

Application of metadata standard for data management in marine geological field

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Certain standards are required to collect and distribute marine data (data and metadata) surveyed and produced by various institutions and researchers. ISO 191115/19139, the international standard for geographic metadata, is used to improve consistency and interoperability and to enable standardized data and metadata to be distributed to users.

ISO 191115/19139 does not provide acquisition information related to 'equipment and platform'. In addition, there are no metadata items that can reflect the characteristics of each sector data (physical, chemical, biological, geological, etc.), and there are no metadata items that can reflect the characteristics of individual data files included in the data set. To complement these shortcomings, institutions are developing new metadata standards or extending ISO 19115 to distribute them within the community.

In this study, we reviewed the metadata standards in the marine geography field commonly used in foreign countries, and defined the metadata standards to represent the meta information stored in seismic binary files constituting equipment and platform information and data sets. In addition, a metadata registration form was developed and the system was configured to automatically match the files and metadata that make up the data set when uploading the data set.

The applied metadata standards are largely divided into four sections. It consists of "datasetInformation" that can write general content of a data set, "questionInformation" related to data set acquisition information, "objectInformation" that can write the contents of each file that constitutes a data set, and "metadataInformation" that contains meta data information. In particular, in "objectinformation", where information of each individual file can be entered, the characteristics of each file can be used as a search keyword by marking the metadata with the user. In addition, manageable words such as equipment and sea area names were added to the code list in order to increase convenience and search utilization when writing metadata (Figure 1).

Researchers register their own research data in the system so that they can manage seismic files in units of projects and cruise. At this time, if detailed information about the registered file is collectively entered in the metadata form (csv file) and uploaded, each file and the metadata are matched and displayed in XML format (Figure 2).

Element	type	VALUE
datasetInformation	Go To: datasetInformation	
datasetID	free text	FPJ0000001
datasetTitle	free text	EEZ2015_20150501_Seismic_Sparker
datasetStartDate	<i>citationDateType</i>	
date	date	2019-10-17
dateTypeCode	<i>dateTypeCode Vocabulary</i>	creation
datasetDescription	free text	EEZ 구역에서 수행된 탄성파 자료
dataClass	<i>dataClass Vocabulary</i>	processed
dataType	<i>dataType Vocabulary</i>	Seismic:Source_Sparker
datasetProcessing	<i>processingParameters</i>	
processingStep	free text	파일보정
processingStepDate	date	2015-06-01
processContact	<i>contactInformation</i>	
organization	<i>organizationName Vocabulary</i>	한국해양과학기술원
name	free text	전정균
email	free text	ckjeon@kiost.ac.kr
boundingCoordinates	<i>boundingCoordinates</i>	
northLat	decimal degrees (-90.00 to 90.00)	37
southLat	decimal degrees (-90.00 to 90.00)	36
eastLong	decimal degrees (-180.0 to 180.00)	125
westLong	decimal degrees (-180.0 to 180.00)	123
geographicFeatures	<i>geographicFeatures</i>	
featureName	<i>geographicExtentName Vocabulary</i>	서해중부외해(㉔)
temporalExtent	<i>temporalExtent</i>	
startDate	date	2014-05-01
endDate	date	2014-05-15
timeZone_GMT	integer	GMT+9
resourceProvider	<i>resourceProviderInformation</i>	
resourceProviderContact	<i>contactInformation</i>	
organization	<i>organizationName Vocabulary</i>	한국해양과학기술원
name	free text or Person Name Lists	주형태
email	free text	
datasetAccessControl	<i>accessControl</i>	
accessState	<i>accessState Vocabulary</i>	open
accessReleaseDate	date	
projectSponsor	<i>projectSponsor</i>	

Figure 1: Developed marine geological metadata standard registration form

The screenshot shows a web browser interface with a detailed view of applied metadata. The left pane shows a tree view of metadata elements, and the right pane shows the corresponding XML code. The metadata includes dataset information, acquisition information, object information, and geographic features.

```

<datasetInformation>
  <datasetID>KIOS120110001</datasetID>
  <datasetTitle>EEZ2015_20150501_Seismic_Sparker</datasetTitle>
  <datasetStartDate>
    <date></date>
    <dateTypeCode>creation</dateTypeCode>
  </datasetStartDate>
  <datasetDescription>남동해역지역에서수행된탄성파자료</datasetDescription>
  <dataClass>processed</dataClass>
  <dataType>Sparker/MCS</dataType>
  <datasetProcessing>
    <processingStep>파일보정</processingStep>
    <processingStepDate>2015-06-01</processingStepDate>
    <processContact>
      <organizationName Vocabulary>한국해양과학기술원</organizationName Vocabulary>
      <name>전정균</name>
      <email>ckjeon@kiost.ac.kr</email>
    </processContact>
  </datasetProcessing>
  <boundingCoordinates>
    <northLat>37</northLat>
    <southLat>36</southLat>
    <eastLong>125</eastLong>
    <westLong>123</westLong>
  </boundingCoordinates>
  <geographicFeatures>
    <featureName Vocabulary>서해중부외해(㉔)</featureName Vocabulary>
  </geographicFeatures>
  <temporalExtent>
    <startDate>2014-05-01</startDate>
    <endDate>2014-05-15</endDate>
    <timeZone_GMT>GMT+9</timeZone_GMT>
  </temporalExtent>
  <resourceProviderInformation>
    <resourceProviderContact>
      <organizationName Vocabulary>한국해양과학기술원</organizationName Vocabulary>
      <name>주형태</name>
    </resourceProviderContact>
  </resourceProviderInformation>
  <datasetAccessControl>
    <accessState Vocabulary>open</accessState Vocabulary>
  </datasetAccessControl>
  <projectSponsor>
  </projectSponsor>
</datasetInformation>

```

Figure 2 : Detailed view of applied metadata