

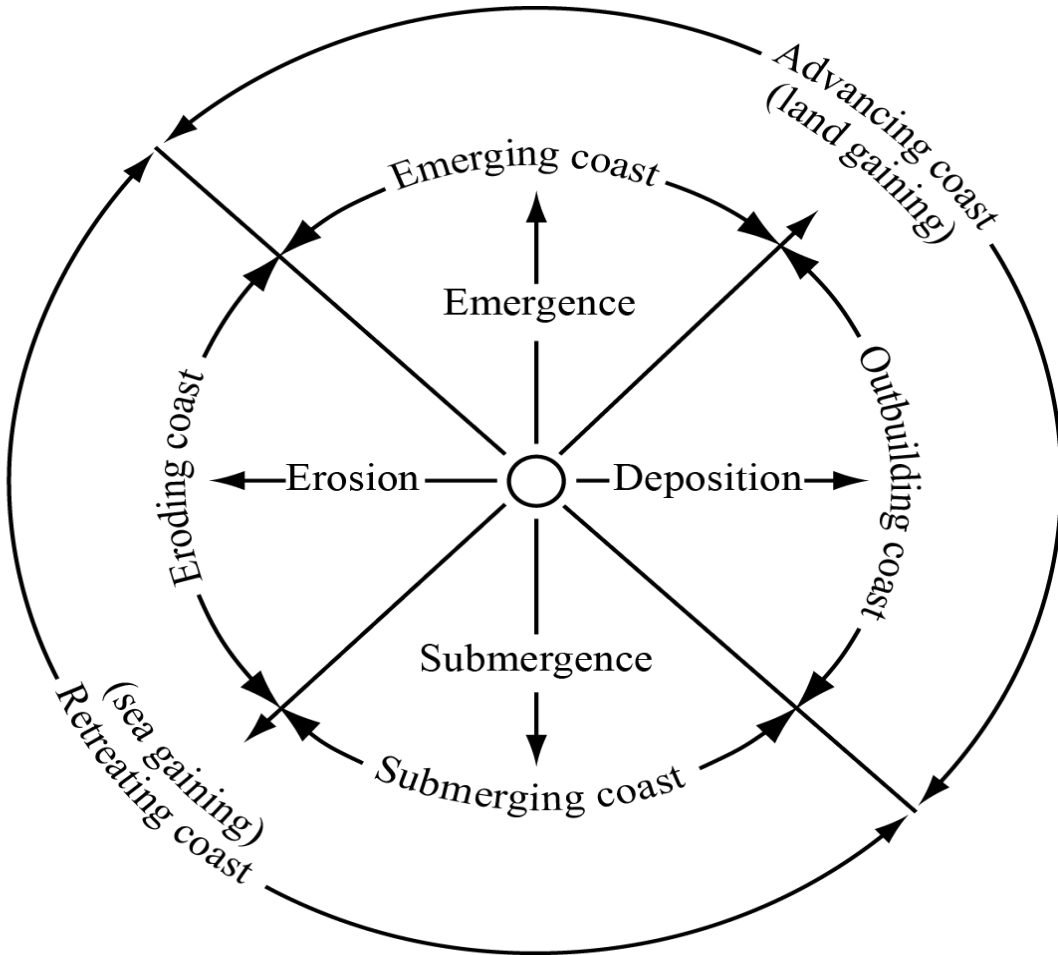
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## SL Paper 2

- a.i. State **two** causes of a negative change in sea level. [2]
- a.ii. Briefly describe **one** landform associated with an advancing coast. [2]
- b. Using examples, explain **two** effects of the oceanic conveyor belt on different places. [6]
- c. "The loss of coral reefs has more serious effects than the loss of mangrove swamps." Discuss this statement. [10]
- 

- 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 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](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]

a. [4]

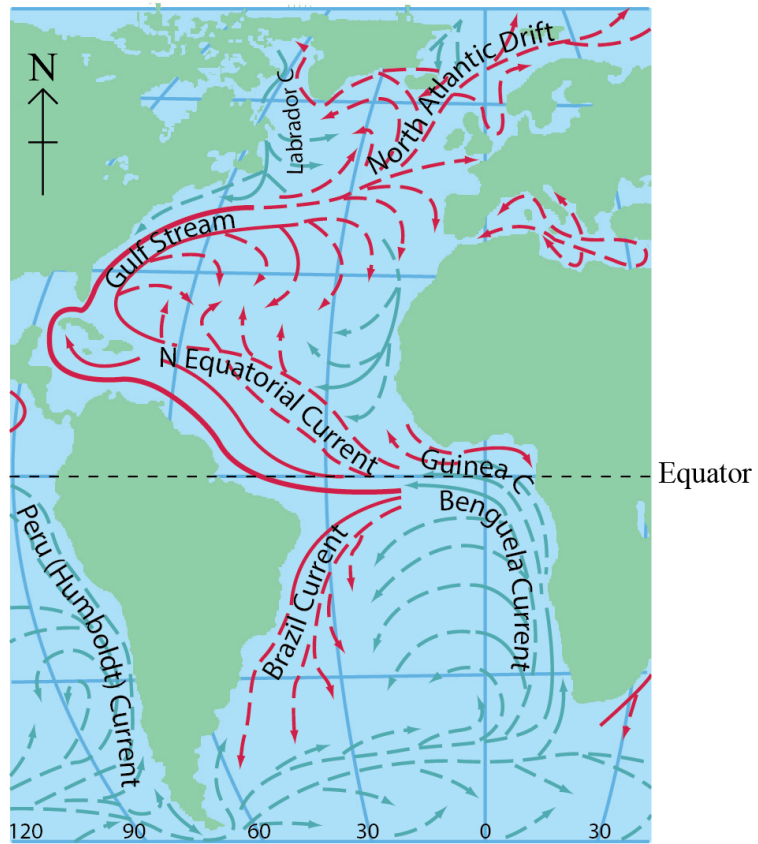
The map shows surface ocean currents in the Atlantic Ocean in January.

## Surface Ocean Currents

### Key:

Cold	Warm	Speed (knots)
		less than 0.5
		0.5 – 1.0
		over 1.0

Scale:  
0 3000 km



cartography ©Philips

Describe the pattern of ocean currents shown on the map.

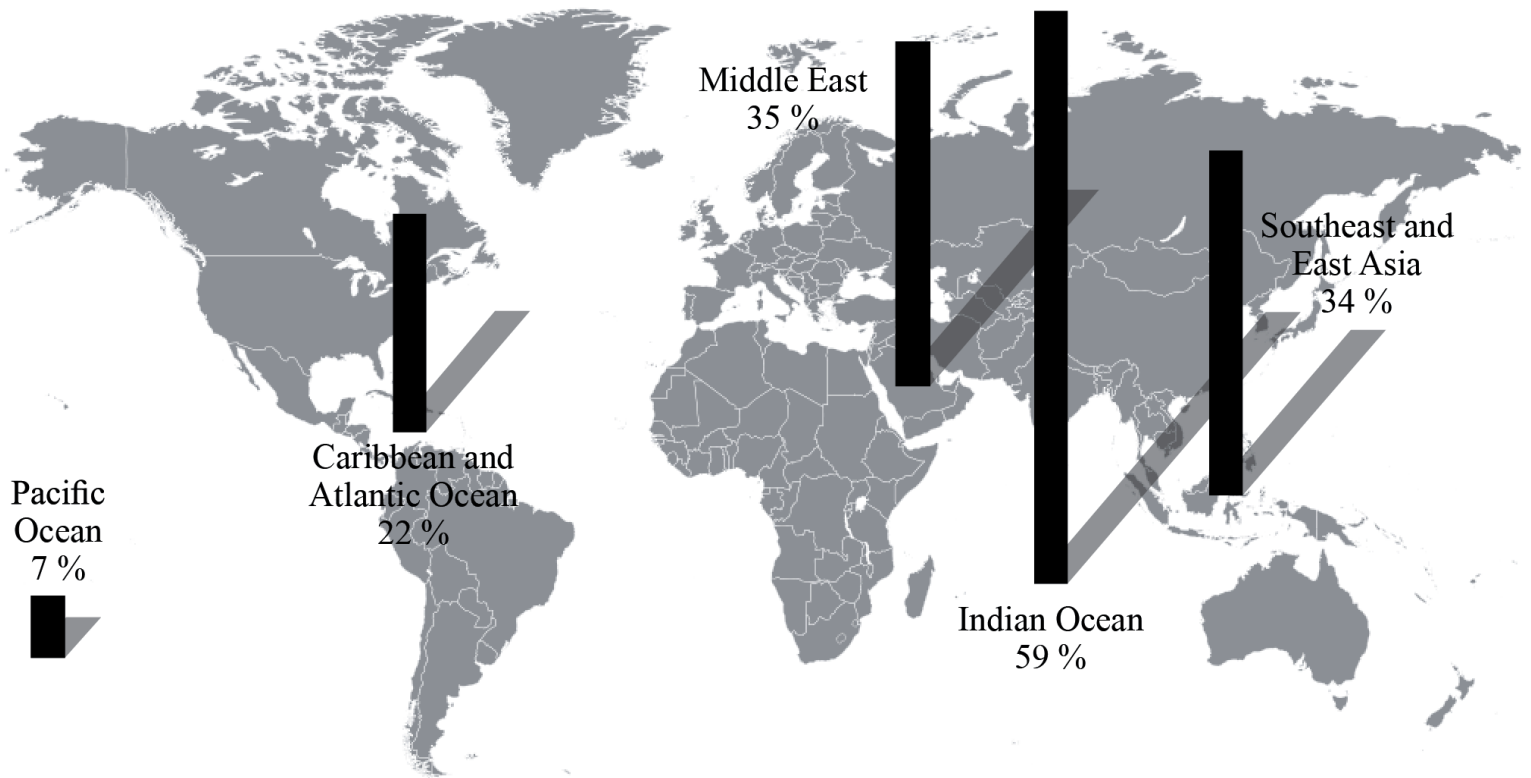
b. Explain the functioning and importance of the oceanic conveyor belt.

[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.



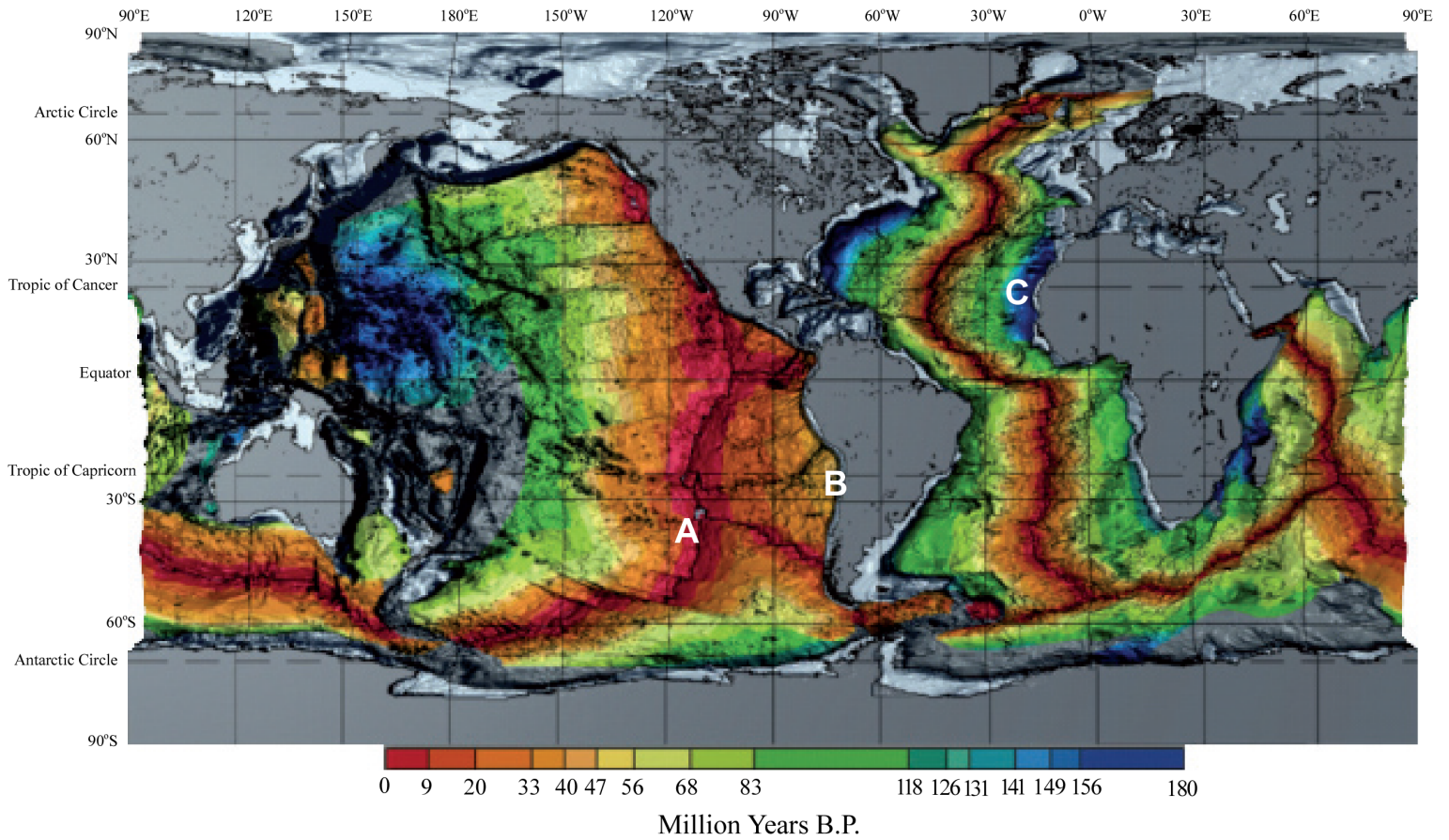
[Source: adapted from [http://commons.wikimedia.org/wiki/File:World\\_Blank\\_Map\\_\(Mercator\\_projection\).svg](http://commons.wikimedia.org/wiki/File:World_Blank_Map_(Mercator_projection).svg)]

- 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]

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The map shows the age of oceanic crust.

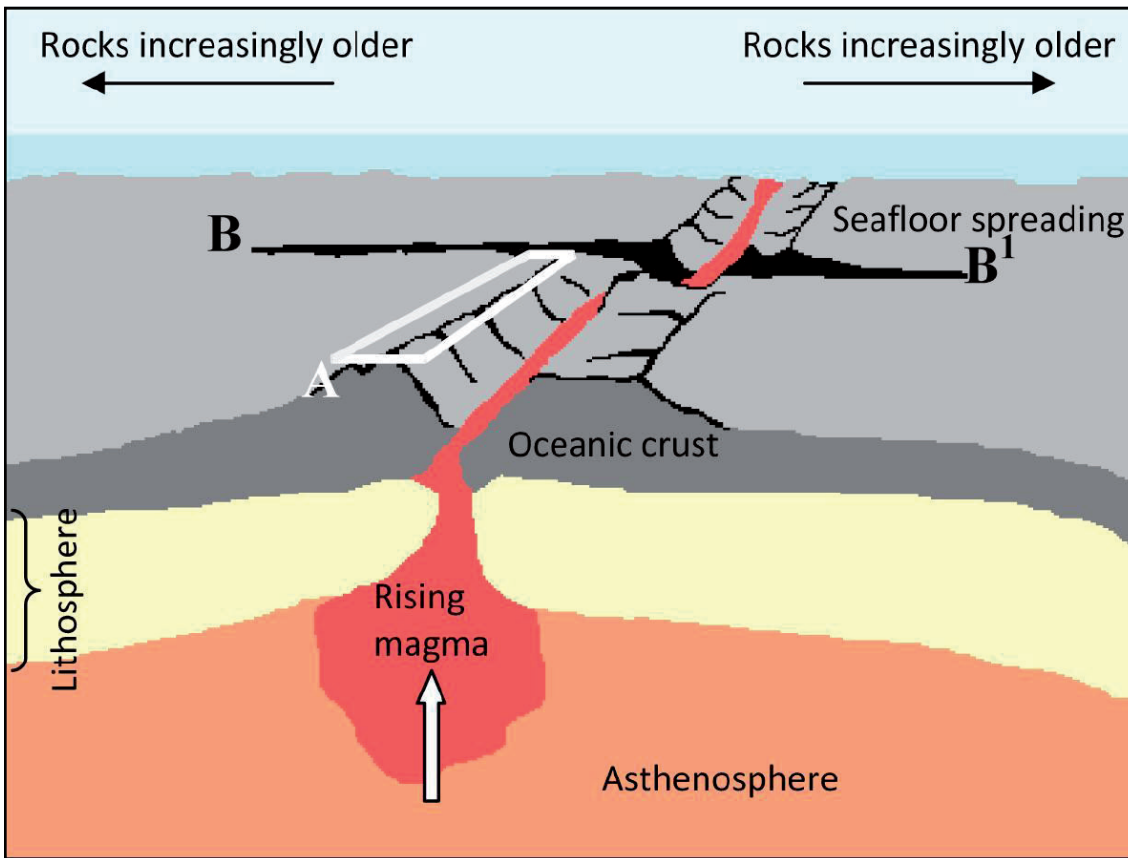
## Crustal Age



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

- a. 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.



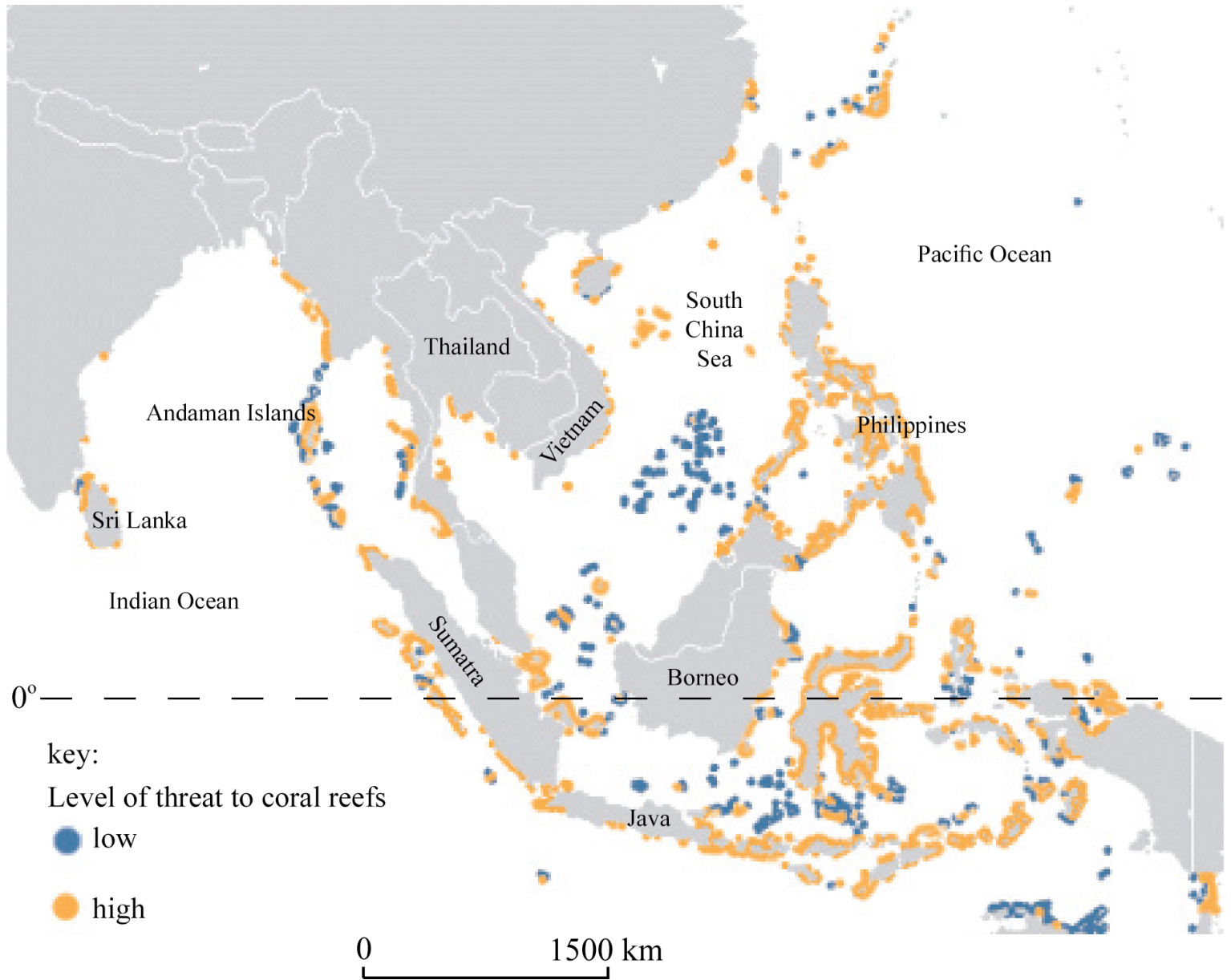
©International Baccalaureate 2013

- a. Referring to the diagram, identify feature A and feature B–B<sup>1</sup>. [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]

- 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]

- a. Outline **one** economic and **one** environmental benefit of coral reefs. [2+2]
- b. Explain the function of the oceanic conveyor belt(s). [6]

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

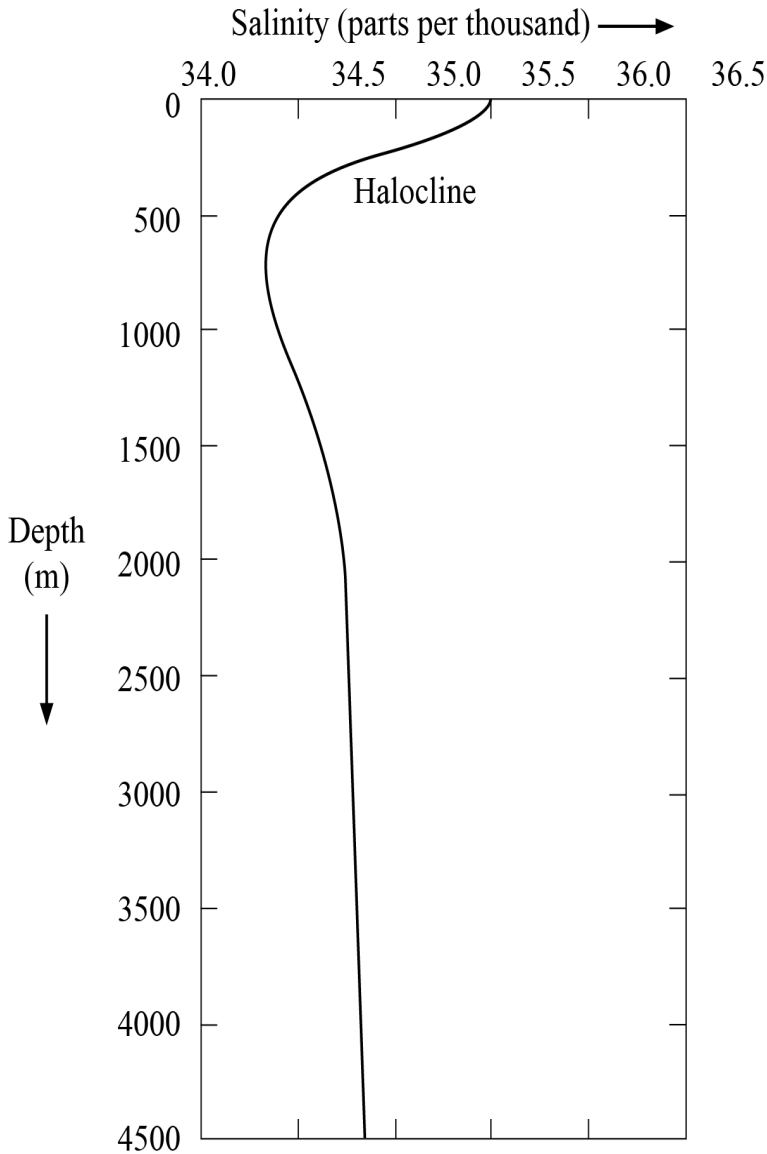


[Source: modified from the United Nations Environment Programme's Global Environment Outlook 2000 publication  
<http://www.unep.org/geo2000/english/i86a.htm>]

- 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]

- 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](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]

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

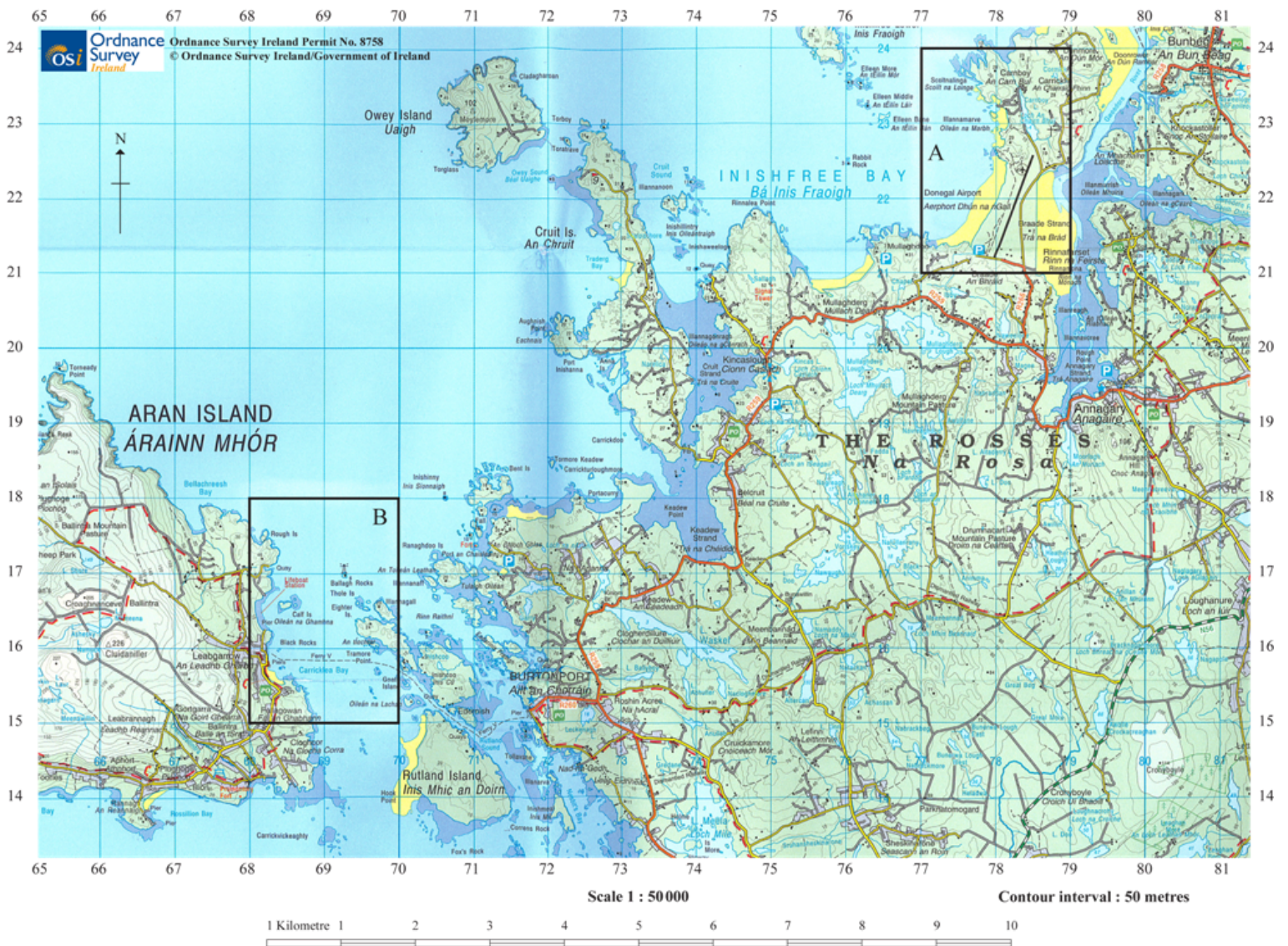
(ii) Briefly describe **one named** feature caused by littoral drift.

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]

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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.

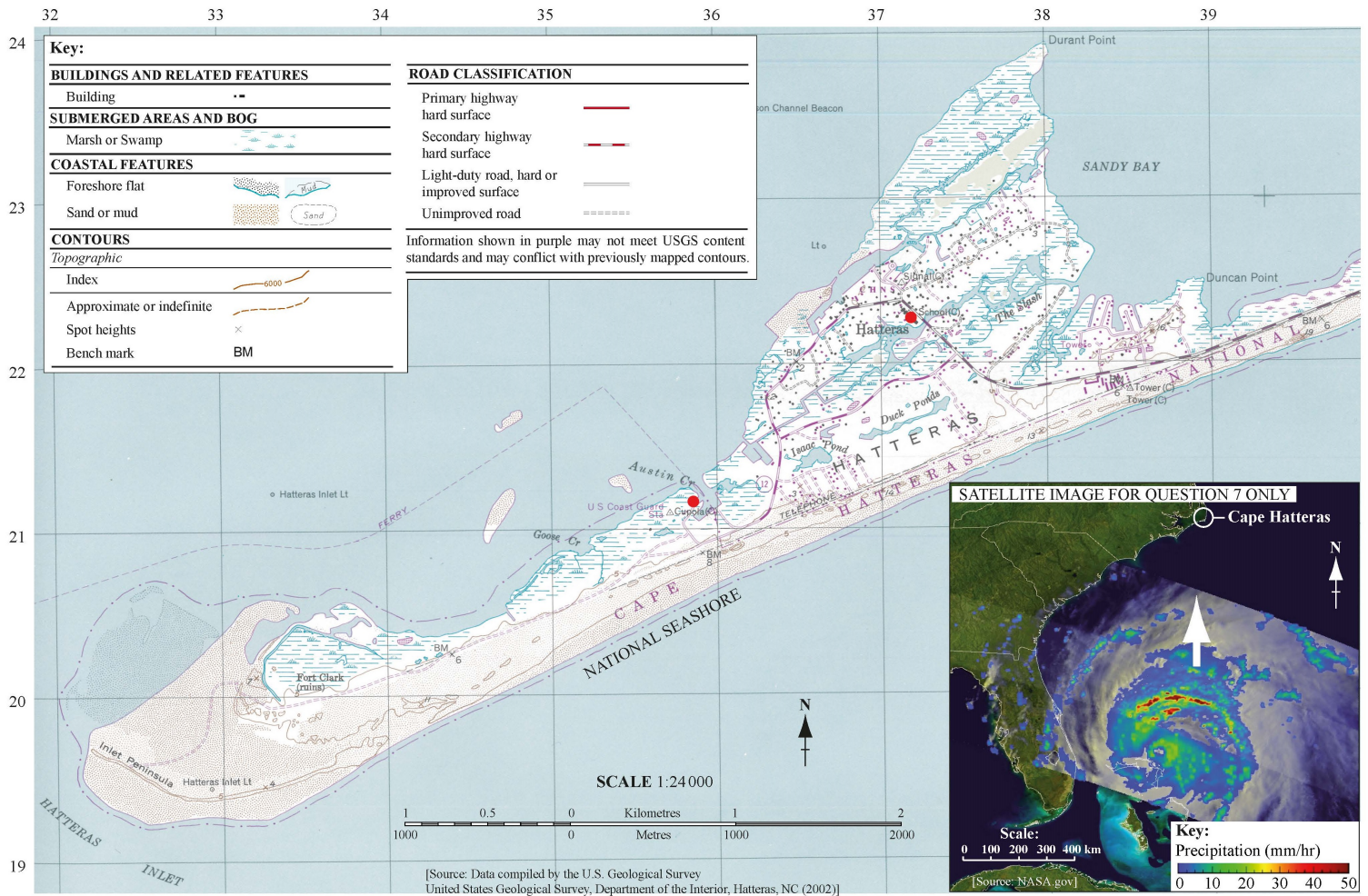


[Source: Ordnance Survey Ireland Permit No. 8758 © Ordnance Survey Ireland/Government of Ireland]

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

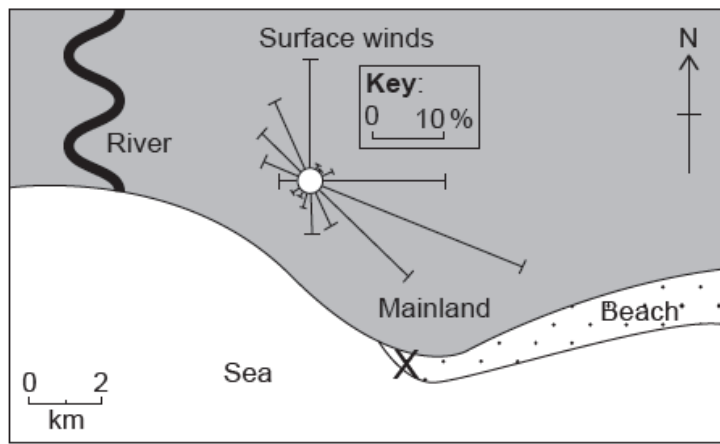
- a. Define the term *exclusive economic zone*. [2]
- b. Briefly describe what is meant by continental shelf. [2]
- c. Explain the environmental **and** economic value of mangrove swamps. [6]
- d. Discuss the conflicts that occur from attempts to manage coastal hazards. [10]

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.



- Using map evidence, describe **two** depositional landforms found on this coastline. [4]
- Explain how **one** geopolitical conflict has developed in relation to a **named** oceanic resource. [6]
- “The fishing industry can never be sustainable.” Discuss this statement. [10]

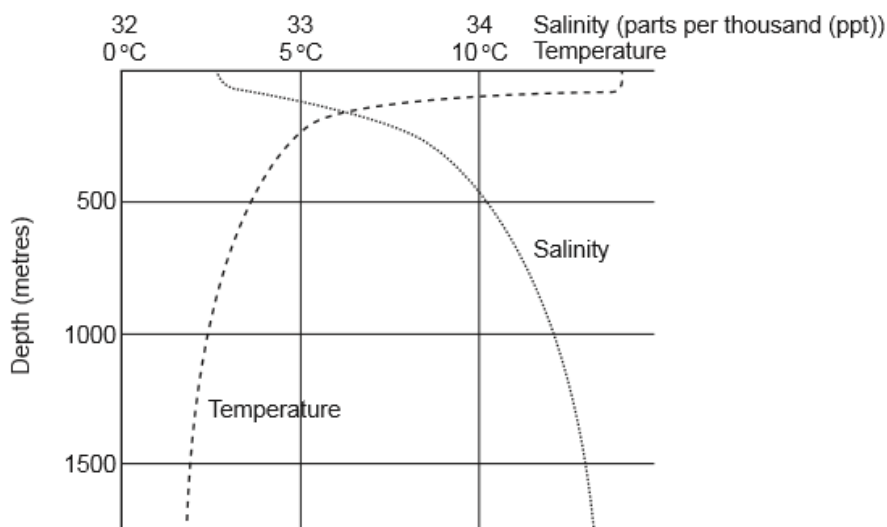
The diagram shows wind frequency over a 30-year period on a beach in the Caribbean.



[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]

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



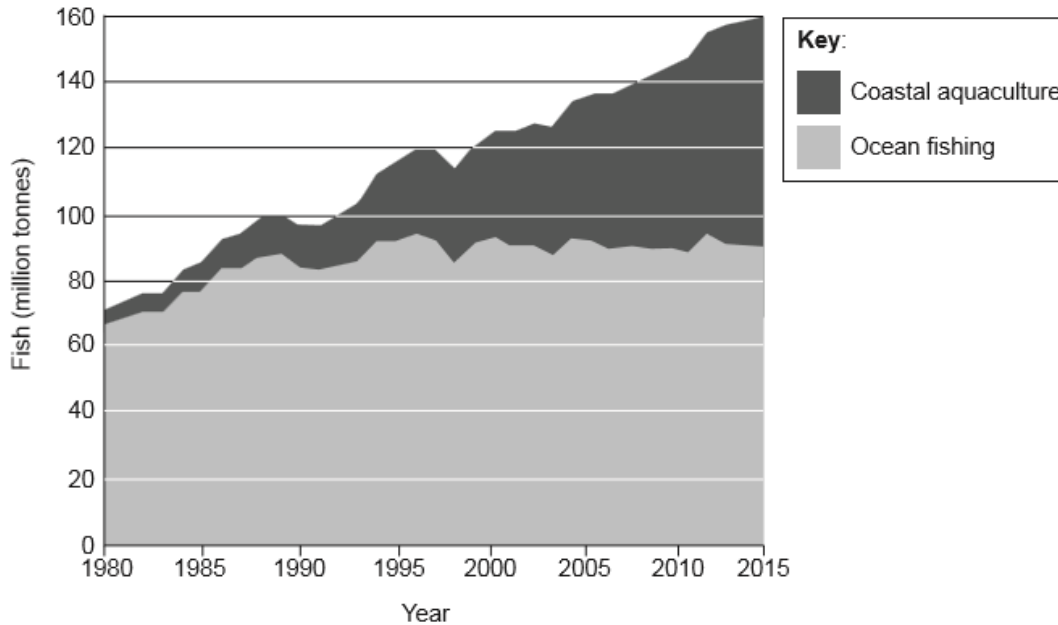
[Source: HOLDEN, J. AN INTRODUCTION TO PHYSICAL GEOGRAPHY AND THE ENVIRONMENT, (c) 2005, p. 60. Reprinted by permission of Pearson Education, Inc., New York, New York.]

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]

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



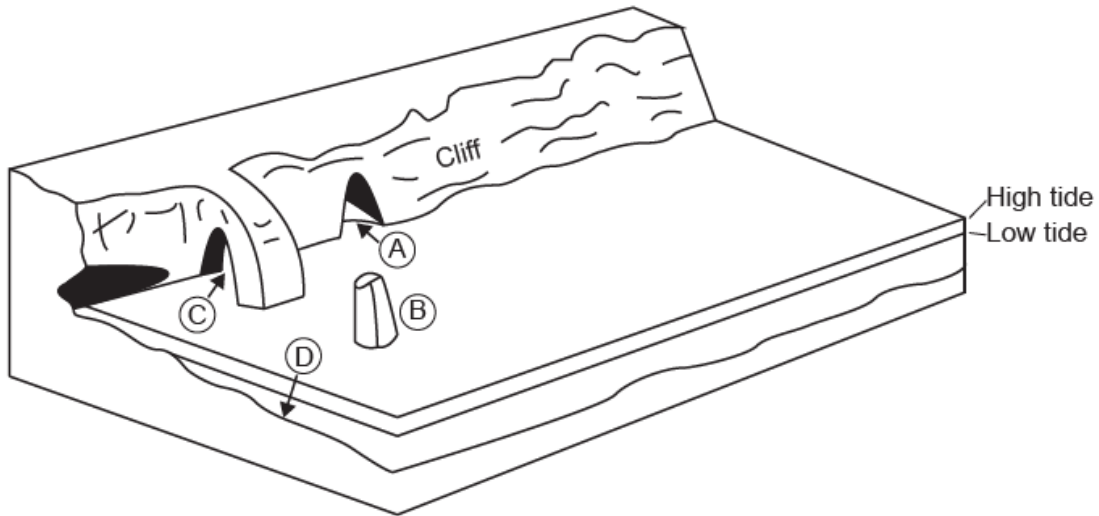
[Source: Food and Agriculture Organization of the United Nations, FAO (2014) *The State of World Fisheries and Aquaculture* <http://www.fao.org/3/a-i3720e.pdf> Reproduced with permission.]

- (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]

- a. Identify **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+2]
- c. Examine the effects of the loss of coral reefs and mangrove swamps. [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 four landforms (A, B, C, D) associated with a cliff.

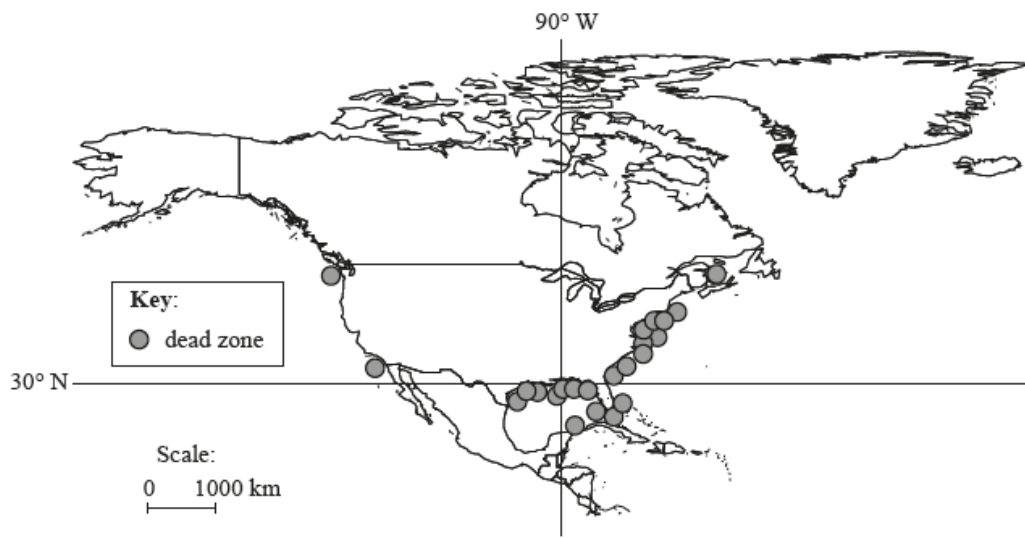


[Source: copyright International Baccalaureate Organization, 2016]

- 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]

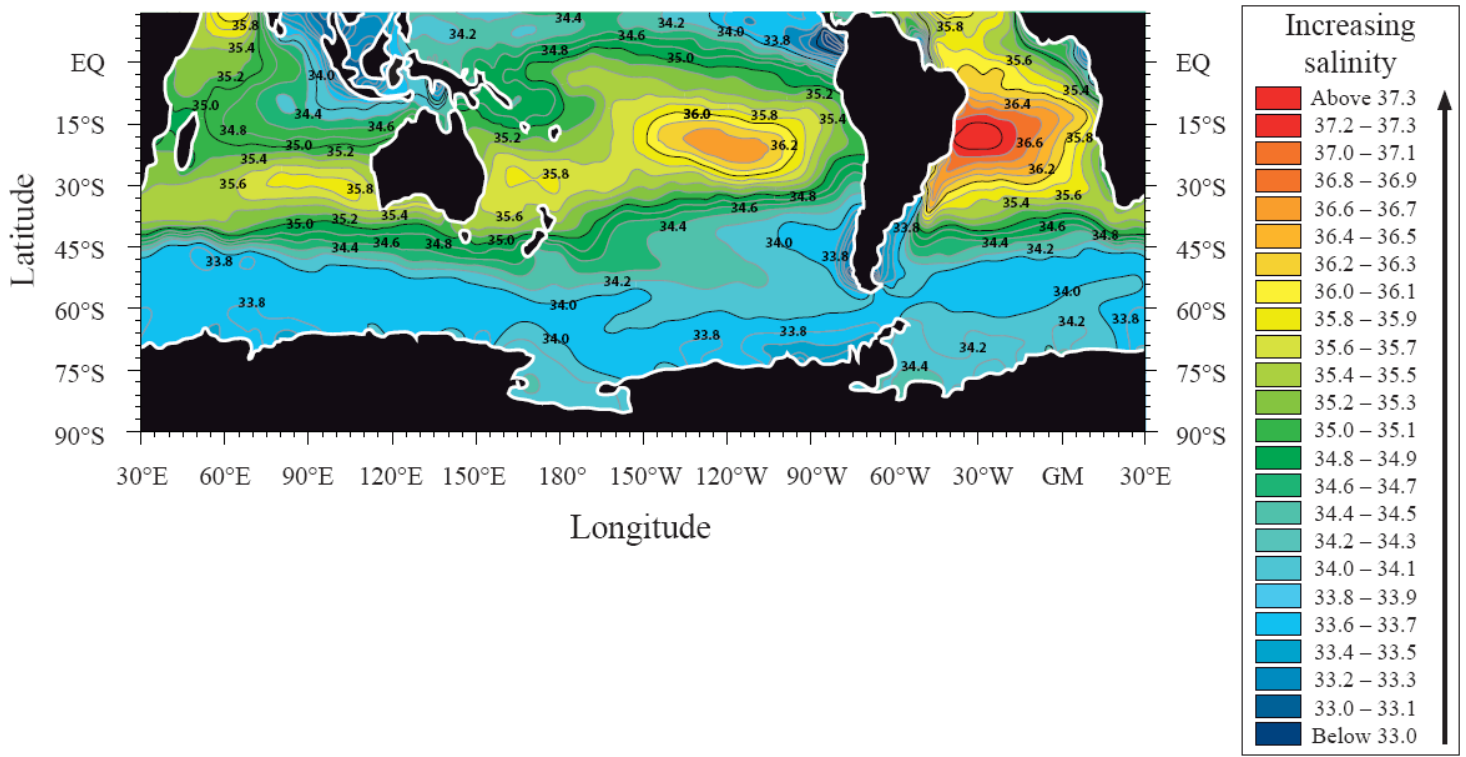
### Option B – Oceans and their coastal margins

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).



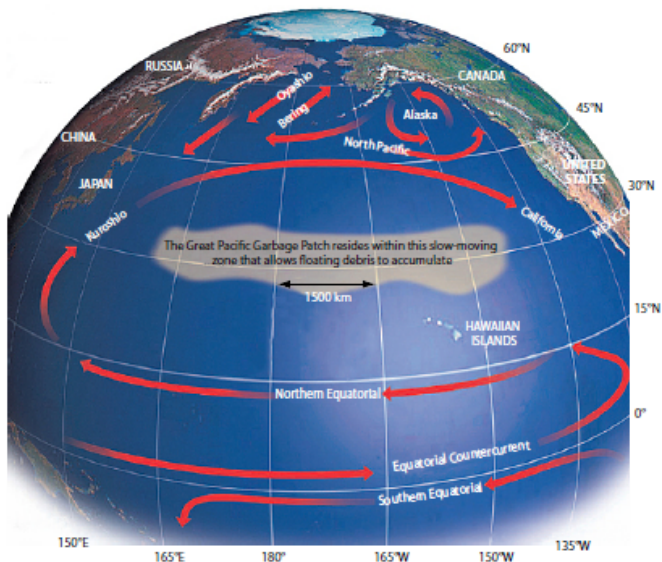
[Source: © UNEP]

- 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]



[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]

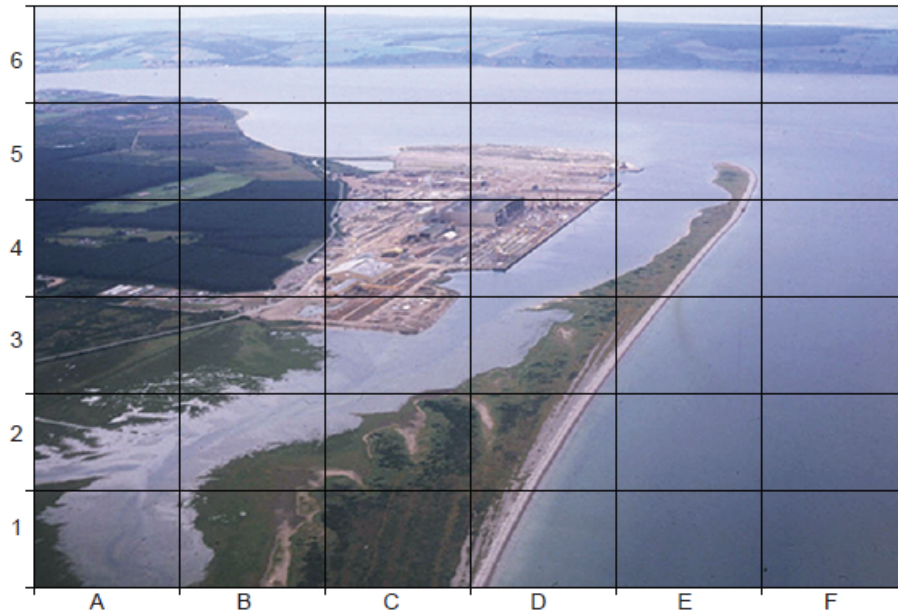


[Source: <http://media-files.gather.com/images/d56/d320/d746/d224/d96/f3/full.jpg>]



- 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]
- 

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 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]

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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]

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### 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.

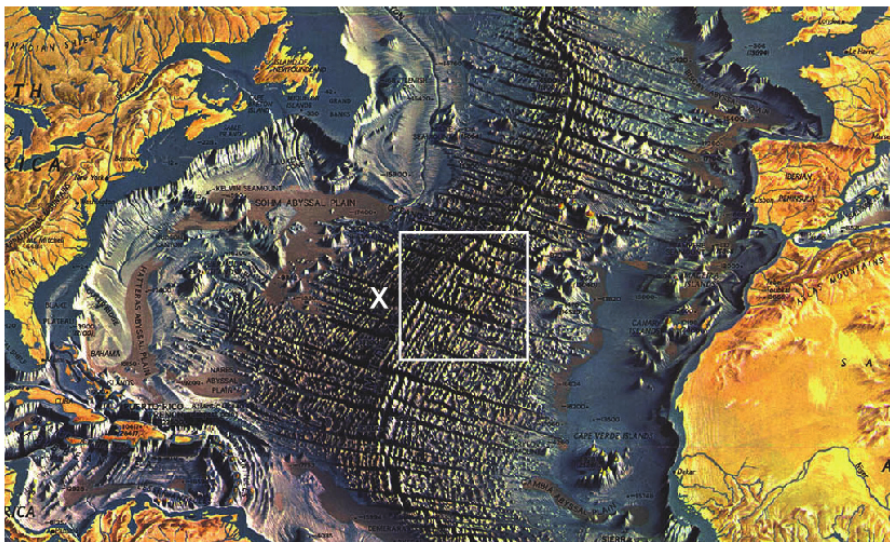
(iii) Define the term *advancing coast*.

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]

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The map shows part of the North Atlantic sea floor.

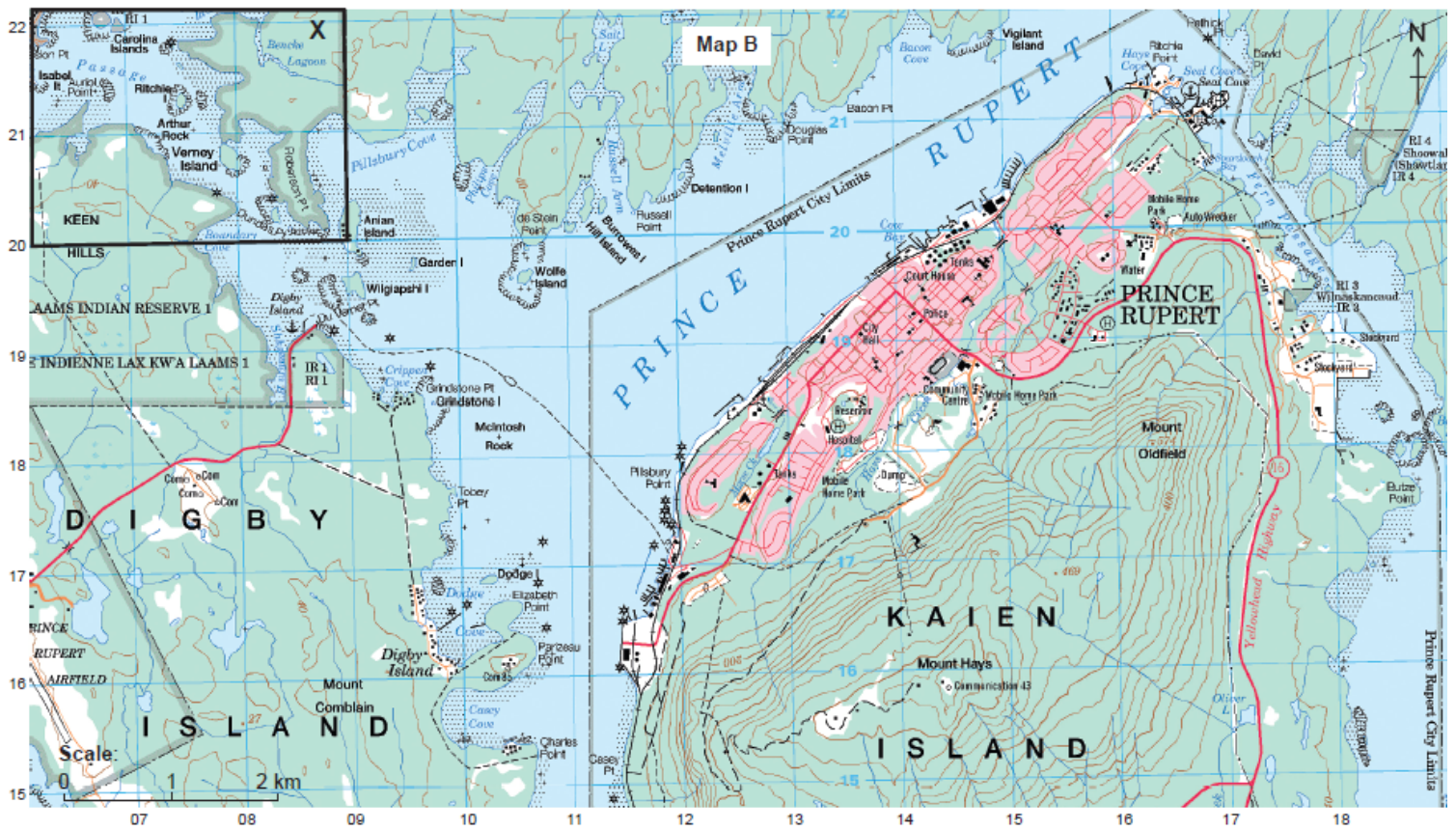


[Source: Heinrich Berann/National Geographic Creative]

- Identify and briefly describe **two** landforms in box X. [4]
- Using examples, explain **two** positive economic impacts that El Niño events can bring. [6]
- “Geopolitical conflict is the inevitable outcome of human use of oceans.” Discuss this statement. [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
- Contour: 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]