

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

**Ms. Randall Marine Science**

***Physical Oceanography Notes***

All about Ocean Waves, Tides and Currents

**Waves-**

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**Why are Waves Important?**

Waves and the currents they generate are the primary factors

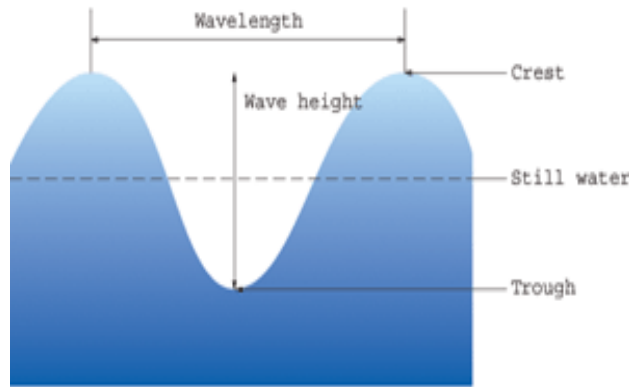
Waves move material along \_\_\_\_\_ for weaker currents to \_\_\_\_\_.

**Caused by:**

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**Parts of a Wave**

- **Crest** – \_\_\_\_\_
- **Trough** – \_\_\_\_\_
- **Wave Height** – \_\_\_\_\_
- **Wavelength** – \_\_\_\_\_
- **Wave period**



Wave climate

**Waves Caused by Wind**

- When wind blows across a body of water, \_\_\_\_\_ causes the water to move \_\_\_\_\_.

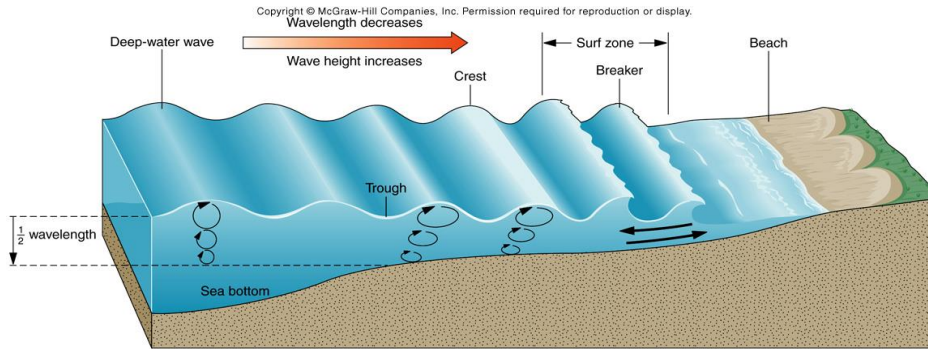
**Wave Height depends on –**

- \_\_\_\_\_
- **Fetch:** \_\_\_\_\_
- **Length of** \_\_\_\_\_

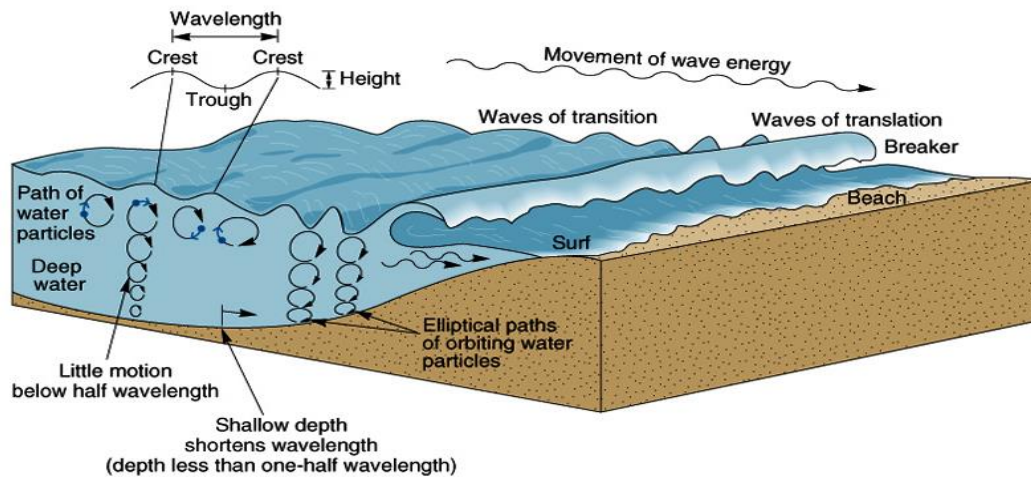
## Swells

### Wave Movement

When a wave passes through the ocean, individual water molecules \_\_\_\_\_ but they do not move forward or backward.



Breaker= \_\_\_\_\_



### Tsunami-

caused by: \_\_\_\_\_

## II. Tides

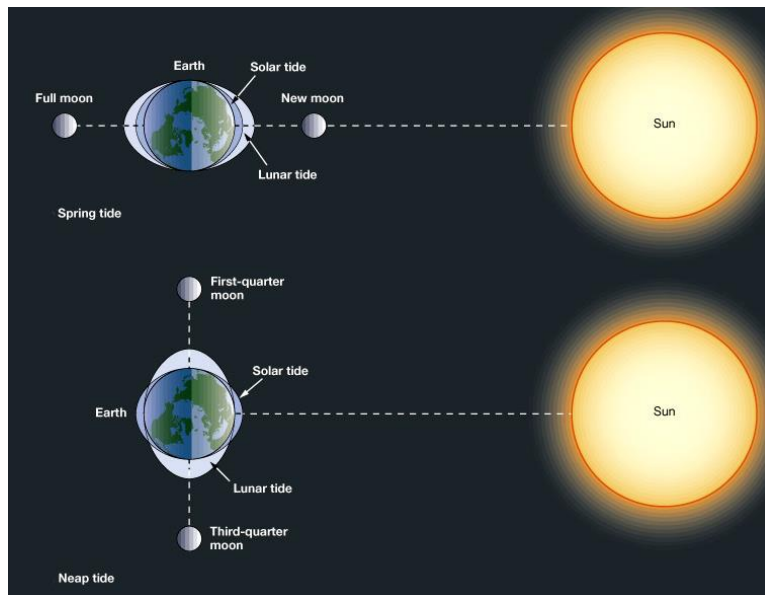
- The rise and fall in sea level is called \_\_\_\_\_
- Tides are actually \_\_\_\_\_ and depend heavily upon \_\_\_\_\_.
- One low-tide/high-tide cycle takes about \_\_\_\_\_
- Tidal range is \_\_\_\_\_

### What Causes Tides?

- The gravitational attractions of \_\_\_\_\_.

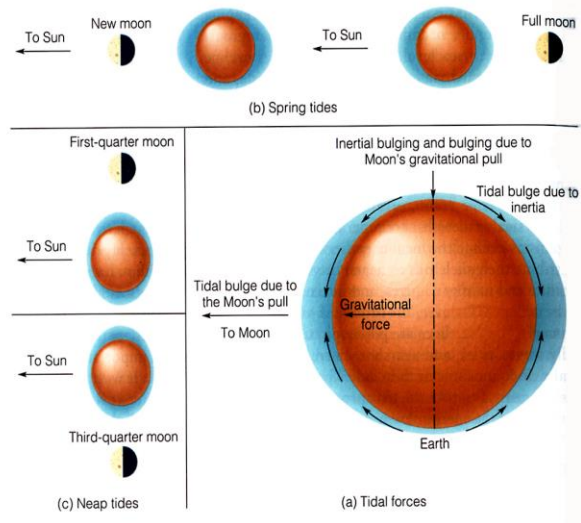
#### 1. Gravitational Effect of the Moon

- \_\_\_\_\_:
- One directly \_\_\_\_\_
- Another on the \_\_\_\_\_
- As the Earth spins, \_\_\_\_\_



#### 2. Gravitational Effect of the Sun and Moon

- Spring Tides
- \_\_\_\_\_
- High Tides \_\_\_\_\_ than normal
- Low Tides \_\_\_\_\_ than normal



**Figure 19.5**  
 (a) Tides are caused by the gravitational pull of the Moon and, to a lesser degree, the Sun. The Earth-Moon-Sun alignments at the times of the (b) spring and (c) neap tides are shown.

### 3. Gravitational Effect of the Sun and Moon

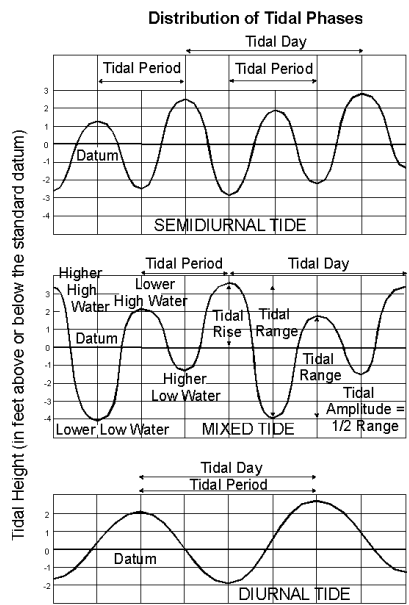
- Neap Tides \_\_\_\_\_
- \_\_\_\_\_
- High Tides \_\_\_\_\_ than normal
- Low Tides \_\_\_\_\_ than normal

### Tidal Patterns

- Diurnal

- Semidiurnal

- Mixed Tides



## What is a Tidal Bore?

- \_\_\_\_\_

## III. Currents

- \_\_\_\_\_
- \_\_\_\_\_
- Two types \_\_\_\_\_

## Surface Currents

- Horizontal, \_\_\_\_\_ that occur at or near the \_\_\_\_\_
- Can reach depths of \_\_\_\_\_ meters

### 1. Controlled by three factors

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

### 2. Global Winds

\_\_\_\_\_

### 3. Coriolis Effect

\_\_\_\_\_

Northern Hemisphere = \_\_\_\_\_

Southern Hemisphere = \_\_\_\_\_

### 4. Continental Deflections

\_\_\_\_\_

## Surface Currents and Climate

- Warm water currents  
On the \_\_\_\_\_  
Bring warm water \_\_\_\_\_  
Example: \_\_\_\_\_

- Cold water currents  
On the \_\_\_\_\_  
Bring cold water to \_\_\_\_\_  
Example: \_\_\_\_\_

# What are Deep Currents?

- Caused by changes \_\_\_\_\_
- Change in \_\_\_\_\_
- Change in \_\_\_\_\_

## Upwelling

- The movement of \_\_\_\_\_
- Nutrients \_\_\_\_\_
- Areas are important fishing grounds

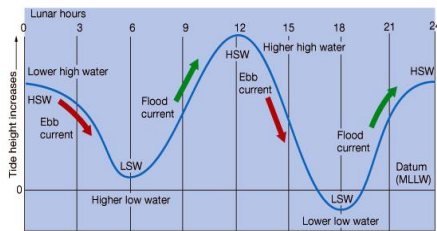
## Wave Induced currents

Undertow-

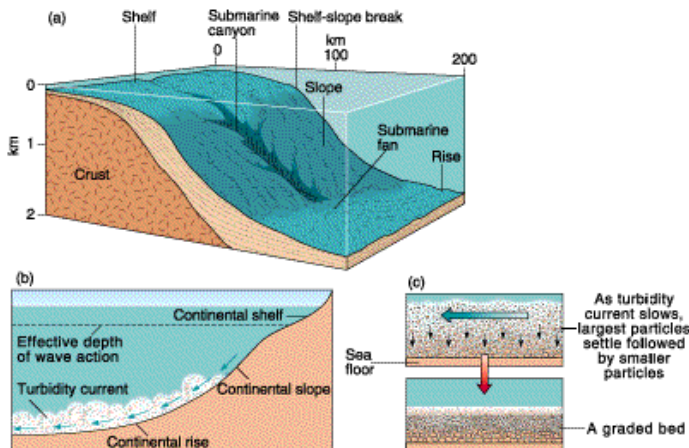
Rip current-

## Tidal Currents

- Ebb currents - \_\_\_\_\_
- Flood currents - \_\_\_\_\_
- LSW means \_\_\_\_\_
- HSW means \_\_\_\_\_



## Turbidity Currents



## Affects on Shoreline Topography

1. Longshore Currents –

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2. Erosion-\_\_\_\_\_

3. Barrier Island-\_\_\_\_\_

4. Groin - \_\_\_\_\_