

Documenting In-Situ Data Using ISO 19115-2

Ted Habermann

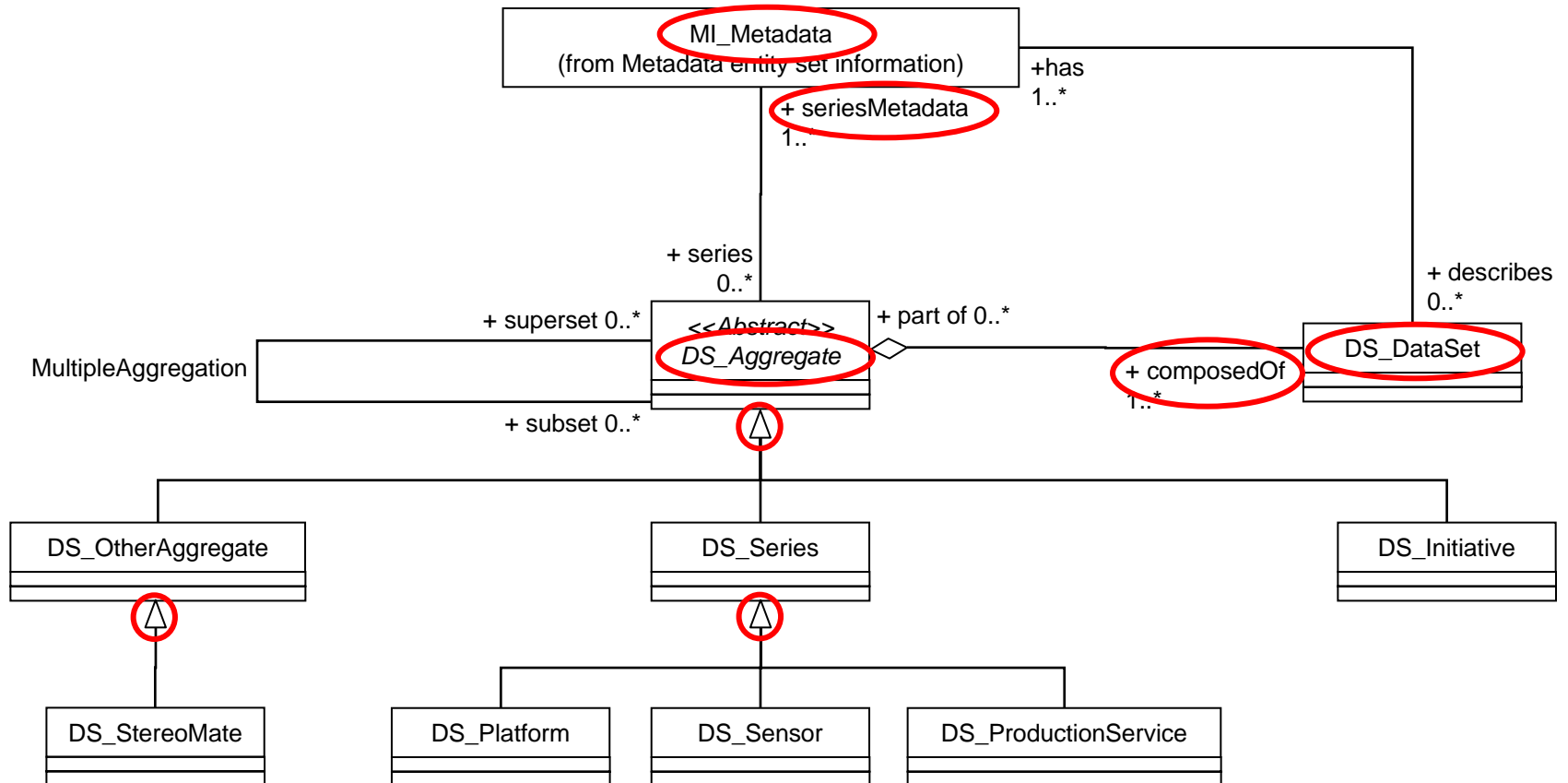
NOAA National Geophysical Data Center

DS_Aggregates: Directory Structures

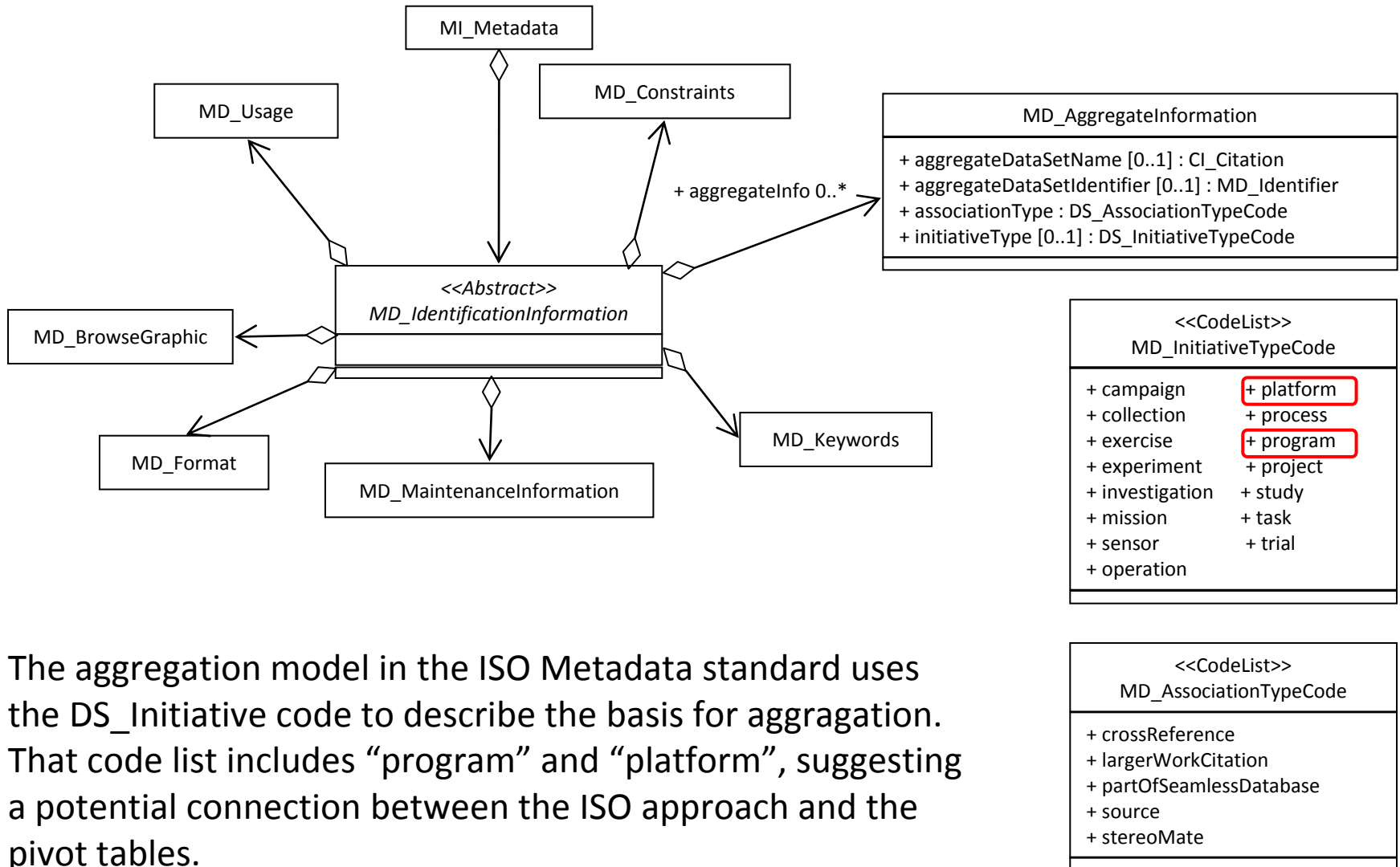
There are many kinds of DS_Aggregates

A DS_Aggregate has one or more seriesMetadata

A DS_Aggregate is composed of one or more DS_Datasets

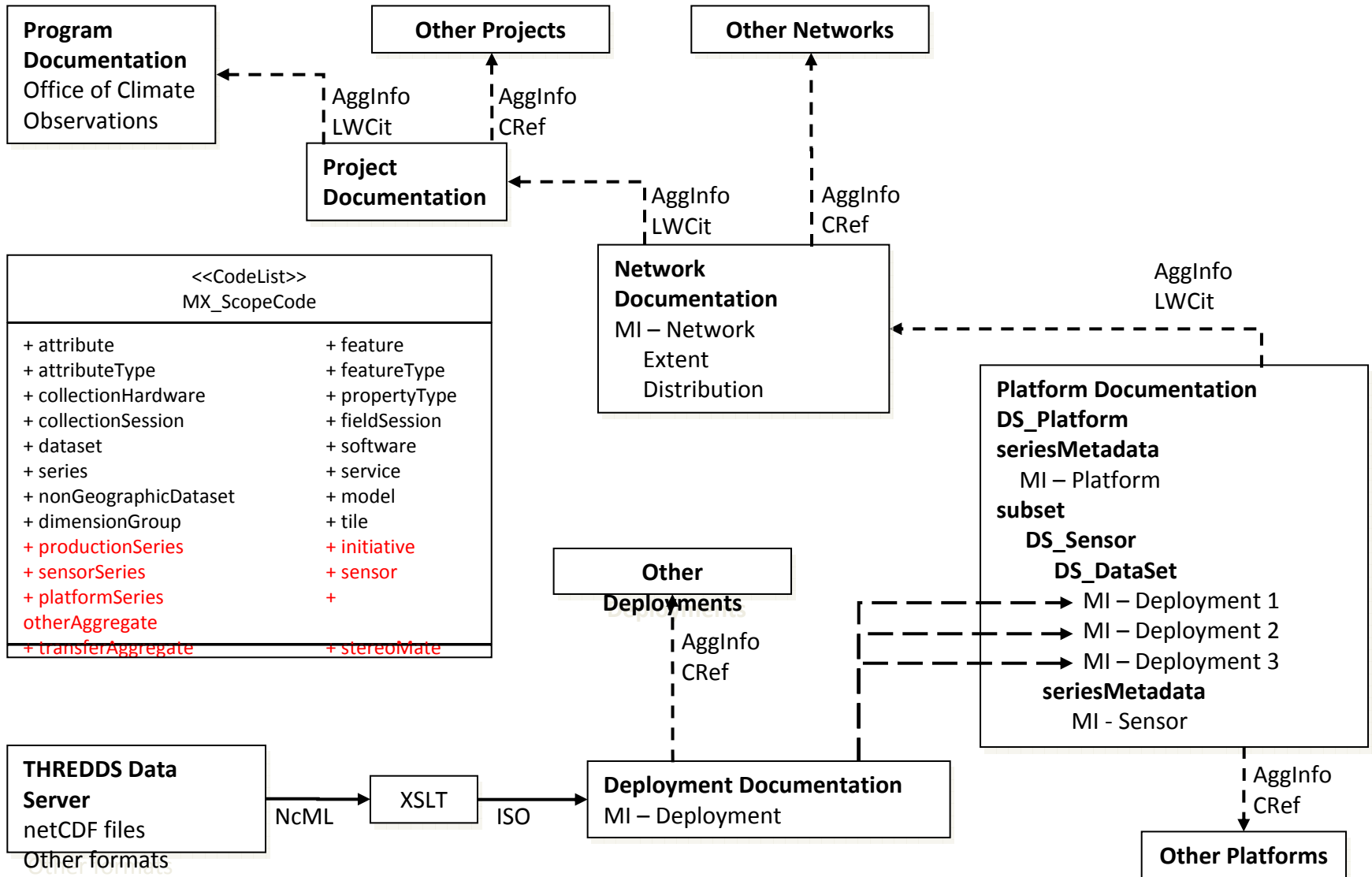


MD_AggregateInformation: External References



The aggregation model in the ISO Metadata standard uses the `DS_Initiative` code to describe the basis for aggregation. That code list includes “program” and “platform”, suggesting a potential connection between the ISO approach and the pivot tables.

Documentation Architecture



Connections

DS_Aggregate/subset/superset
directory structure

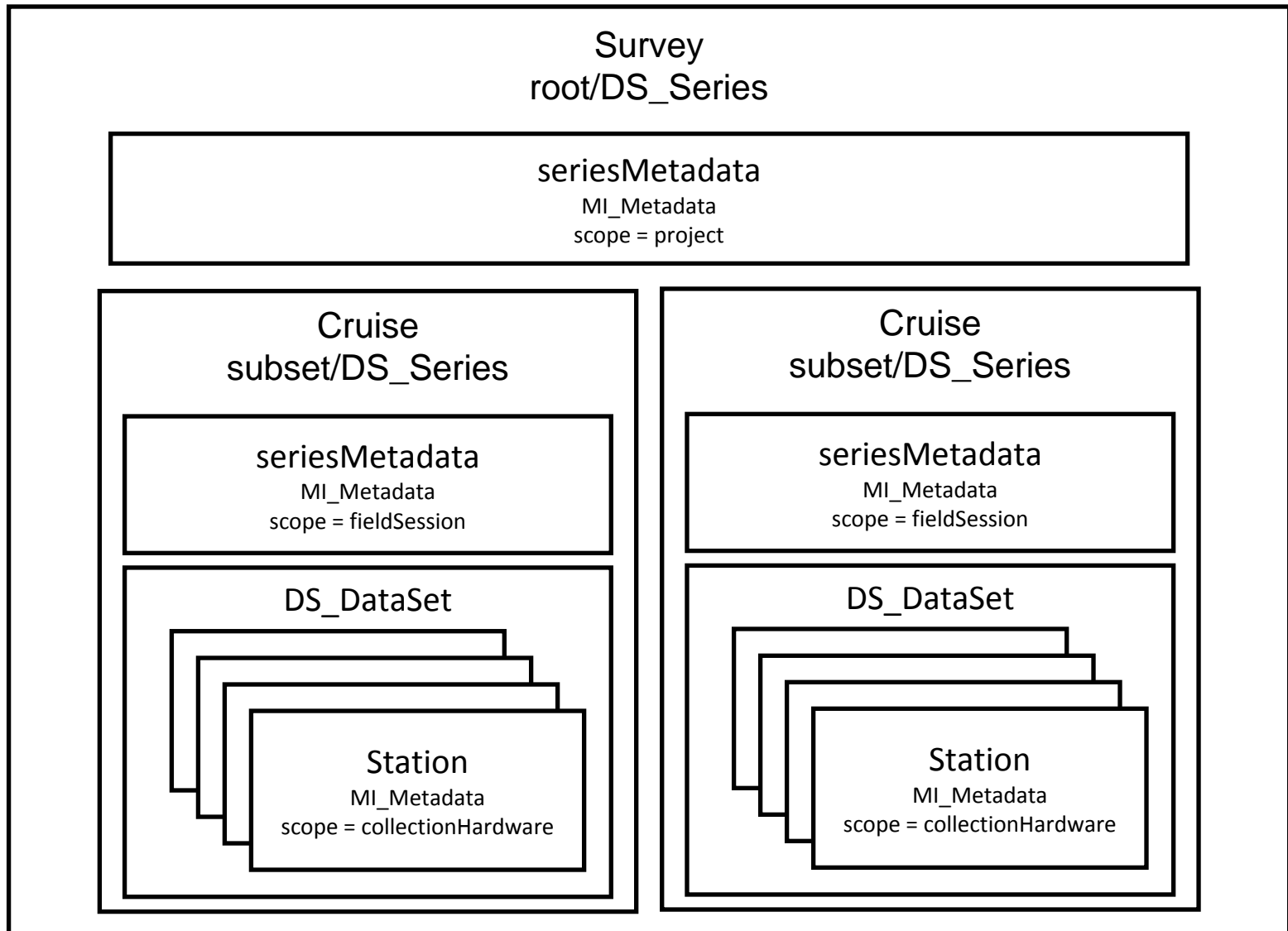
DS_Series/DS_DataSet:
any number of complete MI_Metadata objects
seriesMetadata describes the whole collection
implied inheritance???

AggregationInformation: aggregates that MD_Identification objects belong to
citation, identifier, associationTypeCode, initiativeTypeCode
largerWorkCitation describes parents, crossReference = siblings

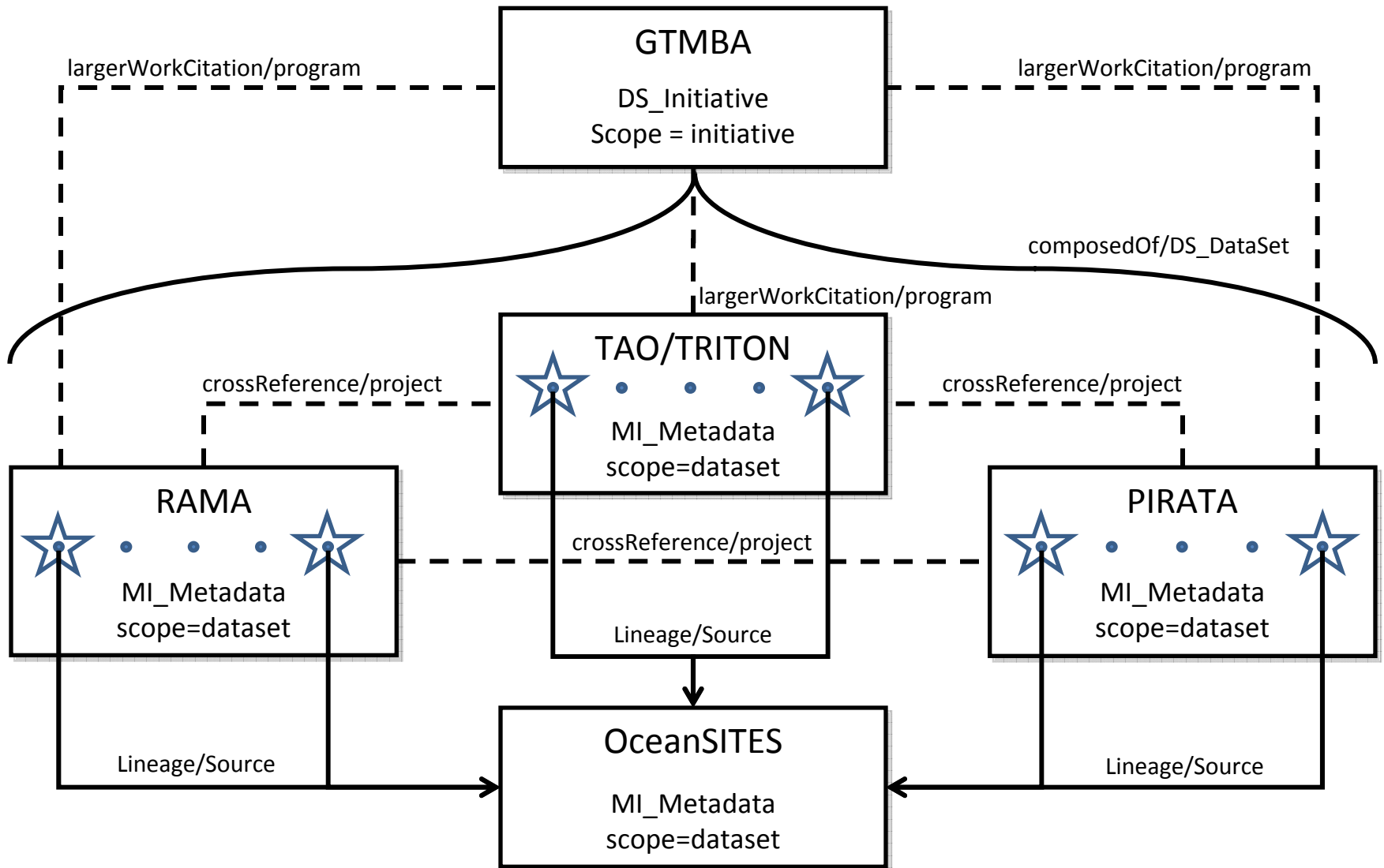
DQ_DataQuality/Lineage/Source:
description (text), citation, extent (temporal/spatial)
describes siblings used to create blended products

featureCatalog:
information about feature types (points = stations, lines = flights,
polygons = networks)

NMFS Survey Documentation Architecture



Moored Buoys: Real-World Architecture



Platform Metadata

Multiple Networks

ESRL Global Monitoring Division - MLO Site Description - Mozilla Firefox

ESRL Global Monitoring Division | Metadata Procedure Directive - Draft - ... | Working with Labels Overview - Configu...

GMU Projects at MAUNA LOA, HAWAII

Carbon Cycle Surface Flasks

Parameter	Formula	First Sample Date	Most Recent Sample Date
Carbon Dioxide	CO ₂	1989-08-20	Ongoing
Methane	CH ₄	1983-05-06	Ongoing
Carbon Monoxide	CO	1989-07-07	Ongoing
Molecular Hydrogen	H ₂	1989-07-07	Ongoing
Nitrous Oxide	N ₂ O	1997-05-09	Ongoing
Sulfur Hexafluoride	SF ₆	1997-05-09	Ongoing
Carbon-13/Carbon-12 in Carbon Dioxide	δ ¹³ C (CO ₂)	1990-01-12	Ongoing
Oxygen-18/Oxygen-16 in Carbon Dioxide	δ ¹⁸ O (CO ₂)	1990-01-12	Ongoing
Carbon-13/Carbon-12 in Methane	δ ¹³ C (CH ₄)	1998-01-02	Ongoing
D/H in Methane	δD (CH ₄)	2005-04-06	Ongoing
Methyl Chloride	CH ₃ Cl	2005-08-10	Ongoing
Benzene	C ₆ H ₆	2007-01-10	Ongoing
toluene	C ₇ H ₈	2007-01-10	Ongoing
ethane	C ₂ H ₆	2005-08-10	Ongoing
ethene	C ₂ H ₄	2005-08-10	Ongoing
propane	C ₃ H ₈	2005-08-10	Ongoing
propene	C ₃ H ₆	2005-08-10	Ongoing
i-butane	i-C ₄ H ₁₀	2005-08-10	Ongoing
n-butane	n-C ₄ H ₁₀	2005-08-10	Ongoing
i-pentane	i-C ₅ H ₁₂	2005-10-12	Ongoing
n-pentane	n-C ₅ H ₁₂	2005-08-10	Ongoing
n-hexane	n-C ₆ H ₁₄	2005-08-10	Ongoing
wind speed		1982-07-01	Ongoing
wind direction		1982-07-01	Ongoing
ambient temperature		1982-11-27	2004-09-22
isoprene	C ₅ H ₈	2007-01-10	Ongoing

Carbon Cycle In Situ Observatory

Parameter	Formula	First Sample Date	Most Recent Sample Date
Carbon Dioxide	CO ₂	1974-01-15	Ongoing
Methane	CH ₄	1987-01-15	Ongoing
Carbon Monoxide	CO	1992-01-15	Ongoing

HATS Flask Sampling

Parameter	Formula	First Sample Date	Most Recent Sample Date
Sulfur Hexafluoride	SF ₆	1988-11-28	Ongoing
HCFC-22	CHF ₂ Cl	1998-11-28	Ongoing
CFC-12	CCl ₂ F ₂	1999-05-02	Ongoing
Methyl Chloride	CH ₃ Cl	1999-04-23	Ongoing
HCFC-142b	CH ₃ CF ₂ Cl	1999-11-28	Ongoing
Halon-1211	CBClF ₂	1998-11-28	Ongoing
CFC-113	CCl ₂ FCClF ₂	1999-11-28	Ongoing
carbon tetrachloride	CCl ₄	1998-11-28	Ongoing
Methyl Chloroform	CH ₃ CCl ₃	1998-11-28	Ongoing
CFC-11	CCl ₃ F	1999-08-25	Ongoing

Multiple Extents

Multiple Parameters

Find: FILE1 | Next | Previous | Highlight all | Match case

Done

Documentation Architecture

OceanSites is a complex collection of information at many levels. The documentation architecture provides an overview of those levels and the relationships between them. One model includes five levels:

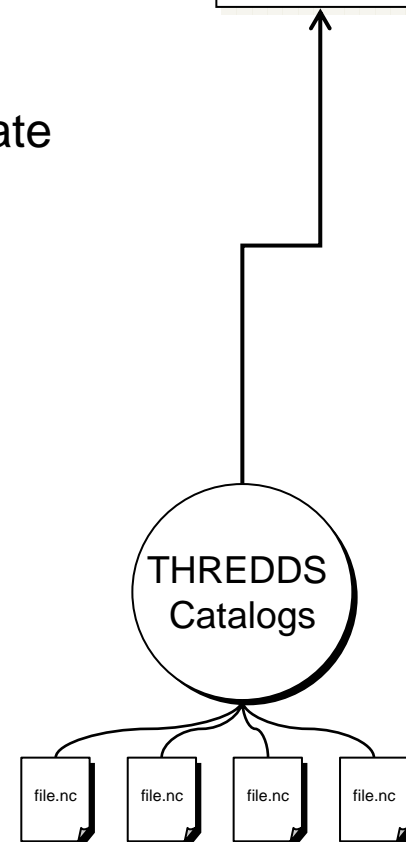


Current granule documentation feeds into this system to create discovery metadata that can feed existing portals

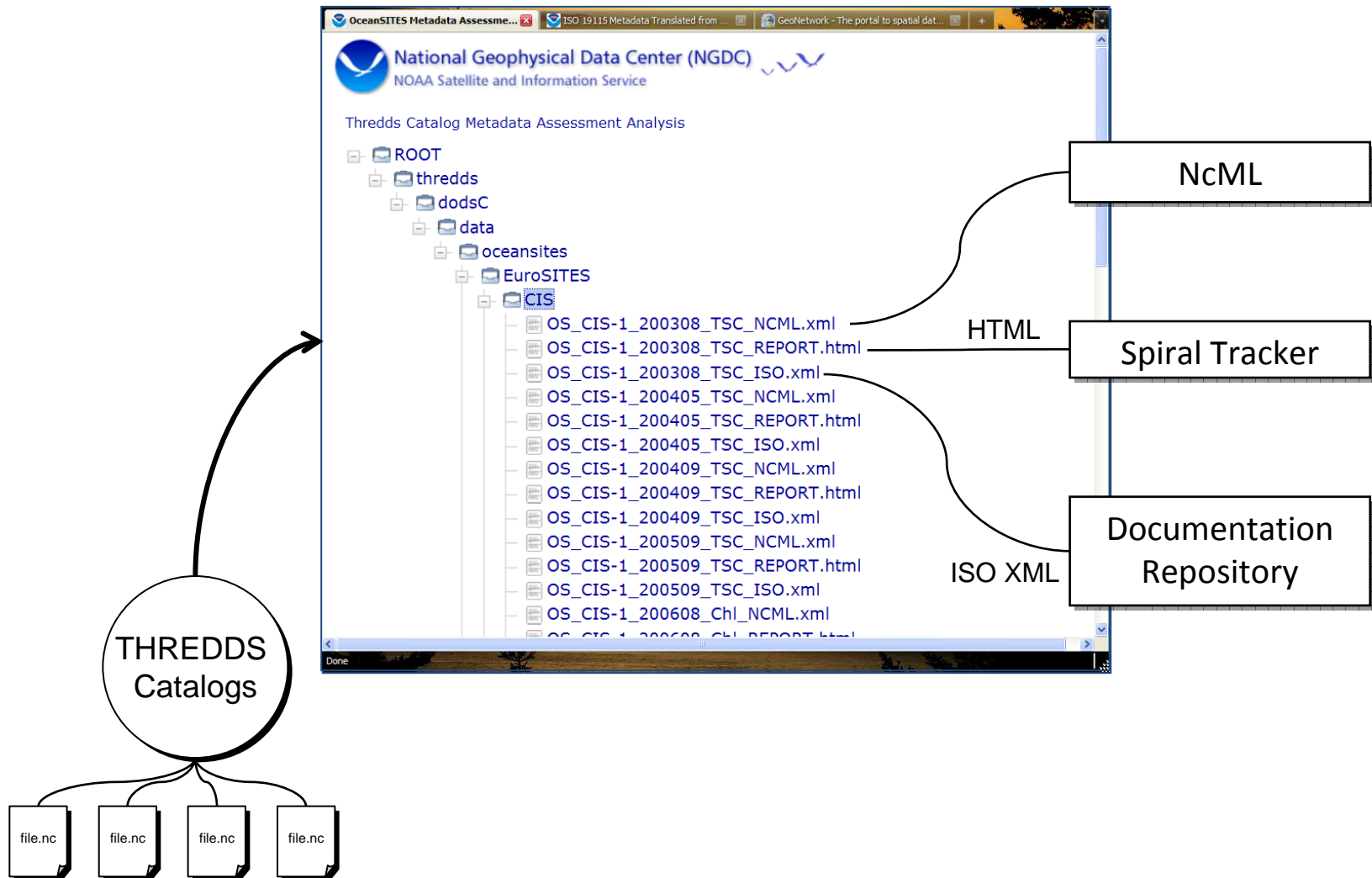
Principle:

Scientists do science and write scientific data

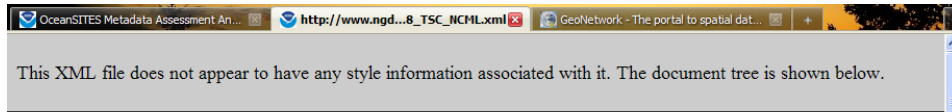
Documentation experts write documentation



Documentation Extraction



Documentation in Three Dialects



```

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  <dimension name="DEPTH" length="1"/>
  <dimension name="LATITUDE" length="1"/>
  <dimension name="LONGITUDE" length="1"/>
  <dimension name="POSITION" length="1"/>
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number 1 at 59.6842 Degrees N -39.6675 Degrees W
09:45:00"/>
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  <attribute name="institution" value="IFM-GEOMA
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  <attribute name="wmo_platform_code" value="444
  <attribute name="source" value="Mooring observat
  <attribute name="history" value="Delayed-mode pr
  <attribute name="data_mode" value="D"/>
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  <attribute name="quality_index" value="A"/>
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http://www.coriolis.eu.org"/>
  <attribute name="comment" value="no comment"/>
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  <attribute name="netcdf_version" value="3.5"/>
  <attribute name="title" value="OceanSITES CIS in-
  <attribute name="summary" value="EuroSITES Eu
collaborative project contract FP7-ENV-2007-1-2029

```

Title: OceanSITES CIS in-situ data
Total Score: 16/43

General File Characteristics

Number of Global Attributes	40
Number of Variables	13
Number of Variable Attributes	148
Number of Standard Names	8

	Spiral	None	1-33%
Total			
Identification			
Text Search			
Extent Search			
Other Extent Information		X	
Creator			X
Contributor		X	
Publisher		X	

- OS_CIS-1_200608_Ch1_I
- OS_CIS-1_200608_TSC
- OS_CIS-1_200608_TSC
- OS_CIS-1_200608_TSC
- OS_CIS-1_200707_TSC

```

This XML file does not appear to have any style information associated with it. The document tree is shown below.

- <gmi:MI_Metadata xsi:schemaLocation="http://www.isotc211.org/2005/gmi http://www.ngdc.noaa.gov/metadata
/published/xsd/schema/gmi/gmi.xsd">
  - <gmd:fileIdentifier>
    <gco:CharacterString>OS_CIS-1_200308_TSC</gco:CharacterString>
  </gmd:fileIdentifier>
  <gmd:contact gco:nilReason="unknown"/>
  <gmd:dateStamp gco:nilReason="unknown"/>
  - <gmd:spatialRepresentationInfo>
    - <gmd:MD_Georectified>
      <gmd:numberOfDimensions gco:nilReason="unknown"/>
      - <gmd:axisDimensionProperties>
        - <gmd:MD_Dimension>
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            codeListValue="column">column</gmd:MD_DimensionNameTypeCode>
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```

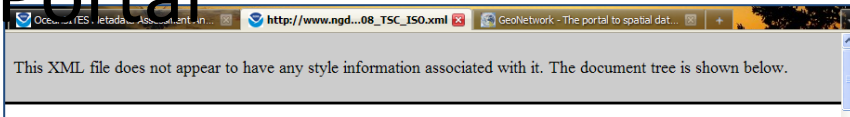
NcML

Spiral Tracker

Documentation
Repository

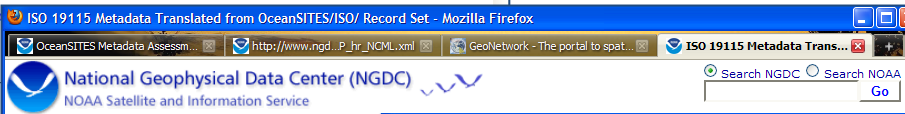
Documentation Repository /

Portal



```

<gmi:MI_Metadata xsi:schemaLocation="http://
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```



NOAA > NESDIS > NGDC > Metadata

NGDC Metadata Home

ISO 19115 Metadata Translated from OceanSITES/ISO/ Record Set - Mozilla Firefox

[View Extents in Google Earth](#)
(Note: Google Earth Plugin required)

#	Title	File Identifier
1	☆☆☆☆	OS_2006_DYFAMED_CTD
2	☆☆☆☆	OS_2004_DYFAMED_CTD
3	☆☆☆☆	OS_DYFAMED_2000_TSC
4	☆☆☆☆	OS_DYFAMED_2001_TSC
5	☆☆☆☆	OS_1999_DYFAMED_CTD
6	☆☆☆☆	OS_2005_W1M3A
7	☆☆☆☆	OS_2009_E1M3A
8	☆☆☆☆	OS_DYFAMED_1999_TSC
9	☆☆☆☆	OS_2010_W1M3A
10	☆☆☆☆	OS_2007_E1M3A
11	☆☆☆☆	OS_DYFAMED_1996_FCO
12	☆☆☆☆	OS_DYFAMED_1995_FCO
13	☆☆☆☆	OS_DYFAMED_1997_FCO
14	☆☆☆☆	OS_1998_DYFAMED_CTD
15	☆☆☆☆	OS_DYFAMED_2007_TSC
16	☆☆☆☆	OS_DYFAMED_2006_TSC
17	☆☆☆☆	OS_DYFAMED_2003_TSC
18	☆☆☆☆	OS_2008_E1M3A
19	☆☆☆☆	OS_DYFAMED_1998_TSC
20	☆☆☆☆	OS_DYFAMED_2002_TSC
21	☆☆☆☆	OS_DYFAMED_2005_TSC

GeoNetwork - The portal to spatial data and information - Mozilla Firefox

National Geophysical Data Center (NGDC)
NOAA Satellite and Information Service

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FIND INTERACTIVE MAPS, GIS DATASETS, SATELLITE IMAGERY AND RELATED APPLICATIONS

WHAT? WHERE? WHEN?

What? [] Title [] Abstract [] Keywords [] Map type [] Digital [] Hard copy [] Search at [] Precise C []

WHERE? lat (max) 90 long (min) -180 long (max) 178.2 (min) -88.2 overlaps []

WHEN? Anytime [] From [] To [] Restrict to: Catalog [] Group OceanSITES [] Category [] Options: Sort by [] Hits per page 10 [] Output Full []

[] sea_water_pressure (245 results) [] sea_water_salinity (228 results) [] sea water pressure (190 results) [] sea water temperature (168 results) [] uncertainty (152 results) [] sea_water_electrical_conductivity (152 results)

Aggregate Results matching search criteria : 1-10/323 (page 1/33), 0 selected Sort by [] Select : all, none [] actions on selection

[] MOORING DATA FROM SITE 'MOVES'

Abstract Oceanographic data collected by the MOVE project in the tropical Atlantic. Measured properties: temperature, pressure.

Keywords sea_water_temperature, time, latitude, longitude, depth, sea_water_pressure, quality flag, sea water temperature, quality flag, time, Latitude of each location, Longitude of each location, Depth of each measurement, sea water pressure

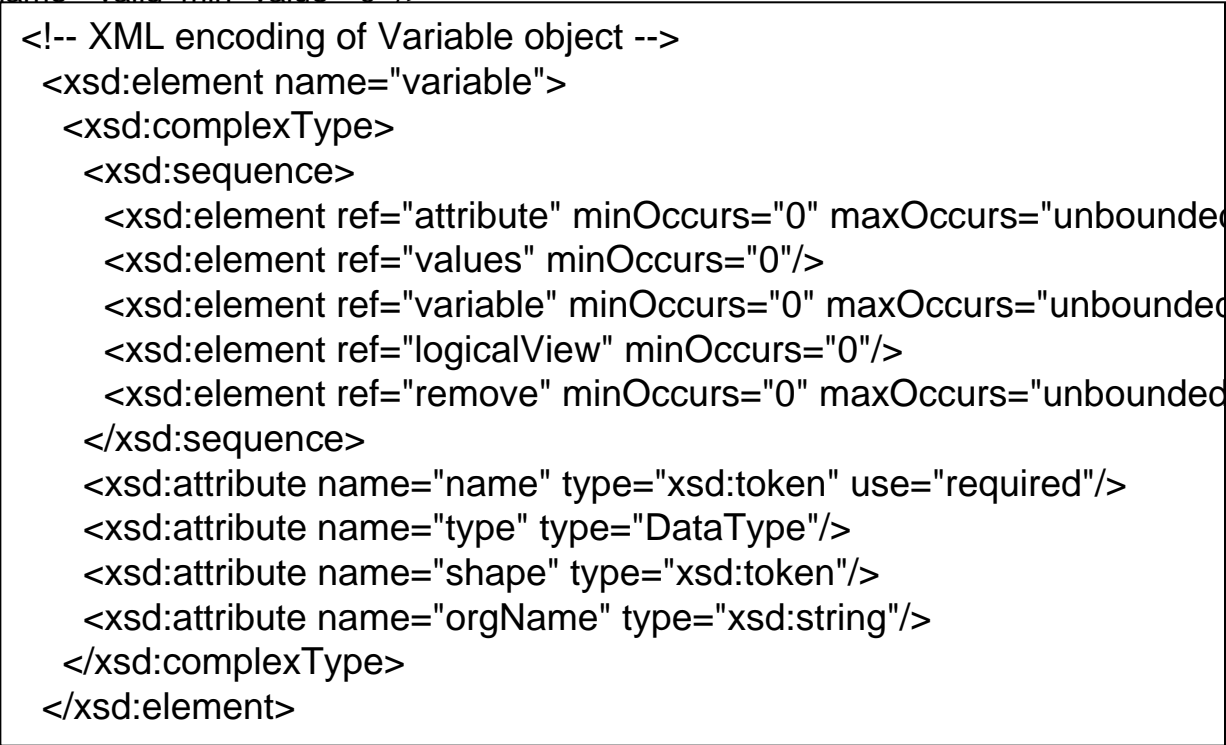
Owner: admin

Level 2 Metadata (NcML)

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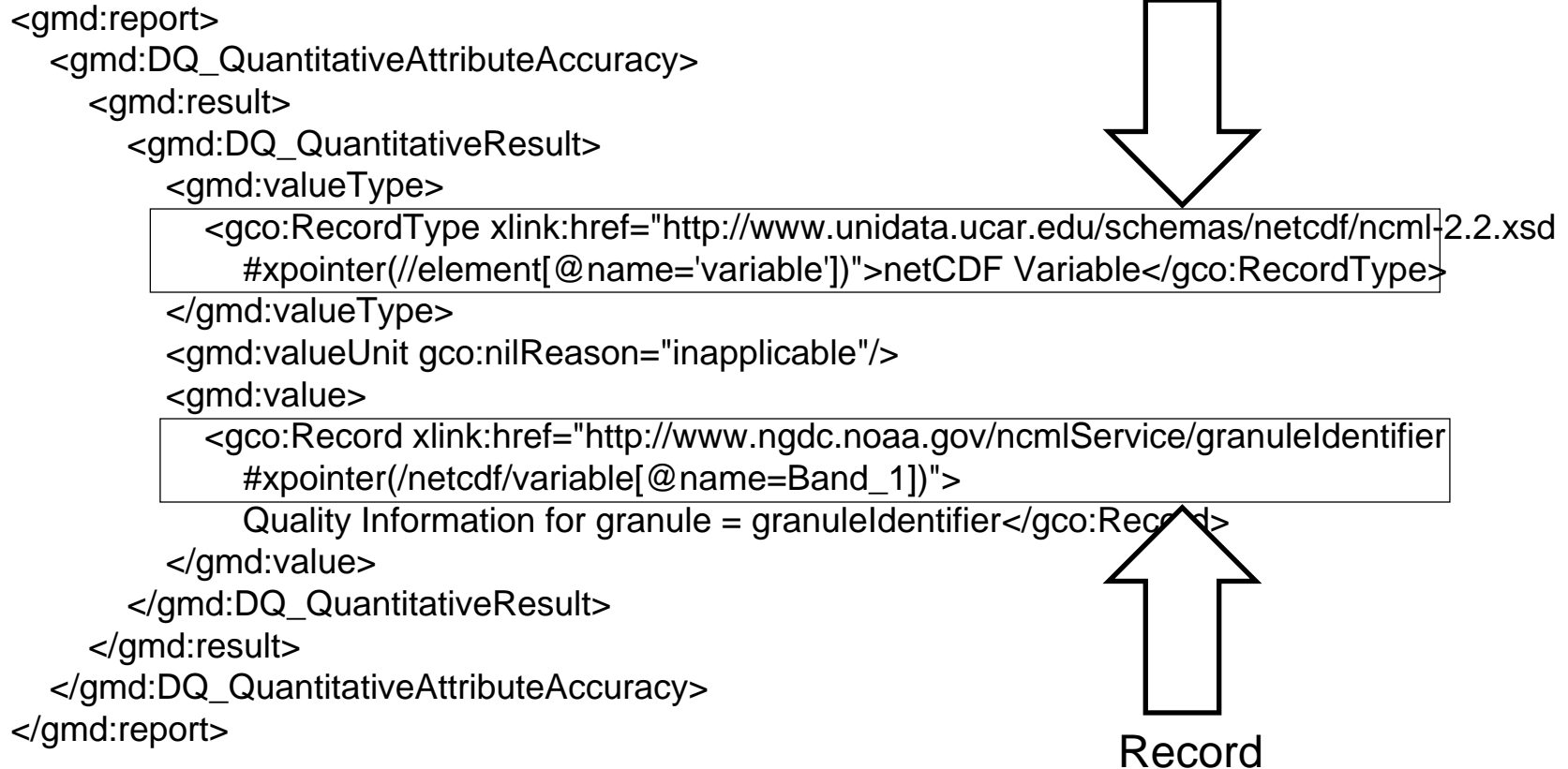


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  <attribute name="brightness_temperature_Standard_Deviation" type="float" value="114.663765" />
  </variable>

```

Level 2 Metadata (ISO)



Questions?

ted.habermann@noaa.gov