

**International Coastal Atlas Network Cookbook:
Connecting your Atlas**



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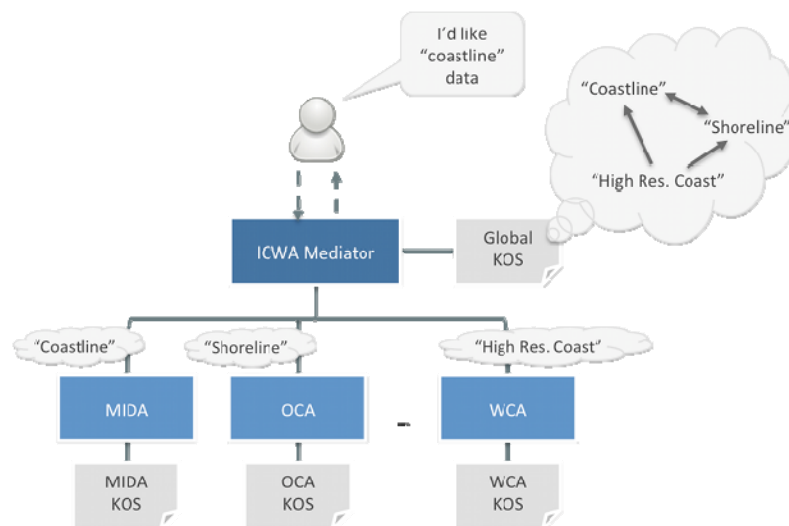
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Introduction

This document is a step-by-step guide explaining how you connect your atlas as a node in the International Coastal Web Atlas (ICWA). It is aimed specifically at members of the International Coastal Atlas Network community and more generally at scientists, data managers, and system developers.

ICWA is a prototype atlas mediator developed by the Technical Working Group (TWG) of the International Coastal Atlas Network (ICAN). It provides a common interface for accessing distributed local atlases, such as MIDA (Marine Irish Digital Atlas), OCA (Oregon Coastal Atlas), and Washington Coastal Atlas (WCA). The current version of ICWA only supports catalogue search. The ICAN TWG are currently investigating the extension of ICWA to support web mapping.

ICWA uses a knowledge organisation system (KOS) to improve data discovery by exploiting the semantics of keywords and allowing users to search data by “meaning” rather than by “mere keywords.” For example, as illustrated below, a user arrives at the ICAN portal and requests “coastline” data. The ICWA mediator is connected to a global knowledge organisation system that is aware that “coastline” is related to both “shoreline” and “high resolution coastline”. The user request and this information from the global knowledge organisation system are then passed on to the local atlases that search on “coastline”, “shoreline” and “high resolution coastline.” The local atlases then return the relevant data to the ICWA and then to the user. This is an implementation of the so-called “smart-search”¹.



A diagram illustrating the use for knowledge organisation systems in the ICWA

¹ Latham, S. E.; Cramer, R.; Grant, M.; Kershaw, P.; Lawrence, B. N.; Lowry, R.; Lowe, D.; O'Neill, K.; Miller, P.; Pascoe, S.; Pritchard, M.; Snaith, H.; Woolf, A. (2009) The NERC DataGrid services. *Philosophical Transactions of the Royal Society A*, 367 (1890). 1015-1019.

ICWA communicates with local atlases through standard OGC CSW (Catalogue Service for the Web) interfaces. It queries the KOS through a semantic web service (SWS) interface.

In order to connect your atlas as a node in the ICWA, you need to:

1. Provide access to your metadata through a CSW interface supporting both Dublin core and ISO-19139 metadata standards.
2. Optionally, provide your local KOS that defines the terms used as keywords in your metadata records and specifies how they semantically relate to the ICAN global KOS terms.

The subsequent sections explain the above two requirements.

CSW Requirements

The ICWA mediator supports CSW 2.0.2 fully and CSW 2.0.1 only partially. Therefore we recommend that you use a CSW 2.0.2 for delivering your metadata to the ICWA.

The ICWA mediator requires a CSW 2.0.2 that is able to deliver metadata in Dublin Core and ISO-19139.

The ICWA mediator has been tested with GeoNetwork 2.4 and later versions. It should support other CSW 2.0.2 implementations but this has not been tested yet.

There is no particular requirement as to the metadata profile used, but metadata records need to include keywords expressed in one of the following four forms:

1. As character strings (`gco:CharacterString`), each containing the URI of a concept from your local KOS (if any). For example:

```
<gmd:descriptiveKeywords>
  <gmd:MD_Keywords>
    <gmd:keyword>
      <gco:CharacterString>
        http://vocab.nerc.ac.uk/collection/A03/current/Beach
      </gco:CharacterString>
    </gmd:keyword>
    <gmd:thesaurusName>
      <gmd:CI_Citation>
        <gmd:title>
          <gco:CharacterString>
            Oregon Coastal Atlas Coastal Erosion Thesaurus discovery terms
          </gco:CharacterString>
        </gmd:title>
        <gmd:date>
          <gmd:CI_Date>
            <gmd:date>
              <gco>Date>2011-08-19</gco>Date>
            </gmd:date>
            <gmd:dateType>
              <gmd:CI_DateTypeCode
codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/
resources/Codelist/gmxCodelists.xml#CI_DateTypeCode" codeListValue="revision">
                Revision
              </gmd:CI_DateTypeCode>
            </gmd:dateType>
          </gmd:CI_Date>
        </gmd:date>
      </gmd:CI_Citation>
    </gmd:thesaurusName>
  </gmd:MD_Keywords>
</gmd:descriptiveKeywords>
```

```

    </gmd:date>
  </gmd:CI_Citation>
</gmd:thesaurusName>
</gmd:MD_Keywords>
</gmd:descriptiveKeywords>

```

2. As character strings, each containing the label of a concept from your local KOS (if any). For example:

```

<gmd:descriptiveKeywords>
  <gmd:MD_Keywords>
    <gmd:keyword>
      <gco:CharacterString>Beach</gco:CharacterString>
    </gmd:keyword>
  </gmd:MD_Keywords>
  <gmd:thesaurusName>
    <gmd:CI_Citation>
      <gmd:title>
        <gco:CharacterString>
          Oregon Coastal Atlas Coastal Erosion Thesaurus discovery terms
        </gco:CharacterString>
      </gmd:title>
      <gmd:date>
        <gmd:CI_Date>
          <gmd:date>
            <gco:Date>2011-08-19</gco:Date>
          </gmd:date>
          <gmd:dateType>
            <gmd:CI_DateTypeCode>
              codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/resources/Codelist/gmxCodetlists.xml#CI_DateTypeCode" codeListValue="revision"
              Revision
            </gmd:CI_DateTypeCode>
          </gmd:dateType>
        </gmd:CI_Date>
      </gmd:date>
    </gmd:CI_Citation>
  </gmd:thesaurusName>
</gmd:MD_Keywords>
</gmd:descriptiveKeywords>

```

3. As anchor elements (gmx:Anchor), each containing both the URI and label of a concept from your local KOS (if any). For example:

```

<gmd:descriptiveKeywords>
  <gmd:MD_Keywords>
    <gmd:keyword>
      <gmx:Anchor xlink:href="http://vocab.nerc.ac.uk/collection/A03/current/Beach">
        Beach
      </gmx:Anchor>
    </gmd:keyword>
  </gmd:MD_Keywords>
  <gmd:thesaurusName>
    <gmd:CI_Citation>
      <gmd:title>
        <gco:CharacterString>
          Oregon Coastal Atlas Coastal Erosion Thesaurus discovery terms
        </gco:CharacterString>
      </gmd:title>
      <gmd:date>
        <gmd:CI_Date>
          <gmd:date>
            <gco:Date>2011-08-19</gco:Date>
          </gmd:date>
          <gmd:dateType>
            <gmd:CI_DateTypeCode>

```

```

codeList="http://standards.iso.org/ittf/PubliclyAvailableStandards/ISO_19139_Schemas/
resources/Codelist/gmxCodelists.xml#CI_DateTypeCode" codeListValue="revision">
    Revision
    </gmd:CI_DateTypeCode>
    </gmd:dateType>
    </gmd:CI_Date>
    </gmd:date>
    </gmd:CI_Citation>
    </gmd:thesaurusName>
    </gmd:MD_Keywords>
</gmd:descriptiveKeywords>

```

4. As character strings containing free text keywords. For example:

```

<gmd:descriptiveKeywords>
  <gmd:MD_Keywords>
    <gmd:keyword>
      <gco:CharacterString>Beach</gco:CharacterString>
    </gmd:keyword>
  </gmd:MD_Keywords>
</gmd:descriptiveKeywords>

```

KOS Requirements

Local knowledge organisation systems are used in ICWA to define the semantics of metadata keywords used within a local atlas and how these relate semantically to the global KOS concepts. A local KOS is a SKOS thesaurus organised into one or many concept schemes and collections. It defines:

- The concepts represented by keywords (themes, parameters, instruments, etc.), their labels (terms), and definitions (free text explaining the meaning of the concepts).
- The semantic relationships between the local concepts.
- The semantic relationships between the local concepts and the global ones. These relationships are referred to as mappings.

You are not required to define you metadata keywords in a KOS. However, you are recommended to do so as this would improve data search as explained in the introductory section above.

The ICWA mediator has a built-in SWS connector for querying global and local KOS. Therefore, for your KOS to be accessed and used by the mediator, it should be delivered through SWS. You can implement your own SWS (source code available from CMRC), but this means an extra maintenance load for you. BODC are hosting and maintaining an operational vocabulary server (NERC Vocabulary Server, NVS) that feeds the NETMAR SWS hosted by CMRC. You are strongly recommended to profit from this existing infrastructure and provide BODC with your KOS for inclusion in the NVS. BODC have made available two worksheets in an Excel document for defining your concepts, relationships, and mappings in a very intuitive way, avoiding the hassle of RDF, SKOS and ontology editing tools. Please refer to the *Understanding Semantics Cookbook* for examples of these worksheets.

Once you have finished filling out the worksheets, BODC can load it onto the NVS.

What is Next?

If your atlas fills the requirements above (CSW and KOS), adding it as a node in ICWA is a very easy process. All you need to do is provide the ICWA administrator (CMRC) with the following details:

1. URL of your CSW;
2. Login and password for accessing metadata through your CSW (if metadata records are not public);
3. Optionally, but ideally, a logo of your atlas (250x250 PNG image)
4. Method used for encoding keywords (c.f., methods 1 to 4 listed in the CSW Requirements section above)
5. If you are using method 1, 2 or 3 for keyword encoding then you will need to provide the ICWA with the following information:
 - a. URL of the SWS responsible for delivering your KOS if other than the NVS and the CMRC SWS;
 - b. URI of the concept schemes containing the concepts used as metadata keywords.

Once provided with this information, the ICWA administrator can add your atlas in the ICWA configuration file and it becomes an active node of ICWA.

Acknowledgements

This cookbook was written for the International Coastal Atlas community under the auspices of the NETMAR (Open Service Network for Marine Environmental Data) project. NETMAR is partially funded by the European Commission under Theme ICT-2009.6.4 ICT for environmental services and climate change adaptation of the Information & Communication Technologies FP7 Programme.

This document has been reviewed by, and incorporates comments from Declan Dunne of the Coastal and Marine Research Centre, University College Cork. Thanks to the reviewers for their help in making the document clear and readable. Further feedback on this document is welcomed, and may be provided by contacting the author whose details are below.

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Version 1.0

Date 2011 December 22

Revisions