Flood Fighting Methods Training

Forward:

The California Department of Water Resources (DWR), Division of Flood Operations has been tasked to prevent, reduce, and mitigate the risk of damages associated with flooding. DWR is the lead state agency responsible for responding to flooding. Our mission is to prevent loss of life, damage to property, infrastructure, and the environment. The Flood Fighting Methods taught in this class have been field tested by DWR, United States Army Corps of Engineers, and local agencies through many flood seasons on flood-related emergencies.



Objective:

This training is given by DWR free of charge, and we will come to your facility for the training. The training is broken into two portions, the morning in the classroom and outside in the afternoon for a hands-on portion. You will learn the threats to levees and how to identify them during highwater, and the mitigation needed for a successful flood fight.



Morning Session held in the classroom, levee threats and how to mitigate them is covered:

- Seepage through or under the levee heavy enough to cause a boil.
- Erosion of the levee or embankment due to swift moving water or wave action.
- Overtopping resulting from water-surface elevations higher than the levee or embankment.
- Flood Fight Safety.



Afternoon Session held outside is hands-on building structures for mitigation:

- Filling, passing, and placing sandbags.
- Sandbag structures; Full and half pyramid and boil sack rings.
- Wavewash, Muscle Wall, Sox Fence, and more.
- Crew management and working with CalFire & CCC's.

To schedule your Flood Fighting Methods training and additional information contact your Levee Inspector or DWR Flood Operations Center at (916) 574-2619

Available Resources:

- Flood Fighting Methods (youtube.com)
- State-Federal Flood Operations Center
  (916) 574-2619
  flood_center@water.ca.gov
- DWR Division of Flood Management
  https://water.ca.gov/Programs/Flood-Managment
- California Data Exchange Center (CDEC) National Weather Service
  https://CDEC.water.ca.gov
- California Governor's Office of Emergency Services
  www.caloes.ca.gov
- National Weather Service
  www.weather.gov
  California Nevada River Forecast Center (CNFRC) www.cnrfc.noaa.gov
- To request a copy of the Directory of Flood Officials or Flood Emergency Phone Card, contact the DWR Flood Operations Center at (916) 574-2619.

Flood Operations Section

The mission of the Department of Water Resources (DWR) Division of Flood Operations (DFO) is to safeguard California through integrated flood management solutions that are data-driven, climate-informed, innovative, equitable, and forward-looking—while supporting water management through forecasting and technical expertise. The Flood Operations Section (FOS), part of the DFO, plays a critical role in safeguarding communities from flood-related hazards and enhancing California's resilience to flood events. This document provides an overview of the FOS, its operational structure, and preparedness efforts.

Overview

The FOS, located at the Joint Operations Center in Sacramento, is part of the DFO Hydrology and Flood Operations Branch. The FOS is comprised of three operational Units. Units have distinct responsibilities for forecasting, managing, and responding to flood-related emergencies.

State-Federal Flood Operations Center (FOC): Part of the FOS, the FOC oversees statewide and regional emergency preparedness and response efforts. This includes managing emergency operation plans, flood emergency response, and related grant projects.

The FOC responds to emergencies such as high-water events, flooding, levee issues, and severe storms. Key functions include:

- Providing 24/7 technical and direct assistance to local jurisdictions during high-water events or floods.
- Continuously acquiring and distributing flood forecasts and high-water alerts to assist with decision making.
- Deploying specialized teams and materials for flood response.
- Coordinating with local, State, federal and tribal partners to prepare and respond to flood emergencies.

Eureka Flood Center: The Eureka Flood Center is a key component of DWR's coordinated flood warning program with the National Weather Service and the California-Nevada River Forecast Center. The Eureka Flood Center is staffed year-round and gathers, analyzes, and disseminates flood information on the North Coast. It maintains readiness of the local flood warning network by Coordinating North Coast flood operations, emergency response planning, and emergency response outreach.

Statewide Flood Response Unit (SFRU): The SFRU works with local, State, and federal agencies to coordinate emergency response logistics and offer technical assistance. Its primary functions include:

- Supporting DWR's incident management teams through regular training focused on equipment, materials, and the incident command structure.
- Providing required emergency response and equipment training, including SEMS/NIMS/ICS, PPE use, inventory management, and participation in multi-agency exercises.



Regional Flood Preparedness Unit (RFPU): The RFPU plays a critical role in the Sacramento-San Joaquin Delta region by administering the Delta Flood Preparedness, Response, and Recovery Program. The RFPU's primary efforts include:

- Managing grant programs that assist local agencies in developing flood preparedness plans, conducting local responder training, and procuring flood fight resources.
- Developing the DWR Delta Flood Emergency Management Plan.

Food Emergency Response

During emergencies, the FOS uses the Standardized Emergency Management System (SEMS), a unified framework to effectively management emergency response activities in California. Emergency response activities within the FOS include, but are not limited to:

Weather and Hydrologic Forecasting: As major storm systems approach, forecasting data predicts the severity of high-water threats to determine response strategies. The FOC notifies partner agencies and downstream affected areas if water levels are forecast to reach or exceed predetermined stages.

Activation: To prepare for extended efforts to respond to high water threats, the FOS may activate the FOC to Level 1, 2, or 3, based on the severity of the flood threat – Level 3 (Enhanced Monitoring) being the lowest level, Level 2 (Partial Activation), and Level 3 (Full Activation) being the highest level.

Contact the DWR Flood Operations Section
24-Hours (916) 574-2619
flood_center@water.ca.gov
3310 El Camino Ave., Suite 200
Sacramento, CA 95821



Incident Management Teams

There are seven Incident Management Teams (IMTs) that can be deployed by the FOC Operations Coordinator. The IMTs, based in regional offices in Red Bluff, Sacramento, West Sacramento, Fresno, and Glendale are composed of engineers, environmental specialists, and administrative staff, and operate under the SEMS/NIMS/ICS structure. Once deployed, either in full or in part by the FOC director, IMTs provide technical analysis and assist with local flood fight efforts. During the rainy season, they maintain situational awareness of flood risks and may remain activated up to two weeks, managing incidents in coordination with the FOC.

Planning and Preparedness

Units in the FOS work year-round to plan and prepare for high-water threats, floods, and severe storms. Efforts include:

Annual Preseason Flood Coordination meetings: Sharing updates and resource information related to regional and local flood preparedness and response activities.

Delta Working Group: Regular meetings focused on information sharing among emergency response organizations across the Sacramento-San Joaquin Delta region.

Delta Levees Habitat Advisory Committee: Monthly coordination meetings discussing habitats near rivers, streams, lakes, ponds, and wetlands as it relates to levee operations and maintenance.

Direct Funding: Administering grant programs to enhance regional flood emergency preparedness and response by developing emergency response plans, supplying flood-fight materials, conducting emergency management training, and funding emergency response exercises Since 2012, FOS has provided $50 million to local agencies funded by Proposition 84, 1, and 1E.

Flood Fight Material Stockpiles and Emergency Materials Transfer Facilities (EMTFs): Overseeing the strategic management of flood fight materials across the state to ensure rapid and effective emergency response. DWR has pre-positioned large stockpiles of rock and steel at its Stockton and Rio Vista EMTFs. These sites support material transfers by truck, barge, or helicopter, and are replenished after use during flood fights, channel closures, or breach repairs. The Stockton Facility holds a substantial inventory for flood response, including over 2.8 million sandbags, nearly 3,000 plastic rolls, and more than 90,000 tons of rock. The Rio Vista site maintains a smaller but critical supply. These materials support rapid deployment during Delta emergencies and are essential for levee stabilization and flood control.

Training and Exercises: Training personnel on proper use of flood-fighting materials, equipment, and the incident command system. Conducting tabletop and functional exercises to evaluate emergency plans, procedures, and coordination among emergency operations centers and incident management teams.



Emergency Plans and Guidance

The FOS leads efforts to update and maintain flood emergency planning and guidance documents. Such documents include:

- PL84-99 MOU DWR/USACE updated in 2024.
- DWR/USACE Delta Flood Emergency Operations Integration Plan (2024).
- Delta Emergency Levee Breach and Channel Closure Guide (Delta BCC) 2024.
- Delta Flood Emergency Management Plan.
- Cal OES Northern California Catastrophic Emergency Response Plan.
- DWR FOC Flood Emergency Operations Manual.



California State-Federal Flood Operations Center

The mission of the Department of Water Resources (DWR) Division of Flood Operations (DFO) is to safeguard California through integrated flood management solutions that are data-driven, climate-informed, innovative, equitable, and forward-looking—while supporting water management through forecasting and technical expertise. The State-Federal Flood Operations Center (FOC), part of the DFO, manages DWR's flood emergency response by centrally coordinating statewide flood response efforts. This document provides an overview of the FOC, its operational structure, training efforts, and response activities.

Overview

The FOC, located at the Joint Operations Center in Sacramento, is part of the DFO Hydrology and Flood Operations Branch. The FOC manages the implementation of DWR's statewide and regional emergency preparedness and response program, including emergency operations plans, flood emergency response, and grant projects. Emergencies the FOC responds to include high water and flooding, levee issues, and large or intense storms. FOC functions include, but are not limited to:

- 24-hour response coverage and technical assistance for incoming flood emergencies throughout the year.
- Year-round acquisition, analysis, and distribution of flood forecasts, high water notifications, and other water-related information to partner agencies, news media, and the public.
- Gathering and disseminating information on forecasts, flood systems, and emergency contracts.
- Deploying Flood Fight Specialists and Incident Management Teams and supplying flood fight materials.



The FOC works with federal, State, and local agencies including NWS, USBR, USACE, USGS, FEMA, CalOES, CAL FIRE, CCC, OAs, and LMAs.

Eureka Flood Center

The FOC and the Eureka Flood Center are key components of DWR's coordinated flood warning program with the National Weather Service and the California-Nevada River Forecast Center. The Eureka Flood Center is staffed year-round and gathers, analyzes, and disseminates flood information on the North Coast. It maintains readiness of the local flood warning network by Coordinating North Coast flood operations, emergency response planning, and emergency response outreach.

For more information on the State-Federal Flood Operations Center
24-Hours (916) 574-2619
flood_center@water.ca.gov
3310 El Camino Ave., Suite 200
Sacramento, CA 95821-9000

Planning & Preparedness

The FOC proactively engages in a series of preseason preparedness activities to enhance its readiness for the upcoming flood season, including:

- Cohosting annual Preseason Flood Coordination meetings across the state along with NWS and County Offices of Emergency Services to share valuable resources and updates on regional and local flood preparedness activities.
- Coordinating with CalOES and local agencies to secure and preposition essential flood fighting materials statewide.

Providing weather and hydrology briefings as needed during flood season (Oct 15 – Apr 15).

Flood Emergency Operations Manual: This manual outlines the coordination of internal and external agencies at the FOC during high water events. It offers a general overview for FOC staff and provides high-level descriptions for staffed positions.



Training & Exercises

The FOC conducts regular training and exercises to strengthen the FOC's capacity for emergency preparedness and response. Training covers flood fighting methods, emergency management plans, ICS, and SEMS positions within the FOC, field personnel, and IMTs. The FOC also participates in dam emergency action plan meetings, tabletops, and functional exercises.



Flood Emergency Response

During emergencies, the FOC uses the Standardized Emergency Management System (SEMS), a unified framework to effectively manage emergency response activities in California. Emergency response activities at the FOC include, but are not limited to:

Forecasting and High-Water Notifications: Forecasting data is used to predict the severity of a high-water threat and determine response strategies. Forecasters from the National Weather Service and DWR issue forecasts at least once daily, increasing the number of river forecasts as major storm systems approach. If water levels are forecast to reach or exceed predetermined stages, the FOC notifies partner agencies and downstream affected areas, and prepares for potential FOC activation. Staffing levels at the FOC are adjusted to ensure coverage during critical high-water periods.

Activation: Forecasted storms may require extended efforts to respond to high water threats. To address statewide needs, the Flood Operations Section (FOS) may activate the FOC to a Level 1, 2, or 3, with Level 3 (enhanced monitoring) being the lowest activation level. Activating at a Level 2 enables DFO to utilize any DWR personnel to assist with response efforts, where a Level 1 activation enables DFO to utilize personnel from any state agency, as needed.

Technical or Direct Assistance: The FOC coordinates requests for assistance, by deploying DWR Flood Fight Specialists and/or Flood Fight Materials to support local flood fight statewide.

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Regulatory Program
El Niño Emergency Activities

October 2026

With an expected prolonged El Niño event in 2026/2027, the U.S. Army Corps of Engineers, Sacramento District (Corps) understands that State, local entities, and others will need to conduct emergency activities in waterways, including actions that involve work or structures in navigable waters under Section 10 of the Rivers and Harbors Act of 1899 (RHA) and/or discharges of dredged or fill material in waters of the United States under Section 404 of the Clean Water Act (CWA).

Under the Corps' Regulatory Program, there are a number of options available for those needing to conduct activities in waterways during an emergency situation.

1. No Department of the Army Permit Needed. Many emergency activities conducted in waters of the U.S. do not require a Department of the Army (DA) permit because they do not constitute work or structures in navigable waters or involve a discharge of dredged or fill material into waters of the U.S. Two common activities, cutting or mowing vegetation and excavating sediment from a non-navigable waterway with a backhoe and depositing the material in an upland area (and no water returning to the waterway) are not regulated by the Corps under Section 404 of CWA. There is no requirement to notify the local Corps District before proceeding with work that does not need a DA permit.

2. Maintenance Exemption under Section 404(f) of the Clean Water Act. Section 404 of CWA provides exemptions from the need to obtain a DA permit for certain types of activities. One exemption covers the reconstruction of recently damaged parts, of currently serviceable structures like dikes, dams, levees, riprap, bridge abutments or approaches, and transportation structures. Emergency reconstruction must happen within a reasonable period of time after damage occurs to qualify. Note there are no exemptions from a DA permit under Section 10 of the Rivers and Harbors Act. There is no requirement to notify the local Corps District before proceeding with the work for activities exempt under Section 404 of CWA.

3. Regional General Permit 8 (Emergency Repair and Protection Activities). Most emergency activities in waters of the U.S. not covered by the exemption above may be verified under the Sacramento District's Regional General Permit 8, *Emergency Repair and Protection Activities* (RGP8). RGP8 authorizes activites under Section 404 of the CWA and Section 10 of RHA necessary for the repair or protection of existing structures, facilities, or fills during an emergency situation where there is an unacceptable hazard to life, a significant loss of property, or an immediate, unforeseen and significant economic hardship if corrective action is not undertaken within a time period less than the normal time to process the request under standard procedures. RGP8 requires the Sacramento District to be notified in advance. The Sacramento District normally verifies an activity under RGP8 in writing within 48 hours.

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4. Nationwide Permit 3 (Maintenance). For activities not covered above, Nationwide Permit 3, *Maintenance*, (NWP3) authorizes the repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure or fill, or of any currently serviceable structure or fill, provided the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or the most recently authorized modification. Minor deviations in the structure's configuration or filled area, including those due to changes in materials, construction techniques, requirements of other regulatory agencies, or current construction codes or safety standards that are necessary to make the repair, rehabilitation, or replacement are authorized. NWP3 also authorizes the removal of accumulated sediments and debris in the vicinity of existing structures and/or the placement of new or additional riprap to protect the structure. NWP3 requires the local Corps District be notified in advance when activities involve the removal of accumulated sediments or debris. Non-maintenance emergency activities may be covered by other Nationwide Permits, some of which do not require advance notification to the Corps.

5. Emergency Procedures. In rare circumstances, activities not covered by the exemption under Section 404 of CWA or authorized under RGP8 or NWP3 (or other NWP) may be processed through the Corps' emergency procedures. Once approved by higher headquarters, emergency procedures allow the local Corps District to expeditiously make a permit decision following coordination with state and federal agencies. After the event, a public notice is issued and any necessary consultations are completed. The procedures require the submission of a complete application for a standard DA permit to the Corps.

The Sacramento District stands ready to advise and assist State, local agencies, and others before, during, and after an emergency event about when a DA permit may be needed. When authorization is necessary, the requester should use the Regulatory Request System (https://rrs.usace.army.mil/rr). Should there be any questions, please contact the Sacramento District Regulatory Division at (916) 557-5250 or SPKRegulatorymailbox@usace.army.mil. You can also visit the Sacramento District website at https://www.spk.usace.army.mil/.

(5. Rehab Program continued)

Under PL 84-99, the Chief of Engineers, acting for the Secretary of the Army, is authorized to undertake activities including rehabilitation of flood control works threatened or destroyed by flood.

- Eligible levee systems are repaired to pre-disaster condition.
- Federal levee systems are repaired at no cost to the owner/public sponsor, and at 20% cost to the eligible non-Federal system owner / public sponsor.
- For eligibility for Rehabilitation Assistance, must be in an Active status at the time of damage from a flood or coastal storm event.
- To gain an Active status, a non-Federal levee system must meet certain engineering, maintenance, and qualification criteria, as determined by the Corps.
- To retain an Active status, Federal and non-Federal levee systems must continue to meet inspection criteria set by the Corps, as determined by the Corps during Continuing Eligibility Inspections (CEI). All levee systems not in an Active status are considered Inactive in the PL84-99 program and are therefore ineligible for rehabilitation assistance.

System-Wide Improvement Framework (SWIF). Levee sponsors can remain temporarily eligible for the PL 84-99 Rehabilitation Program while addressing issues with their levee. Levee sponsors will be required to develop a plan to address issues with their levee and demonstrate progress. Levee sponsors should contact their local USACE District for more information.

Stafford Act, PL 93-288 (FEMA) Emergency Support Function #3: Public Works and Engineering

USACE assists the Department of Homeland Security and FEMA by supporting public works and engineering. Typical ESF 3 assistance includes the following:

- ***Temporary Power.*** Provision of emergency power (generators) to public facilities.
- ***Temporary Roofing.*** Provision and installation of "Blue Tarps" to damaged houses and public buildings that have suffered roof damage and are subject to additional damage from wind and rain.
- ***Debris Management.*** Emergency debris clearance and removal and disposal management of debris from public property.
- ***Infrastructure Assessments.*** Assessments of damaged streets, bridges, ports, waterways, airfields and other facilities necessary for emergency access to disaster victims.
- ***Temporary Housing.*** Technical assistance to FEMA for temporary housing in support of displaced people in the impacted area, up to complete design, installation, and turnover to temporary housing facilities.
- ***Critical Public Facility.*** Emergency restoration of critical public facilities (including temporary restoration of water supplies and wastewater treatment systems).



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Emergency Assistance

Public Law (PL) 84-99 (USACE)
Stafford Act, PL 93-288 (FEMA)



Sacramento District

https://www.spk.usace.army.mil/

Emergency Management
cespk-eoc@usace.army.mil
(916) 557-6911

USACE Disaster Response

In the event of a natural or man-made disaster, the U.S. Army Corps of Engineers is prepared and ready to respond as part of the federal government's unified national response to disasters and emergencies. In any disaster, USACE's top priorities are:

- Save lives and protect property.
- Support immediate emergency response priorities for USACE, DoD, FEMA, and the Federal Government.



Public Law 84-99 (Section 5 of the Flood Control Act of 1941) (PL 84-99)

PL 84-99 is the USACE Emergency Management authority specific to natural disaster response. Under PL 84-99, USACE may undertake the following:

1) Disaster Preparedness. Disaster Preparedness consists of functions required to ensure that USACE activities are ready to respond to a broad range of disasters and emergencies. It includes coordination, planning, training, and exercises with key local, state, Tribal and Federal stakeholders/partners under USACE statutory authorities and in support of the Federal Emergency Management Agency (FEMA).

2) Emergency Operations. USACE responds to flood and storm-related disasters, when requested or tasked, and will activate its Emergency Operations Centers to command and control the operation; provide liaisons to FEMA, States, Tribes, and local governments; provide technical assistance and direct assistance for flood fighting; and conduct rescue operations.
Technical assistance includes advice on flood fighting methods and techniques, inundation mapping, flood modeling, and historical data.
Direct assistance includes the provision of sandbags, pumps, and other types of flood fight materials, and emergency contracting for raising and stabilizing threatened flood risk management projects.
Post Flood Response is a special authority intended to cover the gap (of up to 10 days) between the end of a disaster and the issuance of a presidential disaster declaration under FEMA Stafford Act authority, and can include actions to clear transportation routes, restore public transportation and critical public facilities, clear blocked water courses, and provide technical assistance.



3) Advance Measures. Advance Measures assistance may be provided in order to prevent or reduce damages when there is an imminent threat of unusual flooding. Technical Assistance may be provided to Tribes and States to help them plan and prepare for the threat. Direct Assistance may also be provided to provide materiel or execute a project. Advance Measures projects must be engineeringly feasible and capable of being constructed in time to meet the anticipated threat.

4a) Drought Assistance. Drought Assistance may be provided to drought distressed areas. Drought assistance includes technical assistance, well drilling in limited circumstances, and transportation (but not purchase) of water to drought distressed areas to make up for inadequate supplies of water.

4b) Emergency Water Assistance Due to Contaminated Water Source. Emergency Water Assistance may be provided when a locality is confronted with a source of contaminated water causing or likely to cause a substantial threat to the public health and welfare of the local inhabitants.

5) The Rehabilitation Program. The Rehabilitation Program provides for the inspection (during the Preparedness phase) and rehabilitation of Federal and non-Federal flood risk management projects damaged or destroyed by floods and coastal storms, levees in the Rehabilitation Program, and all projects must meet certain standards in order to be eligible for rehabilitation assistance.

FLOOD AWARENESS WEBSITES

SAVE THESE LINKS TO YOUR FAVORITES TODAY!

FLOOD EMERGENCY RESPONSE

- California Data Exchange Center (CDEC): cdec.water.ca.gov/
- California Nevada River Forecast Center (CNRFC): www.cnrfc.noaa.gov/
- Flood Emergency Response Information Exchange (FERIX): ferix.water.ca.gov/
- DWR Flood Preparedness Videos: www.youtube.com/watch?v=y_h18T9SxWI
- DWR Best Available Maps (BAM): gis.bam.water.ca.gov/bam/
- National Weather Service, Climate Prediction Center: www.cpc.ncep.noaa.gov/
- National Weather Service, Advanced Hydrologic Prediction Service: www.weather.gov/owp/oh_ahps
- National Weather Service, Flood Inundation Mapper: https://water.noaa.gov/
- U.S. Army Corps of Engineers (USACE), Water Control Data System: www.spk-wc.usace.army.mil/plots/california.html
- United States Geological Survey (USGS), National Water Information System Mapper: maps.waterdata.usgs.gov/mapper/index.html?state=ca
- United States Geological Survey (USGS), Flood Inundation Mapper: www.usgs.gov/tools/flood-inundation-mapper
- National Flood Insurance Program: www.floodsmart.gov/floodsmart/m

FLOOD ER DASHBOARD

FLOOD EMERGENCY RESPONSE











