

Seismic Metadata

Rules and Definitions

This metadata template is designed to describe a seismic dataset. A dataset is a logical grouping of files such as one or more seismic lines, a 3D data volume or a set of seismic velocity files. A dataset collection may also be determined by processing level, geographic bounds, or other parameters. The data provider or metadata author may determine the best way to aggregate the information.

SeismicMetadata

The root metadata element.

Element	Type	Conditionality	Definition
datasetInformation	Go to: datasetInformation	1	Collection level information, e.g. contacts, data quality, bounding geographic area, keywords.
acquisitionInformation	Go to: acquisitionInformation	0 to 1	Information about how the data was collected, cruiseID, such as ship names, instruments and detailed acquisition details.
objectInformation	Go to: objectInformation	0 to 1	Object level information, e.g. SEG-Ys, detailed line information.
metadataInformation	Go to: metadataInformation	1	Metadata about this metadata file, including last update and author.

datasetInformation

Collection level information, e.g. contacts, data quality, bounding geographic area, keywords.

Element	Type	Conditionality	Definition	Example
datasetID	free text	1	A unique identifier for the dataset. (Mandatory, Not repeatable)	edu.utexas.ig:ew9101_01p

<http://ngdc.noaa.gov/mgg/ecs/metadata/seismic/seismicmetadata.html>

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datasetTitle	free text	1	Descriptive title for the dataset. (Mandatory, Not repeatable)	EW9101 MCS Processed SEG-Y Data
datasetStartDate	Go to: citationDateType	1 to *	Beginning of data collection, dataset publication or revision. (Mandatory, Repeatable)	
datasetDescription	free text	1	General description of the dataset. A paragraph or two should highlight the characteristics that make this a logical dataset, such as the information content, date range and geographic location of the dataset. (Mandatory. Not repeatable.)	This was a joint UT and Lamont-Doherty Earth Observatory program collecting a series of MCS lines in the Bransfield Strait, across the South Shetland Trench and farther south along the Antarctic margin. UTIG was responsible for the Bransfield Strait and South Shetland Trench data. Additional lines collected farther south along the margin were the responsibility of Lamont-Doherty Earth Observatory.
purpose	free text	0 to 1	Brief statement of dataset objective, intended users or project goals. (Optional, Not repeatable)	The goals of this data collection were to increase understanding of the following processes: Andean-type orogenesis, continental lithosphere extension in a convergent continental margin setting, ridge crest subduction, and interaction of large- offset fracture zones with convergent margins, including the uplift of subduction complexes.
supplementalInformation	free text	0 to 1	Any other descriptive information about the dataset. (Optional, Not repeatable)	

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dataClass	Go to: dataClass Vocabulary	1	Identifies the level of processing data has undergone. (Mandatory, Not repeatable)	Processed
dataType	Go to: dataType Vocabulary	1	Kind of data differentiated by the type of receiver or source. (Mandatory, Not repeatable)	Seismic:Active:MCS
processedMethod	Go to: processedMethod Vocabulary	0 to *	Data may be processed for reflections, refractions or velocities; For use if DataClass = Processed or Compilation. (Optional, Repeatable)	Seismic:Reflection
processedDataClass	Go to: processedDataClass Vocabulary	0 to *	Primary classification of data processing results. (Optional, Repeatable)	Stack, Migration
seismicDataProvenance	Go to: seismicDataProvenance Vocabulary	1 to *	Controlled vocabulary that identifies how the data was generated. (Mandatory, Repeatable)	DigitalSeg:DigitallyAcquired
dataMedia	Go to: dataMedia Vocabulary	1 to *	The media used for dataset transfer. (Mandatory, Repeatable)	Online

datasetQualityDescription	free text	1	General statement of the accuracy of the datasets, any known problems or a qualitative assessment of dataset on part of contributor. If this information is not available put in 'Unknown'. (Mandatory, Not repeatable)	Unknown
datasetProcessing	Go to: processingParameters	1 to *	Descriptive information of processing or lineage pertinent to the entire collection level represented.	
boundingCoordinates	Go to: boundingCoordinates	1 to *	The limits of coverage of a data set expressed by latitude and longitude. (Mandatory, Repeatable)	
geographicFeatures	Go to: geographicFeatures	0 to *	Names of geographic locations and undersea features associated with the dataset and a citation to the featureName authority. (Optional, Repeatable)	
temporalExtent	Go to: temporalExtent	0 to *	Beginning and ending dates of dataset content. (Optional, Repeatable)	
timeZone_GMT	integer	0 to 1	Time zone of the dataset, represented as an integer with +/- hours from Greenwich Mean Time. (Optional, Not repeatable)	

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resourceProvider	Go to: contactInformation	1 to *	Contact information of person or organization that provides the dataset. (Mandatory, Repeatable)	UTX-AUSTIN/IG
dataContact	Go to: contactInformation	1 to *	Contact information of principle investigator (chief scientist) or current responsible party of dataset. (Mandatory, Repeatable)	Mutter_J
datasetAccessControl	Go to: accessControl	1 to *	Reference to the id of information about dataset access, access contact and, if applicable, access date. (Mandatory, Repeatable)	edu.utexas.ig:ew9101_access01
projectSponsor	Go to: projectSponsor	0 to *	Organization that sponsored the development of dataset and award information. (Optional, Repeatable)	
Documentation	Go to: citationInformation	0 to *	Citation of dataset related documentation, such as user guides and science papers. (Optional, Repeatable)	

accessControl

To identify if any one object or the entire dataset is on hold. If nothing is on hold, put "open". (Mandatory, Repeatable)

Element	Type	Conditionality	Definition	Example
accessControl/@ID	free text	0 to 1	Unique identification for this access information.	edu.utexas.ig:ew9101_access01

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accessState	Go to: accessState Vocabulary	1	Vocabulary list of restrictions for accessing the data set. "Open" is an option if there are no restrictions. (Mandatory, Not repeatable)	Open
accessPerson	Go to: contactInformation	1	Contact for access information. (Mandatory, Not repeatable)	Gahagan_L
accessReleaseDate	Date	0 to 1	Date when dataset or seismic data object will be released, YYYY-MM-DD. Required if any part of the dataset is restricted and useful if the dataset is already released. (Optional, Not repeatable)	2005-01-11

boundingCoordinates

The limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most.

Element	Type	Conditionality	Definition	Example
northLat	decimal degrees (-90.00 to 90.00)	1	Northern-most latitude coordinate of the dataset extent expressed in decimal degrees. (Mandatory, Not repeatable)	-60.3486
southLat	decimal degrees (-90.00 to 90.00)	1	Southern-most latitude coordinate of the dataset extent expressed in decimal degrees. (Mandatory, Not repeatable)	-69.4320
eastLong	decimal degrees (-180.00 to 180.00)	1	Eastern-most longitude coordinate of the dataset extent expressed in decimal degrees. (Mandatory, Not repeatable)	-55.502
westLong	decimal degrees (-180.00 to 180.00)	1	Western-most longitude coordinate of the dataset extent expressed in decimal degrees. (Mandatory, Not repeatable)	-79.8162

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contactInformation

Contact information of person or organization.

Element	Type	Conditionality	Definition	Example
contactInformation /@ID	free text	0 to 1	Unique identifier of contact information.	Mutter_J
organization	Go to: Organization Name Lists	1 to *	Name of the contact organization. (Mandatory, Repeatable)	Lamont-Doherty Earth Observatory
name	free text or Go to: Person Name Lists	1	Contact person name. (Mandatory, Not repeatable)	John C. Mutter
email	free text	1	Contact email. (Mandatory, Not repeatable)	jcm@ldeo.columbia.edu
role	Go to: Role Vocabulary	1	Role code of contact, based on ISO 19115 controlled vocabulary. (Mandatory, Not repeatable)	principalInvestigator

citationInformation

Reference to documentation related of cited resource.

Element	Type	Conditionality	Definition	Example
citationInformation /@ID	free text	0 to 1	Unique identifier of the cited resource. (Optional, Not Repeatable)	edu.utexas.ig._001
author	free text	1 to *	Name of the individual that developed the data set or authored the resource. (Mandatory, Repeatable)	GEBCO Sub-Committee on Undersea Feature Names

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title	free text	1 to 1	Name by which the cited resource is known (ISO 19115) (Mandatory, Not repeatable)	IHO-IOC GEBCO Gazetteer
citationDate	Go to: citationDateType	1 to *	(Mandatory, Repeatable)	date: 2007, dateTypeCode: published
journalName	free text	0 to 1	Name of journal where cited resource is published. (Optional, Not repeatable)	
page	free text	0 to 1	Journal pages of cited resource. (Optional, Not repeatable)	
volume	free text	0 to 1	Journal volume. (Optional, Not repeatable)	
doi	free text	0 to 1	Digital Object Identifier of cited resource. (Optional, Not repeatable)	
dataReportFileName	free text	0 to 1	File name of cited object. (Optional, Not repeatable)	
onlineLinkage	free text	0 to 1	URL to remote location or publication of cited resource. (Optional, Not repeatable)	http://www.gebco.net/data_and_products/undersea_feature_names/documents/gazet_sept2007.xls

citationDateType

Abstract element that is utilized in multiple places. (This element name does not appear anywhere in the xml file, but the sub-fields below do) .

Element	Type	Conditionality	Definition	Example
date	date	1	Single value encoded as YYYY, YYYYMM or YYYYMMDD.	1991-02-01
dateTypeCode	Go to: dateTypeCode Vocabulary	1	Controlled vocabulary that classifies the "type of date", e.g. creation represents start of data collection, publication represents when the data was made available to the public, revision represents when the data was revised or reprocessed.	creation

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geographicFeatures

Names of geographic locations associated with the dataset and a citation to the featureName authority.

Element	Type	Conditionality	Definition	Example
featureName	Go to: Feature Name Lists	1 to *	Name of geographic feature, specific location or area.	South Pacific Ocean
featureAuthority	Go to: citationInformation	0 to 1	Citation of publication of geographic names or Gazetteer, for example, the IHO of Undersea Feature Names. (Optional, Not repeatable)	

processingParameters

Processing parameters for the dataset or seismicDataObject.

Element	Type	Conditionality	Definition	Example
processingScope	Go to: processingScope Vocabulary	1	Defines whether the processing was for the dataset or the dataObject. (Mandatory, Not repeatable)	dataset
parentDataset /@ID	free text	0 to *	Identifier of the processed data set that served as parent or field dataset for processing. (Optional, Repeatable)	org.marine-geo:EW9101_parent001

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processingStep	free text	1	Description of processing performed on the dataset or object. (Mandatory, Not repeatable)	UTIG: Data processing used CG and G's Geovecteur software. CMPs for stacking were calculated from a mean distance between shots for each line segment. Some processing histories are in the UTIG archive. LDEO: MCS in house processing. For all files: edit traces, timing correction, outside mute, normal move out and stack.
processingStepDate	date	0 to 1	Date of process step action. (YYYY-MM-DD) (Optional, Not repeatable)	
processContact	Go to: contactInformation	0 to 1	Contact information of person who performed the processing. (Optional, Not repeatable)	

projectSponsor

Organization that sponsored the development of dataset and award information.

Element	Type	Conditionality	Definition	Example
projectSponsor/@ID	free text	0 to 1	ID associated with project sponsor (Optional, Not Repeatable)	gov.nsf:OCE94-18135
organization	Go to: Organization Name Lists	0 to *	(Optional, Repeatable)	National Science Foundation
awardTitle	free text	1	(Mandatory, Not repeatable)	The Pacific Margin of the Antarctic Peninsula: A Marine Geophysical Study of the Tectonic Evolution of Andean-Type Orogen
awardNumber	free text	0 to 1	(Optional, Not repeatable)	8916436

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awardDate	Go to: citationDateType	1 to *	(Mandatory, Repeatable)	See citationDateType
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temporalExtent

Beginning and ending dates of dataset content.

Element	Type	Conditionality	Definition	Example
startDate	date	1	Single value encoded as YYYY, YYYY-MM or YYYY-MM-DD. (Mandatory, Not repeatable)	2009-01-01
endDate	date	1	Single value encoded as YYYY, YYYY-MM or YYYY-MM-DD. (Mandatory, Not repeatable)	2009-12-12

acquisitionInformation

Information about how the data was collected, e.g. specific acquisition details, devices, ships, seismic stations.

Element	Type	Conditionality	Definition
acquisitionParameters	Go to: acquisitionParameters	1 to *	Reference to id for acquisition parameters used to gather the seismic data. (Optional, Repeatable)
platformInformation	Go to: platformInformation	0 to *	Ship Name and responsible organization. Note: this could be apply to other types of platforms. (Optional, Repeatable)
fieldActivity	Go to: fieldActivity	0 to *	(Optional, Repeatable)
seismicStation	Go to: seismicStation	0 to *	Name of OBS or sonobuoy associated with an SDO. (Optional, Repeatable)
seismicNavFile	Go to: seismicNavFile	0 to *	Description of the Seismic navigation at time of acquisition (Optional, Repeatable)

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acquisitionParameters

Details of seismic data collection.

Element	Type	Conditionality	Definition	Subbottom Example	Multichannel Example
acquisitionParameters /@ID	free text	1	Unique id of this acquisition information. If there is more than one acquisition configuration for an expedition then a new table should be created.	edu.columbia.ldeo: MGL0801_ACQxxx	gov.usgs.cmg:S-8-07-SC_ACQxxx
fieldActivity /@ID	free text	0 to *	Unique identifier of the field data acquisition program associated with the data set. (Optional, Repeatable)	S-8-07-SC	MGL0801
receiverType	Go to: deviceType Vocabulary	1	Type of receiver used to detect the arrival of seismic waves. (Mandatory, Not repeatable)	CHIRP	Hydrophone_Streamer
sourceType	Go to: deviceType Vocabulary	1	Type of source used to generate seismic waves. (Mandatory, Not repeatable)	CHIRP	SeismicSource_Gun_Air
acquisitionSystemName	free text	0 to 1	Vendor name for the data acquisition system used to record the seismic signals. (Optional, Not repeatable)		
acquisitionSystemType	Go to: acquisitionSystemType Vocabulary	1	Signal may be recorded in Digital or Analog form. (Mandatory, Not repeatable)	Digital	Digital

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seismicNavSystem	free text	0 to 1	Navigation system used as primary source of positioning information for the data set. (Optional, Not repeatable)	Yonav (USGS)	POS-MV (primary), SeaPath
surveyDatum	Go to: surveyDatum Vocabulary	0 to 1	Geodetic reference system used for seismic survey. (Optional, Not repeatable)	WGS84	WGS84
sourceToNearChannel_inMeters	decimal	0 to 1	Distance between the sound source and the nearest channel or hydrophone group in receiver cable. (Optional, Not repeatable)	0	42
antennaToSource_inMeters	decimal	0 to 1	Distance between the GPS antenna and sound source. (Optional, Not repeatable)	18	62
numberOfChannelsRecorded	integer	0 to 1	Total number of channels (or hydrophone groups) recorded. Corresponds to sum of all channels on all cables. (Optional, Not repeatable)	3	1824
numberOfCables	integer	0 to 1	Number of receiver cables or streamers used in survey. (Optional, Not repeatable)	n/a	3
numberOfChannelsEachCable	integer	0 to 1	Number of receiver channels (or hydrophone groups) on each cable or streamer. (Optional, Not repeatable)	n/a	456

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channelLength_inMeters	decimal	0 to 1	Length of hydrophone group composing one channel. (Optional, Not repeatable)	n/a	12.5
cableLength_inMeters	decimal	0 to 1	Length of receiver cable or streamer. (Optional, Not repeatable)	n/a	6000
cableSpacing_inMeters	decimal	0 to 1	Separation between cables for 3D operations. (Optional, Not repeatable)	n/a	150
nearChannelNumber	integer	0 to 1	Number of the receiver channel located nearest the sound source. (Optional, Not repeatable)	n/a	468
cableReceiverDepth_inMeters	decimal	0 to 1	Nominal depth of the streamer cable or receiver. For Subbottom, this is the same value as sourceDepth. (Optional, Not repeatable)	2	9
cableReceiverDepthRecorded	Go to: yesNo Vocabulary	0 to 1	Yes, If the depth of the streamer cable or receiver is recorded and no, if it is not. Note: this only pertains to digital recording, for example, SEG-D field trace headers. (Optional, Not repeatable)		

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numberSourceArrays	integer	0 to 1	Useful for 3D operations where 2 source arrays are shot alternately. This is not the number of linear gun strings that comprise the source. Number of sources = 1 if all guns were fired simultaneously. Number of source arrays = 2 if the source was fired as 2 arrays fired alternately. (Optional, Not repeatable)	1	1
flipFlopShooting	Go to: yesNo Vocabulary	0 to 1	Yes or No. Depending on whether two source arrays were fired alternately. (Optional, Not repeatable)	No	
sourceArraySeparation_inMeters	decimal	0 to 1	If the source is configured as 2 arrays fired alternately, this number is the separation (in meters) between the arrays. Used for 3D operations and potentially 2D operations. (Optional, Not repeatable)	n/a	n/a
sourceVolume	decimal	0 to 1	Total volume of compressed air/water bubble released by source array. (Optional, Not repeatable)	n/a	54077.31
sourceVolumeUnits	Go to: sourceVolumeUnits Vocabulary	0 to 1	The units of the source volume. (Optional, Not repeatable)	n/a	cubicCentimeters

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sourcePressure_inBars	decimal	0 to 1	Total pressure exerted by the source. (Optional, Not repeatable)	n/a	131.0003
sourceNumber	integer	0 to 1	Number of air/water/GI guns used in the source array. (Optional, Not repeatable)	n/a	18
sourceDepth_inMeters	decimal	0 to 1	Depth at which the source is towed. (Optional, Not repeatable)	2	6.5
shotControl	Go to: shotControl Vocabulary	0 to 1	Source shots are fired at regular intervals of either time or distance. (Optional, Not repeatable)	time	time
shotInterval_inSecondsOrMeters	decimal	0 to 1	Time or distance interval between shots. (Optional, Not repeatable)	0.25	10
sampleInterval_inMicroseconds	integer	0 to 1	Sampling interval for seismic recording. (Optional, Not repeatable)	62	2000
sweepFrequency	free text	0 to 1	For Chirp systems - the manufacturer specified min/max frequency range of the emitted source signal. (Optional, Not repeatable)	500 Hz to 3.5 kHz and 30 millisecond window	n/a
recordLength_inSeconds	decimal	0 to 1	Total length of the recorded seismic trace in time. (Optional, Not repeatable)	300	8192

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compassBirds	Go to: yesNo Vocabulary	0 to 1	Yes if compass birds were used on the steamer cable. (Optional, Not repeatable)	n/a	yes
tailBuoyPositioning	Go to: yesNo Vocabulary	0 to 1	Yes if the tail buoy on end of streamer cable had an active GPS for positioning. (Optional, Not repeatable)	n/a	yes
recordingDelay	Go to: yesNo Vocabulary	0 to 1	Yes if the beginning of data recording is delayed for a specified time interval after each shot. Used for example in older generation seismic surveys in deep water settings to exclude the water column. (Optional, Not repeatable)	no	no
sourcePowerSetting	free text	0 to 1	Power setting of seismic source - used for high frequency subbottom systems. (Optional, Not repeatable)	500 joules	n/a

platformInformation

Ship Name and responsible organization. Note: this could be apply to other types of platforms, as well.

Element	Type	Conditionality	Definition	Example
platform	Go to: Platform Name Lists	1	Name of the ship or other type of vessel from which the instrument device was aboard. Best Practice is to use an externally supported vocabulary list. (Mandatory, Not repeatable)	Maurice Ewing
platformOrganization	Go to: Organization Name Lists	1	Platform operator (not owner). (Mandatory, Not repeatable)	LDEO

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seismicNavFile

If available, description of the navigation file associated with the collection or a seismic object.

Element	Type	Conditionality	Definition	Example
seismicNavFile /@ID	free text	0 to 1	Identifier attribute of navigation file. The unique ids are internally controlled by data provider. (Optional, Not repeatable)	ar54.5558.ew9101.sap02.stack.ploc
associatedSeismicLine /@IDREF	Reference ID, (must match ID of referenced seismic line)	0 to *	Reference to seismic line ID associated with the navigation file. Unique ids that are internally controlled by data provider. (Optional, Repeatable)	sap02
surveyDatum	Go to: surveyDatum Vocabulary	0 to 1	(Optional, Not repeatable)	WGS84
offsetsApplied	Go to: offsetsApplied Vocabulary	1	Offset corrections associated with the navigation system and processing procedures, or of the geographic position of the seismic traces. (Mandatory, Not repeatable)	yes
dataFileFormat	Go to: dataFileFormat Vocabulary	1	File format of the seismic navigation file. Note: TAR and Zip are not formats - they are a compression. (Mandatory, Not repeatable)	Text

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Details	free text	0 to 1	Free text field for further descriptions about the navigation or the navigation file. (Optional, Not repeatable)	Used navigation table relating CMPs to latitude/longitude. Then interpolated latitude/longitude to other CMPs. Positions are the latitude/longitude of the center of the particular cdp bin.
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seismicStation

OBS or sonobuoy associated with dataset or seismic data object.

Element	Type	Conditionality	Definition	Example
seismicStation/@ID	free text	0 to 1	Unique ID of this seismic station information. (Optional)	edu.utexas.ig:fm3001_stn-01
stationName	free text	0 to 1	Name of station. (Optional, Not repeatable)	stn-01
deviceID	free text	0 to 1	Identification of seismic station device (Optional, Not repeatable)	Seismometer_OceanBottomCable
orientation	Go to: orientation Vocabulary	0 to 1	Are horizontal components oriented by rotation? Yes, No, or Undocumented. (Optional, Not repeatable)	no
latitude	decimal value between -90.00 and 90.00	0 to 1	Longitude position of station in decimal degrees.(Optional, Not repeatable)	27.611
longitude	decimal value between -180.00 and 180.00	0 to 1	Longitude position of station in decimal degrees. (Optional, Not repeatable)	-94.114972

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delayType	free text	0 to 1	Specify whether this is the standard SEG-Y specified format with 16 bits in byte 109 or a specialized format (sometimes used by UTIG) with 32 bits in byte 107. (Optional, Not repeatable)	16 bit
maximumOffset1	decimal	0 to 1	Maximum shot distance on side 1 from OBS, in meters. (Optional, Not repeatable)	-16094
maximumOffset2	decimal	0 to 1	Maximum shot distance on side 2 from OBS, in meters. (Optional, Not repeatable)	16495
seismicStationTrace	Go to: seismicStationTrace	0 to *		

seismicStationTrace

Element	Type	Conditionality	Definition	Example
traceNumber	integer	1	(Mandatory, Not repeatable)	1
traceDataType	Go to: traceDataType Vocabulary	1	(Mandatory, Not repeatable)	horizontal

objectInformation

Object level information, e.g. SEG-Ys, detailed line information.

Element	Type	Conditionality	Definition
seismicLine	Go to: seismicLine	0 to *	(Optional, Repeatable)
seismicDataObject	Go to: seismicDataObject	1 to *	A seismic data file (e.g. a SEG-Y) (Optional, Repeatable)

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seismicLine

Unique identifier for seismic line. Identifier value is controlled internally by data providers.

Element	Type	Conditionality	Definition	Example
seismicLine/@ID	free text	1	Unique identifier for seismic line. Identifier value is controlled internally by data providers. (Optional, Repeatable)	sap02
startLat	decimal degrees (-90.00 to 90.00)	0 to 1	Beginning latitude coordinate of seismic line expressed in decimal degrees. (Optional, Not repeatable)	-66.7363
stopLat	decimal degrees (-90.00 to 90.00)	0 to 1	Ending latitude coordinate of seismic line expressed in decimal degrees. (Optional, Not repeatable)	-65.8171
startLong	decimal degrees (-180.00 to 180.00)	0 to 1	Beginning longitude coordinate of seismic line expressed in decimal degrees. (Optional, Not repeatable)	-69.3384
stopLong	decimal degrees (-180.00 to 180.00)	0 to 1	Ending longitude coordinate of seismic line expressed in decimal degrees. (Optional, Not repeatable)	-71.8139
startDateTime	Date and Time	0 to 1	First date and time of seismic line. (Optional, Not repeatable)	1991-03-02T00:00:00
endDateTime	Date and Time	0 to 1	Last date and time of seismic line. (Optional, Not repeatable)	1991-03-03T00:00:00
shotOrCmpStart	integer	0 to 1	(Optional, Not repeatable)	1
shotOrCmpStop	integer	0 to 1	(Optional, Not repeatable)	2923

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recordLength_inSeconds	decimal	0 to 1	Total length of the recorded seismic trace in time. (Optional, Not repeatable)	16
sampleInterval_inMicroseconds	decimal	0 to 1	(Optional, Not repeatable)	4000
lineAcquisitionParameters /@IDREF	Reference ID (must match ID of referenced acquisitionParameters.)	0 to 1	Reference to the ID of data collection details that apply to a particular seismic line. (Optional, Not repeatable)	edu.utexas.ig:ew9101_001

seismicDataObject

A seismic data file (e.g. a SEG-Y). (Optional, Repeatable)

Element	Type	Conditionality	Definition	Example
seismicDataObject /@ID	free text	0	Unique Identifier of the seismic data object file.	ar41.0015.ew9101.ap-02.stack.segy
objectSeismicLine /@IDREF	Reference ID (must match ID of referenced SeismicLine)	0 to *	Identifier reference to seismic line associated with a seismic data object. Either, objectSeismicLine or seismicStation should be populated. The ID is enforced by data providers. (Optional, Repeatable)	sap02
alternateLineName	free text	0 to *	(Optional, Repeatable)	1069
seismicStation /@IDREF	Reference ID (must match ID of referenced seismicStation)	0 to *	Reference to the id of seismic station information (for OBS or sonobuoy) associated with a seismic data object. (Optional, Repeatable)	edu.texas.ig:EW9204_xxx
dataMedia	Go to: dataMedia Vocabulary	1 to *	Media of the data object. (Mandatory, Repeatable)	Online

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dataFileFormat	Go to: dataFileFormat Vocabulary	1	Format of digital file. (Mandatory, Not repeatable)	SEGY
embeddedNavigation	Go to: yesNo Vocabulary	1	Indicates whether the navigation information is included in the seismic data object file header. (Mandatory, Not repeatable)	yes
seismicNavFile	Go to: seismicNavFile	0 to *	Navigation file that corresponds with this data object. There may not always be a navigation file, e.g. for a data compilation represented as one xml element with structured text. (Optional, Repeatable)	ar54.5558.ew9101.sap02.stack.ploc
seismicDataProvenance	Go to: seismicDataProvenance Vocabulary	0 to *	Controlled vocabulary that identifies how the data was generated. (Optional, Repeatable)	DigitalSeg:DigitallyAcquired
processedDataClass	Go to: processedDataClass Vocabulary	0 to *		stack
dataObjectProcessing	Go to: processingParameters	0 to *	Descriptive processing information for a data object, This information is intended to describe unique processing information for each seismic data object. (Optional, Repeatable)	edu.utexas.ig:ew9101:ar54.5558_01
processingDocument	free text	0 to *	Reference to more documentation that captures the processing/lineage in more detail. (Optional, Repeatable)	ar54.5558.hst (e.g., jpeg of sidepanel, sioseis script, program flow)

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objectAccessControl	Go to: accessControl	1	Access control information for the data object, if the access is the same for the entire dataset then you can re-use the dataset access information. (Mandatory, Not repeatable)	edu.utexas.ig:ew9101_access01
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metadataInformation

Metadata about this metadata file, e.g last update date and author.

Element	Type	Conditionality	Definition	Example
metadataDate	date	1	Date when metadata was created or last updated. Recorded as YYYY-MM-DD. (Mandatory, Not repeatable)	Date: 2008-10-15
metadataContact	Go to: contactInformation	1	Contact information of person who wrote the metadata. (Mandatory, Not repeatable)	
metadataStandard	free text	1	Name and version of the standard used to document the dataset. (Mandatory, Not repeatable)	Seismic Metadata version 1.0
dateOfSubmission	date	1	Date of dataset submission to the archive data center. Must be formatted as YYYY-MM-DD. (Mandatory, Not repeatable)	2005-01-11

Controlled Vocabulary

- accessState
- acquisitionSystemType
- dataClass
- dataFileFormat
- dataMedia
- dataType
- dateTypeCode
- deviceType
- offsetsApplied
- orientation
- processedDataClass
- processedMethod
- processingScope
- role
- seismicDataProvenance
- shotControl
- sourceVolumeUnits
- surveyDatum
- traceDataType
- yesNo

accessState

Restrictions for accessing the data set.

Vocabulary	Definition
delay	public access to the data has been delayed (e.g., PI may still be working on data)
open	public has unrestricted access to data
openpartial	public has unrestricted access to only some of the data; access to remaining data may be restricted or delayed
restricted	public does not have access to the data; these data may be proprietary

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acquisitionSystemType

Vocabulary

analog

Digital

dataClass

Describes the level of processing data has undergone.

Vocabulary	Definition
compilation	collection of different types/classes of data (e.g., fledermaus scene, movie of 3D volume, geoquest project)
field	untouched or minimally field processed (e.g., word or media formatting, header additions); includes unprocessed SCS, CHIRP, 3.5 kHz
processed	any irreversible processing or header manipulation

dataFileFormat

Format of digital file.

Vocabulary	Definition
MB System	generic multibeam file type
_raw.all	SIMRAD file type for multibeam
BMP	standard Bit-mapped graphic format
DOC	format used for text documents by Microsoft Word
Fledermaus	output from Fledermaus interactive 3D data visualization system
GIF	Graphics Interchange Format, a bitmap image format
HTML	HyperText Markup Language, the predominant markup language for Web pages

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JPEG	Joint Photographic Experts Group, method of compression for photographic images
KEB	Knudsen Binary format
KMZ	zipped KML files with a .kmz extensionm, for Google Earth or Map applications
KML	Keyhole Markup Language, an XML-based language schema for expressing geographic annotation and visualization in Google Earth or Map applications
MOV	QuickTime file format
P1/90	UKOAA post plot positioning data format
P2	UKOAA data exchange format designed to record positioning data for both 2D and 3D seismic surveys
PDF	Portable Document Format
PNG	Portable Network Graphics format
PostScript	dynamically typed concatenative programming language known for its use as a page description language in the electronic and desktop publishing areas
SEGB	a type of original acquired format for seismic data developed by the Society of Exploration Geophysicists
SEGY	a type of original acquired format for seismic data developed by the Society of Exploration Geophysicists
SEGD	a type of original acquired format for seismic data developed by the Society of Exploration Geophysicists
Text	unformatted ASCII file format
TIFF	Tagged Image File Format
XLS	spreadsheet file format used by Microsoft Excel
XTF	eXtensible Text Framework "is an architecture that supports searching across collections of heterogeneous textual data" (XML, PDF, text)
nonDigital	For non-digital files.

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dataMedia

The media used for dataset transfer.

Vocabulary
External Hard Drive
CD
DVD
Microfilm
Online
Paper
Tape

dataType

Kind of data differentiated by the type of receiver or source.

Vocabulary	Definition
Seismic:Active	controlled source
Seismic:Active:ESP	Expanding Spread Profiling
Seismic:Active:MCS	more than one channel
Seismic:Active:MCS-3D	data is appropriate for 3-D processing
Seismic:Active:OBS	Ocean Bottom Seismograph
Seismic:Active:SCS	one channel only
Seismic:Active:Sonobuoy	floating buoy receiver
Seismic:Active:Subbottom	Chirp, 3.5 kHz controlled sources

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Seismic:Passive

natural source

dateTypeCode

Codelist values that identify the type of date for cited resource.

Vocabulary	Definition
creation	Start date of cruise and/or data collection. This is the recommended value for the dataset or object.
published	When the data was made available to the public, recommended if creation date of dataset is unknown. Typically this is used for the publication date of a paper or cited reference.
revision	When the data was processed or revised or there is a new version released of cited object. (Not recommended for seismic dataset date).

deviceType

Device used to create sound or receive sound.

Vocabulary	Definition
Gravimeter	Measures gravitational field of Earth.
Hydrophone_OceanBottom	Also called OBH, deployed on the sea floor.
Hydrophone_OceanBottomCable	Like an OBH, but connected by a cable.
Hydrophone_Sonobuoy	Like an OBH, but floats at the surface.
Hydrophone_Streamers	Towed array of hydrophones.
Laser_Altimeter	Single beam, measures a range.
Laser_Scanning	Towed scanner using light, aka lidar in aircraft.
Magnetometer	Measures magnetic field of Earth.
SeismicSource_Boomer	Fixed frequency. These penetrate bottom and create SEG Y files.
SeismicSource_Explosive	Makes noises in the water, e.g. dynamite.

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SeismicSource_Flexichoc	
SeismicSource_Gun_Air	Pneumatic, make noises in the water.
SeismicSource_Gun_Air_GI	
SeismicSource_Gun_Water	Pneumatic, make noises in the water.
SeismicSource_Sparker	Fixed frequency. These penetrate bottom and create SEG Y files.
Seismometer_BuriedBroadband	Receiver.
Seismometer_OceanBottomCable	Also called OBS, seismometer placed on the sea floor
Sonar_ADCP	Acoustic doppler current profiler.
Sonar_CHIRP	Swept frequency sub-bottom profiler.
Sonar_Echosounder	Single, dual, and split beams. E.g. 3.5 kHz.
Sonar_Interferometric	Measures bathymetry and sidescan.
Sonar_Multibeam	generic multibeam instrument
Sonar_Scanning	Articulating, profiling. Example: make = Imagenex, model = 801.
Sonar_Sidescan	The intensity of the acoustic reflections from the seafloor.

offsetsApplied

Offset corrections, associated with the navigation system and processing procedures, of the geographic position of the seismic trace that were made.

Vocabulary	Definition
no	no offset corrections between navigation antenna and receiver made for the trace location
partial	some offset corrections between navigation antenna and receiver made for the trace location
undocumented	this information is not documented
yes	all offset corrections made for the trace location

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orientation

Are horizontal components oriented by rotation?

Vocabulary	Definition
no	the horizontal components were not rotated
undocumented	this information is not documented
yes	the horizontal components were rotated

processedDataClass

Primary classification of data processing results.

Vocabulary	Definition
CMPSorted	shot data sorted into common mid-point gathers
CMPSorted:3D	Shot data sorted into 3-D common mid-point gathers.
Migration	method to reposition the seismic image to a truer subsurface position; may be done pre-stack, post-stack, or partially
Migration:3D	migration of 3-D seismic data volume
Migration:3D:Depth	depth migration of 3-D seismic data volume
Migration:Depth	migrated data that was then depth-converted
NearTraceStrip	a single trace from a shot gather used in processing
None	no processing done
Other	e.g., resampled to 4ms
Stack	summed traces of common mid-points
Stack:3D	summed traces of 3-D common mid-points
Undocumented	this information is not documented, yet may still be processed.

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processedMethod

Data may be processed for reflections, refractions or velocities; for use if DataClass = Processed or Compilation.

Vocabulary	Definition
Seismic:Reflection	processed for reflections
Seismic:Refraction	processed for refractions
Seismic:Velocity	processed for velocities

processingScope

The class of information to which the processing was applied.

Vocabulary	Definition
dataset	processing was applied to group of data objects with something in common (e.g., acquired on the same field expedition; processed the same; etc.)
dataObject	processing was applied to a particular dataObject, e.g. a particular SEG-Y.
collectionHardware	processing parameters describes history/lineage of the devices used to collect the data.
fieldSession	processing parameters describes history or processing during data collection

role

Function performed by the responsible party or contact.(from ISO 19115)

Vocabulary	Definition
author	person who writes the paper
custodian	person/organization who cares for the data , e.g. the archive
distributor	person/organization who distributes the data

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originator	person who creates/collects data
owner	person/organization who owns the data
pointOfContact	person who serves as coordinator/information distributor of a project
principalInvestigator	lead scientist of an investigation
processor	the person who processed the data
publisher	organization that published the data/paper
resourceProvider	person/organization who provided the data
user	person who is using the data

seismicDataProvenance

Classification how the data was generated.

Vocabulary	Definition
Analog	Paper, film or other media
DigitalSeg	digitally recorded data in a standard Society of Exploration Geophysics format
DigitalSeg:DigitallyAcquired	Field samples recorded as digital values
DigitalSeg:ScannedFromAnalog	image scanned to create a standard Society of Exploration Geophysics (SEG-Y) format
DigitalImage	scanned from analog record, may have navigation file image is geo-referenced image
Other	

shotControl

Identifies how shot spacing control was activated, either by time or distance.

Vocabulary	Definition
distance	shot spacing controlled by distance between shots
time	shot spacing controlled by time between shots

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sourceVolumeUnits

Used in acquisitionParameters.

Vocabulary
cubicCentimeters
cubicInches

surveyDatum

The identification of the survey reference system, as pertains to the referencing object (e.g. acquisitionParameters or NavFile). Note that the datum could be the same as time of acquisition or different. "referenced from seismicNavFile/surveyDatum, acquisitionParameters/surveyDatum"

Vocabulary
Clark1866
GRS80
NAD27
NAD83
NAD87
WGS84
WGS72

traceDataType

For use with OBS data; describes whether a channel was used to sense vertical ground motion, horizontal ground motion, or pressure variation.

Vocabulary	Definition
horizontal	senses horizontal ground motion
hydrophone	senses pressure variation
undocumented	this information is not documented
vertical	senses vertical ground motion

yesNo

For use with elements that require a yes or no answer.

Vocabulary
no
yes

External Vocabulary Lists

It is highly recommended that these vocabulary lists are used in the appropriate seismic metadata fields, however are not enforced through the XML schema validation.

Geographic Name

These are resources to describe the geographic features or areas of interest.

- [NASA/GCMD Location Keywords](#) (PDF)
- [MGDS Feature IDs](#)
- [MGDS Location IDs](#)
- [GEBSCO Undersea Feature Names](#)

Organization Name

(Can be employed in the following fields: contactInformation/organization, projectSponsor/organization, platformInformation/platformOrganization)

- [NASA/GCMD Data Center Keywords](#) (PDF)
- [MGDS Organization IDs](#)

Person Name

Controlled vocabulary for people names are not common. If there is not a controlled list, it is highly recommended that they are at least consistently represented in a set of metadata from one organization.

(Can be employed in the following fields: contactInformation/name, accessControl/accessPerson, citationInformation/author)

- [MGDS Person IDs](#)

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Platform Name

Ship name.

(Can be employed in the following field: platformInformation/platform)

- [MGDS Platform IDs](#)
- [ICES Ship Codes](#)
- [NERC Ship Name List](#)
- [List from USGS Infobank](#) (Excel)
- [Research Ship Schedules and Information](#)

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