

Map MODERNIZATION

Federal Emergency Management Agency



FEMA's Flood Hazard Mapping Program

Guidelines and Specifications *for* Flood Hazard Mapping Partners

*Appendix L: Guidance for Preparing
Draft Digital Data and DFIRM Database*



FEDERAL EMERGENCY MANAGEMENT AGENCY

www.fema.gov/mit/tsd/dl_cgs.htm

FINAL
February 2002

Appendix L

Draft Digital Data and Digital Flood Insurance Rate Map Database Specifications

The purpose of this Appendix is to provide guidance and specifications to the Mapping Partner that prepares draft digital data for Digital Flood Insurance Rate Map (DFIRM) production and the Mapping Partner that prepares the Preliminary and Final DFIRM and databases for transfer to the Federal Emergency Management Agency (FEMA). For a particular Flood Map Project, the FEMA Lead may assign both tasks to one Mapping Partner or each task to a different Mapping Partners. This Appendix is not intended to specify in-process compilation or digitizing procedures but rather, to present specifications and requirements for output and deliverables.

[February 2002]

L.1 Digital Flood Insurance Rate Map Database Overview

The new FEMA Geographic Information System (GIS) databases will store the digital data used in the map production process, as well as the engineering backup data for floodplain studies. These databases will provide a standard, systematic method for FEMA to distribute comprehensive details of flood studies to the public and others in a digital format.

Preparing these data in digital format has significant advantages for ease of storage, records search, and distribution. But, the most significant advantage is that the data are designed to work within a GIS environment. The FEMA database can be used for automated analyses and map updates that are impractical and costly with paper products.

FEMA will collect as much data as possible in digital format, and archive the data in the GIS database format for each DFIRM created. For publication of these data, FEMA will provide a simplified version of the database for end users who are not interested in the complete engineering backup data. This Appendix describes the minimum acceptable draft digital data submittal requirements and the specifications for the simplified standard DFIRM database that FEMA will publish. The simplified version of the database is not intended to limit the scope of the GIS data collected and submitted to FEMA. In the future, FEMA plans to archive and make the complete engineering backup data package, or “enhanced database,” available in GIS database format to interested users.

To facilitate the ease of use of the DFIRM database, FEMA will avoid the use of abbreviations and codes in the published data where feasible.

Guidelines and Specifications for Flood Hazard Mapping Partners

Where possible, all mapping and engineering data elements will be linked to physical geographic features that are georeferenced. A GIS has the ability to precisely overlay the mapping and engineering data. This approach supports a wide variety of existing and visionary FEMA engineering and mapping products, such as digital mapping; automated hydrologic and hydraulic modeling, automated mapping, web-based publishing, and direct links between modeling and mapping elements.

The DFIRM database is not intended to be used to produce an exact replica of the printed Flood Insurance Rate Map (FIRM). Instead, the DFIRM database is designed to allow a GIS user access to all of the information conveyed on the FIRM in a way that can best take advantage of the automated analysis capabilities of GIS. FEMA will provide a companion product in the form of a scanned or raster image of the hardcopy DFIRM that will allow users to reprint exact replicas of the whole FIRM or portions of the FIRM.

The DFIRM database will be designed to be usable in a standard Relational Database Management System (RDBMS), but will be software independent. Therefore, the products are defined as flat tables in public domain formats (e.g., ESRI Shapefiles, MapInfo MIF files). Users can import these formats into a wide variety of software packages. They manage GIS data in discrete files, generally organized by data theme. As a result, they do not support the inter table relationships and data integrity enforcement capabilities of an RDBMS. However, the data produced by FEMA will be designed, tested to follow these rules, and fully compatible with an RDBMS.

For Preliminary or Final DFIRMs, all of the tables in the DFIRM database are required if they apply to the DFIRM being created. Some tables, like those that depict coastal features, do not apply to every DFIRM. The Mapping Partner that creates the DFIRM shall ensure that all of the applicable tables in the DFIRM database have been completed and documented in the metadata. Generally, the DFIRM database for a new DFIRM will cover the entire jurisdiction. Detailed specifications for the Preliminary or Final DFIRM database are provided in Section L.3. A summary of the standard DFIRM database tables is provided in Table L-1.

Table L-1. DFIRM Database Table Summary

DFIRM Table Name	Table Type	Table Description
L_Comm_Info	Lookup	Information about each community on the DFIRM
L_Cst_Model	Lookup	Information about coastal engineering models reflected on the DFIRM
L_MT1_LOMC	Lookup	Information about LOMCs on the DFIRM
L_Pan_Revis	Lookup	Information about revisions to each FIRM panel
L_Pol_FHBM	Lookup	Information about revisions to FHBM for each community
L_Riv_Model	Lookup	Information about non-coastal engineering models reflected on the DFIRM
L_Wtr_Nm	Lookup	Information about hydrographic features on the DFIRM
S_BFE	Spatial	Location and attributes for base flood elevations lines shown on DFIRM
S_CBRS	Spatial	Location and attributes for Coastal Barrier Resource System units on the DFIRM
S_Cst_Tsct_Ln	Spatial	Location and attributes for coastal transect lines shown on the DFIRM
S_DOQ_Index	Spatial	Location and attributes for orthophotography images used for the DFIRM
S_FIRM_Pan	Spatial	Location and attributes for DFIRM hardcopy map panels
S_Fld_Haz_Ar	Spatial	Location and attributes for flood insurance risk zones on the DFIRM
S_Fld_Haz_Ln	Spatial	Location and attributes for boundaries of flood insurance risk zones on the DFIRM
S_Gen_Struct	Spatial	Location and attributes for flood control structures shown on the DFIRM
S_Label_Ld	Spatial	Location and attributes for leader lines on transportation and hydrography labels shown on the DFIRM
S_Label_Pt	Spatial	Location and attributes for transportation and hydrography labels shown on the DFIRM
S_LOMR	Spatial	Location and attributes for LOMRs on the DFIRM
S_Perm_Bmk	Spatial	Location and attributes for benchmarks on the DFIRM
S_PLSS_Ar	Spatial	Location and attributes of sections, townships and ranges on the DFIRM
S_PLSS_Ln	Spatial	Location and attributes section lines, township lines and range lines on the DFIRM
S_Pol_Ar	Spatial	Location and attributes for political jurisdictions shown on the DFIRM
S_Pol_Ln	Spatial	Location and attributes for political boundaries shown on the DFIRM
S_Quad	Spatial	Location and attributes for USGS quadrangle maps covering the DFIRM area
S_Riv_Mrk	Spatial	Location and attributes for river mile markers shown on the DFIRM
L_Stn_Start	Lookup	Location and attributes for starting points for stream distance measurements
S_Trnsport_Ln	Spatial	Location and attributes for roads, railroads and other transportation features shown on the DFIRM
S_Wtr_Ar	Spatial	Location and attributes for hydrography features shown on DFIRM
S_Wtr_Ln	Spatial	Location and attributes for hydrography features shown on DFIRM
S_XS	Spatial	Location and attributes for cross-section lines in the area covered by the DFIRM
Study_Info	Non-spatial	General information about the DFIRM

Mapping Partners that are assigned other tasks for a Flood Map Project will normally produce draft study components and draft DFIRM digital data. For Mapping Partners

Guidelines and Specifications for Flood Hazard Mapping Partners

that create draft DFIRM digital data, not all the tables in the DFIRM database will apply. These Mapping Partners will often only submit data that cover the geographic area of their work. The tables that are applicable to a specific Flood Map Project will vary, depending on the specific scope of that activity. Table L-2 presents the DFIRM database tables that apply to specific components of a Flood Map Project. The scope of a particular project could include several of these activities and, therefore, all of the tables from each of the activities involved in the project will likely apply. Most Flood Map Projects will include the requirement of a digital base map that meets the requirements as outlined in Appendix K of these Guidelines.

Table L-2. Mapping Partner Activity Table

Digital FIRM Preparation	Digital FIRM Maintenance	Hydrologic and Hydraulic Analyses and Floodplain Mapping	Redelineation of Floodplain Boundaries Using Updated Topographic Data	Refinement of Approximate Zone A Boundaries	Digital Topographic Data Development	Coastal Hazard Analyses and Floodplain Mapping	Digital Base Map Development
L_Comm_Info	L_Comm_Info	L_Riv_Model	L_Riv_Model	L_Wtr_Nm	S_Perm_Bmk	L_Cst_Model	L_Wtr_Nm
L_Cst_Model	L_Cst_Model	L_Stn_Start	L_Stn_Start	S_Fld_Haz_Ar		L_Wtr_Nm	S_DOQ_Index
L_MT1_LOMC	L_MT1_LOMC	L_Wtr_Nm	L_Wtr_Nm	S_Fld_Haz_Ln		S_BFE	S_Gen_Struct
L_Pan_Revis	L_Pan_Revis	S_BFE	S_BFE	S_LOMR		S_CBRS	S_Label_Ld
L_Pol_FHBM	L_Pol_FHBM	S_Fld_Haz_Ar	S_Fld_Haz_Ar	S_Perm_Bmk		S_Cst_Tsct_Ln	S_Label_Pt
L_Riv_Model	L_Riv_Model	S_Fld_Haz_Ln	S_Fld_Haz_Ln	S_Wtr_Ar		S_Fld_Haz_Ar	S_Perm_Bmk
L_Stn_Start	L_Stn_Start	S_Gen_Struct	S_Gen_Struct	S_Wtr_Ln		S_Fld_Haz_Ln	S_PLSS_AR
L_Wtr_Nm	L_Wtr_Nm	S_LOMR	S_LOMR			S_Gen_Struct	S_PLSS_LN
S_BFE	S_BFE	S_Perm_Bmk	S_Perm_Bmk			S_LOMR	S_Pol_Ar
S_CBRS	S_CBRS	S_Riv_Mrk	S_Riv_Mrk			S_Perm_Bmk	S_Pol_Ln
S_Cst_Tsct_Ln	S_Cst_Tsct_Ln	S_Wtr_Ar	S_Wtr_Ar			S_Wtr_Ar	S_Quad
S_DOQ_Index	S_DOQ_Index	S_Wtr_Ln	S_Wtr_Ln			S_Wtr_Ln	S_Trnsport_Ln
S_FIRM_Pan	S_FIRM_Pan	S_XS	S_XS				S_Wtr_Ar
S_Fld_Haz_Ar	S_Fld_Haz_Ar						S_Wtr_Ln
S_Fld_Haz_Ln	S_Fld_Haz_Ln						
S_Gen_Struct	S_Gen_Struct						
S_Label_Ld	S_Label_Ld						
S_Label_Pt	S_Label_Pt						
S_LOMR	S_LOMR						
S_Perm_Bmk	S_Perm_Bmk						
S_PLSS_Ar	S_PLSS_Ar						
S_PLSS_Ln	S_PLSS_Ln						
S_Pol_Ar	S_Pol_Ar						
S_Pol_Ln	S_Pol_Ln						
S_Quad	S_Quad						
S_Riv_Mrk	S_Riv_Mrk						
S_Trnsport_Ln	S_Trnsport_Ln						
S_Wtr_Ar	S_Wtr_Ar						
S_Wtr_Ln	S_Wtr_Ln						
S_XS	S_XS						
Study_Info	Study_Info						

[February 2002]

L.1.1 Spatial Data and Tabular Data

The complete DFIRM database product is a GIS database made up of spatial data describing the location of features on the earth and tabular data that describe the attributes of these spatial features. The tables described in Sections L.4 and L.7 that begin with “S_” have a spatial component associated with them.

FEMA will distribute Preliminary and Final DFIRM databases to end users in GIS formats where the links between the spatial data and the attribute data are inherent in the data structure.

[February 2002]

L.1.2 Draft Digital Data Versus Preliminary and Final Digital Flood Insurance Rate Map Databases

To facilitate the submittal of digital flood hazard mapping data from all Mapping Partners, FEMA has established more flexible requirements for submitting draft DFIRM digital data than for Preliminary or Final DFIRM databases. Section L.2 provides options for submitting draft DFIRM spatial data in a Computer Assisted Drafting and Design (CADD) structure or a GIS structure.

Section L.2 also provides an option for the attribute table structure for DFIRMs that employs a more sophisticated relational structure. This option allows Mapping Partners that create draft DFIRM digital data to take advantage of relational database techniques to ensure data consistency and reduce database size. The Preliminary and Final DFIRM Databases have a simpler structure for ease of use by the general public. The primary difference between the draft table structure and the Preliminary and Final table structure is that domain tables are used in the draft structure and are not used in the Preliminary and Final structure.

The following discussion highlights the differences between the attribute table structure option available for draft DFIRM digital data and the attribute table structure for Preliminary and Final DFIRM Databases. Domain tables (tables in the database that begin with D_) were established to assist FEMA’s Mapping Partners in the creation of the draft DFIRM database. These domain tables provide the Mapping Partner with valid or preferred attribute values for specific fields. A domain table also helps minimize entry differences by standardizing the value. For example, without domain tables, one user might enter “floodway” while another user might enter “FLDWY” while completing the FLOODWAY field in the S_Fld_Haz_Ar table. While both of these entries reflect the same idea, the inconsistency between the two forms makes it difficult to group similar features together. Using a domain table ensures that both users enter the same value (i.e., floodway) to describe the same feature. To capture local characteristics not included in the domain table, Mapping Partners also may add and use their own values in the domain table (e.g., a more restrictive locally regulated floodway could be added to the accepted domain values as “Local Floodway”). An example of a domain table is shown in Table L-3.

Table L-3. Sample Domain Table

FLDWAY_LID	FLOODWAY
1000	FLOODWAY
1010	COLORADO RIVER
1020	FLOODWAY CONTAINED IN CHANNEL
1030	FLOWAGE EASEMENT BOUNDARY
1040	STATE ENCROACHMENT
1050	AREA OF SPECIAL CONSIDERATION

Field names that end with “_LID” in the draft DFIRM specification (e.g., FLDWAY_LID) link to a domain table. The “_LID” field contains an integer that matches a value in the first field of the corresponding domain table. The second field of the domain table provides a more descriptive attribute value. In the Preliminary or Final DFIRM database the “_LID” field is replaced by the second field from the domain table (i.e., FLOODWAY). The attribute value stored in the Preliminary or Final DFIRM database is the descriptive attribute value, rather than an integer. The domain tables are not included in the Preliminary or Final DFIRM database. The Mapping Partner creating draft digital data and using domain tables to create the S_Fld_Haz_Ar table, will enter “1000” in that table as the FLDWAY_LID value. In this instance, “1000” stands for “FLOODWAY.” When the Preliminary or Final DFIRM database is created, the FLDWAY_LID field becomes FLOODWAY, and the record value of “1000” becomes “FLOODWAY”.

When creating the Preliminary or Final DFIRM database the assigned Mapping Partner shall treat the water name lookup table (L_Wtr_Nm) in the draft DFIRM digital data table structure option as a domain table. The surface water feature names stored in the lookup table to must be transferred related fields in other tables.

[February 2002]

L.2 Preparation of Draft Digital Data

L.2.1 General

If the Mapping Partner that creates the draft study components also produces the Preliminary Flood Insurance Study (FIS) report and FIRM, that Mapping Partner does not need to produce separate digital FIS data for the draft study components. Instead, the Mapping Partner will typically be responsible for creating a Preliminary or Final DFIRM database as described in Volume 1, Subsection 1.4.6.6 of these Guidelines and in Section L.3.

The main issues that the assigned Mapping Partner shall consider in the preparation of the digital data are:

- Coordination;
- Standards;
- Horizontal and Vertical Control;
- Data Structure;
- Quality Control;
- Deliverable Format; and
- Metadata.

The portability of the draft digital data is the primary consideration during the Project Scoping phase of a project. This is important because a variety of commercially available mapping and/or survey software packages with varying formats exist. FEMA applications that will use the Mapping Partner's digitally prepared mapping and survey data must be considered when "collecting" the information. To ensure compatibility, the assigned Mapping Partner shall capture the mapping features into a defined schema. The assigned Mapping Partner shall arrange the draft digital data within the draft DFIRM data files in such a manner that features are separated into a GIS table structure or a CADD layer/level and attribute structure. This Appendix provides standard schema for a Mapping Partner to follow that will eliminate the need to separate the spatial elements.

In addition, the digital data must be capable of being translated into a common spatial data exchange format. Normally, the specific data format and structure will be coordinated with the Project Team during the Project Scoping Meeting or immediately afterwards by technical staff.

A major aspect of GISs is horizontal and vertical position on the earth. Mapping data must be referenced to a standard coordinate system, employ a standard projection, and specify both the horizontal and the vertical datums used. These positional references are established prior to the field data collection and topographic mapping phase of the project. All planimetric and topographic features must be collected and referenced to this coordinate system and projection. See Appendix A of these Guidelines for a detailed discussion of aerial mapping and surveying specifications, which includes horizontal and vertical control for new mapping. Also see Appendix B of these Guidelines for a discussion of vertical datum selection and conversion.

Considerations for transfer of digital data also must include the file structure of the data, the transfer medium, the export/import device and the operating systems of the host and receiving systems (e.g., MS Windows, NT, UNIX).

[February 2002]

L.2.2 Coordination

The assigned Mapping Partner must coordinate with the FEMA Lead and other Project Team members before beginning a draft digital submittal. The coordination may occur during the Project Scoping Meeting (see Volume 1, Subsection 1.3.2 of these Guidelines) or during a separate meeting immediately afterward. This meeting should serve to coordinate the digital capture of the restudy data and facilitate the production of digitally generated FIRMs in a timely fashion. Data format is an important consideration to be discussed prior to data capture, as changing data format after the fact can be both time consuming and costly.

For most Flood Map Projects, the assigned Mapping Partner shall submit to FEMA a sample of the digital files being prepared when approximately 10 percent of the project has been completed. This will enable FEMA or another Mapping Partner selected by FEMA to review and comment on the digital data files, and will enable the submitting Mapping Partner to implement any modifications, if required, to the digital capture procedures at an early production stage.

A meeting between the Mapping Partner that produces the draft study components, FEMA, and the Mapping Partner that produces the Preliminary and Final DFIRM may be required at the interim submittal stage, for all parties to be familiar with any unique conditions in the data files.

Before beginning work to produce draft digital data, the assigned Mapping Partner shall coordinate with FEMA to determine if public domain software has been developed, and is available, for whatever hardware platform is chosen by the Mapping Partner for the digital work. Software may be available to assist in GIS table creation, data capture, data coding, layer/level assignment, quality control, and plotting.

[February 2002]

L.2.2.1 Data Sources

As specified in Volume 1, Section 1.3 of these Guidelines, a Mapping Partner must perform initial research to avoid duplication of effort during a Flood Map Project. This is especially critical for

Guidelines and Specifications for Flood Hazard Mapping Partners

digitally prepared study/restudy components because data collection is expensive. The assigned Mapping Partner shall identify and use existing digital data whenever possible, while still meeting required specifications and quality of work.

As part of the initial coordination effort, the Mapping Partner that produces the draft digital study/restudy components shall identify available digital data and obtain datasets and hardcopy plots as necessary for study/restudy areas. Potential sources of digital base map or floodplain boundary data may be State, county, or local government agencies responsible for GIS, planning agencies or real estate assessment agencies. Digital floodplain data also may be available from FEMA, if the area has been previously converted to digital format. Requirement for base maps are specified in Appendix K.

If existing data are available and used by the Mapping Partner that produces the draft digital study/restudy components, that Mapping Partner shall restructure the data to conform to one of the digitizing specification options listed below. If specific arrangements are made with the FEMA Lead—usually, either the FEMA Regional Project Officer or the Project Officer (PO) at FEMA Headquarters—to use another data schema, the assigned Mapping Partner shall provide complete documentation of the spatial data structure and attribute tables.

As part of data collection, coordination and submittal, the assigned Mapping Partner shall document the data sources, date of collection or digitizing, scale of digitizing, projections, coordinate systems, horizontal datum and vertical datum of all of the digital data used and submitted. For each data source used, the assigned Mapping Partner shall add a Source Citation entry to the DFIRM metadata file in the Lineage section under Data Quality. Within the metadata file, each data source is assigned a Source Citation Abbreviation as shown in Table L-4.

Table L-4. Source Citation Abbreviations

Source Citation Abbreviation	Use
BASE	For all base map sources (includes digital orthophotography, roads, railroads, airports, hydrography, U.S. Public Land Survey System (PLSS), political, military, park, forest and other lands)
FIRM	For features extracted from the existing FIRM
FHBM	For features extracted from the existing Flood Hazard Boundary Map (FHBM)
FBFM	For features extracted from the existing Flood Boundary and Floodway Map (FBFM)
LOMC	For information derived from a Letter of Map Change (LOMC)
FIS	For information taken from a previously published FIS report, including Floodway Table and Flood Profiles
STUDY	For information developed for the current Flood Map Project
TSDN	For any information taken from the Technical Support Data Notebook (TSDN) (used for existing backup information in FEMA's archives not published on previous FIRM)

Each source citation abbreviation for a distinct data source should be numbered (e.g., BASE1, BASE2, BASE3). All spatial tables in the standards below have a SOURCE_CIT field. This field should be populated with the Source Citation Abbreviation from the metadata file that applies to the related spatial feature.

[February 2002]

L.2.3 Standards

Maps and spatial data used for flood hazard analyses, floodplain boundary delineations, and FIRM compilation must meet all requirements specified in these Guidelines. The assigned Mapping Partner shall obtain or create these materials and submit these materials to FEMA, and shall ensure that the accuracy of the data in the submitted files, at a minimum, meets or exceeds FEMA's base map and FIS mapping information standards. The requirements for the flood hazard analyses, floodplain boundary delineations, and the base map are detailed in Volume 1, Section 1.4, Appendix A, and Appendix K of these Guidelines, respectively.

[February 2002]

L.2.4 Horizontal and Vertical Control

The assigned Mapping Partner shall create all digital data in a system that is capable of referencing the data to a geographic coordinate system and projection. The data must be in a State Plane coordinate system and associated projection or in the Universal Transverse Mercator (UTM) projection and coordinate system. The assigned Mapping Partner shall obtain approval for

variations from these two options from the FEMA Lead in advance. See Appendix K of these Guidelines for information on raster base maps in other projections and coordinate systems.

In the event that the county or other jurisdiction being mapped lies in more than one projection and coordinate system zone, the assigned Mapping Partner shall ensure that all digital data submitted are projected in the zone that contains the largest portion of the jurisdiction in a single zone. The assigned Mapping Partner shall not use multiple State Plane or UTM zones within a single submittal. The assigned Mapping Partner may compile data in another zone, particularly if this facilitates higher positional accuracy of the data, reproject the data to the chosen zone for the jurisdiction being mapped, and merge the reprojected data with the rest of the data.

The assigned Mapping Partner shall compile all horizontal information on either the North American Datum of 1927 (NAD27) (Clarke 1866 ellipsoid) or North American Datum of 1983 (NAD83) (Geodetic Reference System 1980 -- GRS 80 ellipsoid or revisions thereof). However, it is critical that horizontal datums not be mixed within a Flood Map Project. See Appendix A of these Guidelines for details on horizontal datum requirements.

The assigned Mapping Partner shall reference all vertical information to either the National Geodetic Vertical Datum of 1929 (NGVD29) or the North American Vertical Datum of 1988 (NAVD88). However, the NGVD29 must not mix vertical datums within a Flood Map Project. See Appendix B of these Guidelines for details.

[February 2002]

L.2.5 Digital Data Structure

Digital files must be prepared using a pre-defined system or schema that has been consistently used throughout. The layer/level or attribute assigned to a spatial element must be consistent and the information accessible to all users. The data must be organized in one of the data structures described in this Appendix and provided in one of the acceptable data formats unless specific arrangements are made with the FEMA PO.

[February 2002]

L.2.5.1 Tiling

FEMA requires that all digital data be in one single file or a series of thematic files that cover the entire geographic area being mapped instead of individual small tiles that cover limited geographic areas. The assigned Mapping Partner shall obtain approval for any variations to this requirement from the FEMA Lead.

[February 2002]

L.2.5.2 Topology

The assigned Mapping Partner shall ensure that vector data files must meet the following data structure requirements:

Guidelines and Specifications for Flood Hazard Mapping Partners

- Digitized linework must be collected at a reasonably fine line weight.
- Only simple linestrings or simple linear elements may be used for all linework.
- Line features must be continuous (no dashes, dots, patterns, or hatching).
- CADD files (e.g., MicroStation DGN files or AutoCAD DWG files) must not contain curves, B-splines, arcs or nested cells.
- CADD files must not contain annotation generated from a database; the annotation must be placed as text. GIS files (e.g. ArcInfo coverages or ArcView Shape files) may contain annotation and/or database attributes.
- Vectors may not cross other vectors within the same theme and all intersecting vectors must end at intersections.
- Area spatial features for a given theme must cover the entire study area without overlaps, under laps or sliver polygons between adjacent polygons.
- Files must be free of discontinuities such as overlapping lines, gaps, "turn backs," dangling lines and duplicate elements.
- Spatial files must not contain any linear or area patterns.
- Gaps or overshoots between features that should close must be eliminated .

Logical consistency describes certain node-line-area relationships internal to the digital data. The Node-line-area relationship requirements that the assigned Mapping Partner must meet include the following:

- Areas will be represented by closed polygons, without overshoots or undershoots.
- Unattributed polygons are not permitted, including "sliver" polygons that result from poor digitizing methods.
- Unnecessary nodes and vertices must be avoided.
- Vertices must be placed conservatively when designing features so that only the minimal number of vertices or nodes is used to create the desired shape with appropriate smoothness (e.g., a straight line will be defined with two nodes only).
- Lines must begin and end at nodes.
- Lines must connect to each other at nodes.
- Lines must not extend through nodes.

[February 2002]

L.2.5.3 Edgematching

The matching of features along the “edge” of a hardcopy map or tiles of digital data is critical in the creation of digital map products. Proper edgematching will ensure that a digital map product can be used as a seamless data layer in a GIS. As edges are digitized, features that cross the edge should snap together to form a seamless feature.

The assigned Mapping Partner shall ensure that all submitted digital data is tied into any existing digital data files so that a seamless transition is effected. The assigned Mapping Partner may produce new digital data to reflect new flood hazard information or to convert effective flood hazard information to digital format depending on the scope of the Flood Map Project. Hardcopy deliverables must reflect both the new digital data and any existing digital data previously prepared by FEMA. If no existing digital floodplain data are available from FEMA, deliverables must reflect the new digital data only. The assigned Mapping Partner must ensure that proper edgematching is performed at each step of the data creation process. If the Mapping Partner digitizes separate hardcopy sheets to produce the draft DFIRM data, the Mapping Partner must check that all features that cross the boundaries between separate sheets are smooth and continuous at the sheet boundaries. Likewise, the Mapping Partner must check that all features crossing jurisdiction boundaries are smooth and continuous at the jurisdiction boundary and that all features at the boundary of the draft DFIRM digital data submitted matches the contiguous information on the existing published FIRMs.

- The following are edgematching problems that the assigned Mapping Partner must avoid:
- **Disconnects.** Disconnects occur when the linework for features does not connect, either by being too short or too long at the source maps’ edge.
- **Jogs:** Jogs occur when a common feature on adjoining maps does not line up seamlessly.
- **Missing Features:** Missing features are those that appear on one source map, but not on the adjacent map. The features may be missing from one map because of a variety of reasons, such as (1) different dates of the two maps; (2) an error in one map; (3) a difference in interpretation by the cartographers of the two maps; (4) differing scales of the two source maps, or (5) adjacent data not available.
- **Different Representation of Features:** Different representation of features occurs when features are represented differently on the source maps. For example, a road is a double line on one, and a single line on the other.

[February 2002]

L.2.5.4 Coincident Features

Coincident features are those that share the same location or boundary, such as a flood zone boundary and a floodwall. These coincident features must superimpose, vertex (shape point) for vertex, within the files. If not automated properly, it could appear that the flood zone ends before

the wall, leaving a strip of land on the waterside of the floodwall that is not in the flood zone. A lack of alignment can cause problems with digital files.

For a new DFIRM, the assigned Mapping Partner shall create coincident features by digitizing the graphic features only once. The assigned Mapping Partner shall create additional copies of coincident features by copying part of the first feature to create the relevant portion of the second, when necessary. This will ensure that the lines match perfectly.

In particular, the following pairs of tables have both area features and line features: S_Fld_Haz_Ln/S_Fld_Haz_Ar, S_Pol_Ln/S_Pol_Ar, and S_PLSS_Ln/S_PLSS_Ar. For these feature datasets, two tables are defined because they have attributes that apply to the entire area and attributes that apply to portions of the boundaries of these areas. However, the spatial elements that make up these features must be identical. All elements in the S_Fld_Haz_Ln table must match exactly with the boundaries of the elements in the S_Fld_Haz_Ar table. The same is true for the other two pairs of tables. For draft DFIRM digital data submitted in a spatial data format that supports both area and line attributes for the same spatial file, the assigned Mapping Partner shall submit a single spatial file with both sets of attributes.

[February 2002]

L.2.5.5 Precise Features

The position of horizontal control features of the DFIRM products will be based on published standards. The assigned Mapping Partner shall not re-digitize these control features, but rather the assigned Mapping Partner shall use the exact coordinates in the published standards. Candidate sources of control points include:

- U.S. Geological Survey 7.5-minute series quadrangle map corner coordinates;
- Coordinate grid; and
- Bench mark coordinates from the National Geodetic Survey or local control network.

[February 2002]

L.2.5.6 Data Compilation

Existing digital data may affect the choice of scale for data compilation. If base mapping is available at a scale greater than 1" = 400' (e.g. 1" = 200') the assigned Mapping Partner may choose to compile and digitize the revised data developed during the Flood Map Project at the base map scale.

FEMA's goal is to develop digital data that are as accurate as possible. In general, the most accurate data source must be relied upon to reference other features compiled onto the map. This may mean that, in some circumstances, floodplain boundary delineations made on very high-resolution topographic maps may appear slightly misplaced on a less accurate base map. However, if the base map meets FEMA standards, these differences should be very small. If application of

this approach creates significant visual problems with the floodplain boundary delineations on the base map selected, the assigned Mapping Partner shall resolve the issue with the FEMA Lead.

Likewise, when high accuracy data are collected for a Flood Map Project, it is FEMA's goal to maintain the accuracy of those data. For example, cross-section line features must correspond as closely as possible to the actual field survey locations. Often, the assigned Mapping Partner must graphically extend or reshape that end of a cross section for satisfactory cartographic display. When this is necessary, the Mapping Partner shall perform it as a graphic operation for hardcopy map production. The Mapping Partner shall not modify the digital spatial data that depict the true locations of the surveyed cross sections.

[February 2002]

L.2.5.7 Digitizing

All features must be digitized in their true positions as line strings or simple linear elements. Digitizing must be performed from stable base materials.

How well the registration control points line up to the map to be digitized is an important measurement when digitizing maps. The measurement of fit is sometimes called the Root Mean Square Error (RMSE). The RMSE value represents the amount of error between original and new coordinate locations calculated by the transformation process. The lower the RMSE, the better the fit. The RMSE must be no more than 0.003 inch.

[February 2002]

L.2.5.8 Base Map and Flood Hazard Data

Base map features are physical features like roads, railroads, rivers, lakes, levees, and bench marks, that map users may rely on to locate an area of interest on the FIRM. Flood hazard data are flood insurance risk zones, Base Flood Elevations (BFEs), cross-section locations, and hydraulic structures that depict the results of flood hazard analyses on the FIRM. Some physical features such as surface water features and hydraulic structures are used in the performance of the flood hazard analysis and may be grouped in either category. Table L-5 presents the features for the base map and the flood hazard data.

Table L-5. Base and Flood Hazard Data Tables

Base Map Tables	Flood Hazard Data Tables
L_Wtr_Nm	L_Comm_Info
S_DOQ_Index	L_Cst_Model
S_Gen_Struct	L_MT1_LOMC
S_Label_Ld	L_Pan_Revis
S_Label_Pt	L_Pol_FHBM
S_Perm_Bmk	L_Riv_Model
S_PLSS_Ar	L_Stn_Start
S_PLSS_Ln	S_BFE
S_Pol_Ar	S_CBRS
S_Pol_Ln	S_Cst_Tsct_Ln
S_Quad	S_FIRM_Pan
S_Trnsport_Ln	S_Fld_Haz_Ar
S_Wtr_Ar	S_Fld_Haz_Ln
S_Wtr_Ln	S_Gen_Struct
	S_LOMR
	S_Riv_Mrk
	S_XS
	Study_Info

The purpose of the base map is to present an accurate depiction of the relationship between the results of the flood hazard analyses and the physical features on the ground. Floodplain boundaries are typically delineated on a topographic map and may be subsequently transferred to the base map. The topographic and base map data may be derived from the same sources. The spatial accuracy of both the topographic and the digital base map is critical to maintaining the accuracy of the floodplain delineations.

The digital base map for a Flood Map Project is to be identified during the Project Scoping phase of the project. The assigned Mapping Partner shall use the digital base map in conjunction with the topographic data when preparing the floodplain boundary delineations. For a complete discussion of base maps, see Appendix K of these Guidelines.

For base map files, layers/levels or attributes are provided below for each data structure option. The Mapping Partner should insure that all Draft DFIRM Data files conform to the specifications below. An exception to this is preexisting base map files for transportation and water features, which may retain their normal structure. More detail is provided in the below table descriptions. The standard table formats included below should be used when new base map data creation is included in the Mapping Partner scope of work. If any data from the Mapping Partner are not in one of the structures below, the data must be separated by layers/levels or by attributes. If the base map data are not structured following one of the data schema listed below, detailed documentation of the data structure must be included.

The files produced by a the Mapping Partner that creates draft digital study/restudy components shall typically cover only the area that is revised as a result of the Flood Map Project.

[February 2002]

L.2.5.9 Computer Assisted Drafting and Design or Geographic Information System Preparation

A GIS database normally contains both spatial features and attribute records in the same file or in tables that can be easily related by the GIS system. A CADD system usually does not manage attribute records associated with each spatial feature as easily. As software evolves, there is less distinction between the two technologies. Users of these two systems still tend to apply these technologies in the traditional way. As a result, it is assumed that fundamentally different approaches will be used based on whether the Mapping Partner submits draft DFIRM data in CADD or GIS format. FEMA prefers to have DFIRM data submitted in GIS format. The CADD option is available for Mapping Partners who are unable to submit data in GIS format.

Mapping Partners that submit digital data in GIS format shall separate the spatial data into individual tables or files for each data theme created (e.g., roads are stored in a separate file from flood zones that are in a separate file from political boundaries). The Mapping Partner may store attribute data in the same GIS file as the associated spatial features, or in a parallel table structure in an RDBMS and linked to the spatial features by the primary key for each table. Both the spatial data and the attribute data must have the same primary key field.

Mapping Partners that submit data in CADD format shall store the spatial data in a single file with each data theme stored on a separate layer/level and identified by a color number within the file. See Subsection L.2.2.4.11 for detailed specifications. Each spatial feature in the CADD file must be attributed or tagged with a primary key that can be linked to the DFIRM attribute data for that feature. The Mapping Partner may store attribute data in the DFIRM table structure in an RDBMS or in individual data files in a standard database or spreadsheet format. Attribute data must be linked to the spatial features by the primary key for each table. Both the spatial data and the attribute data must have the same primary key field.

[February 2002]

L.2.5.10 Table Structure

Each DFIRM database table has a primary key field defined. This field is normally the table name followed by “_ID”. The Mapping Partner that creates the digital data must populate these fields. Normally, the assigned Mapping Partner shall number the features in each table sequentially using this field; however, the assigned Mapping Partner may choose another method provided that the method is logical, documented, consistently implemented, and results in a unique ID value for each spatial feature.

Regardless of whether the draft DFIRM digital data is submitted in CADD or GIS format, the assigned Mapping Partner must submit all of the applicable DFIRM database attribute tables. Attribute data must be linked to the spatial features by the primary key for each table. Both the spatial data and the attribute data must have the same primary key field. The Mapping Partner may choose to follow either the table structure defined in Section L.4 for draft digital data, or the table structure in Section L.7 for Preliminary and Final DFIRM databases. Regardless of the table structure selected, the Mapping Partner shall ensure that the applicable fields use the appropriate values from the associated domain tables and that these values are treated consistently across all tables.

For a field that does not apply, the value must be Null (i.e. the field must be left empty, not set to zero). The Mapping Partner shall use the value zero only when an attribute has the specific value of zero. If a data format does not support null values (e.g. numeric fields in ARC/INFO Coverage format) then a value -9999 shall be used in place of null.

Because of production limitations and with approval from the FEMA Project Officer, the mapping partner may leave some fields blank that would otherwise be required by this specification. In this case, the mapping partner should insert the value “NP” for not populated.

Text fields must follow the capitalization standards that apply to the display of that information on the FIRM.

Date fields in the DFIRM database are stored in the native date format for the data format in which table is distributed. Not all of the database formats used for the DFIRM database support date values in the same way. The time of day is not stored or is set to zero depending on the structure of the date object in a particular data format. Where possible the output format of the date is set to YYYYMMDD.

Guidelines and Specifications for Flood Hazard Mapping Partners

In the detailed table documentation in Sections L.4 and L.7, each field name is followed by a letter code as follows:

- R – Required for all records.
- A – Required if applicable to the described spatial feature.

See Section L.4 for specific requirements for each table for draft digital data submittal.

[February 2002]

L.2.5.11 Spatial Files for Computer Assisted Drafting and Design Format

Mapping Partners that submit data in CADD format shall use the layer/level schema shown in Table L-6. No additional feature categories may be added to any layer/level. This ensures that data will not be miscoded in later processing steps or that time will not be spent separating features. To include feature categories that are not specified in the schema below (e.g., watersheds and sub-basins, land use classifications, building footprints), the Mapping Partner shall submit a second file containing these features and documentation of the layer/level schema.

The main purpose of this schema is to provide a logical separation of data themes by layer/level and color. The assigned Mapping Partner shall name each layer/level following the convention provided in Table L-6. The color numbers in the following schema are also important. The layer/level and color number are used to separate feature types. The actual color used is not important for the digital file. It is important that the correct color number is used. The correct colors, line weights, and other cartographic details for a particular feature on the finished FIRM are specified in Appendix K of these Guidelines. Depending on the software used to create the draft DFIRM digital data, the Mapping Partner that creates the Preliminary or Final DFIRM may be able to provide file templates and other tools to facilitate reproduction of the graphic specifications. Coordination should take place between the Mapping Partners and FEMA shortly after the Project Scoping Meeting. The layer/level and color requirements for CADD submittals of draft digital data are presented in Table L-6. See Appendix K for more detailed descriptions of these features and the Glossary for acronym definitions.

Table L-6. Layer/Level Schema Requirements

DESCRIPTION	LEVEL NUMBER	LEVEL NAME	COLOR
Flooding Elements			
Floodway Boundary	1	floodway	1
Colorado River Floodway	1	floodway	2
Area of Special Consideration	1	floodway	3
1% Flood Boundary	2	100-year	4
0.2% Flood Boundary	3	500-year	5
1%/0.2% Flood Boundary	4	100_500-year	6
1% Flood/Floodway Boundary	5	100_fldway	7
1%/0.2%/Floodway Boundary	6	100_500_fldway	8
Zone D Boundary	7	zoned	9
Zone Break	8	zonebreak	10
Limit of Floodway	9	limitfldway	11
Limit of Study	10	limitstudy	12
Limit of Detailed Study	11	lods	13
End of Spatial Extent	12	endspatial	14
BFE	13	bfe	15
Cross Section	14	xs_transect	16
Transect	14	xs_transect	17
Interpolated BFE	15	intbfe_intrxs	18
Intermediate Cross Section	15	intbfe_intrxs	19
Apparent Limit	16	applimit	20
Floodway Shape/Hatch	17	shapefldway	21
1% Flood Hazard Shapes	18	shape100	22
0.2% Flood Hazard Shapes	19	shape500	23
BFE Text	20	bfetxt	24
Cross Section Hexagon	21	xsectxt	25
Limit of Flooding Text	22	limittxt	26
Zone Text	23	zonetxt	27
Flowage Easement Line	24	flowage	28
State Encroachment Line	24	flowage	29
Hydro Elements			
Perennial River/Stream	25	hydro	30
Intermittent River/Stream	25	hydro	31
Shoreline/Coastline	25	hydro	32
Lake	25	hydro	33
Surface Water	25	hydro	34
Reservoir	25	hydro	35
Profile Base Line	25	hydro	36
Swamp	25	hydro	37
Channel	25	hydro	38
Channel Contains 1% Flood	25	hydro	39
Channel Contains 0.2% Flood	25	hydro	40
Ditch	25	hydro	41
Glacier	25	hydro	42

Guidelines and Specifications for Flood Hazard Mapping Partners

Hatchery	25	hydro	43
Race	25	hydro	44
Wash	25	hydro	45
Waterfall	25	hydro	46
Water Separation Line	25	hydro	47
Bog	25	hydro	48
Retention Pond	25	hydro	49
Tailings Pond	25	hydro	50
PBL	25	hydro	51
Water Feature Text	26	draintxt	52
Landform/Island Text	27	islandtxt	53
1000 Foot Marker & Text	28	rivermk	54
River Mile Marker & Text	28	rivermk	55
Structure Elements			
Weir	29	weir_dam	60
Dam	29	weir_dam	61
Levee	30	levee	62
Culvert	31	culvert	63
Culvert Contains 1% Flood	31	culvert	64
Culvert Contains 0.2% Flood	31	culvert	65
Headwalls/Wing walls	31	culvert	66
Bridges	32	bridge	67
Footbridge	32	bridge	68
Pier	33	other_struct	69
Dock	33	other_struct	70
Jetty	33	other_struct	71
Aqueduct	33	other_struct	72
Dike	33	other_struct	73
Fish Ladder	33	other_struct	74
Flume	33	other_struct	75
Gate	33	other_struct	76
Lock	33	other_struct	77
Penstock	33	other_struct	78
Seawall	33	other_struct	79
Structure Text	34	structxt	80
Cobra/OPA Elements			
Cobra Boundary	35	cobra	90
Otherwise Protected Areas	36	opa	91
Cobra Shapes	37	shapecobra	92
OPA Shapes	38	shapeopa	93
Cobra/OPA Notes	39	cobratxt	94
Political Elements			
Corporate Limits	40	corporate	100
Extraterritorial Boundary	40	corporate	101
Area Not Included	40	corporate	102
County Boundary	41	county	103
State Boundary	42	state_intl	104

Guidelines and Specifications for Flood Hazard Mapping Partners

International Boundary	42	state_intl	105
Political Boundary Text	43	polbdtxt	106
City/Borough/Township Name	44	polareatxt	107
Park Boundary	45	park	108
Forest Boundary	45	park	109
Reservation Boundary	45	park	110
Park/Forest/Reservation Text	46	parktxt	111
Urban Growth Boundary	47	other_juris	112
MUD Boundary	47	other_juris	113
LID Boundary	47	other_juris	114
Transportation Elements			
Primary Roads	48	majorrds	120
Secondary Roads	49	minorrds	121
Trail	50	other_rds	122
Undefined Roads	50	other_rds	123
Road Tunnel	50	other_rds	124
Ford	50	other_rds	125
Road Text	51	roadtxt	126
Route & Highway Symbols	51	roadtxt	127
Railroad	52	railroad	128
Abandoned Railroad	52	railroad	129
Undefined Railroad	52	railroad	130
Dismantled Railroad	52	railroad	131
Railroad Tunnel	52	railroad	132
Railroad Text	53	rrtxt	133
Airport/Landing Strip & Text	54	airport	134
Ferry	54	airport	135
Grid Elements			
FIRM Neatline	55	map_neatlines	140
Quad Neatline	55	map_neatlines	141
Quarter Section Lines	56	plss	142
Range Lines	56	plss	143
Township Lines	56	plss	144
Primary Grid & Labels	57	prigrd	145
Secondary Grid & Labels	58	secgrid	146
DOQ Neatline	63	nonplot	147
Misc Elements			
NGS Bench Marks	59	ngs	150
NGS Bench Mark Text	60	ngstxt	151
Gaging Station	61	gaging	152
Landmark	61	gaging	153
Misc Text & Notes	62	misctxt	154
LOMR Box	63	nonplot	155
Non-Plotted Level	63	nonplot	200+

[February 2002]

L.2.6 Quality Control

Digital files must be structured according to one of the pre-established schemas. This allows easy exchange of data between FEMA and Mapping Partners. Files must be free of duplicated elements and complex linestrings. The data must be horizontally controlled and referenced to the appropriate horizontal and vertical datums. All digitizing must be done carefully and in conformance with FEMA accuracy standards. For these reasons, the assigned Mapping Partner shall perform a thorough quality control (QC) review prior to submitting data to FEMA. FEMA will review the data provided by the Mapping Partner using automated and interactive techniques.

The following items must be included in the QC review of a verification plot to ensure that all deliverables meet minimum quality standards:

- All required features have been included.
- The data are correctly referenced to a State Plane or UTM grid coordinates.
- The correct datum has been used and is clearly indicated.
- All digitized linework is within 0.005 inch of its compiled location if digitizing is performed from a hardcopy manuscript. Plotted linework does not show gaps between plotted lines and compiled lines when plots and compilation manuscripts are overlaid.
- Character of features has been maintained (e.g., straight lines are straight; curves are curved).
- No obvious discontinuities exist (e.g., gaps, overshoots).
- Required labels (text) have been placed.
- All plotted data agree with the flood hazard analyses (e.g., regulatory floodway widths match) and cross-section labeling agrees with the appropriate computer model.
- Deliverable plots meet the requirements specified in Subsection L.2.2.6 for deliverables.
- Feature attributes are correct.
- Pseudo-nodes or shape points have been kept to the minimum required to maintain the correct character of the features.

[February 2002]

L.2.7 Deliverables

A complete draft DFIRM data submittal will include the following mapping items:

- Digital base map files and DFIRM database files;
- Digital Elevation Model (DEM) or Digital Terrain Model (DTM) if used;

Guidelines and Specifications for Flood Hazard Mapping Partners

- Work maps (plots);
- Map index; and
- Metadata file.

After completion of an internal QC review process, the Mapping Partner shall submit materials to FEMA in TSDN format. See Appendix M of these Guidelines for detailed requirements for the TSDN.

[February 2002]

L.2.7.1 Hardcopy Deliverables

Each submittal must include hardcopy copies of the work maps. For details on the format and content for work maps, see Volume 1, Section 1.4 of these Guidelines.

[February 2002]

L.2.7.2 Digital Deliverables

The digital data deliverables must clearly identify the data structure option that was used. To facilitate data processing, the assigned Mapping Partner shall submit Federal Geographic Data Committee (FGDC)-compliant metadata as specified in Subsection L.2.2.7. In addition, Mapping Partner shall completely fill out the checklist presented in Section L.5 and include it with any digital data submitted to FEMA. If Mapping Partner's system output capabilities do not fall within these categories, the Mapping Partner shall obtain approval for an exception to these requirements before submitting digital files to FEMA for review.

Raster Data

Digital orthophoto files may be submitted in Tagged Image File Format (.TIF), Georeferenced TIF (GeoTIF), Band Interleaved by Pixel (.BIP or .BIL), or Joint Photographic Experts Group (JPEG) format. Raster files must be accompanied by a file that provides coordinate information that will allow the images to be georeferenced (e.g., a tfw file).

Vector Data

Mapping Partners may submit vector data in the following file formats:

- ARC/INFO export file – E00;
- ArcView shape file – SHP;
- MicroStation design file – DGN;
- MapInfo interchange format – MIF;
- MapInfo native table format – TAB;
- AutoCAD drawing file – DWG;
- Drawing exchange format – DXF;
- Digital Line Graph – DLG; or
- Spatial Data Transfer Standard – SDTS.

Transfer Media

Mapping Partners must submit files on one of the following electronic media:

- CD-ROM (preferred);
- Zip disk;
- 8mm tape;
- 3 ½” diskette;
- Electronic transfer to File Transfer Protocol (FTP) site; or
- Electronic transfer by E-mail (for files under 2 MB).

As technology changes or in special situations, other media may be acceptable if coordinated with FEMA and the Mapping Partner receiving the data.

If a file compression utility was used, provide the utility to uncompress the files.

File Naming

Wherever possible, the assigned Mapping Partner shall use the table names from the DFIRM database specifications as the file names for draft DFIRM data files with an extension appropriate to the file format.

The draft DFIRM digital data files should be stored in a directory named for the state abbreviation, then named for the county (or county equivalent) or community covered by the FIS. Under each jurisdiction, there should be a separate directory for the standard DFIRM data files, a directory for digital orthophotos, if applicable, and a directory for any enhanced DFIRM database information

Guidelines and Specifications for Flood Hazard Mapping Partners

provided. All the files for each data format are stored together in a subdirectory named for the data format. For example, Montgomery County, Maryland, if submitted in ESRI Shapefile format would be stored as:

\\MD\Montgomery_Co\DFIRM_DB\ArcShape\ - Directory contains all draft DFIRM data files in ESRI Shapefile format.

\\MD\Montgomery_Co\DOQ\ - Directory contains all orthophoto files if used.

\\MD\Montgomery_Co\Document\ - Directory containing metadata and a readme file.

\\MD\Montgomery_Co\Enhanced_DB\ArcShape\ - Directory contains any enhanced DFIRM data files in ESRI Shapefile format.

For a single jurisdiction DFIRM, the structure would be the same, with the jurisdiction name instead of the county name. For example, for Dallas, Texas, the directory structure would begin with:

\\TX\Dallas_City_Of\

Data Identification Requirements

Complete documentation of file names, sizes, and contents is required. All digital media submitted must be labeled with at least the following information:

- Mapping Partner name;
- Community name and state for which the FIS was prepared;
- The date the files were written to the media;
- Details that are necessary to read the media. (e.g., submittals on 8mm tape should include the tape writing format, density and command syntax used); and
- A brief description of contents.

The digital media must clearly identify the data structure used. If any variation from these specifications is used, the assigned Mapping Partner shall submit a comprehensive list of the level or attribute structure of the affected data. This particularly applies to base map data, which may often be in a non-standard data structure. The Mapping Partner also shall provide thorough documentation for these files.

[February 2002]

L.2.8 Metadata

To facilitate the use of these data and the transfer of data files between users, the assigned Mapping Partner shall prepare and submit a metadata file with all digital data submittals. Only one metadata

Guidelines and Specifications for Flood Hazard Mapping Partners

file is required for each Flood Map Project, however, in this one file, the assigned Mapping Partner must distinguish between the different origins of the various datasets included. The Metadata file shall follow the [Content Standard for Digital Geospatial Metadata \(version 2.0\)](#), FGDC-STD-001-1998. Details of this standard are available at www.fgdc.gov. A sample metadata file for draft digital data is presented in Section L.6.

The metadata file must include a description of the source material from which the data were derived and the methods of derivation, including all transformations involved in producing the digital files. The description shall include the dates of the source material and the dates of ancillary information used for update. The date assigned to a source must reflect the date that the information corresponds to the ground. If the assigned Mapping Partner does not know this date, then the Mapping Partner may use a date of publication and indicate as such. Each data source in the metadata file must be assigned a Source Citation Abbreviation as described in Subsection L.2.2.1.

The assigned Mapping Partner shall describe any database created by merging information obtained from distinct sources in sufficient detail to identify the actual source for each element in the file.

Because not all DFIRM database tables are included in every draft DFIRM digital data submittal, the Overview Description Section of the Entity and Attribute Information of the metadata file must include a list of all DFIRM database tables included in the submittal.

An example of a metadata file for draft DFIRM digital data is presented in Section L.6 of this Appendix. Portions of the file that are double underlined typically vary with each Mapping Partner's submittal. In addition, the Mapping Partner should modify or replace any other portions of the metadata file to fully document the data submitted.

[February 2002]

L.3 Preparation of Preliminary and Final Digital Flood Insurance Rate Map Databases

L.3.1 General

FEMA's goal is to distribute consistent GIS versions of the flood hazard information for new DFIRMs. Therefore, Preliminary or Final DFIRM databases created by Mapping Partners must be consistent in file structure and in data format. The Mapping Partner that produces the draft DFIRM digital data must coordinate with the Mapping Partner that produces the Preliminary or Final DFIRM and the Preliminary or Final DFIRM database and ensure that the finished data meet applicable FEMA standards, include horizontal and vertical control, are documented properly, and conform with the standard data structure. The Mapping Partner that produces the Preliminary or Final DFIRM also must ensure that the Preliminary or Final DFIRM database meets FEMA specifications and that it is delivered to the FEMA Map Service Center in the proper formats.

[February 2002]

L.3.2 Coordination

One of the responsibilities of the Mapping Partner that produces the Preliminary or Final DFIRM database is to ensure that the Preliminary or Final DFIRM database is consistent. The Mapping Partner that produces the Preliminary or Final DFIRM database must assist FEMA with coordination of the draft DFIRM digital data submittal. The coordination may occur as part of the Project Scoping Meeting or as a separate meeting immediately afterward. This meeting must serve to coordinate the digital capture of the data and to facilitate the production of a digitally generated FIRM in a timely fashion. Data format is an important consideration to be discussed before data capture, as changing the data format after the fact can be both time consuming and costly.

The Mapping Partner that produces the draft DFIRM digital data shall submit to FEMA a sample of the digital files being prepared when the project is 10-percent complete. The Mapping Partner that produces the Preliminary or Final DFIRM database will assist FEMA to review the data files for any recommended modifications to digital capture procedures to be implemented by the Mapping Partner that produces the draft DFIRM digital data.

[February 2002]

L.3.2.1 Data Sources

As specified in Volume 1, Section 1.3 of these Guidelines, initial research must be performed to avoid duplication of effort. This is especially critical for digitally prepared Fuss because data capture is expensive. Existing digital data should be identified and used whenever possible, while still meeting required specifications and quality of work.

Guidelines and Specifications for Flood Hazard Mapping Partners

It is recommended that as part of the initial coordination effort, the Mapping Partner that produces the draft digital study components identify available digital data and obtain data sets and hardcopy plots as necessary for restudy areas. If the Mapping Partner producing the Preliminary or Final DFIRM finds that data required for Preliminary or Final DFIRM database are missing, additional data research may be required. If the Mapping Partner that produces the draft DFIRM digital data is unable to supply the missing data, potential sources of digital base map or floodplain boundary data include state, county, or local government agencies responsible for GIS and planning or real estate assessment agencies. Digital floodplain data also may be available from FEMA, if the mapping for the area has been converted to digital format.

If the Mapping Partner that produces the draft digital study components uses pre-existing data, the Mapping Partner shall restructure the data to conform with the spatial data and table structure requirements in Section L.7.

As part of data collection, coordination and submittal, the Mapping Partner that produces the draft DFIRM digital data must document the data sources, date of collection or digitizing, scale of digitizing, projections, coordinate systems, horizontal datum, and vertical datum of all digital data used and submitted. For each data source used, the Mapping Partner shall add a Source Citation entry to the DFIRM metadata file in the Lineage section under Data Quality. Within the metadata file, the Mapping Partner shall assign each data source a Source Citation Abbreviation. These abbreviations are presented above in Subsection L.2.2.1 in Table L-4:

The Mapping Partner that produces the draft DFIRM digital data shall number each source citation abbreviation for a distinct data source (e.g., BASE1, BASE2, BASE3). All spatial tables in the standards discussed in Subsection L.3.2.2 have a SOURCE_CIT field. The Mapping Partner that produces the draft DFIRM digital data shall populate the field with the Source Citation Abbreviation from the metadata file that applies to the related spatial feature.

[February 2002]

L.3.3 Standards

The Mapping Partner shall ensure that the Preliminary or Final DFIRM database conforms with the standards listed in this Appendix and Volume 1 and Appendices A, B, K of these Guidelines, as applicable.

[February 2002]

L.3.4 Horizontal and Vertical Control

The preferred projection, coordinate system and horizontal datum for the preliminary or final DFIRM Database spatial data is the UTM projection and coordinate system and referenced to NAD 1983. However, certain preliminary or final DFIRM Databases will be referenced to other projections and coordinate systems if the underlying base map data are orthophotos referenced to another projection and coordinate system. All digital data must be in a State Plane coordinate system and associated projection or the UTM projection and coordinate system. The Mapping Partner shall obtain approval from the FEMA Lead in advance for variations to these two options.

See Appendix A of these Guidelines for a discussion of horizontal datum and Volume 1, Subsection 1.4.2.2 for a discussion of raster base maps in other projections and coordinate systems.

In the event that the county or other jurisdiction being mapped lies in more than one UTM or State Plane Coordinate System zone, the assigned Mapping Partner must project all digital data submitted to the zone that contains the largest portion of the county or jurisdiction in a single zone. The assigned Mapping Partner shall not use multiple projection and coordinate system zones in the Preliminary or Final DFIRM database.

All vertical information must reference either NGVD29 or NAVD88. The assigned Mapping Partner must not mix vertical datums within a submittal. See Appendix B of these Guidelines for details.

[February 2002]

L.3.5 Data Structure

All Preliminary or Final DFIRM data must consistently follow the data structure described in Subsections L.2.3.

[February 2002]

L.3.5.1 Tiling

The assigned Mapping Partner shall submit all digital data in one single file or a series of thematic files that cover the entire geographic area being mapped and not in individual small tiles that cover limited geographic areas. Preliminary or Final DFIRM databases should normally cover an entire county (or county equivalent). In situations where countywide mapping is not practical, the DFIRM database must cover an entire community.

[February 2002]

L.3.5.2 Topology

Vector data files must meet the following data structure requirements:

- Vectors may not cross other vectors within the same theme and all intersecting vectors must end at intersections.
- Area spatial features for a given theme must cover the entire study area without overlaps, underlaps or sliver polygons between adjacent polygons.
- Files must be free of discontinuities such as overlapping lines, gaps, "turn backs," dangling lines and duplicate elements.
- Spatial files must not contain any linear or area patterns.
- Gaps or overshoots between features that should close must be eliminated.

Logical consistency describes certain node-line-area relationships internal to the digital data. Node-line-area relationship requirements include the following:

- Areas must be represented by closed polygons, without overshoots or undershoots.
- Uncoded polygons are not permitted, including “sliver” polygons that result from poor digitizing methods.
- Unnecessary nodes and vertices must be avoided. Vertices must be placed conservatively when designing features so that only the minimal number of vertices or nodes is used to create the desired shape with appropriate smoothness (e.g. a straight line will be defined with two nodes only).
- Lines must begin and end at nodes.
- Lines must connect to each other at nodes.
- Lines must not extend through nodes.

[February 2002]

L.3.5.3 Edgematching

Preliminary or Final DFIRM databases must meet the edgematching requirements described above in Subsection L.2.2.4.3.

[February 2002]

L.3.5.4 Coincident Features

Preliminary or Final DFIRM databases must meet the coincident feature requirements described above in Subsection L.2.2.4.4.

[February 2002]

L.3.5.5 Precise Features

Preliminary or Final DFIRM databases must meet the precise feature requirements described above in Subsection L.2.2.4.5.

[February 2002]

L.3.5.6 Data Compilation

FEMA’s goal is to develop digital data that are as accurate as possible. In general, the most accurate data source must be relied upon to reference other features compiled onto the map. This may mean that, in limited circumstances, floodplain boundary delineations made on very high-

resolution topographic maps may appear slightly misplaced on a less accurate base map. However, if the base map meets FEMA standards, these differences should be very small. If this policy creates significant visual problems with the floodplain boundary delineations on the base map selected, the Mapping Partner shall resolve the issue with the FEMA Lead PO.

Likewise, when high-accuracy data are collected for a Flood Map Project, it is FEMA's goal to maintain the accuracy of those data. For example, cross-section line features must correspond as closely as possible to the actual field survey locations. Often, the Mapping Partner must graphically extend or reshape that end of a cross section for satisfactory cartographic display. When this is necessary, it must be performed as a graphic operation for hardcopy map production. The Mapping Partner will not modify the digital spatial data that depict the true locations of the surveyed cross sections.

[February 2002]

L.3.5.7 Digitizing

Preliminary or Final DFIRM databases must meet the digitizing requirements described above in Subsection L.2.2.4.7.

[February 2002]

L.3.5.8 Base Map and Flood Hazard Data

Base map features are physical features like roads, railroads, rivers, lakes, levees, political boundaries, and bench marks, that map users may rely on to locate an area of interest on the FIRM. Flood hazard data are flood insurance risk zones, BFEs, cross-section locations, and hydraulic structures that depict the results of flood hazard analyses on FIRM. Some physical features such as surface water features and hydraulic structures are used while performing the flood hazard analyses and may be grouped in either category. Table L-7 presents the features of the base map and the flood hazard data.

Table L-7. Base and Flood Hazard Data Tables

Base Map Tables	Flood Hazard Data Tables
L_Wtr_Nm	L_Comm_Info
S_DOQ_Index	L_Cst_Model
S_Gen_Struct	L_MT1_LOMC
S_Label_Ld	L_Pan_Revis
S_Label_Pt	L_Pol_FHBM
S_Perm_Bmk	L_Riv_Model
S_PLSS_Ar	L_Stn_Start
S_PLSS_Ln	S_BFE
S_Pol_Ar	S_CBRS
S_Pol_Ln	S_Cst_Tsct_Ln
S_Quad	S_FIRM_Pan
S_Trnsport_Ln	S_Fld_Haz_Ar
S_Wtr_Ar	S_Fld_Haz_Ln
S_Wtr_Ln	S_Gen_Struct
	S_LOMR
	S_Riv_Mrk
	S_XS
	Study_Info

The purpose of the base map is to present an accurate depiction of the results of the flood hazard analyses in relation to the physical features on the ground. The floodplain boundaries are typically delineated on a topographic map and may be subsequently transferred to the base map. The topographic and base map data may be derived from the same sources. The spatial accuracy of both the topographic and the digital base map is critical to maintaining the accuracy of the floodplain delineations.

The assigned Mapping Partner must ensure that all DFIRM database files conform to the required specifications with the exception of the base map files for transportation and water features. If pre-existing data are used by the Mapping Partner the tables presented in Section L.7, it is not necessary to restructure the files to meet the schema listed. This is discussed in more detail in the description of each of the tables in Section L.7. The data, however, must be structured logically. If the base map data are not structured following the standard data structure, the Mapping Partner must ensure that the tables that vary are documented in the Entity and Attribute section of the metadata file.

[February 2002]

L.3.5.9 Computer Assisted Drafting and Design or Geographic Information System Preparation

Preliminary or Final DFIRM databases must be produced in the standard GIS formats listed below. If the Draft DFIRM data were submitted as CADD format data, it is the responsibility of the

Mapping Partner that produces the Preliminary or Final DFIRM data to convert the data to GIS format.

[February 2002]

L.3.5.10 Table Structure

Mapping Partners must follow the attribute table structure presented in Section L.7. The attribute data must be stored directly in the ESRI Shapefile, ESRI ArcInfo Export File, or MapInfo Interchange Format table along with the associated spatial data. The attribute data must not be in an independent data file or relational database format. Lookup tables must be stored in dbf format, info format, or MIF format.

[February 2002]

L.3.5.11 Spatial Files

Mapping Partners must follow the table structure presented in Section L.7. All tables that begin with S_ are spatial files.

DFIRM database table has a primary key field defined. This field is normally the table name followed by “_ID”. The Mapping Partner that creates the digital data must populate these fields. Normally features in each table will be numbered sequentially using this field, although the Mapping Partner may choose another method provided it is logical, documented, consistently implemented, and results in a unique ID value for each spatial feature.

For a field that does not apply, the value must be Null. The field must be empty. The Mapping Partner shall use the value zero only when an attribute has the specific value of zero. If a data format does not support null values (e.g. numeric fields in ARC/INFO Coverage format) then a value -9999 shall be used in place of null.

Because of production limitations and with approval from the FEMA Project Officer, the mapping partner may leave some fields blank that would otherwise be required by this specification. In this case, the mapping partner should insert the value “NP” for not populated.

Text fields must follow the capitalization standards that apply to the display of that information on the FIRM.

Date fields in the DFIRM database are stored in the native date format for the data format in which table is distributed. Not all of the database formats used for the DFIRM database support date values in the same way. The time of day is not stored or is set to zero depending on the structure of the date object in a particular data format. Where possible the output format of the date is set to YYYYMMDD.

In the table documentation in Section L.7, each field name is followed by a letter code as follows:

- R – Required for all records

- A – Required if applicable to spatial feature described

[February 2002]

L.3.6 Quality Control

The digital files must be structured following the standard DFIRM database schema. This allows easy exchange of these data between FEMA, Mapping Partners, and other flood hazard data users. All duplicated elements must be removed. The data must be horizontally controlled and referenced to the appropriate horizontal and vertical datum. All digitizing must be done carefully and in conformance with FEMA's accuracy standards. The assigned Mapping Partner must perform a thorough QC review before submitting data to FEMA. FEMA will review the data provided by the Mapping Partner using automated and interactive techniques.

The Mapping Partner must provide hardcopies of the Preliminary or Final effective DFIRM along with the DFIRM database for quality control review.

[February 2002]

L.3.7 Deliverables

A complete DFIRM database submittal will be comprised of the following items:

- DFIRM database transmittal form;
- Digital base map files and DFIRM database files in ESRI Shapefile, ESRI ArcInfo Export File, and MapInfo Interchange Format;
- Metadata file as an ASCII text file; and
- Applicable word processing version of the FIS report.

[February 2002]

L.3.7.1 Hardcopy Deliverables

The Mapping Partner must provide a transmittal form with the DFIRM database. The transmittal form shall document the scope of the submittal, including the files submitted, jurisdictions covered, etc.

[February 2002]

L.3.7.2 Digital Deliverables

The digital submittal from the Mapping Partner to FEMA must include the complete DFIRM database in ESRI Shapefile, ESRI ArcInfo Export File, and MapInfo Interchange Format. The

Guidelines and Specifications for Flood Hazard Mapping Partners

submittal also must include the metadata file, a raster version of each FIRM panel, and a PDF version of the FIS report.

When a Mapping Partner produces the Preliminary DFIRM database, only ESRI Shapefile format and a metadata file is required.

Transfer Media

The Mapping Partner must submit files to FEMA on one of the following electronic media:

- CD-ROM (preferred); or
- Electronic transfer to File Transfer Protocol (FTP) site.

As technology changes or in special situations, other media may be acceptable, but must be approved by the FEMA Lead.

File Naming

To name DFIRM Database files, the Mapping Partner must use the table names listed in Section L.7 as the file name with an extension appropriate to the file format.

The Mapping Partner must store the DFIRM database files be stored in a directory named for the state abbreviation, then named for the county (or county equivalent) or community covered by the DFIRM database. Under each jurisdiction, the Mapping Partner shall indicate a separate directory for the standard DFIRM database files, a directory for digital orthophotos, if applicable, and a directory for any enhanced DFIRM database information available. All the files for each data format are stored together in a subdirectory named for the data format. For example, Montgomery County, Maryland, would be stored as:

\\MD\Montgomery_Co\DFIRM_DB\MapInfo\ - Directory contains all DFIRM database files in MapInfo MIF format.

\\MD\Montgomery_Co\DFIRM_DB\ArcShape\ - Directory contains all DFIRM database files in ESRI Shapefile format.

\\MD\Montgomery_Co\DFIRM_DB\ArcExport\ - Directory contains all DFIRM database files in ESRI Export format (if available).

\\MD\Montgomery_Co\DOQ\ - Directory contains all orthophoto files if used.

\\MD\Document\ - Directory containing metadata and a readme file.

\\MD\Montgomery_Co\FIRM\ - Directory contains raster images of FIRM panels.

\\MD\Montgomery_Co\FIS\ - Directory contains PDF version of FIS report.

Guidelines and Specifications for Flood Hazard Mapping Partners

\\MD\Montgomery_Co\Enhanced_DB\MapInfo\ - Directory contains all enhanced DFIRM database files in MapInfo MIF format.

\\MD\Montgomery_Co\Enhanced_DB\ArcShape\ - Directory contains all enhanced DFIRM database files in ESRI Shapefile format.

\\MD\Montgomery_Co\Enhanced_DB\ArcExport\ - Directory contains all enhanced DFIRM database files in ESRI Export format (if available).

For a single jurisdiction DFIRM, the structure would be the same, with the jurisdiction name instead of the county name. For example, for Dallas, Texas, the directory structure would begin with:

\\TX\Dallas_City_Of\

Data Identification Requirements

Complete documentation of file names, sizes, and contents is required. The Mapping Partner shall label all digital media submitted to FEMA with at least the following information:

- Mapping Partner name;
- Community name and state affected by the Flood Map Project;
- Preliminary date or effective date of the DFIRM database; and
- Brief description of contents.

[February 2002]

L.3.8 Metadata

To facilitate the use of these data and the transfer of data files between users, a metadata file shall accompany all digital data submittals. Only one metadata file is required for each Flood Map Project. However, in this file, the assigned Mapping Partner must distinguish between the different origins of the various datasets included. The metadata file shall follow the [Content Standard for Digital Geospatial Metadata \(version 2.0\)](#), FGDC-STD-001-1998. Details of this standard are available at www.fgdc.gov. A sample metadata file for Preliminary and Final DFIRM databases is presented in Section L.8 of this Appendix.

This metadata file must include a description of the source material from which the data were derived and the methods of derivation, including all transformations involved in producing the final digital files. The description must include the dates of the source material and the dates of ancillary information used for update. The date assigned to a source must reflect the date that the information corresponds to the ground. If the Mapping Partner does not know this date, the Mapping Partner may use a date of publication and indicate as such. For each data source in the metadata file, the Mapping Partner shall assign a Source Citation Abbreviation as described under Data Sources in Subsection L.2.2.1.

Guidelines and Specifications for Flood Hazard Mapping Partners

The Mapping Partner shall describe any database created by merging information obtained from distinct sources in sufficient detail to identify the actual source for each element in the file.

Because not all DFIRM Database tables are included in every standard DFIRM database, the Overview Description Section of the Entity and Attribute Information should include a list of all DFIRM Database tables included in the submittal.

An example of a metadata file for a DFIRM database is presented in Section L.8. Portions of the file that are double underlined typically vary with each DFIRM Database. In addition, the Mapping Partner must take care to modify or replace other portions of the metadata file to fully document the DFIRM database.

[February 2002]

L.4 Database Table Structure Requirements for Draft Digital Data

Table: S_BFE

The Base Flood Elevation (BFE) table is required for any digital data where BFE lines will be shown on the corresponding Flood Insurance Rate Map (FIRM). Normally, if there are any riverine AE zones, BFE lines are required.

The S_BFE table contains information about the BFEs within a study area. A spatial file with locational information also corresponds with this data table. BFE lines indicate the rounded whole-foot water-surface elevation of the 1-percent-annual-chance flood.

The spatial elements representing BFE features are lines extending from Special Flood Hazard Area (SFHA) boundary to SFHA boundary. The BFE lines will have no visible gaps or overshoots between the SFHA boundary and the end of the BFE line at the publication scale of the DFIRM. However, the ends of the BFE lines are not necessarily snapped precisely to the SFHA boundary. Each BFE is represented by a single line. While BFE lines are depicted as wavy lines on the hardcopy FIRM, they should be primarily straight lines in the spatial data, although they may bend consistent with procedures described in Volume 1 of these Guidelines.

The S_BFE table contains the following elements:

BFE_LN_ID	R Primary key for table lookup. Assigned by table creator.
ELEV	R Base Flood Elevation. The rounded, whole foot elevation of the 1-percent-annual-chance flood. This is the value of the BFE that is printed next to the BFE line on the FIRM.
UNIT_LID	R Unit Lookup Identification. A code that provides a link to a valid unit of measurement from the D_Units table. This unit indicates the measurement system used for the BFEs. Normally this would be feet.
V_DATM_LID	R Vertical Datum Lookup Identification. A code that provides a link to a valid vertical datum from the D_V_Datum table. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_BFE table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
BFE_LN_ID	Text	11
ELEV	Single	4.2
UNIT_LID	Text	11
V_DATM_LID	Text	11
SOURCE_CIT	Text	11

Table: S_CBRS

This table is only required from Mapping Partners producing Preliminary and Final Digital Flood Insurance Rate Map (DFIRM) databases. This table only applies to coastal areas that have specially protected areas designated by Congress on Coastal Barrier Resources System (CBRS) maps. Authoritative CBRS boundary locations are shown on Fish and Wildlife Service maps. Normally these areas are already shown on existing Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) for the area. CBRS areas have restrictions on insurance coverage after specified dates for new or substantially improved structures. See Appendix K of these Guidelines for more detailed information about CBRS areas.

The S_CBRS table contains information about the CBRS areas within the study area, if applicable. A spatial file with locational information also corresponds with this data table.

The spatial elements representing CBRS features are closed polygons. Each contiguous CBRS area of the same CBRS_TYP and same CBRS_DATE should be a single polygon.

The S_CBRS table contains the following elements.

- CBRS_ID R Primary key for table lookup. Assigned by table creator.
- CBRS_LID R CBRS Lookup Identification. A code that provides a link to a valid CBRS type codes found in the D_CBRS_Typ table. The type code provides details of the types of prohibitions that apply to the area. Normally this would be CBRS area or an Otherwise Protected Area (OPA).
- CBRS_DATE R Legislation Date on which restrictions for the CBRS area began. This should be indicated on the FIRM as a note or with a fill pattern indicated on the legend.
- CBRS_TF R This field is True if the area is a CBRS or an OPA.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_CBRS table.

Name	Type	Size
CBRS_ID	Text	11
CBRS_LID	Text	11
CBRS_DATE	Date/Time	8
CBRS_TF	Text	1
SOURCE_CIT	Text	11

Table: S_Cst_Tsct_Ln

This table is required when the corresponding Flood Insurance Rate Map (FIRM) and/or Flood Insurance Study (FIS) will show coastal transect locations. Normally this is any area with a coastal study.

The S_Cst_Tsct_Ln table contains information about the Coastal Transect Lines within the study area, if applicable. The transect lines indicate the location that was used to provide representative topographic information for the coastal flood models used. A spatial file with locational information also corresponds with this data table.

The spatial elements representing coastal transects are lines generally extending from offshore all the way across the coastal floodplain. Each transect should be represented by a single line feature without the circles on each end shown on the hard copy map. The location and shape of the lines should depict as accurately as possible the position of the transect used.

The S_Cst_Tsct_Ln table contains the following elements.

- TRAN_LN_ID R Primary key for table lookup. Assigned by table creator.
- TRAN_NO R Transect number as shown on FIRM or in FIS. Each transect is normally numbered sequentially.
- CST_MDL_ID A Coastal Model Identification. This field is populated by a linking element to the L_Cst_Model table. The L_Cst_Model table contains detailed information about the coastal models that were used to determine the coastal flood hazard for the area of each individual transect line. This ID field should contain a number that matches the CST_MDL_ID field for a record in the L_Cst_Model. Multiple transects may link to a single record in the L_Cst_Model table. This field is not required for digital conversion of existing FISs. Significant additional research may be required to identify the model that applies for each transect. However, for new coastal studies, this field is required.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Cst_Tsct_Ln table.

Name	Type	Size
TRAN_LN_ID	Text	11
TRAN_NO	Text	4
CST_MDL_ID	Text	11
SOURCE_CIT	Text	11

Table: S_DOQ_Index

This table is required if digital orthophotography was used as the base map for the Flood Insurance Rate Map (FIRM).

The S_DOQ_Index table contains information about the digital orthophotography used as a base map for the study area. A spatial file with locational information also corresponds with this data table.

The spatial elements representing digital orthophotography index features are rectangular polygons. For standard U.S. Geological Survey Digital Orthophoto Quadrangles, polygons should match quarter-quad boundaries (excluding overedge). Otherwise, polygons should match the boundaries of the orthophotography used (excluding overedge if present).

The S_DOQ_Index table contains the following elements.

- DOQ_ID R Primary key for table lookup. Assigned by table creator.

- FILENAME R DOQ Filename. This filename should be assigned by either the digital orthophotography provider or the table creator. The filename should match the filename assigned by the primary distributor of the orthophotography used. This should be the complete filename including the file extension.

- DOQ_DATE R DOQ Date. This is the date that the digital orthophotography was flown.

- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_DOQ_Index table.

Name	Type	Size
DOQ_ID	Text	11
FILENAME	Text	50
DOQ_DATE	Date/Time	8
SOURCE_CIT	Text	1

Table: S_FIRM_Pan

This table is required for all draft Digital Flood Insurance Rate Map (DFIRM) data.

The S_FIRM_Pan table contains information about the Flood Insurance Rate Map (FIRM) panel area. A spatial file with locational information also corresponds with this data table.

The spatial entities representing FIRM panels are polygons. The polygon for the FIRM panel corresponds to the geographic area where effective flood hazard information is depicted on the FIRM panel. Where a portion of the area within the FIRM panel neat line is outside the jurisdiction mapped by the FIRM, the panel boundary in the DFIRM spatial data should follow the boundary of the jurisdiction mapped by this FIRM. So for a single jurisdiction FIRM, the outermost panel boundaries would follow the community boundary. For a countywide FIRM, the outermost panel boundaries would follow the county boundary.

The S_FIRM_Pan table contains the following elements.

FIRM_ID	R Primary key for table lookup. Assigned by table creator.
ST_FIPS	R State FIPS. This is the two-digit code that corresponds to the State Federal Information Processing Standard (FIPS) code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4. These two numbers correspond to the first two digits of the panel number.
PCOMM	R Community or County Identification Number. This is the 3 rd through the 6 th digits of the panel number. For community based maps this corresponds to the Federal Emergency Management Agency (FEMA) Community Identification number. For countywide maps this is the county (or county equivalent) FIPS code with a "C".
PANEL	R Panel Number. This is 7 th through the 10 th digits in the complete panel number. This is assigned by the scale of the map and the position within either the community or county. The panel number scheme is described in detail in Appendix K of these Guidelines.
SUFFIX	R Map Suffix. This is the final digit in the complete panel number. This is a letter suffix at the end of the panel number.
FIRM_PAN	R FIRM Panel Number. This is the complete FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX. This is the 11-digit FIRM panel number that is shown in the title block of the map.
PANEL_LID	R Panel Lookup Identification. A code that provides a link to the D_Panel_Typ table; this field will indicate if the maps are printed or not printed, community based, county wide, or an unmapped community.

Guidelines and Specifications for Flood Hazard Mapping Partners

EFF_DATE	A Effective Date. This is the effective date of the current map revision. This field is not populated until the FIRM effective date is established and the Final FIRM is ready for hardcopy production by FEMA. Then it is required.
SCALE_LID	R Map Scale Lookup Identification. A code that provides a link to a value in the D_Scale table, it is the denominator of the scale of the FIRM.
PNP_Reason	A Panel Not Printed Reason. If the FIRM panel is not printed, this is the reason. This could include 'All Zone X' or other reasons. See Appendix K for a listing of Panel Not Printed reasons that may be used. Only completed if the hardcopy panel is not printed by FEMA.
NW_LAT	R Northwest Latitude. This is the latitude of the northwest corner of the FIRM panel neat line. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to U.S. Geological Survey (USGS) 7.5' quadrangle maps using North American Datum of 1983 (NAD83), or even subdivisions thereof. However this value should reflect the actual latitude if non-standard panel sizes are used.
NW_LONG	R Northwest Longitude. This is the longitude of the northwest corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value should reflect the actual longitude if non-standard panel sizes are used.
SE_LAT	R Southeast Latitude. This is the latitude of the southeast corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However, this value should reflect the actual latitude if non-standard panel sizes are used.
SE_LONG	R Southeast Longitude. This is the longitude of the southeast corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value should reflect the actual longitude if non-standard panel sizes are used.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_FIRM_Pan table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
FIRM_ID	Text	11
ST_FIPS	Text	2
PCOMM	Text	4
PANEL	Text	4
SUFFIX	Text	1
FIRM_PAN	Text	11
PANEL_LID	Text	11
EFF_DATE	Date/Time	8
SCALE_LID	Text	11
PNP_REASON	Text	50
NW_LAT	Text	15
NW_LONG	Text	15
SE_LAT	Text	15
SE_LONG	Text	15
SOURCE_CIT	Text	11

Table: S_Fld_Haz_Ar

This table is required for all draft Digital Flood Insurance Rate Map data.

The S_Fld_Haz_Ar table contains information about the flood hazards within the study area. A spatial file with locational information also corresponds with this data table. These zones are used by the federal Emergency Management Agency (FEMA) to designate the Special Flood Hazard Area (SFHA) and for insurance rating purposes. These data are the flood hazard areas that are or will be depicted on the Flood Insurance Rate Map (FIRM).

The spatial elements representing the flood zones are polygons. The entire area of the jurisdiction(s) mapped by the FIRM should have a corresponding flood zone polygon.

The S_Fld_Haz_Ar table contains the following elements.

FLD_AR_ID	R Primary key for table lookup. Assigned by table creator.
ZONE_LID	R Flood Zone Lookup Identification. This is a code that provides a link to a valid entry from the D_Zone table. This is the flood zone label/abbreviation for the area.
FLDWAY_LID	A Floodway Lookup Identification. This is a code that provides a link to a valid entry from the D_Floodway table. Floodway areas are designated by FEMA and adopted by communities to provide an area that will remain free of development to moderate increases in flood heights due to encroachment on the floodplain. If the corresponding area is not designated as a floodway, this field is null.
SFHA_TF	R Special Flood Hazard Area. If the area is within SFHA this field would be True. This field will be true for any area that is coded for any A or V zone flood areas. It should be false for any X or D zone flood areas.
STATIC_BFE	A Static Base Flood Elevation. For areas of constant Base Flood Elevation (BFE), the BFE value is shown beneath the zone label rather than on a BFE line. In this situation the same BFE applies to the entire polygon. This is normally occurs in lakes or coastal zones. This field is only populated where a static BFE is shown on the FIRM.
V_DATM_LID	A Vertical Datum Lookup Identification. A code that provides a link to a valid vertical datum from the D_V_Datum table. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. This field is only populated if the STATIC_BFE is populated.

Guidelines and Specifications for Flood Hazard Mapping Partners

DEPTH A Depth Value for Zone AO Areas. This is shown beneath the zone label on the FIRM. This field is only populated if a depth is shown on the FIRM.

UNIT_LID A Unit Lookup Identification. A code that provides a link to a valid unit of measurement from the D_Units table. This unit indicates the measurement system used for the BFEs. Normally this would be feet. This field is only populated if the DEPTH or STATIC_BFE field is populated.

VELOCITY A Velocity Measurement. This is shown beneath the zone label on the FIRM for alluvial fan areas (certain Zone AO areas). This value represents the velocity of the flood flow in this area. This field is only populated when a velocity is shown on the FIRM.

VEL_UNITS A Unit of Measurement for the Velocity Attribute. This is shown in the legend where alluvial fans are present. This field is only populated if the VELOCITY field is populated.

AR_REVERT A If the area is Zone AR, this field would hold the zone that the area would revert to if the AR zone were removed. This field is only populated if the corresponding area is Zone AR. Acceptable values for this field are listed in the D_Zone table.

BFE_REVERT A If Zone is Zone AR, this field would hold that static base flood elevation for the reverted zone. This field is populated when Zone equals AR and the reverted zone has a static BFE.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Fld_Haz_Ar table.

Name	Type	Size
FLD_AR_ID	Text	11
ZONE_LID	Text	11
FLDWAY_LID	Text	11
SFHA_TF	Text	1
STATIC_BFE	Single	4.2
V_DATM_LID	Text	11
DEPTH	Single	4.2
UNIT_LID	Text	11
VELOCITY	Single	4.2
VEL_UNITS	Text	20
AR_REVERT	Text	6
BFE_REVERT	Single	4.2
SOURCE_CIT	Text	11

Table: S_Fld_Haz_Ln

This table is required for all draft Digital Flood Insurance Rate Map data.

The S_Fld_Haz_Ln table contains information about the flood hazard line features for the study area. A spatial file with locational information also corresponds with this data table.

The spatial elements representing the boundaries of the flood hazard areas depicted on the Flood Insurance Rate Map (FIRM) are lines.

The S_Fld_Haz_Ln table contains the following elements.

- FLD_LN_ID R Primary key for table lookup. Assigned by table creator.
- LN_LID R Line Lookup Identification. A code that provides a link to a valid entry from the D_Ln_Typ table. These line types describe the flood boundary and may be used to indicate how the feature should be depicted on the hardcopy FIRM.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Fld_Haz_Ln table.

Name	Type	Size
FLD_LN_ID	Text	11
LN_LID	Text	11
SOURCE_CIT	Text	11

Table: S_Gen_Struct

This table is required whenever hydraulic structures are shown in the flood profile. It is also required if levees are shown on the FIRM, channels containing the flooding are shown on the FIRM, or any other structure that impacts the area’s flood risk is shown on the FIRM.

The S_Gen_Struct table contains information about the hydraulic structures within the study area. It should include all structures shown in the flood profiles. In addition, levees, sea walls, channels that contain flooding, and other significant flood control structures shown on the Flood Insurance Rate Map (FIRM) should be included. A spatial file with locational information also corresponds with this data table.

Spatial elements representing general structures are represented by lines. The lines should represent the primary characteristic of the structure. For example, bridges should be represented by the transportation centerline carried by the bridge. Dams should be represented by a line corresponding to the top of the dam. Levees should be represented by a line corresponding to the top of levee. A line corresponding to the centerline of the main barrel should represent a culvert.

The S_Gen_Struct table contains the following elements.

- STRUCT_ID R Primary key for table lookup. Assigned by table creator.
- STRUCT_LID R Structure Type Lookup Identification. A code that provides a link to a valid entry from the D_Struct_Typ table. This table contains entries for most major types of structures that would be found in hydraulic analyses.
- STRUCT_NM A Structure Name. This is the name of the feature and the name that will be shown on the hardcopy FIRM. It is blank if the structure is not named on FIRM and/or the name is unknown.
- WTR_NM R Surface Water Feature Name. This is the formal name of the surface water feature associated with the structure, as it will appear on the hardcopy FIRM.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Gen_Struct table.

Name	Type	Size
STRUCT_ID	Text	11
STRUCT_LID	Text	11
STRUCT_NM	Text	50
WTR_NM_LID	Text	11
SOURCE_CIT	Text	11

Table: S_Label_Ld

This table is required for Digital Flood Insurance Rate Map (DFIRM) data if any label leader lines are shown on the hardcopy FIRM.

The S_Label_Ld table contains information about leader lines that would connect labels to feature locations on base maps. The purpose of this table, along with the S_Label_Pt table is so that the DFIRM database can contain the names of roads and other physical features in or near the Special Flood Hazard Areas regardless of the type or structure of the base map used. A spatial file with locational information also corresponds with this data table.

The spatial entities representing label leaders will be lines.

The S_Label_Ld table contains the following element.

- LEADER_ID R Primary key for table lookup. Assigned by table creator.

- LABEL_LID R Label Type Lookup Identification. A code that provides a link to valid entries from the D_Label_Typ table. This type is a description of the planimetric features to which the labels and leaders are associated. For vector based maps, the labels and leaders will be associated with vector features in S_Trnsport_Ln, S_Wtr_Ar and S_Wtr_Ln. For maps with an ortho-photo base, the labels and leaders will be associated with DOQ water and transportation features. For maps that use both vector features and ortho-photos, all values may apply

Name	Type	Size
LEADER_ID	Text	11
LABEL_LID	Text	11

Table: S_Label_Pt

This table is required for all draft Digital Flood Insurance Rate Map (DFIRM) data.

The S_Label_Pt table contains information for text insertion point locations that would link labels to base map features. The purpose of this table, along with the S_Label_Ld table is so that the DFIRM database can contain the names of roads and other physical features in or near the Special Flood Hazard Areas (SFHAs) regardless of the type or structure of the base map used. A spatial file with locational information also corresponds with this data table.

The spatial entities representing labels are points. The point corresponds to the lower left corner of the label.

The S_Label_Pt table contains the following elements.

LABEL_ID R Primary key for table lookup. Assigned by table creator.

LABEL R Label for map feature.

LABEL_LID R Label Type Lookup Identification. A code that provides a link to valid entries from the D_Label_Typ table. This type is a description of the planimetric features to which the labels and leaders are associated. For vector based maps, the labels and leaders will be associated with vector features in S_Trnsport_Ln, S_Wtr_Ar and S_Wtr_Ln. For maps with an ortho-photo base, the labels and leaders will be associated with DOQ water and transportation features. For maps that use both vector features and ortho-photos, all values may apply.

DEGREES R The degrees of rotation required for the placement of a feature label onto a hard copy Flood Insurance Rate Map panel.

Name	Type	Size
LABEL_ID	Text	11
LABEL	Text	255
LABEL_LID	Text	11
DEGREES	Integer	4

Table: S_LOMR

This table is required when a Mapping Partner incorporates the results of effective Letters of Map Revision (LOMRs) into the draft Digital Flood Insurance Rate Map (DFIRM) data submitted to the Federal Emergency Management Agency (FEMA).

The S_LOMR table contains information about LOMR areas that are incorporated into the Flood Insurance Rate Map (FIRM). This table is planned as a mechanism for DFIRM producers to communicate areas of the DFIRM data that were affected by and updated to reflect the results of LOMRs. It is included in the draft DFIRM data submittal. It is not planned for distribution by FEMA once a complete map revision has incorporated these LOMRs into the effective FIRM panel. Therefore it is not included in the finished DFIRM data. A spatial file with locational information also corresponds with this data table.

The spatial entities representing LOMRs are polygons. The spatial information contains the bounding polygon for each LOMR area.

The S_LOMR table contains the following elements.

- LOMR_ID R Primary key for table lookup. Assigned by table creator.
- EFF_DATE R Effective Date of the LOMR.
- CASE_NO R Case Number. This is the case number of the LOMR that is assigned by FEMA. The case number is used to track the LOMR's supporting documentation. The case number should be entered without hyphens or other separators.
- SCALE_LID R Map Scale. A code that provides a link to a value in the D_Scale table. The linked value will contain the denominator of the effective scale of the LOMR.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_LOMR table.

Name	Type	Size
LOMR_ID	Text	11
EFF_DATE	Date/Time	8
CASE_NO	Text	13
SCALE_LID	Text	11
SOURCE_CIT	Text	11

Table: S_Perm_Bmk

This table is required unless there are no National Geodetic Survey (NGS) or other bench marks that meet the minimum standard in the jurisdiction covered by the Flood Insurance Rate Map (FIRM).

The S_Perm_Bmk table contains information about Permanent Bench Marks that are associated with the study area. The bench marks shown in this file must meet the requirements specified in Subsection 1.4.1.4.1 of these Guidelines. A spatial file with locational information also corresponds with this data table.

The spatial entities representing bench marks are points. Generally, these points should be placed based on the coordinates in the NGS database. However, the horizontal coordinates maintained by the NGS for vertical bench marks are often not very precise because the users rely on the location descriptions to locate the bench marks. If the source of the horizontal coordinates used by the NGS is not precise, the data creator may adjust the position based on more accurate data.

The S_Perm_Bmk table contains the following elements.

- BM_ID R Primary key for table lookup. Assigned by table creator.
- PID R Permanent Identifier. This should be the NGS assigned or community assigned permanent identifier. It must be unique for each benchmark.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Perm_Bmk table.

Name	Type	Size
BM_ID	Text	11
PID	Text	11
SOURCE_CIT	Text	11

Table: S_PLSS_Ar

This table is required when U. S. Public Land Survey System (PLSS) areas are shown on the Flood Insurance Rate Map.

The S_PLSS_Ar table contains information about the PLSS areas that are associated within the study area. These include the attributes for the range, township, and section areas. A spatial file with locational information also corresponds with this data table.

The spatial elements representing the PLSS areas are polygons. Generally there is one polygon per section. The PLSS areas should cover the entire jurisdiction where sections are defined. The S_PLSS_Ar table contains the following elements.

- PLSS_AR_ID R Primary key for table lookup. Assigned by table creator.

- RANGE A Range Number. This is the range number assigned to the PLSS area shown. This attribute would also include the designation of E (east) or W (west) as part of the data. For example, 21W would be an acceptable value. This field is applicable whenever the SECT_NO does not equal zero.

- TWP A Township. This is the township number assigned to the PLSS area shown. This attribute would also include the designation of N (north) or S (south) as part of the data. For example, 14S would be an acceptable value. This field is applicable whenever the SECT_NO does not equal zero.

- SECT_NO R Section. This is the section number assigned to the PLSS area shown. Where no section number is defined, such as open water, the section number should be zero.

- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_PLSS_Ar table.

Name	Type	Size
PLSS_AR_ID	Text	11
RANGE	Text	8
TWP	Text	8
SECT_NO	Text	4
SOURCE_CIT	Text	11

Table: S_PLSS_Ln

This table is required when U.S. Public Land Survey System (PLSS) areas are shown on the Flood Insurance Rate Map (FIRM).

The S_PLSS_Ln table contains information about the boundary lines for the PLSS that is associated with the study area, if applicable. This would include the attributes for the adjacent range and township areas. A spatial file with locational information also corresponds with this data table.

The spatial entities representing PLSS boundaries are lines.

The S_PLSS_Ln table contains the following elements.

PLSS_LN_ID	R Primary key for table lookup. Assigned by table creator.
LN_LID	R Line Lookup Identification. A code that provides a link to a valid entry from the D_Ln_Typ table. These line types describe the PLSS boundaries and may be used to indicate how the feature should be depicted on the hardcopy FIRM.
E_RANGE	A East Range Number. This is the range number assigned to the PLSS area shown to the east of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of E (east) or W (west) as part of the data. For example, 21W would be an acceptable value. Only populated for lines that divide one range from another.
W_RANGE	A West Range Number. This is the range number assigned to the PLSS area shown to the west of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of E (east) or W (west) as part of the data. For example, 21W would be an acceptable value. Only populated for lines that divide one range from another.
N_TWP	A North Township. This is the township number assigned to the PLSS area shown to the north of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of N (north) or S (south) as part of the data. For example, 14S would be an acceptable value. Only populated for lines that divide one township from another.
S_TWP	A South Township. This is the township number assigned to the PLSS area shown to the south of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of N (north) or S (south) as part of the data. For example, 14S would be an

Guidelines and Specifications for Flood Hazard Mapping Partners

acceptable value. Only populated for lines that divide one township from another.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_PLSS_Ln table.

Name	Type	Size
PLSS_LN_ID	Text	11
LN_LID	Text	11
E_RANGE	Text	8
W_RANGE	Text	8
N_TWP	Text	8
S_TWP	Text	8
SOURCE_CIT	Text	11

Table: S_Pol_Ar

This table is required for all draft Digital Flood Insurance Rate Map data.

The S_Pol_Ar table contains information about the Political Areas within the study area. This would include the attributes for the political areas and other areas such as forests, parks, military lands, and Native American lands. For the National Flood Insurance Program (NFIP), it is important to know the jurisdiction that has land use authority over an area. Political jurisdictions individually agree to participate in the NFIP and availability of insurance, floodplain regulations, and insurance rates may vary by political jurisdiction. The political jurisdiction assigned to each area corresponds to the jurisdiction responsible for NFIP and floodplain management for that area. A spatial file with locational information also corresponds with this data table.

The spatial entities representing political areas are polygons.

The S_Pol_Ar table contains the following elements.

POL_AR_ID	R Primary key for table lookup. Assigned by table creator.
POL_Name1	R Political Area Name 1. This is the primary name of the area shown. For areas that have more than one name, this would be the primary name with subsequent names shown in fields below. This would correspond to the official name of this jurisdiction used by the Federal Emergency Management Agency (FEMA) within the NFIP. For unincorporated areas of a county, this should be the county name (e.g., Montgomery County).
POL_Name2	A Political Area Name 2. This is the secondary name of the area shown. Populated if there is a common name for an area other than the official jurisdiction name.
CO_FIPS	R County FIPS Code. This is the three-digit county Federal Information Processing Standard (FIPS) code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4.
ST_FIPS	R State FIPS. This is the two-digit code that corresponds to the state FIPS code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4. These two numbers correspond to the first two digits of the panel number.
COMM_NO	R Community identification number. This is the four-digit number assigned by FEMA to each community for tracking purposes under the NFIP. On newer Flood Insurance Rate Maps (FIRMs) the state FIPS and the Community Identification Number (CID) appear below the community name where it is shown in the body of the map. For single jurisdiction FIRMs, this is the 3 rd through the 6 th digits of the panel number. This number can be obtained from the community status book that can be viewed at www.fema.gov/msc .

Guidelines and Specifications for Flood Hazard Mapping Partners

CID R Community Number. This is the six-digit community number assigned by FEMA. It is created by combining the state FIPS code with the CID.

ANI_TF R Area Not Included True/False. This is a true/false field that contains information about the geographical area to determine if it is included in the FIRM or not. Areas Not Included fall within the extent of the map, but no flood risk information is shown on the FIRM. This is either because the area is mapped on another FEMA map or because the area is not mapped at all by FEMA.

COM_NFO_ID A Community Information Identification. This attribute links to the table L_Comm_Info that contains information about the specific community. This table should contain a number that matches a corresponding number in the COM_NFO_ID field of the L_Comm_Info table. This field is populated for any jurisdiction that has a CID number issued by FEMA.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Pol_Ar table.

Name	Type	Size
POL_AR_ID	Text	11
POL_NAME1	Text	50
POL_NAME2	Text	50
CO_FIPS	Text	3
ST_FIPS	Text	2
CID	Text	4
COMM_NO	Text	6
ANI_TF	Text	1
COM_NFO_ID	Text	11
SOURCE_CIT	Text	11

Table: S_Pol_Ln

This table is required for all draft Digital Flood Insurance Rate Map data.

The S_Pol_Ln table contains information about the boundaries of Political Areas within the study area. This would include the attributes for the political areas and other areas such as forests, parks, military lands, and Native American lands. A spatial file with locational information also corresponds with this data table.

The spatial elements representing the boundaries of the political jurisdictions depicted on the Flood Insurance Rate Map (FIRM) are lines.

The S_Pol_Ln table contains the following elements.

POL_LN_ID R Primary key for table lookup. Assigned by table creator.

LN_LID R Line Lookup Identification. A code that provides a link to a valid entry from the D_Ln_Typ table. These line types describe the jurisdictional boundary and can be used to indicate how the feature should be depicted on the hardcopy FIRM.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Pol_Ln table.

Name	Type	Size
POL_LN_ID	Text	11
LN_LID	Text	11
SOURCE_CIT	Text	11

Table: S_Quad

This table is required for all draft Digital Flood Insurance Rate Map data.

The S_Quad table contains information about the US Geological Survey (USGS) 7.5-Minute Series Topographic Quadrangle maps that cover the study area. While USGS 7.5-minute quadrangles do not meet the Federal Emergency Management Agency (FEMA) digital base map standards, they are often useful as a supplementary reference source. The quadrangle information is provided as a convenience to users who may want to cross-reference this map series. A spatial file with locational information also corresponds with this data table.

The spatial entities representing the USGS quadrangles are polygons. Each polygon corresponds to the neatline of a USGS map.

The S_Quad table contains the following elements.

QUAD_ID	R Primary key for table lookup. Assigned by table creator.
QUAD_NO	R Quad Number. This is the eight-digit USGS alphanumeric quadrangle identifier. The list of values for each state is published by USGS in the State Indexes to Topographic and Other Map Coverage. This item is composed of three components: the latitude, rounded down to the nearest whole degree, of the 7.5-minute quadrangle map sheet; the longitude, rounded down to the nearest whole degree, of the 7.5-minute quadrangle map sheet; and the alphanumeric map sheet identifier used by USGS (i.e., A1 through H8).
QUAD_NM	R Quad Name. This is the name of the quad that is assigned by USGS.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for S_Quad table.

Name	Type	Size
QUAD_ID	Text	11
QUAD_NO	Text	8
QUAD_NM	Text	50
SOURCE_CIT	Text	11

Table: S_Riv_Mrk

This table is required if the Flood Insurance Rate Map (FIRM) shows river distance marks.

The S_Riv_Mrk table contains information about the River Marks shown on the hardcopy FIRM if applicable. A spatial file with locational information also corresponds with this data table.

The spatial entities representing the river marks are points. The points are generally located along side of the river at regular intervals.

The S_Riv_Mrk table contains the following elements.

- RIV_MRK_ID R Primary key for table lookup. Assigned by table creator.
- START_ID R Start Identification. A code that provides a link to a point in the L_Stn_Start table at which the river mark distances start.
- RIV_MRK_NO R River Mark Number. This attribute usually represents the distance from a known point (identified by START_ID), such as the confluence with another river, to the current river mark. This is the value shown next to the river mark on the FIRM.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Riv_Mrk table.

Name	Type	Size
RIV_MRK_ID	Text	11
START_ID	Text	11
RIV_MRK_NO	Text	6
SOURCE_CIT	Text	11

Table: S_Trnsport_Ln

This table or an equivalent that is fully documented is required for all Digital Flood Insurance Rate Map databases that use a vector base map rather than orthophotos for the base map.

The S_Trnsport_Ln table contains information about the linear base map transportation features such as roads, railroads, and airports. A spatial file with locational information also corresponds with this data table.

The spatial entities representing linear transportation features are normally lines. However, if the available transportation data depict roads as polygons, this is acceptable also. In general, the transportation table structure is fairly flexible depending on the format of the data available for the map. The Federal Emergency Management Agency's (FEMA's) objective is to have spatially accurate base map data to which the flood hazard information is referenced. Users must be able to identify the names of roads, railroads and other major features in or near the Special Flood Hazard Areas (SFHAs). If these objectives are met, then almost any file structure is acceptable. Road centerlines or edge of pavement files are both acceptable, provided that they meet the FEMA base map standard. With some data structures, it may not be practical to assign feature names or other attributes to each spatial entity. While these attributes are desirable, FEMA recognizes that they may not always be easily available. This is acceptable because the S_Label_Pt and S_Label_Ld tables will identify the names of all of the important features in or near the SFHA.

The S_Trnsport_Ln table contains the following elements.

TRANS_ID	R Primary key for table lookup. Assigned by table creator.
TRANS_LID	R Transportation Lookup Identification. A code that provides a link to valid entries from the D_Trans_Typ table. These line types indicate how the feature should be depicted on the hardcopy Flood Insurance Rate Map.
RD_S_LID	R Road Status Lookup Identification. A code that provides a link to valid entries in the D_Rd_Stat table.
PREFIX	A Prefix of the Feature Name. Not all features will have an entry in this attribute. Valid entries might include N for a transportation feature named N Main Street.
FEAT_NM1	R Feature Name 1. This is the primary name of the feature. For areas that have more than one name, this would be the primary name with subsequent names shown in fields below.
NM_TYP	R Name Type. Transportation feature name type. Valid entries include items such as road, street, or avenue. Acceptable values for this field are listed in the D_Nm_Typ table.

Guidelines and Specifications for Flood Hazard Mapping Partners

- SUFFIX A Suffix of the Feature Name. Not all features will have an entry in this attribute. Valid entries might include NW for a transportation feature named Main Street NW.
- FEAT_NM2 A Feature Name 2. This is the secondary name of the feature.
- FEAT_NM3 A Feature Name 3. This is the tertiary name of the feature.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Trnsport_Ln table.

Name	Type	Size
TRANS_ID	Text	11
TRANS_LID	Text	11
RD_S_LID	Text	11
PREFIX	Text	50
FEAT_NM1	Text	100
NM_LID	Text	11
SUFFIX	Text	50
FEAT_NM2	Text	100
FEAT_NM3	Text	100
SOURCE_CIT	Text	11

Table: S_Wtr_Ar

This table is required for any Digital Flood Insurance Rate Map (DFIRM) database where vector surface water features are shown on the Flood Insurance Rate Map and some of these features are represented as polygons in the spatial data. Vector streams should always be shown with a vector base map. They may also be shown on orthophoto base maps.

The S_Wtr_Ar table contains information about surface water area features. A spatial file with locational information also corresponds with this data table.

The spatial elements representing surface water area features are polygons. Normally lakes, ponds and streams wide enough to show both channel banks will be represented as polygons. However, the main purpose of the S_Wtr_Ar table and the S_Wtr_Ln table are to provide a cartographic depiction of the surface water features for visual interpretation of the mapping data. As a result, the method for structuring surface water features as lines or polygons is very flexible. Surface water features may appear in either the S_Wtr_Ar table or the S_Wtr_Ln table or both. However, features that appear in both must match exactly. The hydrologic structure of the stream network will be represented by tables in the Enhanced DFIRM Database.

In general, the surface water table structure is fairly flexible depending on the format of the data available for the map. The Federal Emergency Management Agency's (FEMA's) objective is to have spatially accurate surface water feature data to which the flood hazard information is referenced. Users must be able to identify the names of flooding sources and other important surface water features. If these objectives are met, then almost any file structure is acceptable. Streams, rivers and lakes may be represented as either polygons or lines. With some data structures, it may not be practical to assign feature names or other attributes to each spatial entity. While these attributes are desirable, FEMA recognizes that they may not always be easily available. This is acceptable because the S_Label_Pt and S_Label_Ld tables will identify the names of flooding sources and other important surface water features.

The S_Wtr_Ar table contains the following elements.

WTR_AR_ID	R Primary key for table lookup. Assigned by table creator.
WATER_LID	R Surface Water Feature Lookup Identification. A code that provides a link to valid entries from the D_Wtr_Typ table. This type value describes the classification of the surface water feature. Valid entries include items such as lake, retention pond, and reservoir.
WTR_NM_LID	R Surface Water Name Lookup Identification. A code that provides a link to the name of the surface water feature. The surface water feature name is taken from the table L_Wtr_Nm. This is a lookup table that is populated by the creator of the database.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Wtr_Ar table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
WTR_AR_ID	Text	11
WATER_LID	Text	11
WTR_NM_LID	Text	11
SOURCE_CIT	Text	11

Table: S_Wtr_Ln

This table is required for any Digital Flood Insurance Rate Map (DFIRM) database where vector surface water features are shown on the Flood Insurance Rate Map and some of these features are represented as lines in the spatial data. Vector streams should always be shown with a vector base map. They may also be shown on orthophoto base maps.

The S_Wtr_Ln table contains information about surface water linear features. A spatial file with locational information also corresponds with this data table.

The spatial elements representing surface water line features are lines. Normally stream centerlines will be represented as line features. However, the main purpose of the S_Wtr_Ar table and the S_Wtr_Ln table are to provide a cartographic depiction of the surface water features for visual interpretation of the mapping data. As a result, the method for structuring surface water features as lines or polygons is very flexible. Lake shorelines and stream channel banks used to show lakes and wide rivers are usually represented as polygons. However, they may be represented as lines based on the structure of the data received and the Mapping Partner's discretion. Surface water features may appear in either the S_Wtr_Ar table or the S_Wtr_Ln table or both. However, features that appear in both must match exactly. The hydrologic structure of the stream network will be represented by tables in the Enhanced DFIRM Database.

In general, the surface water table structure is fairly flexible depending on the format of the data available for the map. The Federal Emergency Management Agency's (FEMA's) objective is to have spatially accurate surface water feature data to which the flood hazard information is referenced. Users must be able to identify the names flooding sources and other important surface water features. If these objectives are met, then most any file structure is acceptable. Streams, rivers and lakes may be represented as polygons or lines. With some data structures, it may not be practical to assign feature names or other attributes to each spatial entity. While these attributes are desirable, FEMA recognizes that they may not always be easily available. This is acceptable because the S_Label_Pt and S_Label_Ld tables will identify the names of flooding sources and other important surface water features.

The S_Wtr_Ln table contains the following elements.

WTR_LN_ID	R Primary key for table lookup. Assigned by table creator.
WATER_LID	R Surface Water Feature Lookup Identification. A code that provides a link to valid entries from the D_Wtr_Typ table. The type value describes the kind of watercourse represented. Valid entries include items such as stream/river, channel, and shoreline/coastline.
CHAN_LID	R Channel Lookup Identification. A code that provides a link to valid entries from the D_Chan_Rep table. This channel type value indicates whether a linear water feature is represented as a stream centerline or represented as channel bank locations. Valid entries include single or double.

Guidelines and Specifications for Flood Hazard Mapping Partners

WTR_NM_LID R Water Name Lookup Identification. A code that provides a link to the name of the water feature. The water feature name is taken from the table L_Wtr_Nm. This is a lookup table that is populated by the creator of the database.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Wtr_Ln table.

Name	Type	Size
WTR_LN_ID	Text	11
WATER_LID	Text	11
CHAN_LID	Text	11
WTR_NM_LID	Text	11
SOURCE_CIT	Text	11

Table: S_XS

This table is required for any Digital Flood Insurance Rate Map database where cross sections are shown on the Flood Insurance Rate Map (FIRM). Normally any FIRM that has associated flood profiles has cross sections.

The S_XS table contains information about Cross Section lines. A spatial file with locational information also corresponds with this data table. These lines represent the locations of channel surveys performed for input into the hydraulic model used to calculate flood elevations. These locations are also shown on the Flood Profiles in the Flood Insurance Study (FIS) report and can be used to cross reference the Flood Profiles to the planimetric depiction of the flood hazards.

The spatial elements representing cross sections are lines generally extending from outside the floodplain, across the entire floodplain and out the other side. Each cross section should be represented by a single line feature without the hexagons shown on each end on the hardcopy map. The location and shape of the lines should depict as accurately as possible the position of the cross section used.

The S_XS table contains the following elements.

XS_LN_ID	R Primary key for table lookup. Assigned by table creator.
XS_LTR	A Cross-Section Letter. The letter that is assigned to the cross section on the hardcopy FIRM and in the FIS report. This attribute is blank if the cross section is not shown on the FIRM. For a digital conversion, only cross sections that are shown on the FIRM will be available.
XS_NO	A Cross-Section Number. This attribute is used for all cross sections that are created during the engineering analysis. This should be populated with the number sequence that the Mapping Partner who performs the engineering analysis uses. Each cross section should have a unique number. This attribute is not filled in for digital conversions.
START_ID	R Start Identification. This is a link to the station start table. The station start describes the origin for the measurements in the STREAM_STN field. This field should contain a number that links to a unique value in the START_ID field in the L_Stn_Start table.
STREAM_STN	R Stream Station. This is the measurement along the stream to the cross-section location. Normally this information is available in the Floodway Data table in the FIS report.
XS_LN_TYP	R Cross-Section Line Type. This attribute should contain 'LETTERED' for cross sections that are shown on the hardcopy FIRM. If the cross section will not be shown on the hardcopy FIRM, this attribute should contain 'NOT LETTERED' to indicate that the cross section is part of the backup data for the study, but is not shown on the FIRM.

Guidelines and Specifications for Flood Hazard Mapping Partners

WTR_NM_LID R Surface Water Feature Name Lookup Identification. A code that provides a link to the name of the water feature associated with the cross section. The water feature name is taken from the table L_Wtr_Nm. This is a lookup table that is populated by the creator of the database.

WSEL_100 R Water-Surface Elevation for the 1-Percent-Annual-Chance Flood Event. This is the precise elevation of the base flood calculated at this cross section. This elevation exactly matches the elevation of the base flood in the Flood Profiles and the Floodway Data table. This number is determined during the engineering analysis for the study. This value should match the regulatory column in the Floodway Data table in the FIS report or the elevation from the corresponding flood profile if no Floodway Data table is published.

RIV_MDL_ID A River Model Identification. A code that provides a link to the riverine model table, L_Riv_Model. The L_Riv_Model table will identify the hydrologic and hydraulic models used to calculate the flood hazard at this cross section line. This ID field should contain a number that matches the RIV_MDL_ID field for a record in the L_Riv_Model table. The L_Riv_Model table documents model information for this cross section. Multiple cross sections may link to a single record in the L_Riv_Model table. This field is not required for digital conversion of existing FISs. Significant additional research may be required to identify the model that applies at a cross section. However, for new FISs, this field is required. .

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_XS table. Table:

Name	Type	Size
XS_LN_ID	Text	11
XS_LTR	Text	12
XS_NO	Text	12
START_ID	Text	11
STREAM_STN	Text	12
XS_LN_TYP	Text	20
WTR_NM_LID	Text	11
WSEL_100	Single	4.2
RIV_MDL_ID	Text	11
SOURCE_CIT	Text	11

Table: Study_Info

This table is required for all draft Digital Flood Insurance Rate Map data.

The Study_Info table contains details about the study such as the study name, datum, projection, etc. There is normally only one record in this table for each Flood Insurance Rate Map (FIRM).

The Study_Info table contains the following elements.

STD_NFO_ID	R Primary key for table lookup. Assigned by table creator.
STUDY_PRE	R Study Prefix. This is the prefix of the study name such as 'City of' or 'Town of'.
STUDY_NM	R Study Name. This attribute contains the main portion of the study name, which is shown in the title block of the hardcopy FIRM. For county-wide FIRMs, or FIRMs for the unincorporated portions of counties, the name should include the county or county equivalent descriptor (e.g. Washington County or Iberia Parish).
STATE_NM	R State Name. This attribute contains the state name for the study and is shown in the title block of the hardcopy FIRM.
CNTY_NM	R County Name. This is the county (or county equivalent) name that the study falls within. The name should include the county or county equivalent descriptor (e.g. Washington County or Iberia Parish). The county name is also shown in the title block section of the hardcopy FIRM.
JURIS_TYP	R Political Jurisdiction Type. This attribute contains entries such as 'Unincorporated Areas' or 'All Jurisdictions' or 'and Incorporated Areas' or it is left empty. If there are data in this attribute, it is also shown in the title block section of the hardcopy FIRM.
LG_PAN_NO	R Largest Panel Number. This is the highest panel number shown on the FIRM Index for the area mapped. This number is shown in the title block section of the hardcopy FIRM.
OPP_TF	R Only Panel Printed. This is a true/false field that is True only if the study has only one printed panel.
H_DATUM	R Horizontal Datum. Valid entries for this attribute include North American Datum of 1927 or North American Datum of 1983 (NAD83). This is the horizontal datum used for the printed FIRM. The horizontal datum describes the reference system on which the horizontal coordinate

Guidelines and Specifications for Flood Hazard Mapping Partners

information shown on the FIRM is based. NAD83 is the preferred horizontal datum.

V_DATM_LID	R Vertical datum Lookup Identification. A code that provides a link to valid vertical datum from the D_V_Datum table. This is the vertical datum of the printed FIRM. The vertical datum describes the reference surface from which elevation on the map is measured. Normally, this would be North American Vertical Datum of 1988 for new studies.
PROJECTION	R Map Projection used for hardcopy FIRM publication. The preferred projection is Universal Transverse Mercator (UTM). If a State Plane coordinate system and associated projection is used, this field should include the name of the projection, the state and the zone (e.g., Lambert Conformal Conic, Virginia North Zone).
PROJ_ZONE	A Projection Zone. When using many map projections and coordinate systems, there is a zone associated with the area. This field is populated based on the projection selected for the Final hardcopy map production. Applies if the projection used has a zone parameter such as UTM or state plane. The zone should be stated as the appropriate Federal Information Processing Standard zone or FIPSZONE.
CW_TF	R Countywide, true/false. This attribute is true if the hardcopy FIRM includes all incorporated areas and any unincorporated areas of the county.
CBRS_PHONE	A Coastal Barrier Resources System (CBRS) Phone number. This is the phone number for the contact person/office for the CBRS legislative area. Applies if the FIRM contains CBRS areas. Enter the phone number as a ten-digit numeric string without hyphens, parentheses or other separators.
CBRS_REG	A CBRS Coordinator's region. This attribute contains the Fish and Wildlife Service (FWS) region within which the FIRM is located. Applies if the FIRM contains CBRS areas.
RTROFT_TF	R Retrofit, True/False. The Retrofit attribute should be True if older study data is used with updated stream location data. If flood features were adjusted to fit new stream locations due to better base map information this attribute would be true.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
STD_NFO_ID	Text	11
STUDY_PRE	Text	20
STUDY_NM	Text	50
STATE_NM	Text	50
CNTY_NM	Text	50
JURIS_TYP	Text	50
LG_PAN_NO	Text	4
OPP_TF	Text	1
H_DATUM	Text	10
V_DATM_LID	Text	11
PROJECTION	Text	50
PROJ_ZONE	Text	4
CW_TF	Text	1
CBRS_PHONE	Text	15
CBRS_REG	Text	1
RTROFT_TF	Text	1

Table: L_Comm_Info

This table is required for all draft Digital Flood Insurance Rate Map data.

The L_Comm_Info table is a lookup table that contains community map repository details and map history information that is shown on the Flood Insurance Rate Map (FIRM) legend or index. There is normally one record in this table for each community mapped on the FIRM.

The L_Comm_Info table contains the following elements.

COM_NFO_ID	R Primary key for table lookup that links to the S_Pol_Ar table. Values in this field should match the values COM_NFO_ID field of the S_Pol_Ar table.
REPOS_ADR1	R First line of the mailing or street address for the map repository. The map repository is the office the community has designated as responsible for maintaining copies of all the flood hazard information the Federal Emergency Management Agency (FEMA) publishes for the community. The public may view copies of the current effective information at the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read ‘Division of Community and Economic Development’.
REPOS_ADR2	R Second line of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read ‘226 W. Fourth Street’.
REPOS_ADR3	A Third line of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read ‘Suite 200’. Populated if address requires additional space.
REPOS_CITY	R City portion of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read ‘Springfield’.
REPOS_ST	R State portion of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read ‘IL’.
REPOS_ZIP	R ZIP Code portion of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read ‘62269’.
IN_ID_DAT	R Initial identification date for the community as shown on the FIRM legend, index, or Flood Insurance Study (FIS) report. This information can also be obtained from FEMA.

Guidelines and Specifications for Flood Hazard Mapping Partners

IN_NFIP_DT R Initial date of the first National Flood Insurance Program map published by FEMA for this community. This can be obtained from the FIRM legend, index, or FIS report. This information can also be obtained from FEMA.

IN_FRM_DAT R Initial date FIRM was created. This can be obtained from the FIRM legend, index, or FIS report. This information can also be obtained from FEMA.

RECENT_DAT A Most recent panel date. This can be obtained from the FIRM Index or the FEMA Community Status book at www.fema.gov/msc. This field is only populated for final DFIRM Databases.

Name	Type	Size
COM_NFO_ID	Text	11
REPOS_ADR1	Text	50
REPOS_ADR2	Text	50
REPOS_ADR3	Text	50
REPOS_CITY	Text	50
REPOS_ST	Text	50
REPOS_ZIP	Text	9
IN_ID_DAT	Date/Time	8
IN_NFIP_DT	Date/Time	8
IN_FRM_DAT	Date/Time	8
RECENT_DAT	Date/Time	8

Table: L_Cst_Model

This table is completed if coastal engineering analysis was performed. It is required for new coastal studies. It is not required for digital conversions of effective flood hazard information because considerable additional effort may be required to research the applicable models.

The L_Cst_Model table is a lookup table that contains information about the coastal models that were used during the engineering analysis.

The L_Cst_Model table contains the following elements.

CST_MDL_ID	R Primary key for table lookup that links to the S_Cst_Tsct_Ln table. Value in this field should match the values in the CST_MDL_ID field of the S_Cst_Tsct_Ln table.
WTR_NM_LID	R Surface Water Feature Name Lookup Identification. This is the name of the water feature that the model is associated with. The water feature name is taken from the table L_Wtr_Nm. This is a lookup table that is populated by the Mapping Partner that creates the database.
SURGE_LID	R Hurricane Surge Model Lookup Identification. This is the name or abbreviation of the Federal Emergency Management Agency (FEMA) approved hurricane surge model that is associated with the coastal model for the engineering analysis. The surge model information is taken from the table D_Surge_Mdl.
EFF_SURGE	R This is a yes/no field that indicates if this is the effective surge model for the area.
WAVE_LID	R Wave Height Model Lookup Identification. This is the name or abbreviation of the FEMA approved wave height model that was used with the coastal model for the engineering analysis. The wave height model information is taken from the table D_Wave_Mdl.
EFF_WAVE	R This is a yes/no field that indicates if this is the effective wave height model for the area.
RUNUP_LID	R Runup Model Lookup Identification. This is the name or abbreviation of the FEMA approved runup model that was used with the coastal model for the engineering analysis. The runup model information is taken from the table D_Runup_Mdl.
EFF_RUNUP	R This is a yes/no field that indicates if this is the effective runup model for the area.

Guidelines and Specifications for Flood Hazard Mapping Partners

- SETUP_METH R Wave Setup Methodology. This information should detail the methodology used when setting up the wave models for the engineering analysis.
- EFF_SETUP R This is a yes/no field that indicates if this is the effective wave setup methodology for the area.
- EROS_TF R This is a true/false field to indicate if erosion treatment has been applied to the area.
- EFF_EROS R This is a yes/no field that indicates if this is the effective erosion methodology for the area.
- PFD_TF R This is a true/false field to indicate if primary frontal dune criteria were applied.
- EFF_PFD R This is a yes/no field that indicates if this is the effective primary frontal dune methodology for the area.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the L_Cst_Model table.

Name	Type	Size
CST_MDL_ID	Text	11
WTR_NM_LID	Text	11
SURGE_LID	Text	11
EFF_SURGE	Text	1
WAVE_LID	Text	11
EFF_WAVE	Text	1
RUNUP_LID	Text	11
EFF_RUNUP	Text	1
SETUP_METH	Text	100
EFF_SETUP	Text	1
EROS_TF	Text	1
EFF_EROS	Text	1
PFD_TF	Text	1
EFF_PFD	Text	1
SOURCE_CIT	Text	11

Table: L_MT1_LOMC

The L_MT1_LOMC table is a lookup table that contains information about Letters of Map Change (LOMCs) for the area. LOMCs typically include property descriptions. Frequently, LOMCs are issued to show that specific locations are outside the Special Flood Hazard Areas (SFHAs). Generally, the amount of detail that can be shown on the map does not allow these areas to be shown explicitly on the Flood Insurance Rate Map (FIRM). Instead, this information is communicated in the form of a LOMC. For data published by the Federal Emergency Management Agency (FEMA), this table would only include letters of map amendment and letters of map revision based on fill that have been revalidated following the map revision. Revalidated LOMCs indicate that the information presented in the LOMC continues to be true regardless of the depiction of the area on the FIRM.

For LOMCs that appear on more than one map panel, multiple records will exist with the same case number, but different panel numbers.

The L_MT1_LOMC table contains the following elements.

- LOMC_ID R Primary key for table lookup. Assigned by table creator.
- CASE_NO R Case Number. This is the case number assigned by FEMA to the LOMC. This should be filled in for reference back to the complete LOMC materials. The case number should be entered without hyphens or other separators.
- EFF_DATE R Effective Date of the LOMC.
- FIRM_PAN R FIRM panel number that the LOMC is on. This is also a foreign key to the S_FIRM_Pan table. MT1 LOMCs can be matched to a specific FIRM panel by matching this field to the FIRM_PAN field of the S_FIRM_Pan table.
- LOMC_STAT R Status of the LOMC. Valid entries for this field include the following:
 ‘superseded’
 ‘revalidated’
 ‘incorporated’

Only revalidated LOMCs are still in effect after a panel has been revised. All others should be superseded or incorporated into the new FIRM.

Name	Type	Size
LOMC_ID	Text	11
CASE_NO	Text	13
EFF_DATE	Date/Time	8
FIRM_PAN	Text	11
LOMC_STAT	Text	20

Table: L_Pan_Revis

This table does not apply for an initial Flood Insurance Rate Map (FIRM) or for a FIRM that has a completely new paneling scheme, such as a first time countywide FIRM. Otherwise, this table is required for all draft Digital Flood Insurance Rate Map data.

The L_Pan_Revis table is a lookup table that contains information about historic revisions to each FIRM panel.

For each FIRM panel that is being revised, there should be at least one record. There may also be multiple records for multiple revision dates for a particular FIRM panel and there may be multiple records for a single revision date if there are multiple revision notes for that date. Each FIRM panel may have a unique set of revision dates and revision codes. There should be one record for each FIRM_PAN, REVIS_DATE, REVIS_NOTE combination.

The L_Pan_Revis table contains the following elements.

- FIRM_PAN R FIRM Panel Number. The primary key for table lookup that links to the S_FIRM_Pan table. This should match a value in the FIRM_PAN field of the S_FIRM_Pan table. This is the complete FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX, which are found in S_FIRM_Pan table. The FIRM panel number is the 11-digit FIRM panel number that is shown in the title block of the map.

- REVIS_DATE R Revision Date. Effective date of revision to the FIRM panel. FIRM revision dates can be found in the FIRM legend or the Flood Insurance Study (FIS) report.

- REVIS_NOTE R Revision Note. Note describing the reason for the revision to the panel. This is shown under the effective date in the FIRM legend or in the FIS report. A list of standard revision notes appears in Appendix K of these Guidelines.

Name	Type	Size
FIRM_PAN	Text	11
REVIS_DATE	Date/Time	8
REVIS_NOTE	Text	255

Table: L_Pol_FHBM

This table does not apply if all communities on the FIRM never had revisions to their Flood Hazard Boundary Maps (FHBM). Otherwise, this table is required for all Digital Flood Insurance Rate Map databases.

The L_Pol_FHBM table is a lookup table that contains a list of communities and FHBM revisions.

Each community may have different revision dates. Each revision date may have multiple revision notes.

The L_Pol_FHBM table contains the following elements.

COMM_NO R Community Number, which is the primary key for table lookup, that links to the S_Pol_Ar table. The value in this field should match a value in the COMM_NO field of the S_Pol_Ar table. This is the six-digit community number assigned by FEMA. It is created by including the state Federal Information Processing Standard or FIPS code with the Community Identification Number.

FHBM_DATE R FHBM revision date.

FHBM_NOTE R FHBM revision note that describes the reason for the revision. FHBM revision notes are shown in the Flood Insurance Rate Map legend or in the Flood Insurance Study report. A list of standard revision notes is included in Appendix K of these Guidelines.

Name	Type	Size
COMM_NO	Text	6
FHBM_DATE	Date/Time	8
FHBM_NOTE	Text	255

Table: L_Riv_Model

This table is only completed if detailed engineering methods were used. It is required for new studies. However, because considerable additional effort may be required to research the applicable models, it is not required for digital conversions of effective flood hazard information.

The L_Riv_Model table is a lookup table that contains detailed information about the hydraulic and hydrologic models used in the engineering analysis for the area.

The L_Riv_Model table contains the following elements.

RIV_MDL_ID	R River Model Identification. The primary key for table lookup that links to the S_XS table. The value in this field should match the values in the RIV_MDL_ID field of the S_XS table.
WTR_NM_LID	R Surface Water Feature Name Lookup Identification. This is the name of the water feature that the models are associated with. Foreign key for table lookup that links to the L_Wtr_Nm table.
HYDRA_LID	R Hydraulic Model Lookup Identification. Foreign key for table lookup that links to the D_Hydra table.
EFF_HYDRA	R This is a yes/no field that indicates if this is the effective hydraulic model for the area.
HYDRA_DATE	R Hydraulic Model Run Date. This is the date that the hydraulic model was run.
HYDRO_LID	R Hydrologic Model Lookup Identification. Foreign key for table lookup that links to the D_Hydro table.
EFF_HYDRO	R This is a yes/no field that indicates if this is the effective hydrologic model for the area.
HYDRO_DATE	R Hydrologic Model Run Date. This is the date that the hydrologic model was run.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the L_Riv_Model table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
RIV_MDL_ID	Text	11
WTR_NM_LID	Text	11
HYDRA_LID	Text	11
EFF_HYDRA	Text	1
HYDRA_DATE	Date/Time	8
HYDRO_LID	Text	11
EFF_HYDRO	Text	1
HYDRO_DATE	Date/Time	8
SOURCE_CIT	Text	11

Table: L_Stn_Start

This table is required for any Digital Flood Insurance Rate Map database that has an S_XS table or S_Riv_Mrk table. Because of production limitations, it may be omitted at the direction of the FEMA Project Officer.

The L_Stn_Start table contains information about station starting locations. These locations indicate the reference point that was used as the origin for distance measurements along streams and rivers. This table is referenced by both the S_XS table that contains stream station information for cross section and by the S_Riv_Mrk table that contains river distance marker points. The location of the stationing start for a group of cross sections is normally referenced as a note on the Floodway Data table and on the Flood Profiles. Generally, all the cross sections for a particular reach are referenced to the same starting point.

The L_Stn_Start table contains the following elements.

START_ID	R Primary key for table lookup. Assigned by table creator. This field is the link that is used to reference cross section in the S_XS table or river marks in the S_Riv_Mrk table to the appropriate stationing starting point.
START_DESC	R Start Description. The description of the location of the station starting point. For example, the confluence with the Main Channel of the Big River.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the L_Stn_Start table.

Name	Type	Size
START_ID	Text	11
START_DESC	Text	255
SOURCE_CIT	Text	11

Table: L_Wtr_Nm

The L_Wtr_Nm table is a lookup table that contains the name of the surface water feature shown on the Flood Insurance Rate Map (FIRM) and referenced throughout the database. This table is required if the draft Digital Flood Insurance Rate Map table structure is used.

The L_Wtr_Nm table contains the following elements.

WTR_NM_LID R Surface Water Feature Name Lookup Identification. The primary key that links to the L_Cst_Model table, L_Riv_Model table, S_Gen_Struct table, S_Wtr_Ar table, S_Wtr_Ln table, and S_XS table. This value should match the value in the WTR_NM_LID field for related records in these tables.

WTR_NM R Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy FIRM.

Name	Type	Size
WTR_NM_LID	Text	11
WTR_NM	Text	100

Table: D_CBRS_Typ

The D_CBRS_Typ table lists valid types of Coastal Barrier Resources System (CBRS) areas and contains the following elements.

CBRS_LID Primary key for table lookup that links to the S_CBRS table.

CBRS_TYP CBRS Type. The type code provides details of the types of prohibitions that apply to the area.

Valid entries are shown in the table below.

CBRS_LID	CBRS_TYP
1000	COASTAL BARRIER RESOURCES SYSTEM
1010	OTHERWISE PROTECTED AREA

Table: D_Chan_Rep

The D_Chan_Rep table lists valid channel representations and contains the following elements.

- CHAN_LID Primary key for table lookup that links to the S_Wtr_Ln table.
- CHAN_REP Channel Representation. Single means linear water features represented by a centerline. Double means linear water features represented by shorelines or channel banks.

Valid entries are shown in the table below.

CHAN_LID	CHAN_REP
1000	SINGLE
1010	DOUBLE

Table: D_Floodway

The D_Floodway table lists valid floodway representations and contains the following elements.

- FLDWAY_LID Primary key for table lookup that links to the S_Fld_Haz_Ar table.
- FLOODWAY Floodway Type. Floodway areas are designated by the Federal Emergency Management Agency to provide an area that must be kept free of encroachment so that the 1-percent-annual-chance flood event can be carried without substantial increase in flood heights. Normal floodway areas are ‘floodway’. Special cases will have a note on the hardcopy Flood Insurance Rate Map.

Valid entries are shown in the table below.

FLDWAY_LID	FLOODWAY
1000	FLOODWAY
1010	COLORADO RIVER
1020	FLOODWAY CONTAINED IN CHANNEL
1030	FLOWAGE EASEMENT BOUNDARY
1040	STATE ENCROACHMENT
1050	AREA OF SPECIAL CONSIDERATION

Table: D_Hydra

The D_Hydra table lists valid hydraulic models and contains the following elements.

HYDRA_LID Primary key for table lookup that links to the L_Riv_Model table.

HYDRA_MDL Hydraulic Model. This is the name or abbreviation of the hydraulic model that was used for the engineering analysis. As the Federal Emergency Management Agency approves the use of new engineering models for use in developing Flood Insurance Rate Maps, this list can be expanded.

Valid entries are shown in the table below.

HYDRA_LID	HYDRA_MDL
1000	ADLCPR
1001	DAMBRK
1002	E431
1003	FEQ
1004	FEQUTL
1005	FESWMS
1006	FLDWY
1007	HEC-2
1008	HEC-RAS
1009	J635
1010	NETWORK
1011	SWMM
1012	TABS2
1013	UNET
1014	WSP-2
1015	WSPG
1016	WSPRO

Table: D_Hydro

The D_Hydro table lists valid hydrologic models and contains the following elements.

HYDRO_LID Primary key for table lookup that links to the L_Riv_Model table.

HYDRO_MDL Hydrologic Model. This is the name or abbreviation of the hydrologic model that was used for the engineering analysis. As the Federal Emergency Management Agency approves the use of new engineering models for use in developing Flood Insurance Rate Maps, this list can be expanded.

Valid entries are shown in the table below.

HYDRO_LID	HYDRO_MDL
2000	DR3M
2001	FAN
2002	HEC-1
2003	HEC-FFA
2004	HEC-IFH
2005	HEC-HMS
2006	HSPF
2007	HYMO
2008	PEAKFQ
2009	PSU-IV
2010	RATIONAL METHOD
2011	REGRESSION EQUATION
2012	TR-20
2013	TR-55

Table: D_Label_Typ

The D_Label_Typ table lists valid features to which the labels and leaders apply.

LABEL_LID Primary key for table lookup that links to the S_Label_Pt and the S_Label_Ld table.

LABEL_TYPE Label type. This is a description of the planimetric features to which the labels and leaders are associated. For vector based maps, the labels and leaders will be associated with vector features in S_Trnsport_Ln, S_Wtr_Ar and S_Wtr_Ln. For maps with an ortho-photo base, the labels and leaders will be associated with DOQ water and transportation features. For maps that use both vector features and ortho-photos, all values may apply.

Valid entries are shown in the table below.

LABEL_LID	LABEL_TYPE
2000	S_Trnsport_Ln
2001	S_Wtr_Ar
2002	S_Wtr_Ln
2003	DOQ-transportation
2004	DOQ-water

Table: D_Ln_Typ

The D_Ln_Typ table lists valid line types used to determine symbology and drawing order on the hardcopy Flood Insurance Rate Map and contains the following elements.

LN_LID Primary key for table lookup that links to the S_Fld_Haz_Ln table, the S_PLSS_Ln table, and the S_Pol_Ln table. Values 1000 thru 1999 are reserved for political lines, values 2000 thru 2999 are reserved for flood hazard lines, and values 3000 thru 3999 are reserved for U.S. Public Lands Survey System (PLSS) lines.

LN_TYP Line Type. This is the boundary line type such as a floodplain boundary line, political boundary line, or PLSS boundary line. NOTE: The symbol ‘%’ is a reserved symbol in most software packages so the word ‘percent’ was abbreviated to ‘pct’.

Some lines may have multiple values. For the S_Pol_Ln table, the following precedence should apply: INTERNATIONAL, STATE, COUNTY, CORPORATE, EXTRATERRITORIAL JURISDICTION, URBAN GROWTH BOUNDARY, MUNICIPAL URBAN DRAINAGE DISTRICT, LEVEE IMPROVEMENT DISTRICT, AREA NOT INCLUDED, RESERVATION, FOREST, PARK.

For the S_Fld_Haz_Ln table, the following precedence should apply: LIMIT OF DETAILED STUDY, LIMIT OF STUDY, LIMIT OF FLOODWAY, FLOODWAY, 1--ANNUAL-CHANCE FLOOD HAZARD, ZONE BREAK, 0.2 pct ANNUAL CHANCE FLOOD HAZARD, FLOWAGE EASEMENT BOUNDARY, STATE ENCHROACHMENT LINE.

For the S_PLSS_Ln table, the following precedence should apply: TOWNSHIP, RANGE, SECTION, QUARTER SECTION.

Guidelines and Specifications for Flood Hazard Mapping Partners

Valid entries are shown in the table below.

LN_LID	LN_TYP
1010	AREA NOT INCLUDED
1020	CORPORATE
1021	EXTRATERRITORIAL JURISDICTION
1030	COUNTY
1040	FOREST
1041	PARK
1042	RESERVATION
1050	INTERNATIONAL
1060	STATE
1070	URBAN GROWTH BOUNDARY
1080	MUNICIPAL URBAN DRAINAGE DISTRICT
1090	LEVEE IMPROVEMENT DISTRICT
2000	0.2 pct ANNUAL CHANCE FLOOD HAZARD
2001	1 pct ANNUAL CHANCE FLOOD HAZARD
2002	ZONE D
2030	APPARENT LIMIT
2031	LIMIT OF DETAILED STUDY
2032	LIMIT OF FLOODWAY
2033	LIMIT OF STUDY
2040	FLOODWAY
2050	FLOWAGE EASEMENT BOUNDARY
2051	STATE ENCROACHMENT LINE
2052	ZONE BREAK
3000	QUARTER SECTION
3010	RANGE
3020	TOWNSHIP
3030	SECTION
3040	MEANDER
9000	END OF SPATIAL EXTENT

Table: D_Nm_Typ

The D_Nm_Typ table lists valid transportation feature name types and contains the following elements.

NM_LID Primary key for table lookup that links to the S_Trnsport_Ln table.

NM_TYP Name Type. The transportation feature name type.

Valid entries are shown in the table below.

NM_LID	NM_TYP	NM_LID	NM_TYP
1000	ALLEY	1022	MOTORWAY
1001	ARCADE	1023	NORTE
1002	AVENIDA	1024	OESTE
1003	AVENUE	1025	PARKWAY
1004	BOULEVARD	1026	PASEO
1005	BYPASS	1027	PASS
1006	CALLE	1028	PATH
1007	CAUSEWAY	1029	PIKE
1008	CENTER	1030	PLACE
1009	CIRCLE	1031	PLAZA
1010	COURT	1032	ROAD
1011	COVE	1033	ROW
1012	CRESCENT	1034	RUE
1013	CROSSING	1035	SQUARE
1014	DRIVE	1036	STREET
1015	ESTE	1037	SUR
1016	EXPRESSO	1038	TERRACE
1017	EXPRESSWAY	1039	THROUGHWAY
1018	FREEWAY	1040	TRAFFICWAY
1019	HIGHWAY	1041	TRAIL
1020	LANE	1042	TURNPIKE
1021	LOOP	1043	WAY

Table: D_Panel_Typ

The D_Panel_Typ table lists valid Flood Insurance Rate Map (FIRM) panel types and contains the following elements.

- PANEL_LID Primary key for table lookup that links to the S_FIRM_Pan table.

- PANEL_TYP Panel Type. The type of FIRM panel that identifies whether the panel is printed or not printed and whether it is community based or countywide mapping.

Valid entries are shown in the table below.

PANEL_LID	PANEL_TYP
1000	COUNTYWIDE, PANEL PRINTED
1010	COUNTYWIDE, NOT PRINTED
1020	COMMUNITY BASED, PANEL PRINTED
1030	COMMUNITY BASED, NOT PRINTED
1040	UNMAPPED COMMUNITY

Table: D_Rd_Stat

The D_Rd_Stat table lists valid road status values and contains the following elements.

RD_S_LID Primary key for table lookup that links to the S_Trnsport_Ln table.

RD_STAT Road Status.

Valid entries are shown in the table below.

RD_S_LID	RD_STAT
1000	PAVED
1010	PROPOSED
1020	UNDER CONSTRUCTION
1030	UNIMPROVED

Table: D_Runup_Mdl

The D_Runup_Mdl table lists valid wave runup models that can be used for the engineering analysis and contains the following elements.

- RUNUP_LID Primary key for table lookup that links to the L_Cst_Model table.
- RUNUP_MDL Runup Model. This is the name or abbreviation of the runup model that was used for the engineering analysis. As the Federal Emergency Management Agency approves the use of new engineering models for use in developing Flood Insurance Rate Maps, this list can be expanded.

Valid entries are shown in the table below.

RUNUP_LID	RUNUP_MDL
1010	RUNUP
1020	ACES RUNUP
1030	GREAT LAKES WAVE RUNUP MODEL

Table: D_Scale

The D_Scale table lists valid Flood Insurance Rate Map (FIRM) scales, ratios, and contains the following elements.

SCALE_LID Primary key for table lookup that links to the S_FIRM_Pan table and the S_LOMR table.

SCALE Map Scale. This is the denominator of the FIRM scale or effective Letter of Map Revision scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map.

Valid entries are shown in the table below.

SCALE_LID	SCALE
1000	6000
1010	12000
1020	24000

Table: D_Struct_Typ

The D_Struct_Typ table lists valid structure types associated with general hydraulic structures and contains the following elements.

STRUCT_LID Primary key for table lookup that links to the S_Gen_Struct table.

STRUCT_TYP Structure Type. These are hydraulic structures within the study area.

Valid entries are listed in the table below.

STRUCT_LID	STRUCT_TYP
1000	AQUEDUCT
1001	BRIDGE
1002	CULVERT
1003	DAM
1004	DIKE
1005	DOCK
1006	FISH LADDER
1007	FOOTBRIDGE
1008	FLUME
1009	GATE
1010	JETTY
1011	LEVEE
1012	LOCK
1013	PENSTOCK
1014	PIER
1015	SEAWALL
1016	WEIR
1017	WING WALL

Table: D_Surge_Mdl

The D_Surge_Mdl table lists valid hurricane surge models that can be used during the engineering analysis and contains the following elements.

- SURGE_LID Primary key for table lookup that links to the L_Cst_Model table.
- SURGE_MDL Hurricane Surge Model. This is the name or abbreviation of the hurricane surge model that was used for the engineering analysis. As the Federal Emergency Management Agency approves the use of new engineering models for use in developing Flood Insurance Rate Maps, this list can be expanded.

Valid entries are listed in the table below.

SURGE_LID	SURGE_MDL
1010	FEMA SURGE
1020	NEW ENGLAND TIDE PROFILE
1030	NOREASTER SURGE MODEL

Table: D_Trans_Typ

The D_Trans_Typ table lists valid transportation feature types for base map features and contains the following elements.

TRANS_LID Primary key for table lookup that links to the S_Trnsport_Ln table. Values 1000 thru 1999 are reserved for road types, values 2000 thru 2999 are reserved for railroads, values 3000 thru 3999 are reserved for airports, and values 4000 thru 4999 are reserved for water transportation.

TRANS_TYP Transportation Feature Type.

Valid entries are listed in the table below.

TRANS_LID	TRANS_TYP
1000	UNDEFINED RD
1001	PRIMARY RD
1002	SECONDARY RD
1003	TRAIL
1010	RD TUNNEL
1020	FORD
2000	UNDEFINED RR
2001	ACTIVE RR
2002	ABANDONED RR
2003	DISMANTLED RR
2010	RR TUNNEL
3000	AIRPORT
4000	FERRY
4001	INTRACOASTAL WATERWAY

Table: D_Units

The D_Units table lists valid units of measurement throughout the database and contains the following elements.

UNIT_LID Primary key for table lookup that links to the S_BFE table and the S_Fld_Haz_Ar table.

UNITS Unit of Measurement. Varies depending on the variable that it is quantifying. The legend on the hardcopy Flood Insurance Rate Map should specify the units.

Valid entries are shown in the table below.

UNIT_LID	UNITS
1000	FEET
1010	METERS

Table: D_V_Datum

The D_V_Datum table lists valid vertical datums and contains the following elements.

- V_DATM_LID Primary key for table lookup that links to the S_BFE table, the S_Fld_Haz_Ar table, and the Study_Info table.
- V_DATUM Vertical Datum. North American Vertical Datum of 1988 (NAVD88) is preferred. However, older studies may have been prepared using the National Geodetic Vertical Datum of 1929 (NGVD29).

Valid entries are shown in the table below.

V_DATM_LID	V_DATUM
1000	MSL
1010	NAVD88
1020	NGVD29

Table: D_Water_Typ

The D_Water_Typ table lists valid water feature types and contains the following elements.

WATER_LID Primary key for table lookup that links to the S_Wtr_Ar table and the S_Wtr_Ln table.

WATER_TYP Surface Water Feature Type.

Valid entries are shown in the table below.

WATER_LID	WATER_TYP
5000	CHANNEL
5001	DITCH
5002	GLACIER
5003	GULCH
5004	HATCHERY
5005	PERENNIAL RIVER/STREAM
5006	RACE
5007	SHORELINE/COASTLINE
5008	WASH
5009	WATERFALL
5020	INTERMITTENT RIVER/STREAM
5021	PROFILE BASE LINE
5022	WATER SEPARATION LINE
6000	LAKE
6001	BOG
6002	RESERVOIR
6003	RETENTION POND
6004	SWAMP
6005	TAILINGS POND

Table: D_Wave_Mdl

The D_Wave_Mdl table lists valid wave height models used during the engineering analysis and contains the following elements.

- WAVE_LID Primary key for table lookup that links to the L_Cst_Model table.
- WAVE_MDL Wave Height Model. This is the name or abbreviation of the wave height model that was used for the engineering analysis. As the Federal Emergency Management Agency approves the use of new engineering models for use in developing Flood Insurance Rate Maps, this list can be expanded.

Valid entries are shown in the table below.

WAVE_LID	WAVE_MDL
1010	WHAFIS
1020	GREAT LAKES WHAFIS

Table: D_Zone

The D_Zone table lists valid Flood Insurance Rate Map (FIRM) flood zones and contains the following elements.

ZONE_LID	Primary key for table lookup that links to the S_Fld_Haz_Ar table.
FLD_ZONE	Flood Zone. This is the flood insurance risk zone designation. These zones are used by the Federal Emergency Management Agency (FEMA) to designate Special Flood Hazard Areas (SFHAs) and for insurance rating purposes. Some older FEMA FIRMs were prepared in the Standard format that uses Zones B, C and numbered A and V zones. Newer FIRMs use the Map Initiatives format where the B corresponds to 0.2 pct ANNUAL CHANCE FLOOD HAZARD; C corresponds to Zone X; numbered A zones (e.g., A1, A2, A3) correspond to Zone AE; and numbered V zones (e.g., V1, V2, V3) correspond to Zone VE. All Digital Flood Insurance Rate Maps (DFIRMs) should use the Map Initiatives zone designations. See Volume 1, Subsection 1.4.6.1.5 of these Guidelines for details on the flood insurance risk zones. (NOTE: The symbol ‘%’ is a reserved symbol in most software packages so the word ‘percent’ was abbreviated to ‘pct’.)

Guidelines and Specifications for Flood Hazard Mapping Partners

Valid entries are shown in the table below.

ZONE_LID	FLD_ZONE
1000	A
1001	AE
1002	AH
1003	AO
1004	AR
1005	1 pct FLOOD HAZARD CONTAINED IN CHANNEL
1006	
1007	1 pct FUTURE CONDITIONS
1008	A99
1009	V
1010	VE
2000	0.2 pct ANNUAL CHANCE FLOOD HAZARD
2001	0.2 pct ANNUAL CHANCE FLOOD HAZARD CONTAINED IN CHANNEL
2002	
3000	AREA NOT INCLUDED
4000	D
4001	X PROTECTED BY LEVEE
4002	X
5000	OPEN WATER

Where the 1-percent-annual-chance flood or the 0.2-percent-annual-chance flood is contained in a culvert or channel, a corresponding feature appears in the S_Fld_Haz_Ar table only if an SFHA or 0.2-percent-annual-chance flood zone is shown on the FIRM in this area. In general, these culverts and channels are to be represented in the general structure table regardless of how the flood insurance risk zones are depicted. So, if these structures are shown on the FIRM as a dashed line passing through a Zone X, no corresponding flood insurance risk zone is shown in S_Fld_Haz_Ar table in the DFIRM database. If a narrow SFHA or 0.2-percent-annual-chance flood zone is shown on the FIRM, then a narrow polygon must be included in the DFIRM database. If the width of this flood insurance risk zone is accurately known and represented in the spatial data, the normal flood insurance risk zone is applied. If the width of the flood insurance risk zone is not accurately known and represented because of scale limitations, then the zone is designated as 1-percent-annual-chance flood contained in channel or 0.2-percent-annual-chance flood contained in channel as appropriate.

[February 2002]

L.5 Federal Emergency Management Agency Digital Mapping Information Checklist

Federal Emergency Management Agency Digital Mapping Information Checklist

The following checklist is intended to solicit information basic information about the format of digital mapping data submitted to the Federal Emergency Management Agency (FEMA) for preparation of a Digital Flood Insurance Rate Map (DFIRM). Please note that metadata compliant with the Federal Geographic Data Committee's *Content Standard for Digital Geospatial Metadata* should be submitted also. This metadata must include the following information and further details about the data submitted.

Point of Contact:

Name and/or Title	_____
Community/Agency	_____
Department	_____
Address	_____ _____
Telephone	_____
Fax	_____
Email	_____

Data Type:

Pertinent information includes the following:

Format:

- ArcInfo
- ArcView
- MapInfo
- Intergraph
- AutoCAD
- Digital Line Graph
- Other _____

Guidelines and Specifications for Flood Hazard Mapping Partners

- Digital Orthophoto
 - Black & white
 - Color
 - TIF
 - JPEG
 - Raw

- Scanned
 - Georeferenced? _____
 - Dots per inch _____
 - Black & white
 - Grey scale
 - Color

Source Information:

How and when were the data compiled? By whom? At what scale? Pertinent information includes the following:

- Photogrammetrically compiled
- Digitized from a hardcopy source
 - Parcel maps/Plat maps
 - USGS quadrangles
 - Orthophotos
 - Aerial photos
 - Other community map _____
 - Generated using coordinate geometry (COGO)
 - Scanned

Date of photography or source material _____

Scale of data creation _____

Agency or firm that produced the data _____

Date of creation (if incomplete, provide estimated completion date) _____

Projection, Datums, Accuracy:

What coordinate system and projection were used? What horizontal and vertical datums were used? What is the stated accuracy of the data?

Guidelines and Specifications for Flood Hazard Mapping Partners

Coordinate system/projection:

- State Plane
- UTM
- Geographic (latitude and longitude)
- Other _____

Units:

- Feet
- Meters
- Decimal degrees
- Degrees, minutes, seconds
- Other _____

Horizontal datum:

- NAD27, Clarke 1866 spheroid
- NAD83, GRS80 spheroid

Vertical datum:

- NGVD29
- NAVD88
- Other _____

Accuracy _____

Data Contents:

What features are contained in the data set(s)? Are feature names included? If so, are they available as attributes and/or graphic text (annotation)? Please provide file structure details in the form of metadata, a data dictionary, or a layer list in addition to this form

Roads

- Centerlines
- Edge of pavement
- Right of ways
- Road names
Scale(s) at which they were intended to be used _____
- Railroads
 - Railroad names
- Airports
 - Airport names

Guidelines and Specifications for Flood Hazard Mapping Partners

- Streams, lakes, other water bodies
 - Feature names
- Range & township/section lines and numbers
- Political boundaries
 - Area names
- Flood control structures (dams, weirs, jetties, culverts, etc.)
- Floodplain boundaries and/or other FIRM features
- Contours
 - Contour interval _____
- DEM/DTM/TIN
- Building outlines
 - Parcels

Transfer Media:

What options are there for transferring the data to other users? What are the platform options?

Media:

- CD-ROM
- 8mm tape
- 4mm tape
- Zip disk
- Diskettes
- Email
- Other _____

Platforms:

- UNIX
- PC
- NT

[February 2002]

L.6 Metadata Example for Draft Digital Data

DFIRM DATABASE, FLOOD COUNTY, USA

Identification Information:

Citation:

Citation Information:

Originator: FEMA Mapping Partner

Publication Date: 20000505

Title: DIGITAL FLOOD INSURANCE RATE MAP DATABASE, FLOOD COUNTY, USA

Geospatial_Data_Presentation_Form: Vector and Raster Digital Data

Publication Information:

Publication Place: Washington, DC

Publisher: Federal Emergency Management Agency

Other_Citation_Details: Metadata_File_Name: DFIRM_DB.htm

Online Linkage: www.fema.gov/msc

Description:

Abstract:

The Digital Flood Insurance Rate Map (DFIRM) Database depicts flood risk information and supporting data used to develop the risk data. The primary risk classifications used are the 1-percent-annual-chance flood event, the 0.2-percent-annual-chance flood event, and areas of minimal flood risk. The DFIRM Database 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, and new mapping data where available. The FISs and FIRMs are published by the Federal Emergency Management Agency (FEMA). The file is georeferenced to earth's surface using the UTM projection and coordinate system. The specifications for the horizontal control of DFIRM data files are consistent with those required for mapping at a scale of 1:12,000.

Purpose:

The FIRM is the basis for floodplain management, mitigation, and insurance activities for the National Flood Insurance Program (NFIP). Insurance applications include enforcement of the mandatory purchase requirement of the Flood Disaster Protection Act, which "... requires the purchase of flood insurance by property owners who are being assisted by Federal programs or by Federally supervised, regulated or insured agencies or institutions in the acquisition or improvement of land facilities located or to be located in identified areas having special flood hazards" (Section 2 (b) (4) of the Flood Disaster Protection Act of 1973). In addition to the identification of Special Flood Hazard Areas (SFHAs), the risk zones shown on the FIRMs are the basis for the establishment of premium rates for flood coverage offered through the NFIP.

The DFIRM Database presents the flood risk information depicted on the FIRM in a digital format suitable for use in electronic mapping applications. The DFIRM Database is a subset of the Digital FIS database that serves to archive the information collected during the FIS.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar Date: 19980701

Currentness_Reference: FIRM and FIS Effective date

Status:

Progress: Complete

Maintenance_and_Update_Frequency: Irregular

Spatial_Domain:

Bounding_Coordinates:

West Bounding Coordinate: -84.125

East Bounding Coordinate: -84.25

Guidelines and Specifications for Flood Hazard Mapping Partners

North Bounding Coordinate: 30.5

South Bounding Coordinate: 30.625

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: FEMA Flood Hazard Zone

Theme_Keyword: DFIRM Database

Theme_Keyword: DFIRM

Theme_Keyword: Special Flood Hazard Area

Theme_Keyword: Digital Flood Insurance Rate Map

Theme_Keyword: CBRS

Theme_Keyword: Coastal Barrier Resources System

Theme_Keyword: Riverine Flooding

Theme_Keyword: Coastal Flooding

Theme_Keyword: NFIP

Theme_Keyword: Base Flood Elevation

Theme_Keyword: SFHA

Theme_Keyword: Flood Insurance Rate Map

Theme_Keyword: FIRM

Theme_Keyword: Floodway

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: FLOOD COUNTY

Place_Keyword: USA

Access_Constraints: None

Use_Constraints:

The hardcopy FIRM and DFIRM maps and the accompanying FISs are the official designation of SFHAs and Base Flood Elevations (BFEs) for the NFIP. For the purposes of the NFIP, changes to the flood risk information published by FEMA may only be performed by FEMA and through the mechanisms established in the NFIP regulations (44 CFR Parts 59-78).

These digital data are produced in conjunction with the hardcopy FIRMs and generally matches the hardcopy map exactly. However the hardcopy flood maps and flood profiles are the authoritative documents for the NFIP.

Acknowledgement of FEMA would be appreciated in products derived from these data.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Mapping Partner Contact Name

Contact_Position: Mapping Partner Position

Contact_Address:

Address_Type: mailing address

Address: Mapping Partner Address

City: Mapping Partner City

State_or_Province: Mapping Partner State

Postal_Code: Mapping Partner Zip

Country: Mapping Partner Country

Contact_Voice_Telephone:

Mapping Partner Phone Number

Contact_Electronic_Mail_Address:

Mapping Partner Email

Native_Data_Set_Environment:

Description of Mapping Partner's digital mapping environment

Cross_Reference:

Citation_Information:

Guidelines and Specifications for Flood Hazard Mapping Partners

Originator: Federal Emergency Management Agency
Publication Date: 19980701
Title: Flood Insurance Rate Map, FLOOD COUNTY, USA
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Washington, DC
Publisher: Federal Emergency Management Agency
Cross_Reference:
Citation_Information:
Originator: Federal Emergency Management Agency
Publication Date: 19980701
Title: Flood Insurance Study, FLOOD COUNTY, USA
Geospatial_Data_Presentation_Form: document
Publication_Information:
Publication_Place: Washington, DC
Publisher: Federal Emergency Management Agency
Cross Reference:
Citation Information:
Originator: Federal Emergency Management Agency
Publication Date: 19980701
Title: Raster DFIRM, FLOOD COUNTY, USA
Geospatial Data Presentation Form: raster digital data
Publication Information:
Publication Place: Washington, DC
Publisher: Federal Emergency Management Agency
Data Quality Information:
Attribute Accuracy:
Attribute_Accuracy_Report:

The DFIRM Database consists of countywide vector files and associated attributes produced in conjunction with the hardcopy FEMA FIRMs. The published effective FIRM and DFIRM are issued as the official designation of the SFHAs. As such, they are adopted by local communities and form the basis for administration of the NFIP. For these purposes they are authoritative. Provisions exist in the regulations for public review, appeals and corrections of the flood risk information shown to better match real world conditions. As with any engineering analysis of this type, variation from the estimated flood heights and floodplain boundaries is possible. Details of FEMA's requirements for the FISs and flood mapping process that produces these data are available in the Guidelines and Specifications for Flood Hazard Mapping Partners. Attribute accuracy was tested by manual comparison of source graphics with hardcopy plots and a symbolized display on an interactive computer graphic system.

Independent quality control testing of FEMA's DFIRM database was also performed.

To obtain more detailed information in areas where **Base Flood Elevations (BFEs)** and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the FIS report that accompanies this DFIRM database. Users should be aware that BFEs shown in the S_BFE table represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be used in conjunction with the FIRM for purposes of construction and/or floodplain management. The 1-percent-annual-chance water-surface elevations shown in the S_XS table match the regulatory elevations shown in the FIS report.

Logical_Consistency_Report:

When FEMA revises an FIS, adjacent studies are checked to ensure agreement between flood elevations at the boundaries of the studies. Likewise, flood elevations at the confluence of streams studied independently are checked to ensure agreement at the confluence. The FIRM and the FIS are developed together and care is taken to ensure that the elevations and other features shown on the flood profiles in the FIS agree with the information shown on the FIRM. However, the elevations as shown on the FIRM are rounded whole-foot elevations. They must be shown so that a profile recreated from the elevations on the FIRM will match the FIS profiles within one half of one foot.

Guidelines and Specifications for Flood Hazard Mapping Partners

Completeness_Report:

The data contained in the DFIRM Database files reflect the content of the source materials. Features may have been eliminated or generalized on the source graphic, due to scale and legibility constraints. With new mapping, FEMA plans to maintain full detail in the spatial data it produces. However, older information is often transferred from existing maps where some generalization has taken place.

Flood risk data are developed for communities participating in the NFIP for use in insurance rating and for floodplain management. Flood hazard areas are determined using statistical analyses of records of river flow, storm tides, and rainfall, information obtained through consultation with the communities, floodplain topographic surveys, and hydrological and hydraulic analysis. Both detailed and approximate analyses are employed. Generally, detailed analyses are used to generate flood risk data only for developed or developing areas of communities. For areas where little or no development is expected to occur, FEMA uses approximate analyses to generate flood risk data. Typically, only drainage areas that are greater than one square mile are studied.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The DFIRM Database consists of countywide vector files and associated attributes produced in conjunction with the hard copy FEMA FIRMs. The published effective FIRM and DFIRM maps are issued as the official designation of the SFHAs. As such they are adopted by local communities and form the basis for administration of the NFIP. For these purposes they are authoritative. Provisions exist in the regulations for public review, appeals and corrections of the flood risk information shown to better match real world conditions. As with any engineering analysis of this type, variation from the estimated flood heights and floodplain boundaries is possible. Details of FEMA's requirements for the FISs and flood mapping process that produces these data are available in the Guidelines and Specifications for Flood Hazard Mapping Partners. Horizontal accuracy was tested by manual comparison of source graphics with hardcopy plots and a symbolized display on an interactive computer graphic system.

Independent quality control testing of FEMA's DFIRM database was also performed.

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report:

The DFIRM Database consists of countywide vector files and associated attributes produced in conjunction with the hard copy FEMA FIRMs. The published effective FIRM and DFIRM maps are issued as the official designation of the SFHAs. As such they are adopted by local communities and form the basis for administration of the NFIP. For these purposes they are authoritative. Provisions exist in the regulations for public review, appeals and corrections of the flood risk information shown to better match real world conditions. As with any engineering analysis of this type, variation from the estimated flood heights and floodplain boundaries is possible. Details of FEMA's requirements for the FISs and flood mapping process that produces these data are available in the Guidelines and Specifications for Flood Hazard Mapping Partners. Vertical accuracy was tested by manual comparison of source graphics with hardcopy plots and a symbolized display on an interactive computer graphic system.

Independent quality control testing of FEMA's DFIRM database was also performed.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Federal Emergency Management Agency

Publication_Date: 1987

Title:

Flood Insurance Study, FLOOD COUNTY USA (Unincorporated areas).

Geospatial_Data_Presentation_Form: map

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Other_Citation_Details:

The hydrologic and hydraulic analyses for the FIS dated April 17, 1987, were prepared by the U.S. Army Corps of Engineers (USACE), Springfield District, for the Federal Emergency Management Agency

Guidelines and Specifications for Flood Hazard Mapping Partners

(FEMA), under Inter-Agency Agreement No. EMW-84-E-1506. That work was completed in December 1985. Denominator of Source Scale: 2400-12000

Source Scale Denominator: 12,000

Type_of_Source_Media: paper

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar Date: 19870601

Source_Currentness_Reference: Effective Date

Source Citation Abbreviation: FIS1

Source_Contribution:

Spatial and attribute information, floodplain widths, BFEs, floodplain location.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Federal Emergency Management Agency

Publication Date: 1987

Title: Flood Insurance Study, FLOODVILLE, Town of

Geospatial_Data_Presentation_Form: map

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Other Citation Details:

The hydrologic and hydraulic analyses for the FIS report dated April 17, 1987, were prepared by the USACE, Springfield District, for the FEMA, under Inter-Agency Agreement No. EMW-84-E-1506, Project Order No. 1, Amendment No. 4. That work was completed in December 1985.

Denominator of Source Scale: 2400-12000

Source Scale Denominator: 12,000

Type_of_Source_Media: paper

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar Date: 19870601

Source_Currentness_Reference: Effective Date

Source Citation Abbreviation: FIS2

Source_Contribution:

Spatial and attribute information, floodplain widths, BFEs, floodplain location.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Federal Emergency Management Agency

Publication Date: 1998

Title:

Flood Insurance Study Report, FLOOD COUNTY, USA and Incorporated areas.

Geospatial_Data_Presentation_Form: map

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Other Citation Details:

For this countywide FIS, the hydrologic and hydraulic analyses were prepared by USACE for FEMA, under Inter-Agency Agreement No. EMW-94-C-0019. This work was completed in October 1995.

Denominator of Source Scale: 2400-12000

Source Scale Denominator: 12000

Type_of_Source_Media: paper

Source_Time_Period_of_Content:

Guidelines and Specifications for Flood Hazard Mapping Partners

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 19980701

Source_Currentness_Reference: Effective Date

Source_Citation_Abbreviation: FIS3

Source_Contribution:

Spatial and attribute information, floodplain widths, BFEs, floodplain location.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Town of Floodville Stormwater Management Department, 126 Royal Oaks Drive, Suite 201, Floodville, USA 99150

Publication_Date: 1995

Title: Base map for Floodville, USA

Geospatial_Data_Presentation_Form: vector digital data

Publication_Information:

Publication_Place: Floodville, USA

Publisher: Town of Floodville Stormwater Management

Other_Citation_Details:

These files were photogrammetrically compiled at scales of 1"=200' (urban areas) and 1"=400' (rural areas) from aerial photographs.

Source_Scale_Denominator: 4,800

Type_of_Source_Media: CD-ROM

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 19950301

Source_Currentness_Reference: ground conditions

Source_Citation_Abbreviation: BASE1

Source_Contribution:

Location of roads, railroads, bridges, streams and other physical features shown.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Flood County Geographic Information Systems Department, 1110 South Road, Suite 205, Floodville, USA 99150

Publication_Date: 1995

Title: Base map for Flood County, USA

Geospatial_Data_Presentation_Form: vector digital data

Publication_Information:

Publication_Place: Floodville, USA

Publisher: Flood County Geographic Information Systems Department

Other_Citation_Details:

These files were photogrammetrically compiled at scales of 1"=200' (urban areas) and 1"=400' (rural areas) from aerial photographs.

Source_Scale_Denominator: 4,800

Type_of_Source_Media: CD-ROM

Source_Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar_Date: 19950301

Source_Currentness_Reference: ground conditions

Source_Citation_Abbreviation: BASE2

Source_Contribution:

Guidelines and Specifications for Flood Hazard Mapping Partners

Location of roads, railroads, bridges, streams and other physical features shown.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

U.S. Geological Survey

Publication Date: 1998

Title: Digital Orthophoto Quadrangle

Geospatial Data Presentation Form: remote-sensing image

Publication Information:

Publication Place: Reston, VA

Publisher: U.S. Geological Survey

Other Citation Details: The digital orthophoto quadrangle (DOQ) is a 1-meter ground resolution, quarter-quadrangle (3.75-minutes of latitude by 3.75-minutes of longitude) image cast on the Universal Transverse Mercator Projection (UTM) on the North American Datum of 1983 (NAD83). The imagery is based on panchromatic black and white (or color infra-red) NAPP or NAPP-like photography.

Source Scale Denominator: 12,000

Type of Source Media: CD-ROM

Source Time Period of Content:

Time Period Information:

Single Date/Time:

Calendar Date: 19970301

Source Currentness Reference: ground conditions

Source Citation Abbreviation: BASE3

Source Contribution:

Location of roads, railroads, bridges, streams and other physical features shown.

Process Step:

Process Description:

The DFIRM Database is compiled in conjunction with the hard copy FIRM and the Final printed FIS report. The specifics of the hydrologic and hydraulic analyses performed are detailed in the FIS report. The results of these studies are submitted in digital format to FEMA. These data and unrevised data from effective FIRMs are compiled onto the base map used for DFIRM publication and checked for accuracy and compliance with FEMA standards.

Source Used Citation Abbreviation: FIS1-FIS3, BASE1-BASE3

Process Date: 1996

Spatial Data Organization Information:

Direct Spatial Reference Method: Vector and raster

Point and Vector Object Information:

SDTS Terms Description:

SDTS Point and Vector Object Type: Point

SDTS Terms Description:

SDTS Point and Vector Object Type: String

SDTS Terms Description:

SDTS Point and Vector Object Type: GT-polygon composed of chains

Raster Object Information:

Raster Object Type: Pixel

Spatial Reference Information:

Horizontal Coordinate System Definition:

Planar:

Grid Coordinate System:

Grid Coordinate System Name: Universal Transverse Mercator

Universal Transverse Mercator:

UTM Zone Number: 16

Transverse Mercator:

Scale Factor at Central Meridian: 0.9996

Longitude of Central Meridian: -87.0

Guidelines and Specifications for Flood Hazard Mapping Partners

Latitude of Projection Origin: 0.0

False Easting: 500000

False Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: Coordinate Pair

Coordinate_Representation:

Abscissa_Resolution: 0.061

Ordinate_Resolution: 0.061

Planar_Distance_Units: meters

Geodetic_Model:

Horizontal Datum Name: North American Datum 1983

Ellipsoid Name: Geodetic Reference System 80

Semi-major Axis: 6378206.4

Denominator of Flattening Ratio: 294.98

Vertical_Coordinate_System_Definition:

Altitude_System_Definition:

Altitude Datum Name: National Geodetic Vertical Datum of 1929

Altitude Resolution: 0.03

Altitude Distance Units: feet

Altitude_Encoding_Method:

Attribute Values

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

The DFIRM 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 SFHA locations, flood zone designations, BFEs, political entities, cross-section locations, FIRM panel information, and other data related to the NFIP.

Entity_and_Attribute_Detail_Citation:

Appendix L of FEMA's Guidelines and Specifications for FEMA Flood Hazard Mapping Partners contains a detailed description of each attribute code and a reference to other relevant information.

Entity_and_Attribute_Detail_Citation:

The following tables are included in this data set:

L_Riv_Model

S_BFE

S_Fld_Haz_Ar

S_Fld_Haz_Ln

S_Gen_Struct

S_LOMR

L_Stn_Start

S_Wtr_Ar

S_Wtr_Ln

S_XS

L_Wtr_Nm

S_DOQ_Index

S_Perm_Bmk

S_PLSS_AR

S_PLSS_LN

S_Pol_Ar

S_Pol_Ln

S_Quad

S_Label_Ld

S_Trnsport_Ln

S_Label_Pt

S_Wtr_Ar

S_Wtr_Ln

Guidelines and Specifications for Flood Hazard Mapping Partners

Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Mapping Partner Contact

Contact_Address:

Address_Type: mailing address

Address: Mapping Partner Address

City: Mapping Partner City

State_or_Province: Mapping Partner State

Postal_Code: Mapping Partner Zip Code

Country: Mapping Partner Country

Contact_Voice_Telephone: Mapping Partner Phone Number

Contact_Electronic_Mail_Address:

Mapping Partner Email Address

Contact_Instructions:

Details for Mapping Partner distribution of data

Distribution_Liability:

Mapping Partner Liability Disclaimer

Standard_Order_Process:

Non-digital_Form:

Information about hardcopy versions available

Fees: Contact Distributor

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: Mapping Partner Data Format

Format_Version_Number: 1

Digital_Transfer_Option:

Offline_Option:

Offline_Media: CD-ROM

Recording_Format: ISO 9660

Fees:

Contact Distributor

Metadata_Reference_Information:

Metadata_Date: 19980509

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Mapping Partner Contact

Contact_Position: Mapping Partner Position

Contact_Address:

Address_Type: mailing address

Address: Mapping Partner Address

City: Mapping Partner City

State_or_Province: Mapping Partner State

Postal_Code: Mapping Partner Zip Code

Country: Mapping Partner Country

Contact_Voice_Telephone: Mapping Partner Phone

Contact_Electronic_Mail_Address:

Mapping Partner Email Address

Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

[February 2002]

L.7 Database Table Structure Requirements for Preliminary and Final Digital Flood Insurance Rate Map Databases

Table: S_BFE

The Base Flood Elevation (BFE) table is required for any digital data where BFE lines will be shown on the corresponding Flood Insurance Rate Map (FIRM). Normally if there are any riverine AE zones, BFE lines are required.

The S_BFE table contains information about the BFEs within a study area. A spatial file with locational information also corresponds with this data table. BFE lines indicate the rounded whole-foot water surface elevation of the 1-percent-annual-chance flood.

The spatial elements representing BFE features are lines extending from Special Flood Hazard Area (SFHA) boundary to SFHA boundary. The BFE lines will have no visible gaps or overshoots between the SFHA boundary and the end of the BFE line at the publication scale of the DFIRM. However, the ends of the BFE lines are not necessarily snapped precisely to the SFHA boundary. Each BFE is represented by a single line. While BFE lines are depicted as wavy lines on the hardcopy FIRM, they should be primarily straight lines in the spatial data, although they may bend consistent with procedures described in Volume 1 of these Guidelines.

The S_BFE table contains the following elements.

BFE_LN_ID	R Primary key for table lookup. Assigned by table creator.
ELEV	R BFE. The rounded, whole-foot elevation of the 1-percent-annual-chance flood. This is the value of the BFE that is printed next to the BFE line on the FIRM.
UNITS	R BFE Units. This unit indicates the measurement system used for the BFEs. Normally this would be feet. Acceptable values for this field are listed in the D_Units table.
V_DATUM	R Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. Acceptable values for this field are listed in the D_V_Datum table.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_BFE table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
BFE_LN_ID	Text	11
ELEV	Single	4.2
UNITS	Text	20
V_DATUM	Text	6
SOURCE_CIT	Text	11

Table: S_CBRS

This table only applies to coastal areas that have specially protected areas designated by Congress on Coastal Barrier Resources System (CBRS) maps. Authoritative CBRS boundary locations are shown on Fish and Wildlife Service maps. Normally these areas are already shown on existing Federal Emergency Management Agency (FEMA) maps for the area. CBRS areas have restrictions on insurance coverage after specified dates for new or substantially improved structures. See Appendix K of these Guidelines for more detailed information about CBRS areas.

The S_CBRS table contains information about the CBRS areas within the study area, if applicable. A spatial file with locational information also corresponds with this data table.

The spatial elements representing CBRS features are closed polygons. Each contiguous CBRS area of the same CBRS_TYP and same CBRS_DATE must be a single polygon.

The S_CBRS table contains the following elements.

- CBRS_ID R Primary key for table lookup. Assigned by table creator.
- CBRS_TYP R CBRS Type. The type code provides details of the types of prohibitions that apply to the area. Normally this would be a CBRS area or Otherwise Protected Area (OPA). Acceptable values for this field are listed in the D_CBRS_Type table.
- CBRS_DATE R Legislation Date on which restrictions for the CBRS area began. This must be indicated on the Flood Insurance Rate Map as a note or with a fill pattern indicated on the legend.
- CBRS_TF R This field is True if the area is a CBRS or an OPA.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_CBRS table.

Name	Type	Size
CBRS_ID	Text	11
CBRS_TYP	Text	35
CBRS_DATE	Date/Time	8
CBRS_TF	Text	1
SOURCE_CIT	Text	11

Table: S_Cst_Tsct_Ln

This table is required when the corresponding Flood Insurance Rate Map (FIRM) and/or Flood Insurance Study (FIS) will show coastal transect locations. Normally this is any area with a coastal study.

The S_Cst_Tsct_Ln table contains information about the Coastal Transect Lines within the study area, if applicable. The transect lines indicate the location that was used to provide representative topographic information for the coastal flood models used. A spatial file with locational information also corresponds with this data table.

The spatial elements representing coastal transects are lines generally extending from offshore all the way across the coastal floodplain. Each transect should be represented by a single line feature without the circles on each end shown on the hard copy map. The location and shape of the lines must depict as accurately as possible the position of the transect used.

The S_Cst_Tsct_Ln table contains the following elements.

- TRAN_LN_ID R Primary key for table lookup. Assigned by table creator.
- TRAN_NO R Transect number as shown on FIRM or in FIS report. Each transect is normally numbered sequentially.
- CST_MDL_ID A Coastal Model Identification. This field is populated by a linking element to the L_Cst_Model table. The L_Cst_Model table contains detailed information about the coastal models that were used to determine the coastal flood hazard for the area of this transect line. This ID field must contain a number that matches the CST_MDL_ID field for a record in the L_Cst_Model table that documents coastal model information for this transect. Multiple transects may link to a single record in the L_Cst_Model table. This field is not required for digital conversion of an existing FIS. Significant additional research may be required to identify the model that applies at a transect. However, for new coastal studies, this field must be populated.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Cst_Tsct_Ln table.

Name	Type	Size
TRAN_LN_ID	Text	11
TRAN_NO	Text	4
CST_MDL_ID	Text	11
SOURCE_CIT	Text	11

Table: S_DOQ_Index

This table is required if digital orthophotography was used as the base map for the Flood Insurance Rate Map (FIRM).

The S_DOQ_Index table contains information about the digital orthophotography used as a base map for the study area. A spatial file with locational information also corresponds with this data table.

The spatial elements representing digital orthophotography index features are rectangular polygons. For standard U.S. Geological Survey Digital Ortho Quadrangles, polygons must match quarter-quad boundaries (excluding overedge). Otherwise, polygons must match the boundaries of the orthophotography used (excluding overedge if present).

The S_DOQ_Index table contains the following elements.

- DOQ_ID R Primary key for table lookup. Assigned by table creator.

- FILENAME R DOQ Filename. This filename must be assigned by the digital orthophotography provider or the table creator. The filename should match the filename assigned by the primary distributor of the orthophotography used. This must be the complete filename including the file extension.

- DOQ_DATE R Digital Orthophotography Date. This is the date that the orthophotography was flown.

- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_DOQ_Index table.

Name	Type	Size
DOQ_ID	Text	11
FILENAME	Text	50
DOQ_DATE	Date/Time	8
SOURCE_CIT	Text	11

Table: S_FIRM_Pan

This table is required for all preliminary or final DFIRM databases.

The S_FIRM_Pan table contains information about the Flood Insurance Rate Map (FIRM) panel area. A spatial file with locational information also corresponds with this data table.

The spatial entities representing FIRM panels are polygons. The polygon for the FIRM panel corresponds to the geographic area where effective flood hazard information is depicted on the FIRM panel. Where a portion of the area within the FIRM panel neatline is outside the jurisdiction mapped by this FIRM, the panel boundary in the Digital Flood Insurance Rate Map spatial data must follow the boundary of the jurisdiction mapped by the FIRM. So for a single jurisdiction FIRM, the outermost panel boundaries would follow the community boundary. For a countywide FIRM, the outermost panel boundaries would follow the county boundary.

The S_FIRM_Pan table contains the following elements.

FIRM_ID	R Primary key for table lookup. Assigned by table creator.
ST_FIPS	R State FIPS. This is the two-digit code that corresponds to the state Federal Information Processing Standard (FIPS) code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4. These two numbers correspond to the first two digits of the panel number.
PCOMM	R Community or County Identification Number. This is the 3 rd through the 6 th digits of the panel number. For community based maps this corresponds to the Federal Emergency Management Agency (FEMA) Community Identification number. For countywide maps this is the county (or county equivalent) FIPS code with a "C".
PANEL	R Panel Number. This is 7 th through the 10 th digits in the complete panel number. This is assigned by the scale of the map and the position within the community or county. The panel number scheme is described in detail in Appendix K of these Guidelines.
SUFFIX	R Map Suffix. This is the final digit in the complete panel number. This is a letter suffix at the end of the panel number.
FIRM_PAN	R FIRM Panel Number. This is the complete FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX. This is the 11-digit FIRM panel number that is shown in the title block of the map.
PANEL_TYP	R Panel Type. The type of FIRM panel that identifies whether the panel is printed or not printed and whether it is community based or countywide

Guidelines and Specifications for Flood Hazard Mapping Partners

	mapping. Acceptable values for this field are listed in the D_Panel_Typ table.
EFF_DATE	A Effective Date. This is the effective date of the current map revision. This field is not populated until the FIRM effective date is established and the Final FIRM is ready for hardcopy production by FEMA. Then it is required.
SCALE	R Map Scale. This is the denominator of the FIRM scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map. Acceptable values for this field are listed in the D_Scale table.
PNP_Reason	A Panel Not Printed Reason. This is the explanation of the reason for the FIRM panels that are not printed. See Appendix K of these Guidelines for a listing of Panel Not Printed reasons that may be used. Only completed if the hardcopy panel is not printed by FEMA.
NW_LAT	R Northwest Latitude. This is the latitude of the northwest corner of the FIRM panel neatline. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to U.S. Geological Survey (USGS) 7.5' quadrangle maps using North American Datum of 1983 (NAD83), or even subdivisions thereof. However this value must reflect the actual latitude if non-standard panel sizes are used.
NW_LONG	R Northwest Longitude. This is the longitude of the northwest corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value must reflect the actual longitude if non-standard panel sizes are used.
SE_LAT	R Southeast Latitude. This is the latitude of the southeast corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value must reflect the actual latitude if non-standard panel sizes are used.
SE_LONG	R Southeast Longitude. This is the longitude of the southeast corner of the FIRM panel. This value is in degrees, minutes, seconds (DDD MM SS.SSS). Normally this corresponds to USGS 7.5' quadrangle maps using NAD83, or even subdivisions thereof. However this value must reflect the actual longitude if non-standard panel sizes are used.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_FIRM_Pan table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
FIRM_ID	Text	11
ST_FIPS	Text	2
PCOMM	Text	4
PANEL	Text	4
SUFFIX	Text	1
FIRM_PAN	Text	11
PANEL_TYP	Text	35
EFF_DATE	Date/Time	8
SCALE	Text	5
PNP_REASON	Text	50
NW_LAT	Text	15
NW_LONG	Text	15
SE_LAT	Text	15
SE_LONG	Text	15
SOURCE_CIT	Text	11

Table: S_Fld_Haz_Ar

This table is required for all preliminary or final DFIRM databases.

The S_Fld_Haz_Ar table contains information about the flood hazard within the study area. A spatial file with locational information also corresponds with this data table. These zones are used by the Federal Emergency Management Agency (FEMA) to designate the Special Flood Hazard Areas (SFHAs) and for insurance rating purposes. These data are the flood hazard areas that are or will be depicted on the Flood Insurance Rate Map (FIRM).

The spatial elements representing the flood zones are polygons. The entire area of the jurisdiction(s) mapped by the FIRM must have a corresponding flood zone polygon.

The S_Fld_Haz_Ar table contains the following elements.

FLD_AR_ID	R Primary key for table lookup. Assigned by table creator.
FLD_ZONE	R Flood Zone. This is a flood zone designation. These zones are used by FEMA to designate the SFHAs and for insurance rating purposes. NOTE: The symbol '%' is a reserved symbol in most software packages so the word 'percent' was abbreviated to 'pct'. Acceptable values for this field are listed in the D_Zone table.
FLOODWAY	A Floodway Type. Floodway areas are designated by FEMA and adopted by communities to provide an area that will remain free of development to moderate increases in flood heights due to encroachment on the floodplain. Normal floodway areas are 'floodway'. Special cases will have a note on the hardcopy FIRM. If the corresponding area is not designated as a floodway, this field is null. Acceptable values for this field are listed in the D_Floodway table.
SFHA_TF	R SFHA. If the area is within an SFHA this field would be True. This field will be true for any area that is coded for any A or V zone flood areas. It must be false for any X or D zone flood areas.
STATIC_BFE	A Static Base Flood Elevation (BFE). For areas of constant base flood elevation, the BFE is shown beneath the zone label rather than on a BFE line. In this situation the same BFE applies to the entire polygon. This is normally occurs in lakes or coastal zones. This field is only populated where a static BFE is shown on the FIRM.
V_DATUM	A Vertical Datum. The vertical datum indicates the reference surface from which the flood elevations are measured. Normally this would be North American Vertical Datum of 1988 for new studies. This field is only populated if the STATIC_BFE field is populated. Acceptable values for this field are listed in the D_V_Datum table.

Guidelines and Specifications for Flood Hazard Mapping Partners

- DEPTH** A Depth Value for Zone AO Areas. This is shown beneath the zone label on the FIRM. This field is only populated if a depth is shown on the FIRM.
- UNITS** A BFE Units. This unit indicates the measurement system used for the BFEs. Normally this would be feet. This field is only populated if the STATIC_BFE or DEPTH field is populated. Acceptable values for this field are listed in the D_Units table.
- VELOCITY** A Velocity Measurement. For alluvial fan areas (certain Zone AO areas), this is shown beneath the zone label on the FIRM. This value represents the velocity of the flood flow in this area. This field is only populated when a velocity is shown on the FIRM.
- VEL_UNITS** A Unit of Measurement for the Velocity Attribute. This is shown in the legend where alluvial fans are present. This field is only populated if the VELOCITY field is populated.
- AR_REVERT** A If the area is Zone AR, this field would hold the zone that the area would revert to if the AR zone were removed. This field is only populated if the corresponding area is Zone AR. Acceptable values for this field are listed in the D_Zone table.
- BFE_REVERT** A If Zone is Zone AR, this field would hold that static base flood elevation for the reverted zone. This field is populated when Zone equals AR and the reverted zone has a static BFE.
- SOURCE_CIT** R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Fld_Haz_Ar table.

Name	Type	Size
FLD_AR_ID	Text	11
FLD_ZONE	Text	55
FLOODWAY	Text	30
SFHA_TF	Text	1
STATIC_BFE	Single	4.2
V_DATUM	Text	6
DEPTH	Single	4.2
UNITS	Text	20
VELOCITY	Single	4.2
VEL_UNITS	Text	20
AR_REVERT	Text	6
BFE_REVERT	Single	4.2
SOURCE_CIT	Text	11

Table: S_Fld_Haz_Ln

This table is required for all preliminary or final DFIRM databases.

The S_Fld_Haz_Ln table contains information about the flood hazard line features for the study area. A spatial file with locational information also corresponds with this data table.

The spatial elements representing the boundaries of the flood hazard areas depicted on the Flood Insurance Rate Map (FIRM) are lines.

The S_Fld_Haz_Ln table contains the following elements.

- FLD_LN_ID R Primary key for table lookup. Assigned by table creator.
- LN_TYP R Line Type. These line types describe the flood boundary and may be used to indicate how the feature must be depicted on the hardcopy FIRM. Acceptable values for this field are listed in the D_Ln_Typ table.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Fld_Haz_Ln table.

Name	Type	Size
FLD_LN_ID	Text	11
LN_TYP	Text	45
SOURCE_CIT	Text	11

Table: S_Gen_Struct

This table is required whenever hydraulic structures are shown in the flood profile. It is also required if levees are shown on the FIRM, channels containing the flooding are shown on the FIRM, or any other structure that impacts the area’s flood risk is shown on the FIRM.

The S_Gen_Struct table contains information about the hydraulic structures within the study area. It must include all structures shown in the flood profiles. In addition, levees, sea walls, channels that contain flooding, and other significant flood control structures shown on the Flood Insurance Rate Map (FIRM) must be included. A spatial file with locational information also corresponds with this data table.

Spatial elements representing general structures are represented by lines. The lines must represent the primary characteristic of the structure. For example, bridges must be represented by the transportation centerline carried by the bridge. Dams must be represented by a line corresponding to the top of the dam. Levees must be represented by a line corresponding to the top of levee. A line corresponding to the centerline of the main barrel must represent a culvert.

The S_Gen_Struct table contains the following elements.

- STRUCT_ID R Primary key for table lookup. Assigned by table creator.
- STRUCT_TYP R Structure Type. Hydraulic structures within the study area. Acceptable values for this field are listed in the D_Struct_Typ table.
- STRUCT_NM A Structure Name. This is the name of the feature and the name that will be shown on the hardcopy FIRM. Blank if the structure is not named on FIRM and/or the name is unknown.
- WTR_NM R Surface Water Feature Name. This is the formal name of the surface water feature associated with the structure, as it will appear on the hardcopy FIRM.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Gen_Struct table.

Name	Type	Size
STRUCT_ID	Text	11
STRUCT_TYP	Text	15
STRUCT_NM	Text	50
WTR_NM	Text	100
SOURCE_CIT	Text	11

Table: S_Label_Ld

This table is required for Digital Flood Insurance Rate Map (DFIRM) data if any label leader lines are shown on the hardcopy FIRM.

The S_Label_Ld table contains information about leader lines that would connect labels to feature locations on base maps. The purpose of this table, along with the S_Label_Pt table is so that the Digital Flood Insurance Rate Map (DFIRM) database can contain the names of roads and other physical features in or near the Special Flood Hazard Areas regardless of the type or structure of the base map used. A spatial file with locational information also corresponds with this data table.

The spatial entities representing label leaders will be lines.

The S_Label_Ld table contains the following element.

LEADER_ID R Primary key for table lookup. Assigned by table creator.

LABEL_TYPE R Label type. This is a description of the planimetric features to which the labels and leaders are associated. For vector based maps, the labels and leaders will be associated with vector features in S_Trnsport_Ln, S_Wtr_Ar and S_Wtr_Ln. For maps with an ortho-photo base, the labels and leaders will be associated with DOQ water and transportation features. For maps that use both vector features and ortho-photos, all values may apply. Acceptable values for this field are listed in the D_Label_Typ table.

Name	Type	Size
LEADER_ID	Text	11
LABEL_TYPE	Text	20

Table: S_Label_Pt

This table is required for all preliminary or final DFIRM databases.

The S_Label_Pt table contains information for point locations that would link labels to base map features. The purpose of this table, along with the S_Label_Ld table is so that the Digital Flood Insurance Rate Map (DFIRM) database can contain the names of roads and other physical features in or near the Special Flood Hazard Areas (SFHAs) regardless of the type or structure of the base map used. A spatial file with locational information also corresponds with this data table.

The spatial entities representing labels are points. The point corresponds to the lower left corner of the label.

The S_Label_Pt table contains the following elements.

LABEL_ID R Primary key for table lookup. Assigned by table creator.

LABEL R Label for map Feature.

LABEL_TYPE R Label type. This is a description of the planimetric features to which the labels and leaders are associated. For vector based maps, the labels and leaders will be associated with vector features in S_Trnsport_Ln, S_Wtr_Ar and S_Wtr_Ln. For maps with an ortho-photo base, the labels and leaders will be associated with DOQ water and transportation features. For maps that use both vector features and ortho-photos, all values may apply. Acceptable values for this field are listed in the D_Label_Typ table.

DEGREES R The degrees of rotation required for the placement of a feature label onto a Flood Insurance Rate Map panel.

Name	Type	Size
LABEL_ID	Text	11
LABEL	Text	255
LABEL_TYPE	Text	20
DEGREES	Integer	4

Table: S_LOMR

This table is required when a Mapping Partner incorporates the results of effective Letters of Map Revision (LOMRs) into the draft Digital Flood Insurance Rate Map (DFIRM) data submitted to the Federal Emergency Management Agency (FEMA).

Guidelines and Specifications for Flood Hazard Mapping Partners

The S_LOMR table contains information about LOMR areas that are incorporated into the Flood Insurance Rate Map (FIRM). This table is planned as a mechanism for DFIRM producers to communicate areas of the DFIRM data that were updated to reflect the results of LOMRs. It is included in the draft DFIRM data submittal. It is not planned for distribution by FEMA once a complete map revision has incorporated these LOMRs into the effective FIRM panel. Therefore it is not included in the Preliminary or Final DFIRM data. A spatial file with locational information also corresponds with this data table.

The spatial entities representing LOMRs are polygons. The spatial information contains the bounding polygon for each LOMR area.

The S_LOMR table contains the following elements.

LOMR_ID	R	Primary key for table lookup. Assigned by table creator.
EFF_DATE	R	Effective Date of the LOMR.
CASE_NO	R	Case Number. This is the case number of the LOMR that is assigned by FEMA. The case number is used to track the LOMR's supporting documentation.
SCALE	R	Map Scale. This is the denominator of the effective LOMR scale as a ratio. For example, 24000 is the denominator for a 1" = 2000' map.
SOURCE_CIT	R	Source Citation. Abbreviation used in the metadata file when describing the source information for the S_LOMR table.

Name	Type	Size
LOMR_ID	Text	11
EFF_DATE	Date/Time	8
CASE_NO	Text	13
SCALE	Text	5
SOURCE_CIT	Text	11

Table: S_Perm_Bmk

This table is required unless there are no National Geodetic Survey (NGS) or other bench marks that meet the minimum standard in the jurisdiction covered by the Flood Insurance Rate Map (FIRM).

The S_Perm_Bmk table contains information about Permanent Bench Marks that are associated with the study area. The bench marks shown in this file must meet the requirements specified in Subsection 1.4.1.4.1. A spatial file with locational information also corresponds with this data table.

The spatial entities representing bench marks are points. Generally, the assigned Mapping must place these points based on the coordinates in the NGS database. However, the horizontal coordinates maintained by the NGS for vertical bench marks is often not very precise because the users usually rely on the location descriptions to locate the bench marks. If the source of the horizontal coordinates used by the NGS is not precise, the Mapping Partner may adjust the position based on better available data.

The S_Perm_Bmk table contains the following elements.

- BM_ID R Primary key for table lookup. Assigned by table creator.
- PID R Permanent Identifier. This must be the NGS assigned or community assigned permanent identifier. It must be unique for each benchmark.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Perm_Bmk table.

Name	Type	Size
BM_ID	Text	11
PID	Text	11
SOURCE_CIT	Text	11

Table: S_PLSS_Ar

This table is required when U.S. Public Land Survey System (PLSS) areas are shown on the Flood Insurance Rate Map.

The S_PLSS_Ar table contains information about PLSS areas that are associated with the study area, if applicable. This would include the attributes for the range, township, and section areas. A spatial file with locational information also corresponds with this data table.

The spatial elements representing the PLSS areas are polygons. Generally there is one polygon per section. The PLSS areas must cover the entire jurisdiction where sections are defined. The S_PLSS_Ar table contains the following elements.

- PLSS_AR_ID R Primary key for table lookup. Assigned by table creator.

- RANGE A Range Number. This is the range number assigned to the PLSS area shown. This attribute would also include the designation of E (east) or W (west) as part of the data. For example, 21W would be an acceptable value. This field is applicable whenever the SECT_NO does not equal zero.

- TWP A Township. This is the township number assigned to the PLSS area shown. This attribute would also include the designation of N (north) or S (south) as part of the data. For example, 14S would be an acceptable value. This field is applicable whenever the SECT_NO does not equal zero.

- SECT_NO R Section. This is the section number assigned to the PLSS area shown.

- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_PLSS_Ar table.

Name	Type	Size
PLSS_AR_ID	Text	11
RANGE	Text	8
TWP	Text	8
SECT_NO	Text	4
SOURCE_CIT	Text	11

Table: S_PLSS_Ln

This table is required when U.S. Public Land Survey System (PLSS) areas are shown on the FIRM.

The S_PLSS_Ln table contains information about the boundary lines for the PLSS that is associated with the study area, if applicable. This would include the attributes for the adjacent range and township areas. A spatial file with locational information corresponds with this data table.

The spatial entities representing PLSS boundaries are lines.

The S_PLSS_Ln table contains the following elements.

PLSS_LN_ID	R Primary key for table lookup. Assigned by table creator.
LN_TYP	R Line Type. This describes the PLSS boundary and may be used to indicate how the feature must be depicted on the hardcopy Flood Insurance Rate Map (FIRM). Acceptable values for this field are listed in the D_Ln_Typ table.
E_RANGE	A East Range Number. This is the range number assigned to the PLSS area shown to the east of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of E (east) or W (west) as part of the data. For example, 21W would be an acceptable value. Only populated for lines that divide one range from another.
W_RANGE	A West Range Number. This is the range number assigned to the PLSS area shown to the west of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of E (east) or W (west) as part of the data. For example, 21W would be an acceptable value. Only populated for lines that divide one range from another.
N_TWP	A North Township. This is the township number assigned to the PLSS area shown to the north of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of N (north) or S (south) as part of the data. For example, 14S would be an acceptable value. Only populated for lines that divide one township from another.

Guidelines and Specifications for Flood Hazard Mapping Partners

S_TWP A South Township. This is the township number assigned to the PLSS area shown to the south of the line feature. This number is shown on the hardcopy FIRM. This attribute would also include the designation of N (north) or S (south) as part of the data. For example, 14S would be an acceptable value. Only populated for lines that divide one township from another.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_PLSS_Ln table.

Name	Type	Size
PLSS_LN_ID	Text	11
LN_TYP	Text	45
E_RANGE	Text	8
W_RANGE	Text	8
N_TWP	Text	8
S_TWP	Text	8
SOURCE_CIT	Text	11

Table: S_Pol_Ar

This table is required for all preliminary or final DFIRM databases.

The S_Pol_Ar table contains information about the Political Areas within the study area. This would include the attributes for the political areas and other areas such as forests, parks, military lands, and Native American lands. For the National Flood Insurance Program (NFIP), it is important to know the jurisdiction that has land use authority over an area. Political jurisdictions individually agree to participate in the NFIP and availability of insurance, floodplain regulations, and insurance rates may vary by political jurisdiction. The political jurisdiction assigned to each area corresponds to the jurisdiction responsible for NFIP and floodplain management for that area. A spatial file with locational information also corresponds with this data table.

The spatial entities representing political areas are polygons.

The S_Pol_Ar table contains the following elements.

POL_AR_ID	R Primary key for table lookup. Assigned by table creator.
POL_Name1	R Political Area Name 1. This is the primary name of the area shown. For areas that have more than one name, this would be the primary name with subsequent names shown in fields below. This would correspond to the official name of this jurisdiction used by the Federal Emergency Management Agency (FEMA) within the NFIP. For unincorporated areas of a county, this must be the county name (e.g., Montgomery County).
POL_Name2	A Political Area Name 2. This is the secondary name of the area shown. Populated if there is a common name for an area other than the official jurisdiction name.
CO_FIPS	R County Federal Information Processing Standard (FIPS) Code. This is the three-digit county FIPS code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4.
ST_FIPS	R State FIPS. This is the two-digit code that corresponds to the state FIPS code. This is a standard numbering system that is used by the Federal government. Defined in FIPS Pub 6-4. These two numbers correspond to the first two digits of the panel number.
COMM_NO	R Community identification number. This is the four-digit number assigned by FEMA to each community for tracking purposes under the NFIP. On newer Flood Insurance Rate Maps (FIRMs) the state FIPS and the Community Identification Number (CID) appear below the community name where it is shown in the body of the map. For single jurisdiction FIRMs, this is the 3 rd through the 6 th digits of the panel number. This number can be obtained from the community status book that can be viewed at www.fema.gov/msc .

Guidelines and Specifications for Flood Hazard Mapping Partners

CID R Community Number. This is the six-digit community number assigned by FEMA. It is created by combining the state FIPS code with the CID.

ANI_TF R Area Not Included True/False. This is a true/false field that contains information about the geographical area to determine if it is included in the FIRM or not. Areas Not Included fall within the extent of the FIRM, but no flood risk information is shown on this map. This is either because the area is mapped on another FEMA map or because the area is not mapped at all by FEMA.

COM_NFO_ID A Community Information Identification. This attribute links to the table L_Comm_Info that contains information about the specific community. This table must contain a number that matches a corresponding number in the COM_NFO_ID field of the L_Comm_Info. This field is populated for any jurisdiction that has a CID number issued by FEMA.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Pol_Ar table.

Name	Type	Size
POL_AR_ID	Text	11
POL_NAME1	Text	50
POL_NAME2	Text	50
CO_FIPS	Text	3
ST_FIPS	Text	2
CID	Text	4
COMM_NO	Text	6
ANI_TF	Text	1
COM_NFO_ID	Text	11
SOURCE_CIT	Text	11

Table: S_Pol_Ln

This table is required for all preliminary or final DFIRM databases.

The S_Pol_Ln table contains information about the boundaries of Political Areas within the study area. This would include the attributes for the political areas and other areas such as forests, parks, military lands, and Native American lands. A spatial file with locational information also corresponds with this data table.

The spatial elements representing the boundaries of the political jurisdictions depicted on the Flood Insurance Rate Map (FIRM) are lines.

The S_Pol_Ln table contains the following elements.

POL_LN_ID R Primary key for table lookup. Assigned by table creator.

LN_TYP R Line Type. This describes the jurisdictional boundary and can be used to indicate how the feature must be depicted on the hardcopy FIRM. Acceptable values for this field are listed in the D_Ln_Typ table.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Pol_Ln table.

Name	Type	Size
POL_LN_ID	Text	11
LN_TYP	Text	45
SOURCE_CIT	Text	11

Table: S_Quad

This table is required for all preliminary or final DFIRM databases.

The S_Quad table contains information about the US Geological Survey (USGS) 7.5-Minute Series Topographic Quadrangle maps that cover the study area. While USGS quadrangles do not meet the Federal Emergency Management (FEMA) digital base map standards, they are often useful as a supplementary reference source. The quadrangle information is provided as a convenience to users who may want to cross-reference this map series. A spatial file with locational information also corresponds with this data table.

The spatial entities representing the USGS quadrangles are polygons. Each polygon corresponds to the neatline of a USGS map.

The S_Quad table contains the following elements.

QUAD_ID	R Primary key for table lookup. Assigned by table creator.
QUAD_NO	R Quad Number. This is the eight-digit USGS alphanumeric quadrangle identifier. The list of values for each state is published by USGS in the State Indexes to Topographic and Other Map Coverage. This item is composed of three components: the latitude, rounded down to the nearest whole degree, of the 7.5-minute quadrangle map sheet; the longitude, rounded down to the nearest whole degree, of the 7.5-minute quadrangle map sheet; and the alphanumeric map sheet identifier used by USGS (i.e., A1 through H8).
QUAD_NM	R Quad Name. This is the name of the quadrangle that is assigned by USGS.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for S_Quad table.

Name	Type	Size
QUAD_ID	Text	11
QUAD_NO	Text	8
QUAD_NM	Text	50
SOURCE_CIT	Text	11

Table: S_Riv_Mrk

This table is required if the Flood Insurance Rate Map (FIRM) shows river distance marks.

The S_Riv_Mrk table contains information about the River Marks shown on the hardcopy FIRM if applicable. A spatial file with locational information also corresponds with this data table.

The spatial entities representing the river marks are points. The points are generally located along side of the river at regular intervals.

The S_Riv_Mrk table contains the following elements.

- RIV_MRK_ID R Primary key for table lookup. Assigned by table creator.
- START_ID R Start Identification. A code that provides a link to a point in the L_Stn_Start table at which the river mark distances start.
- RIV_MRK_NO R River Mark Number. This attribute usually represents the distance from a known point (identified by START_ID), such as the confluence with another river, to the current river mark. This is the value shown next to the river mark on the FIRM.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Riv_Mrk table.

Name	Type	Size
RIV_MRK_ID	Text	11
START_ID	Text	11
RIV_MRK_NO	Text	6
SOURCE_CIT	Text	11

Table: S_Trnsport_Ln

This table or an equivalent that is fully documented is required for all Digital Flood Insurance Rate Map databases that use a vector base map rather than use orthophotos for the base map.

The S_Trnsport_Ln table contains information about the linear base map transportation features such as roads, railroads, and airports. A spatial file with locational information also corresponds with this data table.

The spatial entities representing linear transportation features are normally lines. However, if the available transportation data depict roads as polygons, polygon representation is acceptable. In general, the transportation table structure is fairly flexible depending on the format of the data available for the map. The Federal Emergency Agency's (FEMA's) objective is to have spatially accurate base map data to which the flood hazard information is referenced. Users must be able to identify the names of roads, railroads and other major features in or near the special flood hazard area. If these objectives are met, then almost any file structure is acceptable. Road centerlines or edge of pavement files are both acceptable, provided that they meet the FEMA base map standard. With some data structures, it may not be practical to assign feature names or other attributes to each spatial entity. While these attributes are desirable, FEMA recognizes that they may not always be easily available. This is acceptable because the S_Label_Pt and S_Label_Ld tables will identify the names of all of the important features in or near the SFHA.

The S_Trnsport_Ln table contains the following elements.

TRANS_ID	R Primary key for table lookup. Assigned by table creator.
TRANS_TYP	R Transportation Feature Type. These line types indicate how the feature must be depicted on the hardcopy Flood Insurance Rate Map. Acceptable values for this field are listed in the D_Trans_Typ table.
RD_STAT	R Road Status. Acceptable values for this field are listed in the D_Rd_Stat table.
PREFIX	A Prefix of the Feature Name. Not all features will have an entry in this attribute. Valid entries might include N for a transportation feature named N Main Street.
FEAT_NM1	R Feature Name 1. This is the primary name of the feature. For areas that have more than one name, this would be the primary name with subsequent names shown in fields below.
NM_TYP	R Name Type. Transportation feature name type. Valid entries include items such as road, street, or avenue. Acceptable values for this field are listed in the D_Nm_Typ table.

Guidelines and Specifications for Flood Hazard Mapping Partners

- SUFFIX A Suffix of the Feature Name. Not all features will have an entry in this attribute. Valid entries might include NW for a transportation feature named Main Street NW.
- FEAT_NM2 A Feature Name 2. This is the secondary name of the feature.
- FEAT_NM3 A Feature Name 3. This is the tertiary name of the feature.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Trnsport_Ln table.

Name	Type	Size
TRANS_ID	Text	11
TRANS_TYP	Text	50
RD_STAT	Text	20
PREFIX	Text	50
FEAT_NM1	Text	100
NM_TYP	Text	20
SUFFIX	Text	50
FEAT_NM2	Text	100
FEAT_NM3	Text	100
SOURCE_CIT	Text	11

Table: S_Wtr_Ar

This table is required for any Digital Flood Insurance Rate Map (DFIRM) database where vector surface water features are shown on the Flood Insurance Rate Map (FIRM) and some of these features are represented as polygons in the spatial data. Vector streams must always be shown with a vector base map. They may also be shown on orthophoto base maps.

The S_Wtr_Ar table contains information about surface water area features. A spatial file with locational information also corresponds with this data table.

The spatial elements representing surface water area features are polygons. Normally lakes, ponds and streams wide enough to show both channel banks will be represented as polygons. However, the main purpose of the S_Wtr_Ar table and the S_Wtr_Ln table are to provide a cartographic depiction of the surface water features for visual interpretation of the mapping data. As a result, the method for structuring surface water features as lines or polygons is very flexible. Surface water features may appear in either the S_Wtr_Ar table or the S_Wtr_Ln table or both. However, features that appear in both must match exactly. The hydrologic structure of the stream network will be represented by tables in the Enhanced DFIRM Database.

In general, the surface water table structure is fairly flexible depending on the format of the data available for the map. The Federal Emergency Management Agency's (FEMA's) objective is to have spatially accurate surface water feature data to which the flood hazard information is referenced. Users must be able to identify the names of flooding sources and other important surface water features. If these objectives are met, then almost any file structure is acceptable. Streams, rivers and lakes may be represented as either polygons or lines. With some data structures, it may not be practical to assign feature names or other attributes to each spatial entity. While these attributes are desirable, FEMA recognizes that they may not always be easily available. This is acceptable because the S_Label_Pt and S_Label_Ld tables will identify the names of flooding sources and other important surface water features.

The S_Wtr_Ar table contains the following elements.

WTR_AR_ID	R Primary key for table lookup. Assigned by table creator.
WATER_TYP	R Surface Water Feature Type. This type value describes the classification of the surface water feature. Valid entries include items such as lake, retention pond, and reservoir. Acceptable values for this field are listed in the D_Wtr_Typ table.
WTR_NM	R Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy FIRM.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Wtr_Ar table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
WTR_AR_ID	Text	11
WATER_TYP	Text	25
WTR_NM	Text	100
SOURCE_CIT	Text	11

Table: S_Wtr_Ln

This table is required for any Digital Flood Insurance Rate Map (DFIRM) database where vector surface water features are shown on the Flood Insurance Rate Map (FIRM) and some of these features are represented as lines in the spatial data. Vector streams must always be shown with a vector base map. They may also be shown on orthophoto base maps.

The S_Wtr_Ln table contains information about surface water linear features. A spatial file with locational information also corresponds with this data table.

The spatial elements representing surface water line features are lines. Normally stream centerlines will be represented as line features. However, the main purpose of the S_Wtr_Ar table and the S_Wtr_Ln table is to provide a cartographic depiction of the surface water features for visual interpretation of the mapping data. As a result, the method for structuring surface water features as lines or polygons is very flexible. Lake shorelines and stream channel banks used to show lakes and wide rivers are usually represented as polygons. However, they may be represented as lines based on the structure of the data received and the Mapping Partner's discretion. Surface water features may appear in either the S_Wtr_Ar table or the S_Wtr_Ln table or both. However, features that appear in both must match exactly. The hydrologic structure of the stream network will be represented by tables in the Enhanced DFIRM Database.

In general, the surface water table structure is fairly flexible depending on the format of the data available for the map. The Federal Emergency Management Agency's (FEMA's) objective is to have spatially accurate surface water feature data to which the flood hazard information is referenced. Users must be able to identify the names flooding sources and other important surface water features. If these objectives are met, then most any file structure is acceptable. Streams, rivers and lakes may be represented as polygons or lines. With some data structures, it may not be practical to assign feature names or other attributes to each spatial entity. While these attributes are desirable, FEMA recognizes that they may not always be easily available. This is acceptable because the S_Label_Pt and S_Label_Ld tables will identify the names of flooding sources and other important surface water features.

The S_Wtr_Ln table contains the following elements.

WTR_LN_ID	R Primary key for table lookup. Assigned by table creator.
WATER_TYP	R Surface Water Feature Type. The type value describes the kind of watercourse represented. Valid entries include items such as stream/river, channel, and shoreline/coastline. Acceptable values for this field are listed in the D_Wtr_Typ table.
CHAN_REP	R Channel Representation. Single means linear water features represented by a centerline. Double means linear water features represented by shorelines or channel banks. Acceptable values for this field are listed in the D_Chn_Rep table.

Guidelines and Specifications for Flood Hazard Mapping Partners

WTR_NM R Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy FIRM.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_Wtr_Ln table.

Name	Type	Size
WTR_LN_ID	Text	11
WATER_TYP	Text	25
CHAN_REP	Text	20
WTR_NM	Text	100
SOURCE_CIT	Text	11

Table: S_XS

This table is required for any Digital Flood Insurance Rate Map database where cross sections are shown on the Flood Insurance Rate Map (FIRM). Normally any FIRM that has associated flood profiles has cross sections.

The S_XS table contains information about Cross Section lines. A spatial file with locational information also corresponds with this data table. These lines represent the locations of channel surveys performed for input into the hydraulic model used to calculate flood elevations. These locations are also shown on the Flood Profiles in the Flood Insurance Study (FIS) report and can be used to cross reference the Flood Profiles to the planimetric depiction of the flood hazard.

The spatial elements representing cross sections are lines generally extending from outside the floodplain, across the entire floodplain, and out the other side of the floodplain. Each cross section must be represented by a single line feature without the hexagons shown on each end on the hardcopy FIRM. The location and shape of the lines must depict as accurately as possible the position of the cross section used.

The S_XS table contains the following elements.

XS_LN_ID	R Primary key for table lookup. Assigned by table creator.
XS_LTR	A Cross-Section Letter. The letter that is assigned to the cross section on the hardcopy FIRM and the FIS profiles. This attribute is blank if the cross section is not shown on the FIRM. For a digital conversion, only cross sections that are shown on the FIRM will be available.
XS_NO	A Cross-Section Number. This attribute is used for all cross sections that are created during the engineering analysis. This must be populated with the number sequence that the Mapping Partner who performs the engineering analysis uses. Each cross section must have a unique number. This attribute is not filled in for digital conversions.
START_ID	R Start Identification. This is a link to the station start table. The station start describes the origin for the measurements in the STREAM_STN field. This field must contain a number that links to a unique value in the START_ID field in the L_Stn_Start table.
STREAM_STN	R Stream Station. This is the measurement along the stream to the cross section location. Normally this information is available in the Floodway Data table in the FIS report.
XS_LN_TYP	R Cross-Section Line Type. This attribute must contain 'LETTERED' for cross sections that are shown on the hardcopy FIRM. If the cross section will not be shown on the hardcopy FIRM it must contain 'NOT LETTERED' to indicate that it is part of the backup data for the study.

Guidelines and Specifications for Flood Hazard Mapping Partners

WTR_NM R Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy FIRM.

WSEL_100 R Water-Surface Elevation for the 1-Percent-Annual-Chance Flood Event. This is the precise elevation of the base flood calculated at this cross section. This elevation exactly matches the elevation of the base flood in the flood profiles and the Floodway Data table. This number is determined during the engineering analysis for the study. This value must match the regulatory column in the Floodway Data table in the FIS report or the elevation from the corresponding flood profile if no Floodway Data table is published.

RIV_MDL_ID A River Model Identification. A code that provides a link to the riverine model table, L_Riv_Model. The L_Riv_Model table will identify the hydrologic and hydraulic models used to calculate the flood hazard at this cross section line. This ID field must contain a number that matches the RIV_MDL_ID field for a record in the L_Riv_Model table. The L_Riv_Model table documents model information for this cross section. Multiple cross sections may link to a single record in the L_Riv_Model table. This field is not required for digital conversion of existing FISs. Significant additional research may be required to identify the model that applies at a cross section. However, for new studies, this field is required.

SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the S_XS table.

Name	Type	Size
XS_LN_ID	Text	11
XS_LTR	Text	12
XS_NO	Text	12
START_ID	Text	11
STREAM_STN	Text	12
XS_LN_TYP	Text	20
WTR_NM	Text	100
WSEL_100	Single	4.2
RIV_MDL_ID	Text	11
SOURCE_CIT	Text	11

Table: Study_Info

This table is required for all preliminary or final DFIRM databases.

The Study_Info table contains details about the study such as the study name, datum, projection, etc. There is normally only one record in this table for each Flood Insurance Rate Map (FIRM).

The Study_Info table contains the following elements.

STD_NFO_ID	R Primary key for table lookup. Assigned by table creator.
STUDY_PRE	R Study Prefix. This is the prefix of the study name such as ‘City of’ or ‘Town of’.
STUDY_NM	R Study Name. This attribute contains the main portion of the study name that is shown in the title block of the hardcopy FIRM. For county-wide FIRMs, or FIRMs for the unincorporated portions of counties, the name should include the county or county equivalent descriptor (e.g. Washington County or Iberia Parish).
STATE_NM	R State Name. This attribute contains the state name for the study and is shown in the title block of the hardcopy FIRM.
CNTY_NM	R County Name. This is the county name (or county equivalent) that the study falls within. The name should include the county or county equivalent descriptor (e.g. Washington County or Iberia Parish). The county name is also shown in the title block section of the hardcopy FIRM.
JURIS_TYP	R Political Jurisdiction Type. This attribute contains entries such as ‘Unincorporated Areas,’ ‘All Jurisdictions,’ ‘and Incorporated Areas’ or it is left empty. If there are data in this attribute, it is also shown in the title block section of the hardcopy FIRM.
LG_PAN_NO	R Largest Panel Number. This is the highest panel number shown on the FIRM Index for the area mapped. This number is shown in the title block section of the hardcopy FIRM.
OPP_TF	R Only Panel Printed. This is a true/false field that is True only if the study has only one printed panel.
H_DATUM	R Horizontal Datum. Valid entries for this attribute include North American Datum of 1927 or North American datum of 1983 (NAD83). This is the horizontal datum used for the printed FIRM. The horizontal datum describes the reference system on which the horizontal coordinate information shown on the FIRM is based. NAD83 is the preferred horizontal datum.

Guidelines and Specifications for Flood Hazard Mapping Partners

V_DATUM	R Vertical Datum. This is the vertical datum of the printed FIRM. The vertical datum describes the reference surface from which elevation on the map is measured. Normally this would be North American Vertical Datum of 1988 for new studies. Acceptable values for this field are listed in the D_V_Datum table.
PROJECTION	R Map Projection used for hardcopy FIRM publication. The preferred projection is Universal Transverse Mercator (UTM). If a State Plane coordinate system and associated projection is used, this field must include the name of the projection, the state and the zone (e.g., Lambert Conformal Conic, Virginia North Zone).
PROJ_ZONE	A Projection Zone. When using many map projections and coordinate systems, there is a zone associated with the area. This field is populated based on the projection selected for the Final hardcopy map production. Applies if the projection used has a zone parameter such as UTM or State Plane. The zone must be stated as the appropriate Federal Information Processing Standard zone or FIPZONE.
CW_TF	R Countywide, true/false. This attribute is true if the hardcopy FIRM includes all incorporated areas and any unincorporated areas of the county.
CBRS_PHONE	A Coastal Barrier Resources System (CBRS) Phone number. This is the phone number for the contact person/office for the CBRS legislative area. Applies if the FIRM contains and CBRS areas. Enter the phone number as a ten-digit numeric string without hyphens, parentheses or other separators.
CBRS_REG	A CBRS Coordinator's region. This attribute contains the Fish and Wildlife Service region that contains the FIRM area. Applies if the FIRM contains CBRS areas.
RTROFT_TF	R Retrofit, True/False. The Retrofit attribute is True if old study data is used with updated stream locations. If flood features were adjusted to fit new stream locations due to better base map information this attribute would be true as well.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
STD_NFO_ID	Text	11
STUDY_PRE	Text	20
STUDY_NM	Text	50
STATE_NM	Text	50
CNTY_NM	Text	50
JURIS_TYP	Text	50
LG_PAN_NO	Text	4
OPP_TF	Text	1
H_DATUM	Text	10
V_DATUM	Text	6
PROJECTION	Text	50
PROJ_ZONE	Text	4
CW_TF	Text	1
CBRS_PHONE	Text	15
CBRS_REG	Text	1
RTROFT_TF	Text	1

Table: L_Comm_Info

This table is required for all preliminary or final DFIRM databases.

The L_Comm_Info table is a lookup table that contains community map repository details and map history information that is shown on the Flood Insurance Rate Map (FIRM) legend or index. There is normally one record in this table for each community mapped on the FIRM. The L_Comm_Info table contains the following elements.

COM_NFO_ID	R Primary key for table lookup that links to the S_Pol_Ar table. Value in this field must match the values COM_NFO_ID field of the S_Pol_Ar table.
REPOS_ADR1	R First line of the mailing or street address for the map repository. The map repository is the office the community has designated as responsible for maintaining copies of all the flood hazard information the Federal Emergency Management Agency (FEMA) publishes for the community. The public may view copies of the current effective information at the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read 'Division of Community and Economic Development'.
REPOS_ADR2	R Second line of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read '226 W. Fourth Street'.
REPOS_ADR3	A Third line of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read 'Suite 200'. Populated if address requires additional space.
REPOS_CITY	R City portion of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read 'Springfield'.
REPOS_ST	R State portion of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read 'IL'.
REPOS_ZIP	R ZIP Code portion of the mailing or street address for the map repository. This information is also displayed in the FIRM legend or index. For example, this line might read '62269'.
IN_ID_DAT	R Initial identification date for the community as shown on the FIRM legend, index, or Flood Insurance Study (FIS) report. This information can also be obtained from FEMA.

Guidelines and Specifications for Flood Hazard Mapping Partners

IN_NFIP_DT R Initial date of the first National Flood Insurance Program map published by FEMA for this community. This can be obtained from the FIRM legend, index, or FIS report. This information can also be obtained from FEMA.

IN_FRM_DAT R Initial date FIRM was created. This can be obtained from the FIRM legend, index, or FIS report. This information can also be obtained from FEMA.

RECENT_DAT A Most recent panel date. This can be obtained from the FIRM Index or the FEMA Community Status book at www.fema.gov/msc. This field is only populated for final DFIRM Databases.

Name	Type	Size
COM_NFO_ID	Text	11
REPOS_ADR1	Text	50
REPOS_ADR2	Text	50
REPOS_ADR3	Text	50
REPOS_CITY	Text	50
REPOS_ST	Text	50
REPOS_ZIP	Text	9
IN_ID_DAT	Date/Time	8
IN_NFIP_DT	Date/Time	8
IN_FRM_DAT	Date/Time	8
RECENT_DAT	Date/Time	8

Table: L_Cst_Model

This table is only completed if coastal engineering analysis was performed. It is required for new coastal studies but not required for digital conversion of effective flood hazard information. Significant additional effort may be required to research the applicable models for digital conversions.

The L_Cst_Model table is a lookup table that contains information about the coastal models that were used during the engineering analysis.

The L_Cst_Model table contains the following elements.

CST_MDL_ID	R Primary key for table lookup that links to the S_Cst_Tsct_Ln table. Value in this field must match the values in the CST_MDL_ID field of the S_Cst_Tsct_Ln table.
WTR_NM	R Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy Flood Insurance Rate Map.
SURGE_MDL	R Hurricane Surge Model. This is the name or abbreviation of the Federal Emergency Management Agency (FEMA) approved hurricane surge model that is associated with the coastal model for the engineering analysis. Acceptable values for this field are listed in the D_Surge_Mdl table.
EFF_SURGE	R This is a yes/no field that indicates if this is the effective surge model for the area.
WAVE_MDL	R Wave Height Model. This is the name or abbreviation of the FEMA approved wave height model that was used with the coastal model for the engineering analysis. Acceptable values for this field are listed in the D_Wave_Mdl table.
EFF_WAVE	R This is a yes/no field that indicates if this is the effective wave height model for the area.
RUNUP_MDL	R Runup Model. This is the name or abbreviation of the FEMA approved runup model that was used with the coastal model for the engineering analysis. The runup model information is taken from the table D_Runup_Mdl. Acceptable values for this field are listed in the D_Runup_Mdl table.
EFF_RUNUP	R This is a yes/no field that indicates if this is the effective runup model for the area.

Guidelines and Specifications for Flood Hazard Mapping Partners

- SETUP_METH R Wave Setup Methodology. This information must detail the methodology used when setting up the wave models for the engineering analysis.
- EFF_SETUP R This is a yes/no field that indicates if this is the effective wave setup methodology for the area.
- EROS_TF R This is a true/false field to indicate if erosion treatment has been applied to the area.
- EFF_EROS R This is a yes/no field that indicates if this is the effective erosion methodology for the area.
- PFD_TF R This is a true/false field to indicate if primary frontal dune criteria were applied.
- EFF_PFD R This is a yes/no field that indicates if this is the effective primary frontal dune methodology for the area.
- SOURCE_CIT R Source Citation. Abbreviation used in the metadata file when describing the source information for the L_Cst_Model table.

Name	Type	Size
CST_MDL_ID	Text	100
WTR_NM	Text	25
SURGE_MDL	Text	1
EFF_SURGE	Text	25
WAVE_MDL	Text	1
EFF_WAVE	Text	30
RUNUP_MDL	Text	1
EFF_RUNUP	Text	100
SETUP_METH	Text	1
EFF_SETUP	Text	1
EROS_TF	Text	1
EFF_EROS	Text	1
PFD_TF	Text	1

Table: L_MT1_LOMC

The L_MT1_LOMC table is a lookup table that contains information about Letters of Map Change (LOMC) for the area. LOMCs typically include property descriptions. Frequently, LOMCs are issued to show that specific locations are outside the Special Flood Hazard Areas. Generally, the amount of detail that can be shown on the map does not allow these areas to be shown explicitly on the Flood Insurance Rate Map (FIRM). Instead, this information is communicated in the form of a LOMC. For data published by the Federal Emergency Management Agency (FEMA), this table would only include letters of map amendment and letters of map revision based on fill that have been revalidated following the map revision. Revalidated LOMCs indicate that the information presented in the LOMC continues to be true regardless of the depiction of this area on the FIRM.

For LOMCs that appear on more than one map panel, multiple records will exist with the same case number, but different panel numbers.

The L_MT1_LOMC table contains the following elements.

LOMC_ID	R Primary key for table lookup. Assigned by table creator.
CASE_NO	R Case Number. This is the case number assigned by FEMA to the LOMC. This must be filled in for reference back to the complete LOMC materials. The case number must be entered without hyphens or other separators.
EFF_DATE	R Effective Date of the LOMC.
FIRM_PAN	R FIRM panel number that the LOMC is on. This is also a foreign key to the S_FIRM_Pan table. MT1 LOMCs can be matched to a specific FIRM panel by matching this field to the FIRM_PAN field of the S_FIRM_Pan table.
LOMC_STAT	R Status of the LOMC. Valid entries for this field include the following: ‘superseded’ ‘revalidated’ ‘incorporated’ Only revalidated LOMCs are still in effect after a panel has been revised. All others must be superseded or incorporated into the new FIRM. Therefore, a final DFIRM Database will only include revalidated LOMCs.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
LOMC_ID	Text	11
CASE_NO	Text	13
EFF_DATE	Date/Time	8
FIRM_PAN	Text	11
LOMC_STAT	Text	20

Table: L_Pan_Revis

This table will not apply for an initial Flood Insurance Rate Map (FIRM) or for a FIRM that has a completely new paneling scheme such as a first time countywide FIRM. Otherwise, this table is required for all Preliminary or Final Digital Flood Insurance Rate Map databases.

The L_Pan_Revis table is a lookup table that contains information about historic revisions to each FIRM panel.

For each FIRM panel that is being revised, there must be at least one record. There may also be multiple records for multiple revision dates for a particular panel and there may be multiple records for a single revision date if there are multiple revision notes for that date. Each FIRM panel may have a unique set of revision dates and revision codes. There must be one record for each FIRM_PAN, REVIS_DATE, REVIS_NOTE combination.

The L_Pan_Revis table contains the following elements.

- FIRM_PAN R FIRM Panel Number. The primary key for table lookup that links to the S_FIRM_Pan table. This must match a value in the FIRM_PAN field of the S_FIRM_Pan table. This is the complete FIRM panel number, which is made up of ST_FIPS, PCOMM, PANEL, and SUFFIX, which are found in S_FIRM_Pan table. The FIRM panel number is the 11-digit FIRM panel number that is shown in the title block of the map.
- REVIS_DATE R Revision Date. Effective date of revision to the FIRM panel. FIRM revision dates can be found in the FIRM legend or the Flood Insurance Study (FIS) report.
- REVIS_NOTE R Revision Note. Note describing the reason for the revision to the panel. This is shown under the effective date in the FIRM legend or in the FIS report. A list of standard revision notes appears in Appendix K of these Guidelines.

Name	Type	Size
FIRM_PAN	Text	11
REVIS_DATE	Date/Time	8
REVIS_NOTE	Text	255

Table: L_Pol_FHBM

This table will not apply if all communities on the Flood Insurance Rate Map (FIRM) never had revisions to their Flood Hazard Boundary Maps (FHBM). Otherwise, this table is required for all Digital Flood Insurance Rate Map databases.

The L_Pol_FHBM table is a lookup table that contains a list of communities and FHBM revisions.

Each community may have different revision dates. Each revision date may have multiple revision notes.

The L_Pol_FHBM table contains the following elements.

COMM_NO R Community Number, which is the primary key for table lookup, that links to the S_Pol_Ar table. The value in this field must match a value in the COMM_NO field of the S_Pol_Ar table. This is the six-digit community number assigned by the Federal Emergency Management Agency (FEMA). It is created by combining the state Federal Information Processing Standard code with the Community Identification Number.

FHBM_DATE R FHBM revision date.

FHBM_NOTE R FHBM revision note that describes the reason for the revision. FHBM revision notes are shown in the FIRM legend or Flood Insurance Study report. A list of standard revision notes appears in Appendix K of these Guidelines.

Name	Type	Size
COMM_NO	Text	6
FHBM_DATE	Date/Time	8
FHBM_NOTE	Text	255

Table: L_Riv_Model

This table is only completed if detailed engineering methods were used. It required for new studies but is not required for digital conversions of effective flood hazard information. Significant additional effort may be required to research the applicable models for digital conversions.

The L_Riv_Model table is a lookup table that contains detailed information about the hydraulic and hydrologic models used in the engineering analysis for the area.

The L_Riv_Model table contains the following elements.

RIV_MDL_ID	R River Model Identification. The primary key for table lookup that links to the S_XS table. The value in this field must match the values in the RIV_MDL_ID field of the S_XS table.
WTR_NM	R Surface Water Feature Name. This is the formal name of the surface water feature, as it will appear on the hardcopy Flood Insurance Rate Map.
HYDRA_MDL	R Hydraulic Model. This is the name or abbreviation of the hydraulic model that was used for the engineering analysis. Acceptable values for this field are listed in the D_Hydra table.
EFF_HYDRA	R This is a yes/no field that indicates if this is the effective hydraulic model for the area.
HYDRA_DATE	R Hydraulic Model Run Date. This is the date that the hydraulic model was run.
HYDRO_MDL	R Hydrologic Model. This is the name or abbreviation of the hydrologic model that was used for the engineering analysis. Acceptable values for this field are listed in the D_Hydro table.
EFF_HYDRO	R This is a yes/no field that indicates if this is the effective hydrologic model for the area.
HYDRO_DATE	R Hydrologic Model Run Date. This is the date that the hydrologic model was run.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the L_Riv_Model table.

Guidelines and Specifications for Flood Hazard Mapping Partners

Name	Type	Size
RIV_MDL_ID	Text	11
WTR_NM	Text	100
HYDRA_MDL	Text	25
EFF_HYDRA	Text	1
HYDRA_DATE	Date/Time	8
HYDRO_MDL	Text	25
EFF_HYDRO	Text	1
HYDRO_DATE	Date/Time	8
SOURCE_CIT	Text	11

Table: L_Stn_Start

This table is required for any Digital Flood Insurance Rate Map database that has an S_XS table or S_Riv_Mrk table. Because of production limitations, it may be omitted at the direction of the FEMA Project Officer.

The L_Stn_Start table contains information about station starting locations. These locations indicate the reference point that was used as the origin for distance measurements along streams and rivers. This table is referenced by both the S_XS table that contains stream station information for cross section and by the S_Riv_Mrk table that contains river distance marker points. The location of the stationing start for a group of cross sections is normally referenced as a note on the Floodway Data table and on the Flood Profiles. Generally, all the cross sections for a particular reach are referenced to the same starting point.

The L_Stn_Start table contains the following elements.

START_ID	R Primary key for table lookup. Assigned by table creator. This field is the link that is used to reference cross section in the S_XS table or river marks in the S_Riv_Mrk table to the appropriate stationing starting point.
START_DESC	R Start Description. The description of the location of the station starting point. For example, the confluence with the Main Channel of the Big River.
SOURCE_CIT	R Source Citation. Abbreviation used in the metadata file when describing the source information for the L_Stn_Start table.

Name	Type	Size
START_ID	Text	11
START_DESC	Text	255
SOURCE_CIT	Text	11

[February 2002]

L.8 Metadata Example for Preliminary and Final Digital Flood Insurance Rate Map Databases

DFIRM DATABASE, FLOOD COUNTY, USA

Identification_Information:

Citation:

Citation_Information:

Originator: Federal Emergency Management Agency

Publication Date: 20000505

Title: DIGITAL FLOOD INSURANCE RATE MAP DATABASE, FLOOD COUNTY, USA

Geospatial_Data_Presentation_Form: Vector and Raster Digital Data

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Other_Citation_Details: Metadata_File_Name: DFIRM_DB.htm

Online Linkage: www.fema.gov/msc

Description:

Abstract:

The Digital Flood Insurance Rate Map (DFIRM) Database depicts flood risk information and supporting data used to develop the risk data. The primary risk classifications used are the 1-percent-annual-chance flood event, the 0.2-percent-annual-chance flood event, and areas of minimal flood risk. The DFIRM Database 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, and new mapping data, where available. The FISs and FIRMs are published by the Federal Emergency Management Agency (FEMA). The file is georeferenced to earth's surface using the UTM projection and coordinate system. The specifications for the horizontal control of DFIRM data files are consistent with those required for mapping at a scale of 1:12,000.

Purpose:

The FIRM is the basis for floodplain management, mitigation, and insurance activities for the National Flood Insurance Program (NFIP). Insurance applications include enforcement of the mandatory purchase requirement of the Flood Disaster Protection Act, which "... requires the purchase of flood insurance by property owners who are being assisted by Federal programs or by Federally supervised, regulated or insured agencies or institutions in the acquisition or improvement of land facilities located or to be located in identified areas having special flood hazards," Section 2 (b) (4) of the Flood Disaster Protection Act of 1973. In addition to the identification of Special Flood Hazard Areas (SFHAs), the risk zones shown on the FIRMs are the basis for the establishment of premium rates for flood coverage offered through the NFIP.

The DFIRM Database presents the flood risk information depicted on the FIRM in a digital format suitable for use in electronic mapping applications. The DFIRM database is a subset of the Digital FIS database that serves to archive the information collected during the FIS.

Time_Period_of_Content:

Time_Period_Information:

Single_Date/Time:

Calendar Date: 19980701

Currentness_Reference: FIRM and FIS effective date

Status:

Progress: Complete

Maintenance_and_Update_Frequency: Irregular

Spatial_Domain:

Bounding_Coordinates:

West Bounding Coordinate: -84.125

East Bounding Coordinate: -84.25

North Bounding Coordinate: 30.5

South Bounding Coordinate: 30.625

Guidelines and Specifications for Flood Hazard Mapping Partners

Keywords:

Theme:

Theme_Keyword_Thesaurus: None
Theme_Keyword: FEMA Flood Hazard Zone
Theme_Keyword: DFIRM Database
Theme_Keyword: DFIRM
Theme_Keyword: Special Flood Hazard Area
Theme_Keyword: Digital Flood Insurance Rate Map
Theme_Keyword: CBRS
Theme_Keyword: Coastal Barrier Resources System
Theme_Keyword: Riverine Flooding
Theme_Keyword: Coastal Flooding
Theme_Keyword: NFIP
Theme_Keyword: Base Flood Elevation
Theme_Keyword: SFHA
Theme_Keyword: Flood Insurance Rate Map
Theme_Keyword: FIRM
Theme_Keyword: Floodway

Place:

Place_Keyword_Thesaurus: None
Place_Keyword: FLOOD COUNTY
Place_Keyword: USA
Access_Constraints: None
Use_Constraints:

The hardcopy FIRM and DFIRM and the accompanying FISs are the official designation of SFHAs and Base Flood Elevations (BFEs) for the NFIP. For the purposes of the NFIP, changes to the flood risk information published by FEMA may only be performed by FEMA and through the mechanisms established in the NFIP regulations (44 CFR Parts 59-78).

These digital data are produced in conjunction with the hardcopy FIRMs and generally matches the hardcopy map exactly. However the hardcopy flood maps and flood profiles are the authoritative documents for the NFIP.

Acknowledgement of FEMA would be appreciated in products derived from these data.

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization: Federal Emergency Management Agency

Contact_Position: Federal Insurance and Mitigation Administration Contact_Address:

Address_Type: mailing address

Address: 500 C Street, S.W.

City: Washington

State_or_Province: District of Columbia

Postal_Code: 20472

Country: USA

Contact_Voice_Telephone:

1-800-358-9616

Contact_Electronic_Mail_Address: www.fema.gov/msc

Native_Data_Set_Environment:

Original data development environment varies. Finishing of the data is done using ESRI's ARC/INFO software.

Cross_Reference:

Citation_Information:

Originator: Federal Emergency Management Agency

Publication_Date: 19980701

Guidelines and Specifications for Flood Hazard Mapping Partners

Title: Flood Insurance Rate Map, FLOOD COUNTY, USA

Geospatial_Data_Presentation_Form: map

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Cross_Reference:

Citation_Information:

Originator: Federal Emergency Management Agency

Publication Date: 19980701

Title: Flood Insurance Study, FLOOD COUNTY, USA

Geospatial_Data_Presentation_Form: document

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Cross_Reference:

Citation_Information:

Originator: Federal Emergency Management Agency

Publication Date: 19980701

Title: *Raster DFIRM, FLOOD COUNTY, USA*

Geospatial_Data_Presentation_Form: raster digital data

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Data_Quality_Information:

Attribute_Accuracy:

Attribute_Accuracy_Report:

The DFIRM Database consists of countywide vector files and associated attributes produced in conjunction with the hard copy FEMAFIRM. The published effective FIRM and DFIRM maps are issued as the official designation of the SFHAs. As such they are adopted by local communities and form the basis for administration of the NFIP. For these purposes they are authoritative. Provisions exist in the regulations for public review, appeals and corrections of the flood risk information shown to better match real world conditions. As with any engineering analysis of this type, variation from the estimated flood heights and floodplain boundaries is possible. Details of FEMA's requirements for the FISs and flood mapping process that produces these data are available in the Guidelines and Specifications for Flood Hazard Mapping Partners. Attribute accuracy was tested by manual comparison of source graphics with hardcopy plots and a symbolized display on an interactive computer graphic system.

Independent quality control testing of FEMA's DFIRM database was also performed.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the FIS report that accompanies this DFIRM database. Users should be aware that BFEs shown in the S_BFE table represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report must be used in conjunction with the FIRM for purposes of construction and/or floodplain management. The 1-percent-annual-chance water-surface elevations shown in the S_XS table match the regulatory elevations shown in the FIS report.

Logical_Consistency_Report:

When FEMA revises an FIS, adjacent studies are checked to ensure agreement between flood elevations at the boundaries. Likewise flood elevations at the confluence of streams studied independently are checked to ensure agreement at the confluence. The FIRM and the FIS are developed together and care is taken to ensure that the elevations and other features shown on the flood profiles in the FIS agree with the information shown on the FIRM. However, the elevations as shown on the FIRM are rounded whole-foot elevations. They must be shown so that a profile recreated from the elevations on the FIRM will match the FIS profiles within one half of one foot.

Completeness_Report:

Guidelines and Specifications for Flood Hazard Mapping Partners

Data contained in the DFIRM Database files reflect the content of the source materials. Features may have been eliminated or generalized on the source graphic, due to scale and legibility constraints. With new mapping, FEMA plans to maintain full detail in the spatial data it produces. However, older information is often transferred from existing maps where some generalization has taken place.

Flood risk data are developed for communities participating in the NFIP for use in insurance rating and for floodplain management. Flood hazard areas are determined using statistical analyses of records of river flow, storm tides, and rainfall; information obtained through consultation with the communities; floodplain topographic surveys; and hydrological and hydraulic analysis. Both detailed and approximate analyses are employed. Generally, detailed analyses are used to generate flood risk data only for developed or developing areas of communities. For areas where little or no development is expected to occur, FEMA uses approximate analyses to generate flood risk data. Typically, only drainage areas that are greater than one square mile are studied.

Positional_Accuracy:

Horizontal_Positional_Accuracy:

Horizontal_Positional_Accuracy_Report:

The DFIRM Database consists of countywide vector files and associated attributes produced in conjunction with the hardcopy FEMA FIRM. The published effective FIRM and DFIRM are issued as the official designation of the SFHAs. As such they are adopted by local communities and form the basis for administration of the NFIP. For these purposes they are authoritative. Provisions exist in the regulations for public review, appeals and corrections of the flood risk information shown to better match real world conditions. As with any engineering analysis of this type, variation from the estimated flood heights and floodplain boundaries is possible. Details of FEMA's requirements for the FISs and flood mapping process that produces these data are available in the Guidelines and Specifications for Flood Hazard Mapping Partners. Horizontal accuracy was tested by manual comparison of source graphics with hardcopy plots and a symbolized display on an interactive computer graphic system.

Independent quality control testing of FEMA's DFIRM database was also performed.

Vertical_Positional_Accuracy:

Vertical_Positional_Accuracy_Report:

The DFIRM Database consists of countywide vector files and associated attributes produced in conjunction with the hardcopy FEMA FIRM. The published effective FIRM and DFIRM maps are issued as the official designation of the SFHAs. As such they are adopted by local communities and form the basis for administration of the NFIP. For these purposes they are authoritative. Provisions exist in the regulations for public review, appeals and corrections of the flood risk information shown to better match real world conditions. As with any engineering analysis of this type, variation from the estimated flood heights and floodplain boundaries is possible. Details of FEMA's requirements for the FISs and flood mapping process that produces these data are available in the Guidelines and Specifications for Flood Hazard Mapping Partners. Vertical accuracy was tested by manual comparison of source graphics with hardcopy plots and a symbolized display on an interactive computer graphic system.

Independent quality control testing of FEMA's DFIRM database was also performed.

Source_Information:

Source_Citation:

Citation_Information:

Originator: Federal Emergency Management Agency

Publication Date: 1987

Title:

Flood Insurance Study, FLOOD COUNTY USA (Unincorporated areas).

Geospatial_Data_Presentation_Form: map

Publication_Information:

Publication_Place: Washington, DC

Publisher: Federal Emergency Management Agency

Other Citation Details:

The hydrologic and hydraulic analyses for the FIS dated April 17, 1987, were prepared by the U.S. Army Corps of Engineers (USACE), Springfield District, for the Federal Emergency Management Agency (FEMA), under Inter-Agency Agreement No. EMW-84-E-1506. That work was completed in December 1985. Denominator of Source Scale: 2400-12000.

Source Scale Denominator: 12,000

Guidelines and Specifications for Flood Hazard Mapping Partners

Type_of_Source_Media: paper
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar Date: 19870601
Source_Currentness_Reference: Effective Date
Source Citation Abbreviation: FIS1
Source_Contribution:
Spatial and attribute information, floodplain widths, BFEs, floodplain location.
Source_Information:
Source_Citation:
Citation_Information:
Originator: Federal Emergency Management Agency
Publication Date: 1987
Title: Flood Insurance Study, FLOODVILLE, Town of
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Washington, DC
Publisher: Federal Emergency Management Agency
Other Citation Details:
The hydrologic and hydraulic analyses for the FIS report dated April 17, 1987, were prepared by the USACE, Springfield District, for the FEMA, under Inter-Agency Agreement No. EMW-84-E-1506, Project Order No. 1, Amendment No. 4. That work was completed in December 1985.
Denominator of Source Scale: 2400-12000.
Source Scale Denominator: 12,000
Type_of_Source_Media: paper
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar Date: 19870601
Source_Currentness_Reference: Effective Date
Source Citation Abbreviation: FIS2
Source_Contribution:
Spatial and attribute information, floodplain widths, BFEs, floodplain location.
Source_Information:
Source_Citation:
Citation_Information:
Originator: Federal Emergency Management Agency
Publication Date: 1998
Title:
Flood Insurance Study Report, FLOOD COUNTY, USA and Incorporated areas.
Geospatial_Data_Presentation_Form: map
Publication_Information:
Publication_Place: Washington, DC
Publisher: Federal Emergency Management Agency
Other Citation Details:
For this countywide FIS, the hydrologic and hydraulic analyses were prepared by USACE for FEMA, under Inter-Agency Agreement No. EMW-94-C-0019. This work was completed in October 1995.
Denominator of Source Scale: 2400-12000.
Source Scale Denominator: 12000
Type_of_Source_Media: paper
Source_Time_Period_of_Content:
Time_Period_Information:
Single_Date/Time:
Calendar Date: 19980701
Source_Currentness_Reference: Effective Date

Guidelines and Specifications for Flood Hazard Mapping Partners

Source Citation Abbreviation: FIS3

Source_Contribution:

Spatial and attribute information, floodplain widths, BFEs, floodplain location.

Source_Information:

Source_Citation:

Citation_Information:

Originator:

Town of Floodville Stormwater Management Department, 126 Royal Oaks Drive, Suite 201, Floodville, USA 99150

Publication Date: 1995

Title: Base map for Floodville, USA

Geospatial Data Presentation Form: vector digital data

Publication Information:

Publication Place: Floodville, USA

Publisher: Town of Floodville Stormwater Management

Other Citation Details:

These files were photogrammetrically compiled at scales of 1"=200' (urban areas) and 1"=400' (rural areas) from aerial photographs.

Source Scale Denominator: 4,800

Type of Source Media: CD-ROM

Source Time Period of Content:

Time Period Information:

Single Date/Time:

Calendar Date: 19950301

Source Currentness Reference: ground conditions

Source Citation Abbreviation: BASE1

Source Contribution:

Location of roads, railroads, bridges, streams and other physical features shown.

Source Information:

Source Citation:

Citation Information:

Originator:

Flood County Geographic Information Systems Department, 1110 South Road, Suite 205, Floodville, USA 99150

Publication Date: 1995

Title: Base map for Flood County, USA

Geospatial Data Presentation Form: vector digital data

Publication Information:

Publication Place: Floodville, USA

Publisher: Flood County Geographic Information Systems Department

Other Citation Details:

These files were photogrammetrically compiled at scales of 1"=200' (urban areas) and 1"=400' (rural areas) from aerial photographs.

Source Scale Denominator: 4,800

Type of Source Media: CD-ROM

Source Time Period of Content:

Time Period Information:

Single Date/Time:

Calendar Date: 19950301

Source Currentness Reference: ground conditions

Source Citation Abbreviation: BASE2

Source Contribution:

Location of roads, railroads, bridges, streams and other physical features shown:

Source_Information:

Source_Citation:

Citation_Information:

Guidelines and Specifications for Flood Hazard Mapping Partners

Originator:

U.S. Geological Survey

Publication Date: 1998

Title: Digital Orthophoto Quadrangle

Geospatial Data Presentation Form: remote-sensing image

Publication Information:

Publication Place: Reston, VA

Publisher: U.S. Geological Survey

Other Citation Details: The digital orthophoto quadrangle (DOQ) is a 1-meter ground resolution, quarter-quadrangle (3.75-minutes of latitude by 3.75-minutes of longitude) image cast on the Universal Transverse Mercator Projection (UTM) on the North American Datum of 1983 (NAD83). The imagery is based on panchromatic black and white (or color infra-red) NAPP or NAPP-like photography.

Source Scale Denominator: 12,000

Type of Source Media: CD-ROM

Source Time Period of Content:

Time Period Information:

Single Date/Time:

Calendar Date: 19970301

Source Currentness Reference: ground conditions

Source Citation Abbreviation: BASE3

Source Contribution:

Location of roads, railroads, bridges, streams and other physical features shown:

Process Step:

Process Description:

The DFIRM Database is compiled in conjunction with the hardcopy FIRM and the final FIS report. The specifics of the hydrologic and hydraulic analyses performed are detailed in the FIS report. The results of these studies are submitted in digital format to FEMA. These data and unrevised data from effective FIRMs are compiled onto the base map used for DFIRM publication and checked for accuracy and compliance with FEMA standards.

Source Used Citation Abbreviation: FIS1-FIS3, BASE1-BASE3

Process Date: 1996

Spatial Data Organization Information:

Direct Spatial Reference Method: Vector and raster

Point and Vector Object Information:

SDTS Terms Description:

SDTS Point and Vector Object Type: Point

SDTS Terms Description:

SDTS Point and Vector Object Type: String

SDTS Terms Description:

SDTS Point and Vector Object Type: GT-polygon composed of chains

Raster Object Information:

Raster Object Type: Pixel

Spatial Reference Information:

Horizontal Coordinate System Definition:

Planar:

Grid Coordinate System:

Grid Coordinate System Name: Universal Transverse Mercator

Universal Transverse Mercator:

UTM Zone Number: 16

Transverse Mercator:

Scale Factor at Central Meridian: 0.9996

Longitude of Central Meridian: -87.0

Latitude of Projection Origin: 0.0

False Easting: 500000

False Northing: 0.0

Planar Coordinate Information:

Guidelines and Specifications for Flood Hazard Mapping Partners

Planar_Coordinate_Encoding_Method: Coordinate Pair

Coordinate_Representation:

Abscissa_Resolution: 0.061

Ordinate_Resolution: 0.061

Planar_Distance_Units: meters

Geodetic_Model:

Horizontal_Datum_Name: North American Datum 1983

Ellipsoid_Name: Geodetic Reference System 80

Semi-major_Axis: 6378206.4

Denominator_of_Flattening_Ratio: 294.98

Vertical_Coordinate_System_Definition:

Altitude_System_Definition:

Altitude_Datum_Name: North American Vertical Datum of 1988

Altitude_Resolution: 0.03

Altitude_Distance_Units: feet

Altitude_Encoding_Method:

Attribute Values

Entity_and_Attribute_Information:

Overview_Description:

Entity_and_Attribute_Overview:

The DFIRM 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 SFHA locations, flood zone designations, BFEs, political entities, cross-section locations, FIRM panel information, and other data related to the NFIP.

Entity_and_Attribute_Detail_Citation:

Appendix L of FEMA's Guidelines and Specifications for FEMA Flood Hazard Mapping Partners contains a detailed description of each attribute code and a reference to other relevant information.

Entity_and_Attribute_Detail_Citation:

The following tables are included in this data set:

L_Riv_Model

S_BFE

S_Fld_Haz_Ar

S_Fld_Haz_Ln

S_Gen_Struct

S_LOMR

L_Stn_Start

S_Wtr_Ar

S_Wtr_Ln

S_XS

L_Wtr_Nm

S_DOQ_Index

S_Perm_Bmk

S_PLSS_AR

S_PLSS_LN

S_Pol_Ar

S_Pol_Ln

S_Quad

S_Label_Ld

S_Trnsport_Ln

S_Label_Pt

S_Wtr_Ar

S_Wtr_Ln

Distribution_Information:

Distributor:

Contact_Information:

Contact_Organization_Primary:

Guidelines and Specifications for Flood Hazard Mapping Partners

Contact_Organization: FEMA, Map Service Center
Contact_Address:
Address_Type: mailing address
Address: P.O. Box 1038
City: Jessup
State_or_Province: Maryland
Postal_Code: 20794-1038
Country: USA
Contact_Voice_Telephone: 1-800-358-9616
Contact_Electronic_Mail_Address: www.fema.gov/msc

Contact_Instructions:

Data requests must include the full name of the community or county and the FIRM panel number(s) or the 7.5- minute series quadrangle sheet area(s) covered by the request.

Distribution_Liability:

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.

Standard_Order_Process:

Non-digital_Form:

Printed DFIRMs that match this data set are available from FEMA at the Map Service Center, cited above.

Fees: Contact Distributor

Standard_Order_Process:

Digital_Form:

Digital_Transfer_Information:

Format_Name: ESRI Shapefile

Format_Version_Number: 1

Digital_Transfer_Option:

Offline_Option:

Offline_Media: CD-ROM

Recording_Format: ISO 9660

Digital_Form:

Digital_Transfer_Information:

Format_Name: MapInfo Interchange file (MIF)

Format_Version_Number: 1

Digital_Transfer_Option:

Offline_Option:

Offline_Media: CD-ROM

Recording_Format: ISO 9660

Digital_Form:

Digital_Transfer_Information:

Format_Name: ARCE

Format_Version_Number: 1

Digital_Transfer_Option:

Offline_Option:

Offline_Media: CD-ROM

Recording_Format: ISO 9660

Fees:

Contact Distributor

Metadata_Reference_Information:

Metadata_Date: 19980509

Metadata_Contact:

Contact_Information:

Guidelines and Specifications for Flood Hazard Mapping Partners

Contact_Organization_Primary:

Contact_Organization: Federal Emergency Management Agency

Contact_Position: Federal Insurance and Mitigation Administration

Contact_Address:

Address_Type: mailing address

Address: 500 C Street, S.W.

City: Washington

State_or_Province: District of Columbia

Postal_Code: 20472

Country: USA

Contact_Voice_Telephone: 1-800-358-9616

Contact_Electronic_Mail_Address: www.fema.gov/msc

Metadata_Standard_Name: FGDC Content Standards for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

[February 2002]