

# Question Booklet

## 2006 National Geographic Channel

### Australian Geography Competition

#### I N S T R U C T I O N S

- 1 Fill in your **name**, **school code** (your teacher will give you this), school's **post code**, your **gender** and **age**. You must fill in the ovals, not just write the letters and numbers, as the computer only reads the ovals. For example, a filled-in post code (for some other school) would look like the sample on the right.
- 2 If you are 13 years or under on 31 August 2006 complete Questions 1-30, or continue to Question 40 to be eligible for major prizes.
- 3 If you are 14 or 15 years old on 31 August 2006 complete Questions 1-40.
- 4 If you are 16 years or over on 31 August 2006 complete Questions 16-50.
- 5 Answer all questions by filling in **only one** oval on the answer sheet corresponding to the most appropriate answer for each question.
- 6 You have 30 minutes to answer the questions. The time to fill in the preliminary information is extra.
- 7 Do not mark the front or back of the answer sheet in any other way as this can lead to errors in the computerized marking, or to your not getting a result.

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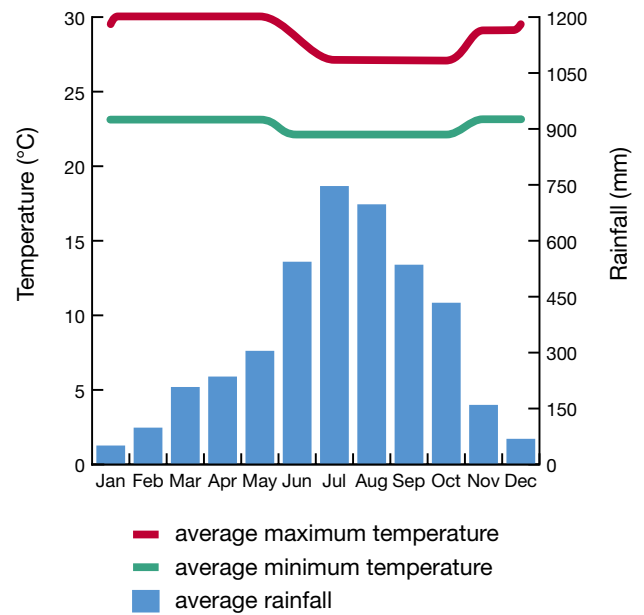
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**Figure 1.**



**Figure 2. Climate graph, Douala**

Source: BBC Weather Centre

Start at Question 1 if you are **under 16 years** old on 31 August 2006.  
Start at Question 16 if you are older.

**1 In Figure 1, which country is shown in yellow?**

- A Cameroon
- B Egypt
- C Peru
- D South Africa
- E Thailand

**2 As Figure 1 follows standard map conventions, the northernmost named city is:**

- A Douala
- B Kribi
- C Maroua
- D Tiko
- E Yaoundé

**3 From Figure 2, what is the average annual rainfall in Douala?**

- A 271 mm
- B 335 mm
- C 742 mm
- D 2103 mm
- E 4027 mm

**4 Using Figure 2, what is the approximate latitude of Douala?**

- A 4°N
- B 24°N
- C 44°N
- D 64°N
- E 84°N

**5 Using Figures 1 and 2 and your own knowledge of rainfall patterns, which of these average monthly rainfalls is highest?**

- A August in Tiko
- B December in Douala
- C February in Yaoundé
- D July in Maroua
- E June in Ngaoundéré

**6 Most people in the country highlighted in Figure 1 work, as is common in this region, in:**

- A agriculture
- B banking
- C communications
- D government
- E manufacturing

**7 Which answer matches a location with its indigenous wildlife?**

- A Kakadu National Park, NT - whales
- B Kangaroo Island, SA - sea lions
- C Lake Pedder, Tas - crocodiles
- D Phillip Island, Vic - cassowaries
- E Wet Tropics, Qld - penguins

**Table 1.** Selected weeds of national significance

Source: Australian Weeds Committee

Common name	Origin	Current distribution '000 km <sup>2</sup>	Potential distribution '000 km <sup>2</sup>
Athel pine	North Africa	80	3 646
Bitou bush	South Africa	231	1 258
Blackberry	Europe	691	1 425
Lantana	Central America	389	1 052
Mesquite	Central America	410	5 110

**8 Which of the weeds in Table 1 has the scope to infest the largest area in the future?**

- A athel pine
- B bitou bush
- C blackberry
- D lantana
- E mesquite

**9 Which of these is NOT a farthestmost point (N/S/E/W) of mainland Australia?**

- A Cape Arnhem, NT
- B Cape Byron, NSW
- C Cape York, Qld
- D Steep Point, WA
- E Wilsons Promontory, Vic



**Figure 3.**

© National Geographic Channels International, Jeff Hutchens

**10 What is the term for the geomorphological features located offshore in Figure 3?**

- A berms
- B bluffs
- C emergents
- D horsts
- E stacks

**11 Which process results in the offshore features in Figure 3?**

- A deposition
- B erosion
- C faulting
- D longshore drift
- E suspension

**12 What is the name of the offshore formation in Figure 3?**

- A The Friars, Tas
- B Investigator Group, SA
- C The Pinnacles, WA
- D South West Rocks, NSW
- E The Twelve Apostles, Vic

**13 New Orleans, which suffered so much damage from Hurricane Katrina, is located:**

- A in the Appalachians
- B in the Florida Keys
- C in the Mississippi Delta
- D on Chesapeake Bay
- E on Lake Erie

**14 Which of these islands produces world-class dairy products?**

- A Cockatoo Island, NSW
- B Hamilton Island, Qld
- C King Island, Tas
- D Melville Island, NT
- E Rottnest Island, WA

**15 The map in Figure 4 (next page) shows an area on the edge of which region?**

- A Atherton Tableland, Qld
- B Central Highlands, Tas
- C Coorong, SA
- D Kimberley, WA
- E Warrumbungle Range, NSW



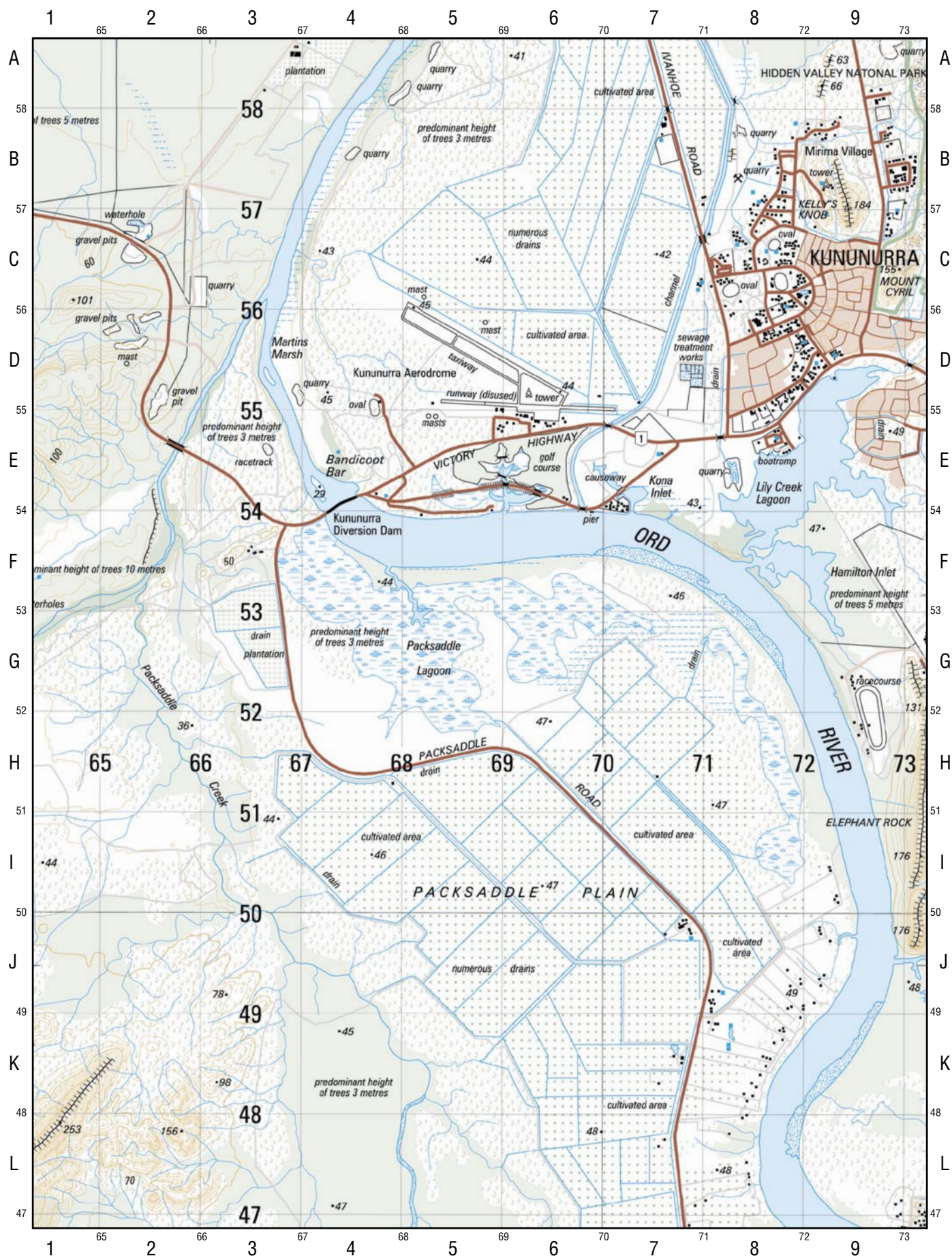


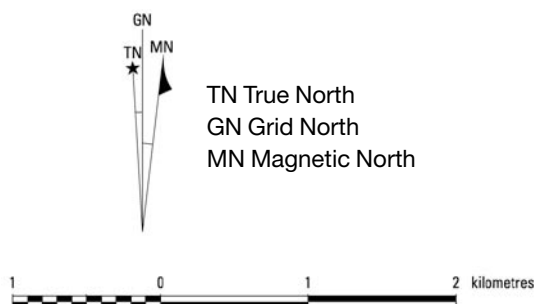
Figure 4. Topographic map

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## Legend

Built-up area; Divided highway; State route marker .....	
Recreation reserve with oval; Drive-in theatre; Underpass ..	
Sealed road two or more lanes; National route marker ....	
Sealed road one lane; Cutting; Embankment .....	
Unsealed road two or more lanes; Culvert; Causeway ....	
Unsealed road one lane; Approximate position (AP) .....	
Vehicle track; Road bridge; Gate; Stock grid .....	
Foot track; Foot bridge .....	
Multiple track railway; Siding; Station .....	
Single track railway; Light railway .....	
Railway tunnel, bridge, Expansion (point of change) .....	
Power transmission line .....	
Administrative boundary .....	
Mine; Building; Ruin; Yard .....	
Windmill; Communication tower; Dish .....	
Fence; Horizontal control point; Spot elevation .....	
Contour with value and cliff; Depression contours .....	
Sand; Distorted surface; Sand dune .....	
Levee; Sand ridge .....	
Ridgeline; Fault line .....	
Trees; Dense, medium, scattered; Cleared lane .....	
Scrub; Scrub Light .....	
Rain forest; Pine; Lone tree .....	
Orchard; Line of trees or windbreak .....	
Watercourse definite; Watercourse indefinite .....	
Area subject to inundation; Swamp .....	
Perennial lake; Watercourse .....	
Intermittent lake; Watercourse .....	
Mainly dry lake; Watercourse .....	
Rapids; Falls; Spring .....	
Tank or small dam; Waterhole .....	
Saline coastal flat; Intertidal flat .....	
Lighthouse; Intertidal ledge or reef .....	
Exposed wreck; Submerged wreck .....	
Submerged reef; Submerged rock .....	
Mangrove; Rock bare or awash .....	



10 metre contour interval

© Commonwealth of Australia

Start at Question 16 if you are **16 years** old or over on 31 August 2006. If you are younger, continue answering questions.

- 16 In Figure 4, the general direction of Packsaddle Road across Packsaddle Plain is:**

A E / W  
B N / S  
C NE / SW  
D SE / NW  
E SW / NW

- 17 What is the predominant vegetation in square K5 in Figure 4?**

A cleared  
B light scrub  
C medium tree cover  
D orchards  
E scattered trees

- 18 Which answer most accurately describes the height above sea level of the base of the mast in square D2, Figure 4?**

A 80-90 m  
B 80-100 m  
C 89 m  
D 90-100 m  
E 100-110 m

- 19 Using Figure 4, what is the approximate distance between the mast (D2) and the highest point of Kelly's Knob (B9)?**

A 5.8 km  
B 6.3 km  
C 6.8 km  
D 7.3 km  
E 7.8 km

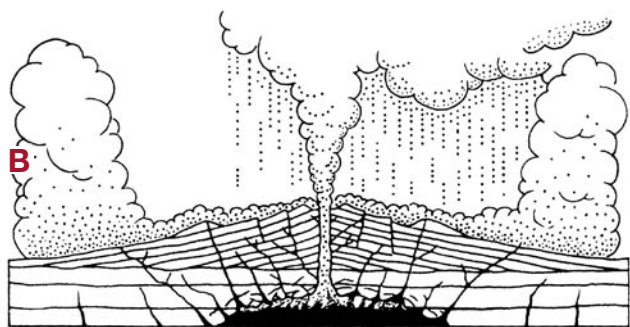
- 20 Which feature is located at Grid Reference 672542 in Figure 4?**

A dam  
B island  
C marsh  
D road  
E waterhole

**21 Using Figure 4, Kununurra Aerodrome is situated on a:**

- A alluvial fan
- B delta
- C floodplain
- D mesa
- E plateau

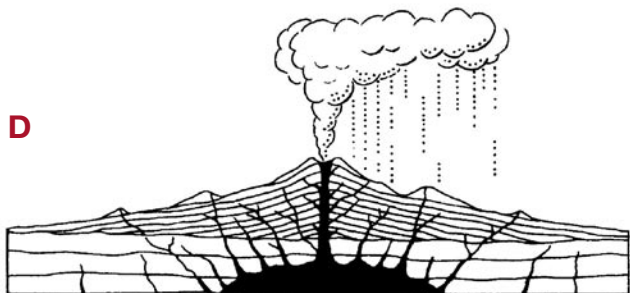
**A**



**C**



**D**



**Figure 5.**

**22 Which sequence of diagrams in Figure 5 best represents the formation of a crater lake?**

- A A D B C
- B B A C D
- C C A D B
- D C D B A
- E D B A C

**23 What is the dark area shown at the base of diagram D in Figure 5 called?**

- A caldera
- B lava dome
- C lava fountain
- D lava lake
- E magma chamber

**24 The eruption cloud in Diagram D in Figure 5 is primarily composed of:**

- A ash and cinders
- B basaltic lava
- C lahar
- D nuée ardente
- E volcanic bombs

**25 Which of these ranges is in the ACT?**

- A Brindabella
- B Flinders
- C Grampians
- D Hamersley
- E Macdonnell



**Figure 6.**

© NGCI, Jeff Hutchens

**26 Which process does the migrating sand dune in Figure 6 illustrate?**

- A deflation
- B deforestation
- C desalination
- D desertification
- E devolution

**27 Hunter Valley, NSW, has large deposits of:**

- A coal
- B gold
- C iron ore
- D oil
- E uranium

**28 GPS (Global Positioning System) receivers calculate their position using:**

- A the Earth's magnetic field
- B a number of orbiting satellites
- C oceanic radio broadcasts by the US Navy
- D the position of the North and South poles
- E signals from transmitters on mountain peaks

**29 Which country is in the process of overtaking the USA as the major source by value of imports to Australia?**

- A China
- B Germany
- C Japan
- D New Zealand
- E United Kingdom



**Figure 7.** Age structures of Australia's indigenous and total populations, 2001 Census *Source: ABS*

**30 From Figure 7, approximately what percentage of Australia's total population is women aged 85 and over?**

- A 0.2%
- B 0.5%
- C 1.0%
- D 1.5%
- E 2.5%

If you are **under 14 years** old on 31 August 2006 you may stop at Question 30 or continue to Question 40 to be eligible for major prizes.

**31 From Figure 7, the percentage of Australia's indigenous population under the age of 15 is approximately:**

- A 10%
- B 20%
- C 30%
- D 40%
- E 50%

**32 Which of the following statements is correct, based on the data in Figure 7?**

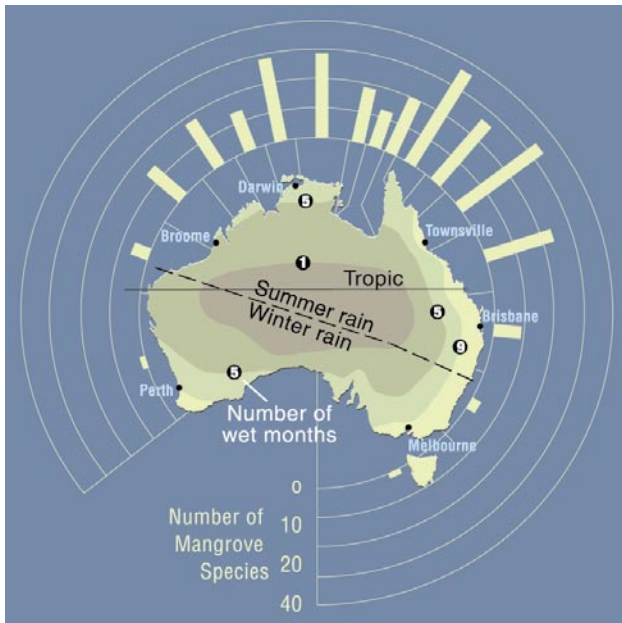
- A The age structure of the indigenous population is a product of high fertility and high mortality.
- B The age structure of the indigenous population is similar to that of the total Australian population.
- C The life expectancy of the indigenous population is higher than that of the total Australian population.
- D There is a higher level of urbanization among the indigenous population.
- E The total fertility rate of indigenous women has risen in recent decades.

**33 The most populous countries absent from the 2006 Winter Olympics were Indonesia, Bangladesh, Nigeria, Philippines and Vietnam. Which element common to all these countries may explain this absence?**

- A None of their land is over 1000 m high.
- B They are all at least partly in the tropics.
- C They are all classified by the United Nations as "least developed countries".
- D They are all in Asia.
- E all of the above

**34 Which of these countries' flags features the crescent moon of Islam?**

- A Austria
- B India
- C Israel
- D Sri Lanka
- E Turkey



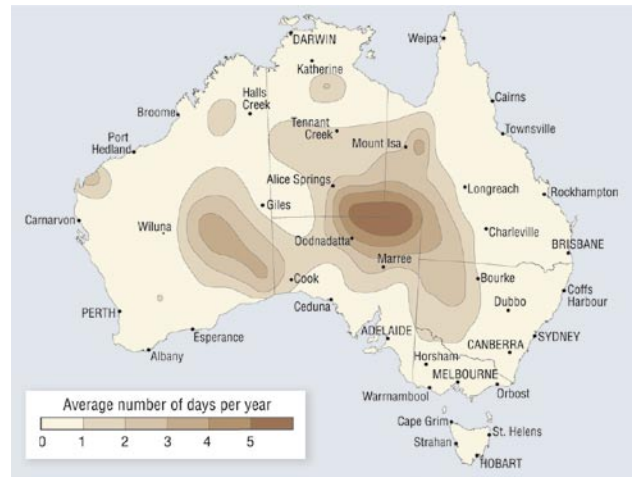
**Figure 8.** Mangrove plant richness around the Australian coastline

Source: Bureau of Meteorology & 2001 State of Environment Report

- 35 With reference to Figure 8, which statement is correct?**
- A In general mangroves prefer cool rather than warm conditions.
  - B Mangrove diversity is greatest in Cape York Peninsula.
  - C Mangroves are found along all Australian coasts.
  - D Most mangrove species grow in areas that receive most rain from June to August.
  - E all of the above
- 36 What is the term for the mangrove root structures that protrude vertically from the ground and allow the trees to breathe when flooded?**
- A epiphytes
  - B hermetic metabolism
  - C hydrophobic pads
  - D pneumatophores
  - E rhizophores
- 37 The first documented map of Australia, drawn 400 years ago by Willem Janszoon, was of which area?**
- A eastern Great Australian Bight, SA
  - B Gippsland coast, Vic
  - C North West Cape, WA
  - D Tasman Peninsula, Tas
  - E western Cape York Peninsula, Qld

**38 Which of these countries competed at the recent Commonwealth Games?**

- A Algeria
- B Cuba
- C Iceland
- D Malta
- E Mongolia



**Figure 9.**

Source: Bureau of Meteorology

**39 The map in Figure 9 indicates the average number per year of:**

- A bush fire days
- B days above 30°C
- C days with hail
- D days without rain
- E dust days

**40 Which statement about the squatter settlements surrounding Lima, Peru, is correct?**

- A They have allowed people to escape from rural deprivation.
- B They have created an urban sprawl which is more expensive for the authorities to adequately service with infrastructure.
- C They have provided housing, which neither the government nor private sector could have afforded, for millions of people.
- D They have resulted in some substandard buildings.
- E all of the above

If you are **under 16 years** old on 31 August 2006 stop at Question 40. If you are older, continue to end.



An **ecological footprint** is a measure of the area of land and water required, no matter where they are located, to sustain a given population, organisation or activity – that is, the area of land and water required to produce the goods consumed and to assimilate the wastes generated. Ecological footprints are expressed in global hectares. The world average ecological footprint is about 2.2 global hectares per person. Individual countries make varying demands on the environment.

The **biocapacity** of a country is calculated using six types of biologically productive areas: cropland, grazing land, forest area, fishing grounds, built-up land for accommodating infrastructure, and land for absorbing CO<sub>2</sub> production from burning fossil fuels. Biocapacity averaged for the world is 1.8 global hectares per person.

Each **global hectare** corresponds to one hectare of biologically productive space, scaled in proportion to its productivity. Out of the Earth's surface area of 51.0 billion hectares, only 9.1 billion hectares of land and 2.3 billion hectares of water are defined by this measure as biologically productive in that they provide economically useful concentrations of resources.

Where a country's use of resources exceeds its biocapacity there is an **ecological deficit**. For nearly three decades world demand for resources has exceeded Earth's capacity to provide those resources, resulting in a growing global ecological deficit.

**Figure 10. Ecological footprints**

Source: adapted from Global Footprint Network

**Table 2. Ecological footprints and other data for selected countries, 2002**

Country	Ecological footprint <sup>1</sup> global hectares per capita	Biocapacity <sup>1</sup> global hectares per capita	GDP <sup>2</sup> US\$ per capita	Area <sup>2</sup> '000 hectares	Population <sup>1</sup> millions
Australia	7.0	11.3	21 255	768 230	19.5
Bangladesh	0.5	0.3	361	13 017	143.8
Brazil	2.1	10.1	3 524	845 942	176.3
Canada	7.5	15.1	24 020	922 097	31.3
China	1.6	0.8	1 097	932 742	1 302.3
Gabon	1.1	19.6	3 870	25 767	1.3
Kuwait	7.3	0.3	14 937	1 782	2.4
Mexico	2.4	1.7	5 736	190 869	102.0
Netherlands	4.4	0.8	23 406	3 388	16.1
New Zealand	6.0	15.2	19 364	26 799	3.8
Sweden	5.5	9.8	27 839	41 162	8.9
UAE	10.5	0.9	25 202	8 360	2.9
USA	9.7	4.7	34 470	915 896	291.0

<sup>1</sup> Global Footprint Network, 2005

<sup>2</sup> UNEP GeoData

**For Questions 40 to 45, refer to Figure 10 and Table 2.**

**41 Which of these countries is running an ecological deficit?**

- A Australia
- B Canada
- C Netherlands
- D New Zealand
- E Sweden

**42 Which of these countries has a high per capita biocapacity despite its relatively small area?**

- A Brazil
- B Gabon
- C Mexico
- D UAE
- E USA

**43 Which of these countries has a larger total ecological footprint than UAE?**

- A Bangladesh
- B Gabon
- C Kuwait
- D New Zealand
- E none of the above

**44 If everyone consumed resources at the same rate as Australians, about how many times larger would Earth's biologically productive areas need to be to sustain this use?**

- A 1.8
- B 2.2
- C 3.2
- D 3.9
- E 7.0

**45 Which of these statements is correct?**

- A Countries with high population density tend to have low per capita biocapacity.
- B Countries with low ecological footprints cannot be in ecological deficit.
- C A country's biocapacity tends to increase with GDP.
- D A country's ecological footprint tends to decrease as it uses more fossil fuels.
- E Rich countries have large total ecological footprints.

The transition zone where water flowing off the surface of the land meets the regular ebb and flood of the tides may be called a **coastal waterway**. Features such as size, depth, tide patterns, types of basins, freshwater flows, saltiness, temperature and types of sediment all vary. Each is unique but all have been shaped over time by the same set of forces – wave action, the movement of the tides and river flow. These forces determine how the waterway looks and also how it works as part of the coastal environment.

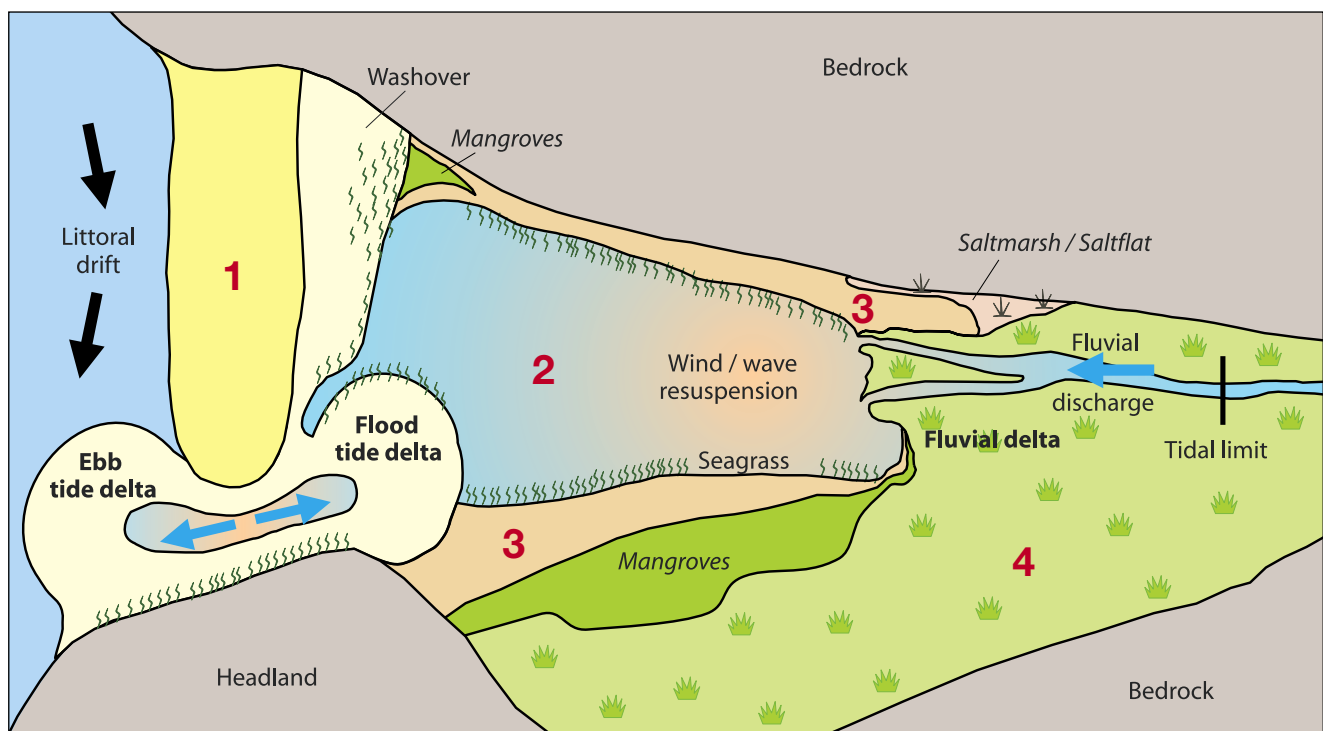
**Figure 11. Coastal waterways**

Source: adapted from Coastal CRC

**For Questions 46 to 50, refer to Tables 3 to 5, Figures 11 to 13 and your own knowledge.**

**46 Which coastal waterway type is most likely to experience a build-up of higher concentrations of nutrients and pollutants?**

- A tidal flats/creeks
- B tide-dominated delta
- C tide-dominated estuary
- D wave-dominated delta
- E wave-dominated estuary




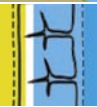




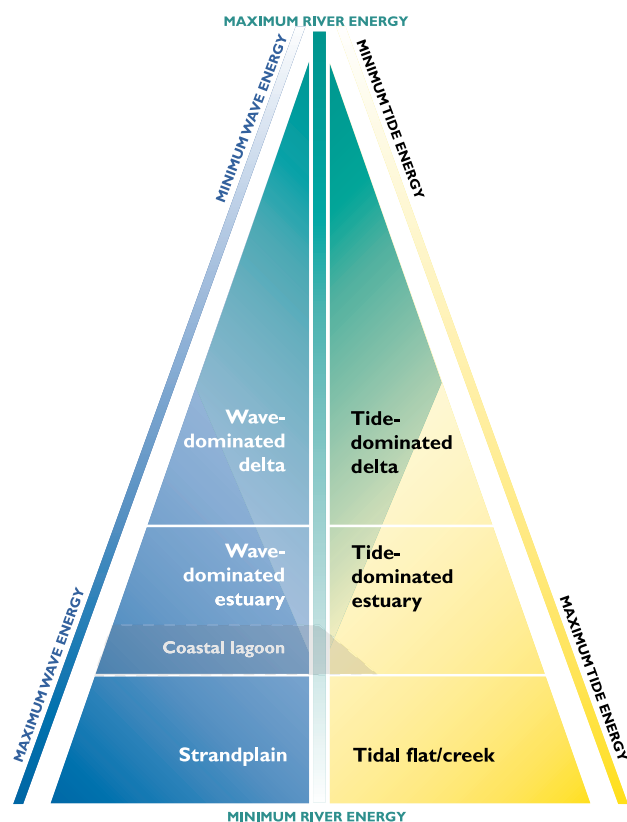
**Figure 12. Conceptual diagram of one type of coastal waterway**

Source: D Ryan, Geoscience Australia

**Table 3.** Characteristics of coastal waterways

Source: Coastal CRC; graphics D Ryan, Geoscience Australia

Dominant energy	Type of coastal environment	Dominant features	Sediment trapping efficiency	Habitat change due to sediment
Wave	 Wave-dominated estuary	Large central basin, narrow entrance	High	High risk
	 Strandplain	Intertidal flats, barrier and channels	Low	Low risk
Tide	 Tide-dominated estuary	Mangroves, saltmarsh and channels, wide entrance	Moderate	Some risk
	 Tidal flats/creeks	Mangroves and saltmarsh, numerous small channels	Low	Low risk
River	 Wave-dominated delta	Mangroves and channels, narrow entrance	Low	Low risk
	 Tide-dominated delta	Mangroves, wide entrance	Low	Low risk

**Figure 13.** The interaction of three sources of energy in the formation of coastal waterways

Source: Coastal CRC

**Table 4.** Choices of labels for Figure 12 (see Q47)

	1	2	3	4
Row A	barrier	central basin	intertidal flats	floodplain
Row B	delta	entrance	levee	intertidal flats
Row C	dune	creek	channel	saltmarsh
Row D	entrance	channel	barrier	swash
Row E	spit	river	delta	central basin

**47 Which row in Table 4 matches the numbers in Figure 12 with the appropriate labels?**

- A Row A
- B Row B
- C Row C
- D Row D
- E Row E

**48 Which coastal waterway type is represented in Figure 12?**

- A strandplain
- B tide-dominated delta
- C tide-dominated estuary
- D wave-dominated delta
- E wave-dominated estuary



**Table 5.** *Distribution of major types of coastal waterways*  
Source: Coastal CRC

Major types of coastal waterways	% of Australian coastal waterways
Deltas (tide- or wave-dominated)	19%
Estuaries (tide- or wave-dominated)	28%
Strandplains and tidal flats/creeks	40%
Other (e.g. immature forms such as drowned river valleys, embayments)	13%

**49 Which figure from Table 5 best indicates that Australia is a dry continent with relatively little river run-off by world standards?**

- A 13%
- B 19%
- C 28%
- D 40%
- E none of the above

**50 Which statement about coastal waterways is true?**

- A All coastal waterways respond in the same way to human-induced changes.
- B Coastal waterway changes are generally slow in geological terms.
- C Deltas form where tide energy is the dominant force.
- D Saltmarsh is more common in coastal waterways dominated by tide energy.
- E Tide-dominated coastal waterways have narrower entrances than other waterways.