# Metadata and Catalogs

- Metadata
- Search
- Catalog
- FGDC
- ISO
- Profiles
- CSW Operations
- OpenSearch

# Resource

- A thing
- Anything which is worth uniquely identifying (over the Web)
- Can be data

# Metadata

- Data about a resource
- Data about data

# Metadata

This is the <u>metadata</u> for this.



aurora with comet

# What is Missing ?

**Nutrition Facts**

Serving Size 172 g

**Amount Per Serving**

**Calories** 200      Calories from Fat 8

| | % Daily Value* |
|---|---|
| **Total Fat** 1g | 1% |
|    Saturated Fat 0g | 1% |
|    Trans Fat | |
| **Cholesterol** 0mg | 0% |
| **Sodium** 7mg | 0% |
| **Total Carbohydrate** 36g | 12% |
|    Dietary Fiber 11g | 45% |
|    Sugars 6g | |
| **Protein** 13g | |

| | | | |
|---|---|---|---|
| Vitamin A | 1% | Vitamin C | 1% |
| Calcium | 4% | Iron | 24% |

*Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

NutritionData.com

# What is Missing ?

# Metadata - Who

- Who collected the data?
- Who processed the data?
- Who wrote the metadata?
- Who to contact for questions?
- Who to contact to order?
- Who owns the data?

# Metadata - What

- What are the data about?
- What project were they collected under?
- What are the constraints on their use?
- What is the quality?
- What are appropriate uses?
- What parameters were measured?
- What format are the data in?

# Metadata - Why

- Why were the data collected?

# Where

- Where were the data collected?
- Where were the data processed?
- Where are the data located?

# When

- When were the data collected?
- When were the data processed?

# How

- How were the data collected?
- How were the data processed?
- How do I access the data?
- How do I order the data?
- How much do the data cost?
- How was the quality assessed?

# Metadata requires update

| 1980 | 2005 |
|---|---|
| British Honduras | Belize |
| West Germany | Germany |

# Metadata Value

- Organizations: captures the knowhow of an organization
- Developers: help share reliable information
- Users: helps discover data

# Search

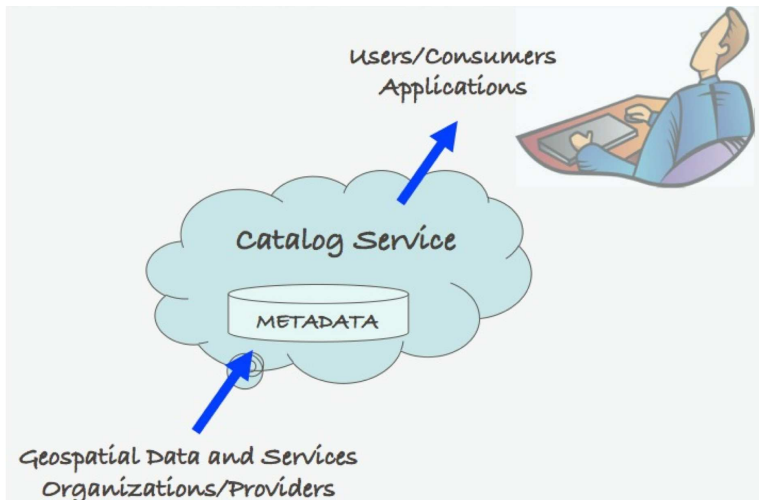Discovery & evaluation of resources through (summary) metadata

# Catalog

- Organized, detailed, descriptive list of items
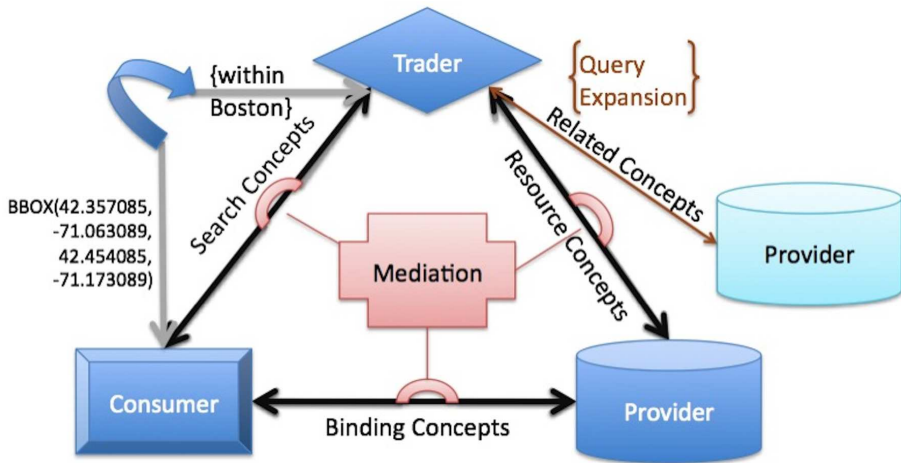- arranged systematically (so they can be found)
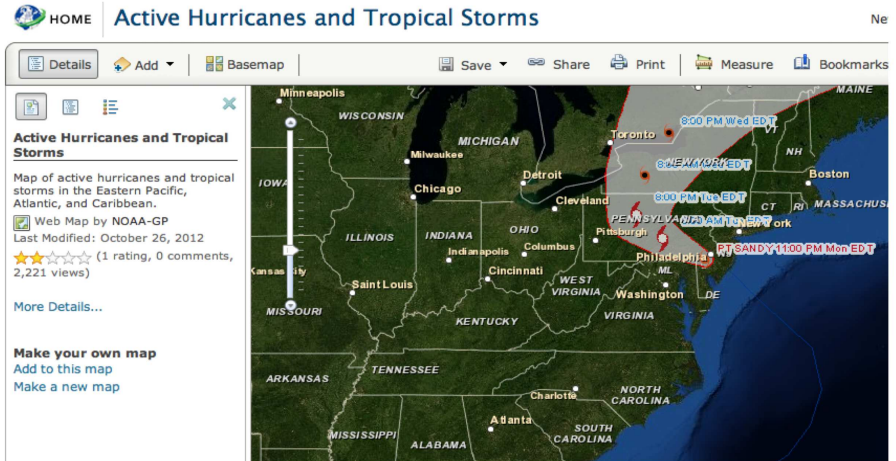
# Catalog

# Catalog Service

# Trader

- Intermediary in a service oriented architecture
- Connects providers with consumers

# Discovery using SOA

# Example: Geospatial Platform

# Metadata for Hurricane Map

## Active Hurricanes and Tropical Storms



Map of active hurricanes and tropical storms in the Eastern Pacific, Atlantic, and Caribbean.

Web Map by **NOAA-GP**

Last Modified: October 26, 2012

⭐⭐☆☆☆ (1 rating, 2,222 views)

Sign In to rate this item.

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### Description

This map contains the following layers:

**Watches, Warnings and Advisories**

*A warning* is issued when a hazardous weather or hydrologic event is occurring, imminent or likely. A warning means weather conditions pose a threat to life or property. People in the path of the storm need to take protective action.

*A watch* is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location or timing is still uncertain.

### Comments (0)

# Metadata for Hurricane Map

**Access and Use Constraints**

The services in this map are not operational and therefore may not be available 24x7.

**Map Contents**

Atlantic and Caribbean:
http://gis.srh.noaa.gov/ArcGIS/rest/services/AtStormViewer/MapServer
Eastern Pacific:
http://gis.srh.noaa.gov/ArcGIS/rest/services/EpStormViewer/MapServer
Imagery with Labels:
http://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer
Imagery with Labels:
http://services.arcgisonline.com/ArcGIS/rest/services/Reference/World_Boundaries_and_Places/

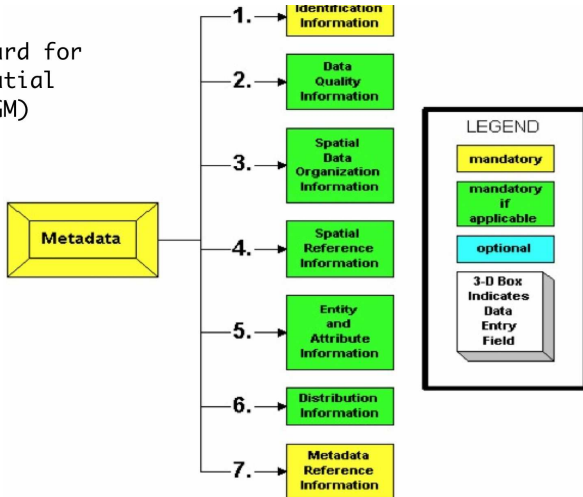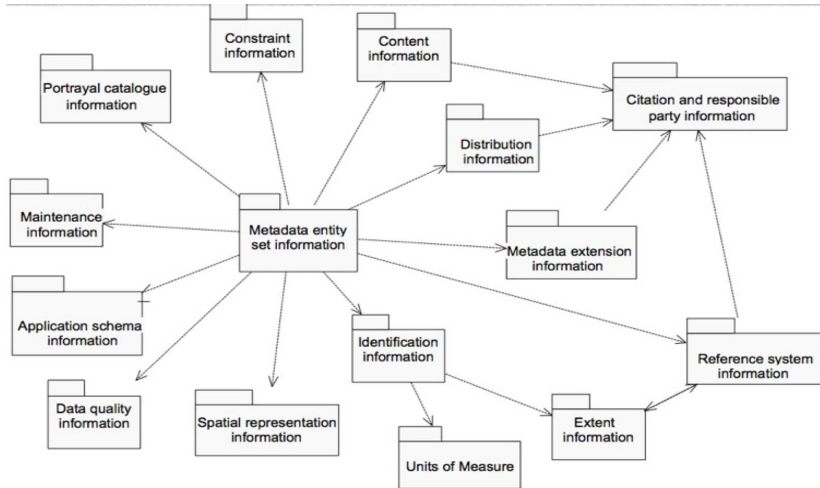| | |
|---|---|
| **Tags** | hurricane forecast, tropical storms |
| **Credits** | National Weather Service, National Hurricane Center |
| **Size** | 184 KB |
| **Extent** | Left: -95.05    Right:    -50.8 |
| | Top: 44.73    Bottom: 16.44 |

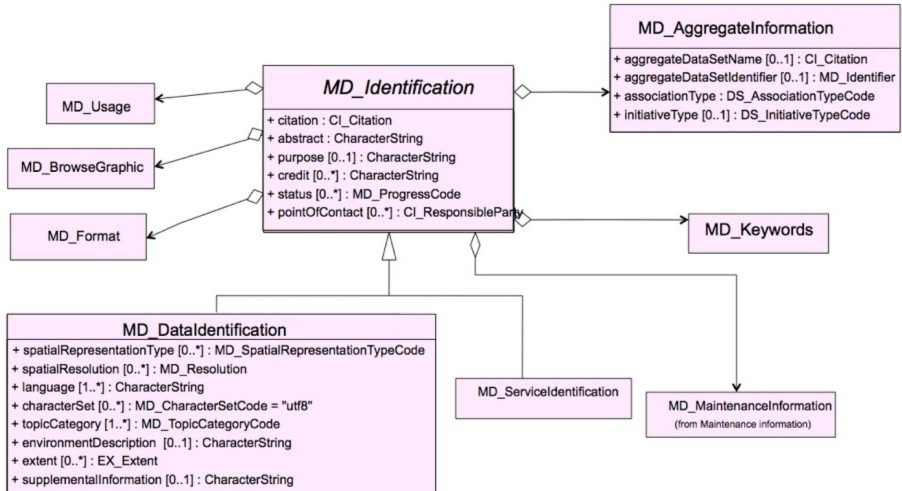# Metadata Standards

Need for consistency

# FGDC

Content Standard for
Digital Geospatial
Metadata (CSDGM)

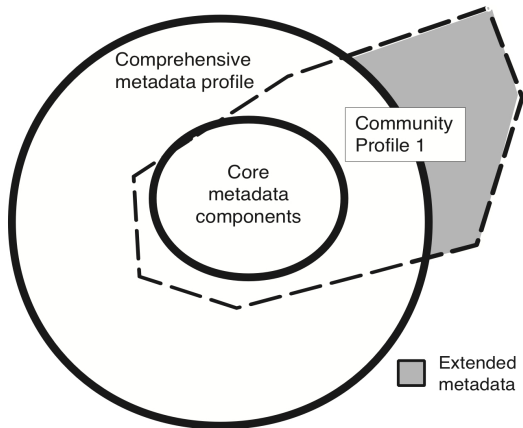# ISO 19115 Geographic Information

# ISO 19115 Geographic Information

# Profiles

# Catalog Service



Catalog

Registered geodata metadata

Metadata for a feature collection, and a URL
Metadata for a feature collection, and a URL
Metadata for a feature collection, and a URL
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# Catalog Services

- CSW
- ISO 19119 Metadata Profile
- Z39.50 Profile
- OASIS ebRIM Profile
- OpenSearch

# CSW Record

```xml
<?xml version="1.0" encoding="ISO-8859-1"?>
<Record
   xmlns="http://www.opengis.net/cat/csw/2.0.2"
   xmlns:dc="http://purl.org/dc/elements/1.1/"
   xmlns:dct="http://purl.org/dc/terms/"
   xmlns:ows="http://www.opengis.net/ows"
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
   xsi:schemaLocation="http://www.opengis.net/cat/csw/2.0.2
                       ../../../csw/2.0.2/record.xsd">
```

# CSW Record

```
...
<Record ...
  <dc:identifier>00180e67-b7cf-40a3-861d-b3a09337b195</dc:identifier>
  <dc:title>Image2000 Product 1 (at1) Multispectral</dc:title>
  <dct:modified>2004-10-04 00:00:00</dct:modified>
  <dct:abstract>IMAGE2000 product 1 individual orthorectified
        scenes. IMAGE2000 was  produced from ETM+ Landsat 7
        satellite data and provides a consistent European
        coverage of individual orthorectified scenes in national
        map projection systems.</dct:abstract>
  <dc:type>dataset</dc:type>
```

# CSW Record

```
...
<Record ...
  <dc:subject>imagery</dc:subject>
  <dc:subject>baseMaps</dc:subject>
  <dc:subject>earthCover</dc:subject>
  <dc:format>BIL</dc:format>
  <dc:creator>Vanda Lima</dc:creator>
  <dc:language>en</dc:language>
  <ows:WGS84BoundingBox>
      <ows:LowerCorner>14.05 46.46</ows:LowerCorner>
      <ows:UpperCorner>17.24 48.42</ows:UpperCorner>
  </ows:WGS84BoundingBox>
</Record>
```

# Queryable Terms

| OGC Term | XML Element |
| --- | --- |
| Title | dc:title |
| Subject | dc:subject |
| Abstract | dc:description |
| Modified | dc:modified |
| Type | dc:type |

# Queryable Terms

| OGC Term | XML Element |
| --- | --- |
| Format | dc:format |
| Identifier | dc:identifier |
| Source | dc:source |
| Association | dc:relation |
| BoundingBox | ows:BoundingBox |

# OGC Queryable Terms

**AnyText**

Full text search

**CRS**

Coordinate Reference System

**BoundingBox**

For identifying a geographic area of interest

# Example Services

GI CAT

pycsw

ESRI GeoPortal

# CSW Operations

- GetCapabilities
- DescribeRecord
- GetRecordById
- GetRecords
- Harvest

# CSW GetCapabilities

```
http://23.21.100.193/
gi-cat-RI/services/cswiso?
service=CSW&
version=2.0.2&
request=GetCapabilities
```

Link

# CSW DescribeRecord

```
http://23.21.100.193/
gi-cat-RI/services/cswiso?
service=CSW&
version=2.0.2&
request=DescribeRecord
```

Link

# CSW GetRecords

```
http://23.21.100.193/
gi-cat-RI/services/cswiso?
service=CSW&
version=2.0.2&
request=GetRecords&
typeNames=csw:Record&
resultType=results&
elementSetName=full&
outputSchema=http://www.opengis.net/cat/csw/2.0.2&
NAMESPACE=xmlns(csw=http://www.opengis.net/cat/csw/2.0.2)
```

Link

# Advanced Queries

**Performed:**

- CQLTEXT
- FILTER

# Asynchronous CSW Harvest Request

```xml
<?xml version="1.0" encoding="ISO-8859-1"?>
<Harvest
  service="CSW"
  version="2.0.2"
  xmlns="http://www.opengis.net/cat/csw/2.0.2"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/cat/csw/2.0.2
                      ../../../csw/2.0.2/CSW-publication.xsd">
  <Source>http://www.yourserver.com/metadata.xml</Source>
  <ResourceType>http://www.fgdc.gov/metadata/csdgm</ResourceType>
  <ResourceFormat>application/xml</ResourceFormat>
  <HarvestInterval>P14D</HarvestInterval>
  <ResponseHandler>
      ftp://ftp.myserver.com/HarvestResponses</ResponseHandler>
</Harvest>
```

# Asynchronous CSW Harvest Response

```xml
<?xml version="1.0" encoding="UTF-8"?>
<csw:HarvestResponse
      xmlns:csw="http://www.opengis.net/cat/csw/2.0.2">
  <csw:Acknowledgement timeStamp="2011-12-05T15:13:59">
    <csw:EchoedRequest>
        <csw:Harvest ...
        </csw:Harvest>
    </csw:EchoedRequest>
    <csw:RequestId>
      e7684bec-1fa9-4053-814f-7ae970d7a4a1
    </csw:RequestId>
  </csw:Acknowledgement>
</csw:HarvestResponse>
```

# Synchronous CSW Harvest Request

```xml
<?xml version="1.0" encoding="UTF-8"?>
<csw:Harvest
        xmlns:csw="http://www.opengis.net/cat/csw/2.0.2"
        xmlns:gmd="http://www.isotc211.org/2005/gmd"
        service="CSW" version="2.0.2">
   <csw:Source>
      http://[ URL to the target CSW server ]?
      request=GetCapabilities&amp;service=CSW
      &amp;version=2.0.2
   </csw:Source>
   <csw:ResourceType>
      http://www.isotc211.org/schemas/2005/gmd/
   </csw:ResourceType>
</csw:Harvest>
```

# Synchronous CCSW Harvest Response

```xml
<?xml version="1.0" encoding="UTF-8"?>
<csw:HarvestResponse
   xmlns:csw="http://www.opengis.net/cat/csw/2.0.2">
    <csw:TransactionResponse>
        <csw:TransactionSummary>
            <csw:totalInserted>22</csw:totalInserted>
            <csw:totalUpdated>0</csw:totalUpdated>
            <csw:totalDeleted>0</csw:totalDeleted>
        </csw:TransactionSummary>
    </csw:TransactionResponse>
</csw:HarvestResponse>
```

# OpenSearch

- Provides a template to create requests for easy querying.
- It is available in CAT 3.0

# Simplifying a query via OpenSearch

To query **all records containing Greece**, we need to perform the following
**GetRecords** request:

```xml
<csw:GetRecords xmlns:csw="http://www.opengis.net/cat/csw/2.0.2" ...">
 <csw:Query typeNames="csw:Record">
   <csw:ElementSetName>brief</csw:ElementSetName>
   <csw:Constraint version="1.1.0">
     <ogc:Filter>
       <ogc:PropertyIsEqualTo>
         <ogc:PropertyName>csw:AnyText</ogc:PropertyName>
         <ogc:Literal>Greece</ogc:Literal>
       </ogc:PropertyIsEqualTo>
     </ogc:Filter>
   </csw:Constraint>
 </csw:Query>
</csw:GetRecords>
```

# Same query but using OpenSearch

OpenSearch **GetRecords** request. The request looks as follows:

```
http://demo.pycsw.org/cite/csw?
mode=opensearch&
service=CSW&
version=3.0.0&
request=GetRecords&
elementsetname=full&
typenames=csw:Record&
resulttype=results&
q=Greece
```

## The template to do request is as follows

```
http://demo.pycsw.org/cite/csw?
mode=opensearch&
service=CSW&
version=3.0.0&
request=GetRecords&
elementsetname=full&
typenames=csw:Record&
resulttype=results&
q={searchTerms?}&
bbox={geo:box?}&
time={time:start?}/{time:end?}&
startposition={startIndex?}&
maxrecords={count?}
```

# Credits

- NOAA NCDDC Metadata training materials