# Tsunami Strike! Pacific Edition

## Student Guide

***Welcome to Tsunami Strike! Pacific Edition.***

**Story & Characters**

On this website, you will follow the perspectives of four main characters to experience a fictional but scientifically realistic tsunami affecting the Pacific Ocean basin. Let's meet the characters:

- Tilda – a middle school student in San Diego, California
- Mike – a high school student and fisherman's son in Chignik, Alaska
- Amanda – a middle school student from Kansas vacationing with her family in Hilo, Hawaii
- Dan – Fire Chief and Emergency Manager in Coos Bay, Oregon. Dan has two kids in middle school and high school, whose names are Anna and Adam. Anna and Adam are on a camping trip along the coast.

Additionally, you will visit the West Coast/Alaska Tsunami Warning Center in Alaska and the Pacific Tsunami Warning Center in Hawaii to see how scientists analyze and interpret the tsunami threat to send alerts to emergency managers and the public.

The website is organized into different time segments, beginning before the earthquake and following the progression of the tsunami from the time of the earthquake until approximately 21 hours after the earthquake.

You will accompany the characters through the time segments as they learn about and respond to the tsunami threat in their locations.

**Lessons**

As you follow the story, you'll also be directed to a series of lessons covering a range of tsunami topics. In order, these fourteen lessons by time segment are:

| Prologue<br>1 lesson | Time of Earthquake<br>3 lessons | 30 min after Earthquake<br>2 lessons |
|---|---|---|
| Where Do Tsunamis Occur? | Seismic Detection | When Tsunamis Strike |
| | Sources of Tsunamis | Wave Detection |
| | Tsunami Alerts | |

| 3.5 hr after Earthquake<br>2 lessons | 4.5 hr after Earthquake<br>3 lessons | 6+ hr after Earthquake<br>3 lessons |
|---|---|---|
| Wave Characteristics and Tsunamis | Force of a Tsunami | Tsunami Legends |
| Preparing for a Tsunami | Wave Propagation—Traveling Tsunami Style | Fatal Tsunamis 1900-2011 |
| | A Tsunami's Reach | After a Tsunami |

**Resources**

Additional resources, including access to the **Media Gallery**, can be found on the "**Resources for Students**" page.

The "**Lessons Menu**" page lists the lessons alphabetically and provides descriptions as well as access to both the multimedia and print versions.

**Estimated times** for completing the website segments and lessons:

Prologue – ~20 min
Time of Earthquake – ~45 min
30 min since Earthquake –~35 min
3.5 hr since Earthquake—~35 min
4.5 hr since Earthquake—~40 min
6+ hr since Earthquake—~40 min
Total content ~ 3.75 hours

**Learning Objectives**

These lessons provide information on both tsunami science and safety. Upon completing the lessons, you should be able to:

1. list the basic physics of water waves (wave height, depth, amplitude, and speed), explain how tsunamis represent a special type of water wave, and calculate or predict (the increase or decrease in) one property of a wave from its other properties.
2. describe the effects of bathymetric features on wave angle and speed (refraction, reflection, shore effects).
3. describe force and momentum and make a basic calculation of the momentum of a tsunami wave and state how that relates to other more familiar objects.
4. describe the types of seismic and other events that can generate tsunamis.
5. have a basic knowledge of the earth's major plates and their locations, and understand why some faults zones are more likely generate tsunamis.
6. recognize the natural signs of an impending tsunami at a coast.
7. describe how tsunami warnings are disseminated by national and local agencies.
8. determine the best tsunami evacuation locations given geographic and urban information.
9. state locations and basic facts about several significant tsunamis that occurred between 1900 and 2011.
10. relate the basic elements of several legends reflecting devastating tsunamis in ancient and pre-literate times.
11. increase your knowledge of many geographic locations by connecting them to historic tsunamis.
12. describe the various technologies and systems involved in seismic monitoring and issuing tsunami warnings.
13. describe community and personal preparedness measures that can be taken for potential tsunamis.