

Coastal systems: changes in sea level & associated features 3.1.3.3

ANSWERS

Q1	<i>True or False?</i>	
A	If the sea is reaching higher along a coast it is eustatic change	False
B	Isostatic change can mean some areas of coast are rising while others are falling	True
C	If there is a raised beach global sea level must have fallen	False
D	Tectonic factors alter the relative sea level at very short & very long timescales	True
E	If eustatic rise matches isostatic rise, the relative sea level remains the same	True

Q2	<i>Match the correct term to the correct landscape description</i>	
A	A wide flat area of solid rock covered in thin vegetation immediately behind the shore and about 10 m higher than the beach.	Marine platform
B	Steep gorge-like walls of rock rising from the sea in a relatively straight channel going inland for some kilometres.	Fjord
C	Long islands just off the coast lying parallel to each other.	Dalmation coast
D	Gentle valley sides rising out of a wide estuary that narrows quite quickly and becomes sinuous as it goes inland.	Ria
E	A flat face of rock with caves a little distance inland and standing like a terrace behind and above a beach.	Relict cliff

Select from: **Relic cliff** **Fjord** **Ria** **Dalmation coast** **Marine platform**

Q3	<i>One sentence is incorrect in each of the explanations below. Identify the wrong one.</i>	
A	Thermal expansion is one of the main causes of current Eustatic sea level rise. It has taken place since the end of the last glacial advance. It has speeded up since the start of the Industrial Revolution. It is set to increase as global temperatures rise. Water expands and occupies a larger volume. Increased evaporation lifts the sea level higher.	
<i>Evaporation may increase in warmer temperatures but it cannot lift the sea level.</i>		
B	A minor cause of current sea level rise is the melting of glacier and land ice. As global temperatures rise glaciers and ice sheets melt more rapidly. But as they melt faster there is also increased snowfall on their surfaces. As water that was locked up as ice enters the oceans it adds to their mass. A greater mass of sea water causes its level to rise relative to the land. This is a global effect.	
<i>It is a 'major' cause of current sea level rise and set to become the main cause over the century</i>		
C	Tectonic activity can result in very rapid movements of land relative to the sea. Seismic events can cause the land to rise in the form of uplift. Land can also fall as a result of downthrust. Both volcanoes and earthquakes can cause very rapid changes in relative sea level. The change can be as much as 9 m in a matter of minutes.	
<i>Earthquakes, but not volcanoes, can cause rapid changes in relative sea level.</i>		
D	Isostatic depression occurs during a glacial advance. The weight of accumulating ice presses the land down into the mantle. At the end of the glacial phase as the ice melts the crust starts to rise back up from the mantle. It is a slow process at first but speeds up thousands of years later as displaced mantle flows back under the crust. The process is still going on in much of North America and northern Europe.	
<i>It is rapid at first as the ice melts, then slows to a more gradual and consistent level with mantle flow</i>		

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E	<p>Tectonic activity can cause one of the slowest forms of relative sea level change. Over millions of years as continental drift takes place ocean basins can get larger. Oceans are spread over a larger area and the level falls. When continents collide they reduce the ratio of continent to ocean and contribute to sea level fall. When submarine volcanoes erupt they release vast amounts of water that fills ocean volumes and causes their levels to rise. At mid-ocean ridges, the upwelling a vast masses of new crust inputs a large rock mass into oceans causing sea level to rise.</p>
<p><i>Submarine volcanoes release some moisture but not enough to raise sea level.</i></p>	

Q4	<i>Decide which heading the various strategies would match with in response to rising sea levels</i>	
	<i>Mitigation Strategies</i>	<i>Adaptation strategies</i>
	<p>Encouraging carbon credit trading Subsidising a 'green' energy policy Expanding nuclear power over coal.</p>	<p>Building new sea walls Developing Managed Retreat plans Zoning new developments away from low-lying coasts Discouraging single-storey building in favour of multi. Draining inundated coastal land Moving populations onto higher land</p>
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Q5	<i>Think about the implication of global sea level rise</i>
A	<p>What are some of the negative implications for some areas?</p> <p><i>More frequent flooding of coastal land – danger to coastal populations</i> <i>Loss of coastal infrastructure (ports, transport networks, power stations)</i> <i>Saline intrusion into coastal agricultural land</i> <i>Submersion of coastal mudflats, biomes and corals</i> <i>Increasing need to divert finance to coastal protection</i> <i>Coastal refugees</i></p>
B	<p>What are some of the positive implications for some areas?</p> <p><i>Deeper harbours</i> <i>Reduced silting of shallow ports</i> <i>Stimulus to coastal engineering companies</i></p>