Appendix C: Use Cases

LIST OF CASES

- NWS flood event forecasting -- when to map an event within an existing library and when to create a new library unique to the event
- AHPS FIM map migration
- USGS streamgage reach - very basic
- USGS Kansas City multi-gage reaches/models business case
- USACE Dam Breach EAP libraries
- USACE District CWMS outputs
- USACE RAS based hydraulic study (outside of the other two)
- 2 1-d models (three total inundation map sets), 1 2-d model (one inundation map set), one documentation map
- NWS Coastal Flooding due to Tropical Storms

Requirements where Use Cases are needed
22 - data aging allowed and write case that uses the DateCertified
124 - USNG
134 - USNG
138 - USNG
159 - USNG geospatial layer available
161 - metadata sufficient to identify single event map
163 - metadata sufficient to identify stream reach historical flood documentation map
164 - metadata sufficient to identify single event map
168 - multiple flood extents display on one map

Title: Uploading a FIM project library for display via IWRSS data services
Actors: Data creator, data consumer
Base Use Case: As a FIM Library Creator, I want to display my FIM library on an IWRSS data service, because openly sharing data with others in a standard format is the right thing to do.
Base Scenario (Required for all subsequent use cases)

1. Identify and collect model data (IWRSS or other sources)
    a. Terrain
    b. Gage information
    c. National Levee Data information
    d. Other observed and historic information
    e. additional various other data needs
2. Perform study
    a. Various steps
3. Prepare data for IWRSS submittal
    a. Assign a 23-character unique Library ID (required)

    b. Provide study, purpose and external data connection (e.g. USGS Gage ID) information.
    c. Additional various reports and metadata
4. Upload Geospatial Data [FIMGeoData/Inundation] to IWRSS
    a. FloodExtent (required)
    b. StudyExtent (required)
    c. FloodDepth
    d. FloodInfo
    e. MappedCrossSections
    f. LeveedAreaFloodExtent
    g. PotentialInundationArea
    h. MappedStreamCenterline
    i. ModelLimits
    j. RiverStation
    k. WaterSurfaceElevationContour
    l. ReferencePoint
5. Upload Model Data [Model] to IWRSS
    a. Hydraulic model including geometry, configuration files and forcing data.
    b. ModelGeoData (spatial features and their attributes):
        i. BoundingPolygon
        ii. ModeledCrossSections
        iii. StorageAreas
        iv. ModeledStreamCenterline
    c. Terrain data - uploaded to the ModelGeoData folder with model files, or provide the link to an external public database (e.g. U.S. Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink)
6. Upload supporting documentation to IWRSS
    a. FGDC metadata files (template provided)
        i. Library (some are required)
        ii. FIMGeoData
        iii. Inundation
        iv. ModelGeoData
        v. Model
    b. Attributes in addition to current metadata standard
        i. Library
        ii. FIMGeoData
        iii. Inundation
        iv. ModelGeoData
        v. Model
        vi. Citations for reports on methods
7. IWRSS FIM reports the upload is complete and makes the available data visible to appropriate users as determined by the Use Restriction Type and Status Type.

Extension Cases: (based on the Generic Use cases, just has additional specific information)

Forecast

1. Upload FIM mapping data into IWRSS System.
    a. Max Depth Grid for forecast
2. Nothing Additional
3. Nothing Additional
4. Provide supporting documentation.
    a. Must somehow identify forecast location information (gages, vips)
5. Nothing Additional

Dam Breach

1. Upload FIM mapping data into IWRSS System.
    a. Max Depth Grid for scenario
    b. Arrival time grid for scenario
    c. Duration grid for scenario
    d. Dam location
2. Upload Hydraulic model and data into IWRSS System
    a. Discussion of breach parameter development
3. Nothing additional
4. Provide supporting documentation.
    a.
5. Nothing Additional

Levee Breach

1. Upload FIM mapping data into IWRSS System.
    a. Max Depth Grid for scenario
    b. Arrival time grid for scenario
    c. Duration grid for scenario
    d. Levee Breach location
2. Upload Hydraulic model and data into IWRSS System
    a. Discussion of breach parameter development
3. Nothing Additional
4. Provide supporting documentation.
    a.
5. Nothing Additional

Title: USGS streamgage reach - very basic

Actors: USGS Scientist (Developer level), IWRSS Manager (governing body/rules for the database), public user

Main Use Case: As a USGS Developer, I want to load an inundation map library for an area around a USGS streamgage to better inform my users about flood risk.

Main Scenario:

1. Identify my data that I need to upload
    a. collect metadata about my hydraulic model (including the model) (requirements X-X)
    b. collect metadata about my terrain model (including the model) (requirements X-X)
    c. ensure my flood inundation polygons meet the IWRSS minimum standards (requirements X-X)
    d. ensure my flood inundation depth grids meet the IWRSS minimum standards (requirements X-X)
    e. prepare report/documentation including:
        i. USGS report (link to pubs warehouse)
        ii. full citation
        iii. short paragraphs that include the pockets of writing on the USGS FIM Print Product Template
        iv. IPDS number
        v. approval memo pdf scan (not public but stored to handle tracking peer reviewers and approvals)
    f. prepare my location metadata
        i. USGS gage ID
        ii. AHPS forecast point ID
        iii. NHD addressing
    g. prepare geospatial metadata
2. Put the data into the IWRSS database
    a. Action to load the data using whatever tools are provided.
    b. Ensure that all dates are listed properly for the last known model date and the date of approval.
    c. Note the rating curve number and top measurement and mapping level to flag when a shift has occurred that is large enough to warrant revisiting the map library.

Title: USGS multi-streamgages with separate set of libraries/models with one report/documentation

Actors: USGS Scientist (Developer level), IWRSS Manager (governing body/rules for the database), public user

Main Use Case: As a USGS Developer, I want to load an inundation map library for an area around multiple USGS streamgages to better inform my users about flood risk. Should be handled as separate libraries. May be easier for change management. Document and refer to single report and multiple libraries/models can reference a single report.

Extension Case Scenario

8. Create, document and peer review FIM Project Libraries following any of the established methodology. (one report with multiple libraries/models)
    a. Contact or be from an IWRSS member agency

    b. Assign a 23 character unique ID (required; create separate ids for each libraries/models)
    c. Provide study, purpose and external data connection (ie USGS Gage ID) information.
9. FIMGeoData upload (spatial features and their attributes)
    a. FIMGeoData\Inundation
        i. FloodExtent (required)
        ii. FloodDepth
        iii. FloodInfo
        iv. MappedCrossSections
        v. LeveedFloodExtent
        vi. PotentialInundationArea
    b. StudyExtent
    c. MappedStreamCenterline
    d. ModelLimits
    e. RiverStation
    f. WaterSurfaceElevationContour
10. Model Data Upload
    a. Hydraulic model including geometry, configuration files and forcing data.
    b. Model\ModelGeoData (spatial features and their attributes)
        i. BoundingPolygon
        ii. ModeledCrossSections
        iii. StorageAreas
        iv. ModeledStreamCenterline
    c. Terrain data - uploaded to the ModelGeoData folder with model files OR provide link to external public database (i.e. US Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink)
11. Provide supporting documentation.
    a. FGDC metadata files (template provided)
        i. Library (required)
        ii. FIMGeoData
        iii. Inundation
        iv. ModelGeoData
        v. Model
    b. Attributes in addition to current metadata standard
        i. Library
        ii. FIMGeoData
        iii. Inundation
        iv. ModelGeoData
        v. Model
        vi. Citations for reports on methods

12. IWRSS FIM certifies the upload is complete and makes the available data visible to appropriate users as determined by the Use Restriction Type and Status Type.

Title: USGS multi-streamgages with matrixed model/map scenarios

Actors: USGS Scientist (Developer level), IWRSS Manager (governing body/rules for the database), public user

Main Use Case: As a USGS Developer, I want to load an inundation map library for an area around multiple USGS streamgages to better inform my users about flood risk. Users can select scenarios based on multiple streamgages independently; select different stages at each gages and flood extent will change accordingly. Assign a primary gage that will be the one to maintain the ID. Need to add fields to the Flood Inundation area/grid/etc that is the SecondaryGageID and SecondaryGageHeight, SecondaryGageFlow

Extension Case Scenario

13. Create, document and peer review a new FIM Project Library following any of the established methodology.
    a. Contact or be from an IWRSS member agency
    b. Assign a 23 character unique ID (required; Assign a primary gage that will be the one to maintain the LibraryID)
    c. Provide study, purpose and external data connection (ie USGS Gage ID) information.
14. FIMGeoData upload (spatial features and their attributes)
    a. FIMGeoData\Inundation
        i. FloodExtent (required; Will need PrimaryGageID, PrimaryGageHeight, PrimaryGageFlow, SecondaryGageID, SecondaryGageHeight, and SecondaryGageFlow)
        ii. FloodDepth (Will need to have GridID that relates to each scenarios)
        iii. FloodInfo
        iv. MappedCrossSections
        v. LeveedFloodExtent
        vi. PotentialInundationArea
    b. StudyExtent
    c. MappedStreamCenterline
    d. ModelLimits
    e. RiverStation
    f. WaterSurfaceElevationContour
15. Model Data Upload
    a. Hydraulic model including geometry, configuration files and forcing data.
    b. Model\ModelGeoData (spatial features and their attributes)
        i. BoundingPolygon
        ii. ModeledCrossSections
        iii. StorageAreas
        iv. ModeledStreamCenterline

    c. Terrain data - uploaded to the ModelGeoData folder with model files OR provide link to external public database (i.e. US Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink)
16. Provide supporting documentation.
    a. FGDC metadata files (template provided)
        i. Library (required)
        ii. FIMGeoData
        iii. Inundation
        iv. ModelGeoData
        v. Model
    b. Attributes in addition to current metadata standard
        i. Library
        ii. FIMGeoData
        iii. Inundation
        iv. ModelGeoData
        v. Model
        vi. Citations for reports on methods
17. IWRSS FIM certifies the upload is complete and makes the available data visible to appropriate users as determined by the Use Restriction Type and Status Type.

Title: USACE Corps Water Management System (CWMS) Libraries

Actors: USACE District Water Manager, USACE data manager, CWMS/IWRSS data interface, NWS River Forecaster

Main Use Case: As a USACE District Water Manager I run regular recurring flood inundation scenarios and want to make them available to USACE decision makers and NWS river forecasters because this information is critical to making informed reservoir regulation decisions, emergency response plans and river forecasts and flood warnings.

Main Scenario:

1. (Outside IWRSS FIM) USACE District Water Manager uses CWMS to generate FIM data for range of possible forecast scenarios based on info such as current and forecast rainfall and reservoir pool levels.
2. (Outside IWRSS FIM) USACE District Water Manager loads results into District CWMS database
3. (Outside IWRSS FIM) USACE data manager consolidates all current info available from district databases into national CWMS database
4. USACE CWMS/IWRSS services data translator automated recurring process transforms and new CWMS-generated FIM data into IWRSS-compliant format and inserts into the CWMS operational basin-specific libraries.
5. NWS River Forecaster obtains USACE CWMS-generated FIMs by accessing USACE IWRSS FIM service.

Title: USACE Dam Breach EAP libraries

Actors: USACE Dam Safety Program Manager (DSPM), USACE data manager, NWS River Forecaster, public user, state emergency manager

Main Use Case: As a USACE Dam Safety Program Manager, I want to provide dam break scenario model results to the NWS River Forecaster and state emergency manager so that they can perform their responsibilities for issuing flood warnings and for initiating evacuations and emergency response.

Main Scenario:

1. USACE DSPM verify that USACE dam break library includes an appropriate scenario
    a. Review existing scenarios for appropriateness of pool elevation, inflows, breach formation times, arrival time and extents
        i. Data interaction: Access the library [mLibrary.AgencyLibraryID, mLibrary.LibraryName, other mLibrary attributes provide supporting information to understand library purpose and use constraints]
        ii. Data interaction: Review model documentation to understand assumptions made for existing scenarios [mModel attributes and media table model reports]
        iii. Display interaction: Display inundation extents and depths from candidate scenarios [Library.Inundation.FloodExtent.InundationEvent, Library.Inundation.InundationEvent]
    b. Attribute the most appropriate existing scenario in the library as the event scenario
        i. Edit interaction. [Library.Inundation.eventDate is not null, !.InundationEvent = Dam Break, !.mapPurpose = Event Based Map
2. (Outside IWRSS FIM) USACE DSPM provide event warning communication to NWS River Forecaster and state emergency manager that an event is in progress and that IWRSS FIM data is available.
    a. Include hyperlink to library & event scenario
        i. Data interaction. Interface serving 1.b provides ability to copy out a URL hyperlink with parameters necessary to reconstruct the display within any IWRSS-compliant map tool.
3. USACE data manager transmit IWRSS FIM information to NWS River Forecaster and state emergency manager through external secure data service.
    a. FIM-d compliant data service and FIM-c compliant map service.
4. NWS River Forecaster develop flood warning
    a. Display the event scenario
        i. Use parameters provided by USACE DSPM to launch NWS IWRSS-compliant tool to view maps and “jump” straight to the event scenario.
    b. (Outside IWRSS FIM) Generalize to flood warning polygon and load it into NWS flood warning system. Issue flood warning, including information about anticipated flood wave arrival times at downstream communities.
5. (Outside IWRSS FIM) Public user receive flood warning

    a. View a map from hyperlink provided within the flood warning message
        i. Same need as 4.a.i
    b. Print a map showing inundation depths near my home
6. (Outside IWRSS FIM) State emergency manager receive USACE DSPM event warning
    a. View interactive map from hyperlink provided within the USACE event warning
        i. Same need as 4.a.i
    b. Request inundation extent map atlas for my jurisdiction
        i. Same need as 4.a.i, with ability to adjust the parameters provided in the email

Title: USACE Dam Breach EAP libraries (EXTENSION)
Actors: USACE Dam Safety Program Manager (DSPM), USACE data manager, NWS River Forecaster, public user, state emergency manager
Extension Use Case: As a USACE Dam Safety Program Manager I want to provide dam break scenario model results to the NWS River Forecaster and state emergency manager so that they can perform their responsibilities for issuing flood warnings and for initiating evacuations and emergency response.
Extension Scenario:

1. Within ~8 hours of initial breach formation USACE DSPM develops model scenario based on actual pool elevation, inflows and breach formation times
    a. Load scenario results into existing map library
    b. Attribute the revised scenario as the latest event scenario
2. Continuation of main scenario...

Title: AHPS FIM map migration
Actors: NWS Hydrologist and Hydro Program Manager of the AHPS FIM libraries (data development user)
Main Use Case: As a NWS Hydrologist or Hydrology Program Manager of the AHPS FIM libraries, I am migrating the NWS AHPS FIM libraries into the IWRSS FIM framework so that it is available to users of NWS AHPS and the IWRSS partners.
Main Scenario:
Data Pre-Processing (three additional steps)

1. 0.1 For projects with leveed areas only, containing a {levee_ risk_area.shp} AND {flood_cntrl.shp} layers:
    a. Compare {flood_cntrl.shp} to the current levee alignments in the National Levee Database.
        i. If {flood_cntrl.shp} does not exist in the National Levee Database, then upload levee centerline from {flood_cntrl.shp} to National Levee Database.
        ii. If {flood_cntrl.shp} does not align with the existing National Levee Database, then reconcile differences and potentially modify the existing

National Levee Database with elements of {flood_cntrl.shp} if {flood_cntrl.shp} is the most current data available.

b. Compare {levee_ risk_area.shp} to the current leveed areas in the National Levee Database.
    i. If {levee_ risk_area.shp} does not exist in the National Levee Database, then upload the leveed area to the National Levee Database {levee_ risk_area.shp}.
    ii. If {levee_ risk_area.shp} does not align with the National Levee Database leveed area, then reconcile differences and potentially modify the existing National Levee Database with elements of {levee_ risk_area.shp} if {levee_ risk_area.shp} is the most current version of the leveed area.

2. 0.2 Develop missing data layers for all projects
    a. ModelLimits= Extract directly from hydraulic model geometry into a shapefile.
    b. MappedStreamCenterline= Extract directly from hydraulic model geometry into a shapefile.
    c. Model BoundingPolygon = Extract directly from hydraulic model geometry into a shapefile.
    d. Model ModeledCrossSections = Extract directly from hydraulic model geometry into a shapefile.
    e. Model StorageAreas = Extract directly from hydraulic model geometry into a shapefile (if applicable).
    f. Model ModeledStreamCenterline = Extract directly from hydraulic model geometry into a shapefile.
3. 0.3 Develop metadata and attribute information for all projects
    a. FGDC metadata files
        i. Extract metadata from existing XML files on all layers in NWS format
        ii. Extract metadata from NWS Project Development Templates
        iii. Extract metadata from study reports
        iv. Extract metadata from NWS AHPS webpage
    b. Attributes in addition to current metadata standard
        i. Extract attributes from existing XML files on all layers in NWS format
        ii. Extract attributes from NWS Project Development Templates
        iii. Extract attributes from study reports
        iv. Extract attributes from NWS AHPS webpage

1. Nothing Additional
2. FIMGeoData upload (spatial features and their attributes)
    a. FIMGeoData\Inundation
        i. FloodExtent (required) = {elev_feet_tenth.shp} Shapefile
        ii. FloodDepth = {elev_feet_tenth} Depth Grid
        iii. FloodInfo = Does not exist
        iv. MappedCrossSections = {xs.shp}
        v. LeveedFloodExtent = Does not exist
        vi. PotentialInundationArea = Does not exist

    b. StudyExtent = {elev_feet_tenth.shp}
    c. MappedStreamCenterline = Developed in pre-processing step.
    d. ModelLimits = Developed in pre-processing step.
    e. RiverStation = Does not exist
    f. WaterSurfaceElevationContour = Does not exist
3. Model Data Upload
    a. Hydraulic model including geometry, configuration files and forcing data.
    b. Model\ModelGeoData (spatial features and their attributes)
        i. BoundingPolygon = Developed in pre-processing step.
        ii. ModeledCrossSections = Developed in pre-processing step.
        iii. StorageArea = Developed in pre-processing step (if applicable).
        iv. ModeledStreamCenterline = Developed in pre-processing step.
    c. Terrain data - uploaded to the ModelGeoData folder with model files OR provide link to external public database (i.e. US Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink) = Terrain data will be uploaded for all projects where a terrain dataset was provided.
4. Provide supporting documentation.
    a. FGDC metadata files (template provided)
        i. Library (required) = Developed in pre-processing step.
        ii. FIMGeoData = Developed in pre-processing step.
        iii. Inundation = Developed in pre-processing step.
        iv. ModelGeoData = Developed in pre-processing step.
        v. Model = Developed in pre-processing step.
    b. Attributes in addition to current metadata standard
        i. Library=Developed in pre-processing step.
        ii. FIMGeoData =Developed in pre-processing step.
        iii. Inundation = Developed in pre-processing step.
        iv. ModelGeoData = Developed in pre-processing step.
        v. Model = Developed in pre-processing step.
        vi. Citations for reports on methods = Developed in pre-processing step.
5. Nothing Additional

Title: NWS Flood Event Forecasting - Forecast Event Setup
Actors: NWS River Forecast Center Staff producing river forecasts
Main Use Case: As a NWS River Forecast Center Staff member producing river forecasts, I am setting up the IWRSS FIM database for a specific reach of river so that it is available to consume real-time FFIM or event maps during the forecast flood event.
Main Scenario:
Data Pre-Processing

1. **Develop data layers**
    a. **Study Extent = Manually developed**

b. MappedCrossSections = Extract from hydraulic model geometry and clip against StudyExtent to derive shapefile.
c. ModelLimits layer = Extract directly from hydraulic model geometry into a shapefile.
d. MappedStreamCenterline = Extract directly from hydraulic model geometry into a shapefile.
e. Model BoundingPolygon= Extract directly from hydraulic model geometry into a shapefile.
f. Model ModeledCrossSections = Extract directly from hydraulic model geometry into a shapefile.
g. Model StorageAreas = Extract directly from hydraulic model geometry into a shapefile (if applicable).
h. Model ModeledStreamCenterline = Extract directly from hydraulic model geometry into a shapefile.

2. Develop metadata and attribute information
    c. FGDC metadata files
    d. Attributes in addition to current metadata standard

Data Upload

1. Nothing Additional
2. FIMGeoData upload (spatial features and their attributes)
    a. FIMGeoData\Inundation
        i. FloodExtent (required) = Test data are uploaded. Operational data will be provided with near real-time model runs
        ii. FloodDepth = Test data are uploaded. Operational data will be provided with near real-time model runs.
        iii. FloodInfo = Does not exist.
        iv. MappedCrossSections = Developed in pre-processing step.
        v. LeveedFloodExtent = Will be provided with near real-time model runs
        vi. PotentialInundationArea = Does not exist
    b. StudyExtent =Developed in pre-processing step
    c. MappedStreamCenterline = Developed in pre-processing step
    d. ModelLimits = Developed in pre-processing step
    e. RiverStation = Does not exist
    f. WaterSurfaceElevationContour = Does not exist
3. Model Data Upload
    a. Hydraulic model including geometry, configuration files and forcing data. Upload Current Version of the Hydraulic model used in operational forecasting.
    b. Model\ModelGeoData (spatial features and their attributes)
        i. BoundingPolygon = Developed in pre-processing step.
        ii. ModeledCrossSections = Developed in pre-processing step.
        iii. StorageArea = Developed in pre-processing step (if applicable).
        iv. ModeledStreamCenterline = Developed in pre-processing step.

c. Terrain data - uploaded to the ModelGeoData folder with model files OR provide link to external public database (i.e. US Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink) = Terrain data will be uploaded for all projects where a terrain dataset was provided.

4. Provide supporting documentation.
    a. FGDC metadata files (template provided)
        i. Library (required) = Developed in pre-processing step.
        ii. FIMGeoData = Developed in pre-processing step.
        iii. Inundation = Developed in pre-processing step.
        iv. ModelGeoData = Developed in pre-processing step.
        v. Model = Developed in pre-processing step.
    b. Attributes in addition to current metadata standard
        i. Library=Developed in pre-processing step.
        ii. FIMGeoData =Developed in pre-processing step.
        iii. Inundation = Developed in pre-processing step.
        iv. ModelGeoData = Developed in pre-processing step.
        v. Model = Developed in pre-processing step.
        vi. Citations for reports on methods = Developed in pre-processing step.
5. Nothing additional

Title: NWS Flood Event Forecasting - Initial Event Forecast (EXTENSION)
Actors: NWS River Forecast Center Staff producing real-time flood forecast inundation maps (FFIM), aka event maps associated with the flood forecasts.
Extension Use Case: As a NWS River Forecast Center Staff member producing river forecasts, I am uploading an initial flood forecast inundation map to IWRSS in near real-time so that it is available to the users of the NWS AHPS and the IWRSS partners.
Extension Scenario:
Data Pre-Processing

1. **TBD processing steps and tools designed to efficiently translate model results into FloodExtent, FloodDepth and LeveedFloodExtent layers in near-real time. The focus will be on developing tools that process and automatically upload these data as fast as possible.**

Data Upload

1. **Nothing Additional - IWRSS Library ID is preserved**
2. **FIMGeoData upload (spatial features and their attributes)**
    a. **FIMGeoData\Inundation**
        i. **FloodExtent (required) = Operational data are provided with near real-time model runs.**
            1. **Forecast flood extent polygons in 6-hr intervals from present time to 7 days out (28 maps total) AND/OR**

2. Forecasts flood extent polygons in 1-hr intervals from present time to 7 days out (168 maps total) AND
3. A maximum water surface flood extent polygon

ii. FloodDepth = Operational data are provided with near real-time model runs.
1. Forecast depth grids in 6-hr intervals from present time to 7 days out (28 maps total) AND/OR
2. Forecasts depth grids in 1-hr intervals from present time to 7 days out (168 maps total) AND
3. A maximum water surface depth grid

iii. LeveedFloodExtent = Operational data are provided with near real-time model runs.
1. Forecast flood extent polygons in 6-hr intervals from present time to 7 days out (28 maps total) AND/OR
2. Forecasts flood extent polygons in 1-hr intervals from present time to 7 days out (168 maps total) AND
3. A maximum water surface flood extent polygon

3. Nothing Additional - No model upload is required assuming only model hydrology (inflows and boundary conditions) have changed and major model geometry (mannnig's n, channel geometry) has not been modified. Operational geometry changes are acceptable (levee breaches, inline structure gate changes).
4. Provide supporting documentation.
    a. Flag the map as the "Event Map"
5. Nothing additional

Title: NWS flood event forecasting: Forecasting an Event - Additional Forecasts Provided After the First Flood Forecast Inundation Map (EXTENSION)

Actors: NWS River Forecast Center Staff producing real-time flood forecast inundation maps (FFIM), aka event maps associated with the flood forecasts.

Extension Use Case: As a NWS River Forecast Center Staff member updating the real-time flood forecast inundation maps (FFIM), aka event maps associated with newer flood forecasts, I am uploading new sets of flood forecast inundation maps to follow up a new forecast to IWRSS in near real-time so that it is available to the users of the NWS AHPS and the IWRSS partners.

Extension Scenario:

Data Pre-Processing

1. Same as preprocessing for *NWS Flood Event Forecasting - Initial Event Forecast (EXTENSION)*

Data Upload

1. Nothing Additional - IWRSS Library ID is preserved
2. Nothing Additional - Same as *NWS Flood Event Forecasting - Initial Event Forecast (EXTENSION)*
3. Nothing Additional - Same as *NWS Flood Event Forecasting - Initial Event Forecast (EXTENSION)*

4. Provide Supporting documentation
    a. Remove the flag from previous existing layers as the “Event Map”
    b. Flag the new map as the “Event Map”
5. Nothing Additional

Title: NWS Coastal Flooding: Forecast Event Setup
Actors: NOAA NWS National Hurricane Center staff producing Potential Storm Surge Flood Map for a tropical cyclone event
Main Use Case: As a NOAA NWS National Hurricane Center staff member producing potential storm surge inundation maps for forecast tropical cyclone events, I am uploading a coastal flood map showing inundation levels that have a 1-in-10 chance (10 %) of being exceeded for areas along the Gulf and East Coast of the United States to IWRSS in near real-time so that it is available to the users of the NWS AHPS and the IWRSS partners when there is a forecast tropical cyclone event (anytime within 48 hours of the anticipated onset of tropical storm force winds). Note: this use case assumes that the area is subject only to coastal flooding and does not contain flooding from a riverine source. For additional information on existing product, see Experimental Potential Storm Surge Flooding Map PDD for an overview of the product or additional description of the methodology from NHC and P-Surge.
Main Scenario:
Data Pre-Processing - Performed internally at NWS Meteorological Development Lab

1. LeveedAreaFloodExtent = does not take into account Flooding inside levees and overtopping of levees.
2. ModelLimits = SLOSH Basins
3. BoundingPolygon = Simulated Storms from SLOSH Models

Data Upload - Inundation Maps generated at the National Hurricane Center

1. Nothing Additional
2. FIMGeoData upload (spatial features and their attributes)
    a. FIMGeoData\Inundation
        i. FloodExtent (required) = Potential Storm Surge Flooding Map Polygons
        ii. FloodDepth = Potential Storm Surge Flooding Map Depth Grids Above Ground Level
        iii. FloodInfo = Does not exist
        iv. MappedCrossSections = Does not exist
        v. LeveedAreaFloodExtent = Developed in pre-processing step.
        vi. PotentialInundationArea = Does not exist
    b. StudyExtent = Developed in pre-processing step.
    c. MappedStreamCenterline = Does not exist
    d. ModelLimits = Developed in pre-processing step.
    e. RiverStation = Does not exist
    f. WaterSurfaceElevationContour = Does not exist
3. Model Data
    a. Hydraulic model including geometry, configuration files and forcing data. - NWS MDL internally runs the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model.
    b. Model\ModelGeoData (spatial features and their attributes)
        i. BoundingPolygon = Developed in pre-processing step.

ii. ModeledCrossSections = Does not exist
iii. StorageAreas = Does not exist
iv. ModeledStreamCenterline = Does not exist

c. Terrain data - can be uploaded to the ModelGeoData folder with model files OR provide link to external public database (i.e. US Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink)

4. Supporting Information Upload
    a. FGDC metadata files (template provide) - Nothing Additional
    b. Attributes in addition to current metadata standard
        i. Establish Mapping Contour Thresholds:
            1. 0 to 3 ft Depths
            2. 3 to 6 ft Depths
            3. 6 to 9 ft Depths
            4. 9 ft + Depths
5. Nothing Additional

Title: NWS Coastal Flooding: Initial Event Forecast (EXTENSION)
Actors: NOAA NWS National Hurricane Center staff producing Potential Storm Surge Flood Map for a tropical cyclone event
Extension Use Case: As a NOAA NWS National Hurricane Center staff member producing potential storm surge inundation maps for forecast tropical cyclone events, I am uploading a coastal flood map showing inundation levels that have a 1-in-10 chance (10 %) of being exceeded for areas along the Gulf and East Coast of the United States to IWRSS in near real-time so that it is available to the users of the NWS AHPS and the IWRSS partners when there is a forecast tropical cyclone event (anytime within 48 hours of the anticipated onset of tropical storm force winds).
Extension Scenario:
Data Pre-Processing - Performed internally at NWS Meteorological Development Lab

1. **LeveedAreaFloodExtent = does not take into account Flooding inside levees and overtopping of levees.**
2. **ModelLimits = SLOSH Basins**
3. **BoundingPolygon = Simulated Storms from SLOSH Models**
4. **PotentialInundationArea = P-Surge compute the possible storm surge values using the SLOSH model and combine the results to calculate a distribution of possible storm surge heights for impacted coast.**

Data Upload - Inundation Maps generated at the National Hurricane Center

1. **Nothing Additional**
2. **FIMGeoData upload (spatial features and their attributes)**
    a. **FIMGeoData\Inundation**
        i. **FloodExtent (required) = Potential Storm Surge Flooding Map Polygons within next 48 hours of a landfalling tropical storm.**
        ii. **FloodDepth (required) = Potential Storm Surge Flooding Map Depth Grids within next 48 hours of a landfalling tropical storm.**
        iii. **FloodInfo = Does not exist**
        iv. **MappedCrossSections = Does not exist**
        v. **LeveedFloodExtent = Developed in pre-processing step.**

vi. PotentialInundationArea = Does not exist
   b. StudyExtent = Developed in pre-processing step.
   c. MappedStreamCenterline = Does not exist
   d. ModelLimits = Developed in pre-processing step.
   e. RiverStation = Does not exist
   f. WaterSurfaceElevationContour = Does not exist
3. Model Data
   a. Hydraulic model including geometry, configuration files and forcing data. - NWS MDL internally runs the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model.
   b. Model\ModelGeoData (spatial features and their attributes)
      i. BoundingPolygon = Developed in pre-processing step.
      ii. ModeledCrossSections = Does not exist
      iii. StorageAreas = Does not exist
      iv. ModeledStreamCenterline = Does not exist
   c. Terrain data - uploaded to the ModelGeoData folder with model files OR provide link to external public database (i.e. US Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink)
4. Supporting Information Upload
   a. FGDC metadata files (template provide) - Nothing Additional
   b. Attributes in addition to current metadata standard
      i. Establish Mapping Contour Thresholds:
         1. 0 to 3 ft Depths
         2. 3 to 6 ft Depths
         3. 6 to 9 ft Depths
         4. 9 ft + Depths
5. Nothing Additional

Title: NWS Coastal Flooding: Forecasting an Event - Additional Forecasts Provided After the First Flood Forecast Inundation Map (EXTENSION)
Actors: NOAA NWS National Hurricane Center staff producing Potential Storm Surge Flood Map for a tropical cyclone event
Extension Use Case: As a NOAA NWS National Hurricane Center staff member producing potential storm surge inundation maps for forecast tropical cyclone events, I am updating a coastal flood map showing inundation levels that have a 1-in-10 chance (10 %) of being exceeded for areas along the Gulf and East Coast of the United States to IWRSS in near real-time so that it is available to the users of the NWS AHPS and the IWRSS partners 45-60 minutes after a new NHC Full Advisory package for given tropical storm.
Extension Scenario:
Data Pre-Processing - Performed internally at NWS Meteorological Development Lab
1. LeveedAreaFloodExtent = does not take into account Flooding inside levees and overtopping of levees.
2. ModelLimits = SLOSH Basins
3. BoundingPolygon = Simulated Storms from SLOSH Models
4. PotentialInundationArea = P-Surge compute the possible storm surge values using the SLOSH model and combine the results to calculate a distribution of possible storm surge heights for impacted coast.

Data Upload - Inundation Maps generated at the National Hurricane Center

1. Nothing Additional
2. FIMGeoData upload (spatial features and their attributes)
    a. FIMGeoData\Inundation
        i. FloodExtent (required) = Potential Storm Surge Flooding Map Polygons to be provided 45-60 minutes after new NHC full advisory package for given landfalling tropical storm.
        ii. FloodDepth (required) = Potential Storm Surge Flooding Map Depth Grids to be provided 45-60 minutes after new NHC full advisory package for given landfalling tropical storm.
        iii. FloodInfo = Does not exist
        iv. MappedCrossSections = Does not exist
        v. LeveedFloodExtent = Developed in pre-processing step.
        vi. PotentialInundationArea = Does not exist
    b. StudyExtent = Developed in pre-processing step.
    c. MappedStreamCenterline = Does not exist
    d. ModelLimits = Developed in pre-processing step.
    e. RiverStation = Does not exist
    f. WaterSurfaceElevationContour = Does not exist
3. Model Data
    a. Hydraulic model including geometry, configuration files and forcing data. - NWS MDL internally runs the Sea, Lake, and Overland Surges from Hurricanes (SLOSH) model.
    b. Model\ModelGeoData (spatial features and their attributes)
        i. BoundingPolygon = Developed in pre-processing step.
        ii. ModeledCrossSections = Does not exist
        iii. StorageAreas = Does not exist
        iv. ModeledStreamCenterline = Does not exist
    c. Terrain data - uploaded to the ModelGeoData folder with model files OR provide link to external public database (i.e. US Interagency Elevation Inventory) within media table (mediaID = FK reference to mModelGeodata PK, FilePath stores hyperlink, Comments describes the information stored at the hyperlink)
4. Supporting Information Upload
    a. FGDC metadata files (template provide) - Nothing Additional
    b. Attributes in addition to current metadata standard
        i. Establish Mapping Contour Thresholds:
            1. 0 to 3 ft Depths
            2. 3 to 6 ft Depths
            3. 6 to 9 ft Depths
            4. 9 ft + Depths
5. Nothing Additional