



FEMA



# NFHL GIS Data

## Perform Spatial Analyses and Make Custom Maps and Reports

### Purpose and Appropriate Use

FEMA provides access to the National Flood Hazard Layer<sup>1</sup> (NFHL) as Geographic Information System (GIS) data. Users can add these flood map and attribute data to GIS applications to perform spatial analyses, either alone or in combination with other data sources and publish the results of the analyses with custom maps and reports. FEMA publishes new Flood Insurance Rate Maps (FIRMs) in the form of paper maps, digital map images and digital geospatial flood hazard data like those in the NFHL. When used appropriately, these representations are equivalent to one another and represent official FEMA designations of Special Flood Hazard Areas (SFHAs), Base Flood Elevations (BFEs), insurance risk zones and other regulatory information.

Users planning to utilize NFHL data for official purposes must ensure that the imagery and other map information displayed with the flood data meet FEMA's standards for map accuracy<sup>2</sup>.

### Before Starting

To utilize NFHL GIS data, users must have GIS capabilities or mapping software. The software must be able to read data encoded in Shapefile format.

### Obtaining NFHL GIS Data

NFHL GIS data is available for download by County/Community and State via the search functionalities on the FEMA Flood Map Service Center (MSC) at <http://msc.fema.gov>.

FEMA provides access to the NFHL and related data using GIS services, made available through a variety of different protocols. Users can add web-based digital flood hazard maps to business applications via the following services. A Representative State Transfer (REST) service is exposed for users of GIS applications. A Web Map Service (WMS) service is offered for users to generate map images and perform queries. A Web Feature Service (WFS) service is offered to support data downloads for small areas of interest.

It is recommended that only users already familiar with GIS applications use the NFHL GIS services directly. Information on accessing the services is available at:

<https://hazards.fema.gov/femaportal/wps/portal/NFHLWMS>.

### Additional Information

<sup>1</sup> The National Flood Hazard Layer is a computer database that contains the digital flood hazard information from FEMA's Risk MAP program. These map data include Flood Insurance Rate Map databases and later changes made by Letters of Map Revision. They do not include changes identified by property description. Maps that have not been modernized are not available in the NFHL but can be viewed from the FEMA Flood Map Service Center at <http://msc.fema.gov>.

<sup>2</sup> A base map shows the location of roads and railroads, streams and lakes, boundaries, structures, and other features. When used with flood hazard data for official purposes, base maps must have a horizontal radial accuracy better than or equal to 38 feet (11.58 meters) as measured using the National Standard for Spatial Data Accuracy. (This measure is equal to maps of scales larger than or equal to 1:12,000 under the old National Map Accuracy Standard).

**RiskMAP**

—Increasing Resilience Together—

## NFHL GIS Data Basics

The NFHL starts with data from FIRM databases (FIRM DBs). For data fields for which FEMA specifies a domain of values, the FIRM data are checked and (if necessary) modified to comply with the specification. A prefix is added to values in the primary key, source citation, and START\_ID fields to ensure that their values are unique among the multiple FIRM DBs contained in the NFHL. Subsequent Letters of Map Revision (LOMRs) change the original FIRM data to reflect new flood hazard information.

The data usually include only the content of “standard” FIRM DB<sup>3</sup>. Any available “enhanced” FIRM DB content is included but such data are rare. The FIRM DB layers for label leader lines (S\_Label\_Ld) and label points (S\_Label\_Pt) are not included. Orthophotos that accompany some FIRM DBs also are not included. No “empty” data layers are provided; if there are no data in a layer for a State, the database tables that would store that layer are not provided.

A metadata record for the NFHL accompanies the data. The product includes all the digital flood hazard data that are effective and available as of the dataset release date. Horizontal coordinates are stored in latitude and longitude coordinates based on the North American Datum of 1983. Because elevation data are measured using different vertical datums and units of measure, records that contain elevation values also identify their datum and units.

## Finding the Flood Hazard for Your Location

Five information themes are of common interest to users: flood hazard zones, cross sections, communities, FIRMs and LOMRs. This information is available in the tables listed below.

- Flood hazard zones: The table S\_Fld\_Haz\_Ar contains information about flood hazards. The associated spatial data are polygons. Standard fields record the:
  - Flood zone designation (field FLD\_ZONE)
  - Identification of the zone as being an SFHA (field SFHA\_TF)

- Designation of the area as a “Floodway” (field ZONE\_SUBTY)
- Static Base Flood Elevation (BFE) (fields STATIC\_BFE, LEN\_UNIT, and V\_DATUM) for certain zones
- Base Flood Depth value for certain zones (fields DEPTH and LEN\_UNIT)
- Velocity measurements for alluvial fans in certain Zone AO areas (fields VELOCITY and VEL\_UNIT)
- If the FLD\_ZONE field identifies the area as being Zone AR, information about the zone to which the area would revert (fields AR\_REVERT, BFE\_REVERT, DEP\_REVERT, LEN\_UNIT, and V\_DATUM)

- Cross sections: When used with the Flood Insurance Study (FIS) for the community, cross sections are the basis for calculating a BFE. The table S\_XS contains information about cross sections. The associated spatial data are lines. Standard fields record the:
  - Regulatory water-surface elevation for the 1-percent-annual chance flood event (fields WSEL\_REG, LEN\_UNIT, and V\_DATUM)
  - Measurement along the stream from a specified point to the cross section (field STREAM\_STN)
  - Letter or number assigned to the cross section on the FIRM and in the FIS report (field XS\_LTR)
  - Name of the primary water feature spanned by the cross section (field WTR\_NM)
- Communities: The table S\_Pol\_Ar contains information about political areas, including political jurisdictions and other areas such as forests, parks, and military lands. The associated spatial data are polygons. Standard fields record the:
  - Primary and secondary names (fields POL\_NAME1, POL\_NAME2, and POL\_NAME3)
  - State and county Federal Information Processing Standard (FIPS) code (fields ST\_FIPS and CO\_FIPS respectively)
  - Community Number and Community Identification Number (CID) (fields COMM\_NO and CID respectively)
  - Database link (field COM\_NFO\_ID) to a look up table (table L\_Comm\_Info) that has additional information about the community

<sup>3</sup> To learn more about FIRM database specifications, view the 2013 “FIRM Database Technical Reference” (<http://www.fema.gov/media-library/assets/documents/34519>) or the superseded 2003 or 2011 “Appendix L: Guidance for Preparing Digital Data and Flood Insurance Rate Map Databases” (<http://www.fema.gov/media-library/assets/documents/13948>).

- FIRM panel layouts: The table S\_FIRM\_Pan contains information about the FIRM panels. The associated spatial data are polygons. Standard fields record the:
  - Panel number (stored in its entirety in field FIRM\_PAN, and by its components in fields ST\_FIPS, PCOMM, PANEL, and SUFFIX)<sup>4</sup>
  - Effective date (field EFF\_DATE)
  - Map scale (field SCALE)
  - Print status (field PANEL\_TYP) and, if not printed, the reason (field PNP\_REASON)
  - LOMRs: The table S\_LOMR contains information about the area affected by LOMRs. The associated spatial data are polygons. Standard fields record the:
    - Case number (field CASE\_NO)
    - Effective date (field EFF\_DATE)
    - Map scale (field SCALE)
    - Status (field STATUS)

---

<sup>4</sup> A combination is a group of individual layers drawn at one time.