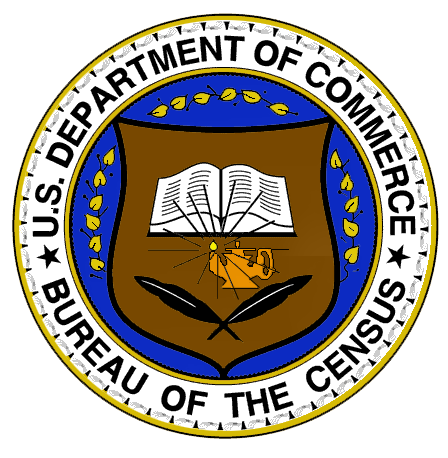
**U.S. Census Bureau**

**Geography Division**

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**Geospatial Product Metadata**

**Content Standard**

**November 14, 2019**

**Version 1.0**



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|  | 1.0 | Deirdre Bishop  Chief, Geography Division |  |
|  | 1.0 | Gregory F. Hanks Jr.  Deputy Chief, Geography Division |  |
|  | 1.0 | Michael Ratcliffe  Features WG Mentor ADC  Assistant Division Chief for Geographic Standards, Criteria, Research and Quality |  |
|  | 1.0 | Vincent Osier  Chief, Geographic Standards, Criteria, and Quality |  |
|  | 1.0 | Andrew Flora  Geographer |  |
|  | 1.0 | Frederick C. Malkus III  Geographic Standards, Criteria, and Quality |  |
|  | 1.0 | Matt J. McCready  Geographic Standards, Criteria, and Quality |  |
|  | 1.0 | Laura Waggoner  Assistant Division Chief for Geographic Data Collection & Products |  |
|  | 1.0 | Lynda Liptrap  Chief, Federal Geographic Coordination Branch |  |

**Change Control for this Document**

This document is subject to review and update throughout the lifecycle of the project. The Revision History tracks changes to this document. For more details, see section 1.7 of this document.

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# 1. Introduction

The objective of the standard is to standardize the documentation of geospatial products offered by the U.S. Census Bureau’s Geography Division (GEO). The standard establishes a structure of data elements and compound elements (groups of data elements) to be used for this purpose.

Adherence to this standard ensures compliance with federally mandated metadata standards that the Census Bureau is required to fulfill when expending federal funds to produce geospatial data.

## 1.1. Purpose

The purpose of the Census Bureau Geospatial Product Metadata Content Standard (GPM-CS) is to establish the content requirements of documentation, known as metadata, for Census Bureau products that have a geospatial component. This standard serves as a reference tool for Census Bureau staff responsible for the collection and generation of geospatial product metadata.

The standard provides a common set of elements and definitions for the documentation of geospatial products that will enable users to obtain consistent information concerning the availability and fitness of use of the division’s geospatial products.

## 1.2. Scope

The GPM-CS applies to geospatial products and services that the Census Bureau offers to internal Census Bureau customers, the public, other agencies, governments, and organizations. Additionally, supporting data, such as internal files and databases that form the basis of Census Bureau geospatial products, must also comply with GPM-CS requirements.

### 1.2.1. In-Scope Activities

This document considers the following activities and topics to be in-scope:

1. Describing metadata concepts for geospatial products.
2. Providing a common set of terminology and definitions for geospatial product metadata.
3. Identifying metadata elements within the standard as mandatory, mandatory if applicable, or optional.

### 1.2.2. Out-of-Scope Activities

This document considers the following activities and topics to be out-of-scope:

1. Developing implementation guidelines.
2. Developing training materials.
3. Developing/maintaining software.
4. Developing/maintaining metadata databases.
5. Collecting, creating, updating, maintaining, or validating metadata.
6. Evaluating specific data sources.
7. Metadata for point features and landmarks.
8. Metadata for Master Address File (MAF) Structure Points (MSPs).
9. Metadata specific to Linear Features.
10. Metadata specific to area landmark features, including hydrographic features.
11. Metadata specific to legal and statistical areas.
12. Metadata specific to addresses.

## 1.3. Assumptions

N/A

## 1.4. Goals and Guidelines

1. Develop consolidated metadata documentation that provides a standard set of terms, provides concise definitions, and explains data relationships for use across all GEO applications related to geospatial products.
2. Develop a common language for the description of geospatial product metadata, as it exists within GEO.
3. Simplify the International Organization for Standardization (ISO) metadata standard by providing specific guidance as to which elements are relevant to Census Bureau geospatial products.
4. Strengthen the requirement for relevant optional ISO metadata elements to make the metadata more meaningful and useful to the Census Bureau and its customers.
5. Provide for a metadata structure that will enable users to obtain consistent information about the availability and fitness of use of Census Bureau geospatial products.

## 1.5. Intended Audience

The intended audience for this document is ANY staff responsible for collecting, storing, formatting, editing, or delivering geospatial product and service metadata.

## 1.6. Participants

Table 1: Sec 1.6 - Participants, Roles, and Responsibilities

The following staff contributed to the development of this document.

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Org.** | **Phone** | **Role** |
| Malkus, Fred | GEO / GSCQB | 301-763-9102 | Product Metadata Subject Matter Expert (SME) / Requirements Analyst / Principle Editor |
| McCready, Matt | GEO / GSCQB | 301-763-9101 | Product Metadata SME / Requirements Analyst/Editor |
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## 1.7. Change Control Plan

This document is a configuration item and is subject to review by stakeholders in GEO. Authorized stakeholders may update this document in accordance with GEO policy for submitting controlled documents to Configuration Management (CM) using procedures established by the GEO Configuration Manager and described in the Geography Division Configuration Management Plan and the Geography Division Program Management Plan. The Revision History tracks changes to this document. When changes are approved, the CM staff will post a new version of the document on the intranet as a reference for all stakeholders.

### 1.7.1. Creating a Baseline

The GPM-CS will be considered baselined when the Change Request (CR) requesting Baseline approval is approved by the GEO Change Control Board.

### 1.7.2. Changes to the Baseline

Changes to the baseline shall be in conformance with the GEO Configuration Management Plan. GSCQB Staff will be responsible for identifying differences and managing changes to the document.

## 1.8. Effective Date and Review Period

The GPM-CS is effective immediately following baseline approval and will remain in effect until modified or replaced pursuant to the procedure described in Section 1.7 of this document.

# 2. Metadata Concepts

The New Merriam-Webster Dictionary defines metadata as “data that provides information about other data.” Metadata helps to locate and understand data.

## 2.1. Geospatial Metadata

The Office of Management and Budget (OMB), “Circular A-16: Coordination of Geographic Information Related Spatial Data Activities” [Ref 1], defines **Geospatial Data** as:

*“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. Statistical data may be included in this definition at the discretion of the collecting agency.”*

OMB Circular A-16 [Ref 1] defines **Metadata** as:

*“Information about data, such as content, source, vintage, accuracy, condition, projection, responsible party, contact phone number, method of collection, and other characteristics or descriptions.”*

Geospatial metadata provide context for the geospatial data by describing what the dataset contains, the reason for its development, and any known limitations. Geospatial metadata supports the effective application of the geospatial data.

## 2.2. Geospatial Metadata within GEO

Use of geospatial metadata within GEO supports operations associated with the MAF/TIGER System (MAF/TIGER) (MTDB). The following four general terms describe MTDB metadata: (a) Source Metadata, (b) Process Metadata, (c) Transaction Metadata, and (d) Product Metadata. Within the context of this document, source, process, transaction, and product are equal and separate types of metadata; the first three types are used as source for product metadata.

### 2.2.1. Source Metadata

Source metadata identifies descriptive information about the source materials used for reference or update purposes to the MTDB. This information includes but is not limited to:

* Title of the source
* Vintage of the source
* Name of the provider
* Projection (if used)
* Geodetic model
* Accuracy of the horizontal coordinate measurements
* Data types
* Legal values
* Source development and maintenance
* Information that GEO collects during the evaluation of the source

### 2.2.2. Process Metadata

Process metadata provides descriptive information about the operations, processes, and application software used to update the MTDB. A process or operation can (a) utilize both interactive and batch update processes, (b) include multiple software applications, and (c) initiate a series of update transactions or process steps. This information includes but is not limited to:

* Process or operation name
* Process or operation ID code
* Process or operation description
* Calendar date & time the process initiated

### 2.2.3. Transaction Metadata

Transactional metadata records information that describes the characteristics of a specific update action to a specific (point, line or area) feature in the MTDB. This information includes but is not limited to:

* Unique ID code of the updated feature/attribute
* Type of update action
* Date/Time stamp of the update
* Process or operation responsible for the update
* User ID of the staff member making the update
* Means/source that validated the update (when available).

The MTDB maintains transaction information only for those geospatial features that currently exist in the MTDB. MTDB does not track deleted features.

### 2.2.4. Product Metadata

Product metadata is data that describes the composition, quality, purpose, spatial extent, temporal extent, and distribution of geospatial products and services published by GEO. These metadata are structured through use of a standard and published to discovery portals on the internet. The publication of these metadata files allows users to discover relevant GEO products and services through searches. The metadata content must be sufficient to describe the product or service and to establish its validity for internal use or public consumption.

For TIGER/Line and Cartographic Boundary File metadata, all product metadata content except data quality information is developed/aggregated during the production process. For other geospatial products, metadata may be created after the product is produced or during the production process.

The content of product metadata files falls into the following nine categories:

1. **Federal Geographic Data Committee (FGDC) Required Information:** Keywords and URLs that satisfy federal requirements for the metadata files describing the GEO's geospatial products and datasets. For a complete description of the relevant federal requirements, refer to Chapter 3 – Compliance.
2. **Dataset Information:** Basic information about the dataset, and the responsible party(s).
3. **Data Quality Information:** A general assessment of the quality of the dataset. The evaluation should include the tests performed and the results.
4. **Spatial Data Organization Information:** The mechanism used to represent spatial information in the dataset.
5. **Spatial Reference Information:** The description of the reference frame for, and the means to encode, coordinates in the dataset. This information includes projection information.
6. **Entity and Attribute Information:** Details about the information content of the dataset, including the entity types, their attributes, and their domains.
7. **Distribution Information:** Information about the distributor of and options for obtaining the dataset.
8. **Computer Service Information:** Information about online mapping services (OMS) such as TIGERweb or REST services.
9. **Metadata Reference Information:** Information on the language and character set the metadata is written in, whether the data file is part of a series, and the responsible party(s) for the metadata.

# 3. Compliance

The Census Bureau is a producer of geospatial data. The Census Bureau collects and maintains these data to support the Decennial Census, American Community Survey (ACS), and current surveys. The Census Bureau also produces and distributes a collection of public products developed as a byproduct of Census Bureau programs. Geospatial public products produced by the Census Bureau include TIGER/Line shapefiles, geodatabases, cartographic boundary files, and online mapping services (OMS) like TIGERweb. All of the datasets produced by Census must use metadata standards endorsed by the Federal Geographic Data Committee to describe its content.

## 3.1. Policy

### 3.1.1. Federal

As a federal agency that produces digital spatial data to fulfill its mission, the Census Bureau is mandated to document this all spatial data provided to the public using federally endorsed metadata formats. Office of Management and Budget (OMB) Circular A-16 [Ref 1] is the source of the requirement. Additional federal requirements for metadata content are found in the National Geospatial Data Assets (NGDA) Metadata Guidelines [Ref 11] and the GeoPlatform Profile of 19115-1 [Ref 12].

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#### 3.1.1.1. OMB Circular A-16

Section 5 identifies the federal agencies that the requirement applies to:

*“This Circular applies to your agency if it collects, produces, acquires, maintains, distributes, uses, or preserves analog (e.g., paper maps) or digital spatial data to fulfill your mission, either directly or through a relationship with other organizations.”*

Section 6 identifies the data that the Circular applies to:

*“All spatial data and geographic information systems activities - financed directly or indirectly, in whole or in part, by federal funds.” (Bullet 1)*

Section 8 identifies what federal agencies are required to do:

*“Use FGDC data standards, FGDC Content Standards for Digital Geospatial Metadata, and other appropriate standards, documenting spatial data with the relevant metadata, and making metadata available online through a registered NSDI-compatible Clearinghouse node.”[[1]](#footnote-1) (Section 8a; bullet 4)*

OMB Circular A-16 [Ref 1] directs the Federal Geographic Data Committee (FGDC) to identify standards for geospatial metadata. The [FGDC](http://www.fgdc.gov/) [Link 1] has endorsed “ISO 19115-2: Geographic information - Metadata - Part 2: Extensions for imagery and gridded data” [Ref 6] and the associated ISO standards. Federal agencies are encouraged to transition to ISO metadata to document spatial data products. The Census Bureau has chosen ISO 19115-2 to document its geospatial products.

Adoption of the ISO suite of standards provides GEO more flexibility in documenting its geospatial resources and services. The CSDGM Standard, last updated in 1998, was developed for the documentation of GIS vector, raster, and point data. Since that time, geospatial data content, format, and supporting applications have evolved significantly. The ISO 19115-1 [Ref 5] standard was developed for the documentation of GIS vector and point data and geospatial data services such as web-mapping applications, data catalogs, and data modeling applications. ISO 19115-2 [Ref 6] includes the base ISO 19115-1 metadata standard plus extended elements for the description of imagery, gridded data, data collected using instruments and improved explanations of lineage and processing information. **Metadata extensions found in ISO 19115-2 support the documentation of the following: (a) ground control points used to geo-locate data, (b) EPSG Geodetic Parameter Datasets, and (c) source imagery.** Specifically, ISO 19115-2 supports:

* Documentation of a wide range of geospatial resources including data, services, sensors/technologies, collection methods, Quality Assurance /Quality Control procedures, models, application schemas, ontologies, symbol sets, and more.
* Documentation of the relationships between geospatial data and associated services, technologies, methods, models, etc.
* Documentation of simple and complex geospatial data parent/child/sibling relations.
* Standardization and discoverability of metadata content via standardized Topic Categories.
* Standardization and discoverability of metadata records across geopolitical boundaries and community-designated profiles.
* Standardization and simplification of documenting geographic coordinate systems and parameters using Spatial Reference System identifiers, e.g. EPSG:5070.

#### 3.1.1.2. NGDA Metadata Guidelines

National Geospatial Data Assets (NGDA) datasets are essential national resources as designated by OMB Circular A– 16 Supplemental Guidance (November 2010). A NGDA dataset is a geospatial dataset that has been designated by the FGDC Steering Committee as a National Geospatial Data Asset. To be considered for designation a dataset must meet at least one of the following criteria: (a) used by multiple agencies or with agency partners such as tribal, state, and local governments*;* (b) needed for Presidential priorities as expressed by OMB; (c) required to meet shared mission goals of multiple Federal agencies or (d) expressly required by statutory mandate. For a listing of DOC-Census Bureau products that are designated as NGDA datasets, see Attachment B: DOC-Census Bureau NGDA Datasets.

As a result of this designation, the metadata files for all NGDA datasets are required to be ‘tagged’ with additional elements that identify them as a NGDA dataset. These required elements promote discovery of NGDA data resources on federally supported data portals such as the GeoPlatform. All these required elements are defined under the NGDA\_Information compound element and include an alternate title, NGDA specific theme keywords URLs for the web mapping, and REST services. More information can be found in Attachment B: DOC-Census Bureau NGDA Datasets

#### 3.1.1.3. GeoPlatform Profile (ISO) 19115-1

The Geospatial Platform (GeoPlatform) is a strategic national resource that provides ready access to the nation’s geospatial data and services and manages these as a portfolio of assets. It is an Internet-based capability providing shared and trusted geospatial data, services, and applications for use by the public and by government agencies and partners to meet their mission needs. The content of the metadata describing these geospatial assets provides the foundation for this portfolio’s data management scheme.

The “GeoPlatform Profile of ISO 19115-1”, or GeoPlatform Profile, is a profile of a metadata standard used to document the data assets of the Geospatial Platform. This profile will help improve the adoption and use of ISO 19115-1 metadata for interoperable exchange of information about geospatial assets. It is a specialized version of ISO 19115-1 intended to make the managing and searching for data on the Geospatial Platform more effective. [**Mime\_Type**] and [**Ontology\_URI**] are examples of data elements added to the GPM-CS to make it compliant with the GeoPlatform Profile. For a complete description of the GPM-CS data elements that satisfy the requirements of the GeoPlatform Profile, see Attachment C: Metadata for the GeoPlatform Profile of (ISO) 19115-1.

### 3.1.2. Census Guidelines

“Policy on Creation and Publication of Metadata for Geospatial Data” [Ref 2] is a Department of Commerce (DOC) policy statement that addresses the requirements listed in OMB Circular A-16 [Ref 1]. The Census Bureau has acknowledged OMB Circular A-16. This policy states that the Census Bureau shall:

* Document all geospatial data that is collected, produced, acquired, maintained, distributed, used, or preserved by the Department using a metadata standard endorsed by the FGDC.
* Ensure metadata meets or exceeds the minimum requirements of the designated standard for both content and format.
* Include additional information whenever appropriate to provide the maximum information available through the standard.
* Submit all geospatial metadata for publication to the FGDC designated Clearinghouse.
* Ensure metadata meets requirements of the Privacy Act of 1974.
* Ensure information in the metadata does not release proprietary, protected, or classified information.

### 3.1.3. Geography Division

The GPM-CS applies to geospatial products offered by the Census Bureau to the public, other agencies, governments, and organizations. The GPM-CS provides content requirements to produce metadata for all geospatial products supplied by the Census Bureau. The objective of this standard is to provide a common set of elements and definitions for the documentation of geospatial products that will enable users to obtain consistent information concerning the availability and fitness of use of the product. The requirements in this standard meet or exceed all requirements found in the DOC metadata policy [Ref 2], and thereby federal requirements.

# 4. Product Profiles

The GPM-CS’s design accommodates the Census Bureau’s diversity of products. It uses an array of profiles to provide an effective adaptation of the content standard to accommodate the wide range of Census Bureau products while assuring compliance with federal metadata standards. Each profile, a subset of GPM-CS elements, represents a specific product type. The implementation of profiles allows for selective application of the GPM-CS elements. By incorporating a common core set of elements, as well as those unique to a product, profiles serve to assure standardized content and specificity while remaining flexible. Profiles are predictable and offer consistency and reproducibility to facilitate automated production of metadata files.

To incorporate profiles into the GPM-CS, Census Bureau products are categorized based on seven different product types. The seven profiles are “Planned,” “MapD,” “Vector,” “Tabular,” “Service,” “GDB,” and “Series.”

The GPM-CS requirements vary for each profile, but all profiles are compliant with federal metadata standards. Mandatory GPM-CS content for all profiles includes citation information, product description, time-period of content, place and theme keyword, and contact information. Requirements for other elements differ by geospatial product type according to its assigned profile. Attachment F, GPM-CS Element Obligations Table, specifies which elements apply to each of the profiles.

## 4.1 Planned

The Planned profile contains the fewest elements. It documents and serves as a notification of a planned data collection activity per the Commerce “Policy on Planned Geospatial Acquisitions [Ref 3]. This policy calls for building partnerships to reduce duplication of effort. The Planned profile includes basic documentation such as a description of the planned activity, the geographic location, citation and publication references, and information on metadata contacts.

## 4.2 MapD

The MapD profile documents paper maps. Maps refer to hardcopy or digital depictions of geography features, thematic data, and other Census related content. This profile requires projection information. This requirement distinguishes the MapD profile from the other profiles.

## 4.3 Vector

The Vector profile incorporates nearly every GPM-CS element. It requires detailed spatial reference information that does not apply to the profiles for most other products. Use this profile to document the Census Bureau’s TIGER/Line shapefiles.

## 4.4 Tabular

The Tabular profile documents databases. This profile includes documentation for non-spatial entities and their attribute values, as well as detailed source data information.

## 4.5 Service

The Service profile documents OMSes. These services produce maps of spatially referenced data dynamically from geographic information through an HTTP request. Simply stated, they provide the user a method to create a map on a web browser. The service profile is the only profile to use the chapter on *Computer\_Service\_Information*. Use this profile to document Web Mapping Services (WMS) and Representational State Transfer (REST) files.

## 4.6 GDB

The GDB profile documents geodatabase files. A geodatabase is a collection of geographic datasets held in a relational Database Management System (DBMS) like Oracle. These files are designed for use with ESRI’s ArcGIS software.

## 4.7 Series

The Series profile documents the existence of an extensive series of data files based on a common theme (e.g. the 2016 Block Group Files) that reside on a federally sponsored data discovery portal. These series can measure in the thousands of individual files. Rather than report every single file that satisfies a search request, the portal sponsors opted to report the series. To that end, a Series Information File, or parent file, is produced. This file summarizes the series as a whole and is stored with the data files. The series profile file is the metadata file for the Series Information File. All links embedded within this file must point to the directory containing all records associated with the series. This profile includes the *Identification\_Information*, *Distribution\_Information*, and *Metadata\_Reference\_Information* chapters. With a few exceptions, all state and county themes have Series Information Files created for them.

For a complete description of contents of the eight profiles, refer to the GPM-CS Element Obligations Table (Attachment F).

Al list of good practices for creating well written Series Information Files can be found at https://www.geoplatform.gov/wp-content/uploads/2018/05/DataGovGeoPMetadataRecommendations\_Published20170614-1.pdf

# 5. GPM-CS Content Standard

## 5.1. General Structure

The standard is organized in a hierarchy of metadata elements documenting a digital geospatial product. The starting point is “Geospatial Product Metadata" (GPM) (chapter 0), a compound element composed of nine other compound elements, each representing a different concept about the geospatial product. Each of these compound elements is a numbered chapter in the standard. Section and element numbers are provided for the user’s navigation of the standard. They are neither authoritative nor intended for use in implementation and are subject to change in future revisions of the standard.

The standard has ten chapters numbered 0 through 9.

* **Chapter 0**, "**GPM**," provides the starting point. It contains all the main sections, or chapters, of the standard. It is the root element for all the metadata.
  + Chapter 1 *FGDC\_Required*
  + Chapter 2 *Identification\_Information*
  + Chapter 3 *Data\_Quality\_Information*
  + Chapter 4 *Spatial\_Data\_Organization\_Information*
  + Chapter 5 *Spatial\_Reference\_Information*
  + Chapter 6 *Entity\_and\_Attribute\_Information*
  + Chapter 7 *Distribution\_Information*
  + Chapter 8 *Computer\_Service\_Information*
  + Chapter 9 *Metadata\_Reference\_Information*

Each chapter is composed of data elements, either directly or using intermediate compound elements.

## 5.2. GPM-CS Element Obligations Table

The GPM-CS Element Obligations Table (Attachment F) shows the structure and organization of the GPM-CS. The table consists of ten columns. The first three columns (GPM-CS Element Number / Repeats / GPM-CS Element Name) describe the structure of the standard. Columns four through ten show the obligation assigned to each element by GPM-CS profile. The header of each column in this part of the table (Planned / MapD / Vector / Tabular / Service / GDB / Series) is the name of a product profile covered by the standard. The number of elements that apply varies by profile.

For a complete description of the GPM-CS Element Obligation Table, see Attachment F. For a full description of the individual GPM-CS elements, refer to Section 5.7, GPM-CS Elements.

## 5.3. Elements

The GPM-CS consists of 181 elements; 125 data elements organized into 53 compound elements.

A data element is a logically primitive item of data. Data elements are the things that you "fill in." An example is [**Publication\_Date** (GPM-CS #2.1.2)], which is the date when a product was published or otherwise made available for release.

A compound element is a group of data elements and other compound elements. All compound elements are ultimately described by data elements, either directly or through intermediate compound elements. Compound elements represent higher-level concepts that cannot be represented by individual data elements. Compound elements serve to organize the metadata information into groups of related elements. An example is [*Citation* (GPM-CS #2.1)], which is the recommended reference for a product or dataset. Within this standard, the compound element [*Citation*] is composed of the following:

* **Data elements**
  + Originator
  + Publication\_Date
  + Title
  + Edition
  + Geospatial\_Data\_Presentation\_Form
  + Online\_Linkage
* **Compound element**
  + Series\_Information

Within this document, every element name, to include those in the Obligations Table, is identified by font. All data elements are shown in **Bold font**, and all compound elements are shown in *Italic font*. Additionally, all element names not in the Obligations Table are enclosed in brackets []. Examples follow:

Body Text Obligation Table

Data Element [**Publication\_Date**] **Publication\_Date:**

Compound Element [*Series\_Information*] *Series\_Information*

## 5.4. Obligation

The GPM-CS stipulates whether metadata information is required or optional for each element based on product type. The requirement to provide an element or not is referred to as its obligation. The obligation specifies whether the metadata element shall always be present (contain metadata information) or be present according to established conditions. The obligation for each element varies by product profile.

### 5.4.1. Obligation Values

For the GPM-CS, the obligation for any element may have the following values:

* Mandatory (M) required for all products. If the information is not known for a mandatory data element, the entry "Unknown" or a similar statement should be given. An example is [**Title** (GPM-CS #2.1.3)], which is the name of the product or dataset. For all profiles, [**Title**] is a mandatory element; it shall always be provided.
* Mandatory if Applicable (MA) required if the dataset exhibits the characteristic defined by the element. An example is [*NGDA\_Information* (GPM-CS #1.2)].

If the data set is designated as a National Geospatial Data Asset, the element is applicable and must be provided.

If the data set is not designated as a National Geospatial Data Asset, the element is not applicable and is not provided.

* Optional (O) desired if available but is not required. An example is [**Edition** (GPM-CS #2.1.4)], which is the version of the Title. [**Edition**] is an optional data element for the MapD, Vector, Tabular, GDB, and Series product profiles and is provided at the discretion of the metadata producer. Edition does not apply to the Planned and Service profiles and is not provided.

### 5.4.2. Obligation values with numbers

An obligation value may include numbers. A number indicates a choice between two or more options; the value of the number indicates the number of options. An example is found in the [***Time\_Period\_of\_Content***(GPM-CS #2.3)] compound element, which is composed of three elements: [**Calendar\_Date** / ***Range\_of\_Dates*** / **Currentness\_Reference**]. Within the [*Time\_Period\_of\_Content*] compound element, [**Currentness\_Reference**] is Mandatory (M) and is always provided. The other two elements, [**Calendar\_Date**] and [*Range\_of\_Dates*], both have an obligation of M2. This indicates that the metadata provider must choose to provide one of these two mandatory options. As a result, the metadata provider will always provide a [**Currentness\_Reference**] and then choose between providing a single [**Calendar\_Date**] and a [*Range\_of\_Dates*].

An obligation of O2 indicates that the provider can choose between two options for providing metadata. For example, in the [*Digital\_Form* (GPM-CS #7.3.2)] compound element, the provider can provide (a) a [**Format\_Version\_Number**], (b) [**Format\_Version\_Date**] or (c) nothing, because the element is optional.

### 5.4.3. Obligation respects structure

The obligation of a compound element always takes precedence over the elements that it contains. Once a compound element is recognized by the data set producer as applicable, then the obligation of its subordinate elements is to be interpreted. If the parent element is not included, then its components are not required. This situation appears in the [*Series\_Information* (GPM-CS #2.1.6)] compound element. If this compound element, identified as optional, is included, then both the [**Series\_Name**] and [**Issue\_Identification**] data elements must be included. Conversely, if the [*Series\_Information*] element is not included, then its two data elements are deleted as well.

## 5.5. Repeating elements

Selected data elements within the GPM-CS can repeat individually or as a member of a compound element. The repeatability of each GPM-CS element is indicated in column 2, ‘Repeats,’ of Attachment F; ‘GPM-CS Element Obligation Table.’ The entry in column 2 indicates how the element repeats. If the element does not repeat, the field remains empty.

An example of a repeatable element is [**Theme\_Keyword** (GPM-CS #2.6.1.2)]. A theme keyword is a common-use word or phrase used to describe the subject of the product. This structure provides for the storage of multiple theme keywords. Each [**Theme\_Keyword**] element stores a single theme keyword or phrase.

The [**Theme\_Keyword**] element is a member of a descriptive category called [*Theme* (GPM-CS #2.1.6)]. This compound element is comprised of a [**Theme\_Keyword\_Thesaurus**], which does not repeat; and a [**Theme\_Keyword**], which does repeat. This structure provides for the association of groups of theme keywords with specific theme keyword thesauri.

[*Theme*] is an example of a compound element that repeats. For each [*Theme*] compound element, there will always be a single [**Theme\_Keyword\_Thesaurus**] element as well as one or more [**Theme\_Keyword**] elements. This structure provides for the storage of multiple thesauri, each with its own collection of keywords.

## 5.6. Production Rules

A production rule specifies the relationship between a compound element, and data elements and other (lower level) compound elements. Each production rule has a left side (identifier) and a right side (expression) connected by the symbol "=," meaning that the term on the left side is replaced by or produces the term on the right side. Terms on the right side are either other compound elements or individual data elements. By making substitutions using matching terms in the production rules, one can explain higher-level concepts using data elements. In addition to specifying the composition of higher-level elements, the production rules specify the elements that are mandatory, and that can be repeated. The symbols used in the production rules have the following meaning:

Symbol Meaning

= **is replaced by, produces, consists of**

+ **and**

[|] **selection** - select one term from the list of enclosed terms (exclusive or). Terms are separated by "|."

m {} n **iteration** - the term(s) enclosed is/are repeated from "m" to "n" times. “m” and “n” are both integers with no restrictions. “m” has typically values of 0 or 1. “n” can be repeated an unlimited number of times.

() **optional** - the term(s) enclosed is/are optional and are provided at the discretion of the data producer.

Examples

a = b + c "a consists of b and c"

a = [b | c] "a consists of one of b or c"

a = 4{b}6 "a consists of four to six occurrences of b"

a = b + (c + d) "a consists of b and optionally c and d"

## 5.7. GPM-CS Elements

This chapter lists the GPM-CS elements in alphabetical order of the element name. There are two types of elements found in this chapter: data elements and compound elements. Data elements contain the actual metadata information. Compound elements, shown in *italic*, contain both data elements and other compound elements. They serve to organize the metadata information into groups of related elements.

### 5.7.1 Root Element - GPM

This compound element is the root, or parent, element for the Geospatial Product Metadata - Content Standard. All other metadata elements are contained within this element either directly or through intermediate compound elements. The production rule for this element is:

*GPM* = 0{*FGDC\_Required*}1 +

*Identification\_Information* +

0{*Data\_Quality\_Information*}1 +

0{*Spatial\_Data\_Organization\_Information*}1 +

0{*Spatial\_Reference\_Information*}1 +

0{*Entity\_and\_Attribute\_Information*}1 +

*Distribution\_Information* +

0{*Computer\_Service\_Information*}1 +

*Metadata\_Reference\_Information*

Of the compound elements making up the root element, three [*FGDC\_Required* / *Distribution\_Information* / *Metadata\_Reference\_Information*] are present in every GPM-CS file. The remaining six compound are all required elements if the dataset exhibits the characteristic defined by the element. None of the compound elements repeats.

### 5.7.2 Compound Elements

Each element in this section includes an element name, definition, GPM-CS Reference number, type, path, and Production Rules (PR). Productions rules are described in section 5.6. Some compound elements may have multiple PRs due to appearing multiple places in the standard. This is indicated by multiple paths for the element. The path the PR applies is indicated in parentheses. For example, the “path a” in the parenthesis for the PR shown below indicates that this is the PR for path a.

PR (path a): *1{Address}n + City + State\_or\_Province + Postal\_Code + Country*

Some multiple PRs are also due to different profiles having different elements and element obligations for different profiles. This indicated by the names of the profiles in the parenthesis in the PR. For example, the Vector, Service, and MapD in parenthesis in the PR below indicates that this PR is for the Vector, Service, and MapD profiles

PR(Vector, Service, MapD):*Attribute\_Accuracy\_Report* + *Non\_Quantitative\_Attribute\_Accuracy\_Report* + *Logical\_Consistency\_Report* + *Completeness\_Report* + (*Horizontal\_Positional\_Accuracy\_Report)* + *Source\_Information* + *Process\_Step*

Some elements may have a PR with both a path name and a profile name. This is due to different profiles having different elements and some compound elements appearing in multiple place. An example of this is shown below:

PR(path a, Service): **1{Originator}n + Publication\_Date + Title + Geospatial\_Data\_Presentation\_Form** + **Online\_Linkage**

The path indicates where to find the element within the standard. Elements used in more than one location include a separate path for each location. Diagonals within the path separate the names of the different compound and data elements. The elements reference number is enclosed in parentheses () and precedes the path.

#### A

##### Attribute

A defined characteristic of an entity. If this attribute is not defined in an authoritative publication, and there is no verified source, leave the attribute out

Type: Compound Short name: attr

Path: (6.1.2) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute*

PR: **Attribute\_Label + Attribute\_Definition + Attribute\_Definition\_Source** + 1{*Attribute\_Domain\_Values*}n

##### Attribute\_Accuracy\_Report

An explanation of the accuracy of the identification of the entities and assignment of values within the product and a description of the tests used to determine accuracy. This report includes documentation on the tests the authors used to check the attribute data and what the results of those tests were. Tests may refer to field checks, cross-referencing, statistical analyses, parallel independent measures, etc. The report will identify all tests used by name and result. Note: This report does NOT include any description of positional accuracy.

Type: Compound Short name: attraccr

Path: (3.1) *GPM/* *Data\_Quality\_Information/Attribute\_Accuracy\_Report*

PR: *Test\_Report*

##### Attribute\_Domain\_Values

The set of legal values that can be assigned to an attribute. The following four attributes types are used by GEO in product metadata: (a) a user defined ‘enumerated’ set of codes, (b) a published ‘codeset’, (c) an alphanumeric ‘range’ of values and (d) an ‘unrepresentable’ domain, not represented by the first three attribute types.

Type: Compound Short name: attrdomv

Path: (6.1.2.4) *GPM/* *Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/Attribute\_Domain\_Values*

PR: [1{*Enumerated\_Domain*}n | *Range\_Domain* | *Codeset\_Domain* | **Unrepresentable\_Domain**]

#### B

##### Bounding\_Coordinates

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

Type: Compound Short name: bounding

Path: (2.5.1) *GPM/* *Identification\_Information/Spatial\_Domain/Bounding\_Coordinates*

PR: **West\_Bounding\_Coordinate + East\_Bounding\_Coordinate + North\_Bounding\_Coordinate + South\_Bounding\_Coordinate**

##### Browse\_Graphic

The Browse Graphic is an illustration or sample image of the data set or application. Its purpose is an aid to data discovery and assessment. It can also serve to create image links to data sets and other resources. The Browse Graphic for a map or data set should display a portion of the map or data set. A Browse Graphic for an application should include the interface as well.

Type: Compound Short name: browse

Path: (2.9*) GPM/ Identification\_Information/Browse\_Graphic*

PR: **Browse\_Graphic\_File\_Name + Browse\_Graphic\_File\_Description + Browse\_Graphic\_File\_Type**

#### C

##### Citation

The recommended reference for (a) the product/dataset, (b) data or other products related to the product/dataset or (c) source material for the product/dataset.

Type: Compound Short name: citation Section: 10

Path: (a) (2.1) *GPM/* *Identification\_Information/Citation*

(b) (2.12.1) *GPM/* *Identification\_Information/Cross\_Reference/Citation*

(c) (3.6.1) *GPM/Data\_Quality\_Information/Source\_Information/Citation*

PR(path a, MapD, Vector, Tabular):**1{Originator}n + Publication\_Date + Title + (Edition) + Geospatial\_Data\_Presentation\_Form**+ (*Series\_Information*) + **Online\_Linkage**

PR(path a, planned): **1{Originator}n + Publication\_Date + Title** + **Online\_Linkage**

PR(path a, Service): **1{Originator}n + Publication\_Date + Title + Geospatial\_Data\_Presentation\_Form** + **Online\_Linkage**

PR(path b):**1{Originator}n + Publication\_Date + Title + 0{Online\_Linkage}n**

PR(path c): **1{Originator}n + Publication\_Date + Title**

##### Codeset\_Domain

A codeset domain is a collection of all valid values for a specific attribute, typically published as a standard or list. Examples of codesets include the Federal Information Processing Series (FIPS) that contain numeric codes for nations, states, and counties.

Type: Compound Short name: codesetd

Path: (6.1.2.4.3*) GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Codeset\_Domain*

PR: **Codeset\_Name + Codeset\_Source**

##### Completeness\_Report

Information about omissions, selection criteria, generalization, definitions, and other rules used to develop the product/dataset. This report describes what is missing concerning geography, time, and attributes. It identifies data omitted from the product that might normally be expected, as well as the reason for the exclusion. Deviations from standard definitions and interpretations shall be described. In particular, the report shall describe the exhaustiveness of a set of features, such as spatial and taxonomic (attribute) properties.

Type: Compound Short name: complete

Path: (3.4) *GPM/* *Data\_Quality\_Information/Completeness\_Report*

PR: *Test\_Report*

##### Computer\_Service\_Information

Facts about an OMS such as TIGERweb. This information includes the type of mapping service, version of the service, and what operations the service can perform. The [**Coupling\_Type** (GPM-CS #5.7.3)] describes how closely associated, or coupled, the web service is with the dataset.

Type: Compound Short name: servinfo

Path: (8) *GPM/Computer\_Service\_Information*

PR: **Service\_Type + (Service\_Type\_Version) + Coupling\_Type** + 1{*Contains\_Operations*}n

##### Connect\_Point

The information and parameters needed to connect to a specific function of the OMS.

Type: Compound Short name: conpnt

Path: (8.4.5) *GPM/Computer\_Service\_Information/Contains\_Operations/Connect\_Point*

PR: **CP\_Link + 0(Protocol)n + Resource\_Name + Resource\_Description**

##### Constraints

The legal, security, and usage restrictions placed on a dataset or resource.

Type: Compound Short name: constrnt

Path: (2.7)*GPM/Identification\_Information/Constraints*

PR: Access\_Constraints + Use\_Constraints + 0{Other\_Constraints}1

##### Contact\_Address

A complete delivery address for the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information. Often the distributor is the same as the point of contact.

Type: Compound Short name: cntaddr

Path: (a) (2.8.2) *GPM/Identification\_Information/Point\_of\_Contact/Contact\_Address*

(b) (7.1.2) *GPM/Distribution\_Information/Point\_of\_Contact/Contact\_Address*

(c) (9.5.2) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact/Contact\_Address*

PR (path a): **1{Address}n + City + State\_or\_Province + Postal\_Code + Country**

PR (path b): **1{Address}n + City + State\_or\_Province + Postal\_Code + Country**

PR (path c): **1{Address}n + City + State\_or\_Province + Postal\_Code + Country**

##### Contains\_Operations

Information about the operations that comprise the OMS.

Type: Compound Short name: operatns

Path: (8.4) *GPM/Computer\_Service\_Information/Contains\_Operations*

PR: **Operation\_Name + DCP + Operation\_Description** + 0(*Operation\_Parameters*)n + *Connect\_Point*

##### Cross\_Reference

Information about other related datasets that are likely to be of interest.

Type: Compound Short name: crossref

Path: (2.12) *GPM/Identification\_Information/Cross\_Reference*

PR: *Citation*

#### D

##### Data\_Quality\_Information

A general assessment of the quality of the product/dataset. This element includes descriptions for (a) the accuracy of codes for entities and attributes, (b) the fidelity of relationships encoded in the data structure, (c) missing data, selection criteria, generalization, and (d) the accuracy of the horizontal coordinate measurements.

Type: Compound Short name: dataqual

Path: (3) *GPM/Data\_Quality\_Information*

PR(Tabular):0{*Attribute\_Accuracy\_Report*}1 + 0{*Non\_Quantitative\_Attribute\_Accuracy\_Report*}1 + *Logical\_Consistency\_Report* + *Completeness\_Report* + (*Horizontal\_Positional\_Accuracy\_Report)* + *Source\_Information* + *Process\_Step*

PR(Vector):*Attribute\_Accuracy\_Report* + *Non\_Quantitative\_Attribute\_Accuracy\_Report* + *Logical\_Consistency\_Report* + *Completeness\_Report* +(*Horizontal\_Positional\_Accuracy\_Report)* + *Source\_Information* + *Process\_Step*

PR (Service, MapD): *Attribute\_Accuracy\_Report* + (*Non\_Quantitative\_Attribute\_Accuracy\_Report)* + *Logical\_Consistency\_Report* + *Completeness\_Report* +(*Horizontal\_Positional\_Accuracy\_Report)* + *Source\_Information* + *Process\_Step*

##### Description

A characterization of the product/dataset as a whole. The description will include the following: (a) a brief summary, (b) reasons for development and (c) any known limitations.

Type: Compound Short name: descript

Path: (2.2) *GPM/Identification\_Information/Description*

PR: **Abstract + Purpose**

##### Detailed\_Description

A characterization of the entities, attributes, attributes values, and related characteristics encoded in the product/dataset. This description includes the valid values for the entities and attributes within the dataset.

Type: Compound Short name: detailed

Path: (6.1) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description*

PR: *Entity\_Type* + 1{*Attribute*}n

##### Digital\_Form

A description of the options for obtaining the dataset on computer-compatible media, including a description of the technical means for obtaining the data and the format the data comes in.

Type: Compound Short name: digform

Path: (7.3.2) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form*

PR( Vector, Tabular, Series): ***Format\_Name + Format\_Version\_Number | Format\_Version\_Date} + 0{File\_Decompression\_Technique}1 + 0(Transfer\_Size)1 +*** 1{*Network\_Address*}n

PR (MapD, Service): ***Format\_Name + Format\_Version\_Number | Format\_Version\_Date} +***1{*Network\_Address*}n

PR (GDB): ***Format\_Name + Format\_Version\_Number | Format\_Version\_Date} + 0{File\_Decompression\_Technique}1 + Transfer\_Size +*** 1{*Network\_Address*}n

##### Distribution\_Information

Information about the organization supplying the dataset and options for obtaining the dataset. This includes any liability assumed by the supplying organization and any technical capabilities the customer must have to use the product/dataset.

Type: Compound Short name: distinfo

Path: (7) *GPM/Distribution\_Information*

PR(Vector, Service, GDB, Series): 1{*Point\_of\_Contact*}n + **Distribution\_Liability** + 1{*Standard\_Order\_Process*}n + **Technical\_Prerequisites**

PR(Tabular):1{*Point\_of\_Contact*}n + **Distribution\_Liability** + 1{*Standard\_Order\_Process*}n + 0{**Technical\_Prerequisites**}1

PR(Planned, MapD): 1{*Point\_of\_Contact*}n + **Distribution\_Liability** + 1{*Standard\_Order\_Process*}n

#### E

##### Entity\_and\_Attribute\_Information

Details about the information content of the product/dataset. The description will include the entity types, their attributes, and their domains.

Type: Compound Short name: eainfo

Path: (6) *GPM/Entity\_and\_Attribute\_Information*

PR(Vector, Tabular, Services): {1{*Detailed\_Description*}n | 1{*Feature\_Catalogue\_Description*}n}

PR(MapD): { 0{*Feature\_Catalogue\_Description*}n}

##### Entity\_Type

The description of a set into which similar object/entity instances are classified.

Type: Compound Short name: enttype

Path: (6.1.1) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Entity\_Type*

PR(Vector, Tabular): **Entity\_Type\_Label + Entity\_Type\_Definition + Entity\_Type\_Definition\_Source + (Ontology\_URI)**

PR(Service):**Entity\_Type\_Label + Entity\_Type\_Definition + Entity\_Type\_Definition\_Source**

##### Enumerated\_Domain

An enumerated domain is a list of all permissible values, typically categorical, for an attribute. For each value within the enumerated domain, specify the value or code, its definition, and the source of the definition.

Type: Compound Short name: edom

Path: (6.1.2.4.1) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Enumerated\_Domain*

PR: **Enumerated\_Domain\_Value + Enumerated\_Domain\_Value\_Definition + Enumerated\_Domain\_Value\_Definition\_Source**

##### EPSG\_Reference

EPSG stands for European Petroleum Survey Group. They publish a database of coordinate system information and other related documents on map projections and datums. The database, an online registry at <http://www.epsg.org/>, is a collection of definitions of coordinate reference systems and coordinate transformations. GEO references the systems stored in this database when identifying projections in metadata files.

Type: Compound Short name: epsgref

Path: (5.1.3) *GPM/Spatial\_Reference\_Information/Map\_Projection/EPSG\_Reference*

PR: **EPSG\_Code + EPSG\_Code\_Space + (EPSG\_Version) + Spatial\_Resolution**

#### F

##### Feature\_Catalogue\_Description

The information needed to link to the feature catalogue file (*also called the ISO 19110 file*).

Type: Compound Short name: featcatd

Path: (6.2) *GPM/Entity\_and\_Attribute\_Information/Feature\_Catalogue\_Description*

PR: **FC\_Title + Included\_With\_Dataset + Feature\_Types + FC\_Online\_Linkage**

##### FGDC\_Required

The contents of this element satisfy federal requirements for metadata files describing the Census Bureau's geospatial products and datasets. Included in this element are the ISO Theme Topic Categories and NGDA tagging information. These metadata elements are designed to promote data discovery on federal sites such as Data.gov and GeoPlatform.

Type: Compound Short name: fgdc

Path: (1) *GPM/FGDC\_Required*

PR(Vector, GDB, Series):*ISO\_Theme* + 0{*NGDA\_Information*}1

PR(MapD, Service): *ISO\_Theme*

#### G

##### Geodetic\_Model

The parameters or set of physical properties describing the shape of the Earth. This information includes the name of the ellipsoid, the radius of the equatorial axis, and the denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when the numerator is set to one.

Type: Compound Short name: geodetic

Path: (5.2) *GPM/Spatial\_Reference\_Information/Geodetic\_Model*

PR: **Horizontal\_Datum\_Name + Ellipsoid\_Name + Semi-Major\_Axis + Denominator\_of\_Flattening\_Ratio**

#### H

##### Horizontal\_Positional\_Accuracy\_Report

An explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used. This report is an overall description of the accuracy of the coordinates in the product/dataset. This description shall include the name of tests used, testing methodology, results obtained, and other relevant data that may be available. Commonly, this report includes information about digitizing, Root Mean Square Error (RMSE), surveying techniques, GPS triangulations, image processing, or photogrammetric methods.

Type: Compound Short name: horizpar

Path: (3.5*) GPM/Data\_Quality\_Information/Horizontal\_Positional\_Accuracy\_Report*

PR: *Test\_Report*

#### I

##### Identification\_Information

Basic information on the product/dataset. This element includes, but not limited to (a) a description of the product/dataset, (b) its state and maintenance, (c) the geographic area covered, (d) keywords, (e) constraints placed on the product/dataset and (f) a point of contact.

Type: Compound Short name: idinfo

Path: (2) *GPM/Identification\_Information*

PR(MapD, Vector, Services, GDC, Series):*Citation* + *Description* + *Time\_Period\_of\_Content* + *Status* + *Spatial\_Domain* + *Keywords* + *Constraints* + 1{*Point\_of\_Contact*}n + (*Browse\_Graphic*) + **Data\_Set\_Character\_Set + 1{Data\_Set\_Language}n** + 0(*Cross\_Reference*)n

PR(Planned, Tabular):*Citation* + *Description* + *Time\_Period\_of\_Content* + *Status* + *Spatial\_Domain* + *Keywords* + *Constraints* + 1{*Point\_of\_Contact*}n **+ Data\_Set\_Character\_Set + 1{Data\_Set\_Language}n** + 0(*Cross\_Reference*)n

##### ISO\_Theme

A mandatory collection of keywords in support of federal metadata catalog sites. They represent the main themes of the product/dataset. The catalog sites, such as data.gov, use these keywords to sort/organize geospatial metadata. These keywords are not related to those found in the compound element [**Theme** (GPM-CS #2.6.1)].

Type: Compound Short name: isotheme

Path: (1.1) *GPM/FGDC\_Required/ISO\_Theme*

PR: **ISO\_Keyword\_Thesaurus + 1{ISO\_Keyword}n**

#### K

##### Keywords

Words or phrases summarizing an aspect of the product/dataset. This element should also identify any appropriate thesaurus or data dictionary.

Type: Compound Short name: keywords

Path: (2.6) *GPM/Identification\_Information/Keywords*

PR(planned, MapD, Tabular): 1{*Theme*}n + 0{*Place*}n

PR(Vector, Service, GDB, Series): 1{*Theme*}n + 1{*Place*}n

#### L

##### Logical\_Consistency\_Report

This element describes the fidelity of relationships encoded in the data structure of the product/dataset. The report details the names of tests performed and the results of those tests. For example, tabular data may be tested for proper domain and format, while geospatial data may be tested to answer the following questions: (a) Do lines intersect only where intended?

(b) Are any lines entered twice?

(c) Are all areas completely described?

(d) Are there any overshoots or undershoots?

(e) Are any polygons too small or any lines too close?

Type: Compound Short name: logic

Path: (3.3) *GPM/Data\_Quality\_Information/Logical\_Consistency\_Report*

PR: *Test\_Report*

#### M

##### Map\_Projection

The systematic representation of all or part of the surface of the Earth on a plane or developable surface. A developable surface is a simple geometric form capable of being flattened without stretching. This compound element consists of a map projection name and a description of that projection. The description can be textual and stored in the [**Map\_Projection\_Description** (GPM-CS #5.1.2)] data element, or a reference to a map projection definition that is stored in the [*EPSG\_Reference* (GPM-CS #5.1.3)].

Type: Compound Short name: mapproj

Path: (5.1) *GPM/*Spatial\_Reference\_Information/Map\_Projection

PR(Vector, GDB):**Map\_Projection\_Name + {Map\_Projection\_Description** | *EPSG\_Reference*}

PR(MapD): **Map\_Projection\_Name + Map\_Projection\_Description**

PR (Service) **Map\_Projection\_Name +** *EPSG\_Reference*

##### Metadata\_Reference\_Information

Information on the producer of the metadata, the date the metadata was created or updated, the language of the metadata and the character set of the metadata.

Type: Compound Short name: metainfo

Path: (9) *GPM/Metadata\_Reference\_Information*

PR(vector, tabular, GDB): **Metadata\_Date** + (**Metadata\_Parent\_Identifier\_Name**) + (**Metadata\_Hierarchy\_Level**) + (**Metadata\_Hierarchy\_Level\_Name**) + 1{*Point\_of\_Contact*}n + **Metadata\_Standard\_Name + Metadata\_Standard\_Version + Metadata\_Character\_Set + Metadata\_File\_Identifier + Metadata\_Language**

PR(planned, MapD, Service, Series): **Metadata\_Date** + 1{*Point\_of\_Contact*}n + **Metadata\_Standard\_Name + Metadata\_Standard\_Version + Metadata\_Character\_Set + Metadata\_File\_Identifier + Metadata\_Language**

#### N

##### Network\_Address

The electronic address from which the data set can be obtained from the distribution computer.

Type: Compound Short name: netwrkr

Path: (7.3.2.6) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form/Network\_Address*

PR: **Network\_Resource\_Name**+ **Mime\_Type+** (Application\_Profile)

##### NGDA\_Information

This element is mandatory for those products/datasets designated as National Geospatial Data Assets (NGDA). These datasets are essential national resources that satisfy multi-agency requirements, achieve Presidential priorities, or are required by statutory mandate. For a listing of DOC-Census products that are designated as NGDA datasets, set Attachment B: DOC-Census Bureau NGDA Datasets

Type: Compound Short name: ngda

Path: (1.2) *GPM/*FGDC\_Required/NGDA\_Information

PR: **Alternate\_Title + NGDA\_Keyword\_Thesaurus + 3{NGDA\_Keyword}3 + WMS\_URL + 0{REST\_URL}1**

##### Non\_Quantitative\_Attribute\_Accuracy\_Report

The measure of whether an attribute that cannot be directly measured is correct or incorrect.

Type: Compound Short name: nqanaar

Path: (3.2)*GPM/ Data\_Quality\_Information/Non\_Quantitative\_Attribute\_Accuracy\_Report*

PR: Test\_Report

#### O

##### Operation\_Parameters

System or user defined constants required for an operation, listed in sequence.

Type: Compound Short name: opparams

Path: (8.4.4)*GPM/ Computer\_Service\_Information/Contains\_Operations/Operation\_Parameters*

PR: **Parameter\_Name + (Parameter\_Direction) + Parameter\_Description**

#### P

##### Place

Words, phrases, and codes that describe the geographic locations characterized by the product/dataset. Most Census Bureau datasets use the American National Standards Institute Information Technology codes (ANSI INCITS) as the code list.

Type: Compound Short name: place

Path: (2.6.2) *GPM/Identification\_Information/Keywords/Place*

PR: **Place\_Keyword\_Thesaurus + 1{Place\_Keyword}n**

##### Point\_of\_Contact

The complete delivery address and other contact information for the organization that is (a) knowledgeable about the product/dataset, (b) responsible for supplying the product/dataset, or (c) responsible for the metadata information. Often the distributor is the same as the point of contact. Repeat this element as necessary to document necessary points of contact.

Type: Compound Short name: ptcontac Section: 11

Path: (a) (2.8) *GPM/Identification\_Information/Point\_of\_Contact*

(b) (7.1) *GPM/Distribution\_Information/Point\_of\_Contact*

(c) (9.5) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact*

PR: **Contact\_Organization** + *Contact\_Address* + **1{Contact\_Voice\_Telephone}n + Contact\_Electronic\_Mail\_Address+ 0(Contact\_Fax)1**

##### Process\_Step

Information about an event or transformation in the life of a resource including the process used to maintain the resource.

Type: Compound Short name: procstep

Path: (3.7) *GPM/Data\_Quality\_Information/Process\_Step*

PR: **Process\_Description + Process\_Date**

#### R

##### Range\_Domain

A range domain is a sequence, series, or scale of values between limits. Typically, it is a numeric measure or count, but it may also be alphabetic (A–ZZZ). The minimum and maximum values are provided.

Type: Compound Short name: rdom

Path: (6.1.2.4.2) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Range\_Domain*

PR: **Range\_Domain\_Minimum + Range\_Domain\_Maximum + (Attribute\_Units\_of\_Measure)**

##### Range\_of\_Dates

A means of encoding the beginning and ending dates of (a) the product/dataset or (b) source material.

Type: Compound Short name: rngdates

Path: (a) (2.3.2) *GPM/*Identification\_Information/Time\_Period\_of\_Content/Range\_of\_Dates

(b) (3.6.4.2) *GPM/Data\_Quality\_Information/Source\_Information/ Time\_Period\_of\_Content/Range\_of\_Dates*

PR: **Beginning\_Date + Ending\_Date**

#### S

##### SDTS\_Terms\_Description

Point and vector object information based on the Geography Markup Language (GML) standard, version 3.2.1.

Type: Compound Short name: sdtsterm

Path: (4.4) *GPM/Spatial\_Data\_Organization\_Information/SDTS\_Terms\_Description*

PR: **SDTS\_Point\_and\_Vector\_Object\_Type + Point\_and\_Vector\_Object\_Count**

##### Series\_Information

The identification of the series, or group, of publications of which the product/dataset is a part.

Type: Compound Short name: serinfo

Path: (2.1.6) *GPM/Identification\_Information/Citation/Series\_Information*

PR: **Series\_Name + Issue\_Identification**

##### Source\_Information

A description of source(s) used to develop the product/dataset. The description of each source will include the source’s title, originator, publication date, and information contributed.

Type: Compound Short name: srcinfo

Path: (3.6) *GPM/Data\_Quality\_Information/Source\_Information*

PR(MapD):*Citation* + **0{Source\_Scale\_Denominator}1** + **Type\_of\_Source\_Media** + *Time\_Period\_of\_Content* + (**Source\_Citation\_Abbreviation) + Source\_Contribution**

PR(Vector, Tabular, Service)):*Citation* + **Type\_of\_Source\_Media** + *Time\_Period\_of\_Content* + (**Source\_Citation\_Abbreviation) + Source\_Contribution**

##### Spatial\_Data\_Organization\_Information

The mechanism used to represent spatial information in the product/dataset. This information includes the types of geographic features, addressing schemes, the system of objects used to represent the space, and the degree of complexity of the spatial relationships in the product/dataset.

Type: Compound Short name: spdoinfo

Path: (4) *GPM/Spatial\_Data\_Organization\_Information*

PR: **Indirect\_Spatial\_Reference + Direct\_Spatial\_Reference\_Method + Topology\_Level +** *SDTS\_Terms\_Description*

##### Spatial\_Domain

The geographic area covered by the product/dataset expressed as a collection of four bounding coordinates.

Type: Compound Short name: spdom

Path: (2.5) *GPM/Identification\_Information/Spatial\_Domain*

PR: *Bounding\_Coordinates*

##### Spatial\_Reference\_Information

The description of the reference frame for, and the means to encode, coordinates in the product/dataset. The description includes the [*Map\_Projection* (GPM-CS #5.1)] and [*Geodetic\_Model* (GPM-CS #5.2)].

Type: Compound Short name: spref

Path: (5) *GPM/Spatial\_Reference\_Information*

PR: *Map\_Projection* + *Geodetic\_Model*

##### Standard\_Order\_Process

Information about methods for obtaining the product/dataset, including data format, fees, and the URL where the product is found.

Type: Compound Short name: stdorder

Path: (7.3) *GPM/Distribution\_Information/Standard\_Order\_Process*

PR(MapD) :{**Non-Digital\_Form** | 1{*Digital\_Form*}n} **+ Fees + (Ordering\_Instructions)**

PR(Planned, Vector, Tabular, Service, GDB, Series):{ 1{*Digital\_Form*}n} + **Fees + (Ordering\_Instructions)**

##### Status

The state of and maintenance information for the product/dataset.

Type: Compound Short name: status

Path: (2.4) *GPM/Identification\_Information/Status*

PR: **Progress + Maintenance\_and\_Update\_Frequency**

#### T

##### Test\_Report

A description of data quality testing completed within the following tests: (a) [*Attribute\_Accuracy\_Report*], (b) [*Non\_Quantitative\_Attribute\_Accuracy\_Report*], (c) [*Logical\_Consistency\_Report*], (d) [*Completeness\_Report*], and (e) [*Horizontal\_Positional\_Accuracy\_Report*]. This element consists of three elements: Measure, Evaluation, and Result. The only required element is Result. For more information on this element, see its definition.

Type: Compound Short name: testrpt Section: 13

Path: (a) (3.1.1) *GPM/Data\_Quality\_Information/Attribute\_Accuracy\_Report/Test\_Report*

(b) (3.2.1) *GPM/Data\_Quality\_Information/Non\_Quantitative\_Attribute\_Accuracy\_Report/Test\_Report*

(c) (3.3.1) *GPM/Data\_Quality\_Information/Logical\_Consistency\_Report/Test\_Report*

(d) (3.4.1) *GPM/Data\_Quality\_Information/Completeness\_Report/Test\_Report*

(e) (3.5.1) *GPM/Data\_Quality\_Information/Horizontal\_Positional\_Accuracy\_Report/Test\_Report*

PR: **(Measure) + (Evaluation) + Result**

##### Theme

Words or phrases indicating the subject(s) covered by the dataset. These keywords are not related to those found in the compound element [**ISO\_Theme** (GPM-CS #1.1)]. Both the ISO Theme keywords & Theme keywords contain keywords describing a main theme of the dataset. The difference is that the ISO Theme keywords are taken from a finite list of values defined by ISO. The Theme keywords in this element have no such restriction and are defined by the product sponsor.

Type: Compound Short name: theme

Path: (2.6.1) *GPM/Identification\_Information/Keywords/Theme*

PR: **Theme\_Keyword\_Thesaurus + 1{Theme\_Keyword}n**

##### Time\_Period\_of\_Content

The date or vintage of the (a) product/dataset or (b) source.

Type: Compound Short name: timeperd Section: 12

Path: (a) (2.3) *GPM/Identification\_Information/Time\_Period\_of\_Content*

(b) (3.6.4) *GPM/Data\_Quality\_Information/Source\_Information/Time\_Period\_of\_Content*

PR: {**Calendar\_Date** | *Range\_of\_Dates*} + **Currentness\_Reference**

### 5.7.3 Data Elements

Each element in this section includes an element name, definition, GPM-CS Reference number, path, and domain.

The path indicates where to find the element within the standard. Elements used in more than one location include a separate path for each location. The element’s reference number is enclosed in parentheses () and precedes the path.

The domain describes/lists the acceptable/legal values for the data element. The domain may include a list of values, a range of values, a code set of permissible values, or un-representable values if the values are open-ended text. Quotes identify individual values. Frequently the domain list includes “free text” or “free date.” “Free” indicates the domain is free from restrictions. “Text” refers to the domain type. Additional domain types include integer, real, and date. The domain for some elements refers to both a restricted list of values and free unrestricted values. For these elements, one value from the restricted list is preferred if appropriate; an unrestricted value may be used if necessary.

#### A

##### Abstract

A brief narrative summary of the product/dataset. This element briefly describes the information that is included within the product/dataset and what geographic areas are covered. This element should include: (a) general content and features, (b) product form, (c) geographic coverage, (d) time period of content, and (e) any special data characteristics or limitations.

Type: Data Short name: abstract

Path: (2.2.1) *GPM/Identification\_Information/Description*/**Abstract**

Domain: free text

##### Access\_Constraints

Any restrictions or legal prerequisites that are in effect for accessing the product/dataset. These include any access constraints applied to assure the protection of privacy or intellectual property. This element commonly applies to products that contain Personally Identifiable Information (PII) or are exempt from public record laws such as those covered by Title 13. The domain of this element is restricted to code list values only. If none of the values accurately describes the constraints, use “otherRestrictions” as the data value. When “otherRestrictions” is used as the data value for this element, an explanation MUST be provided in the [**Other\_Constraints** (GPM-CS #2.7.3)] data element.

Type: Data Short name: accconst

Path: (2.7.1*) GPM/Identification\_Information/Constraints*/**Access\_Constraints**

Domain: “unrestricted, “otherRestrictions”

##### Address

A delivery address line for the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product dataset, or (c) responsible for the metadata information. Often the distributor is the same as the point of contact. Repeat this element if multiple address lines are required. For example, the following is the complete address for the Spatial Data Collection and Products Branch:

Spatial Data Collection and Products Branch

U.S. Census Bureau

4600 Silver Hill Road, stop 7400

Washington, DC. 20233-740

For this address, a separate [Address] element is necessary for each of the first three lines. The last line; composed of the city, state, and ZIP code; is stored in the [City], [State\_or\_Province], and [Postal\_Code] elements respectively.

Type: Data Short name: address

Path: (a) (2.8.2.1) *GPM/Identification\_Information/Point\_of\_Contact/Contact\_Address*/**Address**

(b) (7.1.2.1) *GPM/Distribution\_Information/Point\_of\_Contact/Contact\_Address*/**Address**

(c) (9.5.2.1) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact/Contact\_Address*/**Address**

Domain: free text

##### Alternate\_Title

A short name or other language name for the product/dataset. This element is required for datasets designated as National Geospatial Assets (NGDA). Construct the entry by concatenating the product’s theme name to the end of the following text string: “National Geospatial Data Asset (NGDA).” A special delimiting character is not used within the ‘title.’ A list of NGDA datasets are found in Appendix B.

Type: Data Short name: alttitle

Path: (1.2.1*) GPM/ FGDC\_Required/NGDA\_Information*/**Alternate\_Title**

Domain: free text

##### Application\_Profile:

The URI that uniquely identifies the application profile, or information resource type being requested. It is the application programming interface (API) for the Online Mapping Service. All NGDA datasets are required to have this element.

Type: Data Short name: appprof

Path: (7.3.2.6.3*) /GPM/Distribution\_Information]/Standard\_Order\_Process/Digital\_Form/Network\_Address/Application\_Profile*

Domain: <http://opengis.net/spec/wms> (web mapping services)

<http://www.opengis.net/spec/wfs> (web feature service)

<http://www.opengis.net/spec/wcs(web> catalog service)

<http://opengis.net/spec/wmts> (web map tile service**)**

<http://www.opengis.net/spec/csw> (catalog service)

<http://opengis.net/spec/kml> (keyhole markup language)

<http://www.geoplatform.gov/spec/esri-map-rest> (ESRI REST Map Service)

<http://www.geoplatform.gov/spec/esri-image-rest> (ESRI REST image service)

<http://www.geoplatform.gov/spec/esri-feature-rest> (ESRI REST feature service)

##### Attribute\_Definition

A description of the attribute listed in the [**Attribute\_Label** (GPM-CS #6.1.2.1)] data element.

Type: Data Short name: attrdef

Path: (6.1.2.2) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute*/**Attribute\_Definition**

Domain: free text

##### Attribute\_Definition\_Source

The authority or organization responsible for establishing the attribute’s definition given in the [Attribute\_Definition(GPM-CS #6.1.2.2)] data element. Normally, this organization provided the attribute list. Specify the default value for this element as “U.S. Census Bureau.”

Type: Data Short name: attrdefs

Path: (6.1.2.3) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/* **Attribute\_Definition\_Source**

Domain: free text

##### Attribute\_Label

The name of the defined characteristic of an entity defined in the [**Attribute\_Definition** (GPM-CS #6.1.2.2)] data element. If this attribute is not defined in an authoritative publication, and there is no verified source, leave the attribute out.

Type: Data Short name: attrlabl

Path: (6.1.2.1) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute*/**Attribute\_Label**

Domain: free text

##### Attribute\_Units\_of\_Measure

The standard unit of measure used to define the [*Range\_Domain* (GPM-CS #6.1.2.4.2)] identified under the [**Attribute\_Label** (GPM-CS #6.1.2.1)] data element. This element applies to the [Range\_Domain\_Minimum] and [Range\_Domain\_Maximum] elements.

Type: Data Short name: attrunit

Path: (6.1.2.4.2.3) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Range\_Domain*/**Attribute\_Units\_of\_Measure**

Domain: free text

#### B

##### Beginning\_Date

The beginning date, or vintage, of (a) the product/dataset or (b) source material. Express the [**Beginning\_Date**] data element as a year, a year and month, or a year, month, and day. This element is mandatory if the [**Ending\_Date**] data element is provided. Format: YYYYMMDD. Always express the month as an integer. Always include leading zeros for month (MM) and day (DD).

Type: Data Short name: begdate

Path: (a) (2.3.2.1) *GPM/Identification\_Information/Time\_Period\_of\_Content/Range\_of\_Dates*/**Beginning\_Date**

(b) (3.6.4.2.1) *GPM/Data\_Quality\_Information/Source\_Information/ Time\_Period\_of\_Content/Range\_of\_Dates/***Beginning\_Date**

Domain: “Unknown,” free date

##### Browse\_Graphic\_File\_Description

A textual description of the graphic file’s content.

Type: Data Short name: browsed

Path: (2.9.2) *GPM/Identification\_Information/Browse\_Graphic/***Browse\_Graphic\_File\_Description**

Domain: free text

##### Browse\_Graphic\_File\_Name

Name of the graphic file provided to illustrate the product/dataset. The Browse Graphic visually depicts the product for prospective users. The image might show a simple display of the product, the results of an application that used the product, different aspects of the quality of the product, or other information. List a URL if applicable.

Type: Data Short name: browsen

Path: (2.9.1) *GPM/Identification\_Information/Browse\_Graphic/***Browse\_Graphic\_File\_Name**

Domain: free text

##### Browse\_Graphic\_File\_Type

Description of the graphic file format.

Type: Data Short name: browset

Path: (2.9.3) *GPM/Identification\_Information/Browse\_Graphic*/**Browse\_Graphic\_File\_Type**

Domain: “CGM,” “EPS,” “EMF,” “GIF,” “JPEG,” “PBM,” “PDF,” "PNG," “PS,” “TIFF,” “WMF,” “XWD,” free text

#### C

##### Calendar\_Date

The date, or vintage, of (a) the product/dataset or (b) source material. Express the [**Calendar\_Date**] data element as a year, a year and month, or a year, month, and day. Format: YYYYMMDD. Always express the month as an integer. Always include leading zeros for month (MM) and day (DD).

Type: Data Short name: caldate

Path: (a) (2.3.1) *GPM*/Identification\_Information/Time\_Period\_of\_Content/**Calendar\_Date**

(b) (3.6.4.1) *GPM/Data\_Quality\_Information/Source\_Information/ Time\_Period\_of\_Content*/**Calendar\_Date**

Domain: “Unknown,” free date

##### City

The postal city of the address for the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information. The default value for this element is “Washington.”

Type: Data Short name: city

Path: (a) (2.8.2.2) *GPM/Identification\_Information/Point\_of\_Contact/Contact\_Address*/**City**

(b) (7.1.2.2) *GPM/Distribution\_Information/Point\_of\_Contact/Contact\_Address*/**City**

(c) (9.5.2.2) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact/Contact\_Address/***City**

Domain: free text

##### Codeset\_Name

The title of the codeset. A codeset is a reference to a standard or published list of established valid values. InterNational Committee for Information Technology Standards (INCITS), formerly FIPS, County Codes, are an example of a codeset. Each occurrence of a [*Codeset\_Domain* (GPM-CS #6.1.2.4.3)] compound element will describe no more than one codeset.

Type: Data Short name: codesetn

Path: (6.1.2.4.3.1) *GPM*/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Codeset\_Domain/**Codeset\_Name**

Domain: free text “None,”

“National Standard Codes (ANSI INCITS 38-2009), Federal Information Processing Series (FIPS) – States/State Equivalents,”

“National Standard Codes (ANSI INCITS 31-2009), Federal Information Processing Series (FIPS) - Counties/County Equivalents,”

“National Standard Codes (ANSI INCITS 454-2009), Federal Information Processing Series (FIPS) - Metropolitan and Micropolitan Statistical Areas and Related Geographic Entities,”

“National Standard Codes (ANSI INCITS 455-2009), Federal Information Processing Series (FIPS) - Congressional Districts,”

##### Codeset\_Source

The authority for the codeset listed under the [**Codeset\_Name** (GPM-CS #6.1.2.4.3.1)] data element.

Type: Data Short name: codesets

Path: (6.1.2.4.3.2) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Codeset\_Domain*/**Codeset\_Source**

Domain: free text

##### Contact\_Electronic\_Mail\_Address

The address of the electronic mailbox of the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset, or (c) responsible for the metadata information. Often the distributor is the same as the point of contact. The e-mail addresses of individual staff members shall not be referenced.

Type: Data Short name: cntemail

Path: (a) (2.8.4) *GPM/Identification\_Information/Point\_of\_Contact*/**Contact\_Electronic\_Mail\_Address**

(b) (7.1.4) *GPM/Distribution\_Information/Point\_of\_Contact*/**Contact\_Electronic\_Mail\_Address**

(c) (9.5.4) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact*/**Contact\_Electronic\_Mail\_Address**

Domain: free text

##### Contact\_Organization

The name of the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information. Often the distributor is the same as the point of contact. This element refers to specific branches or divisions within the Census Bureau; Individual staff members shall not be referenced.

Type: Data Short name: cntorg

Path: (a) (2.8.1) *GPM/Identification\_Information/Point\_of\_Contact*/**Contact\_Organization**

(b) (7.1.1) *GPM/Distribution\_Information/Point\_of\_Contact*/**Contact\_Organization**

(c) (9.5.1) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact*/**Contact\_Organization**

Domain: free text

##### Contact\_Fax

The facsimile or fax number that can be used to contact the organizations a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information.

Type: Data Short name: cntfax

Path: (a) (2.8.5) *GPM*/*Identification\_Information/Point\_of\_Contact/***Contact\_Fax**

(b) (7.1.5) *GPM*/Distribution\_Information/Point\_of\_Contact/ **Contact\_Fax**

(c) (9.5.3) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact*/ **Contact\_Fax**

Domain: free text

##### Contact\_Voice\_Telephone

The telephone number by which individuals can speak to the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information. The default value for this element is “301.763.1128.”

Type: Data Short name: cntvoice

Path: (a) (2.8.3) *GPM*/*Identification\_Information/Point\_of\_Contact/***Contact\_Voice\_Telephone**

(b) (7.1.3) *GPM*/Distribution\_Information/Point\_of\_Contact/**Contact\_Voice\_Telephone**

(c) (9.5.3) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact*/**Contact\_Voice\_Telephone**

Domain: free text

##### Country

The country of the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information. The default value for this element is “USA.”

Type: Data Short name: country

Path: (a) (2.8.2.5) *GPM/Identification\_Information/Point\_of\_Contact/Contact\_Address*/**Country**

(b) (7.1.2.5) *GPM*/*Distribution\_Information/Point\_of\_Contact/Contact\_Address/***Country**

(c) (9.5.2.5) *GPM*/*Metadata\_Reference\_Information/Point\_of\_Contact/Contact\_Address*/**Country**

Domain: free text

##### Coupling\_Type

How closely associated, or coupled, the web service is with the dataset. This element can either have a value of “tight,” “loose,” or “mixed.” In a tightly coupled dataset, the service metadata describes both the service and the geographic dataset. A loosely coupled dataset’s metadata does not describe both the service and geographic dataset. In mixed coupled datasets, the service metadata describes some of the datasets but does not describe others. The default value for this element is “tight.”

Type: Data Short name: couptype

Path: (8.3) *GPM/Computer\_Service\_Information*/**Coupling\_Type**

Domain: “tight,” “loose,” “mixed”

##### CP\_Link

The URL of the specific operation (ex: query) that the Online Mapping Service (OMS) may be called to execute. For information on how to write a correct WMS URL, see the Open Geospatial Consortium’s (OGC) WMS Specification [Ref 8].

Type: Data Short name: cplink

Path: (8.4.5.1) *GPM/Computer\_Service\_Information/Contains\_Operations/Connect\_Point*/**CP\_Link**

Domain: Valid URL

##### Currentness\_Reference

Information about the currentness of (a) the product/dataset or (b) source (how “up-to-date” is either the product or source?). Unfortunately, sometimes only the time that the information was recorded or published is known. The [**Currentness\_Reference**] data element requires the producer to identify what the [*Time\_Period\_of\_Content*] dates refer to, the ground condition, or the publication date. If these dates are not known, use “unknown” for the element.

Type: Data Short name: current

Path: (a) (2.3.3) *GPM/Identification\_Information/Time\_Period\_of\_Content/***Currentness\_Reference**

(b) (3.6.4.3) *GPM/Data\_Quality\_Information/Source\_Information/ Time\_Period\_of\_Content*/**Currentness\_Reference**

Domain: free text

“ground condition” *When the “real world” looked the way it is described in the product. Dates reflect the source material.*

“publication date” *Dates reflect when the information was recorded, published, etc.*

“unknown” It is not known when the information was created.

#### D

##### Data\_Set\_Character\_Set

Full name of the character-coding standard used for the product/dataset. This element has a default value of “UTF-8.”, which stands for: “Unicode (or Universal Coded Character Set) Transformation Format – 8-bit.”

Type: Data Short name: datachar

Path: (2.10) *GPM*/*Identification\_Information*/**Data\_Set\_Character\_Set**

Domain: “UTF-8”

##### Data\_Set\_Language

The language used within the product/dataset. The domain represents a selection of language codes taken from “ISO 639-2, Code for the representation of names of languages [Ref 9]. “eng” stands for English, and “spa” stands for Spanish. This element has a default value of “eng.”

Type: Data Short name: datalang

Path: (2.11) *GPM/Identification\_Information*/**Data\_Set\_Language**

Domain: “eng,” “spa,” free text

##### DCP

The method, or Distributed Computing Platform, used to deploy the operation, application, or information listed in the [**Operation\_Name** (GPM-CS #8.4.1)] data element. Most Census Bureau datasets will use “WebServices.”

Type: Data Short name: opdcp

Path: (8.4.2) *GPM/Computer\_Service\_Information*/*Contains\_Operations*/**DCP**

Domain: “XML,” “COBRA,” “JAVA,” “COM,” “SQL,” “SOAP,” “Z3950,” “HTTP,” “FTP,” “WebServices,” free text

##### Denominator\_of\_Flattening\_Ratio

The denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when the numerator is set to 1.

Type: Data Short name: denflat

Path: (5.2.4) *GPM/Spatial\_Reference\_Information/Geodetic\_Model*/**Denominator\_of\_Flattening\_Ratio**

Domain: Denominator\_of\_Flattening\_Ratio > 0.0

##### Direct\_Spatial\_Reference\_Method

The system of objects used to represent space in the product/dataset. These objects are the building blocks for every geospatial feature found in a GEO product. These geospatial features include linear, spatial, and geographic area features. Indicate only one: “Point,” or “Vector,”.

Type: Data Short name: direct

Path: (4.2) *GPM/Spatial\_Data\_Organization\_Information*/**Direct\_Spatial\_Reference\_Method**

Domain: “Point,” “Vector,” “Unknown”

##### Distribution\_Liability

Statement of the liability assumed by the organization responsible for distributing the product/dataset. Use this data element to (a) deny liability if data within the product are incorrect, incomplete, or misused or (b) limit third party distribution of the product.

Type: Data Short name: distliab

Path: (7.2) *GPM/Distribution\_Information*/**Distribution\_Liability**

Domain: free text

#### E

##### East\_Bounding\_Coordinate

The eastern-most coordinate of the limit of coverage expressed in decimal degrees of longitude. Provide this element to six decimal places. If this level of precision is not reflective of the actual data accuracy, indicate this in the [*Horizontal\_Positional\_Accuracy\_Report* (GPM-CS #3.5)] compound element.

Type: Data Short name: eastbc

Path: (2.5.1.2) *GPM/Identification\_Information/Spatial\_Domain/Bounding\_Coordinates*/ **East\_Bounding\_Coordinate**

Domain: -180.0 <= East\_Bounding\_Coordinate <= 180.0

##### Edition

The version of the title. This is normally the year the product/dataset was produced.

Type: Data Short name: edition

Path: (2.1.4) *GPM/Identification\_Information/Citation*/**Edition**

Domain: free text

##### Ellipsoid\_Name

Identification given to established representations of the Earth's shape.

Type: Data Short name: ellips

Path: (5.2.2) *GPM/Spatial\_Reference\_Information/Geodetic\_Model*/**Ellipsoid\_Name**

Domain: “Clarke 1866,” “Geodetic Reference System 80,” free text

##### Ending\_Date

The ending date, or vintage, of (a) the product/dataset or (b) source material. Express the [**Ending\_Date**] data element as a year, a year and month, or a year, month, and day. This element is mandatory if the [**Beginning\_Date**] data element is provided. Format: YYYYMMDD. Always express the month as an integer. Always include leading zeros for month (MM) and day (DD).

Type: Data Short name: enddate

Path: (a) (2.3.2.2) *GPM/Identification\_Information/Time\_Period\_of\_Content/Range\_of\_Dates*/**Ending\_Date**

(b) (3.6.4.2.2) *GPM/Data\_Quality\_Information/Source\_Information/ Time\_Period\_of\_Content/Range\_of\_Dates*/**Ending\_Date**

Domain: “Unknown,” “Present,” free date

##### Entity\_Type\_Definition

A description of the entity type identified in the [**Entity\_Type\_Label** (GPM-CS #6.1.1.1)] data element.

Type: Data Short name: enttypd

Path: (6.1.1.2) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Entity\_Type*/ **Entity\_Type\_Definition**

Domain: free text

##### Entity\_Type\_Definition\_Source

The authority of the definition provided in the [**Entity\_Type\_Definition** (GPM-CS #6.1.1.2)] data element. Usually, this agency originally provided the definition for the entity. If the name of the document that defines this entity is available, provide it here. The default for this element is “U.S. Census Bureau.”

Type: Data Short name: enttypds

Path: (6.1.1.3) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Entity\_Type*/ **Entity\_Type\_Definition\_Source**

Domain: free text

##### Entity\_Type\_Label

The name of the object, feature type or table defined in the [**Entity\_Type\_Definition** (GPM-CS #6.1.1.2)] data element. This is usually the name of the shapefile or shapefile series.

Type: Data Short name: enttypl

Path: (6.1.1.1) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Entity\_Type/***Entity\_Type\_Label**

Domain: free text

##### Enumerated\_Domain\_Value

The name or label of a member of a defined set of possible values or pick list. Enumerated domain values are typically categorical. Examples include road types and entity codes.

Type: Data Short name: edomv

Path: (6.1.2.4.1.1) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Enumerated\_Domain*/**Enumerated\_Domain\_Value**

Domain: free text

##### Enumerated\_Domain\_Value\_Definition

The description of the value listed in the [**Enumerated\_Domain\_Value** (GPM-CS #6.1.2.4.1.1)] data element.

Type: Data Short name: edomvd

Path: (6.1.2.4.1.2) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Enumerated\_Domain*/**Enumerated\_Domain\_Value\_Definition**

Domain: free text

##### Enumerated\_Domain\_Value\_Definition\_Source

The authority of the definition listed in the [**Enumerated\_Domain\_Value\_Definition** (GPM-CS #6.1.2.4.1.2)] data element. Examples of sources include government agencies, standard organizations, and documents.

Type: Data Short name: edomvds

Path: (6.1.2.4.1.3) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Enumerated\_Domain*/**Enumerated\_Domain\_Value\_Definition\_Source**

Domain: free text

##### EPSG\_Code

The unique alphanumeric value that identifies an EPSG projection or the projection on any other online registry. This element has a default value of "gml=urn:ogc:def:crs:EPSG::3395."

Type: Data Short name: epsgcode

Path: (5.1.3.1) *GPM*/*Spatial\_Reference\_Information/Map\_Projection/EPSG\_Reference*/**EPSG\_Code**

Domain: free text, “[EPSG::4269](http://www.epsg-registry.org/export.htm?gml=urn:ogc:def:crs:EPSG::4269),” “EPSG::3395”

##### EPSG\_Code\_Space

The URL of the online registry that contains the projection used in the product/dataset. An example would be the EPSG. This element has a default value of "http://www.epsg-registry.org/export.htm?"

Type: Data Short name: epsgspce

Path: (5.1.3.2) *GPM/Spatial\_Reference\_Information/Map\_Projection/EPSG\_Reference*/**EPSG\_Code\_Space**

Domain: Valid URL

##### EPSG\_Version

The format or vintage of the EPSG projection used in the product/dataset. This element may contain a date or some other alphanumeric combination.

Type: Data Short name: epsgver

Path: (5.1.3.3) *GPM/Spatial\_Reference\_Information/Map\_Projection/EPSG\_Reference*/**EPSG\_Version**

Domain: free text

##### Evaluation

A description of the test listed in the [**Measure** (GPM-CS #)] data element.

Type: Data Short name: eval

Path: (a) (3.1.1.2) *GPM/Data\_Quality\_Information/Attribute\_Accuracy\_Report/Test\_Report*/**Evaluation**

(b) (3.2.1.2) *GPM/Data\_Quality\_Information/Non\_Quantitative\_Attribute\_Accuracy\_Report/Test\_Report*/**Evaluation**

(c) (3.3.1.2) *GPM/Data\_Quality\_Information/Logical\_Consistency\_Report/Test\_Report*/**Evaluation**

(d) (3.4.1.2) *GPM/Data\_Quality\_Information/Completeness\_Report/Test\_Report/***Evaluation**

(e) (3.5.1.2) *GPM/Data\_Quality\_Information/Horizontal\_Positional\_Accuracy\_Report/* *Test\_Report*/**Evaluation**

Domain: free text

#### F

##### FC\_Online\_Linkage

An online computer resource or URL that contains the Feature Catalogue file.

Type: Data Short name: fconlink

Path: (6.2.4) *GPM*/Entity\_and\_Attribute\_Information/Feature\_Catalogue\_Description/**FC\_Online\_Linkage**

Domain: valid URL

##### FC\_Title

The name of the Feature Catalogue (*ISO 19110*) file.

Type: Data Short name: fctitle

Path: (6.2.1) *GPM/Entity\_and\_Attribute\_Information/Feature\_Catalogue\_Description/***FC\_Title**

Domain: free text

##### Feature\_Types

A list of the geographic entity types included (described) in the Feature Catalogue file.

Type: Data Short name: feattyps

Path: (6.2.3) *GPM/Entity\_and\_Attribute\_Information/Feature\_Catalogue\_Description/***Feature\_Types**

Domain: free text

##### Fees

The monetary costs and terms associated with acquiring the product/dataset.

Type: Data Short name: fees

Path: (7.3.3) *GPM/Distribution\_Information/Standard\_Order\_Process*/Fees

Domain: free text

##### File\_Decompression\_Technique

Recommendations of algorithms or processes, including means of obtaining these algorithms or processes, required to read or expand the product/dataset.

Type: Data Short name: filedec

Path: (7.3.2.4) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form/* **File\_Decompression\_Technique**

Domain: “No compression applied,” free text

##### Format\_Name

The name of the data transfer format or method of organizing data.

Type: Data Short name: formname

Path: (7.3.2.1) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form/***Format\_Name**

Domain: “ARCE,” “ARCG,” “ASCII,” “BIL,” “BIP,” “BSQ,” “CDF,” “CFF,” “COORD,” “DBF,” “DEM,” “DFAD,” “DGN,” “DIGEST,” “DLG,” “DTED,” “DWG,” “DX90,” “DXF,” “ERDAS,” “GRASS,” “HDF,” “IGDS,” “IGES,” “MOSS,” “netCDF,” “NITF,” “PRJ,” “REST,” “RPF,” “RVC,” “RVF,” “SDTS,” “SHP,” “SHX,” “SIF,” “SLF,” “TIFF,” “TGRLN,” “VPF,” “WMS,” “XML,” free text

##### Format\_Version\_Date

The release date that this particular form of the format or method of organizing data. Express this element as a year, a year and month, or a year, month, and day. Format: YYYYMMDD. Always express the month as an integer.

Type: Data Short name: formverd

Path: (7.3.2.3) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form/***Format\_Version\_Date**

Domain: “Unknown,” free date

##### Format\_Version\_Number

The number of this particular form of the format or method of organizing data. This number can be all numbers, all letters or a mix of both.

Type: Data Short name: formvern

Path: (7.3.2.2) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form/* **Format\_Version\_Number**

Domain: free text

#### G

##### Geospatial\_Data\_Presentation\_Form

The intended presentation form of the geospatial data in the product/dataset. For example, a paper map would have “map” as a geospatial presentation form. A scanned image of a map also has “map” as the geospatial data presentation form.

Type: Data Short name: geoform

Path: (2.1.5) *GPM/Identification\_Information/Citation/***Geospatial\_Data\_Presentation\_Form**

Domain: “diagramDigital,” “documentDigital,” “mapDigital,” “modelDigital,” “imageHardcopy,” “tableDigital,” “Geodatabase,” “Web Mapping Service,” “unknown”

#### H

##### Horizontal\_Datum\_Name

The identification given to the reference system used for defining the coordinates of points. This element has a default value of “North American Datum of 1983.”

Type: Data Short name: horizdn

Path: (5.2.1) *GPM/Spatial\_Reference\_Information/Geodetic\_Model/***Horizontal\_Datum\_Name**

Domain: “North American Datum of 1927,” “North American Datum of 1983,” free text

#### I

##### Included\_With\_Dataset

Is the Feature Catalogue file included with the product (ex: TIGER\Line Shapefiles)?

Type: Data Short name: wdata

Path: (6.2.2) *GPM/Entity\_and\_Attribute\_Information/Feature\_Catalogue\_Description****/*Included\_With\_Dataset**

Domain: “Yes,” “No”

##### Indirect\_Spatial\_Reference

Name of geographic feature types, addressing schemes, or other means through which locations are referenced in the product/dataset. An indirect spatial reference is any way to describe a location without using coordinates. The reference may use the name of the feature or a code that identifies the feature. Indirect spatial references are included because they are a widespread means by which observations or other attribute information is tied to a location. While these indirect spatial references alone may not be sufficient for geographic analyses, they can serve to link the attribute data to coordinate descriptions of the locations to which the attribute data apply.

Type: Data Short name: indspref

Path: (4.1) *GPM/Spatial\_Data\_Organization\_Information*/**Indirect\_Spatial\_Reference**

Domain: free text “None,”

“National Standard Codes (ANSI INCITS 38-2009), Federal Information Processing Series (FIPS) – States/State Equivalents,”

“National Standard Codes (ANSI INCITS 31-2009), Federal Information Processing Series (FIPS) - Counties/County Equivalents,”

“National Standard Codes (ANSI INCITS 454-2009), Federal Information Processing Series (FIPS) - Metropolitan and Micropolitan Statistical Areas and Related Geographic Entities,”

“National Standard Codes (ANSI INCITS 455-2009), Federal Information Processing Series (FIPS) - Congressional Districts,”

##### ISO\_Keyword

One keyword describing a main theme of the product. Keywords for this element are limited to those detailed on the FGDC web page “[Publishing to geodata.gov](https://outlook.office365.com/owa/?realm=uscensus.onmicrosoft.com&path=/mail/inboxhttps://www.fgdc.gov/dataandservices/pub_guidance)” [link 3].

Type: Data Short name: isokey

Path: (1.1.2) *GPM/FGDC\_Required/ISO\_Theme/***ISO\_Keyword**

Domain: “boundaries,” “economy,” “inlandWaters,” “location,” “oceans,” “society,” “structure,” “transportation”

For table listing the various products GEO creates and the appropriate ISO Keyword, see Appendix D

##### ISO\_Keyword\_Thesaurus

A reference to a formally registered thesaurus or a similar authoritative source of keywords that summarize the subject of a product/dataset. This element has a value of “**ISO 19115 Topic Categories**.”

Type: Data Short name: isokt

Path: (1.1.1) *GPM/FGDC\_Required/ISO\_Theme/***ISO\_Keyword\_Thesaurus**

Domain: “ISO 19115 Topic Categories”

##### Issue\_Identification

Information identifying the issue or version of the series publication of which the product is a part.

Type: Data Short name: issue

Path: (2.1.6.2) *GPM/Identification\_Information/Citation/Series\_Information/***Issue\_Identification**

Domain: free text

#### M

##### Maintenance\_and\_Update\_Frequency

The frequency with which changes and additions are made to the product after the initial dataset is completed.

Type: Data Short name: update

Path: (2.4.2) *GPM/Identification\_Information/Status/***Maintenance\_and\_Update\_Frequency**

Domain: “Continually,” “Daily,” “Weekly,” “Monthly,” “Annually,” “Unknown,” “As needed,” “Irregular,” “None planned,” free text

##### Map\_Projection\_Description

A description of a projection used for the data set not defined in the EPSG Geodetic Parameter Dataset. The information provided shall include the name of the projection, names of parameters and values used for the data set, and the citation of the specification for the algorithms that describe the mathematical relationship between Earth and plane or developable surface for the projection.

Type: Data Short name: mapprojd

Path: (5.1.2) *GPM/Spatial\_Reference\_Information/Map\_Projection*/**Map\_Projection\_Description**

Domain: free text

##### Map\_Projection\_Name

The name of the map projection, or method used to portray a part of the spherical Earth on a flat surface like a piece of paper.

Type: Data Short name: mapprojn

Path: (5.1.1) *GPM/Spatial\_Reference\_Information/Map\_Projection*/**Map\_Projection\_Name**

Domain: “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,” “Stereographic,” “Transverse Mercator,” “van der Grinten,” “Other Projection’s Definition,” free text

##### Measure

The name of the test(s) applied to evaluate the data quality elements of product/source materials.

Type: Data Short name: measure

Path: (a) (3.1.1.1) *GPM/Data\_Quality\_Information/Attribute\_Accuracy\_Report/Test\_Report/***Measure**

(b) (3.2.1.1) *GPM/Data\_Quality\_Information/ Non\_Quantitative\_Attribute\_Accuracy\_Report/Test\_Report*/**Measure**

(c) (3.3.1.1) *GPM/Data\_Quality\_Information/Logical\_Consistency\_Report/Test\_Report*/**Measure**

(d) (3.4.1.1) *GPM/Data\_Quality\_Information/Completeness\_Report/Test\_Report*/**Measure**

(e) (3.5.1.1) *GPM/Data\_Quality\_Information/Horizontal\_Positional\_Accuracy\_Report*/ *Test\_Report*/**Measure**

Domain: free text

##### Metadata\_Character\_Set

Full name of the character-coding standard used for the metadata record. The value of this element is always “UTF-8.” This stands for: “Unicode (or Universal Coded Character Set) Transformation Format – 8-bit.”

Type: Data Short name: metachar

Path: (9.8) *GPM/Metadata\_Reference\_Information*/**Metadata\_Character\_Set**

Domain: “UTF-8”

##### Metadata\_Date

The creation/update date of the metadata. Express this element as a year, a year and month, or a year, month, and day. Format: YYYYMMDD. Always express the month as an integer. Update this element every time the metadata file is modified. This date is used as a trigger for the ‘harvesting’ of files to discovery portals.

Type: Data Short name: metd

Path: (9.1) *GPM/Metadata\_Reference\_Information*/**Metadata\_Date**

Domain: free date

##### Metadata\_File\_Identifier

The unique identifier for the product’s metadata file should be the file name. Use “.gpm” as the file extension for all files in the GPM-CS format. Use “.xml” as the file extension for all files in the XML format. For all files to be published to the Census Bureau web sites or discovery portals, the file extension should be “gpm.xml.”

Type: Data Short name: metfilid

Path: (9.9) *GPM/Metadata\_Reference\_Information*/**Metadata\_File\_Identifier**

Domain: free text

##### Metadata\_Hierarchy\_Level

The type of resource for which metadata is provided. The source of the list of domain values describing the resource is the MD\_ScopeCode code list in ISO 19115-1 [Ref 5]. To satisfy requirements from the GeoPlatform Profile, the following two codes are added to the domain: “map” and “mapDocument.” The code “map” applies to a digital map that has a georeferencing that is exploitable by GIS software. The code “mapDocument” applies to a map document, such as an artistic, schematic, or paper map, whose georeferencing is not directly exploitable by GIS software. The value of the [**Metadata\_Hierarchy\_Level**] data element is directly related to the Product Profile type. The following table shows which hierarchy level each product profile type is related to:

Product profile Metadata Hierarchy Level

Planned initiative

MapD mapDocument

Vector dataset

Tabular dataset

Service service

GDB dataset

Series series

Type: Data Short name: methlvl

Path: (9.3) *GPM/Metadata\_Reference\_Information/***Metadata\_Hierarchy\_Level**

Domain: “dataset,” “initiative,” “map,” “mapDocument,” “series,” “service,”

##### Metadata\_Hierarchy\_Level\_Name

A description of the resource for which metadata is provided. This element is mandatory when the [**Metadata\_Hierarchy\_Level** (GPM-CS #9.3)] data element does not equal “dataset.”

Type: Data Short name: methlvln

Path: (9.4) *GPM/Metadata\_Reference\_Information*/**Metadata\_Hierarchy\_Level\_Name**

Domain: free text

##### Metadata\_Language

The language used for documenting the metadata record. The domain represents a selection of language codes taken from “ISO 639-2, Code for the representation of names of languages [Ref 9].” “eng” stands for English, and “spa” stands for Spanish. This element has a default value of “eng.”

Type: Data Short name: metalang

Path: (9.10) *GPM/Metadata\_Reference\_Information*/**Metadata\_Language**

Domain: “eng,” “spa,” free text

##### Metadata\_Parent\_Identifier\_Name

The name of a related file known as a Series Collection file that identifies this file as part of a larger collection of files. This element is mandatory for all state and county level files. (Exceptions: Alaska Native Regional Corporations, Estates, and Subbarrios).

The format for this element shall be the following*: Product Type, year, Series Information for the, Theme,* where:

Product Type: The type of dataset. Types of products include:

* TIGER/Line Shapefile
* TIGER/Line Geodatabase
* KML file
* WMS file
* Rest file
* Cartographic Boundary file

Year: The year the dataset is produced

Theme: the subject covered by the dataset: Examples include

* Block groups
* School Districts
* Legislative school districts

Type: Data Short name: metpidnm

Path: (9.2) *GPM/Metadata\_Reference\_Information*/**Metadata\_Parent\_Identifier\_Name**

Domain: free text

##### Metadata\_Standard\_Name

The name of the metadata standard used to document the product/dataset.

Type: Data Short name: metstdn

Path: (9.6) *GPM/Metadata\_Reference\_Information*/**Metadata\_Standard\_Name**

Domain: “Content Standard for Digital Geospatial Metadata,” “ISO 19115-2: Geographic information - Metadata - Part 2: Extensions for imagery and gridded data,” free text

##### Metadata\_Standard\_Version

Identification of the version of the metadata standard listed in the [**Metadata\_Standard\_Name** (GPM-CS #9.4)] data element.

Type: Data Short name: metstdv

Path: (9.7) *GPM/Metadata\_Reference\_Information*/**Metadata\_Standard\_Version**

Domain: “FGDC-STD-001-1998,” “ISO 19115-2:2009,” free text

##### Mime\_Type

The media type for the online resource identified in the [**Network\_Resource\_Name** (GPM-CS #7.3.2.6.1)] data element. It is a two-part identifier consisting of a type and a subtype. MIME stands for "Multipurpose Internet Mail Extensions”. It is a way of identifying files on the Internet according to their nature and format. Using this information, the browser can open the file with the proper extension/plugin.

Type: Data Short name: mimetype

Path: (7.3.2.6.2) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form*/ *Network\_Address*/**Mime\_Type**

Domain: free text

“text/html” *- for Html pages*

“application/xml” *- for XML files*

“application/zip” *- for Zip files*

“application/vnd.google-earth.kml+xml” *for KML files*

#### N

##### Network\_Resource\_Name

The name of an online computer resource that contains the product/dataset. Provide a URL if available.

Type: Data Short name: networkr

Path: (7.3.2.6.1) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form/ Network\_Address*/**Network\_Resource\_Name**

Domain: free text

##### NGDA\_Keyword

One keyword describing a main theme of the product. In order to be NGDA compliant, the [*NGDA\_Information* (GPM-CS #1.2)] compound element must include the following three (3) instances of [**NGDA\_Keyword**]: (a) “NGDA,” (b) “National Geospatial Data Asset” and (c) an NGDA theme keyword from the domain list below. For a complete discussion of the NGDA keyword requirements, see the FGDC NGDA Metadata Guidelines [Ref 11].

Type: Data Short name: ngdakey

Path: (1.2.3) *GPM/FGDC\_Required/NGDA\_Information*/**NGDA\_Keyword**

Domain: “NGDA,” “National Geospatial Data Asset,” “Governmental Units and Administrative and Statistical Boundaries Theme,” “Transportation Theme,” “Cultural Resources Theme”

##### NGDA\_Keyword\_Thesaurus

A reference to a formally registered thesaurus or a similar authoritative source of keywords that summarize the subject of the product. This element has a default value of “NGDA Portfolio Themes.” For a complete discussion of the NGDA keyword requirements, see the FGDC NGDA Metadata Guidelines [Ref 11].

Type: Data Short name: ngdakt

Path: (1.2.2) *GPM/FGDC\_Required/NGDA\_Information*/**NGDA\_Keyword\_Thesaurus**

Domain: “NGDA Portfolio Themes”

##### Non-Digital\_Form

The description of options for obtaining the data on non-computer related media like a paper map or for obtaining a hard copy of the data on digital media, such as a DVD or other related digital format.

Type: Data Short name: nondig

Path: (7.3.1) *GPM/Distribution\_Information/Standard\_Order\_Process/***Non-Digital\_Form**

Domain: free text

##### North\_Bounding\_Coordinate

The northern-most coordinate of the limit of coverage expressed in decimal degrees of latitude. Provide this element to six decimal places. If this level of precision is not reflective of the actual data accuracy, indicate this in the [*Horizontal\_Positional\_Accuracy\_Report* (GPM-CS #3.5)] compound element.

Type: Data Short name: northbc

Path: (2.5.1.3) *GPM/Identification\_Information/Spatial\_Domain/Bounding\_Coordinates*/ **North\_Bounding\_Coordinate**

Domain: -90.0 <= North\_Bounding\_Coordinate <= 90.0;

North\_Bounding\_Coordinate >= South\_Bounding\_Coordinate

#### O

##### Online\_Linkage

The name of an online computer resource that contains (a) the product/dataset or (b) a related product. If the data is available online from the Originator, list the URL that leads directly to the product/dataset. For most Census Bureau products (not the Cross Reference), this URL (not the one in [*Cross\_Reference* (GPM-CS #2.12)]) will be identical to the [**Network\_Resource\_Name** (GPM-CS #7.3.2.6.1)] URL.

Type: Data Short name: onlink

Path: (a) (2.1.7) *GPM/Identification\_Information/Citation*/**Online\_Linkage**

(b) (2.12.1.4) *GPM/Identification\_Information/Cross\_Reference/Citation*/**Online\_Linkage**

Domain: free text

##### Ontology\_URI

A unique universal Resource Identifier that refers to the concept denoting the feature type. This identifier is the URL of the Census Bureau website defining the physical feature. For all Census Bureau products, this will be https://www.census.gov/geo/reference/terms.html.

Type: Data Short name: onturi

Path: (6.1.1.4) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Entity\_Type*/**Ontology\_URI**

Domain: valid URL

##### Operation\_Description

A description of the computer command listed in the [**Operation\_Name** (GPM-CS #8.4.1)] data element. The description should include the design purpose of the command, any inputs that it requires, and the results of that operation. Use this element to describe the functions of an OWS.

Type: Data Short name: opdescrp

Path: (8.4.3) *GPM/Computer\_Service\_Information/Contains\_Operations/***Operation\_Description**

Domain: free text

##### Operation\_Name

The phrase, or name, that identifies a specific command that a user of an OMS can request of the service.

Type: Data Short name: opname

Path: (8.4.1) *GPM/Computer\_Service\_Information/Contains\_Operations*/**Operation\_Name**

Domain: “GetCapabilities,” “GetMap,” “GetFeatureInfo,” “esri\_wms: GetStyles,” free text

##### Ordering\_Instructions

General instructions for obtaining the product/dataset. These instructions can also include information regarding special terms and services provided for the product/dataset by the distributor.

Type: Data Short name: ordering

Path: (7.3.4) *GPM/Distribution\_Information/Standard\_Order\_Process*/**Ordering\_Instructions**

Domain: free text

##### Originator

The name of the organization that (a) developed the product/dataset (b) developed data or other products related to the product/dataset or (c) developed a dataset or product that was used as a source for the product. If the original product was edited or compiled by an organization other than the originator, the name must be followed by “(ed.)” or “(comp.),” respectively.

Type: Data Short name: origin

Path: (a) (2.1.1) *GPM/Identification\_Information/Citation*/**Originator**

(b) (2.12.1.1) *GPM/Identification\_Information/Cross\_Reference/Citation*/**Originator**

(c) (3.6.1.1) *GPM/Data\_Quality\_Information/Source\_Information/Citation*/**Originator**

Domain: “Unknown,” free text

##### Other\_Constraints

Restrictions and legal prerequisites for accessing the resource described by the metadata. This element provides a written description of the restrictions referenced in the [**Access\_Constraints** (GPM-CS #2.7.1)] and [**Use\_Constraints** (GPM-CS #2.7.2)] data elements. This element is mandatory if either of the aforementioned elements have a value of “otherRestrictions.” Build each explanation as follows: “[“+ ‘*data element name*’ + “]:” + ‘*The explanation*’. For data elements with both [**Access\_Constraints**] and [**Use\_Constraints**], place the explanations for both in the same [**Other\_Constraints**] data element. For example: “[**Access\_Constraints**]: *explanation* [**Use\_Constraints**]: *explanation*”

Type: Data Short name: othconst

Path: (2.7.3) *GPM/Identification\_Information/Constraints*/**Other\_Constraints**

Domain: free text

#### P

##### Parameter\_Description

An explanation of the role of the parameter

Type: Data Short name: paramdsc

Path: (8.4.4.3) *GPM/Computer\_Service\_Information/Contains\_Operations*/ *Operation\_Parameters*/**Parameter\_Description**

Domain: free text

##### Parameter\_Direction

An indication if the variable or parameter is an input or an output to the service

Type: Data Short name: paramdir

Path: (8.4.4.2) *GPM/Computer\_Service\_Information/Contains\_Operations/ Operation\_Parameters*/**Parameter\_Direction**

Domain: “Input,” “Output”

##### Parameter\_Name

The word or phrase used to designate the variable.

Type: Data Short name: paramnme

Path: (8.4.4.1) *GPM/Computer\_Service\_Information/Contains\_Operations/ Operation\_Parameters*/**Parameter\_Name**

Domain: free text

##### Place\_Keyword

The geographic name of a location, point, or area, characterized by the product/dataset. Include specific and regional references such as (a) city or county name, (b) state, (c) state acronym, or (d) ANSI Code. Examples include “Nevada,” “Montgomery County,” “Yellowstone National Park,” “Washington Monument,” “Appalachia,” “Puget Sound,” “Delmarva Peninsula,” “U.S. Territories,” “09,” “CT” etc. If an ANSI INCITS document or codelist is referenced in the [**Place\_Keyword\_Thesaurus** (GPM-CS #2.6.2.1)] data element, all subsequent Keyword values must belong to that codelist.

Type: Data Short name: placekey

Path: (2.6.2.2) *GPM/Identification\_Information/Keywords/Place*/**Place\_Keyword**

Domain: free text

##### Place\_Keyword\_Thesaurus

A reference to a formally registered thesaurus or a similar authoritative source of keywords describing geographic locations characterized by the product. Do not include more than one thesaurus reference in this element. If multiple thesauri are required for this product, create a separate [*Place* (GPM-CS #2.6.2)] compound element for each thesaurus.

Type: Data Short name: placekt

Path: (2.6.2.1) *GPM/Identification\_Information/Keywords/Place*/**Place\_Keyword\_Thesaurus**

Domain: free text “None,”

“National Standard Codes (ANSI INCITS 38-2009), Federal Information Processing Series (FIPS) – States/State Equivalents,”

“National Standard Codes (ANSI INCITS 31-2009), Federal Information Processing Series (FIPS) - Counties/County Equivalents,”

“National Standard Codes (ANSI INCITS 454-2009), Federal Information Processing Series (FIPS) - Metropolitan and Micropolitan Statistical Areas and Related Geographic Entities,”

“National Standard Codes (ANSI INCITS 455-2009), Federal Information Processing Series (FIPS) - Congressional Districts,”

“INCITS 446:2008 - Geographic Names Information System (GNIS)”

“ISO 3166 Codes for the representation of names of countries and their subdivisions.”

##### Point\_and\_Vector\_Object\_Count

The total number of the point or vector object types occurring in the product/dataset. These are the point and linear elemental features in the MTDB. This element gives a count of the object type identified in the [**SDTS\_Point\_and\_Vector\_Object\_Type** (GPM-CS #4.4.1)] data element.

Type: Data Short name: ptvctcnt

Path: (4.4.2) *GPM/Spatial\_Data\_Organization\_Information/SDTS\_Terms\_Description/* **Point\_and\_Vector\_Object\_Count**

Domain: Point\_and\_Vector\_Object\_Count > 0

##### Postal\_Code

The ZIP Code or other postal code of the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information. The default value for this element is “20233-7400.”

Type: Data Short name: postal

Path: (a) (2.8.2.4) *GPM/Identification\_Information/Point\_of\_Contact/Contact\_Address/***Postal\_Code**

(b) (7.1.2.4) *GPM/Distribution\_Information/Point\_of\_Contact/Contact\_Address*/**Postal\_Code**

(c) (9.5.2.4) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact/Contact\_Address*/**Postal\_Code**

Domain: free text

##### Process\_Date

The date when the series of actions described under the [**Process\_Description** (GPM-CS #3.7.1)] data element were completed. Express the [**Process\_Date**] element as a year, a year and month, or a year, month and day. Format: YYYYMMDD. Always express the month as an integer.

Type: Data Short name: procdate

Path: (3.7.2) *GPM/Data\_Quality\_Information/Process\_Step/***Process\_Date**

Domain: “Unknown,” “Not complete,” free date

##### Process\_Description

An explanation of the series of actions used to create the product/dataset. This explanation should include any related parameters or tolerances. The description of the process can be a single collective description or a series of individual process steps based upon (a) stages of processing, (b) incorporation of sources, and (c) project milestones. Including descriptions of updates to the MTDB is left to the discretion of the product sponsor.

Type: Data Short name: procdesc

Path: (3.7.1) *GPM/Data\_Quality\_Information/Process\_Step*/**Process\_Description**

Domain: free text

##### Progress

The development phase of the product/dataset.

Type: Data Short name: progress

Path: (2.4.1) *GPM/Identification\_Information/Status/***Progress**

Domain: “Completed,” “Historical Archive,” “Obsolete,” “Ongoing,” “Planned,” “Required,” “Under development,” “Unknown.”

##### Protocol

The set of conventions governing the formatting of data used to connect to the OMS.

Type: Data Short name: cpprotcl

Path: (8.4.5.2) *GPM/Computer\_Service\_Information/Contains\_Operations/Connect\_Point*/**Protocol**

Domain: “http/1.1,” free text

##### Publication\_Date

The date when a product was published or otherwise made available for release. The date in question may be describing (a) the product/dataset, (b) a product related to the product/dataset, or (c) a source material. Express this element as a year, a year and month, or a year, month, and day. Format: YYYYMMDD. Always express the month as an integer.

Type: Data Short name: pubdate

Path: (a) (2.1.2) *GPM/Identification\_Information/Citation*/**Publication\_Date**

(b) (2.12.1.2) *GPM/Identification\_Information/Cross\_Reference/Citation*/**Publication\_Date**

(c) (3.6.1.2) *GPM/Data\_Quality\_Information/Source\_Information/Citation*/**Publication\_Date**

Domain: “Unknown,” “Unpublished material,” free date

##### Purpose

A summary of the intentions with which the product was developed. This element documents why the product was created and under what conditions it is appropriate for use.

Type: Data Short name: purpose

Path: (2.2.2) *GPM/Identification\_Information/Description*/**Purpose**

Domain: free text

#### R

##### Range\_Domain\_Maximum

This element represents the greatest used/known or legal value for the attribute within a continuum of valid values.

Type: Data Short name: rdommax

Path: (6.1.2.4.2.2) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute*/ *Attribute\_Domain\_Values/Range\_Domain*/**Range\_Domain\_Maximum**

Domain: free text

##### Range\_Domain\_Minimum

This element represents the least used/known or legal value for the attribute within a continuum of valid values.

Type: Data Short name: rdommin

Path: (6.1.2.4.2.1) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/Range\_Domain/***Range\_Domain\_Minimum**

Domain: free text

##### Resource\_Description

A detailed text description of what the online resource is/does.

Type: Data Short name: cpdescrp

Path: (8.4.5.4) *GPM/Computer\_Service\_Information/Contains\_Operations/Connect\_Point/* **Resource\_Description**

Domain: free text

##### Resource\_Name

A word or phrase that identifies the online resource.

Type: Data Short name: cpname

Path: (8.4.5.3) *GPM/Computer\_Service\_Information/Contains\_Operations/Connect\_Point*/**Resource\_Name**

Domain: free text

##### REST\_URL

The web address or URL of the REST service for the product/dataset. Specifically, the export map function.

Type: Data Short name: resturl

Path: (1.2.5) *GPM/FGDC\_Required/NGDA\_Information*/**REST\_URL**

Domain: valid URL

##### Result

The output of the test listed in the [Test\_Report 3.1.1, 3.2.1, 3.3.1, 3.4.1] data element. This is the only mandatory element for the Test\_Report element.

Type: Data Short name: result

Path: (a) (3.1.1.3) *GPM/Data\_Quality\_Information/Attribute\_Accuracy\_Report/Test\_Report*/**Result**

(b) (3.2.1.3) *GPM/Data\_Quality\_Information/ Non\_Quantitative\_Attribute\_Accuracy\_Report/Test\_Report*/**Result**

(c) (3.3.1.3) *GPM/Data\_Quality\_Information/Logical\_Consistency\_Report/Test\_Report*/**Result**

(d) (3.4.1.3) *GPM/Data\_Quality\_Information/Completeness\_Report/Test\_Report*/**Result**

(e) (3.5.1.3) *GPM/Data\_Quality\_Information/Horizontal\_Positional\_Accuracy\_Report*/ *Test\_Report*/**Result**

Domain: free text

#### S

##### SDTS\_Point\_and\_Vector\_Object\_Type

The type of point and vector spatial objects used to locate zero-, one-, and two-dimensional spatial locations in the product/dataset. The terminology within the domain is taken from Point and vector object information based GML 3.2.1 [Ref 17]. Repeat this element once for each object type found within the dataset.

Type: Data Short name: sdtstype

Path: (4.4.1) *GPM/Spatial\_Data\_Organization\_Information/SDTS\_Terms\_Description*/ **SDTS\_Point\_and\_Vector\_Object\_Type**

Domain: “complex,” “composite,” “curve,” “point,” “solid,” “surface”

##### Semi-Major\_Axis

The radius of the equatorial axis of the ellipsoid expressed in meters.

Type: Data Short name: semiaxis

Path: (5.2.3) *GPM/Spatial\_Reference\_Information/Geodetic\_Model*/**Semi-Major\_Axis**

Domain: Semi-major\_Axis > 0.0

##### Series\_Name

The name of the series publication of which the product/dataset is a part.

Type: Data Short name: sername

Path: (2.1.6.1) *GPM/Identification\_Information/Citation/Series\_Information*/**Series\_Name**

Domain: free text

##### Service\_Type

The kind of Online Mapping Service (OMS) described by the metadata. This element should follow the following format:

<urn><:><domain-name><:><serviceType><:><unique name assigned by the vendor><:>version number>

For Census Bureau datasets, this will most likely be the OGC’s WMS.

Type: Data Short name: srvtyp

Path: (8.1) *GPM/Computer\_Service\_Information*/**Service\_Type**

Domain: free text

##### Service\_Type\_Version

The variation, form or variant of the Service Type listed in the [Service\_Type (GPM-CS #8.1)] data element.

Type: Data Short name: srvtypv

Path: (8.2) *GPM/Computer\_Service\_Information/***Service\_Type\_Version**

Domain: free text

##### Source\_Citation\_Abbreviation

A short-form alias or unique abbreviation assigned to each source for the source citation. One means to create an alias is to use a combination of the [**Originator** (GPM-CS #3.6.1.1)] and [**Publication\_Date** (GPM-CS#3.6.1.2)] of the [*Source\_Information* (GPM-CS#3.6)] compound element. Use the alias in place of the source name when describing the process steps.

Type: Data Short name: srccitea

Path: (3.6.5) *GPM/Data\_Quality\_Information/Source\_Information*/**Source\_Citation\_Abbreviation**

Domain: free text

##### Source\_Contribution

A brief statement identifying the information contributed by a source to the product/dataset.

Type: Data Short name: srccontr

Path: (3.6.6) *GPM/Data\_Quality\_Information/Source\_Information*/**Source\_Contribution**

Domain: free text

##### Source\_Scale\_Denominator

The denominator of the representative fraction on a map. This number shall not contain commas. For example, on a 1:24,000-scale map, the [**Source\_Scale\_Denominator**] is 24000.

Type: Data Short name: srcscale

Path: (3.6.2) *GPM/Data\_Quality\_Information/Source\_Information/***Source\_Scale\_Denominator**

Domain: Source\_Scale\_Denominator > 1

##### South\_Bounding\_Coordinate

The southern-most coordinate of the limit of coverage expressed in decimal degrees of latitude. Provide this element to six decimal places. If this level of precision is not reflective of the actual data accuracy, indicate this in the [*Horizontal\_Positional\_Accuracy\_Report* (GPM-CS #3.5)] compound element.

Type: Data Short name: southbc

Path: (2.5.1.4) *GPM/Identification\_Information/Spatial\_Domain/Bounding\_Coordinates/* **South\_Bounding\_Coordinate**

Domain: -90.0 <= South\_Bounding\_Coordinate <= 90.0;

South\_Bounding\_Coordinate <= North\_Bounding\_Coordinate

##### Spatial\_Resolution

The hardcopy map equivalent scale of an EPSG projection expressed as a denominator.

Type: Data Short name: epsgres

Path: (5.1.3.4) *GPM/Spatial\_Reference\_Information/Map\_Projection/EPSG\_Reference/***Spatial\_Resolution**

Domain: Spatial\_Resolution > 1

##### State\_or\_Province

The state or province of the organization that is (a) knowledgeable about the product/dataset, (b) responsible for distributing the product/dataset or (c) responsible for the metadata information. The default value for this element is “DC.”

Type: Data Short name: state

Path: (a) (2.8.2.3) *GPM/Identification\_Information/Point\_of\_Contact/Contact\_Address/****State\_or\_Province***

(b) (7.1.2.3) *GPM/* D*istribution\_Information/Point\_of\_Contact/Contact\_Address*/**State\_or\_Province**

(c) (9.5.2.3) *GPM/Metadata\_Reference\_Information/Point\_of\_Contact/ Contact\_Address*/State\_or\_Province

Domain: free text

#### T

##### Technical\_Prerequisites

A description of any technical or specialized capabilities that the consumer must possess to use the product/dataset in the form(s) provided by the distributor.

Type: Data Short name: techpreq

Path: (7.4) *GPM/Distribution\_Information/***Technical\_Prerequisites**

Domain: free text

##### Theme\_Keyword

A common-use word or phrase used to describe the subject of the product/dataset. Examples include TIGER, MTFCC, Statistical Entity, etc. At least one [**Theme\_Keyword**] data element must be included in every metadata file.

Type: Data Short name: themekey

Path: (2.6.1.2) *GPM/Identification\_Information/Keywords/Theme*/**Theme\_Keyword**

Domain: “None,” free text

##### Theme\_Keyword\_Thesaurus

A reference to a formally registered thesaurus or a similar authoritative source of keywords that summarize the subject of the product/dataset. Examples of this include the *Global Change Master Directory (GCMD) Science Keywords, the USGS Thesaurus and Topographic Feature Vocabularies and Semantics*

Type: Data Short name: themekt

Path: (2.6.1.1) *GPM/Identification\_Information/Keywords/Theme*/**Theme\_Keyword\_Thesaurus**

Domain: “None,” free text

##### Title

The name of the product/dataset. The product in question may be (a) the product/dataset, (b) a product/dataset related to the product/dataset, or (c) source material used to create the product/dataset. The title should be informative. For the product, this is the field that is rendered when web pages display search results.

If the title is for a product using the Series Profile, the following rule applies:

The format for this element shall be the following*: Product Type, year, Series Information for the, Theme,* where:

Product Type: The type of dataset. Types of products include:

* TIGER/Line Shapefile
* TIGER/Line Geodatabase
* KML file
* WMS file
* Rest file
* Cartographic Boundary file

Year: The year the dataset is produced

Theme: the subject covered by the dataset: Examples include

* Block groups
* School Districts
* Legislative school districts

Type: Data Short name: title

Path: (a) (2.1.3) *GPM/Identification\_Information/Citation*/**Title**

(b) (2.12.1.3) *GPM/Identification\_Information/Cross\_Reference/Citation*/**Title**

(c) (3.6.1.3) *GPM/Data\_Quality\_Information/Source\_Information/Citation*/**Title**

Domain: free text

##### Topology\_Level

The degree of complexity of the spatial relationships contained within the shapefile. The terms listed in the domain are defined in ISO-19115-1, [Ref 5]. Table B.3.31. Appendix E contains a list of Census Datasets and their correct topology.

Type: Data Short name: topolvl

Path: (4.3) *GPM/Spatial\_Data\_Organization\_Information*/**Topology\_Level**

Domain: “geometryOnly,” “topology1D,” “planarGraph,” “fullPlanarGraph,” “surfaceGraph,” “fullSurfaceGraph,” “topology3D,” “fullTopology3D,” “abstract,” “Unknown”

##### Transfer\_Size

The physical magnitude, or estimated size, of the product in megabytes.

Type: Data Short name: transize

Path: (7.3.2.5) *GPM/Distribution\_Information/Standard\_Order\_Process/Digital\_Form*/**Transfer\_Size**

Domain: Transfer\_Size > 0.0

##### Type\_of\_Source\_Media

The medium of the source material.

Type: Data Short name: typesrc

Path: (3.6.3) *GPM/Data\_Quality\_Information/Source\_Information*/**Type\_of\_Source\_Media**

Domain: “paper,” “disc,” “online,” “DVD-ROM,” “electronic bulletin board,” “electronic mail system,” free text

#### U

##### Use\_Constraints

The restrictions and legal prerequisites for using the product. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the product. Common constraints include (a) must read and fully comprehend the metadata prior to data use, (b) acknowledgement of the Originator when using the product as a source, (c) sharing of data products developed using the source materials with the Originator, (d) data should not be used beyond the limits of the source scale, (e) the product does not meet survey quality standards and should not be utilized as such and (f) this product may not be resold. The domain of this element is restricted to code list values only. If none of the values accurately describes the constraints, use “otherRestrictions” as the data value. When “otherRestrictions” is used as the data value for this element, an explanation must be provided in the [**Other\_Constraints** (GPM-CS #2.7.3)] data element.

Special Note: All Census Bureau products that contain *governmental unit* boundaries must include the following disclaimer: “The boundaries in this file are for statistical data collection and tabulation purposes only. They do not represent legal boundaries. Their depiction and designation for statistical purposes does not constitute a determination of jurisdictional authority or rights of ownership or entitlement, and they are not legal land descriptions.” For all products containing ‘governmental unit’ boundaries, use “otherRestrictions as the data value and add the full disclaimer to the [**Other\_Constraints**] data element.

Type: Data Short name: useconst

Path: (2.7.2) *GPM/Identification\_Information/Constraints*/**Use\_Constraints**

Domain: “trademark,” “copyright,” “otherRestrictions”

##### Unrepresentable\_Domain

A domain for which the set of data values cannot be represented by an enumerated list, range of values, or codeset. Reasons include (a) attributes whose values do not exist in a known predefined set, (b) attributes are a concatenation of other code sets, (c) attribute data is not available and (d) attributes have values that cannot be depicted using the forms of representation used for the metadata. Provide the information content for the set of values as well as the reasons why they cannot be represented.

Type: Data Short name: udom

Path: (6.1.2.4.4) *GPM/Entity\_and\_Attribute\_Information/Detailed\_Description/Attribute/ Attribute\_Domain\_Values/***Unrepresentable\_Domain**

Domain: free text

#### W

##### West\_Bounding\_Coordinate

The western-most coordinate of the limit of coverage expressed in decimal degrees of longitude. Provide this element to six decimal places. If this level of precision is not reflective of the actual data accuracy, indicate this in the [*Horizontal\_Positional\_Accuracy\_Report* (GPM-CS#3.5)] compound element.

Type: Data Short name: westbc

Path: (2.5.1.1) *GPM/Identification\_Information/Spatial\_Domain/Bounding\_Coordinates/* **West\_Bounding\_Coordinate**

Domain: -180.0 <= West\_Bounding\_Coordinate < 180.0

##### WMS\_URL

The web address or URL of the GetMap request for a GetMap command. This command should give the user the folder containing the entire web mapping services.

Type: Data Short name: wmsurl

Path: (1.2.4) *GPM/FGDC\_Required/NGDA\_Information*/**WMS\_URL**

Domain: valid URL

# 6. References & Related Documents

## 6.1. Referenced Documents

The Geospatial Product Metadata Content Standard references the following documents:

[Ref 1] U.S. Office of Management and Budget, **“Circular A-16: Coordination of Geographic Information and Related Spatial Data Activities,”** August 2002

[Ref 2] U.S. Department of Commerce, **“Policy on Creation and Publication of Metadata for Geospatial Data,”** September 2013

[Ref 3] U.S. Department of Commerce, **“Policy on Planned Geospatial Acquisitions,”** September 2013

[Ref 4] Federal Geographic Data Committee, **“Content Standard for Digital Geospatial Metadata,”** June 1998

[Ref 5] International Organization for Standardization. **“ISO 19115-1: Geographic information - Metadata - Part 1: Fundamentals,”** 2014

[Ref 6] International Organization for Standardization. **“ISO 19115-2: Geographic information - Metadata - Part 2: Extensions for imagery and gridded data,”** January 2012

[Ref 7] International Organization for Standardization. **“ISO 19110: Geographic information - Methodology for Feature Cataloguing,”** December 2016

[Ref 8] Open Geospatial Consortium Inc. **“OpenGIS® Web Map Server Implementation Specification,”** March 15 2016

[Ref 9] International Organization for Standardization. **“ISO 639-2: Codes for the Representation of Names of Languages,”** 2010

[Ref 10] American National Standards Institute. “Spatial Data Transfer Standard (SDTS),

[Ref 11] Federal Geographic Data Committee, December 2019, FGDC Technical Guidance: Data.gov and The GeoPlatform Metadata Recommendations. 32 pp.

[Ref 12] National Geospatial Profile Initiative, **“GeoPlatform Profile of 19115-1, Draft Revision 1,”** July 2016

[Ref 13] Wolfram Mathworld, Topology, <http://mathworld.wolfram.com/Topology.html>

[Ref 14] ESRI, ArcGIS™: Working With Geodatabase Topology: An ESRI ® White Paper • May 2003, Redlands, CA. May 2003

[Ref 15] Galdi, David “Spatial Data Storage and Topology in the Redesigned MAF/TIGER System”, <https://pdfs.semanticscholar.org/0b29/15627fff2471a534cb34903e02ea3a53f355.pdf>

[Ref 16] Arbia, G. “The Use of GIS in Spatial Statistical Surveys”, International Statistical Review, Aug 1993, pp 339-359.

[Ref 17] Open GIS Consortium (OGC), The OpenGIS™ Abstract Specification Topic 1: Feature Geometry (ISO 19107 Spatial Schema)Version 5, Wayland, MA, 2001

[Ref 18] Theobald, David M. Understanding Topology and Shapefiles, ArcUser, April-June 2001

[Ref 19] Open Geospatial Consortium Inc. OpenGIS® Geography Markup Language (GML) Encoding Standard, Ver. 3.2.1 Wayland, MA, 2001. Retrieved from: <https://www.opengeospatial.org/standards/gml>

[Ref 20] Federal Geographic Data Committee, Withdrawal. Retrieved from <https://www.fgdc.gov/standards/projects/FGDC-standards-projects/SDTS>

[Ref 21] Linfinti GeoBlog, GIS for Educators Topic 6: Topology, <http://linfiniti.com/dla/worksheets/6_Topology.pdf>

## 6.2. Referenced Codesets

American National Standards Institute **“National Standard Codes (ANSI INCITS 38-2009), Federal Information Processing Series (FIPS) – States/State Equivalents,”** November 2014

American National Standards Institute **“National Standard Codes (ANSI INCITS 31-2009), Federal Information Processing Series (FIPS) - Counties/County Equivalents,”** 2014

American National Standards Institute **“National Standard Codes (ANSI INCITS 454-2009), Federal Information Processing Series (FIPS) - Metropolitan and Micropolitan Statistical Areas and Related Geographic Entities,”** November 2014

American National Standards Institute **“National Standard Codes (ANSI INCITS 455-2009), Federal Information Processing Series (FIPS) - Congressional Districts,”** November 2014

## 6.3. Referenced URLs

[Link 1] FGDC website:[*https://www.fgdc.gov/*](https://www.fgdc.gov/)

[Link 2] GeoPlatform Profile of ISO 19115-1:[*https://www.geoplatform.gov/gp-profile/*](https://www.geoplatform.gov/gp-profile/)

[Link 3] FGDC/Publishing to geodata.gov:[*https://www.fgdc.gov/dataandservices/pub\_guidance*](https://www.fgdc.gov/dataandservices/pub_guidance)

[Link 4] FGDC: A-16 NGDA Portfolio Management: National Geospatial Data Asset (NGDA) Datasets: [*https://www.fgdc.gov/ngda-reports/NGDA\_Datasets.html*](https://www.fgdc.gov/ngda-reports/NGDA_Datasets.html)

## 6.4. Related Documents

U.S. Census Bureau, **“Linear Features Metadata Master Plan,”** March 2015

International Organization for Standardization. **“ISO 19119: Geographic information – Services,”** January 2016

International Organization for Standardization. **“ISO 19157: Geographic information - Data quality standards,”** December 2016

# Attachments

## A: Metadata Lexicon

Within the GEO, the term Metadata is commonly used as the default term for all data maintained or produced within the division that describe the structure content, source, and update actions for features in the MTDB. As there are several different categories of metadata within the division, this results in substantial confusion and wasted time. The purpose of this attachment is to develop a lexicon of standard terms to be used in describing metadata as it is used within the GEO.

### A.1. Concepts

#### ISO Suite of Geospatial Metadata Standards

ISO geospatial metadata standards have been developed as a suite of standards. The base Fundamental standard (ISO 19115-1) is the core of the suite. Fundamentals includes information common to most geospatial data resource types.

Additional standards have been developed to:

* **extend** the Fundamental standard by adding content that must be used in conjunction with the Fundamental standard
* **document** related information that can stand alone or associated with a Fundamental metadata record
* **encode** and validate a standardize XML metadata record

The suite approach enables metadata creators to select and apply only those standards relevant to their organization and data types. The suite also allows the one-time documentation of information, e.g., Data Acquisition and Processing, Feature Catalogs, Data Quality Methods, and Measures, etc., that may be applied to multiple geospatial resources and their associated metadata records. The following ISO standards are supported by the GPM-CS:

* ISO 19115-1: Geographic information - Metadata - Part 1: Fundamentals: This is the foundational geospatial metadata standard for providing information about identification, extent, quality, spatial and temporal aspects, content, spatial reference, portrayal, distribution, and other properties of digital geographic data and services.
* ISO 19115-2: Geographic information - Metadata - Part 2: Extensions for imagery and gridded data: ISO 19115-2 extends the existing geographic metadata standard by defining the schema required for describing imagery and gridded data. It provides information about the properties of the measuring equipment used to acquire the data, the geometry of the measuring process employed by the equipment, and the production process used to digitize the raw data.
* ISO 19110: Geographic information - Methodology for Feature Cataloguing: ISO 19110 defines the methodology for cataloguing feature types and specifies how the classification of feature types is organized into a feature catalogue and presented to the users of a set of geographic data.
* ISO 19119: Geographic information – Services: This standard identifies and defines the architecture patterns for service interfaces used for geographic information, defines its relationship to the Open Systems Environment model, presents a geographic services taxonomy, and a list of example geographic services placed in the services taxonomy. The open systems model allows service interfaces, interface protocols, and supporting data to be defined in non-proprietary specifications that evolve through public consensus.
* ISO 19157: Geographic information - Data quality standards: ISO 19157 establishes principles for describing the quality of geographic data. It defines components for describing data quality, specifies components and content structure of a register for data quality measures, describes general procedures for evaluating the quality of geographic data, and establishes principles for reporting data quality.

#### National Geospatial Data Assets

An NGDA Dataset is defined as a geospatial dataset that has been designated by the FGDC Steering Committee as an important national asset/resource. NGDA datasets are organized into the following three levels:

* **NGDA Portfolio:** A collection of NGDA Portfolio Themes, each of which is comprised of related NGDA Datasets. These datasets are selected from a much larger and continually changing universe of geospatial datasets. Only a select subset of these are designated as NGDA Datasets by the FGDC Steering Committee. There are ~17 NGDA Themes made up of ~176 NGDA Datasets. Together, these NGDA Datasets and Profile Themes comprise the NGDA Portfolio.
* **NGDA Portfolio Theme:** An NGDA Portfolio Theme is a management unit for a collection of related NGDA datasets. There are ~17 NGDA Portfolio Themes, two of which are maintained by GEO (“Transportation” and “Governmental Units, and Administrative and Statistical Boundaries”).
* **NGDA Dataset:** A NGDA dataset is a geospatial dataset that has been designated by the FGDC Steering Committee as a National Geospatial Data Asset. To be considered for designation a dataset must meet at least one of the following criteria: (a) used by multiple agencies or with agency partners such as Tribal, state, and local governments; (b) needed for Presidential priorities as expressed by OMB; (c) required to meet shared mission goals of multiple Federal agencies or (d) expressly required by statutory mandate. There are ~176 NGDA Datasets, 35 of which are maintained by the GEO.

#### OMS vs. WMS vs REST

An **OMS** provides data to the data user through a structured URL request or an Application Programming Interface (API) that the data user constructs. OMS come in two varieties: the OGC WMS and ESRI’s REST service.

An **OGC WMS** provides the data in an open recognizable way across different platforms and clients. A WMS is a method of dynamically generating a geographic image from a GIS database using a URL or HTTP request. This HTTP request includes the region to be mapped, the datasets to be used, the Coordinate Reference System, and the desired image output.

The GeoServices **REST** Specification also provides a standard method for data users to issue requests to the server through structured URLs. This is accomplished using REST technology, a way of providing interoperability between computer systems on the internet. Unlike the OGC WMS, the data user must invoke the REST service using an application written in PYTHON or JAVA, which can make HTTP requests.

#### URI vs. URN vs URL

A Uniform Resource Identifier (URI) is a string of characters used to identify a name or a resource on the Internet. A URI identifies a resource either by location, or a name, or both. A URI has two specializations known as URL and URN. Both URNs (names) and URLs (locators) are URIs, and a particular URI may be both a name and a locator at the same time.

A Uniform Resource Locator (URL) is a subset of the URI that specifies where an identified resource is available and the mechanism for retrieving it. A URL defines how the resource can be obtained. It does not have to be HTTP URL (https ://), a URL can also be (ftp ://) or (smb ://).

A Uniform Resource Name (URN) is a URI that uses the URN scheme, and does not imply availability of the identified resource. An URN is similar to a person's name, while a URL is like a street address. The URN defines something's identity, while the URL provides a location. Essentially, "what" vs. "where."

### A.2. Terms

**Database:** A collection of related data that is organized so that it can be easily accessed managed and updated.

**Dataset:** Actual logical and physical data representations of geographic features.

**Descriptive Category:** These are also known as compound elements. A compound element is a group of related elements and other compound elements that in combination describe the element. All compound elements are described by data elements, either directly or through intermediate compound elements. Compound elements represent higher-level concepts that cannot be represented by an individual data element.

**Discovery Portal:** An Internet-based capability providing a managed portfolio of shared and trusted geospatial data, services, and applications for use by government agencies and partners to meet their mission needs. Discovery portals provide an enhanced focal point for easy discovery and access to trusted geospatial data, services, applications, and infrastructure. They effectively support problem solving and policy formulation while avoiding duplicative costs. These discovery portals are open to the public.

**Feature Type:** A feature type is a class of objects that have geographic location and other properties. An example of a feature type is a Census block.

**Geographic Names Information System (GNIS):** (INCITS 446:2008) A database developed by the United States Geological Survey (USGS) that identifies official, variant and historical names for physical and select cultural geographic features of the United States, its territories, outlying areas, and freely associated areas, and the waters of the same to the limit of the twelve-mile statutory zone.

**Geodatabase:** A collection of geographic datasets of various types held in a common file system folder, a Microsoft Access database, or a multiuser relational DBMS (such as Oracle, Microsoft SQL Server, PostgreSQL, Informix, or IBM DB2). It is the native data structure for ArcGIS and is the primary data format used for editing and data management.

**Geospatial Data:** Information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the Earth. Geospatial data is information derived from, among other things, remote sensing, mapping, and surveying technologies.

**Geospatial product:** The Census Bureau considers geographic feature data to be geospatial data. A Census Bureau geospatial product can be defined as “the compilation of geospatial data in any medium or form, including textual, numerical, graphical, cartographic, or audiovisual, to be disseminated to a defined audience or customer, either public or inter/intra division.” Product types defined in this standard include vector digital data files, tabular digital data files, maps, atlases, documents, planned acquisitions, and legacy products.

**Metadata:** Data about data. In the context of geographic features, metadata may describe the source, vintage, provider, and the assessed quality of geospatial data as well as the operations, applications, operator, update transactions responsible for the update.

**Online Mapping service (OMS):** These services access vector and raster data and render them in the form of a map for display (combines access and portrayal). Independent of whether the underlying data are features (point, line, and polygon) or coverages (such as gridded digital terrain models or images), the OMS produces data that can be directly viewed in a Web browser.

**Product profile:** A subset of GPM-CS metadata elements needed to describe the distinctive features or characteristics of Census Bureau geospatial products. Since each geographic product is unique, each product profile will contain different elements and different obligations for each element and section.

**Provider:** The organization responsible for compiling geospatial data and submitting a geospatial dataset to the Census Bureau for the purpose of updating the MTDB. The provider may have compiled the data from other sources.

**Root Mean Square Error:** A common measure for evaluating the quality of an estimate. It measures how much error there is in a dataset by measuring how far an estimated value is from an accepted value.

**Service:** A specific type of component that is explicitly intended to be shared and reused by multiple applications, either internal or external to the organization. Also defined as a distinct part of the functionality that is provided by an entity through interfaces.

**Source:** A specific data file or document used to update geospatial data in the MTDB. Each source has a defined coverage area, a particular vintage, and a known provider. Note that datasets covering the same area but having either a different provider or vintage or both constitute separate sources.

**Vintage:** A date indicating how current a source is. It may represent the last update date or the last date that a source dataset was reviewed and verified to be current.

### A.3. Acronyms

ACS American Community Survey

ADC Assistant Division Chief

ANSI American National Standards Institute

API Application Programming Interface

CM Configuration Management

CP Connect Point

CR Change Request

CSDGM Content Standard for Digital Geospatial Metadata

DBMS Database Management System

DCP Distributed Computing Platform

DOC Department of Commerce

EPSG European Petroleum Survey Group

ESRI Environmental Systems Research Institute

FGDC Federal Geographic Data Committee

FIPS Federal Information Processing Series

GDA Geospatial Data Act

GEO Census Bureau Geography Division

GNIS Geographic Names Information System

GPM-CS Geospatial Product Metadata Content Standard

GPS Global Positioning System

GSCQB Geographic Standards, Criteria, and Quality Branch

GSS-I Geographic Support System Initiative

INCITS InterNational Committee for Information Technology Standards

IPT Integrated Project Team

ISO International Organization for Standardization

MA Mandatory if Applicable

MAF Master Address File

MSP MAF Structure Point

MTDB MAF/TIGER Database

MTFCC MAF/TIGER Feature Classification Codes

NGDA National Geospatial Data Assets

NSDI National Spatial Data Infrastructure

OGC Open Geospatial Consortium

OMB Office of Management and Budget

OMS Online Mapping Service

PII Personally Identifiable Information

PR Production Rule

QA Quality Assurance

QC Quality Control

REST Representational State Transfer

RMSE Root Mean Square Error

SDTS Spatial Data Transfer Standard

SME Subject Matter Expert

TIGER Topologically Integrated Geographic Encoding and Referencing System

URI Uniform Resource Identifier

URL Uniform Resource Locator

URN Uniform Resource Name

USGS United States Geological Survey

UTF Unicode Transformation Format

WG Working Group

WMS Web Mapping Service

XML EXtensible Markup Language

ZIP Zone Improvement Plan

## B: DOC-Census Bureau NGDA Datasets

Select Census Bureau datasets are designated as NGDA datasets by the FGDC Steering Committee. NGDA datasets are essential national resources that satisfy multi-agency requirements, achieve Presidential priorities, or are required by statutory mandate. As a result of this designation, these datasets require additional metadata elements to promote their discovery on federally supported data discovery portals such as the GeoPlatform. These extra elements include [**Alternate\_Title**], [**NGDA\_Keyword\_Thesaurus**], [**NGDA\_Keyword**], [**WMS\_URL**], and [**REST\_URL**]. All these data elements are defined under the [*NGDA\_Information* (GPM-CS#1.2)] compound element.

What follows is the official list of NGDA designated datasets produced by the GEO. This list is found on the FGDC web site under “A-16 NGDA Portfolio Management” subpage “National Geospatial Data Asset (NGDA) Datasets” [Link 4]. This list is current as of May 9, 2018, and is subject to change.

### Governmental Units, and Administrative and Statistical Boundaries

Governmental Units designated datasets describe boundaries that delineate geographic areas for the following uses:

* + Governance and the general provision of services (e.g., States, American Indian reservations, counties, cities, towns, etc.),
  + administration and/or for a specific purpose (e.g., Congressional Districts, school districts, fire districts, Alaska Native Regional Corporations, etc.),
  + Provision of statistical data (e.g., census tracts, census blocks, metropolitan and micropolitan statistical areas, etc.).

Other boundaries may include international limits, those of federal land ownership, the extent of administrative regions for various federal agencies, as well as the jurisdictional offshore limits of U.S. sovereignty. Boundaries associated solely with natural resources and/or cultural entities are excluded from this theme and are included in the appropriate subject themes. The Governmental Units designated datasets distributed by GEO are:

1. 116th Congressional District National

2. 2010 Census 5-digit ZIP Code Tabulation Area

3. 2010 Census Population & Housing Unit Counts

4. 2010 Census Public Use Microdata Area

5. 2010 Census Urban Area

6. 2010 Census Urban Growth Area (UGA)

7. 2010 Census Voting District

8. Alaska Native Regional Corporation (ANRC)

9. American Indian Tribal Subdivision

10. American Indian/Alaska Native/Native Hawaiian (AIANNH) Homeland Areas

11. Block Group

12. Census Block

13. Census Bureau Regional Office Boundaries

14. Census Tract

15. Combined New England City and Town Area

16. Combined Statistical Area (CSA)

17. Consolidated City

18. County and Equivalent

19. County Subdivision

20. Elementary School Districts

21. Estate (US Virgin Islands)

22. Metropolitan Division

23. Metropolitan Statistical Area/Micropolitan Statistical Area (CBSA)

24. NECTA Division

25. New England City and Town Area

26. Place

27. Secondary School District

28. State and Equivalent

29. State Legislative District (SLD) Lower Chamber

30. State Legislative District (SLD) Upper Chamber

31. Subbarrio (Sub minor Civil Division)

32. Tribal Block Group

33. Tribal Census Tract

34. Unified School Districts

### Transportation

Transportation designated datasets describe those features that are the means of conveying persons and/or goods between locations. Transportation features include both physical (e.g. roads) and non-physical (e.g. 2010 Census Traffic Analysis Zone) components. The Transportation designated dataset distributed by GEO is:

1 Roads (All Roads)

## C: Metadata for the GeoPlatform Profile of (ISO) 19115-1

The elements described in this attachment are limited to those GPM-CS elements that have been modified to satisfy requirements from the GeoPlatform Profile. These descriptions include the changes that were made and the reasons for those changes. For a complete summary of these data elements, see the elements definition in chapter 6. The remainder of the ISO data elements described in the GeoPlatform Profile are not added to the GPM-CS as they are optional and not necessary for the documentation of the GEOs geospatial products.

### Data Elements Added

* [**Ontology\_URI** (GPM-CS#6.1.1.4)] This Profile element is added to the [*Entity\_and\_Attribute\_Information*] chapter of the GPM-CS to improve the performance of searches for feature types. A feature type is a class of objects that have geographic location and other properties. An example of a feature type is a Census block. The [**Ontology\_URI**] data element is the URL of the Census website defining the feature type.
* [**Mime\_Type** (GPM-CS#7.3.2.6.2)] This Profile element is added to the [*Distribution*] chapter of the GPM-CS to provide a better description of online resources. The [**Mime\_Type**] data element describes the media type used for the online resource. It is an identifier for file format content transmitted on the internet.

### Data Elements Modified

* [**Metadata\_Hierarchy\_Level** (GPM-CS#9.3)] A member of the [*Metadata\_Reference\_Information*] chapter of the GPM-CS. The domain list of this element is expanded to accommodate the expansions to the MD\_ScopeCodeList in ISO metadata standard. The “map” and “mapDocument” values are added to the [**Metadata\_Hierarchy\_Level**] data element in the GPM-CS to accommodate reference to these product types.
* [**SDTS\_Point\_and\_Vector\_Object\_Type** (4.4.1)]**:** The domain for this element is now derived from Geographic Markup Language (GML) version 3.2.1. This is due to the Spatial Data Transfer Standard being withdrawn by the FGDC and replaced by GML version 3.2.1 [Ref 20]

### Existing Data Elements satisfying Profile requirements

* [*Theme* (GPM-CS#2.6.1)] A member of the [*Identification\_Information*] chapter under the [*Keyword*] compound element. The GPM-CS already allows for multiple occurrences of the ISO MD\_Keyword class by allowing multiple theme keyword sections.
* [**Online\_Linkage** (GPM-CS #2.1.7)] A member of the [*Identification\_Information*] chapter under the [*Citation*] subsection. This data element is used to store the URI for the online resource. The GPM-CS already identifies this data element as mandatory in all Product Profiles but one, “Service.”
* [**Network\_Resource\_Name** (GPM-CS#7.3.2.6.1)] A member of the [*Distribution\_Information*] chapter under the [*Standard\_Order\_Process/Digital\_Form/Network\_Address*] compound element. This data element is used to store the URI for the online resource. The GPM-CS already identifies this data element as mandatory in all cases.
* [**Contact\_Electronic\_Mail\_Address** (GPM-CS#2.8.4 & #7.1.4 & 9.5.4)] A member of the [*Point\_of\_Contact*] compound element. The GPM-CS already identifies this data element as mandatory in all cases.
* [**Format\_Name** (GPM-CS#7.3.2.1)] A member of the [*Distribution\_Information*] chapter under the [*Digital\_Form*] compound element. The GPM-CS already identifies this data element as mandatory in all cases.

### Profile requirements Not Accommodated

* The ISO MD\_LayerIdentification class is not added, as this class does not apply to any of the GEOs geospatial products.
* The ISO MD\_MapIdentification Class is not added, as this class does not apply to any of the GEOs geospatial products.

## D Table of Census Datasets and the appropriate ISO Keyword

The following is a list of Census Datasets and the relevant ISO keyword. This list is current as of October 2019. Due to changes in products Geo offers, this list may not be complete. A more comprehensive list is available on the Geographic Standards, Criteria, and Quality Branch (GSCQB) SharePoint page in the metadata section.

Most census datasets will have an ISO keyword of“boundaries.” In fact, all the cartographic boundary and KML files will have an ISO keyword of“boundaries” Other census datasets may have ISO Keywords of “location,” “inlandWaters,” “intelligenceMilitary,” “oceans,” “society,” “structure,” and “transportation.”

| **Census Dataset** | **ISO Topic Keyword(s)** |
| --- | --- |
| All Cartographic Boundary Shapefiles | boundaries |
| Address Ranges County-based Relationship File | location |
| Address Range-Feature | location |
| Address Range-Feature Name | location |
| American Indian/Alaska Native/Native Hawaiian Areas | boundaries |
| American Indian Tribal Subdivision | boundaries |
| Alaska Native Regional Corporation | boundaries |
| Area Landmark | structure |
| Area Hydrography | inlandWaters |
| Current Block Group | boundaries |
| Current Metropolitan Statistical Area/Micropolitan Statistical Area (CBSA) | boundaries |
| Congressional District | boundaries |
| Current Combined New England City and Town Area (CNECTA) | boundaries |
| Coastline | oceans |
| Consolidated City | boundaries |
| Current County and Equivalent | boundaries |
| County Subdivision | boundaries |
| Combined Statistical Area (CSA) | boundaries |
| All Lines (edges) | boundaries, transportation, inlandWaters |
| Current Elementary School Districts | boundaries |
| Current Estate | boundaries |
| Topological Faces (Polygons With All Geocodes) | boundaries |
| Topological Faces-Area Hydrography | inlandWaters |
| Topological Faces-Area Landmark | Society, structure, |
| Topological Faces-Military Installation Relationship File | boundaries |
| Feature Names County-based Relationship File | boundaries |
| Linear Hydrography | inlandWaters |
| Current Metropolitan Division | boundaries |
| Military Installation National Shapefile | Boundaries, intelligenceMilitary |
| New England City and Town Area (NECTA) | boundaries |
| NECTA Division National | boundaries |
| Current Place | boundaries |
| Point Landmark | structure |
| Primary Roads | transportation |
| Primary and Secondary Roads | transportation |
| Public Use Microdata Area (PUMA) | boundaries |
| Rails | transportation |
| All Roads | boundaries |
| Secondary School Districts | boundaries |
| State Legislative District (SLD) Lower Chamber | boundaries |
| State Legislative District (SLD) Upper Chamber | boundaries |
| Current State and Equivalent | boundaries |
| Subbarrio (Sub minor Civil Division) | boundaries |
| Census Block | boundaries |
| Tribal Block Group | boundaries |
| Census Tract | boundaries |
| Tribal Census Tract | boundaries |
| Census Urban Area | boundaries |
| Unified School Districts | boundaries |
| Census 5-Digit ZIP Code Tabulation Area (ZCTA5) | boundaries |
| Address Ranges National Geodatabase | location |
| American Indian Area Related Geodatabase | boundaries |
| Areal Hydrography National Geodatabase | inlandWaters |
| Census Blocks Geodatabase | boundaries |
| Legislative Areas National Geodatabase | boundaries |
| Linear Hydrography National Geodatabase | inlandWaters |
| National Nation-Level Geography Geodatabase | boundaries |
| National Sub-State Geography Geodatabase | boundaries |
| Rails National Geodatabase | transportation |
| Roads National Geodatabase | transportation |
| School Districts Geodatabase | boundaries |
| State-based Geodatabase | boundaries |
| Edges (Lines)State Geodatabase | boundaries, transportation, inlandWaters |
| Puerto Rico Geodatabase | boundaries |
| AIANNH KML file | boundaries |
| ANRC KML file | boundaries |
| BG KML file | boundaries |
| CBSA KML file | boundaries |
| CNECTA KML file | boundaries |
| concity KML file | boundaries |
| county KML file | boundaries |
| county\_within\_cd116 KML file | boundaries |
| county\_within\_ua KML file | boundaries |
| cousub KML file | boundaries |
| CSA KML file | boundaries |
| division KML file | boundaries |
| ELSD KML file | boundaries |
| nation KML file | boundaries |
| NECTA KML file | boundaries |
| place KML file | boundaries |
| puma10 KML file | boundaries |
| region KML file | boundaries |
| SCSD KML file | boundaries |
| SLDL KML file | boundaries |
| SLDU KML file | boundaries |
| state KML file | boundaries |
| Subbarrio KML file | boundaries |
| tract KML file | boundaries |
| ua10 KML file | boundaries |
| UNSD KML file | boundaries |
| zcta510 KML file | boundaries |
| TIGERweb/tigerWMS\_Current Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ACS2019 Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ACS2018 Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ACS2017 Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ACS2016 Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ACS2015 Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ACS2014 Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ACS2013 Web Mapping Service | boundaries |
| TIGERweb/tigerWMS\_ECON2012 Web Mapping Service | economy |
| TIGERweb/tigerWMS\_Census2010 | boundaries, transportation |
| TIGERweb/tigerWMS\_PhysicalFeatures | boundaries, transportation, InlandWaters, intelligenceMilitary, Society, structure |
| Census2010/tigerWMS\_Census2010 | boundaries |
| Census2010/tigerWMS\_Census2000 | boundaries |
| Census2010/tigerWMS\_PhysicalFeatures | boundaries, transportation, InlandWaters, intelligenceMilitary |
| ACS\_2017\_5YR\_AIARES.gdb.zip | Boundaries, society |
| ACS\_2017\_5YR\_ANRC.gdb.zip | Boundaries, society |
| ACS\_2017\_5YR\_TBG.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_TTRACT.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_CD\_115.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_MSA.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_METDIV.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_CSA.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_NECTA.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_NECTADIV.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_CNECTA.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_COUNTY.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_PLACE.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_PUMA.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_SDE.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_SDS.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_SDU.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_STATE.gdb.zi | boundaries, society |
| ACS\_2017\_5YR\_SLDU.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_SLDL.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_UA.gdb.zip | boundaries, society |
| ACS\_2017\_5YR\_ZCTA.gdb.zip | boundaries, society |
| All BG with demographic data | boundaries, society |
| All Census tracts with demographic data | boundaries, society |
| All County Subdivisions with | boundaries, society |
| Congressional Districts Wall Map | boundaries |
| BAS Maps | boundaries |
| CBSA Maps | boundaries, society |
| NECTA Maps | boundaries, society |
| State Legislative District Reference Maps | boundaries |
| Census Regions and Divisions of the United States | boundaries |
| Sub-borough Maps | boundaries |
| United States of America Section 203 Determinations | boundaries |
| Block Maps | boundaries |
| Tribal Tract Reference Maps | boundaries |

## E: Topology and Census Datasets.

### Introduction

Topology is the study of the properties that are preserved through deforming, twisting, and stretching of objects, referred to as “topological spaces” or a “topological complex” [Ref 13]. An example of this deformation would be if geographic data were transformed from one coordinate system to another [Ref 17]). For the purposes of mapping and GIS, it is the relationships between connecting or adjacent vector, or line, features in a Geographic Information System (GIS) ([Ref 21].

Topology in cartographic files was developed to ensure data quality by promoting “a rigorous, automated method to clean up data entry errors and verify data [Ref 18). It does this by allowing for the easy detection of gaps, overshoots, and inadvertent overlap of areal features [Ref 15].

Topology also enables certain spatial functions. These function include network routing (<https://www.slideshare.net/RohitKumar431/topology-in-gis>) and the calculation of areas and perimeters [Ref 16].

Conflation, or spatial data matching, is also enabled by topology. Conflation allows other source data to be used to correct the accuracy of the file [Ref 15]

Shared geometry is also enabled by topology. It allows the modeling of a continuous fabric of faces or polygons like soil polygons and county boundaries. Topology also enables a nested hierarchy of features like Census blocks, block groups, and tracts [Ref 14]

### Dimension

Topology divides objects by their dimension, which is the number of points or coordinates needed to specify a location on the object. A zero-dimensional figure is a point, since no coordinate can be given to define it. Lines are two-dimensional objects, since only a point is needed to specify a location on the line. Rectangles are two-dimensional, since only two coordinates (x, y) are required to specify a location. Spheres are three dimensional, since three coordinates(x, y, z) are needed to determine a position on or in the sphere. Table 1 illustrates the relationship between dimension and topologic object. [Ref 13]

Table 2: relationship between dimension and topological object

|  |  |
| --- | --- |
| **Dimension** | **Object** |
| 0 | Point, node, vertex |
| 1 | Lines, edges, arcs |
| 2 | Rectangles, polygons, faces, planes, regions |
| 3 | Cubes, spheres |

### Topologic Values

Within each dimension, there may be one or two values to choose from. All zero dimension, or point features, will have a value of “geometryOnly’. One dimensional, or datasets with edges that do not have faces, can either have a topological value of either “topology1D” or “planarGraph.” Most Census datasets will have the value of “topology1D”, which is the traditional GIS topology consisting of each chain’s or line segment’s starting and end nodes, and a node topology table, which lists the chains that connect to each node (Davis, 99). A few Census datasets can be drawn in a plane without the edges or lines crossing. These few datasets have a value of “planarGraph.” An example of a planarGraph dataset is Linear Hydrology. A table showing the topologic code, dimension and definition is shown in Table 1. Census datasets and their topologic value is shown in Table 2. It should be noted that this list is current as of October, 2019 and is subject to change. An updated version can be found on the GSCQB SharePoint page.

Table 1: Topologic Codes

|  |  |  |
| --- | --- | --- |
| **Topologic Code** | **Dimension** | **Definition** |
| geometryOnly | 0 | geometric objects without any additional structure which describes topology |
| topology1D | 1 | 1-dimensional topological complex – commonly called “chain-node” topology |
| planarGraph | 1 | 1-dimensional topological complex that is planar. (A planar graph is a graph that can be drawn in a plane in such a way that no two edges intersect except at a vertex.) |
| fullPlanarGraph | 2 | 2-dimensional topological complex that is planar. (A 2-dimensional topological complex is commonly called “full topology” in a cartographic 2D environment.) |

### Table2 Census Datasets and their topologic Value

| **Census Datasets** | **Topologic Value** |
| --- | --- |
| Address Range-Feature | topology1D |
| American Indian/Alaska Native/Native Hawaiian Areas | fullPlanarGraph |
| American Indian Tribal Subdivision | fullPlanarGraph |
| Alaska Native Regional Corporation | fullPlanarGraph |
| Area Landmark | fullPlanarGraph |
| Area Hydrography | fullPlanarGraph |
| Current Block Group | fullPlanarGraph |
| Current Metropolitan Statistical Area/Micropolitan Statistical Area (CBSA) | fullPlanarGraph |
| Congressional District | fullPlanarGraph |
| Current Combined New England City and Town Area (CNECTA) | fullPlanarGraph |
| Coastline | planarGraph |
| Consolidated City | fullPlanarGraph |
| Current County and Equivalent | fullPlanarGraph |
| County Subdivision | fullPlanarGraph |
| Combined Statistical Area (CSA) | fullPlanarGraph |
| All Lines (edges) | topology1D |
| Current Elementary School Districts | fullPlanarGraph |
| Current Estate | fullPlanarGraph |
| Topological Faces (Polygons With All Geocodes) | fullPlanarGraph |
| Linear Hydrography | planarGraph |
| Current Metropolitan Division | fullPlanarGraph |
| Military Installation National Shapefile | fullPlanarGraph |
| New England City and Town Area (NECTA) | fullPlanarGraph |
| NECTA Division National | fullPlanarGraph |
| Current Place | fullPlanarGraph |
| Point Landmark | geometryOnly |
| Primary Roads | topology1D |
| Primary and Secondary Roads | topology1D |
| Public Use Microdata Area (PUMA) | fullPlanarGraph |
| Rails | planarGraph |
| All Roads | topology1D |
| Secondary School Districts | fullPlanarGraph |
| State Legislative District (SLD) Lower Chamber | fullPlanarGraph |
| State Legislative District (SLD) Upper Chamber | fullPlanarGraph |
| Current State and Equivalent | fullPlanarGraph |
| Subbarrio (Sub minor Civil Division) | fullPlanarGraph |
| Census Block | fullPlanarGraph |
| Tribal Block Group | fullPlanarGraph |
| Census Tract | fullPlanarGraph |
| Tribal Census Tract | fullPlanarGraph |
| Census Urban Area | fullPlanarGraph |
| Unified School Districts | fullPlanarGraph |
| Census 5-Digit ZIP Code Tabulation Area (ZCTA5) | fullPlanarGraph |
| American Indian Areas Related National Geodatabase | fullPlanarGraph |
| Areal Hydrography National Geodatabase | fullPlanarGraph |
| Census Blocks National Geodatabase | fullPlanarGraph |
| Legislative Areas National Geodatabase | fullPlanarGraph |
| Linear Hydrography National Geodatabase | planarGraph |
| National Nation-Level Geography Geodatabase | fullPlanarGraph |
| National Sub-State Geography Geodatabase | fullPlanarGraph |
| Rails National Geodatabase | topology1D |
| Roads National Geodatabase | topology1D |
| School Districts National Geodatabase | fullPlanarGraph |
| State Level Geodatabase | fullPlanarGraph |
| All Cartographic Boundary Shapefiles | fullPlanarGraph |
| All KML Files | fullPlanarGraph |

## F: GPM-CS Element Obligations Table

The GPM-CS Element Obligations Table (Attachment F) shows the structure and organization of the GPM-CS. The table consists of ten columns. The first three columns (GPM-CS Element # / Repeats / GPM-CS Elements) describe the structure of the standard. Columns four through ten show the obligation assigned to each element by GPM-CS profile. The header of each column in this part of the table (Planned / MapD / Vector / Tabular / Service / GDB / Series) is the name of a product profile covered by the standard. The number of elements that apply varies by profile. Within the table, element names are found in the GPM-CS Elements column. For the entries within this column, a **Bold font** followed by a colon (:) indicates a data element where a value is required. An *Italic font* indicates a compound element.

| **GPM-CS Element #** | **Repeats** | **GPM-CS Element Name** | | | | | | **Planned** | **MapD** | **Vector** | **Tabular** | **Service** | **GDB** | **Series** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *0* |  | *GPM* | | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
|  |  |  | | | | | |  |  |  |  |  |  |  |
| *1* |  | *FGDC\_Required* | | | | | |  | *M* | *M* |  | *M* | *M* | *M* |
| *1.1* |  |  | *ISO\_Theme* | | | | |  | *M* | *M* |  | *M* | *M* | *M* |
| 1.1.1 |  |  |  | **ISO\_Keyword\_Thesaurus:** | | | |  | M | M |  | M | M | M |
| 1.1.2 | 1{x}n |  |  | **ISO\_Keyword:** | | | |  | M | M |  | M | M | M |
| *1.2* |  |  | *NGDA\_Information* | | | | |  |  | M |  |  | M | M |
| 1.2.1 |  |  |  | **Alternate\_Title:** | | | |  |  | MA |  |  | MA | MA |
| 1.2.2 |  |  |  | **NGDA\_Keyword\_Thesaurus:** | | | |  |  | M |  |  | M | M |
| 1.2.3 | 3{x}3 |  |  | **NGDA\_Keyword:** | | | |  |  | M |  |  | M | M |
| 1.2.4 |  |  |  | **WMS\_URL:** | | | |  |  | M |  |  | M | M |
| 1.2.5 |  |  |  | **REST\_URL:** | | | |  |  | MA |  |  | MA | MA |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *2* |  | *Identification\_Information* | | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| *2.1* |  |  | *Citation* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.1.1 | 1{x}n |  |  | **Originator:** | | | | M | M | M | M | M | M | M |
| 2.1.2 |  |  |  | **Publication\_Date:** | | | | M | M | M | M | M | M | M |
| 2.1.3 |  |  |  | **Title:** | | | | M | M | M | M | M | M | M |
| 2.1.4 |  |  |  | **Edition:** | | | |  | O | O | O |  | O | O |
| 2.1.5 |  |  |  | **Geospatial\_Data\_Presentation\_Form:** | | | |  | M | M | M | M | M | M |
| *2.1.6* |  |  |  | *Series\_Information* | | | |  | *O* | *O* | *O* |  | *O* | *O* |
| 2.1.6.1 |  |  |  |  | **Series\_Name:** | | |  | M | M | M |  | M | M |
| 2.1.6.2 |  |  |  |  | **Issue\_Identification:** | | |  | M | M | M |  | M | M |
| 2.1.7 | 0{x}n |  |  | **Online\_Linkage:** | | | | M | M | M | M | O | M | M |
| *2.2* |  |  | *Description* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.2.1 |  |  |  | **Abstract:** | | | | M | M | M | M | M | M | M |
| 2.2.2 |  |  |  | **Purpose:** | | | | M | M | M | M | M | M | M |
| *2.3* |  |  | *Time\_Period\_of\_Content* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.3.1 |  |  |  | **Calendar\_Date:** | | | | M2 | M2 | M2 | M2 | M2 | M2 | M2 |
|  |  |  |  | ***OR*** | | | |  |  |  |  |  |  |  |
| *2.3.2* |  |  |  | *Range\_of\_Dates* | | | | *M2* | *M2* | *M2* | *M2* | *M2* | *M2* | *M2* |
| 2.3.2.1 |  |  |  |  | **Beginning\_Date:** | | | M | M | M | M | M | M | M |
| 2.3.2.2 |  |  |  |  | **Ending\_Date:** | | | M | M | M | M | M | M | M |
| 2.3.3 |  |  |  | **Currentness\_Reference:** | | | | M | M | M | M | M | M | M |
| *2.4* |  |  | *Status* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.4.1 |  |  |  | **Progress:** | | | | M | M | M | M | M | M | M |
| 2.4.2 |  |  |  | **Maintenance\_and\_Update\_Frequency:** | | | | M | M | M | M | M | M | M |
| *2.5* |  |  | *Spatial\_Domain* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| *2.5.1* |  |  |  | *Bounding\_Coordinates* | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.5.1.1 |  |  |  |  | **West\_Bounding\_Coordinate:** | | | M | M | M | M | M | M | M |
| 2.5.1.2 |  |  |  |  | **East\_Bounding\_Coordinate:** | | | M | M | M | M | M | M | M |
| 2.5.1.3 |  |  |  |  | **North\_Bounding\_Coordinate:** | | | M | M | M | M | M | M | M |
| 2.5.1.4 |  |  |  |  | **South\_Bounding\_Coordinate:** | | | M | M | M | M | M | M | M |
| *2.6* |  |  | *Keywords* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| *2.6.1* | *1{x}n* |  |  | *Theme* | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.6.1.1 |  |  |  |  | **Theme\_Keyword\_Thesaurus:** | | | M | M | M | M | M | M | M |
| 2.6.1.2 | 1{x}n |  |  |  | **Theme\_Keyword:** | | | M | M | M | M | M | M | M |
| *2.6.2* | *0{x}n* |  |  | *Place* | | | | *O* | *O* | *M* | *O* | *M* | *M* | *M* |
| 2.6.2.1 |  |  |  |  | **Place\_Keyword\_Thesaurus:** | | | M | M | M | M | M | M | M |
| 2.6.2.2 | 1{x}n |  |  |  | **Place\_Keyword:** | | | M | M | M | M | M | M | M |
| *2.7* |  |  | *Constraints* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.7.1 |  |  |  | **Access\_Constraints:** | | | | M | M | M | M | M | M | M |
| 2.7.2 |  |  |  | **Use\_Constraints:** | | | | M | M | M | M | M | M | M |
| 2.7.3 |  |  |  | **Other\_Constraints:** | | | | O | O | O | O | O | O | O |
| *2.8* | *1{x}n* |  | *Point\_of\_Contact* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.8.1 |  |  |  | **Contact\_Organization:** | | | | M | M | M | M | M | M | M |
| *2.8.2* |  |  |  | *Contact\_Address* | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.8.2.1 | 1{x}n |  |  |  | **Address:** | | | M | M | M | M | M | M | M |
| 2.8.2.2 |  |  |  |  | **City:** | | | M | M | M | M | M | M | M |
| 2.8.2.3 |  |  |  |  | **State\_or\_Province:** | | | M | M | M | M | M | M | M |
| 2.8.2.4 |  |  |  |  | **Postal\_Code:** | | | M | M | M | M | M | M | M |
| 2.8.2.5 |  |  |  |  | **Country:** | | | M | M | M | M | M | M | M |
| 2.8.3 | 1{x}n |  |  | **Contact\_Voice\_Telephone:** | | | | M | M | M | M | M | M | M |
| 2.8.4 |  |  |  | **Contact\_Electronic\_Mail\_Address:** | | | | M | M | M | M | M | M | M |
| 2.8.5 |  |  |  | **Contact\_Fax** | | | | O | O | O | O | O | O | O |
| *2.9* |  |  | *Browse\_Graphic* | | | | |  | *O* | *O* |  | *O* | *O* | *O* |
| 2.9.1 |  |  |  | **Browse\_Graphic\_File\_Name:** | | | |  | M | M |  | M | M | M |
| 2.9.2 |  |  |  | **Browse\_Graphic\_File\_Description:** | | | |  | M | M |  | M | M | M |
| 2.9.3 |  |  |  | **Browse\_Graphic\_File\_Type:** | | | |  | M | M |  | M | M | M |
| 2.10 |  |  | **Data\_Set\_Character\_Set:** | | | | | M | M | M | M | M | M | M |
| 2.11 | 1{x}n |  | **Data\_Set\_Language:** | | | | | M | M | M | M | M | M | M |
| *2.12* | *0{x}n* |  | *Cross\_Reference* | | | | | *O* | *O* | *O* | *O* | *O* | *O* | *O* |
| *2.12.1* |  |  |  | *Citation* | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 2.12.1.1 | 1{x}n |  |  |  | **Originator:** | | | M | M | M | M | M | M | M |
| 2.12.1.2 |  |  |  |  | **Publication\_Date:** | | | M | M | M | M | M | M | M |
| 2.12.1.3 |  |  |  |  | **Title:** | | | M | M | M | M | M | M | M |
| 2.12.1.4 | 1{x}n |  |  |  | **Online\_Linkage:** | | | M | M | M | M | M | M | M |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *3* |  | *Data\_Quality\_Information* | | | | | |  | *M* | *M* | *M* | *M* |  |  |
| *3.1* |  |  | *Attribute\_Accuracy\_Report* | | | | |  | *O* | *M* | *O* | *M* |  |  |
| *3.1.1* |  |  |  | *Test\_Report* | | | |  | *M* | *M* | *M* | *M* |  |  |
| 3.1.1.1 |  |  |  |  | **Measure:** | | |  | O | O | O | O |  |  |
| 3.1.1.2 |  |  |  |  | **Evaluation:** | | |  | O | O | O | O |  |  |
| 3.1.1.3 |  |  |  |  | **Result:** | | |  | M | M | M | M |  |  |
| *3.2* |  |  | *Non\_Quantitative\_Attribute\_Accuracy\_Report* | | | | |  | *O* | *M* | *O* | *O* |  |  |
| *3.2.1* |  |  |  | *Test\_Report* | | | |  | *M* | *M* | *M* | *M* |  |  |
| 3.2.1.1 |  |  |  |  | **Measure:** | | |  | O | O | O | O |  |  |
| 3.2.1.2 |  |  |  |  | **Evaluation:** | | |  | O | O | O | O |  |  |
| 3.2.1.3 |  |  |  |  | **Result:** | | |  | M | M | M | M |  |  |
| *3.3* |  |  | *Logical\_Consistency\_Report* | | | | |  | *M* | *M* | *M* | *M* |  |  |
| *3.3.1* |  |  |  | *Test\_Report* | | | |  | *M* | *M* | *M* | *M* |  |  |
| 3.3.1.1 |  |  |  |  | **Measure:** | | |  | O | O | O | O |  |  |
| 3.3.1.2 |  |  |  |  | **Evaluation:** | | |  | O | O | O | O |  |  |
| 3.3.1.3 |  |  |  |  | **Result:** | | |  | M | M | M | M |  |  |
| *3.4* |  |  | *Completeness\_Report* | | | | |  | *M* | *M* | *M* | *M* |  |  |
| *3.4.1* |  |  |  | *Test\_Report* | | | |  | *M* | *M* | *M* | *M* |  |  |
| 3.4.1.1 |  |  |  |  | **Measure:** | | |  | O | O | O | O |  |  |
| 3.4.1.2 |  |  |  |  | **Evaluation:** | | |  | O | O | O | O |  |  |
| 3.4.1.3 |  |  |  |  | **Result:** | | |  | M | M | M | M |  |  |
| *3.5* |  |  | *Horizontal\_Positional\_Accuracy\_Report* | | | | |  | *O* | *O* |  | *O* |  |  |
| *3.5.1* |  |  |  | *Test\_Report* | | | |  | *M* | *M* |  | *M* |  |  |
| 3.5.1.1 |  |  |  |  | **Measure:** | | |  | O | O |  | O |  |  |
| 3.5.1.2 |  |  |  |  | **Evaluation:** | | |  | O | O |  | O |  |  |
| 3.5.1.3 |  |  |  |  | **Result:** | | |  | M | M |  | M |  |  |
| *3.6* | *1{x}n* |  | *Source\_Information* | | | | |  | *M* | *M* | *M* | *M* |  |  |
| *3.6.1* |  |  |  | *Citation* | | | |  | *M* | *M* | *M* | *M* |  |  |
| 3.6.1.1 | 1{x}n |  |  |  | **Originator:** | | |  | M | M | M | M |  |  |
| 3.6.1.2 |  |  |  |  | **Publication\_Date:** | | |  | M | M | M | M |  |  |
| 3.6.1.3 |  |  |  |  | **Title:** | | |  | M | M | M | M |  |  |
| 3.6.2 |  |  |  | **Source\_Scale\_Denominator:** | | | |  | M |  |  |  |  |  |
| 3.6.3 |  |  |  | **Type\_of\_Source\_Media:** | | | |  | M | M | M | M |  |  |
| *3.6.4* |  |  |  | *Time\_Period\_of\_Content* | | | |  | *M* | *M* | *M* | *M* |  |  |
| 3.6.4.1 |  |  |  |  | **Calendar\_Date:** | | |  | M2 | M2 | M2 | M2 |  |  |
|  |  |  |  |  | **OR** | | |  |  |  |  |  |  |  |
| *3.6.4.2* |  |  |  |  | *Range\_of\_Dates* | | |  | *M2* | *M2* | *M2* | *M2* |  |  |
| 3.6.4.2.1 |  |  |  |  |  | **Beginning\_Date:** | |  | M | M | M | M |  |  |
| 3.6.4.2.2 |  |  |  |  |  | **Ending\_Date:** | |  | M | M | M | M |  |  |
| 3.6.4.3 |  |  |  |  | **Currentness\_Reference:** | | |  | M | M | M | M |  |  |
| 3.6.5 |  |  |  | **Source\_Citation\_Abbreviation:** | | | |  | MA | MA | MA | MA |  |  |
| 3.6.6 |  |  |  | **Source\_Contribution:** | | | |  | M | M | M | M |  |  |
| *3.7* | *1{x}n* |  | *Process\_Step* | | | | |  | *M* | *M* | *M* | *M* |  |  |
| 3.7.1 |  |  |  | **Process\_Description:** | | | |  | M | M | M | M |  |  |
| 3.7.2 |  |  |  | **Process\_Date:** | | | |  | M | M | M | M |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *4* |  | *Spatial\_Data\_Organization\_Information* | | | | | |  |  | *M* |  | *M* | *O* |  |
| 4.1 |  |  | **Indirect\_Spatial\_Reference:** | | | | |  |  | M |  | M |  |  |
| 4.2 |  |  | **Direct\_Spatial\_Reference\_Method:** | | | | |  |  | M |  | M |  |  |
| 4.3 |  |  | **Topology\_Level:** | | | | |  |  | M |  | M |  |  |
| *4.4* |  |  | *SDTS\_Terms\_Description* | | | | |  |  | *M* |  | *M* |  |  |
| 4.4.1 |  |  |  | **SDTS\_Point\_and\_Vector\_Object\_Type:** | | | |  |  | M |  | M |  |  |
| 4.4.2 |  |  |  | **Point\_and\_Vector\_Object\_Count:** | | | |  |  | M |  | M |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *5* |  | *Spatial\_Reference\_Information* | | | | | |  | *M* | *M* |  | *M* | *O* |  |
| *5.1* |  |  | *Map\_Projection* | | | | |  | *M* | *M2* |  | *M2* | *M2* |  |
| 5.1.1 |  |  |  | **Map\_Projection\_Name:** | | | |  | M | M |  | M | M |  |
| 5.1.2 |  |  |  | **Map\_Projection\_Description:** | | | |  | M | M2 |  |  | *M2* |  |
|  |  |  |  | **OR** | | | |  |  |  |  |  |  |  |
| *5.1.3* |  |  |  | *EPSG\_Reference* | | | |  |  | *M2* |  | *M* | *M2* |  |
| 5.1.3.1 |  |  |  |  | **EPSG\_Code:** | | |  |  | M | M | M | M |  |
| 5.1.3.2 |  |  |  |  | **EPSG\_Code\_Space:** | | |  |  | M | M | M | M |  |
| 5.1.3.3 |  |  |  |  | **EPSG\_Version:** | | |  |  | O | O | M | M |  |
| 5.1.3.4 |  |  |  |  | **Spatial\_Resolution:** | | |  |  | M | M | M | M |  |
| *5.2* |  |  | *Geodetic\_Model* | | | | |  | *M2* | *M2* |  | *M2* | *M2* |  |
| 5.2.1 |  |  |  | **Horizontal\_Datum\_Name:** | | | |  | M | M |  | M | M |  |
| 5.2.2 |  |  |  | **Ellipsoid\_Name:** | | | |  | M | M |  | M | M |  |
| 5.2.3 |  |  |  | **Semi-Major\_Axis:** | | | |  | M | M |  | M | M |  |
| 5.2.4 |  |  |  | **Denominator\_of\_Flattening\_Ratio:** | | | |  | M | M |  | M | M |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *6* |  | *Entity\_and\_Attribute\_Information* | | | | | |  | *O* | *M* | *O* | *M* |  |  |
| *6.1* | *1{x}n* |  | *Detailed\_Description* | | | | |  |  | *M2* | *M2* | *M2* |  |  |
| *6.1.1* |  |  |  | *Entity\_Type* | | | |  |  | *M* | *M* | *M* |  |  |
| 6.1.1.1 |  |  |  |  | **Entity\_Type\_Label:** | | |  |  | M | M | M |  |  |
| 6.1.1.2 |  |  |  |  | **Entity\_Type\_Definition:** | | |  |  | M | M | M |  |  |
| 6.1.1.3 |  |  |  |  | **Entity\_Type\_Definition\_Source:** | | |  |  | M | M | M |  |  |
| 6.1.1.4 |  |  |  |  | **Ontology\_URI** | | |  |  | O | O |  |  |  |
| *6.1.2* | *1{x}n* |  |  | *Attribute* | | | |  |  | *M* | *M* | *M* |  |  |
| 6.1.2.1 |  |  |  |  | **Attribute\_Label:** | | |  |  | M | M | M |  |  |
| 6.1.2.2 |  |  |  |  | **Attribute\_Definition:** | | |  |  | M | M | M |  |  |
| 6.1.2.3 |  |  |  |  | **Attribute\_Definition\_Source:** | | |  |  | M | M | M |  |  |
| *6.1.2.4* | *1{x}n* |  |  |  | *Attribute\_Domain\_Values* | | |  |  | *M* | *M* | *M* |  |  |
| *6.1.2.4.1* | *1{x}n* |  |  |  |  | *Enumerated\_Domain* | |  |  | *M4* | *M4* | *M4* |  |  |
| 6.1.2.4.1.1 |  |  |  |  |  |  | **Enumerated\_Domain\_Value:** |  |  | M | M | M |  |  |
| 6.1.2.4.1.2 |  |  |  |  |  |  | **Enumerated\_Domain\_Value\_Definition:** |  |  | M | M | M |  |  |
| 6.1.2.4.1.3 |  |  |  |  |  |  | **Enumerated\_Domain\_Value\_Definition\_Source:** |  |  | M | M | M |  |  |
|  |  |  |  |  |  | **OR** | |  |  |  |  |  |  |  |
| *6.1.2.4.2* |  |  |  |  |  | *Range\_Domain* | |  |  | *M4* | *M4* | *M4* |  |  |
| 6.1.2.4.2.1 |  |  |  |  |  |  | **Range\_Domain\_Minimum:** |  |  | M | M | M |  |  |
| 6.1.2.4.2.2 |  |  |  |  |  |  | **Range\_Domain\_Maximum:** |  |  | M | M | M |  |  |
| 6.1.2.4.2.3 |  |  |  |  |  |  | **Attribute\_Units\_of\_Measure:** |  |  | O | O | O |  |  |
|  |  |  |  |  |  | **OR** | |  |  |  |  |  |  |  |
| *6.1.2.4.3* |  |  |  |  |  | *Codeset\_Domain* | |  |  | *M4* | *M4* | *M4* |  |  |
| 6.1.2.4.3.1 |  |  |  |  |  |  | **Codeset\_Name:** |  |  | M | M | M |  |  |
| 6.1.2.4.3.2 |  |  |  |  |  |  | **Codeset\_Source:** |  |  | M | M | M |  |  |
|  |  |  |  |  |  | **OR** | |  |  |  |  |  |  |  |
| 6.1.2.4.4 |  |  |  |  |  | **Unrepresentable\_Domain:** | |  |  | M4 | M4 | M4 |  |  |
|  |  |  | **AND/OR** | | | | |  |  |  |  |  |  |  |
| *6.2* | *0{x}n* |  | *Feature\_Catalogue\_Description* | | | | |  | *O* | *M2* | *M2* | *M2* |  |  |
| 6.2.1 |  |  |  | **FC\_Title:** | | | |  | M | M | M | M |  |  |
| 6.2.2 |  |  |  | **Included\_With\_Dataset:** | | | |  | M | M | M | M |  |  |
| 6.2.3 |  |  |  | **Feature\_Types:** | | | |  | M | M | M | M |  |  |
| 6.2.4 |  |  |  | **FC\_Online\_Linkage:** | | | |  | M | M | M | M |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *7* |  | *Distribution\_Information* | | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| *7.1* | *1{x}n* |  | *Point\_of\_Contact* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 7.1.1 |  |  |  | **Contact\_Organization:** | | | | M | M | M | M | M | M | M |
| *7.1.2* |  |  |  | *Contact\_Address* | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 7.1.2.1 | 1{x}n |  |  |  | **Address:** | | | M | M | M | M | M | M | M |
| 7.1.2.2 |  |  |  |  | **City:** | | | M | M | M | M | M | M | M |
| 7.1.2.3 |  |  |  |  | **State\_or\_Province:** | | | M | M | M | M | M | M | M |
| 7.1.2.4 |  |  |  |  | **Postal\_Code:** | | | M | M | M | M | M | M | M |
| 7.1.2.5 |  |  |  |  | **Country:** | | | M | M | M | M | M | M | M |
| 7.1.3 | 1{x}n |  |  | **Contact\_Voice\_Telephone:** | | | | M | M | M | M | M | M | M |
| 7.1.4 |  |  |  | **Contact\_Electronic\_Mail\_Address:** | | | | M | M | M | M | M | M | M |
| 7.1.5 |  |  |  | **Contact\_Fax** | | | | O | O | O | O | O | O | O |
| 7.2 |  |  | **Distribution\_Liability:** | | | | | M | M | M | M | M | M | M |
| *7.3* | *1{x}n* |  | *Standard\_Order\_Process* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 7.3.1 |  |  |  | **Non-Digital\_Form:** | | | |  | M2 |  |  |  |  |  |
|  |  |  |  | **OR** | | | |  |  |  |  |  |  |  |
| *7.3.2* | *1{x}n* |  |  | *Digital\_Form* | | | | *M* | *M2* | *M* | *M* | *M* | *M* | *M* |
| 7.3.2.1 |  |  |  |  | **Format\_Name:** | | | M | M | M | M | M | M | M |
| 7.3.2.2 |  |  |  |  | **Format\_Version\_Number:** | | | O2 | O2 | O2 | O2 | M2 | O2 | O2 |
|  |  |  |  |  | **OR** | | |  |  |  |  |  |  |  |
| 7.3.2.3 |  |  |  |  | **Format\_Version\_Date:** | | | O2 | O2 | O2 | O2 | M2 | O2 | O2 |
| 7.3.2.4 |  |  |  |  | **File\_Decompression\_Technique:** | | |  |  | M | M |  | M | M |
| 7.3.2.5 |  |  |  |  | **Transfer\_Size:** | | |  | O | O | O |  | M | O |
| *7.3.2.6* | *1{x}n* |  |  |  | *Network\_Address* | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 7.3.2.6.1 |  |  |  |  |  | **Network\_Resource\_Name:** | | M | M | M | M | M | M | M |
| 7.3.2.6.2 |  |  |  |  |  | **Mime\_Type:** | | M | M | M | M | M | M | M |
| 7.3.2.6.3 |  |  |  |  |  | **Application\_Profile** | |  |  | O |  | O |  |  |
| 7.3.3 |  |  |  | **Fees:** | | | | M | M | M | M | M | M | M |
| 7.3.4 |  |  |  | **Ordering\_Instructions:** | | | | O | O | O | O |  | O | O |
| 7.4 |  |  | **Technical\_Prerequisites:** | | | | |  |  | M | O | M | M | M |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *8* |  | *Computer\_Service\_Information* | | | | | |  |  |  |  | *M* |  |  |
| 8.1 |  |  | **Service\_Type:** | | | | |  |  |  |  | M |  |  |
| 8.2 |  |  | **Service\_Type\_Version:** | | | | |  |  |  |  | O |  |  |
| 8.3 |  |  | **Coupling\_Type:** | | | | |  |  |  |  | M |  |  |
| *8.4* | *1{x}n* |  | *Contains\_Operations* | | | | |  |  |  |  | *M* |  |  |
| 8.4.1 |  |  |  | **Operation\_Name:** | | | |  |  |  |  | M |  |  |
| 8.4.2 |  |  |  | **DCP:** | | | |  |  |  |  | M |  |  |
| 8.4.3 |  |  |  | **Operation\_Description:** | | | |  |  |  |  | M |  |  |
| *8.4.4* | *0{x}n* |  |  | *Operation\_Parameters* | | | |  |  |  |  | *O* |  |  |
| 8.4.4.1 |  |  |  |  | **Parameter\_Name:** | | |  |  |  |  | M |  |  |
| 8.4.4.2 |  |  |  |  | **Parameter\_Direction:** | | |  |  |  |  | O |  |  |
| 8.4.4.3 |  |  |  |  | **Parameter\_Description:** | | |  |  |  |  | M |  |  |
| *8.4.5* |  |  |  | *Connect\_Point* | | | |  |  |  |  | *M* |  |  |
| 8.4.5.1 |  |  |  |  | **CP\_Link:** | | |  |  |  |  | M |  |  |
| 8.4.5.2 | 0{x}n |  |  |  | **Protocol:** | | |  |  |  |  | O |  |  |
| 8.4.5.3 |  |  |  |  | **Resource\_Name:** | | |  |  |  |  | M |  |  |
| 8.4.5.4 |  |  |  |  | **Resource\_Description:** | | |  |  | O | O | M |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *9* |  | *Metadata\_Reference\_Information* | | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 9.1 |  |  | **Metadata\_Date:** | | | | | M | M | M | M | M | M | M |
| 9.2 |  |  | **Metadata\_Parent\_Identifier\_Name:** | | | | |  |  | O | O |  | O |  |
| 9.3 |  |  | **Metadata\_Hierarchy\_Level:** | | | | |  |  | O | O |  | O |  |
| 9.4 |  |  | **Metadata\_Hierarchy\_Level\_Name:** | | | | |  |  | O | O |  | O |  |
| *9.5* | *1{x}n* |  | *Point\_of\_Contact* | | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 9.5.1 |  |  |  | **Contact\_Organization:** | | | | M | M | M | M | M | M | M |
| *9.5.2* |  |  |  | *Contact\_Address* | | | | *M* | *M* | *M* | *M* | *M* | *M* | *M* |
| 9.5.2.1 | 1{x}n |  |  |  | **Address:** | | | M | M | M | M | M | M | M |
| 9.5.2.2 |  |  |  |  | **City:** | | | M | M | M | M | M | M | M |
| 9.5.2.3 |  |  |  |  | **State\_or\_Province:** | | | M | M | M | M | M | M | M |
| 9.5.2.4 |  |  |  |  | **Postal\_Code:** | | | M | M | M | M | M | M | M |
| 9.5.2.5 |  |  |  |  | **Country:** | | | M | M | M | M | M | M | M |
| 9.5.3 | 1{x}n |  |  | **Contact\_Voice\_Telephone:** | | | | M | M | M | M | M | M | M |
| 9.5.4 |  |  |  | **Contact\_Electronic\_Mail\_Address:** | | | | M | M | M | M | M | M | M |
| 9.5.3 |  |  |  | **Contact\_Fax** | | | | O | O | O | O | O | O | O |
| 9.6 |  |  | **Metadata\_Standard\_Name:** | | | | | M | M | M | M | M | M | M |
| 9.7 |  |  | **Metadata\_Standard\_Version:** | | | | | M | M | M | M | M | M | M |
| 9.8 |  |  | **Metadata\_Character\_Set:** | | | | | M | M | M | M | M | M | M |
| 9.9 |  |  | **Metadata\_File\_Identifier:** | | | | | M | M | M | M | M | M | M |
| 9.10 |  |  | **Metadata\_Language:** | | | | | M | M | M | M | M | M | M |

1. The FGDC Content Standard for Digital Geospatial Metadata (CSDGM) [Ref 4] has, in some cases, been superseded by ISO metadata standards endorsed by the FGDC. [↑](#footnote-ref-1)