

National Marine Science Centre

Coastal Dynamics and
Management



Name: _____

School: _____

Date: ____/____/____



Beach Dynamics Introduction

Beaches are always moving. Winds, waves and currents shape and reshape the beach throughout the year. Seasonal patterns develop in response to waves that are observable.

Coastal environments constantly adapt to change as a result of dynamic natural processes, such as tides, waves, floods, storms and cyclones, and changes in sea level. Climate change impacts, such as increasing sea levels, increasing intensity of storms and cyclones, and changed rainfall patterns will compound and extend the vulnerability of low-lying coastal areas to coastal hazards.

Decisions affecting undeveloped ocean front land are becoming critical as economic pressures collide with public interests. Decisions that will determine the ecological character of our coastal shorelines will also influence human access to the coastal regions, as well as economic, legal, political, and aesthetic aspects of our future. Knowledge of the oceans physical and biological processes is vital in selecting the best choices.

Making a beach profile gives a recording of the surface or profile of the beach and is an excellent way to determine beach topography and understand the principles at work along our coastline.

Study Aims

- Investigate a number of **physical environmental processes** at work on coastal beaches.
- Students produce an accurate **profile** of the beach by graphing data they collected.
- Students discuss **physical factors** that may change beach profiles and explain their reasoning.
- Students will identify **coastal erosion** as a natural process and explain how **human activity** can increase the associated with coastal erosion.
- Students will identify options for **reducing risks** coastal erosion, and discuss the advantages and associated with these options.
- Students discuss strategies to **minimise** coastal erosion

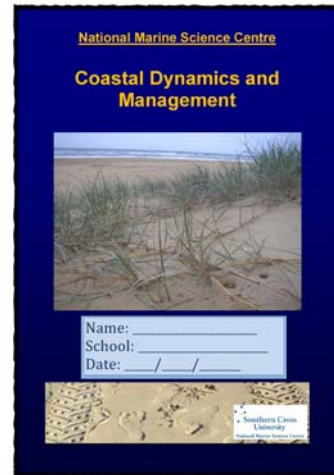
Safety Measures

- Enclosed footwear must be worn at ALL times (sandals recommended).
- Slip, Slop, Slap.
- Stay with the class.
- Fully stocked First Aid Kit to be taken.
- Don't touch unknown organisms without asking teacher first.
- Bring a water bottle.
- Don't take live specimens from their natural environment.
- Don't enter the water without permission from the teacher at ANY time.

Equipment



Sighting poles (2x)



Activity booklet







Pencil 2B



Remember to HAVE SOMEONE WATCHING THE OCEAN AT ALL TIMES to prevent injury from waves.

Complete the weather conditions table below:

Data Sheet A: Weather Conditions			
Time:			
Tide: (circle)	High	Mid	Low
Temperature:			
Wind direction:			
Wind speed:			



Data Collection

DIRECTIONS: Use sighting poles to record the elevation of each site at two meter intervals (or one pole length). Readings should start at the base of the dunes (site #1) and go in a straight line to the water's edge. In addition to elevation data, record observations of each site. Examples of observations might include sand conditions (wet, dry, etc.), sand grain size (fine, coarse, rocky, etc.), evidence of human activity (tire-tracks, debris, structures, etc.) and evidence of plant or animal life.

SITE #	READING	OBSERVATIONS
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
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21		
22		
23		
24		
25		
26		
27		

LOCATION PROFILED: _____

DATE: _____ WEATHER CONDITIONS: _____

TIME OF DAY: _____ TIDAL STAGE: _____

DATA COLLECTORS (name): _____

Extension questions

1. Explain what dynamic processes are at work at your study site.

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2. In which way has this beach been modified by human activity?

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3. List other examples in which humans have effected coastal areas?

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4. What happens when human activity interferes with the normal sand cycle?

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5. Research and explain some of the methods used to minimise coastal erosion.

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