



FEMA

March 31, 2011

Procedure Memorandum No. 65

Amending the Guidelines and Standards for Flood Hazard Mapping Partners

Title: Guidance for Additional Enhanced Dataset Definitions and Flood Risk Database Standards

Effective Date: Immediately – For use on FY-2010 and subsequent projects which include Flood Risk Database deliverables

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Federal Insurance and Mitigation Administration

This Document is Superseded.
For Reference Only.

Background: FEMA introduced the Flood Risk Database with the issuance of Operating Guidance for Version 1.0 of Flood Risk Data and Products in Fiscal Year (FY) 2010. The Flood Risk Database (FRD) is a required product to be delivered with all FY2010-funded and subsequent studies/mapping projects. The Operating Guidance provides a description of the FRD and many of the datasets, but provides no detailed standards of the data tables or how those data tables were related. Since the Operating Guidance was released, FEMA has further-defined these datasets as well as other optional or enhanced datasets and database standards with sufficient detail so that supplementary database implementation guidance can be provided.

Issues: As Mapping Partners begin implementation of FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) vision with FY2010-funded studies/mapping projects, FEMA Regions and Mapping Partners (i.e., FEMA contractors, Cooperating Technical Partners {CTPs}, and Other Federal Agencies {OFAs}) require more details about the physical design of the FRD and enhanced datasets. This memorandum provides Version 1.0 of the FRD standards. These standards are expected to evolve based upon stakeholder feedback and the evaluation of early demonstration projects. Ultimately, these database standards will be provided in Appendix O of the *Guidelines and Standards for Flood Hazard Mapping Partners (Guidelines)*. These database standards do not fully address coastal and levee potential products. These products will be defined in subsequent guidance.

Actions Taken: For FY2010-funded and subsequent Risk MAP studies/mapping projects that include Flood Risk Database deliverables, Mapping Partners will utilize the additional enhanced dataset definitions as necessary and will deliver Flood Risk Databases that follow the standards

found in Procedure Memo 65 Guidance. Risk MAP conversion projects will utilize those same standards to the extent that schedule and scope of the projects allow. FEMA anticipates that implementation of this guidance will have no adverse impacts on budget or schedule however, issues that arise should be escalated thru the Region to Headquarters as appropriate for resolution. Furthermore, Mapping Partners shall apply the same quality management principals to Risk MAP products and datasets that they would normally apply to regulatory products.

Supersedes/Amends: This Procedure Memo supersedes the database descriptions and amends the dataset descriptions from the Operating Guidance for Version 1.0 of Flood Risk Data and Products in Fiscal Year (FY) 2010.

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STATUS: FINAL

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1. Overview

This Procedure Memorandum (PM) provides further definition for enhanced datasets which were not originally described in the Operating Guidance for Version 1.0 of Flood Risk Data and Products in Fiscal Year (FY) 2010. This PM also provides database standards for the Flood Risk Database. An illustrated database schema is provided as Attachment A and a Metadata profile is provided in Attachment B.

2. Additional Enhanced Dataset Definitions

Expanded definitions are provided for the following dataset categories:

- Enhanced Flood Depth & Analysis Datasets; and
- Enhanced Flood Risk Datasets

2.1. Enhanced Flood Depth & Analysis Datasets

Name: Depth Grids for flood frequencies other than 10, 04, 02, 01 and 0.2 percent annual chance

Layer Name: Depth_XXPct (where XX is the “20”, “50”, “0.5” percent annual chance exceedance probability)

Description: Flood Depth Grids are typically generated for all riverine flooding return periods available for a particular flooding source. For the standard RiskMAP project scope, this corresponds to the 0.2 percent, 1 percent, 2 percent, 4 percent and 10 percent flooding return periods. However, local flood mitigation studies may require additional frequencies. Examples would include the 0.5 percent annual chance (200-year) for a refined annualized loss estimate and more frequent flooding events such as the 50 and 20 percent annual chance (2 and 5 year return period) flood events. Additional information for the creation of this dataset can be found in the upcoming Appendix N of the *Guidelines*.

Spatial Extent: The spatial extent for each grid will cover the entire area being studied. If the study is not based upon a HUC-8 boundary, the grid(s) will be delivered for the coastal area, levee area or other defined geographic area of study.

Additional

Details: Grids shall be floating point with data rounded to the nearest tenth. Vertical units will be feet. The cell size for all grids delivered in the FRD shall be 10 meters.

Example: The graphic below is intended to demonstrate how the dataset may be visualized. No cartographic standards have been developed for this product at this time.



Name: Velocity Grid

Layer Name: Vel_XXPct (where XX is the “10”, “04”, “02”, “01”, or “0.2” percent annual chance exceedance probability)

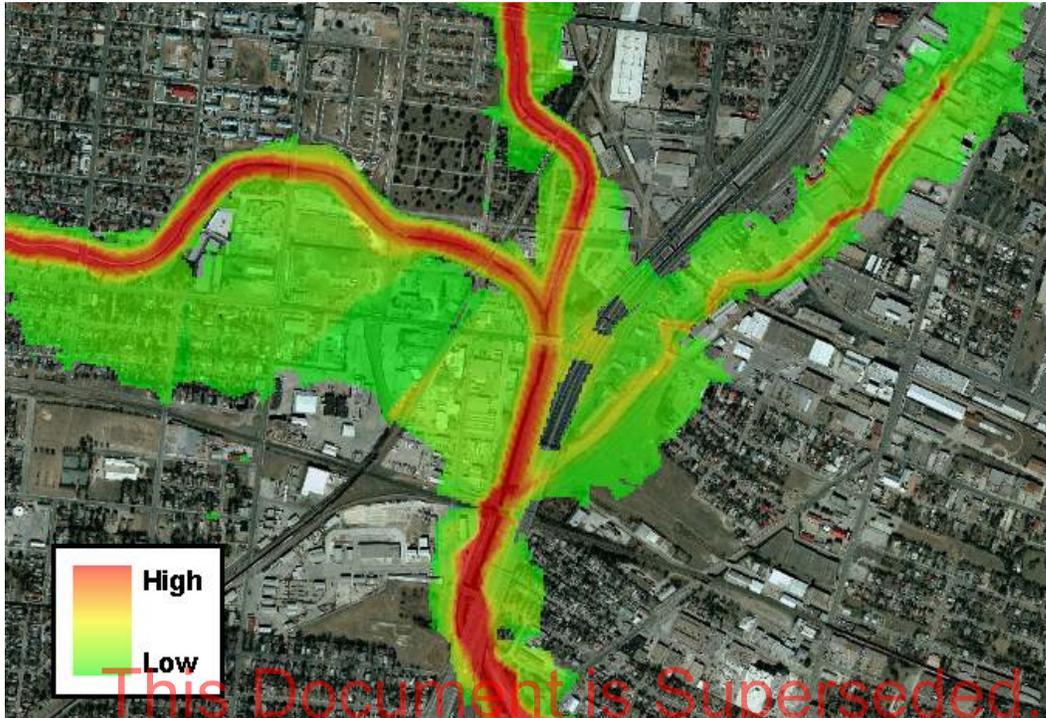
Description: Velocity grids represent the flood water velocities (in feet/second) within the floodplain. Velocity data is often used in conjunction with depth information to help identify locations where erosion, scour, or other structural instability may occur, and can be an effective tool to communicate potential impact/damage to built structures. This dataset **does not** replace regulatory velocity information that may be published on a FIRM or in the FIS. Additional information for the creation of this dataset can be found in the upcoming Appendix N of the *Guidelines*.

Spatial Extent: The spatial extent for each grid will cover the entire area being studied. If the study is not based upon a HUC-8 boundary, the grid(s) will be delivered for the coastal area, levee area or other defined geographic area of study.

Additional

Details: Grids shall be floating point with data rounded to the nearest tenth. The cell size for all grids delivered in the FRD shall be 10 meters.

Example: The graphic below is intended to demonstrate how the dataset may be visualized. No cartographic standards have been developed for this product at this time.



For Reference Only.

Name: Water Surface Elevation Change Grid

Layer Name: WSE_Change

Description: The Water Surface Elevation Change grid is produced to reflect the changes in water surface elevation for a given flood frequency (most likely the 1 percent annual chance flood), to the nearest tenth of a foot. For areas where the previous water surface elevation grid data does not exist, cross sections or other data needed to recreate the effective water surface elevation surface will need to be captured in digital format. This grid contains the water surface elevation changes that are common to both the previous and newly-studied WSE input grids. All other grid cells should be reflected as “NO DATA”. Additional information for the creation of this dataset can be found in the upcoming Appendix N of the *Guidelines*.

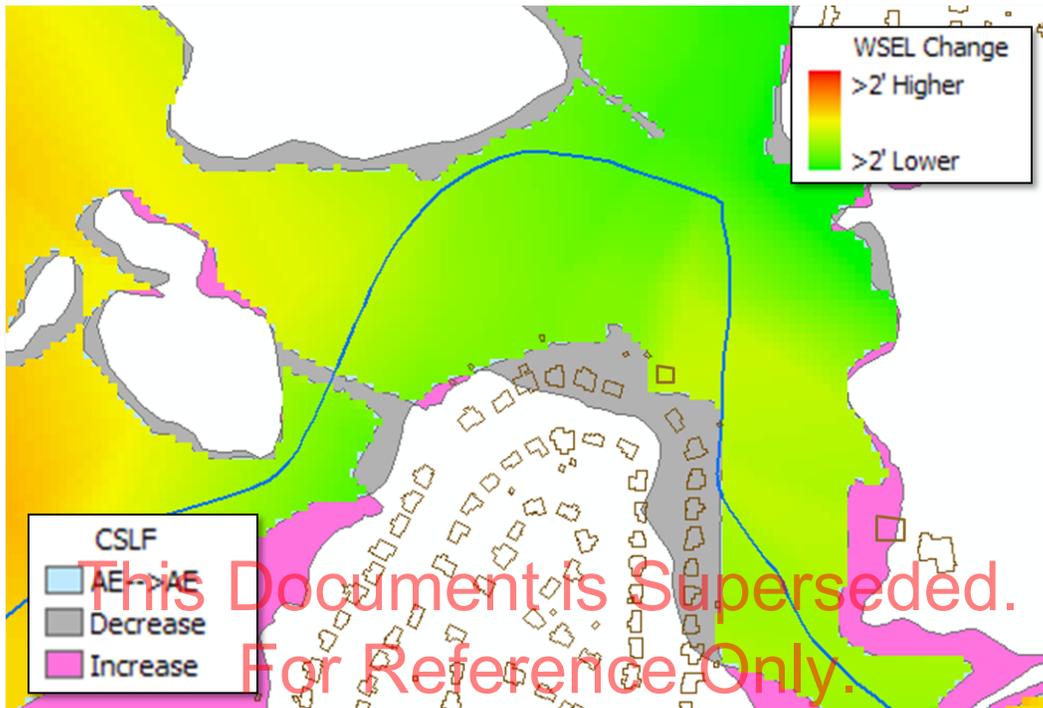
Spatial Extent: The spatial extent for the grid will cover a similar spatial extent as the WSE grids used in the creation of this dataset. Horizontally, the Water Surface Elevation Change Grid will align with the Changes Since Last FIRM polygons that correspond to areas that were a Special Flood Hazard Area on the previous FIRM and remain a the Special Flood Hazard Area on the new FIRM.

Additional

Details: Grids shall be floating point with data rounded to the nearest tenth. Vertical units will be feet. The cell size for all grids delivered in the FRD shall be 10 meters.

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Example: The graphic below is intended to demonstrate how the dataset may be visualized. No cartographic standards have been developed for this product at this time.



2.2. Enhanced Flood Risk Datasets

Name: User Defined Facilities (Point/Site-specific)

Layer Name: S_UDF_PT

Description: The default delivery output for the flood risk assessments is at the census block level. However, in communities that possess building-specific structure information (e.g., structure value, structure type, first floor elevation, etc.), it may be desired to generate enhancements to this data by performing and reporting the risk assessment at a more precise, site-specific level than aggregated to the census block level. Hazus does not include any default user-defined facilities, but includes capability for a user to import data to analyze specific structures.

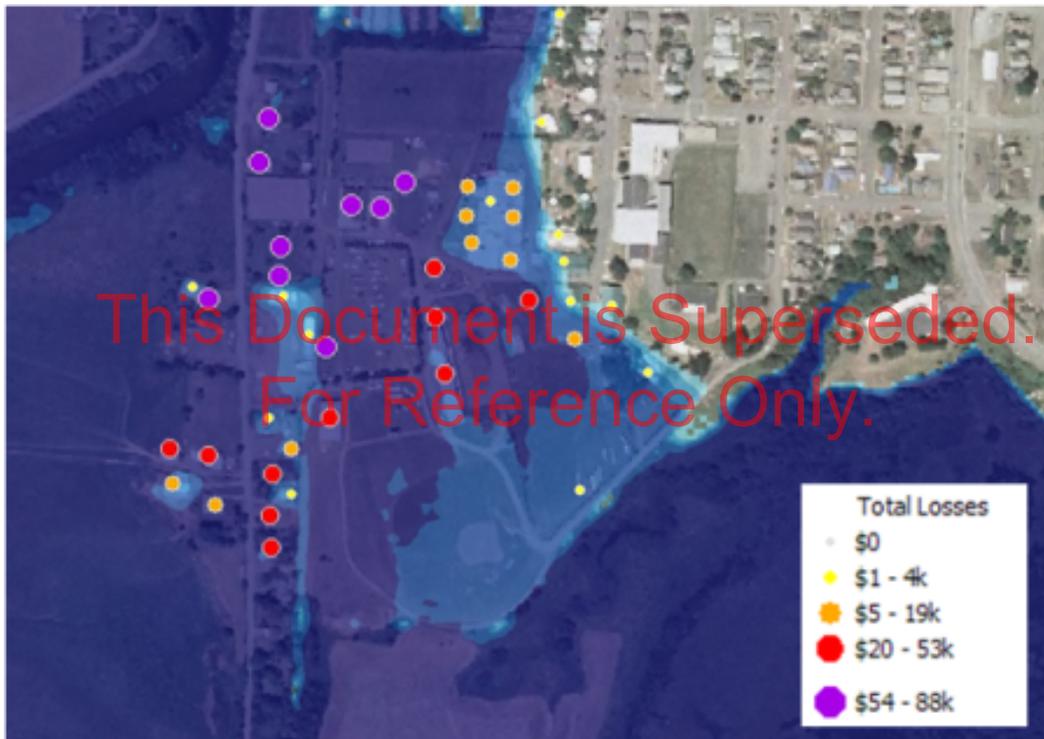
If site or location-specific risk assessments are performed as an enhancement, the results can be stored in a risk assessment table and related to the point feature (at the centroid of the building footprint, parcel boundary, etc.). More information about how Hazus processes user-defined facility data may be found in the latest Hazus Flood Model Technical Manual as well as the Hazus Flood Model User

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Manual. Additional information for the creation of this dataset can be found in the upcoming Appendix N of the *Guidelines*.

Spatial Extent: The spatial extent for this dataset will be limited to the area(s) being analyzed with site-specific risk assessment. If the study is not based upon a HUC-8 boundary, the dataset will be delivered for the coastal area, levee area or other defined geographic area of study.

Example: The graphics below are intended to demonstrate how the dataset may be visualized. No cartographic standards have been developed for this product at this time



Name: Areas of Mitigation Interest (AoMI)

Layer Name: S_AOMI_PT

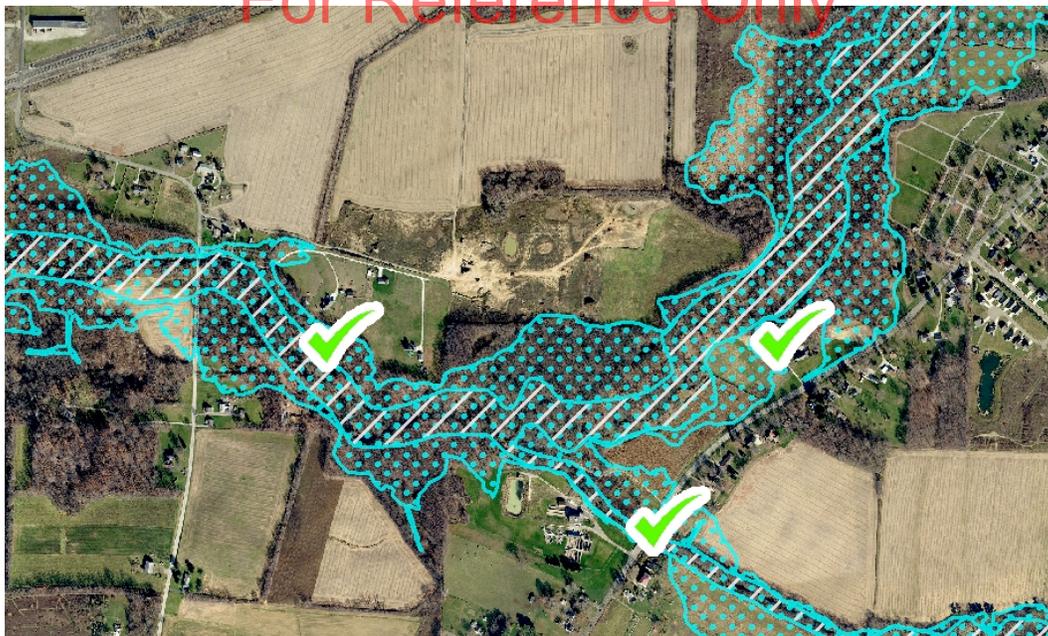
Description: The Areas of Mitigation Interest (AoMI) dataset is primarily a communication tool intended to direct users to areas and issues that warrant further investigation or research for possible mitigation action. Presentation of the dataset is also intended to allow neighboring communities in a watershed or other study area to gain a more holistic picture of issues that may impact them. Additional information for the creation of this dataset can be found in the upcoming Appendix N of the *Guidelines*. AoMI locations include (but are not limited to) the following:

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- Dams
- Levee and non-levee embankments
- Areas where stream flow is constricted
- Coastal structures
- Key emergency routes overtopped during frequent flood events
- Past claims hot spots
- Individual Assistance and Public Assistance claim areas
- Areas of significant land use change
- Areas of significant coastal or riverine erosion
- Past mitigation project success stories, and
- Other miscellaneous flood risk areas

Spatial Extent: The spatial extent for this dataset will cover the entire area being studied. If the study is not based upon a HUC-8 boundary, the dataset will be delivered for the coastal area, levee area or other defined geographic area of study.

Example: The graphics below are intended to demonstrate how the dataset may be visualized. No cartographic standards have been developed for this product at this time.



3. Flood Risk Database Standards Version 1.0

3.1. Overview

The Flood Risk Database (FRD) is the key product that will support all other flood risk products. It is a project level (e.g., watershed or other geographic area) database of flood risk data. The FRD will be shared during post-preliminary processing and will be published and maintained in a standardized format that will support local, state, regional, and national distribution. Although the individual data layers differ from those found in the Flood Insurance Rate Map (FIRM) Database, the FRD shares a similar overall structure. Flood risk data will be stored in a database that will contain both spatial geometry (i.e., shapes) as well as descriptive attributes (i.e., probability, loss, flood depth, etc). Similar to the FIRM Database, the FRD will contain geospatial data layers, attribute domain tables, supporting files, and other information necessary to create other flood risk products. At Version 1.0, the FRD does not store all of the report text required for the Flood Risk Report (FRR), however that functionality is currently under development. All the data required to create the tables in the FRR is included the FRD.

3.1.1. Flood Risk Datasets

The FRD will contain the core datasets that are produced as part of a flood risk project. The FRD may also contain enhanced (optional) datasets that are created at the discretion of the Region. These datasets were introduced in the Operating Guidance for Version 1.0 of Flood Risk Data and Products in Fiscal Year (FY) 2010. Guidance for the creation of flood risk datasets can be found in Appendix N of the *Guidelines*. The flood risk datasets are defined as:

- Changes Since Last FIRM: A polygon dataset that depicts changes in the 1 percent and 0.2 percent annual chance floodplains and floodways as a result of new and/or updated engineering or redelineation. Includes attributes which indicate the engineering (hydrologic and hydraulic) factors that may have contributed to the changes.
- Flood Depth and Analysis Grids: Grid (or raster) datasets that may depict flood depths for various rain events; percent annual chance of flooding; percent chance of flooding during a 30-year period; and others.
- Flood Risk Assessment Results: A polygon dataset that contains the risk assessment results (by census block) from the nationwide Average Annualized Loss (AAL) study, refined Hazus loss estimates, and a composite of both for each census block affected by flooding sources studied during the project.
- Areas of Mitigation Interest: A point dataset that includes areas/issues which contribute to flood losses, highlight flood issues and associated effects. Examples include: previous flood insurance claims (including Repetitive Loss and Severe Repetitive Loss), proposed development, riverine and coastal flood control structures and other community-identified “hot spot” areas.

3.1.2. Database Contents

Where applicable, the FRD will utilize existing tables from the corresponding FIRM Databases that were prepared during the flood risk project. When multiple FIRM Databases are utilized, the

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appropriate tables will be appended, clipped to the geographic extent of the flood risk project if necessary, and delivered as a single table or feature class in the FRD.

To aid in the national rollup and quality control, all spatial FRD layers should exist within one feature dataset named “FRD_Spatial_Layers”. Non-spatial tables shall exist outside of the FRD_Spatial_Layers feature dataset, as standalone feature classes at the ‘root’ level inside the FRD. Table 3.1 provides a list of tables included in the FRD. Enhanced tables are denoted as (e).

Table 3.1 Flood Risk Database Tables

FRD Table Name	Table Type	Table Description
L_AOMI_SUMMARY	Lookup	Areas of mitigation interest summary table used for the Flood Risk Report (e)
L_CLAIMS	Lookup	Claims data for each community and watershed (1 record each)
L_CSLF_SUMMARY	Lookup	Changes since last FIRM summary table used for the Flood Risk Report
L_EXPOSURE	Lookup	Exposure data for each community and watershed (1 record each)
L_LOCAL_GBS	Lookup	Local general building stock data by census block (e)
L_RA_AAL	Lookup	Stores risk assessment results from the Average Annualized Loss (AAL) study by census block, by frequency and by hazard type (riverine, coastal, levee)
L_RA_COMPOSITE	Lookup	Stores composite risk assessment results by census block, by frequency
L_RA_REFINED	Lookup	Stores refined risk assessment results by census block, by frequency and by hazard type (riverine, coastal, levee)
L_RA_SUMMARY	Lookup	Risk assessment summary table by community and watershed
L_RA_UDF_REFINED	Lookup	Refined risk assessment results for user-defined facilities (e)
L_SOURCE_CIT	Lookup	Source citations for data sources used in the project; used for metadata.
MODEL_INFO	Non-Spatial	Information about engineering models used in prior and updated analysis.
S_AOMI_PT	Spatial	Areas of mitigation interest points which contribute to flood losses or highlight flood issues and/or associated effects. (e)
S_CARTO_AR	Spatial	Polygons used for cartographic representations only on the Flood Risk Map
S_CARTO_LN	Spatial	Lines used for cartographic representations only on the Flood Risk Map
S_CARTO_PT	Spatial	Points used for cartographic representations only on the Flood Risk Map
S_CENBLK_AR	Spatial	Census Block polygons
S_CSLF_AR	Spatial	Changes Since Last FIRM polygons depicting areas of change between new and previous flood hazards
S_FRD_POL_AR	Spatial	Location and attributes for political jurisdictions shown on the FIRMs utilized in the flood risk project
S_FRD_PROJ_AR	Spatial	Polygon representing the extents of the flood risk project area.
S_HUC_AR	Spatial	HUC watershed boundaries for the flood risk project area including sub-types for 8, 10, 12, (14-optional) digit HUC
S_UDF_PT	Spatial	Locations of user-defined facilities used in site-specific risk analysis. (e)
STUDY_INFO	Non-Spatial	General information about the FIRM database(s) utilized in the flood risk project

In addition to tables stored in the geodatabase, several raster datasets will be delivered as part of each flood risk project. Table 3.2 provides a list of rasters that will be delivered as part of each FRD. Enhanced rasters are denoted with an (e) and xx refers to the percent annual chance for a

given modeled event (e.g., Depth_06pct would be the name for a depth grid for the 6 percent annual chance event.)

Table 3.2 Flood Risk Database Rasters

FRD Raster Name	Data Description
CST_Dpthxxpct	Coastal depth grid for the xx percent annual chance event (e)
Depth_0_2pct	Depth grid for the 0.2 percent annual chance event
Depth_01pct	Depth grid for the 1 percent annual chance event
Depth_02pct	Depth grid for the 2 percent annual chance event
Depth_04pct	Depth grid for the 4 percent annual chance event
Depth_10pct	Depth grid for the 10 percent annual chance event
Depth_01Plus	Depth Grid for the 1 percent plus annual chance event (e)
Depth_xxpct	Depth Grid for the xx percent annual chance event (e)
Hillshade	Hillshade raster used as a background for the FRM
Pct30yrChance	Percent chance of flooding over a 30-year period grid
PctAnnChance	Percent annual chance of flooding grid
Vel_xxpct	Velocity Grid for the xx percent annual chance event (e)
WSE_0_2pct	Water surface elevation grid for the 0.2 percent annual chance event (e)
WSE_01pct	Water surface elevation grid for the 1 percent annual chance event (e)
WSE_02pct	Water surface elevation grid for the 2 percent annual chance event (e)
WSE_04pct	Water surface elevation grid for the 4 percent annual chance event (e)
WSE_10pct	Water surface elevation grid for the 10 percent annual chance event (e)
WSE_01Plus	Water surface elevation grid for the 1%plus annual chance event (e)
WSE_Change	Water surface elevation change grid since last FIRM (e)
WSE_xxPct	Water surface elevation grid for the xx percent annual chance event (e)

3.1.3. File Formats

FEMA recognizes that there are many popular GIS file formats that may be utilized during the creation and assembly of the FRD. However, to provide national consistency, the FRD must be delivered in the following file formats, compatible with ArcGIS v9.3:

- ESRI File Geodatabase (includes both vector and raster)
- ESRI Shapefiles
- GeoTIFF files (raster only)

3.2. Spatial Characteristics

3.2.1. Horizontal and Vertical Control

The Mapping Partner will select an appropriate projection and coordinate system to be used during data production as part of the flood risk project. Although the geographic extents of most flood

risk projects will be based upon HUC-8 sub-basin boundaries, the extents of an FRD could be as large as a coastal study area or as small as a single riverine reach. Consequently, the underlying data for the FRD could come from many sources or just a single source. If more than one projection and/or coordinate system are present in the source data, the Mapping Partner will select an appropriate Spatial Reference System (SRS), including appropriate projection and coordinate system, to be used during data production as part of the flood risk project. This chosen SRS shall maintain sufficient accuracy for engineering analysis for the project spatial extents. This original source projection information shall be captured and described in the metadata submitted with each FRD.

Prior to delivery of the FRD, Mapping Partners shall convert all vector data in the FRD to Geographic Coordinate System (GCS) with a defined horizontal datum as the North American Datum of 1983 (2007) (NAD83 {2007}). All horizontal units shall be in decimal degrees. Further details are as follows:

- Spheroid:
 - Name: GRS_1980
 - Semi major Axis: 6378137
 - Semi minor Axis: 6356752.3141403561
- Angular Unit
 - Name: Degree
 - Radians per unit: 0.017453292519943299
- Prime Meridian
 - Name: Greenwich
 - Longitude 00° 00' 00"

The assigned Mapping Partner shall reference all elevation data, including water surface elevation grids, to the North American Vertical Datum of 1988 (NAVD88). This guidance is consistent with Procedure Memorandum No. 41 – North American Vertical Datum of 1988 (NAVD88) Policy. See Appendix B of the *Guidelines* for additional details on vertical datum conversion requirements if necessary. All vertical units shall be in feet.

All raster datasets shall be delivered in Universal Transverse Mercator (UTM) projection with a zone that provides the best coverage for the project area. Only one UTM zone shall be used within a given FRD.

3.2.2. Spatial Tolerances

The cluster tolerance and spatial resolution settings of the file geodatabase must be consistent for all submitted FRDs to allow for a national rollup strategy. The following values will be used for all FRD submittals:

- Cluster Tolerance: 7.84415×10^{-7} decimal degrees (approximately .25 feet)
- Spatial Resolution: 7.84415×10^{-8} decimal degrees (approximately .025 feet)

As previously stated, FEMA anticipates that the Mapping Partners may perform data compilation and analysis in a projected coordinate system (e.g., State Plane Coordinate System). In such cases, the Mapping Partner shall utilize an appropriate XY cluster tolerance and resolution in the production database that will migrate to the delivered version with no movement of spatial features or loss of topological integrity. The tables delivered in SHP format must also comply with these same cluster tolerance requirements as stated above.

3.2.3. Geographic Extents

Although, flood risk projects will primarily be conducted at an 8-digit Hydrologic Unit Code (HUC) watershed scale, there are also instances when projects may be performed in coastal or levee areas or on selected streams within a watershed. Mapping partners will create a single polygon feature (stored within S_FRD_PROJ_AR) that best represents the geographic extent of the entire flood risk project.

The extents of the individual datasets within the FRD will vary by project. For example, the extents of the CSLF dataset may only encompass a few stream reaches, while the extents of the census blocks (used to show risk assessment results from the AAL and composite analysis) will be for the entire project area. Similarly, the extents of the AoMI dataset (if created) will vary greatly as there may be more AoMI points located near the updated engineering analysis, and fewer points scattered throughout the rest of the watershed, depending on community feedback and participation.

3.2.4. Tiling

Although spatial data contained within the flood risk database may have come from previous countywide flood mapping projects, data shall be delivered as single, complete datasets and shall not have a countywide or FIRM panel tiling scheme. For example, a flood risk database is being prepared for watershed 12345678. As part of this project, streams were studied from two different counties having an effective FIRM database. To create the Changes Since Last FIRM dataset, flood hazards would be combined with the newly-studied areas to create one seamless dataset. Only **one** Changes Since Last FIRM dataset would be delivered in the FRD.

3.2.5. Raster Standards

The depth and analysis grids in the FRD have an inherent relationship to the underlying topographic data used during the development of the flood hazard delineations depicted on the FIRM. FEMA recognizes that a variety of terrain sources will be utilized, each with a potentially different grid cell size. As a national standard for the FRD, the grid cell size (resolution) of all grid datasets in the FRD shall be 10 meters. If higher resolution depth grids are produced as part of the flood risk project, Mapping Partners shall submit that data, along with other support data, outside of the FRD using submittal standards in Appendix M. Grids shall be floating point with data rounded to the nearest tenth and shall have the same spatial reference and a common origin.

3.3. Metadata

One Metadata file will be delivered for each FRD using the metadata profile in Attachment D. Using this profile, partners will define the spatial characteristics of the submitted FRD, provide a

source citation for each source of information, and provide a description of all the datasets, rasters, and tables being delivered with the submittal.

3.4. Versioning

In keeping with FEMA’s database and products versioning strategy, all datasets, tables and metadata within the FRD will contain a VERSION_ID field. This field will contain the 4-point version number (e.g., 1.5.2.1) representing the standards by which the data should be measured. Since the current version number can change as frequently as monthly, no versioning domain will be established in the individual database standards, but quality review tools (current and future) may maintain a list of acceptable version numbers.

3.5. Submittal

Currently, FEMA does not have a defined submittal process for acceptance, quality control, storage and retrieval of the FRD. However, it is expected that the submittal process will include some form of electronic transfer (ftp) or digital media (CD or DVD) submittal. Before submittal to FEMA, the Mapping Partner will export the FRD vector datasets and tables to shapefile and database file (.dbf) formats. When performing the export to shapefile, partners must populate the domain fields with the actual descriptions (not the coded value) using the field widths found on the domain lists in the schema. Null values must also be populated using the same rules provided in Appendix L to the *Guidelines*. The Mapping Partner must export all grids to GeoTIFF format. This will allow FEMA to distribute the FRD to users that may not have sophisticated GIS software.

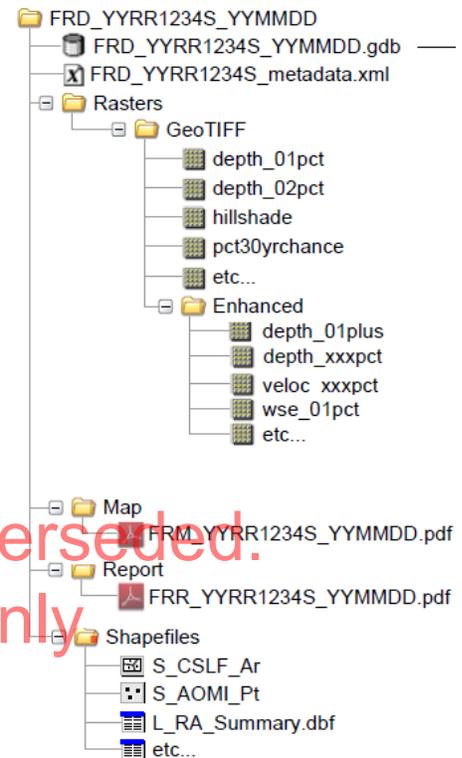


Figure 3.1 Proposed Submittal Structure

Ultimately, FEMA anticipates that each FRD will be stored nationally, within a seamless flood risk layer. This vision is consistent with National Flood Hazard Layer (NFHL), where individual FIRM databases are submitted and stored in a seamless national database of flood hazards. Although the specific details for how this will occur for a national FRD are undetermined at this time, the FRD schema will support a national rollup strategy similar to the NFHL.

The FRD and all associated files will be contained within one folder which will be named after the 9-digit FEMA case number for the flood risk project. The Mapping Partner shall substitute the Case Number, without hyphens nor angle brackets, and the submittal date as shown in the figure. An example of the proposed submittal structure is Figure 3.1.

No specific quality control procedures or workflows have been defined for Risk MAP products and datasets. However, Mapping Partners shall apply the same quality management principals to Risk MAP products and datasets that they would normally apply to regulatory products.

3.6. Database Schema

Attachment B contains an illustrated representation of the database schema. However, the following sub-sections provide additional information for how to read and interpret the schema.

3.6.1. Tables

The FRD contains spatial and non-spatial tables. Each table will be preceded by a special icon depicting the type of information contained in the table. Table icons and their descriptions are as follows:

-  Spatial table containing polygons
-  Spatial table containing lines
-  Spatial table containing points
-  Non-spatial or lookup table

All tables are listed in the Geodatabase Summary section of the schema and are further defined in separate breakout sections. Included in each breakout is a complete listing of field names, data types, domains (if applicable), field lengths and a brief description of each attribute.

3.6.2. Rasters

Grid datasets and their descriptions are listed in the Depth and Analysis Grids section of the schema. As previously mentioned, depth and analysis grids are contained within FRD file geodatabase. Raster datasets are denoted by the following icon: 

3.6.3. Relationships

To enable easier and consistent use of the database, pre-defined relationships have been established between certain tables using what is known as a “relationship class”. Commonly used in database designs, the use of table relationship classes will allow Mapping Partners to create or update information stored in one table and simply “relate” that information to another table based on a common set of fields. In Figure 3.2 below, the attributes of the Average Annualized Loss table (L_RA_AAL) are related to the census block polygons (S_CenBlk_Ar) using a relationship class (CenBlk_AAL) and a common field (CEN_BLK_ID). Relationship classes are denoted by the following icon: 

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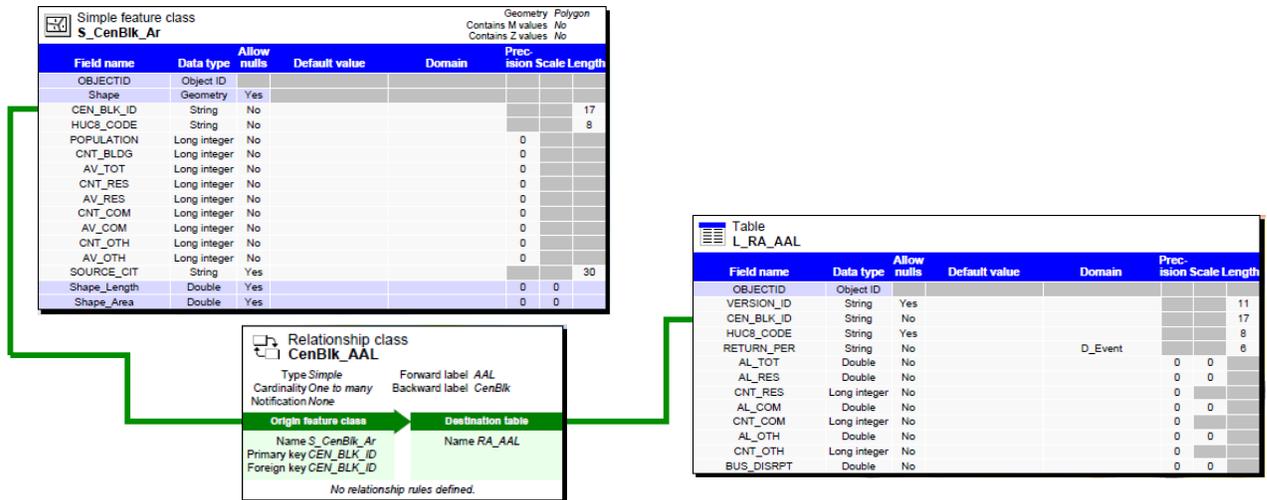


Figure 3.2 Example Relationship Class

3.6.4. Domains

The flood risk database will implement the use of table domains to provide a standardized list of acceptable values for some fields. Mapping Partners will utilize these domains when preparing the flood risk database to provide consistency. Many of the domains in the FRD have been leveraged from the FIRM and Coordinated Needs Management Strategy (CNMS) database designs. Figure 3.3 below shows the domain for the AOMI_Typ field (D_AOMI_Typ).

Coded value domain
D_AOMI_Typ
 Description AOMI Type
 Field type String - Shape Field Width = 60
 Split policy Default value
 Merge policy Default value

Code	Description
0100	Dams
0200	Non-Accredited Levees
0210	Accredited Levees
0300	Coastal Structures
0400	Under Capacity Culvert or Bridge Openings
0500	Key Emergency Routes Overtopped
0600	Past Claims Hot Spot
0700	Individual Assistance (IA) or Public Assistance (PA)
0800	Significant Land Use Change
0900	Areas of Significant Erosion
1000	Significant Non-Levee Embankments
1100	At Risk Essential Facilities
2000	Other Flood Risk Areas
3000	Areas of Mitigation Success
9999	Other

Figure 3.3 Example Domain

Attachment A. Flood Risk Database Data Model

This Document is Superseded.
For Reference Only.

Attachment B. Flood Risk Database Metadata Profile

**This Document is Superseded.
For Reference Only.**

FEMA NFIP Metadata Profile¹ for Flood Risk Datasets

Version 1.0
March 31, 2011

Legend:

Required Elements:

Boxed Text with Regular Font: Boxed elements that appear in regular font were ***required*** in the FGDC standard and ***remain required*** for NFIP purposes.

Boxed Text with Bold Font: Boxed elements that appear in bold font were ***optional*** in the FGDC standard but were ***made required*** for NFIP purposes.

Optional Elements:

Unboxed Text with Gray Font: Unboxed elements that appear in gray font were ***optional*** in the FGDC standard and ***remain optional*** for NFIP purposes.

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FEMA Business Rules and Recommendations:

Text highlighted in gray contains profile-specific comments, recommendations and business rules regarding the noted element.

Notes:

- (1) An asterisk (*) after an element means that this element can be repeated an unlimited number of times. Example:

1.1.10 *OnLink** -- Online Linkage – etc. means onlink can be repeated. (Note that *OnLink* is the “official” abbreviation for Online Linkage and hence should be used as the column name in the database.)

¹ Federal Geographic Data Committee (FGDC) Content Standard for Digital Geospatial Metadata (CSDGM), FGDC-STD-001-1998. Available at <http://www.fgdc.gov/metadata/metadata.html>.

- (2) All required elements are shown in bold and regular text (no gray!). Optional elements (shown in gray text), if supplied are also supported.
- (3) “Submission Date” is the date on which the Flood Risk Database was entered into the MIP (Mapping Information Platform) database.
- (4) Flood Risk metadata files should be named according to the convention: <FEMA Case Number>_<FRD >_metadata. The FEMA Case Number is a unique 9-digit number assigned to each flood risk project in yyrrnnnS format, without hyphens.

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1 *idinfo* – Identification Information – Basic information about the data set

This section is required for all FGDC-compliant metadata

1.1 *Citation* -- Citation -- information to be used to reference the data set

The Citation section describes the Data Package.

1.1.1 *Citeinfo* – Citation Information -- the recommended reference to be used for the data set.

1.1.1.1 *Origin** -- Originator -- the name of an organization or individual that developed the data set.

Domain: free text

1.1.1.2 *Pubdate* -- Publication Date -- the date when the data set is published or otherwise made available for release.

Domain: free date

Must be in the form of YYYYMMDD

For FRD products, the date is the MIP Submission Date.

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1.1.1.3 *Pubtime* -- Publication Time -- the time of day when the data set is published or otherwise made available for

Domain: "Unknown" free time

1.1.1.4 *Title* -- Title -- the name by which the data set is known.

Domain: **Title should be of format: “name of data-package type for MIP Project Title”, where name of data-package type reflects MIP**

Must have as part of the title: “FLOOD RISK DATABASE,

1.1.1.5 *Edition* -- Edition -- the version of the title.

Domain: free text

1.1.1.6 *Geoform* -- Geospatial Data Presentation Form -- the mode in which the geospatial data are represented.

Domain: Used to identify the type of NFIP dataset. Must be:

1.1.1.7 *Serinfo* -- Series Information -- the identification of the series publication of which the data set is a part.

1.1.1.7.1 *Sername* -- Series Name -- the name of the series publication of which the data set is a part.

Domain: free text

1.1.1.7.2 *Issue* -- Issue Identification -- information identifying the issue of the series publication of which the data set is a part.

Domain: free text

1.1.1.8 *Pubinfo* -- Publication Information -- publication details for published data sets.

1.1.1.8.1 *Pubplace* -- Publication Place -- the name of the city (and state or province, and country, if needed to identify the city) where the data set was published or released.

Domain: free text
"Washington, DC"

1.1.1.8.2 *Publish* -- Publisher -- the name of the individual or organization that published the data set.

Domain: free text
"Federal Emergency Management Agency"

1.1.1.9 *Othercit* -- Other Citation Details -- other information required to complete the citation.

Domain: free text

1.1.1.10 *Onlink** -- Online Linkage -- the name of an online computer resource that contains the data set. Entries should follow the Uniform Resource Locator convention of the Internet.

Domain:
The first occurrence should reference the online dataset location; additional onlink elements can be used to reference associated webpages or web map servers, etc. For FEMA-FRD, online linkage should be: *http://msc.fema.gov*

1.1.1.11 *Lworkcit* -- Larger Work Citation -- the information identifying a larger work in which the data set is included.

Lworkcit refers to the FEMA case under which the data package was uploaded. The 'lworkcit' element is a compound element and does not take a value.

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1.1.1.11.1 Citeinfo

Note: This Citeinfo block is used to reference the FEMA Case study.

1.1.1.11.1.1 Origin*

Domain: "Federal Emergency Management Agency"

1.1.1.11.1.2 Pubdate

Domain: "completed"

1.1.1.11.1.3 Pubtime

1.1.1.11.1.4 Title

Domain: Title must be "FEMA CASE num" where num is the case number associated to the project by FEMA of the form:

where:

yy = year

nnnn = 4 character project code

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For Reference Only.**

1.1.1.11.1.5 Edition

1.1.1.11.1.6 Geoform

1.1.1.11.1.7 Serinfo/sername & serinfo/issue

1.1.1.11.1.8 Pubinfo/pubplace & pubinfo/publish

1.1.1.11.1.9 Othercit

1.1.1.11.1.10 Onlink

1.2 Descript -- Description -- a characterization of the data set, including its intended use and limitations.

1.2.1 Abstract -- Abstract -- a brief narrative summary of the data set.

Domain:

“The Flood Risk Database (FRD) contains risk information and supporting data used to depict risk data on a project level. The primary risk data developed are the Changes Since Last FIRM, Risk Assessment Results, Areas of Mitigation Interest, Depth and Annual Chance grids. The FRD is derived from Flood Insurance Studies (FISs), previously published Flood Insurance Rate Maps (FIRMs), flood hazard analyses performed in support of the FISs and FIRMs, new mapping data, where available, and Hazus risk analysis. The Flood Risk Report, Flood Risk Map, and the average annualized loss are published by the Federal Emergency Management Agency (FEMA).”

1.2.2 Purpose -- Purpose -- a summary of the intentions with which the data set was developed.

Domain: free text

“The Flood Risk Map (FRM) and Flood Risk Report (FRR) provide local communities with a summary of flood risk that can be used to develop mitigation strategies and actions. The information presented herein will assist local elected officials, floodplain managers, planners, emergency managers, and many other stakeholders in understanding local flood risk so that it can be better communicated to the general public. Data within this report is presented at both the watershed and/or community levels, in narrative, spatial, and tabular formats. Providing risk assessment information at the watershed level emphasizes that flood risk extends beyond community corporate limits and flood risk reduction activities impact areas beyond the immediate site. A project-level FRM is also included, which highlights areas of relative risk within the watershed, community boundaries in relation to the overall watershed, flooding sources and stream reaches that were newly or re-studied, and the contributing factors to flood losses. The Flood Risk Database (FRD) presents the risk information depicted on the FRM in a digital format suitable for use in electronic mapping applications.”

1.2.3 Suppl -- Supplemental Information -- other descriptive information about the data set.

Domain: free text

1.3 Timeperd --Time Period of Content -- time period(s) for which the data set corresponds to the currentness reference.

1.3.1 Timeinfo – Time Period of Information – Information about date and time of event.

1.3.1.1 Sngdate – Single Date/Time – means of encoding a single date and time.

1.3.1.1.2 Caldate – Calendar Date – the year (and optionally month, or month and day)

Domain: "Unknown" or free date

Must be in the form of YYYYMMDD

[Redacted]

1.3.2 *Current* -- Currentness Reference -- the basis on which the time period of content information is determined.

Domain:
[Redacted]

Currentness Reference must synchronize with Progress element

1.4 *Status* -- Status -- the state of and maintenance information for the data set.
1.4.1 *Progress* -- Progress -- the state of the data set.

Domain: "Complete" "In work"
For FEMA-FRD: "Complete".

1.4.2 *Update* -- Maintenance and Update Frequency -- the frequency with which changes and additions are made to the data set after the initial data set is completed.

Domain: "**Unknown**"

This Document is Superseded.
For Reference Only.

1.5 *Spdom* -- Spatial Domain - the geographic areal domain of the data set.
1.5.1 *Bounding* -- Bounding Coordinates - the limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most. For data sets that include a complete band of latitude around the earth, the West Bounding Coordinate shall be assigned the value -180.0, and the East Bounding Coordinate shall be assigned the value 180.0

1.5.1.1 *Westbc* -- West Bounding Coordinate -- western-most coordinate of the limit of coverage expressed in longitude.

Domain: -180.0 <= real number < 180.0

1.5.1.2 *Eastbc* -- East Bounding Coordinate -- eastern-most coordinate of the limit of coverage expressed in longitude.

Domain: -180.0 <= real number <= 180.0

1.5.1.3 *Northbc* -- North Bounding Coordinate -- northern-most coordinate of the limit of coverage expressed in latitude.

Domain: -90.0 <= real number <= 90.0;
North Bounding Coordinate >= South Bounding Coordinate

1.5.1.4 *Southbc* -- South Bounding Coordinate -- southern-most coordinate of the limit of coverage expressed in latitude.

Domain: -90.0 <= real number <= 90.0;
South Bounding Coordinate <= North Bounding Coordinate

1.5.2 *Dsgpoly** -- Data Set G-Polygon -- coordinates defining the outline of an area covered by a data set.

1.5.2.1 *Dsgpolyo* -- Data Set G-Polygon Outer G-Ring -- the closed nonintersecting boundary of an interior area.

1.5.2.2 *Dsgpolyx* -- Data Set G-Polygon Exclusion G-Ring -- the closed nonintersecting boundary of a void area (or "hole" in an interior area).

1.6 *Keywords* -- Keywords -- words or phrases summarizing an aspect of the data set.

1.6.1 *Theme** -- Theme -- subjects covered by the data set (for a list of some commonly-used thesauri, see Part IV: Subject/index term sources in Network Development and MARC Standards Office, 1988, USMARC code list for relators, sources, and description conventions: Washington, Library of Congress).

All metadata submissions must have two separate ‘theme’ elements, each referencing distinct topic category thesauri and keywords. The first theme element should reference the “ISO 19115 Topic Category” thesaurus (theme.themekt) and keywords (theme.themekey). The second ‘theme’ element should reference the “FEMA NFIP Topic Category” thesaurus and keywords.

1.6.1.1 *Themekt* -- Theme Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of theme keywords.

Domain: "None" free text
“ISO 19115 Topic Category” and “FEMA NFIP Topic Category”

1.6.1.2 *Themekey** -- Theme Keyword -- common-use word or phrase used to describe the subject of the data set.

Domain: free text

For the “ISO 19115 Topic Category” thesaurus, for FEMA Flood Risk submissions, these keywords are required: “hydrology”, “environment”, “inlandWaters”, “structure”, “transportation”, “elevation”, and “boundaries”. If appropriate, the “oceans” keyword should also be used.

For the “FEMA NFIP Topic Category” thesaurus, FRD submissions, these keywords are required: “Flood Risk Database (FRD)”

1.6.2 Place* -- Place -- geographic locations characterized by the data set.

1.6.2.1 Placekt -- Place Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of place keywords.

Domain: "None" "Geographic Names Information System" free text

1.6.2.2 Placekey* -- Place Keyword -- the geographic name of a location covered by a data set.

Domain: The following eight (8) Place Keywords are required for each Place (1.6.2) element:

- “REGION num” where num is the FEMA Region number.
- “STATE abbreviation” where abbreviation is the 2-letter FIPS-standard state abbreviation (e.g., “STATE VA” for Virginia).
- “HUC8 name” where name is the name of the watershed.
- “HUC8-num code” where code is the numeric watershed code.
- “COUNTY name” where name is the name of the county.
- “COUNTY-FIPS code” where code is the county FIPS code.
- “COMMUNITY name” where name is name of the community.
- “FEMA-CID code” where code is the FEMA Community ID code.

Note that all FEMA Regions, Hydrologic units, states, counties, communities and community ID codes included in the FRD should be listed.

Users may include additional Place Keyword elements using free text.

1.6.3 Stratum* -- Stratum -- layered, vertical locations characterized by the data set.

1.6.3.1 Stratkt -- Stratum Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of stratum keywords.

Domain: "None" free text

1.6.3.2 *Stratkey** -- Stratum Keyword -- the name of a vertical location used to describe the locations covered by a data set.

Domain: free text

1.6.4 *Temporal** -- Temporal -- time period(s) characterized by the data set.

1.6.4.1 *Tempkt* -- Temporal Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of temporal keywords.

Domain: "None" free text

1.6.4.2 *Tempkey** -- Temporal Keyword -- the name of a time period covered by a data set.

Domain: free text

1.7 *Accconst* -- Access Constraints -- restrictions and legal prerequisites for accessing the data set. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the data set.

Domain: ***“Restricted” “View-only” “None”***

1.8 *Useconst* -- Use Constraints -- restrictions and legal prerequisites for using the data set after access is granted. These include any use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the data set.

Domain: ***“The Flood Risk Database(FRD) and the accompanying Flood Risk Report (FRR) and Flood Risk Map (FRM) are not intended to be the final authoritative source of all flood risk data in a watershed. Rather, they should be used in conjunction with other data sources (including hazard mitigation plans and emergency action plans) to provide a more complete picture of flood risk. Flood risk is always changing, and there may be other studies, reports, and other sources of information available that provide more information. Acknowledgement of FEMA would be appreciated in products derived from these data.”***

1.9 *Ptcontac* -- Point of Contact -- contact information for an individual or organization that is knowledgeable about the data set.

This point of contact is the same as the Distributor point of contact in Section 6. If the Originator (1.1.1) of the data chooses to distribute the data themselves, then this should be the contact information of the Distributor. Otherwise, this (and the Distributor point of contact) should be FEMA.

1.9.1 Cntinfo -- Contact Information -- Identity of, and means to communicate with, person(s) and organization(s) associated with the data set.

1.9.1.1 Cntperp² -- Contact Person Primary -- the name of the individual to which the contact type

1.9.1.1.1 Cntper -- Contact Person -- the name of the individual to which the contact type applies.

Domain: free text

1.9.1.1.2 Cntorg -- Contact Organization -- the name of the organization to which the contact type applies.

Domain: free text

1.9.1.2 Cntorgp² -- Contact Organization Primary -- the organization, and the member of the organization associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.

Domain: Compound

1.9.1.2.1 Cntorg -- Contact Organization -- the name of the organization to which the contact type applies.

Domain: *Federal Emergency Management Agency.*

1.9.1.2.2 Cntper -- Contact Person -- the name of the individual to which the contact type applies.

Domain: free text

1.9.1.3 Cntpos -- Contact Position -- the title of individual.

Domain: free text

1.9.1.4 Cntaddr* -- Contact Address -- the address for the organization or individual.

1.9.1.4.1 Addrtype -- Address Type -- the information provided by the address.

Domain: *mailing*

1.9.1.4.2 Address* -- Address -- an address line for the address.

Domain: 500 C Street, S.W.

1.9.1.4.3 City -- City -- the city of the address.

² Note: Use of the *Cntinfo.Cntperp* and *Cntinfo.Cntorgp* elements is mutually exclusive. *Cntinfo.Cntorgp* is specified in this context as mandatory so the *Cntinfo.Cntperp* element must not be used here.

Domain: **Washington**

1.9.1.4.4 *State* -- State or Province -- the state or province of the address.

Domain: **District of Columbia**

1.9.1.4.5 *Postal* -- Postal Code -- the ZIP or other postal code of the address.

Domain: **20472**

1.9.1.4.6 *Country* -- Country -- the country of the address.

Domain: **USA**

1.9.1.5 *Cntvoice** -- Contact Voice Telephone -- the telephone number by which individuals can speak to the organization or individual.

Domain: **1-877-336-2627**

1.9.1.6 *Cnttdd** -- Contact TDD/TTY Telephone -- the telephone number by which hearing-impaired individuals can contact the organization or individual.

Domain: free text

1.9.1.7 *Cntfax** -- Contact Facsimile Telephone -- the telephone number of a facsimile machine of the organization or individual.

Domain: free text

1.9.1.8 *Cntemail -- Contact Electronic Mail Address -- the address of the electronic mailbox of the organization or individual.**

Domain: For FEMA-FRD: FEMAMapSpecialist@riskmapcds.com

1.9.1.9 *Hours* -- Hours of Service -- time period when individuals can speak to the organization or individual.

Domain: free text

1.9.1.10 *Cntinst* -- Contact Instructions -- supplemental instructions on how or when to contact the individual or organization.

Domain: free text

1.10 *Browse** -- Browse Graphic -- a graphic that provides an illustration of the data set. The graphic should include a legend for interpreting the graphic.

1.10.1 *Browse**n* -- Browse Graphic File Name -- name of a related graphic file that provides an illustration of the data set.

Domain: free text

1.10.2 *Browse**d* -- Browse Graphic File Description -- a text description of the illustration.

Domain: free text

1.10.3 *Browsset* -- Browse Graphic File Type -- graphic file type of a related graphic file.

Domain: domain values in the table below; free text

Value Definition

"CGM" Computer Graphics Metafile

"EPS" Encapsulated Postscript format

"EMF" Enhanced Metafile

"GIF" Graphic Interchange Format

"JPEG" Joint Photographic Experts Group format

"PBM" Portable Bit Map format

"PS" Postscript format

"TIFF" Tagged Image File Format

"WMF" Windows metafile

"XWD" X-Windows Dump

1.11 *Datacred* -- Data Set Credit -- recognition of those who contributed to the data set.

Domain: free text

1.12 *Secinfo* -- Security Information -- handling restrictions imposed on the data set because of national security, privacy, or other concerns.

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Security information is optional; however, if some of the data contains sensitive information (bridges, dams, etc), the publisher can specify that information in this Section. There is currently no process to remove any information that has security information attached to it. Everything submitted in the FRD is available for public distribution.

1.12.1 *Secsys* -- Security Classification System -- name of the classification system.

Domain: free text

1.12.2 *Secclass* -- Security Classification -- name of the handling restrictions on the data set.

Domain: "Top secret" "Secret" "Confidential" "Restricted" "Unclassified" "Sensitive" free text

1.12.3 *Sechandl* -- Security Handling Description -- additional information about the restrictions on handling the data set.

Domain: free text

1.13 *Native* -- Native Data Set Environment -- a description of the data set in the producer's processing environment, including items such as the name of the software (including version), the computer operating system, file name (including host-, path-, and filenames), and the data set size.

This section is used to capture information about production of FRD datasets.

Domain is free text

1.14 Crossref* -- Cross Reference -- information about other, related data sets that are likely to be of interest.

The Cross Reference section is used to relate the Study Package to the

1.14.1 *Citeinfo* – Citation Information -- the recommended reference to be used for the data set.

1.14.1.1 *Origin**

Federal Emergency Management Agency

1.14.1.2 *Pubdate*

Represents the Submission Date.

1.14.1.3 *Pubtime*

1.14.1.4 *Title*

Domain: Name of the Flood Risk Map, CASE Number, USA (e.g.,

Name of the Flood Risk Report, CASE Number, USA (e.g., *Flood Risk* .)

1.14.1.5 *Edition*

1.14.1.6 *Geoform*

1.14.1.7 *Serinfo.sername & serinfo.issue*

1.14.1.8 *Pubinfo.pubplace & pubinfo.publish*

1.14.1.9 *Othercit*

1.14.1.10 *Onlink**

1.14.1.11 *Lworkcit*

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2 dataqual -- Data Quality Information -- General assessment of the quality of the data set

This section is required for all FRD submissions

2.1 Attracc -- Attribute Accuracy -- an assessment of the accuracy of the identification of entities and assignment of attribute values in the data set.

2.1.1 Attraccr -- Attribute Accuracy Report -- an explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the tests used.

Domain:

“The Flood Risk Database (FRD) consists of watershed based vector and raster files containing the associated attributes produced in conjunction with the Flood Risk Map (FRM) and Flood Risk Report (FRR). To obtain more detailed information users are encouraged to consult the Flood Risk Report that accompanies this Flood Risk Database.”

“Independent quality control testing of FEMA's Flood Risk Database was also performed.”

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2.1.2 *Qattracc** -- Quantitative Attribute Accuracy Assessment -- a value assigned to summarize the accuracy of the identification of the entities and assignments of values in the data set and the identification of the test that yielded the value.

2.1.2.1 *Attraccv* -- Attribute Accuracy Value -- an estimate of the accuracy of the identification of the entities and assignments of attribute values in the data set.

Domain: "Unknown" free text

2.1.2.2 *Attracce* -- Attribute Accuracy Explanation -- the identification of the test that yielded the Attribute Accuracy Value.

Domain: free text

2.2 Logic -- Logical Consistency Report -- an explanation of the fidelity of relationships in the data set and tests used.

Domain:

“Text to be added based on the QA/QC process still to be developed. The FRR and FRM are developed from the FRD to ensure that the information shown on the FRM and in the FRR agree with the FRD. ”

2.3 *Complete* -- Completeness Report -- information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set.

Domain:

2.4 *Posacc* -- Positional Accuracy -- an assessment of the accuracy of the positions of spatial objects.

2.4.1 *Horizpa* -- Horizontal Positional Accuracy -- an estimate of accuracy of the horizontal positions of the spatial objects.

2.4.1.1 *Horizpar* -- Horizontal Positional Accuracy Report -- an explanation of the accuracy of the horizontal coordinate measurements and a description of the tests used.

Domain: free text

“The Flood Risk Database consists of watershed based vector and raster data containing the associated attributes produced in conjunction with the Flood Risk Map and Flood Risk Report. Independent quality control testing of FEMA's Flood Risk Database was also performed.”

2.4.1.2 *Qhorizpa** -- Quantitative Horizontal Positional Accuracy Assessment -- numeric value assigned to summarize the accuracy of the horizontal coordinate measurements and the identification of the test that yielded the value.

2.4.1.2.1 *Horizpav* -- Horizontal Positional Accuracy Value -- an estimate of the accuracy of the horizontal coordinate measurements in the data set expressed in (ground) meters.

Domain: free real

2.4.1.2.2 *Horizpae* -- Horizontal Positional Accuracy Explanation -- the identification of the test that yielded the Horizontal Positional Accuracy Value.

Domain: free text

2.4.2 *Vertacc* -- Vertical Positional Accuracy -- an estimate of accuracy of the vertical positions in the data set.

2.4.2.1 *Vertaccr* -- Vertical Positional Accuracy Report -- an explanation of the accuracy of the vertical coordinate measurements and a description of the tests used.

Domain:

“The Flood Risk Database consists of watershed-based vector and raster data containing associated attributes produced in conjunction with the Flood Risk Map and Flood Risk Report. Independent quality control testing of FEMA's Flood Risk Database was also performed.”

2.4.2.2 *Qvertpa** -- Quantitative Vertical Positional Accuracy Assessment -- numeric value assigned to summarize the accuracy of vertical coordinate measurements and the identification of the test that yielded the value.

2.4.2.2.1 *Vertaccv* -- Vertical Positional Accuracy Value -- an estimate of the accuracy of the vertical coordinate measurements in the data set expressed in (ground) meters.

Domain: free real

2.4.2.2.2 *Vertacce* -- Vertical Positional Accuracy Explanation -- the identification of the test that yielded the Vertical Positional Accuracy Value.

Domain: free text

2.5 *Lineage* -- Lineage -- information about the events, parameters, and source data which constructed the data set, and information about the responsible parties.

2.5.1 *Srcinfo -- Source Information -- list of sources and a short discussion of the information contributed by each.**

All FRD datasets must reference all sources used in production of this dataset per the mechanism described in Guides and Specs, Appendix O, (Data Sources). Particular emphasis is placed on the use of the <srccitea> element to reference features/layers in the FRD dataset for which this is a source.

Should be synchronized with Entity Types (5.1.1) described in Section 5.1

2.5.1.1 *Srccite* -- Source Citation -- reference for a source data set.

2.5.1.1.1 *Citeinfo*

2.5.1.1.1.1 *Origin**

2.5.1.1.1.2 *Pubdate*

2.5.1.1.1.3 *Pubtime*

2.5.1.1.1.4 *Title*

2.5.1.1.1.5 *Edition*

2.5.1.1.1.6 *Geoform*

2.5.1.1.1.7 *Serinfo.sername* & *serinfo.issue*

2.5.1.1.1.8 *Pubinfo.pubplace* & *pubinfo.publish*

2.5.1.1.1.9 *Othercit*

2.5.1.1.1.10 *Onlink**

2.5.1.1.1.11 *Lworkcit*

2.5.1.2 *Srcscale* -- Source Scale Denominator -- the denominator of the representative fraction on a map (for example, on a 1:24000-scale map, the Source Scale Denominator is 24000).

Domain: integer > 1

Note: This is an integer number and must not contain a comma character, decimal point nor the numerator part of the representative fraction.

2.5.1.3 *Typesrc* -- Type of Source Media -- the medium of the source data set.

Domain: *“online” “CD-ROM” “DVD-ROM” free text*

2.5.1.4 *Srctime* -- Source Time Period of Content -- time period(s) for which the source data set corresponds to the ground.

2.5.1.4.1 *Timeinfo* -- Time Period of Information -- Information about date and time of event.

2.5.1.4.1.1 *Sngdate* -- Single Date/Time -- means of encoding a single date and time.

2.5.1.4.1.1.1 *Caldate* -- Calendar Date -- the year (and optionally month, or month and day)

2.5.1.4.2 *Srccurr* -- Source Currentness Reference -- the basis on which the source time period of content information of the source data set is determined.

Domain: "ground condition" "publication date" free text

2.5.1.5 *Srccitea* -- Source Citation Abbreviation -- short-form alias for the source citation.

Domain:

Per Guides & Specs, Appendix O, the following abbreviations must be used: “BASE”, “FIRM”, “FHBM”, “FBFM”, “LOMC”, “FIS”, “FRR” “STUDY”, “TSDN”

2.5.1.6 *Srctr* -- Source Contribution -- brief statement identifying the *information contributed by the source to the data set*.

Domain: free text

2.5.2 *Procstep** -- Process Step -- information about a single event.

2.5.2.1 *Procdesc* -- Process Description -- an explanation of the event and related parameters or tolerances.

Domain: **First occurrence of Process Description must state:**
“The Flood Risk Database is a non-regulatory database that includes flood hazard information from previously effective and new studies. If present, flood depth grids were compiled using computed water surface elevations along flooding sources. If present, risk assessment results were derived from Hazus calculations. If present, areas of mitigation interest, were compiled from information gathered from local mitigation plans or discussion with local officials.”

Additional occurrences optional.

2.5.2.2 *Srcused** -- Source Used Citation Abbreviation -- the Source Citation Abbreviation of a data set used in the processing step.

Domain: Source Citation Abbr. <srccitea> from the Source info entries for the data set.

A comma delimited list of <srccitea> values is NOT VALID. Each <srccitea> must be listed individually using one or more <srcused> elements.

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For Reference Only.

2.5.2.3 *Procdte* -- Process Date -- the date when the event was completed.

Domain: free date

Must be in the form of YYYYMMDD

For an FRD, the date is the submission date.

See also Section 1.1.1.2 and Section 1.3.1

2.5.2.4 *Proctime* -- Process Time -- the time when the event was completed.

Domain: free time

2.5.2.5 *Sreprod* -- Source Produced Citation Abbreviation -- the Source Citation Abbreviation of an intermediate data set that (1) is significant in the opinion of the data producer, (2) is generated in the processing step, and (3) is used in later processing steps.

Domain: Source Citation Abbr. from the Source info entries for the data set.

2.5.2.6 *Proccont* -- Process Contact -- the party responsible for the processing step information.

2.5.2.6.1 *Cntinfo* -- Contact Information -- Identity of, and means to communicate with, person(s) and organization(s) associated with the data set.

2.5.2.6.1.1 *Cntperp*³ -- Contact Person Primary -- the name of the individual to which the contact type.

2.5.2.6.1.1.1 *Cntper* -- Contact Person -- the name of the individual to which the contact type applies.

Domain: free text

2.5.2.6.1.1.2 *Cntorg* -- Contact Organization -- the name of the organization to which the contact type applies.

Domain: free text

2.5.2.6.1.2 *Cntorgp*³ -- Contact Organization Primary -- the organization, and the member of the organization associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.

Domain: Compound

2.5.2.6.1.2.1 *Cntorg* -- Contact Organization -- the name of the organization to which the contact type applies.

Domain: free text

2.5.2.6.1.2.2 *Cntper* -- Contact Person -- the name of the individual to which the contact type applies.

Domain: free text

2.5.2.6.1.3 *Cntpos* -- Contact Position -- the title of individual.

Domain: free text

2.5.2.6.1.4 *Cntaddr** -- Contact Address -- the address for the organization or individual.

2.5.2.6.1.4.1 *Addrtype* -- Address Type -- the information provided by the address.

Domain: "mailing" "physical" "mailing and physical", free text

2.5.2.6.1.4.2 *Address** -- Address -- an address line for the address.

Domain: free text

³ Note: Use of the *Cntinfo.Cntperp* and *Cntinfo.Cntorgp* elements is mutually exclusive.

2.5.2.6.1.4.3 *City* -- City -- the city of the address.

Domain: free text

2.5.2.6.1.4.4 *State* -- State or Province -- the state or province of the address.

Domain: free text

2.5.2.6.1.4.5 *Postal* -- Postal Code -- the ZIP or other postal code of the address.

Domain: free text

2.5.2.6.1.4.6 *Country* -- Country -- the country of the address.

Domain: free text

2.5.2.6.1.5 *Cntvoice** -- Contact Voice Telephone -- the telephone number by which individuals can speak to the organization or individual.

Domain: free text

2.5.2.6.1.6 *Cnttdd** -- Contact TDD/TTY Telephone -- the telephone number by which hearing impaired individuals can contact the organization or individual.

Domain: free text

2.5.2.6.1.7 *Cntfax** -- Contact Facsimile Telephone -- the telephone number of a facsimile machine of the organization or individual.

Domain: free text

2.5.2.6.1.8 *Cntemail** -- Contact Electronic Mail Address -- the address of the electronic mailbox of the organization or individual.

Domain: free text

2.5.2.6.1.9 *Hours* -- Hours of Service -- time period when individuals can speak to the organization or individual.

Domain: free text

2.5.2.6.1.10 *Cntinst* -- Contact Instructions -- supplemental instructions on how or when to contact the individual or organization.

Domain: free text

2.6 *Cloud* -- Cloud Cover -- area of a data set obstructed by clouds, expressed as a percentage of the spatial extent.

Domain: 0 <= Integer <= 100 "Unknown"

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For Reference Only.

3 Spdoinfo – Spatial Data Organization Information – the mechanism used to represent spatial information in the data set.

This section NOT required for Flood Risk submissions.

3.1 *Indspref* -- Indirect Spatial Reference -- name of types of geographic features, addressing schemes, or other means through which locations are referenced in the data set.

Domain: free text

3.2 *Direct* -- Direct Spatial Reference Method -- the system of objects used to represent space in the data set.

Domain: **“Vector” “Raster” “Vector and Raster”**

3.3 *Ptvctinf*⁴ -- Point and Vector Object Information -- the types and numbers of vector or nongridded point spatial objects in the data set.

This element or <spdinfo.rastinfo>, not both.

3.3.1 *Sdtstern** -- SDTS Terms Description -- point and vector object information using the terminology and concepts from Spatial Data Transfer Standard (SDTS).

Must occur 3 times for Point, String and GT-polygon composed of chains.

3.3.1.1 *Sdstype* -- SDTS Point and Vector Object Type -- name of point and vector spatial objects used to locate zero-, one-, and two-dimensional spatial locations in the data set.

Domain:

“Point”, “String” and “GT-polygon composed of chains”

3.3.1.2 *Ptvctnt* -- Point and Vector Object Count -- the total number of the point or vector object type occurring in the data set.

Domain: Integer > 0

3.3.2 *Vpfterm* -- VPF Terms Description -- point and vector object information using the terminology and concepts from Department of Defense, 1992, Vector Product Format (MILSTD-600006)

⁴ Note: Use of the *spdoinfo.ptvctinf* and *spdoinfo.rastinfo* elements is mutually exclusive.

3.3.2.1 *Vpflevel* -- VPF Topology Level -- the completeness of the topology carried by the data set. The levels of completeness are defined in Department of Defense, 1992, Vector Product Format (MIL-STD-600006).

Domain: 0 <= Integer <= 3

3.3.2.2 *Vpfinfo** -- VPF Point and Vector Object Information -- information about VPF point and vector objects

3.3.2.2.1 *Vpftype* -- VPF Point and Vector Object Type -- name of point and vector spatial objects used to locate zero-, one-, and two-dimensional spatial locations in the data set.

Domain: "Node" "Edge" "Face" "Text"

3.3.2.2.2 *Vpfcnt* -- VPF Point and Vector Object Count.

Domain: Integer > 0

3.4 *Rastinfo*⁴ -- Raster Object Information -- the types and numbers of raster spatial objects in the data set.

This must not be included if <spinfo.ptvctinf> is used.

3.4.1 *Rasttype* -- Raster Object Type -- raster spatial objects used to locate zero-, two-, or three-dimensional locations in the data set.

Domain: "Point" "Pixel" "Grid Cell" "Voxel"

3.4.2 *Rowcount* -- Row Count -- the maximum number of raster objects along the ordinate (y) axis. For use with rectangular raster objects.

Domain: Integer > 0

3.4.3 *Colcount* -- Column Count -- the maximum number of raster objects along the abscissa (x) axis. For use with rectangular raster objects.

Domain: Integer > 0

3.4.4 *Vrtcount* -- Vertical Count -- the maximum number of raster objects along the vertical (z) axis. For use with rectangular volumetric raster objects (voxels).

Domain: Integer > 0

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4 Spref -- Spatial Reference Information – the description of the reference frame for, and the means to encode coordinates in the data set.

This section is required for all Flood Risk submissions.

4.1 *Horizsys* -- Horizontal Coordinate System Definition -- the reference frame or system from which linear or angular quantities are measured and assigned to the position that a point occupies. (4.2.1 or 4.2.2 or 4.2.3)

4.1.1 *Geograph*⁵ -- Geographic -- the quantities of latitude and longitude which define the position of a point on the Earth's surface with respect to a reference spheroid.

4.1.1.1 *Latres* -- Latitude Resolution -- the minimum difference between two adjacent latitude values expressed in Geographic Coordinate Units of measure.

Domain: real > 0.0

4.1.1.2 *Longres* -- Longitude Resolution -- the minimum difference between two adjacent longitude values expressed in Geographic Coordinate Units of measure.

Domain: real > 0.0

4.1.1.3 *Geounits* -- Geographic Coordinate Units -- units of measure used for the latitude and longitude values.

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

4.1.2 *Planar** -- Planar⁵ -- the quantities of distances, or distances and angles, which define the position of a point on a reference plane to which the surface of the Earth has been projected.

4.1.2.1 *Mapproj*⁶ -- Map Projection -- the systematic representation of all or part of the surface of the Earth on a plane or developable surface.

4.1.2.1.1 *Mapprojn* -- Map Projection Name -- name of the map projection.

Domain: "Albers Conical Equal Area" "Azimuthal Equidistant"
"Equidistant Conic" "Equirectangular" "General Vertical Nearsided"

⁵ Note: Use of the *horizsys.geograph*, *horizsys.planar* and *horizsys.local* elements is mutually exclusive (i.e., only one of these can be used). Since *horizsys.planar* is mandatory, use of *horizsys.geograph* and *horizsys.local* elements is therefore invalid.

⁶ Note: Use of the *planar.mapproj*, *planar.gridsys* and *planar.localp* elements is mutually exclusive (i.e., only one of these can be used). Since *planar.gridsys* is mandatory, use of *planar.mapproj* and *planar.localp* elements is therefore invalid.

Projection "Gnomonic" "Lambert Azimuthal Equal Area" "Lambert Conformal Conic" "Mercator" "Modified Stereographic for Alaska" "Miller Cylindrical" "Oblique Mercator" "Orthographic" "Polar Stereographic" "Polyconic" "Robinson" "Sinusoidal" "Space Oblique Mercator" "Stereographic" "Transverse Mercator" "van der Grinten" free text

4.1.2.1.2 [map projection parameters for selected projection, e.g., projection center, meridian, false easting/northing, etc.¹]

4.1.2.2 *Gridsys*⁶ -- Grid Coordinate System -- a plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates.

4.1.2.2.1 *Gridsysn* -- Grid Coordinate System Name -- name of the grid coordinate system.

Domain: "Universal Transverse Mercator" "Universal Polar Stereographic" "State Plane Coordinate System 1927" "State Plane Coordinate System 1983" "ARC Coordinate System" "other grid system"

4.1.2.2.2 [grid system parameters for selected grid system. E.g UTM or state zone]

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4.1.2.3 *Localp*⁶ -- Local Planar -- any right-handed planar coordinate system of which the z-axis coincides with a plumb line through the origin that locally is aligned with the surface of the Earth.

4.1.2.3.1 *Localpd* – Local planar description

4.1.2.3.2 *Localpgi* – Georeference Information

4.1.2.4 *Planci* -- Planar Coordinate Information -- information about the coordinate system developed on the planar surface.

4.1.2.4.1 *Plance* – planar coordinate encoding method (Domain: “coordinate pair” “distance and bearing” “row and column”)

4.1.2.4.2 *Coordrep*⁷ – coordinate representation (specify either *coordrep* OR *distbrep* NOT BOTH)

4.1.2.4.2.1 *Absres* – Abscissa resolution (Domain: real)

⁷ Note: Use of the *planci.coordrep* and *planci.distbrep* elements is mutually exclusive. Since *planci.coordrep* is mandatory, use of *planci.distbrep* element is therefore invalid.

4.1.2.4.2 *Ordres* – Ordinate resolution (Domain: real)

4.1.2.4.3 *Distbrep*⁷ – distance and bearing representation

4.1.2.4.3.1 *Distres* – Distance resolution (Domain: real)

4.1.2.4.3.2 *Bearres* – Bearing resolution (Domain: real)

4.1.2.4.3.3 *Bearunit* – Bearing units (Domain: “Decimal degrees” “Decimal minutes” “Decimal seconds” “Degrees and decimal minutes” “Degrees, minutes, and decimal seconds” “Radians” “Grads”)

4.1.2.4.3.4 *Bearrefd* – Bearing reference direction (Domain: “North” “South”)

4.1.2.4.3.5 *Bearrefm* – Bearing reference meridian (Domain: “Assumed” “Grid” “Magnetic” “Astronomic” “Geodetic”)

4.1.2.4.4 *Plandu* – planar distance units

4.1.3 *Local*⁵ -- Local – a description of any coordinate system that is not aligned with the surface of the Earth.

4.1.3.1 *Localdes* -- Local Description -- a description of the coordinate system and its orientation to the surface of the Earth.

Domain: free text

4.1.3.2 *Localgeo* -- Local Georeference Information -- a description of the information provided to register the local system to the Earth (e.g., control points, satellite ephemeral data, inertial navigation data).

Domain: free text

4.1.4 *Geodetic* -- Geodetic Model -- parameters for the shape of the earth.

4.1.4.1 *Horizdn* -- Horizontal Datum Name -- the identification given to the reference system used for defining the coordinates of points.

Domain: "North American Datum of 1983" free text

4.1.4.2 *Ellips* -- Ellipsoid Name -- identification given to established representations of the Earth's shape.

Domain: "Clarke 1866" "Geodetic Reference System 80" free text

4.1.4.3 *Semixis* -- Semi-major Axis -- radius of the equatorial axis of the ellipsoid.

Domain: real > 0.0

4.1.4.4 *Denflat* -- 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.

Domain: Denominator of Flattening > 0.0

4.2 *Vertdef* -- Vertical Coordinate System Definition -- the reference frame or system from which vertical distances (altitudes or depths) are measured.

4.2.1 *Altsys* -- Altitude System Definition -- the reference frame or system from which altitudes (elevations) are measured. The term "altitude" is used instead of the common term "elevation" to conform to the terminology in Federal Information Processing Standards 70-1 and 173.

4.2.1.1 *Altdatum* -- Altitude Datum Name -- the identification given to the surface taken as the surface of reference from which altitudes are measured.

Domain: North American Vertical Datum of 1988" free text

4.2.1.2 *Altres** -- Altitude Resolution -- the minimum distance possible between two adjacent altitude values, expressed in Altitude Distance Units of measure.

Domain: real > 0.0

4.2.1.3 *Altunits* -- Altitude Distance Units -- units in which altitudes are recorded.

Domain: "meters" "feet" free text

4.2.1.4 *Altenc* -- Altitude Encoding Method -- the means used to encode the altitudes.

Domain: "Explicit elevation coordinate included with horizontal coordinates" "Implicit coordinate" "Attribute values"

4.2.2 *Depthsys* -- Depth System Definition -- the reference frame or system from which depths are measured.

4.2.2.1 *Depthdn* -- Depth Datum Name -- the identification given to surface of reference from which depths are measured.

Domain: see FGDC standard

4.2.2.2 *Depthres** -- Depth Resolution -- the minimum distance possible between two adjacent depth values, expressed in Depth Distance Units of measure.

Domain: real > 0.0

4.2.2.3 *Depthdu* -- Depth Distance Units -- units in which depths are recorded.

Domain: "meters" "feet" free text

4.2.2.4 *Depthem* -- Depth Encoding Method -- the means used to encode depths.

Domain: "Explicit depth coordinate included with horizontal coordinates"

"Implicit coordinate" "Attribute values"

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For Reference Only.

5 eainfo –Entity and Attribute Information – details about information content of the data set, including entity types, their attributes and the domains from which attribute values may be assigned.

This section is required to summarize information about the different pieces of a submission.

5.1 Detailed* -- Detailed Description -- description of the entities, attributes, attribute values, and related characteristics encoded in the data set.

Create an entity type for each entity enclosed in the current submission (entity type label and definition included below). Authority is FEMA Data Capture Guidelines & Standards, where entity type list can be found in Table O-1 (Flood Risk database table summary). Only spatial Flood Risk tables used in a submission should be included as entities.

enttypl	enttypd
	Location and attributes of areas of mitigation interest on the FRM and referenced in the FRR.
S_CARTO_AR	Location and attributes for cartographic polygons for the background on the FRM.
S_CARTO_LN	Location and attributes for cartographic lines for the background on the FRM.
S_CENBLK_AR	Location and attributes for US Census Block data used in the FRM.
S_CSLF_AR	Location and attributes for the changes since last FIRM for the study area referenced in the FRR.
S_HUC_AR	Location and attributes for cartographic polygons for the background on the FRM.
S_FRD_Pol_Ar	Location and attributes for political jurisdictions shown on the FRM.
S_UDF_Pt	Location and attributes for user defined facilities shown on the FRM.
CST_Dpthxxpct	Raster dataset of the Coastal Depth grids with xx replaced by appropriate value of percent chance.
Depth_01pct	Raster dataset of flood depth for a 1% event.
Depth_02pct	Raster dataset of flood depth for a 2% event.
Depth_04pct	Raster dataset of flood depth for a 4% event.
Depth_10pct	Raster dataset of flood depth for a 10% event.
Depth_0_2pct	Raster dataset of flood depth for a 0.2% event.

Depth_xxpct	Raster dataset of flood depth for additional frequencies with xx replaced by appropriate value of percent chance.
Lev_Dpthxxpct	Raster dataset of Depth grids for Levees with xx replaced by appropriate value of percent chance.
Hillshade	Raster dataset for the hillshade of the watershed shown on the FRM.
PctAnnChance	Raster dataset of the Percent Annual Chance Grid.
Pct30yrChance	Raster dataset of the Percent 30yr Chance Grid.
Veloc_xxpct	Raster dataset of the velocity grids with xx replaced by appropriate value of percent chance.
WSE_01pct	Raster dataset of the water surface for a 1% event.
WSE_02pct	Raster dataset of the water surface for a 2% event.
WSE_04pct	Raster dataset of the water surface for a 4% event.
WSE_10pct	Raster dataset of the water surface for a 10% event.
WSE_0_2pct	Raster dataset of the water surface for a 0.2% event.
WSE_xxpct	Raster dataset of the water surface for additional frequencies with xx replaced by appropriate value of percent chance.
WSE_Change	Raster dataset of the water surface change since the last FIRM.

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For Reference Only.

5.1.1 Enttyp -- Entity Type -- the definition and description of a set into which similar entity instances are classified.

5.1.1.1 Enttyp1 -- Entity Type Label -- the name of the entity type.

Domain: free text
See table above.

5.1.1.2 Enttypd -- Entity Type Definition -- the description of the entity type.

Domain: free text
See table above.

5.1.1.3 Enttypds -- Entity Type Definition Source -- the authority of the definition.

Domain:
“*FEMA Guidelines and Standards for Flood Hazard Mapping Partners, Appendix O: Guidance for Preparing Flood Risk Databases (available at http://www.fema.gov/fhm/dl_cgs.shtm)*”

5.1.2 *Attr** -- Attribute -- a defined characteristic of an entity.

5.1.2.1 *Attrlabl* -- Attribute Label -- the name of the attribute.

Domain: free text

5.1.2.2 *Attrdef* -- Attribute Definition -- the description of the attribute.

Domain: free text

5.1.2.3 *Attrdefs* -- Attribute Definition Source -- the authority of the definition.

Domain: free text

5.1.2.4 *Attrdomv** -- Attribute Domain Values -- the valid values that can be assigned for an attribute.

5.1.2.4.1 *Edom* – enumerated domain (value & definition & source)

5.1.2.4.2 *Rdom* – range domain

5.1.2.4.3 *Codesetd* – codeset domain

5.1.2.4.4 *Udom* ~~unrepresentable domain~~

5.1.2.5 *Begdatea** -- Beginning Date of Attribute Values -- earliest or only date for which the attribute values are current. In cases when a range of dates are provided, this is the earliest date for which the information is valid.

Domain: free date

5.1.2.6 *Enddatea** -- Ending Date of Attribute Values -- latest date for which the information is current. Used in cases when a range of dates are provided.

Domain: free date

5.1.2.7 *Attrvai* -- Attribute Value Accuracy Information -- an assessment of the accuracy of the assignment of attribute values.

5.1.2.7.1 *Attrva* – attribute value accuracy

5.1.2.7.2 *Attrvae* – attribute value accuracy explanation

5.1.2.8 *Attrmfrq* -- Attribute Measurement Frequency -- the frequency with which attribute values are added.

Domain: "Unknown" "As needed" "Irregular" "None planned" free text

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5.2 *Overview** -- Overview Description -- summary of, and citation to detailed description of, the information content of the data set.

5.2.1 *Eaover* -- Entity and Attribute Overview -- detailed summary of the information contained in a data set.

Domain:

“The Flood Risk Database is made up of several data themes containing both spatial and attribute information. These data together represent the current flood risk for the subject area as identified by FEMA. The attribute tables include NHD subbasins, Changes Since Last FIRM, Political Areas, US Census Blocks, Areas of Mitigation Interest, location of User Defined Facilities, and annual chance grids.”

5.2.2 *Eadetcit** -- Entity and Attribute Detail Citation -- reference to the complete description of the entity types, attributes, and attribute values for the data set.

Domain:

First occurrence:

“Appendix O of FEMA Guidelines and Standards for FEMA Flood Hazard Mapping Partners contains a detailed description of each attribute code and a reference to other relevant information.”

Second occurrence:

“The following tables are included in this data set: CST_Dpthxxpct Depth_01pct Depth_02pct Depth_04pct Depth_10pct Depth_0_2pct Depth_xxpct Depth_Annual Lev_Dpthxxpct Hillshade L_AOMI_Summary L_CSLF_Summary L_Claims L_Exposure L_Local_GBS L_RA_AAL L_RA_Composite L_RA_Refined L_RA_Summary L_RA_UDF_Refined L_Source_Cit L_Versions Model_Info PctAnnChance Pct30yrChance S_FRD_Pro_Ar S_AOMI_Pt S_Carto_Ar S_Carto_LN S_CenBlk_Ar S_CSLF_AR S_FRD_Pol_AR S_HUC_Ar S_UDF_AR Study_Info Veloc_xxpct WSE_01pct WSE_02pct WSE_04pct WSE_10pct WSE_0_2pct WSE_xxpct WSE_Change.”

Note that only applicable dataset names (grids, tables, spatial datasets) should be listed in this section.

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6 *distinfo – Distribution Information – information about the distributor of and options for obtaining the data set.**

This section is required for all FloodRisk submissions.

The distributor of the data is either FEMA or the publisher of the metadata.

6.1 *Distrib* -- Distributor -- the party from whom the data set may be obtained.

If FEMA is the Distributor (6.1.1) of the data, then for FEMA-FRD use MSC contact information. If FEMA is not the Distributor of the FRD, then contact information for the Distributor must be provided in Section 6.1.1.

6.1.1 *Cntinfo* -- Contact Information -- Identity of, and means to communicate with, person(s) and organization(s) associated with the data set.

6.1.1.1 *Cntperp*² -- Contact Person Primary -- the name of the individual to which the contact type.

Contact Person Primary (Cntperp 6.1.1.1) is not used; Contact Organization Primary (Cntorgp 6.1.1.2) serves as primary contact.

6.1.1.2 *Cntorgp*² -- Contact Organization Primary -- the organization, and the member of the organization associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.

Domain: Compound

6.1.1.2.1 *Cntorg* -- Contact Organization -- the name of the organization to which the contact type applies.

Domain: "FEMA, Map Service Center" or free text

6.1.1.2.2 *Cntper* -- Contact Person -- the name of the individual to which the contact type applies.

Domain: free text

6.1.1.3 *Cntpos* -- Contact Position -- the title of individual.

Domain: free text

6.1.1.4 *Cntaddr** -- Contact Address -- the address for the organization or individual.

6.1.1.4.1 *Addrtype* -- Address Type -- the information provided by the address.

Domain: "mailing" or free text

6.1.1.4.2 Address* -- Address -- an address line for the address.

Domain: **"P.O. Box 1038"** or free text

6.1.1.4.3 City -- City -- the city of the address.

Domain: **"Jessup"** or free text

6.1.1.4.4 State -- State or Province -- the state or province of the address.

Domain: **"Maryland"** or free text

6.1.1.4.5 Postal -- Postal Code -- the ZIP or other postal code of the address.

Domain: **"20794-1038"** or free text

6.1.1.4.6 Country -- Country -- the country of the address.

Domain: **"USA"** or free text

6.1.1.5 Cntvoice* -- Contact Voice Telephone -- the telephone number by which individuals can speak to the organization or individual.

Domain: **"877-336-2627"** or free text

6.1.1.6 Cnttdd* -- Contact TDD/TTY Telephone -- the telephone number by which hearing-impaired individuals can contact the organization or individual.

Domain: free text

6.1.1.7 Cntfax* -- Contact Facsimile Telephone -- the telephone number of a facsimile machine of the organization or individual.

Domain: free text

6.1.1.8 Cntemail* -- Contact Electronic Mail Address -- the address of the electronic mailbox of the organization or individual.

Domain: For FEMA-FloodRisk:
FEMAMapSpecialist@riskmapcds.com or free text

6.1.1.9 Hours -- Hours of Service -- time period when individuals can speak to the organization or individual.

Domain: free text

6.1.1.10 Cntinst -- Contact Instructions -- supplemental instructions on how or when to contact the individual or organization.

Domain: **"Data requests must include the full name of the community, county, watershed, or watershed code."**

6.2 Resdesc -- Resource Description -- the identifier by which the distributor knows the data set.

Domain: free text

6.3 *Distliab* -- Distribution Liability -- statement of the liability assumed by the distributor.

Domain: *“No warranty expressed or implied is made by FEMA regarding the utility of the data on any other system nor shall the act of distribution constitute any such warranty. FEMA will warrant the delivery of this product in a computer-readable format, and will offer appropriate adjustment of credit when the product is determined unreadable by correctly adjusted computer input peripherals, or when the physical medium is delivered in damaged condition. Requests for adjustment of credit must be made within 90 days from the date of this shipment from the ordering site.”*

6.4. *Stdorder** -- Standard Order Process – the common ways in which the data set may be obtained or received, and related instructions and fee information.

Note: the child elements, <nondig> (6.4.1) and <digform> (6.4.2) are mutually exclusive (i.e., only one can occur within a given <stdorder> element).

6.4.1 *Nondig* -- Non-digital Form -- the description of options for obtaining the data set on non-computer-compatible media.

Domain: free text

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For Reference Only.

6.4.2 *Digform** -- Digital Form -- the description of options for obtaining the data set on computer-compatible media

6.4.2.1 *Diginfo* -- Digital Transfer Information - description of the form of the data to be distributed.

6.4.2.1.1 *Formname* -- Format Name -- the name of the data transfer format.

Domain: domain values from the “Data Formats” listed in table below.

Valid formats for Flood Risk Database (Appendix O):

Vector Data Formats	Description
	ESRI Shapefile (.SHP)
	ESRI File Geodatabase

Raster Data Formats	Description
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"ESRI GRID"	ESRI GRID

6.4.2.1.2 *Formvern* – format version

6.4.2.1.3 *Formverd* – format version date

6.4.2.1.4 *Formspec* - Format specification

6.4.2.1.5 *Formcont* – format information content

6.4.2.1.6 *Filedasc* – file decompression technique

6.4.2.1.7 *Transize* – transfer size

6.4.2.2 *Digtopt* -- Digital Transfer Option -- the means and media by which a data set is obtained from the distributor.

6.4.2.2.1 *Onlinopt** -⁸ Online Option -- information required to directly obtain the data set electronically.

6.4.2.2.1.1 *Computer** -- Computer Contact Information -- instructions for establishing communications with the distribution computer.

6.4.2.2.1.1.1 *Networka* - network address

6.4.2.2.1.1.1.1 *Networkr** - Resource name

Domain: **For FRD: "http://www.msc.fema.gov"..**

6.4.2.2.1.2 *Accinstr* -- Access Instructions -- instructions on the steps required to access the data set.

6.4.2.2.1.3 *Oncomp* – Online Computer and Operating system

6.4.2.2.2 *Offoptn*⁸ -- Offline Option -- information about media-specific options for receiving the data set.

⁸ *digform/diginfo/digtopt/onlinopt* and *digform/diginfo/digtopt/offoptn* are mutually exclusive (e.g., one or the other but not both must be specified)

6.4.2.2.2.1 *Offmedia – Offline Media* Domain: For Flood Risk datasets, only “DVD-ROM”) are officially supported.

6.4.2.2.2.2 *Reccap – recording capacity*

6.4.2.2.2.3 *Recfmt – recording format*

For DVD-ROM: “ISO 9660”

6.4.2.2.2.4 *Compat – compatibility information*

6.4.3 *Fees* -- Fees -- the fees and terms for retrieving the data set.

Domain: “Contact distributor” free text

6.4.4 *Ordering* -- Ordering Instructions -- general instructions and advice about, and special terms and services provided for, the data set by the distributor.

Domain: free text

6.4.5 *Turnarnd* -- Turnaround -- typical turnaround time for the filling of an order.

Domain: free text

6.5 *Custom* -- Custom Order Process -- description of custom distribution services available, and the terms and conditions for obtaining these services.

Domain: free text

6.6 *Techpreq* -- Technical Prerequisites -- description of any technical capabilities that the consumer must have to use the data set in the form(s) provided by the distributor.

Domain: free text

6.7 *Availabl* -- Available Time Period -- the time period when the data set will be available from the distributor.

Domain: timeperiod (single, multiple, range of dates)

**This Document is Superseded.
For Reference Only.**

7 *metainfo* – Metadata Reference Information – information on the currentness of the metadata information and the responsible party.

This section is required for all FGDC-compliant metadata.

7.1 *Metd* -- Metadata Date -- the date that the metadata were created or last updated.

Domain: free date
YYYYMMDD

7.2 *Metrd* -- Metadata Review Date -- the date of the latest review of the metadata entry.

Domain: free date; Metadata Review Date later than Metadata Date

This element may be used when a FRD is revised or amended, etc.

7.3 *Metfrd* -- Metadata Future Review Date -- the date by which the metadata entry should be reviewed.

Domain: free date; Metadata Future Review Date later than Metadata Review Date

7.4 *Metc* -- Metadata Contact -- the party responsible for the metadata information.

7.4.1 *Cntinfo* -- Contact Information -- Identity of, and means to communicate with, person(s) and organization(s) associated with the data set.

7.4.1.1 *Cntper*⁹ -- Contact Person Primary -- the name of the individual to which the contact type.

Domain: Compound

7.4.1.1.1 *Cntper* -- Contact Person -- the name of the individual to which the contact type applies.

Domain: free text

7.4.1.1.2 *Cntorg* -- Contact Organization -- the name of the organization to which the contact type applies.

Domain: free text

7.4.1.2 *Cntorgp*⁹ -- Contact Organization Primary -- the organization, and the member of the organization associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.

⁹ Note: Use of the *Cntinfo.Cntperp* and *Cntinfo.Cntorgp* elements is mutually exclusive. *Cntinfo.Cntperp* is specified in this context as mandatory so the *Cntinfo.Cntorgp* element must not be used here.

Contact Organization Primary (Cntorgp 7.4.1.2) is not used; Contact Person Primary (Cntperp 7.4.1.1) serves as primary contact.

7.4.1.3 *Cntpos* -- Contact Position -- the title of individual.

Domain: ***Federal Insurance and Mitigation Administration***

7.4.1.4 *Cntaddr** -- Contact Address -- the address for the organization or individual.

7.4.1.4.1 *Addrtype* -- Address Type -- the information provided by the address.

Domain: free text

7.4.1.4.2 *Address** -- Address -- an address line for the address.

Domain: free text

7.4.1.4.3 *City* -- City -- the city of the address.

Domain: free text

7.4.1.4.4 *State* -- State or Province -- the state or province of the address.

Domain: free text

7.4.1.4.5 *Postal* -- Postal Code -- the ZIP or other postal code of the address.

Domain: free text

7.4.1.4.6 *Country* -- Country -- the country of the address.

Domain: free text

7.4.1.5 *Cntvoice** -- Contact Voice Telephone -- the telephone number by which individuals can speak to the organization or individual.

Domain: free text

7.4.1.6 *Cnttdd** -- Contact TDD/TTY Telephone -- the telephone number by which hearing-impaired individuals can contact the organization or individual.

Domain: free text

7.4.1.7 *Cntfax** -- Contact Facsimile Telephone -- the telephone number of a facsimile machine of the organization or individual.

Domain: free text

7.4.1.8 *Cntemail** -- Contact Electronic Mail Address -- the address of the electronic mailbox of the organization or individual.

Domain: free text

7.4.1.9 *Hours* -- Hours of Service -- time period when individuals can speak to the organization or individual.

Domain: free text

7.4.1.10 *Cntinst* -- Contact Instructions -- supplemental instructions on how or when to contact the individual or organization.

Domain: free text

7.5 *Metstdn* -- Metadata Standard Name -- the name of the metadata standard used to document the data set.

Domain: "FGDC Content Standard for Digital Geospatial Metadata" free text

7.6 *Metstdv* -- Metadata Standard Version -- identification of the version of the metadata standard used to document the data set.

Domain: free text

7.7 *Mettc* -- Metadata Time Convention -- form used to convey time of day information in the metadata entry. Used if time of day information is included in the metadata for a data set.

Domain: "local time" "local time with time differential factor" "universal time"

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7.8 *Metac* -- Metadata Access Constraints -- restrictions and legal prerequisites for accessing the metadata. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the metadata.

Domain: free text

7.9 *Metuc* -- Metadata Use Constraints -- restrictions and legal prerequisites for using the metadata after access is granted. These include any metadata use constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on using the metadata.

Domain: free text

7.10 *Metsi* -- Metadata Security Information -- handling restrictions imposed on the metadata because of national security, privacy, or other concerns.

7.10.1 *Metscs* -- Metadata Security Classification System -- name of the classification system for the metadata.

Domain: free text

7.10.2 *Metsc* -- Metadata Security Classification -- name of the handling restrictions on the metadata.

Domain: "Top secret" "Secret" "Confidential" "Restricted" "Unclassified"
"Sensitive" free text

7.10.3 *Metshd* -- Metadata Security Handling Description -- additional information about the restrictions on handling the metadata.

Domain: free text

7.11 *Metextns -- Metadata Extensions a reference to extended elements to the standard which may be defined by a metadata producer or a user community. Extended elements are elements outside the Standard, but needed by the metadata producer. If extended elements are created, they must follow the guidelines in Appendix D, Guidelines for Creating Extended Elements to the Content Standard for DigitalGeospatial Metadata.**

7.11.1 *Onlink -- Online Linkage -- the name of an online computer resource that contains the metadata extension information for the data set. Entries should follow the Uniform Resource Locator convention of the Internet.**

Domain:

Two onlinks are required:

- Link to URL on MIP (or data capture guidelines & standards) for information on this profile: <http://hazards.fema.gov>

- Link to the data's EPSG code (in the form of a URL). More info about EPSG code can be found at: <http://www.epsg.org>

7.11.2 *Metprof* -- Profile Name -- the name given to a document that describes the application of the Standard to a specific user community.

Domain:

"FEMA NFIP Metadata Content and Format Standard"

Document Management History

Revision History

Version Number	Version Date	Summary of Changes	Team/Author
0.5	Oct 19, 2010	Released for PTS review.	STARR
0.6	Nov 05, 2010	Released for FEMA SME Review	STARR
0.7	Nov 23, 2010	Released for FEMA IPT & External Stakeholder Rev	STARR
0.8	Dec 10, 2010	Released for FEMA SME Review	STARR
0.9	Jan 14, 2011	Released for FEMA & Public Review	STARR
0.95	Feb 10, 2011	Released for FEMA HQ Review	STARR

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