



Northern California Catastrophic Flood Response Plan, June 2018

Overview

The Northern California Catastrophic Flood Response Plan (NCCFRP) provides a framework for the local, state, and federal response to a catastrophic flood affecting the Sacramento River Basin and the Sacramento-San Joaquin Delta Region in Northern California. This plan was developed in support of Senate Bill 27, the Sacramento-San Joaquin Delta Emergency Preparedness Act of 2008.

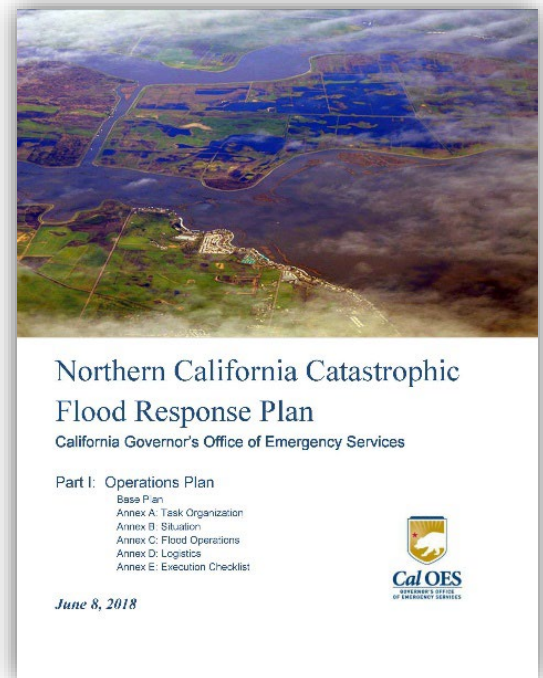
The NCCRP was a state-led planning effort in coordination with numerous state agencies including the California Department of Water Resources, federal agencies including the Federal Emergency Management Agency, local stakeholders, and ten counties in the planning area.

This planning effort is the first weather-based catastrophic flood plan and is the first to encompass a progressive hydrological (weather based) event. The planning objectives enable a phased response based on measurable conditions (triggers), focusing on executable strategies for state and federal agency support to affected communities.

The NCCFRP identifies flood and earthquake threats with in or out of flood zone. The NCCFRP is more than a Delta flood response plan and is designed for state/federal operations, planning, training, and exercises. The NCCFRP can be used for any type of flood event in the planning area and can be used as a model for county flood plans. A new catastrophic planning addition to the NCCFRP are tools for geographic operations (Operational Areas and Branch profiles). The January/February 2017 winter storms validated the NCCFRP phases, assumptions, and planning factors.

Impacted Counties

Butte, Colusa, Contra Costa, Glenn, Sacramento, San Joaquin, Solano, Sutter, Yolo, and Yuba.



Scenario

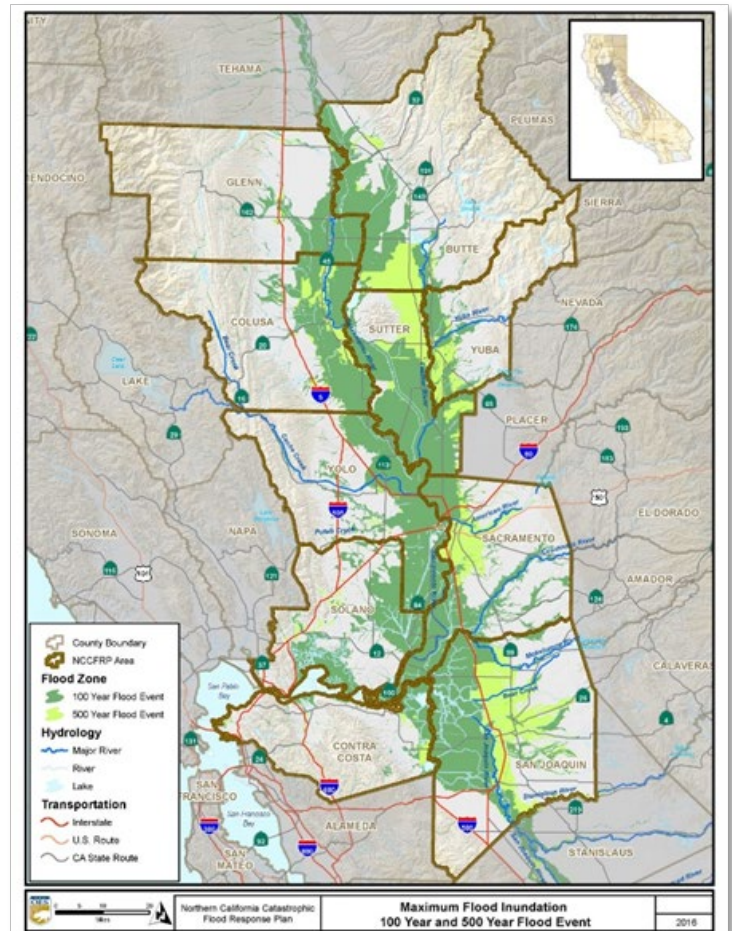
This plan centers around a severe weather event in Northern California causing catastrophic flooding and inundating a great portion of the Sacramento River Basin and the Delta Region in the Central Valley. Widespread evacuations would affect millions of residents along with local and state government agencies. Infrastructure restoration could take several months to years. Catastrophic flooding could significantly disrupt land and water commerce and cause more than \$100 billion in damages.

This plan is risk-based versus scenario-driven, utilizing the Flood Insurance Rate Map (FIRM) floodplains, under the National Flood Insurance Program. The FIRM maps identify the flood hazard zones for insurance and floodplain management purposes, but also provide a statement of probability of future occurrence. To determine the impact of a catastrophic flood, planners used a risk-based approach utilizing the FIRM 100- and 500-year floodplains in combination with the US Army Corps of Engineers 100- and 500-year comprehensive flood plain study. Both 100-year and 500-year flood plains were combined to create the 100- and 500-year event boundaries. A 100-year flood event is a flood that has a 1% percent chance of occurring in any given year, while a 500-year flood event has a 0.2% chance of occurring in any given year.

Threat

Winter storms that could produce catastrophic flooding generally occur in the winter months of January and February; however massive storms are a recurring feature of the state. Scientists have determined that the largest storms in California are the product of atmospheric rivers phenomenon or events such as El Nino, La Nina, and the ARkStorm scenario. Contributing factors such as burn areas, snowpack, and reservoir conditions/operations can amplify flood impacts.

Depending on the severity of high-water conditions, tides, wind and other factors, multiple levees could fail during a single high-water event. High water conditions can cause



Flood inundation in the Sacramento River Basin and Delta Region of the Central Valley.

Fact Sheet: Northern California Catastrophic Flood Response Plan

overtopping or failure of levees. Levee failure events are not exclusive to high-water events; dry weather or unanticipated levee failure events can also occur. Other threats to levees include coastal hazards (high and low tides), climate change, marine debris, and hazardous waste. Seismic risk to the Delta is moderate to high due to active faults in the San Francisco Bay Area. A massive failure of the Delta Region levee system would have significant adverse effects on the agricultural economy, transportation, delicate ecosystems, salinity balance, and commerce.

Planning Factors

A weather event large enough to cause catastrophic flooding will have far reaching impacts and response assets will be engaged throughout the entire state.

- Approximately 2.3 million acres are exposed to flooding, with Sutter County having the highest acres (79% of 2.3 million acres) exposed to flooding.
- Approximately 1.4 million people may need to evacuate and 25% (350,000 people) may require sheltering or support. Sutter County has the highest percentage of population exposed to flooding (97%) followed by Yuba County (71%), San Joaquin County (59%), Sacramento County (42%), Yolo County (38%), and Glenn County (35%). The remaining counties have less than 30% of their population exposed to flooding. There are five cities with populations over 100,000 with Sacramento (466,488) and Stockton (302,389) as the two largest cities. The daily commuting population in downtown Sacramento can swell to over 110,000.
- Sheltering in place is not a viable strategy for flooded areas.
- Flooding and landslides will disrupt surface transportation networks. Ports, major highways, and railroads will be affected. Heavy rainfall, flooding, snow, and landslides will affect roads into the Sierra Nevada, limiting evacuations to the east.
- The Delta Region is particularly vulnerable to levee failures due to location, aging infrastructure, low elevation, and subsidence. Other areas in Northern California are considered at high-risk.
- Flooding will impact agricultural and farm-related businesses resulting in the loss of farm equipment, agricultural production facilities, livestock, orchards, and other farm facilities, causing economic damages and losses totaling more than \$2.7 billion.
- Flooding could impact over 503,000 homes and on average, only 12% of residents carry flood insurance, with an average deductible of \$40,000.
- Flooding could impact over 62,000 (40%) businesses resulting in a loss of jobs causing long term economic damages and major economic impacts to local/intra/interstate commerce.
- The State Capital and numerous state agency headquarters are in downtown Sacramento. Flooding may impact their ability to support local government while conducting continuity of government/continuity of operations activities.

Fact Sheet: Northern California Catastrophic Flood Response Plan

- There are nine federally recognized tribal governments in the planning area and six may have a portion of their property in a flood zone. In a catastrophic flood event, all tribes may require some assistance.

Major impacts are expected to the Sacramento River and Sacramento-San Joaquin Delta region infrastructure, transportation, water and wastewater services, electrical power, communications capabilities, and state government. Below is baseline information on risk for the ten counties in the planning area.

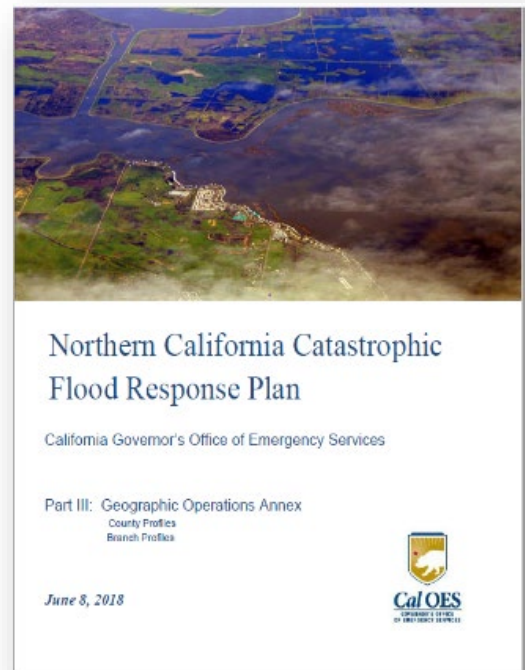
Facilities	In Planning Area	At Risk	100-year flood zone	500-year flood zone
Law Enforcement Facilities	172	50	18	32
Fire Facilities	426	146	52	94
Emergency Operations Centers	71	24	6	18
Correctional Facilities	36	18	6	12
County Government Centers	10	7	1	6
Tribal Government	9		3	
Schools	2,235	775	164	711
Power	3 power plants in Contra Costa County supply 70% of power to the Bay Area. Substations: 597	244	84	160
Water/Wastewater Treatment Plants	133	58	37	21
Health Care Facilities	850 licensed health care facilities	372	41	331
Medical Facilities-General Acute Care Hospitals	44	17 may require some evacuation		
Medical Facilities-Emergency Departments	37	14 exposed to flooding		
Long Term Care Facilities	269	110	8	102
Agriculture	California produces most of national crop of almonds, dates, figs, kiwifruit, olives, clingstone peaches, pistachios, dried plums, raisins, and walnuts	1,462,000 (\$2.7 billion) crop acres exposed to flooding		
Dairies (cows)	177	53	34 (21,760)	19 (12,160)
Approximately 346,063 dogs, 378,060 cats, 42,073 birds, and 24,296 horses in the flood zone.				

Fact Sheet: Northern California Catastrophic Flood Response Plan

Plan Structure

Part I of the NCCFRP provides a framework to begin operations in the State Operations Center and the transition to unified state/federal coordination. Part I and Part II (Functional Annexes) of the plan are used in tandem with each other. Part I provides baseline information whereas Part II of the plan provides in-depth details and statistics for functional areas such as Infrastructure, Mass Care, and Public Health/Medical.

Part III, Geographic Operations Annex (cover shown right) contains the ten Operational Area profiles and the four geographic branch profiles. This portion of the plan is designed to provide detailed information on assets at risk in each county and branch. Each profile was developed in coordination with the counties to determine community response capabilities and their anticipated roles and responsibilities or needs in a catastrophic flood.



For more information, please visit:

<https://www.caloes.ca.gov/office-of-the-director/operations/planning-preparedness-prevention/planning-preparedness/catastrophic-planning/>