

# The California Coast

## Background and Location:

California is situated on the western side of the USA and is surrounded by other states such as Nevada and Oregon. Specifically between San Francisco and San Diego is a disaster hotspot. It is at risk from many geophysical hazards such as earthquakes as well as a range of other **hazards such as drought, wildfire and impacts on the El Nino Southern Oscillation.**

## Why is the California Coast a disaster hotspot?

- There are a network of active faults such as the San Andreas fault which underlies the Los Angeles and San Francisco bay area. The Pacific plate moves north west past the North American Plate. They both move in the same direction, however the Pacific plate moves a faster speed, creating more friction.
- The El Nino Southern Oscillation **increases the amount of rainfall** that the region gets. This increase the number of floods, landslides and coastal erosion.

**Around 3.5 million semi-legal migrants** live in hazardous locations increasing their **vulnerability**. Furthermore many people live on the coast which also increases the **vulnerability** from a wide range of hazards.

## Key Hazards:

### 1. Loma Prieta Earthquake, San Fransisco, 1989:

At 5:04pm on the 17 October 1989 a **large 7.1 earthquake struck**, with the epicentre being in the Santa Cruz mountains. **37 minutes after the initial quake another 5.2 magnitude** after shock struck. It was caused by a movement at the San Andreas fault, which is a **conservative plate boundary**.

<b>Social</b>	<b>Economic</b>	<b>Environmental</b>
63 people died when the Cyprus Freeway collapsed, leaving them trapped with no escape in their cars	The damage cost was estimated at around \$6 billion	There was a large amount of landslides and rock fall close to the epicentre.
13,757 people were injured due to shattering glass and falling objects.	1,018 were completely destroyed with 23,408 homes damaged by the quake. Many insurance companies had to pay out thousands to repair/rebuild houses.	
3,000-12,000 people were left homeless	366 businesses were destroyed and, 3530 damaged.	
Houses in The Bay Distrcit fell down as they were built reclaimed land from the sea, which was made up of water filled sediment. This meant that as the quake struck <b>liquefaction occurred, resulting in damages.</b>	A large amount of infrastructure was damaged such as electricity and gas pipes. Some gas pipes fractured and ignited which caused explosions and fires.	

## Impacts:

### Why the impacts were so minimal?

The impacts of the Loma Pieta earthquake were minimal, with only 63 deaths. This is because of the building design and procedures that had been put in place in order to protect people. **Aseismic design** on buildings



meant that **hospitals close to the epicentre only experienced minor cosmetic damages, without interruption to services.**

## 2. Drought 2007-2009:

Droughts have occurred in California for years on end and have a severe impact on its economy. The lack of water, soaring temperatures and little wind mean that wildfires also begin to form. It was due to the persistent **blocking anticyclone** over the southwest USA and North Pacific Ocean, forcing the jet stream north of its usual track.

### Impacts:

- Water shortages meant that allocations for **irrigation had been reduced by 90% in western Central Valley.**
- Arable farmers had to leave their land unsown, while avocado and citrus fruit growers had to chop down trees in their orchards because they couldn't irrigate them.
- Total **economic losses for 2009 were \$700 million**, with **21,000 jobs being lost in the farming sector.**
- Due to the low levels in rivers and lakes, the **electricity generation due to HEP fell to just 8% in California compared with 16.6% in 2006.** Low levels also caused devastation to ecosystems such as **the death of fish and disruption to Pacific salmon migration.**
- The lack of snow in Sierra Nevada affected ski resorts, and low reservoir levels limited recreational activities.

## 3. Northridge Earthquake, Los Angeles, 1994:

At 4:31am on the 17 January 1994 a powerful 6.7 magnitude earthquake struck Los Angeles and the surrounding area, with the epicentre being in the San Fernando Valley. For weeks after the initial quake thousands of after shocks occurred with magnitude 4-5 on the Richter scale.

### Impacts:

- 57 people were killed with 1500 being seriously injured
- **12,500 buildings were damaged**, and 25% suffered severe to moderate damage
- **9000 home and businesses were left without electricity, 20,000 without gas and 500 people without water for several days**

After the Loma Prieta and Northridge earthquakes there was a sharp rise in the number of residents in California taking out insurance claims, however after 1996 it fell again to figures similarly prior to 1989.

