

GGOS Portal and Metadata Flow

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1. Metadata standards for products and data

1.1. *What are metadata and why they should be used*

Metadata are data about data.

- Metadata describe what, where, when and by whom a particular set of data were collected, and how the data are formatted.
- Metadata are used to facilitate the understanding, use and management of data. The metadata required for effective data management varies with the type of data and context of use.
- Metadata are essential for understanding information stored in data warehouses and have become increasingly important in XML-based Web applications.

Metadata do not contain the actual data nor do they replace a database.

1.2. *Why interoperability is important*

- The IEEE Standard Computer Dictionary describes interoperability as follows: Ability of two or more systems or components to exchange information and to use the information that has been exchanged.
- [ISO /IEC 2382-01](#), Information Technology Vocabulary, Fundamental Terms, defines interoperability as follows: "The capability to communicate, execute programs, or transfer data among various functional units in a manner that requires the user to have little or no knowledge of the unique characteristics of those units".

Products / applications achieve interoperability with other products / applications using either or both of two approaches:

- By adhering to published interface standards
- By making use of a "broker" of services that can convert one product's interface into another product's interface "on the fly".

Both methods will be used in GGOS applications to achieve the interoperability of metadata. The ISO 19115 standard for geographic metadata is widely used in the GIS world and recommended e.g., by FGDC, OGC and GEOSS. Presently the WMO will apply an extended ISO 19115 metadata standard to its datasets. Here it is proposed to follow the same strategy for the GGOS and the data provided through the services.

Cross mapping allows the use of different metadata standards as long as the necessary information covers the requested formalities and are based on XML technology. E.g., the NASA proposed Directory Interchange Format (DIF) and ISO 19115 crosswalk is provided in table 11, displaying an example in the field of habit classification which easily can be adapted to other science fields.

1.3. Different levels of metadata granularity

The ISO 19115 standard defines an extensive set of metadata elements; typically only a subset of the full number of elements is used. However, it is essential that a basic minimum number of metadata elements be maintained for a dataset.

Core Metadata to be consistent with ISO 19115

The core metadata elements required to identify a dataset are used typically for catalogue purposes. These core metadata include the Dublin core which is accepted as basis for various standards. The list of core metadata contains metadata elements answering the following questions: “Does a dataset on a specific topic exist (‘what’)?”, “For a specific place (‘where’)?”, “For a specific date or period (‘when’)?” and “A point of contact to learn more about or order the dataset (‘who’)?”. Already these core metadata facilitates interoperability, because they allow users to understand without ambiguity the geographic data and the related metadata provided by either the producer or the distributor. The required elements are listed in table 1.

Table 1 The ISO core-element set with mandatory fields, the core elements contain several sub-elements

| ISO19115 metadata entity set information | ISO No | Metadata elements | |
|--|--------|---------------------------------|---|
| MD_Metadata | 8 | Metadata point of contact | m |
| | 9 | Metadata date stamp | m |
| | 360 | Dataset title | m |
| MD_Identification | 362 | Dataset reference date | m |
| | 25 | Abstract describing the dataset | m |
| | 39 | Dataset language | m |
| MD_DataIdentification | 41 | Dataset topic category | m |

Table 1: The ISO core-element set with mandatory fields

Core light metadata set as mandatory metadata for all geodetic datasets

This core light metadata set should be the minimum basis for all geodetic data sets provide by GGOS and the IAG Services. Using most of the recommended optional elements in the core metadata set as mandatory in addition to the already mandatory elements result in a small list of core metadata for geographic datasets which comprises 22 elements (table 2). The main extensions are the descriptive keywords, the spatial resolution, the reference system, format information. But also the still as conditional marked elements are worth to be filled. With these extensions a more detailed information about data within GGOS can be provided which is accessible by international services outside our community e.g., GEOSS. Because the core light metadata set is clearly arranged it should be possible to describe almost all data sets produced by the IAG services in a simple way without too many efforts. The lists of descriptive keywords and data set categories topics can be set up according the GCMD list as a beginning and more improved during discussion (table 9). The format descriptions should follow the table 4 with extensions for gravity and other geodetic fields not covered here.

To create the core light metadata follow chapter 1.4.

Table 2. A recommended Core light metadata set for all geodetic datasets, an extended recommended ISO core-element set

| ISO19115 metadata entity set information | ISO No | Metadata elements | IERS GGOS | |
|--|---|--|-----------------------------------|---|
| MD_Metadata | 2 | Metadata file identifier | o | |
| | 10 | Metadata standard name | o | |
| | 11 | Metadata standard version | o | |
| | 3 | Metadata language | c | |
| | 4 | Metadata character set | c | |
| | 8 | Metadata point of contact | m | |
| | 9 | Metadata date stamp | m | |
| | 6 | Scope to which the metadata applies | c | |
| MD_Identification | 360 | Dataset title | m | |
| | 361 | Dataset short title | o | |
| | 362 | Dataset reference date | m | |
| | 29 | Dataset responsible party | m | |
| | 25 | Abstract describing the dataset | m | |
| | 33 | Descriptive keywords | m | |
| | 28 | Status | o | |
| | MD_DataIdentification | 37 | Spatial representation type | o |
| | | 38 | Spatial resolution of the dataset | m |
| | | 39 | Dataset language | m |
| 40 | | Dataset character set | c | |
| 41 | | Dataset topic category | m | |
| 42 | | Geographic location | m | |
| 43 | | bounding box or geographic identifier | m | |
| 45 | Vertical and temporal extent of dataset | m | | |
| MD_Constraints | 71 | Constraints on using the resource | o | |
| DQ_DataQuality | 79 | Scope of data | m | |
| | 81 | Lineage statement | m | |
| | 135 | Value unit for reporting a data quality result | o | |
| | 137 | Quantitative value of the evaluation procedure | o | |
| MD_MaintenanceInformation | 143 | Maintenance frequency | o | |
| MD_ReferenceSystem | 196 | Reference system | m | |
| MD_Distribution | 271 | Distribution format | m | |
| | 277 | On-line resource | m | |
| | 285 | Format name | m | |
| | 286 | Format version | m | |
| MD_MetadataExtension-Information | 14 | Information on metadata extensions | o | |
| MD_ApplicationSchema-Information | 321 | Application schema information | o | |

(m = mandatory, c = conditional, o = optional, (o) = not part of core set).

Extended Metadata sets

The full ISO metadata standard (ISO 19115) might be able to address most IAG service requirements. This standard is very complex, but it specifies a process (in ISO 19115 Annex C) where a community can adopt parts of the standard which it feels relevant (including the "Core Elements") and also extend the elements, keywords and code table instances to suit that community. As an example, the WMO Core Metadata Profile has been adapted to the geodetic requirements in a first step and is named GGOS Core Metadata Profile. In principle each IAG service can develop its own profile based on GGOS Core Metadata Profile (ISO19115 p. 120).

To follow this strategy the following granularity can be developed:

- GGOS provides core metadata information for almost all geodetic data sets. This solution should be realised fast to comply (e.g., GEOSS). If it is operational this service attracts users from other communities and fields of interest and "links" them to the specific IAG services or components.
- The individual IAG services expand the ISO metadata standard to their requirements. Based on this specific metadata profile a more detailed response can be made available.
- An alternative might be that the GGOS metadata profile will include all service specific specifications. As a consequence the GGOS master profile might be not clearly arranged and will confuse the user by e.g., much extended code lists.

A first draft to create a Geodetic Metadata Profile is given in the (table 3). This profile is based on the discussion and the result which took place at WMO for several years. The extended code list can be complemented to the need of the IAG service or product. As an example to describe the SINEX file in addition to the core light elements for search in GEOSS: What, Where, When, Who extensions of core elements for search in GGOS:

- stations: technique, time period,
- parameter: type, time period, quality, data frequency

is added.

1.4. Tools to create and export metadata sets and to search for metadata

The ISO 19115 standard provides a general definition for directory searches and exchange that should be applicable to a wide variety of GGOS datasets. It does not specify how these metadata should be archived or presented to users. It also does not specify any particular implementation and could be implemented as a database, a flat file, or any other suitable mechanism.

Here different methods can be applied:

- The information needed is extracted from the data set by scripts and provided in the required format (XML)
- The information can only partly be extracted from the data set and must be completed by the data provider
- The information must be completed by the provider

Scripts should be developed by some institutions and made available for the broad geodetic community. To add information the use of editors is recommended, e.g. CatMDEdit, disyPreludio. The latter offers a very comfortable user interface and as a special service, user

profiles according to ISO 19115 will be developed on request. As an example the IERS Bulletin A is described by GGOS core light metadata

The screenshot shows the 'disy Preludio' web interface. The left sidebar contains navigation options: DOCUMENT (New document, Save document, View as XML, View as HTML), DOCUMENT SECTIONS (Metadata record information, Identification information, Spatial representation information, Content information, Distribution information, Data quality information), and TEMPLATES (Save as template, Fluss, Gebirge). The main content area displays the 'Metadata record information' form for document 'disy-14269'. The form includes fields for Record ID, Headline, Last change, Language, Hierarchy level, Creation date, Standard name, and Standard version. Below this is the 'Contact' section with fields for Responsible party, Individual name, Organization, and Position. The 'Contact information' section includes fields for Voice, Fax, Delivery point, City, Administrative area, Postal code, Country, E-mail address, and Hours of service.

The screenshot shows the 'disy Preludio' web interface displaying the 'Identification information' and 'Citation' forms. The 'Identification information' section includes fields for Status, local File Path, Keyword, Spatial representation type, Language, Character set, and Topic category. The 'Citation' section includes fields for Presentation form, Series name, Issue identification, Other citation details, Page, ISBN, and ISSN. Below these are sections for 'Title' (text element, language, additional information), 'Date' (Date, Date type), and 'Author' (Role).

1.5. Applications

Metadata management within IERS

Based on a decision of the IERS Directing Board the IERS Data and Information System should realize a central access point for all IERS Products and Information related to the field of Earth Rotation and Reference Systems. It has been developed in the framework of the “Geotechnologienprojekt” financed by the Federal Ministry of Science and Application and contributions from BKG.

An important part of the data system is the metadata management. Initially, a metadata schema (profile) has been developed to describe the characteristics of all IERS products by one common schema. This metadata schema allows search for specific information, to compare the various products, to give a descriptive summary of a product, etc. This metadata profile was designed to describe all characteristics of the IERS products. The profile comprises metadata fields like Content, Data, Time, Accuracy, Format, Access, Creator, Contact, Documentation, etc. The metadata are the basis for the dynamic IERS Web site.

The process to collect the metadata consists of two steps. A general metadata class is being assigned to each product. As soon as a new product version is being archived the metadata of the superior class is being attached complemented by information extracted from the individual product version.

To be compliant to the international metadata standard for geographic information (ISO 19115) the IERS metadata schema has been extended. In table 10 the elements in column 2 are indicated by “yes” to align the IERS metadata to the metadata set of “GeoPortal.Bund” the German Geoportal. This applied standard is widely used by metadata catalogues

allowing for interdisciplinary searches by so called catalogue service web interfaces (CSW). By this extension and inclusion in the "GeoPortal.Bund" the IERS data are interoperable and made available for the GEOSS pilot project.

2. Standardised data formats

A preliminary list of known formats within selected IAG services has been compiled and provided in the annex as table 4.

3. List of relevant information common to all Services

The Inter-Service Data Integration for Geodetic Operations (INDIGO) (<http://indigo.nasa.gov>) provides support for the central offices of the International GNSS Service (IGS, formerly the International GPS Service), International Laser Ranging Service (ILRS), and International VLBI Service for Geodesy and Astrometry (IVS), International DORIS Service as well as the Crustal Dynamics Data Information System (CDDIS) data archive system, to develop information systems which enable the simultaneous use of multiple space geodetic techniques for earth science. Development activities for INDIGO continue.

The data and products from these services are made possible by the many worldwide agencies that utilize their own resources to collaboratively create them.

INDIGO works closely with the International Earth Rotation and Reference Systems Service (IERS) and the Global Geodetic Observing System (GGOS), and intends to develop systems which are extensible, to allow other space geodetic techniques to participate.

The tables 5 to 8 IAG Geometric Services Comparison Charts: Data, Products, Service Information, Site Information (s. annex) give an overview of the geometrical services; other services are not yet included and should be added.

4. GGOS & Service Portals

Introduction

The GGOS Portal will be a unique access point for all GGOS products. The portal will also provide a route to the heterogeneous IAG service/technique specific information systems. The portal will be equipped with a database of relevant metadata and WEB services established according to international standards, which will enable searches for relevant data and products in a most effective way.

Background

The IAG services, as components of GGOS, provide very important and valuable data, information, and products, which are indispensable for Earth sciences and their applications. The GGOS portal will give access to these data and products as well as general information about geodesy. The portal will contribute to GGOS objectives to promote and improve the visibility of scientific research in geodesy and to achieve maximum benefit for the scientific community and in society in general. Behind the GGOS portal, each contributing service will continue its own visibility and responsibility to maintain and manage its supporting data and information system.

The IAG services produce important and valuable products that cannot only be promoted by GGOS but are critical to the generation of GGOS products. These products and data are only available at the data centres of the individual components of GGOS. It is clear that for a future GGOS, all the relevant products for Earth sciences and applications have to be made accessible through the GGOS portal, that leads the user – including the non-specialists working in neighbouring or different fields – to the individual products and their characteristics, as shown in Figure 1 below. The products and data themselves will remain physically located at many different data and product centres and will be promoted by the individual IAG services as well. As a draw for newcomers or scientists that are not familiar with space geodesy, the initial web pages of the GGOS portal will present the “burning questions” of society and lead the way from there to the products relevant for the corresponding topic, their characteristics, location, availability, latency, accuracy, etc. The expert user will have the ability to skip these introductory pages and immediately proceed to the databases themselves. General information about the GGOS project will also be available through the portal, providing a valuable resource for both the external and internal GGOS communities.

GGOS Portal Architecture

The success of the GGOS portal will depend on data and information providers accepting and implementing a set of interoperability arrangements, including technical specifications for collecting, processing, storing, and disseminating shared data, metadata and products. GGOS interoperability will be based on non-proprietary standards, with preference given to formal international standards. The eXtensible Markup Language (XML) has become a quasi standard to facilitate the sharing of data across different information systems, particularly via the Internet. Moreover, Web services for the support of interoperable Machine to Machine communication over a network are built on XML based standards (SOAP, WSDL).

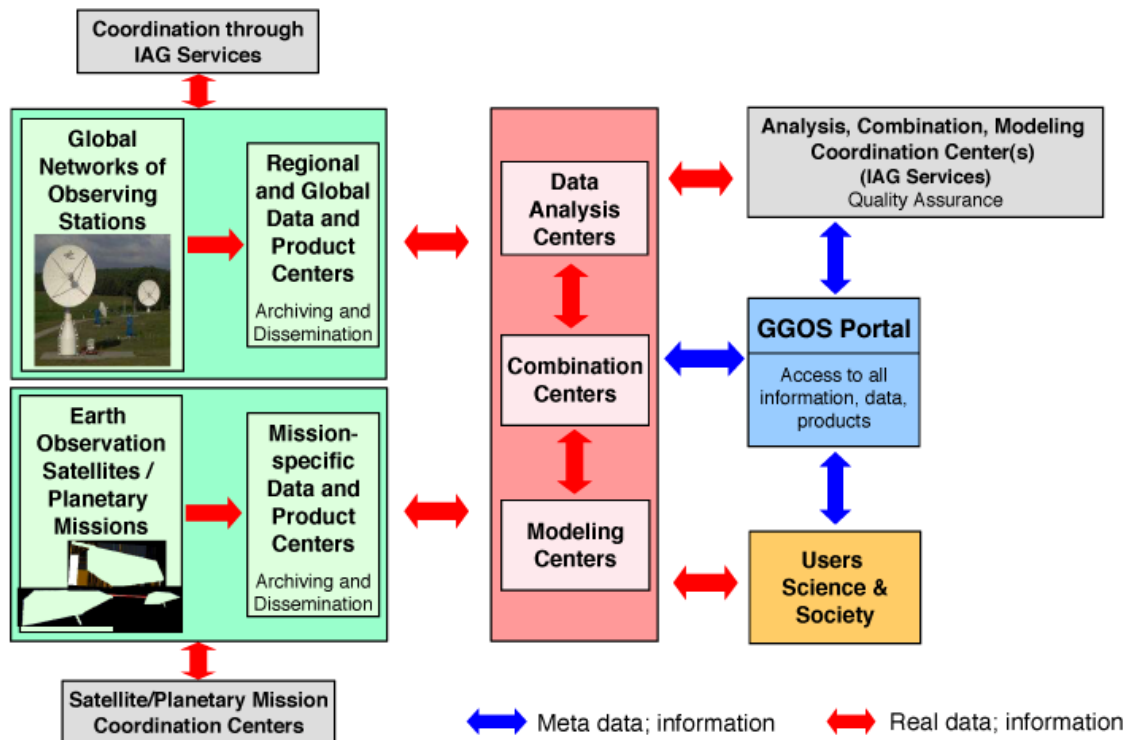


Figure 1. GGOS system design, directing users through the portal to underlying data, products and information.

Data, products, and information from contributing IAG services will be catalogued in a publicly accessible clearinghouse maintained collectively under the GGOS portal. The catalogue including thesauri will itself be subject to GGOS interoperability specifications, including the standard search and portrayal services.

The functions of the GGOS portal (e.g., search capabilities for stations, satellites, data, products, institutions, data mining tools, visualization, Web services, connections to other catalogues, etc.) are supported by the GGOS Clearinghouse (Figure 2). The GGOS Clearinghouse will be an facility that collects and distributes information concerning the data catalogues and services.

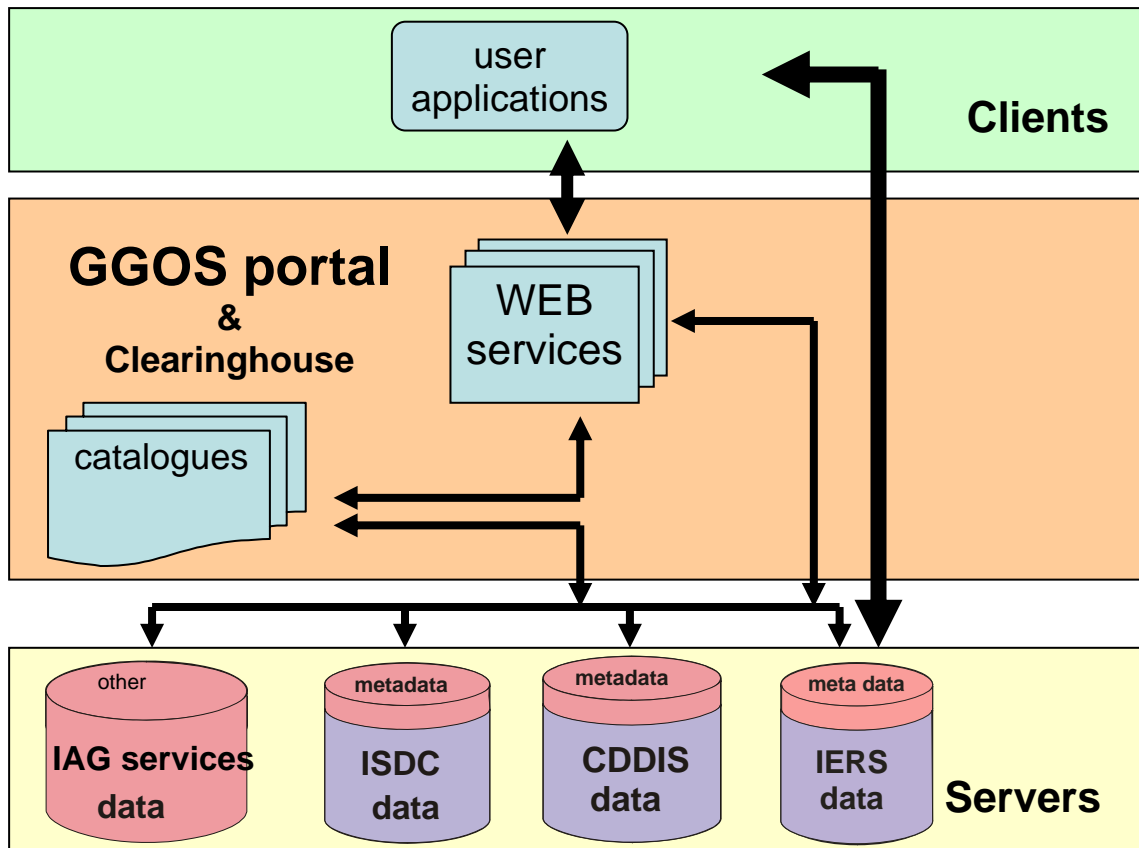


Figure 2. GGOS portal architecture

The GGOS Clearinghouse provides access to a distributed network of catalogue services that support the interoperability agreements of GGOS. Contributing IAG services may nominate catalogues containing structured, standards-based metadata and other Web services for access by the GGOS Clearinghouse. The clearinghouse provides search capability across the catalogues and their registered resources by mapping these catalogues. The GGOS portal will search the GGOS Clearinghouse but will also provide access to other GGOS resources e.g., calendar functions, bulletin boards, etc. Through the use of interoperability standards, additional portals may be established for national or professional communities to access the GGOS Clearinghouse.

The metadata to be held by the clearinghouse is dependent upon the approach used for searching. Two anticipated capabilities for access to remote catalogues (see Figure 3) may include:

- Distributed search approach: search requests are sent in parallel to registered distributed catalogues of the IAG services.
- Harvested approach: The clearinghouse periodically harvests all metadata from registered distributed catalogues. A user search request is executed against the metadata harvested from the remote catalogues and the results are managed and portrayed in the GGOS Clearinghouse.

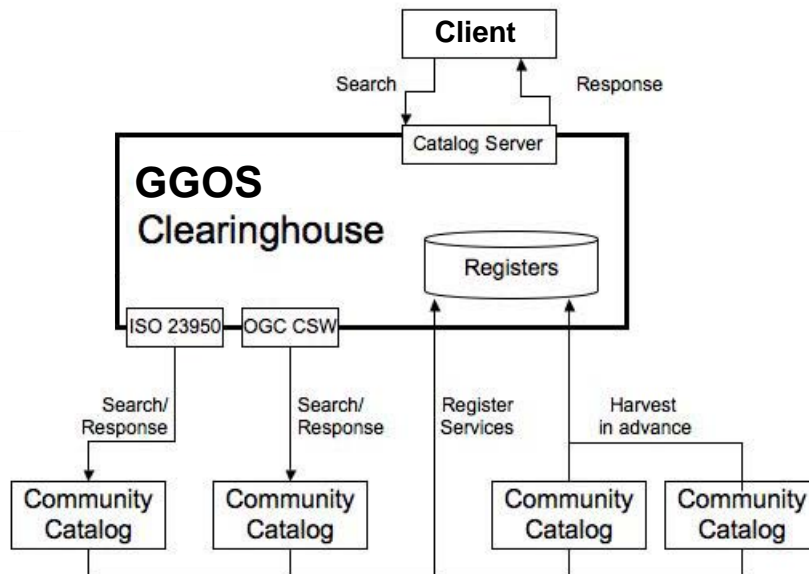


Figure 3. GGOS Clearinghouse architecture – engineering viewpoint (according to D. Nebert).

GGOS Portal Goals and Objectives

The GGOS Portal will provide a Web site that:

- represents a single Web access point (door of entry) for all geodetic products relevant in the framework of GGOS,
- access to general information about GGOS,
- help in answering the “burning questions of society” and leads the way to the products, their characteristics, location, availability, latency, and accuracy,
- an information resource for GGOS participants (e.g., working group resources, calendar, meeting summaries, presentation archive, etc.),
- access the GGOS clearinghouse to search data catalogues, products and data sets generated by GGOS components,
- allows searching and information retrieval of descriptive metadata from multiple, diverse target resources, databases, web pages, and library catalogues.

Later the GGOS portal should offer a set of tools for organized knowledge discovery including visualisation to assist identification and selection of appropriate resources (information, data, products).

Tasks to be addressed by the GGOS Portal:

1. Installation of a GGOS Web site
 - Basic functionalities, hot spot information, news, tutorials, quick links, announcements, etc.
 - General information on and explanations of data, products, and geodetic techniques, with direction to service-specific resources
 - Facilitate GGOS communication
 - Calendars
 - User forums on relevant topics
 - Bibliography
 - Presentations
 - Meeting summaries
 - Working group activities
2. Installation of a clearinghouse
 - host catalogues for metadata for all “products” of the IAG services relevant to GGOS based on GGOS standards

- ensure interoperability within the GGOS community and to other systems e.g. GEOSS:
 - Data
 - Products
 - Organizational components (e.g., infrastructure, supporting institutions, personnel, services)
 - Networks and their stations
 - Search (temporal, spatial, multi-technique, keywords, etc.) of metadata, data, and product databases
 - Web services (Catalogue Service Web, Web Map Service (Portrayal), etc...)
3. Distributed applications for data mining of the GGOS products /data files to be provided through the GGOS Portal include:
- Data location tools (parse and merge data)
 - Data visualization tools
 - Data analysis tools

The Web portal applications allowing users to download, install and customize the portal services in their own environment.

Based on modern architecture, standards and Web services the requested tasks to build up the GGOS portal can be realized not only by single institutions but also by consortia with distributed server architecture. The portal should be designed and implemented in such a fashion to permit mirroring/installation at alternate physical locations.

Table 3

Version 0.1 of GGOS Core Metadata Profile of the ISO Metadata Standard

- November 2007 -

Notes: The GGOS Core Meta Data Profile is developed based on the WMO Core Metadata Profile of the ISO Metadata Standard and recommendations of the GEO Architecture and Data Committee.

The following table provides an overview of the GGOS Core Metadata Profile suitable for use by decision makers and users. To implement this standard the International Standard ISO 19115: 2003 and its corrigendum 1, which describe the complete ISO standard, must be consulted.

Of the core elements listed, those in **bold** are mandatory and those in *italic* are optional with all others being conditional.

This Metadata Profile is a core set as a basic profile to collect the metadata for GGOS data sets. The ISO Standard in general provide more features to describe the data sets in more details.

Deviations from the ISO 19115 are marked in red, information marked in green are lists which have to be complemented by GGOS or the IAG services. The lists of descriptive keywords and data set categories topics can be set up according the GCMD list as a beginning and more improved during discussion (table 7). The format descriptions should follow the table 2 with extensions for gravity and other geodetic fields not covered here.

| Generic Name | ISO Name/Role name and Reference Lines | Definition |
|--|---|--|
| Information about the metadata - Basic information of GGOS Core Metadata Profile version 0.1 | | |
| [Metadata entity] | | |
| File ID | MD_Metadata (1) <i>fileIdentifier (2)</i> | Root entity which defines metadata about a resource or resources Unique identifier for this metadata file |
| Language | <i>language (3)</i> | Language of this metadata item (ISO639-2, other parts may be used) |
| Character set | <i>characterSet (4)</i> MD_CharacterSetCode (B.5.10) | Full name of the character coding standard used for this metadata set |
| File identifier | <i>parentIdentifier (5)</i> | File identifier of the metadata to which this metadata is a subset (child) |
| Scope of metadata | <i>hierarchyLevel (6)</i> MD_ScopeCode (B.5.25) | Scope to which the metadata applies |
| Number of hierarchy | <i>hierarchyLevelName (7)</i> | Name of the hierarchy levels for which the metadata is provided |
| Contact | contact (8) CI_ResponsibleParty (see 374)- | Party responsible for the metadata information |
| Date | dateStamp (9) | Date that the metadata was created (ISO8601) |
| Standard name | <i>metadataStandardName (10)</i> | Name of the metadata standard (including profile name) used |

| | | |
|--|---|---|
| Standard version URI Localized character string | <i>metadataStandardVersion (11)</i> <i>dataSetURI (11.1)</i> <i>locale (11.2)</i> <i>PT_Locale (ISO19139)</i> languageCode LanguageCode (ISO639) country CountryCode (ISO3166) characterEncoding MD_characterSetCode (B.5.10) | Version of the metadata standard (version of the profile) used Uniformed Resource Identifier (URI) of the dataset to which the metadata applies Provides information about an alternatively used localized character string for a linguistic extension |
| Spatial information | <i>spatialRepresentationInfo (12)</i> <i>MD_SpatialRepresentation</i> (see 156) | Digital representation of spatial information in the dataset |
| Reference system | <i>referenceSystemInfo (13)</i> <i>MD_ReferenceSystem (see 186)</i> | Description of the spatial and temporal reference systems used in the dataset |
| Metadata extension | <i>metadataExtensionInfo (14)</i> <i>MD_MetadataExtensionInform</i> <i>ation (see 303)</i> extensionOnlineResource (304) CI_OnlineResource (see 396) extendedElementInformation (305) MD_ExtendedElementInf ormation(see 306) | Information describing metadata extensions |
| Dataset identification | identificationInfo (15) MD_Indentification (see 36) | Basic information about the resource(s) to which the metadata applies |
| Content | <i>contentInfo (16)</i> <i>MD_ContentInformation (see</i> 232) | Content of the dataset in more detail than the keywords. |
| Distribution Information | <i>distributionInfo (17)</i> <i>MD_Distribution (see 270)</i> | Information about the distributor of and options for obtaining the resource(s) |
| Data quality | <i>dataQualityInfo (18)</i> <i>DQ_DataQuality (see 78)</i> | Overall assessment of quality of resource(s) Information about the catalogue of rules defined for the portrayal of resource(s) |

| | | |
|-------------------------|---|---|
| Catalogues | <i>portrayalCatalogueInfo (19)</i> <i>MD_PortrayalCatalogueReference (see 268)</i> | <p>Restrictions on the access and use of the dataset (Could specify GGOS additional Data as free text) Note: At present the GGOS Core Metadata will not contain the ISO parameters that describe access constraints to the metadata, but implementers should be aware that the ISO parameters exist and might be required in later versions of the GGOS Core. Any metadata “published” through a system developed for the GGOS Core is therefore likely to be disclosed regardless of privacy markings on the metadata.</p> <p>Information about the conceptual schema of a dataset</p> <p>Information about the frequency of metadata updates, and the scope of those updates</p> <p>Aggregation of dataset</p> <p>Dataset</p> <p>Textual information related to the feature type</p> <p>Textual information describing the concept of a feature type</p> <p>Class of attribute definitions of a feature type</p> |
| Restriction | <i>metadataConstraints (20)</i> <i>MD_Constraints (see 67)</i> | |
| Conceptual schema | <i>applicationSchemaInfo (21)</i> <i>MD_ApplicationSchemaInformation (see 320)</i> | |
| Frequency of update | <i>metadataMaintenance (22)</i> <i>MD_MaintenanceInformation (see 142)</i> | |
| Aggregation of dataset | <i>series</i> <i>DS_Aggregate</i> | |
| Dataset | <i>describes</i> <i>DS_DataSet</i> | |
| Property type | <i>propertyType</i> <i>GF_PropertyType (ISO19109)</i> <i>featureType</i> <i>GF_FeatureType (ISO19109)</i> <i>featureAttribute</i> <i>GF_AttributeType (ISO19109)</i> | |
| | | |
| [Identification] | MD_Identification (23) MD_ServiceIdentification (47) MD_DataIdentification (36) citation (24) CI_Citation (see 359) abstract (25) <i>purpose (26)</i> <i>credit (27)</i> <i>status (28)</i> | <p>Basic information required to uniquely identify resource(s) See ISO19119 for further information</p> <p>Citation data for the dataset</p> <p>Brief narrative summary of the content of the dataset Summary of the intentions with which the dataset was developed</p> <p>Recognition of those who contributed to the dataset</p> <p>Status of the dataset</p> |

| | | |
|------------------|---|---|
| | <p><i>MD_ProgressCode</i> (B.5.23) <i>pointOfContact</i> (29) <i>CI_ResponsibleParty</i> (see 374) <i>resourceMaintenance</i>(30) <i>MD_MaintenanceInformation</i> (see 142) <i>graphicOverview</i> (31) <i>MD_BrowseGraphic</i> (see 48) <i>resourceFormat</i> (32) <i>MD_Format</i> (see 284) descriptiveKeywords (33) <i>MD_Keywords</i> (see 52) <i>resourceSpecificUsage</i> (34) <i>MD_Usage</i> (see 62) <i>resourceConstraints</i> (35) <i>MD_Constraints</i> (see 67) <i>aggregationInfo</i> (35.1) <i>MD_AggregateInformation</i> (see 66.1)</p> <p>(MD_DataIdentification (36)) <i>spatialRepresentationType</i> (37) <i>MD_spatialRepresentationTypeCode</i> (B.5.26) <i>spatialResolution</i> (38) <i>MD_Resolution</i> (see 59) language (39) characterSet (40) <i>MD_CharacterSetCode</i> (B.5.10) topicCategory (41) <i>MD_TopicCategoryCode</i> (B.5.27)</p> <p><i>environmentDescription</i> (44) extent (45) EX_Extent (see 334) <i>supplementalInformation</i> (46)</p> | <p>Identification of, and means of communication with, person(s) and organizations(s) associated with the dataset Information about the frequency of resource updates, and the scope of those updates A graphic that illustrates the dataset A description of the format of the dataset Commonly used words or formalised words or phrases used to describe the subject Basic information about specific applications for which the dataset have been or being used by different users Restrictions on the access and use of the resource or metadata (could specify GGOS additional data as free text) Aggregate dataset information</p> <p>Method used to spatially represent geographic information Spatial density of the data in the dataset (e.g. grid spacing) Language(s) used in the dataset (ISO639-2, other parts may be used) Full name of the character coding standard used for the dataset Discipline covered by this dataset ISO code list B.5.27 - Note this field is of limited use for GGOS purposes but is a required field within the ISO standard and is included to ensure conformity Description of the dataset in the producer's processing environment Extent information including the bounding box, bounding polygon, vertical and temporal extent of dataset Any other descriptive information about the dataset</p> |
| [Browse graphic] | MD_BrowseGraphic (48) | |

| | | |
|---------------------------|--|---|
| | fileName (49) <i>fileDescription (50)</i> <i>fileType (51)</i> | Name of the file that contains a graphic that provides an illustration of the dataset Text description of the illustration Format in which the illustration is encoded, e.g. CGM, EPS, GIF, JPEG, PBM, PS, TIFF, XWD |
| [Keywords] | MD_Keywords (52) keyword (53) GGOS_Keyword (GGOS) <i>type (54)</i> MD_KeywordTypeCode (B.5.17) <i>thesaurusName (55)</i> CI_Citation (see 359) | List of predefined and other keywords used to describe the dataset. Keywords should be taken from a standard thesaurus (the URI for this thesaurus should be given – this, for example, would facilitate searching in different languages), or other defined list but free form keywords are permitted as well. Subject matter used to group similar keywords Name of the formally registered thesaurus or a similar authoritative source of keywords |
| [Representative fraction] | MD_RepresentativeFraction (56) denominator (57) | The number below the line in a vulgar fraction |
| [Resolution] | MD_Resolution (59) <i>equivalentScale (60)</i> MD_RepresentativeFraction (56) <i>distance (61)</i> | Level of detail expressed as the scale of a comparable hardcopy map or chart Ground sample distance |
| [Usage] | MD_Usage (62) specificUsage (63) <i>usageDateTime (64)</i> <i>userDeterminedLimitations (65)</i> userContactInfo (66) CI_ResponsibleParty (see 374) | Brief description of the resource and/or resource series usage Date and time of the first use or range of uses of the resource and/or resource series Applications, determined by the user for which the resource and/or resource series is not suitable Identification of and means of communicating with person(s) and organization(s) using the resource(s) |
| [Aggregation] | MD_AggregateInformation (66.1) <i>aggregateDataSetName (66.2)</i> CI_Citation (see 359) <i>aggregateDataSetIdentifier (66.3)</i> MD_Identifier (see 205) associationType (66.4) DS_AssociationTypeCode | Citation information about the aggregate dataset Identification information about aggregate dataset Association type of the aggregate dataset |

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| | <p>(B.5.7) <i>initiativeType</i> (66.5) <i>DS_InitiativeTypeCode</i> (B.5.8)</p> | Type of initiative under which the aggregate dataset was produced |
| [Constraint (includes legal and security)] | <p>MD_Constraints (67) <i>useLimitation</i> (68)</p> | Limitation affecting the fitness for use of the resource. |
| Legal Constraint | <p>MD_LegalConstraints (69) <i>useLimitation</i> (68) <i>accessConstraints</i> (70) <i>MD_RestrictionCode</i> (B.5.24) <i>useConstraints</i> (71) <i>MD_RestrictionCode</i> (B.5.24) otherConstraints (72)</p> | <p>Restrictions and legal prerequisites for accessing and using the dataset Limitation affecting the fitness for use of the resource. Any special restrictions or limitations on obtaining the dataset</p> <p>Any special restrictions or limitations or warnings on using the dataset</p> <p>Other restrictions and legal prerequisites for accessing and using the dataset</p> |
| Security Constraint | <p>MD_SecurityConstraints (73) <i>useLimitation</i> (68) classification (74) MD_ClassificationCode (B.5.11) <i>userNote</i> (75) <i>classificationSystem</i> (76) <i>handlingDescription</i> (77)</p> | <p>Handling restrictions imposed on the dataset for security reasons Limitation affecting the fitness for use of the resource. Name of the handling restrictions on the dataset</p> <p>Explanation of the application of the legal constraints or other restrictions and legal prerequisites for obtaining and using the dataset Name of the classification system Additional information about the restrictions on handling the dataset</p> |
| [Data quality] | <p>DQ_DataQuality (78) scope (79) DQ_Scope (see 138) report (80) DQ_Element (see 99) lineage (81) LI_Lineage (see 82)</p> | <p>The specific data to which the data quality information applies</p> <p>Quantitative quality information for the data specified by the scope</p> <p>Non-quantitative quality information about the lineage of the data specified by the scope</p> |
| [Lineage] | <p>LI_Lineage (82)</p> | <p>Information about the level of processing applied to the dataset. This field should be used to indicate whether the data are observations, analyses (re-analyses), forecast (based on initial states including observations), simulations or other sources of data. Could also be used to include the platform/mission in the source of data (e.g. Ship, aircraft, satellite, satellite id).</p> <p>May need to use pairs of [source, processing step] to provide additional information. May contain references (e.g. URI) to external information on the</p> |

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| | <p>statement (83)</p> <p>processStep (84)</p> <p> LI_ProcessStep (see 86)</p> <p>source (85)</p> <p> LI_Source (see 92)</p> | <p>processing and source.</p> <p>Information about the events or source data used in constructing the dataset</p> <p>Information about an event in the creation process for the dataset</p> <p>Information about the source data used in creating the dataset</p> |
| [Process step] | <p>LI_ProcessStep (86)</p> <p>description (87)</p> <p><i>rationale (88)</i></p> <p><i>dateTime (89)</i></p> <p><i>processor (90)</i></p> <p> <i>CI_ResponsibleParty (see 374)</i></p> <p><i>source (91)</i></p> <p> <i>LI_Source (see 92)</i></p> | <p>Description of the event, including related parameters or tolerances</p> <p>Requirement or purpose for the process step</p> <p>Date and time or range of date and time on or over which the process step occurred</p> <p>Identification of, and means of communication with, person(s) and organization(s) associated with the process step</p> <p>Information about the source data used in creating the data specified by the scope</p> |
| [Source] | <p>LI_source (92)</p> <p>description (93)</p> <p><i>scaleDenominator (94)</i></p> <p> <i>MD_RepresentativeFraction (see 56)</i></p> <p><i>sourceReferenceSystem (95)</i></p> <p> <i>MD_ReferenceSystem (see 186)</i></p> <p><i>sourceCitation (96)</i></p> <p> <i>CI_Citation (see 359)</i></p> <p>sourceExtent (97)</p> <p> EX_Extent (see 334)</p> | <p>Detailed description of the level of the source data</p> <p>Denominator of the representative fraction on a source map</p> <p>Spatial reference system used by the source data</p> <p>Recommended reference to be used for the source data</p> <p>Information about the spatial, vertical and temporal extent of the source data</p> |
| [Data quality element] | <p>DQ_Element (99)</p> <p>DQ_Completeness (108)</p> <p>DQ_CompletenessCommission (109)</p> <p>DQ_CompletenessOmission (110)</p> <p>DQ_LogicalConsistency (111)</p> <p>DQ_ConceptualConsistency (112)</p> <p>DQ_DomainConsistency (113)</p> <p>DQ_FormatConsistency (114)</p> | <p>Aspect of quantitative quality information</p> <p>Presence and absence of features, their attributes and their relationship</p> <p>Excess data present in the dataset, as described by the scope</p> <p>Data absent from the dataset, as described by the scope</p> <p>Degree of adherence to logical rules of data structure, attribution and relationships</p> <p>Adherence to rules of the conceptual schema</p> <p>Adherence of values to the value domains</p> <p>Degree to which data is stored in accordance with the physical structure of the dataset, as described by the scope</p> |

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| | <p>DQ_TopologicalConsistency (115)</p> <p>DQ_PositionalAccuracy (116)</p> <p>DQ_AbsoluteExternalPositionalAccuracy (117)</p> <p>DQ_GriddedDataPositionalAccuracy (118)</p> <p>DQ_RelativeInternalPositionalAccuracy (119)</p> <p>DQ_TemporalAccuracy (120)</p> <p>DQ_AccuracyOfATimeMeasurement (121)</p> <p>DQ_TemporalConsistency (122)</p> <p>DQ_TemporalValidity (123)</p> <p>DQ_ThematicAccuracy (124)</p> <p>DQ_ThematicClassificationCorrectness (125)</p> <p>DQ_NonQuantitativeAttributeAccuracy (126)</p> <p>DQ_QuantitativeAttributeAccuracy (127)</p> <p><i>nameOfMeasure (100)</i></p> <p><i>measureIdentification (101)</i></p> <p><i>MD_Identifier (see 205)</i></p> <p><i>measureDescription (102)</i></p> <p><i>evaluationMethodType (103)</i></p> <p><i>DQ_EvaluationMethodTypeCode (B.5.6)</i></p> <p><i>evaluationMethodDescription (104)</i></p> <p><i>evaluationProcedure (105)</i></p> <p><i>CI_Citation (see 359)</i></p> <p><i>dateTime (106)</i></p> <p>result (107)</p> <p>DQ_Result (see 128)</p> | <p>Correctness of the explicitly encoded topological characteristics of the dataset as described by the scope</p> <p>Accuracy of the position of features</p> <p>Closeness of reported coordinate values to values accepted as or being true</p> <p>Closeness of gridded data position values to values accepted as or being true</p> <p>Closeness of the relative positions of features in the scope to their respective relative positions accepted as or being true</p> <p>Accuracy of the temporal attributes and temporal relationships of features</p> <p>Correctness of the temporal references of an item (reporting of error in time measurement)</p> <p>Correctness of ordered events or sequences, if reported</p> <p>Validity of data specified by the scope with respect to time</p> <p>Accuracy of quantitative attributes and the correctness of non-quantitative attributes and of the classifications of features and their relationships</p> <p>Compassion of the classes assigned to features or their attributes to a universe of discourse</p> <p>Accuracy of non-quantitative attributes</p> <p>Accuracy of quantitative attributes</p> <p>Name of the test applied to the data</p> <p>Code identifying a registered standard procedure</p> <p>Description of the measure</p> <p>Type of method used to evaluate quality of the dataset</p> <p>Description of the evaluation method</p> <p>Reference to the procedure information</p> <p>Date or range of dates on which a data quality measure was applied</p> <p>Value obtained from applying a data quality measure or the outcome of evaluating the obtained value against a specified acceptable conformance quality level</p> |
| [Result] | DQ_Result (128) | |
| Conformance result | DQ_ConformanceResult (129) | Information about the outcome of evaluating the obtained value against a specified |

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| Quantitative result | specification (130) CI_Citation (see 359) explanation (131) pass (132) DQ_QuantitativeResult (133) <i>valueType (134)</i> valueUnit (135) <i>errorStatistic (136)</i> value (137) | acceptable conformance quality level Citation of products specification or user requirement against which data is being evaluated Explanation of the meaning of conformance for this result Indication of the conformance result where 0= fail and 1=pass The values or information about the value(s) obtained from applying a data quality level Value type for reporting a data quality result Value unit for reporting a data quality result Statistical method used to determine the value Quantitative value or values, content determined by the evaluation procedure used |
| [Scope] | DQ_Scope (138) level (139) MD_ScopeCode (B.5.25) <i>extent (140)</i> <i>EX_Extent (see 334)</i> levelDescription (141) MD_ScopeDescription (see 149) | Hierarchical level of the data specified by the scope Information about the horizontal, vertical and temporal extent of the data specified by the scope Detailed description about the level of the data specified by the scope |
| [Maintenance] | MD_MaintenanceInformation (142) maintenanceAndUpdateFrequency (143) MD_MaintenanceFrequencyCode (B.5.18) <i>dateOfNextUpdate (144)</i> <i>userDefinedMaintenanceFrequency (145)</i> <i>updateScope (146)</i> <i>MD_ScopeCode (B.5.25)</i> <i>updateScopeDescription (147)</i> <i>MD_ScopeDescription (see 149)</i> <i>maintenanceNote (148)</i> <i>contact (148.1)</i> <i>CI_ResponsibleParty (see 374)</i> | Frequency with which changes and additions are made to the resource after the initial resource is completed Scheduled revision date for resource Maintenance period other than those defined Scope of data to which maintenance is applied Additional information about the range or extent of the resource Information regarding specific requirements for maintenance the resource Identification of, and means of communicating with, person(s) and organizations with responsible party for maintaining the metadata |
| [Scope description] | MD_ScopeDescription (149) attribute (150) feature (151) | Attributes to which the information applies Features to which the information applies |

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| | <p>featureInstances (152) attributeInstances (153) dataset (154) other (155)</p> | <p>Feature instances to which the information applies Attribute instances to which the information applies Dataset to which the information applies Class of information that does not fall into the other categories to which the information applies</p> |
| [Spatial representation] | <p>MD_SpatialRepresentation (156) Grid spatial rep. MD_GridSpatialRepresentation (157) MD_Georectified (162)</p> | |
| | <p>numberOfDimensions (158) axisDimensionsProperties (159) MD_Dimension (see 179) cellGeometry (160) MD_CellGeometryCode (B.5.9) transformationParameterAvailability (161) (MD_Georectified)</p> | <p>Number of independent spatial-temporal axes Information about spatial-temporal axis properties Identification of grid data as point or cell Identification of whether or not parameters for transformation between image coordinates and geographic or map coordinates exist (are available)</p> |
| Regularly spaced | <p>checkPointAvailability (163) checkPointDescription (164) cornerPoints (165) <i>centerPoint(166)</i> pointInPixel (167) MD_PixelOrientationCode (B.5.22) <i>transformationDimensionDescription (168)</i> transformationDimensionMapping (169)</p> | <p>Indication of whether or not geographic position points are available to test the accuracy of the georeferenced grid data Description of geographic position points used to test the accuracy of the georeferenced grid data Earth location in the coordinate system defined by the Spatial Reference System and the grid coordinate of the cells at opposite ends of grid coverage along two diagonals in the grid spatial dimensions. There are four corner points in a georectified grid; at least two corner points along one diagonal are required. Earth location in the coordinate system defined by the Spatial Reference System and the grid coordinate of the cell halfway between opposite ends of the grid in the spatial dimensions Point in a pixel corresponding to the Earth location of the pixel General description of the transformation Information about which grid axes are the spatial map axes</p> |
| Irregularly Spaced | <p>MD_Georeferenceable (170) numberOfDimensions (158)</p> | <p>Number of independent spatial-temporal axes</p> |

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| Vector spatial rep. | <p>axisDimensionsProperties (159) MD_Dimension (see 179) cellGeometry (160) MD_CellGeometryCode (B.5.9) transformationParameterAvailability (161) controlPointAvailability (171) orientationParameterAvailability (172) <i>orientationParameterDescription (173)</i> georeferencedParameters (174) <i>parameterCitation (175)</i> <i>CI_Citation (see 359)</i></p> <p>MD_VectorSpatialPresentation (176) <i>topologyLevel (177)</i> <i>MD_TopologyLevelCode (B.5.28)</i> <i>geometricObjects (178)</i> <i>MD_GeometricObjects (see 183)</i></p> | <p>Information about spatial-temporal axis properties</p> <p>Identification of grid data as point or cell</p> <p>Identification of whether or not parameters for transformation between image coordinates and geographic or map coordinates exist (are available)</p> <p>Indication of whether or not control point(s) exists</p> <p>Indication of whether or not orientation parameters are available</p> <p>Description of parameters used to describe sensor orientation</p> <p>Terms which support grid data georeferencing Reference providing description of the parameters</p> <p>Code which identifies the degree of complexity of the spatial relationship</p> <p>Information about the geometric objects used in the dataset</p> |
| [Dimension] | <p>MD_Dimension (179) dimensionName (180) MD_DimensionNameTypeCode (B.5.14) dimensionSize (181) <i>resolution (182)</i></p> | <p>Name of the axis</p> <p>Number of elements along the axis Degree of detail in the grid dataset</p> |
| [Geometric objects] | <p>MD_GeometricObjects (183) geometricObjectType (184) MD_GeometricObjectTypeCode (B.5.15) <i>geometricObjectCount (185)</i></p> | <p>Name of point or vector objects used to locate zero-, one-, two-, or three-dimensional spatial locations in the dataset</p> <p>Total number of the point or vector object type occurring in the dataset</p> |
| [Reference System] | <p>MD_ReferenceSystem (186) <i>referenceSystemIdentifier (187)</i> <i>RS_Identifier (see 208)</i></p> | <p>Information about the reference systems used (temporal, coordinate and geographic) Name of reference system</p> |

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| <p>Spacial and temporal reference</p> | <p>RS_ReferenceSystem (195) name (196) RS_Identifier (see 208) <i>domainOfValidity (197)</i> <i>EX_Extent (see 334)</i></p> | <p>Name of reference system used</p> <p>Range which is valid for the reference system</p> |
| <p>[Identifier]</p> <p>Identifier for reference system</p> | <p>MD_Identifier (205) <i>authority (206)</i> <i>CI_Citation (see 359)</i> code (207)</p> <p>RS_Identifier (208) <i>authority (206)</i> <i>CI_Citation (see 359)</i> code (207) <i>codeSpace (208.1)</i> <i>version (208.2)</i></p> | <p>Person or party responsible for maintenance of the namespace</p> <p>Alphanumeric value identifying an instance in the namespace</p> <p>Person or party responsible for maintenance of the namespace</p> <p>Alphanumeric value identifying an instance in the namespace</p> <p>Name or identifier of the person or organization responsible for namespace</p> <p>Version identifier for the namespace</p> |
| <p>[Content Information]</p> <p>FeatureCatalogue</p> <p>Grid data cell</p> | <p>MD_ContentInformation (232)</p> <p>MD_FeatureCatalogueDescription (233)</p> <p><i>complianceCode (234)</i></p> <p><i>language (235)</i></p> <p>includeWithDataset (236)</p> <p><i>featureTypes (237)</i></p> <p>featureCatalogueCitation (238) <i>CI_Citation (see 359)</i></p> <p>MD_CoverageDescription (239)</p> | <p>The ISO standard provides both “feature catalogues” and “Coverage” to describe the attributes of the data held in the dataset. This GGOS Core Metadata chooses to use “feature” to describe all aspects of these attributes, including those relating to grids of data.</p> <p>Identification of whether or no the cited feature catalogue complies with [ISO 19110. Value 1 if feature catalogue is compliant with ISO19110. Default is 0 (not compliant)</p> <p>Language(s) used in the Catalogue (ISO639-2, other parts can be used)</p> <p>Indication of whether or not the feature catalogue is included with the dataset. Required if feature Catalogue is used. Value 1 in feature catalogue is included in dataset, 0 if not.</p> <p>Subset of feature types from the cited feature catalogue occurring in the dataset. Note: the physical variables described by the data are attributes of a feature (which could be an observed profile or a field of data, for example).</p> <p>Complete bibliographic reference to one or more external feature catalogue. Required if feature Catalogue is used. Bibliographic reference to the feature catalogue(s) used.</p> |

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| | <p>MD_ImageDescription (243) attributeDescription (240) contentType (241) MD_CoverageContentType Code (B.5.12) <i>dimension (242)</i> <i>MD_RangeDimension (256)</i> (MD_ImageDescription) <i>illuminationElevationAngle (244)</i> <i>illuminationAzimuthAngle (245)</i> <i>imagingCondition (246)</i> <i>MD_ImagingConditionCode (B.5.16)</i> <i>imageQualityCode (247)</i> <i>MD_Identifier (see 205)</i> <i>cloudCoverPercentage (248)</i> <i>processingLevelCode (249)</i> <i>MD_Identifier (see 205)</i> <i>compressionGenerationQuantity (250)</i> <i>triangulationIndicator (251)</i> <i>radiometricCalibrationDataavailability (252)</i> <i>cameraCalibrationInformationAvailability (253)</i> <i>filmDistortionInformationAvailability (254)</i> <i>lensDistortionInformationAvailability (255)</i></p> | <p>Description of the attribute described by the measurement value Type of information represented by the cell value Information on the attribute described by the measurement value Illumination elevation measured in degrees clockwise Illumination azimuth measured in degrees clockwise Conditions affected the image Specifies the image quality Area of the dataset obscured by clouds, expressed as percentage of spatial extent Image distributor's code that identifies the level of radiometric and geometric processing that has been applied Count of the number of lossy compression cycles performed on the image Indication of whether or not triangulation has been performed upon the image Indication of whether or not the radiometric calibration information for generating the radiometrically calibrated standard data product is available Indication of whether or not constants are available which allow for camera calibration corrections Indication of whether or not Calibration Reseau information is available Indication of whether or not lens aberration correction information is available</p> |
| <p>[Range dimension]</p> Range of wavelengths | <p>MD_RangeDimension (256) MD_Band (259) <i>sequenceIdentifier (257)</i> <i>descriptor (258)</i> (MD_Band) <i>maxValue (260)</i></p> | <p>Number that uniquely identifies instances of bands of wavelength on which a sensor operates Description of the range of a cell measurement value Longest wavelength that the sensor is capable of collecting within a designated band</p> |

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| | <i>minValue</i> (261) <i>units</i> (262) <i>peakResponse</i> (263) <i>bitsPerValue</i> (264) <i>toneGradation</i> (265) <i>scaleFactor</i> (266) <i>offset</i> (267) | Shortest wavelength that the sensor is capable of collecting within a designated band Units in which sensor wavelengths are expressed Wavelength at which the response is the highest Maximum number of significant bits in the uncompressed representation for the value in each and of each pixel Number of discrete numerical values in the grid data Scale factor which has been applied to the cell value The physical value corresponding to a cell value of zero |
| [Portrayal catalogue] | MD_PortrayalCatalogueReference (268) portrayalCatalogueCitation (269) CI_Citation (see 359) | Bibliographic reference to the portrayal catalogue cited |
| [Distribution] | MD_Distribution (270) <i>distributionFormat</i> (271) MD_Format (see 284) <i>distributor</i> (272) MD_Distributor (see 279) <i>transferOptions</i> (273) MD_DigitalTransferOptions (see 274) | A description of the format of the data to be distributed Information about the distributor Information about technical means and media by which a resource is obtained from the distributor |
| [Digital transfer options] | MD_DigitalTransferOptions (274) <i>unitsOfDistribution</i> (275) <i>transferSize</i> (276) <i>onLine</i> (277) CI_OnlineResource (see 396) <i>offLine</i> (278) MD_Medium (see 291) | Tiles, layers, geographic areas, etc., in which data is available Estimated size of a unit in the specified transfer format, expressed in megabytes. Information about online sources from which the resource can be obtained Information about offline media on which the resource can be obtained |
| [Distributor information] | MD_Distributor (279) distributorContact (280) CI_ResponsibleParty (see 374) <i>distributionOrderProcess</i> (281) MD_StandardOrderProcess (see 298) <i>distributorFormat</i> (282) MD_Format (see 284) | Party from whom the resource may be obtained. This list need not be exhaustive Information about how the resource may be obtained, and related instructions and fee information Information about the format used by the distributor |

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| | <i>distributorTransferOptions</i> (283) <i>MD_DigitalTransferOptions</i> (see 274) | Information about the technical means and media used by the distributor |
| [Format] | MD_Format (284) name (285) version (286) <i>amendmentNumber</i> (287) <i>specification</i> (288) <i>fileDecompressionTechnique</i> (289) <i>formatDistributor</i> (290) <i>MD_Distributor</i> (279) | Name of the data transfer format(s) Version of the format (date, number, etc.) Amendment number of the format version Name of a subset, profile, or product specification of the format Recommendations of algorithms or processes that can be applied to read or expand resources to which compression techniques have been applied Information about the distributor's format |
| [Medium] | MD_Medium (291) <i>name</i> (292) <i>MD_MediumNameCode</i> (B.5.20) <i>density</i> (293) <i>densityUnits</i> (294) <i>volumes</i> (295) <i>mediumFormat</i> (296) <i>MD_MediumFormatCode</i> (B.5.19) <i>mediumNote</i> (297) | Name of the medium on which the resource can be received Density at which the data is recorded Units of measure for the recording density Number of items in the media identified Method used to write to the medium Description of other limitations or requirements for using the medium |
| [Standard order process] | MD_StandardOrderProcess (298) <i>fees</i> (299) <i>plannedAvailableDateTime</i> (300) <i>orderingInstructions</i> (301) <i>turnaround</i> (302) | Fees and terms for retrieving the resource. Include monetary units (as specified in ISO 4217) Date and time when the resource will be available General instructions, terms and services provided by the distributor Typical turnaround time for the filling of an order |
| [Extended element] | MD_ExtendedElementInformation (306) name (307) shortName (308) domainCode (309) definition (310) obligation (311) MD_ObligationCode (B.5.21) | Name of the extended metadata element Short form suitable for use in an implementation method such as XML or SGML. NOTE other methods may be used Three digit code assigned to the extended element Definition of the extended element Obligation of the extended element |

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| | <p>condition (312) dataType (313) MD_DatatypeCode (B.5.13) maximumOccurrence (314) domainValue (315) parentEntity (316)</p> <p>rule (317) <i>rationale (318)</i> source (319) CI_ResponsibleParty (see 374)</p> | <p>Condition under which the extended element is mandatory Code which identifies the kind of value provided in the extended element</p> <p>Maximum occurrence of the extended element Valid values that can be assigned to the extended element Name of the metadata entity(s) under which this extended metadata element may appear. The name(s) may be standard metadata element(s) or other extended metadata element(s) Specifies how the extended element relates to other existing elements and entities Reason for creating the extended element Name of the person or organization creating the extended element</p> |
| [Application schema] | <p>MD_ApplicationSchemaInformation (320) name (321) CI_Citation (see 359) schemaLanguage (322) constraintLanguage (323) <i>schemaAscii (324)</i> <i>graphicsFile (325)</i> <i>softwareDevelopmentFile (326)</i> <i>softwareDevelopmentFileFormat (327)</i></p> | <p>Name of the application schema used</p> <p>Identification of the schema language used Formal language used in Application Schema Full application schema given as an ASCII file Full application schema given as a graphics file Full application schema given as a software development file Software dependent format used for the application schema software dependent file</p> |
| [Extent] | <p>EX_Extent (334) description (335) geographicElement (336)</p> <p>extentTypeCode (340)</p> <p>polygon (342)</p> | <p>Spatial and temporal extent for the dataset (in text) GGOS metadata must contain the “bounding box” where relevant – even if global. However, either or both of a geographical name and/or a bounding polygon and/or an irregular point set should be used as well. Identification of whether the bounding polygon encompasses an area covered by the data or an area where data is not present The polygon is defined as a set of co-ordinate pairs with the last pair the same as the first. When the points in the polygon are traversed, the interior is to the left of the direction of travel. If the region has “holes”, multiple polygons may be used. The points of the outer polygon will be traversed anti-clockwise, and those of inner polygons will be traversed clockwise. NOTE For polar-orbiting satellites, polygon should be used to appropriately encompass a slant area which is composed by orbits.</p> |

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|------------------|---|--|
| | <p>westBoundLongitude (344) eastBoundLongitude (345) southBoundLatitude (346) northBoundLatitude (347)</p> <p>geographicIdentifier (349) MD_Identifier (205)</p> <p>temporalElement (337) extent (351)</p> <p>verticalElement (338)</p> <p>minimumValue (355) maximumValue (356) unitOfMeasure (357)</p> <p>verticalDatum (358)</p> | <p>Western-most limit of the dataset, longitude in decimal degrees (positive east) Eastern-most limit of the dataset, longitude in decimal degrees (positive east) Southern-most limit of the dataset, latitude in decimal degrees (positive north) Northern-most, limit of the dataset, latitude in decimal degrees (positive north) Sets of points defining a bounding polygon. NOTE This is only an approximate reference so specifying the co-ordinate system is unnecessary. Using latitude and longitude, for any box surrounding a Pole, the limits are +/-90 and the southern (northern) most latitude, and the longitude extent must be +/-180. Bounding box may not be effective when used to search for data that cross the international date line or a pole.</p> <p>Identifier used to represent a geographic area or location. While it is preferable to use names from a well-known Gazetteer (this should be referred to in the identifier), it is acceptable to use names that are not in a Gazetteer. NOTE: Each of the Extent fields below is required if applicable</p> <p>Date and time for the content of the dataset</p> <p>Vertical domain of the dataset (Note: There is potential ambiguity about vertical extent, particularly in oceanography. This can be resolved by the unitOfMeasure.) Lowest vertical extent contained in the dataset Highest vertical extent contained in the dataset Vertical units used for vertical extent information (E.g.: metres, feet, hectopascals) This must include the sign convention for height (whether values increase upwards or downwards). Information about the origin from which the maximum and minimum elevation values are measured (see ISO 1911).</p> |
| <p>[Station]</p> | <p>station</p> <p>stationDescription (GGOS) InternationalStationId (GGOS) code (GGOS) owner (GGOS) stationName (GGOS) country (GGOS) GGOSRegion (GGOS) latitude (GGOS) longitude (GGOS) statonHeight (GGOS)</p> | <p>Description of a geodetic station</p> <p>Code list for station types; e.g. DOMES</p> <p>Name of the station</p> <p>Name of county</p> <p>Name of GGOS Region</p> <p>Latitude</p> <p>Longitude</p> <p>Height of the station</p> |

| | | |
|---------------------|--|---|
| | <p>referenceHeight (GGOS) stationContactInfo (GGOS) CI_Contact (see 387) prodctList (GGOS) product (GGOS) timePeriod (GGOS) beginDateTime (GGOS) endDateTime (GGOS) dataFrequency (GGOS) accessRights (GGOS) quality (GGOS)</p> | <p>Reference height Contact point of the station List of products Time period Access rights Quality</p> |
| [Citation] | <p>CI_Citation (359) title (360) <i>alternateTitle (361)</i> date (362) CI_Date (see 393) <i>edition (363)</i> <i>editionDate (364)</i> <i>identifier (365)</i> <i>MD_Identifier (see 205)</i> <i>citedResponsibleParty (367)</i> <i>CI_ResponsibleParty (see 374)</i> <i>presentationForm (368)</i> <i>CI_PresentationFormCode (B.5.4)</i> <i>series (369)</i> <i>CI_Series (see 403)</i> <i>otherCitationDetails (370)</i> <i>collectiveTitle (371)</i> <i>ISBN (372)</i> <i>ISSN (373)</i></p> | <p>Standardized resource reference Name by which the cited resource is known Short name or other language name by which the cited information is known Reference date for the cited resource Version of the cited resource Date of the edition Value uniquely identifying an object within a namespace Name and position information for an individual or organization that is responsible for the resource Mode in which the resource is represented Information about the series, or aggregate dataset, of which the dataset is a part Other information required to complete the citation that is not recorded elsewhere Common title with holdings note NOTE title identifies elements of a series collectively, combined with information about what volumes are available at the source cited International Standard Book Number International Standard Serial Number</p> |
| [Responsible party] | <p>CI_ResponsibleParty (374) individualName (375)</p> | <p>Identification of, and means of communication with, person(s) and organizations associated with the dataset Name of the responsible person-surname, given name, title, separated by a delimiter</p> |

| | | |
|-------------------|---|---|
| | <p>organisationName (376) positionName (377) <i>contactInfo</i> (378) <i>CI_Contact</i> (see 387) role(379) CI_RoleCode (B.5.5)</p> | <p>Name of the responsible organization Role or position of the responsible person Address of the responsible party NOTE: Either a phone number or address is required Function performed by the responsible party</p> |
| [Address] | <p>CI_Address (380) <i>deliveryPoint</i> (381) <i>city</i> (382) <i>administrativeArea</i> (383) <i>postalCode</i> (384) <i>country</i> (385) <i>electronicMailAddress</i> (386)</p> | <p>Address line for the location (as described in ISO11180, Annex A) City of the location State, province of the location Postal code (Zip or other) Country (ISO3166-3, other parts may be used) Electronic mail address of the responsible party</p> |
| [Contact] | <p>CI_Contact (387) <i>phone</i> (388) <i>CI_Telephone</i> (see 407) <i>address</i> (389) <i>CI_Address</i> (see 380) <i>onlineResource</i> (390) <i>CI_OnlineResource</i> (see 396) <i>hoursOfService</i> (391) <i>contactInstructions</i> (392)</p> | <p>Telephone numbers at which the organization or individual may be contacted Physical and email address at which the organization or individual may be contacted On-line information that can be used to contact the individual or organization Time period (including time zone) when individuals can contact the organization or individual Supplemental instructions on how or when to contact the organization or individual</p> |
| [Date] | <p>CI_Date (393) date (394) dateType (395) CI_DateTypeCode (B.5.2)</p> | <p>Reference date for the dataset Type of date [code list: creation, publication or revision date]</p> |
| Online resources] | <p>CI_OnlineResource (396) linkage (397) <i>protocol</i> (398) <i>applicationProfile</i> (399) <i>name</i> (400) <i>description</i> (401) <i>function</i> (402) <i>CI_OnlineFunctionCode</i> (B.5.3)</p> | <p>Location for on-line access using Uniform Resource Locator (URL) etc. Connection protocol to be used Name of an application profile that can be used with the online resource Name of the online resource Detailed text description of what the online resource is/does Code for function performed by the online resource</p> |
| [Series] | <p>CI_Series (403)</p> | |

| | | |
|-------------|--|--|
| | <i>name (404)</i> <i>issueidentification (405)</i> <i>page (406)</i> | Name of the series, or aggregate dataset, of which the dataset is a part Information identifying the issue of the series Details on which pages of the publication the article was published |
| [Telephone] | CI_Telephone (407) <i>voice (408)</i> <i>facsimile (409)</i> | Telephone numbers by which individuals can speak to the responsible organization or individual Telephone numbers of a facsimile machine for the responsible organization or individual |

Extensions to ISO Code Lists

B.5.2 CI_DateTypeCode <<CodeList>>

| | Name | Domain code | Definition |
|---------------------------|-----------------|--------------------|---|
| 1. | CI_DateTypeCode | DateTypCd | identification of when a given event occurred |
| 2. | creation | 001 | date identifies when the resource was brought into existence |
| 3. | publication | 002 | date identifies when the resource was issued |
| 4. | revision | 003 | date identifies when the resource was examined or re-examined and improved or amended |
| Additional entries | | | |
| 5. | reference | 004 | |

B.5.5 CI_RoleCode <<CodeList>>

| | Name | Domain code | Definition |
|-----|-----------------------|--------------------|--|
| 6. | CI_RoleCode | RoleCd | function performed by the responsible party |
| 7. | resourceProvider | 001 | party that supplies the resource |
| 8. | custodian | 002 | party that accepts accountability and responsibility for the data and ensures appropriate care and maintenance of the resource |
| 9. | owner | 003 | party that owns the resource |
| 10. | user | 004 | party who uses the resource |
| 11. | distributor | 005 | party who distributes the resource |
| 12. | originator | 006 | party who created the resource |
| 13. | pointOfContact | 007 | party who can be contacted for acquiring knowledge about or acquisition of the resource |
| 14. | principalInvestigator | 008 | key party responsible for gathering information and conducting research |
| 15. | processor | 009 | party who has processed the data in a manner such that the resource has been modified |
| 16. | publisher | 010 | party who published the resource |
| 17. | author | 011 | party who authored the resource |

B.5.10 MD_CharacterSetCode <<CodeList>>

| | Name | Domain code | Definition |
|-----|---------------------|--------------------|---|
| 18. | MD_CharacterSetCode | CharSetCd | name of the character coding standard used for the resource |
| 19. | ucs2 | 001 | 16-bit fixed size Universal Character Set, based on ISO/IEC 10646 |
| 20. | ucs4 | 002 | 32-bit fixed size Universal Character Set, based on ISO/IEC 10646 |
| 21. | utf7 | 003 | 7-bit variable size UCS Transfer Format, based on ISO/IEC 10646 |
| 22. | utf8 | 004 | 8-bit variable size UCS Transfer Format, based on ISO/IEC 10646 |
| 23. | utf16 | 005 | 16-bit variable size UCS Transfer Format, based on ISO/IEC 10646 |
| 24. | 8859part1 | 006 | ISO/IEC 8859-1, Information technology – 8-bit single-byte coded graphic character sets – Part 1: Latin alphabet No. 1 |
| 25. | 8859part2 | 007 | ISO/IEC 8859-2, Information technology – 8-bit single-byte coded graphic character sets – Part 2: Latin alphabet No. 2 |
| 26. | 8859part3 | 008 | ISO/IEC 8859-3, Information technology – 8-bit single-byte coded graphic character sets – Part 3: Latin alphabet No. 3 |
| 27. | 8859part4 | 009 | ISO/IEC 8859-4, Information technology – 8-bit single-byte coded graphic character sets – Part 4: Latin alphabet No. 4 |
| 28. | 8859part5 | 010 | ISO/IEC 8859-5, Information technology – 8-bit single-byte coded graphic character sets – Part 5: Latin/Cyrillic alphabet |
| 29. | 8859part6 | 011 | ISO/IEC 8859-6, Information technology – 8-bit single-byte coded graphic character sets – Part 6: Latin/Arabic alphabet |
| 30. | 8859part7 | 012 | ISO/IEC 8859-7, Information technology – 8-bit single-byte coded graphic character sets – Part 7: Latin/Greek alphabet |
| 31. | 8859part8 | 013 | ISO/IEC 8859-8, Information technology – 8-bit single-byte coded graphic character sets – Part 8: Latin/Hebrew alphabet |
| 32. | 8859part9 | 014 | ISO/IEC 8859-9, Information technology – 8-bit single-byte coded graphic character sets – Part 9: Latin alphabet No. 5 |

| | Name | Domain code | Definition |
|---------------------------|---------------------------|-------------|---|
| 33. | 8859part10 | 015 | ISO/IEC 8859-10, Information technology – 8-bit single-byte coded graphic character sets – Part 10: Latin alphabet No. 6 |
| 34. | 8859part11 | 016 | ISO/IEC 8859-11, Information technology – 8-bit single-byte coded graphic character sets – Part 11: Latin/Thai alphabet |
| 35. | (reserved for future use) | 017 | a future ISO/IEC 8-bit single-byte coded graphic character set (e.g. possibly ISO/IEC 8859-12) |
| 36. | 8859part13 | 018 | ISO/IEC 8859-13, Information technology – 8-bit single-byte coded graphic character sets – Part 13: Latin alphabet No. 7 |
| 37. | 8859part14 | 019 | ISO/IEC 8859-14, Information technology – 8-bit single-byte coded graphic character sets – Part 14: Latin alphabet No. 8 (Celtic) |
| 38. | 8859part15 | 020 | ISO/IEC 8859-15, Information technology – 8-bit single-byte coded graphic character sets – Part 15: Latin alphabet No. 9 |
| 39. | 8859part16 | 021 | ISO/IEC 8859-16, Information technology – 8-bit single-byte coded graphic character sets – Part 16: Latin alphabet No. 10 |
| 40. | jjs | 022 | japanese code set used for electronic transmission |
| 41. | shiftJIS | 023 | japanese code set used on MS-DOS based machines |
| 42. | eucJP | 024 | japanese code set used on UNIX based machines |
| 43. | usAscii | 025 | united states ASCII code set (ISO 646 US) |
| 44. | ebcdic | 026 | ibm mainframe code set |
| 45. | eucKR | 027 | korean code set |
| 46. | big5 | 028 | traditional Chinese code set used in Taiwan, Hong Kong of China and other areas |
| 47. | GB2312 | 029 | simplified Chinese code set |
| Additional entries | | | |
| 48. | CP1251 | 030 | |

B.5.11 MD_ClassificationCode <<CodeList>>

| | Name | Domain code | Definition |
|-----|-----------------------|------------------|--|
| 49. | MD_ClassificationCode | ClassificationCd | name of the handling restrictions on the dataset |
| 50. | unclassified | 001 | available for general disclosure |
| 51. | restricted | 002 | not for general disclosure |
| 52. | confidential | 003 | available for someone who can be entrusted with information |
| 53. | secret | 004 | kept or meant to be kept private, unknown, or hidden from all but a select group of people |
| 54. | topsecret | 005 | of the highest secrecy |

B.5.18 MD_MaintenanceFrequencyCode <<CodeList>>

| | Name | Domain code | Definition |
|---------------------------|-----------------------------|-------------|--|
| 55. | MD_MaintenanceFrequencyCode | MaintFreqCd | frequency with which modifications and deletions are made to the data after it is first produced |
| 56. | continual | 001 | data is repeatedly and frequently updated |
| 57. | daily | 002 | data is updated each day |
| 58. | weekly | 003 | data is updated on a weekly basis |
| 59. | fortnightly | 004 | data is updated every two weeks |
| 60. | monthly | 005 | data is updated each month |
| 61. | quarterly | 006 | data is updated every three months |
| 62. | biannually | 007 | data is updated twice each year |
| 63. | annually | 008 | data is updated every year |
| 64. | asNeeded | 009 | data is updated as deemed necessary |
| 65. | irregular | 010 | data is updated intervals that are uneven in duration |
| 66. | notPlanned | 011 | there are no plans to update the data |
| 67. | unknown | 012 | frequency of maintenance for the data is not known |
| Additional entries | | | |
| 68. | hourly | 013 | |
| 69. | 3-hourly | 014 | |
| 70. | 6-hourly | 015 | |
| 71. | 12-hourly | 016 | |

B.5.20 MD_MediumNameCode <<CodeList>>

| | Name | Domain code | Definition |
|-----|---------------------------|-------------|--|
| 72. | MD_MediumNameCode | MedNameCd | name of the medium |
| 73. | cdRom | 001 | read-only optical disk |
| 74. | dvd | 002 | digital versatile disk |
| 75. | dvdRom | 003 | digital versatile disk, read only |
| 76. | 3halfInchFloppy | 004 | 3.5 inch magnetic disk |
| 77. | 5quarterInchFloppy | 005 | 5.25 inch magnetic disk |
| 78. | 7trackTape | 006 | 7 track magnetic tape |
| 79. | 9trackTape | 007 | 9 track magnetic tape |
| 80. | 3480Cartridge | 008 | 3480 cartridge tape drive |
| 81. | 3490Cartridge | 009 | 3490 cartridge tape drive |
| 82. | 3580Cartridge | 010 | 3580 cartridge tape drive |
| 83. | 4mmCartridgeTape | 011 | 4 millimetre magnetic tape |
| 84. | 8mmCartridgeTape | 012 | 8 millimetre magnetic tape |
| 85. | 1quarterInchCartridgeTape | 013 | 0.25 inch magnetic tape |
| 86. | digitalLinearTape | 014 | half inch cartridge streaming tape drive |
| 87. | onLine | 015 | direct computer linkage |
| 88. | satellite | 016 | linkage through a satellite communication system |
| 89. | telephoneLink | 017 | communication through a telephone network |
| 90. | hardcopy | 018 | pamphlet or leaflet giving descriptive information |

B.5.23 MD_ProgressCode <<CodeList>>

| | Name | Domain code | Definition |
|---------------------------|-------------------|-------------|--|
| 91. | MD_ProgressCode | ProgCd | status of the dataset or progress of a review |
| 92. | completed | 001 | production of the data has been completed |
| 93. | historicalArchive | 002 | data has been stored in an offline storage facility |
| 94. | obsolete | 003 | data is not longer relevant |
| 95. | onGoing | 004 | data is continually being updated |
| 96. | planned | 005 | fixed date has been established upon or by which the data will be created or updated |
| 97. | required | 006 | data needs to be generated or updated |
| 98. | underDevelopment | 007 | data is currently in the process of being created |
| Additional entries | | | |
| 99. | owner | 008 | |

B.5.24 MD_RestrictionCode <<CodeList>>

| | Name | Domain code | Definition |
|------|----------------------------|-------------|---|
| 100. | MD_RestrictionCode | RestrictCd | limitation(s) placed upon the access or use of the data |
| 101. | copyright | 001 | exclusive right to the publication, production, or sale of the rights to a literary, dramatic, musical, or artistic work, or to the use of a commercial print or label, granted by law for a specified period of time to an author, composer, artist, distributor |
| 102. | patent | 002 | government has granted exclusive right to make, sell, use or license an invention or discovery |
| 103. | patentPending | 003 | produced or sold information awaiting a patent |
| 104. | trademark | 004 | a name, symbol, or other device identifying a product, officially registered and legally restricted to the use of the owner or manufacturer |
| 105. | license | 005 | formal permission to do something |
| 106. | intellectualPropertyRights | 006 | rights to financial benefit from and control of distribution of non-tangible property that is a result of creativity |
| 107. | restricted | 007 | withheld from general circulation or disclosure |
| 108. | otherRestrictions | 008 | limitation not listed |

B.5.25 MD_ScopeCode <<CodeList>>

| | Name | Domain code | Definition |
|------|----------------------|-------------|--|
| 109. | MD_ScopeCode | ScopeCd | class of information to which the referencing entity applies |
| 110. | attribute | 001 | information applies to the attribute value |
| 111. | attributeType | 002 | information applies to the characteristic of a feature |
| 112. | collectionHardware | 003 | information applies to the collection hardware class |
| 113. | collectionSession | 004 | information applies to the collection session |
| 114. | dataset | 005 | information applies to the dataset |
| 115. | series | 006 | information applies to the series Note: "series" applies to any DS_Aggregate |
| 116. | nonGeographicDataSet | 007 | information applies to non-geographic data |
| 117. | dimensionGroup | 008 | information applies to a dimension group |
| 118. | feature | 009 | information applies to a feature |
| 119. | featureType | 010 | information applies to a feature type |
| 120. | propertyType | 011 | information applies to a property type |
| 121. | fieldSession | 012 | information applies to a field session |
| 122. | software | 013 | information applies to a computer program or routine |
| 123. | service | 014 | information applies to a capability which a service provider entity makes available to a service user entity through a set of interfaces that define a behaviour, such as a use case |
| 124. | model | 015 | information applies to a copy or limitation of an existing or hypothetical object |
| 125. | tile | 016 | information applies to a tile, a spatial subset of geographic data |

B.5.26 MD_SpatialRepresentationTypeCode <<CodeList>>

| | Name | Domain code | Definition |
|---------------------------|----------------------------------|--------------|--|
| 126. | MD_SpatialRepresentationTypeCode | SpatRepTypCd | method used to represent geographic information in the dataset |
| 127. | vector | 001 | vector data is used to represent geographic data |
| 128. | grid | 002 | grid data is used to represent geographic data |
| 129. | textTable | 003 | textual or tabular data is used to represent geographic data |
| 130. | tin | 004 | triangulated irregular network |
| 131. | stereoModel | 005 | three-dimensional view formed by the intersecting homologous rays of an overlapping pair of images |
| 132. | video | 006 | scene from a video recording |
| Additional entries | | | |
| 133. | bitmap | 007 | |
| 134. | irregularPoints | 008 | Irregularly-spaced points, such as meteorological stations |

B.5.27 MD_TopicCategoryCode <<CodeList>>

| | Name | Domain code | Definition |
|------|----------------------|-------------|--|
| 135. | MD_TopicCategoryCode | TopicCatCd | high-level geographic data thematic classification to assist in the grouping and search of available geographic data sets. Can be used to group keywords as well. Listed examples are not exhaustive. NOTE It is understood there are overlaps between general categories and the user is encouraged to select the one most appropriate. |
| 136. | farming | 001 | rearing of animals and/or cultivation of plants Examples: agriculture, irrigation, aquaculture, plantations, herding, pests and diseases affecting crops and livestock |
| 137. | biota | 002 | flora and/or fauna in natural environment Examples: wildlife, vegetation, biological sciences, ecology, wilderness, sealife, wetlands, habitat |
| 138. | boundaries | 003 | legal land descriptions Examples: political and administrative boundaries |

| | Name | Domain code | Definition |
|---------------------------|----------------------------------|-------------|--|
| 139. | climatologyMeteorologyAtmosphere | 004 | processes and phenomena of the atmosphere Examples: cloud cover, weather, climate, atmospheric conditions, climate change, precipitation |
| 140. | economy | 005 | economic activities, conditions and employment Examples: production, labour, revenue, commerce, industry, tourism and ecotourism, forestry, fisheries, commercial or subsistence hunting, exploration and exploitation of resources such as minerals, oil and gas |
| 141. | elevation | 006 | height above or below sea level Examples: altitude, bathymetry, digital elevation models, slope, derived products |
| 142. | environment | 007 | environmental resources, protection and conservation Examples: environmental pollution, waste storage and treatment, environmental impact assessment, monitoring environmental risk, nature reserves, landscape |
| 143. | geoscientificInformation | 008 | information pertaining to earth sciences Examples: geophysical features and processes, geology, minerals, sciences dealing with the composition, structure and origin of the earth's rocks, risks of earthquakes, volcanic activity, landslides, gravity information, soils, permafrost, hydrogeology, erosion |
| 144. | health | 009 | health, health services, human ecology, and safety Examples: disease and illness, factors affecting health, hygiene, substance abuse, mental and physical health, health services |
| 145. | imageryBaseMapsEarthCover | 010 | base maps Examples: land cover, topographic maps, imagery, unclassified images, annotations |
| 146. | intelligenceMilitary | 011 | military bases, structures, activities Examples: barracks, training grounds, military transportation, information collection |
| 147. | inlandWaters | 012 | inland water features, drainage systems and their characteristics Examples: rivers and glaciers, salt lakes, water utilization plans, dams, currents, floods, water quality, hydrographic charts |
| 148. | location | 013 | positional information and services Examples: addresses, geodetic networks, control points, postal zones and services, place names |
| 149. | oceans | 014 | features and characteristics of salt water bodies (excluding inland waters) Examples: tides, tidal waves, coastal information, reefs |
| 150. | planningCadastre | 015 | information used for appropriate actions for future use of the land Examples: land use maps, zoning maps, cadastral surveys, land ownership |
| 151. | society | 016 | characteristics of society and cultures Examples: settlements, anthropology, archaeology, education, traditional beliefs, manners and customs, demographic data, recreational areas and activities, social impact assessments, crime and justice, census information |
| 152. | structure | 017 | man-made construction Examples: buildings, museums, churches, factories, housing, monuments, shops, towers |
| 153. | transportation | 018 | means and aids for conveying persons and/or goods Examples: roads, airports/airstrips, shipping routes, tunnels, nautical charts, vehicle or vessel location, aeronautical charts, railways |
| 154. | utilitiesCommunication | 019 | energy, water and waste systems and communications infrastructure and services Examples: hydroelectricity, geothermal, solar and nuclear sources of energy, water purification and distribution, sewage collection and disposal, electricity and gas distribution, data communication, telecommunication, radio, communication networks |
| Additional entries | | | |
| 155. | TRF | 020 | |
| 156. | ICRF | 021 | |
| 157. | EOP | 022 | |
| 158. | hydrology | 023 | |
| 159. | climatology | 024 | |
| 160. | Mapping function | 025 | |
| 161. | GPS | 026 | |
| 162. | DORIS | 027 | |
| 163. | LASER | 028 | |

| | Name | Domain code | Definition |
|------|------------------|-------------|------------|
| 164. | VLB | 029 | |
| 165. | Gravity | 030 | |
| 166. | Gravity models | 031 | |
| 167. | Absolute gravity | 032 | |
| 168. | | | |
| 169. | | | |
| 170. | | | |
| 171. | | | |
| 172. | | | |
| 173. | | | |
| 174. | | | |
| 175. | | | |
| 176. | | | |
| 177. | | | |
| 178. | | | |
| 179. | | | |

GGOS DataFrequencyCode <<CodeList>> (GGOS)

| | Name | Domain code | Definition |
|-----|------------------------|-------------|--|
| 1. | GGOS_DataFrequencyCode | DataFreqCd | Temporal sampling frequency of the data within the dataset |
| 2. | continuous | 001 | More than once per minute |
| 3. | 1-minute | 002 | |
| 4. | 5-minute | 003 | |
| 5. | 10-minute | 004 | |
| 6. | 15-minute | 005 | |
| 7. | 30-minute | 006 | |
| 8. | hourly | 007 | |
| 9. | 3-hourly | 008 | |
| 10. | 6-hourly | 009 | |
| 11. | 8-hourly | 010 | |
| 12. | 12-hourly | 011 | |
| 13. | daily | 012 | |
| 14. | weekly | 013 | |
| 15. | 10-daily | 014 | |
| 16. | fortnightly | 015 | |
| 17. | monthly | 016 | |
| 18. | quarterly | 017 | |
| 19. | biannually | 018 | |
| 20. | annually | 019 | |
| 21. | decadally | 020 | Decade or longer |
| 22. | irregularly | 021 | |

Table 4

Standardized Data Formats

| Format | Description | Version | ASCII/ Binary | Type | IGS | ILRS | IVS | IDS |
|----------|---|-----------------------|------------------|------|-----|-------|-----|-----|
| RINEX | Receiver Independent Exchange format that can accommodate GNSS data (GPS, GLONASS, future Galileo). Seven main file types: C (satellite and receiver clock), D (Hatanaka compressed GNSS observation data) G (GLONASS broadcast ephemeris), H (GEO broadcast ephemeris) M (meteorological), N (GPS broadcast ephemeris), O (GNSS observation data). Each file type consists of a header and data section which contains information for the entire file. Each file contains the data from one receiver and one session (e.g., day, hour, sub-hour). Observables are: time, pseudo-range, phase, and Doppler. ftp://igscb.jpl.nasa.gov/pub/data/format/rinex210.txt ftp://igscb.jpl.nasa.gov/pub/data/format/rinex211.txt ftp://igscb.jpl.nasa.gov/pub/data/format/rinex300.txt | 2.10, 2.11 3.0 (F) | A | D | X | | | |
| Hatanaka | Compression format used with RINEX observation data files ftp://terras.gsi.go.jp/software | 4.0. | A | D | X | | | |
| NPT | Normal point format. Data are sampled over time based upon the presence of some minimum number of data points in the sampling interval Data record contains data from one station and one pass segment. Pass segment consists of a header record followed by data records. http://ilrs.gsfc.nasa.gov/products_formats_procedures/normal_point/np_format.html | 2 | A | D | | X | | |
| FR | Full-rate format. The full-rate data are sorted by satellite and time and are available in daily and monthly increments. http://ilrs.gsfc.nasa.gov/products_formats_procedures/fullrate/fr_format_v3.html | 3 | A | D | | X | | |
| CRD | Consolidated Laser Ranging Data format under development. An integrated, flexible, extensible format for the ILRS full-rate, sampled engineering, and normal point data. Will accommodate transponder data and to handle high repetition rate laser data without unnecessary redundancy. File consists of header, configuration, and data records from one satellite and one session (hourly, daily, monthly). http://ilrs.gsfc.nasa.gov/products_formats_procedures/crd.html | 0.26 | A | | | X | | |
| CPF | Consolidated Prediction Format. The CPF information accurately predicts positions and ranges for a much wider variety of laser ranging targets than had been previously possible. CPF files include daily tables of X, Y, and Z positions for each target which can then be interpolated for very accurate predictions. CPF provides an expanded format capability and greatly improves tracking on low satellites because the full modeling potential of the orbit computation at the prediction center will be passed on to the stations. http://ilrs.gsfc.nasa.gov/products_formats_procedures/predictions/cpf.html | 1.01 | A | P | | X | | |
| SINEX | Software Independent Exchange Format. General-purpose solution exchange format for space geodesy that facilitates the task of combining solutions. SINEX was designed to be modular and general enough to handle multiple techniques. It provides complete information on a priori information that can be removed when required, making it unnecessary to submit or distribute multiple SINEX solution files, e.g. constrained and unconstrained (free) solution files. Also used for VLBI experiment data. http://ilrs.gsfc.nasa.gov/products_formats_procedures/predictions/cpf.html | 2.01 | A | P | X | X | X | X |
| SP | Standard Product (for orbits) for all satellite types. The basic format is a position and clock record; a second, optional, record contains velocities and clock rates-of-change. Also includes satellite clock corrections, orbit accuracy exponents, comment lines, as many as three different sets of | SP3c, SP1 | A | | X | X (F) | | X |

| | | | | | | | | |
|-----------------|---|--------|---|---|---|---|---|---|
| | satellite position accuracy indicators. ftp://igscb.jpl.nasa.gov/pub/data/format/sp1.pdf ftp://igscb.jpl.nasa.gov/pub/data/format/sp3c.txt | | | | | | | |
| IONEX | Ionosphere Exchange format. A common data format to exchange, compare, or combine TEC maps. Supports the exchange of 2- and 3-dimensional TEC maps given in a geographic grid. ftp://igscb.jpl.nasa.gov/pub/data/format/ionex1.pdf | 1 | A | P | X | | | |
| Site log | Information organized by section describing sites used by analysts in reducing data. Information includes site IDs, location, coordinates/eccentricities, surveys, co-location, instrument information, site ownership, etc. ftp://igscb.jpl.nasa.gov/pub/station/general/blank.log ftp://cddis.gsfc.nasa.gov/reports/slrlog/slr_blank.txt ftp://ivscc.gsfc.nasa.gov/pub/config/ns-config.txt | | A | O | X | X | X | X |
| ANTEX | Contain information for GNSS satellite and receiver antennas, including phase center offsets. ftp://igscb.jpl.nasa.gov/pub/station/general/antex13.txt | 1.3 | A | O | X | | | |
| Tropo SINEX | Format based on SINEX for the series of total zenith path delay transformed to precipitable water vapor. ftp://igscb.jpl.nasa.gov/pub/data/format/sinex_tropo.txt | 0.01 | A | P | X | | | |
| ERP | ftp://igscb.jpl.nasa.gov/pub/data/format/erp.txt | 2 | A | P | X | | | |
| GSFC DB | Goddard VLBI database format. The VLBI database is a binary format for archiving and handling geodetic/astrometric observables delay and delay rate generated by fringe-fitting algorithms from raw correlator output. Developed for the CALC/SOLVE data analysis system, the files also contain other generated outputs such as correlation coefficients, fringe amplitudes and total phases; cable calibration and station weather information; theoretical observables and parameter partial derivatives (from CALC); and editing and ambiguities (from SOLVE). http://gemini.gsfc.nasa.gov/solve/ | 8.8.89 | B | D | | | X | |
| NGS Card | NGS format for VLBI data transfer. Partial ASCII transcription of a Goddard database file. This format is being used by VLBI analysis packages such as Modest, Occam, and SteelBreeze. http://lacerta.gsfc.nasa.gov/mk5/help/dbngs_format.txt | | A | D | | | X | |
| Baseline length | Time series of baseline lengths consisting of downloadable baseline length results, including graphs and statistics, for a chosen baseline. An automatic script computes the information online from the submissions of six participating Analysis Centers as well as a combined solution. The data, residual, and plot files for all seven time series can be downloaded for further analysis. http://vlbi.geod.uni-bonn.de/baseline-project/ | | A | P | | | X | |
| DORIS data | Standard exchange format for range-rate observations; DORIS-specific. ftp://ftp.cls.fr/pub/ids/data/doris21.fmt | 2.1 | A | D | | | | X |
| STCD | Station Coordinate Difference format for time series of coordinates expressed at a reference epoch. Provides coordinate time-series results in both Cartesian and ellipsoidal coordinates. Coordinate time-series consist of residuals relative to a reference position. Each coordinate of the series is assumed to be expressed in the same reference system as at the observation epoch. http://ids.cls.fr/documents/report/CB_STCD_format_v1.0.pdf | 1.0 | A | D | | | | X |

A=ASCII
B=Binary
D=Data

P=Product
O=Other
F=Future

Table 5

IAG Geometric Services Comparison Chart

– Data –

| Item | IGS | ILRS | IVS | IDS |
|-------------------------------|---|--|--|------------------------------------|
| Data Storage at | Global, Regional, and Local Data Centers | Global, Regional, and Operational Data Centers | Data Centers | Data Centers |
| Primary (Global) Data Centers | CDDIS (USA), SIO (USA), IGN (France), KASI (Korea) | CDDIS (USA), EDC (Germany) | CDDIS (USA), BKG (Germany), OPAR (France) | CDDIS (USA), IGN (France) |
| Regional Data Centers | BKG (Germany), GA (Australia), NRCAN (Canada), NGS (USA), JPL (USA) | Shanghai (China) | CNR (Italy), GeoDAF (Italy), NICT (Japan) | – |
| Data Availability | 1990 to today | 1976 to today | 1979 to today | 1990 to today |
| Data File Organization | Sub-hourly, hourly, and daily files per station (grouped by year and day-of-year) | Hourly, daily, and monthly files per satellite and station (grouped by year and satellite) | Session-wise (grouped by year and session) | 10-day “cycle” files per satellite |
| Format of Data Files | RINEX (obs, nav, met) | NP Format (quick-look), Full-rate Format | Goddard data base format (binary), NGS card format (ASCII) | DORIS format |
| Auxiliary Data Files | official abbrev. for rcvr, ant, radomes (rcvr_ant.tab); ant. phase center (igs_01.pcv); reference pt info (antenna.gra) | Satellite orbit prediction files (by email or ftp) | Observing schedules, session logs, met data, notes | Satellite information |
| Standard compression software | Z compressed format | Z compressed format | Z compressed format | Z compressed format |
| Special compression software | Hatanaka | – | – | – |
| Data Transfer Mechanism | FTP | FTP | FTP | FTP |

– non-existent; n/a not applicable

Table 6

IAG Geometric Services Comparison Chart
– Products –

| Item | IGS | ILRS | IVS | IDS | IERS |
|-------------------------------|---|---|---|---|---|
| Analysis Centers (AC) | about 10 ACs, additional AACs | 8 ACs, additional AACs | about 20 ACs | 6 ACs, additional AACs | product centers (TRF, EOP, rapid service/prediction), convention center |
| Software | Gipsy/OASIS, Bernese, GAMIT, EPOS, PAGE, NAPEOS | Geodyn, Solve, UTOPIA, DOGS, EPOS, SATAN, GINS/MATLO | Calc/Solve, Modest, Occam, Gloria, SteelBreeze, Geosat | Gipsy/OASIS, Geodyn, Zoom, GINS, Bernese | Various |
| Combined Solution | Analysis Center Coordinator, & Product Centers (RF, Time) | Analysis Coordinator (primary and backup) | Analysis Coordinator | Analysis Coordinator | Combination Centers |
| Products Overview | http://igsb.jpl.nasa.gov/components/prods.html | http://ilrs.gsfc.nasa.gov/products_formats_procedures/products.html | http://ivsc.gsfc.nasa.gov/products-data/products.html | http://ids.cls.fr/html/analysis_coord/documents/struct_dc.html | http://www.iers.org/MainDisp.csl?pid=8-10 |
| Product Types: | | | | | |
| Satellite Orbit Prediction | – | daily | n/a | – | n/a |
| Satellite Orbit Determination | satellite ephemerides for GPS (4 types) and GLONASS (2 types) | { satellite ephemerides } | n/a | n/a | n/a |
| Satellite Clocks | GPS clock information | n/a | n/a | n/a | n/a |
| EOP | Polar motion, Polar motion rates, length-of-day | EOP, length-of-day | session-wise EOP solution (EOP-S) | Polar motion, length-of-day | Long term, rapid service, and predictions for EOP |
| | | | 1-hour Intensive EOP solution (EOP-I) | | |
| TRF | IGS tracking station coordinates and velocities | TRF solution (station positions and velocities) | TRF solution (station positions, velocities, correlations) roughly every 3 months | Weekly and monthly time series of DORIS station positions, cumulative solutions (positions/velocities), time series of coordinates of the TRF origin, station coordinate difference plots | ITRF |
| CRF | n/a | n/a | CRF solution at irregular time schedule | n/a | ICRF |
| Troposphere | Zenith tropospheric path delay estimates | – | troposphere parameters per session and station | – | – |
| Ionosphere | Global ionospheric maps | – | – | derived vertical total electron content (VTEC) | – |
| Contributions to IERS | Station positions, polar motion, polar motion rates, length-of-day (weekly combined solutions) | Station positions, polar motion, length-of-day (weekly combined solutions) | EOP & position (DSNX) (combined solutions by session) | Station positions, polar motion, length-of-day (weekly combined solutions) | n/a |

– non-existent; n/a not applicable; { } planned

Table 7

IAG Geometric Services Comparison Chart
– Service Information –

| Item | IGS | ILRS | IVS | IDS | IERS |
|----------------------|---|---|---|---|---|
| Service Inauguration | 1994 | 1998 | 1999 | 2003 | 1988 |
| Organization (Chart) | http://igsb.jpl.nasa.gov/organization/figure1.html | http://ilrs.gsfc.nasa.gov/about_ilrs/organiza.html | http://ivscc.gsfc.nasa.gov/about/org/index.html | http://ids.cls.fr/html/organization/schema.html | http://www.iers.org/MainDisp.csl?pid=15-33 |
| Terms of Reference | http://igsb.jpl.nasa.gov/organization/bylaws.html | http://ilrs.gsfc.nasa.gov/about_ilrs/termsref.html | http://ivscc.gsfc.nasa.gov/about/org/documents/ivsTOR.html | http://ids.cls.fr/html/organization/tor.html | http://www.iers.org/MainDisp.csl?pid=14-36 |
| Publications | Annual Reports, Technical Reports, Workshop Proceedings | Annual Reports, Performance Report Cards, Special Reports | Annual Reports, Newsletters, General Meeting Proceedings | Annual Reports, Workshop Proceedings | Annual Reports, Bulletins, Technical Notes |
| Meetings | Workshop | General Assembly, Technical Workshop | General Meeting, Technical Meeting, Workshop | Workshop | Workshop |
| Working Groups | Reference Frame, Clock Products, Troposphere, Ionosphere, GNSS, LEO, Real-Time, Data Center | Analysis, Data Formats and Procedures, Missions, Networks and Engineering, Transponder | GPS Phase Center Mapping, IVS Product Specification and Observing Programs, VLBI2010, Second Realization of the ICRF | Analysis, Site Selection | Site Survey and Co-Location, Combination, Prediction, Second Realization of the ICRF |
| Pilot Projects | Tide Gauge Benchmark Monitoring, GLONASS (closed) | – | Tropospheric parameters (closed), Baseline products | – | – |
| Mailing Lists | http://igsb.jpl.nasa.gov/mail/mailindex.html | http://ilrs.gsfc.nasa.gov/contact_ilrs/mail_services/ | http://ivscc.gsfc.nasa.gov/mailman/listinfo | http://ids.cls.fr/html/report/doris_mails.html | http://www.iers.org/MainDisp.csl?pid=45-25788 |
| FTP Archives | ftp://igsb.jpl.nasa.gov/igsb | At data centers | ftp://ivscc.gsfc.nasa.gov/pub/ | http://ids.cls.fr/html/data_centers.html | http://www.iers.org/MainDisp.csl?pid=34-8 |

– non-existent; n/a not applicable

Table 8

IAG Geometric Services Comparison Chart
– Site Information –

| Item | IGS | ILRS | IVS | IDS |
|---|---|---|---|---|
| Network Map | http://igscb.jpl.nasa.gov/network/maps/allmaps.html | http://ilrs.gsfc.nasa.gov/stations/index.html | http://ivscs.gsfc.nasa.gov/stations/ns-map.html | http://ids.cls.fr/html/doris/sitelog.html |
| Network List | http://igscb.jpl.nasa.gov/network/list.html | http://ilrs.gsfc.nasa.gov/stations/sitelist/index.html | ftp://ivscs.gsfc.nasa.gov/about/org/components/ns-list.html | http://ids.cls.fr/html/doris/sitelog.html |
| Form of Site Log | ASCII file | HTML document or ASCII file | ASCII file | ASCII file |
| Example Site Log (Greenbelt) | http://igscb.jpl.nasa.gov/igscb/station/log/gode_20030911.log | ftp://cddis.gsfc.nasa.gov/pub/reports/slrlog | http://ivscs.gsfc.nasa.gov/pub/config/ns/ggao.config.txt | http://ids.cls.fr/html/doris/stations/GREB.shtml |
| Site Identification | [Sec 1] site name, 4-character ID, DOMES, CDP number | [Sec 1&3] site name, DOMES, CDP number, 4-char code | [Sec 1] site name, 8-letter code, DOMES, CDP number | [Sec 1] site name, DOMES, 4-char code |
| Approx. Station Coordinates | [Sec 2] | [Sec 2] | [Sec 2.1] | [Sec 1&3&4] |
| Tectonic Plate | [Sec 2] | [Sec 2] | [Sec 2.1] | [Sec 1] |
| Geologic Information | [Sec 1] | [Sec 1] | – | [Sec 1] |
| Monument/Marker Description | [Sec 1] | [Sec 1] | – | [Sec 2] |
| Local Surveys | – | – | [Sec 2.2] | – |
| Local Ties, Collocation | [Sec 5&7] local vectors between collocated techniques | [Sec 13] local vectors between co-located techniques, vectors between collocated SLR systems | [Sec 10] list of techniques, no local difference vectors | [Sec 5&6&7] local vectors between co-located techniques, vectors between collocated DORIS system |
| Instrument Information (antenna, receiver, laser) | [Sec 3&4] incl. history of antenna and receiver changes | [Sec 4&5&6] | [Sec 3&4] | [Sec 2&3] |
| Local Events (possibly affecting position) | – | [Sec 14] | – | – |
| Time/Frequency Standards | [Sec 6] | [Sec 9] | [Sec 8] | – |
| Meteorological Instrumentation | [Sec 8] | [Sec 12] | [Sec 7] | [Sec 8] |
| Field System Computer | – | – | [Sec 11] | – |
| Aircraft Detection | n/a | [Sec 11] | n/a | n/a |
| Local Contact Information | [Sec 11] | [Sec 15] | [Sec 13] | [Sec 9] |

[Sec ?] Section in site log file; – non-existent; n/a not applicable

Table 9

Selected keywords as used in the Global Change Master Directory (GCMD).

For full information please go to http://gcmd.gsfc.nasa.gov/Resources/valids/gcmd_parameters.html.

*Olsen, L.M., G. Major, K. Shein, J. Scialdone, R. Vogel, S. Leicester, H. Weir, S. Ritz, T. Stevens, M. Meaux, C. Solomon, R. Bilodeau, M. Holland, T. Northcutt, R. A. Restrepo, 2007 .
NASA/Global Change Master Directory (GCMD) Earth Science Keywords. Version 6.0.0.0.0*

GCMD Earth Science Keywords

TOPIC > TERM > VARIABLE_LEVEL_1

Land Surface > Topography > Contours
Land Surface > Topography > Landforms
Land Surface > Topography > Surface Roughness
Land Surface > Topography > Terrain Elevation
Land Surface > Topography > Topographic Effects
Land Surface > Topography > Topographical Relief
Oceans > Coastal Processes > Sea Level Rise
Oceans > Coastal Processes > Sea Surface Height
Oceans > Sea Surface Topography > Sea Surface Height
Oceans > Sea Surface Topography > Sea Surface Slope
Oceans > Tides > Storm Surge
Oceans > Tides > Tidal Components
Oceans > Tides > Tidal Currents
Oceans > Tides > Tidal Height
Oceans > Tides > Tidal Range
Solid Earth > Geodetics/Gravity > Control Surveys
Solid Earth > Geodetics/Gravity > Crustal Motion
Solid Earth > Geodetics/Gravity > Geoid Properties
Solid Earth > Geodetics/Gravity > Gravitational Field
Solid Earth > Geodetics/Gravity > Gravity
Solid Earth > Geodetics/Gravity > Ocean Crust Deformation
Solid Earth > Geodetics/Gravity > Polar Motion
Solid Earth > Geodetics/Gravity > Reference Systems
Solid Earth > Geodetics/Gravity > Rotational Variations
Solid Earth > Geodetics/Gravity > Satellite Orbits
Solid Earth > Tectonics > Plate Boundaries
Solid Earth > Tectonics > Plate Tectonics
Solid Earth > Tectonics > Strain
Terrestrial Hydrosphere > Glaciers/Ice Sheets > Glacier Thickness/Ice Sheet Thickness
Terrestrial Hydrosphere > Glaciers/Ice Sheets > Glacier Topography/Ice Sheet Topography

GCMD Earth Science Services Keywords

TOPIC > TERM > VARIABLE

Data Analysis And Visualization > Calibration/Validation
Data Analysis And Visualization > Geographic Information Systems > Desktop Geographic Information Systems
Data Analysis And Visualization > Geographic Information Systems > Web-based Geographic Information Systems
Data Analysis And Visualization > Geographic Information Systems
Data Analysis And Visualization > Global Positioning Systems
Data Management/Data Handling > Data Interoperability > Data Reformatting
Data Management/Data Handling > Data Interoperability
Data Management/Data Handling > Data Mining
Data Management/Data Handling > Data Networking/Data Transfer Tools
Data Management/Data Handling > Data Search And Retrieval

GCMD Data Center Keywords

SHORT_NAME > LONG_NAME

Models > Hydrologic And Terrestrial Water Cycle Models

Models > Land Surface Models DE/FIH/GRDC > Global Runoff Data Center, Federal Institute of Hydrology, Germany

DE/GFZ > Geo Research Center Potsdam, Germany

DE/GFZ/ISDC > Information System and Data Center, GeoForschungszentrum Potsdam, Germany

DE/GKSS/ICR > Institute for Coastal Research, GKSS Forschungszentrum GmbH Geesthacht, Germany

EU/JRC/INSPIRE > Infrastructure for Spatial Information in Europe, Joint Research Center, European Union

GCMD Project Keywords

SHORT_NAME > LONG_NAME

GIANT > Geodetic Infrastructure in Antarctica

GIG91 > GPS IERS and Geodynamics Experiment

GCMD Instrument Keywords

Short Name > Long Name

GLAS > Geoscience Laser Altimeter System

ALT (TOPEX) > TOPEX Radar Altimeter

ALTIMETERS

KBR > K-Band Ranging system

POSEIDON-2 > JASON-1 RADAR ALTIMETER

RA > ERS Radar Altimeter

RADAR ALTIMETERS

SSALT > POSEIDON Solid State Radar Altimeter

C-SAR > C-Band Synthetic Aperture Radar

GEOSAR > Geographic Synthetic Aperture Radar

SAR > Synthetic Aperture Radar

SIR-A > Shuttle Imaging Radar-A

SIR-B > Shuttle Imaging Radar-B

SIR-C > Spaceborne Imaging Radar-C

SLAR > Side-Looking Airborne Radar

SLRAR > Side-Looking Real Aperature Radar

SRTM > Shuttle Radar Topography Mission

X-SAR > X-Band Synthetic Aperture Radar

MOBLAS > Mobile Laser Systems

LASERS > Light Amplification by Stimulated Emission of Radiation

LIDAR > Light Detection and Ranging

GPS > Global Positioning System

GPS CLOCKS

GPS RECEIVERS

GRAS > Global navigation satellite system Receiver for Atmospheric Sounding

LASER REFLECTOR

LASER TRACKING REFLECTOR

LRA > Laser Retroreflector Array

LRR > Laser Retro-Reflector

RIS > Retroreflector in Space

SLR > Satellite Laser Ranging

TLRS > Transportable Laser Ranging Systems

SDPTR > Satellite Doppler Positioning Transit Receivers

SUPERSTAR > Space Triaxial Accelerometer for Research Missions

ARGOS > ARGOS Data Collection and Position Location System

DORIS > Doppler Orbitography and Radiopositioning Integrated by Satellite

HAIRS > High Accuracy Inter-satellite Ranging System

INS > Inertial Navigation System

LORAN > Long Range Navigation

GYROS

GPS SONDE

RADIOMETERS

BOTTOM PRESSURE GAUGES
GROUND WATER LEVEL GAUGES
GWLG > GROUND WATER LEVEL GAUGES
RAIN GAUGES
TIDE GAUGES
WATER LEVEL GAUGES
ACCELEROMETERS
GRAVIMETERS
INCLINOMETERS
LRGM > Lacoste-Romberg Gravity Meter
SUPERCONDUCTING GRAVIMETER
SEISMOGRAPHS
SEISMOMETERS
THEODOLITE
BAROMETERS
CLINOMETERS
PRESSURE SENSORS
SOIL MOISTURE PROBE
SODAR > Sound Detection and Ranging
SONAR > Sound Navigation and Ranging
CLOCKS
OPTICAL TELESCOPES
VIRGO > Variability of Solar Irradiance and Gravity Oscillations
VLA > The Very Large Array
VLBI > Very Long Baseline Interferometry

GCMD Platform Keywords

SHORT_NAME > LONG_NAME
AERIAL PHOTOGRAPHS
AIRCRAFT
AJISAI > Experimental Geodetic Satellite (Japanese EGS)
ALOS > Advanced Land Observing Satellite
ANTHMS > Antarctic Hydrometric Stations
APOLLO
ARWS > Automatic Remote Weather Station
ASOS > Automated Surface Observing System
BALLOONS
BE-B > Beacon Explorer-B
BE-C > Beacon Explorer-C
BUOYS
CHAMP > Challenging Minisatellite Payload
COASTAL STATIONS
CRYOSAT
DEM > Digital Elevation Model
ECHO-1
ECHO-2
ENVISAT > Environmental Satellite
ETALON-1
ETALON-2
GEODYNAMIC STATIONS
GEOSAT > Geodetic Satellite
GEOSTATIONARY SATELLITES
GFO-1 > GEOSAT FOLLOW-ON-1
GFZ-1 > GeoForschungsZentrum-1
GLONASS-40-82 > Global Navigation Satellite System 40-82
GPS > Global Positioning System Satellites
GPS-35 > Global Positioning System Satellites-35
GPS-36 > Global Positioning System Satellites-36
GRACE > Gravity Recovery and Climate Experiment
GRAVITY STATIONS
GROUND STATIONS
GROUND-BASED OBSERVATIONS

GSN > Global Seismic Network
JASON-1
JERS-1 > Japanese Earth Resources Satellite-1
LABORATORY
LAGEOS-1 > Laser Geodetic Satellite-1
LAGEOS-2 > Laser Geodetic Satellite-2
LANDSAT
LANDSAT-1
LANDSAT-2
LANDSAT-3
LANDSAT-4
LANDSAT-5
LANDSAT-7
METEOROLOGICAL STATIONS
MODELS
NAVSTAR > NAVSTAR Global Positioning System
OBSERVATORIES
OCEAN PLATFORMS
RADIOSONDES
SEASAT > Ocean Dynamics Satellite
SEISMOLOGICAL STATIONS
SGO > Superconducting Gravimeter Observatory
SHIPS
SPACE SHUTTLES
SPACELAB-1
SPACELAB-3
SPAS-II > Shuttle Pallet Satellite-II
SPOT-1 > Systeme Probatoire Pour l'Observation de la Terre-1
SPOT-2 > Systeme Probatoire Pour l'Observation de la Terre-2
SPOT-3 > Systeme Probatoire Pour l'Observation de la Terre-3
SPOT-4 > Systeme Probatoire Pour l'Observation de la Terre-4
SPOT-5 > Systeme Probatoire Pour l'Observation de la Terre-5
STARLETTE
STELLA
TERRA > Earth Observing System, TERRA (AM-1)
TOPEX/POSEIDON > Ocean Topography Experiment
WEATHER STATIONS
WESTPAC > Western Pacific Laser Satellite

Table 10

| GIERS | GPB (GPB = GeoPortal.Bund) | | | C O R E | M C O | Condition | Meaning | Short name | Domain | GGOS Name |
|------------------------------|----------------------------|---------------------------------|--|------------------|-------------|---|--|------------------|----------------------|--|
| metaData | | MD_Metadata Metadata (1) | | ... | | | | | | |
| metadataFileIdentifier | yes | fileIdentifier (2) | | O | | | unique identifier for this metadata file | mdFileID | Free text | Metadata file identifier |
| metadataLanguage | yes | language (3) | | C | | not defined by encoding? | language used for documenting metadata | mdLang | ISO 639-2 | Metadata language |
| metadataCharacterSet | yes | characterSet (4) | | C | | ISO/IEC 10646-1 not used and not defined by encoding? | full name of the character coding standard used for the metadata set | mdChar | ISO 19115 B.5.10 | Metadata character set |
| - | ? | parentIdentifier (5) | | C | | (6) is not equal to "dataset" | file identifier of the metadata to which this metadata is a subset (child) | mdParentID | Free text | Metadata parent identifier |
| - | yes | hierarchyLevel (6) | | C | | (6) is not equal to "dataset" (default) | scope to which the metadata applies | mdHrLv | ISO 19115 B.5.25 | Metadata hierarchy level |
| - | yes | hierarchyLevelName (7) | | C | | (6) is not equal to "dataset" | name of hierarchy levels for which the metadata is applied | mdHrLvName | Free text | Metadata hierarchy level name |
| metadataContact | | contact (8) | CI_ResponsibleParty RespParty (374) | (M) | | | | [mdContact] | | |
| individualName | yes | individualName (375) | | C | | (376) and (377) not documented | name of responsible person for the metadata (surname, given name, title) | rpIndName | Free text | Metadata contact individual name |
| organisationName | yes | organisationName (376) | | C | | (375) and (377) not documented | name of responsible organization for the metadata | rpOrgName | Free text | Metadata contact organisation name |
| positionName | no | positionName (377) | | C | | (375) and (376) not documented | role or position of the person responsible for the metadata | rpPosName | Free text | Metadata contact position name |
| contactInfo | | contactInfo (378) | CI_Contact Contact (387) | ... | | | | [rpCntInfo] | | |
| phone | | phone (388) | CI_Telephone Telephone (407) | ... | | | | [cntPhone] | | |
| voice | yes | voice (408) | | O | | | telephone number of organisation or individual responsible for the metadata | voiceNum | Free text | Metadata contact phone voice |
| facsimile | no | facsimile (409) | | O | | | facsimile number of organisation or individual responsible for the metadata | faxNum | Free text | Metadata contact phone facsimile |
| address | | address (389) | CI_Address Address (380) | ... | | | | [cntAddress] | | |
| deliveryPoint | no | deliveryPoint (381) | | O | | | address line for the location of organis. or individ. responsible for the metadata | delPoint | see ISO11180 Annex A | Metadata contact address delivery point |
| city | no | city (382) | | O | | | city of the location of organis. or ... | city | Free text | Metadata contact address city |
| administrativeArea | no | administrativeArea (383) | | O | | | state, province of the location of org. ... | adminArea | Free text | Metadata contact address administrative area |
| postalCode | no | postalCode (384) | | O | | | ZIP or other postal code of the loc. ... | postCode | Free text | Metadata contact address postal code |
| country | no | country (385) | | O | | | country of the pyhsical address of ... | country | ISO 3166-3 | Metadata contact address country |
| <u>electronicMailAddress</u> | yes | electronicMailAddress (386) | | O | | | eMail address of organis. or individ. ... | eMailAdd | Free text | Metadata contact address electronic mail |
| - | | onlineResource (390) | CI_OnlineResource OnlineRes (396) | ... | | | | [cntOnlineRes] | | |
| onlineAddress | no | linkage (397) | | M | | | URL for on-line information about the organisation or individual responsible... | linkage | URL | Metadata contact address online resource |
| <u>role</u> | yes | role (379) | | M | | | function performed by the party responsible for the metadata | role | ISO 19115 B.5.5 | Metadata contact role |
| metadataDateStamp | yes | dateStamp (9) | | M | | | date that the metadata was created | mdDateSt | ISO19115 B.4.2 | Metadata date stamp |
| metadataStandardName | yes | metadataStandardName (10) | | O | | | name of the metadata standard (including profile name) used | mdStanName | Free text | Metadata standard name |
| metadataStandardVersion | yes | metadataStandardVersion (11) | | O | | | version (profile) of the metadata standard used | mdStanVer | Free text | Metadata standard version |
| referenceSystemInfo | | referenceSystemInfo (13) | MD_ReferenceSystem RefSystem (186) | ... | | | | [refSysInfo] | | |
| - | | referenceSystemIdentifier (187) | RS_Identifier Rsident (208) | ... | | | | [refSysId] | | |
| <u>referenceIdentifier</u> | yes | code (207) | | O | | | name of reference system used | identCode | Free text | Dataset reference system name |
| identificationInfo | | identificationInfo (15) | MD_Identification Ident (23) | ... | | | | [dataIdInfo] | | |
| citation | | citation (24) | CI_Citation Citation (359) | ... | | | | [idCitation] | | |
| <u>resourceTitle</u> | yes | title (360) | | M | | | name by which the cited resource is known | resTitle | Free text | Dataset citation title |
| - | yes | alternateTitle (361) | | O | | | short name or other language name by which the cited information is known | resAltTitle | Free text | Dataset citation alternate title |
| auf der Ebene | | date (362) | CI_Date DateRef (393) | (M) | | | | resRefDate | | |
| identificationinfo | yes | date (394) | | M | | | reference date for the cited resource | refDate | ISO19115 B.4.2 | Dataset citation date |
| eingeorndet! (mehrfach!) | yes | dateType (395) | | M | | | event used for reference date | refDateType | ISO 19115 B.5.2 | Dataset citation date type |
| abstract | yes | abstract (25) | | M | | | brief narrative summary of the content of the resource(s) | idAbs | Free text | Dataset abstract |
| - | yes | status (28) | | O | | | status of the resource(s) | idStatus | ISO 19115 B.5.23 | Dataset status |
| pointOfContact | | pointOfContact (29) | CI_ResponsibleParty RespParty (374) | (O) | | | | [idPoC] | | |
| individualName | yes | individualName (375) | | C | | (376) and (377) not documented | name of person responsible for the data (surname, given name, title) | rpIndName | Free text | Dataset contact individual name |
| organisationName | yes | organisationName (376) | | C | | (375) and (377) not documented | name of organisation responsible for the data | rpOrgName | Free text | Dataset contact organisation name |
| positionName | no | positionName (377) | | C | | (375) and (376) not documented | role or position of the person responsible for the data | rpPosName | Free text | Dataset contact position name |

| | | | | | | | | |
|---|-----|--------------------------------|---|--|---|------------------|-------------------------------|--|
| contactInfo | | contactInfo (378) | CI_Contact Contact (387) | | | [rpCntInfo] | | |
| phone | | | phone (388) | CI_Telephone Telephone (407) | | [cntPhone] | | |
| voice | yes | | voice (408) | O | | voiceNum | Free text | Dataset contact phone voice |
| <u>facsimile</u> | yes | | facsimile (409) | O | | faxNum | Free text | Dataset contact phone facsimile |
| address | | | address (389) | CI_Address Address (380) | | [cntAddress] | | |
| deliveryPoint | yes | | deliveryPoint (381) | O | | delPoint | see ISO11180 Annex A | Dataset contact address delivery point |
| city | yes | | city (382) | O | | city | Free text | Dataset contact address city |
| administrativeArea | no | | administrativeArea (383) | O | | adminArea | Free text | Dataset contact address administrative area |
| postalCode | yes | | postalCode (384) | O | | postCode | Free text | Dataset contact address postal code |
| country | yes | | country (385) | O | | country | ISO 3166-3 | Dataset contact address country |
| <u>electronicMailAddress</u> | yes | | electronicMailAddress (386) | O | | eMailAdd | Free text | Dataset contact address electronic mail |
| - | | | onlineResource (390) | CI_OnlineResource OnlineRes (396) | ... | [cntOnlineRes] | | |
| onlineAddress | yes | | linkage (397) | M | | linkage | URL | Dataset contact address online resource |
| <u>role</u> | yes | role (379) | | M | | role | ISO 19115 B.5.5 | Dataset contact role |
| descriptiveKeywords | | descriptiveKeywords (33) | MD_Keywords Keywords (52) | ... | | [descKeys] | | |
| - kein Unterelement | yes | keyword (53) | | M | | keyword | Free text | Dataset keywords |
| - | | | MD_DataIdentification DataIdent (36) | ... | | | | |
| spatialRepresentationType | yes | spatialRepresentationType (37) | | O | | spatRpType | ISO 19115 B.5.26 | Dataset spatial representation type |
| spatialResolution | | spatialResolution (38) | MD_Resolution Resol (59) | (O) | | [dateScale] | | |
| <u>? Leeres Element: spationResolution!</u> | yes | equivalentScale (60) | MD_RepresentativeFraction RepFract (56) | | either (69) resp. (57) or (61) must be documented | [equScale] | | |
| | no | denominator (57) | | C | | rdDenom | Integer > 0 | Dataset spatial resolution denominator |
| dataLanguage | yes | language (39) | distance (61) | C | | scaleDist | ISO 19115 B.4.3 | Dataset spatial resolution distance |
| dataCharacterSet | yes | characterSet (40) | | M | | dataLang | ISO 639-2 | Dataset language |
| topicCategory | yes | topicCategory (41) | | C | ISO/IEC 10646-1 not used? | dataChar | ISO19115 B.5.10 | Dataset character set |
| dataExtent | | extent (45) | EX_Extent Extent (334) | M | (6) equals "dataset" | tpCat | ISO19115 B.5.27 | Dataset topic category |
| description | no | description (335) | | C | (336), (337) + (338) not documented | [dataExt] | | |
| geographicElement | | geographicElement (336) | EX_GeographicExtent GeoExtent (339) | | | exDesc | Free text | Dataset extent description |
| geographicBoundingBox | | | EX_GeographicBoundingBox GeoBndBox (343) | | | [geoEle] | | |
| westBoundLongitude | yes | westBoundLongitude (344) | | C | | westBL | Angle B.4.3 [-180, 180] | Dataset extent geographic bb westBL |
| eastBoundLongitude | yes | eastBoundLongitude (345) | | C | if (6) equals "dataset" either (343) or (348) is required | eastBL | Angle B.4.3 [-180, 180] | Dataset extent geographic bb eastBL |
| southBoundLatitude | yes | southBoundLatitude (346) | | C | | southBL | Angle B.4.3 [-90, 90] | Dataset extent geographic bb southBL |
| <u>northBoundLatitude</u> | yes | northBoundLatitude (347) | | C | | northBL | Angle B.4.3 [-90, 90] | Dataset extent geographic bb northBL |
| - | | | EX_GeographicDescription GeoDesc (348) | | | | | |
| <u>geographicIdentifier</u> | yes | geographicIdentifier (349) | MD_Identifier MIdent (205) | | | code | Free text | Dataset extent geographic description ident. |
| temporalElement | | temporalElement (337) | EX_TemporalExtent TempExtent (350) | | | [tempEle] | | |
| beginDateTime | yes | extent (351) | TM_Primitive.begin (B4.5) | O | | begin | ISO 19108 | Dataset extent temporal begin |
| <u>endDateTime</u> | yes | extent (351) | TM_Primitive.end (B4.5) | O | | end | ISO 19108 | Dataset extent temporal end |
| verticalElement | | verticalElement (338) | EX_VerticalExtent VertExtent (354) | | | [vertEle] | | |
| minimumValue | no | minimumValue (355) | | O | | vertMinVal | Real | Dataset extent vertical minimum value |
| maximumValue | no | maximumValue (356) | | O | | vertMaxVal | Real | Dataset extent vertical maximum value |
| <u>unitOfMeasure</u> | no | unitOfMeasure (357) | | O | | vertUoM | ISO 19115 UomLength B.4.3 | Dataset extent vertical unit of measure |
| - | no | verticalDatum (358) | | O | | vertDatum | ISO 19115 SC_Vert.Datum B.4.9 | Dataset extent vertical datum |

| | | | | | | | | |
|--|-----------------------|--------------------------------------|---|--|---|------------------|------------------------|---------------------------------------|
| distributionInfo | distributionInfo (17) | MD_Distribution Distrib (270) | ... | | | [distInfo] | | |
| distributionFormat | | distributionFormat (271) | MD_Format Format (284) | ... | | [distFormat] | | |
| formatName | yes | | name (285) | O | name of the data transfer format(s) | formatName | Free text | Dataset distribution format name |
| <u>formatVersion</u> | yes | | version (286) | O | version of the format | formatVer | Free text | Dataset distribution format version |
| - | | distributor (272) | MD_Distributor Distributor (279) | ... | | [distributor] | | |
| - | | | distributorContact (280) | CI_ ResponsibleParty RespParty (374) | ... | [distorCont] | | |
| - | yes | | organisationName (376) | O | name of the organisation responsible for distribution | rpOrgName | Free text | Dataset distributor organisation name |
| - | yes | | role (379) | O | function performed by the party responsible for distribution | role | ISO 19115 B.5.5 | Dataset distributor role |
| - | | | distributionOrderProcess (281) | MD_StandardOrderProcess StanOrdProc (298) | ... | [distorOrdPrc] | | |
| - | yes | | fees (299) | O | fees and terms for retrieving the resource | resFees | Free text | Dataset fees |
| - | | distributorTransferOptions (283) | MD_DigitalTransferOptions DigTranOps (274) | ... | | [distorTran] | | |
| - | | | offLine (278) | MD_Medium Medium (291) | ... | [offLineMed] | | |
| offLineMedium (unterhalb von transferOptions!) | yes | | name (292) | O | name of the medium on which the resource can be received | medName | ISO 19115 B.5.20 | Dataset off-line resource name |
| transferOptions | | transferOptions (273) | MD_DigitalTransferOptions DigTranOps (274) | ... | | [distTranOps] | | |
| - | | | onLine (277) | CI_OnlineResource OnlineRes (396) | ... | [onLineSrc] | | |
| <u>onLineSource</u> | yes | | linkage (397) | O | location (address) for on-line access using a URL | linkage | IETF RFC 1738/2056 | Dataset on-line resource name |
| dataQualityInfo | | dataQualityInfo (18) | DQ_DataQuality DataQual (78) | ... | | [dqInfo] | | |
| - | | | scope (79) | DQ_Scope DQScope (138) | ... | [dqScope] | | |
| - | yes | | level (139) | M | hierarchy level of the data specified by the scope | scplvl | ISO 19115 B.5.25 | Dataset scope level |
| - | | report (80) | DQ_Element DQElement (99) | ... | | [dqReport] | | |
| - | | | result (107) | DQ_QuantitativeResult QuanResult (133) | ... | [measResult] | | |
| - | yes | | valueUnit (135) | C | quantitative value(s) | quanValUnit | ISO 19115 Record B.4.3 | Dataset completeness value |
| - | yes | | value (137) | C | value unit for reporting a data quality result | quanVal | UnitOfMeasure B.4.3 | Dataset completeness value unit |
| - | | lineage (81) | LI_Lineage Lineage (82) | ... | | [dataLineage] | | |
| <u>lineageStatement</u> | yes | | statement (83) | O | general explan. of the data producer's knowl. about the lineage of a dataset | statement | Free text | Dataset lineage statement |
| legalConstraints | | metadataConstraints (20) | MD_LegalConstraints LegConsts (69) | ... | | [mdConst] | | |
| <u>useConstraints</u> | yes | | useConstraints (71) | O | constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations or warnings on using the resource or metadata | useConsts | ISO 19115 B.5.24 | Metadata use constraints |

DIF

Table 11

ISO 11915 Core metadata components
 ISO 11915 Other (comprehensive) metadata components
 GCMD DIF Required Fields (Req.)
 GCMD DIF Recommended Fields (Rec.)
 GCMD DIF Optional Fields (O)

FGDC Content Standard for Digital Geospatial Metadata

| OBIS metadata | Description | ISO 19115 Metadata for geographic datasets | obligation | UML hierarchy | Description | GCMD DIF metadata | obligation | Description | FGDC Content Standard for Digital Geospatial Metadata | Obligation | Description | Proposed OBIS usage | Query from IOBIS database | From DIGIR Entry | Other Comment |
|-------------------------|--|--|---|--|--|--|--|--|--|------------|--|---------------------------------|---------------------------|------------------|--------------------------|
| Database name | Name or title (may include acronyms) | 360 Dataset title | (M) | (MD_Metadata > MD_DataIdentification.citation > CI_Citation.title) | "Name by which the cited resource is known" | Entry_Title (this field may be duplicated under Data_Set_Citation > Data_Set_Title) | (Req.) | "Title of DIF": descriptive enough so that a user can determine the general content of the data set | 8,4 Title | (M) | The name by which the data set is known. | Include | | | |
| | Version - would recommend be part of a citation group | 363 Dataset edition | (O) | (MD_Metadata > MD_DataIdentification.citation > CI_Citation.edition) | "Version of the cited resource" | Data_Set_Citation > Version | (Rec.) | "Version is the version of the data set" | 8,5 Edition | (MIA) | The version of the title. | Include within citation | | | |
| | Date released - would recommend be part of a citation group | 362 Dataset reference date | (M) | (MD_Metadata > MD_DataIdentification.citation > CI_Citation.date) | "Reference date for the cited resource" | Data_Set_Citation > Data_Set_Release_Date | (Rec.) | "The date when the data set was made available for release" | 8,2 Publication Date | (M) | The date when the data set is published or otherwise made available for release. | Include within citation | | | |
| | Status (e.g. Final version or Data continus to be added) | 28 Status of dataset | (O) | (MD_Metadata > MD_Identification.Status) | "Status of the resource(s)" | Data_Set_Progress | (O) | "The production status of the data set regarding its completeness": Options: Planned, In Work, or Complete | 1.4.1 Progress | (M) | The state of the data set. Domain: "Complete" "In work" "Planned". | Omit (only posting online data0 | | | |
| | | 70 Access constraints for dataset | (O) | (MD_Metadata > MD_Constraints.accessConstraints) | "Access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the resource or metadata" ISO list: copyright, patent, patentPending, trademark, license, intellectualPropertyRights, restricted, otherRestrictions | Access_Constraints | (Rec.) | "Restrictions, limitations and legal prerequisites for accessing the data set" - free-text field | 1,7 Access Constraints | (M) | Restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data set. Domain "None", free text. | Omit (only posting public data) | | | |
| Citation | Follow bibliographic standards, e.g. Author, year, title, publisher, place of publication, where appropriate. This will duplicate some other fields. Name or title, Date Released, Version will be duplicated | 24 Dataset Citation | (M) - Only Dataset Title and Dataset Reference Date as part of the citation are mandatory | (MD_Metadata > MD_Identification.Citation) - Citation (359): MD_Metadata > MD_Identification.Citation > CI_Citation.title MD_Metadata > MD_Identification.Citation > CI_Citation.date | Citation data for the resource(s) | "Data_Set_Citation" Group: Dataset_Creator: Dataset_Title: Dataset_Series_Name: Dataset_Release_Date: Dataset_Publisher: Version: Issue_Identification: Data_Presentation_Form: Other_Citation_Details: Online_Resource: | (Rec.) Entry_Title (// Dataset_Title) is a required DIF field | "A citation for the data set to properly credit the data set producer. This fields indicates how the data set should be cited in the professional scientific literature." | 8 "Citation" compound item: 8.1 Originator: 8.2 Publication Date: 8.4 Title: 8.7.1 Series Name: 8.8.2 Publisher: 8.8.1 Publication Place | (MIA) | The recommended reference to be used for the data set. | Include | | | |
| Taxonomic scope | Include names in informal OBIS taxonomic hierarchy, add others where appropriate. | No Match | | | | Science Keywords Auxiliary Keywords | (Req.) (O) | "Science keywords allows the specification of keywords that are representative of the data set being described" - controlled vocabulary used for data discovery "Auxiliary Keywords - any words or phrases used to further describe data sets." | | | | Include | Yes | | Use IOBIS Taxonomic List |
| Geographic scope | Common place name (e.g. North-east Atlantic) | 343 Geographic location of the dataset (by four coordinates or by geographic identifier) | Mandatory under certain conditions - (C) | (MD_Metadata > MD_DataIdentification.extent > EX_Extent > EX_GeographicExtent > EX_GeographicBoundingBox or EX_GeographicDescription) | "Geographic position of the dataset: (Note: This is only an approximate reference so specifying the coordinate reference system is unnecessary)" | Location | (Rec.) | "names of places which may be used for searching" - controlled vocabulary | 1.6.2.2 Place Keyword | (MIA) | The geographic name of a location covered by a data set. | Include | Yes | | |

| | | | | | | | | | | | | | | | |
|---|---|---------|--|---|--|--|--|---|---|--|--|--|--|--------------------------|-----------------------------------|
| | Latitude-longitude box (Min Lat, Min Long, Max Lat, Max Long) | 344-347 | see above (+ westBoundLongitude, eastBoundLongitude, southBoundLatitude, northBoundLatitude) | | | "Spatial_Coverage" group: Southernmost_Latitude: Northernmost_Latitude: Easternmost_Longitude: Minimum_Altitude: Maximum_Altitude: Minimum_Depth: Maximum_Depth: | (Rec.) | "Geographic coverage (horizontal/vertical) of the data described" | 1.5 | Spatial Domain: 1.5.1 Bounding Coordinates: 1.5.1.1 West Bounding Coordinate: 1.5.1.2 East Bounding Coordinate: 1.5.1.3 North Bounding Coordinate: 1.5.1.4 South | (M) | the geographic areal domain of the data set. | Include | data XMAP(1), 10.12.2007 | |
| | Geographical resolution (see guidelines) | 38 | Spatial Resolution | (O) | (MD_Metadata > MD_Data/identification.spatialResolution) | "Factor which provides a general understanding of the density of spatial data in the dataset" | "Data_Resolution" group: Latitude_Resolution: Longitude_Resolution: Horizontal_Resolution_Range: Vertical_Resolution: Vertical_Resolution_Range: Temporal_Resolution: Temporal_Resolution_Range: | (Rec.) | "The difference between two adjacent geographic, vertical, or time values." Keyword list can be viewed at http://gcmd.nasa.gov/Resources/valids/keyword_list.html | 4 | Spatial Reference Information: 4.1 Horizontal Coordinate System Definition: 4.1.1 Geographic: 4.1.1.1 Latitude Resolution: 4.1.1.2 Longitude Resolution: | (M) | The description of the reference frame for, and the means to encode, coordinates in the data set | Include | |
| | Number of locations | | No Match | | | | | | | | | | Include | Yes | |
| Temporal coverage | Date of first record | 350 | Additional extent information for the | (O) | (MD_Metadata > MD_Data/identification.exte | "Time period covered by the content of the dataset" or | "Temporal_Coverage" group: Start_Date: [yyyy-mm-dd] | (Rec.) | "Temporal Coverage" in DIF – start and stop | 1.3 | Time Period of Content: 9.3.1 | (M) | Time period of the content | Include | Yes |
| | Date of last record | 351 | | | | | | | | | | | | Include | Yes |
| Habitat coverage | Major environment such as marine, brackish, freshwater, coast-land (seal haulouts, bird nesting). | 53 | No Exact Match Dataset keywords | (O) - the free-text character string "keyword" is the only mandatory field in the "MD_Keyword" optional field | (MD_Metadata > MD_Keywords.keyword); also see MD_KeywordTypeCode CodeList (B.5.17) | "Commonly used word(s) or formalised word(s) or phrase(s) used to describe the subject - free-text | Science Keywords Auxiliary Keywords (user can choose from a controlled vocabulary list or enter habitat-related keyword(s) as "free-text") | (Req.) (O) | Some "science keywords" pertaining to habitat classification: Benthic Habitat: Coastal Habitat: Demersal Habitat: Estuarine Habitat: Pelagic Habitat: Reef Habitat: Rivers/Stream Habitat: Lakes: Saline Lakes. Keyword list can be viewed at http://gcmd.nasa.gov/Resources/valids/keyword | | | | Same as GCMD | Include | Need to review available keywords |
| | Depth zone (e.g. littoral, sublittoral, coastal, continental slope, deep-sea, abyssal) | | | | | | | | | | | | | Include | |
| | Seascape features (e.g. estuary, seamounts, bay, lagoon, canyon) | | | | | | | | | | | | | Include | |
| | Species habitats (sediment, rocky, front, | | | | | | | | | | | | | Include | |
| | Community association (e.g. coral reef, kelp forest, sea grass bed, oyster bed) | | | | | | | | | | | | | Include | |
| Total distribution records provided to OBIS | Insert number | | No Match | | | | No Match | | | | | | Include | Yes | |
| Total number of taxa | Insert number | | No Match | | | | No Match | | | | | | Include | Yes | |
| Collection method | Sampling method (e.g. trawl, grab, visual observation, video) | | No Match | | see MD_KeywordTypeCode CodeList (B.5.17) <KeyTypCd value="instrument"/> | | Instrument (i.e sensor) Sensor_Name: [SHORT NAME] > [Long Name] | (Rec.) | "Instrument or hardware used to acquire the data." Keyword list can be viewed at http://gcmd.nasa.gov/Resources/valids/keyword | 1.2.3 | Supplementary Information | (O) | other descriptive information about the data set. | Include | |
| Data source | e.g. field observation, specimen in collection, image. | | No Match | | | | Platform (i.e Source) Source_Name: [SHORT NAME] > [Long Name] | (Rec.) | "The platform of data collection, as in a spacecraft, ship or ground station housing the sensor(s) used to acquire the data; or as in a map from which the data were digitized; or as in a model from which the data were generated." | 1.2.3 | Supplementary Information | (O) | other descriptive information about the data set. | Include | |
| Abstract | Short description of dataset for potential users. Mention any quality control issues. | 25 | Abstract describing the dataset | (M) | (MD_Metadata > MD_Data/identification.abstr act) | "Brief narrative summary of the content of the resource(s) | Summary | (Req.) | "A brief description of the data set, descriptive enough to allow potential users of the data set to determine if the data set is useful for their needs." | 1.2.1 | Abstract | (M) | a brief narrative summary of the data set. | Include | |
| Publications from this data | Provide citation (e.g. author, year, title, journal, volume, pages). Typically paper, but can be CD or diskette publications. | 359 | Citation (359) | (O) | some ISO profiles uses MD_PortrayalCatalogue Reference (B.2.9) | | Reference | (O) | "key bibliographic references pertaining to the data set" | | | | | Include | |

| | | | | | | | | | | | | | | | |
|----------------------------------|--|------------|------------------------------|-----|---|--|---|-------------------------------------|---|-------|--|-----|--|---------|--------------------------|
| Scientific Contact | Scientist responsible for the quality and content of the data (e.g. Principal Investigator). | 374 | Dataset responsible party | (O) | (MD_Metadata > MD_DataIdentification.pointOfContact > CI_ResponsibleParty) | "Identification of, and means of communication with, person(s) and organizations associated with the dataset" ISO list: resourceProvider, custodian, owner, user, distributor, originator, pointOfContact, principalInvestigator, processor, publisher, author | Data_Center_Name: [SHORT NAME] > [Long Name] Data_Center_URL: Data_Set_ID: "Personnel" Group: Role: First_Name: Middle_Name: Last_Name: Email: Phone: FAX: "Contact_Address" Group: Address: City: Province_Or_State: Postal_Code: Country: | (Rec.) | INVESTIGATOR – person who headed the investigation or experiment that resulted in the acquisition of the data. TECHNICAL CONTACT – person who is knowledgeable about the technical content of the data (quality, processing methods, units...etc). DIF AUTHOR – person who is responsible for the content of the DIF (metadata contact); | 1.9 | Point of Contact : 10.1 Contact Person Primary :10.1.1 Contact Person : 10.3 Contact Position (title of individual) : 10.4 Contact Address : 10.4.2 Address (Group) 10.4.3 City: 10.4.4 State or Province : 10.4.6 Country : 10.5 Contact Voice Telephone : 10.6 Contact TDD/TTY Telephone : 10.7 Contact Facsimile Telephone : 10.8 | (O) | contact information for an individual or organization that is knowledgeable about the data set. Where Position Title like 'Investigator' | Include | data XMAP(1), 10.12.2007 |
| Technical contact | OBIS contact to ensure interoperability. | 29 | Metadata point of contact | (M) | (MD_Metadata.contact > CI_ResponsibleParty) | "Identification of, and means of communication with, person(s) and organizations associated with the resource(s)" ISO list: resourceProvider, custodian, owner, user, distributor, originator, pointOfContact, principalInvestigator, processor, publisher, author | "Data_Center" Group: Personnel Role: TECHNICAL CONTACT and/or DIF Author | [Req.] | DATA CENTER CONTACT (Required field in "DATA CENTER" Group) –Identifies the data center point of contact responsible for the distribution of the data: Or someone who knows about the data (see definition above for TECHNICAL CONTACT) | 1.9 | As above | (O) | Where Position Title like 'Technical Contact' | Include | |
| Website | One or more website url where more information on the data set is available. Indicate relationship of site to dataset, e.g. Original project description, museum collection catalogue, data centre, host organization. | 396 397 | On-line resource | (O) | (MD_Metadata > MD_Distribution > MD_DigitalTransferOption.online > CI_OnlineResource) | "Information about on-line sources from which the dataset, specification, or community profile name and extended metadata elements can be obtained." | "Related_URL" URL Type keywords can be found at http://gcmd.nasa.gov/Resources/valids/url_type.html & "Project" [SHORT NAME] > [Long Name] | (Rec.) | This field provides hypertext URL links to Internet sites that contain information related to the subject of the data, as well as other useful Internet sites such as project home pages, related data archives/servers, metadata extensions, online software packages, web mapping services, and | 8.10 | Online Linkage | (O) | the name of an online computer resource that contains the data set. Entries should follow the Uniform Resource Locator convention of the Internet. | Include | |
| | | 292 | Name of medium | (O) | (MD_Metadata > MD_Distribution > MD_Medium.name) | "Name of the medium on which the resource can be received" | "Distribution" group: Distribution_Media: Distribution_Size: Distribution_Format: Fees: | (Rec.) | "Distribution - The medium, size, scientific data format, and fees involved in distributing the data set"; Distribution_Media: the media options for the user receiving the data. | 6.4.2 | Digital Form 6.4.2.1.1 Format Name : 'OBIS' : 6.4.2.2.1.1 : Network Resource Name (??/digir.php) :6.4.2.2.1.1.1 Network Resource Name | (O) | The description of options for obtaining the data set on computer-compatible media. | Omit | |
| Comment | Optional | 46 | Supplemental info on dataset | (O) | (MD_Metadata > MD_DataIdentification.supplementalInformation) | "Any other descriptive information about the dataset" | No Match | | Such comments could also be recorded in the abstract/summary, and/or auxiliary keyword metadata field. | 1.2.3 | Supplementary Information | (O) | other descriptive information about the data set. | Omit | |
| Date this entry completed | Date this metadata form completed | 9 | Metadata date stamp | (M) | (MD_Metadata.dateStamp) | "Date that the metadata was created" | DIF_Creation_Date | (O) however automatically filled in | "The date the DIF was created" [yyyy-mm-dd] | 7. | Metadata Reference Information : 7.1 Metadata Date | (M) | information on the currentness of the metadata information, and the responsible party. | Include | |