A background image of a classical stone building with columns and arches, overlaid with a semi-transparent grey rectangle containing the text 'Booklet graphic Channel by Competition'. At the bottom, a dark green horizontal bar contains the word 'TIONS' in white capital letters.

Booklet

graphic Channel
by Competition

TIONS

INSTRUCTIONS

- [illegible]

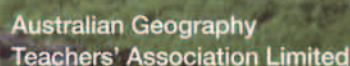
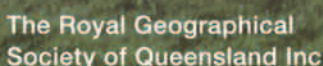




Figure 1.

Start at Question 1 if you are **under 16 years** old on 31 August 2009. Start at Question 16 if you are older.

- 1 The northwest corner of Figure 1 is in the foothills of the:
 - A Andes
 - B Drakensbergs
 - C Himalayas
 - D Rockies
 - E Urals
- 2 Which country is shaded green in Figure 1?
 - A Afghanistan
 - B Bangladesh
 - C Indonesia
 - D Malaysia
 - E Pakistan
- 3 Most people in the green-shaded country in Figure 1 are:
 - A Buddhist
 - B Christian
 - C Hindu
 - D Jewish
 - E Muslim

- 4 Which body of water is located in the south of Figure 1?

- A Arabian Sea
- B Bay of Bengal
- C Cook Strait
- D Gulf of Aden
- E Mozambique Channel

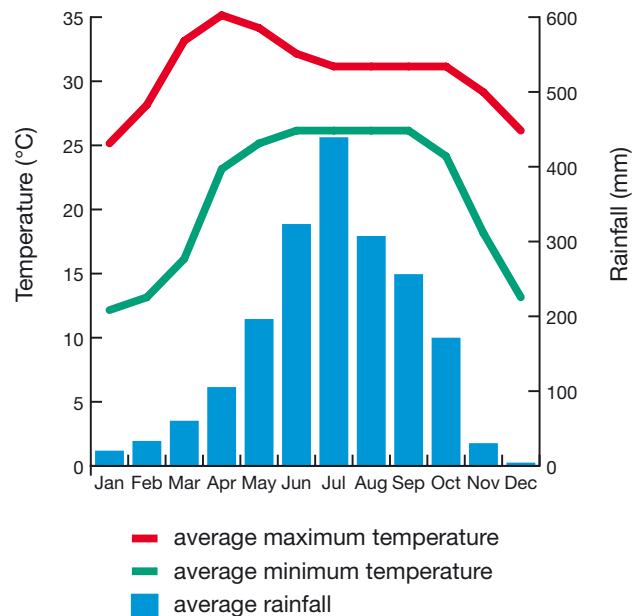


Figure 2. Climate graph, Dhaka Source: BBC Weather

- 5 From Figure 2, what is the average maximum temperature in Dhaka in October?
 - A 10°C
 - B 24°C
 - C 29°C
 - D 31°C
 - E 53°C
- 6 From Figure 2, what is Dhaka's average annual rainfall?
 - A 160 mm
 - B 437 mm
 - C 881 mm
 - D 1312 mm
 - E 1920 mm
- 7 Using Figure 2, Dhaka's climate is:
 - A alpine
 - B equatorial
 - C monsoonal
 - D semi-arid
 - E temperate

- 8 From Figure 2, the smallest variation between maximum and minimum temperatures in Dhaka is during:

A autumn
B spring
C summer
D winter
E It is the same all year.

- 9 Populations of which large animal are threatened by massive human impact on its habitat in the southwest of Figure 1?

A grizzly bears
B lions
C llamas
D pandas
E tigers

- 10 All the terms below were used in the media to describe the deadly natural disaster associated with Cyclone Nargis in Burma in May 2008. Which is the correct geographical term?

A ocean surge
B storm surge
C storm wave
D tidal surge
E tidal wave

- 11 Which canal is currently undergoing a multi-billion dollar expansion to upgrade the link between the Pacific and Atlantic Oceans?

A Corinth
B Kiel
C Panama
D Suez
E Welland

- 12 What is the term for the type of mining where the overburden is removed allowing surface access to the mineral?

A dredging
B hydraulic mining
C in situ leaching
D opencut mining
E shaft mining

Table 1. Life expectancy in the Northern Territory, 1981-2000
Source: NT Dept of Health and Families

Time period	Indigenous (years)		Non-indigenous (years)	
	Male	Female	Male	Female
1981-1985	57.9	63.5	70.4	80.2
1986-1990	56.2	63.2	71.8	84.4
1991-1995	58.6	64.4	72.7	81.8
1996-2000	59.4	65.0	76.1	84.0

- 13 From Table 1, what is the life expectancy of indigenous males born in the Northern Territory between 1996 and 2000?

A 57.9 years
B 59.4 years
C 65.0 years
D 76.1 years
E 84.0 years

- 14 From Table 1, what is the difference in life expectancy between NT indigenous and non-indigenous females born 1991-1995?

A 5.8 years
B 8.3 years
C 14.1 years
D 17.4 years
E 23.2 years

- 15 From Table 1, which statement is true regarding life expectancy in the Northern Territory between 1981 and 2000.

A The difference between indigenous and non-indigenous life expectancy has widened.
B Female life expectancy has decreased while male life expectancy has increased.
C Life expectancy is increasing at a faster rate for indigenous than for non-indigenous people.
D Male and female life expectancies have remained static.
E Male life expectancy has remained static while female life expectancy has increased.

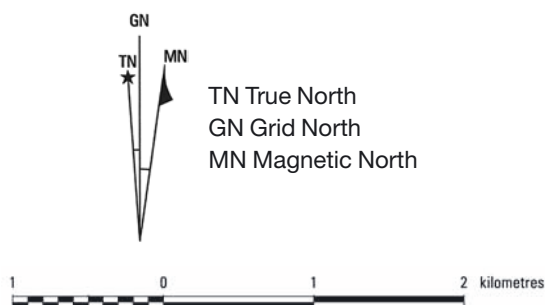


Figure 3. Topographic map

Reproduced by permission of the Dept. of Defence, with the assistance of Geoscience Australia

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 2009. If you are younger, continue answering questions.

- 16 From Figure 3, in approximately which direction do you travel from Six Mile (L7) to Wyndham township (K4) along the Great Northern Hwy?

A east
B northeast
C northwest
D southeast
E southwest

- 17 What is the direct distance from the jetty at Anthon Landing (H2) to the navigation pylon (C4) in Figure 3?

A 3.5 km
B 4 km
C 4.5 km
D 5 km
E 5.5 km

- 18 What is the approximate height above sea level of the speedway (L8 Figure 3)?

A 10 m
B 21-22 m
C 30-35 m
D 40-50 m
E 60-80 m

- 19 The causeways on the Great Northern Hwy (see Figure 3) were built to cross:

A intertidal ledges
B mangrove areas
C perennial lakes
D saline coastal flats
E swamps

- 20 What is located at Grid Reference 065886 in Figure 3?

A built-up area
B Great Northern Hwy
C hospital
D quarry
E Three Mile Creek

Fold this page back on itself to see the map at the same time.

21 Signs adjacent to the wharf (G2 Figure 3) warn of danger from:

- A coral snakes
- B killer whales
- C saltwater crocodiles
- D sand worms
- E water buffalo

22 The map in Figure 3 shows a portion of which state or territory?

- A Australian Capital Territory
- B Queensland
- C Tasmania
- D Victoria
- E Western Australia

23 The southern part of the map (Figure 3) shows Three Mile Creek, Six Mile Creek and Seven Mile Creek. (1 mile \approx 1.6 km) What is the most likely point from which the road distances to these creeks were measured?

- A Mount Dixon (J2)
- B navigation pylon (C4)
- C West Bastion (G4)
- D wharf (G2)
- E Wyndham township (K4)

24 Which of these is commonly found in Australia's rangelands?

- A cattle property
- B dairy farm
- C rice farm
- D sugar cane farm
- E all of the above

25 In which state or territory is Australia's deepest lake, Lake St Clair?

- A Australian Capital Territory
- B Northern Territory
- C Queensland
- D Tasmania
- E Western Australia



Figure 4. In the Warrumbungle Range © Col Grant

26 The photo in Figure 4 was taken in the Warrumbungles, NSW. The main feature is a:

- A butte
- B drumlin
- C fossilised dune
- D pyramidal peak
- E volcanic plug

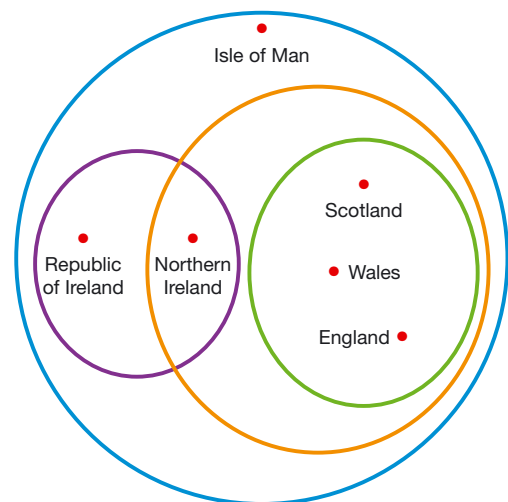


Figure 5.

27 In Figure 5, which circle encloses only the United Kingdom?

- A blue
- B green
- C orange
- D purple
- E none of the above

28 What is the chief source of electricity generation in Australia?

- A coal
- B gas
- C hydro
- D nuclear
- E solar

29 Which state's physical divisions include the Murray Basin Plains, Western District Plains and Gippsland Plains?

- A New South Wales
- B South Australia
- C Tasmania
- D Victoria
- E Western Australia

30 The problems affecting Lake Albert, at the mouth of the Murray, include:

- A acid sulphate soils
- B high salinity levels
- C low water levels
- D reduced inflow
- E all of the above

If you are **under 14 years** old on 31 August 2009 you may stop at Question 30 or continue to Question 40 to be eligible for major prizes.

31 Which is the largest island in the Southern Hemisphere?

- A Greenland
- B Madagascar
- C New Guinea
- D Sumatra
- E Tasmania

32 From Figures 6 and 7, which region has already achieved Target 1A?

- A Eastern and South-Eastern Asia
- B Latin America and the Caribbean
- C Northern Africa and Western Asia
- D Southern Asia
- E Sub-Saharan Africa

All the United Nations Member States have adopted the Millennium Development Goals as a framework to reduce the grinding poverty of millions of people. Goal 1, "Eradicate extreme poverty & hunger", is partially measured by Target 1A: **Halve, between 1990 and 2015, the proportion of people living in extreme poverty.** Extreme poverty is now defined as living on less than \$1.25 a day.

Figure 6. Millennium Development Goals

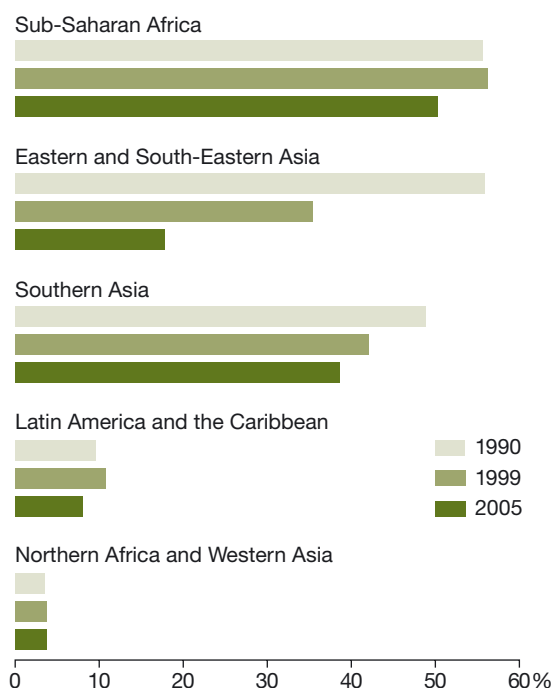


Figure 7. Proportion of people living on less than \$1.25 a day, 1990-2005

Source: United Nations

33 From Figures 6 and 7, which of these regions has made the least progress in achieving Target 1A?

- A Eastern and South-Eastern Asia
- B Latin America and the Caribbean
- C Northern Africa and Western Asia
- D Southern Asia
- E Sub-Saharan Africa

34 Which of these is NOT a major contributing factor to the number of people in Sub-Saharan Africa living on less than \$1.25 a day?

- A AIDS epidemic
- B deteriorating terms of trade
- C economic stagnation
- D high food prices
- E high number of refugees

35 Which country declared its independence in 2008?

- A East Timor
- B Georgia
- C Hong Kong
- D Kosovo
- E Puerto Rico

36 Where is the Nazca tectonic plate located?

- A eastern Pacific Ocean
- B Indian Ocean
- C northern Atlantic Ocean
- D southern Atlantic Ocean
- E western Pacific Ocean

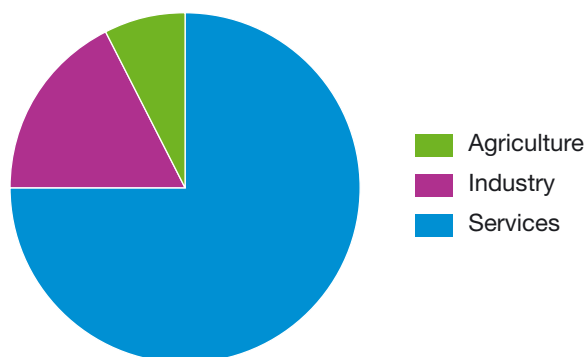


Figure 8. Employed persons by industry

37 Figure 8 shows the employment profile of which country?

- A China
- B Mongolia
- C Pakistan
- D South Korea
- E Vietnam

38 The term counterurbanisation is used to describe:

- A demolition of slums adjoining large cities to counter riots arising from poor living conditions
- B merging of several settlements into one large urban area
- C movement of people and employment from large urban areas to towns and rural areas
- D process by which the percentage of a nation's population living in urban areas increases
- E transformation of an urban area by replacing housing of an existing low socio-economic group with that for a more affluent group

39 The easternmost coastline of Africa has become a haven for pirates. It is in:

- A Senegal
- B Somalia
- C South Africa
- D Tunisia
- E Zimbabwe

40 Orographic rainfall is most likely to occur at which of these locations?

- A Bathurst Island, NT
- B Bellenden Ker Range, Qld
- C Hay Plains, NSW
- D Lake Eyre, SA
- E Little Desert, Vic

If you are **under 16 years** old on 31 August 2009 stop at Question 40. If you are older, continue to Question 50.

A degree confluence is a point at which lines of whole degrees of latitude and longitude meet. Examples of five degree confluences are shown on the map in Figure 10.

Figure 9. Degree confluences

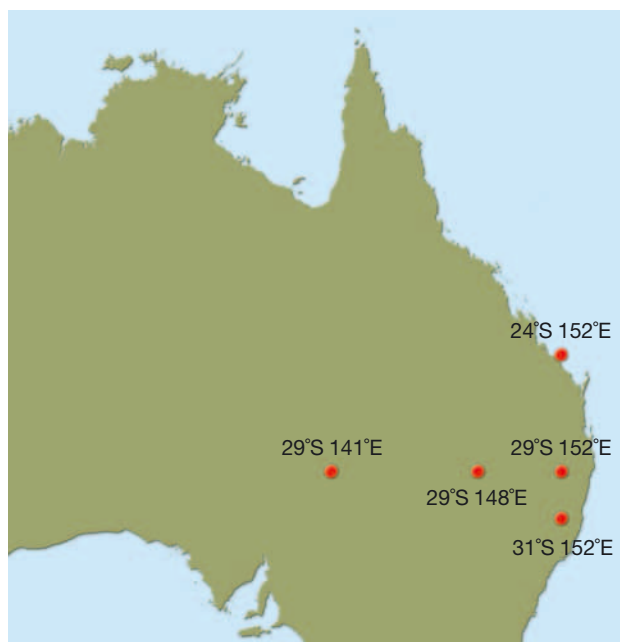


Figure 10. Examples of degree confluences

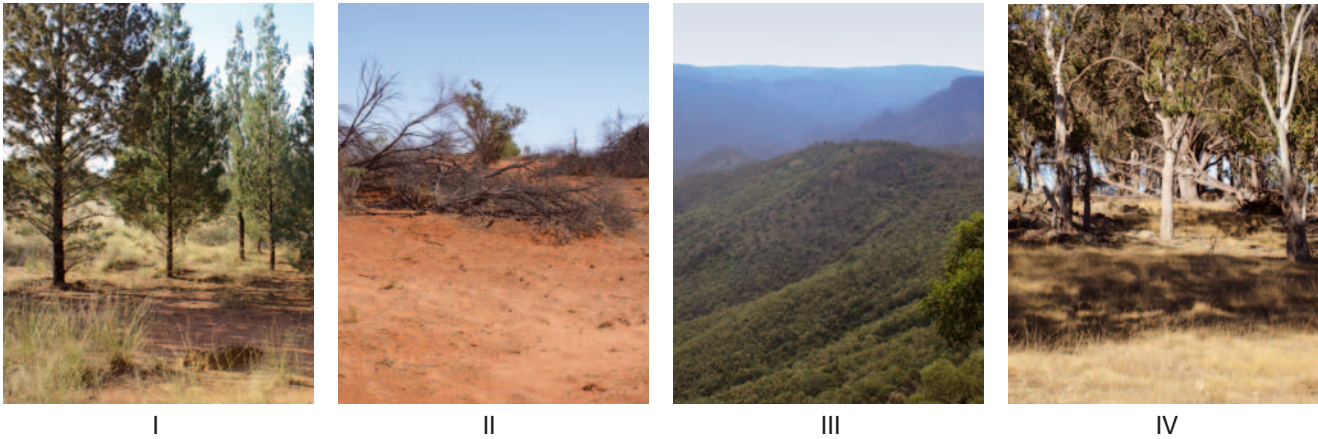


Figure 11. Photographs taken at some confluence points

© Col Grant

- 41 Given the definition in Figure 9, which Australian state has the greatest number of degree confluences?
- A New South Wales
 - B Queensland
 - C South Australia
 - D Tasmania
 - E Western Australia
- 42 Which of the degree confluences marked in Figure 10 is on the border of three states?
- A 24°S 152°E
 - B 29°S 141°E
 - C 29°S 148°E
 - D 29°S 152°E
 - E 31°S 152°E
- 43 Using Figure 10, which of these degree confluences is in the sea?
- A 15°S 150°E
 - B 20°S 140°E
 - C 25°S 130°E
 - D 30°S 135°E
 - E 35°S 145°E

Table 2. Matching photos with locations in Figure 10

	Photo I	Photo II	Photo III	Photo IV
A	24°S 152°E	31°S 152°E	29°S 152°E	29°S 141°E
B	29°S 141°E	24°S 152°E	29°S 148°E	31°S 152°E
C	29°S 148°E	29°S 141°E	31°S 152°E	29°S 152°E
D	29°S 152°E	24°S 152°E	29°S 141°E	29°S 148°E
E	31°S 152°E	29°S 148°E	29°S 141°E	24°S 152°E

- 44 Which row in Table 2 correctly matches the photos in Figure 11 with their locations in Figure 10?
- A row A
 - B row B
 - C row C
 - D row D
 - E row E
- 45 The vegetation in Photo III (Figure 11) is:
- A closed forest
 - B low woodland
 - C open forest
 - D tall open shrubland
 - E tall woodland

Table 3. Properties of selected drainage basins in Australia

Source: Australian Natural Resources Atlas

Property	Basin 1	Basin 2	Basin 3	Basin 4	Basin 5
Area (km ²)	79,630	81,646	130,138	494,827	93,829
Improved pasture (% of area)	0	9	2	0	0
Cropping (% of area)	0	15	1	0	0
Horticulture (% of area)	6	1	0	0	0
Rain (mm/y averaged over basin)	824	565	596	252	606
Total evaporation (mm/y)	600	454	549	245	507
Runoff (mm/y)	225	129	48	7	99
Net primary production (tC/ha/y)	1	3	2	1	1
Plant carbon (t/ha)	18	138	34	13	9
Litter plus soil carbon (t/ha)	18	152	41	22	12
Nitrogen from fertiliser (kgN/ha/y)	0	3	1	0	0
Total nitrogen (kgN/ha)	1,513	13,020	3,489	1,748	961
Phosphorus from fertiliser (kgP/ha/y)	0	2	0	0	0
Total phosphorus (kgP/ha)	260	1,719	525	273	173

C=carbon, ha=hectare, kg=kilogram, N=nitrogen, P=phosphorus, t=tonne, y=year

Landscape Material Balances

The availability of light, water and nutrients determines the capacity of land to produce natural vegetation and agricultural yield. In Australia, long-term availability of resources and the consequent potential for generating yield, can be assessed by examining the mass balances of the key resources: water and nutrients (in this case nitrogen and phosphorus).

Mass balance gives a quantitative picture of resource inflows and outflows, the landscape stores of resources available for use, and change over time. The mass balances of water and nutrients are linked by carbon since plant biomass is approximately 50% carbon.

'Net primary production' is a measure of plant biomass gain. It is the net rate at which plants build up carbon from the atmosphere through photosynthesis, and integrates the water, carbon, nitrogen and phosphorus balances. It is a fundamental measure of 'landscape yield'.

Figure 12. Landscape material balances

Adapted from Australian Natural Resources Atlas

**Figure 13. Selected drainage basins in Australia**

To answer Questions 46 to 50 use the information in Table 3, Figures 12 to 14 and your own knowledge.



I



II



III

Figure 14. Photos I - III were taken along the same river in July during the dry season. Photo I is in limestone gorge country. Photo II is downstream of Photo I. Photo III concerns a weed whose burr is almost impossible to remove from wool.

© Col Grant

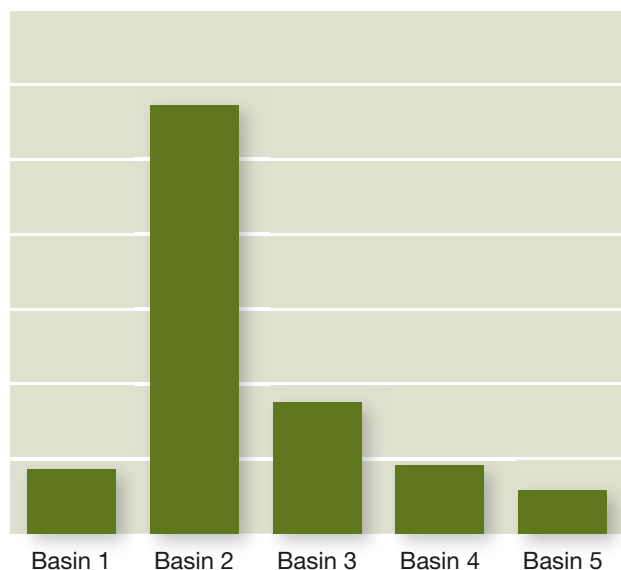


Figure 15. Property from Table 3

46 Which property in Table 3 is graphed in Figure 15?

- A area
- B cropping
- C net primary production
- D rain
- E total phosphorus

47 Net primary production has a positive correlation with which of these factors for the basins in Table 3?

- A horticulture
- B rain
- C runoff
- D total evaporation
- E total nitrogen

48 Which statement is correct?

- A Carbon and phosphorus are key plant nutrients.
- B Fertiliser application has contributed a significant proportion of total nitrogen levels.
- C Limited light constrains the agricultural productivity of the Burdekin Basin.
- D Natural vegetation has fundamentally different requirements to crops.
- E Plant matter is a significant landscape store of carbon.

49 The photos in Figure 14 were taken in Table 3's Basin 5. Which statement is true of this river system?

- A The area has no sheep grazing.
- B In its lower reaches the river's flow is usually sufficient to transport large rocks.
- C Much of the agricultural land in this basin is irrigated.
- D The river's flow is highly variable.
- E Tree trunks are rarely moved by the river when in flood.

50 Basin 5 in Table 3 is the:

- A Burdekin Basin
- B Fitzroy Basin
- C Murrumbidgee Basin
- D Roper Basin
- E Salt Lake Basin

Thank you for taking part in the
2009 National Geographic Channel
Australian Geography Competition.