

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 (NFHL)¹ as Geographic Information System (GIS) data. Add these flood map and attribute data to your GIS applications to perform spatial analyses using the flood data, either alone or in combination with your data (see Figure 1). Publish the results of the analyses with custom maps and reports.

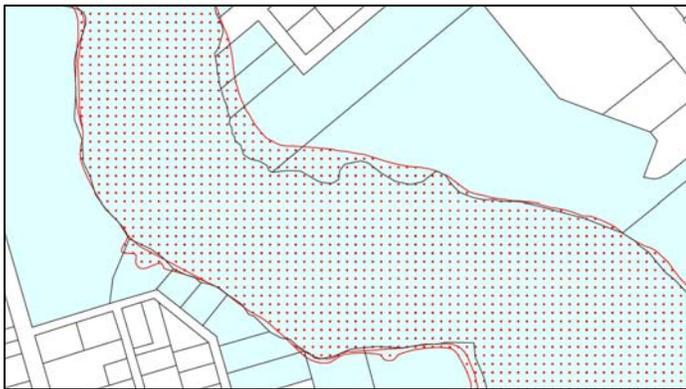


Figure 1. Results of a GIS analysis of parcel and NFHL GIS data. The parcels shaded in blue overlap areas of high flood hazard in whole or in part. Areas of high flood hazard are shaded in red. Such combinations of NFHL and local GIS data offer new opportunities to understand hazards and inform the public. (Parcel data courtesy of the Delaware DataMIL and Kent County, Delaware.)

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.

If you plan to use the NFHL GIS data for official purposes, ensure that the imagery and other map information displayed with the flood data meet FEMA's standards for map accuracy².

¹The National Flood Hazard Layer is a computer database that contains the digital flood hazard information from FEMA's Flood Map Modernization program. These map data include Digital 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 and ordered from FEMA's Map Service Center at <http://msc.fema.gov>.

²A 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 (Accuracy_r) better than or equal to 38 feet (11.58 meters) as measured using the National Standard for Spatial

Before You Start

To use the NFHL GIS data, you need GIS or mapping software. The software must be able to read data encoded in the Shapefile format.

FEMA distributes a *MapViewer – Desktop* tool (beta release) that allows you to view NFHL GIS data (and Digital Flood Insurance Rate Map (DFIRM) databases) stored on your computer. After you install the tool on your computer, it does not require that you have access to the Internet. The tool is available from FEMA's Map Service Center (MSC) at <http://msc.fema.gov>.

Obtaining NFHL GIS Data

Order NFHL GIS data from the MSC at <http://msc.fema.gov>. Follow the link "Order NFHL GIS Datasets by state on DVD" or use the Product Catalog to determine product availability and to place an order.

You must register on the MSC web site to place an order. Use the *Register* link in the *Log On* area of the home page. The MSC uses the registration information to ship the data to you.

The NFHL GIS data products are organized by State or State-equivalent. The data are delivered on DVDs.

NFHL GIS Data Basics

The NFHL starts with data from DFIRM databases. For data fields for which FEMA specifies a domain of values, the DFIRM 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 DFIRM databases contained in the NFHL. Subsequent Letters of Map Revision (LOMRs) change the original DFIRM data to reflect new flood hazard information.

The data usually include only the content of "standard" DFIRM databases.³ Any available "enhanced" DFIRM database content is included, but such data are rare. The DFIRM database layers for label leader lines (S_Label_Ld) and label points (S_Label_Pt) are not included. Orthophotos that accompany some DFIRM databases also are not included. No "empty" data layers are provided; if there are no

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.)

³To learn more about DFIRM database specifications, see section L7, "Database Table Structure for Preliminary and Final Digital Flood Insurance Rate Map Databases," of Appendix L, "Guidance for Preparing Draft Digital Data and DFIRM Databases," in *Guidelines and Specifications for Flood Hazard Mapping Partners*. Appendix L is available through <http://www.fema.gov/library/viewRecord.do?id=2206>.



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. The *MapViewer – Web* tool, available through the MSC web site at <http://msc.fema.gov>, provides a status map of NFHL data coverage.

FEMA provides new releases of the NFHL GIS data monthly. Between these releases, new FIRMs, FIRM Scans, FIRMettes, DFIRM databases, and LOMRs will be available from the MSC.

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 FLOODWAY).
 - Static BFE (fields STATIC_BFE, LEN_UNIT, and V_DATUM) for certain zones.
 - 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 and POL_NAME2).
- 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.
- 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).⁴
 - Effective date (field EFF_DATE).
 - Map scale (field SCALE).
 - Print status and project type (field PANEL_TYP) and, if not printed, the reason (field PNP_REASON).
 - Corner coordinates for the FIRM panel (fields NW_LAT, NW_LONG, SE_LAT, and SE_LONG).
- 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).

Sources of Additional Information

Questions or comments about the NFHL GIS data: Direct them to MIPhelp@mapmodteam.com. Please include the words “NFHL GIS Data” in the subject of your message. Note that FEMA cannot answer questions about using the data in a brand of GIS software.

To view and buy flood maps and data: See the MSC web site at <http://msc.fema.gov>.

For information and resources associated with using or requesting changes to FEMA Flood Maps: See the Flood Hazard Mapping web site at <http://www.fema.gov/plan/prevent/fhm/index.shtm>.

For general information about flood risk, flood insurance, and the National Flood Insurance Program: See the FloodSmart web site at <http://www.floodsmart.gov>.

⁴ For most of North Carolina, the State panel number is in the field FIRM_PAN and the FEMA panel number is in the component fields.