

# TSUNAMIS

Tsunamis have been documented extensively in California since 1806. Although the majority of tsunamis have occurred in Northern California, Southern California has been impacted as well.

Upon receipt of a Tsunami Watch/Warning Bulletin, an immediate evaluation will be made of the potential threat to the coastal areas of Orange County. After a thorough evaluation, a determination will be made as to the degree of evacuation necessary to eliminate any threats to residents and visitors.

Once the degree of evacuation has been determined, officers will block all movements on Pacific Coast Highway except those necessary to gain access to the nearest arterial highway leading away from the ocean. The population will be directed inland using the closest available northbound or eastbound arterial highway. It is imperative that the evacuation routes be kept open and clear at all times.

Additionally, if a large tsunami were to hit the Orange County coastline, approximately 89,000 local residents would have to be evacuated to neighboring cities such as Costa Mesa. Neighboring jurisdictions along with the American Red Cross would be called upon for care and shelter duties.

# NATURAL AND BENEFICIAL FUNCTIONS OF FLOODPLAINS

Floodplains are a natural component of the Orange County environment. When flooding spreads out across the floodplain, its energy is dissipated which results in lower flood flows downstream, reduced erosion of the streambank and channel, deposition of sediments higher in the watershed and improved groundwater recharge. Floodplains are scenic, valued wildlife habitat, and suitable for farming. Poorly planned development in floodplains can lead to streambank erosion, loss of valuable property, increased risk of flooding to downstream properties and degradation of water quality.

*Help wildlife flourish by not dumping pollutants in the storm drains!*



# HISTORY OF FLOODING IN ORANGE COUNTY

The major flood threat in Orange County is from the Santa Ana River. The 1969 storm caused the largest losses in Orange County history. Extensive efforts have been made towards flood control protection for this floodplain including construction of the Seven Oaks Dam and Prado Dam.

Despite extensive flood control protection efforts by Orange County Flood Control District (OCFCD), portions of the County could still be subject to flooding from overflow of storm water drainage facilities that are presently inadequate for carrying the 100-year discharge.



East Garden Grove-Wintersburg Channel and Ocean View Channel system is one of the underlying channel systems that does not currently have the capacity to contain the 100-year flood as the channel banks and levees have over-topped at several locations.

## 1930s

Four tsunamis strike the Los Angeles, Orange County and San Diego coastal areas. In Orange County, the tsunami wave reached heights of 20-feet or more above sea level.



Photo courtesy Orange County Archives. Circa 1938.

## 1964

Following a 8.2 earthquake in Alaska, tidal surges of approximately 4-feet to 5-feet hit the Huntington Harbor area causing moderate damage.

## 1969

A major storm caused the largest losses in Orange County history.



Photo courtesy Orange County Archives. Circa 1969.

## 2010

On February 27, 2010, a magnitude 8.8 earthquake off Chile generated a tsunami that produced 3-foot high waves in Orange County 13 hours later. The tsunami, which traveled about 6,000 miles to arrive here, led officials to close virtually every beach in Orange County as well as most piers.



# COUNTY OF ORANGE RESOURCES



AlertOC is a mass notification system designed to keep Orange County residents and businesses informed of emergencies and certain community events. By registering with AlertOC, time-sensitive messages from the County or City in which you live or work may be sent to your home, cell or business phone. Text messages may also be sent to cell phones, e-mail accounts and hearing-impaired receiving devices.

For more information, please visit: [www.AlertOC.com](http://www.AlertOC.com)



County Service Center, 1st Floor  
601 North Ross Street  
Santa Ana 92701  
[www.ocpublicworks.com](http://www.ocpublicworks.com)  
ocpublicworks

- OC Development Services..... (714) 667-8888
- OC Operations & Maintenance.....(714) 955-0200
- Department Operations Center .....(714) 955-0333

**myOCeServices**  
[myOCeServices.ocgov.com](http://myOCeServices.ocgov.com)

- Apply for permits
- Report illegal dumping
- Make payments
- ...and more!

**OC Public Libraries**  
For general FEMA documents and maps, use the search term "National Flood Insurance Program" at: [catalog.ocpl.org](http://catalog.ocpl.org).

# ADDITIONAL RESOURCES

- United States Geological Survey**  
[www.usgs.gov](http://www.usgs.gov)
- National Oceanic and Atmospheric Administration**  
[www.noaa.gov](http://www.noaa.gov)
- Federal Emergency Management Agency**  
[www.fema.gov](http://www.fema.gov)  
[www.fema.gov/nfip](http://www.fema.gov/nfip)
- National Flood Insurance Program**  
[www.floodsmart.gov](http://www.floodsmart.gov)  
877-336-2627



# OC Public Works

# BE FLOOD READY!



FLOOD SAFETY & AWARENESS

It is the mission of Orange County Flood Control District to "reduce risk of Orange County life and property from the threat and damage of floods."



[www.ocflood.com/safety/fight](http://www.ocflood.com/safety/fight)

# ORANGE COUNTY IS WORKING TO REDUCE YOUR FLOODING RISK



## OC Public Works' comprehensive approach to reducing your flooding risk in Orange County:

- ✓ **Repairs** drain gates, catch basins, inlets, channels and roadways to ensure storm water flows freely and to the intended facility
- ✓ **Removes** debris, vegetation, sediment and trash buildup from flood facilities and roadways in unincorporated areas
- ✓ **Disseminates** flood prevention information to residents
- ✓ **Installs** preventative barriers, such as sandbags, hay bales, silt boards and K-rails to redirect flow
- ✓ **Inspects** flood and road facilities with heightened focus on canyon burn areas
- ✓ **Tests** gates, maintains dams and retarding basins
- ✓ **Monitors** National Weather Service weather forecasts
- ✓ **Maintains** and monitors the ALERT (Automated Local Evaluation in Real Time) flood warning system consisting of numerous automated rain gages, water level sensors and computer base stations

Even with these measures in place, it is important for Orange County residents to consider whether or not they are ready for a flood in their neighborhood. Review these recommended actions for before, during and after a flood to prepare your household.

## WHAT SHOULD YOU DO...?

### BEFORE A FLOOD

**Determine if your property is located in an area subject to flooding.** There are Federal Emergency Management Agency (FEMA) Special Flood Hazard Areas (SFHAs) identified on the Federal Insurance Rate Maps (FIRM) with known potential for flooding.

For properties located within unincorporated Orange County, County staff can make flood zone determinations. If located in an "A" Zone, your property is within the SFHA, which is an area that has been

determined to have the potential for flooding caused by a 100-year storm. If located in a "V" Zone, your property is within the SFHA and could also be subject to velocity wave action. County staff can also provide property owners in unincorporated County with information regarding if a property is located in a floodway, near a choke point, flood depths in AE or AO FIRM zones, special flood-related hazards, historical flooding, or natural floodplain functions.

Elevation certificates for unincorporated Orange County properties and FEMA maps are available for review at the County Service Center and at the following websites:

<b>Elevation Certificates</b>	 <a href="http://www.ocpublicworks.com/ds/building/flood">www.ocpublicworks.com/ds/building/flood</a>
<b>FEMA Maps</b>	<a href="http://www.ocflood.com/safety/floodplain/firm">www.ocflood.com/safety/floodplain/firm</a>

### Purchase flood insurance for your property and contents.

Many communities within Orange County participate in the National Flood Insurance Program (NFIP) which provides federally backed flood insurance for all structures located inside or outside of the SFHA. Visit [www.floodsmart.gov](http://www.floodsmart.gov) to learn more and contact your insurance agency to get your policy. Flooding is not covered by a standard homeowner's insurance policy. A separate flood insurance policy is required to cover damages incurred by flooding. Also, there is a 30-day waiting period before flood insurance coverage goes into effect.

More than 25% of the NFIP claims are filed for properties located outside the SFHA.

### Protect your property from the hazards of flooding.

1. If the floor level of your property is lower than the "Base Flood Elevation" (elevation of the 100-year flood, based on FEMA maps), consider elevating your structure.
2. Make sure gutters are clear of leaves and debris and roof repairs are complete before the rainy season.
3. Have weakened trees inspected by an arborist. Downed trees and branches can cause significant damage.

Brochures discussing flood proofing and other mitigation measures are available in Orange County Public Libraries and from OC Public Works at the County Service Center. If a flood is imminent, property can be protected by sandbagging areas. Valuables and furniture may also be moved to higher areas to minimize damages.

From October - April of each year, free, empty sandbags for the protection of homes from rain and mud are available at 2310 N. Glassell St., Orange, CA 92867. This service is for unincorporated Orange County residents and proof of residency will be required.

### Keep channels free of obstructions and debris.

Residents are encouraged to assist in maintaining the drainage in their areas by removing or reporting obstructions (such as shopping carts, leaves, debris, trash, etc.). Keeping drainage channels free of obstructions reduces flooding in the event of heavy rains.

According to County Ordinance Article 3, Sec. 4-13-52, it is illegal to dump trash, leaves, landscape debris, paint, grease, or any other material into any portion of the County's drainage system.

To report obstructions or illegal dumping, for questions regarding drainage system maintenance, or for property protection advice or site visits regarding flooding and drainage issues, visit [www.myOCeServices.ocgov.com](http://www.myOCeServices.ocgov.com) or contact OC Operations & Maintenance.

### Meet improvement and permitting requirements.

The NFIP requires that if the cost of reconstruction, additions, or other improvements to a building equals or exceeds 50% of the building's market value, then the building must meet the same construction requirements as a new building. Substantially damaged buildings must also be brought up to the same standards as a new building. For example, a residence damaged so that the cost of repairs equals or exceeds 50% of the building's value before it was damaged must be elevated above the base flood elevation.

All development within unincorporated Orange County requires a permit. Always check and fulfill permitting requirements with OC Development Services before you build, alter, fill, or re-grade any portion of your property, and if you suspect permitting violations.

### Keep an emergency supply and have an evacuation plan.

Non-perishable food, water, batteries, flashlights, a manual can opener, and a battery-operated radio should be kept available.

### DURING A FLOOD

If your property is in imminent danger of flooding, please contact your electric and gas provider to request that your power and natural gas be shut off, or for guidance on how to do it yourself.

Tune-in to local commercial radio, television stations, or NOAA Weather Radio (frequencies 162.450 or 162.550) for **Watch and Warning** bulletins and any corresponding emergency instructions. The Orange County Sheriff will order evacuations if conditions warrant this action.

- ➔ If dangerous flooding conditions are imminent, avoid driving a vehicle.
- ➔ Do not attempt to drive or wade through deep pockets of water or running washes. Avoid unstable banks.
- ➔ Avoid low-lying areas. Seek shelter in the highest areas possible.

OC Public Works' Department Operations Center (DOC) may be activated when heavy to extreme rainfall is predicted or occurs, when storm runoff conditions are such that there is a possibility of flood damage, and/or other hazardous weather conditions or emergency events. When activated, the DOC will monitor the emergency situation on a 24-hour basis. Flood control channels will be patrolled, and if needed, emergency equipment and personnel will be deployed to reinforce the levees. If you see alarming conditions on any County-maintained road or flood control facility during an active event, please call the DOC. If you are in an emergency or disaster-related situation and need immediate assistance, please call 9-1-1.

## AFTER A FLOOD

1. If your home, apartment, or business has suffered flood damage, immediately call the agent or company who handles your flood insurance policy.
2. Prior to entering a building, check for structural damage. Turn off outside gas lines at the meter or tank.
3. Follow established procedures for property damage repairs. Require your contractors to obtain the proper permits for work being performed. Permits are required for any permanent improvement (including painting, roofing, siding, additions, alterations, etc.) to a structure and for site work such as grading, filling, etc. Permits are required even if a homeowner is doing the work themselves.

Select a contractor who is licensed in their trade. The County of Orange requires contractors to be licensed and/or registered with Orange County and to have a County of Orange Business License.

You need to verify that contractors are licensed before signing or agreeing to any repair contracts. It is also recommended that you verify certification of liability and worker's compensation insurance. Complaints against licensed contractors may be referred to the appropriate licensing agency.

Questions about permits or contractor licensing may be addressed to OC Development Services.

