2023
Year 10 – answers

What is meant by biodiversity?

○ interconnected biological processes in an ecosystem

○ diverse ways of looking at biology

○ differences in the total mass of living organisms in an area

● the variety of living organisms and their ecosystems

Land and Sea use Change (Including habitat loss and degradation) | Pollution | Species overexploitation | Climate Change | Invasive species and disease

The five threats to biodiversity © WWF, CC

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What is the main cause of biodiversity loss in Australia? Click on the correct answer in the image below.

Land and Sea use Change (Including habitat loss and degradation) | Pollution | Species overexploitation | Climate Change | Invasive species and disease

The five threats to biodiversity © WWF, CC

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Using the graphs below, which region was most successful in reversing its decline in biodiversity between 2010 and 2016?

( ) North America   (●) Asia/Pacific   ( ) Africa   ( ) Europe/Central Asia

Average change in the size of monitored vertebrate species populations in the Living Planet Index, 1970-2016
▶ By region   Index value (1970 = 1)

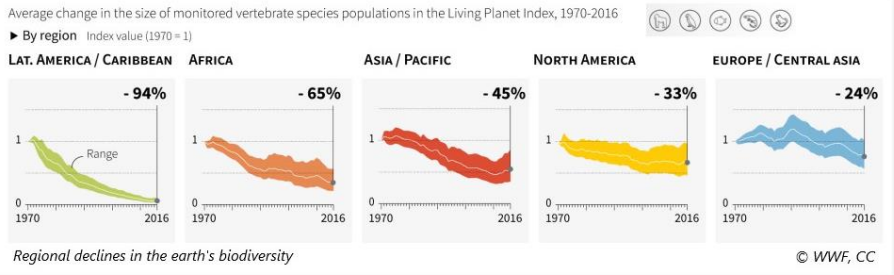| Lat. America / Caribbean	Africa	Asia / Pacific	North America	Europe / Central Asia
- 94%	- 65%	- 45%	- 33%	- 24%

Regional declines in the earth's biodiversity   © WWF, CC

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Are these statements relating to biodiversity changes between 1970 and 2016 supported or unsupported by the information in the graphs? Classify them by choosing the correct drop-down word.

Statement	Supported/Unsupported
33% of North America's vertebrate species have become extinct.	Unsupported ▼
Developing countries have suffered the worst declines.	Supported ▼
China has improved its protection of biodiversity.	Unsupported ▼
The worst period for biodiversity loss has been since 2010.	Unsupported ▼

Average change in the size of monitored vertebrate species populations in the Living Planet Index, 1970-2016
▶ By region   Index value (1970 = 1)

Lat. America / Caribbean	Africa	Asia / Pacific	North America	Europe / Central Asia
- 94%	- 65%	- 45%	- 33%	- 24%

Regional declines in the earth's biodiversity   © WWF, CC

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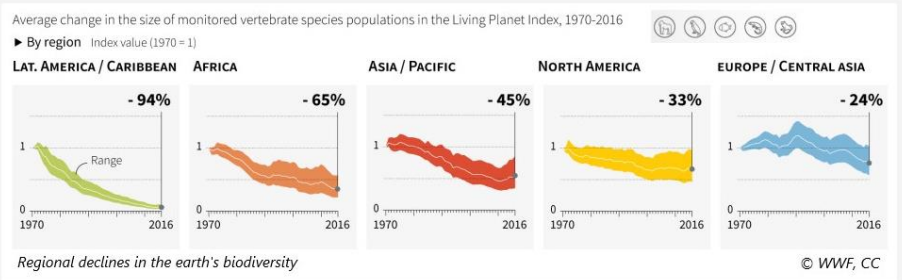
Using the graph below, approximately how many hectares of primary forest were lost in Brazil in 2014?

(•) 940,000   ( ) 1,100,000   ( ) 1,250,000   ( ) 1,500,000
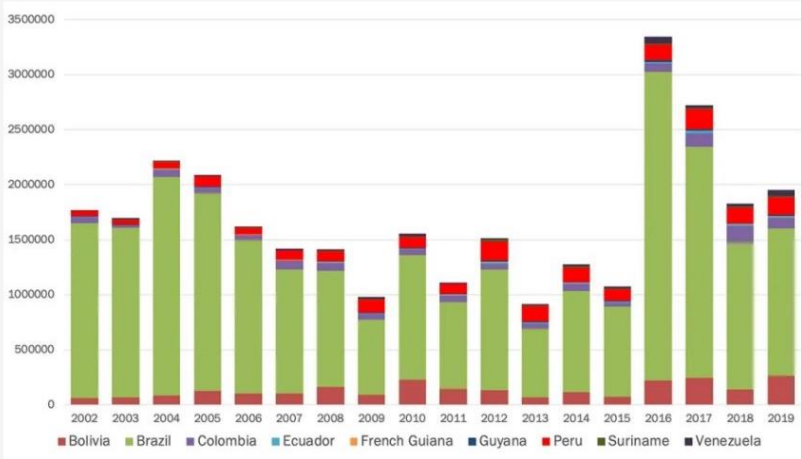
Annual primary forest loss in the Amazon, 2002-2019 (hectares)   © Mongabay; data source Hansen

◄ **Back**   **Flag** �   **Next** ►

What would be the main reason for the change in Amazonian forests in 2016, as seen in the graph?

(•) change of government protection policy in Brazil   ( ) forest dieback because of climate change

( ) insect infestation from adjacent boreal forest   ( ) forest fires set by Indigenous communities
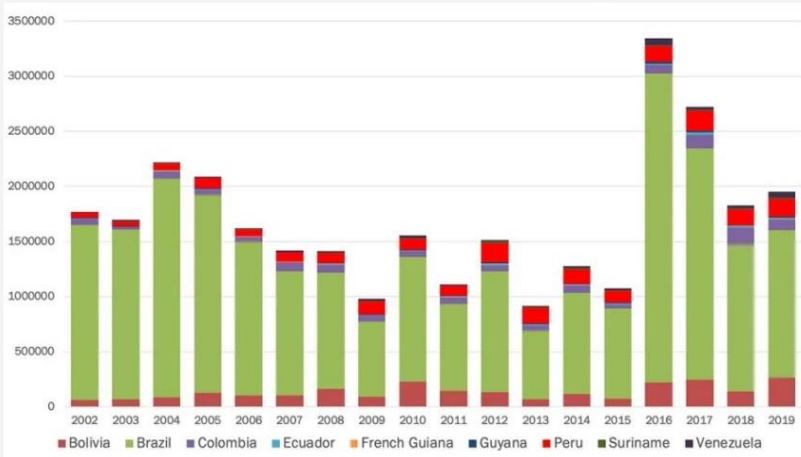
Annual primary forest loss in the Amazon, 2002-2019 (hectares)   © Mongabay; data source Hansen

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Why does the majority of the Amazonian forest loss occur in Brazil?

- ● The other Amazonian countries have much smaller areas of forest.
- ○ The other Amazonian countries are more economically developed.
- ○ The forest areas in the other Amazonian countries are too remote to reach.
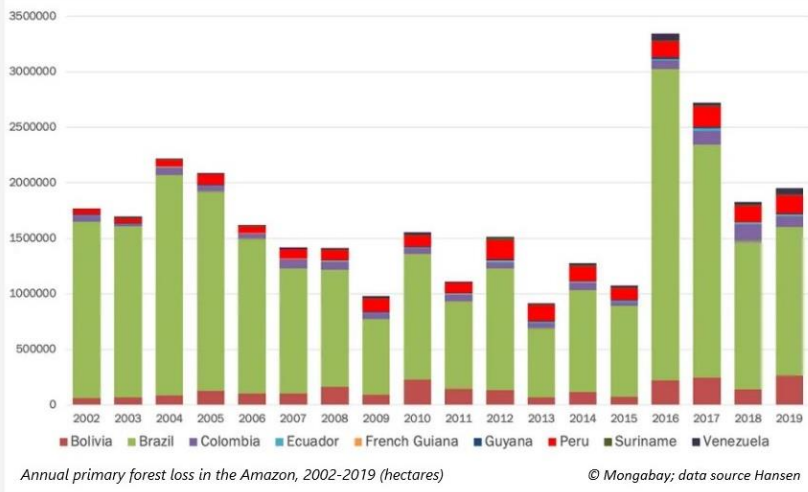- ○ Other Amazonian countries do not allow the destruction of forest.

Annual primary forest loss in the Amazon, 2002-2019 (hectares)   © Mongabay; data source Hansen

Bolivia ■ Brazil ■ Colombia ■ Ecuador ■ French Guiana ■ Guyana ■ Peru ■ Suriname ■ Venezuela
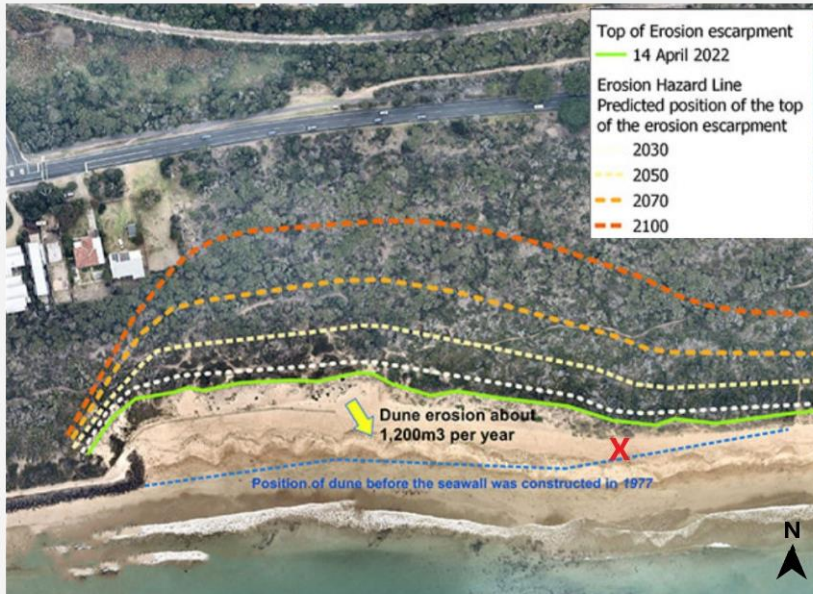
Back   Flag   Next

What is the primary reason that countries such as Norway contribute to the Amazon Fund to preserve the rainforest?

- ● to reduce greenhouse gas emissions
- ○ to protect local communities from harm
- ○ to prevent the waste of valuable timber resources
- ○ to ensure the survival of endemic species

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Which process best explains the pattern of erosion shown in the image below?

- ● terminal scouring at the end of the seawall
- ○ disruption of the pattern of swash and backwash
- ○ differential erosion of the beach material
- ○ longshore drift removing sand from the beach

Top of Erosion escarpment
— 14 April 2022

Erosion Hazard Line
Predicted position of the top
of the erosion escarpment
  2030
  2050
  2070
  2100

Dune erosion about
1,200m3 per year

X

Position of dune before the seawall was constructed in 1977

N

Estimated erosion, Dog Beach, Point Lonsdale/Queenscliff, Vic   © State of Victoria, DELWP

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What would be a short-term, soft-engineering strategy to lessen the erosion problem seen in the image?

- ○ extending the sea wall
- ○ constructing a groyne
- ● beach nourishment
- ○ creating rock revetements
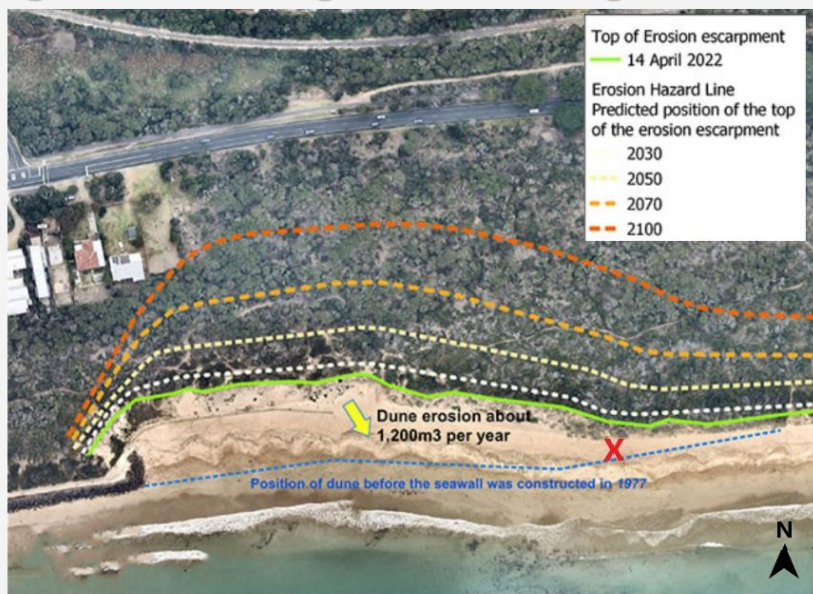
Top of Erosion escarpment
— 14 April 2022

Erosion Hazard Line
Predicted position of the top
of the erosion escarpment
  2030
  2050
  2070
  2100

Dune erosion about
1,200m3 per year

X

Position of dune before the seawall was constructed in 1977

N

Estimated erosion, Dog Beach, Point Lonsdale/Queenscliff, Vic   © State of Victoria, DELWP

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What would be the probable effects of constructing a groyne where the red X is marked on the image? Select all that apply.

- ☑ an increase in sediment deposition and a wider beach area to the west of the groyne
- ☐ no effect on sediment transport and beach morphology
- ☐ a decrease in sediment deposition and a narrower beach area to the west of the groyne
- ☑ a change in wave direction resulting in increased erosion on the east of the groyne
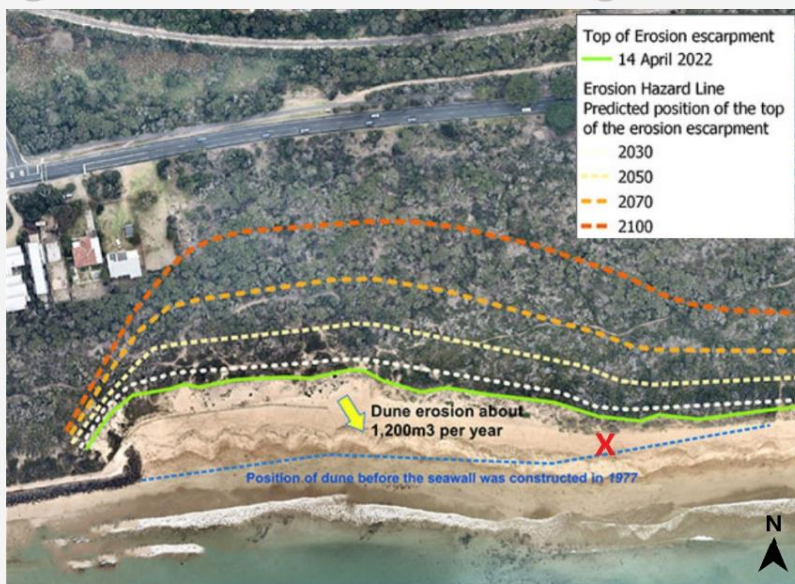

Top of Erosion escarpment
— 14 April 2022

Erosion Hazard Line
Predicted position of the top
of the erosion escarpment
2030
2050
2070
2100

Dune erosion about 1,200m3 per year

Position of dune before the seawall was constructed in 1977
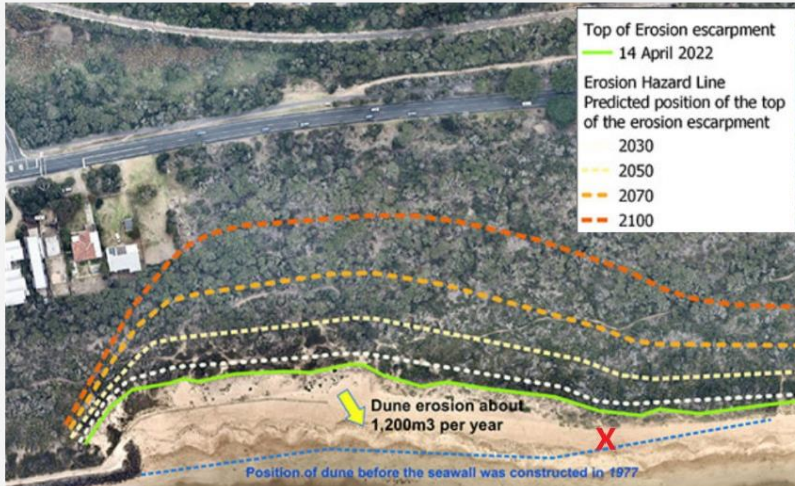
Back | Flag | Next

Which problem does the image highlight?

- ○ natural wave erosion of beaches
- ○ sea level rise
- ○ rising values of coastal property
- ● development planning on coasts

Top of Erosion escarpment
— 14 April 2022

Erosion Hazard Line
Predicted position of the top
of the erosion escarpment
2030
2050
2070
2100

Dune erosion about 1,200m3 per year

Position of dune before the seawall was constructed in 1977

N

Estimated erosion, Dog Beach, Point Lonsdale/Queenscliff, Vic   © State of Victoria, DELWP

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Aboriginal peoples in Australia commonly manipulated the land to enhance food availability through:

- ● controlled burning
- ○ irrigation systems
- ○ crop rotation
- ○ contour ploughing

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CSIRO has studied the wide-ranging benefits associated with Indigenous land management. Classify these benefits by dragging and dropping the appropriate text into the table.

Category	Benefit example
Health and well-being	Better diet reducing lifestyle risk factors
Cultural and sociopolitical	Support for intergenerational transfer of knowledge
Economic	Creation of saleable carbon credits
Environmental	Lower rates of weed infestation

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Problem in farming area
© NSW DPI

Which of these human activities is most likely to have caused the problem shown in the image?

- ● clearing deep-rooted native vegetation
- ○ building fences and gates
- ○ planting improved pasture grasses
- ○ anthropogenic climate change

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Problem in farming area
© NSW DPI

Which of these is a suitable response to the problem shown in the image?

- ○ planting rows of pine trees
- ○ irrigating the land more intensively
- ○ ploughing the land to break the surface
- ● planting salt tolerant plants, e.g. saltbush

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Problem in farming area
© NSW DPI

Which type of image is this?
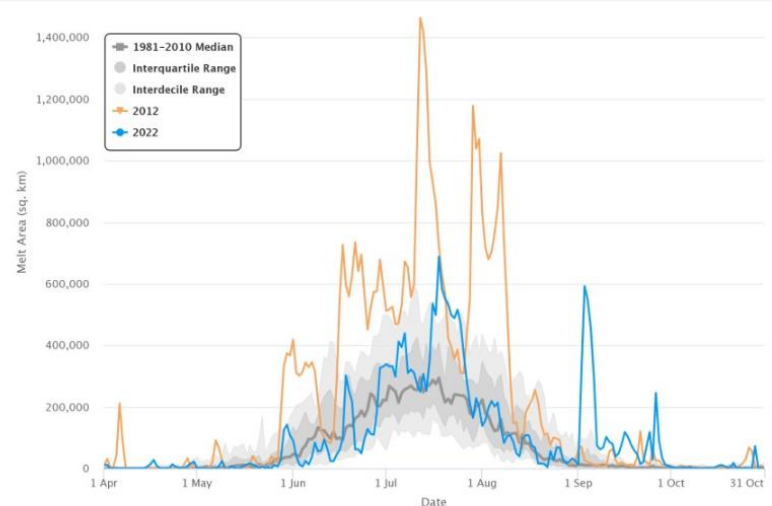
- (●) aerial
- ( ) satellite
- ( ) terrestrial
- ( ) macro

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Using the graph below, which of these statements is true?

- ( ) The extent of ice melt in 2022 was greater than in 2012.
- (●) The extent of ice melt in Greenland is naturally variable.
- ( ) The interdecile range is by definition smaller than the interquartile range.
- ( ) The extent of the ice melt increases each year.

Greenland surface melt extent
© National Snow and Ice Data Center

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What are some of the effects in Greenland of the trend shown in the graph? Select all that apply.

- ☑ Mineral and hydrocarbon resources are becoming easier to exploit.
- ☑ Traditional hunting and fishing practices of the Inuit have been disrupted.
- ☐ Greenland's total land area is increasing.
- ☐ Increased sea ice is improving the polar bears' hunting in southern Greenland.

Greenland surface melt extent © National Snow and Ice Data Center
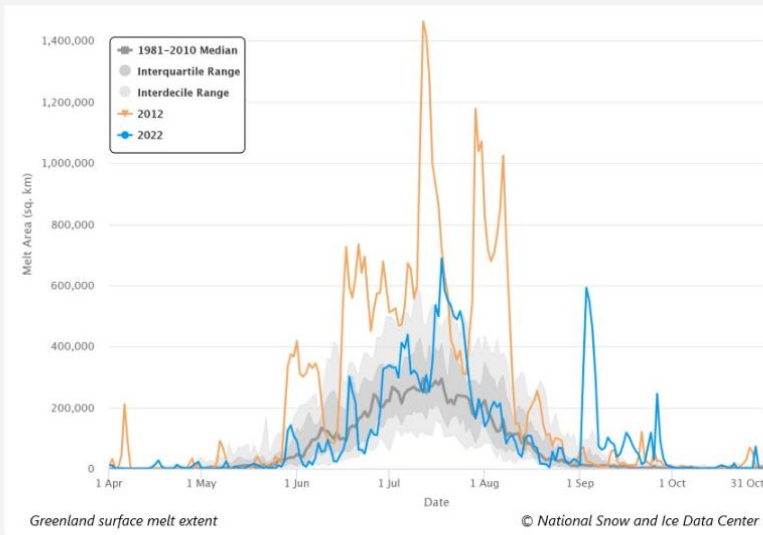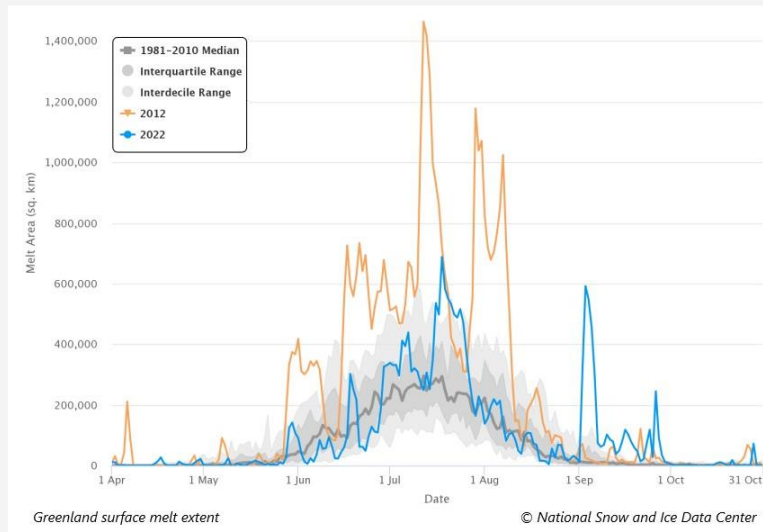
Back   Flag   Next
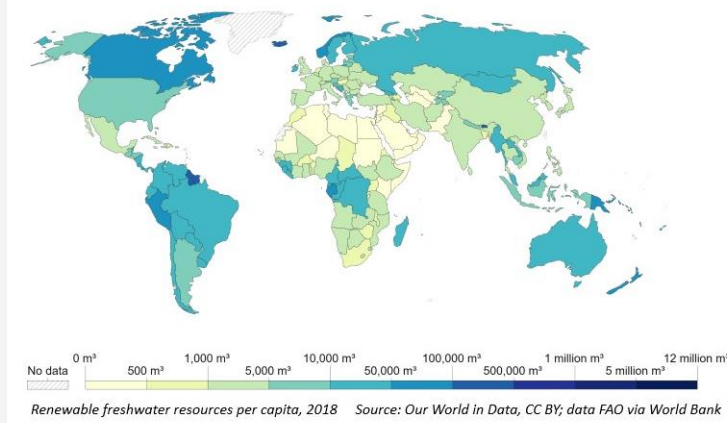
Choose the drop-down text that correctly completes the sentence.

The trend shown in the graph is of interest to Pacific Island communities because it will lead to an increase in [mean sea level ▼] .

Greenland surface melt extent © National Snow and Ice Data Center

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The map below is a [choropleth ▼] map.

Renewable internal freshwater resources flows refer to internal renewable resources (internal river flows and groundwater from rainfall) in the country.

Renewable freshwater resources per capita, 2018   Source: Our World in Data, CC BY; data FAO via World Bank

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Australia is classified in the medium range in the map below mainly because of its:

◉ low population   ○ high population   ○ low rainfall   ○ high rainfall

Renewable internal freshwater resources flows refer to internal renewable resources (internal river flows and groundwater from rainfall) in the country.

Renewable freshwater resources per capita, 2018   Source: Our World in Data, CC BY; data FAO via World Bank

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Which is the most significant limitation of the data shown in the map?

- ( ) does not include country name labels
- (●) does not show variation within countries
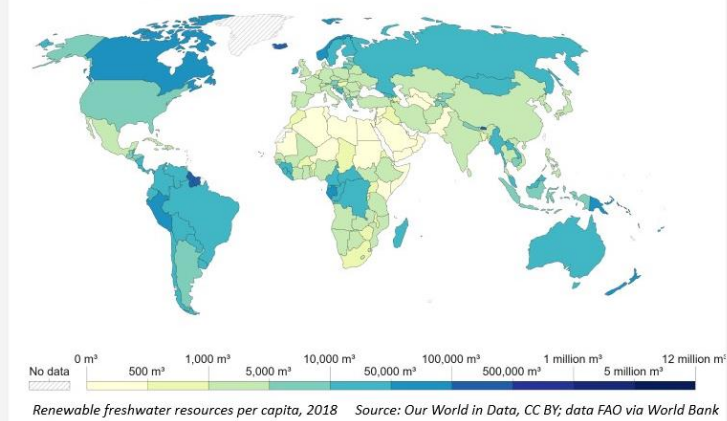- ( ) missing data for one country
- ( ) does not show major dams

Renewable internal freshwater resources flows refer to internal renewable resources (internal river flows and groundwater from rainfall) in the country.

Renewable freshwater resources per capita, 2018   Source: Our World in Data, CC BY; data FAO via World Bank

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India experiences more water stress than Egypt. What information is missing from the map that would explain this?

- ( ) rainfall
- (●) water use
- ( ) population
- ( ) area

Renewable internal freshwater resources flows refer to internal renewable resources (internal river flows and groundwater from rainfall) in the country.
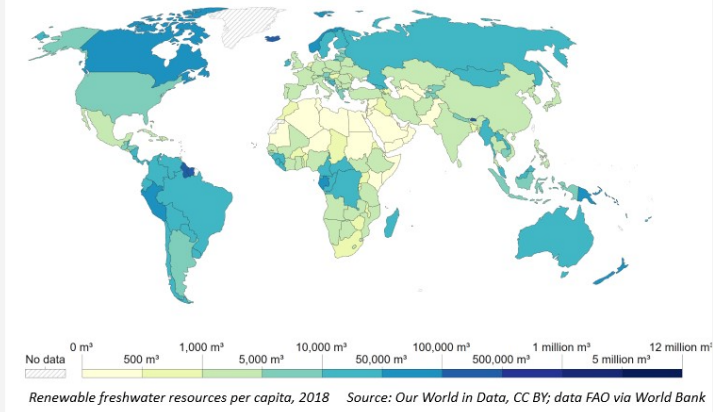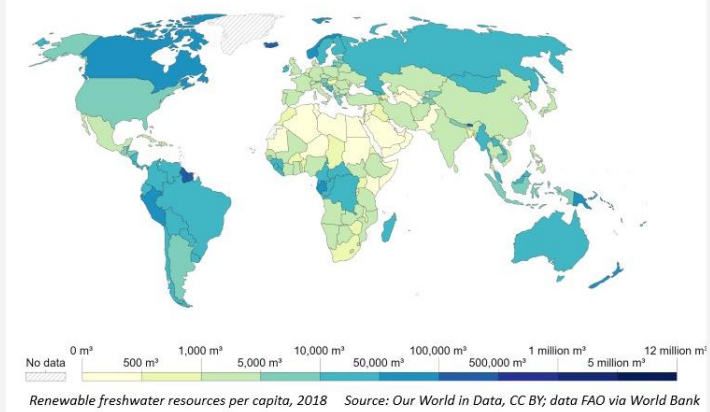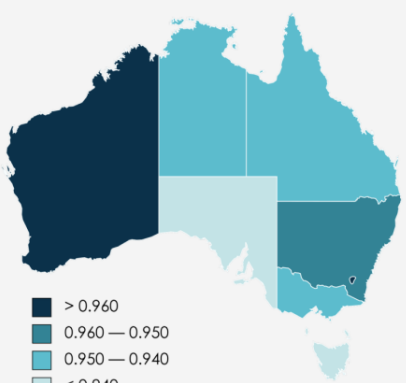

Renewable freshwater resources per capita, 2018   Source: Our World in Data, CC BY; data FAO via World Bank

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Which of these initiatives are most likely to help reduce the risk of water scarcity for residents? Select all that apply.

- ☑ recycling water
- ☑ promoting water conservation measures
- ☐ privatising the water supply
- ☐ deregulating discharge from sewage treatment facilities

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> 0.960
0.960 — 0.950
0.950 — 0.940
< 0.940

Human Development Index (HDI) scores by state, 2021
© A Hunter, CC BY SA 4.0; data Global Data Lab

Drag and drop these states in order from highest Human Development (HDI) score to lowest.
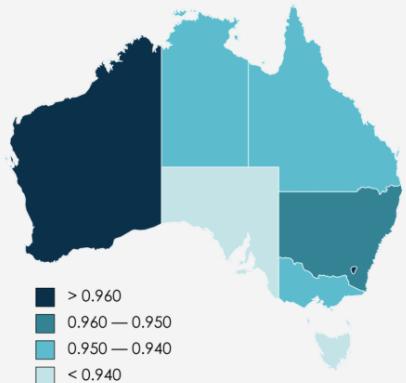
Western Australia

New South Wales

Victoria

South Australia

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Which of the indicators that make up the HDI best explains Western Australia's score compared to the other states?

○ life expectancy at birth

○ expected years of schooling

○ mean years of schooling

● gross income per capita

> 0.960
0.960 — 0.950
0.950 — 0.940
< 0.940

Human Development Index (HDI) scores by state, 2021
© A Hunter, CC BY SA 4.0; data Global Data Lab

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Drag and drop the Human Development Index (HDI) scores to correctly match the countries below.

Country	HDI score
Afghanistan	0.478
Fiji	0.730
Switzerland	0.962
USA	0.921

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Using the map below, which of the following statements are correct? Select all that apply.

- ✔ Africa has a high number of low-income countries.
- ☐ Australia is an upper-middle-income country.
- ✔ Australia is wealthier than most of the countries in its region.
- ☐ The distribution of low-middle-income countries across the world is random.
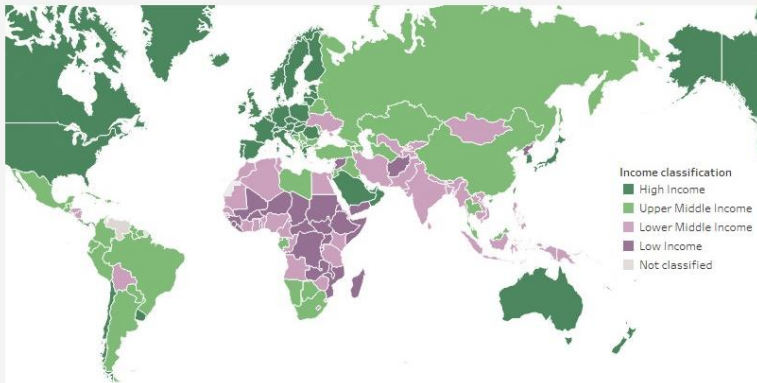
Income classification
- High Income
- Upper Middle Income
- Lower Middle Income
- Low Income
- Not classified

World Bank country classification by income level, 2021   © World Bank, CC BY 4.0

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The EIU Liveability Index is another way of measuring the quality of life. It measures 30 factors in 5 categories. Drag and drop the category into the table below to correctly classify the selected factors.
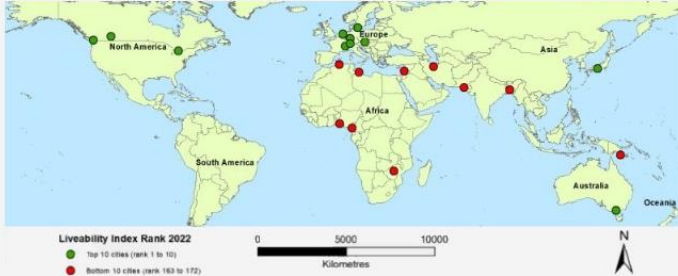
Category	Selected factor
Healthcare	Availability of over-the-counter drugs
Education	Public education indicators
Infrastructure	Quality of water provision
Culture & environment	Social or religious restrictions
Stability	Threat of civil unrest/conflict

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Which of these statements is correct based on the TWO maps below? (Scroll down to see all the maps.)

○ Liveability and income level are not connected.

● A city's liveability has a strong correlation with its country's income level.

○ It is probable that cities in a low-income country will have a high liveability rank.

○ It is probable that cities in a high-income country will have a low liveability rank.

Liveability Index Rank 2022
● Top 10 cities (rank 1 to 10)
● Bottom 10 cities (rank 163 to 172)

0   5000   10000
Kilometres

N

Global Liveability Index 2022: 10 most liveable and least liveable cities   *Data source: Economist Intelligence Unit*

Income classification
■ High Income
■ Upper Middle Income
■ Lower Middle Income
■ Low Income
■ Not classified

World Bank country classification by income level, 2021   © World Bank, CC BY 4.0

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Based on the photo below, which of these factors could best be addressed to improve the liveability of Dharavi? Select all that apply.

☐ climate   ☑ infrastructure   ☑ environmental quality

☐ tradition and spiritual connection   ☐ feeling of connection to family and community

Dharavi, Mumbai, India   © Erin, CC BY 2.0

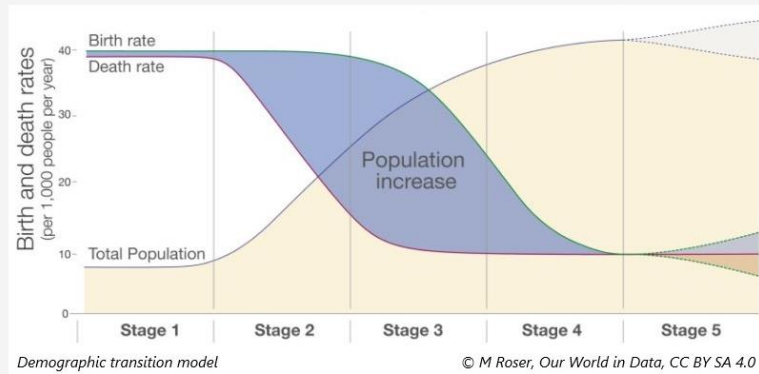◄ **Back**   Flag ▷   **Next** ▶

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Choose your answer from the drop-down text.

According to the demographic transition model below, population increases most rapidly during [Stage 2 ▼] .

Demographic transition model

© M Roser, Our World in Data, CC BY SA 4.0
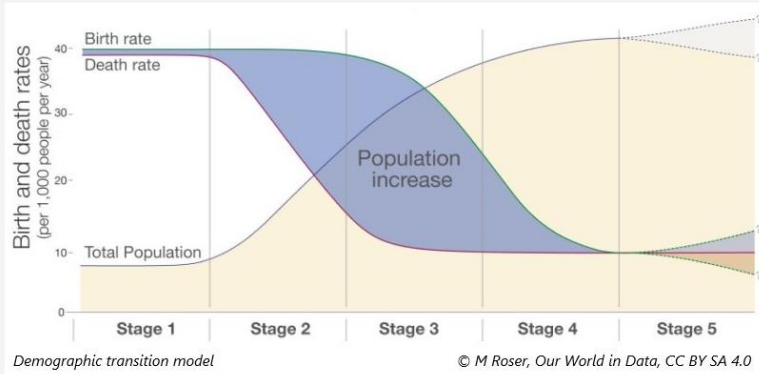
Stage 5 was added to the model to account for the declining population of some countries. What is the main reason for this decline?

○ death rate from lifestyle diseases increasing   ○ availability of birth control

○ large families no longer needed to support the elderly   ● birth rate dropping below replacement level

Demographic transition model

© M Roser, Our World in Data, CC BY SA 4.0

Population pyramid of Australia, 2023
© PopulationPyramid.net, CC BY 3.0
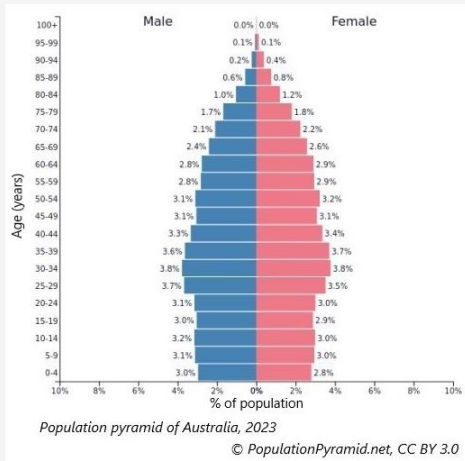
Based on its population pyramid, what is an accurate description of Australia's population structure in 2023?

- ● constrictive
- ○ expansive
- ○ stationary

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Which stages of the demographic transition model are represented by the four population pyramids? Drag your answers below the appropriate graph.

Stage 1

Stage 4   Australia - 2023
Population: 26,439,111

Stage 3   Indonesia - 2023
Population: 277,534,122

Stage 5   Japan - 2023
Population: 123,294,513
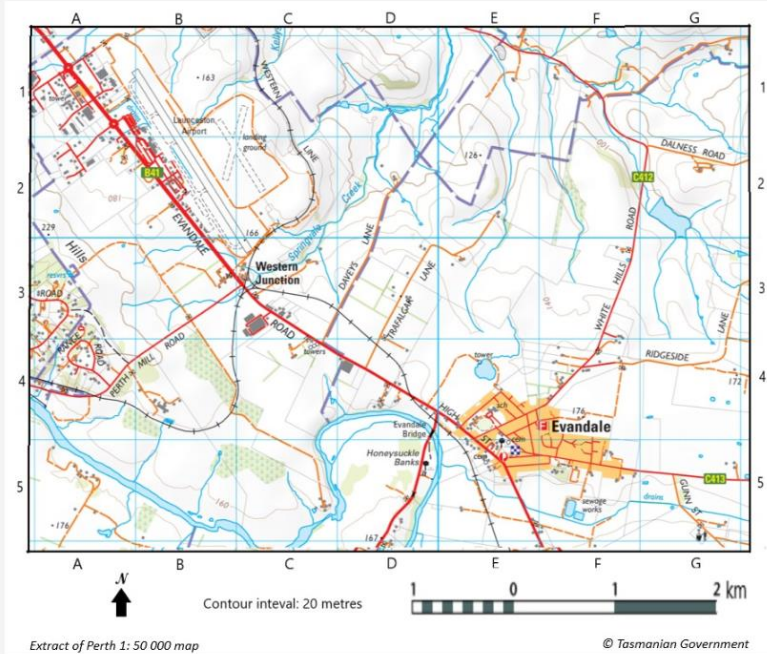
Stage 2   Pakistan - 2023
Population: 240,485,657

Population pyramids of selected countries
© PopulationPyramid.net, CC BY 3.0

Demographic transition model
© M Roser, Our World in Data, CC BY SA 4.0

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Using the map, in approximately which direction would you be driving to go from Evandale to Western Junction?

- ● WNW
- ○ SSE
- ○ NNW
- ○ ESE

Contour inteval: 20 metres

1   0   1   2 km
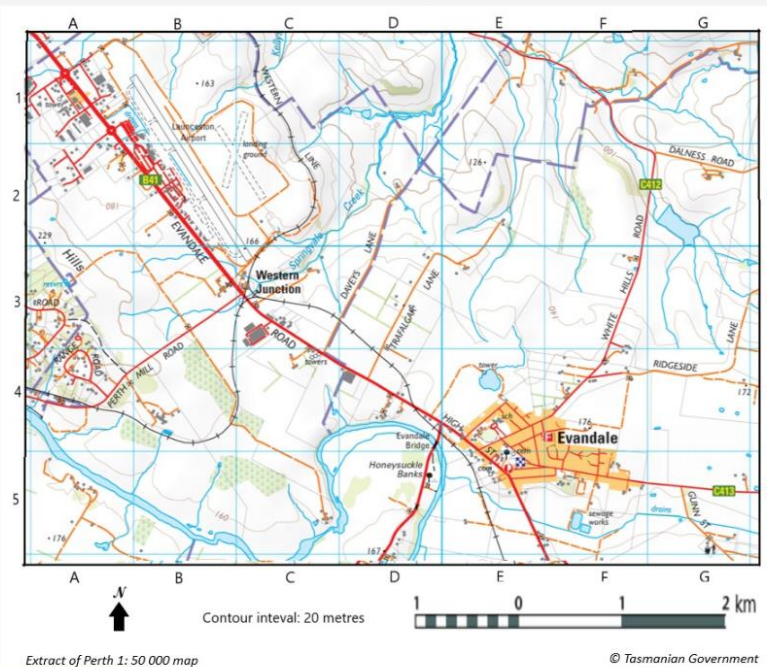
Extract of Perth 1: 50 000 map
© Tasmanian Government

◄ Back   Flag ▷   Next ▶

Drag and drop the number that correctly completes the sentence. You may need to scroll down to see all the map.

| 150 | 170 | 190 | 200 |

The plantation shown in grid square C5 on the map is approximately [170] metres above sea level.
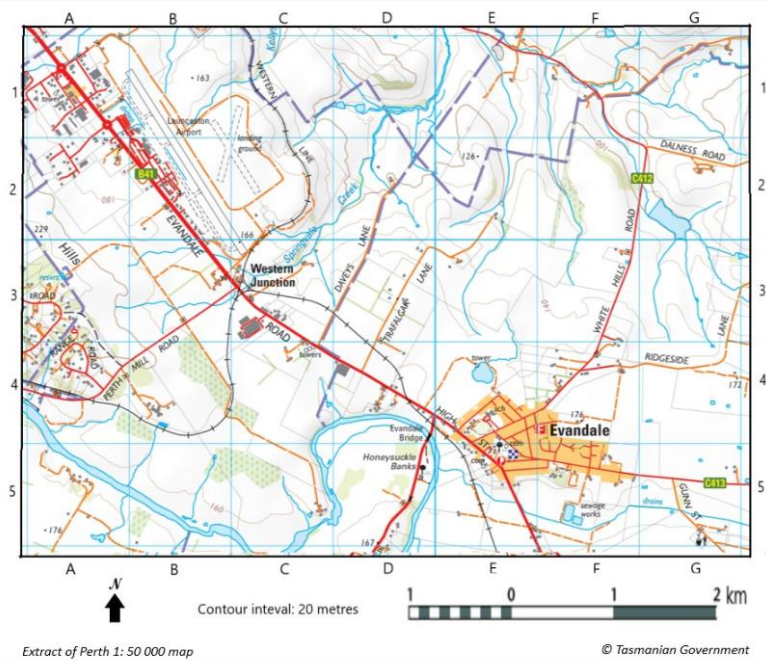

Contour inteval: 20 metres

1   0   1   2 km

Extract of Perth 1: 50 000 map
© Tasmanian Government

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Which of these is located in grid square G2 on the map?

● farm dam   ○ hydroelectric station   ○ lagoon   ○ swamp

Contour inteval: 20 metres

Extract of Perth 1: 50 000 map   © Tasmanian Government

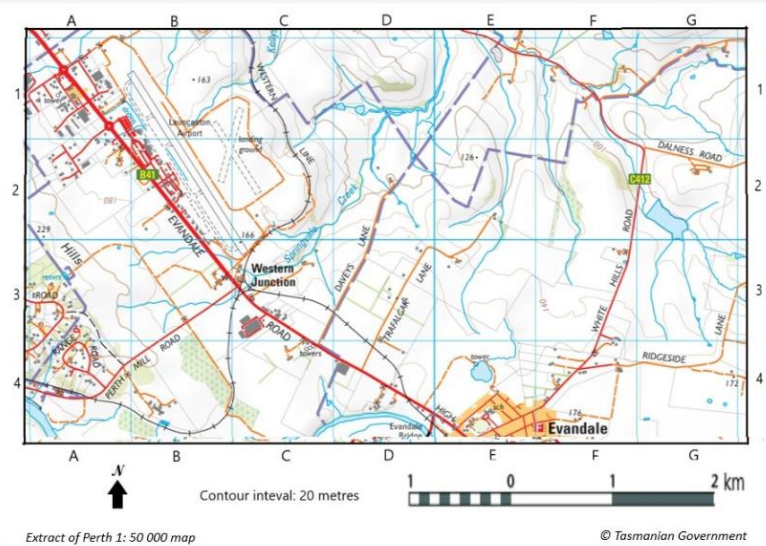Back   Flag   Next

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Drag and drop the number that correctly completes the sentence. You may use the on-screen ruler - click on the symbol in the top right corner, drag and rotate it.

| 1.2 | 3.2 | 4.3 |

Using the map below, the length of Launceston Airport's main runway (see B1) is approximately **2.1** km.

Contour inteval: 20 metres

Extract of Perth 1: 50 000 map   © Tasmanian Government

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