

DSS-WISE™ Web

Decision Support System for Water Infrastructural Security Web

**User Manual
for
DSS-WISE™ Web
Version 4.1**

August 27, 2026

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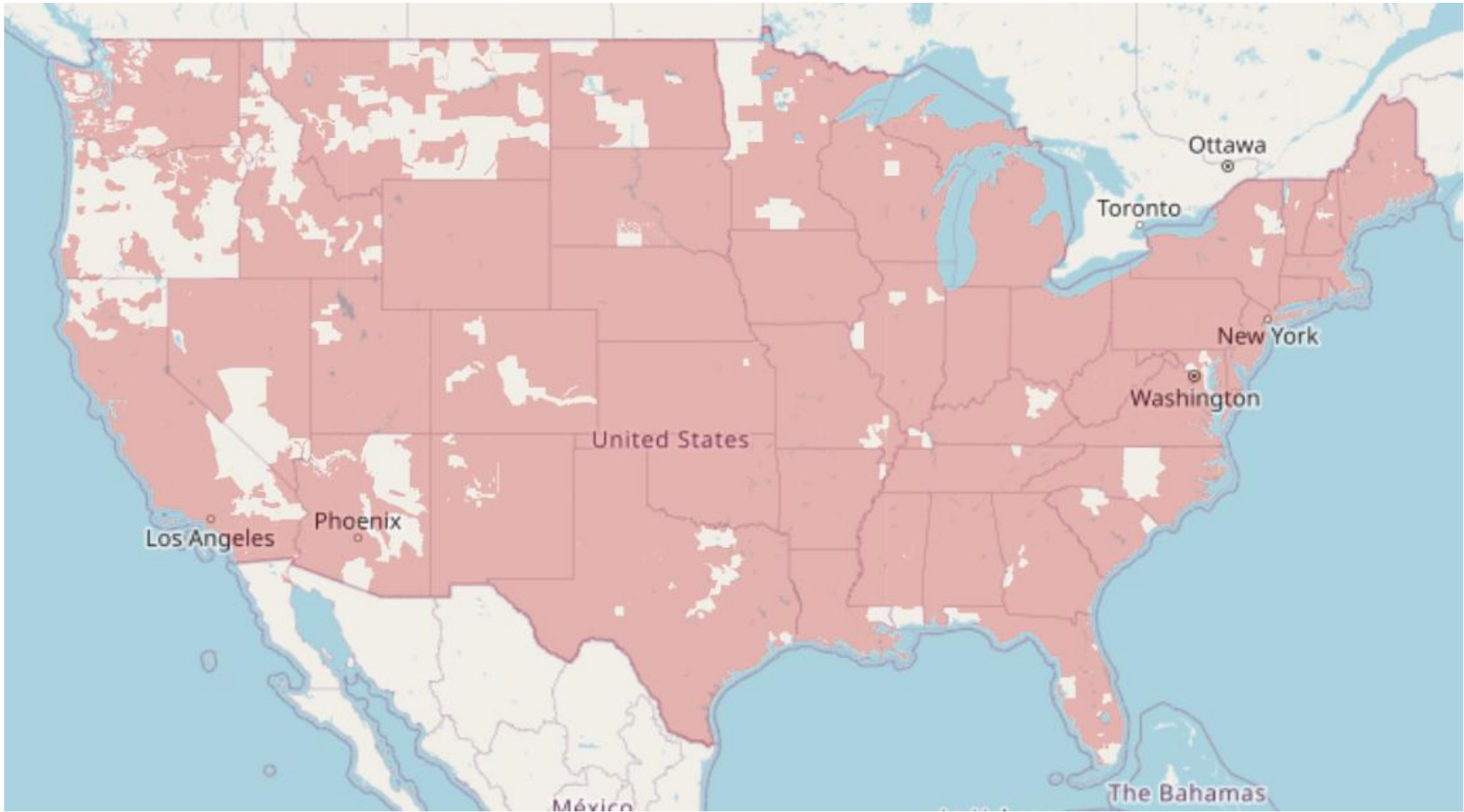
Section 1: Overview

This new 4.1 version of the DSS-WISE™ Web system is part of a broad effort funded through the of Department of Homeland Security Science and Technology Directorate, Engineer Research and Development Center and the FEMA National Dam Safety Program in order to bring improvements not only to the web interface, but to the backend system as well. The results of this work is a system that is much easier to navigate and use, with a flexible backend that allows for job prioritization and the ability to scale out to the cloud during peak usage of the system.

The DSS-WISE Web 4.1 beta release includes the following updates:

- Enable broad back-end system improvements as part of new user-facing updates, including a new, consolidated web front-end.
- Develop the ability to model levee breaches.
- Develop the ability for privileged users to submit high-priority simulations that may be run on the fastest available compute nodes.
- Update to USGS 3DEP 1-meter DEM data.
- Update simulation report map images.
- Broad improvements to the user interface based on user feedback.
- Cascading dam failures.
- Culvert modeling.
- Inflow hydrographs and USGS stream gage integration.

Please note that this manual is meant to be a supplement to the version 3.0 user manual in order to highlight the features and functionality of the new DSS-WISE™ Web 4.1 system. The version 3.0 manual is available for download here:
https://dsswiseweb.ncche.olemiss.edu/documentation/DSS-WISE_Web_v3_User_Manual.pdf



Map of USGS 3DEP 1-meter DEM data coverage in DSS-WISE™ Web version 4.1. As a result, groups with a 15-foot minimum cell size have been adjusted to 10 feet.

In addition to the transition to a unified web front-end with improvements to the overall look and feel of the interface, many changes were made to the DSS-WISE™ Web Viewer application including:

- A new “scenario-first” simulation workflow has been introduced.
- Map layers and tools now open by default on the left side of the screen. However, there is an option to overlay that window over the map, allowing the prep step and the map tool to be active at the same time.
- Layer list categories in the pop-up are now collapsible.
- The elevation profile tool now queries directly from the local visible elevation layer.
- The elevation profile tool, elevation layer visualization, and simulation DEM all use the same source data, including custom group DEM data.
- The elevation layer colormap now scales based on the histogram of data on-screen instead of linearly between MIN and MAX on screen, reducing the effect of outliers.
- Inactive user-drawn features are now styled differently to distinguish them from active ones.
- Editing map features now shows vertices.
- The map can now zoom to fractional levels.
- "Zoom to Feature" button added in the interface.
- Removed the tool bar from the top of the left panel and moved relevant map tools to the layer panel.
- Changing the selected user group in the Viewer is now accessed by clicking the group name in the page header.
- The dams search tool now searches both the dam name and the alternative name (usually the reservoir name) fields as well as the ID.

- The group-area check has been updated so that at least one active breach or water source must be inside the group's area.
- Groups with a dedicated compute node/cluster can now optionally select to run on the default cluster instead.
- Added a vertical split-screen for the map/prep tool on mobile screens.
- Breaches now have a trigger condition of either a specified time or a structure overtopping depth/elevation.
- Breaches can now be named.
- Reduced cooldown timer on simulation submissions.
- The simulation ID with a direct link to the results page and queue position are now instantly available after simulation submission.
- Users can now log in on multiple devices at once.
- Logged-in sessions now last longer than the 10-hour maximum of the previous version.

New Interface (Scenario-First Setup)

Users now **choose a scenario type** first (e.g., sunny-day dam breach, cascading failures, levee breach).

The guide then **creates defaults** and **orders the setup steps** for that scenario.

Benefits:

- Guided setup
- Recommended steps clearly separated from optional ones
- All steps remain available, whichever guide is chosen
- Workflows tailored to event type

Choose Scenario Guide

Pick a scenario guide. We'll group the steps on the left by what you need for that scenario.

Sunny-day dam breach with reservoir☒

Simple setup for sunny-day dam breach events

Sunny-day dam breach hydrograph☐

Dam breach setup without needing to model the reservoir

Wet-day dam breach with inflows☐

Wet-day dam breach with hydrograph inflows

Levee breach☐

Hydrograph-type release from an embankment

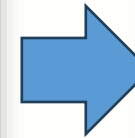
Inflows Only☐

For non-dam related flooding

+ Blank reservoir

Search reservoir

Skip the scenario guide



Back to Portal

SCENARIO

DefaultChange

ONE OR MORE

1Reservoirs & Dams

Not configured

2Levees

Not configured

3Breaches

Not configured

4Inflow Sources

Not configured

OPTIONAL

5Culverts

Optional

6Bridges to Remove

Optional

7Observation Lines

Optional

SUBMISSION

Configurations

Defaults

Parameters

10Review & Submit

Reset

Tools

Next >

Reservoirs & Dams

Model reservoirs and the structures that impound them.

+ Blank reservoir

Search for reservoir

Levee Breach Hydrograph Calculator

BETA DSS-WISE Web System Marcus McGrath

Breach Center Point

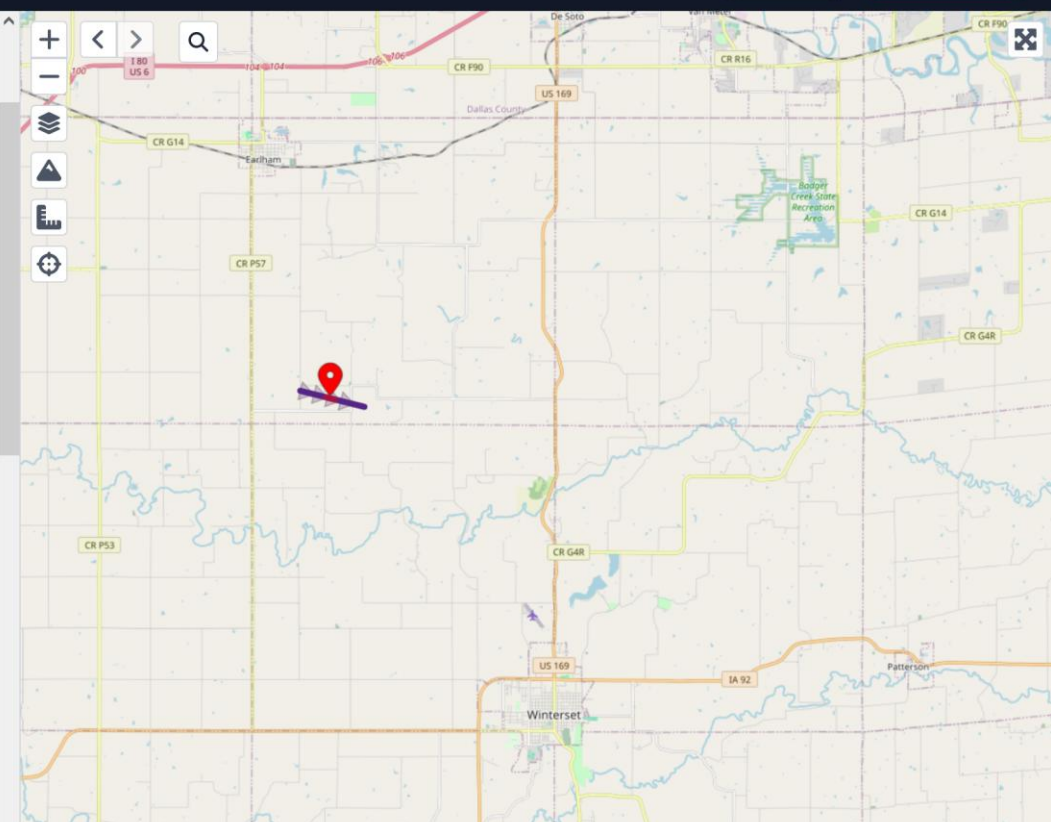
Information
Selected levee: Levee 1

Trigger Type
Time Depth Elevation

Trigger Time (hr)
0

Breach Type
Physical **Hydrograph**

Hydrograph Mode
Automatic Manual



- Uses an **Artificial Neural Network (ANN)** to estimate levee breach outflow from **soil properties, embankment geometry, and flood conditions**.
- The resulting hydrograph is released downstream of the selected breach location.

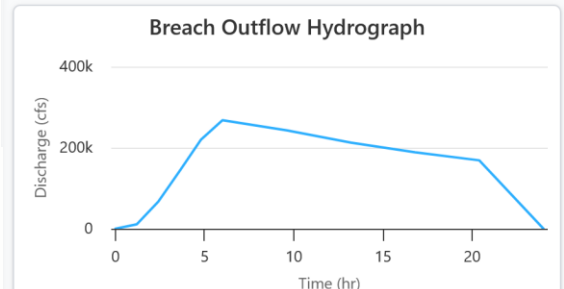
Event Duration (hr)
☐ 0.5 hours
☐ 1 hour
☐ 3 hours
☒ 6 hours
☐ 12 hours
☐ 24 hours
☐ 48 hours
☐ 72 hours

Levee Height (ft)
30.2

Upstream Slope (H:V)
3

818
Clay Content Fraction
35.4%

Breach Outflow Hydrograph



Estimated breach width: 899.77 ft

Done

Section 2: DSS-WISE™ Web Version 4.1 Interface

When accessing the new DSS-WISE™ Web website located at <https://dsswiseweb-beta.ncche.olemiss.edu>, the user is presented with a new entrance page to the Portal.

As noted on the front page, the system will initially be available only to existing users of the DSS-WISE™ Web system. New user signup will come at a later date.

Click the “Enter” button to access the Portal page.



The main DSS-WISE™ Web Portal page provides access to the various functions of the site including the Viewer, group management, running simulations and results, account management and a help section. The help section includes access to quickstart tutorials, videos and manuals, a FAQ section, in-depth explanations of common error messages and detailed information about the data sources and datasets used by DSS-WISE™ Web.

The screenshot shows the DSS-WISE Web Portal interface. The top navigation bar includes a 'BETA' badge, the 'DSS-WISE Web' logo, and a user profile for 'Paul Smith'. A left sidebar contains a menu with 'Portal', 'Viewer', 'Groups', 'Simulations', 'Account', and 'Help'. The main content area is titled 'DSS-WISE Web Portal' and includes a 'Select a module' prompt. A prominent yellow announcement banner states: 'Announcements: January 1, 2026 BETA SYSTEM. You are accessing the DSS-WISE Web 4.0 BETA System. Any simulations submitted, group management, or account changes will only apply to this system and not the live system. All simulations and HCOM requests submitted to this system will be deleted after the beta period is over.' Below the banner are five large buttons for 'Viewer' (Submit new simulations), 'Groups' (Manage group memberships), 'Simulations' (View submitted simulations), 'Account' (Manage your user profile), and 'Help' (View Documentation). Two red callout boxes are present: one pointing to the sidebar menu with the text 'Links to main website functions', and another pointing to the announcement banner with the text 'Please note that all simulations submitted to the Beta version of the website **will be deleted** once the Beta system goes live!'.

Links to main website functions

Please note that all simulations submitted to the Beta version of the website **will be deleted** once the Beta system goes live!

Before accessing the DSS-WISE™ Web Viewer, it may be helpful to have a look around at some of the other functions first, since many enhancements and improvements have been made to the system. For example, in the “Groups” section, groups are now searchable via text or tags.

The screenshot displays the DSS-WISE Web interface. The top navigation bar includes a 'BETA' badge, the 'DSS-WISE Web' title, and a user profile for 'Paul Smith'. A left sidebar contains navigation links: Portal, Viewer, Groups, Simulations, Account, and Help. The main content area is titled 'Groups' with the subtitle 'Search for, apply to, and manage group memberships'. It features a search bar and a horizontal list of tags: Admin, Testing, Country, FEMA, State, Territory, Dependency, Federal, Training, Local, County, District, and Education. Below the tags, two group cards are visible: 'System' (Joined Nov 7, 2016) and 'ALABAMA' (State). The 'System' card has 'Admin' and 'Testing' tags, and the 'ALABAMA' card has a 'State' tag. A blue 'Apply' button is located at the bottom right of the 'ALABAMA' card. Two red callout boxes with arrows point to specific elements: one labeled 'Search tags' points to the tag list, and another labeled 'Click to apply to a group' points to the 'Apply' button.

Search tags

Click to apply to a group

The “Simulations” section provides improvements to filtering as well, providing users with text search, as well as type, group and date filter options. It should be noted that the text search looks for simulation ID, project name, scenario name, and scenario description.

Pagination

Text search

Type filter

Group filter

Date filter

Note that the “Load simulation setup as new” functionality is available on the new simulation search page.

Portal

Viewer

Groups

Simulations

Account

Help

Simulations 1 - 10 of 119

#103517 • System • Paul Smith

Sep 19, 2025

MEADOW LAKE TEST #1

TEST1-res type,4 res,1st breach,all res active

SIM

Load

#103510 • System • Paul Smith

Sep 19, 2025

Sardis Dam

Hydrograph-type, sudden and complete breach

SIM

Load

#103486 • System • Paul Smith

Sep 19, 2025

Sardis Dam

Hydrograph-type, sudden and complete breach

SIM

Load

#103484 • System • Paul Smith

Sep 19, 2025

Sardis Dam

Hydrograph-type, sudden and complete breach

SIM

Load

#103483 • System • Paul Smith

Sep 19, 2025

Sardis Dam

Hydrograph-type, sudden and complete breach

SIM

Load

#103478 • System • Paul Smith

Sep 19, 2025

Sardis Dam

10 / 20 / 100 / 1000

Page 1

Filters

Search...

☐ My simulations

☐ Queued simulations

☐ Running simulations

☐ Hide error simulations

Group

Filter by Group

Date Range (click calendar start/end)

January 2026

Sun Mon Tue Wed Thu Fri Sat

1 2 3

4 5 6 7 8 9 10

11 12 13 14 15 16 17

18 19 20 21 22 23 24

25 26 27 28 29 30 31

Information provided for individual simulations has been updated with an improved layout. The new page also indicates which compute cluster the job was assigned to. In addition, a new “Actions” button has been added.

Portal

Viewer

Groups

Simulations

Account

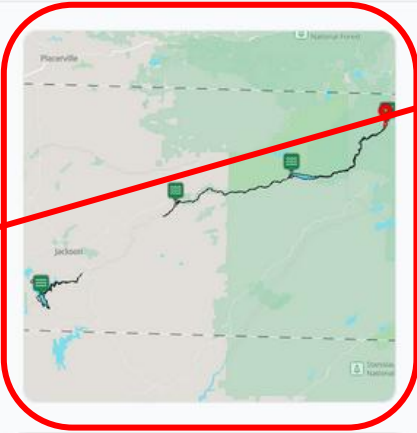
Help

Simulations list

Simulation #103517

Actions

Expandable Map



Simulation Information

Simulation ID 103517 Submitted by Paul Smith

Submitted on Sep 19, 2025, 6:57 PM Dam ID CA00381

Project name MEADOW LAKE TEST #1

Scenario name TEST1-res type,4 res,1st breach,all res active

Scenario description - dam in series, no hyd - # in names of all features - modified manning - user-drawn levee (check inclusion and shp) - check % vol left - check extended dams - HCOM

Simulation Results

Hydraulic Calculation

32.82 miles downstream reached

5.04 square miles inundated

1 day duration

Caution Reservoir 3 (Tiger Creek Res)'s initial filled volume was not able to be matched

Caution The breaching reservoir may not have fully drained

Simulation Processes

Results processing Sep 19, 2025, 7:09 PM Finished in 9 minutes

Simulation Sep 19, 2025, 6:58 PM Finished in 10 minutes

Distance Achieved 32.82 miles

Time Achieved 1.02 days

Breaching Res. Vol. Released 0.38%

Compute Cells 112,588

Note

Simulation Actions

Actions

Load

Calculate HCOM

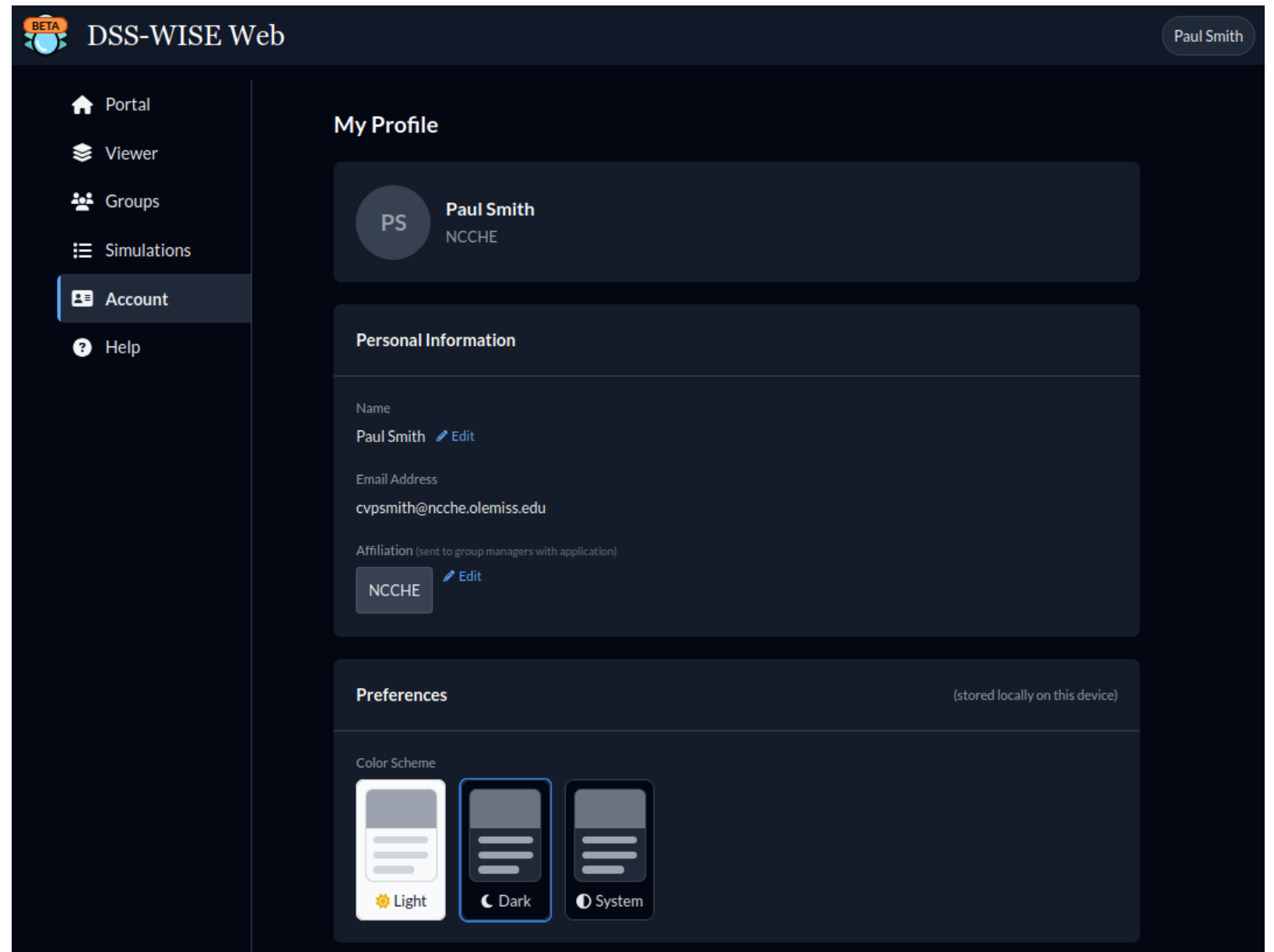
A new “Account” section has been added with support for password/device/affiliation management, as well as dark mode!

The screenshot shows the 'My Profile' page of a system. On the left is a sidebar with navigation links: Portal, Viewer, Groups, Simulations, Account (highlighted), and Help. The main content area is divided into sections: 'My Profile' (showing user Paul Smith, NCCHE), 'Personal Information' (Name, Email Address, Affiliation), 'Preferences' (Color Scheme: Light, Dark, System), 'Security' (Change Password, Active Sessions), and 'Active Sessions' (Monterotondo, 62). Red boxes and arrows highlight specific features: 'Edit personal details' points to the 'Personal Information' section; 'Light/Dark mode' points to the 'Color Scheme' section; 'Change password' points to the 'Change Password' button; and 'Revoke/log out from a device' points to the 'Revoke' button in the 'Active Sessions' list.

Annotations and their targets:

- Edit personal details** points to the **Personal Information** section.
- Light/Dark mode** points to the **Color Scheme** section.
- Change password** points to the **Change Password** button.
- Revoke/log out from a device** points to the **Revoke** button.

Here is a look at dark mode in action. Note that this setting is **stored locally on the device**, so it must be set on a per-device basis.



Clicking on the “Help” section takes the user to the documentation page. Here, clicking on the “Quickstarts and Tutorials” button will provide access to quickstart guides and user manuals.

In addition, the user has access to the DSS-WISE™ Web webinar, which may be viewed directly from the website.

There are also PDF documentation sets for several DSS-WISE™ Web short courses.

There are additional sections featuring common error messages, a history of the DSS-WISE™ Web system, our privacy policy, and details about the various data sources and datasets in use by the system.

[Home](#) > [Documentation](#)

Overview

Welcome to the DSS-WISE Web documentation. Here you'll find comprehensive guides, tutorials, and resources to help you make the most of our platform. Whether you're new to DSS-WISE Web or an experienced user, our documentation provides everything you need to understand and effectively use our dam breach simulation system.

Browse through our quickstart guides, check common troubleshooting solutions, or dive into detailed technical documentation using the resources below.



Quickstarts and Tutorials

Get started with step-by-step guides and tutorials for using DSS-WISE Web



Common Errors

Find solutions to frequently encountered issues and troubleshooting guides



About DSS-WISE Web

Learn about the platform, its features, and how it can help your workflow



Privacy Policy

Understand how we handle and protect your data and privacy



Data Sources

Learn about the data sources used in DSS-WISE Web



Datasets

Comprehensive guide to datasets used in DSS-WISE Web for flood simulation and analysis

Frequently Asked Questions

What is DSS-WISE™? DSS-WISE™ Web? DSS-WISE™ Lite?

▼

Section 3: Levee Breach

As one of the primary goals of this new 4.1 version is the development and release of a new tool to simulate levee breaches, it is appropriate to become familiar with the new DSS-WISE™ Web Viewer interface through the introduction of this tool to setup and submit a levee breach simulation.

For the simplest of breaches, three things must be defined: a levee, a breach center point, and a hydrograph. The new 4.1 version of DSS-WISE™ Web features an Artificial Neural Network (ANN) in order to estimate the breach discharge hydrograph using levee height, upstream slope and clay content fraction value sliders as input to the ANN.

The first step is to select “Levee Breach” from the Scenario Guide in the DSS-WISE™ Web Viewer and click the “Continue” button.

Choose Scenario Guide

Pick a scenario guide. We'll group the steps on the left by what you need for that scenario.

Sunny-day dam breach with reservoir

Simple setup for sunny-day dam breach events

Sunny-day dam breach hydrograph

Dam breach setup without needing to model the reservoir

Wet-day dam breach with inflows

Wet-day dam breach with hydrograph inflows

Levee breach

Hydrograph-type release from an embankment

Inflows Only

For non-dam related flooding

Continue

Skip the scenario guide

It may be useful to click on the “Map Layers” button in the map window and click the “Move to map” button (similar to the “Move to panel” button) in order to turn on the “National Levee Database” overlay map layer.

Move to Panel Button

Map Layers button

Levee Draw Tool

National Levee Database

Note that selecting the “Levee breach” scenario automatically populates the Viewer with the required “Levees” and “Breaches” items.

Map Feature Search and Elevation Profile Tools

Scenario “Reset” button, available at any time during setup

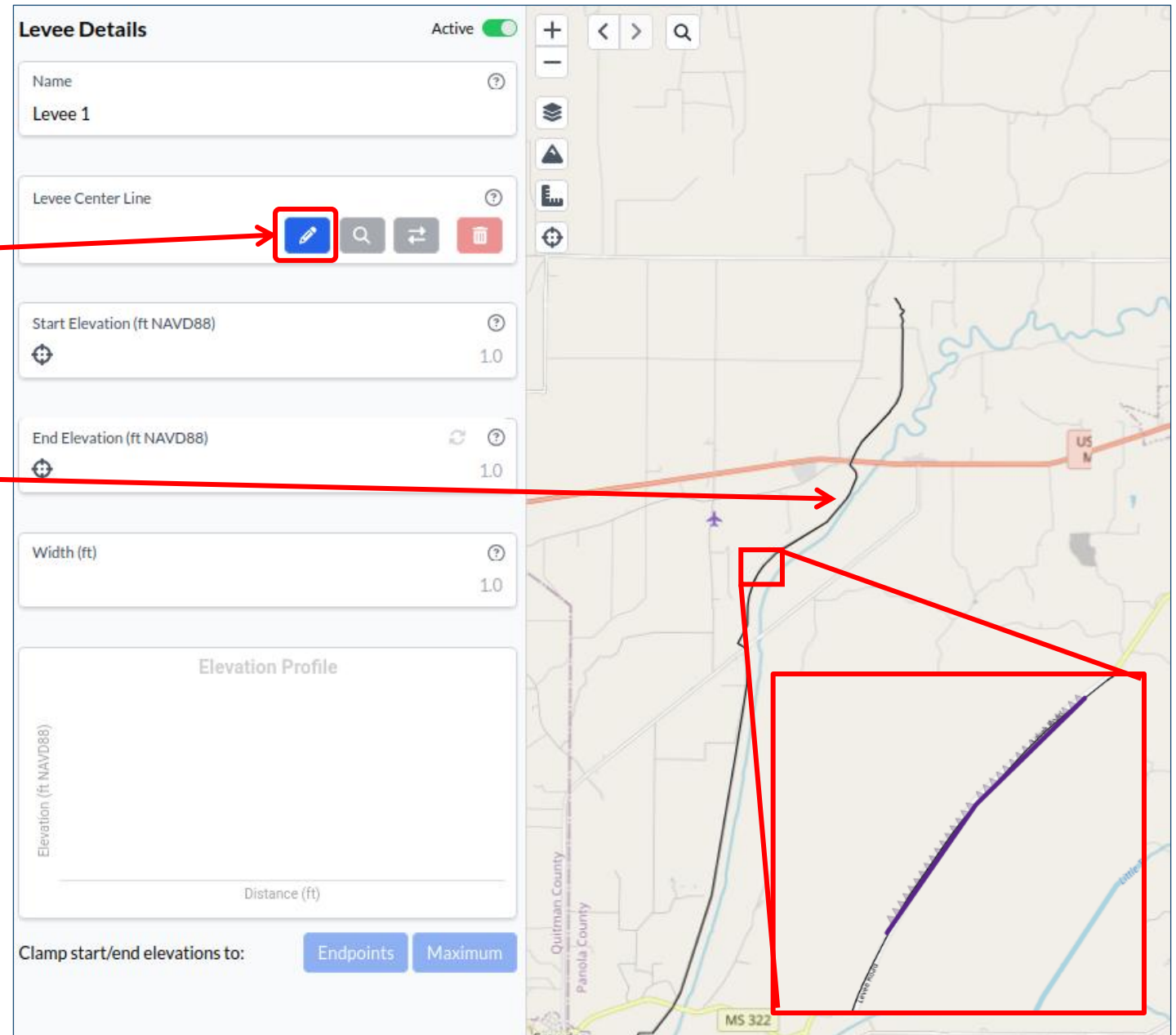
The screenshot displays the 'Levee Details' interface for 'Levee 1'. The interface is divided into several sections: a left sidebar with a scenario list, a central details panel, and a right map window. The scenario list on the left includes 'REQUIRED' items (Levees, Breaches) and 'OPTIONAL' items (Reservoirs & Dams, Inflow Sources, Culverts, Bridges to Remove, Observation Locations). The central panel shows details for 'Levee 1', including its name, center line, start and end elevations (ft NAVD88), and width (ft). The right map window shows a map with various layers. Annotations with red boxes and arrows point to specific elements: 'Move to Panel Button' points to the 'Levee breach' button; 'Map Layers button' points to the 'Map Layers' button in the top right; 'Levee Draw Tool' points to the draw tool icon in the center panel; 'National Levee Database' points to the 'National Levee Database' layer in the map layers list; 'Map Feature Search and Elevation Profile Tools' points to the 'Reset' and 'Tools' buttons at the bottom; and 'Scenario “Reset” button, available at any time during setup' points to the 'Reset' button. The map layers list on the right includes 'Elevation', 'DEM Sources', '1-meter DEM Acquisition Years', 'National Land Cover Database', 'Sentinel-2 Land Use/Land Cover', 'LandScan Population', 'Group Area', 'National Levee Database' (checked), 'National Inventory of Dams', 'National Bridge Inventory', 'Watershed Boundaries', 'USGS Stream Gages', 'FEMA Flood Maps/National Flood Insurance Program', and 'Input Layers' (Reservoirs, Impounding Structures, User-drawn Levees).

This takes us to the “Levee Details” dialog, where we may define the levee by clicking to input the center line vertices.

Levee Center Line button

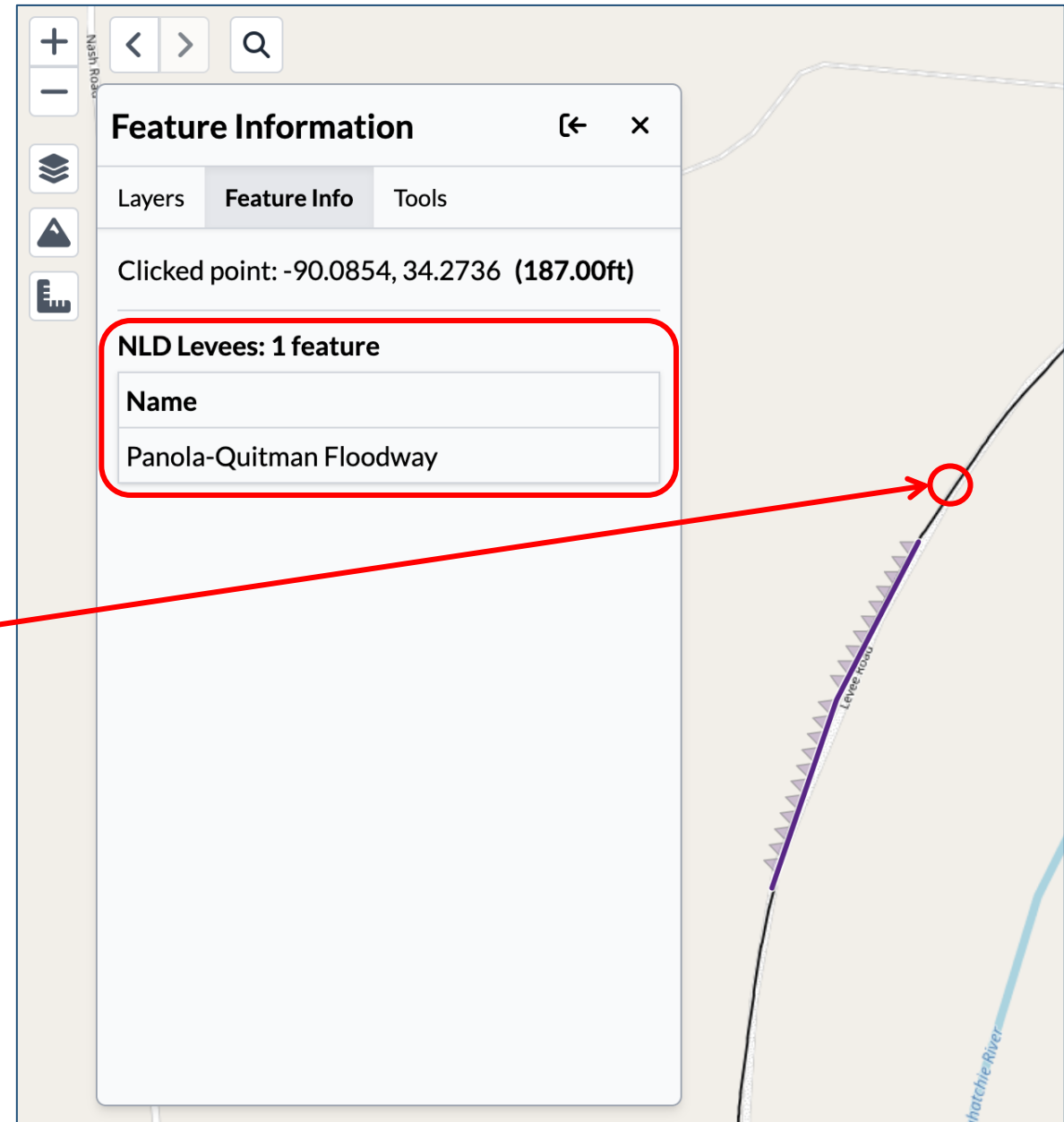
Note the levee shown on the map here by turning on the National Levee Database layer

The levee feature should be drawn with the same convention as with other features in the Viewer, in that "downstream" is to the right when looking from one point to the successive one. Do this by first clicking on the Levee Center Line button, then clicking the first point. Subsequent single-clicks define line segments of the levee center line. Finally, double-click to complete the definition of the levee.



Since the National Levee Database layer has been enabled, it is possible to click on any part of the levee in order to obtain information about the feature at that point. This holds true for *any* feature in an Overlay Data layer that has been enabled, but note that this is *not true* for user-defined features.

Click here for feature information



After the levee has been defined, we must enter the levee width with half being to the left of the Levee Center Line and half being to the right. For this example, we can set it to 100ft.

By default, we must enter both starting and ending elevations. The line's elevation will change linearly from the start elevation to the end elevation. You can click the crosshairs icon to the left of the input and then click a point on the map to select the elevation elevation at that point.

However, it is also possible to set the elevation along the entire levee to either a linear feature from the start point of the Levee Center Line to the end point of the Levee Center Line, or to the maximum elevation extracted along the feature.

We can now click the “Done” button and move on to defining the breach parameters.

Clamp to maximum elevation

Linear clamp from start to end points

Levee Details Active + < > Q Waldrup Road

Name ?
Levee 1

Levee Center Line ?
Length: 0.59 mi ✎ Q ↔ 🗑️

Start Elevation (ft NAVD88) ?
📍 186.62

End Elevation (ft NAVD88) ?
📍 186.62

Width (ft) ?
100

Elevation Profile

Elevation (ft NAVD88) 190 180 170
Distance (mi) 0 0.2 0.4

Clamp start/end elevations to: Endpoints Maximum

Click on the “Configure” button inside the “Breach 1” element to move on to the Breach Details dialog.

Here, we click on the “Breach Center Point” button and click a point along the Breach Center Line to designate as the breach point.

Here we see the “Automatic” Hydrograph Mode which, as mentioned earlier, utilizes an Artificial Neural Network (ANN) in order to estimate the breach discharge hydrograph. Here we can use the slider bars to adjust the levee height, upstream slope and clay content fraction values that serve as inputs to the ANN.

The screenshot displays the "Breach Details for Levee 1" dialog box on the left and a map on the right. The dialog box has a title bar with "Active" and a green toggle switch. It contains several sections: "Name" with a text field "Breach 1"; "Breach Center Point" with a blue location pin icon (highlighted by a red box), a magnifying glass icon, and a red trash can icon; "Breach Type" with "Physical" and "Hydrograph" buttons (the latter is highlighted in blue); "Hydrograph Mode" with "Automatic" and "Manual" buttons (the former is highlighted in blue); "Event Duration (hr)" with radio buttons for 0.5, 1, 3, 6 (selected), 12, 24, 48, and 72 hours; and "Levee Height (ft)" with a slider bar (highlighted by a red box) and a value of 9.8. The map on the right shows a river, a road, and a levee. A red dashed circle with a red location pin icon (highlighted by a red box) is placed on the levee, with a red arrow pointing to it from a text box that says "Breach Center Point once selected".

Breach Details for Levee 1

Active

Name
Breach 1

Breach Center Point

Breach Type
Physical Hydrograph

Hydrograph Mode
Automatic Manual

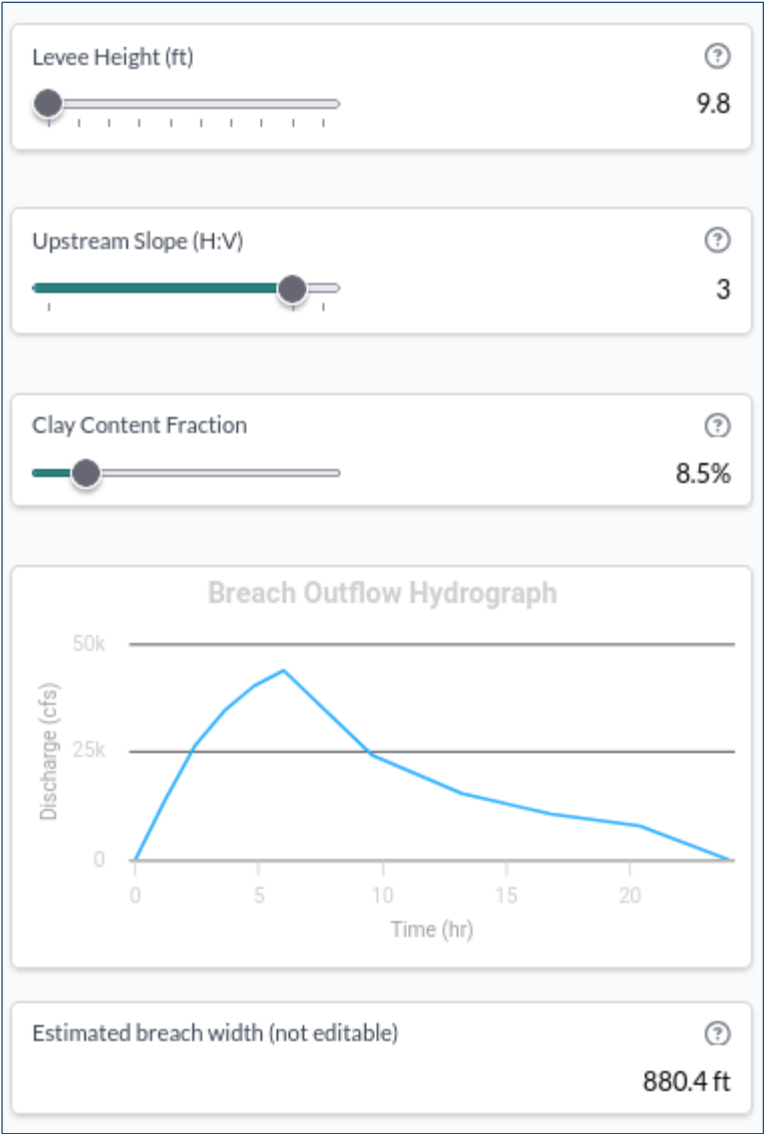
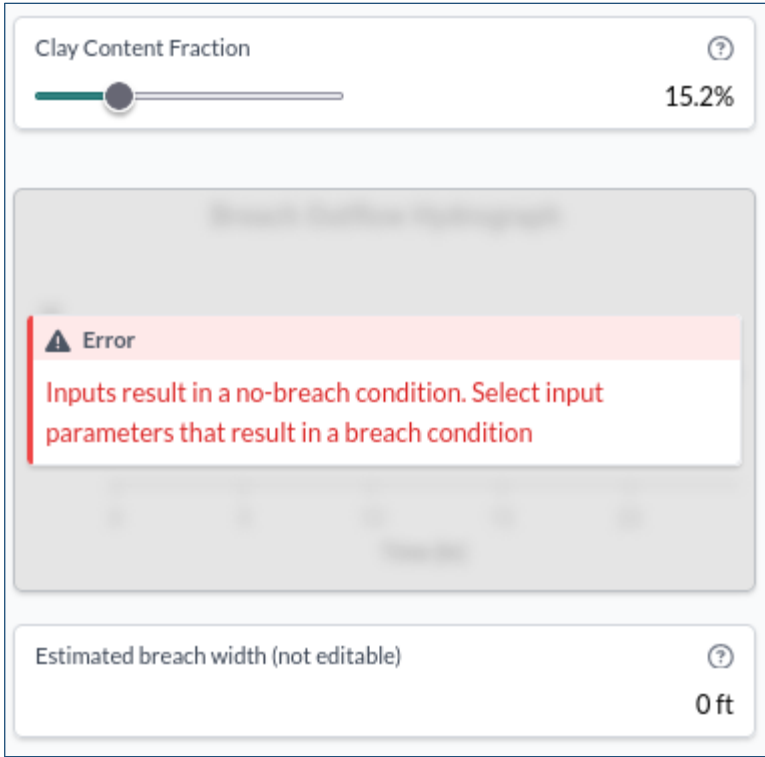
Event Duration (hr)
☐ 0.5 hours
☐ 1 hour
☐ 3 hours
☒ 6 hours
☐ 12 hours
☐ 24 hours
☐ 48 hours
☐ 72 hours

Levee Height (ft)
9.8

Breach Center Point once selected

ANN input slider bar for Automatic Hydrograph Mode

Here is a closer look at the slider inputs for the trained ANN and the resulting breach inflow hydrograph. Note that the hydrograph and the estimated breach width values change in real-time as the sliders are adjusted. Additionally, the hydrograph will report an error if the selected clay content fraction percentage will result in a no-breach condition.



2.5 Breach Conditions

Failure Conditions

Structure Name:	Levee 1
Structure Type:	levee
Failure Mode:	Total Breach
Breach Width (ft):	2015.3
Breach Location (Latitude/Longitude):	37.8946707299/-96.6460760709
Levee Hydrograph Mode:	Automatic

Automatic Levee Breach Hydrograph Parameters

Soil Record ID:	813
Soil Erodibility ($\text{cm}^3/(\text{N}\cdot\text{s})$):	8.65
Critical Shear Stress (Pa):	5.44
Sediment Diameter (mm):	55.70
Porosity:	0.134
Clay Content (%):	18.8
Headcut Coefficient:	0.000601
Cohesion (Pa):	22000

ANN-Generated Breach Hydrograph

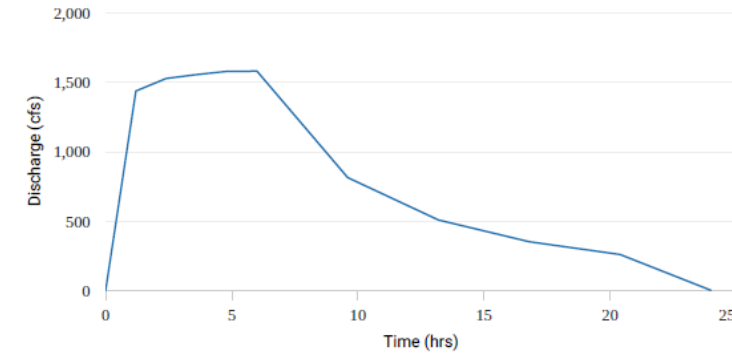


Figure 1: Breach inflow hydrograph for: Levee 1.

Parameters for automatic ANN-generated breach hydrograph are described in detail in the results report.

Finally, we may click the “Submit scenario” button and submit the job for processing. But first, let’s take a look at the “Configurations” options by clicking the “Edit” button in that element or, alternatively, by clicking the link under “SUBMISSION.”

All green, so everything checks out!

Use the “Edit” link of an element in order to make any changes/adjustments.

The “Configurations” section

Back to Portal

Review & Submit
Review your setup and submit your simulation

SCENARIO
Levee breach [Change](#)

REQUIRED

- Levees
1 levee
- Breaches
1 breach

OPTIONAL

- Reservoirs & D...
Optional
- 4 Inflow Sources
Optional
- 5 Culverts
Optional
- 6 Bridges to Rem...
Optional
- 7 Observation Li...
Optional

SUBMISSION

- 8 **Configurations**
Defaults
- 9 Parameters

Go to Breaches

SETUP SUMMARY

Levees
[Levee 1](#) [Edit](#)

Breaches
[Breach 1](#) [Edit](#)

Configurations
Configured [Edit](#)

Parameters
Configured [Edit](#)

SCENARIO DETAILS

Project Name [Link](#) [Help](#)
Levee 1 project

Scenario Name [Link](#) [Help](#)
Complete breach of Levee 1

[Submit scenario](#)

Reset Tools

[Prev](#)

0 1000 ft 2000 ft

-90.1173, 34.2651, 166.72ft

Here we have the option to edit individual Manning Roughness values.

In addition, there are options for compute and priority settings. Here we can designate which compute cluster to use, depending on what clusters are available to us as a member of our group(s).

The priority setting determines the order in which simulations are scheduled to run. Simulations from higher priority levels are scheduled before any from levels below. Please be mindful of limited system resources when requesting high priority.

Click the “Done” button to exit this dialog, then click the “Review and Submit” button to move on to the final step.

The image shows a software interface titled "Advanced Configuration". It contains three main sections: "Manning roughness Settings", "Compute & Priority Settings", and a map view on the right. The "Manning roughness Settings" section has a text input field labeled "Manning Roughness Values" and a blue "Configure" button. The "Compute & Priority Settings" section includes a "Compute Cluster" dropdown menu currently set to "Default", and a "Simulation Priority" section with three radio button options: "High Priority" (with subtext "Schedule ahead of all other simulations" and a red warning "Please reserve for time-sensitive circumstances"), "Normal Priority" (which is selected with a blue checkmark and has subtext "Most simulations fall into this category"), and "Low Priority" (with subtext "Schedule after all other simulations"). The map on the right shows a geographical area with a red line, a purple airplane icon, and the label "Birdsong Landing Strip". Navigation controls like zoom in (+), zoom out (-), and search (Q) are visible at the top of the map.

Once the job has been submitted, the user has the option to view the results page for the simulation. This page shows details of the simulation progress, as well as general information about the scenario.

Simulation was submitted as id **#111881** and is **#1** in the queue

View on results Page

Continue

Simulation Processes

Default cluster

SIMULATION

Aug 24, 2026, 2:34 AM

Running for 3 minutes

57 minutes est. remaining

Node: dsswise-linux4

Distance Achieved 5.27 miles

Time Achieved 0.5 days

Compute Cells 769,993

DATA PREP

Aug 24, 2026, 2:34 AM

Finished in 13 seconds

Node: dsswise-linux4

Storage: 84.77 kB

Input Details

Scenario Properties

Cell size: 30 ft

Domain buffer distance: 65 miles

Max. simulation duration: 5 days

Breaches

Structure type: levee

Structure name: Levee 1

Breach type: Hydrograph

Partial breach width: 772 ft

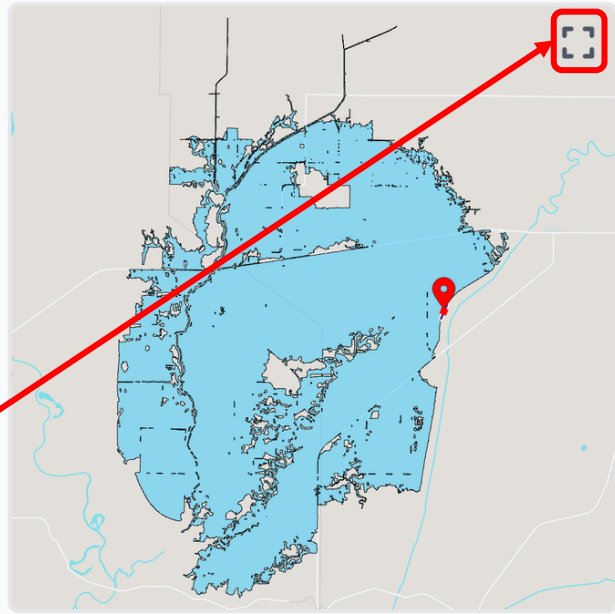
Breach Hydrograph

Time (hr)	Discharge (cfs)
0	0
6	40,000
10	25,000
12	15,000
15	10,000
20	5,000
24	0

*This breach hydrograph was automatically generated using an Artificial Neural Network

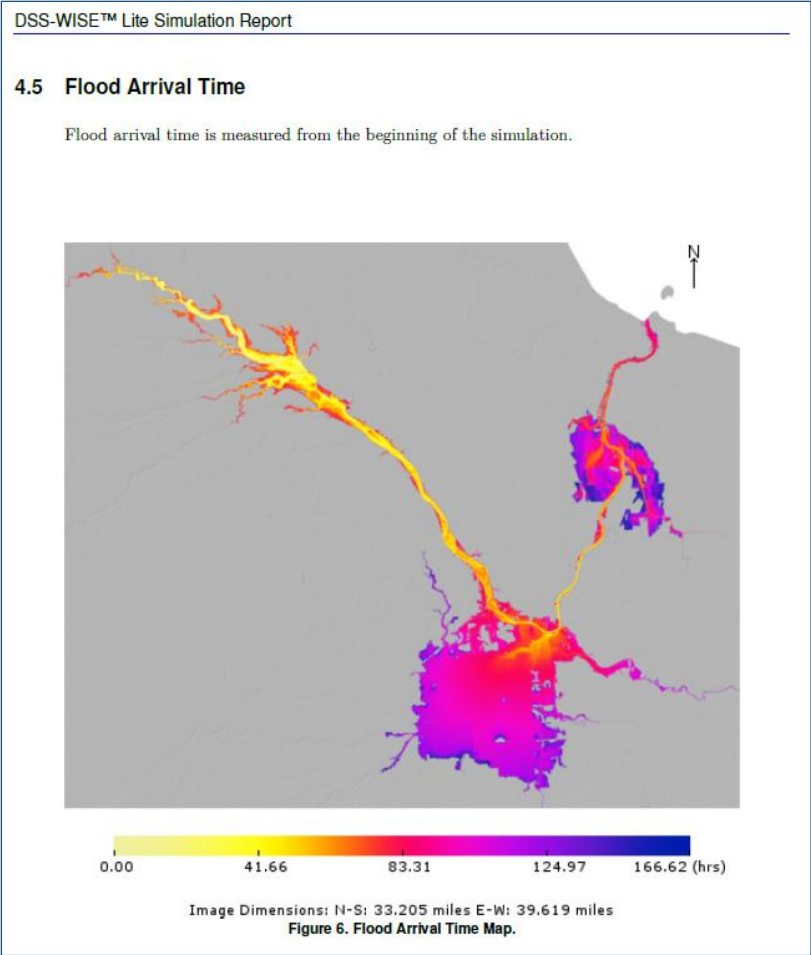
Once the job is complete, the user may view the results map interactively and download the simulation results.

Interactive Map

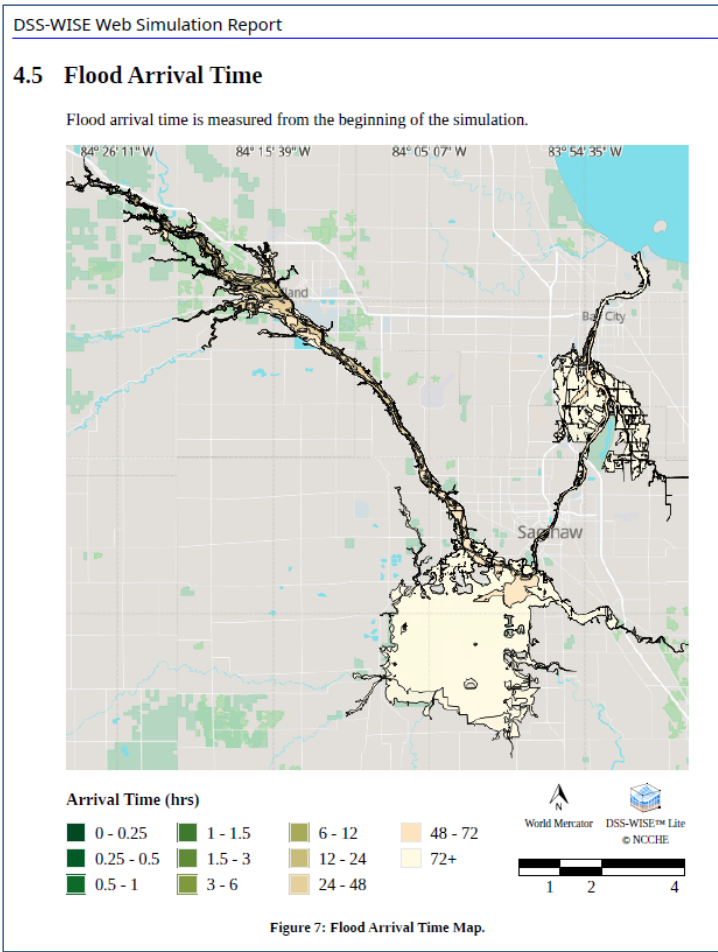


Section 4: Results

Much of the new development work for version 4.1 has been related to the production of updated simulation report map images. The following are some examples from this effort.



Old Flood Arrival Time map



New Flood Arrival Time map

4.4 Maximum Flood Depth

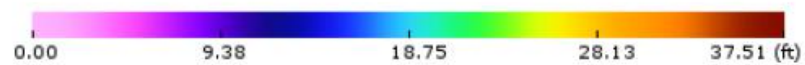
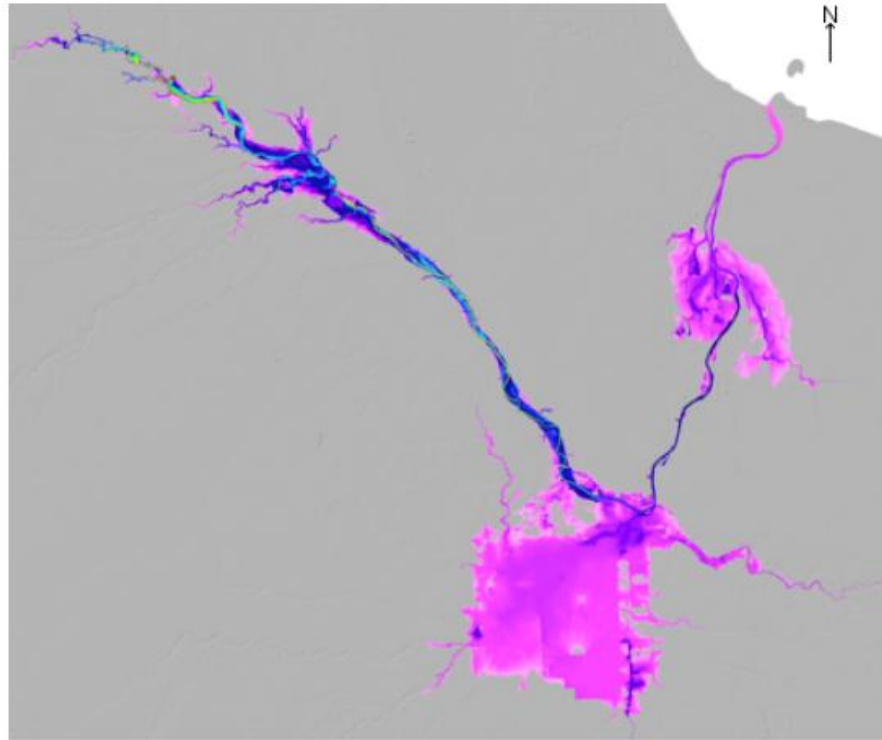


Image Dimensions: N-S: 33.205 miles E-W: 39.619 miles

Figure 5. Maximum Flood Depth Map.

Old Maximum Flood Time map



4.4 Maximum Flood Depth

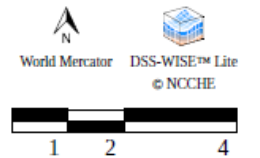
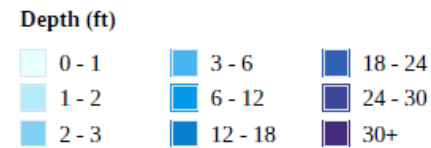
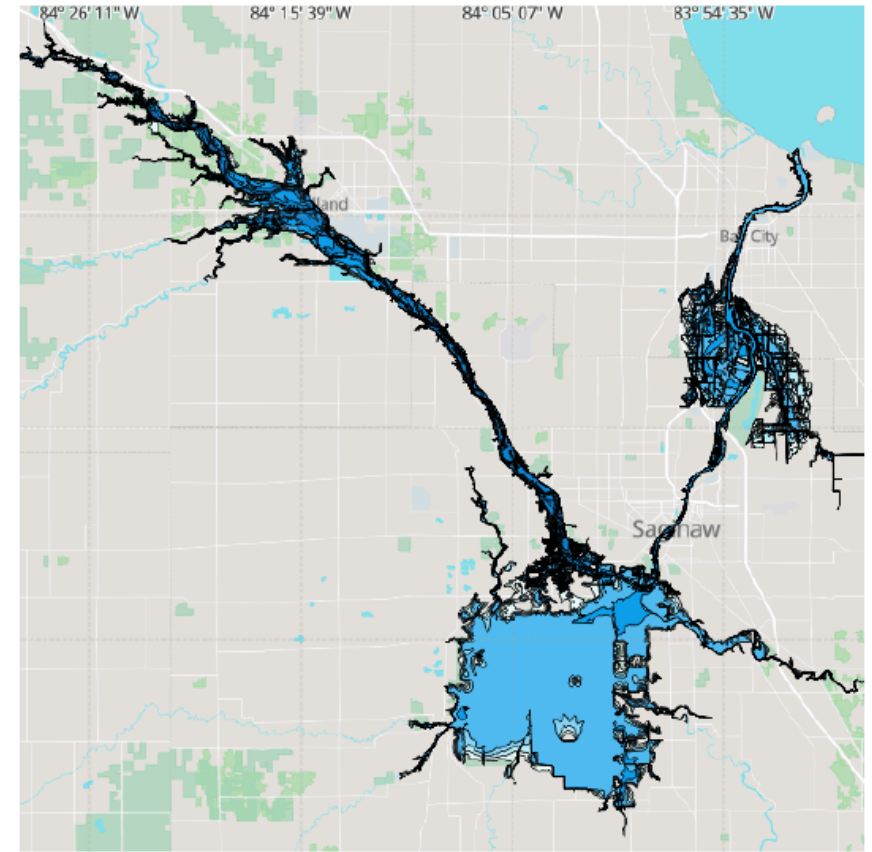


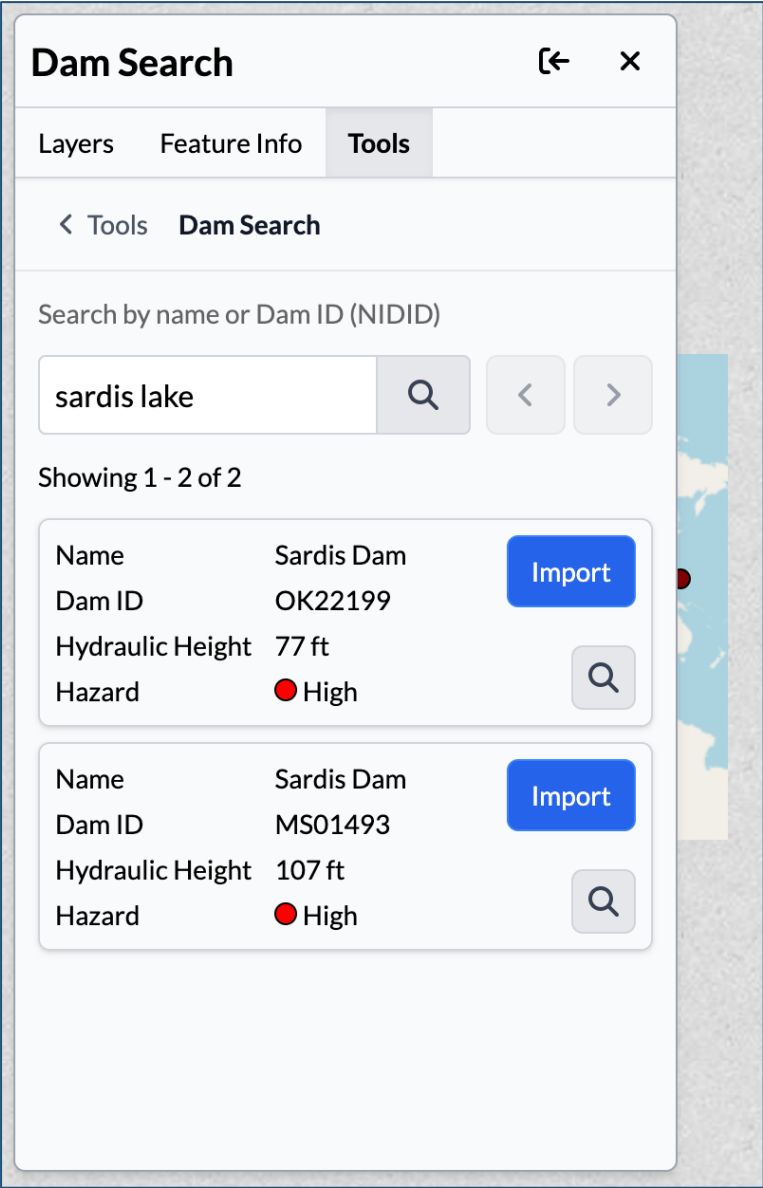
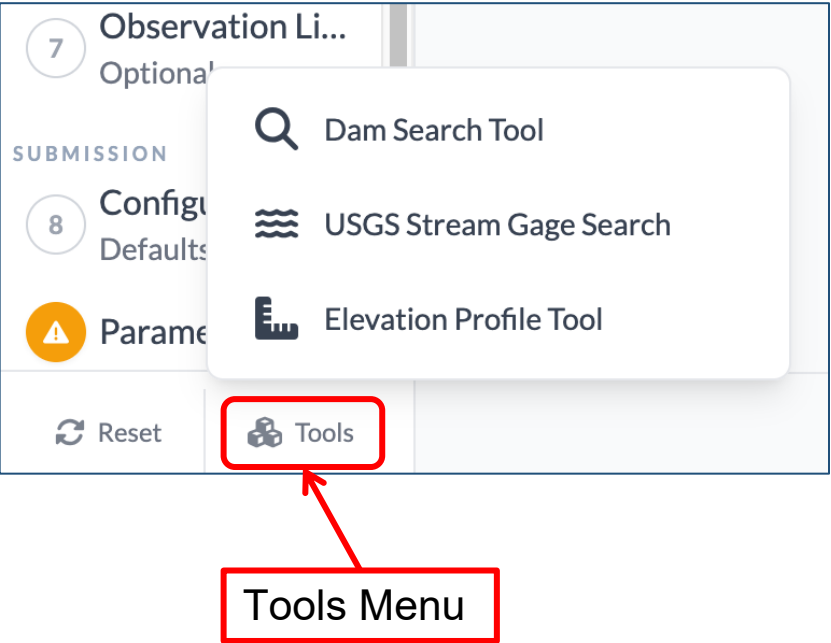
Figure 6: Maximum Flood Depth Map.

New Maximum Flood Time map

Section 5: Tools

The “Tools” menu button is available at any time during the Scenario setup process.

This menu includes an improved dams search tool which now searches both the dam name and the alternative name (usually the reservoir name) fields, as well as the NIDID.



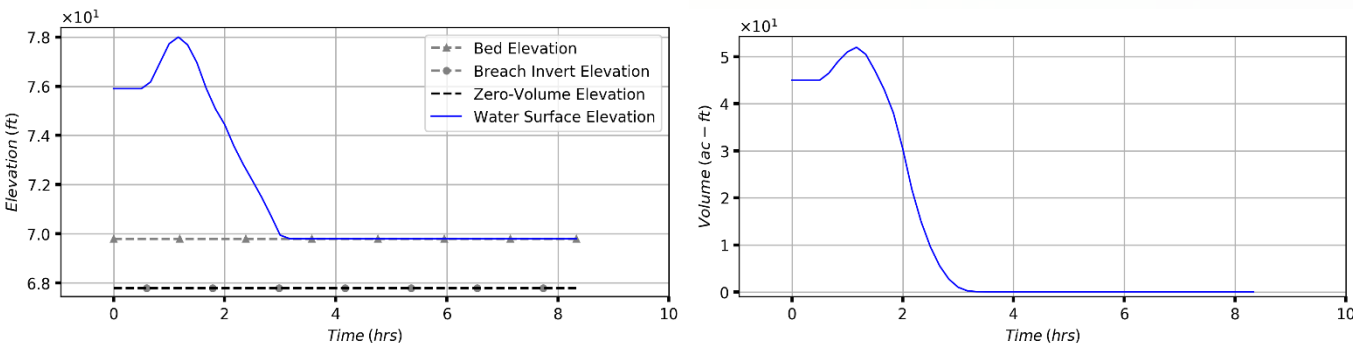
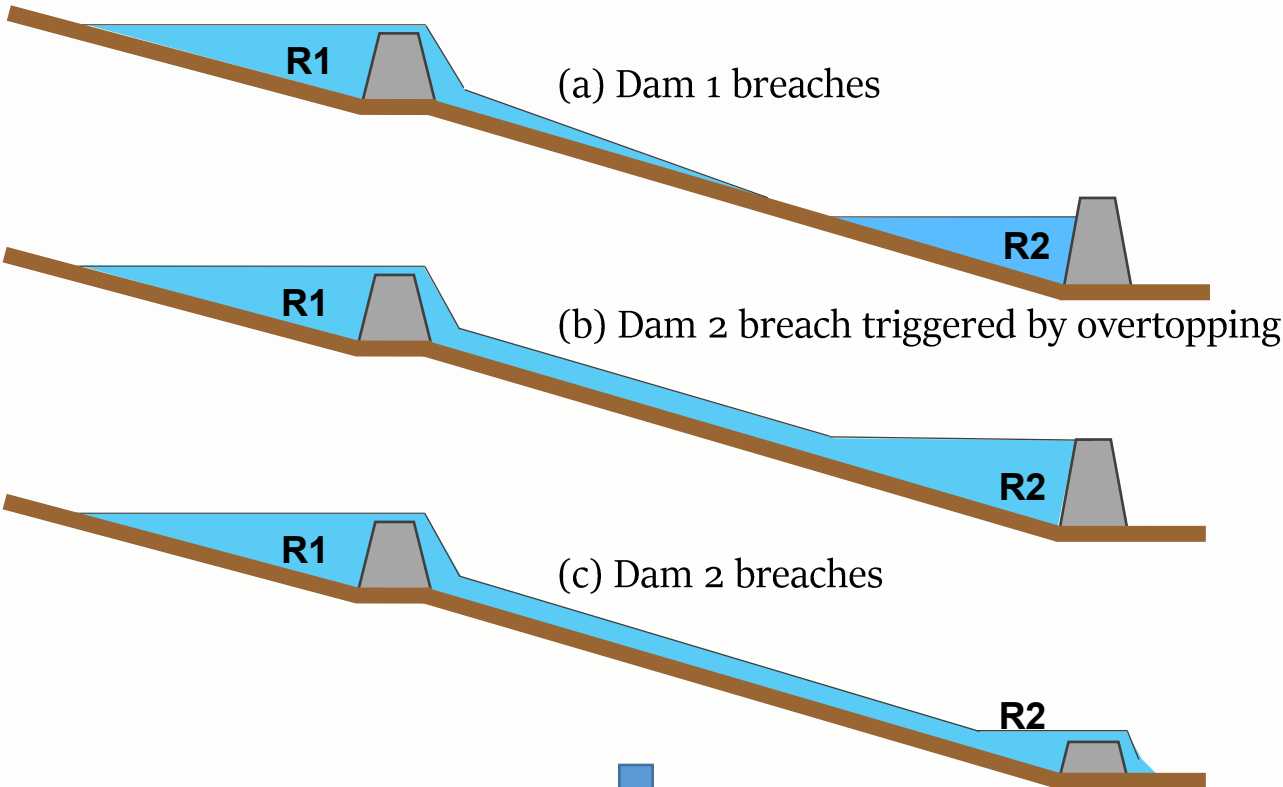
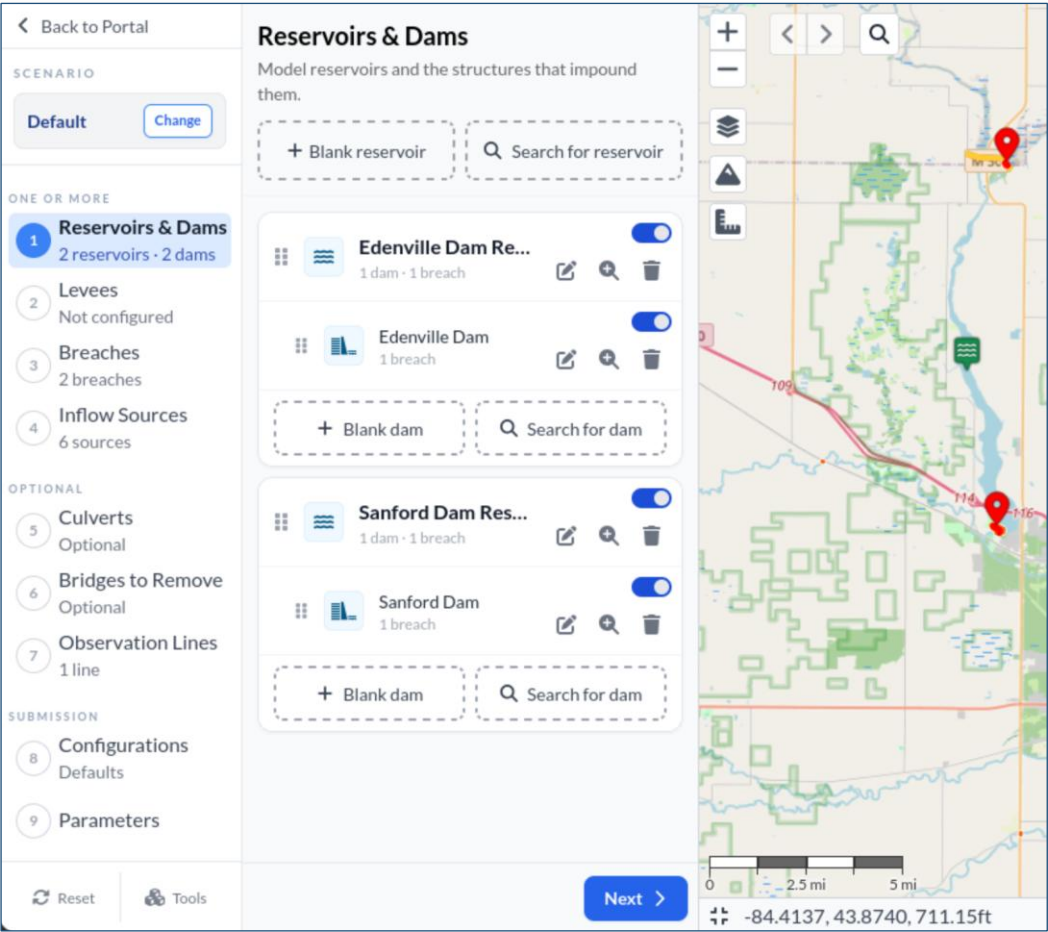
Section 6: New Developments specific to DSS-WISE™ Web Version 4.1

Improvements Based on User Feedback

- Restored step navigation in Viewer
- Simplified Viewer Panel overview
- Layers panel can be docked
- Ability to search for a dam/reservoir and import from first step
- Made the scenario guide explicitly optional
- Made the downstream distance reference explicit and visible in simulation parameters step
- Added acquisition year overlay layer for USGS 3DEP 1-meter data

Cascading dam failures

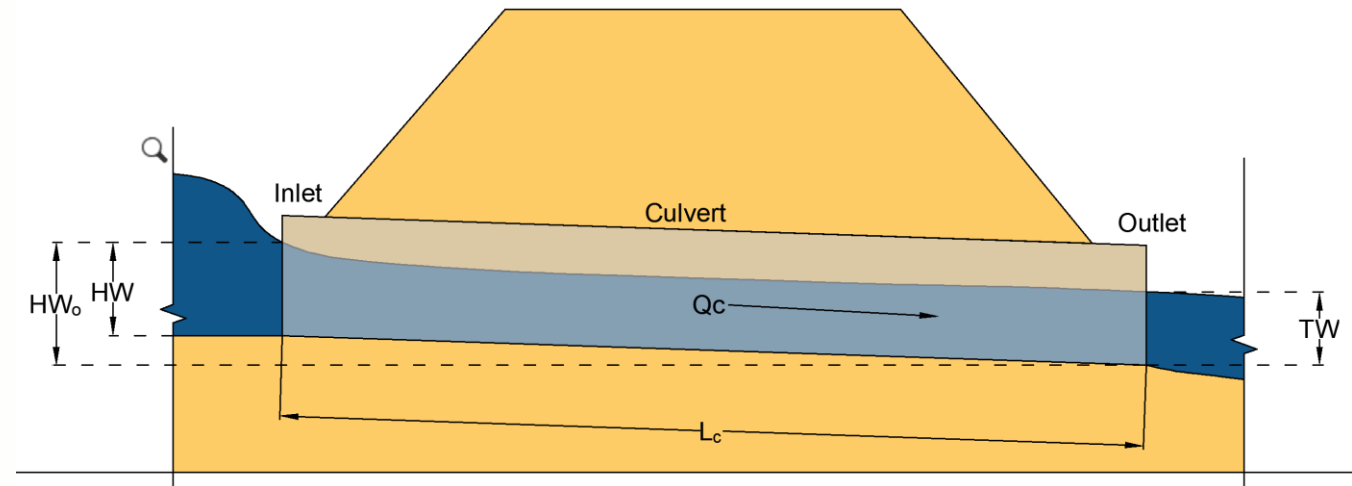
Develop the ability to model cascading dam failures



Culvert Implementation Details

Flow Inputs and Control

- Discharge is calculated from headwater (HW) and tailwater (TW) elevations.
- A rating table for discharge is developed and is bilinearly interpolated to get discharge through the culvert at each time step
- Only discharge is transferred between the source and sink; momentum is not transferred.
- Both inlet-control and outlet-control discharges are calculated, and the smaller value determines the controlling discharge.
- Inlet control occurs when the culvert barrel can convey more flow than the inlet will accept.
- Outlet control flow occurs when the culvert barrel cannot convey as much flow as the inlet opening will accept.



Culvert Implementation Details (cont.)

Inlet Control

- Calculated using the FHWA HDS-5 inlet control equations which depend on type of culvert and submergence.
- K, M, c, Y are empirical constants, which vary depending on culvert shape, materials and inlet edges (Taken from Table A.1 HDS-5).

For unsubmerged conditions:

$$\frac{HW_{unsub1}}{D} = \frac{H_c}{D} + K \left(\frac{Q}{A\sqrt{D}} \right)^M - 0.5S$$

$$\frac{HW_{unsub2}}{D} = K \left(\frac{Q}{A\sqrt{D}} \right)^M$$

For submerged conditions:

$$\frac{HW_{sub}}{D} = c \left(\frac{Q}{A\sqrt{D}} \right)^2 + Y - 0.5S$$

Outlet Control

- Evaluated using the Bernoulli energy equation.
- Partially full outlet-controlled flow is evaluated using the backward direct-step method beginning at the downstream end and working backward toward the culvert inlet.

$$HW_o + \frac{v_{inlet}^2}{2g} = TW + H_{Loss}$$

User Inputs for Culverts

- The users have two sets of inputs, mandatory and advanced inputs
- The advanced parameters are set to default values (based on the mandatory parameters) unless changed by toggling advanced mode

Mandatory Parameters

- Centerline drawn on map
- Type of culvert (Box, Circular, Elliptical, or Arch)
- Culvert dimensions
- Culvert Material (Concrete, Steel, or Plastic)
- Inlet Edge (Depends on culvert type and material)

Advanced Parameters

- Upstream and Downstream invert elevations (Based on centerline and the DEM)
- Manning’s Roughness Coefficient (Based on culvert material)
- Entrance Coefficient (Based on Inlet Edge)
- Number of Culverts (Default = 1)
- Unidirectional Flow (Default = False)

Culvert Details

Active

Name

Culvert 1

Centerline

Length: 265.5 ft

Culvert Type

Box

Circular

Elliptical

Arch

Inlet Edge

0 Deg Wingwall Flares

30 To 75 Deg Wingwall Flares

90 And 15 Deg Wingwall Flares

Width (ft)

7

Height (ft)

7

Culvert Material

Concrete

Corrugated Metal (Steel)

Inlet Edge

0 Deg Wingwall Flares

30 To 75 Deg Wingwall Flares

90 And 15 Deg Wingwall Flares

Advanced Parameters	
Parameter	Value
Upstream Invert Elevation	622.3
Downstream Invert Elevation	618.5
Manning Roughness Coefficient	0.011
Entrance Coefficient	0.7
Number of Culverts	1
Unidirectional Flow	false

User Inputs for Culverts (cont.)

- Once all mandatory parameters are entered, the system automatically generates a culvert discharge matrix.
- The discharge matrix updates in real time, adjusting instantly whenever the user modifies any of the input values.
- The discharge through the culvert is reported as a time series graph to the user.

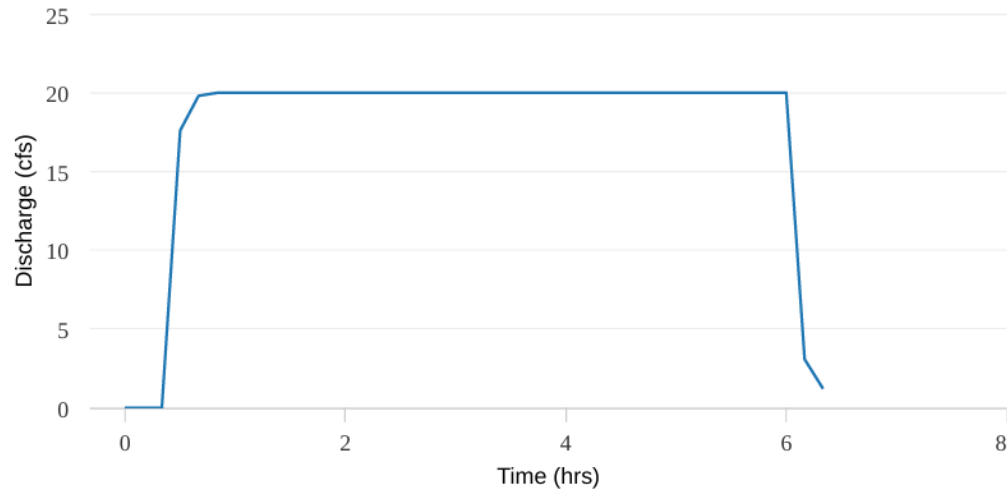
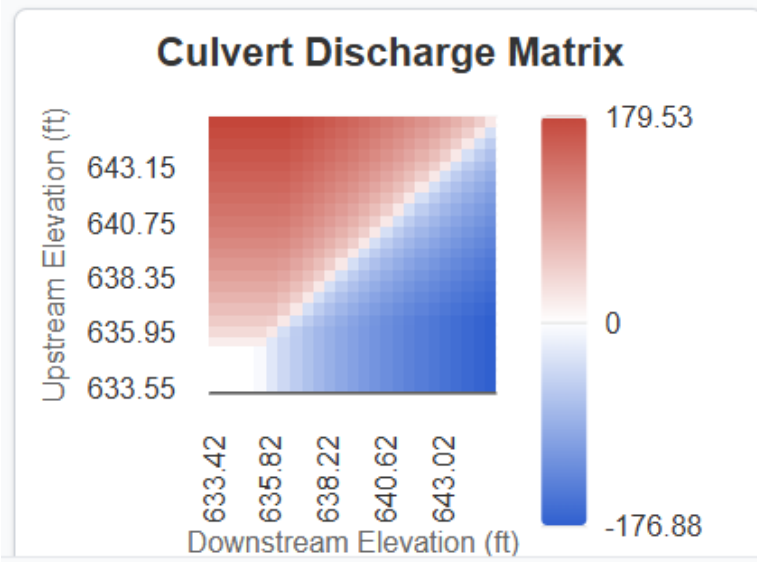
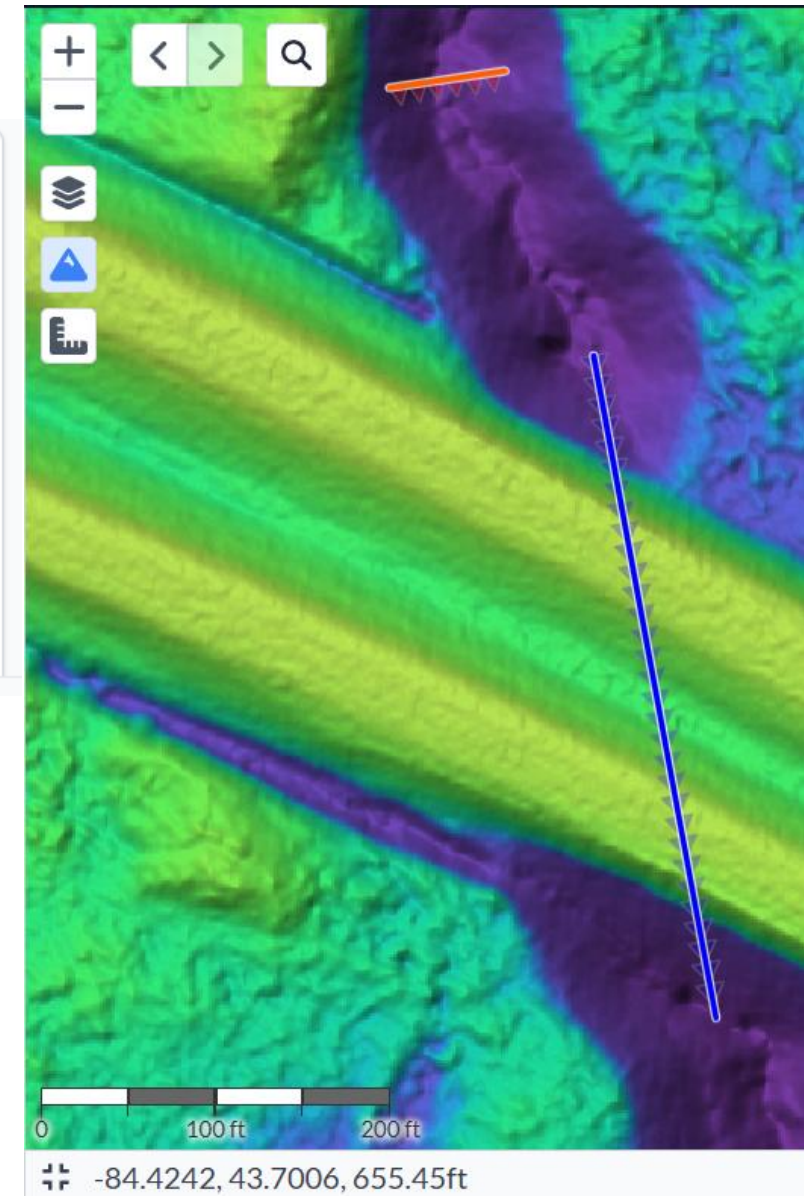
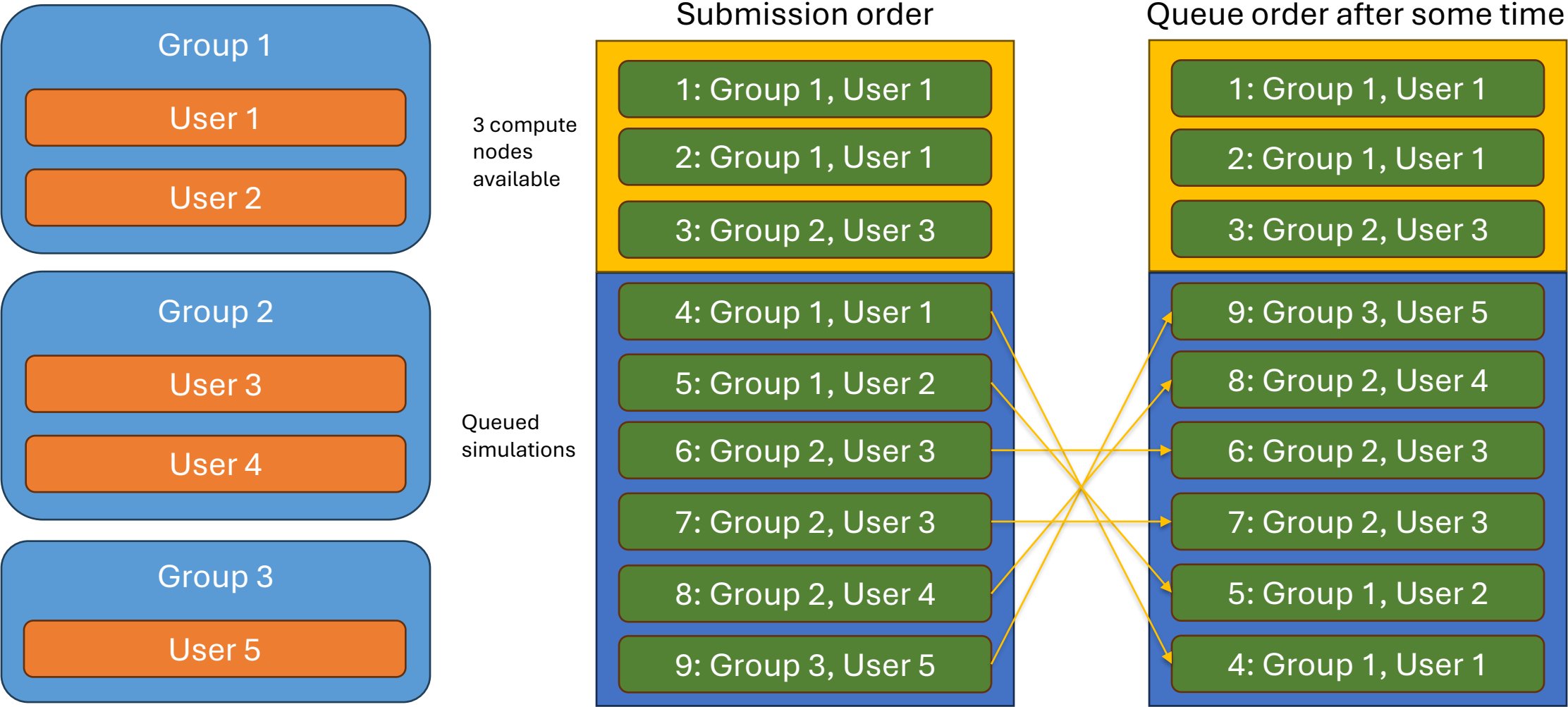


Figure 6: Discharge through culvert: Culvert 1

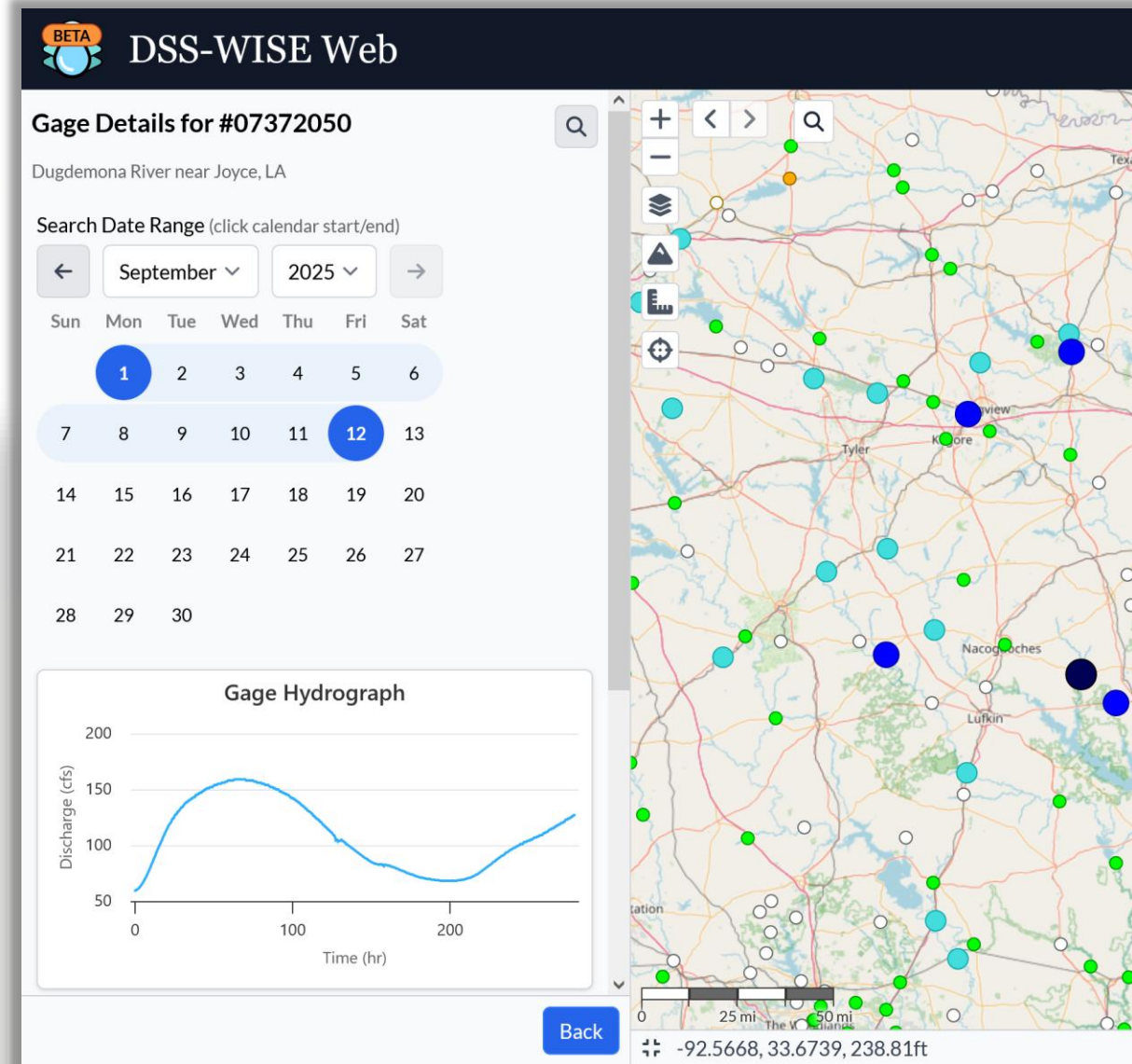
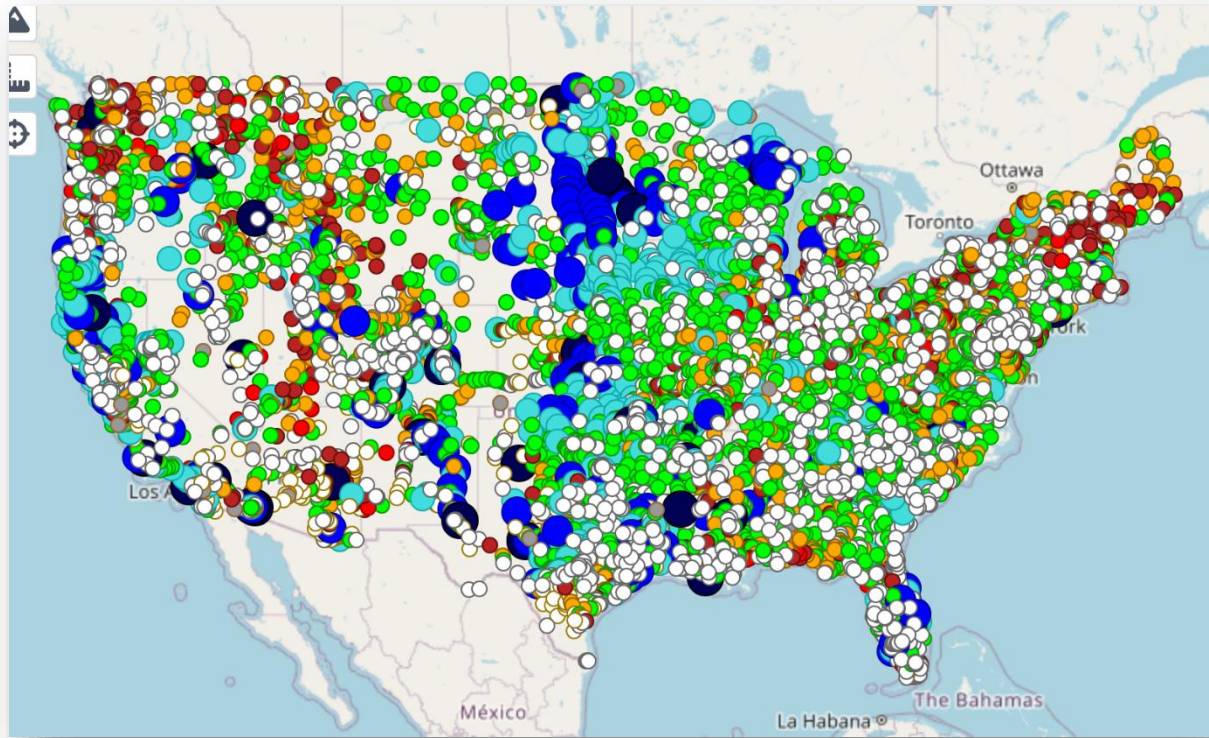


Simulation Scheduling Algorithm Updated



Inflow Hydrographs & USGS Stream Gage Integration

Develop the capability for users to automatically import this USGS stream gage data for use in their simulations instead of having to obtain it manually.



search for the stream gage



view and select a window of time for historical discharge data



import it as a new inflow hydrograph