under the name *Physeter catodon* in many sources, and in fact WoRMS gives the following exhaustive synonym list for this species, refer <http://www.marinespecies.org/aphia.php?p=taxdetails&id=137119> :

- *Catodon australis* Wall, 1851 (synonym)
- *Catodon colneti* Gray, 1850 (synonym)
- *Catodon macrocephalus* Lacépède, 1804 (synonym)
- *Cetus cylindricus* Billberg, 1828 (synonym)
- *Delphinus bayeri* Risso, 1826 (synonym)
- *Phiseter cylindricus* Bonnaterre, 1789 (synonym)
- *Phiseter mular* Bonnaterre, 1789 (synonym)
- *Phiseter trumpo* Bonnaterre, 1789 (synonym)
- *Physalus cylindricus* Lacépède, 1804 (synonym)
- *Physeter andersonii* Borowski, 1780 (synonym)
- *Physeter australasiensis* Desmoulins, 1822 (synonym)

- *Physeter australis* Gray, 1846 (synonym)
- *Physeter catodon* Linnaeus, 1758 (synonym)
- *Physeter maximus* G. Cuvier, 1798 (synonym)
- *Physeter microps* Linnaeus, 1758 (synonym)
- *Physeter microps rectidentatus* Kerr, 1792 (synonym)
- *Physeter novaeangliae* Borowski, 1780 (synonym)
- *Physeter orthodon* Lacépède, 1804 (synonym)
- *Physeter tursio* Linnaeus, 1758 (synonym)
- *Physeterus sulcatus* Lacépède, 1818 (synonym)
- *Tursio vulgaris* Fleming, 1822 (synonym)

For the purposes of metadata encoding it is recognised that inclusion of lists scientific name synonyms such as the above would most likely be overkill and barely tractable, especially in multi-species situations, and since such lists can be generated from third party sources such as the above via a separate process, if required (e.g. at data search time) they should be handled by a synonym generation/query expansion service extrinsic to the metadata records themselves.

Scalability and potential for generalisation: while recognising that the context of the present document is addressing is that of the existing “marine community” in Australia, there are obvious benefits in promoting a structure which is not confined to this, for the following reasons:

- The needs of the marine community intersect with those of the nonmarine (freshwater and terrestrial) community, particularly in coastal studies, and indeed a solution which also suits the needs of the purely terrestrial community would be a candidate for adoption without modification by them if desired
- There will almost certainly be a requirement to handle non-Australian as well as “currently known” Australian taxa, for example in regional and/or comparative studies, or new records for Australia (but not the world) and thus not yet on the relevant regional lists.

In addition, it should be noted there may be either a present or future requirement for inclusion of fossil as well as extant taxa, for example in paleoecological studies, oil and gas exploration, etc. (Currently one of the taxon lists mentioned above, WoRMS, includes a subset of fossil taxa and this proportion may increase over time; alternatively, additional suitable resources might be added to the list of recommendations).

Summarising the “requirements” as detailed above, the present requirement can be stated as the option to record the following for one or more taxa (taxonomic units at any rank) of interest:

- Taxon scientific name + authority [mandatory for each taxon to be cited] - examples:
 - (animal, sperm whale): “**Physeter macrocephalus Linnaeus, 1758**”
 - (plant, grey mangrove): “**Avicennia marina (Forssk.) Vierh.**”
- Taxon common name [optional as available] – example: “**Sperm Whale**”, “**Grey Mangrove**”
- Taxonomic hierarchy (preferred syntax to be discussed later). For *Physeter macrocephalus* this could be either (full hierarchy as held in AFD, with non-standard capitalisation rectified):
 - Kingdom Animalia
 - Phylum Chordata

- Subphylum Vertebrata
- Suprageneric Gnathostomata
- Class Mammalia
- Subclass Eutheria
- Order Cetacea
- Suprageneric Odontoceti
- Family Physeteridae
- Genus Physeter

Or (with only key i.e. “Linnaean” ranks reported):

- Kingdom Animalia
- Phylum Chordata
- Class Mammalia
- Order Cetacea
- Family Physeteridae
- Genus Physeter

Note: some sources e.g. Catalogue of Life only include “Linnaean” ranks, others include intermediate ranks too as per the above example, however with less between-source consistency

- Taxon identifier, source details, and a functional URL to the record in the source database, in a cascading set of preferred taxonomy sources – suggested to be:
 1. **Australian NSLs (AFD for animals, APC/APNI for plants)** - via <http://biodiversity.org.au/>, see <http://biodiversity.org.au/service/name-search> - examples:
 - *Physeter macrocephalus*: “**urn:lsid:biodiversity.org.au:afd.taxon:e2705e7a-a83c-4d04-87d3-b793e79671d7**”
 - Actionable URL: <http://biodiversity.org.au/afd.taxon/e2705e7a-a83c-4d04-87d3-b793e79671d7.xml>
 - *Avicennia marina*: “**urn:lsid:biodiversity.org.au:apni.name:61463**”
 - Actionable URL: <http://biodiversity.org.au/apni.name/61463>

Notes: Need to establish the preferred citation mechanism for this source, i.e. either the NSL aggregated list, or its “feeder” lists including APNI, AFD and other lists included

2. **Catalogue of Life** – global lists with full to partial coverage of most groups (excluding fossils), see <http://webservice.catalogueoflife.org/> - examples:
 - *Physeter macrocephalus*: either “**urn:lsid:catalogueoflife.org:taxon:415df5cc-52c2-102c-b3cd-957176fb88b9:col20120124**” or “**6850359**” (preferred version to be clarified)
 - Actionable URL: <http://www.catalogueoflife.org/col/details/species/id/6850359> (alternative: <http://www.catalogueoflife.org/col/details/species/id/6850359&response=full>)
 - *Avicennia marina*: “**urn:lsid:catalogueoflife.org:taxon:d22a876b-2dc5-11e0-98c6-2ce70255a436:col20120124**” or “**11787302**” (preferred version to be clarified)

- Actionable URL: <http://www.catalogueoflife.org/col/details/species/id/11787302> (alternative: <http://www.catalogueoflife.org/col/details/species/id/11787302&response=full>)

Notes: Need to establish the preferred citation mechanism for this source; also clarify with Cat. of Life some issues regarding the stability and availability of identifiers for all species it contains

3. **World Register of Marine Species** - see <http://www.marinespecies.org/aphia.php?p=webservice> - examples:

- *Physeter macrocephalus*: “**urn:lsid:marinespecies.org:taxname:137119**”
 - Actionable URL: <http://www.marinespecies.org/aphia.php?p=taxdetails&id=137119>
- *Avicennia marina*: “**urn:lsid:marinespecies.org:taxname:235040**”
 - Actionable URL: <http://www.marinespecies.org/aphia.php?p=taxdetails&id=235040>

Notes: Need to establish the preferred citation mechanism for this source

Finally, it should be noted that the list is potentially extensible e.g. if fossil coverage is required

4.6.3 Recommended XML syntax

It is recommended that for the present purpose, an XML syntax endorsed by the Taxonomic Databases Working Group TDWG (<http://www.tdwg.org/>) is utilised. There are 2 candidate schemas: Taxon Concept Schema or TCS (<http://www.tdwg.org/standards/117/>), ratified 2005, and Darwin Core or DwC (<http://www.tdwg.org/standards/450/>), ratified 2009. (A third one, ABCD, <http://www.tdwg.org/standards/115/> is also available but even more complex and will not be discussed further). An examination of both TCS and Darwin Core reveals that Darwin Core is a considerably less complex method for information exchange than TCS, in particular with regard to relations between scientific names and common names, and a scientific name and its parents in a hierarchy; for both the latter situations, DwC permits the use of a single taxon instance to express all the required information, whereas TCS requires the establishment of a separate name instance and identifier for every name (typically 8 per taxon including all ranks plus a single common name) plus separate expression of relationships between them. The only drawbacks of Darwin Core at this time appear to be the apparent current restriction to a single common name per taxon, which would not seem to be a critical omission for the present purpose; to go to the complexity of TCS just for this feature would seem to be too onerous a step in this case.

Here then is a representation of the example taxon “*Physeter macrocephalus*” (sperm whale) using DwC XML syntax (current best effort, following usage notes at <http://rs.tdwg.org/dwc/terms/>) and information sourced from AFD in this instance; Catalogue of Life or WoRMS would be alternative sources if not found in the preceding source (note also, each of these uses its own preferred schema at this time so a degree of translation using XSLT will be required).

```
<dwc:Taxon xmlns:dwc="http://rs.tdwg.org/dwc/terms/">
  <dwc:taxonID>urn:lsid:biodiversity.org.au:afd.taxon:e2705e7a-a83c-4d04-87d3-b793e79671
  <dwc:scientificName>Physeter macrocephalus Linnaeus, 1758</dwc:scientificName>
  <dwc:vernacularName>Sperm Whale</dwc:vernacularName>
  <dwc:kingdom>Animalia</dwc:kingdom>
  <dwc:phylum>Chordata</dwc:phylum>
  <dwc:class>Mammalia</dwc:class>
  <dwc:order>Cetacea</dwc:order>
  <dwc:family>Physeteridae</dwc:family>
  <dwc:genus>Physeter</dwc:genus>
  <dwc:specificEpithet>macrocephalus</dwc:specificEpithet>
```

```
<dwc:scientificNameAuthorship>Linnaeus, 1758</dwc:scientificNameAuthorship>
</dwc:Taxon>
```

4.6.4 Recommended placement in MCP schema

It would be possible to develop a complete set of elements to hold the taxonomic extension to the MCP as per the NBII extension previously cited (note, the NBII extension uses its own term definitions with no regard to TDWG standards). However there are a number of arguments against this:

- the MCP governance committee would have to develop these elements and maintain them
- mappings from DwC, TCS and other syntaxes would need to be developed and maintained by the MCP governance committee and/or by members of the marine community

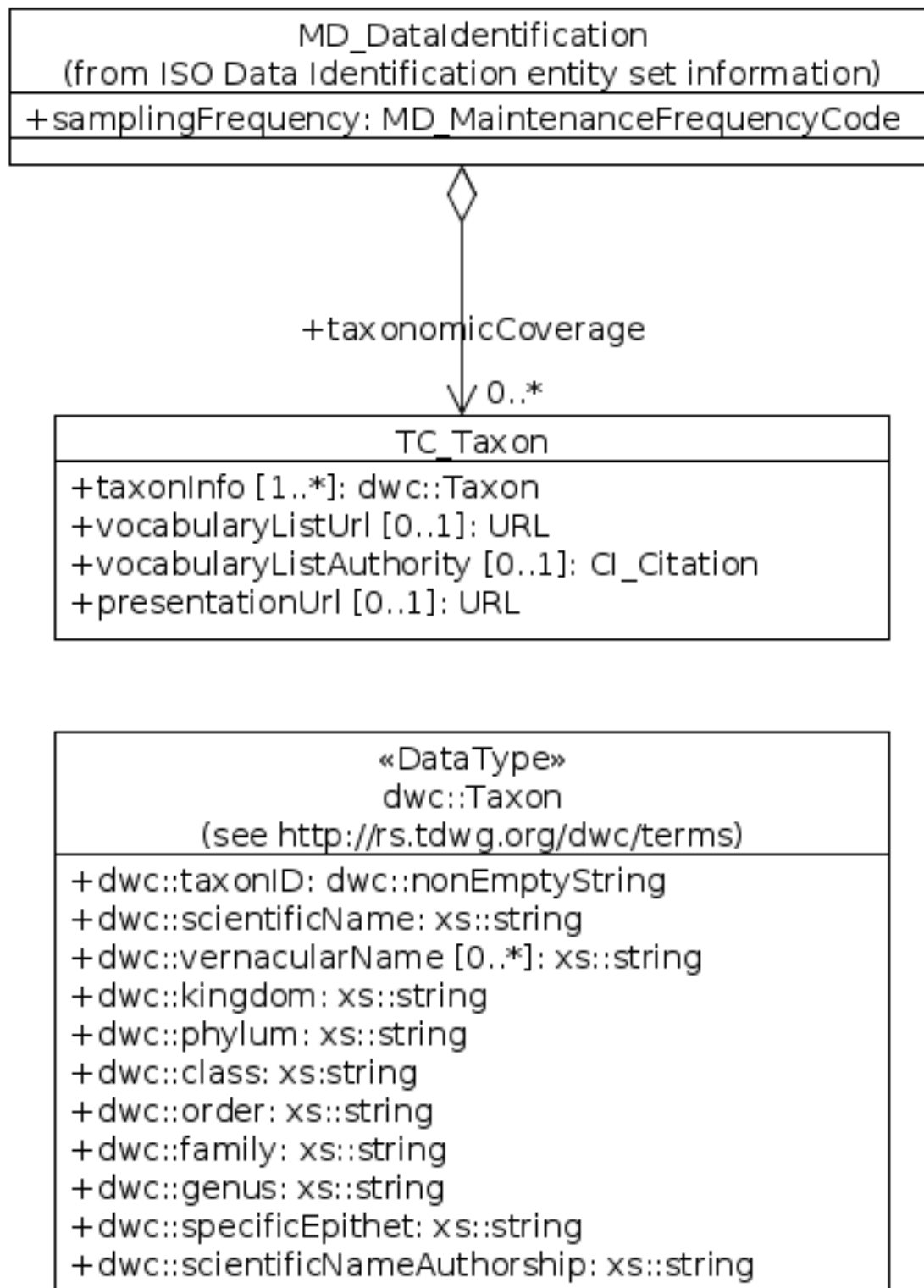
Instead, it seems preferable to hold this domain knowledge in one of the chosen schemas (DwC) and embed the container element for that knowledge (dwc:Taxon) in the MCP. The advantages of this approach are:

- at least some of the services provide taxonomic info in DwC already - these can be included with little or no additional work
- mappings from other taxonomic schemas to DwC have already been or are already being developed within the domain hopefully by domain experts - this body of work can be used directly with little or no modification and maintenance by the marine community

This practice has already been successfully implemented for the ALA experimental extensions to the MCP (albeit using TCS as opposed to DwC as provided by the Australian NSL service at <http://www.biodiversity.org.au>).

As the taxonomic coverage relates to the data set being described, a new element (mcp:taxonomicCoverage) that will hold the taxonomic coverage of the data set (one or more dwc:Taxon elements) can be added to the ISO19115 Data Identification element (mcp:MD_DataIdentification).

4.6.5 UML



UML diagram showing inclusion of DwC Taxon Element and supporting elements

4.6.6 Data Dictionary

No.	Name	Definition	Cond/ Oblig	Max. Occurrence	Data Type	Do- main
970	TC_TaxonomicCoverage	Container for taxonomic coverage	Note 1	Note 2	Aggregated Class	Line 971
971	taxon	Taxon description	M	N	Class	TC_Taxon

Obligation / Condition Key

- **Note 1** - Use obligation from referencing object
- **Note 2** - Use maximum occurrence from referencing object
- **M** - Mandatory
- **O** - Optional
- **C** - Conditional

No.	Name	Definition	Cond/ Oblig	Max. Occ	Data Type	Do- main
972	TC_Taxon	Container for description of taxonomic data	Note 1	Note 2	Aggregated Class	Lines 973-976
973	taxonInfo	Taxonomic Information	M	N	Class	dwc::Taxon
974	vocabularyListUrl	URL of vocabulary service or taxonomic ID resolver for resolving dwc::taxonID	O	1	Class	URL
975	vocabularyListAuthority	Citation of vocabulary service providing Taxonomic Information	O	1	Class	CI_Citation
976	presentationUrl	URL of HTML presentation of dwc::taxonID	O	1	Class	URL

Obligation / Condition Key

- **Note 1** - Use obligation from referencing object
- **Note 2** - Use maximum occurrence from referencing object
- **M** - Mandatory
- **O** - Optional
- **C** - Conditional

No	Name	Definition	O	Max Occ	Data Type	Domain
980	dwc::Taxon	Darwin Core Container for Taxonomic Information	Note 1	Note 2	Class	981-991
981	dwc::taxonID	An identifier for the set of taxon information (data associated with the Taxon class). May be a global unique identifier or an identifier specific to the data set. Examples: “8fa58e08-08de-4ac1-b69c-1235340b7001”, “32567”, “ http://species.gbif.org/abies_alba_1753 ”, “urn:lsid:gbif.org:usages:32567”	M	1	dwc::nonEmptyString	URI
982	dwc::scientificName	The full scientific name, with authorship and date information if known. When forming part of an Identification, this should be the name in lowest level taxonomic rank that can be determined. Examples: Coleoptera” (order), “Ctenomys sociabilis” (genus + specificEpithet)	M	1	xs::string	FreeText
983	dwc::vernacularName	A common or vernacular name. Example: “Andean Condor”, “Condor Andino”, “American Eagle”, “Gänsegeier”	0	N	xs::string	FreeText
984	dwc::kingdom	The full scientific name of the kingdom in which the taxon is classified. Example: “Animalia”, “Plantae”	M	1	xs::string	FreeText
985	dwc::phylum	The full scientific name of the phylum or division in which the taxon is classified. Example: “Chordata” (phylum), “Bryophyta” (division)	M	1	xs::string	FreeText
986	dwc::class	The full scientific name of the class in which the taxon is classified. Example: “Mammalia”, “Hepaticopsida”.	M	1	xs::string	FreeText
987	dwc::order	The full scientific name of the order in which the taxon is classified. Example: “Carnivora”, “Monocleales”	M	1	xs::string	FreeText
988	dwc::family	The full scientific name of the family in which the taxon is classified. Example: “Felidae”, “Monocleaceae”	M	1	xs::string	FreeText
989	dwc::genus	The full scientific name of the genus in which the taxon is classified. Example: “Puma”, “Monoclea”	M	1	xs::string	FreeText
990	dwc::specificEpithet	The name of the first or species epithet of the scientificName. Example: “concolor”, “oxyadenia”, “sayi”.	M	1	xs::string	FreeText
991	dwc::scientificNameAuthorship	The authorship information for the scientificName. Example: Linnaeus, 1758	M	1	xs::string	FreeText

Obligation / Condition Key

- **Note 1** - Use obligation from referencing object
- **Note 2** - Use maximum occurrence from referencing object
- **M** - Mandatory
- **O** - Optional

- C - Conditional

4.6.7 XML

Two examples are presented here. The first shows how taxonomic information that uses DwC can be embedded in the MCP record. The second shows how DwC taxonomic information could be XLink'd from an external vocabulary service.

Example 1 - embedded DwC

```
<mcp:taxonomicCoverage>
  <mcp:TC_Taxon>
    <mcp:taxonInfo>
      <dwc:Taxon xmlns:dwc="http://rs.tdwg.org/dwc/terms/">
        <dwc:taxonID>urn:lsid:biodiversity.org.au:afd.taxon:e2705e7a-a83c-4d04-87d3-b793</dwc:taxonID>
        <dwc:scientificName>Physeter macrocephalus Linnaeus, 1758</dwc:scientificName>
        <dwc:vernacularName>Sperm Whale</dwc:vernacularName>
        <dwc:kingdom>Animalia</dwc:kingdom>
        <dwc:phylum>Chordata</dwc:phylum>
        <dwc:class>Mammalia</dwc:class>
        <dwc:order>Cetacea</dwc:order>
        <dwc:family>Physeteridae</dwc:family>
        <dwc:genus>Physeter</dwc:genus>
        <dwc:specificEpithet>macrocephalus</dwc:specificEpithet>
        <dwc:scientificNameAuthorship>Linnaeus, 1758</dwc:scientificNameAuthorship>
      </dwc:Taxon>
    </mcp:taxonInfo>
    <mcp:taxonInfo>
      <dwc:Taxon xmlns:dwc="http://rs.tdwg.org/dwc/terms/">
        <dwc:taxonID>urn:lsid:biodiversity.org.au:afd.taxon:ba90a132-1584-4ec9-8d1c-07c2</dwc:taxonID>
        <dwc:scientificName>Hyperoglyphe antarctica (Carmichael, 1818)</dwc:scientificName>
        <dwc:vernacularName>Deep-sea Trevalla</dwc:vernacularName>
        <dwc:vernacularName>Blue-eye</dwc:vernacularName>
        <dwc:vernacularName>Blue-eye Cod</dwc:vernacularName>
        <dwc:vernacularName>Blue-nose</dwc:vernacularName>
        <dwc:vernacularName>Big-eye Trevalla</dwc:vernacularName>
        <dwc:vernacularName>Griffin's Silverfish</dwc:vernacularName>
        <dwc:vernacularName>Stoney-eye</dwc:vernacularName>
        <dwc:vernacularName>Bream Trevalla</dwc:vernacularName>
        <dwc:vernacularName>Deepsea Trevalla</dwc:vernacularName>
        <dwc:vernacularName>Blue Eye</dwc:vernacularName>
        <dwc:vernacularName>Trevalla</dwc:vernacularName>
        <dwc:vernacularName>Deep Sea Trevalla</dwc:vernacularName>
        <dwc:vernacularName>Sea Trevally</dwc:vernacularName>
        <dwc:vernacularName>Big Eye</dwc:vernacularName>
        <dwc:vernacularName>Bluenose</dwc:vernacularName>
        <dwc:vernacularName>Bluenose Warehou</dwc:vernacularName>
        <dwc:vernacularName>Blue-eye Trevalla</dwc:vernacularName>
        <dwc:kingdom>Animalia</dwc:kingdom>
        <dwc:phylum>Chordata</dwc:phylum>
        <dwc:class>Actinopterygii</dwc:class>
        <dwc:order>Perciformes</dwc:order>
        <dwc:family>Centrolophidae</dwc:family>
        <dwc:genus>Hyperoglyphe</dwc:genus>
        <dwc:specificEpithet>antarctica</dwc:specificEpithet>
      </dwc:Taxon>
    </mcp:taxonInfo>
  </mcp:TC_Taxon>
</mcp:taxonomicCoverage>
```

```
<dwc:scientificNameAuthorship>Carmichael, 1818</dwc:scientificNameAuthorship>
  </dwc:Taxon>
</mcp:taxonInfo>
<mcp:vocabularyListUrl>
  <gmd:URL>http://biodiversity.org.au/taxon/<taxonID>.xml</gmd:URL>
</mcp:vocabularyListUrl>
<mcp:presentationUrl>
  <gmd:URL>http://biodiversity.org.au/taxon/<taxonID>.html</gmd:URL>
</mcp:presentationUrl>
</mcp:TC_Taxon>
</mcp:taxonomicCoverage>
```

Example 2 - XLink'd DwC from an external vocabulary resolver service

```
<mcp:taxonomicCoverage>
  <mcp:TC_Taxon>
    <mcp:taxonInfo xlink:href="http://taxonresolver.aodn.org.au/taxonresolver?id=urn:lsid:
    <mcp:taxonInfo xlink:href="http://taxonresolver.aodn.org.au/taxonresolver?id=urn:lsid:
    <mcp:vocabularyListUrl>
      <gmd:URL>http://biodiversity.org.au/afd.taxon/<taxonID>.xml</gmd:URL>
    </mcp:vocabularyListUrl>
    <mcp:presentationUrl>
      <gmd:URL>http://biodiversity.org.au/afd.taxon/<taxonID>.html</gmd:URL>
    </mcp:presentationUrl>
  </mcp:TC_Taxon>
</mcp:taxonomicCoverage>
```

4.6.8 References

- Belbin, Lee & Pigot, Simon, 2010. Realising the full potential of scientific data in the 21st Century – metadata requirements for a living Australia (powerpoint presentation to 2010 ANDS metadata workshop). Available online at <http://ands.org.au/events/metadatavorkshop08-11-2010/belbin2010-11-08.pdf>
- Chapman, A.D., 2009. Numbers of living species in Australia and the world. 2nd edition. ABRS, Canberra. Available online at <http://www.environment.gov.au/biodiversity/abrs/publications/other/species-numbers/2009/pubs/nlsaw-2nd-complete.pdf>
- Darwin Core Project site for discussion and development, <http://code.google.com/p/darwincore/wiki/Taxon>
- Darwin Core Terms: A quick reference guide, <http://rs.tdwg.org/dwc/terms/index.htm>
- NODC, 2012. ISO19115 Geographic information – Metadata – Biological Extensions Workbook. Available online at ftp://ftp.ncddc.noaa.gov/pub/Metadata/Online_ISO_Training/workbooks/BIO_Metadata.pdf

4.6.9 Appendix: Current XML web response formats for the three recommended taxonomic data providers

1: www.biodiversity.org.au (Australian National Species Lists project) – example taxon: *Physeter macrocephalus* (source: <http://biodiversity.org.au/afd.taxon/e2705e7a-a83c-4d04-87d3->

b793e79671d7.xml)

2: Catalogue of Life – example taxon: *Physeter macrocephalus* (source: <http://www.catalogueoflife.org/col/webservice?name=Physeter+macrocephalus&response=full>)

3: World Register of Marine Species: A worked example is difficult to obtain via http query since the only query method apparently currently supported is SOAP. However see <http://www.marinespecies.org/aphia.php?p=soap&wsdl=1>

Extensions to ISO19115 Codelists

Annex B of the ISO19115 standard contains the codelists used in the standard. The MCP extends some of these codelists. For each codelist extended in the MCP, this section of the manual describes:

- the original codes and definitions
- the new codes and definitions

5.1 CI_DateTypeCode (Annex B.5.2 in ISO19115)

No.	Name	Domain Code	Definition	New
1	CI_Date-TypeCode	Date-TypeCd	identification of when a given event occurred	
2	creation	001	date identifies when the resource was brought into existence	
3	publication	002	date identifies when the resource was issued	
4	revision	003	date identifies when the resource was examined or re-examined and improved or amended	
5	unknown	004	it is unknown what the date identifies	Y

5.1.1 Metadata about changes to this codelist

- **Rationale:** Sometimes it is unknown what the date refers to. Rather than pick an event at random, it is better to flag that it is unknown what event the date refers to.
- **Proposer:** AODCJF Technical Committee
- **Date proposed:** 2006
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.2 onwards

5.2 CI_RoleCode (Annex B.5.5 in ISO19115)

No.	Name	Do-main Code	Definition	New
1	CI_RoleCode	RoleCd	function performed by the responsible party	
2	resource-Provider	001	party that supplies the resource	
3	custodian	002	party that accepts accountability and responsibility for the data and ensures appropriate care and maintenance of the resource	
4	owner	003	party that owns the resource	
5	user	004	party who uses the resource	
6	distributor	005	party who distributes the resource	
7	originator	006	party who created the resource	
8	pointOf-Contact	007	party who can be contacted for acquiring knowledge about or acquisition of the resource	
9	principal-Investigator	008	key party responsible for gathering information and conducting research	
10	publisher	009	party who published the resource	
11	author	010	party who authored the resource	
12	coinvestigator	011	one of the key parties responsible for gathering information and conducting research	Y
13	licensor	012	party responsible for licensing	Y
14	re-searchassistant	013	party who helped gather information and conduct research	Y
15	IPowner	014	party who owns the intellectual property	Y
16	moral-RightsOwner	015	party who owns the moral rights	Y
17	metadata-Contact	016	party who can be contacted about the metadata	Y

5.2.1 Metadata about changes to this codelist

This metadata relates to codes 12-17:

- **Rationale:** ISO19115 role codes do not fully describe the range of roles that were found when adding metadata about research projects. These 6 additional codes cover some of the most important omissions.
- **Proposer:** BlueNet Staff (Kate Roberts)
- **Date proposed:** 2010
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.4 onwards

5.3 MD_MaintenanceFrequencyCode (Annex B.5.18 in ISO19115)

See *Data Sampling Frequency (mcp:samplingFrequency)* for UML diagram and details of a new element that uses this extended code list.

No.	Name	Domain Code	Definition	New
1	MD_Maintenance-FrequencyCode	Maint-FreqCd	frequency with which modifications and deletions are made to the data after it is first produced	
2	continual	001	data is repeatedly and frequently updated	
3	daily	002	data is updated each day	
4	weekly	003	data is updated on a weekly basis	
5	fortnightly	004	data is updated every two weeks	
6	monthly	005	data is updated every month	
7	quarterly	006	data is updated every three months	
8	biannually	007	data is updated twice each year	
9	annually	008	data is updated every year	
10	asNeeded	009	data is updated as deemed necessary	
11	irregular	010	data is updated in intervals that are uneven in duration	
12	notPlanned	011	there are no plans to update the data	
13	unknown	012	frequency of maintenance for the data is unknown	
14	hourly	013	data is updated every hour	Y

5.3.1 Metadata about changes to this codelist

This metadata relates to code 14:

- **Rationale:** As this code list is now used for *Data Sampling Frequency (mcp:samplingFrequency)* as well as maintenanceFrequency, an hourly interval was required.
- **Proposer:** AODCJF
- **Date proposed:** 2006
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.2 onwards

5.4 MD_ScopeCode (Annex B.5.25 in ISO19115)

No.	Name	Do-main Code	Definition	New
1	MD_ScopeCode	ScopeCd	class of information to which the referencing entity applies	
2	attribute	001	information applies to the attribute class	
3	attribute-Type	002	information applies to the characteristic of a feature	
4	collec-tion-Hard-ware	003	information applies to the collection hardware class	
5	collec-tionSes-sion	004	information applies to the collection session	
6	dataset	005	information applies to the dataset	
7	series	006	information applies to the series	
8	nonGeo-graphic-Dataset	007	information applies to non-geographic data	
9	dimen-sion-Group	008	information applies to a dimension group	
10	feature	009	information applies to a feature	
11	feature-Type	010	information applies to a feature type	
12	property-Type	011	information applies to a property type	
13	fieldSes-sion	012	information applies to a field session	
14	software	013	information applies to a computer program or routine	
15	service	014	information applies to a capability which a service provider entity makes available to a service user entity through a set of interfaces that define a behaviour, such as a use case	
16	model	015	information applies to a copy or imitation of an existing or hypothetical object	
17	tile	016	information applies to a tile, a spatial subset of geographic data	
18	observed	017	information applies to observed data	Y
19	derived	018	information applies to derived data	Y
20	publica-tion	019	information applies to publications	Y
21	dataOb-ject	020	information applies to data objects	Y
22	project	021	information applies to a project	Y

5.4.1 Metadata about changes to this codelist

This metadata relates to codes 18-20:

- **Rationale:** ISO19115 scope codes do not fully describe the scope of metadata records from the Marine Research projects. These 3 additional scope codes cover some of the most important omissions.
- **Proposer:** AODCJF
- **Date proposed:** 2006
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.2 onwards

This metadata relates to code 21:

- **Rationale:** ISO19115 scope codes do not describe data objects.
- **Proposer:** Craig Jones, AODN and IMOS eMii
- **Date proposed:** 2012
- **Date confirmed by MCP Governance Committee:** Unknown
- **Included in MCP Version:** 1.4 onwards

This metadata relates to code 22:

- **Rationale:** ISO19115 scope codes do not describe projects.
- **Proposer:** GeoScience Australia (already include in GA codelist <http://asdd.ga.gov.au/asdd/profileinfo/GAScopeCodeList.xml>)
- **Date proposed:** ????
- **Date confirmed by MCP Governance Committee:** Unknown
- **Included in MCP Version:** 1.4 onwards

MCP Codelists and Enumerations

The MCP adds two new Codelists and one Enumeration to support the new elements that have been added. The codelists and enumerations are shown without explanation in the MCP UML diagrams. Full descriptions are given in the following sections.

6.1 MD_CurrencyTypeCode

See *Temporal Extent (mcp:EX_TemporalExtent)* for UML diagram and details of elements that use this code list.

No.	Name	Domain Code	Definition
1	MD_CurrencyTypeCode	CurrCd	Defines the temporal currency of the resource
2	mostRecent	001	resource currency is most recent
3	historical	002	resource currency is historical
4	predicted	003	resource currency is predicted
5	unknown	004	resource currency is unknown

6.1.1 Metadata about changes to this codelist

Metadata refers to codes 1-5:

- **Rationale:** Provide MD_CurrencyTypeCode with controlled vocabulary.
- **Proposer:** AODCJF
- **Date proposed:** 2006
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.2 onwards

6.2 MD_TemporalAggregationUnitCode

See *Temporal Extent (mcp:EX_TemporalExtent)* for UML diagram and details of elements that use this code list.

No.	Name	Domain Code	Definition
1	MD_TemporalAggregationUnitCode	AgUnitCd	temporal aggregation of the resource
2	day	001	aggregation unit is day
3	multi-day	002	aggregation unit is multi-day
4	week	003	aggregation unit is week
5	month	004	aggregation unit is month
6	multi-month	005	aggregation unit is multi-month
7	year	006	aggregation unit is year
8	multi-year	007	aggregation unit is multi-year
9	none	008	aggregation unit is none

6.2.1 Metadata about changes to this codelist

Metadata refers to codes 1-9:

- **Rationale:** Provide MD_TemporalAggregation with controlled vocabulary.
- **Proposer:** AODCJF
- **Date proposed:** 2006
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.2 onwards

6.3 DP_TypeCode

See *Data Parameters (mcp:dataParameters)* for details.

No.	Name	Domain Code	Definition
1	DP_TypeCode	DPTypeCd	type of parameter or unit
2	shortName	001	the short name by which the parameter or unit is known
3	longName	002	the long name by which the parameter or unit is known
4	code	003	the code by which the parameter or unit is known
5	other	004	the parameter or unit is known by this name for some other reason

6.3.1 Metadata about changes to this codelist

Metadata refers to codes 1-5:

- **Rationale:** Provide DP_TypeCode with controlled vocabulary.
- **Proposer:** BlueNet staff (Kate Roberts)
- **Date proposed:** 2010
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.4 onwards

6.4 CommonsTypeCode <<Enumeration>>

See *Commons Licensing Constraints (mcp:MD_Commons)* for details.

No.	Name	Domain Code	Definition
1	common-sType	Common-sTypeCode	Specifies the type of commons license that will be described by the MD_Commons class
2	Creative Commons	001	Creative Commons license (see http://creativecommons.org)
3	Data Commons	002	Data Commons license (see http://bluenet3.antcrc.utas.edu.au/datacommons) - possibly deprecated?

6.4.1 Metadata about changes to this codelist

Metadata refers to codes 2-3:

- **Rationale:** Provide list of commons licensing schemas that can be described by MD_Commons.
- **Proposer:** BlueNet Project (Kate Roberts)
- **Date proposed:** 2010
- **Date confirmed by MCP Governance Committee:** 2010
- **Included in MCP Version:** 1.4 onwards

Vocabularies used by the MCP

7.1 Descriptive Keywords (gmd:keywords)

The MCP mandates usage of the NASA Global Change Master Directory (GCMD) Science Keywords vocabulary for the descriptive keywords section of the MCP record. See http://gcmd.nasa.gov/Resources/valids/archives/keyword_list.html

Originally these keywords were only available as a web page or CSV document. More recently, these keywords have been made available through a specific web service, details of which are available at <http://gcmd.gsfc.nasa.gov/Connect/docs/kms/KeywordManagementServiceAPI.pdf>.

Some implementations of the MCP still use a GCMD keyword ‘picker’ developed by the [Australian Institute of Marine Science](#). Other implementations have moved to a *SKOS* file developed from the keywords used in this GCMD keyword picker.

Regardless of the method used to include GCMD science keywords in an MCP record, it is highly recommended that a description of the GCMD thesaurus used is included in the `gmd:thesaurusName` section of `gmd:descriptiveKeywords` with the following information:

- the version number of the GCMD keyword list used
- an online link to the GCMD science keyword list from which keywords have been chosen
- a reference to the GCMD Science keyword authors (as suggested by NASA on http://gcmd.nasa.gov/Resources/valids/archives/keyword_list.html)

An example of how to do this is as follows:

```
<gmd:descriptiveKeywords>
  <gmd:MD_Keywords>
    (...)
  <gmd:type>
    <gmd:MD_KeywordTypeCode codeList="http://bluenet3.antcrc.utas.edu.au/mcp-1.4/sche
  </gmd:type>
  <gmd:thesaurusName>
    <gmd:CI_Citation>
      <gmd:title>
        <gco:CharacterString>Global Change Master Directory Earth Science Keyw
      </gmd:title>
      <gmd:date gco:nilReason="unknown"/>
      <gmd:edition>
```

```
        <gco:CharacterString>bc44a748-f1a1-4775-9395-a4a6d8bb8df6:conceptschema
    </gmd:edition>
    <gmd:editionDate gco:nilReason="unknown"/>
    <gmd:identifier>
        <gmd:MD_Identifier>
            <gmd:code>
                <gmx:Anchor
xlink:href="http://yourgeonetwork.com/geonetwork/srv/en/?uuid=bc44a748-f1a1-
geonetwork.thesaurus.register.discipline.bc44a748-f1a1-4775-9395-a4a6d8bb8
                </gmd:code>
            </gmd:MD_Identifier>
        </gmd:identifier>
    <gmd:otherCitationDetails>
        <gco:CharacterString>Olsen, L.M., G. Major, K. Shein,
        J. Scialdone, S. Ritz, T. Stevens, M. Morahan, A. Aleman,
        R. Vogel, S. Leicester, H. Weir, M. Meaux, S. Grebas,
        C.Solomon, M. Holland, T. Northcutt, R. A. Restrepo,
        R. Bilodeau,2012. NASA/Global Change Master Directory (GCMD)
        Earth Science Keywords</gco:CharacterString>
    </gmd:otherCitationDetails>
</gmd:CI_Citation>
</gmd:thesaurusName>
</gmd:MD_Keywords>
</gmd:descriptiveKeywords>
```

7.2 Geographic Extent Names

Geographic Extent Names for common Marine regions have been developed for the MCP by the AOD-CJF Technical Committee. Rather than reproduce that extent name list in this document an online link to the extent name list (in ISO19139 CT_CodelistCatalogue format) can be found [here](#).

Geographic Extent Names can be used in the following places in an MCP metadata record:

- ‘Region’ type keywords in gmd:descriptiveKeywords
- geographic identifiers in gmd:EX_GeographicDescription

7.3 Collection Method Vocabulary

A collection method vocabulary based on the NASA GCMD Instruments Keyword list (see http://gcmd.nasa.gov/Resources/valids/archives/keyword_list.html) is also suggested for use in MCP records.

Note: Usage of this vocabulary does not appear to be common in MCP implementations. Some additional work needs to be done to extract this list of instruments and produce a SKOS and/or ISO19139 CT_CodelistCatalog version that can be used by MCP implementations.

Glossary

- Creative Commons** The MCP has extensions to support description of Creative Commons licenses governing both metadata and resources. This documentation is also released under the Creative Commons Attribution-ShareAlike 3.0 Unported License. Find more information at <http://creativecommons.org>
- CSW** Catalog Service for the Web. The OGC Catalog Service defines common interfaces to discover, browse, and query metadata about data, services, and other potential resources.
- DwC** The Darwin Core is designed to facilitate the exchange of information about the geographic occurrence of organisms and the physical existence of biotic specimens in collections. Extensions to the Darwin Core provide a mechanism to share additional information, which may be discipline-specific, or beyond the commonly agreed upon scope of the Darwin Core itself. The Darwin Core and its extensions are minimally restrictive of information content by design, since doing so would render the standard useless for the implementation of data quality tools. <http://rs.tdwg.org/dwc/terms/index.htm>
- GeoNetwork** GeoNetwork opensource is a standards based, Free and Open Source catalog application to manage spatially referenced resources through the web. There are implementations of the MCP (versions 1.4 and 1.5-experimental) available as plugin schemas for GeoNetwork version 2.8.0. GeoNetwork version 2.8.0 can be downloaded from <http://geonetwork-opensource.org>
- GeoServer** GeoServer is an open source software server written in Java that allows users to share and edit geospatial data. Designed for interoperability, it publishes data from any major spatial data source using open standards.
- ISO** International Standards Organisation is an international-standard-setting body composed of representatives from various national standards organizations. <http://www.iso.org>
- ISO TC211** ISO/TC 211 is a standard technical committee formed within ISO, tasked with covering the areas of digital geographic information (such as used by geographic information systems) and geomatics. It is responsible for preparation of a series of International Standards and Technical Specifications numbered in the range starting at 19101. TC211 has its own web site at <http://www.isotc211.org>
- ISO19115** International Standards Organisation standard for Geographic Metadata. This document refers to AS/NZS ISO19115:2005, **Australian/New Zealand Standard, Geographic Information-Metadata**, 27th April 2005, Standards Australia and Standards New Zealand, ISBN - 0 7337 6653 6

ISO19139 International Standards Organisation standard describing an XML implementation of ISO19115. This document refers to ISO/TS 19139:2007(E), **Geographic Information-Metadata-XML schema implementation**, *15th April 2007*, ISO

ISO19115/19139 Term used to describe an implementation of ISO19115 using ISO19139.

OGC Open Geospatial Consortium. A standards organization for geospatial information systems <http://www.opengeospatial.org>

Profile Modification of ISO19115 to suit the needs of a particular community.

SKOS The Simple Knowledge Organisation Systems (SKOS) is an area of work developing specifications and standards to support the use of knowledge organisation systems (KOS) such as thesauri, classification schemes. <http://www.w3.org/2004/02/skos/>

URL A Uniform Resource Locator specifies where an identified resource is available and the mechanism for retrieving it.

UUID A Universally Unique Identifier (UUID) is an identifier standard used in software construction, standardized by the Open Software Foundation (OSF) as part of the Distributed Computing Environment (DCE).

XML Extensible Markup Language is a general-purpose specification for creating custom markup languages. <http://www.w3schools.com/xml>

XSD XML Schema, published as a W3C recommendation in May 2001, is one of several XML schema languages. <http://en.wikipedia.org/wiki/XSD>

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