Summary of Updates to Exhibit D

Updates to Exhibit D: Data Submittal Guidelines for Regional Flood Planning

This document summarizes the updates for Exhibit D: Data Submittal Guidelines for Regional Flood Planning.

Note: For a complete listing of the geodatabase structure with changes since July 2021 highlighted, please see this link.

The GDB Templates on the Flood Data Hub have also been updated.

The Table of Changes section lists all changes from August 2021 to March 2022 which affect feature class specifications or the Unique ID Guidance table.

The Additional Guidance section includes items that are not reflected in the feature class specifications or Unique ID guidance.

Contents

Table of Changes Since July 2021

The following table shows all changes since July 2021 affecting the feature class specifications/templates as well as the Unique ID Guidance table. After the first three items, they are listed in Exhibit D order.

For specifications for added fields and feature classes, see later sections as well as the complete listing of the geodatabase structure with highlighted changes here.

Table 1 Summary of Changes

Date	Exhibit D		Feature Class/Table	Field	Description of Change
	Section	Table #			
1/31/22			ModelCoverage		Feature class added
3/10/22			Fut_Map_Gaps		Feature class added
3/10/22	3.5.1.1	10	Fld_Map_Gaps		Feature class renamed to Ex_Map_Gaps
2/28/22	3	2	Unique ID Guidance	EXHAZ_ID	Length increased: "Region No. + 10 Digits"
2/28/22	3	2	Unique ID Guidance	FUTHAZ_ID	Length increased: "Region No. + 10 Digits"
4/12/22	3	2	Unique ID Guidance	GAPS_ID	Renamed to EXGAPS_ID
4/12/22	3	2	Unique ID Guidance	FUTGAPS_ID	Entry added with guidance: "Region No. + 6 Digits"
4/12/22	3	2	Unique ID Guidance	MODEL_ID	Entry added with guidance: "Region No. + 10 Digits"
12/3/21	3.2	4	Watersheds	FME_ID	Field added
12/3/21	3.2	4	Watersheds	EXPROJ_ID	Field added
12/3/21	3.2	4	Watersheds	FMP_ID	Field added
12/3/21	3.2	4	Watersheds	FMS_ID	Field added
3/10/22	3.3.1	5	ExFldInfraPol	INFRA_TYPE	Valid entry added: Reservoir
3/10/22	3.3.3	7	ExFldInfraPt	INFRA_TYPE	Valid entry added: Inlet
12/3/21	3.4	8	ExFldProjs	SOURCE	Field added
3/10/22	3.5.1.1	10	Ex_Map_Gaps	GAPS_ID	Field renamed to EXGAPS_ID
10/18/22	3.5.1.1	10	Ex_Map_Gaps	REASON	Field added

3/28/22	3.5.1.1	10	Ex_Map_Gaps	FLOOD_FREQ	Correction: Valid entry list moved from WS_ID to FLOOD_FREQ
3/28/22	3.5.1.1	10	Ex_Map_Gaps	WS_ID	Correction: Valid entry list moved from WS_ID to FLOOD_FREQ
4/12/22	3.5.2.2	12	ExFldExpLn	POP_DAY	Changed to NOT required
4/12/22	3.5.2.2	12	ExFldExpLn	POP_NIGHT	Changed to NOT required
4/12/22	3.5.3	14	ExFldExpAll	CRIT_TYPE	Valid entry removed: Emergency
4/12/22	3.5.3	14	ExFldExpAll	CRIT_TYPE	Valid entries added: Police, Fire, EMS, Water Treatment, Wastewater Treatment, Power Generation
4/12/22	3.5.3	14	ExFldExpAll	CRIT_DESC	Field Added
4/12/22	3.6.3	19	FutFldExpAll	CRIT_TYPE	Valid entry removed: Emergency
4/12/22	3.6.3	19	FutFldExpAll	CRIT_TYPE	Valid entries added: Police, Fire, EMS, Water Treatment, Wastewater Treatment, Power Generation
4/12/22	3.6.3	19	FutFldExpAll	CRIT_DESC	Field Added
1/31/22	3.10	23	FME	MODEL_ID	Field added
12/3/21	3.11.1	24	FMP	SOURCE	Field added
1/31/22	3.11.1	24	FMP	MODEL_ID	Field added
12/14/22	3.12	26	FMS	NRNC_COST	Field added
1/31/22	3.12	26	FMS	MODEL_ID	Field added

Additional Guidance

1. In the infrastructure feature classes, owner and operator are required fields. In the case of no owner or operator, such as for natural features, please use the code "999999" to indicate that this field is intentionally left "blank".
2. In the FMP and ExFldProjs feature classes, it is the intent that the feature shapes show the project area while the associated Watersheds show all the affected drainage area *including contributing drainage area*. The watershed ID field in the FMP and ExFldProjs feature classes must be filled with associated watersheds in this case.
3. Maps should be of a size that could be printed if desired, such as 11x17 or 36x36. Maps are expected to be PDFs in the flood plan with supporting GIS data supplied, such as Pro/ArcMap "workmaps" with supporting shapefiles or feature classes.
4. All digits of the Unique ID strings should be numeric.

Specifications for Additional Feature Classes

- Model Coverage
- Fut_Map_Gaps

Model Coverage [ModelCoverage]

Description:

The 'ModelCoverage' polygon feature class identifies models which are relevant to the region's FMP, FMS, or FMEs. This includes models that are used to determined negative impact. Each model should be represented with a polygon showing the coverage of the model.

List of Fields for 'ModelCoverage'

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Model ID	Y	MODEL_ID	Text	The two-digit region code, followed by a unique 10-digit numerical identifier, for a total of 12 digits.	
	Y	MODEL_NAME	Text		
	Y	MODEL_DESCR	Text	Description of model including scenario modeled	
RFPG	Y	RFPG_NUM	Short (2)	RFPG number	
	Y	RFPG_NAME	Text		

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Model Descriptors	Y	MODEL_TYPE	Text		Hydraulic, Hydrologic, Coastal, Combined Riverine-Coastal, 2D, Risk Assessment, Economics/BCA, Other, Unknown
	N	MODEL_SOFTW	Text	Software used, such as "HEC-RAS"	HEC-RAS, HEC-HMS, HEC-GeoHMS, HEC-WAT, HEC-EFM, HEC-MetVue, HEC-SSP, RiverWare, Infoworks ICM, SWMM, InfoSWMM, XPSWMM, XPStorm, ICPR, OpenFlows StormCAD, OpenFlows CivilStorm, OpenFlows FLOOD, OpenFlows CulvertMaster, ADCIRC, WHAFIS, SWAN, MIKE 21, FEMA Hazus, FEMA BCA, HEC-FDA, HEC-FIA, Hydro-CAD, HY-8 Culvert, Delft3D, SWAT, PRMS, WRAP, EPANET, FLO-2D, Other, Unknown
	N	SOFTW_VERS	Text	Version of software	
Date	N	LAST_UPDATE	Date		
	N	CREATE_DATE	Date		

Guidelines:
Identify all models used in the flood planning process, including those for determining negative impact.

Future Flood Mapping Gaps [Fut_Map_Gaps]

Description:
A polygon feature class identifying future gaps in inundation boundary mapping.

List of Fields for 'Fut_Map_Gaps'

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Flood Mapping Gap	Y	FUTGAPS_ID	Text	Must be unique for each feature	

Item	Requ ired?	Field Name	Data Type	Guidance	Valid Entries
RFPG	Y	RFPG_NUM	Short (2)	RFPG number	
	Y	RFPG_NAME	Text		
Counties	Y	COUNTY	Text	County name, without "County" (e.g., "Harris", not "Harris County"); comma-separated if multiple.	
HUC8s	Y	HUC8	Text	NHD HUC8 numbers, comma-separated	
HUC10s	N	HUC10	Text	NHD HUC10 numbers, comma-separated	
HUC12s	N	HUC12	Text	NHD HUC12 numbers, comma-separated. May be left blank if too many for field length.	
Watersheds	N	WS_ID	Text	WS_IDs from Watershed feature, comma-separated. May be left blank if too many for field length.	
Annual Probability	Y	FLOOD_FREQ	Text	Annual probability of occurrence	10, 4, 1, 0.2, Unknown
Entities with Oversight	Y	ENTITY_ID	Text	ENTITY_ID from Entity feature class, comma-separated if multiple	
Associated FMEs	N	FME_ID	Text	IDs from FME features, comma-separated. This optional field is intended to identify cases where there is an associated FME.	
Hazard Map Date	N	MAP_DATE	Date	The date the hazard map was produced, if applicable	
Reason Description	Y	REASON	Text	The reason that this gap is specified	

Guidelines:
Future flood mapping gaps are areas anticipated to be with insufficient or outdated mapping data. Existing maps covering the area may be or become out of date or be lacking in analytical

rigor. The minimum feature size is one watershed, which should be no smaller than one square mile. RFPGs are to utilize their own discretion to decide which maps are outdated since this will depend on various factors including but not limited to date of existing H&H models and mapping, change of land use and impervious cover in the area, change in rainfall pattern and availability of updated hydrology information.

Specifications for Additional Fields

In this section, added fields are grouped by feature class. Please note that other types of field changes are not listed here and can be found in the Table of Changes section and also in this document which lists the complete geodatabase specification with highlighted changes.

Watersheds [Watersheds]

These fields have been added to the Watersheds feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Associated FMEs	N	FME_ID	Text	IDs from FME features, comma-separated. This optional field is intended to identify cases where there is an associated FME.	
Associated FMSs	N	FMS_ID	Text	IDs from FMS features, comma-separated. This optional field is intended to identify cases where there is an associated FMS.	
Associated FMPs	N	FMP_ID	Text	IDs from FMP features, comma-separated. This optional field is intended to identify cases where there is an associated FMP.	
Existing Project	N	EXPROJ_ID	Text	IDs from Existing Project features, comma-separated. This optional field is intended to identify cases where there is an associated Existing Project.	

Proposed and Ongoing Flood Mitigation Projects [ExFldProjs]

This field has been added to the ExFldProjs feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Planning Study or Document Name	N	SOURCE	Text	Can be used to connect project to originating document such as such as a city or county master plan	

Existing Flood Mapping Gaps [Ex_Map_Gaps]

This field has been added to the Ex_Map_Gaps (formerly Fld_Map_Gaps) feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Reason Description	Y	REASON	Text	The reason that this gap is specified	

Flood Management Evaluation [FME]

This field has been added to the FME feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Model ID	N	MODEL_ID	Text	Associated Model IDs from Model Coverage feature class, if any. Comma-separated if multiple.	

Project Service Area [FMP]

These fields have been added to the FMP feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Planning Study or Document Name	N	SOURCE	Text	Can be used to connect project to originating document such as such as a city or county master plan	
Model ID	N	MODEL_ID	Text	Associated Model IDs from Model Coverage feature class. Include all models used for this project, including those used to	

				show no negative effect. Comma-separated if multiple.	

Flood Management Strategy [FMS]

These fields have been added to the FMS feature class:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Nonrecurring, Noncapital Cost	Y	NRNC_COST	Float	Estimated nonrecurring, noncapital cost in dollars	
Model ID	N	MODEL_ID	Text	Associated Model IDs from Model Coverage feature class. Include all models used for this strategy including those used to show no negative effect, if applicable. Comma-separated if multiple.	

In addition, the original FMS_COST field is unchanged, but the description is modified here to clarify that this should be used for the total cost:

Item	Required?	Field Name	Data Type	Guidance	Valid Entries
Estimated Total Strategy Cost	Y	FMS_COST	Float	Estimated total cost in dollars	

In a related change, in Table 14 of the report (refer to page 66 of Exhibit C) and in the FMS Excel worksheet associated with Exhibit C, please insert a field for nonrecurring, noncapital cost to the left of the existing cost field (current column Q) and update the existing field to be total cost.

Nonrecurring, Noncapital Cost ($)	Estimated Total Strategy Cost ($)

Archive (Changes Prior to July 2, 2021)

Changes below were included in the 7/2/21 Template update					
7/2/21	3.3.3	24	ExFldInfraPt	INFRA_TYPE	Added "Dam" to valid entries
6/24/21	3.3.3	24	ExFldInfraPt	INFRA_TYPE	Added "LWC" to valid entries
5/10/21	3.1	18	Entities	CID	Field added
5/10/21			Most feature classes	HUC10	Field added
5/10/21	3.5.2.2, 3.10	32, 51	ExFldExpLn, FME	POP_NIGHT, POP_DAY	Fields added
5/10/21	3.3	19	Infrastructure classes	COND_DESCR	Field added
5/10/21	3.10, 3.11	51, 54	FME, FMP	various	Fields renamed for consistency
5/10/21	3.11	54	FMP	PREPROJLOS, POSPROJLOS, SVI	Fields added
5/10/21	3.11.2	59	FMP_HazPost	REGULATORY	Renamed from REG
5/10/21	3.12	61	FMS	various	Fields renamed for consistency
5/10/21	3.12	61	FMS	REMSTRC500, REMLWC100, REMRDLEN100, WSUP_DESCR, FMS_COST, COSTSTRUCT, REDSTRUCT100, POP_NIGHT100, POP_DAY100, WATER_SUP	Fields added
5/10/21	3.4	26	ExFldProjs	FUND_SRC, BENEFIT	Fields added
5/10/21	3.9	48	Streams	NHD_CODE, CNMS_CODE	Replace REACH_CODE
5/10/21	3.2	18	Watersheds	WS_DESC	Field added
5/10/21			All		Feature class names shortened