

Energy sources & sediment cells / budgets 3.1.3.2 ANSWERS

Q1	<i>True or False?</i>	
A	A longer fetch creates destructive waves.	True
B	Constructive waves are higher frequency than destructive waves.	False
C	Coriolis Force deflects winds counter-clockwise in the northern hemisphere.	False
D	The moon and sun at right angles to the earth create a spring tide.	False
E	Surface ocean currents move faster than deep ocean currents.	True

Q2	Match the correct term to the correct process description	
A	How the Earth's rotation affects the direction in which winds travel across the earth.	Coriolis force
B	The movement of warm water away from the equator and cold water from the poles.	Global conveyor belt
C	The maximum length of open water over which the wind can blow.	Fetch
D	The process by which material is shifted laterally along the coast at an oblique angle.	Littoral drift
E	The movement of water up to the surface of the ocean.	Upwelling
Select from: Fetch Coriolis force Global conveyor belt Upwelling Littoral drift		

Q3	One sentence is incorrect in each of the explanations below. Identify the wrong one.	
A	Destructive waves are created when a large fetch occurs. The wind blows over the water for a long distance and creates low energy waves with a long wavelength. When these waves reach the coastline, they break onto the beach and scour away material.	A long fetch creates high energy waves which are tall with a short wavelength.
B	Coriolis force deflects winds in a certain direction. In the northern hemisphere winds are shifted clockwise. This movement in the northern hemisphere decreases erosion rates at eastern coasts such as the Holderness coast.	The movement of winds clockwise will create high energy waves being pushed against eastern coasts, hence increased erosion.
C	The gravitational pull of the moon and sun creates tides in the oceans. There are two tides a day – a high tide and a low tide. When the sun, moon and earth are in alignment we also get spring tides which are higher than usual and this is as a result of increased gravitational pull.	There are four tides a day; 2 high and 2 low. (or 3 in 24 hrs to be precise; 4 in 24 hrs & 50 mins)
D	A sediment cell is an area around a coastline where the movement of material is self-contained. It occurs as a result of the topography of the land controlling the key processes within the cell. Where the coastline is straight, material will be restricted from moving along into a nearby cell or prevented from moving offshore.	An indented coastline is needed to restrict outward movement of material and therefore the creation of a sediment cell.
E	A sediment budget is the amount of energy going into a sediment cell. Various factors will affect the budget, including changes in sediment load in a river as well as human intervention, such as dredging material out of a river to prevent flooding.	A sediment budget is the balance between the inputs and outputs of sediment.

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Q4	Decide which heading the various factors would match with, in regards to a dynamic (changing) net sediment budget.	
	Positive sediment budget	Negative sediment budget
	<p>Rockfall in an upland area</p> <p>Creation of groynes</p> <p>Sea level rise (with reference to increased cliff face erosion).</p> <p>Deforestation along the coast</p> <p>Building of a coastal port (acts as a sediment trap)</p> <p>Creation of a campsite along the top of a cliff</p>	<p>Dam built along a river's course</p> <p>Dredging a river</p> <p>Creation of a sea wall</p> <p>Sea level rise (may disturb natural movement within the sediment cell and create increased offshore transportation)</p> <p>Building of a coastal port (material may be dredged within shallow harbours to allow for deep hulled boats to dock)</p>
	<p>Rockfall in an upland area</p> <p>Dredging a river</p> <p>Sea level rise</p> <p>Creation of a campsite along the top of a cliff</p>	<p>Dam built along a river's course</p> <p>Creation of a sea wall</p> <p>Building of a coastal port</p> <p>Creation of groynes</p> <p>Deforestation along the coast</p>

Q5	Think about the implication of global sea level rise on coastal energy sources and sediment cells/budgets.
A	<p>What are some of the negative implications?</p> <p>Increased erosion due to an increased high tide.</p> <p>Increased storm conditions due to associated climate change and resulting impact upon erosion.</p> <p>Sediment cell collapse and impact upon processes within an area – for example – loss of coastal habitats on spits due to lack of available sediment.</p> <p>Diverted ocean currents, impacting upon coastal processes</p>
B	<p>What are some of the positive implications?</p> <p>Increased sediment availability due to increased coastal erosion.</p> <p>Increased sediment availability – for industrial use.</p> <p>Improved job opportunities in sea level rise mitigation – engineers, construction etc. for coastal protection measures.</p>