When the Flood Waters are Rising, Who'll Do the Maps?

The Development of Standard Operating Guidelines for GIS Specialists in Flood Response

Christina Boggs
Jaime Matteoli
Jonathan Mulder
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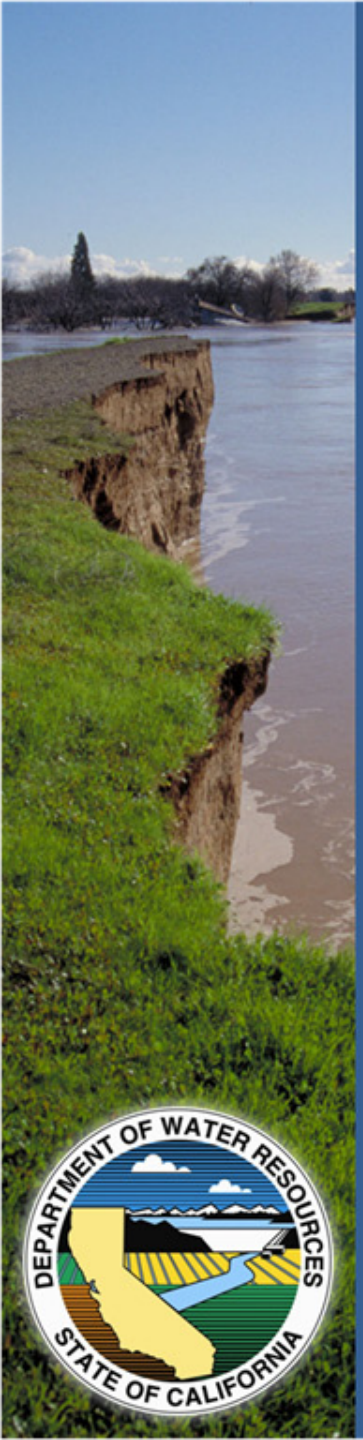
California Department of Water Resources



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- Data Needs (Jane)
- Answering Questions (Jon)
- Mapping (Jon)
- Future Resources (Jaime)
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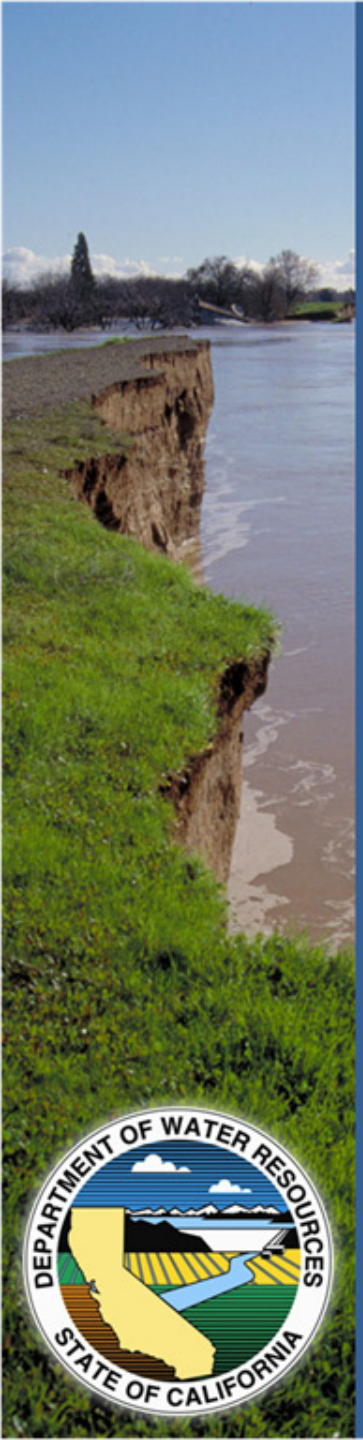

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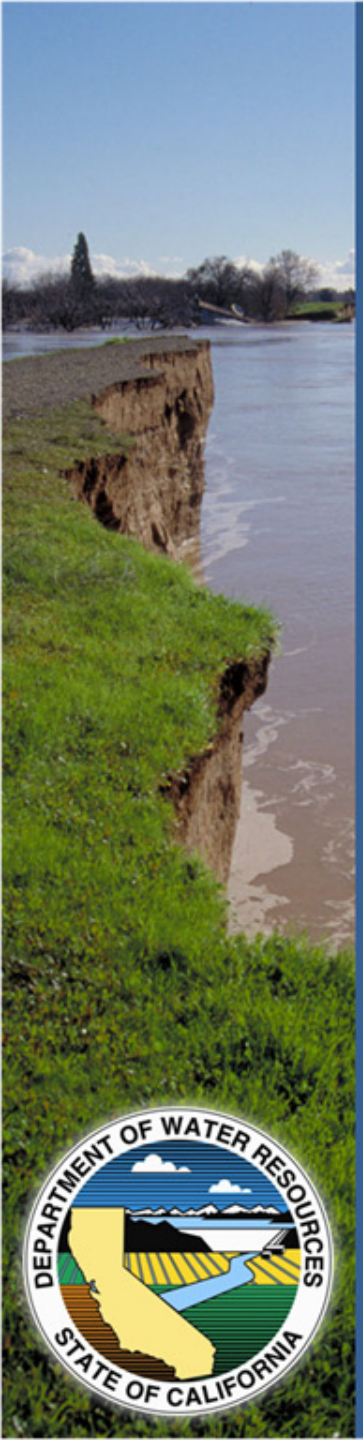

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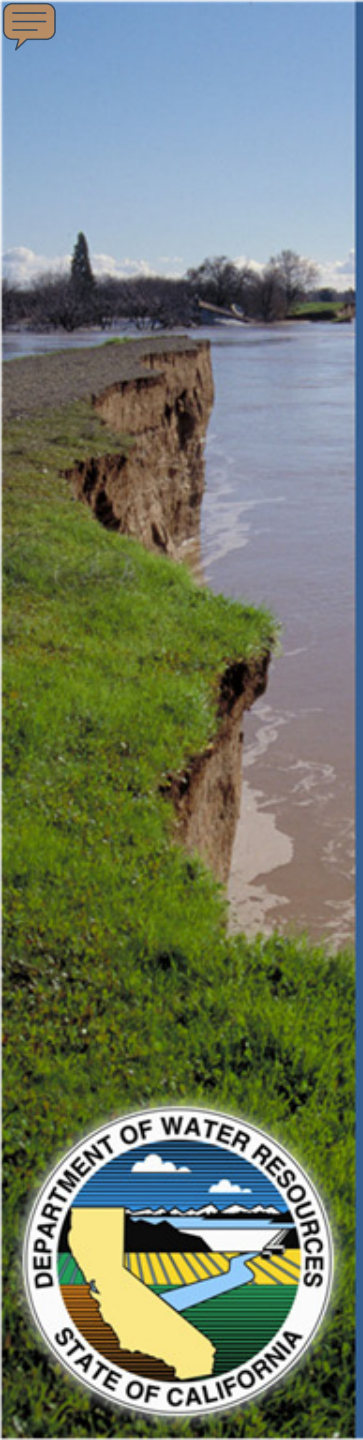
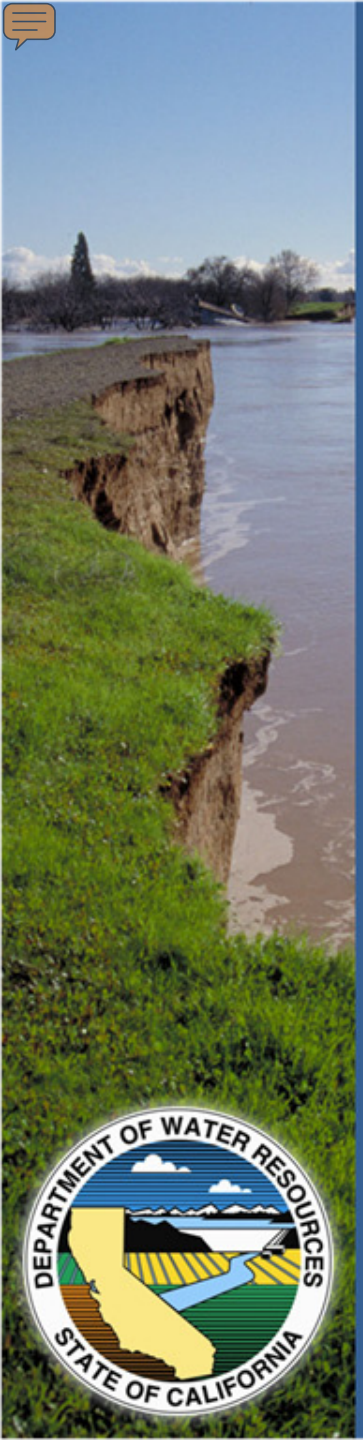
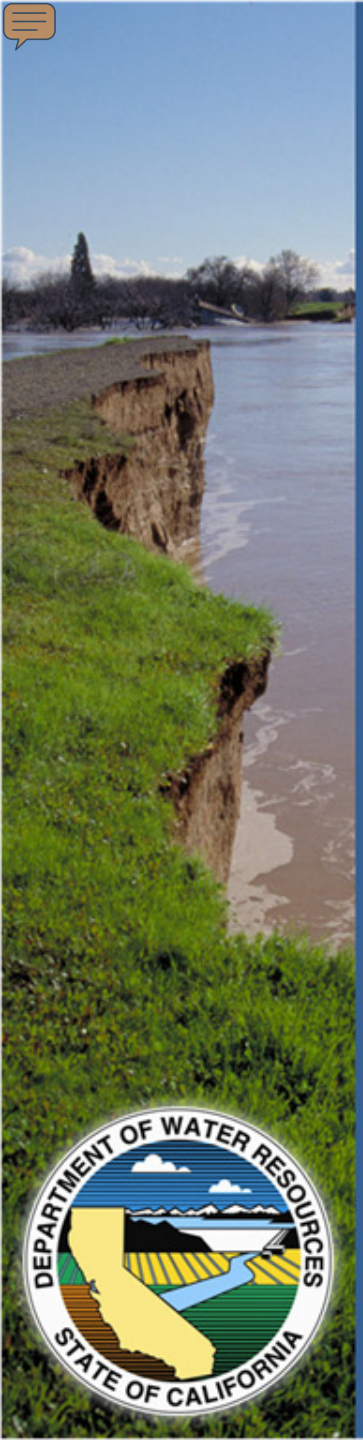


Nothing Ever Happens

- Fall 2007
  Southern California Wildfires
- July 2008
  Inyo County Mud Flow
- January 2009
  Medford Island Levee Repair
- August 2009
  Ship Soft Grounding – Bradford Island
- October 12-13, 2009
  Columbus Day Storms
- Golden Guardian Exercise 2010/2011
- F-CO Exercise 2009/2010/2011

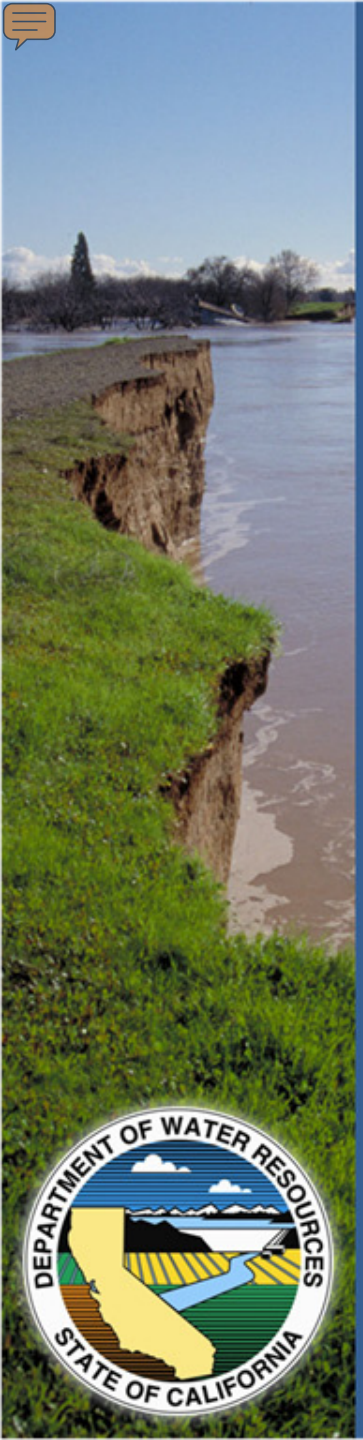


I need 4 maps in the next hour and someone needs to know what County Hamilton City is in.



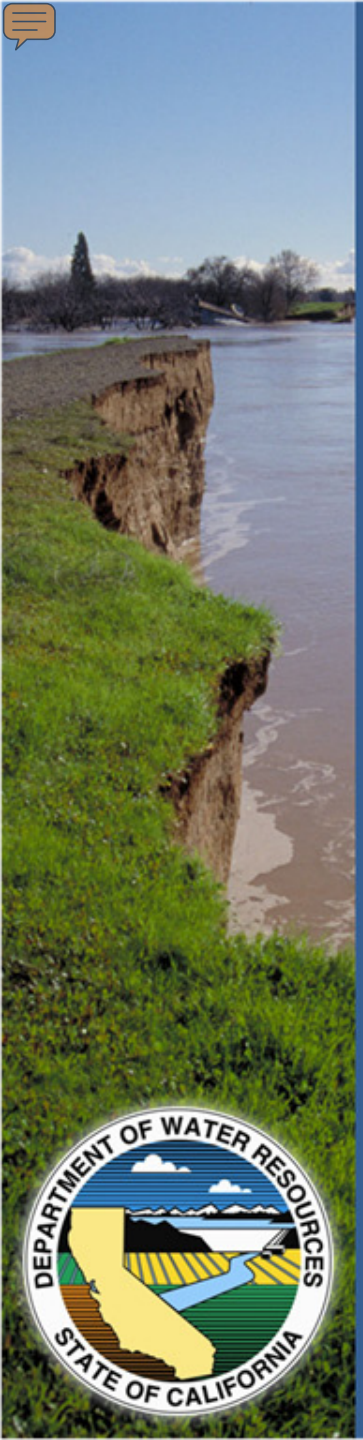
Purpose

- We all work differently, standardizing is good.
- We have a need.

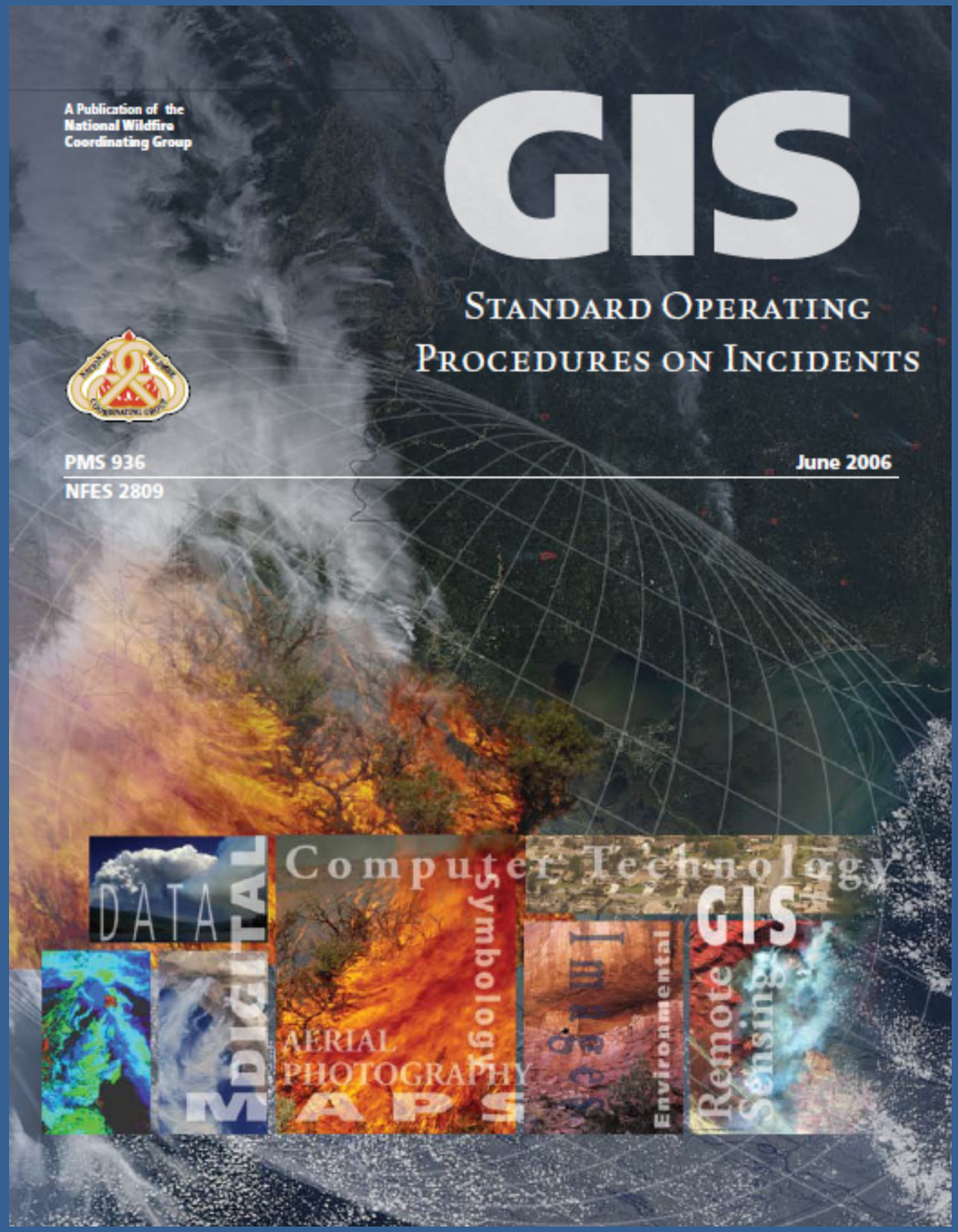


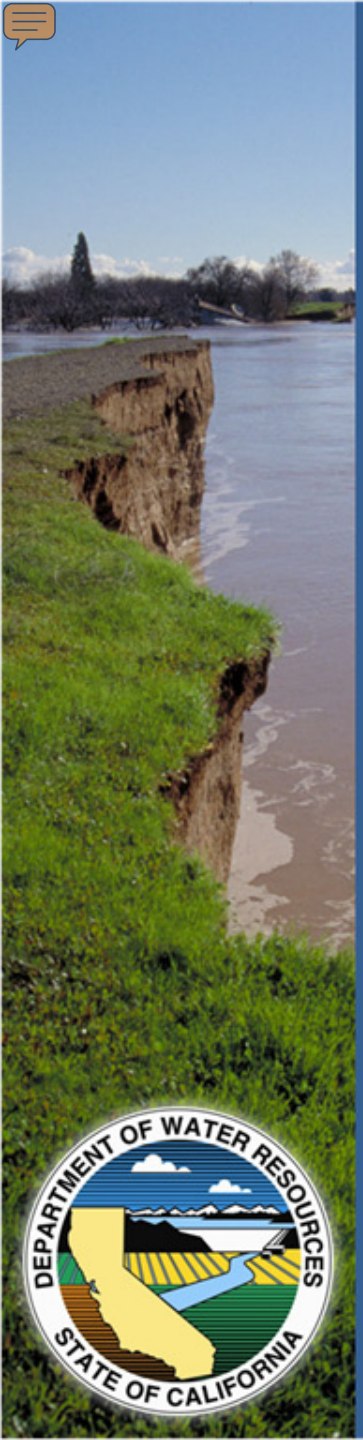
Development History and Process

- Take something awesome
- Make it fit us
- Keep fixing
- Repeat

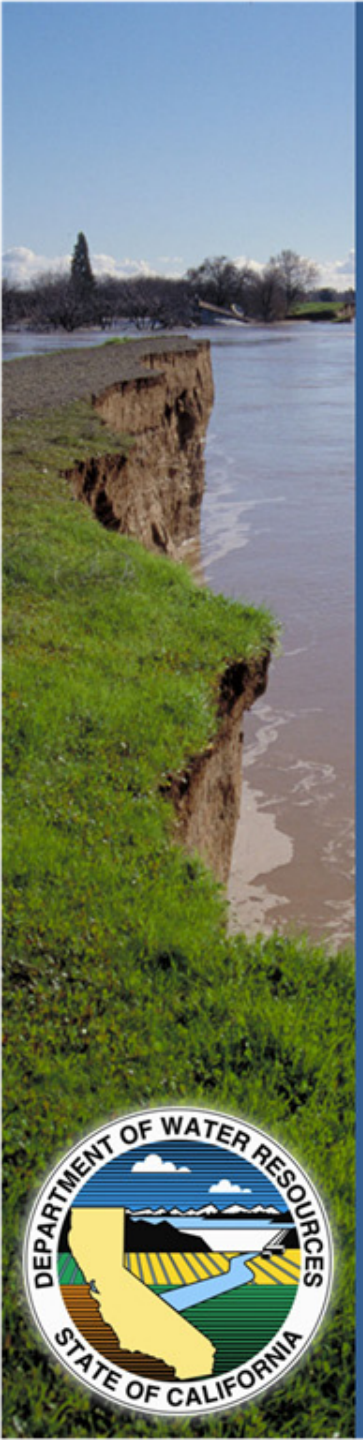


Imagine Angels Singing





Handy Dandy Toolbox



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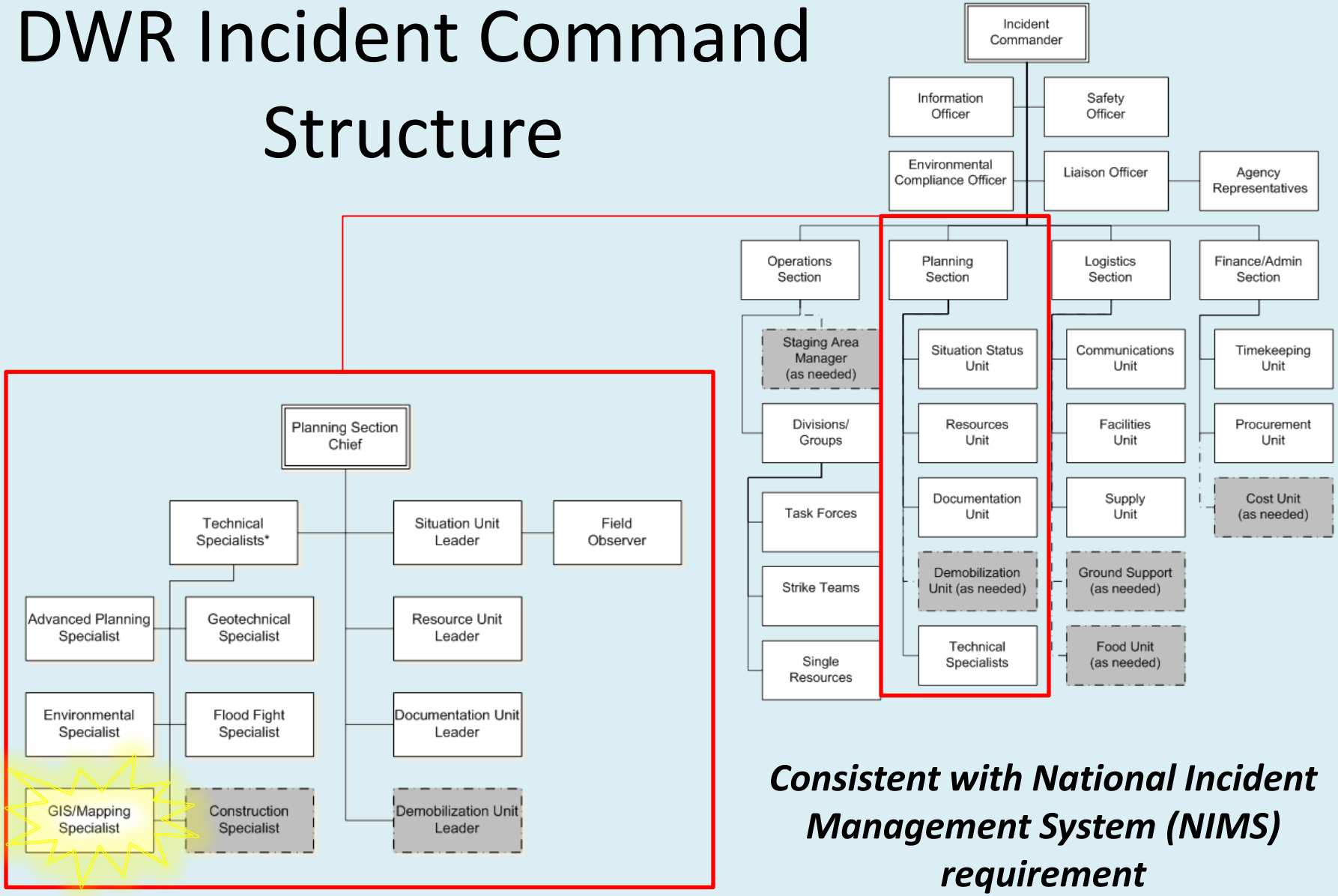
DWR Incident Command Structure



Consistent with National Incident Management System (NIMS) requirement

Bacon Island Road Incident
June 2004
(Jones Tract Flood)

Incident Response Activity

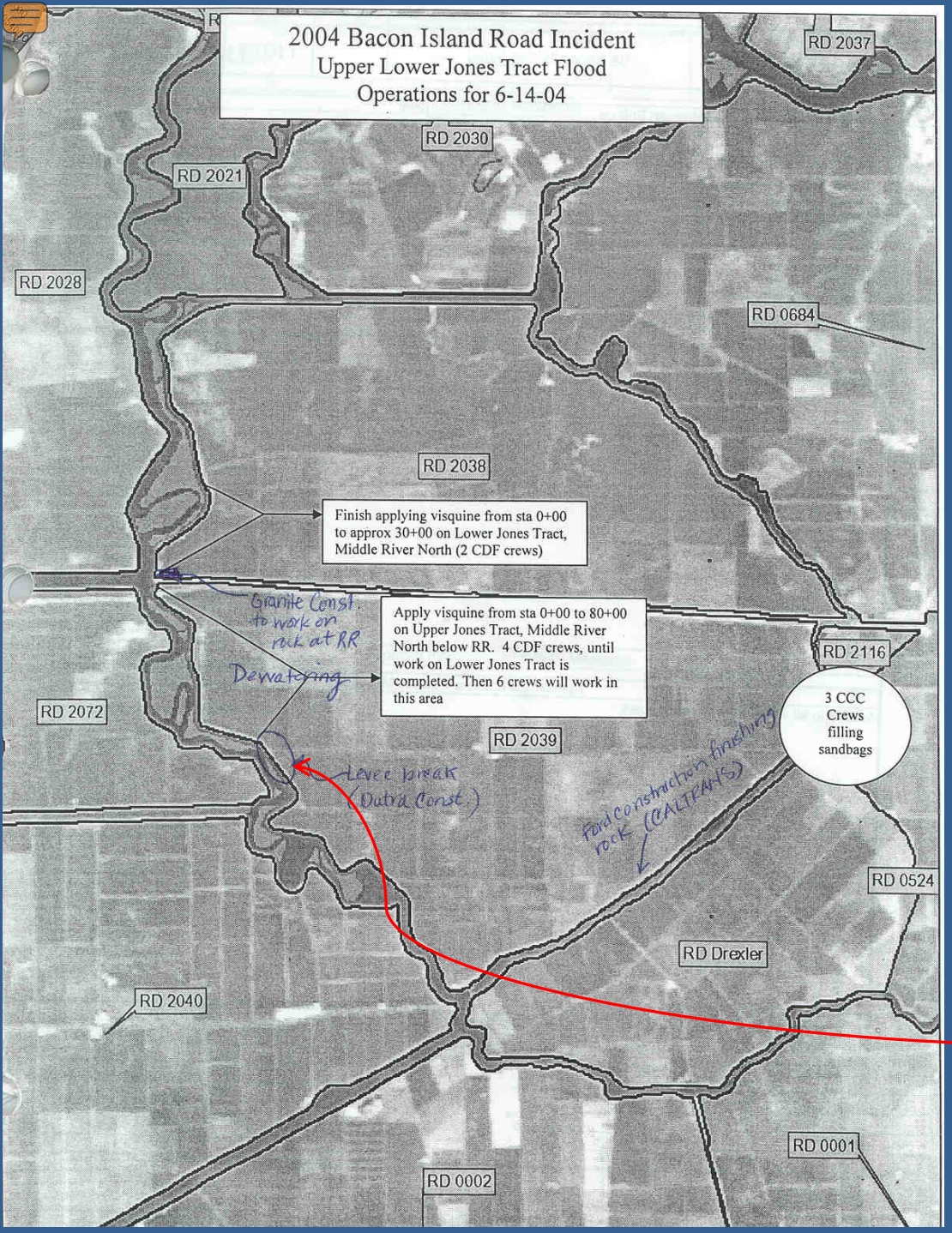
Incident Command Center

ICC Planning Meeting

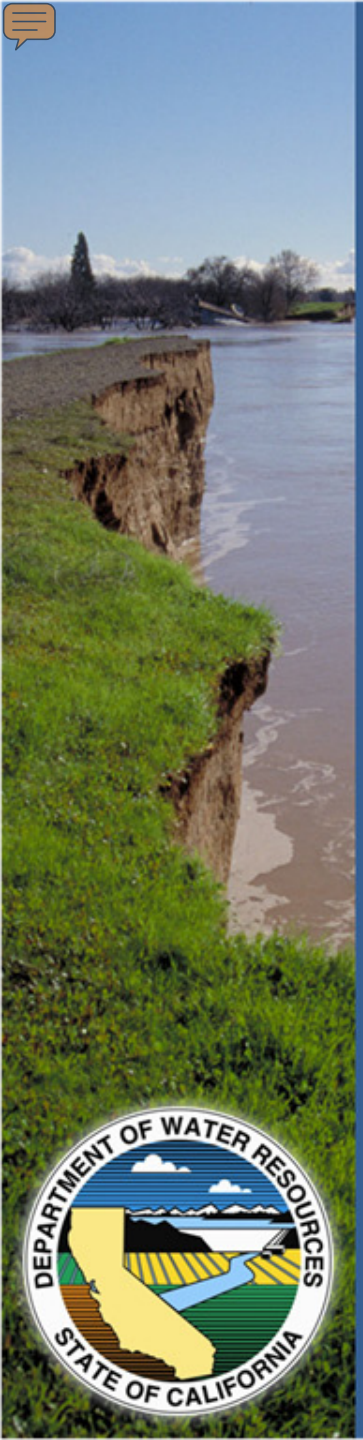
California Conservation Corps Crew Reinforces At-Risk Levee

McDONALD ISLAND
BACON ISLAND
SHERIFF CLOSURE
6/5/04
6/4/04
LOWER JONES
6/3/04
6/4/04
BNSF
WOODWARD ISLAND
UPPER JONES
BACON ISLAND ROAD
MAIN BREACH
N37 55.287
W121 31.033
6/3/04
6/5/04
FIRST DEFENCE
TRAPPER SLOUGH
FLOOD FIGHT
DREXLER TRACT
ROBERTS ISLAND
THIRD DEFENCE
LAST STAND
SECOND DEFENCE
DREXLER TRACT

Incident Action Plan map created from background image and MS Word graphics

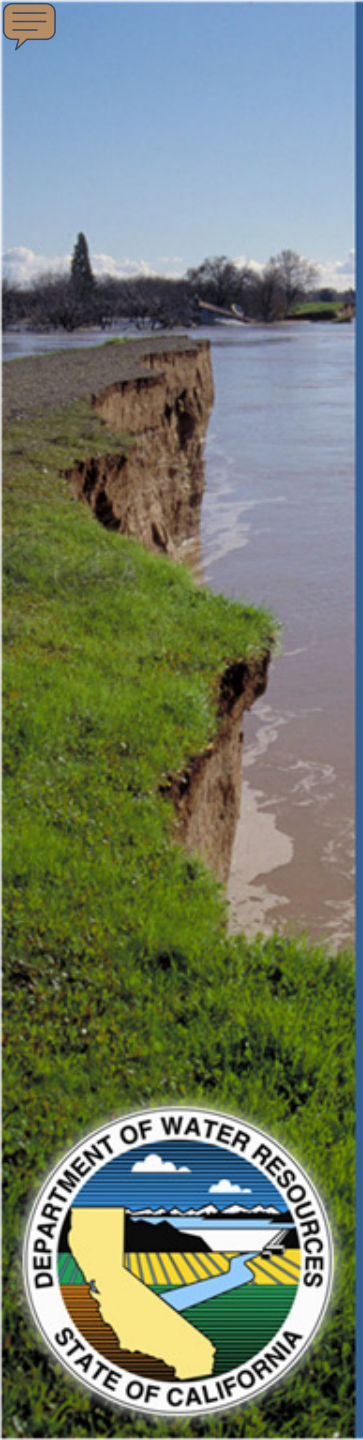


Crane mounted on barge places rock to fill the breech



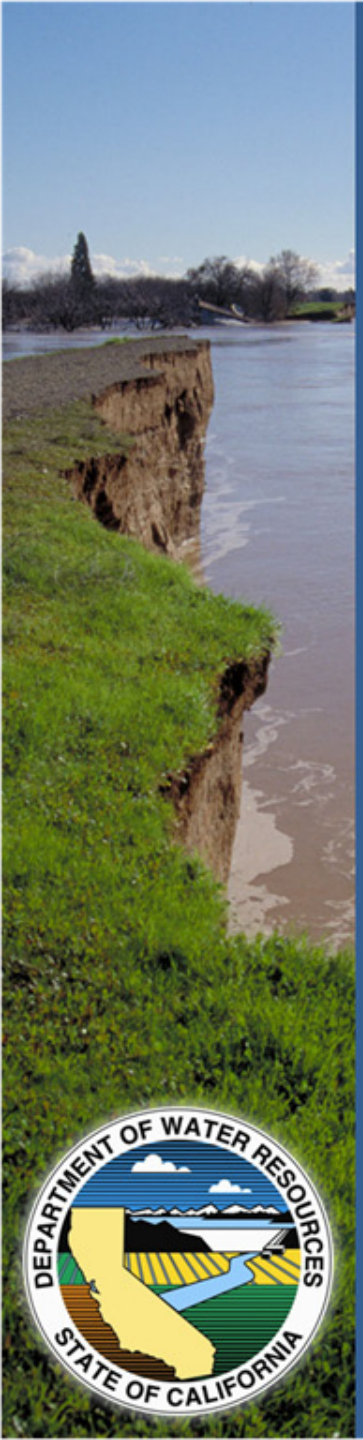
Then (2004)

- No internet connectivity
- Limited cell phone coverage
- Limited computer hardware
- No GIS software available
- Data acquired via CD, flashdrive, paper, and phone calls
- IC planning staff recruited on-the-fly, no advance training
- Planning Section staff worked 14+ hour shifts to produce daily Incident Action Plan



Now (2012)

- 3 communication trailers staged to provide instant connectivity
- ArcGIS pre-installed on dedicated laptops
- GIS data pre-loaded on hard drives
- 6 Incident Command Teams formed
- Periodic readiness exercises
- Annual GISS training course established
- DWR Field Operations Guide map symbology updated
- GISS Standard Operating Guidelines written
- GISS are ready for the next flood



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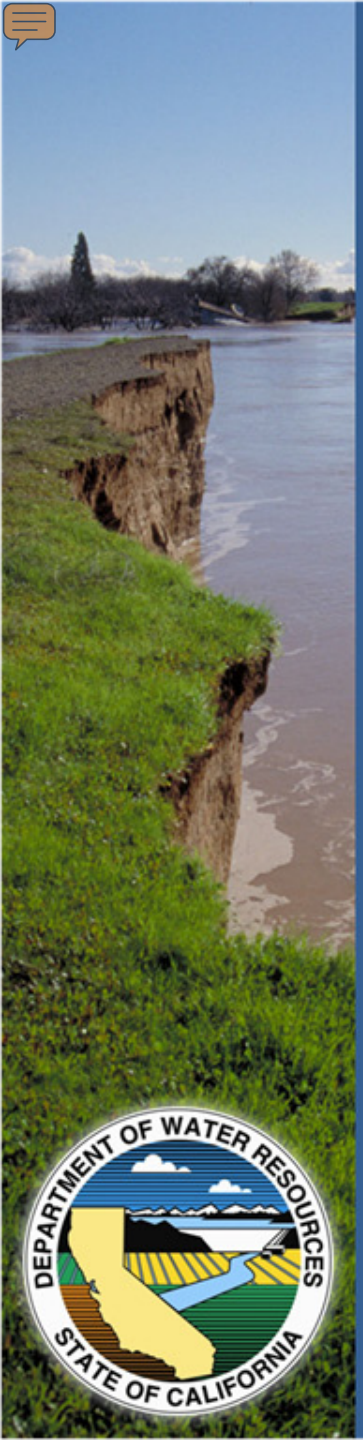
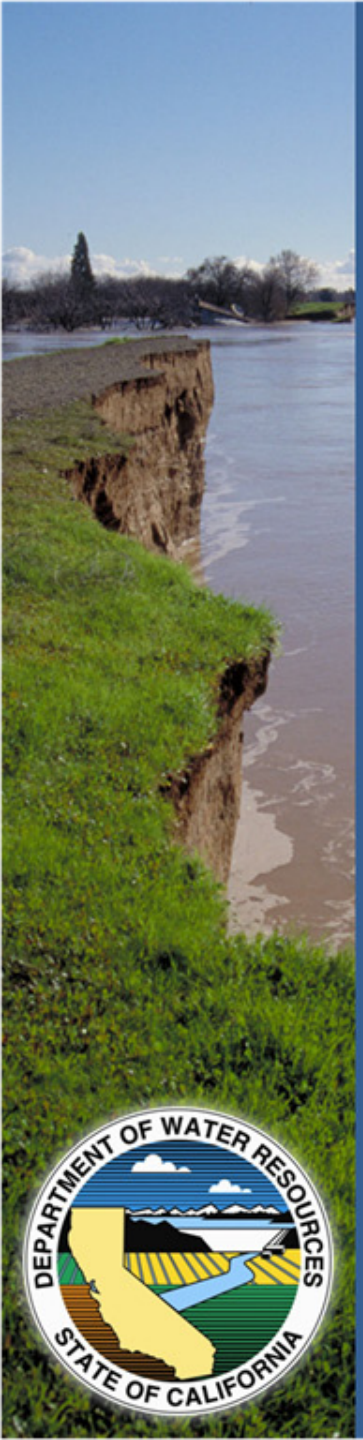


Flood Fight Data Needs

- Hydrography
- California Levee Database
- Civil boundaries
- Transportation and Infrastructure
- Elevation (high resolution)
- Environmental (sensitive habitats)
- USGS Topo Maps and NAIP Imagery for basemaps
- Weather Reports and Tide Tables

Emergency Response GIS Subcommittee meets throughout the year with staff of DWR's Division of Flood Management



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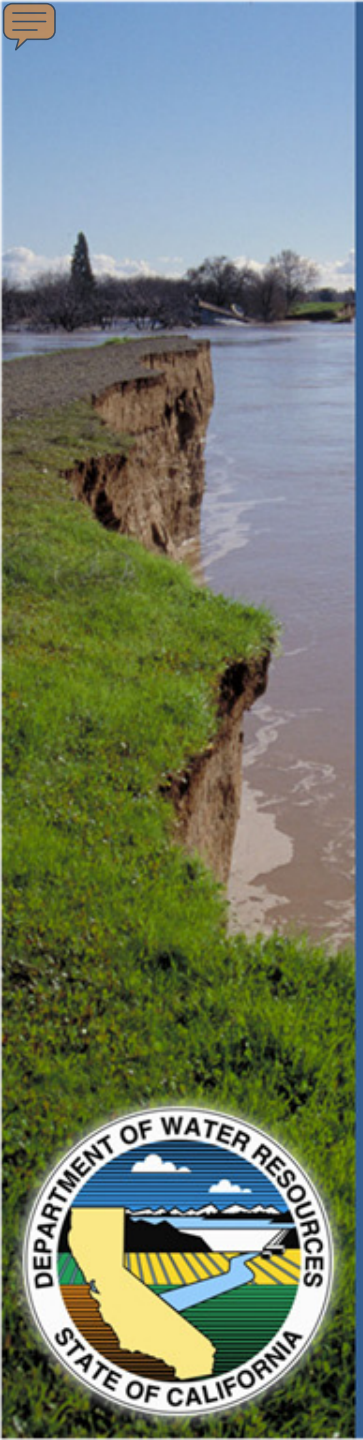
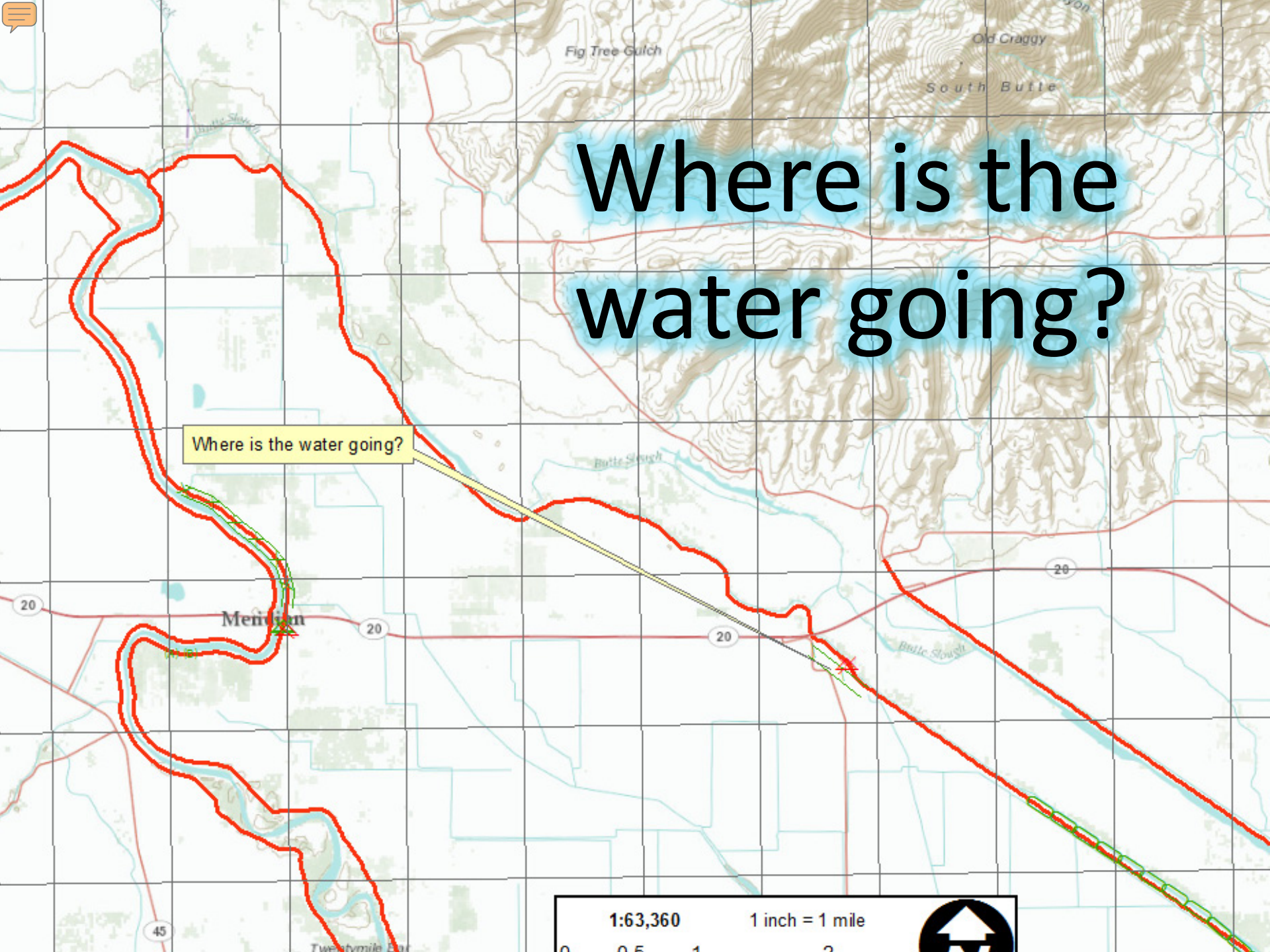


"I know what GIS can do. I don't just want maps; I want answers."

DWR Plans/Intel Chief

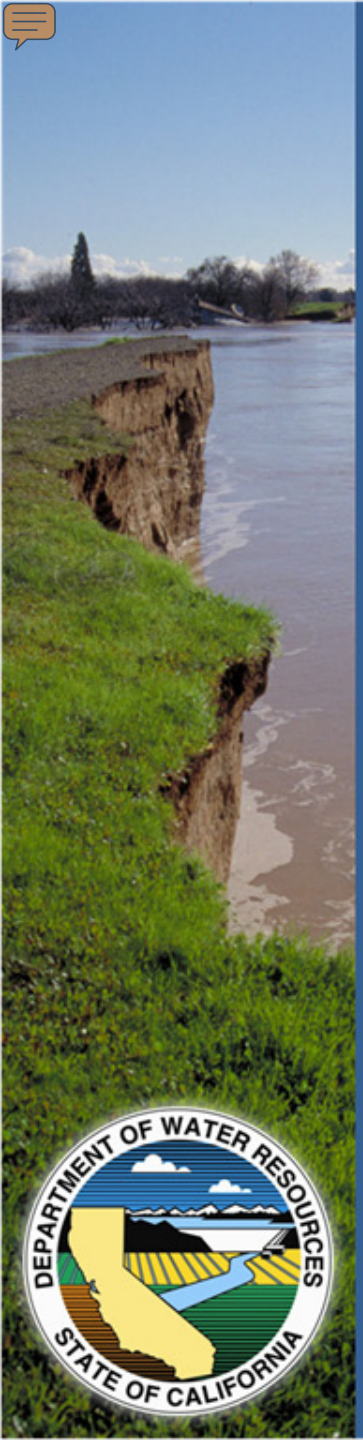
Where is the water going?



Who are at risk?

Vulnerable Populations

What is at risk?
Critical Infrastructure



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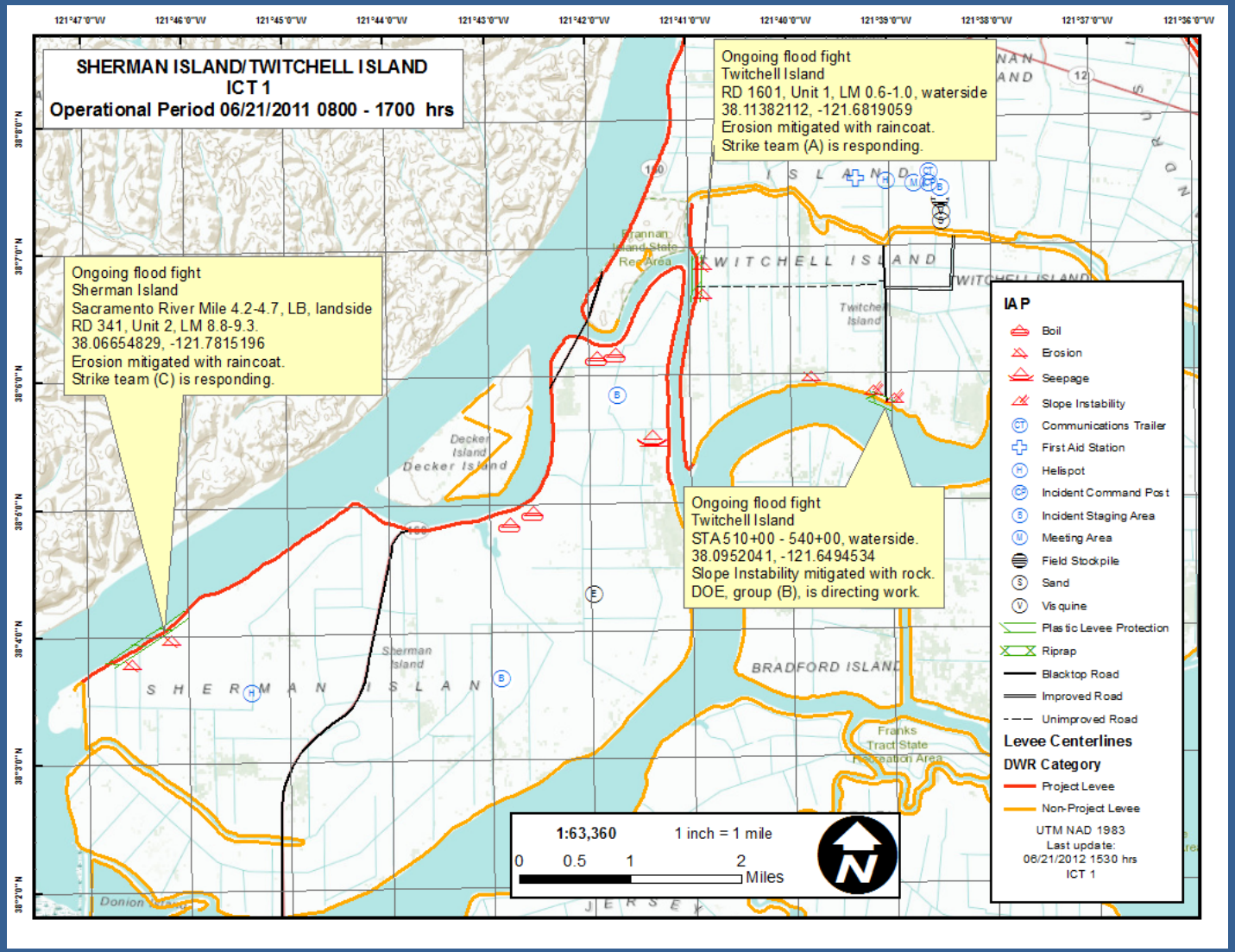
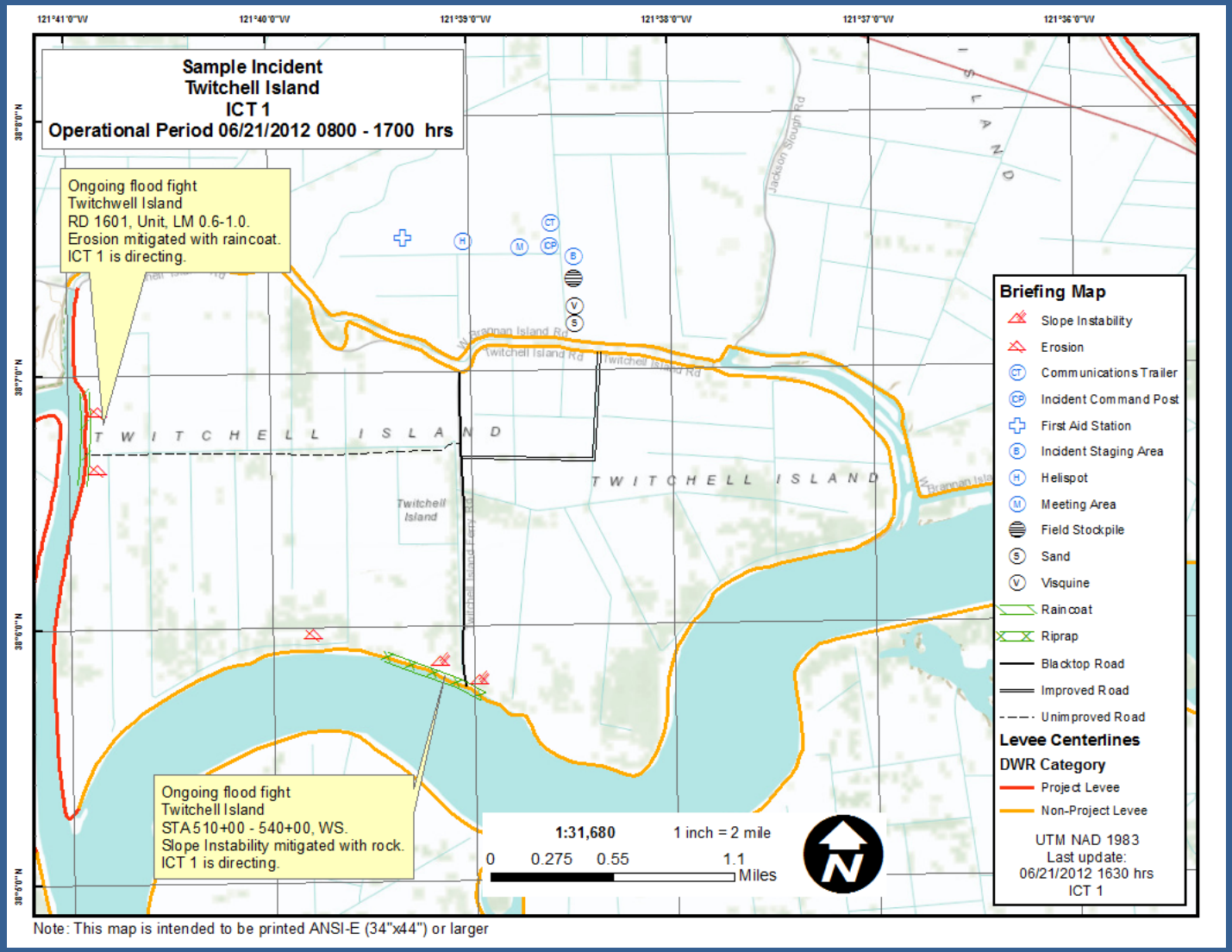
Incident Action Plan Map

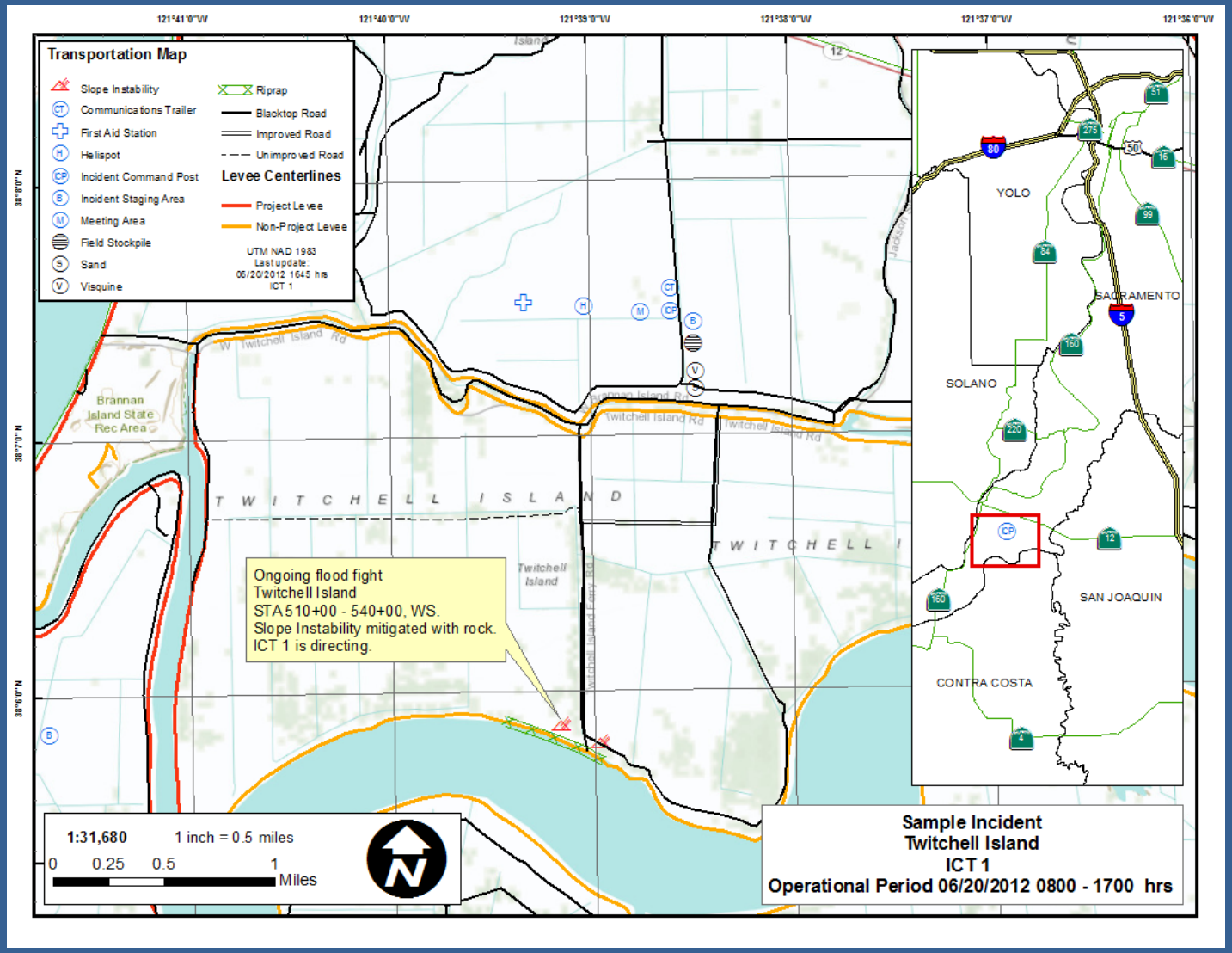


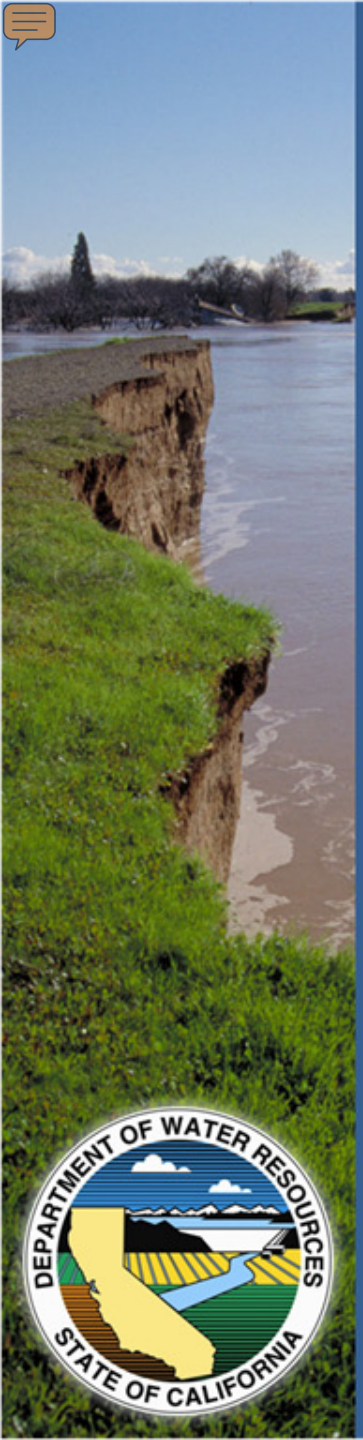
Briefing Map



Note: This map is intended to be printed ANSI-E (34"x44") or larger

Transportation Map





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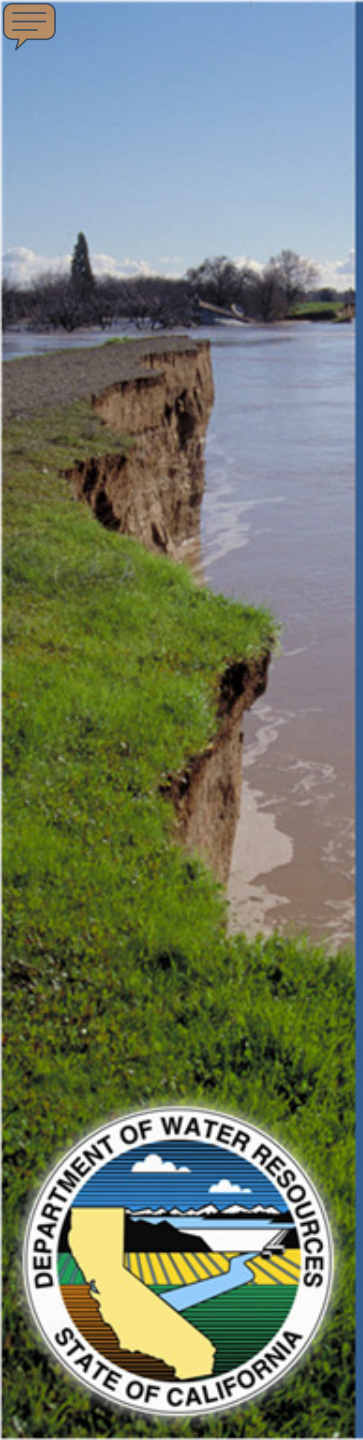
Common Operating Picture



Incident Geodatabase

Administrative Symbols

- ICP — Incident Command Post
- B — Incident Staging Area
- H — Helispot
- T — Telephone
- CT — Cellular Telephone
- M — Meeting Area
- mph — Wind Direction and Speed
- First Aid Station

Access Route Symbols

- Unimproved Road
- Improved Road
- Blacktop Road

Problem Symbols

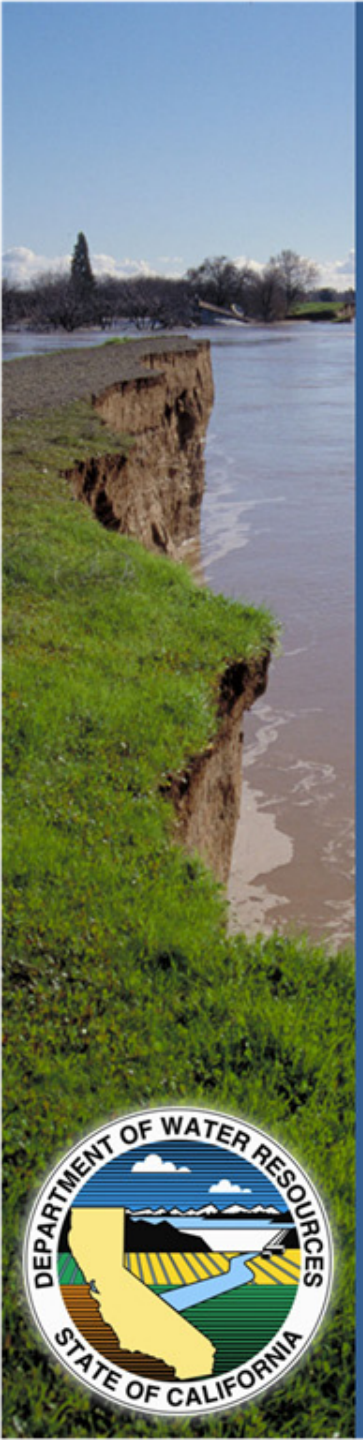
- Levee
- Levee Break
- Boil
- Overtopping
- Subsidence
- Erosion
- Seepage

Solution Symbols

- (A) (B) — Groups
- Riprap
- Visqueen
- Sandbag Wall
- Temporary Levee
- Relief Levee Cut

Supply Symbols

- Field Stockpile
- E — Empty Sandbags
- F — Filled Sandbags
- S — Sand
- V — Visqueen



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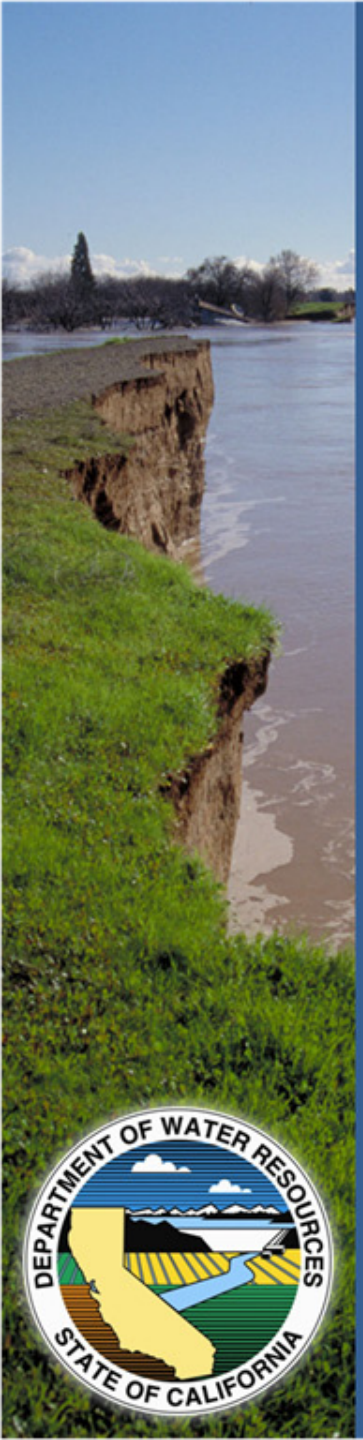
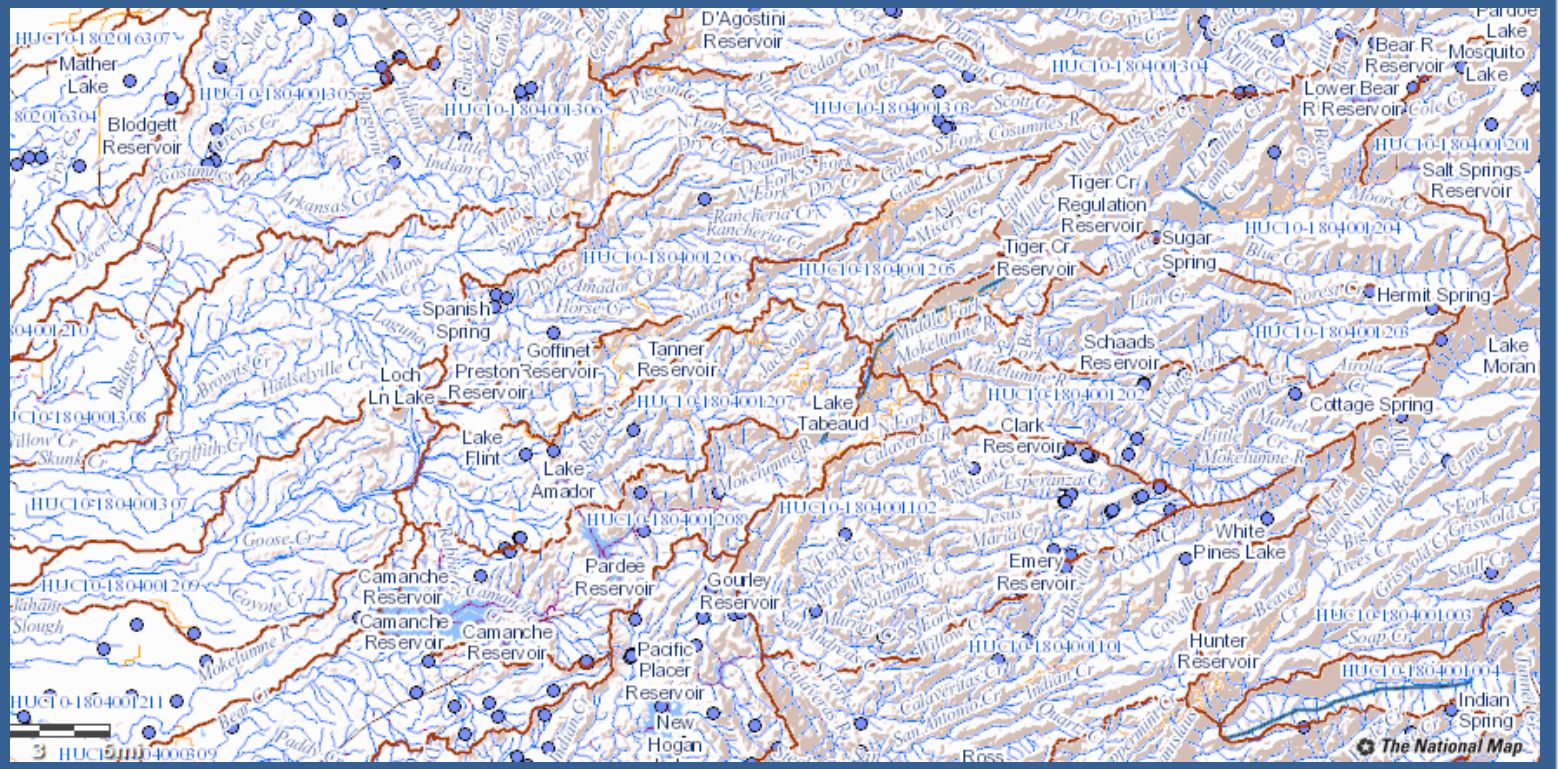


Questions?

Shameless NHD Plug from Christina



*The National Hydrography dataset is always relevant and important. You should support it!