

# THE CASCADIA SUBDUCTION ZONE

Living in the North American Pacific Northwest comes with the guarantee that one will face semi-frequent earthquakes. But why do so many seismic events occur here? The answer lies under the ocean. For, just a few hundred kilometres off the coast, is the Cascadia Subduction Zone.

In the ocean offshore of the west coast, from Vancouver Island to California, there is a massive thousand kilometre fault between the Juan de Fuca and North America tectonic plates. The Juan de Fuca plate is currently in the process of subducting underneath the North America plate, moving at a rate of around four centimetres a year.

The disappearing plate material is equalized further offshore, where the Juan de Fuca and Pacific plates interact in a divergent boundary. The Juan de Fuca plate moves east and underneath the North American plate, whilst the Pacific plate moves northwest and away from the boundary. Here, new material is excreted upwards to form the Juan de Fuca ridge.

Due to the Cascadia Subduction Zone, the Pacific Northwest receives a multitude of earthquakes, derived from the tremors and friction inevitably generated in the fault. There are also multiple minor faults in the area that only multiple the earthquake risk. These earthquakes have been weathered well enough in most population centres.

However, these semi frequent earthquakes are not the biggest threat that the Cascadia Subduction Zone poses. Parts of the Juan de Fuca and North America plates are currently locked in a state of friction, building up force. The tremors released from other areas of the boundary relieve stress on those parts but dump it all on the portion building friction. Eventually, that stress has to be alleviated.

This cycle has happened many times before, each time creating a magnitude 8-9 megathrust earthquake that had extreme effects on the Pacific Northwest. The last one, around 1700, fostered legends in North America and was felt as far away as Japan. Predictions forecast the next such earthquake will occur within the next fifty years and will wreak havoc upon the Northwest.

The conflict of these tectonic plates creates regular hazards for the people of the Northwest. Usually these are earthquakes of magnitude five to six, which are not as bad as they could be – the Northwest has weathered them for years. As for the megathrust quake – will it actually happen? Perhaps, perhaps not. It could certainly devastate the northwest if it did. But how many other disasters are there, waiting to happen? The Yellowstone Caldera, Mount Rainer's volcano – so many other natural disasters set to happen 'somewhere in the future'. We can't do anything about that, so, why worry?

# SOURCES

<https://www.pnsn.org/outreach/earthquakesources/csz>

<https://www.oregon.gov/oem/hazardsprep/pages/cascadia-subduction-zone.aspx#:~:text=The%20Cascadia%20Subduction%20Zone%20is,this%20fault%20was%20on%20Jan.>

[https://en.wikipedia.org/wiki/Cascadia\\_subduction\\_zone](https://en.wikipedia.org/wiki/Cascadia_subduction_zone)

# ESSAY ORGANIZER

## INTRODUCTION

The North American west coast receives a lot of earthquakes, so where do they come from? Underneath the ocean, a few hundred kilometres off the coast, is the Cascadia subduction zone.

## CONTENT

- Factors that elevate Vancouver's vulnerability to earthquakes
- The relationship between the Pacific, Juan de Fuca, and North American plates at the zone.
- The history of earthquakes in the fault and the potential for another in future, and it's potential impact on civilization.

## CONCLUSION

Summarize and alleviate concern over future seismic activity