Flood Inundation Map Library Minimum Report Documentation

In order to facilitate USGS oversight of the quality of the maps, all submissions of Flood-Inundation Maps (FIMs) to the USGS Flood Mapper shall be accompanied by documentation. The documentation shall include the following sections, and shall meet the minimum documentation requirements for each section.

**Purpose and Scope**

A general description of the purpose and scope of the study shall be provided, including the reach length, identification of the upstream and downstream study limits, and the range in stage, referenced to the USGS streamgage within the study reach that is covered by the FIMs.

**Disclaimer, uncertainties, use limitations, and accuracy assessment of maps**

The disclaimer shall incorporate the default USGS disclaimer and the default USGS use limitations. Any applicable project specific use limitations shall be incorporated into the documentation. For Official Use Only (FOUO) data shall be clearly identified, and the conditions for which FOUO data may be released to the public shall be stated.

A generalized accuracy assessment of the mapping products shall be developed based upon the horizontal and vertical mapping error associated with the data in the digital elevation model and hydraulic model that was used to create the FIMs and any additional project specific information. The accuracy assessment shall include a list of streamgage(s) and shall clearly identify any FIM maps that depict a stage higher than the equivalent highest measured discharge (extended rating) at the specified streamgage(s).

**Study area description, including flood risk analysis of impacts to life and property**

A generalized study area description shall be included which includes a description of the geographic location of the study, a description of the study river reach, any hydraulic structures within the study reach (including bridges, dams, and levees), the streamgage(s) that are tied to the study, the elevations mapped by the study, a list of communities included within the study reach, the flood history, and significant flood impacts within the study reach.

**Elevation data source, datum and nominal accuracy**

A description of the quality of the streamgage vertical datum shall be provided for any streamgage(s) that are associated with the mapping products. The description shall include: the date of the last streamgage elevation survey, source of the streamgage survey, survey technique, survey datum, methods used to convert the survey datum, and nominal accuracy of the survey.

A description of the quality of the digital elevation model (DEM) source(s) shall be provided. The description shall include: a description of the data source, acquisition date, publication date, vertical/horizontal nominal accuracies, native horizontal datum/projection, native vertical datum, format (raster or TIN), DEM cell size (if applicable). If the original DEM is resampled to a larger cell size, state the new cell size and the resultant vertical accuracy.

A description of the quality of survey information used to develop the hydraulic and/or terrain model geometry shall be provided. The description shall include: a description of the data source, survey acquisition date, vertical/horizontal nominal accuracies, native horizontal datum/projection, and native vertical datum. If bathymetric data were collected, state the methods used and describe how the field-collected data were merged with the DEM data.

A description of the quality of other information, such as as-built bridge or dam plans, used to develop the hydraulic and/or DEM geometry shall be provided. The description shall include: a description of the data source, acquisition date, publication date, vertical/horizontal nominal accuracies, native horizontal datum/projection, native vertical datum, and format.

**Hydrologic methods**

A description of the hydrologic analysis shall include a discussion of the model boundary conditions, the location and assumptions made at the model boundaries, an analysis of the local flow contributions within the study reach, and an evaluation of backwater influences on the study reach.

**Hydraulic modeling, methods (model and version), calibration procedures and validation results**

A description of the hydraulic model shall include the type and version of the model, the model dimension (1D or 2D), and the mode of operation (steady or unsteady flow). The assumptions and justification for selection of a one- or two-dimensional analysis and a steady or unsteady mode of operation shall be described. The source of the model geometry and any updates to the source geometry shall be described. Major assumptions made during the modeling analysis, including boundary conditions and modeling approaches for levees or other storage areas (if applicable) shall be described. Final channel and floodplain roughness coefficients (n-values) used in the model shall be presented and channel and floodplain characteristics that justify use of these values shall be discussed. For maps connecting inundation data to forecast points, a rating curve analysis shall be developed to compare the model results with the operational rating curve. A table of streamgage stages and associated flows that were input to the hydraulic model to generate water-surface profiles through the study reach shall be presented. Hydraulic model calibration and validation techniques, assumptions, and results shall be described. An error analysis, including a specified level of modeled inundation uncertainty, shall be published and based on the best available high-water mark observations and streamgage data.

**Flood-inundation mapping methods**

A description of the GIS techniques used to convert the hydraulic model water-surface profiles into inundation polygons and optional depth grids shall include the name and version of the program used and the estimated vertical accuracy of the resultant FIMs. A description of DEM post-processing shall be provided. Steps taken to post-process the FIM polygons by removal of “orphan” polygons and the decision on when to display bridge surfaces as inundated shall be discussed.

**List of data/products developed and delivered**

A list of the product deliverables and optional deliverables shall be included.

**List of references cited**

A list of references cited throughout the documentation shall be published in standard format.