Advancing Transportation Hydraulics with SRH-2D TWO-DIMENSIONAL MODELING

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SRH-2D Model

- SRH-2D (Sedimentation and River Hydraulics – 2D River Flow Modeling
 - Developed by the US Bureau of Reclamation (USBR)
 - Developer Dr. Yong Lai, Hydraulic Engineer, USBR
 - Used for river analyses since 2004
 - Very robust finite volume numerical model
 - Uses a flexible mesh
 - 2D sediment transport







SRH-2D Capabilities

Current (SMS 11.2)

- Steady or unsteady flow
- Sub- and supercritical flow
- Multiple inflows/outflows
- Multiple boundary conditions

Beta (SMS 12.0)

- Culvert hydraulics
- Bridge pressure flow
- Weirs
- Gates
- Drop Inlets (orifice/weir/conduit)
- Depth dependent roughness
- Sediment Transport

http://www.fhwa.dot.gov/engineering/hydraulics/

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More on <u>Highway Drainage</u>	More on <u>All Publications</u>						

SMS / SRH-2D Software and Licensing

Hydraulics Engineering - Software

The software available at this site is in the public domain and is available for downloading as zipped files or sel used without restriction.

By downloading the software, the user accepts responsibility for understanding the following conditi

- The FHWA does not provide user assistance or support for this software.
- The application of this software is the responsibility of the user. It is imperative that the responsible engin
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Click on the software title to go to the software description and download area. Some manuals are in electronic the <u>ISDDC web site</u>.

- FHWA provides licenses for DOT and FHWA
- <u>www.fhwa.dot.gov/engineering/</u> <u>hydraulics/software.cfm</u>

The FHWA software and related publications listed below are available from McTrans or P				
FHWA Hydraulics Engine	ering			_
Software Title		Software	Services	Downloads
HEC 26 HEC 26 Spreadsheet				
Software:	Downloads			
www.aquaveo.com/downloads	AHGW GMS SMS WMS	Hardware Lock [rivers	
 Reviewers license: <u>www.aquaveo.com/regulatory-review</u> 	v Surface-water Mod	eling System	ı	
 USBR SRH-2D Info: 	SMS 11.2.4 (32-bit) Release Notes		13Aug14	337MB
www.usbr.gov/pmts/sediment/model	SMS 11.2.4 (64-bit) Release Notes		13Aug14	336MB
<u>srh2d/</u>	SMS 11.2 Tutorials		13Dec13	674MB
	 Beta Release 			
	► Nightly Build			

AQUAVEO

http://www.xmswiki.com/xms/SMS:SMS

<u>http://www.aquaveo.com/software/sms-learning-tutorials</u>

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Course Description



Improving the Performance of the Transportation Industry Through Training

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Surface Water Modeling System with Flo2DH and SMS Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments PROGRAM AREA: Hydraulics COURSE NUMBER: FHWA-NHI-135071 Sign Up for Session Alerts

2014

Instructor-led Training (ILT)

Calendar Year Length

CEU F

Host Price

4 Days 2.4 Units \$850 Per Participant 3 Days

TRAINING LEVEL: Accomplished

CLASS SIZE: Minimum: 20 Maximum: 26

COURSE DESCRIPTION:





SRH-2D EXAMPLE APPLICATIONS



Musselshell River, MT



Contour Mapping from LiDAR and Channel surveys





✓ Cross section geometry

- ✓ Reach lengths
- ✓ Bank stations
- ✓ Roughness values
 - embankment geometry
- ✓ Ineffective flow areas
- Boundary conditions

Define model limitsBoundary conditions



✓ Define model limits

- Boundary conditions
- ✓ Roughness values





✓ Define model limits





- Velocity (w/ vectors) \succ
- Depth
- WSEL \succ
- Froude Number >
- **Channel Shear Stress**



Cross Section Time Step: 0 06:00:00



San Joaquin River, CA





Define model limitsBoundary conditions



✓ Define model limits

- ✓ Boundary conditions
- ✓ Roughness values





- ✓ Define model limits
- ✓ Boundary conditions
- ✓ Roughness values
- ✓ Specify bridge geometry











Federal Highway Administration

QUESTIONS

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