

DSS-WISE™ Web

Decision Support System for Water Infrastructural Security Web

User Manual

for

DSS-WISE™ Web

Version 4.0 – Beta Release

March 10, 2026



NCICHE
UNIVERSITY OF MISSISSIPPI.



DSS-WISE™ Web

Table of Contents

[Section 1: Overview 3](#)

[Section 2: DSS-WISE™ Web Version 4.0 Interface 7](#)

[*Groups Section 9*](#)

[*Simulations Section 10*](#)

[*Account Section 12*](#)

[*Help Section 14*](#)

[Section 3: Levee Breach 15](#)

[*Map Layers 16*](#)

[*Levee Creation and Options 17*](#)

[*Breach Creation and Options 20*](#)

[*Review and Simulation Submission 23*](#)

[Section 4: Results 26](#)

[Section 5: Tools 28](#)

Section 1: Overview

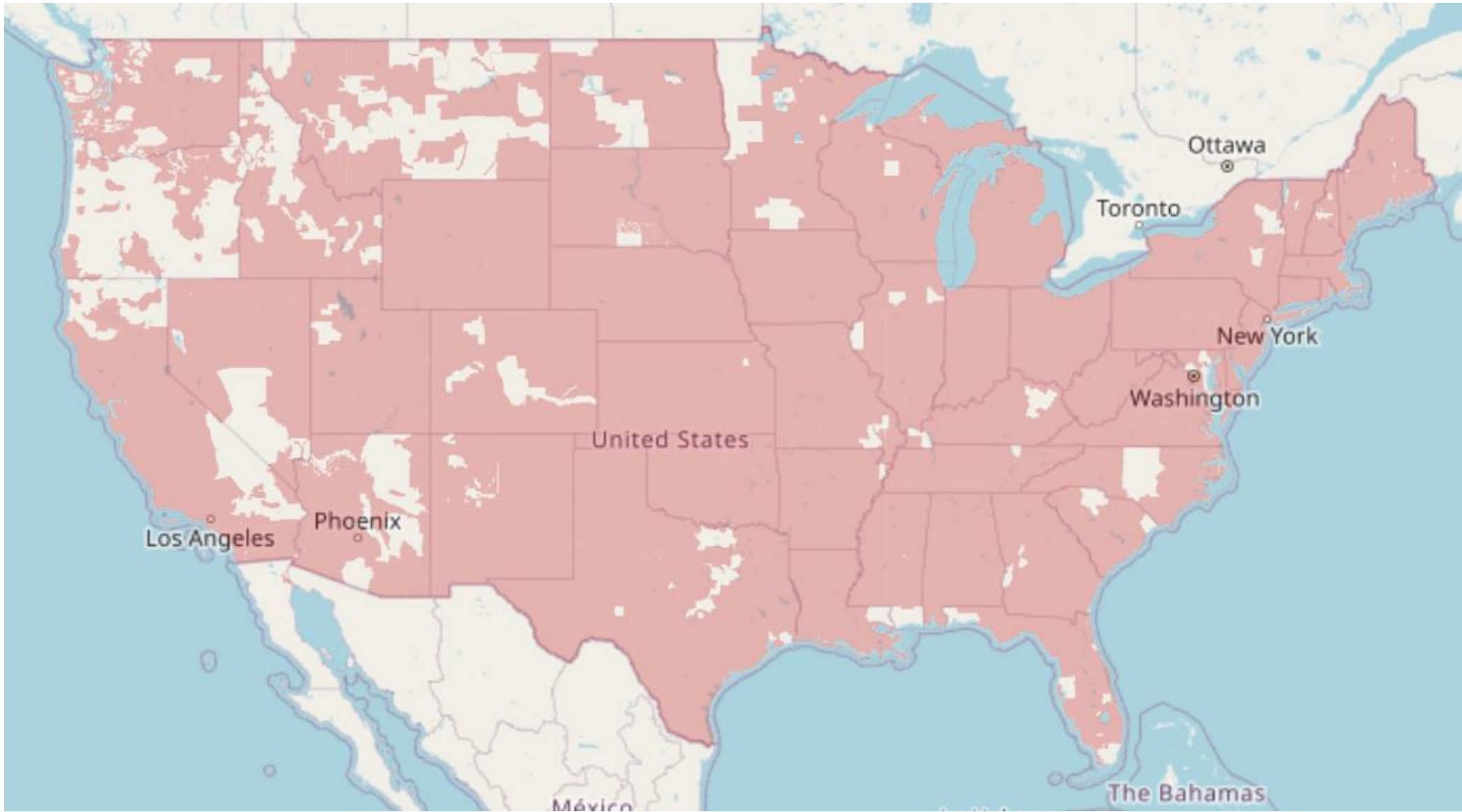
This new 4.0 version of the DSS-WISE™ Web system is part of a broad effort funded through the of Department of Homeland Security Science and Technology Directorate, Engineer Research and Development Center and the FEMA National Dam Safety Program in order to bring improvements not only to the web interface, 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 4.0 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.

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 4.0 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 4.0. 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:

- Layers and elevation profile tool now open in a popup over the map on larger screens, allowing the prep step and the 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.
- Removed the tool bar from the top of the left panel and moved relevant map tools to dedicated buttons on the map.
- 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 has to 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.

Section 2: DSS-WISE™ Web Version 4.0 Interface

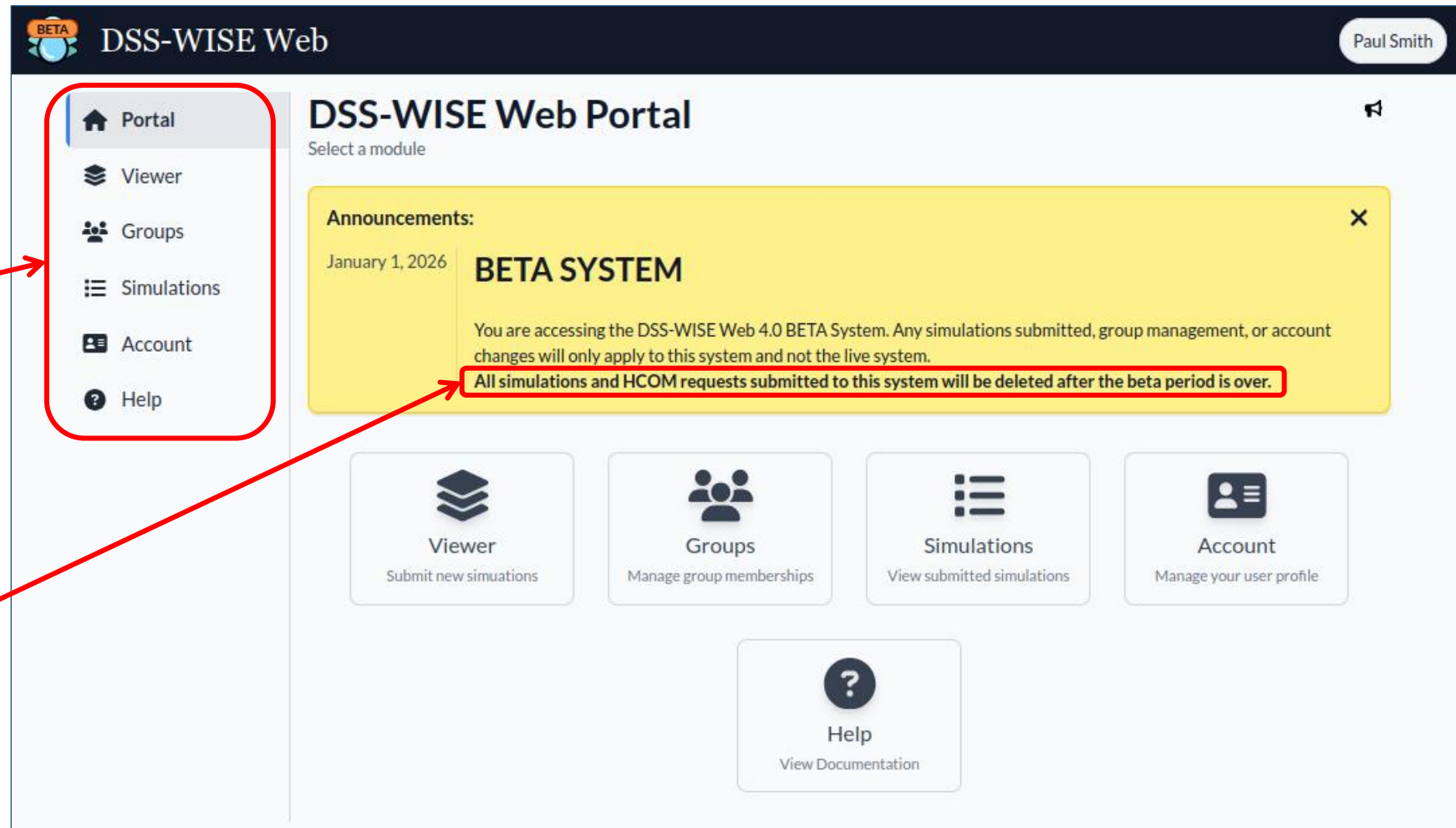
When accessing the new DSS-WISE™ Web website located at <https://dsswiseweb-beta.ncche.olemiss.edu>, the user is presented with a new entrance page to the Portal.

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.



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. At the top left, there is a 'BETA' logo and the text 'DSS-WISE Web'. On the top right, the user's name 'Paul Smith' is shown. A left-hand navigation menu includes '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'. Below this is a search bar with the placeholder text 'Search...'. A horizontal row of search tags is displayed, including 'Admin', 'Testing', 'Country', 'FEMA', 'State', 'Territory', 'Dependency', 'Federal', 'Training', 'Local', 'County', 'District', and 'Education'. Below the tags, two group cards are visible. The first card is for 'System', which has a world map icon, the text 'System', 'Joined Nov 7, 2016', and a 'Member' button. It also has 'Admin' and 'Testing' tags. The second card is for 'ALABAMA', which has a map of Alabama icon, the text 'ALABAMA', and a 'State' tag. A blue 'Apply' button is located at the bottom right of the 'ALABAMA' card.

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.

The screenshot shows a web interface for managing simulations. On the left is a navigation menu with items: Portal, Viewer, Groups, Simulations (selected), Account, and Help. The main content area is titled "Simulations 1 - 10 of 119" and displays a list of simulation cards. Each card includes a map thumbnail, a simulation ID (e.g., #103517), a name (e.g., MEADOW LAKE TEST #1), a description (e.g., TEST1-res type, 4 res, 1st breach, all res active), a status indicator (SIM), and a "Load" button. On the right side, there is a control panel with a pagination bar (10 / 20 / 100 / 1000), a "Page 1" selector, a "Filters" section with a search input and checkboxes for "My simulations", "Queued simulations", "Running simulations", and "Hide error simulations", a "Group" filter dropdown set to "Filter by Group", and a "Date Range" calendar for the year 2026.

Pagination → 10 / 20 / 100 / 1000

Text search → Search...

Type filter → My simulations
 Queued simulations
 Running simulations
 Hide error simulations

Group filter → Filter by Group

Date filter → Date Range (click calendar start/end)

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

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.

The screenshot displays a simulation results page for Simulation #10351. The page is divided into several sections:

- Navigation:** Portal, Viewer, Groups, Simulations, Account, Help.
- Simulation Information:** Simulation ID 103517, Submitted by Paul Smith, Submission 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 (Finished in 9 minutes, Sep 19, 2025, 7:09 PM), Simulation (Finished in 10 minutes, Sep 19, 2025, 6:58 PM). Metrics: Distance Achieved 32.82 miles, Time Achieved 1.02 days, Breaching Res. Vol. Released 0.38%, Compute Cells 112,588.
- Simulation Actions:** A modal window with buttons for Load and Calculate HCOM.

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

Edit personal details

Light/Dark mode

Change password

Revoke/log out from a device

The screenshot shows a user profile page for Paul Smith. The left sidebar contains navigation links: Portal, Viewer, Groups, Simulations, Account (highlighted), and Help. The main content area is titled "My Profile" and includes a profile card for Paul Smith (NCCHE). Below this are sections for "Personal Information", "Preferences", "Security", and "Active Sessions".

- Personal Information:** Contains fields for Name (Paul Smith), Email Address (cvpsmith@ncche.olemiss.edu), and Affiliation (NCCHE). Each field has an "Edit" link.
- Preferences:** Titled "(stored locally on this device)", it includes a "Color Scheme" section with three options: Light, Dark, and System.
- Security:** Includes a "Change Password" section with the text "Manage your login credentials and keep your account secure." and a "Change Password" button.
- Active Sessions:** Lists a session for "Monterotondo, 62" using "Firefox 146.0 on GNU/Linux" with IP "192.168.206.1" and creation time "1/13/2026, 6:58:00 PM". A "Revoke" button is present for this session.

Red boxes and arrows highlight the following elements:

- A red box around the "Account" link in the sidebar.
- A red box around the "Personal Information" section.
- A red box around the "Color Scheme" options (Light, Dark, System).
- A red box around the "Change Password" button.
- A red box around the "Revoke" button for the active session.

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.

The screenshot displays the DSS-WISE Web application interface in dark mode. The top navigation bar includes a 'BETA' badge, the title 'DSS-WISE Web', and a user profile for 'Paul Smith'. A left sidebar contains navigation links for 'Portal', 'Viewer', 'Groups', 'Simulations', 'Account' (which is highlighted), and 'Help'. The main content area is titled 'My Profile' and contains three sections: a profile card for Paul Smith (NCCHE), a 'Personal Information' section with fields for Name, Email Address, and Affiliation, and a 'Preferences' section. The 'Preferences' section is noted as '(stored locally on this device)' and shows three color scheme options: 'Light', 'Dark' (which is selected and highlighted with a blue border), and 'System'.

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.

The screenshot shows the 'Overview' page of the DSS-WISE Web documentation. At the top, there is a breadcrumb trail 'Home > Documentation' and a large 'Overview' heading. Below the heading is a welcome message: '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.' This is followed by a sub-heading: 'Browse through our quickstart guides, check common troubleshooting solutions, or dive into detailed technical documentation using the resources below.' The main content area consists of six light gray rounded rectangular cards arranged in a 2x3 grid. Each card features an icon, a title, and a short description. The cards are: 1. 'Quickstarts and Tutorials' with a play button icon, 'Get started with step-by-step guides and tutorials for using DSS-WISE Web'. 2. 'Common Errors' with a warning triangle icon, 'Find solutions to frequently encountered issues and troubleshooting guides'. 3. 'About DSS-WISE Web' with an information 'i' icon, 'Learn about the platform, its features, and how it can help your workflow'. 4. 'Privacy Policy' with a shield icon, 'Understand how we handle and protect your data and privacy'. 5. 'Data Sources' with a globe icon, 'Learn about the data sources used in DSS-WISE Web'. 6. 'Datasets' with a database icon, 'Comprehensive guide to datasets used in DSS-WISE Web for flood simulation and analysis'. At the bottom of the page is a 'Frequently Asked Questions' section with a search bar containing the text 'What is DSS-WISE™? DSS-WISE™ Web? DSS-WISE™ Lite?' and a downward arrow icon on the right.

Section 3: Levee Breach

As one of the primary goals of this new 4.0 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 4.0 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.

< Back to Portal

Choose Scenario Guide

Select a scenario type to get started with your simulation setup

- 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
- Levee breach
Hydrograph-type release from an embankment
- Advanced / All Options
Multi-hazard or advanced analysis presenting all setup options

Continue

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

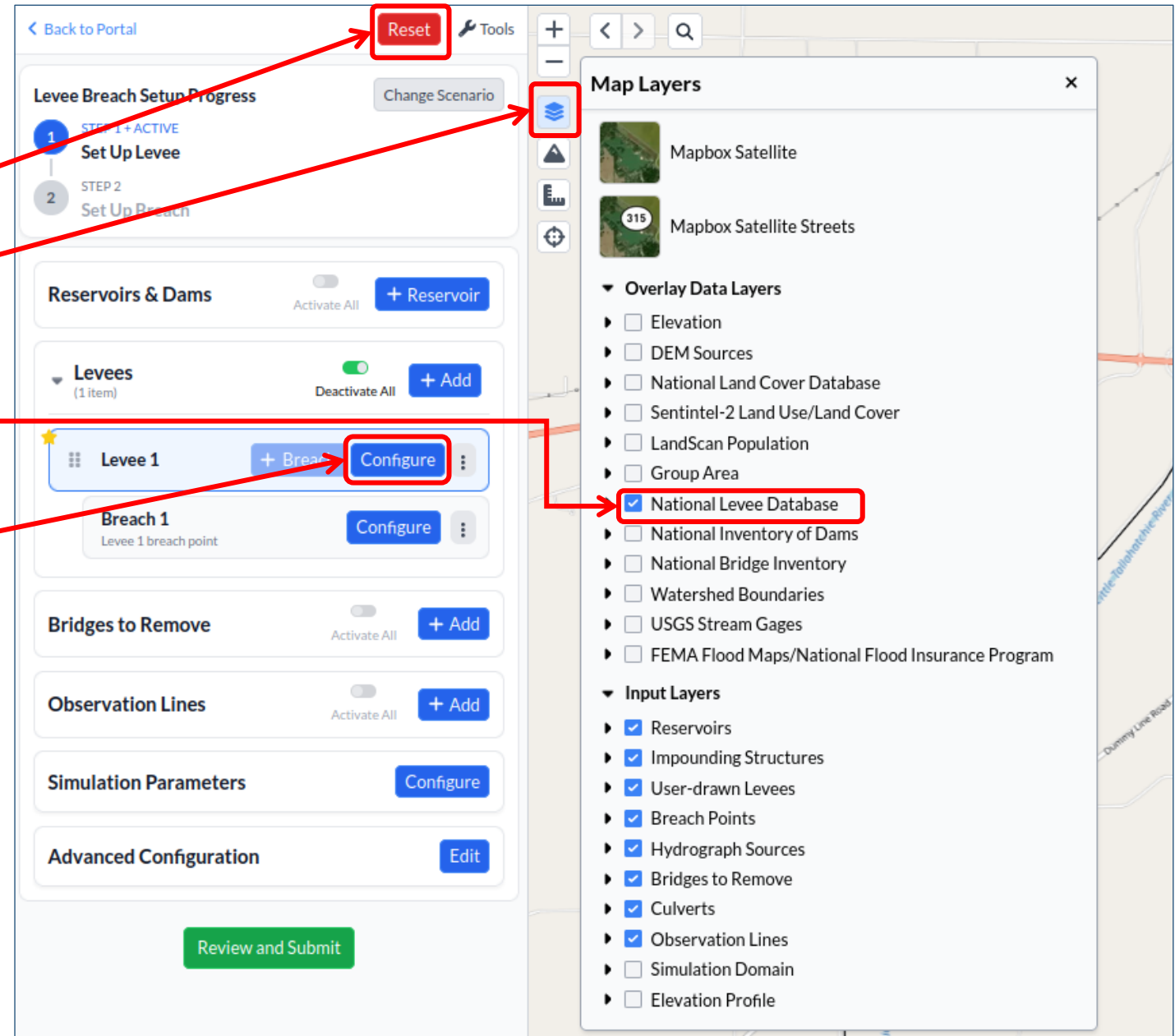
Scenario “Reset” button, available at any time during setup

Map Layers button

National Levee Database

Levee Configure button

Next, click the “Configure” button inside the “Levee 1” element in order to configure the levee details



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.

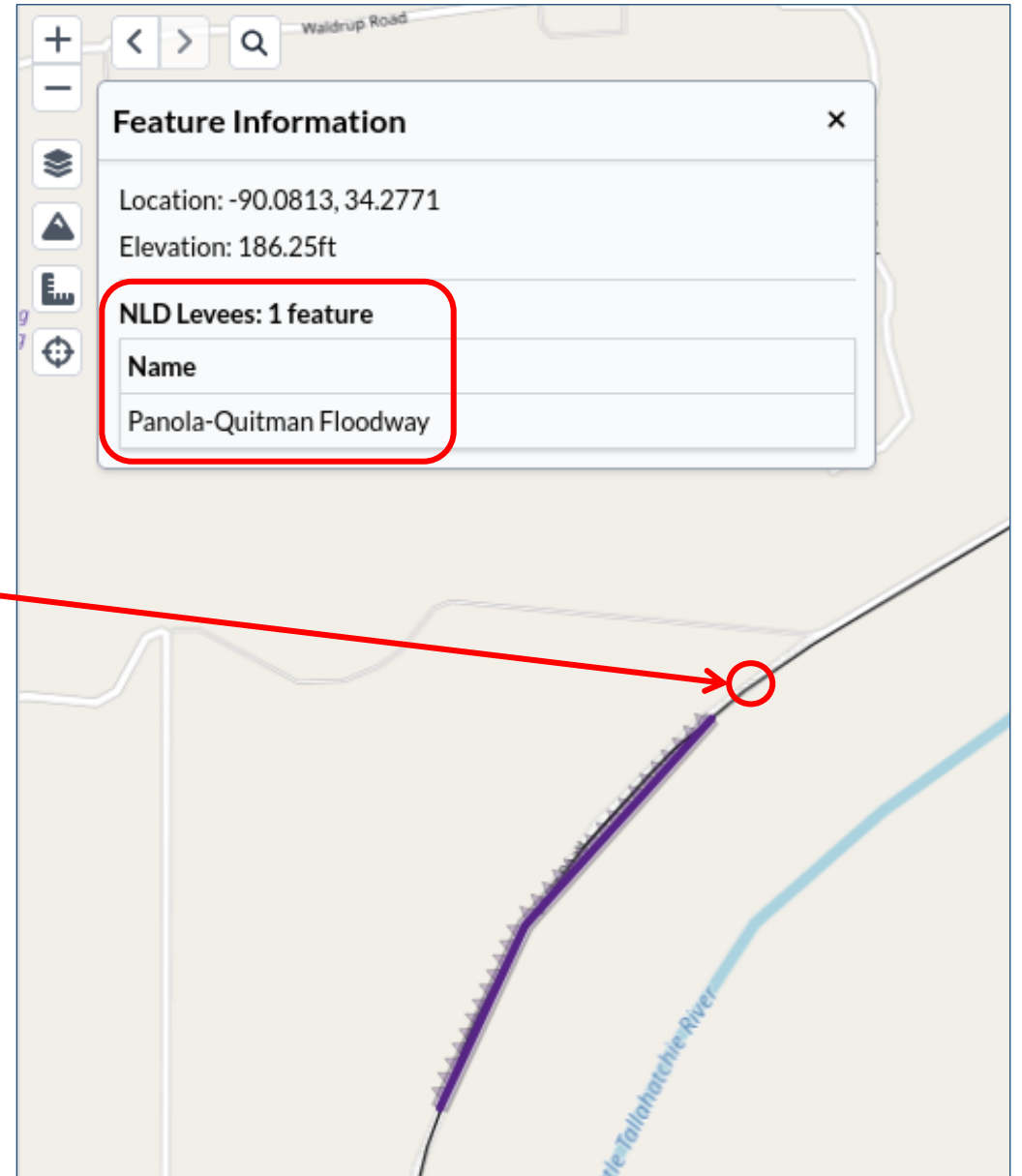
The screenshot displays the 'Levee Details' dialog on the left and a map on the right. The dialog includes the following fields and controls:

- Levee Details** (Active): A toggle switch is turned on.
- Name:** Levee 1
- Levee Center Line:** A blue pencil icon is highlighted with a red box. To its right are search, undo, and delete icons.
- Start Elevation (ft NAVD88):** 1.0
- End Elevation (ft NAVD88):** 1.0
- Width (ft):** 1.0
- Elevation Profile:** A graph showing Elevation (ft NAVD88) on the y-axis and Distance (ft) on the x-axis.
- Clamp start/end elevations to:** Two buttons, 'Endpoints' and 'Maximum', are visible.

The map on the right shows a river and a levee feature. A red box highlights a section of the levee, and a red arrow points from the 'Levee Center Line' button to this section. A larger red box on the map shows a zoomed-in view of the levee's cross-section, which is a purple line with a sawtooth pattern on its right side, indicating the downstream direction.

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.

Levee Details Active

Name: Levee 1

Levee Center Line Length: 0.59 mi

Start Elevation (ft NAVD88): 186.62

End Elevation (ft NAVD88): 186.62

Width (ft): 100

Elevation Profile

Elevation (ft NAVD88) vs. Distance (mi)

Clamp start/end elevations to: **Maximum**

Callout boxes:
- Clamp to maximum elevation
- Linear clamp from start to end points

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 Level 1" dialog box on the left and a map on the right. The dialog box includes the following sections:

- Name:** Breach 1
- Breach Center Point:** A button with a location pin icon is highlighted with a red box.
- Breach Type:** Physical and Hydrograph (selected)
- Hydrograph Mode:** Automatic (selected) and Manual
- Event Duration (hr):** Radio buttons for 0.5, 1, 3, 6 (selected), 12, 24, 48, and 72 hours.
- Levee Height (ft):** A slider bar is highlighted with a red box, with the value 9.8 displayed to its right.

The map on the right shows a levee structure with a breach center line. A red location pin is placed on the center line, circled with a red dashed line. A red arrow points from a text box to this pin.

ANN input slider bar for Automatic Hydrograph Mode

Breach Center Point once selected

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.

Clay Content Fraction ? 15.2%

Error
Inputs result in a no-breach condition. Select input parameters that result in a breach condition

Estimated breach width (not editable) ? 0 ft

Levee Height (ft) ? 9.8

Upstream Slope (H:V) ? 3

Clay Content Fraction ? 8.5%

Breach Outflow Hydrograph

Time (hr)	Discharge (cfs)
0	0
5	40,000
6	45,000
10	25,000
15	15,000
20	10,000
24	0

Estimated breach width (not editable) ? 880.4 ft

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 (cm ³ /(N·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

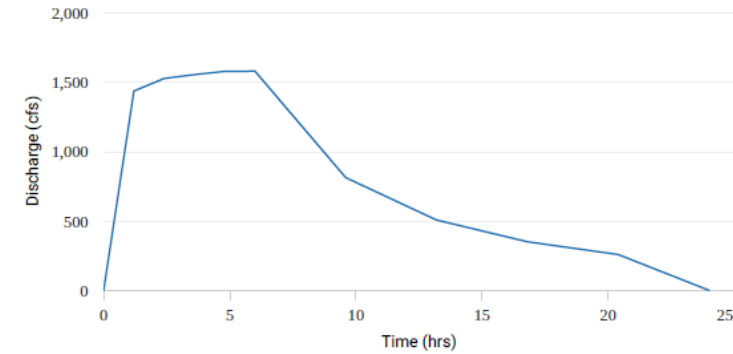


Figure 1: Breach inflow hydrograph for: Levee 1.

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

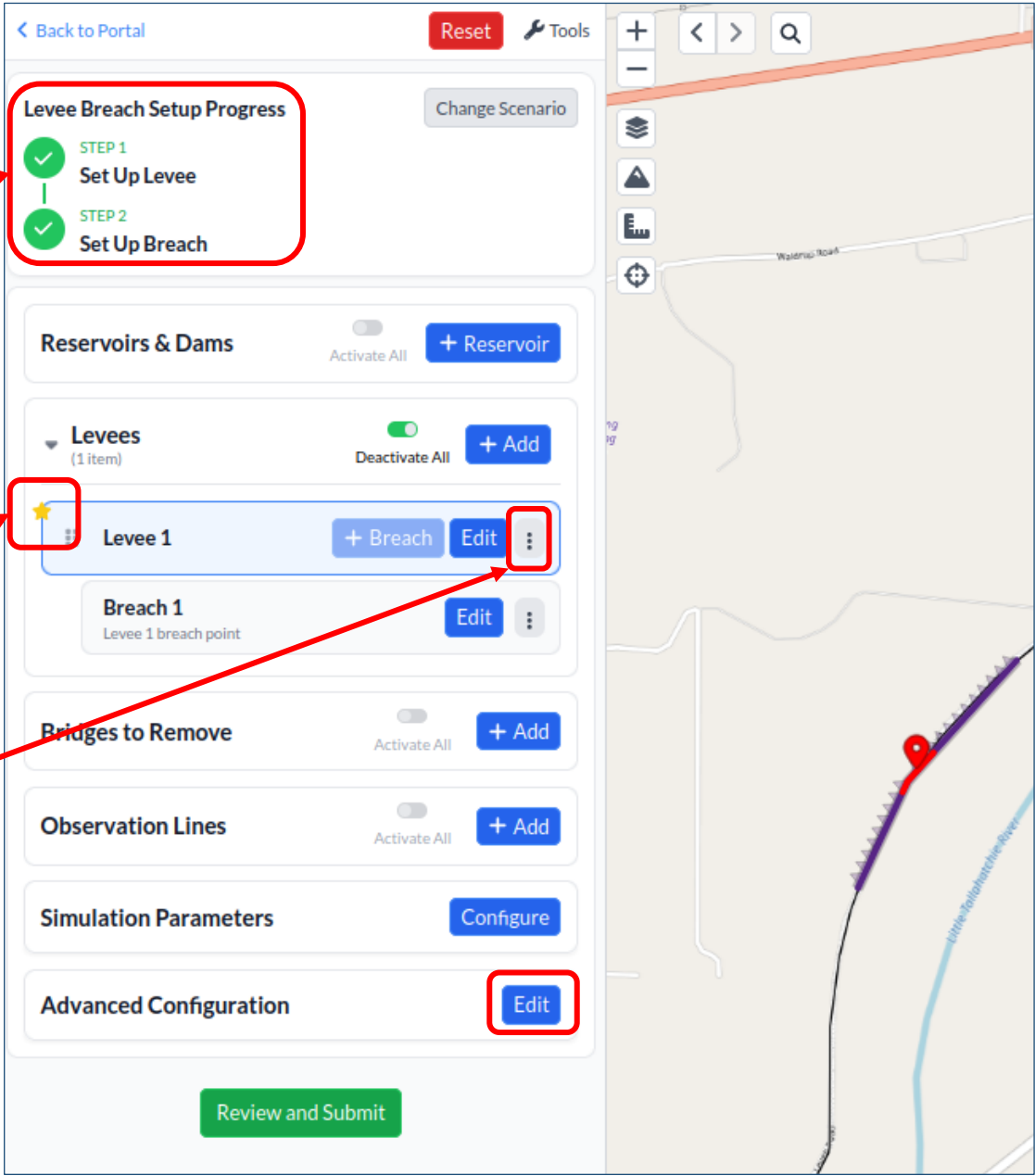
Finally, we may click the “Done” button and get ready to submit the job for processing. But first, let’s take a look at the “Advanced Configuration” options by clicking the “Edit” button in that element.

Everything checks out!

Note that, with the addition of levee breaches in version 4.0, it is necessary to specify the “main” breach which becomes the focus of reporting downstream distance and other metrics in the PDF report generation.

This levee is designated as the “main” focus of breach reporting

Use the “three dot” menu of an element in order to designate a structure as the “main” item.



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.

Advanced Configuration

Manning roughness Settings

Manning Roughness Values ? **Configure**

Compute & Priority Settings

Compute Cluster ?
Default ▼

Simulation Priority ?

High Priority
Schedule ahead of all other simulations
Please reserve for time-sensitive circumstances

Normal Priority ✓
Most simulations fall into this category

Low Priority
Schedule after all other simulations

Before final submission, we are given the opportunity to provide a proper project name as well as detailed scenario descriptions.

It is useful to be as descriptive as possible here, since these fields may be used in the future for search terms on the “Simulations” page. This is especially relevant when searching for different scenarios within the same project.

Review & Submit

Describe your simulation and submit it

Project Name ?

Panola-Quitman Floodway Levee Breach

Scenario Name ↺ ?

Hydrograph-type, partial breach

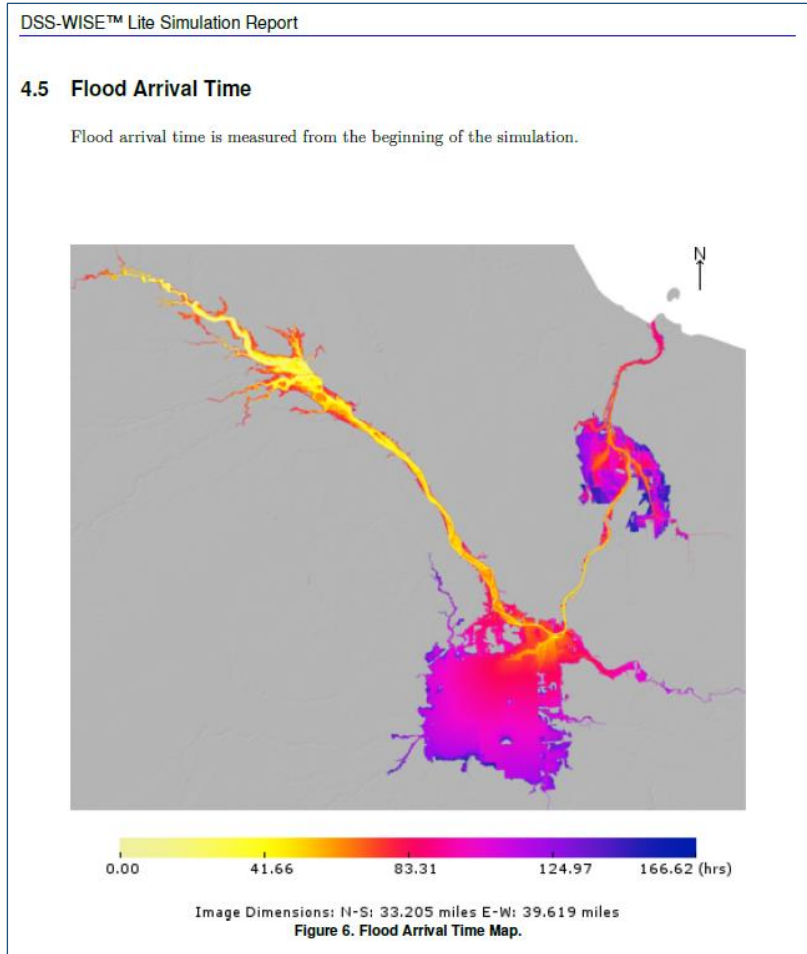
Scenario Description ?

Hydrograph-type, partial breach of Levee 1

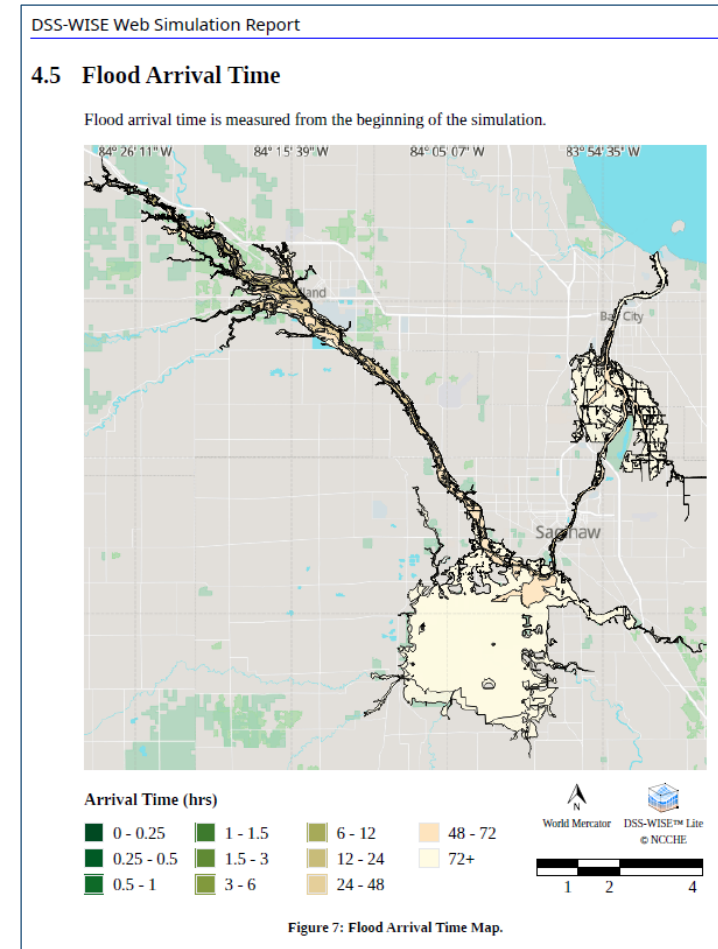
Submit Simulation

Section 5: Results

Much of the new development work for version 4.0 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

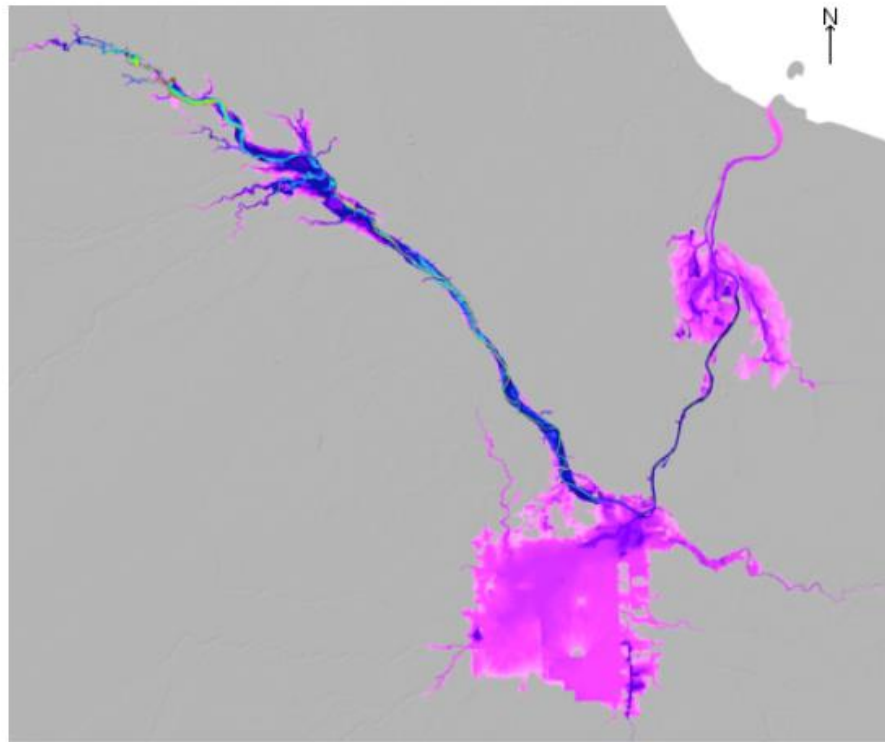


Image Dimensions: N-S: 33.205 miles E-W: 39.619 miles
Figure 5. Maximum Flood Depth Map.

Old Maximum Flood Time map



4.4 Maximum Flood Depth

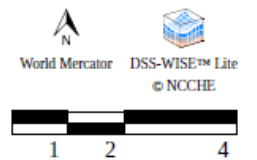
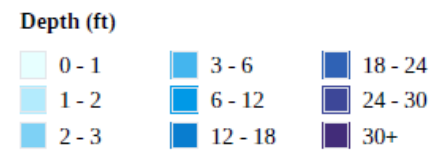
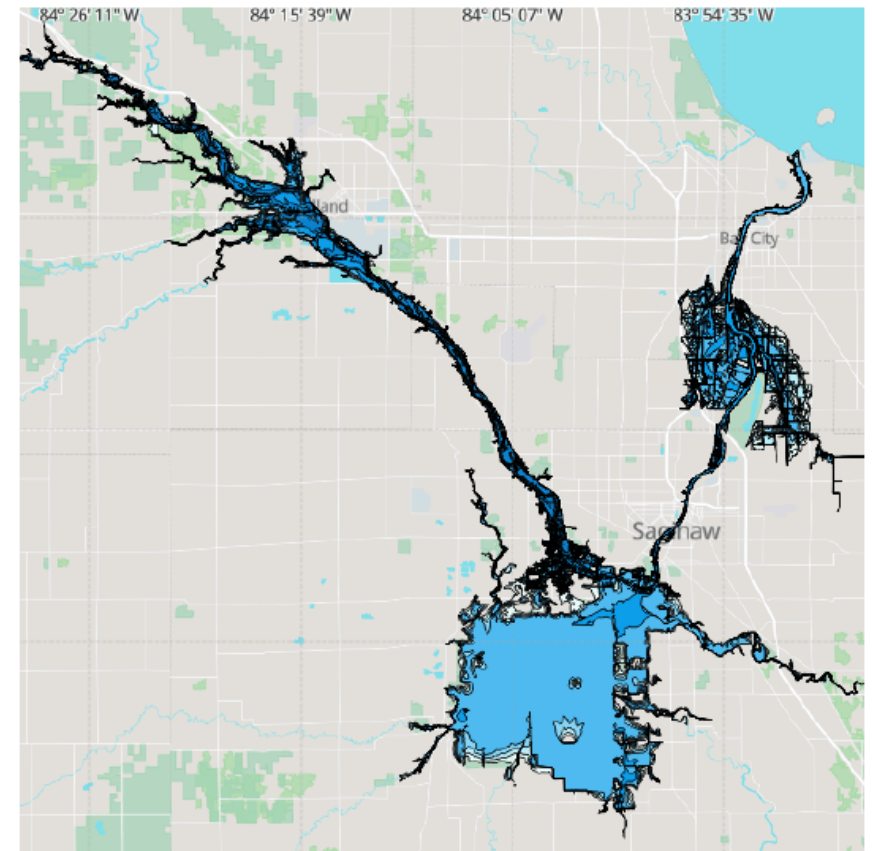


Figure 6: Maximum Flood Depth Map.

New Maximum Flood Time map

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.

Dams Search Tool

Search by name or Dam ID (NIDID)

Showing 1 - 2 of 2

Name	Sardis Dam	<input type="button" value="Import"/>
Alt. Name	Sardis Lake	
Dam ID	OK22199	
Hydraulic Height	77 ft	
Normal Storage	274330 ac-ft	
Max. Storage	735830 ac-ft	<input type="button" value="Q"/>
Hazard	● High	

Name	Sardis Dam	<input type="button" value="Import"/>
Alt. Name	Sardis Lake	
Dam ID	MS01493	
Hydraulic Height	107 ft	
Normal Storage	108000 ac-ft	
Max. Storage	3016000 ac-ft	<input type="button" value="Q"/>
Hazard	● High	

Tools Menu

BETA DSS-WISE Web

[Back to Portal](#)

Sunny-Day Dam Breach With Reservoir Setup Progress

- STEP 1 + ACTIVE**
Set Up Reservoir
- STEP 2
Configure Dam
- STEP 3
Set Up Breach

Reservoirs & Dams

(1 item) Deactivate All

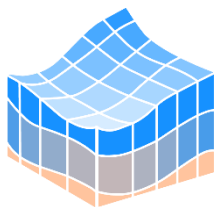
Reservoir 1
1 Dam

Dam 1
1 Breach

Breach 1
Dam 1 breach point

Contact Information

- **Technical questions:** Please contact the DSS-WISE Web support team at admin@dsswiseweb.ncche.olemiss.edu .
- **Administrative questions:** Please contact the Project PI, Dr. Mohammad Al-Hamdan (Director of NCCHE and Professor of Civil Engineering), at alhamdan@ncche.olemiss.edu.



National Center for Computational
Hydroscience and Engineering
UNIVERSITY OF MISSISSIPPI.



DSS-WISE™ Web