



GIS Standards for Planning Grants

Resilient Florida Grant Program

Overview

Pursuant to [Section 380.093\(3\)\(c\), Florida Statutes](#) (F.S.), grantees who receive funding from the Resilient Florida Grant Program (Program) to complete a Vulnerability Assessment (VA) shall submit all electronic mapping data used to illustrate the flooding and sea level rise impacts identified in the VA to the Florida Department of Environmental Protection (Department). The Program has compiled the following standards and recommendations to support grantees and to ensure all geospatial data provided is compatible with the Department's GIS infrastructure, and in support of the Program's effort in creating and maintaining the comprehensive statewide flood vulnerability and sea level rise data set and comprehensive statewide flood vulnerability and sea level rise assessment.

Acceptable Data Formats

The Environmental Systems Research Institute, Inc. (ESRI) is the Department's primary provider of GIS software. All state agencies and water management districts leverage ESRI's geospatial solutions to manage and distribute all geospatial data in digital format. Therefore, all delivered electronic data must be compatible with the ESRI's software ecosystem. Below is a summary for acceptable data formats based on data type. For more information about compatible data formats please see the [Resources – Reference Links](#) section on page 10.

1. Vector Data
 - File Geodatabase Feature Class
 - Shapefile
2. Raster Data
 - File Geodatabase Raster
 - TIFF / GeoTIFF
3. Project Packages
 - ESRI's Project Package
 - OGC GeoPackage

Datums and Coordinate Reference Systems

Datums

1. Horizontal Datum: North American Datum of 1983 with the 2011 Adjustments (NAD83/2011).
2. Vertical Datum: North American Vertical Datum of 1988 (NAVD88).

Coordinate Reference Systems (CRS)

1. Datasets from local communities must conform to the appropriate State Plane CRS zone projection for their location (North zone, East zone, or West zone).
2. Statewide or regional datasets that extend throughout multiple State Plane zones can use the *FL GDL Albers* projected statewide system.
3. Data provided with the Geographic Coordinate System (GCS) only (without any map projection), can be accepted in specific cases (GCS must be either NAD83/2011 or WGS84). Example cases include, but are not limited to:

- Source data maintained only in GCS

Sensitive Data

Pursuant to [Chapter 119, F.S., Public Records](#), any data submitted to the Department becomes public domain and is subject to public record requests. However, any datasets or individual asset features considered to be sensitive by the grantee can be exempt from this requirement. Datasets/asset features intended to be excluded from public records must be explicitly identified by the grantee in at least one of three ways:

1. Marking the data as Sensitive in the Background Data Catalog;
2. Marking the data as Sensitive in the dataset metadata (*Use Limitations/Access Constrains* section);
3. For a dataset in which only some asset features are considered 'Sensitive,' this can be marked in the feature attributes (*Restricted_Public_Disclosure* field).

Sensitive assets/datasets will still be used in the Department's Statewide Vulnerability Assessment (SVA), but the results will not be shared with the public.

Background Data Catalog

A catalog for all acquired data must be created and submitted. The catalog must be in Excel file format (xlsx), and it must contain the information listed on the table below, as applicable. Description of the expected dataset information is shown in table 1: **Background Data Catalog Table Description**. A spreadsheet containing the table description, an empty template table and an example catalog is available for download in the [Resources – Tables](#) section.

Table 1: Background Data Catalog Table Description.

Field Name	Domain / Values	Description
Dataset Name	----	Name of the dataset.
Feature Dataset Name (If Any)	----	Name of the Feature Dataset. Applicable if the dataset is stored in a File Geodatabase.
File Geodatabase / Folder Name	----	Name of the File Geodatabase, or name of last folder if dataset in Shapefile format.
Dataset Format Type	Feature Class Shapefile Raster Other N/A	Digital format of dataset.
Geometry Type	Point Polyline Polygon N/A	Geometry type, if critical asset dataset.
Feature Count	----	Number of features, if critical asset dataset.
Data Category	Critical Asset Flood Scenario Elevation Other	Data category of the dataset being listed.
Asset Type	Asset Type List	Asset type from within the asset groups defined in s. 380.093, F.S.
Asset Group	Asset Group List	One of the four Asset Groups defined in s. 380.093, F.S.
Dataset Source Entity	----	Name of the dataset source.
Dataset Source Link	Hyperlink N/A	Web link to the source dataset.
Metadata Link	Hyperlink N/A	Web link to the source dataset metadata.
Regionally Significant	Y N Partial	Mark "Y" if dataset considered regionally significant.
Sensitive	Y N Partial	Mark "Y" if dataset not intended for public distribution.
Comments	----	Any relevant comments about the dataset.

Flood Risk Scenario Matrix

As part of the *Acquire Background Data* task, a matrix table for all the Flood Risk Scenarios (FRS) used in the VA must be created and submitted. The table must contain all the parameters for each FRS that were evaluated in the VA. Parameters include, but are not limited to: Return Period, Planning Horizons, and Sea Level Rise (SLR) Projections. The table must be in Excel file format (xlsx) and follow the matrix arrangement (or similar) shown in Table 2 below. A spreadsheet table of a matrix schema example is available for download in the [Resources – Tables](#) section.

Table 2: Flood Risk Scenario Matrix Example, taken from the Statewide VA data.

Flood Risk Scenario	Return Period	Planning Horizon	SLR Projection
Coastal Tidal Flooding	N/A	2020	N/A
		2050	Intermediate-Low
			Intermediate
		2080	Intermediate-Low
			Intermediate
		Storm Surge Flooding	100-Year
2050	Intermediate-Low		
	Intermediate		
2080	Intermediate-Low		
	Intermediate		
500-Year	Current		N/A
	2050		Intermediate-Low
			Intermediate
	2080		Intermediate-Low
			Intermediate
	Rainfall-Induced Flooding	100-Year	2020
2050			
2080			
500-Year		2020	
		2050	
		2080	

Critical Assets Data

Compiled asset dataset must be formatted to follow the provided standardized table attribution schema. Fields names, field types and other details of the required standard schema are shown in Table 3: **Critical Assets Basic Attributes Schema**. A spreadsheet containing the attribute schema table is available for download in the [Resources – Tables](#) section.

All asset features within a dataset must be properly classified based on the asset groups and types listed in s. 380.093, F.S. These classification values must be included within the dataset attributes. The complete list of asset groups and types is shown in Table 4: **Critical Assets Groups and Types** and is also

available for download in the [Resources – Tables](#) section. Additional asset feature information must be included in the attributes as well, if applicable:

- Asset Feature
- Asset Name
- Asset Elevation (if available)
- Asset Owner
- Asset Maintained By
- Asset Type
- Asset Group
- Source Asset ID (if available)

Publicly available datasets do not need to be submitted to the Program as part of the *Acquire Background Data* grant task. Instead, information about the dataset can be provided in the **Background Data Catalog** with a link to the online hosted feature service or a link to the data download web page.

Table 3: Critical Assets Basic Attributes Schema.

Field Purpose	Field Name	Field Name Alias	Field Type	Field Length	Field Domain / Values	Field Description
Asset Basic Details	Asset_Feature	Asset Feature	Text	255	N/A	Specific asset feature, if applicable (i.e. sewer manhole, stormwater outfall, etc.). Not necessarily listed in s. 380.093, F.S., but part of the listed classifications.
	Asset_Name	Asset Name	Text	255	N/A	Specific asset name, if applicable (i.e. airport name, bridge name, roadway name, etc.).
	Asset_Elevation	Asset Elevation	Double	N/A	N/A	Elevation value of asset, if available (NAVD88 US Feet).
	Asset_Owner	Asset Owner	Text	255	County, Municipality, Special District, Government Agency	Entity name who owns the asset feature. Official entity name from Census lists.
	Asset_Maintained_By	Asset Maintained By	Text	255	County, Municipality, Special District, Government Agency	Entity name in charge of providing maintenance to the asset. Official entity name from Census lists.
Asset Classification Details	Asset_Sub_Type	Asset Sub-Type	Text	255	N/A	Asset sub-type for further classification, if applicable. (i.e. stormwater sewer system, etc.). Not necessarily listed in s. 380.093, F.S., but part of the listed classifications.
	Asset_Type	Asset Type	Text	255	Asset Type List	Asset type from within the asset groups defined in s. 380.093, F.S.
	Asset_Group	Asset Group	Text	255	Asset Group List	One of the four Asset Groups defined in s. 380.093, F.S.
	Asset_Relevancy	Asset Relevancy	Text	255	Local Asset, Regional Asset	Whether the asset is Locally or Regionally significant.
Asset Location Details	Municipality	Municipality	Text	255	Municipality List (412)	Municipality where asset is physically located.
	County	County	Text	255	County List (67)	County where asset is physically located.
Asset Source Dataset Details	Source_Dataset_Availability	Source Dataset Availability	Text	255	Locally Provided, Publicly Available	Availability of the source dataset (i.e., private, public).
	Source_Dataset_Entity	Source Dataset Entity	Text	255	N/A	Entity who provided the dataset (i.e. federal agency, county, municipality, state agency, etc.).
	Source_Dataset_Name	Source Dataset Name	Text	255	N/A	Original name of the dataset from the source entity.
	Source_Asset_ID	Source Asset ID	Text	255	N/A	Asset Unique ID assigned by source entity, found in the source dataset.
	Restricted_Public_Disclosure	Restricted Public Disclosure	Text	255	Yes / No	If asset not intended for public.
	Notes	Notes	Text	1000	N/A	Relevant comments on the asset.

Table 4: Critical Assets Groups and Types listed in s. 380.093, F.S.

Asset Type	Asset Group
Affordable Public Housing	Critical Community and Emergency Facilities
Colleges and Universities	Critical Community and Emergency Facilities
Community Centers	Critical Community and Emergency Facilities
Correctional Facilities	Critical Community and Emergency Facilities
Disaster Recovery Centers	Critical Community and Emergency Facilities
Emergency Medical Service Facilities	Critical Community and Emergency Facilities
Emergency Operation Centers	Critical Community and Emergency Facilities
Fire Stations	Critical Community and Emergency Facilities
Health Care Facilities	Critical Community and Emergency Facilities
Hospitals	Critical Community and Emergency Facilities
Law Enforcement Facilities	Critical Community and Emergency Facilities
Local Government Facilities	Critical Community and Emergency Facilities
Logistical Staging Areas	Critical Community and Emergency Facilities
Risk Shelter Inventory	Critical Community and Emergency Facilities
Schools	Critical Community and Emergency Facilities
State Government Facilities	Critical Community and Emergency Facilities
Communications Facilities	Critical Infrastructure
Disaster Debris Management Sites	Critical Infrastructure
Drinking Water Facilities	Critical Infrastructure
Electric Production and Supply Facilities	Critical Infrastructure
Military Installations	Critical Infrastructure
Solid and Hazardous Waste Facilities	Critical Infrastructure
Stormwater Treatment Facilities and Pump Stations	Critical Infrastructure
Wastewater Treatment Facilities and Lift Stations	Critical Infrastructure
Water Utility Conveyance Systems	Critical Infrastructure
Conservation Lands	Natural, Cultural, and Historical Resources
Historical and Cultural Assets	Natural, Cultural, and Historical Resources
Parks	Natural, Cultural, and Historical Resources
Shorelines	Natural, Cultural, and Historical Resources
Surface Waters	Natural, Cultural, and Historical Resources
Wetlands	Natural, Cultural, and Historical Resources
Airports	Transportation and Evacuation Routes
Bridges	Transportation and Evacuation Routes
Bus Terminals	Transportation and Evacuation Routes
Major Roadways	Transportation and Evacuation Routes
Marinas	Transportation and Evacuation Routes
Ports	Transportation and Evacuation Routes
Rail Facilities	Transportation and Evacuation Routes
Railroad Bridges	Transportation and Evacuation Routes

As part of the *Final Vulnerability Assessment* grant task, all datasets used in the assessment must be submitted and must include the results from all flood risk scenarios analyzed. To store the result values, the datasets must be formatted to follow the **Vulnerability Assessment Results Attributes Schema** (in addition to the **Critical Assets Basic Attributes Schema**). An example of the attribute schema is shown in table 5 and is also available for download in the [Resources – Tables](#) section.

The field naming format proposed in this schema uses the parameters of the VA (which are shown in the **Flood Risk Scenario Matrix**), as the core pieces of the name. Additional to the VA parameters, there are four main data categories in which the results can be classified into and form part of the field name. The categories are:

- Flood Depth
- Flood Percentage
- Water Elevation
- Risk Level

Categories can be added or omitted as needed, based on the specific scenarios used in the assessment, and parameters not applicable for a specific scenario must be skipped from the name. The standard field naming format is as follows:

Flood Risk Scenario → Data Category → Return Period → Planning Horizon → SLR Projection
(FRS → DC → RP-YR → PH → SLRP)

The abbreviations of parameters (three-letter for the flood scenario, two-letter for the data category) and concatenated by an underscore (_) forms the field name. For example, a data field for the scenario and parameters below would result in the field name: SSF_RL_100YR_2080_IL.

- Flood Risk Scenario: Storm Surge Flooding
- Data Category: Risk Level
- Return Period: 100-Years
- Planning Horizon: 2080
- Sea Level Rise Projection: Intermediate-Low

Table 2: Vulnerability Assessment Results Attributes Schema example.

Field Purpose	Field Name	Field Name Alias	Field Type
VA Results – Data Category #, Flood Risk Scenario #	FRS_DC_RP1YR_CURR	FRS_DC_RP1YR_CURR	Double Text
	FRS_DC_RP1YR_PH1_SLRP1	FRS_DC_RP1YR_PH1_SLRP1	Double Text
	FRS_DC_RP1YR_PH1_SLRP2	FRS_DC_RP1YR_PH1_SLRP2	Double Text
	FRS_DC_RP1YR_PH2_SLRP1	FRS_DC_RP1YR_PH2_SLRP1	Double Text
	FRS_DC_RP1YR_PH2_SLRP2	FRS_DC_RP1YR_PH2_SLRP2	Double Text
	FRS_DC_RP2YR_CURR	FRS_DC_RP2YR_CURR	Double Text
	FRS_DC_RP2YR_PH1_SLRP1	FRS_DC_RP2YR_PH1_SLRP1	Double Text
	FRS_DC_RP2YR_PH1_SLRP2	FRS_DC_RP2YR_PH1_SLRP2	Double Text
	FRS_DC_RP2YR_PH2_SLRP1	FRS_DC_RP2YR_PH2_SLRP1	Double Text
	FRS_DC_RP2YR_PH2_SLRP2	FRS_DC_RP2YR_PH2_SLRP2	Double Text

The specific field types for the different data categories are shown in the table below:

Table 3: Field types of the different data categories.

Field Data Category	Field Type
Flood Depth	Double
Flood Percentage	Double
Water Elevation	Double
Risk Level	Text

Abbreviations for the different VA parameters used as field-name components are shown in the table below:

Table 4: Components of the Field Naming Format.

Flood Risk Scenario	
Coastal Tidal Flooding	CTF
Storm Surge Flooding	SSF
Rainfall-Induced Flooding	RIF
Data Category	
Flooding Depth	FD
Flooding Percentage	FP
Water Elevation	WE
Risk Level	RL
Flood Event	
100-Year	100YR
500-Year	500YR
Planning Horizon	
Current	CURR
2050	2050
2080	2080
SLR Projection	
Intermediate-Low	IL
Intermediate	INT
Intermediate-High	IH
High	HIG
Extreme	EXT

The relationship between the **Flood Risk Scenario Matrix** and the final field names is shown in the table below.

Table 5: Relationship between the Flood Risk Scenario Matrix and the final field names of the VA Results Attributes Schema

Data Category	Flood Risk Scenario	Return Period	Planning Horizon	SLR Projection	Data Field Name	
Flood Percentage	Coastal Tidal Flooding	N/A	2020	N/A	CTF_FP_2020	
			2050	Intermediate-Low	CTF_FP_2050_IL	
				Intermediate	CTF_FP_2050_INT	
			2080	Intermediate-Low	CTF_FP_2080_IL	
				Intermediate	CTF_FP_2080_INT	
			Storm Surge Flooding	100-Year	Current	N/A
	2050	Intermediate-Low			SSF_FP_100YR_2050_IL	
		Intermediate			SSF_FP_100YR_2050_INT	
	2080	Intermediate-Low			SSF_FP_100YR_2080_IL	
		Intermediate			SSF_FP_100YR_2080_INT	
	500-Year	Current			N/A	SSF_FP_500YR_CURR
		2050			Intermediate-Low	SSF_FP_500YR_2050_IL
					Intermediate	SSF_FP_500YR_2050_INT
		2080	Intermediate-Low	SSF_FP_500YR_2080_IL		
	Intermediate		SSF_FP_500YR_2080_INT			
	Rainfall-Induced Flooding	100-Year	2020	N/A	RIF_FP_100YR_2020	
2050			RIF_FP_100YR_2050			
2080			RIF_FP_100YR_2080			
500-Year		2020	RIF_FP_500YR_2020			
		2050	RIF_FP_500YR_2050			
		2080	RIF_FP_500YR_2080			

A spreadsheet containing the tables describing the components of the field naming format used in the **Vulnerability Assessment Results Attributes Schema** is available for download in the [Resources – Tables](#) section.

Flood Risk Scenario Data

As part of the *Acquire Background Data* and *Final Vulnerability Assessment* grant tasks, Flood Risk Scenarios (FRS) to be used in the VA must be submitted to the Program, in an acceptable data format (see [Acceptable Data Formats](#) section). However, publicly available flood scenario data does not need to be submitted. Instead, information about the scenario dataset must be provided in the **Background Data Catalog**, including a link to the online hosted feature service, image service or map service, or link to the data download web page. Custom or modified FRS data used in the VA and not publicly available must be submitted.

Elevation Data

As part of the *Acquire Background Data* grant task, Digital Elevation Models (DEM) or Elevation Certificate digital data to be used in the VA must be submitted to the Program in an acceptable data format (see [Acceptable Data Formats](#) section). However, publicly available elevation data does not need

to be submitted. Instead, information about the elevation dataset must be provided in the **Background Data Catalog**, including a link to the online hosted feature service, image service or map service, or link to the data download web page.

Metadata

As part of the *Acquire Background Data* and *Final Vulnerability Assessment* grant tasks, metadata must be submitted alongside each geospatial dataset, in a format compliant with the *Content Standard for Geospatial Metadata* (CSDGM) from the Federal Geographic Data Committee (FGDC). Acceptable file formats are listed below. For more information about metadata please see the [Resources](#) section.

- Feature Dataset Layer or Shapefile FGDC-CSDGM
- XML file

At minimum, local dataset metadata is required to contain the following information:

- Title
- Summary
- Description
- Date of Creation / Collection
- Contact Person
- Update Frequency
- Use Limitations / Access Constrains

Metadata for publicly available data does not need to be submitted. Instead, a link to the source's metadata web page must be provided in the **Background Data Catalog**. Grantees are not responsible for the completeness of metadata for datasets they do not own.

Metadata for datasets following the **Vulnerability Assessment Results Attributes Schema** must include a description of all the fields created by this schema.

Resources

Tables

All tables are provided below in Excel workbook format file (xlsx):

1. Table 1: [Background Data Catalog Table](#)
2. Table 2: [Flood Risk Scenario Matrix](#)
3. Table 3: [Critical Assets Basic Attributes Schema](#)
4. Table 4: [Critical Assets Groups and Types](#)
5. Table 5: [Vulnerability Assessment Results Attribute Schema](#)

Reference Links

- [ESRI, Supported Data Types and Items](#)
- [ESRI, Feature Classes](#)
- [ESRI, Shapefiles in ArcGIS Pro](#)
- [ESRI, Supported Raster Dataset File Format](#)
- [OGC, GeoTIFF Standard](#)

- [ESRI, Share a Project Package](#)
- [OGC, GeoPackage Encoding Standard](#)
- [FGDC, Content Standard for Digital Geospatial Metadata](#)
- [ESRI, Create FGDC CSDGM Metadata](#)