HL Paper 2

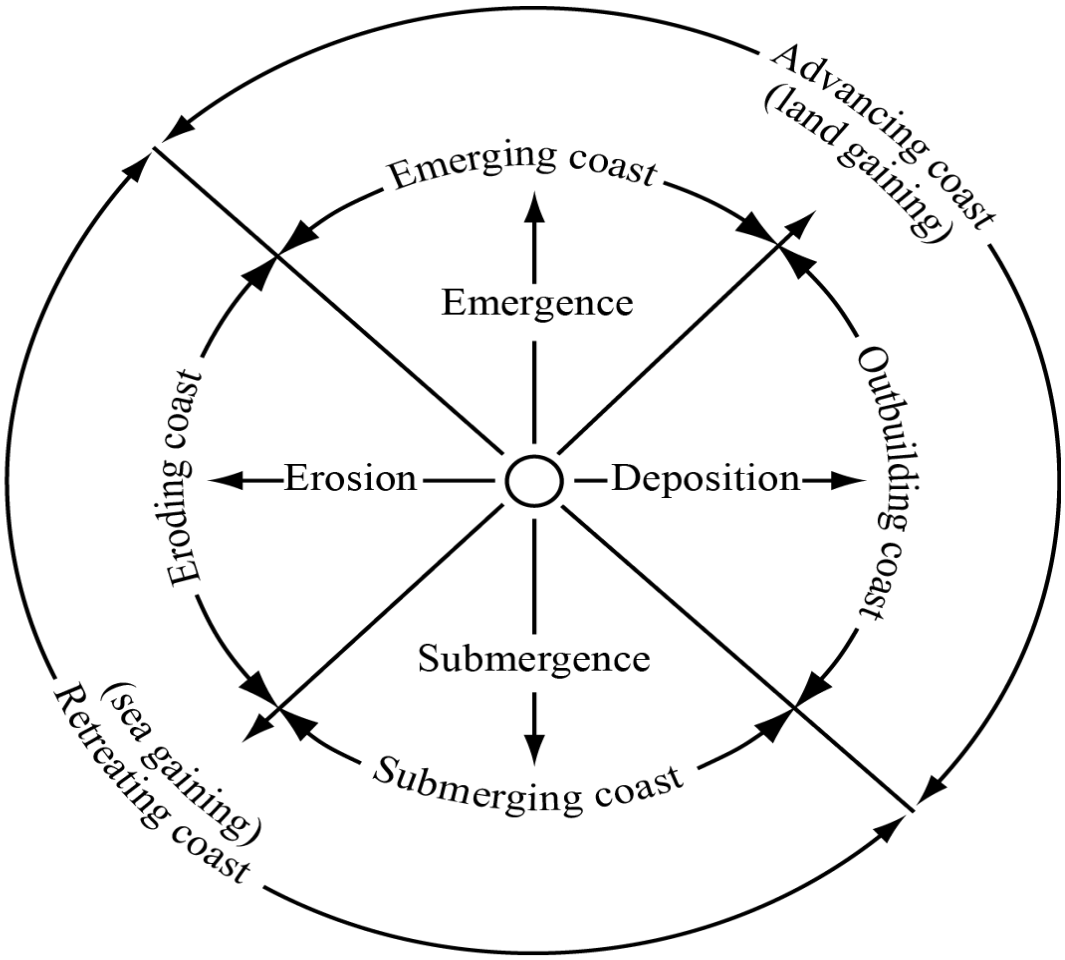
a. (i) Define the term *littoral drift* (longshore drift). [4]

(ii) Briefly describe **one named** feature caused by littoral drift.

b. Explain the formation of **two** ocean floor landforms associated with volcanic or tectonic activity. [6]

c. "The loss of coral reefs is not just a local concern." Discuss this statement. [10]

The diagram shows a model of coastal advance and retreat.



[Source: http://science.jrank.org/article_images/science.jrank.org/coasts-and-coastal-processes.1.jpg]

a. Identify **two** reasons shown on the diagram why some coasts advance. [2]

b. Explain why cliffs are often found along retreating coasts. [3]

c. Explain the global distribution of ocean ridges. [5]

d. Examine how the exploitation of **one** named oceanic resource has led to geopolitical conflict. [10]

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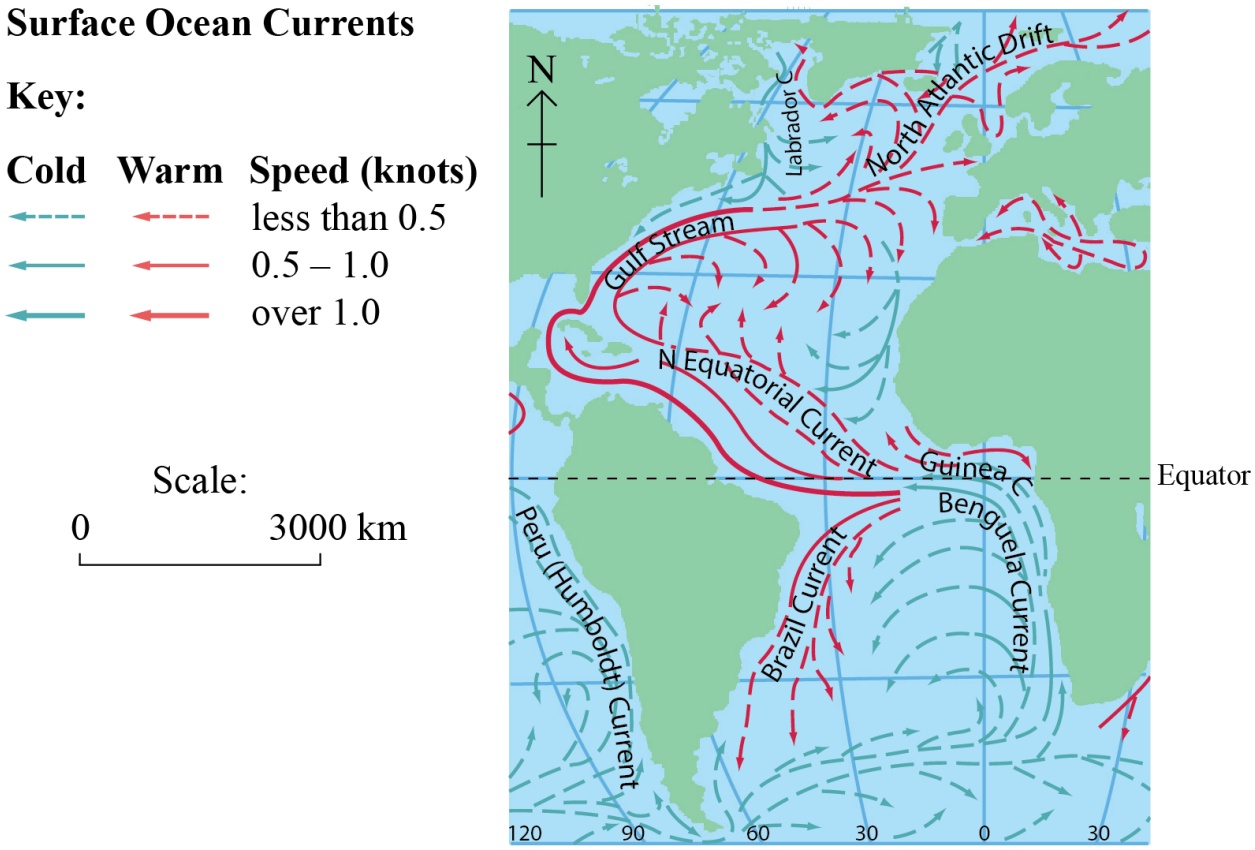
a. [4]

The map shows surface ocean currents in the Atlantic Ocean in January.



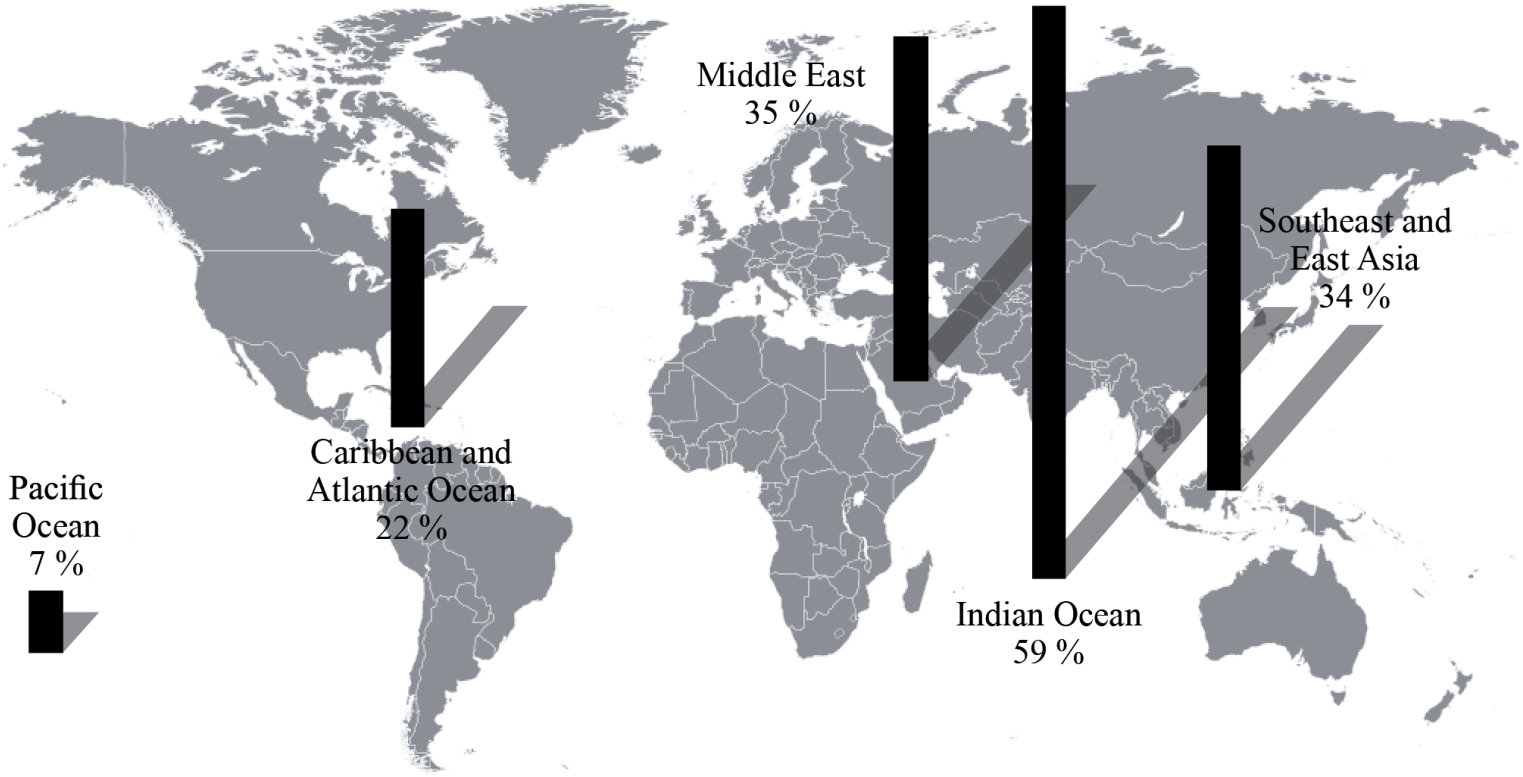
cartography ©Philips

Describe the pattern of ocean currents shown on the map.

b. Explain the functioning and importance of the oceanic conveyor belt. [6]

c. “Ocean fishing can never be sustainable.” Discuss this statement. [10]

The graph shows the percentage of coral reefs that have been lost since 1960.



[Source: adapted from http://commons.wikimedia.org/wiki/File:World_Blank_Map_(Mercator_projection).svg]

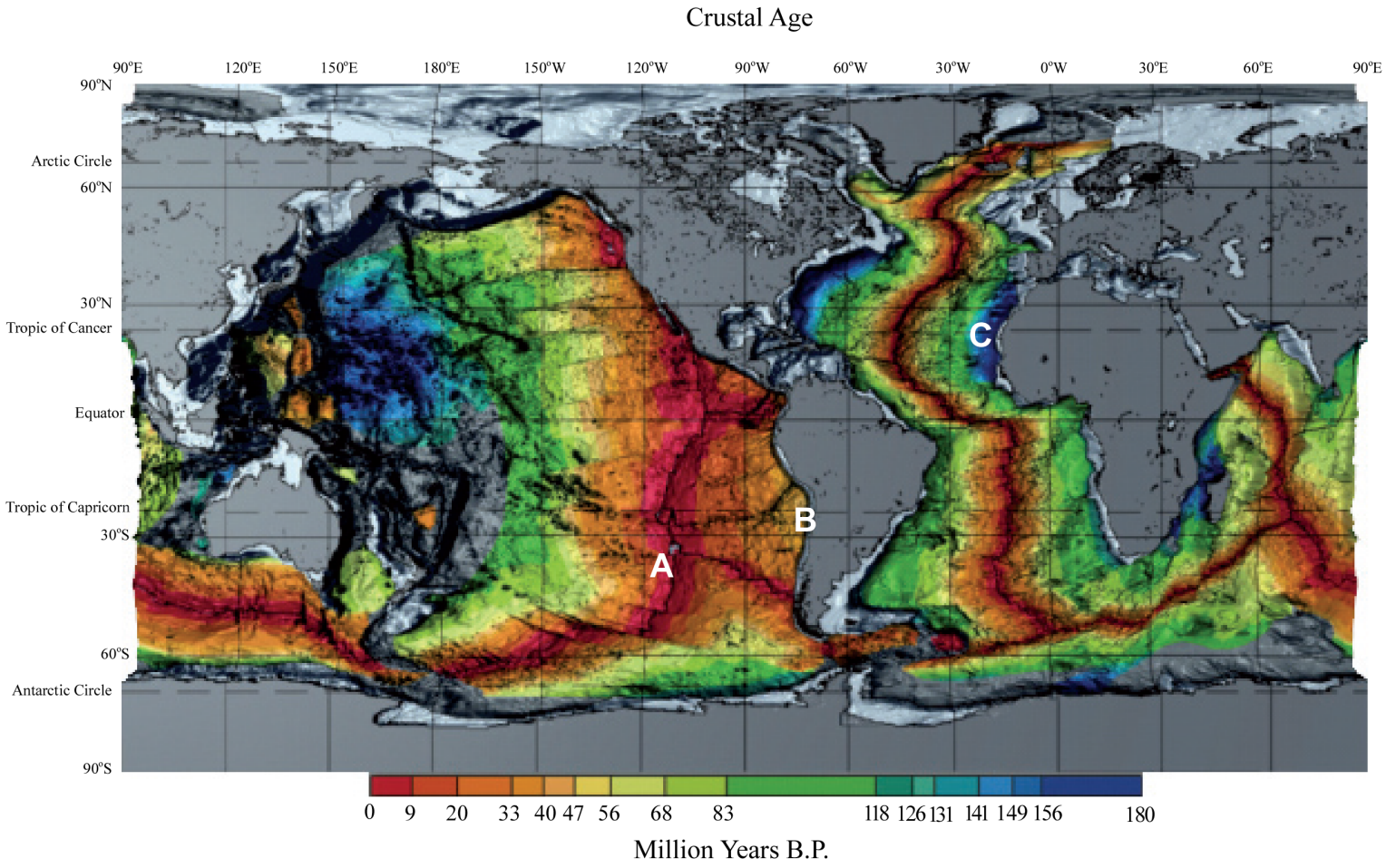
ai. Describe the pattern of loss of coral reefs. [2]

aii. State **two** physical factors which are needed for the development of coral reefs. [2]

b. Explain **three** benefits that coral reefs bring to people. [3x2]

c. Examine the conflicts which arise from competing land uses in coastal margins. [10]

The map shows the age of oceanic crust.



[Source: Computerized digital images and associated databases from the National Geophysical Data Centre, National Oceanic and Atmospheric Administration, U.S. Department of Commerce]

ai+aii. Referring to the map, identify the type of plate boundary shown on the map at: [2]

(i) A

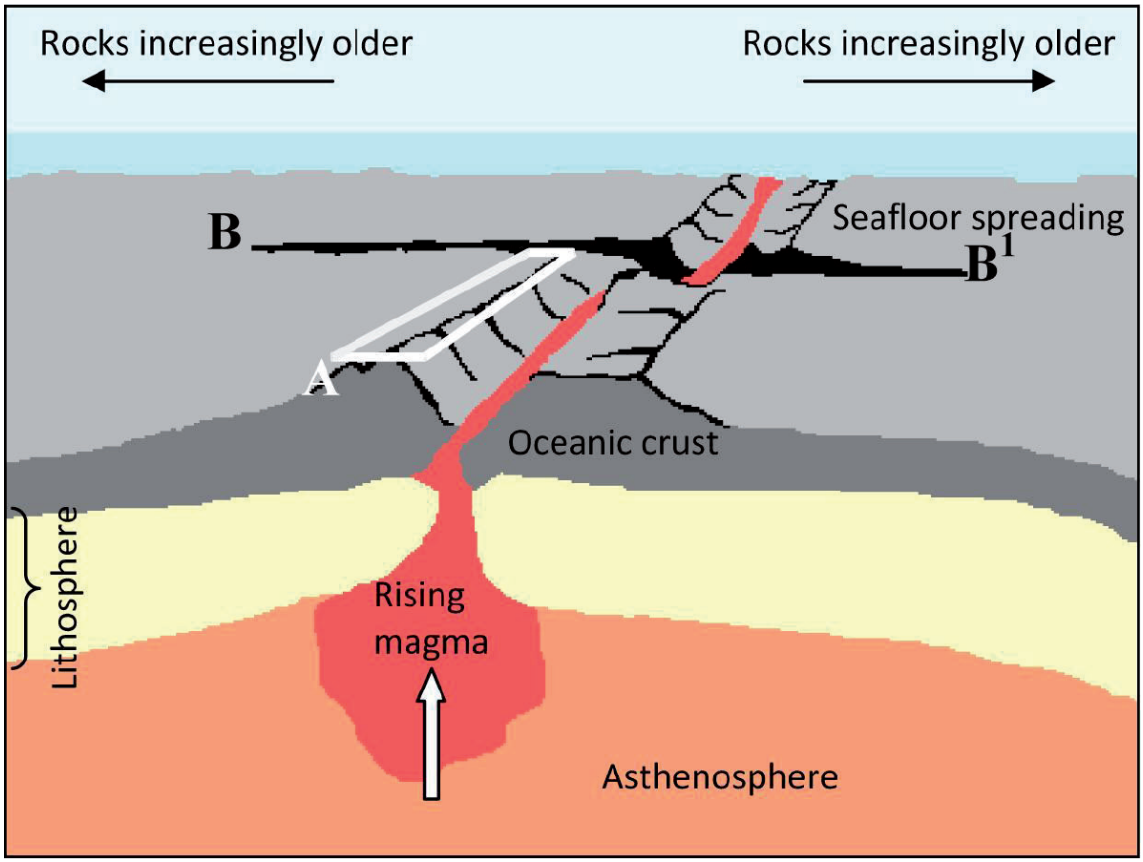
(ii) B.

b. State the age of the oceanic crust at C shown on the map. [2]

c. Using an annotated diagram **only**, explain why the age of oceanic crust changes with distance from the mid-ocean ridges. [6]

d. Referring to specific nations, discuss the geopolitical issues that arise over ocean areas. [10]

The diagram shows some of the main features of the ocean floor.



a. Referring to the diagram, identify feature A and feature B–B[1]. [1+1]

b. Explain why the ocean floor becomes increasingly older with distance from A. [2]

c. Using an annotated diagram **only**, explain the formation of an ocean trench. [6]

d. Examine why oceans are areas of geopolitical conflict. [10]

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a.i. Briefly outline the role of oceans as a source of carbon dioxide. [2]

a.ii. Briefly outline the role of oceans as a store of carbon dioxide. [2]

b.i. Explain what is meant by the term “oceanic conveyor belt”. [2]

b.ii. Suggest **two** reasons why the oceanic conveyor belt is important. [4]

c. Evaluate the success of **one named** conservation policy for sustainable fishing. [10]

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a. Define the term *exclusive economic zone*. [2]

b. Briefly describe what is meant by continental shelf. [2]

c. Explain the environmental **and** economic value of mangrove swamps. [6]

d. Discuss the conflicts that occur from attempts to manage coastal hazards. [10]

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a. Outline **one** economic and **one** environmental benefit of coral reefs. [2+2]

b. Explain the function of the oceanic conveyor belt(s). [6]

c. Examine the economic effects of El Niño and/or La Niña events. [10]

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a. (i) Define the term *exclusive economic zone (EEZ)*. [4]

(ii) Outline how a conflict might arise from competition over exclusive economic zones (EEZs).

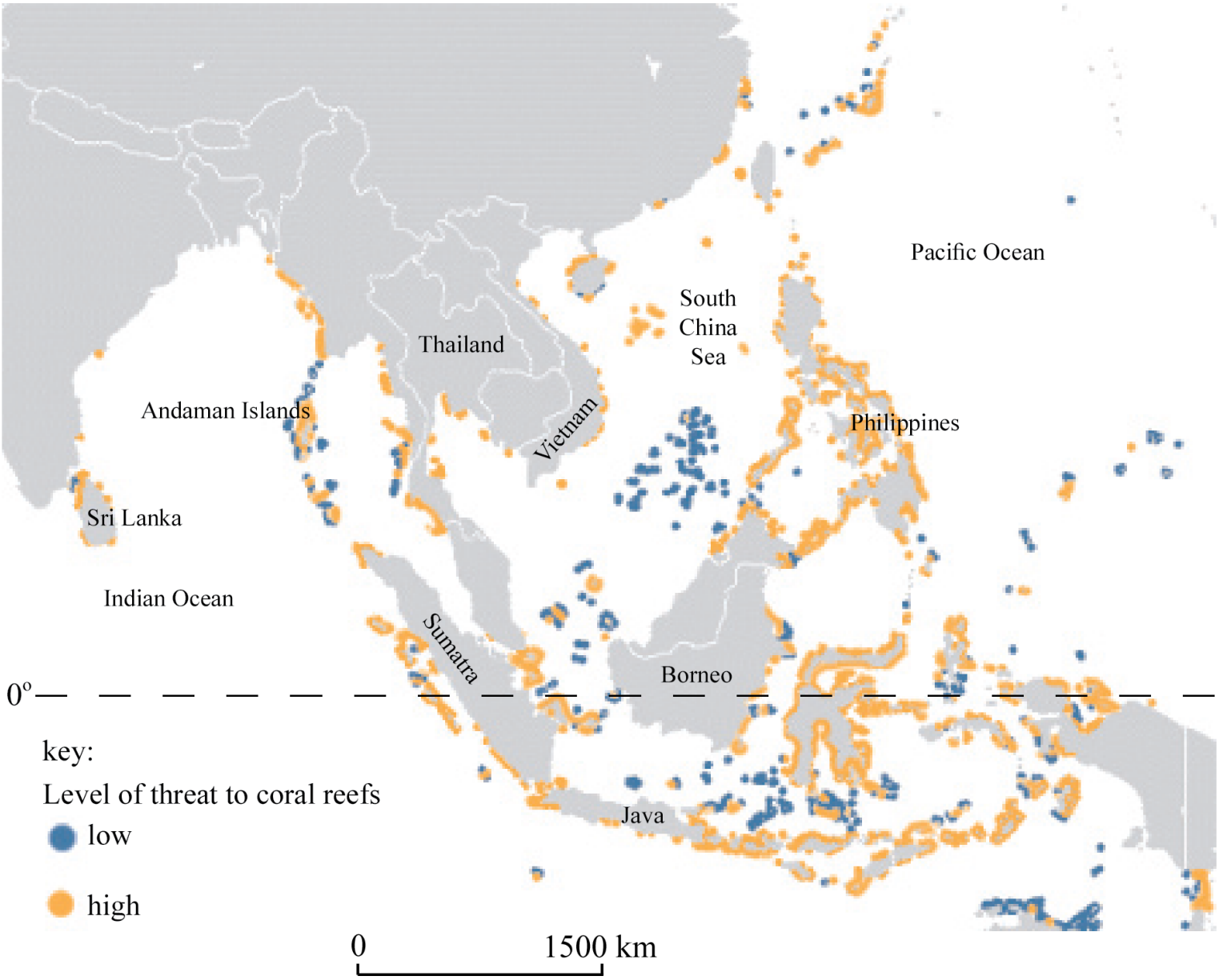
b. Explain the role of oceans: [6]

(i) as a store of carbon dioxide;

(ii) as a source of carbon dioxide.

c. "To provide sustainable fish yields we must stop overfishing the oceans and promote aquaculture instead." Discuss this statement. [10]

The map shows the estimated threat to coral reefs in South-East Asia.



[Source: modified from the United Nations Environment Programme's Global Environment Outlook 2000 publication http://www.unep.org/geo2000/english/i86a.htm]

a. Describe the pattern of threat to coral reefs shown on the map of South-East Asia. [4]

b. Explain **three** socio-economic impacts of the loss of coral reefs and mangrove systems. [6]

c. Using a case study, evaluate the management strategies adopted to resolve the pressures on a particular coastline. [10]

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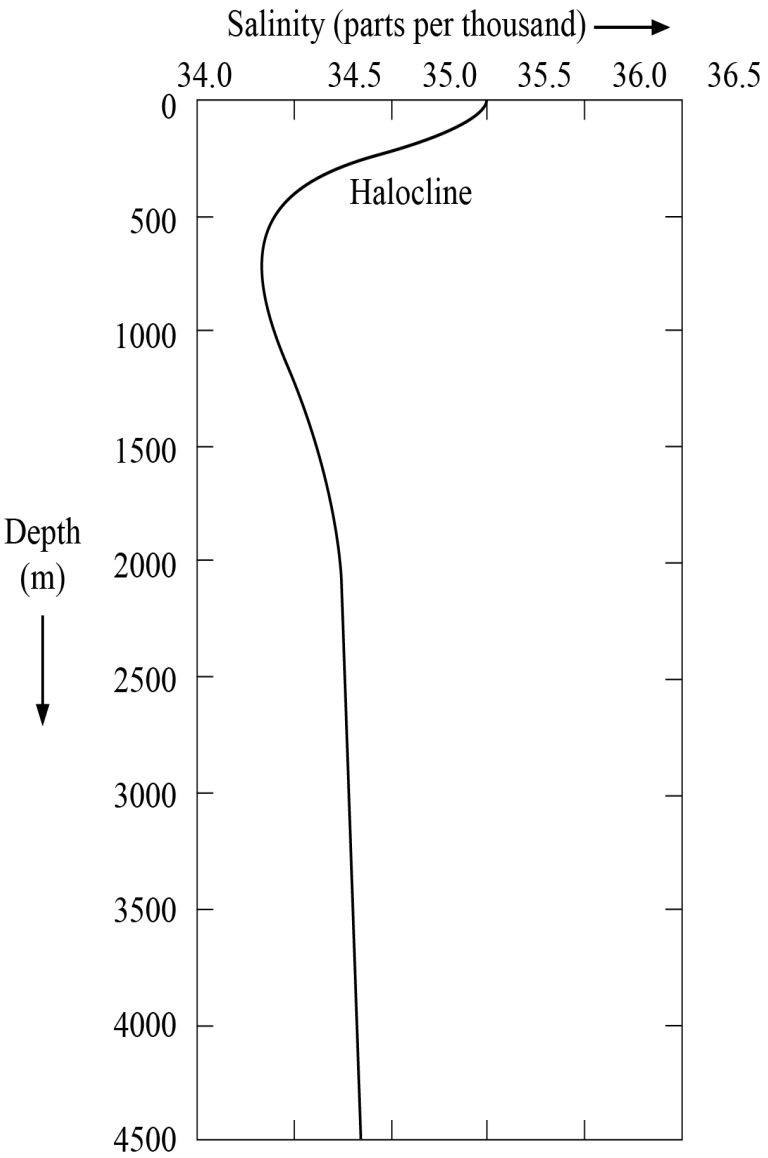
a. Describe **two** characteristics of oceanic crust. [4]

b.i. Briefly outline the oceanic circulation in the Pacific Ocean during an El Niño event. [2]

b.ii. Explain the wind and pressure systems in an El Niño event. [4]

c. Examine the spatial and temporal consequences of overfishing. [10]

The graph shows vertical variations in the salinity of ocean water.



[Source: http://cimss.ssec.wisc.edu/sage/oceanography/lesson4/images/sm_salinity_depth.jpg]

a. Describe the vertical variations in the salinity shown on the graph. [4]

bi. Explain what is meant by “oceanic conveyor belts”. [2]

bii. Suggest **two** reasons why oceanic conveyor belts are important. [2+2]

c. Discuss the effects of El Niño on some coastal margins. [10]

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b. Explain **two** conflicts that may arise as a result of aquaculture. [4]

c. “The disposal of waste in the oceans is causing serious harm to people and places.” Discuss this statement. [10]

The map extract shows a coastal area in Ireland. The scale of the map is 1:50 000 and the contour interval is 50 metres.

[Source: Ordnance Survey Ireland Permit No. 8758 © Ordnance Survey Ireland/Government of Ireland]

a. Using map evidence, describe the effects of deposition in Area A. [4]

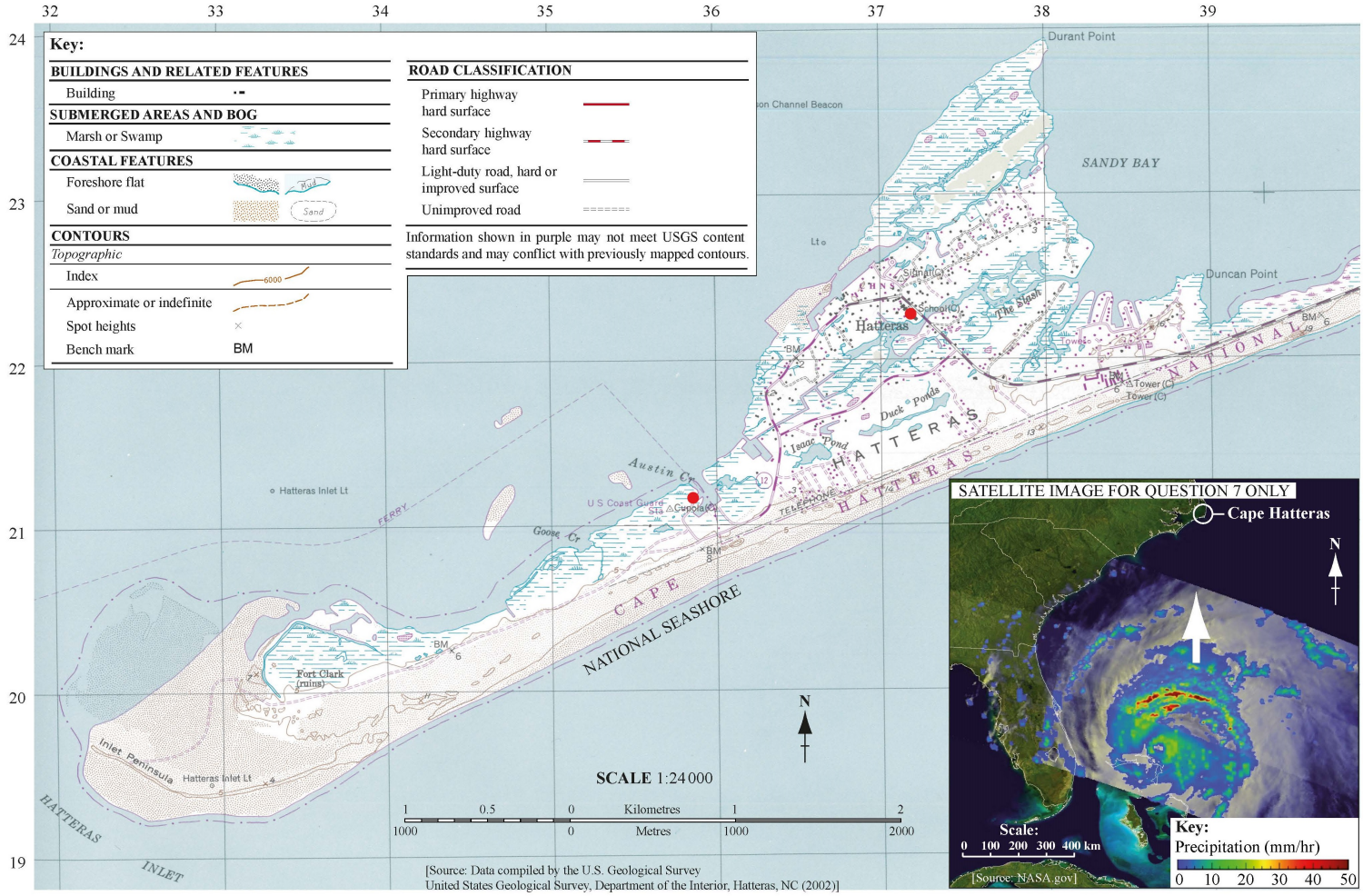
bi+bii. Using map evidence, explain **one** likely conflict between types of human activity in: [2x3]

(i) Area A,

(ii) Area B.

c. Examine the sources and impacts of waste disposal in oceans. [10]

The map shows the Cape Hatteras area of the east coast of the USA. The satellite image shows Hurricane Irene (2011), a few days before it reached Cape Hatteras.



a. Using map evidence, describe **two** depositional landforms found on this coastline. [4]

b. Explain how **one** geopolitical conflict has developed in relation to a **named** oceanic resource. [6]

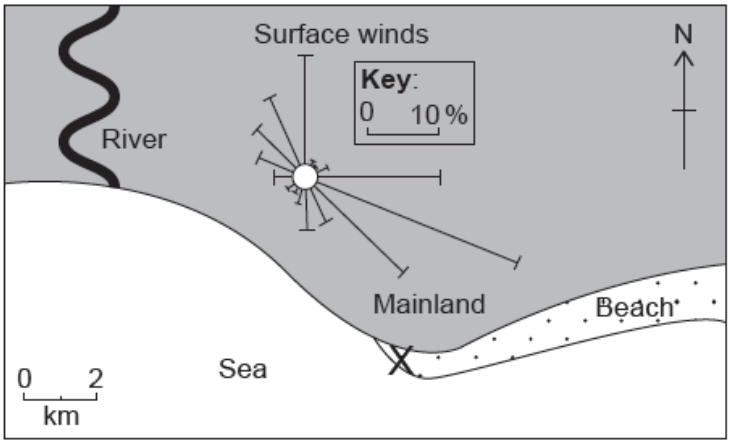
c. "The fishing industry can never be sustainable." Discuss this statement. [10]

a. Outline the global distribution of oceans. [4]

b. Explain **two** ways in which wind action helps different coastal landforms to develop. [6]

c. "Geopolitical conflicts over oceans, including their resources, will only get worse in the future." Discuss this statement. [10]

The diagram shows wind frequency over a 30-year period on a beach in the Caribbean.



[Source: © International Baccalaureate Organization 2018]

a.i. Estimate the percentage of days when the wind blows from the north. [1]

a.ii. Identify the direction of the most frequent wind. [1]

a.iii. State the direction towards which longshore drift is most likely to occur at X on the diagram. [1]

a.iv. State **one** landform likely to be produced by longshore drift at X. [1]

b. Explain **three physical** factors that affect the development of coral reefs. [6]

c. "Coastal hazard management always creates more problems than it solves." Discuss this statement, with reference to **one or more** areas of coastline. [10]

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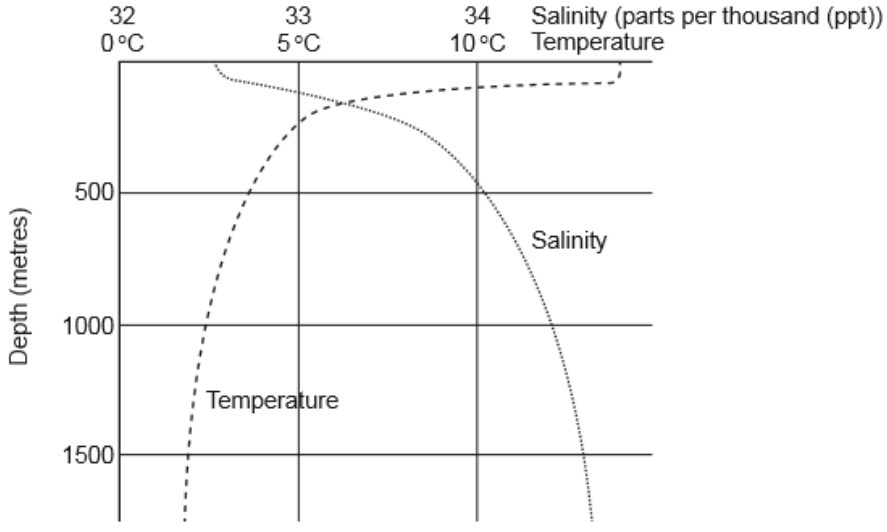
a. The graph shows changes in average annual ocean salinity and temperature with depth. [4]



[Source: HOLDEN, J. AN INTRODUCTION TO PHYSICAL GEOGRAPHY AND THE ENVIRONMENT, (c) 2005, p. 60. Reprinted by permission of Pearson Education, Inc., New York, New York.]

Referring to the graph:

(i) describe how ocean salinity varies with depth;

(ii) describe how ocean temperature varies with depth.

b. Explain **three** economic benefits of mangrove swamps. [6]

c. To what extent have the management strategies adopted to resolve human pressures on **one named** coastline been successful? [10]

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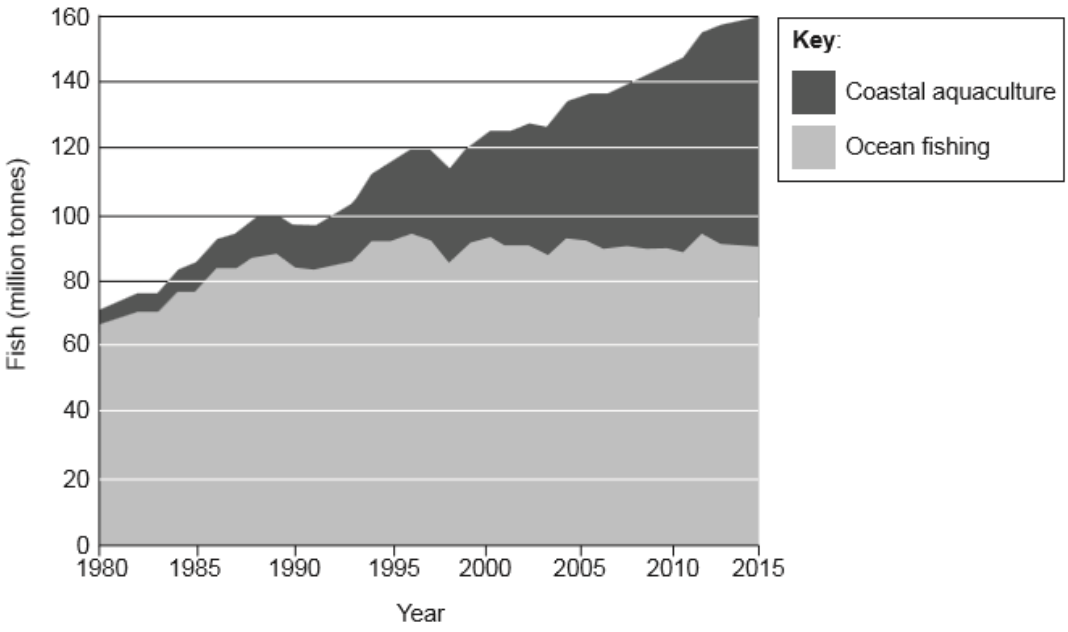
a. The graph shows the global production of fish from coastal aquaculture and ocean fishing between 1980 and 2015. [4]



[Source: Food and Agriculture Organization of the United Nations, FAO (2014) *The State of World Fisheries and Aquaculture* http://www.fao.org/3/a-i3720e.pdf Reproduced with permission.]

(i) Describe what is meant by the term “aquaculture”.

(ii) Describe the trends in coastal aquaculture shown on the graph.

b. (i) Briefly outline the sovereignty rights of nations in relation to oceanic resources. [6]

(ii) Explain how oceanic resources are the cause of one geopolitical conflict.

c. Compare the importance of coastal processes and lithology for the formation of **two or more** coastal features. [10]

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ai+aidentify **two** abiotic resources found in each of the following: [2+2]

(i) continental shelf areas

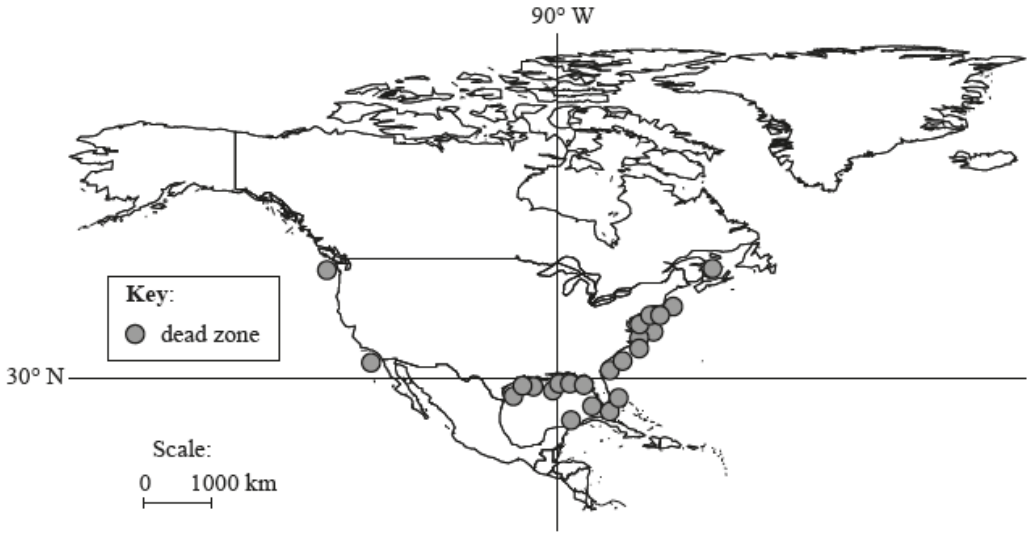
(ii) ocean floor deposits.

b. Explain **three** consequences of oil pollution in oceans. [2+2+

c. Examine the effects of the loss of coral reefs and mangrove swamps. [10]

Option B — Oceans and their coastal margins

The map shows the distribution of coastal "dead zones" in North America and the Caribbean. A dead zone is an area with significantly reduced marine life (due to pollution).



[Source: © UNEP]

a. (i) Describe the location of dead zones. [4]

(ii) Outline how chemical waste may result in a dead zone.

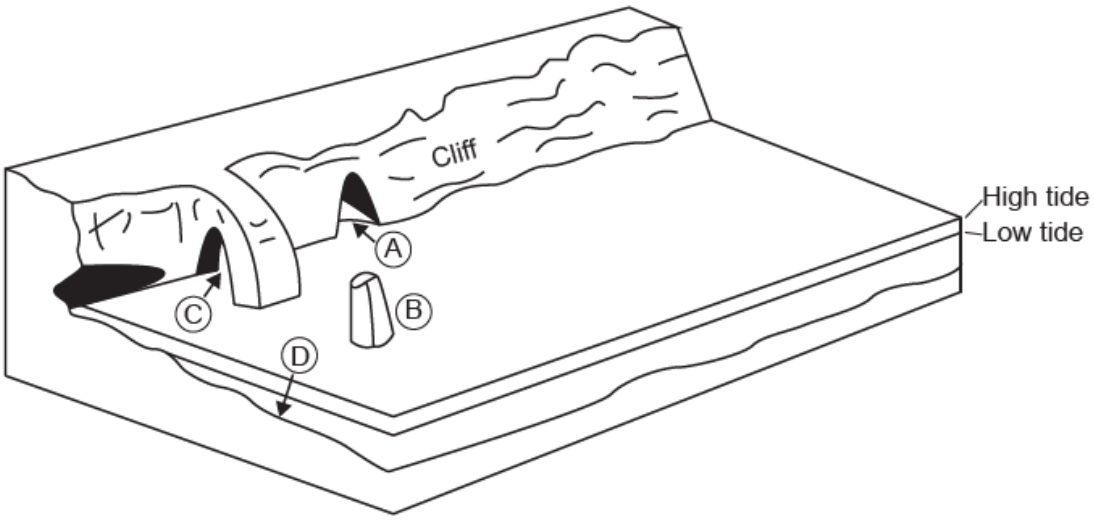
b. Briefly explain the formation of: [6]

(i) **one** coastal landform resulting mainly from erosion;

(ii) **one** coastal landform resulting mainly from deposition.

c. "Management strategies for coastlines are generally **ineffective**." Discuss this statement with reference to **one named** coastline you have studied. [10]

The diagram shows four landforms (A, B, C, D) associated with a cliff.



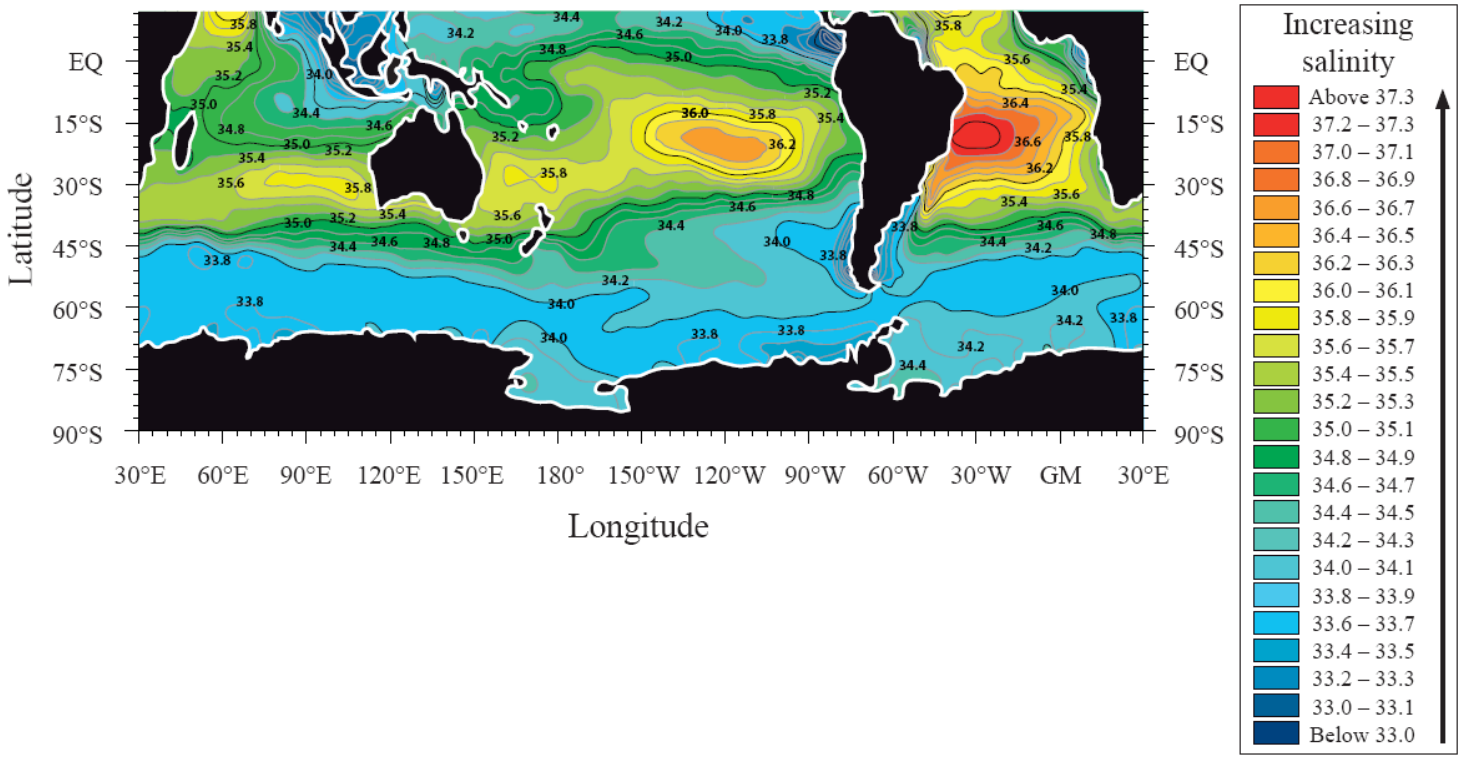
[Source: copyright International Baccalaureate Organization, 2016]

a. (i) Identify **two** of the landforms shown in the diagram. [4]

(ii) Outline how wave action could lead to the collapse of the cliff.

b. Explain **three** factors favouring the growth of coral reefs. [6]

c. Examine the environmental and economic impacts of the pollution of oceans by oil. [10]



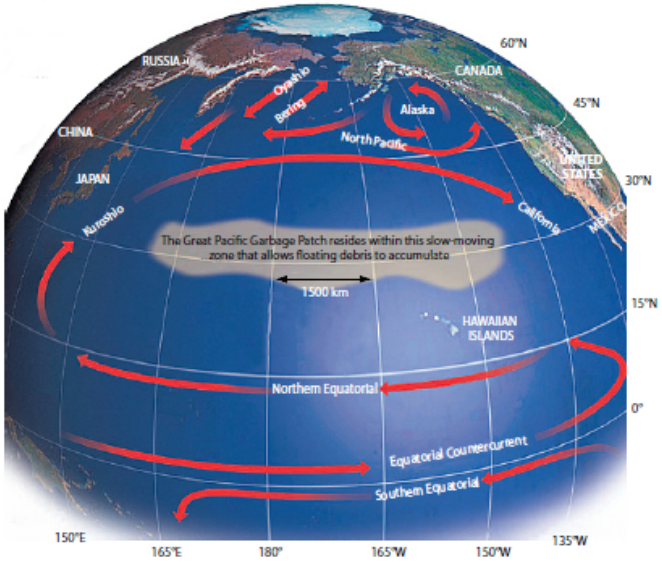
[Source: http://serc.carleton.edu/eslabs/corals/4c.html]

a. Describe the pattern of ocean salinity shown on the map. [4]

b(i). Explain what is meant by the La Niña phenomenon. [2]

b(ii). Using examples, analyse **two** economic impacts associated with La Niña. [4]

c. Examine the role of oceans as a store and source of carbon dioxide. [10]



[Source: http://media-files.gather.com/images/d56/d320/d746/d224/d96/f3/full.jpg]

a. Describe the size and location of the oceanic “garbage patch” shown. [4]

b. Explain why most types of ocean pollution occur along coastal margins. [6]

c. Compare the conflicts that arise in coastal areas from habitat restoration schemes with those that arise from aquaculture. [10]

Optional Theme B — Oceans and their coastal margins

4. The photographs A and B show two coastal areas.

Photograph A

[Source: © International Baccalaureate Organization, 2012]

Photograph B

[Source: www.bgs.ac.uk]

a. (i) State which of these photographs shows an advancing coast. [4]

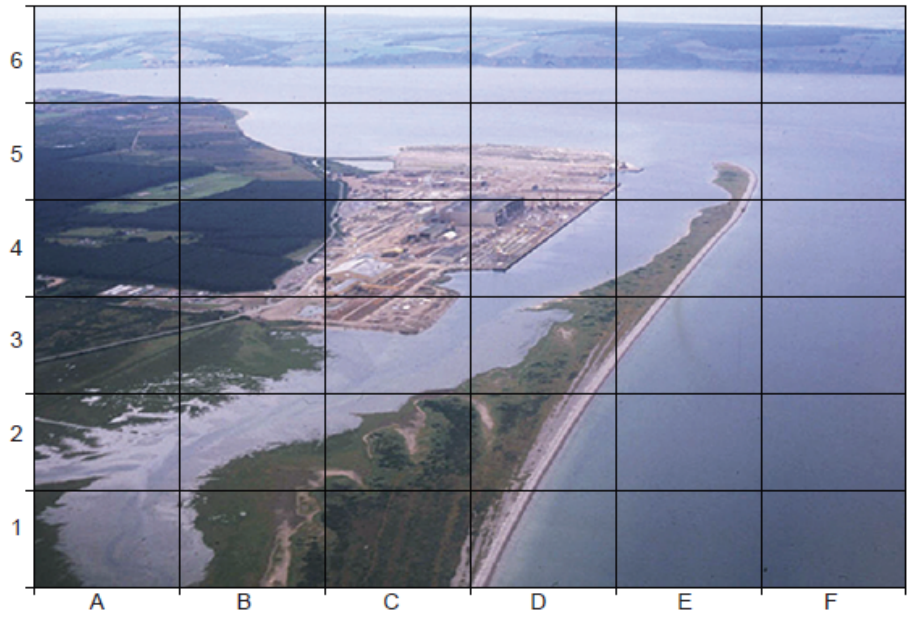
(ii) Identify **one** landform in the photograph you have chosen that shows it is an advancing coast.

(iii) Define the term *advancing coast*.

b. Distinguish between the climatic conditions experienced on the east coast and the west coast of the Pacific Ocean during an El Niño event. [6]

c. Using examples, examine the geographic consequences of the pollution of oceans. [10]

The photograph shows part of an advancing coast.



[Source: copyright International Baccalaureate Organization, 2015]

a. Describe **two** physical and/or human features shown in the photograph that suggest this is an advancing coastline. [4]

b. Explain how oceanic trenches are formed. [6]

c. "There are no simple solutions for the conflicts that arise over the use of coastal areas." Discuss this statement. [10]

The photograph shows an area of sand dune restoration.

[Source: copyright International Baccalaureate Organization, 2016]

a. (i) State **one** natural cause **and one** human cause of sand dune degradation. [4]

(ii) Identify **two** ways in which people are attempting to restore the sand dunes shown in the photograph.

b. Briefly explain the characteristics **and** formation of **two ocean floor** landforms found at a constructive plate boundary. [6]

c. Examine the possible impacts of changes in the ocean carbon store. [10]

The photograph shows an actively eroding cliff.

[Source: © International Baccalaureate Organization 2015]

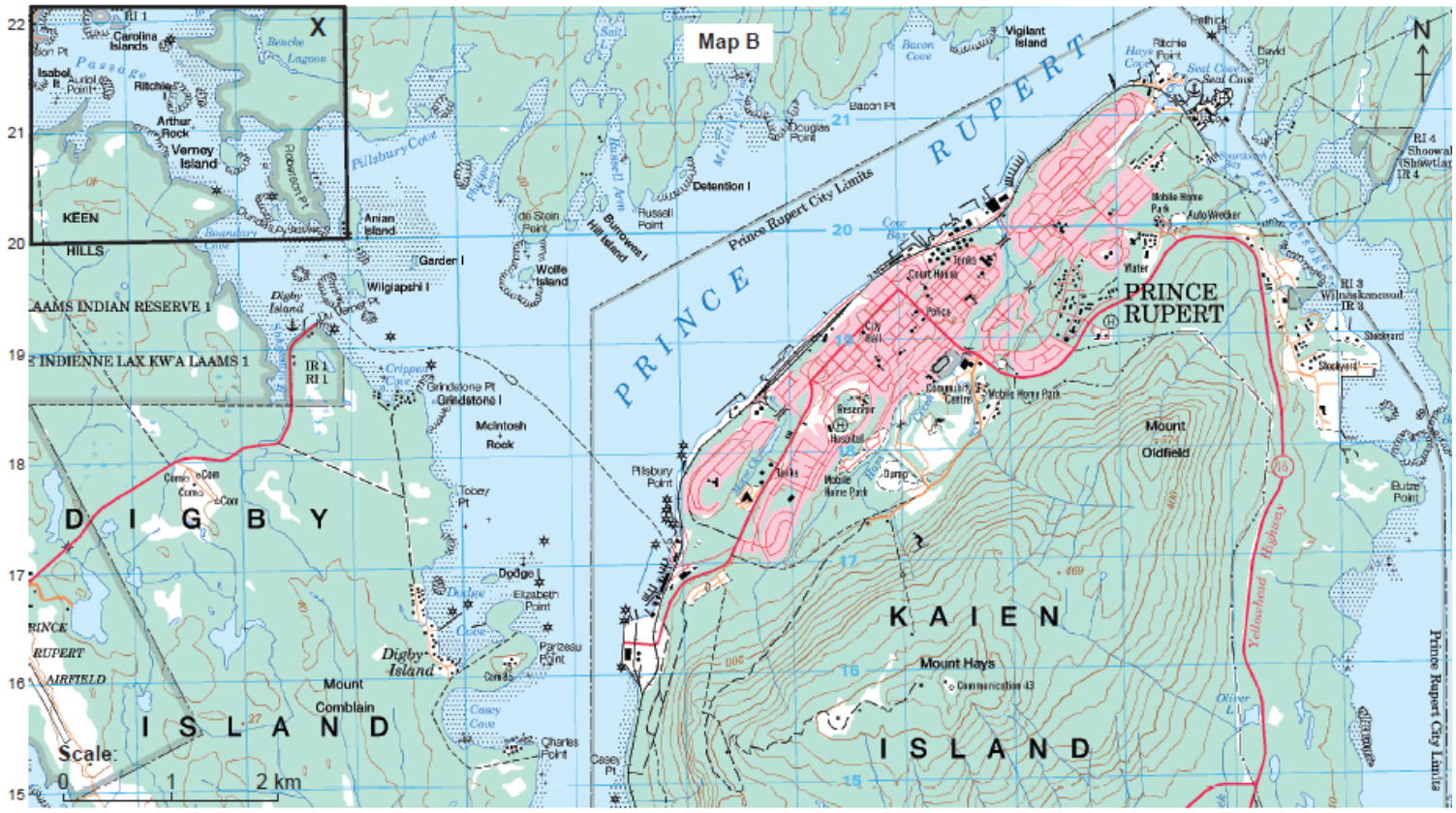
a. State **two** subaerial processes that may affect the cliff in the photograph and briefly outline how each process operates. [4]

b. Explain **two** conflicts that could arise from attempts to manage cliff failure. [6]

c. Examine the contribution that conservation can make to protecting oceanic fish stocks. [10]

Map B

Map B shows the area around the city of Prince Rupert (population: 13 000) on the west coast of Canada. The scale of the map is 1:50 000. The contour interval is 40 metres.



[Source: http://geogratis.gc.ca]

Key (refers to Map B):

- Dual highway, hard surface
- Road, hard surface, more than 2 lanes, highway route number
- Road, hard surface, 2 lanes
- Road, loose or stabilized surface, all season, 2 lanes or more
- Road, loose or stabilized surface, all season, less than 2 lanes
- Vehicle track or winter road; gate
- Trail, cut line or portage; portage, short
- Built-up area; street; park/sports field
- Railway, single track, multiple tracks, side track; station
- Bridge; footbridge; tunnel
- Cut; embankment, causeway
- Seaplane base; heliport; navigation light
- Building(s)
- Church; non-Christian place of worship; shrine
- School; elevator; fire station
- Cemetery; historic site or point of interest; greenhouse
- Golf course; ski area; mine
- Oil or natural gas facility; electrical facility
- International boundary with monument
- Boundary, ninth class
- Dam: small; large; carrying road
- Watercourse or shoreline: definite; indefinite
- Rapids; falls (with height in black)
- Lake or pond; slough, intermittent lake or pond
- Foreshore flats or sand in water
- Rocks in water or small island
- Rocky ledge; rocky reef
- Marsh; swamp
- Contours: index; intermediate; approximate
- Cliff or escarpment
- Sand; esker; pingo
- Glacier: ice cap; snowfield
- Wooded area; orchard; vineyard, hopfield

a. Identify and briefly describe **two** coastal landforms in area X marked on map B. [4]

b. Using located examples, suggest **two** reasons why ocean pollution may impact areas far from the source of pollution. [6]

c. Evaluate the contribution that subaerial processes and wave action make to the development of coastal landforms. [10]