

Modeling, FEMA Guidelines to Go: 2D or Not 2D – Part 2

2D Modeling in CA-DWR Flood Management

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Outline

- General Guidance in when/where, what, and how to use 2D modeling in flood management
- Examples of applications of 2D modeling in DWR flood management programs/projects
- Examples of foundational 2D model development



General Guidance

Practical and Flexible

- When and where to use 2D modeling?
- What 2D model platform to use?
- How to conduct 2D modeling?



When & Where to Use 2D Modeling?

- **Floodplain evaluation and delineation for**
 - FEMA NFIP
 - Land use development planning
 - Flood project benefits assessment
 - Flood ER early warning purpose
 - Community flood risk awareness
- **Flood hydraulic flow routing**
 - intense channel and floodplain interactions (e.g., Stockton east streams)
 - Complex system (e.g., Fremont Weir flow split)
- **Flood project design evaluation**
(velocity and scour)



What 2D Model Platform to Use?

- Commonly used by flood modeling community
- Public domain
- Government alignment
 - FEMA acceptance (e.g. FLO-2D)
 - USACE development (HEC-RAS 2D)
 - Easy deployment at local agencies
- Special studies (e.g., TUFLOW, RMA2, RiverFLO2D)



How to Conduct 2D Modeling?

- Consistent with FEMA Guidelines for NFIP studies
- DWR study specific guidelines
 - grid size
 - overland break-line representation
 - embankment assumptions (height to include, failure)
 - underpass modeling
- Model validation and calibration (if historical data available)



2D Modeling Applications

- Flood Management Planning
 - BWFS/CVFPP – project benefit/impact assessments
- Legislative Mandates
 - SB1278 Urban 200-year Informational Floodplain Mapping for land use planning
 - SB 5 Levee Flood Protection Zone
- Flood Emergency Response Planning
 - Pilot Flood Evacuation Study
 - Flood Inundation Mapping (early warning)
- FEMA NFIP Cooperative Technical Partners (CTP)
- Community Advisory Mapping (alluvial fan floodplain mapping, floodplain awareness mapping)



Foundational 2D Model Development

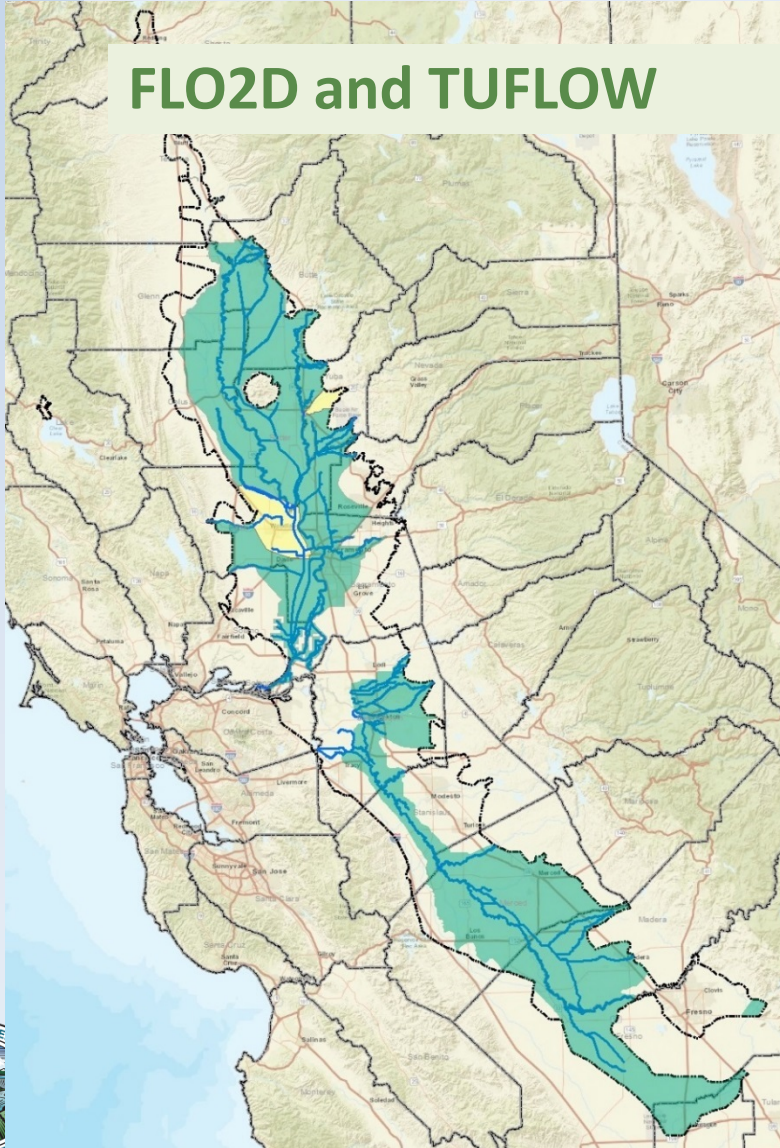
In the past eight years, as part of CVFED:

- 25 domains of FLO-2D models for both Sac & SJ basins
- Two TUFLOW models (Yuba River & Cache Creek)
- Two HEC-RAS 2D models (Stockton & Merced)

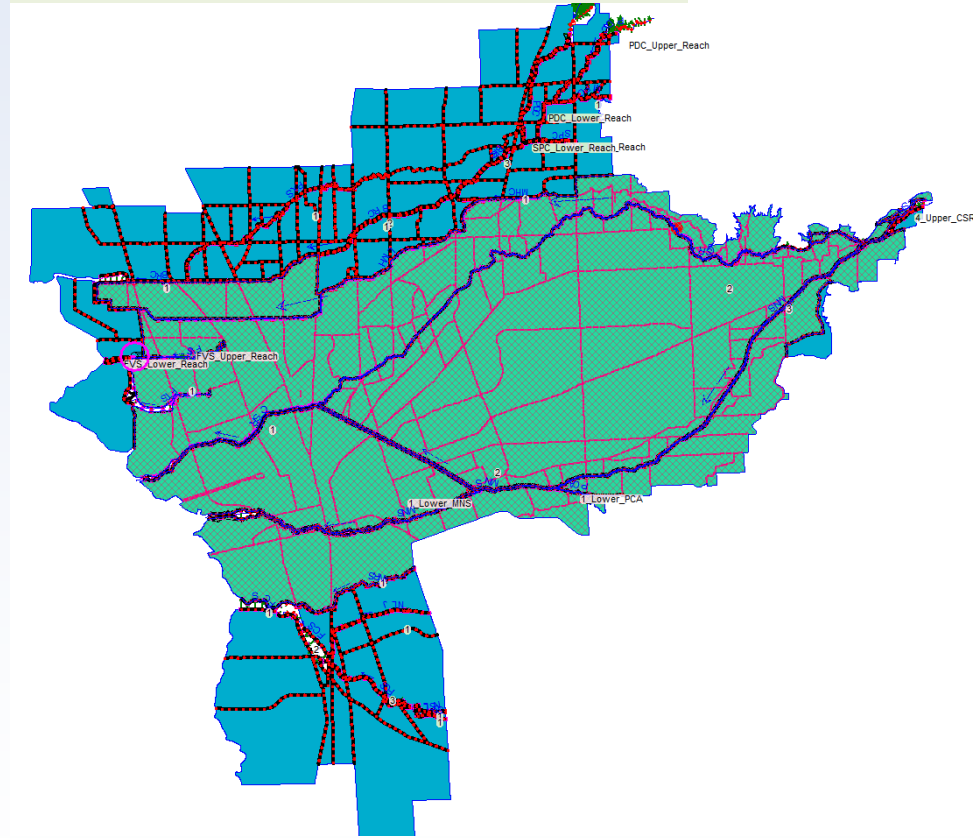


Foundational 2D Model Development

FLO2D and TUFLOW



HEC-RAS 2D



DWR Library of Models

<http://cdec4gov.water.ca.gov/lom/>

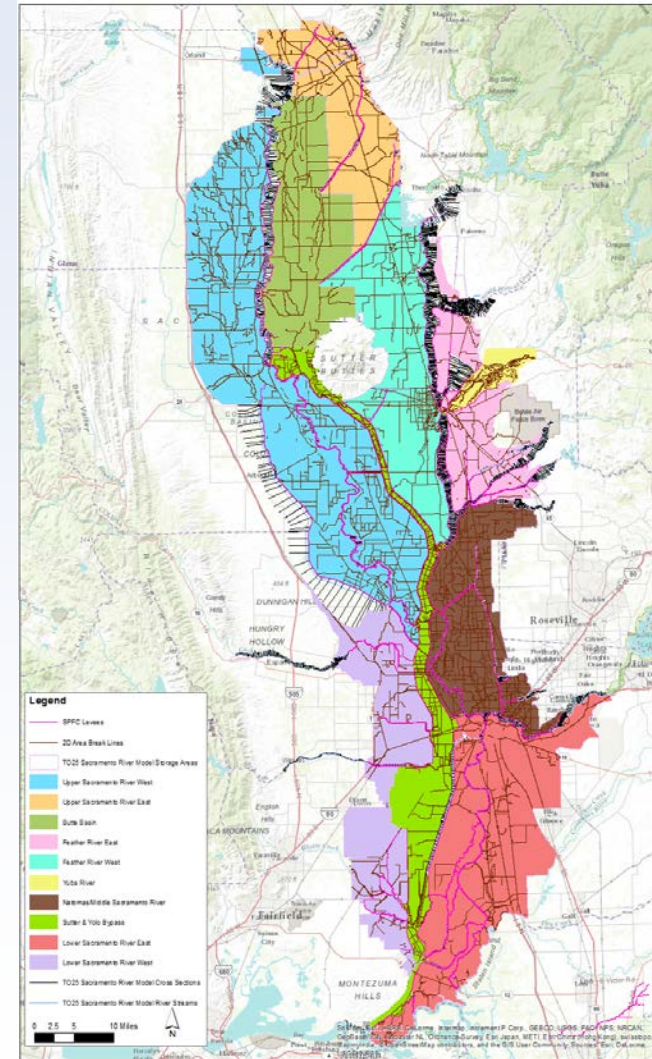
The screenshot shows a web browser window displaying the DWR Library of Models website. The browser's address bar shows the URL cdec4gov.water.ca.gov/lom/. The website header includes the CA.GOV logo, the text "DEPARTMENT OF WATER RESOURCES LIBRARY OF MODELS", and navigation links for "Skip to: Content | Footer | Accessibility". A search bar is located in the top right corner, with "California" and "DWR" selected. Below the header, a navigation menu lists "Home", "LOM Home", "About LOM", "User Accounts", "Contact Us", and "Browser Support". A "QUICK LINKS" sidebar on the left contains links for "About LOM", "User Accounts", "Contact Us", "Browser Support", "Log-in", and "Registration". The main content area features a stylized illustration of a library with bookshelves labeled "Hydraulic Design", "Reservoir Operation", "Flood Assessment", "Snowmelt Forecast", "Hydrologic", and "Risk Assessment". A central sign reads "Welcome to the LIBRARY OF MODELS" and "Register as a LOM User Today!". Below this, a message states "The Library of Models is open to all. Just select the 'Registration' option - it is easy. So why do you wait! Do it TODAY!". Two smaller signs provide instructions: "HOW TO START" (Log in to access the Library or Register as a new LOM user.) and "IMPORTANT" (Visit the 'About Us' page to read about the LOM Scope, Objectives, and Organization.). The "FloodSAFE CALIFORNIA" logo is visible in the bottom left of the main content area. The footer contains links for "Back to Top", "Help", "Comments or Suggestions", and "Document Viewers".



Foundational 2D Model Development

Ongoing:

- 10 HEC-RAS 2D models for Sacramento River Basin



Questions

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