Dynamic Flood Mapping

Dynamic = characterized by constant change, activity, or progress

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My Vision for Dynamic Flood Mapping
(primarily applies to rivers like the Boise River, that span numerous jurisdictions)

A process allowing flood information to be centrally located and systematically updated.

A process to serve Flood Plain Administrators, Flood Control District, Engineers, Developers, Planners, Property Owners, and Others.
Current Issues

Flood Mapping is More than Flood Insurance

Flood Insurance Studies and Mapping are Outdated and Often Poorly Suited to Identify Some Types of Flood Hazards.

Hard to evaluate impacts of LOMR-F

Quality of Studies and Mapping May be Insufficient

Difficulty in Locating and Obtaining Up-to-date Data

Timeliness of Updating - River & Floodplain is Constantly Changing

Use of Best Practical Tools and Data
Process for Central Location

Oversight Through State Government
Divide River System Into Logically Manageable Segments
Select Central Entity Who Can Provide Local Support (Universities, Flood Control Districts, Counties, Cities, other?)

Support Functions Should Include –
- Interface with Flood Administration Entities
- Engineering Support for Hydraulics, Hydrology, Surveying
- GIS (geographical information system) Mapping Support
- Data Management
- Updating Flood Insurance Maps
Possible Process for Systematic Updating

Determine resolution of hydraulic modeling needed within the river system – “base model” is the most detailed hydraulic model to fulfill needs – it is better or equal to FEMA model and can provide acceptable regulatory flood mapping.

Determine the data required for the base model

Start with latest regulatory hydraulic model, improve and build upon it to produce the base model or build the base model and dumb it down

Develop process to handle new data on demand

Establish benchmark stationing for bathymetry

Establish schedule for data collection for bathymetry, lidar, stream gages, and base model updates

Update base model systematically and on demand – similar to open source software development
Process to Serve Flood Plain Administrators, Engineers, Developers, Planners, Property Owners, and Others

Develop Easy to Use Graphical Interface, Likely GIS Driven—Utilize National Flood Hazard Layer, County Parcel, Planning & Zoning, Various Detail Levels from Base Model.

Links to Digital Data for Viewing and Download

Interface to Base Model, Upload Capabilities for Grading Plans in Correct Horizontal and Vertical Coordinate Systems

Interface Could Also Add Terrain Changes for Immediate Hydraulic Result. For Example: Determining impacts of failing levee or other features, or evaluating flood control measures to be used, or a proposed development
Example: Evaluating Undeveloped Land Use and Modeling Options
See if FEMA Hydraulic Model Could be Used as the Base Model
Need to evaluate the data needs for the base model, adequacy of terrain, bathymetry, setup, etc.
LiDAR will most likely be the base terrain for a base model. The terrain and bathymetry needs to be updatable within the model.
Bathymetry could be from surveyed cross sections, Green LiDAR, or combination of the two.
Benchmark sections could be established to evaluate channel morphology and provide a basis for bathymetric updating.
Additional section could be added as need via standard survey or drone LiDAR.
Here’s what a completed base model output might look like to a user.
A proposed grading plan could interactively be loaded to the base model.
Here’s what the grading plan modification to the base model might look like
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Just lots of possibilities