Idaho Technology Authority (ITA)

ENTERPRISE STANDARDS – S4000 – INFORMATION AND DATA

Category: S4266 –Flood Hazard Layers Standard

CONTENTS:

I. DEFINITION

See ITA Guideline G105 (ITA Glossary of Terms) for definitions.

II. RATIONALE

A statewide National Flood Hazard Layer and data standard, which is part of the Hazards data theme is a critical source of information for State officials (e.g., emergency management and water resources), tribal partners, community officials (planners, GIS professionals, emergency managers, engineers), private entities (engineers, surveyors, architects, real estate professionals, lending, and insurance professionals), homeowners, renters, and business owners.

III. APPROVED STANDARD(S)

See Attachment

IV. APPROVED PRODUCTS(S)

Any GIS Software, either desktop or online, capable of ingesting and displaying Open Geospatial Consortium (OGC) Web Map Standard (WMS) services.

V. JUSTIFICATION

A statewide National Flood Hazard Layer dataset is a critical source of information, as stated under 'II Rationale' in this standard. A data exchange standard supports the use of the National Flood Hazard Layer to facility a predictable format, improve collaboration and encourage the use of this dataset.

VI. TECHNICAL AND IMPLEMENTATION CONSIDERATIONS

Any GIS Software, either desktop or online, capable of ingesting and displaying Open Geospatial Consortium (OGC) Web Map Standard (WMS) services.

VII. EMERGING TRENDS AND ARCHITECTURAL DIRECTIONS

Data will be shared in accordance with Enterprise Standard S4250 – Enterprise Geographic Information System (GIS) Data Sharing Standards.

VIII. PROCEDURE REFERENCE

The format, content, and development of this standard adhere to ITA Policy P5030 - Framework Standards, ITA Standard S4250 - Data Sharing Standards and ITA Standard S4220 - Geospatial Metadata.

IX. REVIEW CYCLE

Review will occur at least annually.

X. CONTACT INFORMATION

For more information, contact the ITA Staff at (208) 605-4064.

XI. REVISION HISTORY

07/20/2023 – Standard Presented to the IGC-EC

STATE OF IDAHO

Idaho National Flood Hazard Layers Data Exchange Standard

Part of the Hazards Theme

Version 1
Effective July 20, 2023

Developed by the Hazards Technical Working Group

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CONTENTS

1. Introduction to the Flood Hazard Layers Standard

A statewide collection of Flood Hazard Layers is a critical source of information for State officials (e.g., emergency management and water resources), tribal partners, community officials (planners, GIS professionals, emergency managers, engineers), private entities (engineers, surveyors, architects, real estate professionals, lending, and insurance professionals), homeowners, renters, and business owners.

The standard described in this document is based on the National Flood Hazard Layer (NFHL) published by the Federal Emergency Management Agency (FEMA). FEMA provides flood hazard data to support the National Flood Insurance Program and the information can be used to better understand the level of flood risk and type of flooding. The NFHL is made from effective flood maps and Letters of Map Change delivered to communities. NFHL digital data covers over 90 percent of the U.S. population. New and revised data is being added continuously. Many private sector and local, state, and federal government agencies have business needs for National Flood Hazard Layer data.

The NFHL comprises a collection of 33 layers, not all of them specific flood related data created by FEMA or relevant to Idaho which does not have any coastal areas. The following 9 layers are included in this standard, because FEMA is the authoritative source, and the data is relevant for Idaho:

1. NFHL Availability
2. FIRM Panels
3. Letter of Map Revisions (LOMR)
4. Letter of Map Amendments (LOMA)
5. Profile Baselines
6. Cross-Sections
7. Base Flood Elevations
8. Flood Hazard Boundaries
9. Flood Hazard Boundaries

The Idaho Flood Hazards standard is intended to promote and increase the use of NFHL data for Idaho. This standard does not instruct on how National Flood Hazard Layer databases are designed for internal use.

This standard was developed by the Hazards Technical Working Group, a subgroup of the Idaho Geospatial Council – Executive Committee (IGC-EC). This standard will be reviewed at least annually and updated as needed.

1.1. **Mission and Goals of the Standard**

The National Flood Hazard Layer Standard supports a statewide dataset that is consistent with applicable state and national standards. It establishes the minimum attributes and geospatial database schema for the National Flood Hazard Layer Framework. The standard will communicate with, and may have similar attributes to, other Idaho Framework data standards.

The National Flood Hazard Layer Framework will be appropriately shared and beneficial to all. The fields in the National Flood Hazard Layer Data Exchange Standard will be general enough to incorporate basic information without requiring major changes in internal data models. This standard allows for expansion to a more complex data structure and schema.

1.2. **Relationship to Existing Standards**

This National Flood Hazard Layer Exchange Standard relates to various existing standards and technical reference documents as described by FEMA in the Technical References for Flood Risk Analyses and Mapping.

1.3. **Description of the Standard**

This standard describes the vision and geospatial data structure of a National Flood Hazard Layer Framework in the state of Idaho. This standard is devised to be:

- Simple, easy to understand, and logical.
- Uniformly applicable, whenever possible
- Flexible and capable of accommodating future expansions
- Dynamic in terms of continuous review

1.4. **Applicability and Intended Uses**

This standard applies to the National Flood Hazard Layer element of the Hazards theme of The Idaho Map (TIM).

When implemented, this standard will enable access to the National Flood Hazard Layer. When aligned with other hazard and risk products, the standard will provide users a more comprehensive view of natural hazard risk for decision making purposes.

This standard does not consider data sharing agreements, contracts, transactions, privacy concerns, or any other issues relating to the acquisition and dissemination of National Flood Hazard Layer data.

1.5. **Standard Development Process**

The Hazards Technical Working Group is a voluntary group of private, city, county, tribal, state, and federal representatives. In 2022 the National Flood Hazard Layer Lead began developing the standard for the National Flood Hazard Layer Framework using the standard development automation tools developed by the IGC-EC to generate the first draft of the Standard. This standard was then reviewed and edited by the members of the Hazards Technical Working Group.

After initial development the draft standard document was shared with the Idaho Geospatial Council Executive Committee (IGC-EC) and the Idaho Geospatial Council (IGC) in accordance with the review and approval process described in ITA Policy P5030 Framework Standards Development.

1.6. **Maintenance of the Standard**

This standard will be revised on an annual basis and in accordance with ITA Policy P5030 - Framework Standards Development.

2. Body of the Standard

2.1. **Scope and Content**

The scope of the Flood Hazard Layers Standard is to describe a statewide layer which identifies the physical locations and attributes of National Flood Hazard Layers in Idaho.

2.2. **Need**

Flood Hazard Layers are a key dataset needed for State officials (e.g., emergency management and water resources), tribal partners, community officials (planners, GIS professionals, emergency managers, engineers), private entities (engineers, surveyors, architects, real estate professionals, lending, and insurance professionals), homeowners, renters, and business owners. This standard provides the foundation to aggregate National Flood Hazard Layer data for centralized access and stewardship information.

National Flood Hazard Layer data is needed because it is intended to be a comprehensive dataset of flood hazards in Idaho.

2.3. **Participation in the Standard Development**

The development of the National Flood Hazard Layer Data Exchange Standard adheres to the ITA Policy P5030 - Framework Standards Development. The Hazards Standard Team tasked with development, invites input and comments from private, county, state, and federal organizations. As the standard is reviewed in accordance with Policy P5030 requirements, there will be opportunity for broad participation and input by stakeholders. The process will be equally broad for input on updates and enhancements to the standard. As with all Idaho Framework standards, public review and comment on the National Flood Hazard Layer Data Exchange Standard is encouraged.

2.4. **Integration with Other Standards**

The National Flood Hazard Layer Data Exchange Standard follows the same format as other Idaho geospatial framework data standards. The National Flood Hazard Layer standard may contain some of the same attributes as other framework standards and may adopt the field name, definition, and domain from the other standards to promote consistency.

2.5. **Technical and Operation Context**

2.5.1. **Data Environment**

The data environment is a digital Map/App with a specific, standardized set of attributes pertinent to the National Flood Hazard Layer Framework. National Flood Hazard Layer data shared under this standard must be in a format supporting digital Map/Apps.

2.5.2. **Reference Systems**

The National Flood Hazard Layer Framework is published in the NAD 1983 coordinate system (WKID 4269).

2.5.3. **Global Positioning Systems (GPS)**

Some data provided might contain geometry from GPS methods, and the provided metadata should describe this, if applicable.

2.5.4. **Interdependence of Themes**

National Flood Hazard Layer is related to Hydrography and Elevation datasets.

2.5.5. **Encoding**

When data is imported into and exported from the National Flood Hazard Layer Framework, encoding will take place to convert data formats and attributes.

2.5.6. **Resolution**

Please see standards 47, 148, 149, 605, and 606 here: https://www.fema.gov/flood-maps/guidance-reports/guidelines-standards/standards-flood-risk-analysis-and-mapping-public-review. Resolution will be documented in the metadata.

2.5.7. **Accuracy**

Any new digitizing has to be done in conformance with FEMA's accuracy standards and is further described in the Guidance for Flood Risk Analysis and Mapping – Flood Insurance Rate Map (FIRM) Database.

2.5.8. **Edge Matching**

No edge matching is required between jurisdictions, or between this and other framework layers.

2.5.9. **Unique Identifiers**

The unique identifier for each layer is assigned by FEMA and are as follows:

NFHL Availability	STUDY_ID
FIRM Panels	FIRM_ID
Letter of Map Revisions (LOMR)	LOMR_ID

Letter of Map Amendments (LOMA)	CASENUMBER
Profile Baselines	BASELN_ID
Cross-Sections	XS_LN_ID
Base Flood Elevations	BFE_LN_ID
Flood Hazard Boundaries	FLD_LN_ID
Flood Hazard Zones	FLD_AR_ID

2.5.10. **Attributes**

Attributes for public and intergovernmental distribution are described in Section 3 of this standard.

2.5.11. **Stewardship**

Perpetual maintenance and other aspects of lifecycle management are essential to the National Flood Hazard Layer Framework. Details of stewards, their roles and responsibilities, and processes are set forth, or are being planned to set forth in a National Flood Hazard Layer Framework Stewardship Plan and related documents.

2.5.12. **Records Management and Archiving**

Records management and archiving will be provided by FEMA contract support.

2.5.13. **Metadata**

The National Flood Hazard Layer Framework metadata will describe the methods used to update and aggregate the individual National Flood Hazard Layer data contributions, processes or crosswalks performed, definition of attributes, and other required information. This metadata will conform to the metadata standards as set out in ITA Standard S4220- Geospatial Metadata.

3. Data Characteristics

3.1. **Minimum Graphic Data Elements**

The geometry of the features in National Flood Hazard Layer Framework is polygons.

3.2. **Optional Graphic Data Elements**

Not applicable.

3.3. **Standard Attribute Schema**

3.3.1. **NFHL Availability**

Field Name	Data Type	Length	Description	Examples
STUDY_ID	String	6	Equal to the DFIRM ID of the data	12127C

3.3.2. **FIRM Panels**

Field Name	Data Type	Length	Description	Examples
DFIRM_ID	Text	6	Study identifier, within each FIRM Database, the DFIRM_ID value will be identical	16005C
VERSION_ID	Text	11	Identifies the product version and relates the features to standards according to how it was created	1.1.1.0
FIRM_ID	Text	32	Primary key for table lookup	16005C_1
ST_FIPS	Text	2	State FIPS code	16
PCOMM	Text	4	Community or county identification number (first two digits of panel number)	005C
PANEL	Text	4	Panel number (7^{th} – 10^{th} digits in complete panel number)	0410
SUFFIX	Text	1	Map suffix (final digit in complete panel number)	D
FIRM_PAN	Text	11	Complete FIRM panel number	16005C0565D
PANEL_TYP	Text	30	Whether panel is community-based of countywide, whether panel is printed or not	Countywide, Panel Printed
PRE_DATE	Date	-	Preliminary release date of current map revision	9/9/9999
EFF_DATE	Date	-	Effective date of current map revision	7/7/2009
SCALE	Text	5	Denominator of map scale	6000, 12000
PNP_REASON	Text	254	Reason panels are not printed if hardcopy panel is not printed by FEMA	AREA OUTSIDE COUNTY BOUNDARY, NO SPECIAL FLOOD HAZARD LAYERS

Field Name	Data Type	Length	Description	Examples
BASE_TYP	Text	10	Type of basemap used for the FIRM panel	NP
SOURCE_CIT	Text	21	Abbreviation used in metadata file when describing source information for the feature	16005C_BASE14

3.3.3. **Letters of Map Revisions**

Field Name	Data Type	Length	Description	Examples
DFIRM_ID	Text	6	Study identifier, within each FIRM Database, the DFIRM_ID value will be identical	16005C
VERSION_ID	Text	11	Identifies the product version and relates the features to standards according to how it was created	1.1.1.0
LOMR_ID	Text	32	Primary key for table lookup	16005C_1
EFF_DATE	Date	-	Effective date of the LOMR	3/2/2022
CASE_NO	Text	13	Case number of the LOMR assigned by FEMA	21-10-0870P
SCALE	Text	5	Denominator of map scale	6000, 12000
STATUS	Text	12	Status of the LOMR	EFFECTIVE
SOURCE_CIT	Text	21	Abbreviation used in metadata file when describing source information for the feature	16005C_LOMC1

3.3.4. **Letters of Map Amendments**

Field Name	Data Type	Length	Description	Examples
CASENUMBER	Text	16	FEMA case number	18-10-1607A

Field Name	Data Type	Length	Description	Examples
STATUS	Text	16	The status of the LOMA as it is moved through the MIP workflow. The LOMA point layer includes only LOMAs that are marked as Complete in the Mapping Information Platform (MIP) workflow.	Completed
PROJECTNAME	Text	128	Information about the project, such as the Lot/Block/Subdivision information and the street address of the subject property for the LOMA is included when applicable.	FIRST ADDITION TO FERNWOOD, BLOCK 8, LOTS 1-2 – 23 PHEASANT DRIVE
PROJECTCATEGORY	Text	128	>Reflects the LOMC type. The LOMA point layer only includes Letters of Map Amendments ('LOMA'), Letters of Map Revision Based on Fill ('LOMR-F'), Letters of Map Revision Floodway ('LOMR-FW'), Letters of Map Revision V Zone ('LOMR-VZ') cases.	LOMA
DATEENDED	Text	8	Reflects the date of the LOMA determination letter and is populated in the MIP when FEMA approves the MT-1(amendments application) docket for the case.	10/29/2018, 6:00 PM
DATEENDEDSTR	Text	12	The value in the DATEENDED field converted to a string.	
CID	Text	6	The CID in which the subject property is shown on the effective FIRM.	160014
COMMUNITYNAME	Text	50	The community name in which the subject property is shown on the effective FIRM.	BENEWAH COUNTY
DETERMINATIONTYPE	Text	64	The LOMC letter type. The LOMA point layer only includes cases that have a type of “DeterminLetter” cases.	DetermLetter
LAT	Double		Latitude of the subject structure.	47.11
LON	Double		Longitude of the subject structure.	-116.39
PDFHYPERLINKID	Text	30	The Case Number concatenated with the CID.	18-10-1607A-160014

Field Name	Data Type	Length	Description	Examples
REVAL_STAT	Text	50	LOMA revalidation Status	None, Incorporated, Not Incorporated, Reevaluated, Contact Community
LOTTYPE	Text	50	Lot Types and descriptions	Single lot
OUTCOME	Text	100	Outcome types and descriptions	Property out as shown

3.3.5. **Profile Baselines**

Field Name	Data Type	Length	Description	Examples
DFIRM_ID	Text	6	Study identifier, within each FIRM Database, the DFIRM_ID value will be identical	16005C
VERSION_ID	Text	11	Identifies the product version and relates the features to standards according to how it was created	2.3.3.2
BASELN_ID	Text	25	Primary key for table lookup	16005C_1
WTR_NM	Text	100	Surface Water Feature Name	LAKE FORK
SEGMT_NAME	Text	254	Segment Name	Main Channel
WATER_TYP	Text	38	Surface Water Feature Type. The type value describes the kind of watercourse represented.	Profile Baseline
STUDY_TYP	Text	38	Study Type. This describes the type of Flood Risk Project performed for flood hazard identification.	SFHAs WITH LOW FLOOD RISK
SHOWN_FIRM	Text	1	Profile Baseline Shown on FIRM	T
R_ST_DESC	Text	254	Reach Name Start Description. This describes the location of the start of the Flood Risk Project reach.	West Roseberry Road
R_END_DESC	Text	6	Reach Name End Description. This describes the location of the end of the Flood Risk Project reach.	Confluence with Tyee Creek
V_DATM_OFF	Text	16	Vertical Datum Offset	-9999
DATUM_UNIT	Text	254	Vertical Datum Offset Units	Feet

Field Name	Data Type	Length	Description	Examples
FLD_PROB1	Text	254	Description of Flooding Problems by flooding source	RIVERINE FLOODING FROM STORM AND SEASONAL HYDROLOGIC EVENTS
FLD_PROB2	Text	254	Description of Flooding Problems by flooding source, continued. Used when FLD_PRB1 field does not have enough characters to hold the flooding problem description.	-8888
FLD_PROB3	Text	254	Description of Flooding Problems by flooding source, continued. Used when FLD_PRB1 and FLD_PRB2 fields do not have enough characters to hold the flooding problem description.	-8888
SPEC_CONS1	Text	254	Special Considerations field for describing the modeling methodology used	-8888
SPEC_CONS2	Text	254	Second Special Considerations field for describing the modeling methodology used. Used when the description cannot be contained within the SPEC_CONS1 field.	-8888
START_ID	Text	25	Station Start Identification	16085C_9
SOURCE_CIT	Text	11	Abbreviation used in metadata file when describing source information for the feature	16085C_FIS1

3.3.6. **Cross-Sections**

Field Name	Data Type	Length	Description	Examples
DFIRM_ID	Text	6	Study identifier, within each FIRM Database, the DFIRM_ID value will be identical	16005C
VERSION_ID	Text	11	Identifies the product version and relates the features to standards according to how it was created	1.1.1.0
XS_LN_ID	Text	25	Primary key for table lookup	16005C_1
WTR_NM	Text	100	Surface Water Feature Name	LAKE FORK

Field Name	Data Type	Length	Description	Examples
STREAM_STN	Double		Stream Station. This is the measurement along the profile baseline to the cross section location.	56633.00
START_ID	Text	25	Station Start Identification. The station start describes the origin for the measurements in the STREAM_STN field.	16001C_10
XS_LTR	Text	12	Cross Section Letter. This is the letter or number that is assigned to the cross section on the hardcopy FIRM and in the FIS Report.	DH
XS_LN_TYP	Text	24	Cross-Section Line Type	LETTERED, MAPPED
WSEL_REG	Double		Regulatory Water Surface Elevation for the 1-PercentAnnual-Chance Flood Event	2738.5
STRMBED_EL	Double		Streambed Elevation. This is the water-surface elevation for the thalweg or the lowest point in the main channel.	2316.70
LEN_UNIT	Text	16	Water-Surface and Streambed Elevation Units	Feet
V_DATUM	Text	17	Vertical datum	NAVD88
PROFXS_TXT	Text	80	Profile Cross Section Text	
MODEL_ID	Text	100	Model Identifier	NP
SEQ	Integer		Sequence. This is the order in which the cross sections plot on the profile.	-9999
SOURCE_CIT	Text	11	Abbreviation used in metadata file when describing source information for the feature	16085C_STUDY1

3.3.7. **Base Flood Elevation**

Field Name	Data Type	Length	Description	Examples
DFIRM_ID	Text	6	Study identifier, within each FIRM Database, the DFIRM_ID value will be identical	16005C
VERSION_ID	Text	11	Identifies the product version and relates the features to standards according to how it was created	1.1.1.0
BFE_LN_ID	Text	25	Primary key for table lookup	16005C_1

Field Name	Data Type	Length	Description	Examples
ELEV	Double		The rounded, whole-foot elevation of the 1-percent-annual chance flood	2521.00
LEN_UNIT	Text	16	Base flood elevation units	Feet
V_DATUM	Text	17	Vertical datum	NAVD88
SOURCE_CIT	Text	11	Abbreviation used in metadata file when describing source information for the feature	16005C_STUDY1

3.3.8. **Flood Hazard Boundaries**

Field Name	Data Type	Length	Description	Examples
DFIRM_ID	Text	6	Study identifier, within each FIRM Database, the DFIRM_ID value will be identical	16005C
VERSION_ID	Text	11	Identifies the product version and relates the features to standards according to how it was created	1.1.1.0
FLD_LN_ID	Text	25	Primary key for table lookup	16005C_1
LN_TYPE	Text	26	Line Type. These line types describe the flood boundary.	SFHA / Flood Zone Boundary
SOURCE_CIT	Text	11	Abbreviation used in metadata file when describing source information for the feature	16005C_LOMC1

3.3.9. **Flood Hazard Zones**

Field Name	Data Type	Length	Description	Examples
DFIRM_ID	Text	6	Study identifier, within each FIRM Database, the DFIRM_ID value will be identical	16005C
VERSION_ID	Text	11	Identifies the product version and relates the features to standards according to how it was created	1.1.1.0
FLD_AR_ID	Text	32	Primary key for table lookup	16005C_1
STUDY_TYP	Text	38	Describes the type of Flood Risk Project performed for flood hazard identification	NP
FLD_ZONE	Text	17	Flood zone designation used by FEMA to designate SFHAs and for insurance rating purposes	A, AE, AO, AH, X, etc.

Field Name	Data Type	Length	Description	Examples
ZONE_SUBTY	Text	76	Captures additional information about flood zones not related to insurance rating purposes	0.2 PCT ANNUAL CHANCE FLOOD HAZARD
SFHA_TF	Text	1	If area is within a special flood hazard zone	T, F
STATIC_BFE	Double	-	Static base flood elevation for areas determined to have a constant BFE over a flood zone	4526, -9999
V_DATUM	Text	17	Vertical datum	NAD88
DEPTH	Double	-	Depth for Zone AO areas	2, -9999
LEN_UNIT	Text	16	Measurement system used for BFEs and/or depths	Feet
VELOCITY	Double	-	Velocity measurement of the flood flow in the area	-9999
VEL_UNIT	Text	20	Unit of measurement for VELOCITY	
AR_REVERT	Text	17	If area is Zone AR, this field holds the zone the area would revert to if AR zone were removed	
AR_SUBTRV	Text	57	If area is Zone AR, this field holds the zone subtype the area would revert to if AR zone were removed	
BFE_REVERT	Double	-	If area is Zone AR, this field holds STATIC_BFE for reverted zone	-9999
DEP_REVERT	Double	-	If area is Zone AR, this field holds DEPTH for reverted zone	-9999
DUAL_ZONE	Text	1	If area shall be designated as ‘dual’ flood insurance rate zones	T, F
SOURCE_CIT	Text	21	Abbreviation used in metadata file when describing source information for the feature	16005C_FIRM 1

3.4. **Data Quality**

Data quality considerations for National Flood Hazard Layers include:

a) All National Flood Hazard Layers should have National Flood Hazard Layer IDs as specified in section 2.5.9 of this Standard document.

Appendix A: References

Federal Emergency Management Agency (FEMA). *Technical References for Flood Risk Analysis and Mapping.* Technical References for Flood Risk Analysis and Mapping | FEMA.gov

Federal Emergency Management Agency (FEMA), 2020. *Guidance for Flood Risk Analysis and Mapping. Floors Insurance Rate Map (FIRM) Database.* https://www.fema.gov/sites/default/files/documents/fema_firm-database-guidance.pdf

Idaho Technology Authority (ITA). *Information and Data Policy P5000, Category: P5030 Framework Standards Development Policy.* https://ita.idaho.gov/psg/p5030.pdf

Idaho Technology Authority (ITA). *Enterprise Standards S4000 Geographic Information Systems (GIS) Data, Category: S4220 Geospatial Metadata.* https://ita.idaho.gov/psg/s4220.pdf

Appendix B: Glossary

See ITA Guideline G105 (ITA Glossary of Terms) for definitions.

Flood Layers