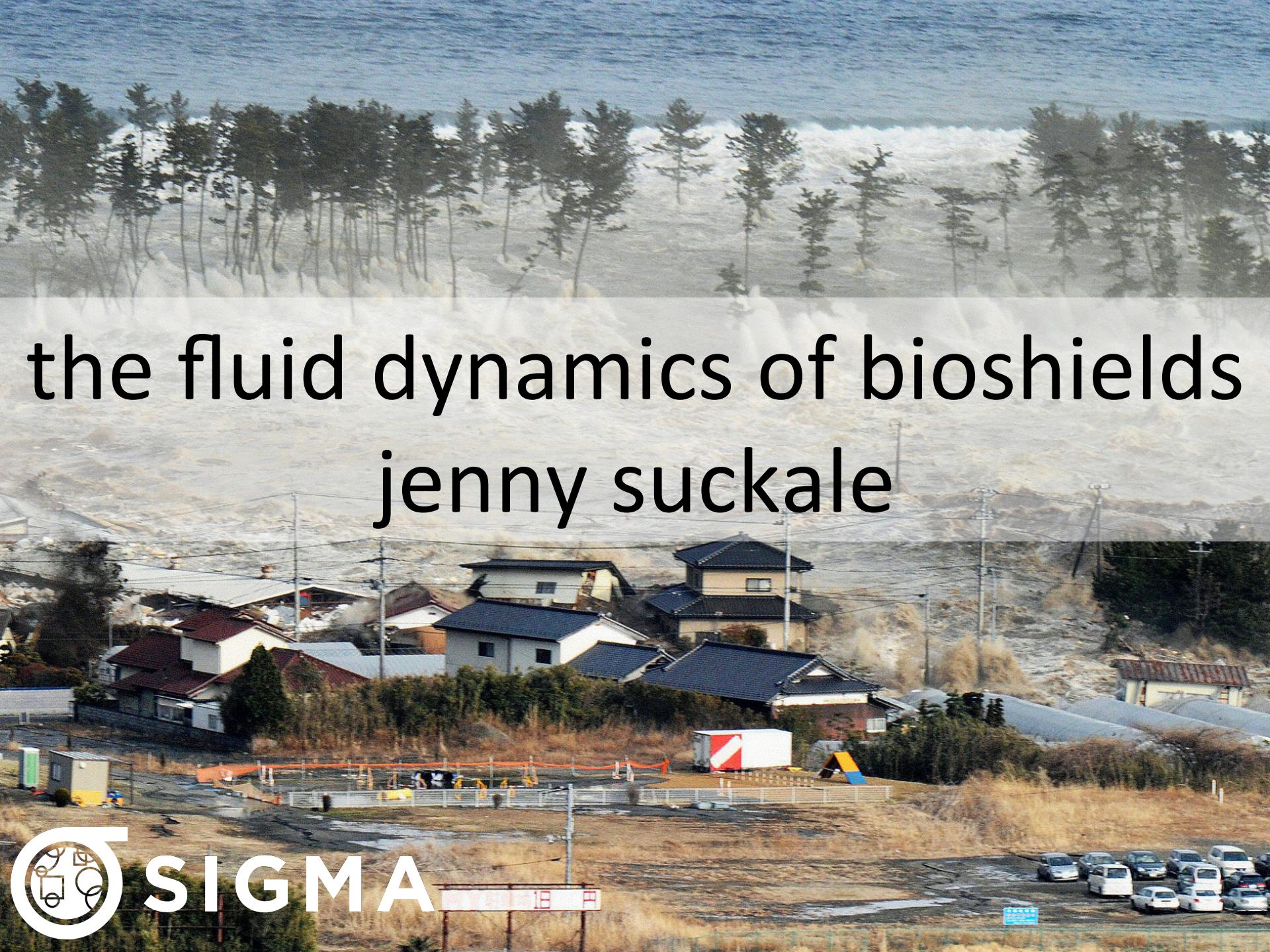


# the fluid dynamics of bioshields

## jenny suckale





An aerial photograph of a coastal city, likely Gold Coast, Australia. The image shows a long, sandy beach stretching along the coastline, with numerous high-rise buildings and skyscrapers lining the shore. The water is a vibrant blue, and the sky is clear and blue. In the foreground, large white text is overlaid on the image.

50%



50%

75%



# yes/no?

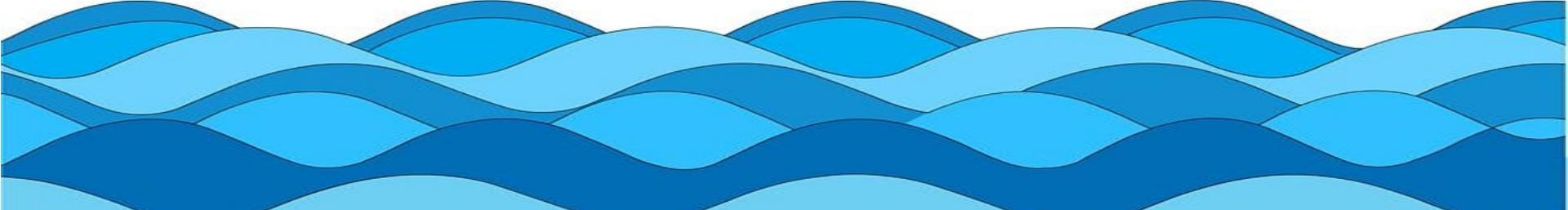


yes/no?

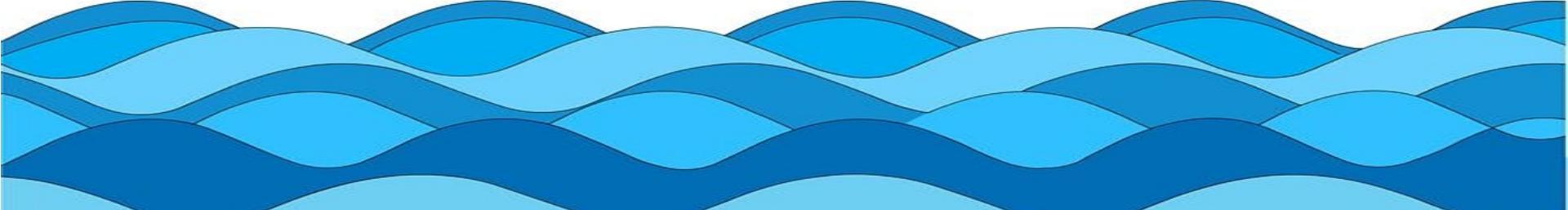


when/  
how?

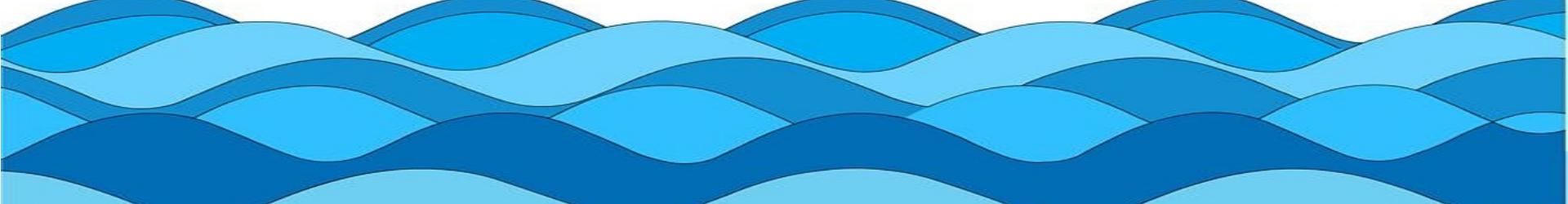
not



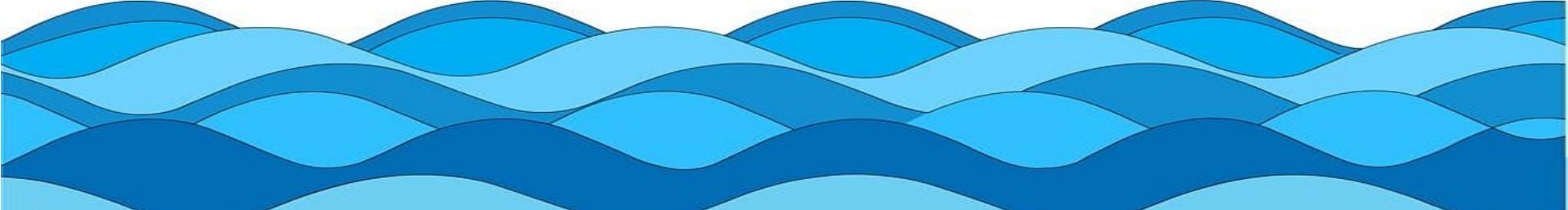
not all



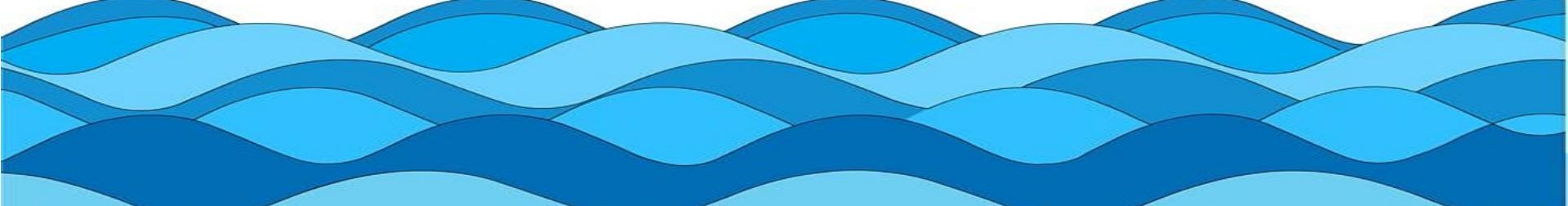
not all **coastal hazards**



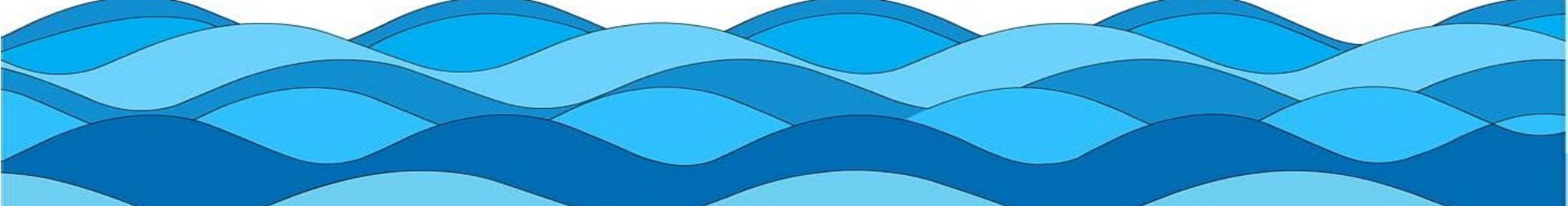
not all **coastal hazards** are



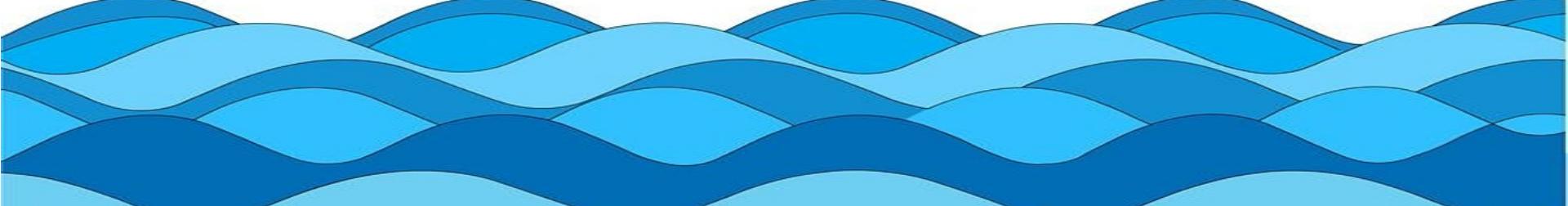
not all **coastal hazards** are created

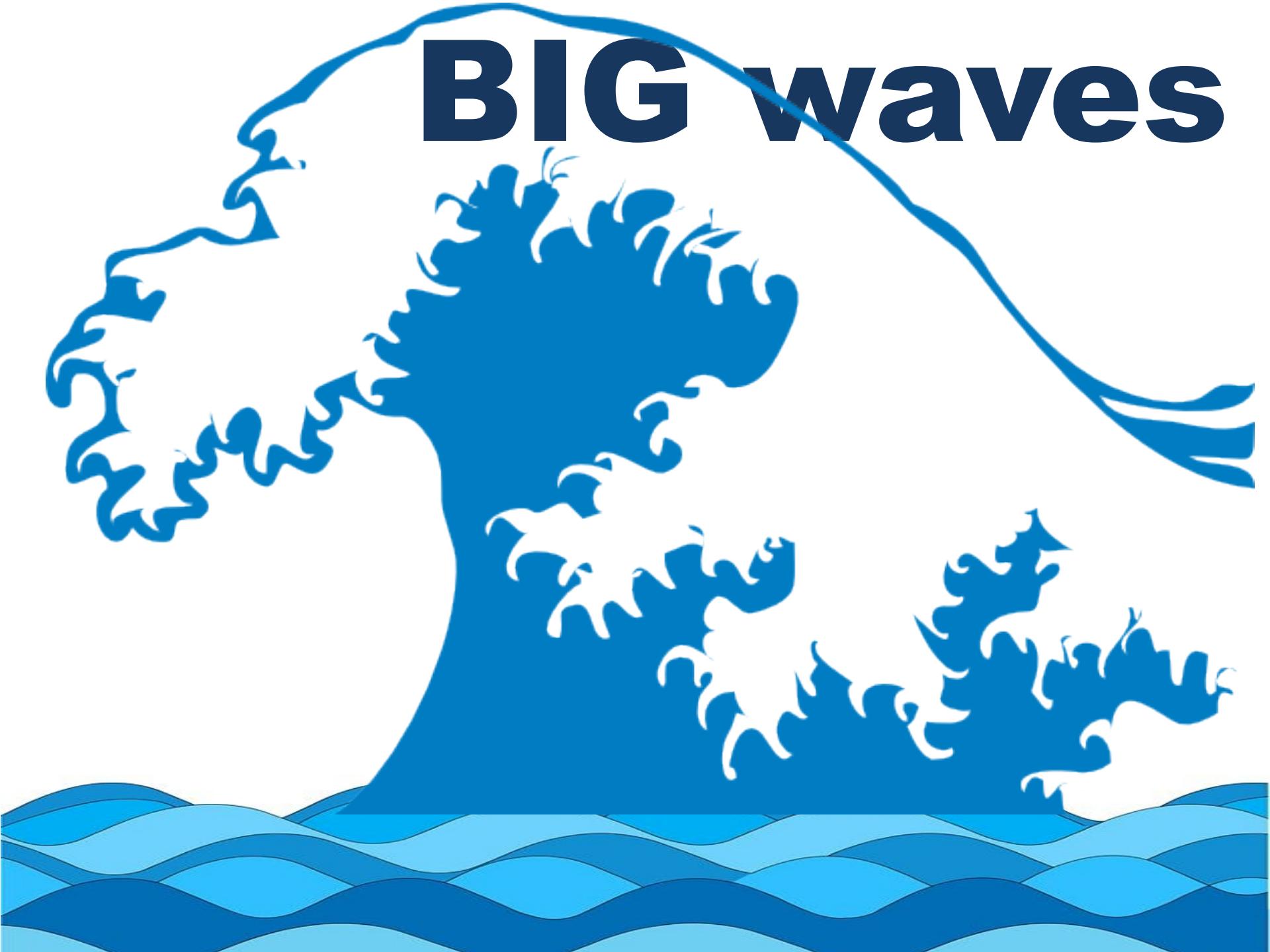


not all **coastal hazards** are created **equal**



*small waves...*





# **BIG waves**

not all **coastal plants** are created **equal**

*grassy plants....*





# woody plants

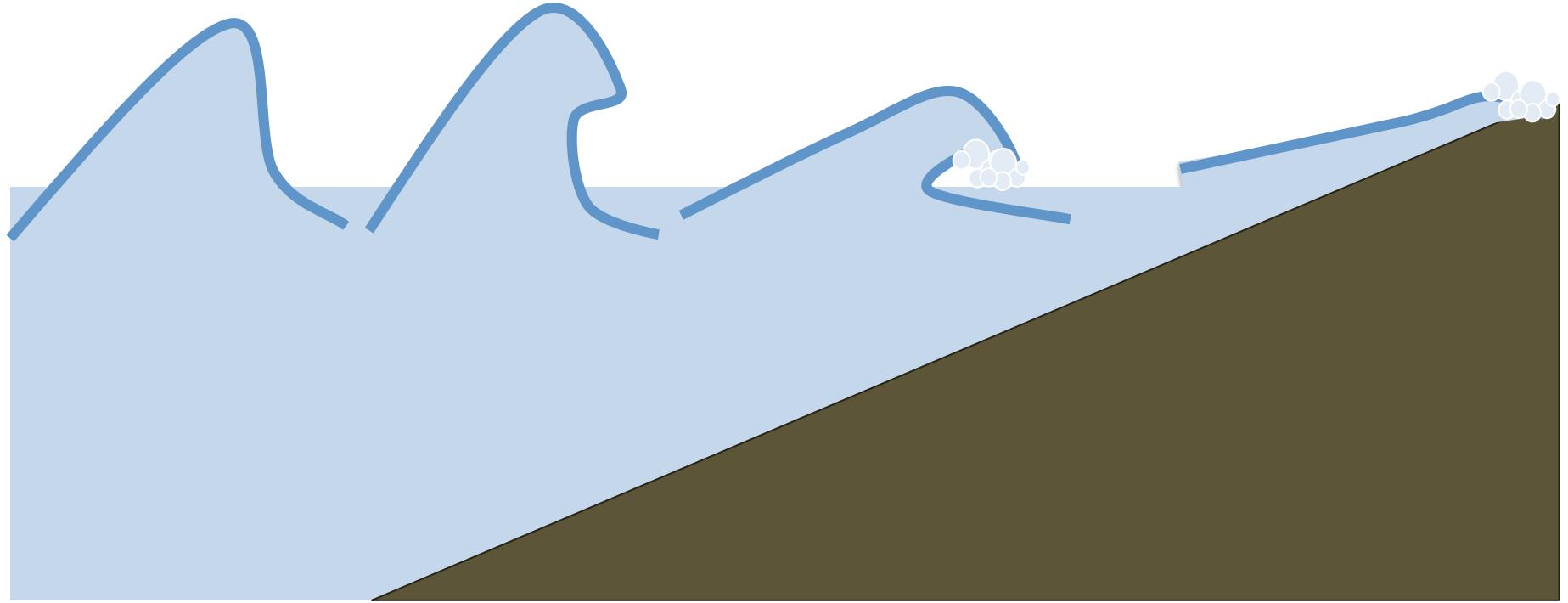
*grassy plants....*

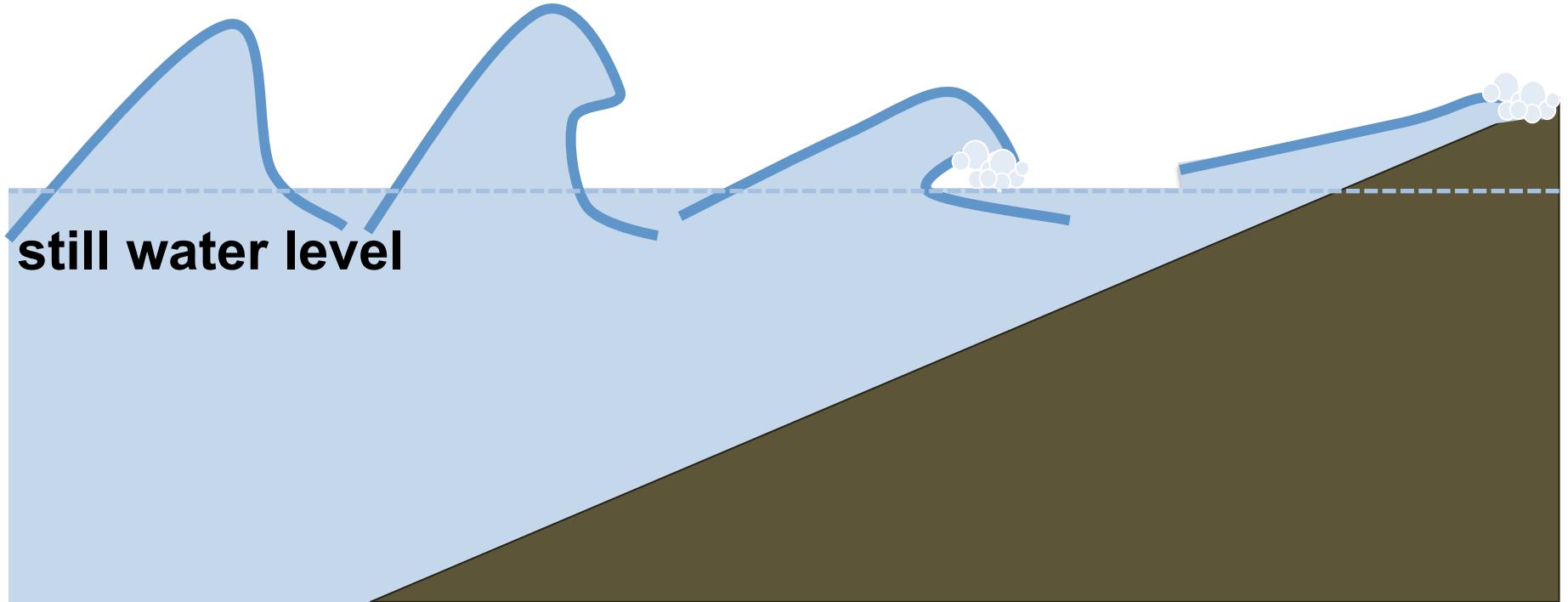
A photograph of a lush, green forest reflected in the still water of a lake or river. The trees are varied in type, with some having broad leaves and others more pointed ones. The reflection is clear, creating a symmetrical scene.

The “HOW”



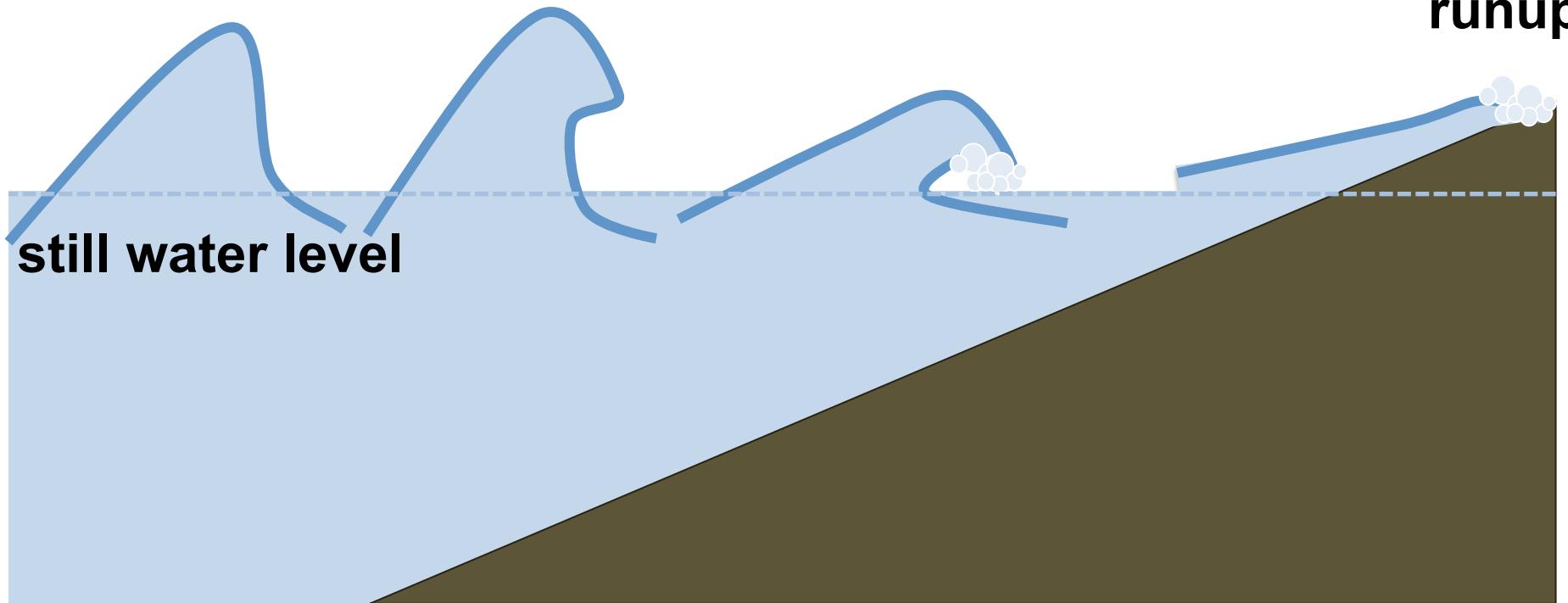
The “HOW”  
matters....





1

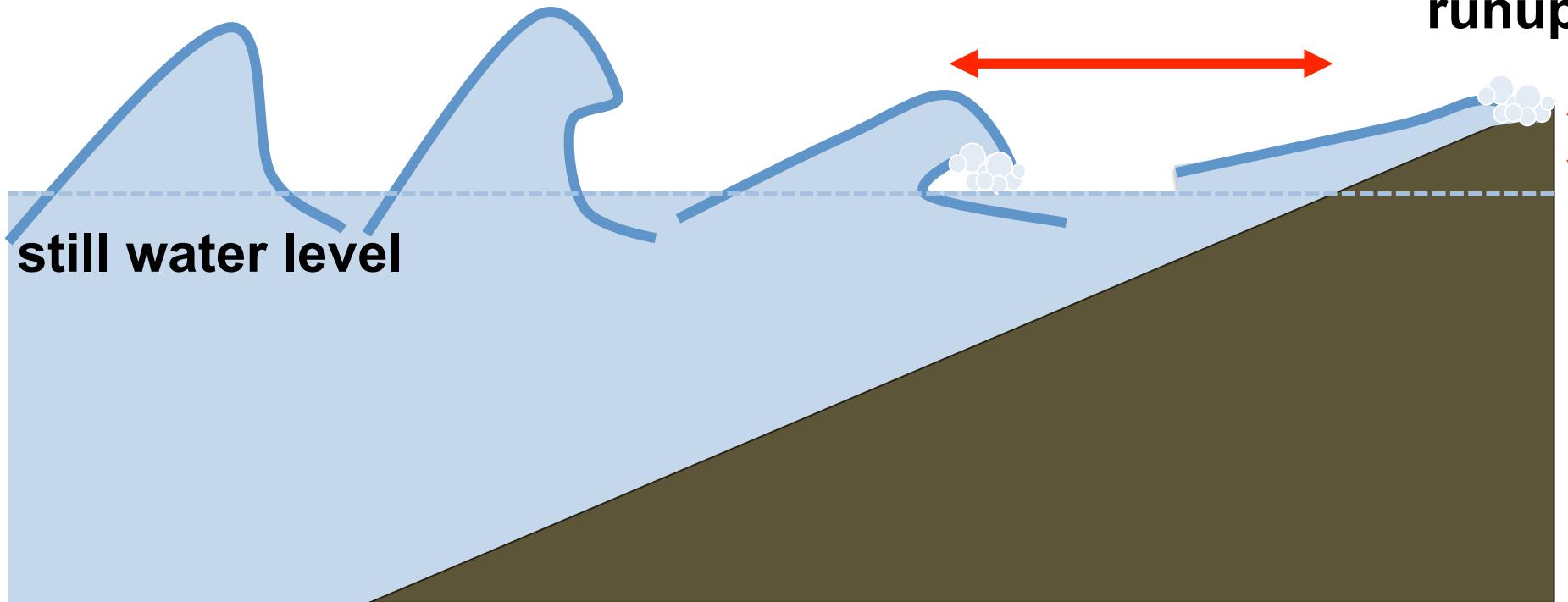
wave  
runup



2 1

**breaking point**

**wave  
runup**



# 3

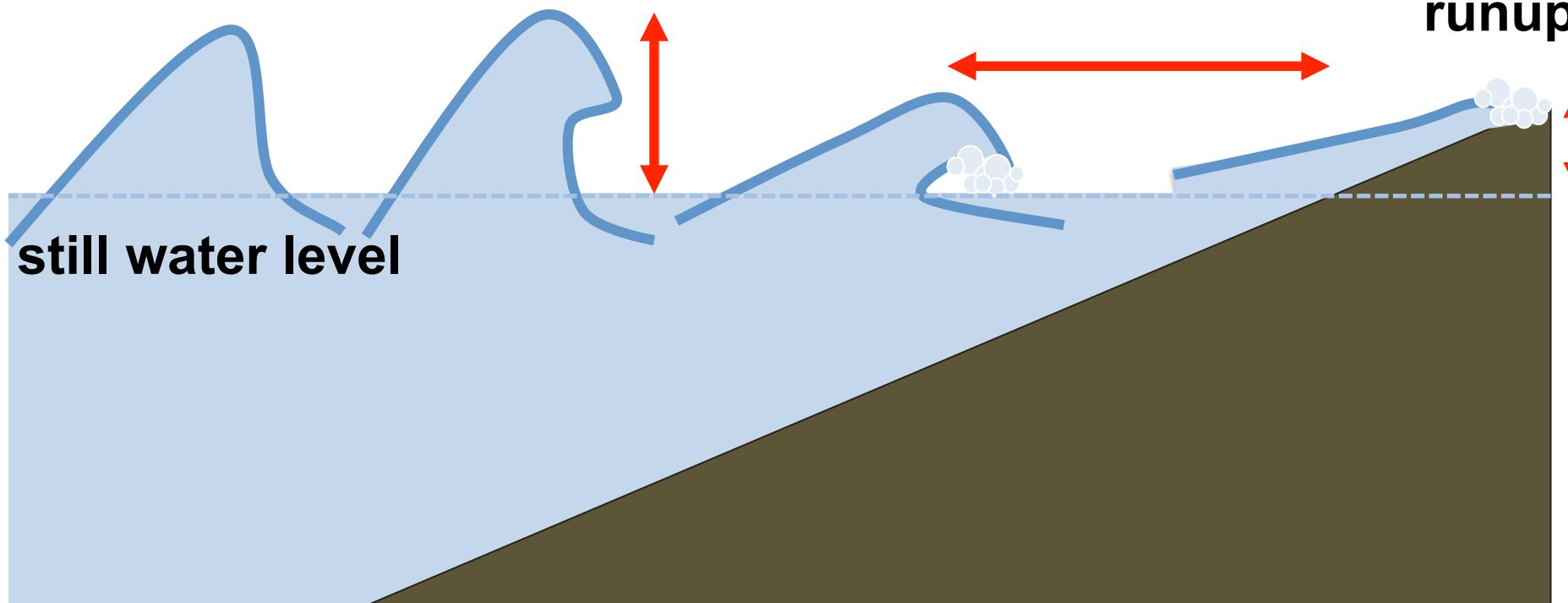
# 2

# 1

wave height

breaking point

wave  
runup



# 3

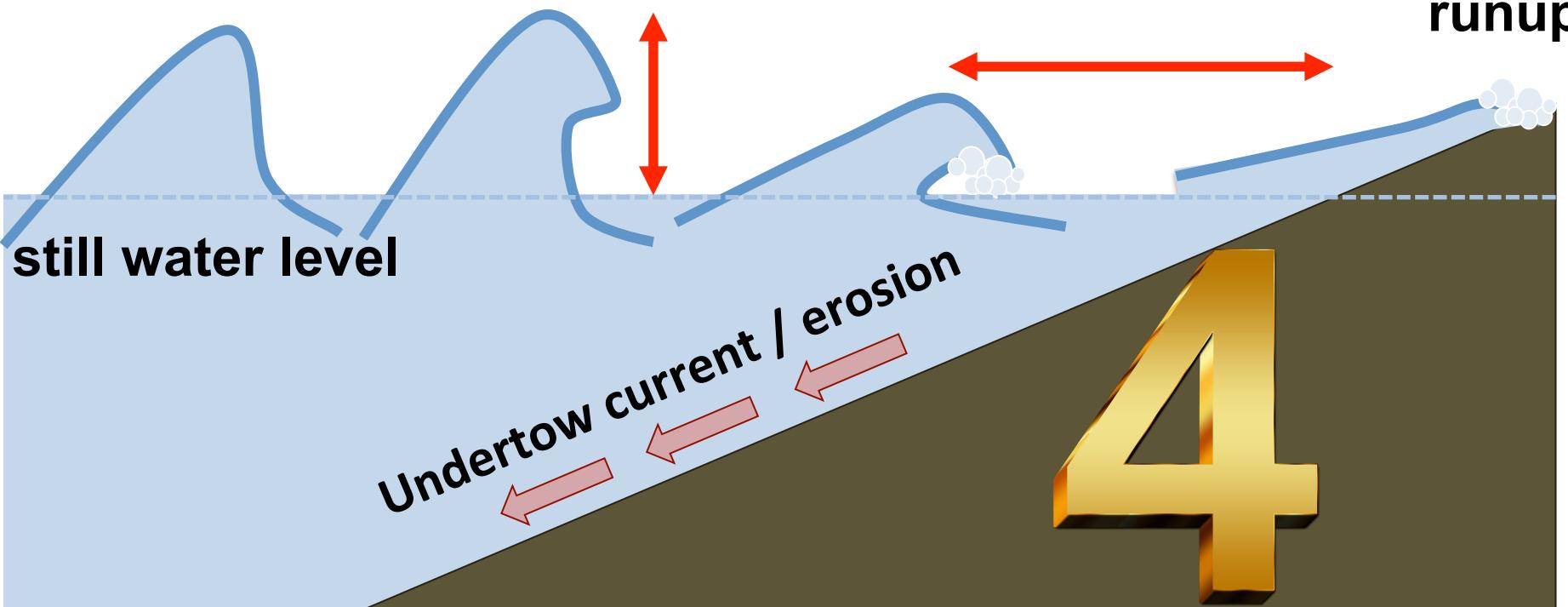
# 2

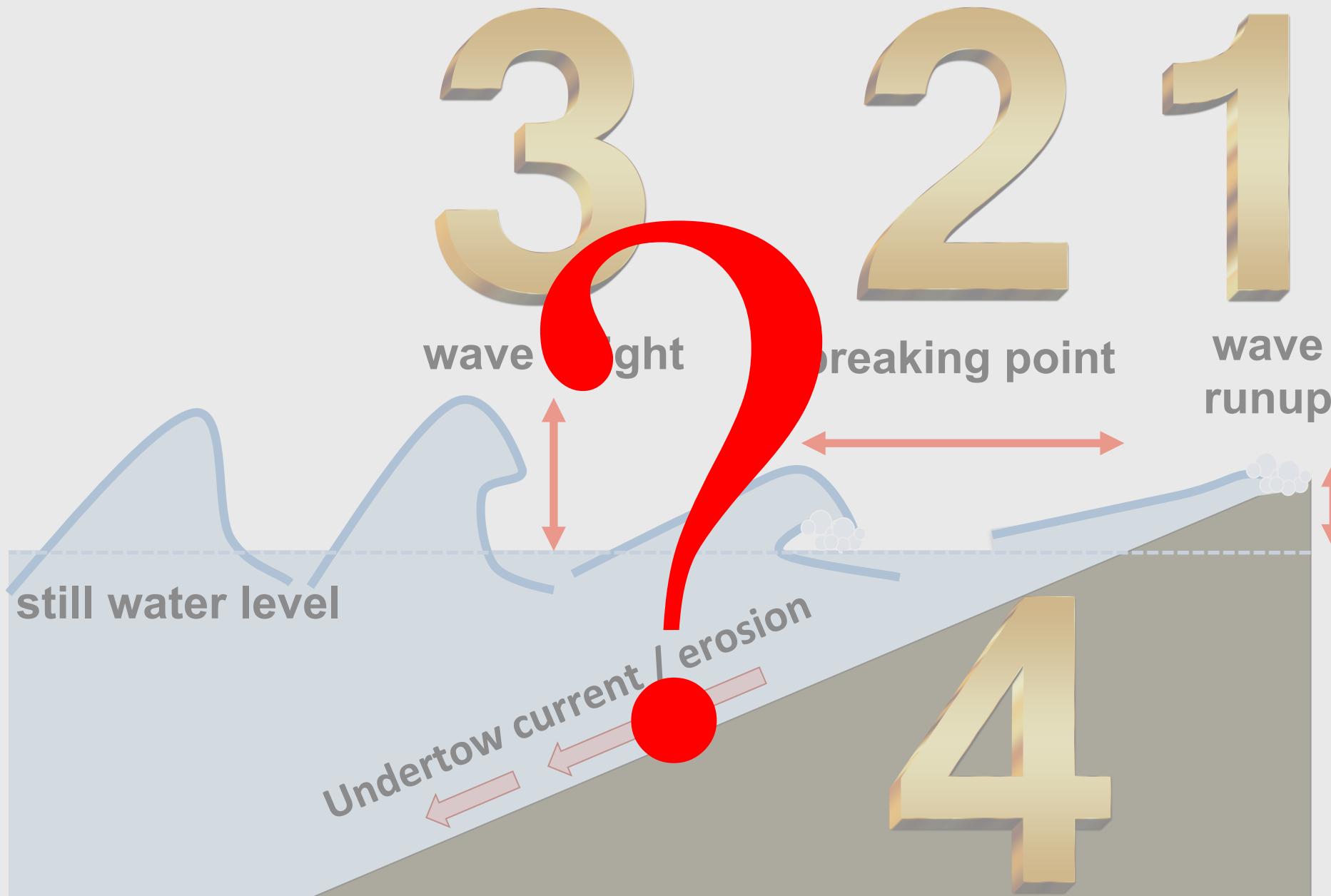
# 1

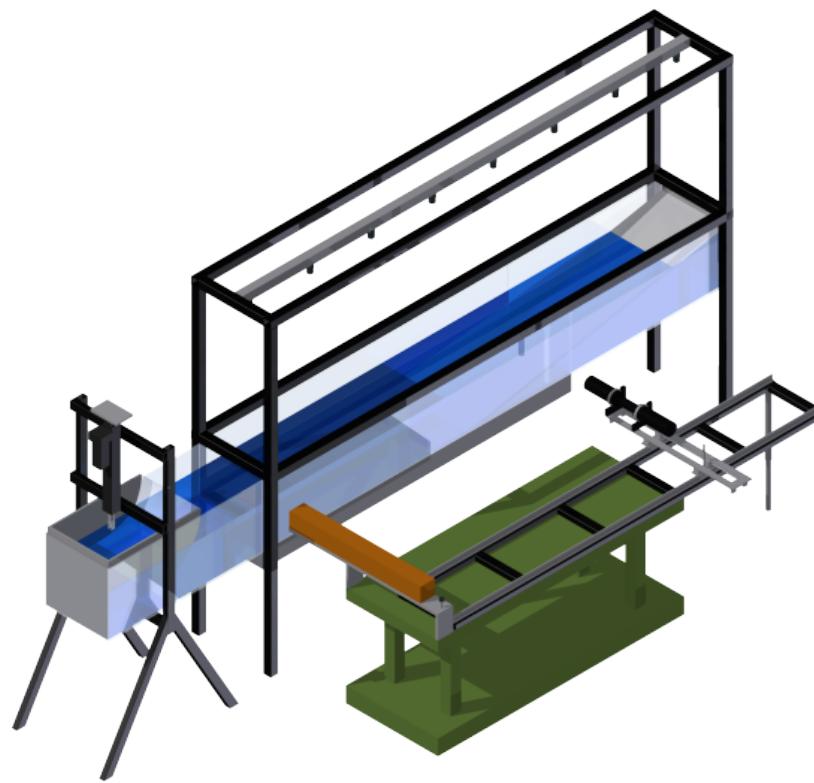
wave height

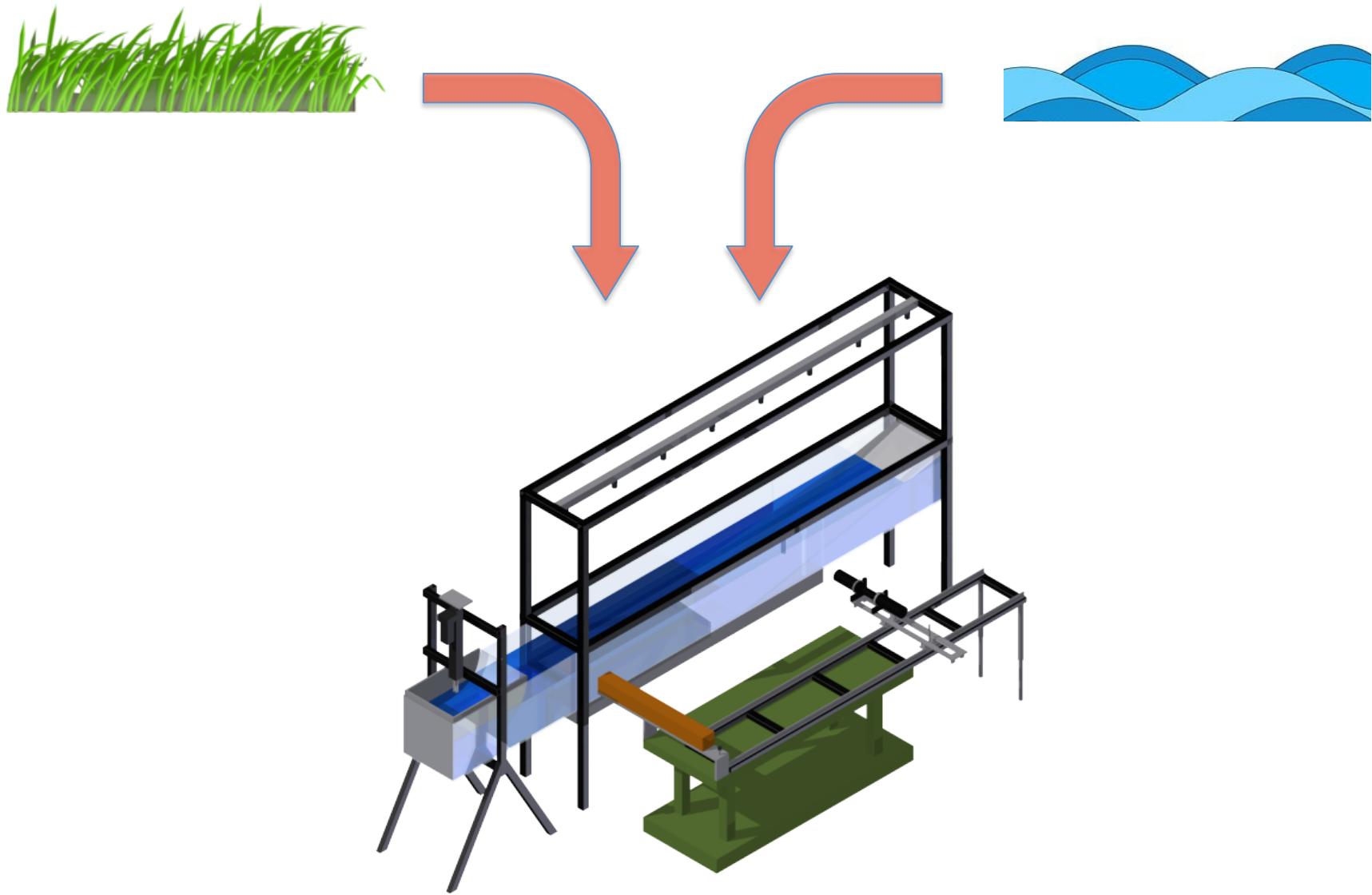
breaking point

wave runup

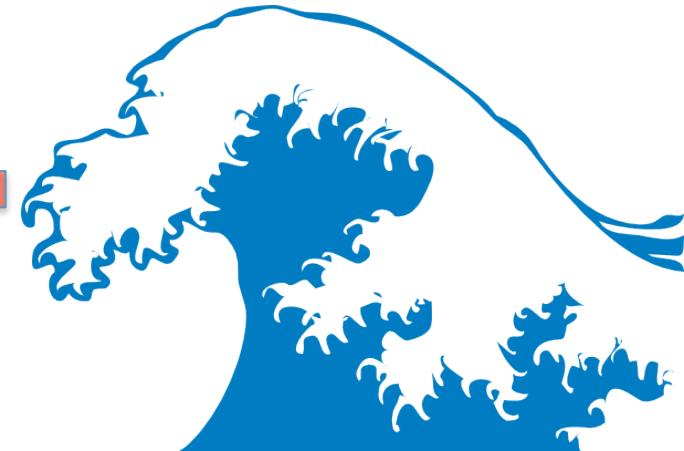
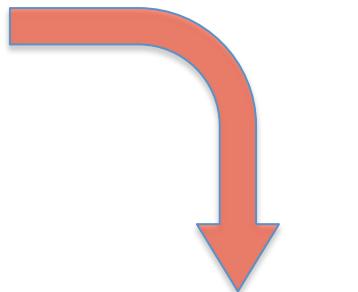
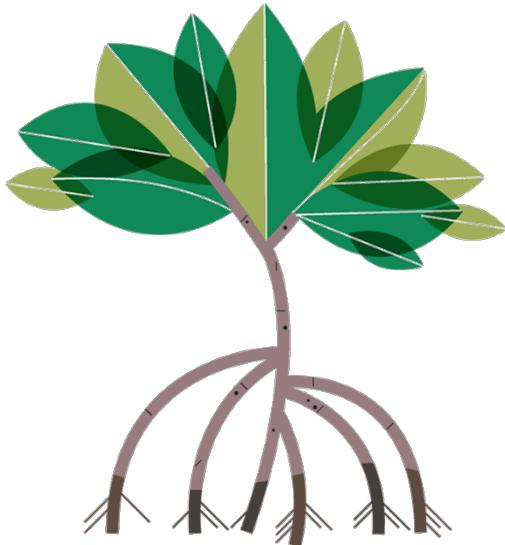




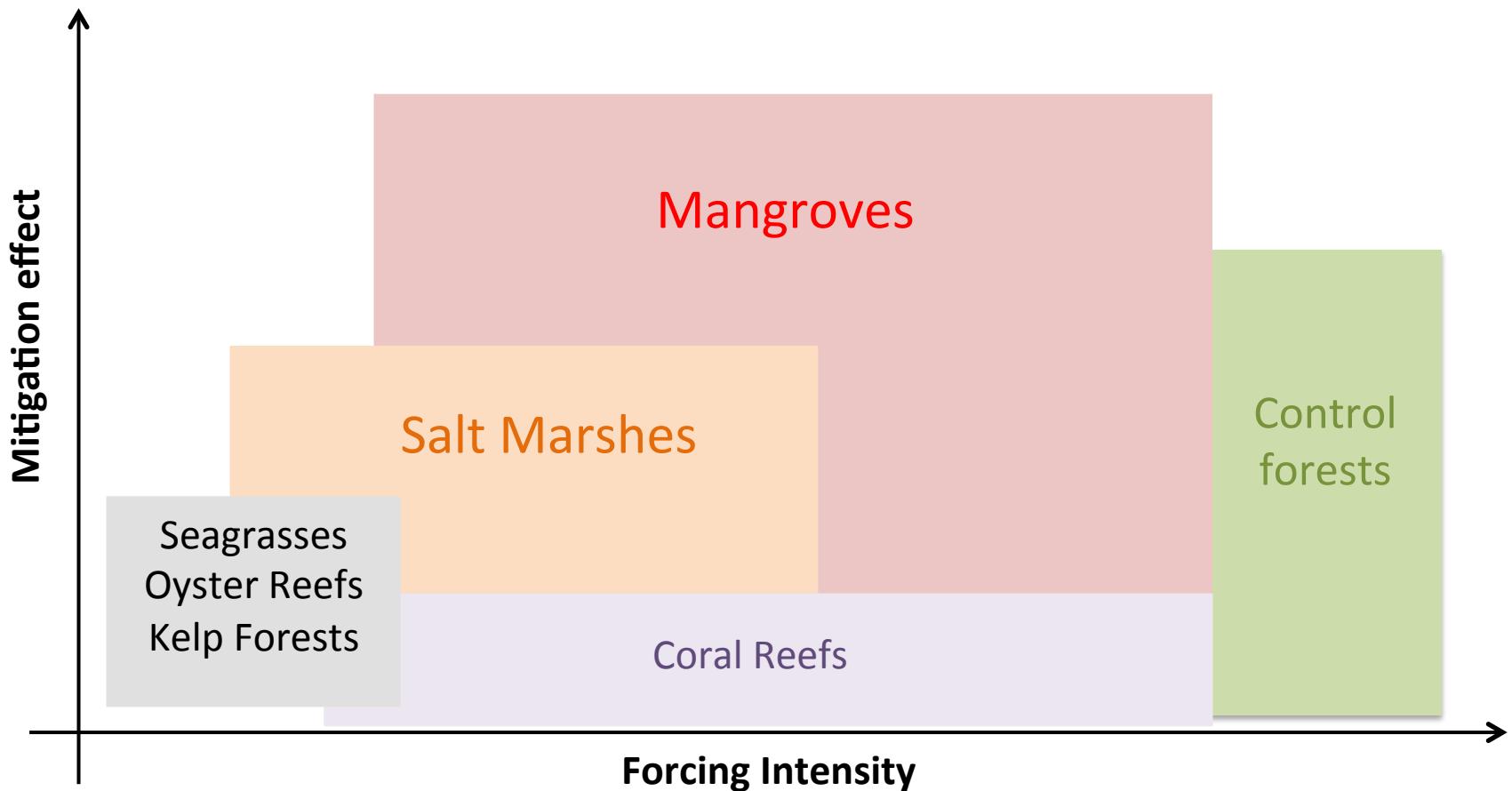




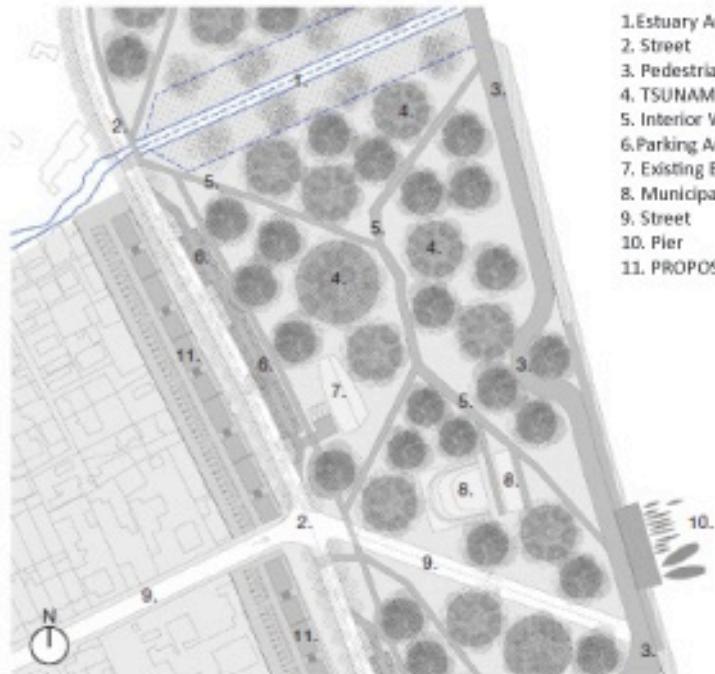




# it depends...

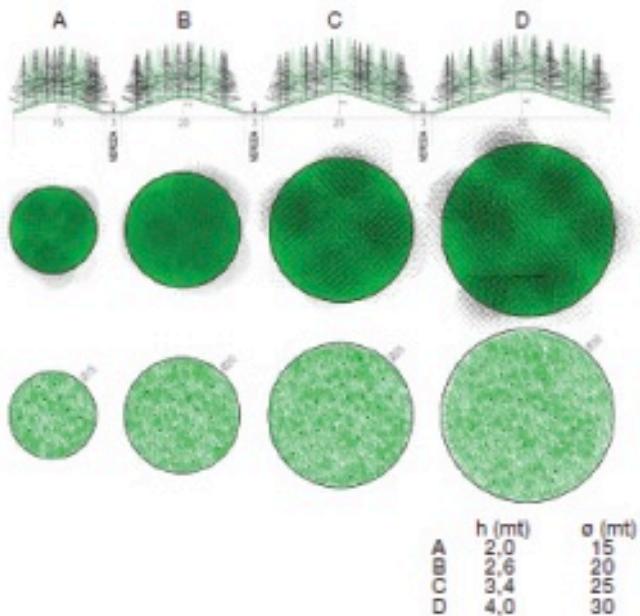


# it depends...



- 1. Estuary Area
- 2. Street
- 3. Pedestrian Promenade and Bike Path
- 4. TSUNAMI MITIGATION HILLS
- 5. Interior Walkways
- 6. Parking Areas
- 7. Existing Boat Houses
- 8. Municipal Theater
- 9. Street
- 10. Pier
- 11. PROPOSED RESIDENTIAL

Hills Mitigation



Plant Park Details





Simulations  
of Geophysical  
Multi-phAse flows