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Chesapeake Bay Program
Information Access Strategy

The Chesapeake Bay Program is a unique regional partnership leading and directing restoration of the Chesapeake Bay since 1983. The Chesapeake Bay Program partners include the state of Maryland; commonwealths of Pennsylvania and Virginia; the District of Columbia; the Chesapeake Bay Commission, a tri-state legislative body; the U. S. Environmental Protection Agency, which represents the federal government; and participating citizen advisory groups.

In 1996, the Chesapeake Executive Council adopted the Chesapeake Bay Program’s “Strategy for Increasing Basin-wide Public Access to Chesapeake Bay Information.” The strategy calls for development of a shared resource of information, that is available through the Internet, based on standards and protocols that facilitate access to information and data across agency and jurisdictional boundaries.

The Chesapeake Information Management System (CIMS) is being created to implement this strategy. CIMS will be a coordinated, user-friendly system designed as a distributed network among participating organizations throughout the watershed and nationwide. The online address is www.chesapeakebay.net
Chesapeake
Information Management System
Metadata Reporting Guidelines

September 1998

Based on:

Content Standard for Digital Geospatial Metadata
Federal Geographic Data Committee
FGDC-STD-001-1998
Revised June 1999
and
DRAFT
Content Standard for National Biological Information
Infrastructure Metadata
National Biological Service
December 1995

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Glossary
I. INTRODUCTION

This document presents reporting guidelines for the metadata, or descriptive information, that should accompany any information generated by the Chesapeake Bay Program and its partners, or others wishing to participate in the Chesapeake Information Management System (CIMS).

In 1996, the Chesapeake Executive Council adopted the *Strategy for Increasing Basin-wide Public Access to Chesapeake Bay Information*. The *Strategy* calls for development of a shared resource of information, available through the Internet, and based on standards and protocols that facilitate access to information and data across agency and jurisdictional boundaries. CIMS was created as the framework to carry out the *Strategy*. Within CIMS, it is necessary to have consistent standards and uniformity for recording and reporting data and information to allow users in different locations to access the data and information they need. The foundation to this level of consistency and uniformity is metadata. Metadata provide basic documentation about the source, content, and quality of data and other information.

The purpose of this document is to guide CIMS participants in entering metadata about data and documents in such a way that the metadata can be effectively searched and the data or documents accessed and queried by a variety of users. This document is also browsable on the CIMS Web page at: (http://www.chesapeakebay.net).

This document is arranged in the following sections:

- **Section I - Introduction.** Includes a description of the 1996 Chesapeake Executive Council *Strategy for Increasing Basin-wide Public Access to Chesapeake Bay Information* and the role of metadata in supporting that strategy, as well as a description of the purpose and intended use of this document.

- **Section II - Background.** Defines metadata; explains why metadata are important; explains the need for and utility of metadata; and describes the relationship between CIMS metadata and the Federal Geographic Data Committee and National Biological Information Infrastructure metadata standards.

- **Section III - CIMS Metadata.** Describes in detail the origins of the CIMS metadata guidelines, and the differences between these guidelines and the Federal Geographic Data Committee (FGDC) and National Biological Information Infrastructure (NBII) metadata standards. Also describes the role and importance of metadata within CIMS, including descriptions of related CIMS components such as the planned metadata entry tool, metadata database, and metadata search engine.

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1 Information, as used in this document, refers to any type, group, or set of data, documents, publications, images, or other item or group of items that can be accessed through CIMS.
• **Section IV - How to Use this Document.** Describes the organization of the remaining sections of this document, and provides definitions of the various components of metadata that users must understand. Also provides guidelines on the applicability of the three CIMS Metadata Levels, and categorizes and describes in sequence the initial steps necessary to use this document as a reference when creating metadata.

• **Section V - CIMS Level 1 Metadata.** Explains the purpose of CIMS Level 1 Metadata (minimum metadata required for all information types). Provides a summary table of all Level 1 metadata elements, followed by detailed descriptions of each element.

• **Section VI - CIMS Level 2 Metadata.** Explains the purpose of CIMS Level 2 Metadata (required information for non-spatial, tabular data). Provides a summary table of all Level 2 metadata elements, followed by detailed descriptions of each element.

• **Section VII - CIMS Level 3 Metadata.** Explains the purpose of CIMS Level 3 Metadata (required information for spatially-referenced data). Provides a summary table of all Level 3 metadata elements, followed by detailed descriptions of each element.
II. BACKGROUND

A. What is Metadata?

Descriptive information about datasets and data processing, and other types of information is called metadata. Metadata are essential to enable the effective transfer of information to data users and the general public. It describes the content, quality, usability, access instructions, and other characteristics about data and publications. Metadata are essentially the electronic card catalog for data and other publications such as reports and multimedia presentations. Different levels of detail can be provided, but at a minimum sufficient detail should be provided that an individual searching for the dataset or document in question can find it and quickly determine its contents, among other characteristics. The minimum metadata required to allow automated, computer-driven searching capability are defined in Section V, CIMS Metadata Level 1, of this document. Metadata can be used to identify datasets or publications of interest, to provide understanding about assumptions made during data collection, and provide names and telephone numbers of contacts who can answer questions about the data or document.

A metadata record contains the documentation for one dataset or publication. For example there is a Chesapeake Bay Program multimedia presentation called “Touch the Bay.” As part of CIMS, a metadata record will be entered into the metadata database for this multimedia presentation. Another example is the publication titled “State of the Chesapeake Bay 1995.” The Chesapeake Bay Program publishes this report intended to provide an update on the health of the Bay. Below is an example of a metadata record for this publication:

Identification Information:

Citation Information:

Originator: Chesapeake Bay Program (CBP)
Publication Date: 1995
Title: The State of the Chesapeake Bay 1995
Publication Information:

Publication Place:
410 Severn Avenue, Suite 109, Annapolis, MD 21403
Publisher:
U.S. Environmental Protection Agency, Chesapeake Bay Program Office (USEPA CBPO)

Information Type (Data Presentation Form): document
Description:

Abstract:
The State of the Chesapeake Bay is a semi-annual report that attempts to capture the major elements of the Chesapeake Bay’s health. Findings reflect the current perceptions of scientists, managers and citizens as to what constitutes the state of the Bay. It contains many traditional measures such as seafood harvests, water quality and the amounts of pollution reaching the Bay. There is also information about the impacts of humans on the Bay, such as the specific linkages between pollution and water quality and living resources such
as fish, shellfish and waterfowl.

Purpose:
To provide information to the general public about the health of the Chesapeake Bay.

Supplemental Information: General Public

Time_Period_of_Content:
Time_Period_Information:
Range_of_Dates/Times:
Beginning_Date: 1650
Ending_Date: 1994

Currentness_Reference: ground condition

Status:
Progress: Complete

Maintenance_and_Update_Frequency: Biannually

Spatial_Domain:
Bounding_Coordinates:
West_Bounding_Coordinates: -80.515
East_Bounding_Coordinates: -74.592
North_Bounding_Coordinates: 42.940
South_Bounding_Coordinates: 36.7

Keywords:
Theme:
Theme_Keyword Thesaurus: None
Theme_Keyword: Birds
Theme_Keyword: Contaminant
Theme_Keyword: Fishery
Theme_Keyword: Forest
Theme_Keyword: Habitat
Theme_Keyword: Land
Theme_Keyword: Land Cover
Theme_Keyword: Land Use
Theme_Keyword: Rivers
Theme_Keyword: Highly Summarized
Theme_Keyword: Report
Theme_Keyword: Plants
Theme_Keyword: Water
Theme_Keyword: Watershed
Theme_Keyword: Wetlands
Theme_Keyword: Wildlife
Theme_Keyword: Bay Grasses
Theme_Keyword: Blue Crabs
Theme_Keyword: CBP
Theme_Keyword: Chesapeake Bay Program
Theme_Keyword: Conservation
Theme_Keyword: Development
Theme_Keyword: Ecosystem
Theme_Keyword: Management
Theme_Keyword: Finfish
Metadata should be created for any data or document that must be accessible to a variety of people and/or organizations. Some examples of data or documents suitable for associated metadata include the following:

- GIS datasets of the Chesapeake Bay Watershed, such as those used in the Watershed Model
- The document *Identification of Submerged Aquatic Vegetation in the Chesapeake Bay*
- Fish species databases
- *Touch the Bay* multimedia presentation
- Photo galleries.
To ensure metadata information is accurate, it should be created no later than the release or publication date of the data or publication, and updated whenever necessary, which is any time information about the data or publication changes. Information that can commonly change includes the contact name or telephone number, the URL for the data or document, or the data or document update or release date.

B. Why are Metadata Important to CIMS?

In the context of CIMS, metadata are critical. Although metadata provide all of the information described above, they will also be used to search and query information about the Chesapeake Bay. All metadata will be entered into a database, and analytical tools will access this database to conduct searches or queries requested by the user. The analytical tools or search engine will allow users to search for information meeting their needs, and select specific information to view and / or download. For example a user can search for all multimedia presentations for the General Public, or a teacher will be able to search for all materials relevant to K-12 students on Submerged Aquatic Vegetation (SAV) habitat. Users accessing CIMS through the Internet can search for information by querying the metadata stored in the database using criteria they specify.

The user may be you trying to research information to perform your job. Having this information available through the Internet will save you time previously required to research and contact other organizations for this information. The user may be a scientist, an educator, a manager, or a student who will be now be able to find information quickly and efficiently. This will save time previously required for public outreach allowing everyone to perform their job more efficiently. This metadata will effectively serve as a marketing tool to promote the results of contributors hard work. It is therefore critical that metadata be conscientiously entered for all data and documents. Effective metadata are the key to the successful implementation of CIMS.

C. Other Efforts to Compile Metadata

The realization of how important metadata are has many organizations and institutions preparing metadata. Because information sharing is important to a wide variety of user communities, standards have been developed to facilitate the collection and recording of metadata. An Executive Order (EO) was given regarding data acquisition and access. In response to this EO, the National Spatial Data Infrastructure (NSDI) was created and these data acquisition efforts are lead by the Federal Geographic Data Committee (FGDC). Described below are three such initiatives relevant to the creation of the CIMS Metadata Guidelines.

   Executive Order 12906
All federal agencies are required to comply with *Executive Order 12906, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure* (http://www.fgdc.gov/Communications/GenInfo/execord.html). One section of this Executive Order relates to standardized documentation of data. It states that “…each agency shall document all new [beginning January 1, 1995] geospatial data it collects or produces, either directly or indirectly, using the standard under development by the FGDC [the Federal Geographic Data Committee, described below], and make that standardized documentation electronically accessible....”

**The Federal Geographic Data Committee (FGDC)**

Much data are geospatial, or referenced to a location on the earth. The NSDI has been created to establish policies, standards, and procedures for organizations to cooperatively produce and share geospatial data. The FGDC has assumed leadership in the evolution of the NSDI in cooperation with State and local governments, academia, and the private sector.

The FGDC has developed the document *Content Standard for Digital Geospatial Metadata*, Version 1.0, which can be found on the Internet at the following address: (http://www.fgdc.gov/Metadata/ContStan.html). The standard provides a common set of terminologies and definitions for the documentation of geospatial data. The standard establishes the names of data fields and groups of data fields to be used for these purposes, the definitions of these data fields and groups, and information about the values that are to be provided for the data fields. Information about metadata terms that are mandatory, mandatory under certain conditions, and optional (i.e., provided at the discretion of the data provider) are also provided by the standard.

The FGDC Standard is comprehensive and can be modified to meet the needs of more than geospatial data. At this time the FGDC Standard is being revised to accommodate additional fields and field values for data applicable to a wider scope of user communities, such as that of biological data, and other non-geospatial information types. The FGDC Geospatial Metadata Content Standard - Revision 2 is anticipated to be available in Fall 1997. The idea is that large user communities may modify or extend the FGDC standard for their information needs. For example, fields relevant to biological data may be added, or specific values for data format may be further defined for non-geospatial data. These extensions would be called a profile and would be formally approved by FGDC. These profiles could then be adopted by other organizations. Federal agencies which adopt a profile would meet the requirements of Executive Order 12906.

**The National Biological Information Infrastructure (NBII)**

In an effort to make data and information on biological resources more accessible for more people, the U.S. Geological Survey’s Biological Research Division (BRD), previously known as the National Biological Service (NBS), has developed a national partnership for sharing biological information: the National Biological Information Infrastructure (NBII). The NBII provides information about, and access to, biological data and information that is maintained by Federal,
State, and local governments, and non-government organizations. The FGDC Standard is specifically designed for geospatial data, and does not include fields specific to biological data. Based on the FGDC Standard, NBII developed the *Content Standard for National Biological Information Infrastructure*. This Standard is a superset of FGDC and contains additional information specifically designed for biological data (e.g., taxonomy, and laboratory and field methods) and will most likely be one of the first profiles submitted to FGDC for Revision 2.

These existing standards can be found online at a number of locations, including:

- http://www.mews.org/nsdi/ - original and draft revision of FGDC Standard
- http://www.nbs.gov/nbii/non-spatial.html - instructions to download draft NBII Standard
III. CIMS METADATA

A. The Origin of CIMS Metadata

One of the main goals of CIMS is to provide users with the ability to search for and select information to view and/or download. Capabilities include searching for water quality monitoring data by Chesapeake Bay Program personnel, searching for all multimedia presentations for the general public, and searching for all materials relevant to K-12 students. Answering these questions will require querying the metadata stored in the database. This makes development and maintenance of metadata crucial to the success of CIMS.

The development of CIMS metadata guidelines required careful evaluation of the types of information that users want to search for and how users will want to conduct their search. The result of this evaluation was the driving force in developing CIMS metadata guidelines to meet user needs.

A standard provides a common set of terms and definitions for the documentation of data. It establishes the names of data fields and groups of data fields to be used for these purposes, the definitions of these data fields and groups, and information about the values that are to be provided for the data fields. A standard also provides information about what fields are required and under what conditions. Guidelines provide recommendations and suggestions on interpreting and applying a standard for a specific purpose.

In developing CIMS metadata guidelines, the Chesapeake Bay Program worked with existing, well-recognized and accepted standards, evaluating them for the unique needs of CIMS. Rather than duplicate efforts, CIMS metadata guidelines are built on the efforts expended by, and the expertise of others. The Federal Geographic Data Committee (FGDC) and National Biological Information Infrastructure (NBII) Metadata Standards were adopted and modified by CIMS for the following reasons:

- The FGDC and NBII Standards are comprehensive and well-defined.
- The FGDC Standard was developed specifically for geospatial information, and much information regarding the Chesapeake Bay is geospatial.
- Biological data are another significant contribution to the wealth of Chesapeake Bay information and therefore the biological extensions of NBII are desired.
- Much of the Chesapeake Bay information has been funded by Federal monies, and therefore the information must adhere to the FGDC Metadata Standard as directed by EO 12906.
- One of the main goals of the search component of CIMS is to be able to access a wide range of information types. Using one standard to describe these information types will facilitate this ability. With some modifications, the FGDC Standard can be modified to handle these information types in addition to geospatial information.
- The public review process for Revision 2 of the FGDC Standard provided CBP the
opportunity to provide input to the FGDC Metadata Standard to suit the needs of CIMS.

The remainder of this document provides guidelines on how to interpret and apply the FGDC Metadata Standard to ensure Chesapeake Bay information can be searched, and queried as part of CIMS. These guidelines have been developed so data documentation is captured consistently among data generators throughout the Chesapeake Bay Watershed, and that it adheres to the FGDC Standard dated June 8, 1994.

**It is important to note that this is a living document. As CIMS evolves and FGDC and NBII Metadata Standards are revised, this document will be updated to reflect these changes.**

There are seven main chapters or number sections in the FGDC and NBII metadata standards:

- Section 1 - Identification Information
- Section 2 - Data Quality
- Section 3 - Spatial Data Organization Information
- Section 4 - Spatial Reference Information
- Section 5 - Entity & Attribute Information
- Section 6 - Distribution Information
- Section 7 - Metadata Reference Information

The sections themselves and the elements in each section are categorized into 3 levels:

- “Mandatory” meaning it must be provided
- “Mandatory If Applicable” meaning it must be provided if the section or element is relevant to the dataset or document
- “Optional” meaning information can be provided if desired

The FGDC metadata elements have also been grouped, for the purposes of CIMS, into three levels. Several organizations including University of Maryland Baltimore County\(^2\) (UMBC) are also adopting a three-tier approach to implementing metadata. The purpose of each CIMS level is described as follows.

**Level 1**

The elements in Level 1 of CIMS metadata are the minimum information required to search the CIMS metadata database as previously determined. Level 1 of CIMS metadata include all of the FGDC elements classified as “Mandatory.” Elements in Level 1 are


required for all information types including maps, publications, and multimedia presentations. Filling out all Level 1 metadata elements does not necessarily ensure that the entry is FGDC compliant, as CIMS Level 1 metadata do not account for all of the FGDC “Mandatory If Applicable” elements.

CIMS metadata Level 1 consists of selected information FGDC sections 1, 6, and 7 - Identification Information, Distribution Information, and Metadata Reference Information of the FGDC and NBII Metadata Standards. Note that not all FGDC elements from these sections are included in CIMS Level 1; there may be other elements that are relevant for your type of information and therefore you are encouraged to fill out additional relevant elements so others can easily search for your entry.

Refer to CIMS Level 1 Metadata in Section V for details.

Level 2
The elements in Level 2 of CIMS metadata are required to query and analyze the tabular data in CIMS. This level of metadata are not usually needed for nontechnical documents. Level 2 contains those metadata elements in Level 1 as well as additional elements from sections 2 and 5 - Data Quality and Entity & Attribute Information of the FGDC and NBII Metadata Standards.

Note that not all FGDC elements from these sections are included in CIMS Level 2; there may be other elements that are relevant for your type of information and therefore you are encouraged to fill out additional relevant elements so others can easily search for your entry.

Refer to CIMS Level 2 Metadata in Section VI for details.

Level 3
The elements in Level 3 of CIMS metadata are those required to query and analyze GIS or spatially referenced data. Level 3 contains those elements in Levels 1 and 2 as well as additional elements from section 4 - Spatial Reference Information of the FGDC and NBII Metadata Standards.

Again, note that not all FGDC elements from these sections are included in CIMS Level 3; there may be other elements that are relevant for your type of information and therefore you are encouraged to fill out additional relevant elements so others can easily search for your entry.

Refer to CIMS Level 3 Metadata in Section VII for details.

B. CIMS Metadata: A Comprehensive Package
This report provides guidance on the content of CIMS metadata. The guidelines presented in this document are part of a comprehensive metadata package. Other elements of the package include:

- **Tools.** An evaluation of existing metadata entry tools was performed to determine which are best suited for CIMS, and which can be customized to meet the needs of CIMS. The NBII MetaMaker tool was chosen and has been customized to meet the needs of CIMS. In addition, a new front end to MetaMaker has been created for the CIMS Levels of metadata. This tool is called C-MEnT, CIMS - Metadata Entry Tool, the foundation of CIMS. See the CIMS webpage (www.chesapeakebay.net/tools) for instructions on how to get C-MEnT and the customized MetaMaker.

- **Database.** The metadata database is where the metadata will be stored. Along with the evaluation of metadata entry tools, an evaluation of database management systems is also underway to determine which is best suited to store and provide access to the metadata. A metadata database will be designed and implemented in the selected system to ensure the metadata adheres to the CIMS guidelines. The metadata entry tools will be used to put information into this metadata database.

- **Search Engine.** The search engine will be the heart of CIMS by allowing users to search for information meeting their needs, and select specific information to view and/or download. For example, a user can search for all multimedia presentations for the general public, or a teacher will be able to search for all materials relevant to K-12 students. This will be accomplished by querying the metadata stored in the database using criteria the user specifies. The guidelines in this document were created to facilitate this search capability. As the entry tools and database are being put into place, a search engine will be developed that accesses the metadata base and takes subsequent action based on the information that is found.
IV. HOW TO USE THIS DOCUMENT

This document provides guidance to CIMS participants on how to interpret and apply the FGDC Metadata Standard to data and documents to ensure the metadata can be efficiently and effectively searched, and the information queried by a variety of users as part of the CIMS. These guidelines have been developed to ensure documentation is captured consistently among data generators throughout the Chesapeake Bay Watershed, and that it adheres to the FGDC Metadata Standard dated June 8, 1994.

A. Organization

CIMS metadata elements or fields are grouped into three categories or levels: Level 1, Level 2, and Level 3. To be CIMS compliant you must fill out the level of metadata applicable to your informational product. The elements in Level 1 of CIMS metadata are the minimum required to provide the CIMS search functionality and must be filled out for all informational products including maps, publications, and multimedia presentations.

For tabular data, that is not referenced by geographic coordinates, both Level 1 and Level 2 elements must be filled out. For spatially referenced data such as tabular datasets with coordinates and GIS data, all three levels of CIMS metadata must be filled out. Details regarding Levels 1, 2 and 3 are presented in the following three sections; Sections V, VI, and VII, respectively.

Each section presenting details of a Level is composed of:

- **Overview**
  The overview explains the purpose of the level, what information is included in this level, and any general comments about how the individual pieces of information or elements should be entered for CIMS.

- **Summary of Unique Elements Table**
  This table lists the individual pieces of information that are unique to this level. The Table has five columns, with the following headings: Metadata Section, Compound Element, Paragraph Number, Element Name, and Repeat.
Definitions of table column headings:

<table>
<thead>
<tr>
<th>Metadata Section</th>
<th>Compound Element</th>
<th>FGDC (NBII) Paragraph Number</th>
<th>Element Name</th>
<th>Repeat</th>
</tr>
</thead>
</table>

**Metadata Section:** The name of the main FGDC Section or Chapter.

**Compound Element:** The name of the FGDC compound element. A compound element represents a higher level concept that cannot be represented by an individual data element. It refers to a group of related data elements or other compound elements.

**Paragraph Number:** The FGDC paragraph number, and the NBII paragraph number in parentheses if different. The FGDC paragraph number is the number used in the FGDC Workbook and Content Standard to refer to a specific data element, and will allow the user to easily refer back to the summary table.

A paragraph number illustrates the hierarchical structure of the metadata standard by concatenating numbers of section and elements with dots “.” (for example, 1.3.9.9.1). The first number corresponds to the Metadata Section name, followed by the number of the compound element within the section this piece of information is grouped under. Elements may be nested within multiple compound elements; an element is uniquely numbered within a compound element. Compound elements may be nested, and therefore a paragraph number is of variable length. The last number specifies the number of the individual pieces of information within its parent compound element.

**Element Name:** The name of the data element. A data element is a logically primitive item of data. These are the things you “fill in.”

**Repeat:** Repeat refers to whether or not multiple entries are allowed for the individual element or all elements in a compound element. If an individual data element may be entered or repeated multiple times this column will be filled in with a ✔. If an entire compound element may be entered or repeated multiple times, each data element will be filled in with a ✗. There are times where a compound element may be repeated, and the individual element may be repeated within one instance of the compound element. These elements will be noted with ✔✓. For example the compound element, Source Information - Citation, may be repeated multiple times. And within the Source Information, Citation, there may be several Originators or organizations involved in producing a source dataset. Therefore, this element will be noted with ✗✔. 
What does Bolded Text in the Tables Mean?

In the tables, some of the Compound Elements are bolded. Bolded compound elements are references to supporting sections of the FGDC Metadata Standard. As stated earlier there are seven main sections to the standard. In addition, there are three supporting sections, Section 8 Citation, Section 9 Time Period, and Section 10 Contact. These sections provide a common method to define citation, temporal, and contact information. These sections are referred to in several places throughout the Standard, and are never used alone. To highlight which elements refer to these supporting sections, the Compound Element name has been bolded. In the hardcopy document, the portion of the paragraph number referring to the supporting section is also bolded.

For example, Calendar Date is identified by paragraph number 9.1.1 in supporting section 9, Time Period Information. The Calendar Date is referred to several times in the standard for different purposes.

First it is referred to in section 1, Identification Information, element 3 for Time Period of Content (1.3). Therefore, Calendar Date for the document content is referenced by paragraph number 1.3.9.1.1.

Calendar Date is also referred to in Section 2, Data Quality, under the nested compound element, Lineage, Source Information, Source Time Period of Content, 2.5.1.4. In this section the Calendar Date for source content is referenced by paragraph number 2.5.4.1.9.1.1.

What do Bolded Lines in the Tables Mean?

Bolded lines in the tables for Levels 1-3 encircle groups of elements where there is a choice between an element and group of elements and another element or group of elements. For example, in the table CIMS Level 1 Metadata Summary Table, the compound element “Time Period of Content” contains four elements. Three of these elements are contained within a bolded box. To the left of the bolded box is a notation indicating that a Single OR Multiple Date(s)/Time(s) may be entered for a dataset or document in which case element 1.3.9.1.1 Calendar Date(s) for Content would be filled in. Or a Range of Dates/Times may be more applicable for the data or document. Therefore, the Beginning Date for Content and Ending Date for Content (elements 1.3.9.3.1 and 1.3.9.3.3, respectively) should be filled in. Bolded lines and boxes indicating this type of either-or choice are located in several places in the tables for Levels 1 through 3.

These bold boxes may be nested. Such is the case in Section 6 - Distribution Information. There is a box around URL and Offline Media, as well as one around format version number or date. Both of these are straightforward. But encompassing all of this is the distinction between non-digital form and digital. In this case, at least non-digital form or digital information must be filled out. Digital form starts with Format Name and continues...
through Offline Media. But if the data or document is available both in non-digital and
digital forms, both sections may be filled out.

- Element Descriptions
Details of the individual pieces of information or data elements are included in this section.
The descriptions of the elements include the FGDC Paragraph Number, Element name,
Definition, and Domain, as well as Example and Comments. The format is illustrated
below with each component defined.

| Paragraph No.: The FGDC paragraph number is the number used in the FGDC Workbook and Content
| Standard to refer to a specific element, and will allow the user to easily refer back to
| the table. The FGDC paragraph number is described in the Table Column Definitions
| above. This provides a reference from the summary table. These are in numerical order
| by section to facilitate locating the description.
| Element: The element is the FGDC element name. If there is another name more appropriate for
| CIMS, this has been used and the FGDC element name is included in parentheses.
| Some of the element names have been slightly modified from the FGDC Standard for
| clarification, and these modifications have been recommended to FGDC for Revision 2
| of the FGDC Standard. The FGDC name of the data element. A data element is a
| logically primitive item of data. These are the things you “fill in.”
| Definition: The definition is the FGDC definition of the data element, with minimal modifications
| for clarification.
| Domain: The domain is the list of values that can be entered for the element, where each value is
| enclosed in double quotes (e.g., “Complete,” “In work,” or “Planned” for the Progress
| element). In some cases, the user may enter any text they wish, and this is noted by the
| words, free text, in the domain. The domain is essentially a pick list for the element.
| Note: If only three values are listed, only one of those three values can be used, unless
| free text is part of the domain. In some cases the domain list has been modified for
| CIMS needs, and values may be more limited than those in the FGDC domain list.
| Example: The example illustrates one possible entry for the element. For example, “Complete”
| for the element Progress.
| Comments: Comments include any notes specific to entering metadata for CIMS, and may include
| additional explanation provided in the FGDC Standards Workbook.

B. Where do I Begin?

If you haven’t already, begin by reading the previous section on How Do I Use This Document,
the Organization portion.
In creating CIMS metadata for a dataset or document, first determine what level of metadata is appropriate for your data or document. To do this, read the Overview in each CIMS Level Section, Sections V, VI, and VII respectively. Once you determine which level is applicable to your information, start with reading CIMS Level 1 Metadata, Section V completely. Level 1 Metadata is required for any information type: data, documents, and multimedia presentations. Next, refer to the Summary of Unique Elements table, Element Name field or column. You will need to determine the appropriate information to fill in for each and every one of these pieces of information for your data or document. Note whether or not the information is repeatable.

For a detailed description of this element, use the paragraph number to refer to the Element Descriptions in Section C. These are in numeric order.

There may be additional pieces of information significant to publications. Read Appendix C - Additional Guidance on Metadata for Publications, to evaluate the relevance of this information. The CIMS metadata Levels build on one another. CIMS Level 1 includes all information required for all data and documents. If you have tabular data without spatial references (i.e., latitudes / longitudes), refer to CIMS Level 2 Metadata. CIMS Level 2 Metadata requires that the user refer to and enter metadata for CIMS Level 1, and then the additional fields unique to CIMS Level 2. For data with spatial references, tabular data with latitudes and longitudes, maps, or GIS coverages, refer to CIMS Level 3 Metadata. CIMS Level 3 Metadata requires that the user refer to and enter metadata for CIMS Level 1, then the additional fields unique to CIMS Level 2, and finally the additional fields noted in CIMS Level 3 Metadata.

These guidelines are not meant to be a replacement for the FGDC Content Standard for Digital Geospatial Metadata or the NBII Content Standard for National Biological Information Infrastructure. These guidelines provide instruction on how to apply these standards to suit CIMS. For those creating metadata for tabular datasets and spatially referenced data in particular, it is highly recommended these Standards are read. There are many interesting responses to users questions called FAQ’s (Frequently Asked Questions) in the FGDC Standard Workbook which may be of help.

Currently, an evaluation of metadata entry tools is in progress. Until a tool has been recommended or customized for the needs of CIMS, a user may use a word processor template to enter FGDC compliant metadata. The instructions to do this can be found at http://www.fgdc.gov/Metadata/Toollist/MetaTool.html. Refer to Instructions for Implementing METADATA using a wordprocessor (text format).
V. CIMS Level 1 Metadata

A. Overview

The purpose of the CIMS Level 1 Metadata is to provide for the desired search functionality of CIMS. The elements in Level 1 of CIMS metadata will furnish the minimum information about a dataset or document required to search for and select a particular dataset or document, to view and download. A data generator or server will need to create a metadata record, which includes all of the information in CIMS Level 1, for information of any type (e.g., maps, publications, multimedia presentations).

In addition, the CIMS Level 1 Metadata include all the FGDC elements classified as “Mandatory.” Supplying this information will ensure the core FGDC Metadata is filled out and therefore the metadata record can be submitted to a Federal Clearinghouse. Filling out all CIMS Level 1 metadata elements does not necessarily guarantee that the entry is FGDC compliant. To be FGDC compliant one would be required to fill out all “Mandatory” elements, and any elements classified as “Mandatory If Applicable” that are relevant to the dataset or document. CIMS Level 1 Metadata do not account for all of the FGDC “Mandatory If Applicable” elements.

CIMS Level 1 Metadata is comprised of information from Section 1 - Identification Information, Section 6 - Distribution Information, and Section 7 - Metadata Reference Information of the FGDC and NBII Metadata Standards.

This section contains a summary table listing the elements that comprising Level 1. The Table has five columns, with the following headings: Metadata Section, Compound Element, Paragraph Number, Element Name, and Repeat. Also, included in this section are detailed descriptions of the metadata elements unique to this Level. Details of the individual pieces of information or data elements are included in this section. The descriptions of the elements include the FGDC Paragraph Number, Element name, Definition, and Domain, as well as Example and Comments. For more information on how to use this section or how it is organized, refer to Section IV - How To Use This Document.

Note there may be additional relevant FGDC metadata elements, such as a point of contact, that are not required, but may be helpful for others to find your information. Information providers are encouraged to specify as much valuable information as seems necessary.
## B. CIMS Level 1 - Summary of Unique Elements

<table>
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<tr>
<th>Metadata Section</th>
<th>Compound Element</th>
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2 **Repeat**

✅ - This is an individual data element which may be repeated or entered multiple times.

➕ - This is an individual data element within a compound element. This compound element may be repeated or entered multiple times.

➕✓ - This is an individual data element within a compound element. This compound element may be entered multiple times. In addition, this individual data element may be repeated or entered multiple times within one instance of the compound element.
C. CIMS Level 1 - Element Descriptions

Paragraph No.: 1.1.8.1

Element: Originator

Definition: The name of an organization or individual that developed the dataset or document. If the name of editors or compilers are provided, the name must be followed by “(ed.)” or “(comp.)” respectively. If possible, the organization name should be given to the sub-organizational level to which the individual(s) that developed the data is (are) “attached”.

Domain: (Refer to the CIMS list of data originators/organizations in Appendix A)

Example: Virginia Institute of Marine Sciences (VIMS)

Comments: The FGDC Standard allows free text for this element’s domain. To ensure accurate entry of this element and subsequent searching, use the list provided. Notify the CIMS Data Librarian of missing/incorrect values and the necessary modification(s) will be made to the list. This element may be repeated multiple times to illustrate that the data or document was developed by several organizations.

Paragraph No.: 1.1.8.2

Element: Publication Date

Definition: The date when the dataset or document was published or otherwise made available for release. Encodes a date as the year, and optionally month, or month and day.

Domain: “Unknown” “Unpublished Material” free date (see comments below for format)

Example: 19920124

Comments: As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...).
Paragraph No.: 1.1.8.4

**Element:** Title

**Definition:** The name by which the dataset or document is known.

**Domain:** free text

**Example:** Toxicants In The Chesapeake Bay Finfish And Shellfish

**Comments:**

---

Paragraph No.: 1.1.8.6

**Element:** Information Type (Data Presentation Form)

**Definition:** The mode in which the data are represented. This field is applicable if the information being cited is in a describable form. This identifies the style with which the originator intended that the information be presented to the user. For example, a paper map would have a “map” data presentation form.

**Domain:** “atlas” “diagram” “globe” “map” “model” “profile” “remote-sensing image” “section” “view” with additions for NBII and CIMS: “database” “document” “table” “graph” “spreadsheet” “multimedia presentation” “audio” “video” “image”

**Example:** database

**Comments:** This element will be used for the CIMS Information Type. Nontechnical publications will usually be considered “document.” The specific type of document is specified in Subject (Theme) Keyword. The domain is based on pp.88-91 in Anglo-American Committee on Cataloguing of Cartographic Materials, 1982, Cartographic materials: A manual of interpretation for AACR2: Chicago, American Library Association with additions for other information types.

---

Paragraph No.: 1.2.1

**Element:** Abstract

**Definition:** A brief narrative summary of the dataset or document.

**Domain:** free text

**Example:** The finfish toxics database contains data from Chesapeake Bay Program-sponsored (CBP) research and other studies from which the CBP collected historical data on toxics. Sources are either CBP, private industries, National Bureau of Standards, state agencies, EPA STORET or other historical sources. Data include concentrations of heavy metals, pesticides, and organic compounds in tissues of menhaden, striped bass (rockfish) and oysters. (MDVASG)

**Comments:** The abstract briefly describe the “what” aspects of the dataset - what information is in the dataset, what area is covered.
Paragraph No.: 1.2.2

Element: Purpose

Definition: A summary of the intentions with which the dataset or document was developed.

Domain: free text

Example: To determine the extent of submerged aquatic vegetation (SAV). These data will be compared to previous years of the study to determine if there is an increase or decrease in the acreage of SAV coverage in the tidal Chesapeake Bay.

Comments: The “Purpose” describes the “why” aspects of the information - why was the dataset or document created.

Paragraph No.: 1.2.3

Element: Target Audience (Supplemental Information)

Definition: The audience this information is intended for.


Example: Technical/Scientific Users

Comments: Pick applicable items from the list. According to FGDC, the Supplemental Information element is optional. In the CIMS context, this element will be used to identify the “supplemental” information of target audience.
Paragraph No.: 1.3.1

**Element:** Content Date Explanation (Currentness Reference)

**Definition:** An explanation justifying the Calendar Date for Content or Beginning/Ending Dates for Content. This element is used to clarify how the date(s) provided in Time Period of Content were generated. This element requires the producer to identify if the Time Period of Content dates refer to the ground condition (i.e., when the “real world” looked the way it is described in the dataset), or some later time when the information was recorded, published, etc.

**Domain:** “ground condition” “publication date” “observed” free text

**Example:** ground condition

**Comments:** NBII has added the domain value “observed.” If ground condition is the same as observed, enter ground condition.

If “June, July, and August” were derived from “Summer”, or calendric dates were generated from the radioisotopic (e.g., carbon) dating of samples, or some other interpretation, an explanation of the interpretation or derivation should be included in this element. In the case of calendar dates derived from radiocarbon dating, the radiocarbon age (B.P.), its standard deviation, and the isotope fractionation (if done), along with the calibration scheme used, should be included.

Paragraph No.: 1.3.9.1.1

**Element:** Calendar Date for Content

**Definition:** Time period(s) for which the dataset or information is valid or relevant. Encodes a date as the year, and optionally month, or month and day. This can be used for multiple dates if applicable. Use Beginning Date for Content and Ending Date for Content if the data or information covers a range of dates, and leave Calendar Date for Content empty.

**Domain:** “Unknown” free date (see comments below for format)

**Example:** 199409

**Comments:** As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...).
Element: Beginning Date for Content

Definition: Beginning Date for which the dataset or information is valid or relevant. Encodes the beginning date as the year, and optionally month, or month and day.

Domain: “Unknown” free date (see comments below for format)

Example: 19910401

Comments: As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...).
Paragraph No.: 1.4.1

Element: Progress

Definition: The state of the dataset or information.

Domain: “Complete” “In work” “Planned”

Example: In work

Comments:

Paragraph No.: 1.4.2

Element: Maintenance and Update Frequency

Definition: The frequency with which changes and additions are made to the dataset or document after the initial dataset or document is completed.


Example: Annually

Comments:

Paragraph No.: 1.5.1.1 (1.5.2.1)

Element: West Bounding Coordinate

Definition: Western-most coordinate of the limit of data or document expressed in longitude.

Domain: \(-180.0 \leq \text{West Bounding Coordinate} < 180.0\)

Example: -80.4375

Comments: The purpose of the spatial domain coordinates is to provide a “footprint” of the data or information.
1.5.1.2 (1.5.2.2)

**Element:** East Bounding Coordinate  
**Definition:** Eastern-most coordinate of the limit of data or document expressed in longitude.  
**Domain:** \[-180.0 \leq \text{East Bounding Coordinate} \leq 180.0\]  
**Example:** 
-74.7720  
**Comments:** The purpose of the spatial domain coordinates is to provide a “footprint” of the data or information.

1.5.1.3 (1.5.2.3)

**Element:** North Bounding Coordinate  
**Definition:** Northern-most coordinate of the limit of data or document expressed in latitude.  
**Domain:** \[-90.0 < \text{North Bounding Coordinate} \leq 90.0; \text{North Bounding Coordinate} \geq \text{South Bounding Coordinate}\]  
**Example:** 42.9783  
**Comments:** The purpose of the spatial domain coordinates is to provide a “footprint” of the data or information.

1.5.1.4 (1.5.2.4)

**Element:** South Bounding Coordinate  
**Definition:** Southern-most coordinate of the limit of data or information document expressed in latitude.  
**Domain:** \[-90.0 < \text{South Bounding Coordinate} \leq 90.0; \text{South Bounding Coordinate} \leq \text{North Bounding Coordinate}\]  
**Example:** 36.8432  
**Comments:** The purpose of the spatial domain coordinates is to provide a “footprint” of the data or information.
Paragraph No.: 1.6.1.1

Element: Subject (Theme) Keyword Thesaurus

Definition: Reference to a formally registered thesaurus or a similar authoritative source of theme (subject) keywords. For CIMS purposes, this element will generally be filled in with “None.” A thesaurus is a source of a controlled vocabulary.

Domain: “None” free text

Example: None

Comments: For a list of some commonly-used thesauri, refer to Part IV: Subject/index term sources in Network Development and MARC Standards Office, 1988, USMARC code list for relators, sources, and description conventions: Washington, Library of Congress. This element can be repeated multiple times to illustrate that several theme keyword thesauri are sources for the theme keywords.
Paragraph No.: 1.6.1.2

Element: Subject (Theme) Keyword

Definition: Words or phrases summarizing an aspect of the information. Common-use word or phrase used to describe the subject of the dataset or document. For CIMS search capability, **Subject Keywords** are organized into four categories: *Level of Detail, Media, Type of Document, Major Subjects, Specific Subjects.*

The **Level of Detail** category refers to the level of detail of the information in the dataset or document. The majority of public documents may be classified as “Highly Summarized” whereas the Toxics Database as “Analyzed”.

The **Media** category is the substance or surroundings that describes where the information in the document exists or where the information was collected.

The **Type of Document** category is applicable for documents only.

**Major Subject** provides a discrete list of subjects to categorize the document or dataset, while the **Specific Subject** provides a list to allow users to more easily document their data and provides a consistent means of doing so. **Specific Subject** also allows users to add their own keywords.

**Domain:**

**Level of Detail:** “Highly Summarized” “Analyzed” “Primary/Raw Data”

**Media:** “Water” “Land” “Air”

**Type of Document:**


**Major Subjects:**


**Specific Subjects:**

Example: Analyzed
Water
Brochure
Living Resources
Submerged Aquatic Vegetation
Habitat
Restoration
Trends

Comments:
Pick one applicable item from Level of Detail list.
Pick at least one applicable item from Media list.
Pick appropriate item from Type of Document list, if applicable.
Pick at least one applicable item from Major Subjects list.
Optionally, pick applicable items from Specific Subjects list.

Paragraph No.: 1.6.2.1

Element: Place Keyword Thesaurus
Definition: Reference to a formally registered thesaurus or a similar authoritative source of place keywords.
A thesaurus is a source of a controlled vocabulary.

Domain: “None” “Geographic Names Information System” free text

Example: None

Comments: This element can be repeated multiple times to illustrate that several place keyword thesauri are sources for the place keywords.

Paragraph No.: 1.6.2.2

Element: Place Keyword
Definition: The geographic name of a location covered by a dataset or document.

Domain: Geographic
Level of Detail: “State” “County” “Municipality” “Major Watershed/ Basin” “Subbasin” “Hydrologic Unit” “Monitoring Segment” “Modeling Segment” “Tributary” “Airshed”

Specific Names: (Refer to the CIMS Specific Place Names List in Appendix B)

Example: Major Watershed/ Basin
Chesapeake Bay Watershed

Comments: Pick one applicable item from Geographic Level of Detail list.
Pick applicable items from Specific Names list.
The FGDC Standard allows free text for this element’s domain. To ensure accurate entry of this element and subsequent searching, use the list provided. Notify the CIMS Data Librarian of missing/incorrect values and the necessary modification(s) will be made to the list.
Paragraph No.: 1.7 (1.8)

Element: Access Constraints

Definition: Restrictions and legal prerequisites for accessing the dataset or document. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the dataset.

Domain: “None” “CIMS Participants Only” “Originating Agency Only”

Example: None

Comments: CBP documents and datasets have no access constraints, so “None” is appropriate value.

Paragraph No.: 1.8 (1.9)

Element: Use Constraints

Definition: Restrictions and legal prerequisites for using the dataset after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the dataset.

Domain: “None” “Not for redistribution without written consent” “Use at your own risk” “Citation Required” “Dataset Credit Required” free text

Example: Not for redistribution without written consent

Comments: CBP publications require a citation.

Paragraph No.: 6.1.10.1.2

Element: Contact Organization

Definition: The name of the organization to contact regarding distribution of the data or document.

Domain: (Refer to the CIMS list of data originators/organizations in Appendix A)

Example: U.S. Environmental Protection Agency, Chesapeake Bay Program Office (USEPA CBPO)

Comments: The FGDC Standard allows free text for this element’s domain. To ensure accurate entry of this element and subsequent searching, use the list provided. Notify the CIMS Data Librarian of missing/incorrect values and the necessary modification(s) will be made to the list.
**Paragraph No.: 6.1.10.4.1**

**Element:** Address Type  
**Definition:** The type of address for the Contact Organization distributing the data or document.  
**Domain:** “mailing address” “physical address” “mailing and physical address”  
**Example:** mailing and physical address  
**Comments:** The entire compound element, Contact Address, may be repeated multiple times if there are several addresses for one contact organization. Address Type is one of the elements within Contact Address.

**Paragraph No.: 6.1.10.4.2**

**Element:** Address  
**Definition:** An address for the Contact Organization distributing the data or document. This field is appropriate for a street address or PO Box number or similar address information for the contact.  
**Domain:** free text  
**Example:** 410 Severn Avenue, Suite 109  
**Comments:** The FGDC Standard allows free text for this element’s domain. To ensure accurate search results, consistency in data entry of this element is of key importance. The entire compound element, Contact Address, may be repeated multiple times if there are several addresses for one contact organization. Address is one of the elements within Contact Address.

**Paragraph No.: 6.1.10.4.3**

**Element:** City  
**Definition:** The city of the address.  
**Domain:** free text  
**Example:** Annapolis  
**Comments:** The entire compound element, Contact Address, may be repeated multiple times if there are several addresses for one contact organization. City is one of the elements within Contact Address.
6.1.10.4.4

**Element:** State or Province

**Definition:** The state or province of the address.

**Domain:** free text

**Example:** MD

**Comments:** Express state or province as postal service two digits, uppercase abbreviation. The entire compound element, Contact Address, may be repeated multiple times if there are several addresses for one contact organization. State or Province is one of the elements within Contact Address.

6.1.10.4.5

**Element:** Postal Code

**Definition:** The ZIP or other postal code of the address.

**Domain:** free text

**Example:** 21403

**Comments:** The entire compound element, Contact Address, may be repeated multiple times if there are several addresses for one contact organization. Postal Code is one of the elements within Contact Address.

6.1.10.5

**Element:** Contact Voice Telephone

**Definition:** The telephone number of the contact organization or individual.

**Domain:** free text

**Example:** (410) 267-5671

**Comments:** The FGDC Standard allows free text for this element’s domain. To ensure accurate search results, consistency in data entry of this element is of key importance. An example of a consistent format would be (ddd)ddd-dddd xddd. Contact Voice Telephone may be repeated multiple times if there are several phone numbers for one contact organization.
Paragraph No.: 6.3

Element: Distribution Liability

Definition: Statement of the liability assumed by the distributor.

Domain: free text

Example: The Chesapeake Bay Program is performing a service by providing data on behalf of the Alliance for the Chesapeake Bay (ACB), and makes no claim as to the quality or validity of the data. All questions and concerns should be directed to ACB.

Comments: The FGDC Standard allows free text for this element’s domain. It is recommended to create standard statements for an informational product within an organization or group for consistency.

Paragraph No.: 6.4.1

Element: Non-digital Form

Definition: The description of options for obtaining the dataset on non-computer-compatible media.

Domain: “hardcopy” free text

Example: hardcopy

Comments: The FGDC Standard allows free text for this element’s domain. The entire Standard Order Process compound element may be repeated multiple times if there are several non-digital forms of the dataset or document available.
Paragraph No.: 6.4.2.1.1

Element: Format Name

Definition: The name of the data transfer format or computer program storing the dataset or document.

Domain: free text, or pick from the following categories:

GIS:
- "ARCE" - ARC/INFO Export format;
- "ARCG" - ARC/INFO Generate format;
- "BIL" - Imagery, band interleaved by line;
- "BIP" - Imagery, band interleaved by pixel;
- "BSQ" - Imagery, band interleaved sequential;
- "CDF" - Common Data Format;
- "CFF" - Cartographic Feature File (U.S. Forest Service);
- "COORD" - User-created coordinate file, declared format;
- "DEM" - Digital Elevation Model format (U.S. Geological Survey);
- "DFAD" - Digital Feature Analysis Data (Defense Mapping Agency);
- "DGN" - Microstation format (Intergraph Corporation);
- "DIGEST" - Digital Geographic Information Exchange Standard;
- "DLG" - Digital Line Graph (U.S. Geological Survey);
- "DTED" - Digital Terrain Elevation Data (MIL-D-89020);
- "DWG" - AutoCAD Drawing format;
- "DX90" - Data Exchange '90;
- "DXF" - AutoCAD Drawing Exchange Format;
- "ERDAS" - ERDAS image files (ERDAS Corporation);
- "GIRAS" - Geographic Information Retrieval and Analysis System;
- "GRASS" - Geographic Resources Analysis Support;
- "IGDS" - Interactive Graphic Design System format (Intergraph Corporation);
- "IGES" - Initial Graphics Exchange Standard;
- "MIF" - Map Info format;
- "MOSS" - Multiple Overlay Statistical System export file;
- "NITF" - National Imagery Transfer Format;
- "RPF" - Raster Product Format (Defense Mapping Agency);
- "RVF" - Raster Vector Format (MicroImages);
- "SDTS" - Spatial Data Transfer Standard (Federal Information Processing Standard 173);
- "SHAPE" - ArcView format;
- "SIF" - Standard Interchange Format (DOD Project 2851);
- "SLF" - Standard Linear Format (Defense Mapping Agency);
- "SPLUS" - S-Plus file;
- "TGRLN" - Topologically Integrated Geographic Encoding and Referencing (TIGER) Line format (Bureau of the Census);
- "VPF" - Vector Product Format (Defense Mapping Agency)

Graphics Output:
- "CGM" - Computer Graphics Metafile;
- "DIF" - VisiCalc format;
- "EPS" - Encapsulated Postscript;
- "GIF" - Graphics Interchange Format;
- "GRA" - ARC/INFO graphic file;
- "HPGL/2" - Hewlett Packard Graphics Language;
- "PLT" - ARC/INFO plot file;
- "PS" - Postscript

Word Processor:
- "DOC" - Microsoft Word file;
“PDF” - Adobe Portable Document format;
“PM” - Aldus PageMaker;
“WP” - WordPerfect

**Spreadsheet:**
“EXCEL” - Excel data file;
“FW” - Framework Spreadsheet or database format;
“LOTUS” - Lotus 1-2-3 spreadsheet;
“QP” - Quattro Pro data file;

**Database:**
“ACC” - Access database file;
“DBF” - dBASE data file;
“HDF” - Hierarchical Data Format;
“netCDF” - network Common Data Format;
“RPD” - RapidFile;
“SAS” - SAS Transport Dataset

**Multimedia Files:**
“AIFF” - Audio Interchange File Format;
“AU” - Audio file;
“AVI” - Microsoft’s Audio Visual Interleaved format;
“JPEG” - Joint Photographic Experts Group format;
“MOV” - QuickTime Audio/Video compression standard;
“MPEG” - Moving Pictures Expert Group;
“RA” - Real Audio;
“RV” - Real Video;
“TIFF” - Tagged Image File Format;
“WAV” - Windows Wave format sound file;
“VRML” - Virtual Reality Modeling Language;

**Other:**
“ASCII” - ASCII file, formatted for text attributes, declared format;
“EMF” - Enhanced metafile;
“HTML” - HyperText Markup Language format;
“PBM” - Portable Bit Map format file;
“SGML” - Standard Generalized Markup Language;
“WM” - Windows metafile;
“XWD” - X-Windows Dump format;

**Example:**
WP

**Comments:** This is the name of the format or computer program for the common ways in which the dataset may be obtained or received in digital form. The entire Standard Order Process, Digital Form compound element may be repeated multiple times if there are several digital forms of the dataset or document available. Format Name is one of the elements contained within this compound element. If there are several formats available, all related fields must be filled out such as Format Version Number, File Decompression Technique, Transfer Size, etc.
Paragraph No.: 6.4.2.1.2

Element: Format Version Number

Definition: Version number of the format or computer program.

Domain: free text

Example: 6.1

Comments: Enter this element or version date. This is the version number of the format or computer program for the common ways in which the dataset or document may be obtained or received in digital form. The entire Standard Order Process, Digital Form compound element may be repeated multiple times if there are several digital forms of the dataset or document available. Format Version Number is one of the elements contained within this compound element. If there are several formats available, all related fields must be filled out such as Format Name, File Decompression Technique, Transfer Size, etc.

Paragraph No.: 6.4.2.1.3

Element: Format Version Date

Definition: Date of the version of the format or computer program.

Domain: free date

Example: 19920508

Comments: Enter this element or version number. This is the version date of the format or computer program for the common ways in which the dataset or document may be obtained or received in digital form. The entire Standard Order Process, Digital Form compound element may be repeated multiple times if there are several digital forms of the dataset or document available. Format Version Date is one of the elements contained within this compound element. If there are several formats available, all related fields must be filled out such as Format Name, File Decompression Technique, Transfer Size, etc.
Paragraph No.: 6.4.2.1.6

Element: File Decompression Technique

Definition: Recommendations of algorithms or processes (including means of obtaining these algorithms or processes) that can be applied to read or expand datasets to which data compression techniques have been applied. This field is applicable whenever a data or document file has been compressed. If some files are compressed but others are not, “No compression applied” would be applicable for the appropriate files. If compression is never used, this field is not applicable.

Domain: “No compression applied” “tar” “cpio” “dd” “uncompress” “gunzip” “unsit” “pkunzip” “unzip” “uncompress and tar” “gunzip and tar”

Example: Pkunzip

Comments: This refers to the decompression technique the user must apply to get back to the original file. The FGDC Standard allows free text for this element’s domain. To ensure accurate entry of this element and subsequent searching, select a value from the domain list provided, if appropriate. The entire Standard Order Process, Digital Form compound element may be repeated multiple times if there are several digital forms of the dataset or document available. File Decompression Technique is one of the elements contained within this compound element. If there are several formats available, all related fields must be filled out such as Format Name, Format Version Number, Transfer Size, etc.

Paragraph No.: 6.4.2.1.7

Element: Transfer Size

Definition: The size, or estimated size, of the transferred dataset in megabytes.

Domain: Transfer Size > 0.0

Example: 0.4

Comments: The entire Standard Order Process, Digital Form compound element may be repeated multiple times if there are several digital forms of the dataset or document available. Transfer size is one of the elements contained within this compound element. If there are several formats available, all related fields must be filled out such as Format Name, Format Version Number, File Decompression Technique, etc.
**Paragraph No.: 6.4.2.2.1.1.1**

**Element:** URL (Network Resource Name)

**Definition:** The name of the file and service from which the dataset or document can be obtained. This is the URL or Homepage Address.

**Domain:** free text

**Example:** http://www.chesapeakebay.net/file4231

**Comments:** Values for network addresses for computer systems and related services should follow the Uniform Resource Locator (URL) convention for the Internet. See http://www.ncsa.uiuc.edu/demoweb/url-primer.html for additional details about the URL. The URL is a network extension of the UNIX file naming conventions. The basic form of the URL is: service://hostname:port/path/filename where service - the name of the service to be used with the resource. Examples include “file”, “fcp.”, “telnet”, “gopher”, “wais”, “news”, “http”, “rlogin”, and “tn3270.” hostname:port - the Internet address of the machine and the port through which the service is provided. The identification of the port is required only if a non-standard implementation is being used. path - the directory path to the file. filename - the name of the file. This element may be repeated multiple times if there are several files making up this dataset or document.

---

**Paragraph No.: 6.4.2.2.1**

**Element:** Offline Media

**Definition:** Name of the media on which the digital dataset or document can be received, other than the Internet.

**Domain:** “CD-ROM” “3-1/2 inch floppy disk” “5-1/4 inch floppy disk” “9-track tape” “4 mm cartridge tape” “8 mm cartridge tape” “1/4-inch cartridge tape” “zip disk” free text

**Example:** CD-ROM, 3-1/2 inch floppy disk

**Comments:** This element may be repeated multiple times if there are several transfer options available for this dataset or document.
Paragraph No.: 6.4.3

Element: Fees
Definition: The fees and terms for retrieving the dataset.
Domain: “None” free text
Example: $75
Comments: The entire Standard Order Process compound element may be repeated multiple times if there are several forms of the dataset or document available. Fees is one element within Standard Order Process and therefore may be entered multiple times, if the fee for the forms available varies.

Paragraph No.: 7.1

Element: Metadata Date
Definition: The date that the metadata were created or last updated. Encodes a date as the year, and optionally month, or month and day.
Domain: free date (see comments below for format)
Example: 19930515
Comments: As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...).
Paragraph No.: 7.4.10.1.2

Element: Contact Organization

Definition: The name of the organization to contact regarding metadata for the data or document.

Domain: (Refer to the CIMS list of data originators/organizations in Appendix A)

Example: U.S. Environmental Protection Agency, Chesapeake Bay Program Office (USEPA CBPO)

Comments: The FGDC Standard allows free text for this element’s domain. To ensure accurate entry of this element and subsequent searching, use the list provided. Notify the CIMS Data Librarian of missing/incorrect values and the necessary modification(s) will be made to the list.

Paragraph No.: 7.4.10.4.1

Element: Address Type

Definition: The information provided by the address.

Domain: “mailing address” “physical address” “mailing and physical address”

Example: mailing and physical address

Comments: The entire compound element, Contact Address, may be repeated multiple times if there are several addresses for one contact organization. Address Type is one of the elements within Contact Address.

Paragraph No.: 7.4.10.4.2

Element: Address

Definition: An address line for the address. This field is appropriate whenever there is a street address or PO Box number or similar address information for the contact.

Domain: free text

Example: 312 Seitz Hall, Virginia Tech

Comments: The FGDC Standard allows free text for this element’s domain. To ensure accurate search consistency in data entry of this element is of key importance. The entire compound element, Contact Address, may be repeated multiple times if there are several addresses for one contact organization. Address is one of the elements within Contact Address.
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</thead>
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<tr>
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<tr>
<td><strong>Definition:</strong></td>
</tr>
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<td><strong>Domain:</strong></td>
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<td><strong>Example:</strong></td>
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<td><strong>Definition:</strong></td>
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<td><strong>Example:</strong></td>
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<tr>
<td><strong>Definition:</strong></td>
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<td><strong>Domain:</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
</tr>
<tr>
<td><strong>Comments:</strong></td>
</tr>
</tbody>
</table>
Paragraph No.: 7.4.10.5

Element: Contact Voice Telephone
Definition: The telephone number for the metadata contact organization or individual.
Domain: free text
Example: (540) 261-6000

Comments: The FGDC Standard allows free text for this element’s domain. To ensure accurate search results, consistency in data entry of this element is of key importance. Contact Voice Telephone may be repeated multiple times if there are several phone numbers for one contact organization.

Paragraph No.: 7.5

Element: Metadata Standard Name
Definition: The name of the metadata standard used to create the dataset.
Domain: free text
Example: Content Standards for Digital Geospatial Metadata

Comments: Although CIMS Metadata must adhere to the CIMS Metadata Guidelines, it does not constitute a recognized Standard. Currently the Standard federal agencies must adhere to for spatial information is Content Standards for Digital Geospatial Metadata. In the future there may be FGDC recognized metadata profiles which may be referenced in this element, such as for NBII.

Paragraph No.: 7.6

Element: Metadata Standard Version
Definition: Identification of the version of the metadata standard used to document the dataset.
Domain: free text
Example: 19940608

Comments:
VI. CIMS Level 2 Metadata

A. Overview

The purpose of CIMS Level 2 Metadata is to make available the information necessary to achieve the desired query and analysis capabilities of CIMS tabular datasets that are not spatially referenced. The elements in Level 2 of CIMS metadata will store the majority of information required to query and analyze particular dataset(s) accessible through CIMS.

CIMS Level 2 Metadata builds upon Level 1. Compliance with CIMS Level 2 Metadata requires users refer to and enter metadata for all CIMS Level 1 elements (see Section V), and the additional elements unique to CIMS Level 2. The additional Level 2 elements are described in this section. Level 2 metadata are applicable to tabular datasets that are not spatially referenced. Geospatial or spatially referenced data are data that contain coordinates (e.g., latitude and longitude). Non-geospatial data or data that are not spatially referenced are data that do not include coordinates in the data itself. Toxicity Effects Data and Agricultural Census Data are examples of non-geospatial datasets for which CIMS Level 2 metadata would be entered.

The information unique to CIMS Level 2 is taken from Section 2- Data Quality Information, and Section 5 - Entity and Attribute Information of the FGDC and NBII Metadata Standards. It is important to understand the quality and source(s) of the non-spatially referenced tabular data to use or analyze the data correctly. In addition, the Level 2 elements regarding attributes and values are necessary to support the query and analysis capability of CIMS.

This section contains a summary table listing the elements that are unique to Level 2. The Table has five columns, with the following headings: Metadata Section, Compound Element, Paragraph Number, Element Name, and Repeat. Also, included in this section are detailed descriptions of the metadata elements unique to this Level. Details of the individual pieces of information or data elements are included in this section. The descriptions of the elements include the FGDC Paragraph Number, Element name, Definition, and Domain, as well as Example and Comments. For more information on how to use this section or how it is organized, refer to Section IV - How To Use This Document.

Note that some element descriptions contain comments that are relevant to both CIMS Level 2 and Level 3. As CIMS Metadata levels build upon one another, element descriptions are not duplicated in the next CIMS Level. Therefore Level 2 and 3 comments are included in element descriptions in this section and are marked with the appropriate level for clarity.
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<th>Compound Element</th>
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<td>Title</td>
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<td>5.2.2</td>
<td>Entity and Attribute Detail and Citation</td>
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</table>

2 Repeat
✓ - This is an individual data element which may be repeated multiple times.
+ - This is an individual data element within a compound element. This compound element may be repeated multiple times.
+/✓ - This is an individual data element within a compound element. This compound element may be repeated multiple times. In addition, this individual data element may be repeated within one instance of the compound element.
C. CIMS Level 2 - Element Descriptions

Paragraph No.: 2.1.1
Element: Attribute Accuracy Report
Definition: An explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the tests used.
Domain: free text
Example: <TBD>
Comments: The attribute accuracy report is a complete description of the accuracy of the attribute information in the dataset, including the identification of tests used, testing methodology, results obtained, etc. Attributes are the labels on polygons in a GIS coverage or the fields in a tabular dataset. Accuracy assessment for measures on a continuous scale shall be performed using procedures similar to those used for positional accuracy (providing a numerical estimate of expected discrepancies). The report of a test of attribute accuracy shall include the date of the test and the dates of the materials used. In the case of different dates, the report shall describe the rates of change in the phenomena classified.
Applicable to Level 3 Metadata: Spatial variations in attribute accuracy may be reported in a quality overlay. Accuracy tests for categorical attributes may be performed by one of the following methods. All methods shall make reference to a map scale in interpreting classifications.
**Deductive Estimate:** Any estimate, even a guess based on experience, is permitted. The basis for the deduction shall be explained. Statements such as “good” or “poor” should be explained in as quantitative manner as possible.
**Tests Based on Independent Samples:** A misclassification matrix shall be reported as counts of sample units cross tabulated by the categories of the sample and of the tested material. The sampling procedure and the location of sample units shall be described.
**Tested Based on Polygon Overlay:** A misclassification matrix shall be reported as areas. The relationship between the two maps shall be explained; as far as possible, the two sources should be independent and one should have higher accuracy.

Paragraph No.: 2.1.2.1
Element: Attribute Accuracy Value
Definition: An estimate of the accuracy of the identification of the entities and assignments of attribute values in the data set.
Domain: “Unknown” free text
Example: <TBD>
Comments: The entire compound element, Quantitative Attribute Accuracy Assessment, may be repeated several times for different assessments of the same dataset. Attribute Accuracy Value is one element within this compound element and therefore may be entered multiple times.
2.1.2.2

**Element:** Attribute Accuracy Explanation

**Definition:** The identification of the test that yielded the Attribute Accuracy Value.

**Domain:** free text

**Example:** <TBD>

**Comments:** The entire compound element, Quantitative Attribute Accuracy Assessment, may be repeated several times for different assessments of the same dataset. Attribute Accuracy Explanation is one element within this compound element and therefore may be entered multiple times.

---

2.2

**Element:** Logical Consistency Report

**Definition:** An explanation of the fidelity of the relationships in the data set and tests used.

**Domain:** free text

**Example:** <TBD>

**Comments:** A report on logical consistency shall describe the fidelity of relationships encoded in the data structure of the digital data. The report shall detail the tests performed and the results of the tests. The report should include tests of valid values, general tests for data, specific tests for data, and date of tests. Different tests may be applied, but the quality report shall contain a description of the tests applied or a reference to documentation of the software used. The report shall state whether all inconsistencies were corrected or it shall detail the remaining errors by case.

---

2.3

**Element:** Completeness Report

**Definition:** Information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set.

**Domain:** free text

**Example:** <TBD>

**Comments:** The report on completeness shall describe the relationship between the objects represented and the abstract universe of such objects. In particular, the report shall describe the exhaustiveness of a set of features. Exhaustiveness concerns spatial and attribute properties, both of which can be tested. A test for spatial completeness can be obtained from topological tests for logical consistency described in 3.4.3 of SDTS (Standard Data Transfer Standard). Tests for attribute completeness operate by comparison of a master list of codes to the codes actually appearing in the file. The procedures used for testing and the results shall be described in the quality report.
Paragraph No.: 2.5.1.1.8.1

Element: Originator

Definition: The name of an organization or individual that provided source datasets or documents used to compile this dataset or document.

Domain: (Refer to the CIMS list of data originators/organizations in Appendix A)

Example: Maryland Department of Natural Resources (MD DNR)

Comments: If the name of editors or compilers are provided, the name must be followed by "(ed.)" or "(comp.)" respectively. If possible, the organization name should be given to the sub-organizational level to which the individual(s) that developed the data is (are) "attached". This element may be repeated multiple times to illustrate that a source of this data or document was developed by several organizations. In addition, the entire compound element, Source Information, Citation, may be repeated if there are multiple source datasets used in putting together this dataset or document. Originator is one element within Source Information, Citation, and therefore may be repeated multiple times, once per source dataset.

Paragraph No.: 2.5.1.1.8.2

Element: Publication Date (Source Citation)

Definition: The date when the source data set is published or otherwise made available for release. Encodes a date as the year, and optionally month, or month and day.

Domain: “Unknown” “Unpublished Material” free date (see comments below for format)

Example: 19920124

Comments: As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...).
**Element:** Title

**Definition:** The name by which the source data set is known.

**Domain:** free text

**Example:** American Shad Population Estimates for the Upper Bay

**Comments:** The entire compound element, Source Information - Citation, may be repeated if there are multiple source datasets used in putting together this dataset or document. Title is one element within Source Information, Citation, and therefore may be repeated multiple times, once per source dataset.

**Paragraph No.: 2.5.1.3**

**Element:** Type of Source Media

**Definition:** The medium of the source data set.

**Domain:** “paper” “stable-base material” “microfiche” “microfilm” “audiocassette” “chart” “filmstrip” “transparency” “videocassette” “videodisc” “videotape” “physical model” “computer program” “disc” “cartridge tape” “magnetic tape” “online” “CD-ROM” “electronic bulletin board” “electronic mail system” free text

**Example:** paper

**Comments:** The entire compound element, Source Information - Citation, may be repeated if there are multiple source datasets used in putting together this dataset or document. Title is one element within Source Information, Citation, and therefore may be repeated multiple times, once per source dataset.
Element: Source Content Date Explanation (Source Currentness Reference)

Definition: The basis on which the content date information of a source data set is determined. An explanation justifying the Calendar Date for Content or Beginning/Ending Dates for Content for a source dataset. This element is used to clarify how the date(s) provided in Source Time Period of Content were generated. This element requires the producer to identify if the Source Time Period of Content dates refer to the ground condition (that is, when the “real world” looked the way it is described in the dataset), or some later time when the information was recorded, published, etc.

Domain: “ground condition” “publication date” “observed” free text

Example: ground condition

Comments: NBII has added the domain value “observed”. If ground condition is the same as observed, enter ground condition.

If “June, July, and August” were derived from “Summer”, or calendric dates were generated from the radioisotopic (e.g., carbon) dating of samples, or some other interpretation, an explanation of the interpretation or derivation should be included in this element. In the case of calendar dates derived from radiocarbon dating, the radiocarbon age (B.P.), its standard deviation, and the isotope fractionation (if done), along with the calibration scheme used, should be included.
Paragraph No.: 2.5.1.4.9.1.1

Element: Calendar Date for Content

Definition: Time period(s) for which the source dataset or information is valid or relevant. Encodes a date as the year, and optionally month, or month and day. This can be used for multiple dates if applicable. Use Beginning Date for Content and Ending Date for Content if the data or information covers a range of dates, and leave Calendar Date for Content empty.

Domain: “Unknown” free date (see comments below for format)

Example: 199409

Comments: As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...). The entire compound element, Source Information, Source Time Period of Content, may be repeated if there are multiple source datasets used in putting together this dataset or document. Calendar Date for Content of the source dataset is one element within Source Information, Source Time Period of Content and therefore may be repeated multiple times, once per source dataset.
**Paragraph No.:** 2.5.1.4.9.3.1

**Element:** Beginning Date for Content

**Definition:** Beginning Date for which the source dataset or information is valid or relevant. Encodes the beginning date as the year, and optionally month, or month and day.

**Domain:** “Unknown” free date (see comments below for format)

**Example:** 19910401

**Comments:** As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYYMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYY...). The entire compound element, Source Information, Source Time Period of Content, may be repeated if there are multiple source datasets used in putting together this dataset or document. Beginning Date for Content of the source dataset is one element within Source Information, Source Time Period of Content and therefore may be repeated multiple times, once per source dataset.
Paragraph No.: 2.5.1.4.9.3.3

**Element:** Ending Date for Content

**Definition:** Ending Date for which the dataset or information is valid or relevant. Encodes the ending date as the year, and optionally month, or month and day.

**Domain:** “Unknown” free date (see comments below for format)

**Example:** 19910430

**Comments:** As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...). The entire compound element, Source Information, Source Time Period of Content, may be repeated if there are multiple source datasets used in putting together this dataset or document. Ending Date for Content of the source dataset is one element within Source Information, Source Time Period of Content, and therefore may be repeated multiple times, once per source dataset.

Paragraph No.: 2.5.1.5

**Element:** Source Citation Abbreviation

**Definition:** Short-form alias for the source citation.

**Domain:** free text

**Example:** ANNCONCNO3

**Comments:** This element can provide the means to link a source with the process steps using or producing this dataset/document. This is achieved by entering the same text in the Source Used or Produced Citation Abbreviation element as in this element. The entire compound element, Source Information - Citation, may be repeated if there are multiple source datasets used in putting together this dataset or document. Source Citation Abbreviation is one element within Source Information, Citation, and therefore may be repeated multiple times, once per source dataset.
**Paragraph No.: 2.5.1.6**

**Element:** Source Contribution

**Definition:** Brief statement identifying the information contributed by the source to the data set.

**Domain:** free text

**Example:** American shad population estimates for the upper bay based on shad captured, tagged, and recaptured.

**Comments:** The entire compound element, Source Information may be repeated if there are multiple source datasets used in putting together this dataset or document. Source Contribution is one element within Source Information and therefore may be repeated multiple times, once per source dataset.

---

**Paragraph No.: 2.5.2.1**

**Element:** Process Description

**Definition:** An explanation of a single event or data manipulation and related parameters or tolerances.

**Domain:** free text

**Example:** Tabular data were hand entered from Agricultural Census books for acres of pasture, crop, and hay into an Excel spreadsheet.

**Comments:** The entire compound element, Process Step, may be repeated if there are multiple methods of data collection and processing used to produce this dataset or document. Process Description is one element within Process Step, and therefore may be repeated multiple times, once per Process Step. The compound element, Process Step, including the Process Description, Source Used Citation Abbreviation, Process Date, and Source Produced Citation will be used to capture all pertinent information from sampling methodology to data manipulation and presentation. Note the NBII Standard has implemented an additional and separate set of elements used to capture field and lab methodology, from the FGDC’s data processing elements. For CIMS all methods/processing steps are required to be entered in the compound element, Process Step.
Paragraph No.: 2.5.2.2

Element: Source Used Citation Abbreviation

Definition: The Source Citation Abbreviation (2.5.1.5) of a dataset used in the processing step.

Domain: Source Citation Abbreviations from the Source Information entries for the dataset.

Example: ANNCONCNO3

Comments: The entire compound element, Process Step, may be repeated if there are multiple methods of data collection and processing used to produce this dataset or document. Source Used Citation Abbreviation is one element within Process Step, and therefore may be repeated multiple times, once per Process Step. The compound element, Process Step, including the Process Description, Source Used Citation Abbreviation, Process Date, and Source Produced Citation will be used to capture all pertinent information from sampling methodology to data manipulation and presentation. Note the NBII Standard has implemented an additional and separate set of elements used to capture field and lab methodology, from the FGDC’s data processing elements. For CIMS all methods/processing steps are required to be entered in the compound element, Process Step. This is the element that ties this processing step to a particular Source Citation. This element can provide the means to link what Source Citation was used in this processing step to create the dataset or document. This is achieved by entering the same text in the Source Citation Abbreviation element as in this element.
Element: Process Date

Definition: The date when the event was completed. Encodes a date as the year, and optionally month, or month and day.

Domain: “Unknown” “Not Complete” free date (see comments below for format)

Example: 19920124

Comments: As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...).

The entire compound element, Process Step, may be repeated if there are multiple methods of data collection and processing used to produce this dataset or document. Process Date is one element within Process Step, and therefore may be repeated multiple times, once per Process Step.

Paragraph No.: 2.5.2.5

Element: Source Produced Citation Abbreviation

Definition: The Source Citation Abbreviation (2.5.1.5) of an intermediate dataset that (1) is significant in the opinion of the data producer, (2) is generated in the processing step, and (3) is used in later processing steps.

Domain: Source Citation Abbreviations from the Source Information entries for the dataset.

Example: CBPLU 1990

Comments: The entire compound element, Process Step, may be repeated if there are multiple methods of data collection and processing used to produce this dataset or document. Source Produced Citation Abbreviation is one element within Process Step, and therefore may be repeated multiple times, once per Process Step.
Paragraph No.: 5.1.1.1

Element: Entity Type Label
Definition: The name of the entity type. An entity type is the definition and description of a set into which similar entity instances are classified (e.g., bridge, duck, air sample, etc.).
Domain: free text
Example: Toxicity
Comments:

Paragraph No.: 5.1.1.2

Element: Entity Type Definition
Definition: The description of the entity type. An entity type is the definition and description of a set into which similar entity instances are classified (e.g., bridge, duck, air sample, etc.).
Domain: free text
Example: <TBD>
Comments:

Paragraph No.: 5.1.1.3

Element: Entity Type Definition Source
Definition: The authority of the entity type definition. An entity type is the definition and description of a set into which similar entity instances are classified (e.g., bridge, duck, air sample, etc.).
Domain: free text
Example: <TBD>
Comments:
Paragraph No.: 5.1.2.1

Element: Attribute Label

Definition: The name of the attribute (e.g., species name, land-cover type, size, etc.). An attribute is a defined characteristic of an entity; any measurement or label attached to the entity is an attribute.

Domain: free text

Example: effect

Comments:

Paragraph No.: 5.1.2.2

Element: Attribute Definition

Definition: The description of the attribute. An attribute is a defined characteristic of an entity; any measurement or label attached to the entity is an attribute.

Domain: free text

Example: toxicity effect code

Comments:

Paragraph No.: 5.1.2.3

Element: Attribute Definition Source

Definition: The authority of the attribute definition. An attribute is a defined characteristic of an entity; any measurement or label attached to the entity is an attribute.

Domain: free text

Example: <TBD>

Comments:
Paragraph No.: 5.1.2.4.1.1
Element: Enumerated Domain Value
Definition: The name or label of a member of the set (i.e., a list of all the valid attribute values).
Domain: free text
Example: LC50
Comments: Enter this element or Range Domain or Codeset Domain

Paragraph No.: 5.1.2.4.1.2
Element: Enumerated Domain Value Definition
Definition: The description of the value.
Domain: free text
Example: Lethal concentration effect, 50% of organisms
Comments: Enter this element or Range Domain or Codeset Domain

Paragraph No.: 5.1.2.4.1.3
Element: Enumerated Domain Value Definition Source
Definition: The authority of the definition.
Domain: free text
Example: <TBD>
Comments: Enter this element or Range Domain or Codeset Domain

Paragraph No.: 5.1.2.4.2.1
Element: Range Domain Minimum
Definition: The lowest value that the attribute can be assigned.
Domain: free text
Example: 0
Comments: Enter this element or Enumerated Domain or Codeset Domain
**Paragraph No.: 5.1.2.4.2.2**

**Element:** Range Domain Maximum  
**Definition:** The greatest value that the attribute can be assigned.  
**Domain:** free text  
**Example:** 160  
**Comments:** Enter this element or Enumerated Domain or Codeset Domain

---

**Paragraph No.: 5.1.2.4.3.1**

**Element:** Codeset Name  
**Definition:** The title of the codeset.  
**Domain:** free text  
**Example:** <TBD>  
**Comments:** Enter this element or Enumerated Domain or Range Domain. Codeset Domain should only be used in addition to Enumerated or Range Domain. Enumerated or Range Domain should be used to access CIMS Query/Analysis capabilities.

---

**Paragraph No.: 5.1.2.4.3.2**

**Element:** Codeset Source  
**Definition:** The authority for the codeset.  
**Domain:** free text  
**Example:** <TBD>  
**Comments:** Enter this element or Enumerated Domain or Range Domain. Codeset Domain should only be used in addition to Enumerated or Range Domain. Enumerated or Range Domain should be used to access CIMS Query/Analysis capabilities.
Element: Attribute Units of Measure
Definition: The standard of measurement for an attribute value. This field is not applicable if an attribute is not measured (e.g., name, sex, codes, etc.).
Domain: free text
Example: meters/second
Comments: Enter this element or Enumerated Domain or Range Domain. Codeset Domain should only be used in addition to Enumerated or Range Domain. Enumerated or Range Domain should be used to access CIMS Query/Analysis capabilities.

Paragraph No.: 5.2.1
Element: Entity and Attribute Overview
Definition: Detailed summary of the information contained in a data set.
Domain: free text
Example: <TBD>
Comments: Enter this element or Detailed Description. Use Detailed Description to access CIMS capabilities.

Paragraph No.: 5.2.2
Element: Entity and Attribute Detail and Citation
Definition: Reference to the complete description of the entity types, attributes, and attribute values for the data set.
Domain: free text
Example: <TDB>
Comments: Enter this element or Detailed Description. Use Detailed Description to access CIMS capabilities.
VII. CIMS Level 3 Metadata

A. Overview

The purpose of CIMS Level 3 Metadata is to begin to provide the information necessary to initiate queries and analyses of spatially referenced data including tabular datasets with coordinates, maps, and GIS coverages. The elements in Level 3 of CIMS metadata will supply the information about a dataset necessary to query and analyze a particular dataset or sets.

As stated earlier, the CIMS metadata Levels build upon one another. Compliance with CIMS Level 3 Metadata requires that users refer to and enter metadata for all CIMS Level 1 elements (see Section V), the additional elements unique to CIMS Level 2 (see Section VI) which pertain to data quality and attributes, and the additional elements unique to CIMS Level 3. The elements unique to Level 3 are detailed below.

Level 3 metadata are applicable to spatially referenced data. Geospatial or spatially referenced data are data that contain coordinates (e.g., latitude and longitude). Non-geospatial data or data that are not spatially referenced are data that do not include coordinates in the data itself. Tabular datasets which contain geographic coordinates, maps, and GIS data such as an ARC/INFO coverage of counties are examples of geospatial datasets for which CIMS Level 3 metadata would be entered.

The information unique to CIMS Level 3 is taken from Section 2- Data Quality Information, Section 3 - Spatial Data Organization Information, and Section 4 - Spatial Reference Information of the FGDC and NBII Metadata Standards.

For geospatial data, it is important to know the scale of the source materials and the accuracy of the data. To analyze two or more spatially referenced datasets, the coordinates must be in the same projection and datum. Additionally, to analyze raster spatial datasets, they must have the same bounding coordinates and number of rows and columns. Therefore, these pieces of information are crucial to provide the desired query and analytical functions in CIMS.

This section contains a summary table listing the elements that are unique to Level 3. The Table has five columns, with the following headings: Metadata Section, Compound Element, Paragraph Number, Element Name, and Repeat. Also, included in this section are detailed descriptions of the metadata elements unique to this Level. Details of the individual pieces of information or data elements are included in this section. The descriptions of the elements include the FGDC Paragraph Number, Element name, Definition, and Domain, as well as Example and Comments. For more information on how to use this section or how it is organized, refer to Section IV - How To Use This Document.
## B. CIMS Level 3 - Summary of Unique Elements

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<td>FGDC (NBII) Paragraph Number</td>
<td>Element Name</td>
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<td>SPCS Zone Identifier</td>
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² Repeat

✓ - This is an individual data element which may be repeated multiple times.

+ - This is an individual data element within a compound element. This compound element may be repeated multiple times.

+✓ - This is an individual data element within a compound element. This compound element may be repeated multiple times. In addition, this individual data element may be repeated within one instance of the compound element.
C.  CIMS Level 3 - Element Descriptions

Paragraph No.: 2.4.1.1
Element: Horizontal Positional Accuracy Report
Definition: An explanation of the accuracy of the horizontal coordinate measurements and a description of
the tests used.
Domain: free text
Example: <TBD>
Comments:

Paragraph No.: 2.4.1.2.1
Element: Horizontal Positional Accuracy Value
Definition: An estimate of the accuracy of the horizontal coordinate measurements in the data set expressed
in (ground) meters.
Domain: free real
Example: <TBD>
Comments:

Paragraph No.: 2.4.1.2.2.2
Element: Horizontal Positional Accuracy Explanation
Definition: The identification of the test that yielded the Horizontal Positional Accuracy Value.
Domain: free text
Example: <TBD>
Comments:
Paragraph No.: 2.4.2.1
Element: Vertical Positional Accuracy Report
Definition: An explanation of the accuracy of the vertical coordinate measurements and a description of the tests used.
Domain: free text
Example: <TBD>
Comments:

Paragraph No.: 2.5.1.2
Element: Source Scale Denominator
Definition: The denominator of the representative fraction on a map.
Domain: Source Scale Denominator > 1
Example: 24000
Comments: On a 1:24,000-scale map, the Source Scale Denominator is 24000.

Paragraph No.: 3.1
Element: Indirect Spatial Reference
Definition: Name of types of geographic features, addressing schemes, or other means through which locations are referenced in the data set.
Domain: free text
Example: Wicomico County
Comments: An indirect spatial reference is any way to describe a location without using coordinates.

Paragraph No.: 3.2
Element: Direct Spatial Reference Method
Definition: The system of objects used to represent space in the data set.
Domain: “Point” “Vector” “Raster”
Example: Point
Comments:
Paragraph No.: 3.3.1.1

Element: SDTS Point and Vector Object Type

Definition: Name of point and vector spatial objects used to locate zero-, one-, and two-dimensional spatial locations in the data set.

Domain: (The domain is from "Spatial Data Concepts," which is chapter 2 of part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, Department of Commerce, National Institute of Standards and Technology): "Point" "Entity point" "Label point" "Area point" "Node, planar graph" "Node, network" "String" "Link" "Complete chain" "Area chain" "Network chain, planar graph" "Network chain, nonplanar graph" "Circular arc, three point center" "Elliptical arc" "Uniform B-spline" "Piecewise Bezier" "Ring with mixed composition" "Ring composed of strings" "Ring composed of chains" "Ring composed of arcs" "G-polygon" "GT-polygon composed of rings" "GT-polygon composed of chains" "Universe polygon composed of rings" "Universe polygon composed of chains" "Void polygon composed of rings" "Void polygon composed of chains"

Example: Point

Comments:

---

Paragraph No.: 3.3.1.2

Element: Point and Vector Object Count

Definition: The total number of the point or vector object type occurring in the data set.

Domain: Point and Vector Object Count > 0

Example: 462

Comments: Enter information in this element if Direct Spatial Reference Method (3.2) is Point or Vector.

---

Paragraph No.: 3.4.2

Element: Row Count

Definition: The maximum number of raster objects along the ordinate (y) axis. For use with rectangular raster objects.

Domain: Row Count > 0

Example: 989

Comments: Enter information in this element if Direct Spatial Reference Method (3.2) is Raster.
Paragraph No.: 3.4.3

Column Count

Definition:

raster objects.

Domain:

Example: 762

Enter information in this element if Direct Spatial Reference Method (3.2) is Raster.

Paragraph No.:

Element: Latitude Resolution

The minimum difference between two adjacent latitude values expressed in Geographic Coordinate Units of measure.

Latitude Resolution > 0.0

Example:

Comments:

Paragraph No.:

Element: Longitude Resolution

The minimum difference between two adjacent longitude values expressed in Geographic Coordinate Units of measure.

Longitude Resolution > 0.0

Example:

Comments:
Paragraph No.: 4.1.1.3

Element: Geographic Coordinate Units

Definition: Units of measure used for the latitude and longitude values.

Domain: "Decimal degrees" "Decimal minutes" "Decimal seconds" "Degrees and decimal minutes" "Degrees, minutes, and decimal seconds" "Radians" "Grads"

Example: Degrees and decimal minutes

Comments:

Paragraph No.: 4.1.2.1.1

Element: Map Projection Name

Definition: Name of the map projection.

Domain: "Albers Conical Equal Area" "Azimuthal Equidistant" "Equidistant Conic" "Equirectangular" "General Vertical Near-sided Projection" "Gnomonic" "Lambert Azimuthal Equal Area" "Lambert Conformal Conic" "Mercator" "Modified Stereographic for Alaska" "Miller Cylindrical" "Oblique Mercator" "Orthographic" "Polar Stereographic" "Polyconic" "Robinson" "Sinusoidal" "Space Oblique Mercator" "Stereographic" "Transverse Mercator" "van der Grinten" "other projection"

Example: Albers Conical Equal Area

Comments:
Paragraph No.: 4.1.2.1.2 (4.1.2.1.2.1 - 4.1.2.1.2.17)

Element: Map Projection Parameters

Definition: The map projection parameters for: Albers Conical Equal Area, Azimuthal Equidistant, Equidistant Conic, Equirectangular, General Vertical Near-sided Perspective, Gnomonic, Lambert Azimuthal Equal Area, Lambert Conformal Conic, Mercator, Modified Stereographic for Alaska, Miller Cylindrical, Oblique Mercator, Orthographic, Polar Stereographic, Polyconic, Robinson, Sinusoidal, Space Oblique Mercator (Landsat), Stereographic, Transverse Mercator, van der Grinten -- parameters for a specific map projection, each having a unique mathematical relationship between the Earth and the plane or developable surface.

Domain: (The data elements 4.1.2.1.2.1 through 4.1.2.1.2.17 are map project parameters. Each map projection has a specific set of defining parameters. Refer to FGDC’s Content Standard for Digital Geospatial Metadata where these sets of parameters are provided in the syntax for each projection.)

Example:


Paragraph No.: 4.1.2.1

Element: Grid Coordinate System Name

Definition: Name of the grid coordinate system. A grid coordinate system is a plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates.


Example: Universal Transverse Mercator

Comments: The majority of CIMS information will be “Universal Transverse Mercator”
Paragraph No.: 4.1.2.2.1

Element: UTM Zone Number

Definition: Identifier for the UTM zone.

Domain: $1 \leq UTM\ Zone\ Number \leq 60$ for the northern hemisphere; $-60 \leq UTM\ Zone\ Number \leq -1$ for the southern hemisphere

Example: 18

Comments: Enter zone in this element if Grid Coordinate System Name (4.1.2.2.1) is Universal Transverse Mercator.

---

Paragraph No.: 4.1.2.4.1

Element: SPCS Zone Identifier

Definition: Identifier for the SPCS zone.


Example: 1900

Comments: Enter zone in this element if Grid Coordinate System Name (4.1.2.2.1) is State Plane Coordinate System 1927 or State Plane Coordinate System 1983.
Appendix A - CIMS Data Originator/Organization List

NOTE: To add a data originator or organization and/or make corrections, contact the CIMS Data Librarian.

Alliance for the Chesapeake Bay (ACB)
AmeriCorps*National Civilian Community Corps (NCCC)
Chesapeake Bay Institute (CBI)
Chesapeake Bay Program (CBP)
Chesapeake Research Consortium (CRC)
Delaware Department of Natural Resources & Environmental Control (DNREC)
Department of the Air Force (USAF)
Department of the Navy (USN)
District of Columbia Environmental Regulation Administration (DCRA)
Federal Emergency Management Agency (FEMA)
George Mason University (GMU)
Interstate Commission on the Potomac River Basin (ICPRB)
Maryland Department of Agriculture (MDA)
Maryland Department of Housing and Community Development (MD DHCD)
Maryland Department of Natural Resources (MD DNR)
Maryland Department of Natural Resources, Forest, Wildlife & Heritage (MD DNR FWH)
Maryland Department of Natural Resources, Chesapeake and Coastal Watershed Service (MD DNR CCWS)
Maryland Department of Natural Resources, Land & Water Conservation Service (MD DNR LWCS)
Maryland Department of Natural Resources, Resource Assessment Service (MD DNR RAS)
Maryland Department of the Environment (MDE)
Maryland Office of Planning (MD OP)
Maryland State Highway Administration (MD SHA)
Metropolitan Washington Council of Governments (MW COG)
National Aeronautics and Space Administration (NASA)
National Oceanic and Atmospheric Administration (NOAA)
National Oceanic and Atmospheric Administration, Coastal Ocean Program (COP)
National Oceanic and Atmospheric Administration, National Climate Data Center (NCDC)
National Oceanic and Atmospheric Administration, National Environmental Satellite, Data, and Information Service (NESDIS)
National Oceanic and Atmospheric Administration, National Geophysical Data Center (NGDC)
National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)
National Oceanic and Atmospheric Administration, National Ocean Service (NOS)
National Oceanic and Atmospheric Administration, National Oceanographic Data Center (NODC)
National Oceanic and Atmospheric Administration, National Weather Service (NWS)
National Oceanic and Atmospheric Administration, Oceanic and Atmospheric Research (OAR)
National Oceanic and Atmospheric Administration, Office of Global Programs (OGP)
National Park Service (NPS)
National Science Foundation (NSF)
Virginia Institute of Marine Science (VIMS)
Virginia Marine Resources Commission (VMRC)
Virginia Polytechnic Institute and State University (VPI&SU)
West Virginia Geological & Economic Survey (WVGES)
Appendix B - CIMS Specific Place Names List

NOTE: This list was generated from various sources such as the Geographic Names Information System (GNIS), TIGER, and Federal Information Processing Standard (FIPS). To add a Specific Place Name and/or make corrections, contact the CIMS Data Librarian.

### Populated Places (with populations greater than 20,000)

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<th>Place Name</th>
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Susquehanna County  Warren County  Wyoming County
Sussex County  Washington County  Yates County
Talbot County  Wayne County  York County
Tioga County  Westmoreland County
Tompkins County  Wicomico County

Rivers
Anacostia River  Indian River  Patuxent River
Appomattox River  James River  Pocomoke River
Blackwater River  Little Annemessex River  Potomac River
Bohemia River  Little Blackwater River  Rappahannock River
Bush River  Little Cacapon River  Sassafras River
Cacapon River  Little Magothy River  Savage River
Chenango River  Little Monocacy River  Severn River
Chester River  Little Patuxent River  Shenandoah River
Chicamacomico River  Little Wicomico River  South River
Choptank River  Lynnhaven River  Staunton River
Coan River  Magothy River  Susquehanna River
Cohocton River  Mattaponi River  Tioga River
Conestoga River  Middle River  Warwick River
East River  Middle Patuxent River  West River
Elizabeth River  Monocacy River  Wicomico River
Great Wicomico River  Nanticoke River  Wye East River
Gunpowder Falls  Occoquan River  Wye River
Gunpowder River  Pamunkey River  York River
Hampton River  Patapsco River

Streams
Abrahams Creek  Allen Creek  Antietam Creek

CIMS Metadata Guidelines Revision 1
Appendix B
CBP September 1998
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<tr>
<td>Browns Creek</td>
<td>Elk Lick Run</td>
<td>Hunters Run</td>
</tr>
<tr>
<td>Cabin Run</td>
<td>Ellis Brook</td>
<td>Israel Creek</td>
</tr>
<tr>
<td>Cahoon Creek</td>
<td>Elmington Creek</td>
<td>Jackson Branch</td>
</tr>
<tr>
<td>Cattail Creek</td>
<td>Fall Run</td>
<td>Johnny Moore Creek</td>
</tr>
<tr>
<td>Cave Run</td>
<td>Falling Branch</td>
<td>Kentuck Run</td>
</tr>
<tr>
<td>Charlies Run</td>
<td>Felgates Creek</td>
<td>Laning Creek</td>
</tr>
<tr>
<td>Cherry Run</td>
<td>Fidlers Run</td>
<td>Laurel Brook</td>
</tr>
<tr>
<td>Church Run</td>
<td>Fly Creek</td>
<td>Lewes Creek</td>
</tr>
<tr>
<td>Clark Creek</td>
<td>Foley Branch</td>
<td>Little Anderson Creek</td>
</tr>
<tr>
<td>Coal Run</td>
<td>Fox Run</td>
<td>Little Blackwater River</td>
</tr>
<tr>
<td>Colby Creek</td>
<td>France Creek</td>
<td>Little Creek</td>
</tr>
<tr>
<td>Coleman Creek</td>
<td>German River</td>
<td>Martin Creek</td>
</tr>
<tr>
<td>Little Nelson Run</td>
<td>Long Marsh Run</td>
<td>Massaponax Creek</td>
</tr>
<tr>
<td>Little Rocky Creek</td>
<td>Lynnwood Run</td>
<td></td>
</tr>
</tbody>
</table>
Mataponi Creek
Mayer Branch
Meads Creek
Merry Run
Meshoppen Creek
Michael Run
Middle Branch Wyalusing Creek
Middletown Branch
Miles Creek
Mill Creek
Millenbeck Prong
Monie Creek
Monongahela Creek
Moravian Run
Morgan Branch
Mosquito Creek
Mouse Run
Muddy Run
Mudlick Run
Myrtle Swamp
Newport Creek
North Branch Rock Creek
Otego Creek
Paint Branch
Phelps Creek
Pimmit Run
Piney Branch
Piney Creek
Podickery Creek
Politts Branch
Porter Run
Porterfield Run
Portobago Creek
Powhite Creek
Poythress Run
Pursley Run
Quantico Creek
Red Oak Creek
Rock Creek
Rockhouse Branch
Rockwell Run
Roys Run
Sandtown Branch
Sandy Run
Sawmill Run
Schell Run
Sears Run
Seneca Creek
Sevenmile Run
Shaws Fork
Shenton Creek
Sherman Creek
Silver Creek
Simpson Creek
Sinking Creek
Sir Johns Run
Skimino Creek
Sloop Creek
Snitz Creek
Sowell Branch
Spady Creek
Specks Run
Spences Creek
Spotico Creek
Spring Run
Standing Stone Creek
Sterling Run
Stone Mill Brook
Stony Creek
Stony Hollow Run
Strait Creek
Sugar Grove Run
Sugar Works Run
Sullivan Branch
Sulphur Run
Swan Point Creek
Syberries Creek
Thompson Creek
Three Forks Run
Tilghman Branch
Tobe Run
Toms Run
Tonys Creek
Troups Creek
Tubbs Branch
Tuscarora Creek
Tyler Creek
Tyler Run
Valley Creek
Valley Run
Wapti Creek
Waukiki Creek
Wet Stone Branch
White Marsh Branch
Willett Run
Willow Run
Wills Creek
Worton Creek
Yaleville Brook
Zeke Run
Appendix C - Additional Metadata Guidance for Publications

The purpose of this appendix is to provide additional guidance to those entering metadata for publications. Its purpose is two-fold:

1. Present a limited number of additional metadata elements relevant when creating publication metadata

   CIMS Level 1 Metadata discussed in Section V, details the minimum information required for all information types. There are several additional elements of metadata that are of particular relevance to publications. The elements described below do not constitute a comprehensive list of all possible elements, but are those that are considered to be highly relevant. Entering information for these additional elements is optional, and not required to be CIMS compliant.

2. Explain more fully how several CIMS Level 1 metadata elements, described in Section V, may be filled out specifically for publications.

Additional Metadata Elements for Publications

The following are descriptions of additional elements that may be relevant for publications:

---

**Paragraph No.:** 1.1.8.5

**Element:** Edition

**Definition:** The version of the title.

**Domain:** free text

**Example:**

**Comments:** This element is “Mandatory If Applicable” according to FGDC, and part of the Citation compound element.

---
<table>
<thead>
<tr>
<th>Paragraph No.:</th>
<th>1.11 (1.12)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element:</td>
<td>Dataset Credit</td>
</tr>
<tr>
<td>Definition:</td>
<td>Recognition of those who contributed to the data set</td>
</tr>
<tr>
<td>Domain:</td>
<td>free text</td>
</tr>
<tr>
<td>Example:</td>
<td>Staff from the Maryland Department of the Environment’s Chesapeake Bay and Special Projects Program contributed substantial time and effort toward successful completion of the technical synthesis.</td>
</tr>
<tr>
<td>Comments:</td>
<td>This element allows the originator to recognize other person(s), organization(s), or events that made the data set possible. These might include sponsors, sources of funds, reviewers, dedications, etc. This element is “Optional” according to FGDC, but should be entered for all CBP documents.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Paragraph No.:</th>
<th>1.14.8.1 (1.15.8.1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Element:</td>
<td>Cross Reference - Originator</td>
</tr>
<tr>
<td>Definition:</td>
<td>The Cross Reference provides information about other, related datasets and information products that are likely to be of interest. The name of an organization or individual that developed the related dataset or document. If the name of editors or compilers are provided, the name must be followed by “(ed.)” or “(comp.)” respectively. If possible, the organization name should be given to the sub-organizational level to which the individual(s) that developed the data is (are) “attached”.</td>
</tr>
<tr>
<td>Domain:</td>
<td>(Refer to the CIMS list of data originators/organizations in Appendix A)</td>
</tr>
<tr>
<td>Example:</td>
<td>Virginia Institute of Marine Sciences (VIMS)</td>
</tr>
<tr>
<td>Comments:</td>
<td>The FGDC Standard allows free text for this element’s domain. To ensure accurate entry of this and subsequent searching, use the list provided. Notify the CIMS Data Librarian of missing/incorrect values and the necessary modification(s) will be made to the list. This element may be repeated multiple times to illustrate that the data or document was developed by several organizations. The Cross Reference element is “Optional” according to FGDC.</td>
</tr>
</tbody>
</table>
Paragraph No.: 1.14.8.2 (1.15.8.2)

Element: Cross Reference - Publication Date

Definition: The Cross Reference provides information about other, related datasets and information products that are likely to be of interest. The date when the related dataset or document was published or otherwise made available for release. Encodes a date as the year, and optionally month, or month and day.

Domain: “Unknown” “Unpublished Material” free date (see comments below for format)

Example: 19920124

Comments: As an example, January 24, 1992 A.D. would be expressed as “19920124”. For any date A.D. through December 31, 9999 A.D., values for day, month of year, and year, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year with the month of the year expressed as an integer, and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information exchange (ANSI X3.30-1985) and Federal Information Processing Standards (FIPS) 4-1. For any date B.C. through 9999 B.C., values for the day, month of year, and year, shall follow the calendar date convention, preceded by the lower case letter “bc” (general forms of bcYYYY for years; bcYYYYMM for month of a year, with month being expressed as an integer, and bcYYYYMMDD for a day of the year). For any dates B.C. before 9999 B.C., values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters “cc” (general form of ccYYYYYYYY...). The Cross Reference element is “Optional” according to FGDC.

Paragraph No.: 1.14.8.4 (1.15.8.4)

Element: Cross Reference - Title

Definition: The Cross Reference provides information about other, related datasets and information products that are likely to be of interest. The name by which the related dataset or document is known.

Domain: free text

Example: Submerged Aquatic Vegetation Habitat Requirements and Restoration Targets: A Technical Synthesis

Comments: The Cross Reference element is “Optional” according to FGDC.
6.2

Element:

Definition: The identifier by which the distributor knows the data set.

free text

Example:

Comments: A resource description is a label by which a dataset can be requested from a distributor. A to FGDC.

---

Detailed Explanation of Selected Metadata Elements for Publications

Some publications are updated on a regular or semi-regular basis, retaining the same title and other metadata components (the Resources Monitoring Data publication is one example). In such instances, only minor changes though there may be several physical documents, only one metadata record is necessary. This single record can refer to numerous issues of the same publication by referring to all distinct elements may facilitate this approach.

The (1.1.8.2) should be filled in with the publication date of the most recent version of the publication.

for each time the document was published, should be entered for the Calendar Date the Time Period of Content Time Period of Content Explanation

The Maintenance and Update Frequency to be updated. A publication such as the State of the Bay two years, therefore a value of “Biennially” may be used. Other publications such as the Users may not change on a regular basis, but will be updated as formats of data submitted to the CBP change or
As for Time Period of Content, there may be multiple versions of the publication that are available or that users are interested in obtaining. References to the multiple versions can be entered in a single metadata record. The **Network Resource Name** (6.4.2.1.1.1.1) is the name of the file or service from which the publication can be obtained. This element may be repeated multiple times, once for each version. It is suggested that a unique name be created for each published document which indicates the date or version of the publication.

**Series**

A series is a succession of volumes or issues published with related subjects or authors, similar format and price, or continuous numbering. Much of the metadata for individual documents in a series is the same or nearly so. A metadata record should be created for each dataset or document in a series.

There are two additional metadata elements that are required for publication series. These individual data elements are contained in the compound element, **Series Information** (1.1.8.7). The detailed descriptions of these two elements are not included in any CIMS Level of metadata and therefore can be found below.

---

**Paragraph No.:** 1.1.8.7.1

**Element:** Series Name

**Definition:** The name of the series publication of which the dataset is a part.

**Domain:** free text

**Example:** TIGER/Line Census Files (1995)

**Comments:**

---

**Paragraph No.:** 1.1.8.7.2

**Element:** Issue Identification

**Definition:** Publication details for published datasets

**Domain:** free text

**Example:** Version (0024)

**Comments:**

---

**Fact Sheets and Press Releases**

Fact Sheets and Press Releases present brief statements of important information in a timely manner. These publications are numerous and are released frequently. To minimize the amount
of effort required to make this type of information accessible and searchable at a minimum by subject, author, title, and date as in a typical card catalog, a subset of CIMS Level 1 Metadata.

The following are the minimum CIMS Level 1 elements which must be entered for small publications such as Fact Sheets and Press Releases:

- **Publication Date**
- **Information Type (Data Presentation Form)**
- **Subject (Theme) Keyword**
- **Place Keyword Thesaurus**
- **Format Name (If other than an HTML document)**
- **Format Version Number (If other than an HTML document)**

(1.1.8.1)
(8.2)
(1.1. )
(8.6)
(1.6.1.1)
(1.6.2.1)
(1.6.2.2)
(6.4.2.1.2)
(6.4.2.2.1.1.1.1)
Appendix D - URL Reference List

The purpose of this appendix is to provide a complete listing of URL’s referred to throughout this document.

http://www.chesapeakebay.net/bayprogram
    The Chesapeake Bay Program web page

http://www.chesapeakebay.net
    The CIMS web page

http://www.fgdc.gov/Metadata/Toollist/MetaTool.html
    FGDC Metadata Tools web page (provides lists and evaluation of metadata tools)

http://www.fgdc.gov/Metadata/ContStan.html
    Content Standard for Digital Geospatial Metadata (CSDGM)

http://www.mews.org/nsdi/
    Solicitation of Comments for Revision of the CSDGM (contains FGDC Metadata Standard revision 2 which can be downloaded)

http://www.nbs.gov/nbii/non-spatial.html
    Developing an NBII Metadata Standard for Non-spatial Data: Strategy and Status (provides a link to FTP a WordPerfect version of the NBII Metadata Standard)

http://www.fgdc.gov/Communications/GenInfo/execord.html
    Executive Order 12906, Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure

http://www.ncsa.uiuc.edu/demoweb/url-primer.html
    A Beginner's Guide to URLs (provides details about the URL)
Glossary


abscissa -- the coordinate of a point in a plane cartesian coordinate system obtained by measuring parallel to the x-axis (“the ‘x’ value”).

accuracy -- the closeness of results of observations, computations or estimates to the true values or the values accepted as being true.

altitude -- elevation above or below a reference datum, as defined in Federal Information Processing Standard 70-1. See also elevation.

ARC/INFO -- a commercially available geographic information system (GIS) developed by the Environmental Systems Research Institute (ESRI), Redlands, CA

area -- a generic term for a bounded, continuous, two-dimensional object that may or may not include its boundary.

area chain -- a chain that explicitly references left and right polygons and not start and end nodes. It is a component of a two-dimensional manifold.

area point -- a representative point within an area usually carrying attribute information about that area.

arc -- a locus of points that forms a curve that is defined by a mathematical expression.

attribute -- a defined characteristic of an entity type (e.g. composition, plant coverage, basal area, etc.).

attribute value -- a specific quality or quantity assigned to an attribute (e.g., steel), for a specific entity instance.

CBP -- Chesapeake Bay Program, U.S. Environmental Protection Agency

chain -- a directed nonbranching sequence of nonintersecting line segments and (or) arcs bounded by nodes, not necessarily distinct, at each end. A area chain, complete chain, and network chain are special cases of chain, and share all characteristics of the general case as defined above.

CIMS -- the Chesapeake Information Management System, the information management framework initiated by the U.S. Environmental Protection Agency, Chesapeake Bay Program Office

clearinghouse -- see National Geospatial Data Clearinghouse.

complete chain -- a chain that explicitly references left and right polygons and start and end nodes. It is a component of a two-dimensional manifold.

compound element -- a group of data elements and other compound elements. Compound elements represent higher-level concepts that cannot be represented by individual data elements.

coordinates -- pairs of numbers expressing horizontal distances along orthogonal axes; alternatively, triplets of numbers measuring horizontal and vertical distances.
coverage -- an electronic map comprised of many files storing the coordinates to spatially reference the information and its associated attributes that can be viewed or modified with a Geographic Information System.

data element -- a logically primitive item of data.

data generator -- any individual, agency, or organization that creates or provides data, documents, or other information products related to the Chesapeake Bay that require metadata.

Data Librarian -- the individual responsible for maintaining the U.S. Environmental Protection Agency's Chesapeake Bay Program Office's data library.

dataset -- a collection of related data.

depth -- perpendicular distance of an interior point from the surface of an object.

developable surface -- a surface that can be flattened to form a plane without compressing or stretching any part of it. Examples include cones and cylinders.

digital -- electronic format that can be stored and manipulated in a computer.

digital image -- a two-dimensional array of regularly spaced picture elements (pixels) constituting a picture.

digital volume -- a three-dimensional array of regularly spaced volume elements (voxels) constituting a volume.

domain -- in the definition of the elements in the metadata standard, the domain identifies valid values for a data element.

download -- to move a file in electronic format from a computer network (such as the Internet) onto a local computer or diskette for viewing or other use.

Edge, Topology Level 0 -- VPF term for a string.

Edge, Topology Level 1 -- VPF term for a network chain in a network (in SDTS, a "Network chain, non-planar graph").

Edge, Topology Level 2 -- VPF term for a network chain in a planar graph (in SDTS, a "Network chain, planar graph").

Edge, Topology Level 3 -- VPF term for a complete chain.

element -- also called element name. A specific piece of metadata information that is "filled-in," such as "Title." See data element.

elevation -- conforming to Federal Information Processing Standard 70-1, the term "altitude" is used in this standard, rather than the common term elevation.

entity -- a set into which similar entity instances are classified; a set of similar attributes.

entity instance -- a spatial phenomenon of a defined type that is embedded in one or more phenomena of different type, or that has at least one key attribute value different from the corresponding attribute values of surrounding phenomena (e.g., the 10 Street Bridge, vegetation field plot #271).

entity point -- a point used for identifying the location of point features (or areal features collapsed to a point), such as towers, buoys, buildings, places, etc.
entity type -- the definition and description of a set into which similar entity instances are classified (e.g., bridge, vegetation field plot).

explicit -- method of identifying positions directly by pairs (for horizontal positions) or triplets (for horizontal and vertical positions) of numbers.

Face, Topology Level 3 -- VPF term for a GT-polygon composed of rings.

FGDC -- Federal Geographic Data Committee

field -- a field, also called a data field or element, is a location for a specific piece of data or information. Fields can exist both in electronic and paper formats. A space on a form designated for an address is one example of a field.

free text -- text not bound by a set of pre-determined options; users may enter any text deemed appropriate.

GIS -- Geographic Information System

G-ring -- a ring created from strings and (or) arcs.

geospatial data -- information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies.

graph -- a set of topologically interrelated zero-dimensional (node), one-dimensional (link or chain), and sometimes two-dimensional (GT-polygon) objects that conform to a set of defined constraint rules. Numerous rule sets can be used to distinguish different types of graphs. Three such types, planar graph, network, and two-dimensional manifold, are used in this standard. All three share the following rules: each link or chain is bounded by an ordered pair of nodes, not necessarily distinct; a node may bound one or more links or chains; and links or chains may only intersect at nodes. Planar graphs and networks are two specialized types of graphs, and a two-dimensional manifold is an even more specific type of planar graph.

grid -- (1) a set of grid cells forming a regular, or nearly regular, tessellation of a surface; (2) a set of points arrayed in a pattern that forms a regular, or nearly regular, tessellation of a surface. The tessellation is regular if formed by repeating the pattern of a regular polygon, such as a square, equilateral triangle, or regular hexagon. The tessellation is nearly regular if formed by repeating the pattern of an "almost" regular polygon such as a rectangle, non-square parallelogram, or non-equilateral triangle.

grid cell -- a two-dimensional object that represents the smallest nondivisible element of a grid.

GT-polygon -- an area that is an atomic two-dimensional component of one and only one two-dimensional manifold. The boundary of a GT-polygon may be defined by GT-rings created from its bounding chains. A GT-polygon may also be associated with its chains (either the bounding set, or the complete set) by direct reference to these chains. The complete set of chains associated with a GT-polygon may also be found by examining the polygon references on the chains.

GT-ring -- a ring created from complete and (or) area chains.

horizontal -- tangent to the geoid or parallel to a plane that is tangent to the geoid.

implicit -- method of identifying positions by a place in an array of values.

information -- any type, group, or set of data, documents, publications, images, or other item or group of items that might be included in a metadata database
interior area -- an area not including its boundary.

Keywords -- words used to describe information in data, documents, or other information products. These words are used to index information to allow for automated searches of all information with similar keywords.

label point -- a reference point used for displaying map and chart text (e.g., feature names) to assist in feature identification.

latitude -- angular distance measured on a meridian north or south from the equator.

distance measured on a meridian north or south from the equator.

distance measured on a meridian north or south from the equator.

distance measured on a meridian north or south from the equator.

layer -- an integrated, areally distributed, set of spatial data usually representing entity instances within one theme, or having one common attribute or attribute value in an association of spatial objects. In the context of raster data, a layer is specifically a two-dimensional array of scaler values associated with all of part of a grid or image.

line -- a generic term for a one-dimensional object.

lineage -- information about events, parameters, and source data which constructed the data set or information product, and information about the responsible parties.

line segment -- a direct line between two points.

link -- a topological connection between two nodes. A link may be directed by ordering its nodes.

longitude -- angular distance between the plane of a meridian east or west from the plane of the meridian of Greenwich.

mandatory -- metadata that must be entered under the FGDC Metadata Standard

mandatory if applicable -- metadata that must be entered if it is applicable to the data set, document, or other information in question under the FGDC Metadata Standard.

map -- a spatial representation, usually graphic on a flat surface, of spatial phenomena.

media -- the physical devices used to record, store, and (or) transmit data.

meridian -- a great circle on the Earth that passes through the geographic poles.

metadata -- data about the content, quality, condition, and other characteristics of data or other information product.

metadata record -- a collection of metadata about a single dataset, document, or other information product or group of related datasets, documents, or products.

metadata section -- the name of the main Section or Chapter in the FGDC Metadata Standard.

multimedia presentation -- a presentation of data or information through a computer system that combines text, sound, images, or other presentation formats.

National Geospatial Data Clearinghouse -- a distributed network of geospatial data producers, managers, and users linked electronically. Building on initiatives such as the national information infrastructure, the clearinghouse uses a distributed, electronically connected network, such as the Internet. Each data provider will describe available data in an electronic form, and provide these descriptions (or "metadata") using means that can be accessed over a communications network. Thus, the data for the clearinghouse are located at the sites of data producers (or, where more efficient, at the sites of intermediaries) throughout the country. Using the
network, users will search these descriptions to locate data that are suitable for their applications.

NBII -- The National Biological Information Infrastructure; an initiative led by the Biological Resources Division (BRD) of the U.S. Geological Survey (USGS), dedicated to the development of an electronic “federation” of biological data and information sources.

network -- a graph without two dimensional objects. If projected onto a two-dimensional surface, a network can have either more than one node at a point and (or) intersecting links or chains without corresponding nodes.

network address -- the electronic address from which the dataset or information product can be obtained from the distribution computer.

network chain -- a chain that explicitly references start and end nodes and not left and right polygons. It is a component of a network.

network resource name -- the name of the file or service from which the dataset or information product can be obtained from a distributor. The name of the dataset or information product on the network. When appropriate, Uniform Resource Locators (URL) is provided.

node -- a zero-dimensional object that is a topological junction of two or more links or chains, or an end point of a link or chain.

Node, Topology Level 0 -- VPF term for a point (in SDTS, a "point").

Node, Topology Level 1 -- VPF term for a node on a network (in SDTS, a "node, network").

Node, Topology Level 2 -- VPF term for a node on a planar graph (in SDTS, a "node, planar graph").

Node, Topology Level 3 -- VPF term for a point used to represent isolated features. These are topologically linked to a containing face.

object -- a digital representation of all or part of an entity instance.

offline -- electronic media such as floppy diskette or CD ROM that is an alternative to the Internet or other file transfer systems.

optional -- metadata that are not mandatory or mandatory if applicable under the FGDC and NBII Metadata Standards. Such metadata may be entered by the user if desired.

ordinate -- the coordinate of a point in a plane cartesian coordinate system obtained by measuring parallel to the y-axis ("the 'y' value").

paragraph number -- The FGDC or NBII paragraph number used to refer to a specific metadata element.

phenomenon -- a fact, occurrence or circumstance. Route 10, George Washington National Forest, and Chesterfield County are all phenomena.

pixel -- two-dimensional picture element that is the smallest nondivisible element of a digital image.

planar graph -- the node and link or chain objects of the graph occur or can be represented as though they occur upon a planar surface. Not more than one node may exist at any given point on the surface. Links or chains may only intersect at nodes.

point -- a zero-dimensional object that specifies geometric location. One coordinate pair or triplet specifies the location. A rea point, entity point, and label point are special implementations of the general case.
polygon -- an area consisting of an interior area, one outer G-ring and zero or more nonintersecting, nonnested inner G-rings. No ring, inner or outer, shall be collinear with or intersect any other ring of the same G-polygon.

primitive -- the quality of not being subdivided; atomic.

quality -- an essential or distinguishing characteristic necessary for data to be fit for use.

query -- a user-specified, automated search of a computerized database to obtain desired data or information.

raster -- one or more overlapping layers for the same grid or digital image.

raster object - one or more images and/or grids, each grid or image representing a layer, such that corresponding grid cells and/or pixels between layers are congruent and registered.

rectangle coordinates -- the geographic locations identifying the extent of data or information; identified by four extreme locations or corners of the data.

resolution -- the minimum difference between two independently measured or computed values which can be distinguished by the measurement or analytical method being considered or used.

ring -- sequence of nonintersecting chains or strings and (or) arcs, with closure. A ring represents a closed boundary, but not the interior area inside the closed boundary.


search engine -- a software tool used to locate and organize information in a computerized database.

spatial data -- see geospatial data.

standard -- a metadata standard provides a common set of terms and definitions for the documentation of data or information.

stratum -- one of a series of layers, levels, or gradations in an ordered system. For this standard, the term is used in the sense of (1) a region of sea, atmosphere, or geology that is distinguished by natural or arbitrary limits; (2) a socioeconomic level of society comprised of persons of the same or similar status, especially with regard to education or culture; or (3) a layer of vegetation, usually of the same or similar height.

string -- a connected nonbranching sequence of line segments specified as the ordered sequence of points between those line segments. Note: A string may intersect itself or other strings.

tabular data -- data that are stored in columns and rows, as in a spreadsheet.

two-dimensional manifold -- a planar graph and its associated two dimensional objects. Each chain bounds two and only two, not necessarily distinct, GT-polygons. The GT-polygons are mutually exclusive and completely exhaust the surface.

type -- in the definition of the elements in the metadata standard, a compound element has the type “compound" to provide a unique way to identify compound elements. For a data element, the type identifies the kind of value that can be assigned to the data element. The choices are "integer" for integer numbers, "real" for real numbers, "text" for ASCII characters, "date" for day of the year, and "time" for time of the day.

universe polygon -- defines the part of the universe that is outside the perimeter of the area covered by other GT-polygons ("covered area") and completes the two-dimensional manifold. This polygon completes the adjacency
relationships of the perimeter links. The boundary of the universe polygon is represented by one or more inner rings and no outer ring. Attribution of the universe polygon may not exist, or may be substantially different from the attribution of the covered area.

**URL** -- Uniform Resource Locator. A unique address for a page of information on the Internet. A URL consists of four separate parts: the protocol, the domain name, the path, and a filename. A complete URL will usually look something like - http://www.chesapeakebay.net/bayprogram.

vector -- composed of directed lines.

vertical -- at right angles to the horizontal; includes altitude and depth.


void polygon -- defines a part of the two-dimensional manifold that is bounded by other GT-polygons, but otherwise has the same characteristics as the universe polygon. The geometry and topology of a void polygon are those of a GT-polygon. Attribution of a void polygon may not exist, or may be substantially different from the attribution of the covered area.

voxel -- a three-dimensional element that is the smallest nondivisible element of a digital volume.