



COUNTYWIDE DFIRM BASE MAP DATA

This document is intended to serve as a guide to gathering, evaluating, and submitting datasets for inclusion in a countywide Digital Flood Insurance Rate Map (DFIRM), including an explanation of base mapping data needs and standards.

OVERVIEW

In the beginning phases of a DFIRM project, data is gathered and compiled by the contractor into countywide GIS layers for use in FEMA DFIRM hard-copy map production. This data is also converted to the FEMA Standard DFIRM Database format that will be distributed to the communities with the hard-copy flood insurance maps and the Flood Insurance Study (FIS). The gathered and compiled data will form the base map for the project. FEMA has set forth GIS and mapping standards adopted from the National Standards for Spatial Data Accuracy (NSSDA) and published in FEMA's document: *Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A* (http://www.fema.gov/pdf/fhm/frm_gsaa.pdf). FEMA feels that the best data is local data and ultimately prefers to use community datasets that meet or exceed their specifications rather than using National-level datasets.

Certification

For FEMA to use the data, certification and permission must be provided with the data. The certification is a written statement from the contributing organization that the data meets FEMA's minimum standards and specifications. The permission is a written statement that FEMA may use the data for their digital base map, and that FEMA may use and distribute hardcopy and digital products using the digital base map with no monetary charge. Please contact the DNRC for sample certification and permission documents.

Submittal Deadline

A FEMA-approved base map is one of the first steps in developing a DFIRM for each county. The base map must be submitted to FEMA early in the process; therefore, it is essential that contractors receive all locally-developed data that the communities would like to see in their maps by the deadline. Submittal methods are noted below.

DATA STANDARDS

This section outlines the mapping data standards set forth by FEMA for data to be included in any DFIRM project. All data submitted for this project must conform to these standards to be included in the final DFIRM hard-copy and Database products. These specifications are published in the *Guidelines and Specification for Flood Hazard Mapping Partners* and are available from FEMA's web site.

File Format

FEMA specifies many acceptable formats, and a full listing can be found in *Appendix L* of the *Guidelines and Specifications for Flood Hazard Mapping Partners*. The vector mapping files will be submitted to FEMA in an ESRI format and production work will take place in either an ESRI coverage format or an ESRI geodatabase format for vector datasets. Data to be included in the County DFIRM should be submitted in these formats or shapefile if possible. A Microstation CAD format is also acceptable as an alternative if the data is not available in a GIS format. Imagery may be submitted in many formats including: .jpg, .tif, .sid, or .ecw. Topographic information can be accepted in grid, DEM, TIN, or TVC formats. If you have data to be submitted in a format other than those listed, please contact us and we can work with you toward a solution. Please include the coordinate system, datum, and projection information with the imagery as well as referenced world files if applicable.

Quality

Topological fidelity must be maintained on all vector layers submitted for inclusion in the County DFIRM. If shapefiles or CAD files for both polyline and polygon are submitted for a single layer (i.e. Floodplain delineation polygons and line work are submitted in two separate files), those boundaries must be mathematically coincident. Overshoots, undershoots, dangles, psuedonodes, and slivers must be eliminated from the submitted datasets prior to submission.

Scale and Accuracy

FEMA relies on National Map Accuracy Standards for dataset accuracy. These standards are located in *Guidelines and Specifications for Flood Hazard Mapping Partners, Appendix A and L*. These standards for base mapping layers (aerial photography, centerlines, etc.) are:

- scale of 1:20,000 or better;
- raster resolution of 1M or better;
- radial-RMSE (rRMSE) of 38 feet at the 95% confidence level.

Coordinate System and Projection

The final data layers for this project will be submitted to FEMA and published in: Montana State Plane, NAVD88, NAD83, feet. Data may be submitted for inclusion to

the DFIRM in any coordinate system, projection, horizontal or vertical datum so long as it is common, recognizable, documented, and easily converted to the project system.

Distribution

FEMA must be able to distribute an unlimited number of hardcopy maps produced from these data, and they must be able to freely distribute the datasets used to create the maps. The data must also be available at zero cost to FEMA. Data distribution and use agreements can be signed by FEMA to limit data distribution in some cases and are dealt with on a case-by-case basis. FEMA also allows high quality data used in production of hard copy mapping products to be distributed in a reduced quality format. For example, 1-foot pixel aerial photography used to create DFIRM maps may be resampled to the 1-meter minimum resolution for distribution. Additionally, sensitive vector data, on special occasion, may be rasterized for distribution.

Currency

Data to be included in the countywide DFIRM must have been created or reviewed for currency within the past seven (7) years.

Coverage

FEMA requires complete county coverage in either a raster or vector format. The base map data for the county must ultimately cover the entirety of the County and Incorporated Communities in a **vector** dataset. Although a vector dataset will be used as the countywide base map, submission of ortho-rectified aerial imagery will assist the project by providing a source for georeferencing hard copy scans as well as assisting with feature verification. Data may come from multiple sources but all sources must meet the requirements stated above.

Metadata

All datasets delivered from the community to the DNRC for use in the DFIRM project must be accompanied by descriptive metadata files. FGDC compliant metadata will be delivered to FEMA with preliminary and final maps and data. This format is also the preferred format for community submittal of data to the DNRC for inclusion to the DFIRM. If the FGDC format does not exist for the datasets and/or is not attainable, an alternate format is acceptable. A data dictionary and detailed description of the datasets are required at a minimum.

Summary

If the above FEMA standards: scale of 1:20,000; resolution of 1 meter; currency of 7 years; freely distributable; accuracy of 38 feet rRMSE; complete coverage, and accompanying metadata can not be met or exceeded with existing community datasets for inclusion into the DFIRM and submittal to FEMA for the countywide DFIRM, then FEMA will necessitate the use of USGS quarter quadrangle aerial photography collected through the National Aerial Photography Program as the default base map for the project.

DATA LAYERS FOR INCLUSION INTO THE DFIRM

FEMA and the DNRC are requesting that the following data layers from your area be submitted for inclusion into the DFIRM if they are available from your area. If your community has data meeting the above-described data standards and formats, and your community is willing to certify and allow this data for FEMA's use, please let us know which layers you can contribute, and send them in.

We are looking for:

- Transportation
 - Street and Highway Centerlines
 - Railroads
 - Airport Runways
 - Feature names. Should be included in a database or linked table

- Flooding Sources
 - Stream centerlines
 - Lakes
 - Ponds
 - Ditches, canals, laterals, and other sources contributing to the floodplain delineations included in the DFIRM study.

- Flood Hazard Features
 - 1% annual chance flood hazard areas (100 year flood hazard), including shallow flooding areas
 - 0.2% annual chance flood hazard areas (500 year flood hazard)
 - Floodway
 - Flood structures: dams, levees, bridges, culverts, etc.
 - Cross Sections
 - Base Flood Elevation Lines

- Corporate Limits
 - Corporate Boundaries
 - Annexations
 - Extra Territorial Jurisdictions
 - State or National Parks and Forests
 - Airports
 - Any other accurate boundary file defining jurisdictional limits

- Survey Benchmarks
 - Exact coordinates and identification of any locally used benchmarks that are desired to be placed on the DFIRM.

- Public Land Survey System
 - Township, Range, and Section boundaries

- Topographic Data
 - Detailed contours suitable for floodplain delineation – preferably in a digital format
 - Digital topographic surface (DEM, TIN, or other) suitable for floodplain delineation

- Aerial Orthophotography
 - Most recent ortho-rectified aerial imagery referenced to a common coordinate system and projection

We are not looking for:

- Utilities
- Building footprints
- Parcels
- Right-of-way or easements

DELIVERY

All data should be submitted for review and possible inclusion into the countywide DFIRM by the project base mapping acquisition deadline established. The base map is the foundation for a Digital Conversion project, and without it, mapping the county cannot proceed. We request that the data be submitted by the established deadline to keep the project on schedule and produce the preliminary and effective maps for your community as quickly and accurately as possible. Data submittals received after deadline will be considered for incorporation into the preliminary DFIRM, but due to FEMA schedule constraints, no assurances concerning the incorporation of such late submittals can be given in order to keep the project on schedule. If a community desires additional time for a submission, please call us and we will work with you to make considerations. These mapping data submissions should be in a format as previously described and may be included in email (if less than 2MB), CD or DVD-ROM, or other arrangement on a case-by-case basis.

QUESTIONS?

Contact the DNRC for more information:

Laurence Siroky, Water Operations Bureau Chief
 DNRC Floodplain Program
 1424 9th Ave
 Helena, MT 59620
 Tel: 406-444-6816
 Email: lsiroky@mt.gov

Local Base Map Data Certification and Redistribution Agreement

The Federal Emergency Management Agency (FEMA) is embarking on an effort to convert some of the previously published Flood Insurance Rate Maps for _____ County, Montana, and all incorporated communities, to a Digital Flood Insurance Rate Map (DFIRM) in a Geographic Information System (GIS) format. According to current guidelines for DFIRMs in GIS format, the base map digital data must meet minimum accuracy standards and be available for public distribution.

At this time, FEMA is requesting:

- Certification from your community that the digital base map data that you have provided for this DFIRM conversion project meet the FEMA minimum accuracy standards, and,
- Approval from your community to distribute base map data previously provided.

If consent is not obtained for the certification or release of base map data files for your community, the DFIRM must be republished using alternative public domain base map data available from the U.S. Geological Survey (USGS). Use of the USGS data may make the DFIRM less compatible with your community's GIS.

Certification: I hereby certify that the digital base map data provided by the community of _____ to FEMA for use in preparing a DFIRM for _____ County, Montana, meet the FEMA minimum accuracy standards. The digital base map data provided to FEMA for use in preparing this DFIRM are available for distribution to the public by FEMA.

Signature

Date

Title