U.S. Department of Homeland Security
500 C Street, SW
Washington, DC 20472

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

Approval: Roy E. Wright
Acting Director, Risk Analysis Division
Federal Insurance and Mitigation Administration

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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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Procedure Memorandum # 65 Guidance

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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

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

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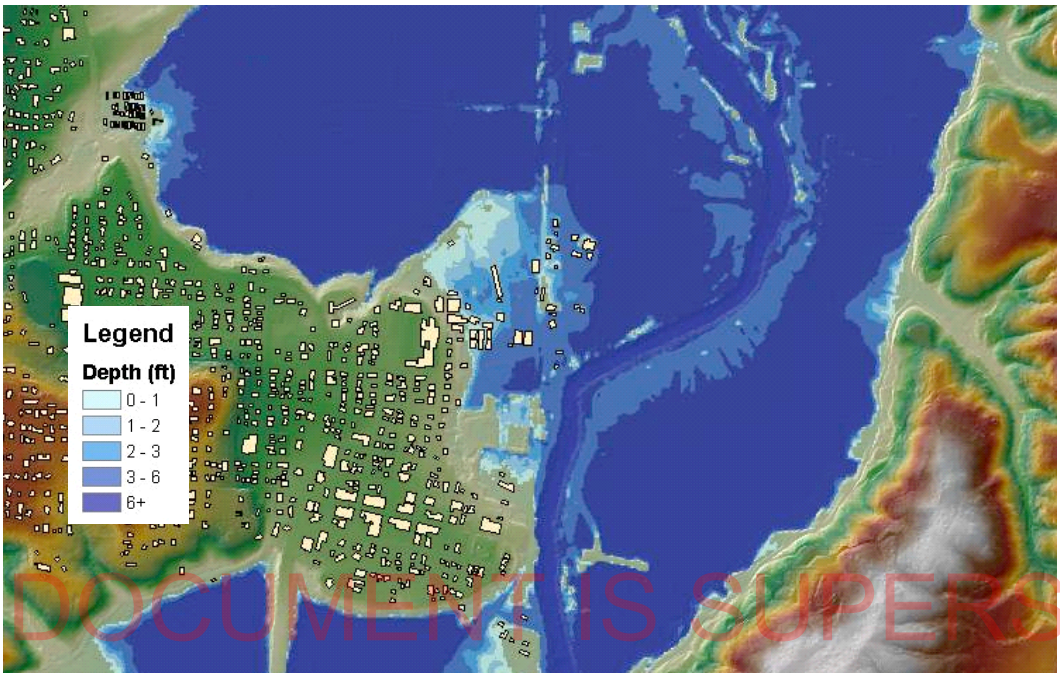
Description: Flood Depth Grids are typically generated for all riverine flooding return periods available for a particular flooding source. For the standard RiskMAP project scope, this corresponds to the 0.2 percent, 1 percent, 2 percent, 4 percent and 10 percent flooding return periods. However, local 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.



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Name: Velocity Grid

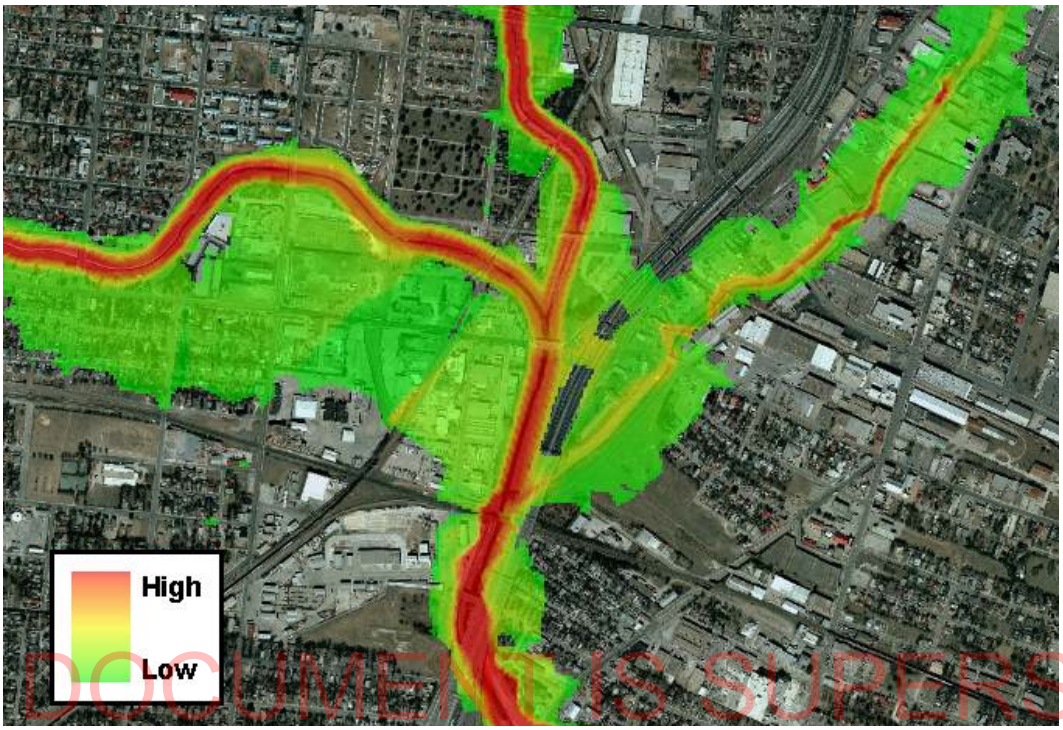
Layer Name: Vel_XXPct (where XX is the "10", "04", "02", "01", or "0.2" percent annual chance exceedance probability)

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.



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Name: Water Surface Elevation Change Grid

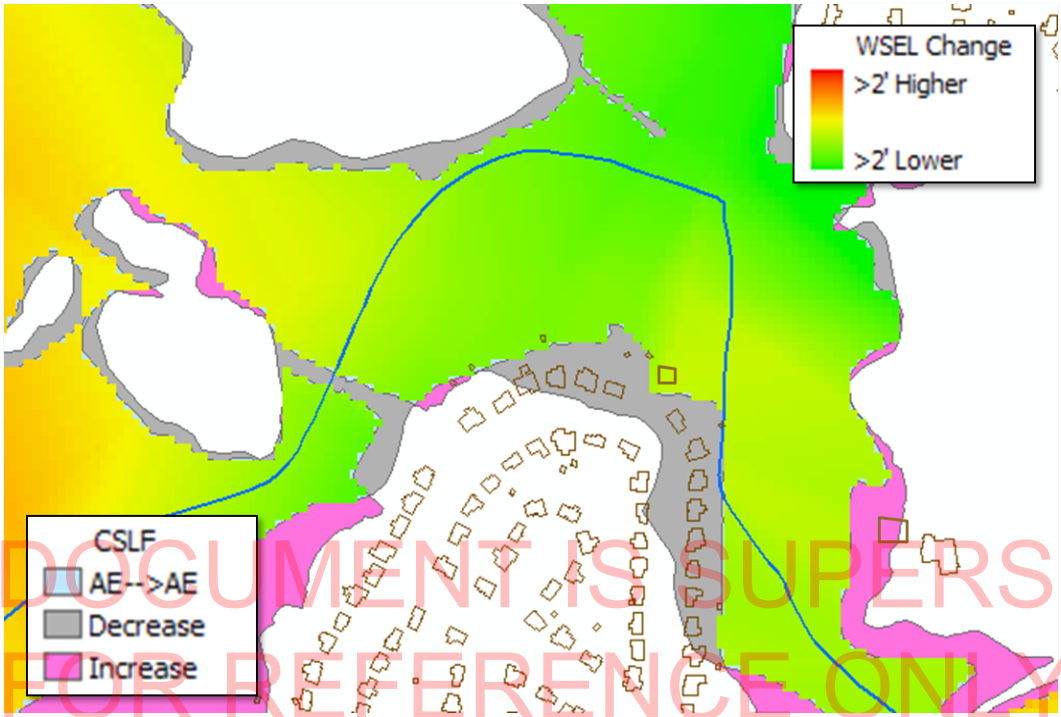
Layer Name: WSE_Change

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.

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.



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2.2. Enhanced Flood Risk Datasets

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

Layer Name: S_UDF_PT

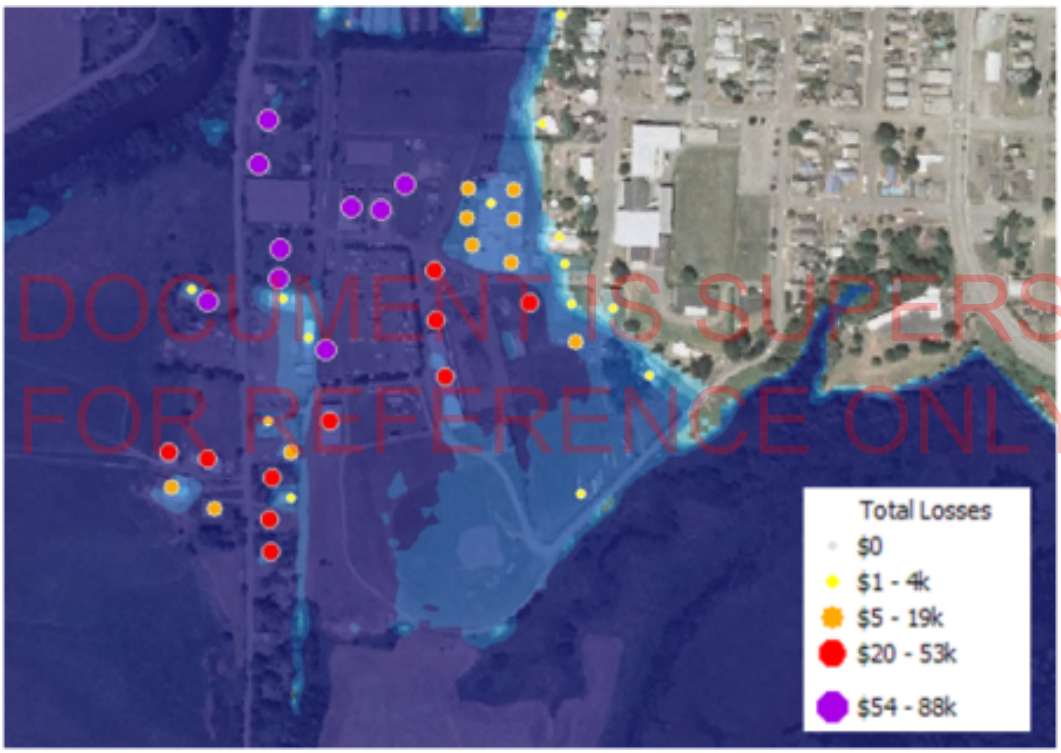
Description: The default delivery output for the flood risk assessments is at the census block level. However, in communities that possess building-specific structure information (e.g., structure value, structure type, first floor elevation, etc.), it may be desired to generate enhancements to this data 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

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



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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:

- 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.

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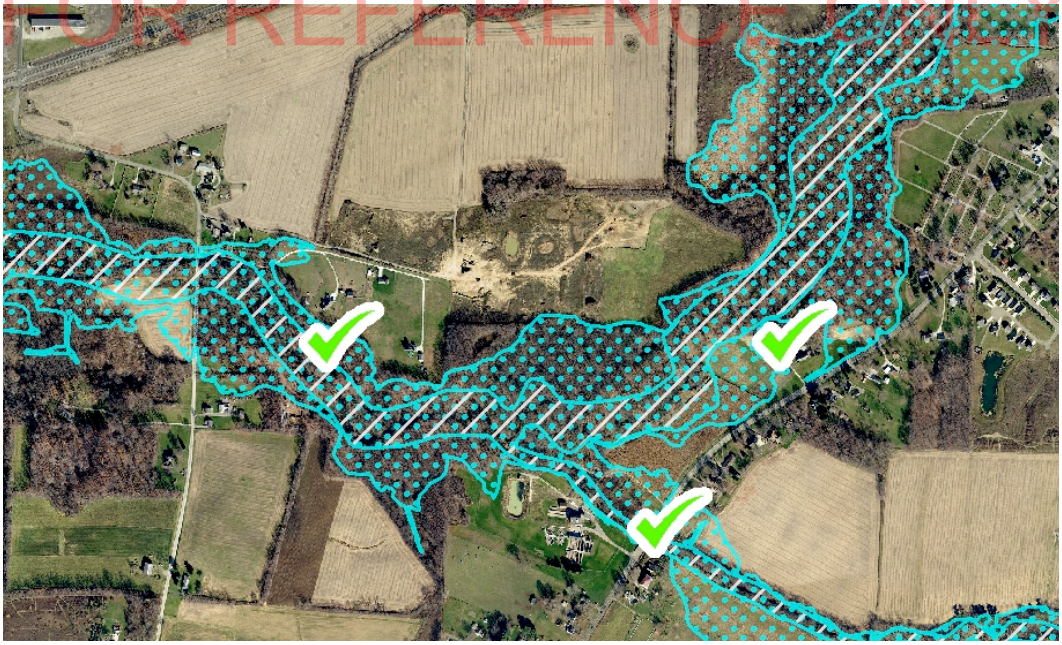

3. Flood Risk Database Standards Version 1.0

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

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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:

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- 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

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

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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)**

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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”

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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.

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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.

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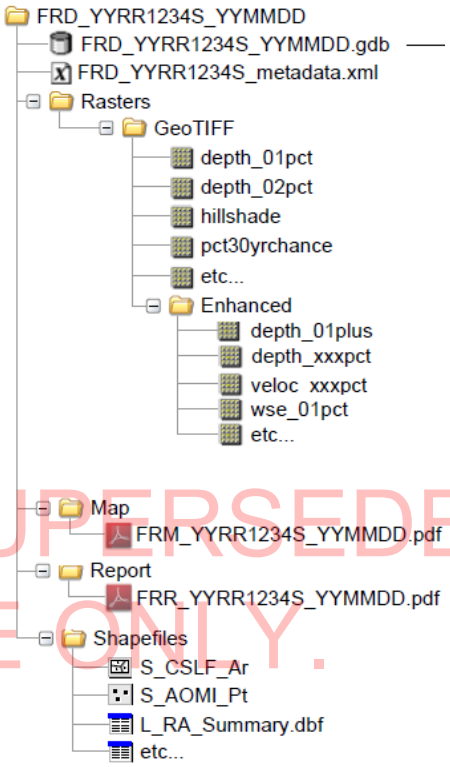

Figure 3.1 Proposed Submittal Structure

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.

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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:

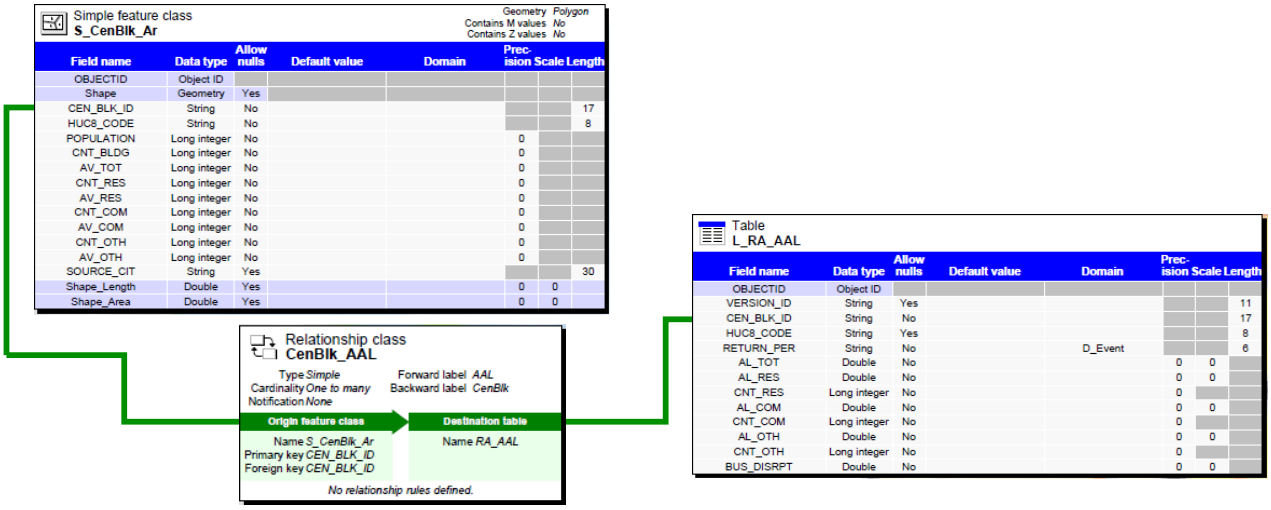

Figure 3.2 Example Relationship Class

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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

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Attachment B. Flood Risk Database Metadata Profile

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