

**2018 USSD Conference and Exhibition – A Balancing Act: Dams, Levees and Ecosystems**  
**ONE-DAY SHORT COURSE**  
**Thursday, May 3, 2018**

**RAPID, CUTTING-EDGE FLOOD MODELING ON THE WEB:  
HANDS-ON WITH DSS-WISE™ LITE**



DSS-WISE™ Lite is a web-based, automated two-dimensional dam- and levee-break flood modeling and mapping capability developed at the National Center for Computational Hydroscience and Engineering, the University of Mississippi with funding from the Federal Emergency Management Agency (FEMA). It is accessible via DSS-WISE™ Web platform providing access to a secure, web-based environment consisting of a graphical user interface and a map server. The system is available 24/7 and free of charge to registered users. The graphical user interface (GUI) DSS-WISE™ Lite Prep Tool with real-time error checking allows the user to set up and run dam and levee breach scenarios resolutions from 20 ft. to 200 ft. extremely quickly in 12 intuitive easy steps. The data entry by the user is minimal. The preparation of the input data for the numerical model, based on the user-provided scenario, is fully automated.

Parallelized computational engine solves full dynamic shallow water equations efficiently using a state-of-the-art, shock capturing upwind scheme, and provides the results quickly. In 70% of the cases, the GIS compatible final-results files are returned to the user within half an hour accompanied by an automatically generated final report. The system is currently being used by various federal agencies and state dam safety offices both for preparing emergency action plans and for emergencies. Thanks to its exceptional computational speed, the system has been successfully used as an operational modeling tool during numerous emergencies, and the results have been used to plan for emergency response planning. DSS-WISE™ Lite provides a rich set of results files. As the simulation is being computed, the user can monitor the propagation of the flood and the inundation extent on a secure web page.

This one-day short-course:

- 1) overviews the system components for DSS-WISE™ Web and GUI;
- 2) reviews dam-break flood hydraulics and the computational engine;
- 3) teaches step-by-step how to set up and run “reservoir-type” and “hydrograph-type” simulations;
- 3) discusses how to view and use the results files provided;
- 4) peers into behind-the-scenes of automated input data preparation;
- 5) discusses typical users mistakes and how to avoid them; and
- 6) presents tips and techniques for dealing with challenging cases.

## SHORT COURSE AGENDA

Time	Topic
08:30AM – 08:35AM	Opening Remarks (James Demby and Gokhan Inci, FEMA)
08:35AM – 09:00AM	1- Introduction to DSS-WISE™ Web and DSS-WISE™ Lite <ul style="list-style-type: none"> <li>• Website</li> <li>• Group Concept</li> <li>• Quick Start (Registration, Log in and GUI)</li> </ul>
09:00AM – 09:45AM	2- Basics of 2D Dam-Break Flood Modeling with DSS-WISE™ Lite <ul style="list-style-type: none"> <li>• Overview and Approach</li> <li>• Problem Statement</li> <li>• Preparatory Work</li> <li>• DSS-WISE™ Lite Prep Tool Walkthrough</li> </ul>
09:45AM – 10:00AM	SHORT BREAK
10:00AM – 10:30AM	3- Scenario Setup for Reservoir-Type Simulations
10:30AM – 10:45AM	4- Scenario Setup for Hydrograph-Type Simulations
10:45AM – 11:15AM	5- Viewing and Using Simulation Results
11:15AM – 12:00PM	6- Looking under the Hood: Review of Dam Break Flow Hydraulics and Computational Engine of DSS-WISE™ Lite
12:00PM – 01:00PM	LUNCH BREAK
01:00PM – 03:00PM	7- Hands on Practice Session
03:00PM – 03:45PM	8- Behind the Scenes of Automated Input Data Preparation and Limitations
03:45PM – 04:00PM	SHORT BREAK
04:00PM – 04:30PM	9- Typical User Errors, Understanding Error Messages and Corrective Actions
04:30PM – 04:45PM	10- Advanced Tips and Techniques
04:45PM – 05:15PM	11- Roundtable Session with Questions and Feedback, and Closing Remarks
05:15PM – as needed	12- Informal discussion/interaction with participants, answers to questions, etc. (as long as necessary)

## Instructors

The course will be taught by the three members of the DSS-WISE™ Lite development team at the National Center for Computational Hydroscience and Engineering (NCCHE) of the University of Mississippi in Oxford Mississippi

- **Dr. Mustafa S. Altinakar**, Director and Research Professor.
- **Marcus McGrath**, Research and Development Engineer and Ph.D. Candidate.
- **Dr. Vijay Ramalingam**, Research Scientist.

Opening remarks will be presented by

- **Mr. James E. Demby, Jr., PE**, Senior Technical and Policy Advisor, National Dam Safety Program (NDSP), FEMA
- **Gokhan Inci, PhD, PE, PEng, PMP**, Civil Engineer, National Dam Safety Program, Planning and Safety Branch, Risk Management, Federal Insurance and Mitigation Administration (FIMA), FEMA

## Workshop Materials

Workshop participants will receive a link to download reference materials, including copies of the slides used by the instructors, as well as the data set to be used during the “Group Exercise” session. Participants, who are not already users, will receive a temporary password to be used for the purposes of the short course. This temporary password will remain valid for 3 days after the short course to allow participants practicing on their own.

## What to Bring

Participants are asked to bring their own laptop to be able to participate in the group exercise session to acquire hands-on experience to set up and submit simulations. Electrical outlets and Internet service will be provided. The laptop should be Wi-Fi enabled and have a web browser (other than Internet Explorer!). There is no need to install any programs on the computer for setting up and submitting simulations.

For the post processing of the results, the participants should have a GIS software (for example ArcGIS or QGIS) and a spreadsheet software (such as Microsoft Excel) installed on their laptop. If you do not already have a GIS software on your computer, you may download and install QGIS free of charge. QGIS is an excellent software package and offers all functionalities needed to display, and post-treat the results files provided by DSS-WISE™ Lite. DSS-WISE™ Lite development team members use for their own work.

QGIS is open source software available under the terms of the GNU General Public License. The latest (development) version or long-term release versions of QGIS software is available for different platforms (Windows, Mac OS X, Linux, BSD, Android): <http://www.qgis.org/en/site/forusers/download.html>

For detailed information on QGIS, please visit the homepage at <http://www.qgis.org/en/site/>

Bringing your own computer is preferable. However, in order to provide a hands-on experience for all participants, we will do our best to team up those who do not have a laptop with those who do.

## Professional Development Hours

Upon request, the participants who complete the entire one-day short course will be provided a certificate for 8 Professional Development Hours (PDH).