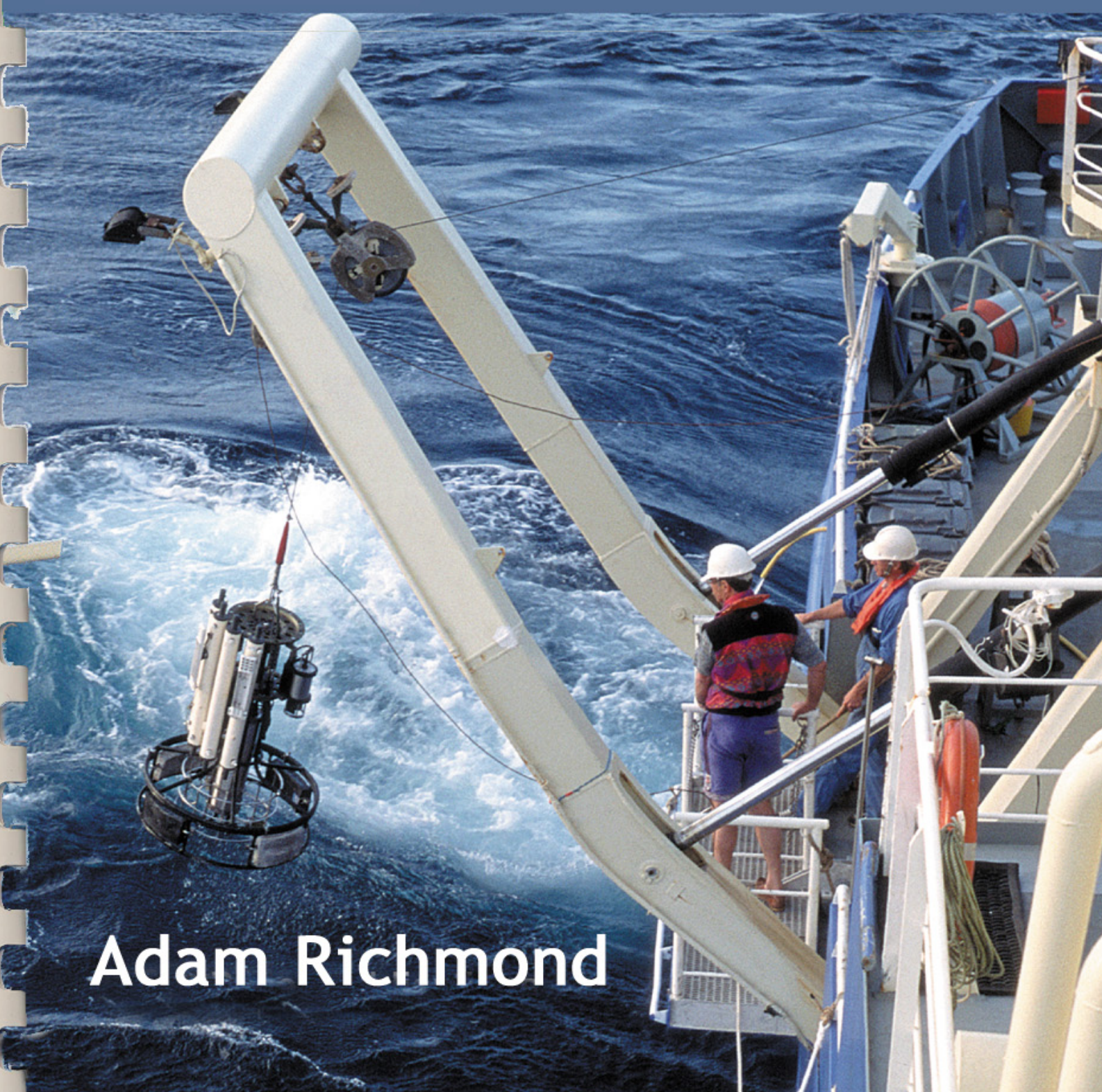


Marine Science
For Australian Students

Suggested Answers



Adam Richmond



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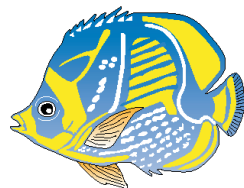
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Contents

Licence agreement	2
Errata Sheet - Marine Science for Australian Students	6
<i>Chapter 1 Ocean and coastline formation</i>	7
Chapter 1: Ocean and coastline formation	8
Page 15 Suggested answers	8
Page 29 Suggested answers - Case study 1.1	9
Page 31 Suggested answers - Case study 1.2	9
Page 32 Suggested answers - Chapter 1	10
<i>Chapter 2 Oceans and waves</i>	13
Chapter 2: Oceans and waves	14
Page 40 Suggested answers - Exercise 2.1	14
Page 43 Suggested answers - Exercise 2.2	15
Page 46 Suggested answers - Exercise 2.3	16
Page 53 Suggested answers - Exercise 2.5	16
Page 54 Suggested answers - Exercise 2.6	17
Page 56 Suggested answers - Questions Chapter 2	17
<i>Chapter 3 Currents and weather</i>	21
Page 64 Suggested answers - Questions	22
Page 67 Suggested answers - Questions	22
Page 67 Suggested answers - Exercise 3.1	22
Page 71 Suggested answers - Questions	23
Page 77 Suggested answers - Exercise 3.4	23
Page 78 Suggested answers - Case Study 3.1	24
Page 79 Suggested answers - Case Study	24
Page 80 Suggested answers - Questions Chapter 3	25
<i>Chapter 4 Coastlines</i>	27
Page 89 Suggested answers - Questions	28
Page 90 Suggested answers - Case Study 4.1	28
Page 100 Suggested answers - Exercise 4.2	29
Page 104 Suggested answers - Exercise 4.3	29
Page 106 Suggested answers - Exercise 4.4	30
Page 108 Suggested answers - Questions Chapter 4	30
<i>Chapter 5 Coastal engineering</i>	33
Page 116 Suggested answers - Case Study 5.1	34
Page 120 Suggested answers - Case Study 5.2	34
Page 124 Suggested answers - Exercise 5.1	35
Page 128 Suggested answers - Questions Chapter 5	35
<i>Chapter 6 Sea Water</i>	37
Page 138 Suggested answers - Exercise 6.2	38
Page 149 Suggested answers - Exercise 6.3	38
Page 155 Suggested answers to question	38
Page 158 Suggested answers - Questions Chapter 6	39

<i>Chapter 7 Marine pollution</i>	41
Page 171 - 173 Suggested answers - Case Study 7.1	42
Page 176 Suggested answers - Case Study 7.2	42
Page 178 Suggested answers - Exercise 7.2	43
Page 189 Suggested answers - Exercise 7.4	43
Page 190 Suggested answers - Questions: Chapter 7	43
<i>Chapter 8 Classification and marine biodiversity</i>	45
Page 199 Suggested answers - Exercise 8.1	46
Page 200 Suggested answers - Case study 8.1	47
Page 203 Suggested answers - Exercise 8.2	47
Page 212 Suggested answers - Exercise 8.4	48
Page 226 Suggested answers - Case Study 8.3	49
Page 227 Suggested answers - Questions: Chapter 8	49
<i>Chapter 9 and 10 Marine Plants</i>	53
Page 239 Suggested answers - Exercise 9.2	54
Page 241 Suggested answers - Questions on your model	54
Page 245 Suggested answers - Research Questions	54
Page 246 Suggested answers - Questions: Chapter 9	55
Page 255 Suggested answers - Exercise 10.1	56
Page 268 Suggested answers - Questions: Chapter 10.	56
<i>Chapter 11 and 12 Marine Invertebrates</i>	59
Page 274 Suggested answers - Exercise 11.1	60
Page 275 Suggested answers - Exercise 11.2	60
Page 281 Suggested answers - Questions	60
Page 285 Suggested answers - Exercise 11.3	62
Page 298 Suggested answers - Exercise 11.4	63
Page 298 Suggested answers - Exercise 11.5	63
Page 299 Suggested answers - Questions Chapter 11	63
Page 325 Suggested answers - Questions Chapter 12	65
<i>Chapters 13 and 14 Marine Vertebrates</i>	67
Page 347 Suggested answers - Exercise 13.2	68
Page 347 Suggested answers - Exercise 13.3	68
Page 348 Suggested answers - Exercise 13.4	68
Page 350 Suggested answers - Exercise 13.5	68
Page 352 Suggested answers - Questions Chapter 13	68
Page 382 Suggested answers - Questions Chapter 14	70
<i>Chapter 15 How they survive</i>	73
Page 393 Suggested answers - Exercise 15.1	74
Page 404 Suggested answers - Exercise 15.2. Fish adaptations	76
Page 404 Suggested answers - Exercise 15.2. Fish adaptations	77
Exercise 15.3 Writing definitions.	77
Page 409 Suggested answers - Case study 15.1.	77
Page 410 Suggested answers - Questions Chapter 15	77

<i>Chapter 16 Ecosystems</i>	79
Page 417 Suggested answers - Questions	80
Page 418 Suggested answers - Case study 16.1	81
Page 424 Suggested answers - Make a transect square	81
Page 425 Suggested answers - Exercise 16.1	81
Page 426 Suggested answers - Exercise 16.2	82
Page 427 Suggested answers - Case study 16.2	83
Page 428 Suggested answers - Questions: Chapter 16	83
<i>Chapter 17 Problems in our seas</i>	85
Page 449 Suggested answers - Exercise 17.1	86
Page 450 Suggested answers - Exercise 17.2	86
Page 451 Suggested answers - Case Study 17.1	87
Page 453 Suggested answers - Case study 17.2	87
Page 454 Suggested answers - Questions Chapter 17	87
<i>Chapter 18 Sustainable use of the sea</i>	89
Page 476 Suggested answers - Case study 18.1	90
Page 478 Suggested answers - Case study 18.2	90
Page 484 Suggested answers - Questions Chapter 18	91
<i>Chapter 19 Biodiversity and marine life</i>	93
Page 501 Suggested answers - Case study 19.1	94
Page 502 Suggested answers - Case study 19.2	94
Page 504 Suggested answers - Questions Chapter 19	95
<i>Chapter 20 Australia's fisheries and their management</i>	97
Page 531 Suggested answers - Case study 20.1	98
Page 532 Suggested answers - Questions Chapter 20	99
<i>Chapter 21 Aquaculture</i>	101
Page 545 Suggested answers - Case study 21.1	102
Page 550 Suggested answers - Questions Chapter 21	103
<i>Chapter 22 The future: Marine parks and marine protected areas</i>	105
Page 575 Suggested answers - Case study 22.1	106
Page 585 Suggested answers - Questions Chapter 22	107

Chapter 1: Ocean and coastline formation

Page 15 Suggested answers

- Q1. Echo sounders work by transmitting sound waves with frequencies between 10 kHz and 100kHz. These sound waves are reflected off the sea floor back to the transducer. The time taken for the sound wave to return is measured and used to calculate the depth.
- Q2. Students' own diagram. See Fig 11.1 Ocean floor topography
The continental shelf is usually flat because it is built up with sediment run off from the continent.

Q3.

	Asthenosphere	Lithosphere
Location	Beneath lithosphere	Upper layers of mantle
Composition	Plastic	Cool, relatively rigid rock
Density	3.5g/cm ³	2.8-3.3 g/cm ³

- Q4. 50% of the earth's surface is deep ocean basin floor, which is made up of abyssal plains and abyssal hills.
- Q5. The continental slope can be as great as 45°, but has an average slope of 25°. The continental rise is much less: a gradient of about 1:300.
- Q6. Submarine canyons are large valleys that cut into the continental shelf. Murray Canyon is near Kangaroo Island off the South Australian coast.
Ancient rivers may have formed these canyons.
- Q7. The bathyscape Trieste was able to descend to over 10 000 metres deep by taking on seawater as ballast (making its density higher). The Trieste could then sink. To ascend the Trieste releases its ballast.
- Q8. See Fig 14.1: The composition of the earth.
- Q9. Sial is a light coloured, low density granitic rock made of silica and alumina (density 2.8 g/cm³). Sima is a darker coloured, higher density basaltic rock made of silica and magnesia (density @ 3.0g/cm³).
Sial floats on sima because it is less dense.
- Q.10 The 1982 Law of the Sea states that Australia has sovereign rights to resources out as far as the seaward edge of the continental rise (see Fig 13.1).
Where tectonic plates rift apart, it is difficult to accurately define our borders with Indonesia and New Zealand.