



Flood Inundation Mapping Program

Requirements for submitting data to the online mapper FOR STUDIES WITH TWO GAGE CONDITIONAL MAPPING

Last Update: September 23, 2015

Projects wishing to include their data on the USGS FIM Program Mapper need to follow the process and meet the specifications for data submission listed here. If you have any questions or a unique library, please contact Moon Kim (mkim@usgs.gov or 317.600.2787) or Marie Peppler (mpeppler@usgs.gov or 703.648.5314).

Data Submission Process

1. Prepare your files using the submission guidelines below for posting in the peer-review mapper (<http://wim.usgs.gov/fimireview/>). You are encouraged to use the peer-review mapper to assist your reviewers. Submit your files to allow for two weeks processing time before your reviewers need to access the maps
2. Fill out the SharePoint form: <https://xcollaboration.usgs.gov/wg/wiWSC/FIMI/>, being sure to fill in ALL required fields (*) for the review mapper submission. Missing information can result in delays. If you need permissions on the SharePoint to submit your data, please email Moon.
 - Zip all of your organized files together and place them on a public FTP site. Submit the public FTP location to WiM via the SharePoint form.
 - Please attach the “Page 1 text template” to your SharePoint submission. You are also encouraged to submit this text to your peer reviewers and editorial review. Strict character limits will be enforced. The same text will be applied to both gages in the reach.
 - Processing will begin as soon as your data is complete. Please contact us as soon as possible if you have a strict deadline you need to meet. Normal processing time for complete submissions is two weeks.
3. Once peer-reviews are completed and any revisions completed, you may resubmit your files, once, as a final mapper version, via public FTP. If no updates are needed or if the revisions and resubmission of files are ready for a final mapper version, please fill out the remaining fields in the SharePoint form. You must have all relevant fields completed before final publishing on the mapper.
 - Approved Report number and link to Pubs Warehouse and location of data download files
 - Names, URLs and logos for the parties involved in creating and reviewing the maps (partners and OFA)
 - Basic logos are on file (USGS, NWS, and USACE) but please let us know which ones to post, and upload any additional logos that should appear on the “Services and Data” tab. Logos should be a maximum height of 150 pixels to fit in the lower left side of the tab.
4. The final mapper upload and proofing can happen concurrently with your SPN layout but the final links to pubs warehouse are needed before the maps can be published.



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Requirements for Mapper Submission for two-gage libraries

Flood extent areas

Please submit one shapefile with the polygons attributed for each stage height pair. Each polygon or polygons for a given stage height pair should be dissolved into one multipart polygon (i.e. if there are 10 stage height pairs in the study, there should be 10 rows in the shapefile attribute table for the flood library). See Appendix A for guidance on merging multiple shapefiles.

Naming Convention: The shapefile should be named ShortName.shp, where “ShortName” is a logical, unique name for the library that is no more than 10 characters in length. The ShortName must start with a letter, and end with the 2-letter state abbreviation for the state where the library is located. If feasible, incorporate the name of the stream/river in addition to the location. For example, an ideal ShortName for a library based on a gage on the Yahara River in Madison, Wisconsin would be “yahmadWI.”

Attributes: The required attribute fields are listed in table 1. Please be sure to make the USGSID field a text type (this allows for the leading zero present in USGS gage IDs). See Table 1 for the required table schema. See Figure 1 for example attribute table. See Appendix B for instructions on editing an attribute table.

Projection: The Spatial Reference required for shapefile mapper submission is WGS 1984 Web Mercator Auxiliary Sphere (WKID 3857). See Appendix C for detailed instructions on projecting to Web Mercator.

Table 1. Required schema

Name	Data Type	Description
STAGE_1	Double	USGS stage height associated with the area and USGSID_1
ELEV_1	Double	NAVD88 elevation that correlates with the stage and USGSID_1
QCFS_1	Double	Discharge in cfs that correlates with the stage and USGSID_1
USGSID_1	Text	USGS station ID number, including leading zeroes
STAGE_2	Double	USGS stage height associated with the area and USGSID_2
ELEV_2	Double	NAVD88 elevation that correlates with the stage and USGSID_2
QCFS_2	Double	Discharge in cfs that correlates with the stage and USGSID_2
USGSID_2	Text	USGS station ID number, including leading zeros
GRIDID	Integer	Code to match the appropriate grid with the flood depths. Please double check your numbers and data.



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Figure 1. Example flood extent file attribute table for two-gage library

Table

fim_flood_extents_multi_sites

OBJECTID *	Shape *	STAGE_1	STAGE_2	ELEV_2	GRIDID	ELEV_1	USGSID_1	USGSID_2	Shape_Length	Shape_Area	QCFS_1	QCFS_2
758	Polygon	34	30	596.1	83	626.6	03150500	03150700	189187.43089	20819092.066822	72500	269000
759	Polygon	34	28	594.1	82	626.6	03150500	03150700	187249.521618	20584336.265621	72500	243000
760	Polygon	34	26	592.1	81	626.6	03150500	03150700	183025.905877	20365023.004759	72500	218000
761	Polygon	34	24	590.1	80	626.6	03150500	03150700	183025.905877	20365023.004759	72500	193000
762	Polygon	34	22	588.1	79	626.6	03150500	03150700	183025.905877	20365023.004759	72500	170000
763	Polygon	34	20	586.1	78	626.6	03150500	03150700	183025.905877	20365023.004759	72500	148000
764	Polygon	34	18	584.1	77	626.6	03150500	03150700	183025.905877	20365023.004759	72500	126000
765	Polygon	32	54	620.1	76	624.6	03150500	03150700	187899.569953	31107535.344487	61300	672000
766	Polygon	32	52	618.1	75	624.6	03150500	03150700	185060.155238	30592127.768218	61300	632000
767	Polygon	32	50	616.1	74	624.6	03150500	03150700	187438.532881	29159088.326662	61300	590000
768	Polygon	32	48	614.1	73	624.6	03150500	03150700	187336.180717	28494545.911945	61300	552000
769	Polygon	32	46	612.1	72	624.6	03150500	03150700	185002.957272	27480755.063572	61300	515000

Depth Grids

One raster grid for each stage is required. Please place grids together in a folder named “grids” within the zip file placed in the public FTP folder.

Naming Convention: Each grid should be named ShortName_GridID. “ShortName” should be the same from the name of the flood extent polygon shapefile outlined on page 2. GridID is the number of the grid which matches the GRIDID of the stage found in the flood extent polygon attribute table. For example, the accompanying grids to the “yahmadWI” example from page 2 would be “yahmadWI_01”, “yahmadWI_02”, etc.

Projection: Grids **DO NOT need to be reprojected**. Grids are not displayed visually so there is no need to project them for the sake of the FIM application. The application queries the grids in the background.

Study boundary lines

Lines representing the extent of the study area should be submitted as a shapefile of a line feature type with same projection information as the flood extent area polygons. In most cases, you will have more than one line (top and bottom of the extent). The lines for a site should be dissolved into a single multi-part feature. Use the "Dissolve" tool in ArcMap. The only field needed is USGSID. See Figure 2 for example study boundary attribute table. See Appendix B for instructions on editing an attribute table.



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Figure 2. Example study boundary file attribute table

Limit of study area				
	OBJECTID *	Shape *	USGSID	Shape_Length
▶	10	Polyline	05540500	7567.773969
	6	Polyline	05531175	1282.511003
	7	Polyline	05531175	1282.511003
	4	Polyline	05528100	9498.886494
	11	Polyline	05331000	10728.717176
	1	Polyline	04182000	10769.067807
	12	Polyline	04100500	1808.575552
	5	Polyline	03381700	231538.74352
	3	Polyline	03363000	5920.906854
	2	Polyline	03351000	9877.808812
	9	Polyline	03341500	7716.517633
	8	Polyline	01390450	1218.20941

Levee extent areas (optional)

Leveed flood extent area polygons should mimic the regular flood extent polygons (Table 1). Like the regular flood extents, there should be a polygon for each distinct level you want to represent. They should also have the same projection: WGS 1984 Web Mercator Auxiliary Sphere (WKID 3857).

If you would like the same polygon to represent multiple stages above a threshold, please copy and attribute that polygon the appropriate number of times. Each breach extent which corresponds to a stage level should have its own line in the attribute table. For example, if you have a library with stages 1-9, but the breached area begins at stage 5, you would submit a file that has that has breached flood area polygons for stages 5, 6, 7, 8 and 9, with the respective stage and elevation for each level. This is true whether all of those above the threshold are different or the same.

If you have grids for the leveed areas, submit those just like the other grids, with the same naming convention applied to the regular grids (ShortName_GridIDb), with a letter "b" appended to the end of the grid number. "ShortName" should be the same from the name of the flood extent polygon shapefile outlined on page 2. Example: yahmadWI_01b

Naming Convention: The shapefile should be named ShortName_breach.shp. The grids should be zipped together and named ShortName_breachgrid.zip.

Attributes: Same as regular flood extents area polygons

Projection: Same as regular flood extents area polygons - WGS 1984 Web Mercator Auxiliary Sphere (WKID 3857). Grids do not need to be reprojected.

Levee Centerlines (optional)

Lines representing levees should be submitted as a shapefile of a line feature type. If there is more than one contiguous levee represented, the lines for single site should be dissolved into a single multi-part feature. Use the Dissolve tool in ArcMap. The only field needed is USGSID. See Figure 2 for example the levee shapefile's attribute table for an example.



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Figure 2. Example levee centerline file attribute table

Levee				
	OBJECTID *	Shape *	USGSID	Shape_Length
▶	1	Polyline	04182000	6113.547327
	2	Polyline	03351000	1890.848544
	3	Polyline	03341500	6899.762523
	4	Polyline	03287500	3198.429877
	5	Polyline	01570500	5714.563067
	6	Polyline	05331000	19471.868852
	7	Polyline	04100500	636.178179

Data download files

Data download zip files should be on your publications webpage in Pubs Warehouse. The SPN has a webpage template for FIM reports and download libraries.

Required files include:

Shapefiles of flood extent areas – as above or in local coordinate system

Shapefiles of study boundary lines – as above or in local coordinate system

Grids – named as described above

Metadata – FGDC compliant, including the FIM disclaimer, contact information, and use restrictions.

Metadata template files (.XML format) can be downloaded from the FIM Library Tools webpage, under “Mapping Application Tools.” A single metadata file may be created for all the grids and shapefiles in your project, or individual files may be created for each layer. Open the XML file in ArcCatalog and edit by selecting the “FGDC” icon in the toolbar.

Optional Files include:

Additional shapefiles of leveed areas and centerlines – as required by your study

ReadMe – file describing the file names and any additional information that didn’t go into the metadata.



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APPENDIX A: Merging multiple polygon shapefiles into one

1. Access the Merge tool: ArcToolbox > Data Management Tools > General > Merge.
2. For "Input Datasets" individually browse to and select each flood extent shapefile. Each time you add one, it will appear in the list below.
3. Select a name and location for the "Output Dataset", following the ShortName.shp convention described on page 2.
4. Click OK, and the new, merged shapefile should be ready wherever you saved it.

APPENDIX B: Editing an attribute table in ArcMap

The attribute table can be edited by viewing the shapefile in ArcMap, opening the table, and beginning an editing session with the Editor toolbar.

1. Click Customize on the top row of menu options, then Toolbars>Editor.
2. Once the Editor toolbar is open, click Editor>Start Editing.
3. Make changes to table as necessary.
4. When finished making changes, select "Save Edits" and then "Stop Editing" (Note that edits to the table must be saved within the Editor toolbar. Saving the MXD file WILL NOT save your changes to the table).

APPENDIX C: Steps for projecting flood-extents shapefile to Web Mercator

1. Access the Project tool in ArcMap: ArcToolbox> Data Management Tools> Projections and Transformation>Feature > Project
2. Select the flood extents shapefile as "Input Dataset"
3. Name and select a location for output in the "Output Dataset or Feature Class" field. Click on "Output Coordinate System" browse icon.
4. In "Spatial Reference Properties", click "Select", then "Projected Coordinate Systems"> "World"> "WGS 1984 Web Mercator (Auxiliary Sphere).prj", click Add. Click "OK" in "Spatial Reference Properties" window.
5. Select appropriate Geographic Transformation. If converting from NAD1983 to WGS84 for a site within the lower 48 states and Alaska (most common case), use the transformation #5 (NAD_1983_To_WGS_1984_5).
6. Click OK at bottom of "Project" tool window.



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For more information on Geographic Transformation, or if you are unsure of which to use, see the Esri links below, which include a link to a document listing the appropriate transformation for every region of the world. You may wish to consult your local GIS specialist if the appropriate transformation is unclear.

<http://blogs.esri.com/esri/arcgis/2009/05/06/about-geographic-transformations-and-how-to-choose-the-right-one/>

<http://support.esri.com/en/knowledgebase/techarticles/detail/21327>