

Lecture-Level learning goals for *Waves*
UBC EOSC 114, *The Catastrophic Earth-Natural Disasters*

Day 1

- Identify key properties of waves
- Use these properties to determine wave speed and behavior in either shallow or deep water
- Explain how waves move matter and energy
- Describe the forces that generate waves, eliminate waves, and return the ocean to a flat surface.
- Explain the factors that determine the roughness of the sea

Day 2

- Define wave breaking, and determine when a wave will break.
- Explain differences between plunging and spilling breakers.
- Predict the type of breaker that will be found on a given beach.
- Describe how coastlines affect waves, and how waves affect coastlines.
- Compare the effects of breakers, groins, seawalls, and other structures on coastal erosion.

Day 3

- Determine how two waves will interact, and explain constructive and destructive interference.
- Discuss wave reflections, standing waves, and resonance.
- Relate wave interference and resonance to marine hazards.
- Explain how a tsunami differs from more common ocean waves.

Day 4

- Discuss why tsunamis come ashore so violently.
- Describe how tsunamis form.
- Identify tsunami warning signs, and know how to respond.
- Describe the processes responsible for a storm surge, and identify where in a hurricane the maximum surge will occur.

Day 5

- List 2 causes of eustatic changes in sea level.
- List 2 causes of regional changes in sea level.
- Relate these changes to risks for coastal communities.
- Describe the impact of sea ice and permafrost melt on erosion in the Arctic.
- Describe the impact of Mississippi erosion efforts on New Orleans.