

How to collect data about flows in a coastal environment

Longshore drift is the movement of sediment (such as sand or pebbles) along the coast. By collecting information, such as depth of sediment and movement of materials in the sea, we can assess whether longshore drift is happening and, if so, in what direction and at what speed.

Groynes trap sediment to prevent it being moved further along the coast by longshore drift. Measuring the build-up of sediment on either side of the groynes should provide evidence of the direction of longshore drift.

Figure 5 A survey of sediment on a beach



Step One Measure each groyne. Collect data at three points along the groyne at 0m, 20m, and 40m.

Step Two Measure the distance from the top of the groyne to the level of sediment on each side of the groyne at each of the three sample points. Record this data on the data recording sheet.

Step Three Take measurements at the same sample point along each groyne.

Step Four Process the data by calculating the mean distance (from the groyne to the beach) for each groyne by adding the three results together and dividing by three.

Figure 6 Data collected on a beach in NE England

Groyne	North side Mean distance to sediment (cm)	South side Mean distance to sediment (cm)	Difference in mean height (cm)
1	150	100	
2	120	80	
3	120	78	
4	140	88	
5	138	70	
6	132	56	
7	110	92	
8	56	54	
9	68	60	
10	82	72	

How to measure speed of transport of material in the sea

A float in the sea can provide an indication of the speed and direction of longshore drift. Equipment needed to measure the speed and direction of movement:

- a float such as an orange, or a painted tennis ball;
- a stopwatch (you could use the stopwatch app on your phone);
- a tape measure;
- a data collection sheet

Step One Place the tape measure as close to the sea as is safe, parallel to the shore line.

Step Two Mark a set distance, for example, 10 metres, perhaps with poles.

Step Three Place the float gently into the sea adjacent to the start point.

Step Four Measure and record the time it takes the float to travel 10 metres.

Step Five Repeat this process a number of times and calculate an average time.

Figure 7 How to measure the speed and direction of longshore drift



Strengths and limitations of measuring speed and direction of longshore drift

Some strengths

The equipment required is low cost.
An orange as a float is biodegradable (but as it would take a long time to decompose, it is better to try and retrieve the orange).
The speed of movement of the float may be affected by wind speed and direction so these variables should also be recorded.
Results for areas of managed and unmanaged coastline can be compared.

Some limitations

Rocky outcrops in the water may obstruct/deflect the float.
Swimmers or people paddling in the water may affect the movement of the float.
If the float is thrown into the water, it will gain extra momentum and your result will be unreliable.
The float may be dragged out to sea by the backwash and get lost.

Activities

1 Use Figure 6.

- Calculate the difference in sediment height either side of the groynes.
- Decide and justify whether it would be better to present these results using line graphs or bar charts.
- Explain what the results suggest about the direction of longshore drift on this stretch of coastline.

2 Discuss how the limitations listed above could be reduced.