

Paper Reference 4GE1/01
Pearson Edexcel
International GCSE (9–1)

Geography

PAPER 1: Physical geography

Monday 22 May 2023 – Afternoon

Time: 1 hour 10 minutes

Resource Booklet

Do not return this Resource Booklet with the Question Paper.

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For some Figures there is a modified colour and modified black and white diagram. You may use whichever version is easier for you to view. Some diagrams are only in modified colour but you are then provided with a description of the diagram.

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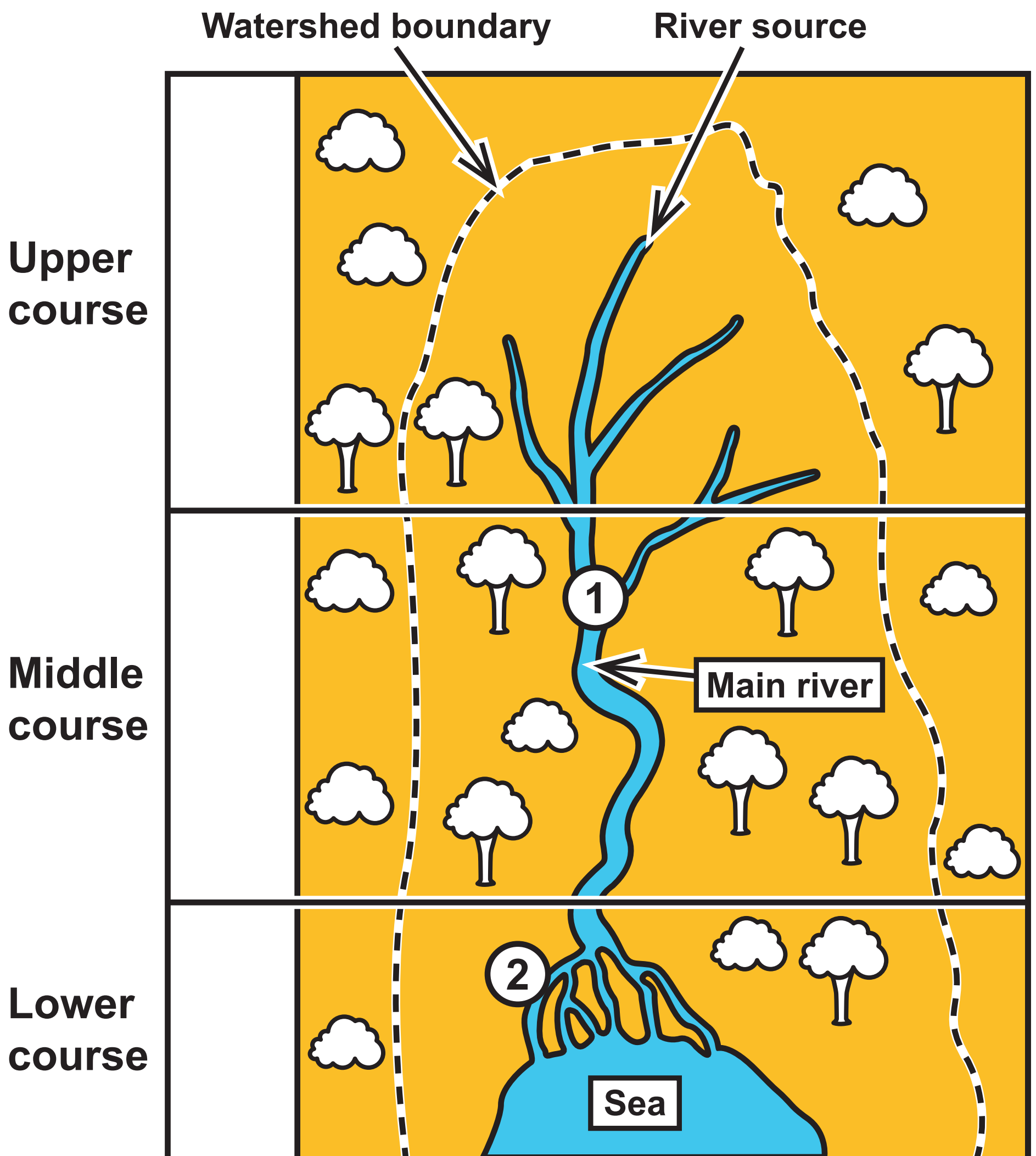
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Figure 1a – Colour Diagram of a drainage basin Drainage basin

KEY:



Turn over

**Figure 1a – Black and White
Diagram of a drainage basin**

Drainage basin

KEY:

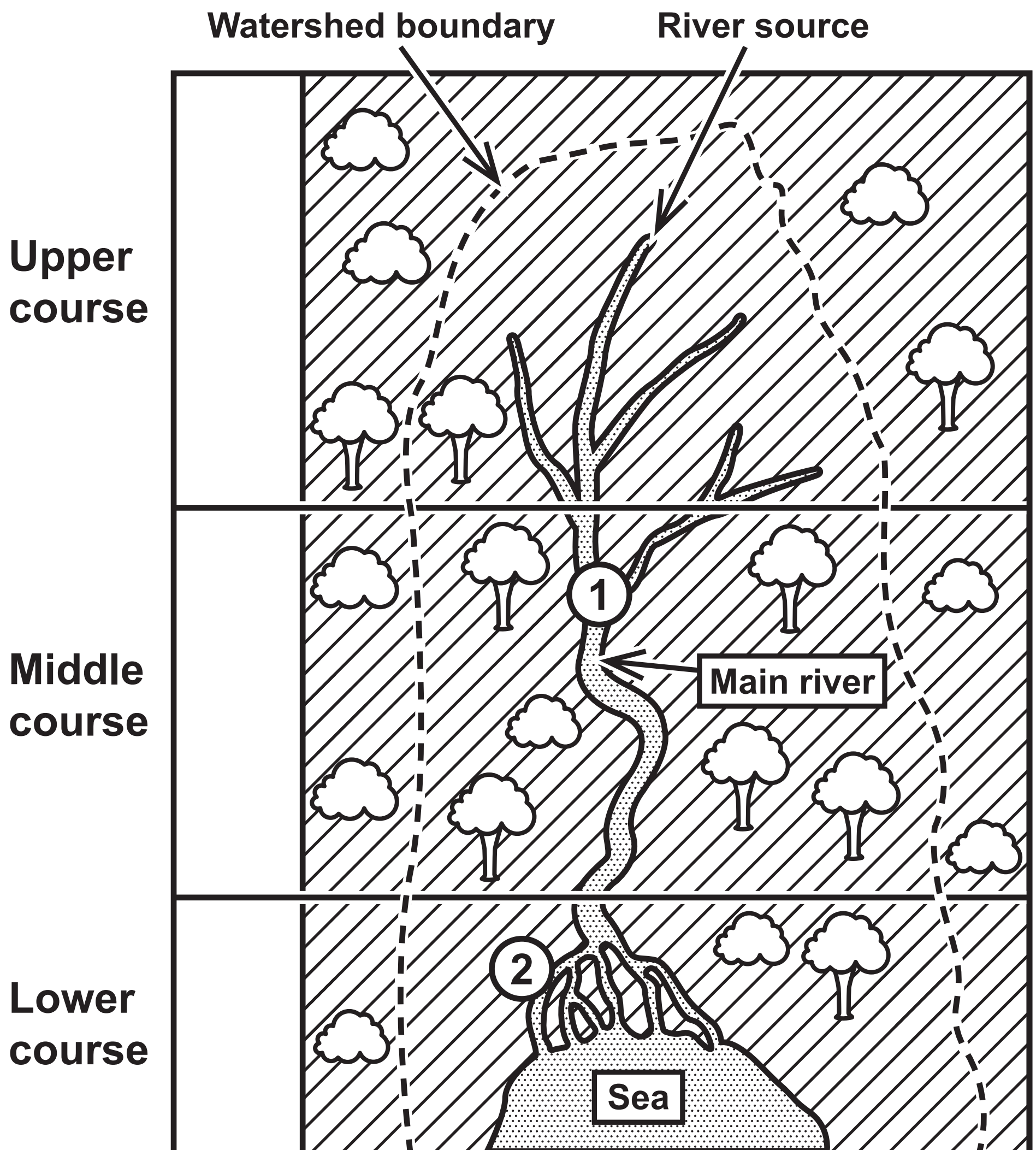
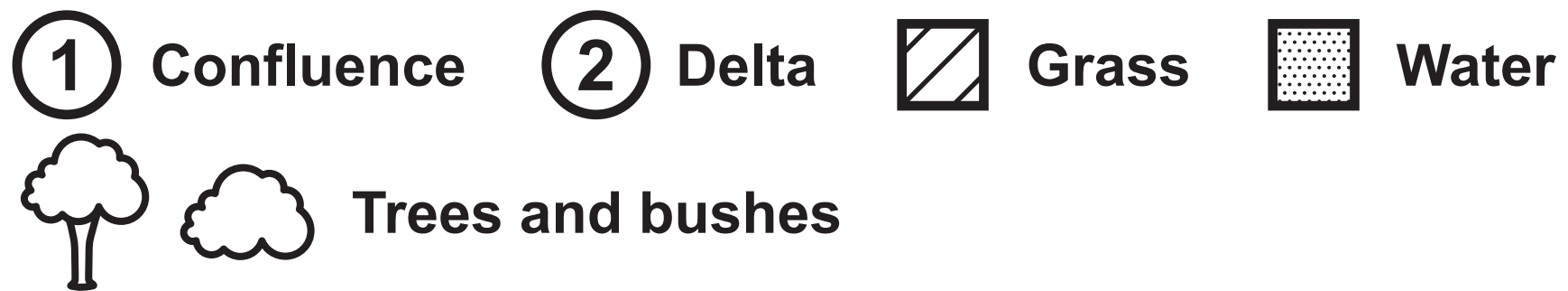
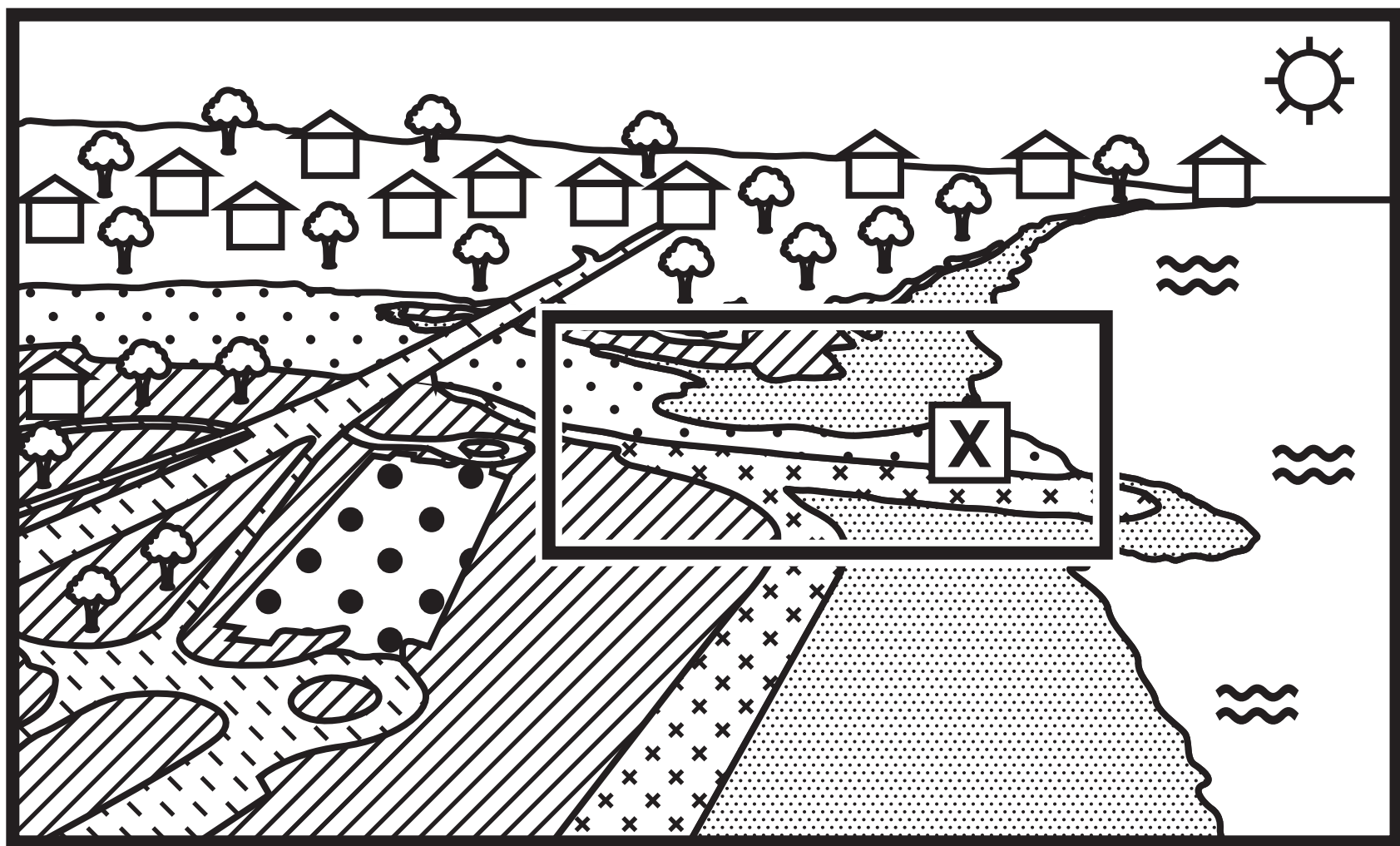


Figure 1b

Umgeni river, South Africa



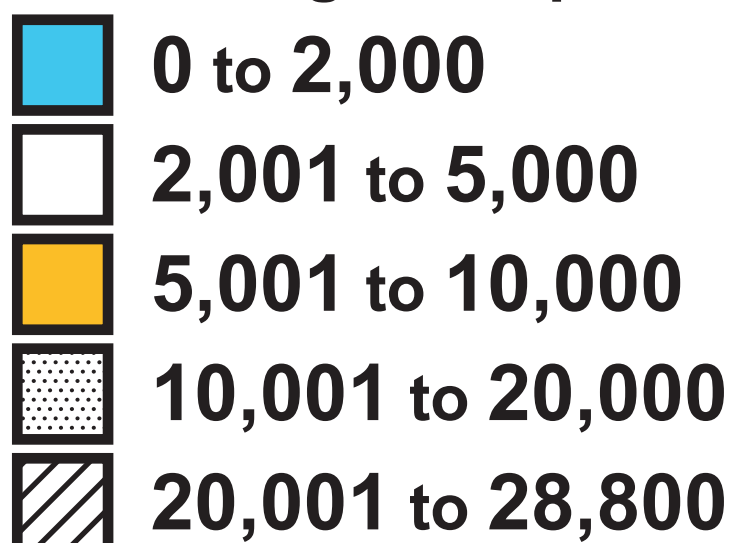
KEY: Sea Beach River Grass Path
 Road Car park Buildings Trees Sun

Figure 1c – Colour (Part 1)

Map of water use in the USA

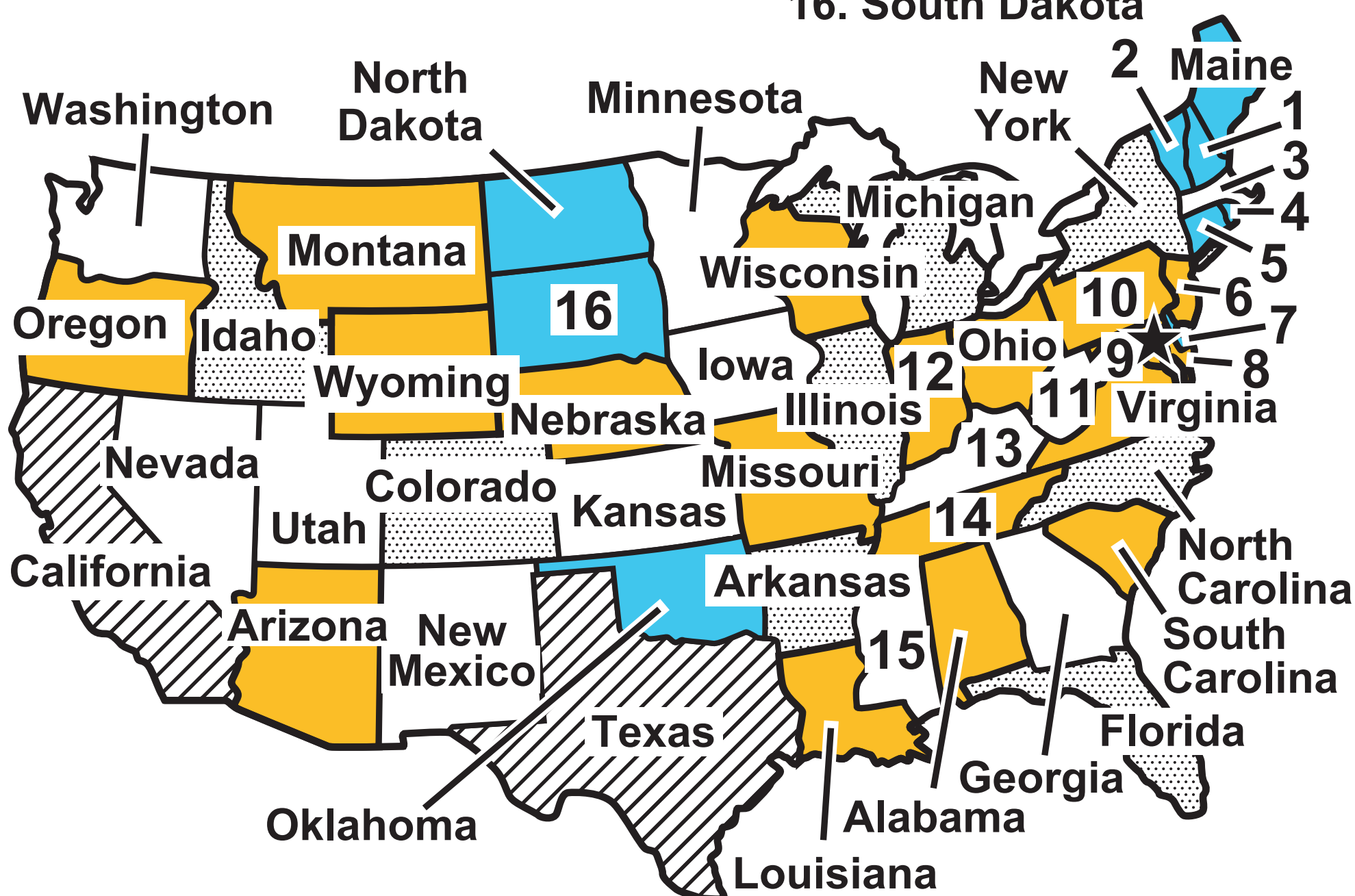
KEY:

Water withdrawals,
in million gallons per day



Note: 1 gallon of water is
4.5 litres

1. New Hampshire
2. Vermont
3. Massachusetts
4. Rhode Island
5. Connecticut
6. New Jersey
7. Delaware
8. Maryland
9. Washington, DC
10. Pennsylvania
11. West Virginia
12. Indiana
13. Kentucky
14. Tennessee
15. Mississippi
16. South Dakota



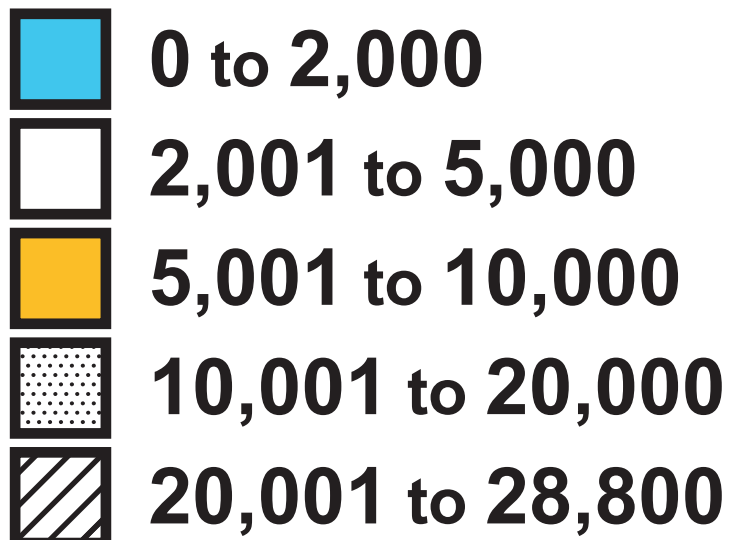
Turn over

Figure 1c – Colour (Part 2)

Map of water use in the USA

KEY:

Water withdrawals,
in million gallons per day



Note: 1 gallon of water is
4·5 litres

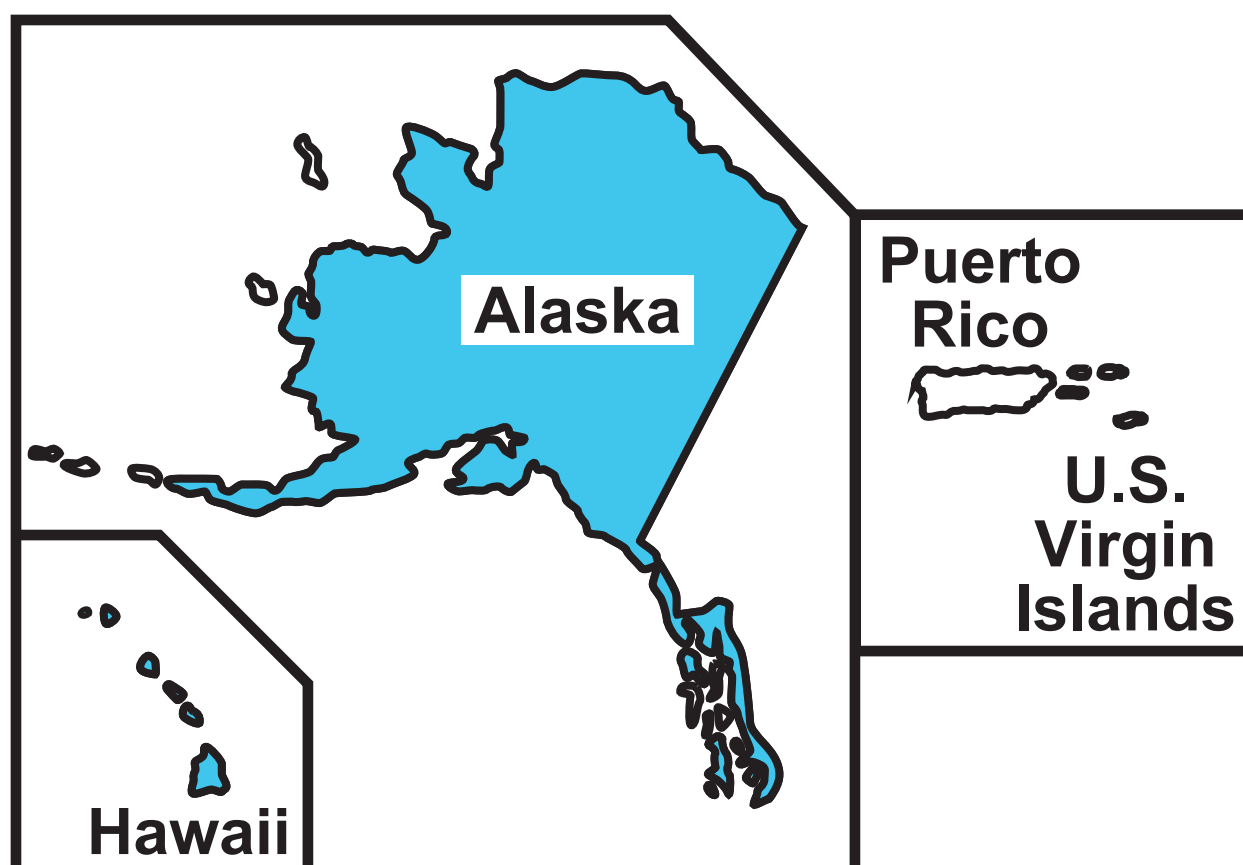
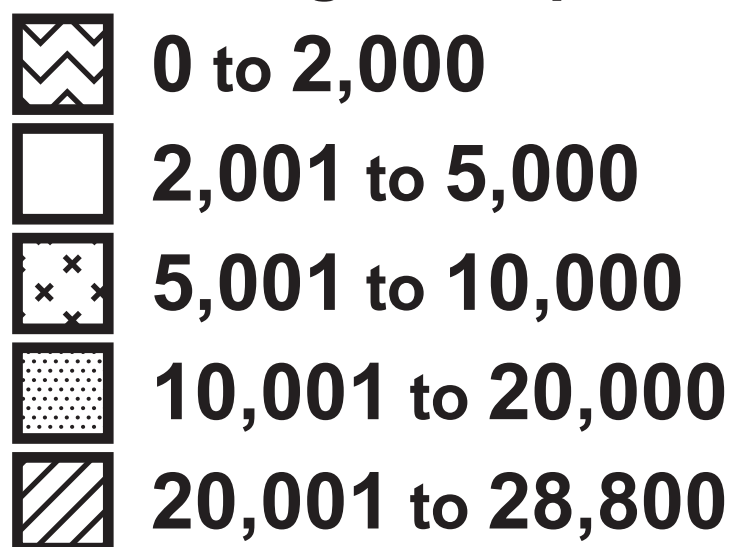


Figure 1c – Black and White (Part 1)

Map of water use in the USA

KEY:

Water withdrawals, in million gallons per day



Note: 1 gallon of water is 4.5 litres

1. New Hampshire
2. Vermont
3. Massachusetts
4. Rhode Island
5. Connecticut
6. New Jersey
7. Delaware
8. Maryland
9. Washington, DC
10. Pennsylvania
11. West Virginia
12. Indiana
13. Kentucky
14. Tennessee
15. Mississippi
16. South Dakota



Figure 1c – Black and White (Part 2)**Map of water use in the USA****KEY:**

**Water withdrawals,
in million gallons per day**



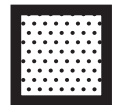
0 to 2,000



2,001 to 5,000



5,001 to 10,000



10,001 to 20,000



20,001 to 28,800

**Note: 1 gallon of water is
4·5 litres**

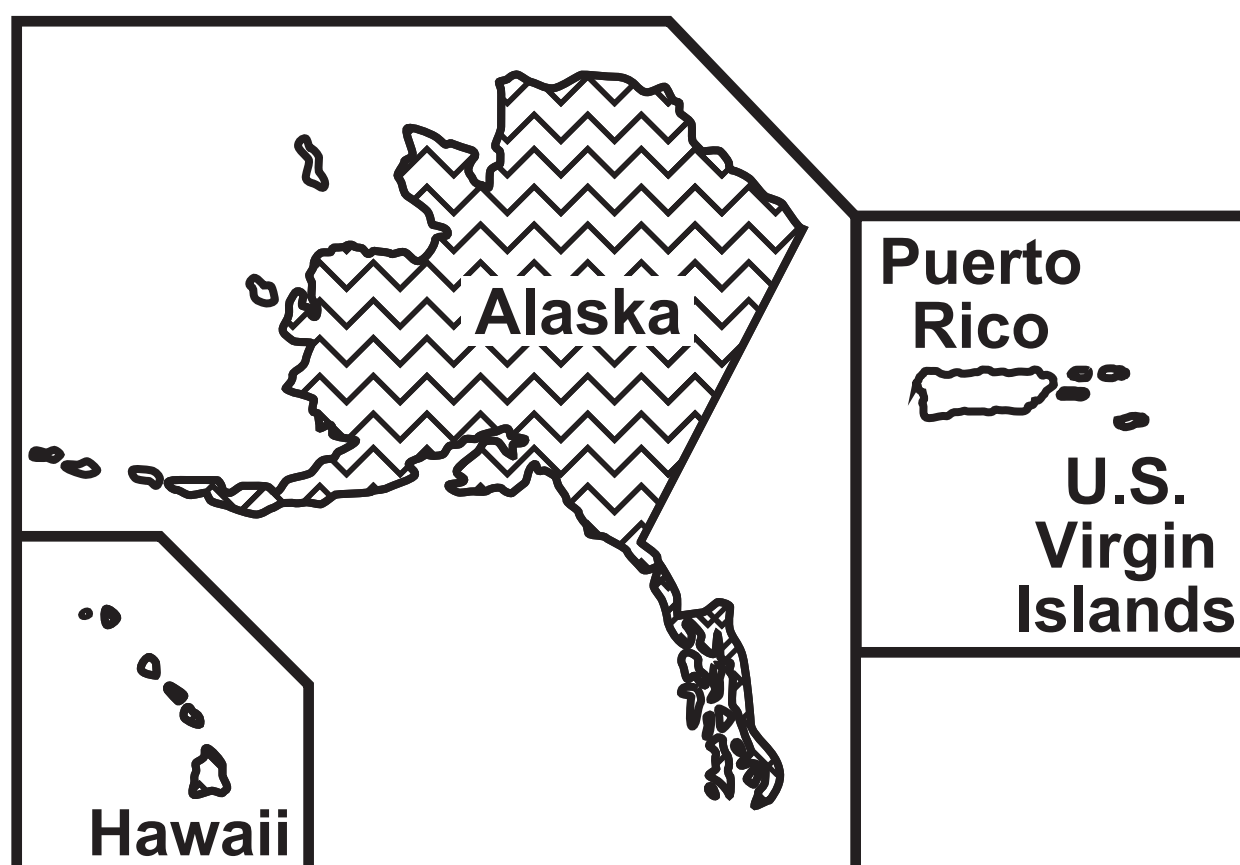


Figure 1d

Information on water use in a developed country, USA

America has a huge demand for water.

The average household in the USA goes through 350 gallons of water per day.

The average American uses 99 gallons of water per day.

The world's poorest live on less than 2·5 gallons of water per day.

Power, farming and the public are top consumers.

American water use

49% Power

32% Irrigation and livestock

12% Public and domestic supply

4% Industrial

3% Mining and aquaculture

1 gallon of water is 4·5 litres

Figure 2a – Colour

Diagram of coastline

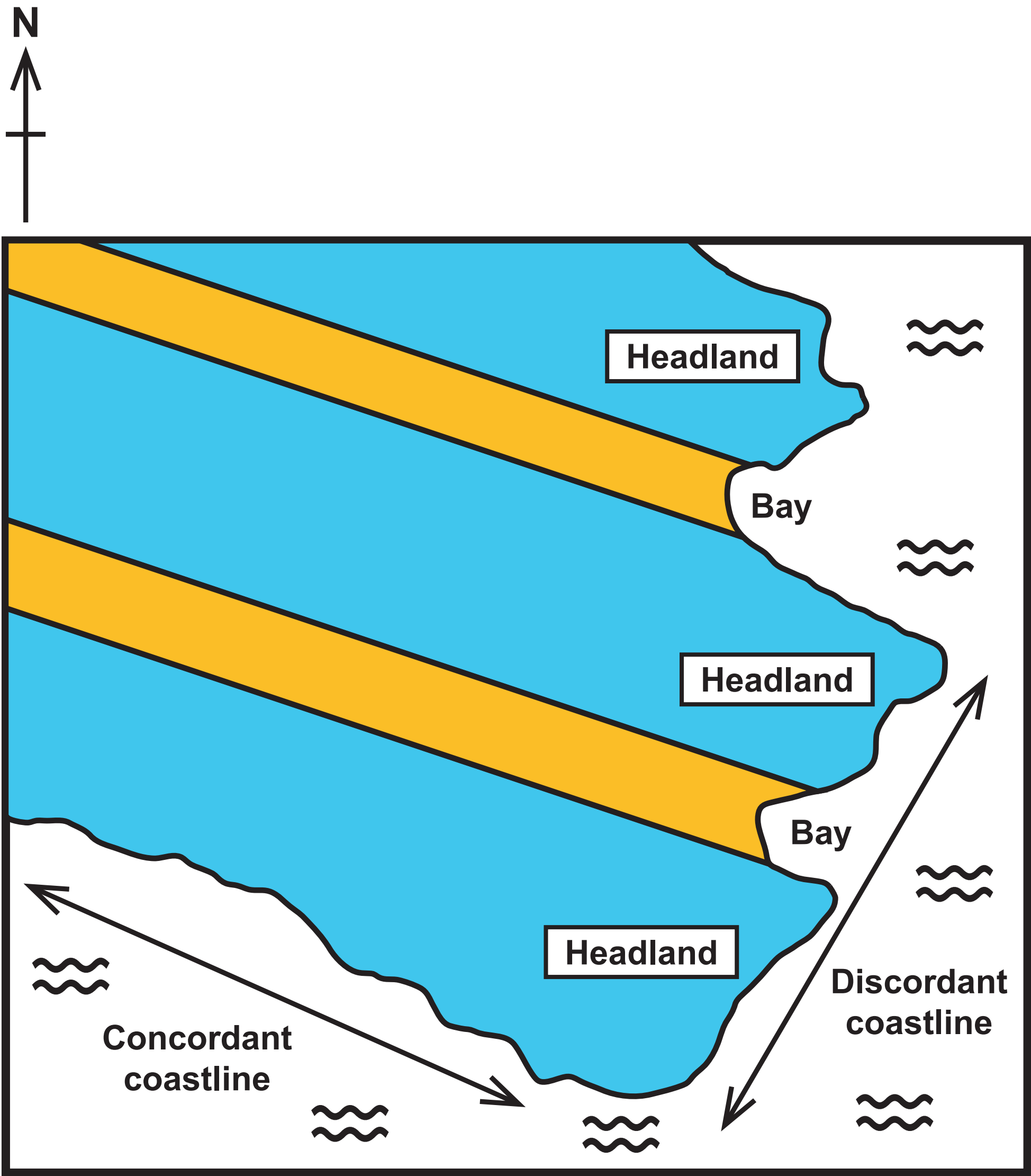


Figure 2a – Black and White

Diagram of coastline

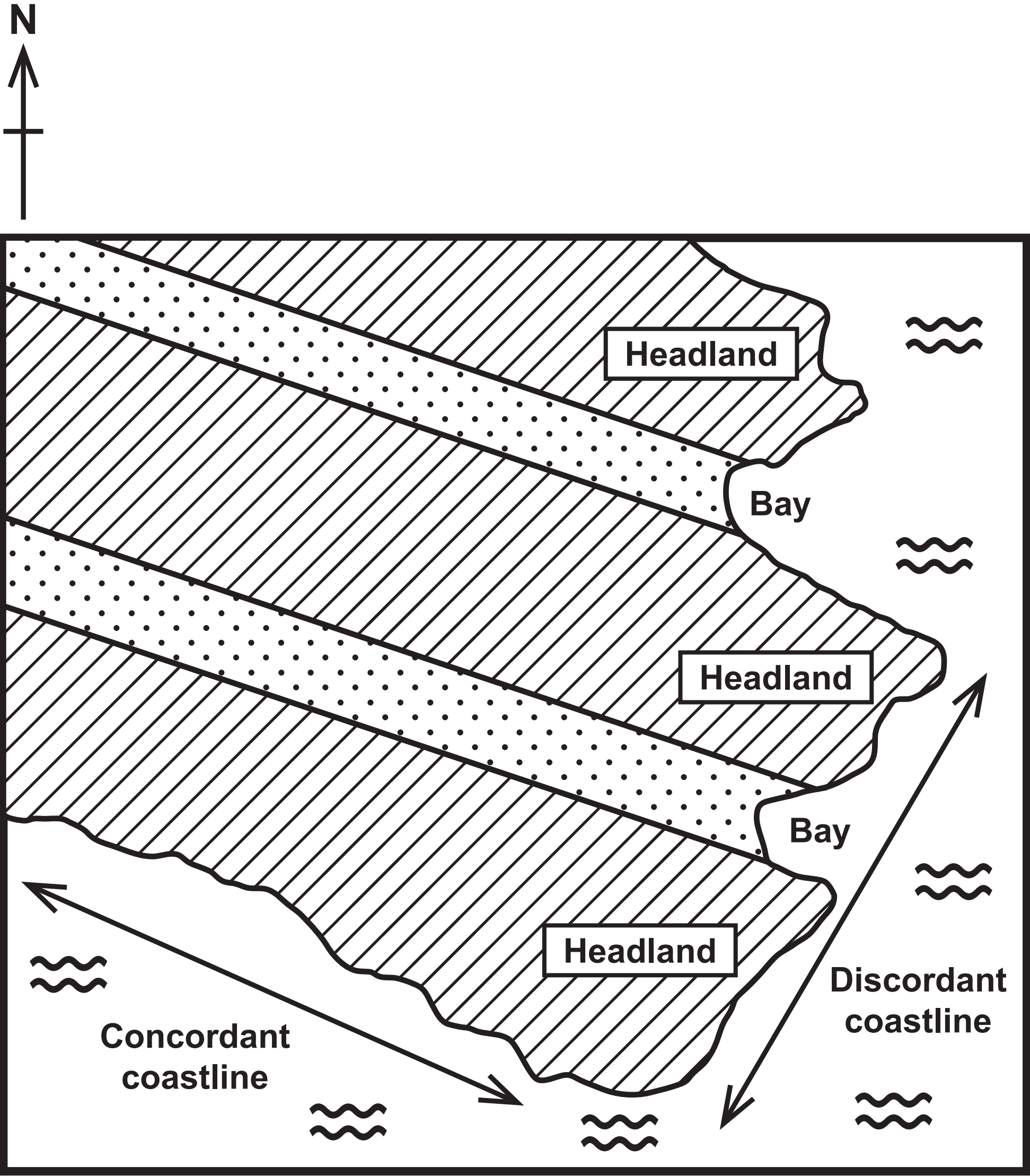
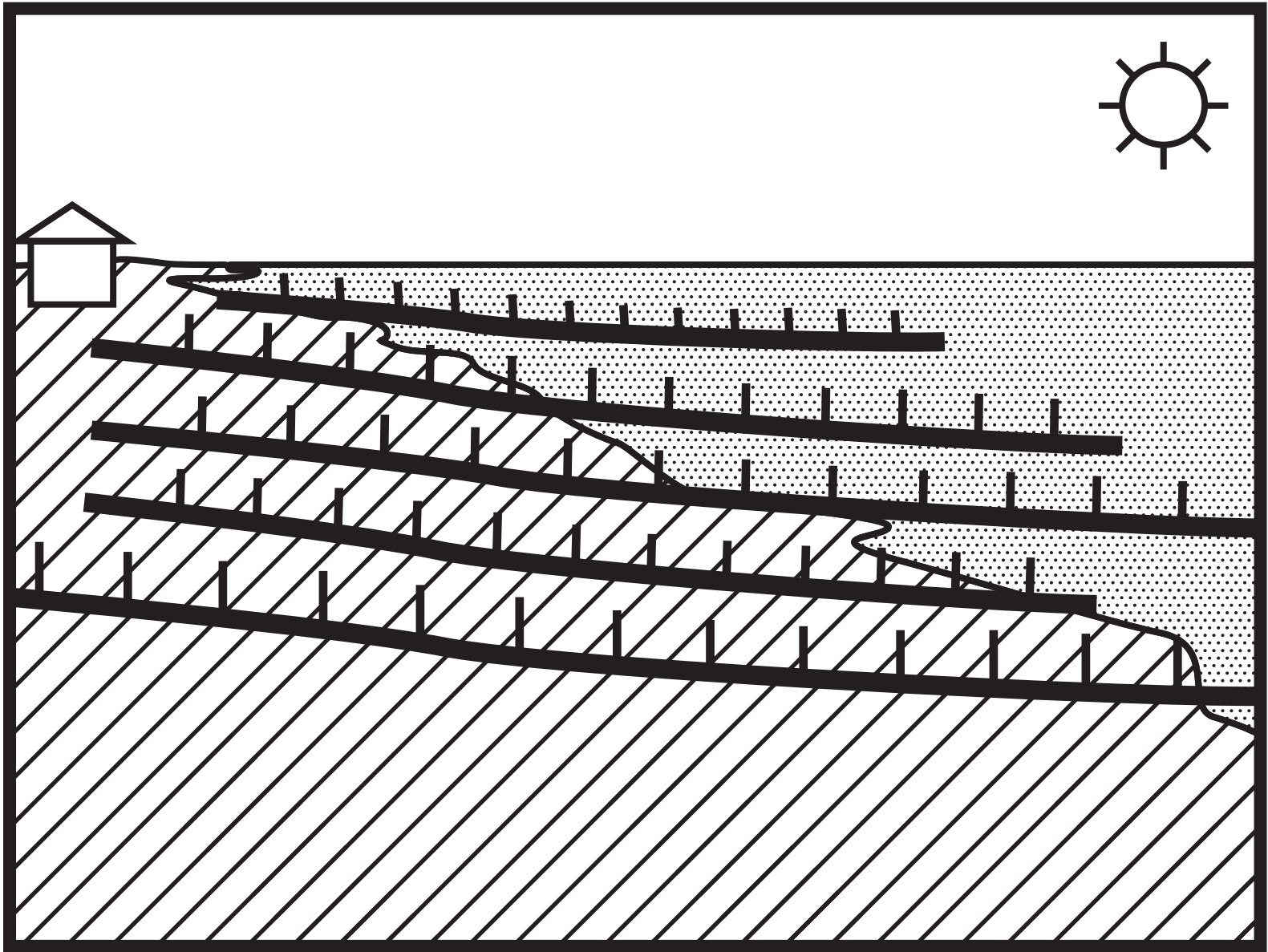





Figure 2b

Coastal management strategy



KEY:  Beach  Sea  Wooden structures



 Building  Sun

Figure 2c – Colour

Coastal flood risk in New Orleans, USA

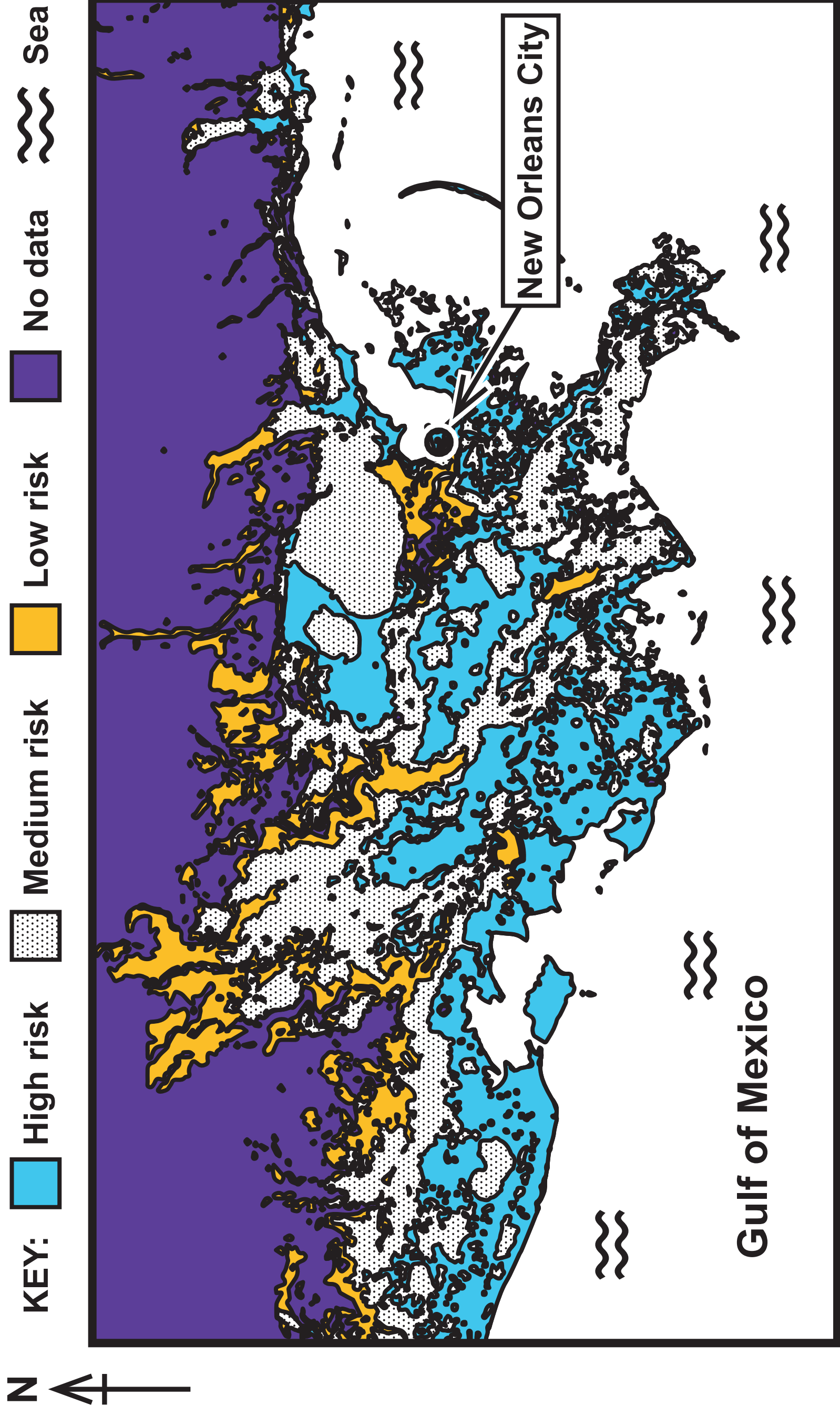


Figure 2c – Black and White
Coastal flood risk in New Orleans, USA

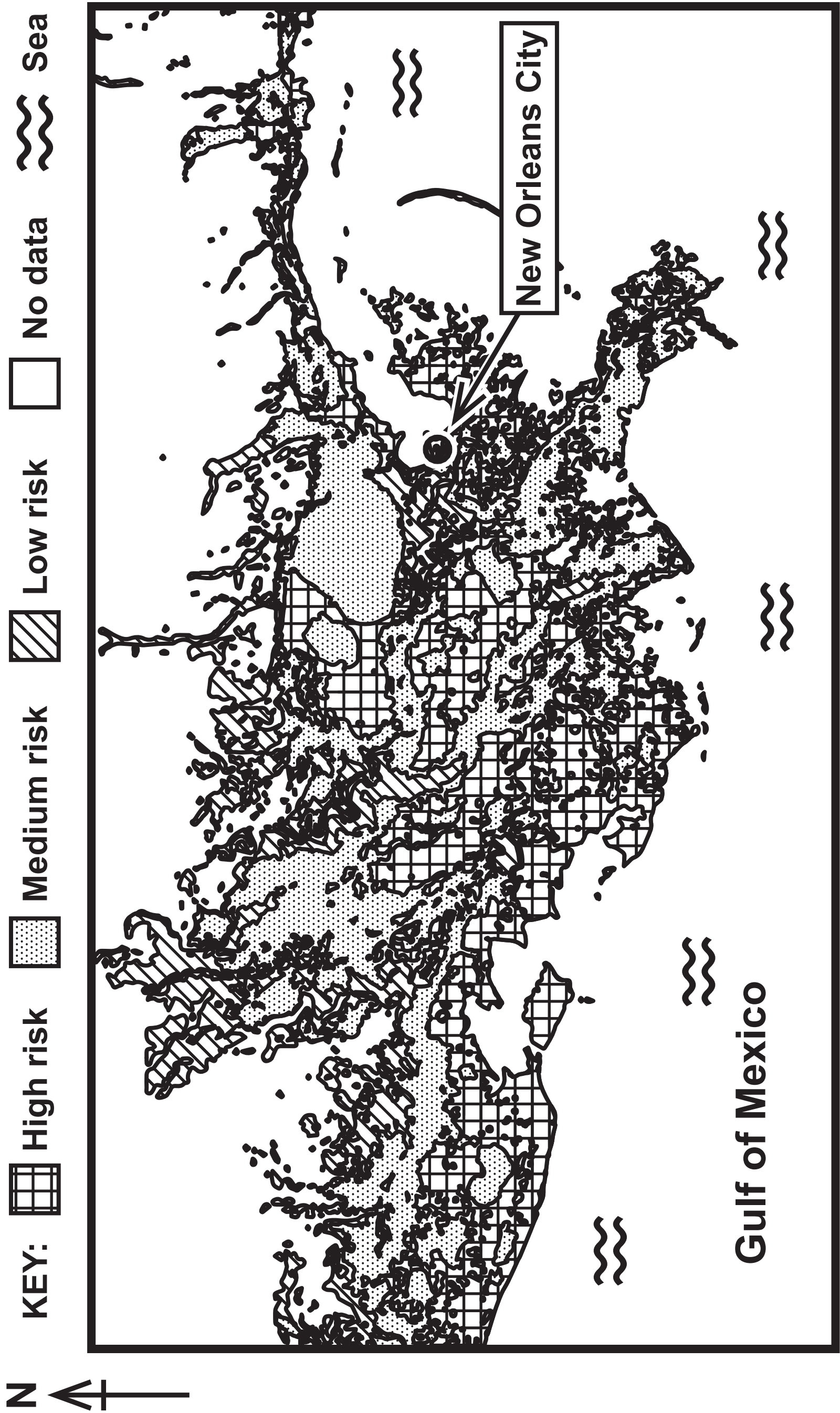
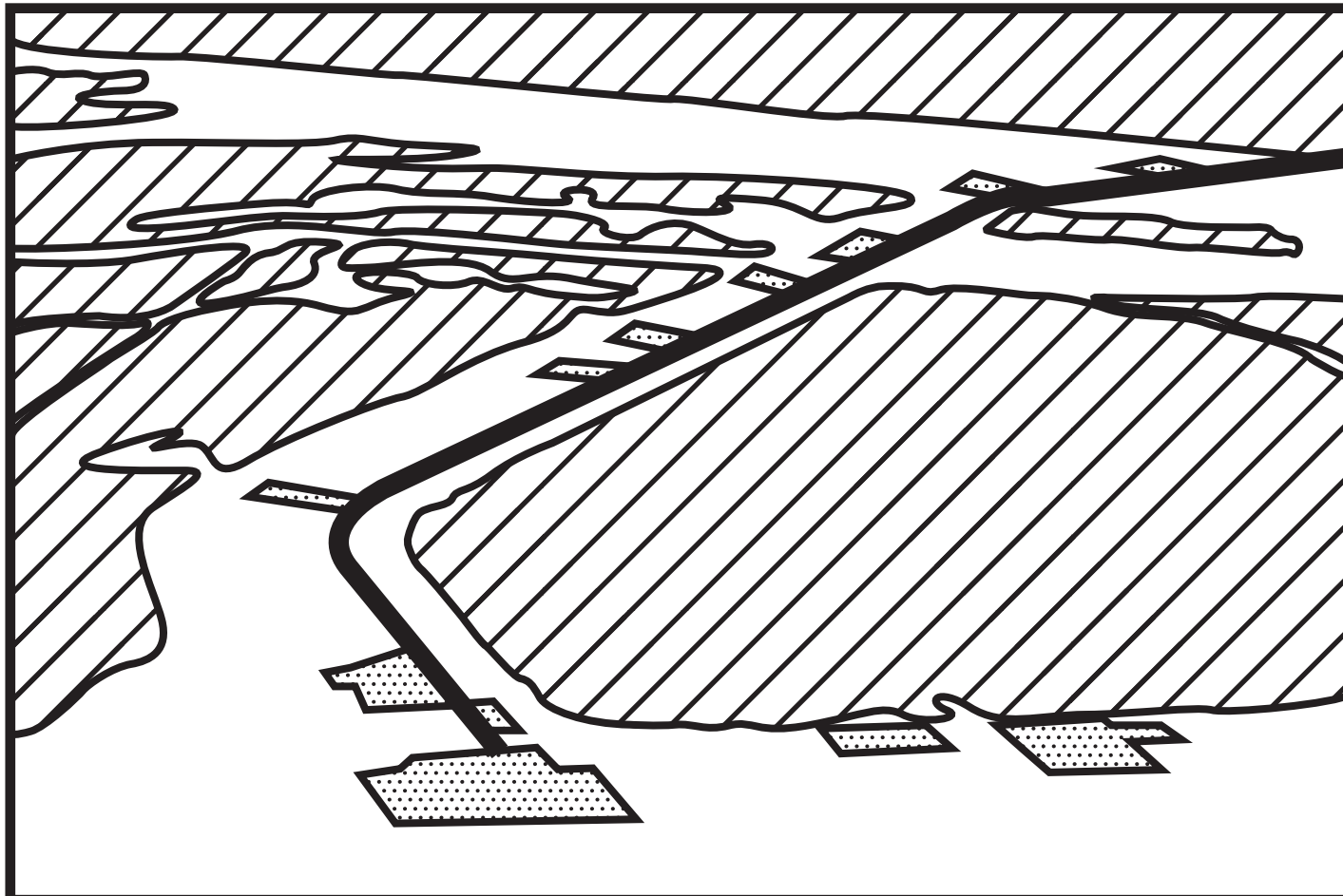


Figure 2d – Images (Part 1)

Information about coastal flood protection in New Orleans, USA

Flood walls (new walls completed in 2018)



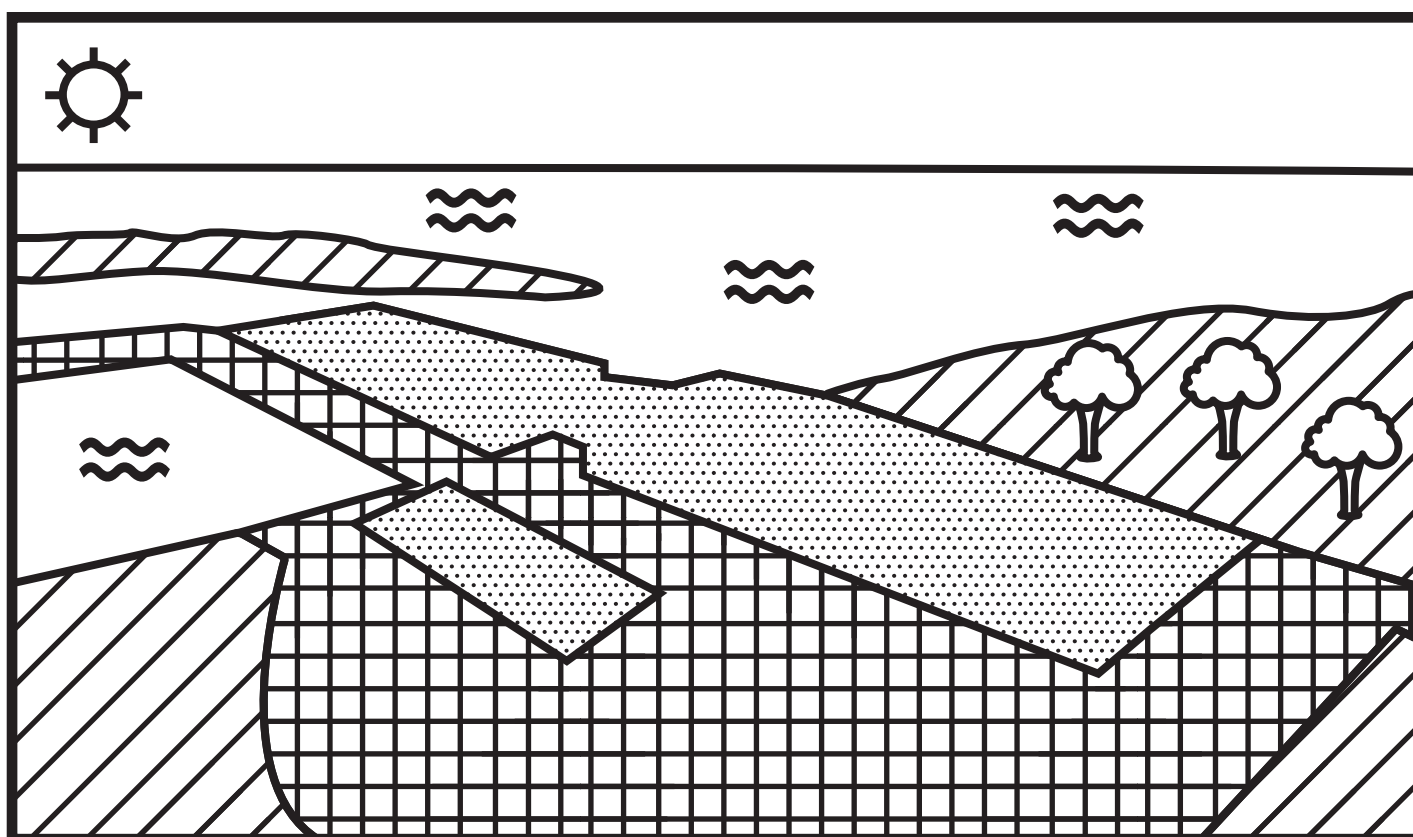
KEY:  Waterways  Grasslands  Platforms for cranes  Flood wall

Turn over

Figure 2d – Images (Part 2)

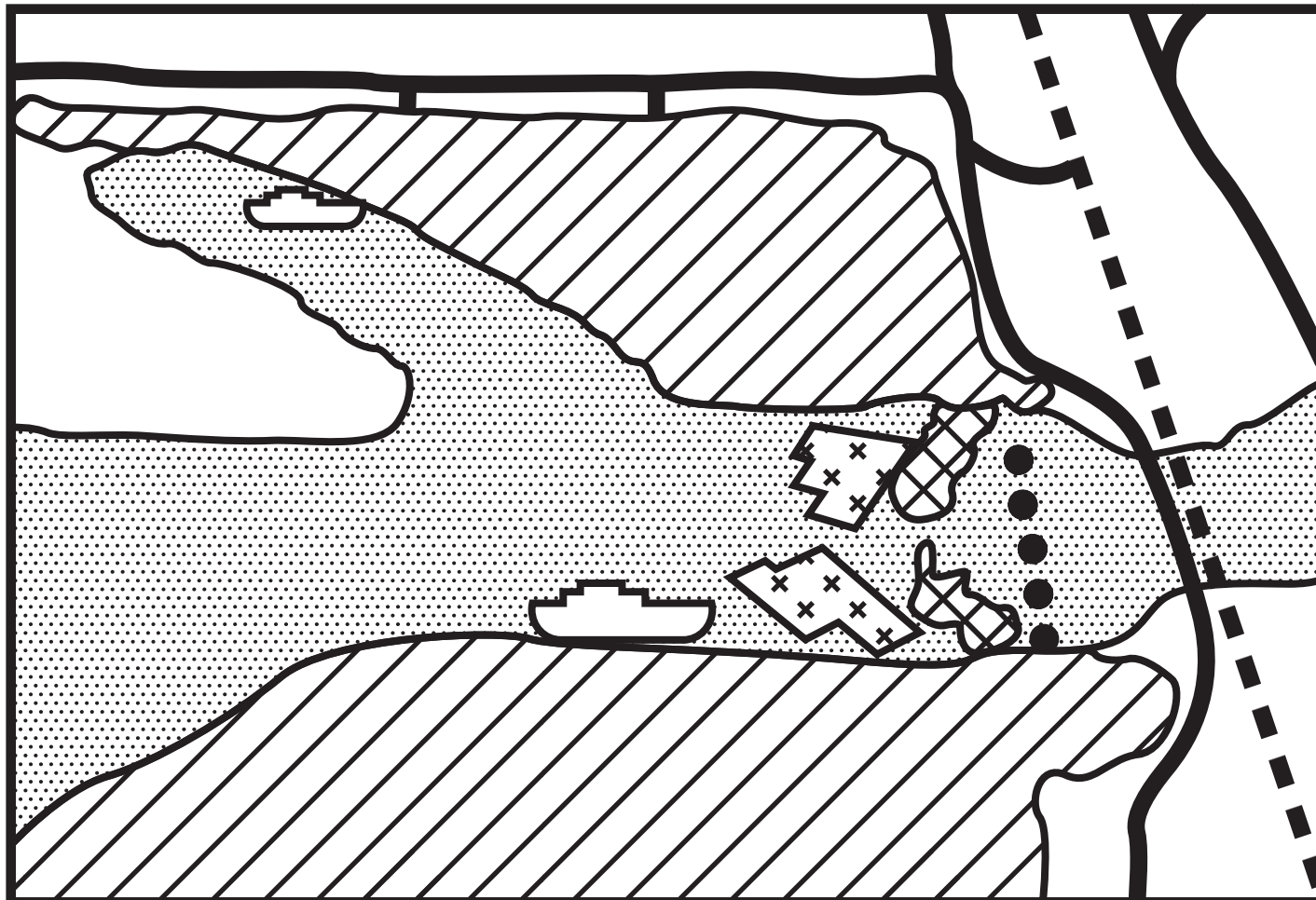
Information about coastal flood protection in New Orleans, USA

Water pump stations (completed in 2017)



KEY:  Water pump station  Grass  Concrete
 Sea  Trees  Sun

Figure 2d – Images (Part 3)
Information about coastal flood protection in
New Orleans, USA
Flood gate (completed in 2012)












KEY:  **Water**  **Fields**  **Building sites**  **Floodgate**
 **Platforms for cranes**  **Stones**  **Boats**
 **Roads**  **Railway**

Figure 2d – Information

Information about coastal flood protection in New Orleans, USA

Information about Hurricane Katrina, 2005:

- **1,000** people died.
- **200,000** homes and businesses destroyed.
- **800,000** people forced to leave.
- **50** flood walls and levees failed due to poor maintenance and lack of investment.

Information about flood prevention in 2021:

- After Hurricane Katrina **US\$14** billion network of levees and flood walls were built to protect New Orleans. There are reports that this protection may only last a few more years due to rising sea levels and shrinking levees.
- During Hurricane Ida in **2021** no levee or flood wall was broken or flooded.

Note: Water pump stations remove water from the area in a flood event

Figure 3a – Colour (Key)

Diagrams of tropical cyclone damage



Figure 3a – Colour (Diagram)

Diagrams of tropical cyclone damage

Saffir–Simpson hurricane wind scale

Category 1

Minimal damage

Winds 119–153 kph



Category 2

Moderate damage

Winds 154–177 kph



Category 3

Extensive damage

Winds 178–208 kph



Category 4

Extreme damage

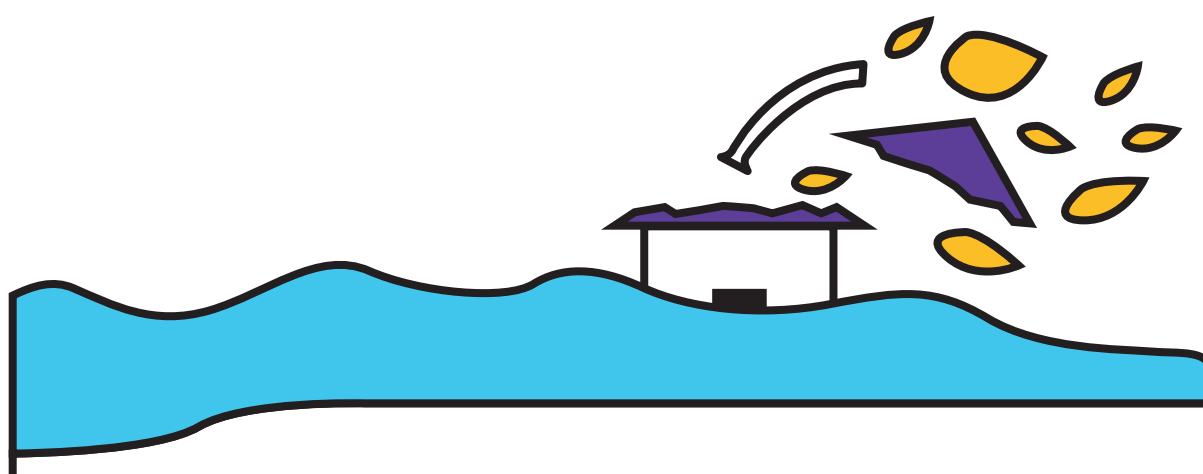
Winds 209–251 kph



Category 5

Catastrophic damage

Winds 252 kph
and more



Turn over

Figure 3a – Black and White (Key)

Diagrams of tropical cyclone damage



Figure 3a – Black and White (Diagram)

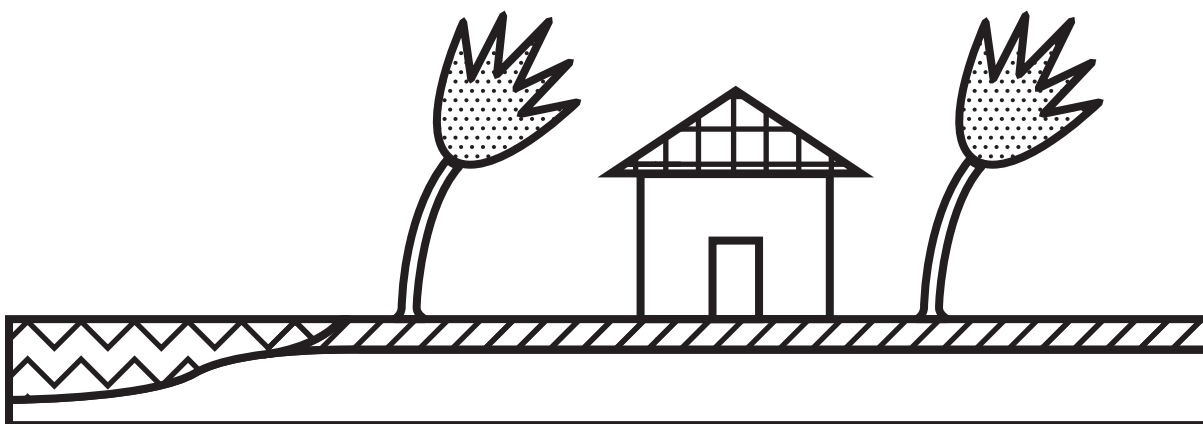
Diagrams of tropical cyclone damage

Saffir–Simpson hurricane wind scale

Category 1

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Winds 119–153 kph



Category 2

Moderate damage

Winds 154–177 kph



Category 3

Extensive damage

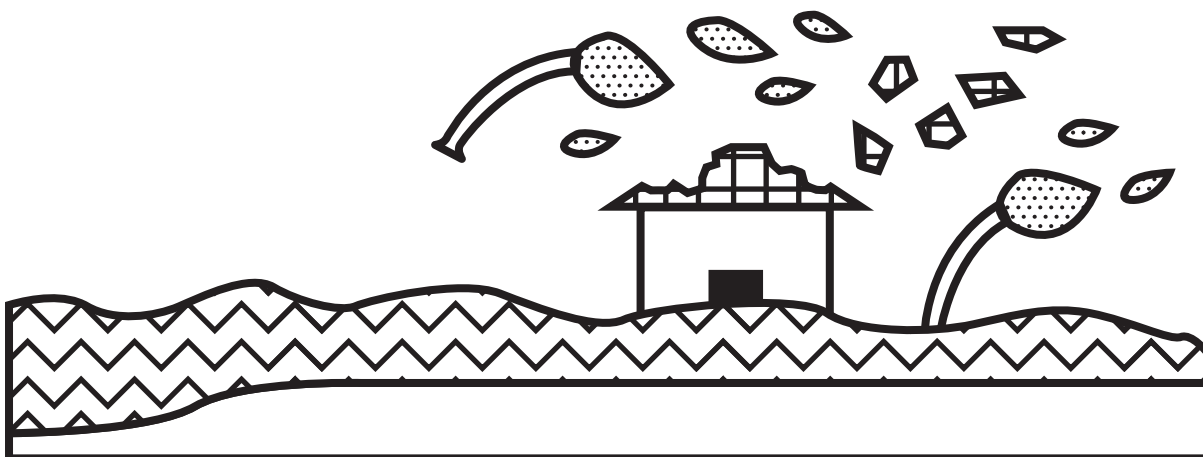
Winds 178–208 kph



Category 4

Extreme damage

Winds 209–251 kph



Category 5

Catastrophic damage

Winds 252 kph

and more

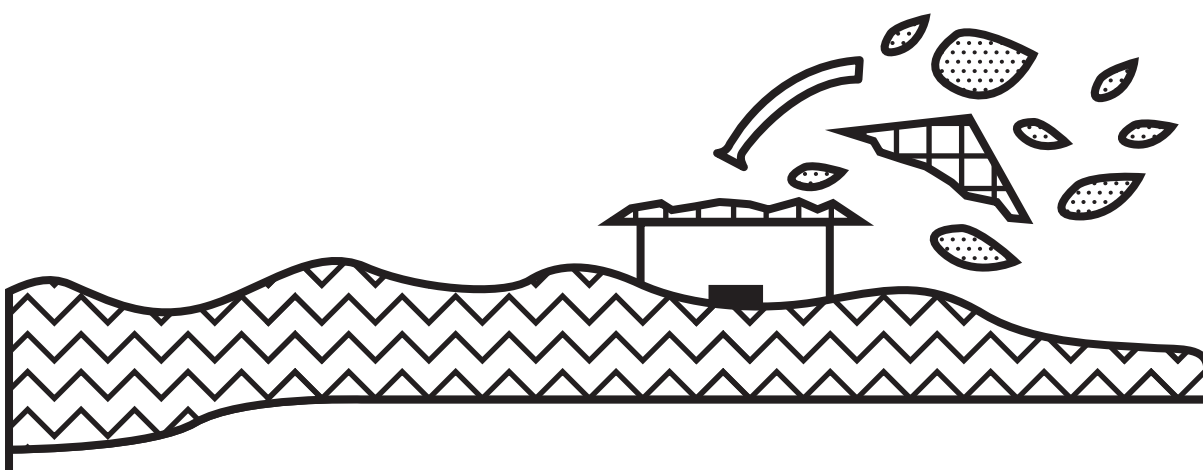
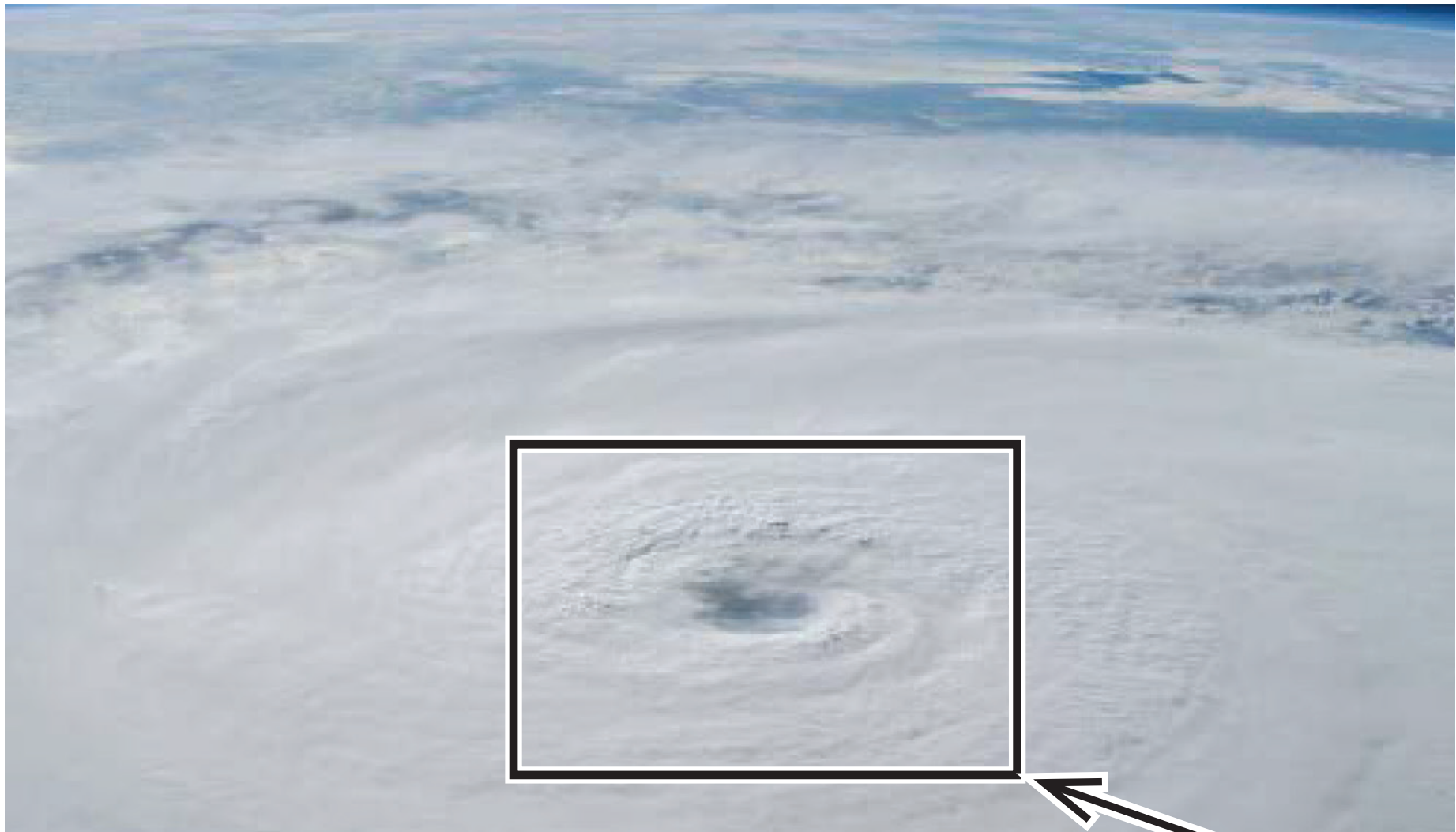
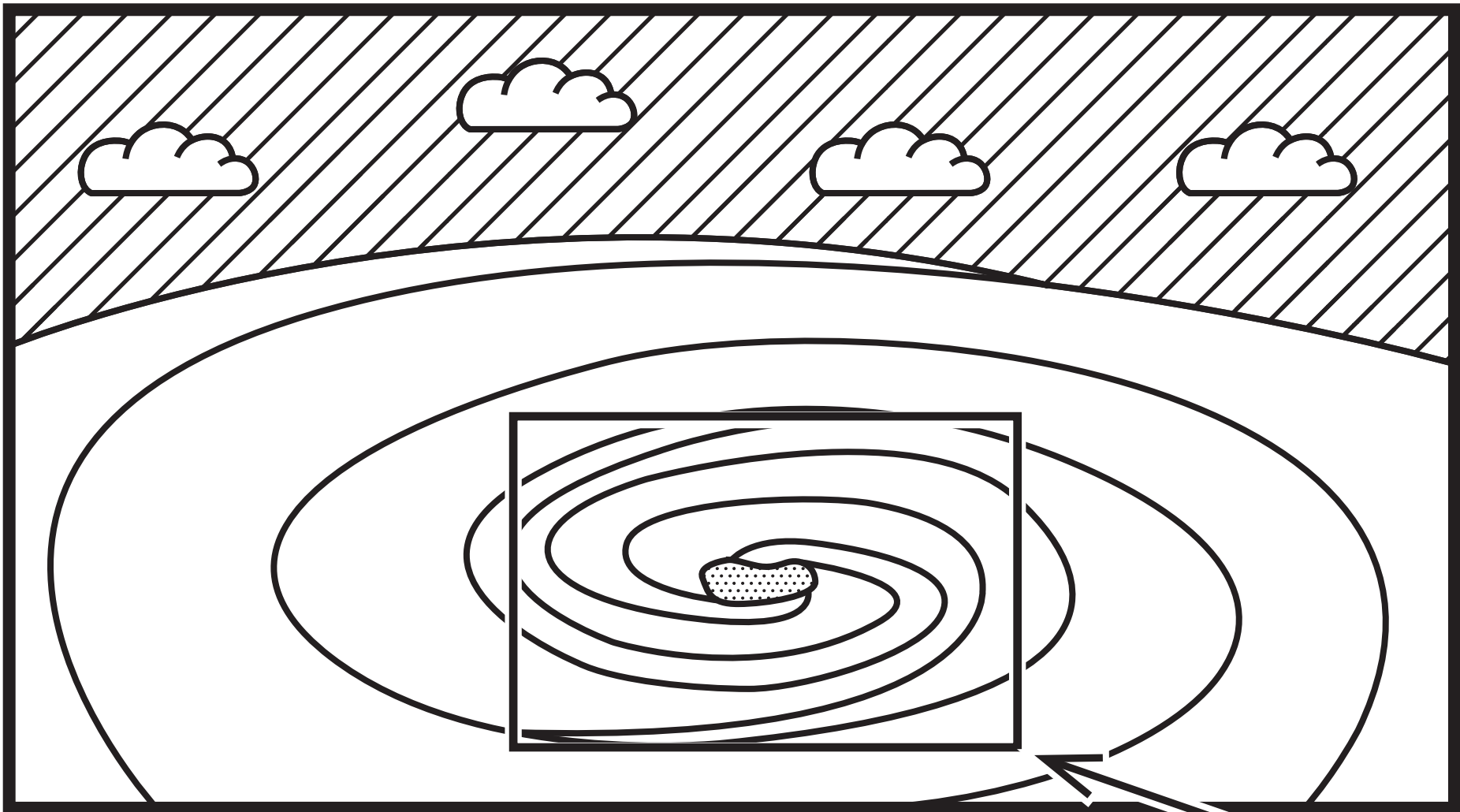


Figure 3b

Image of a tropical cyclone



X



X


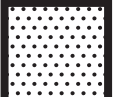


KEY:  Cyclone  Centre of the cyclone
 Earth  Clouds

Figure 3c – Colour (Part 1)

Distribution of people killed by seismic hazard 2010–2020

Map shows the average annual number of people killed by seismic hazards 2010–2020

KEY: Average annual number of fatalities

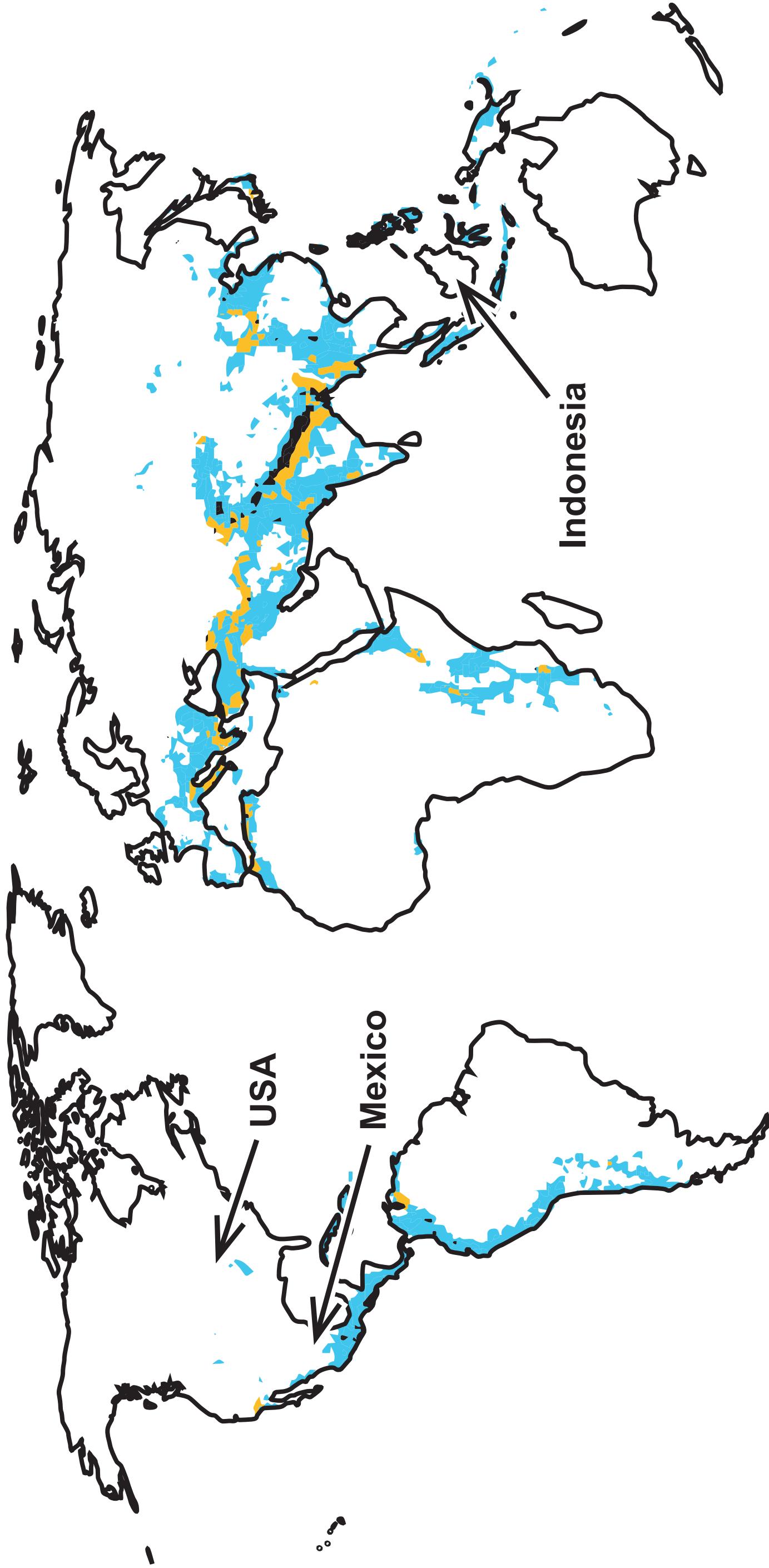


Figure 3c – Colour (Part 2)

Distribution of people killed by seismic hazard
2010–2020

KEY: Average annual number of fatalities

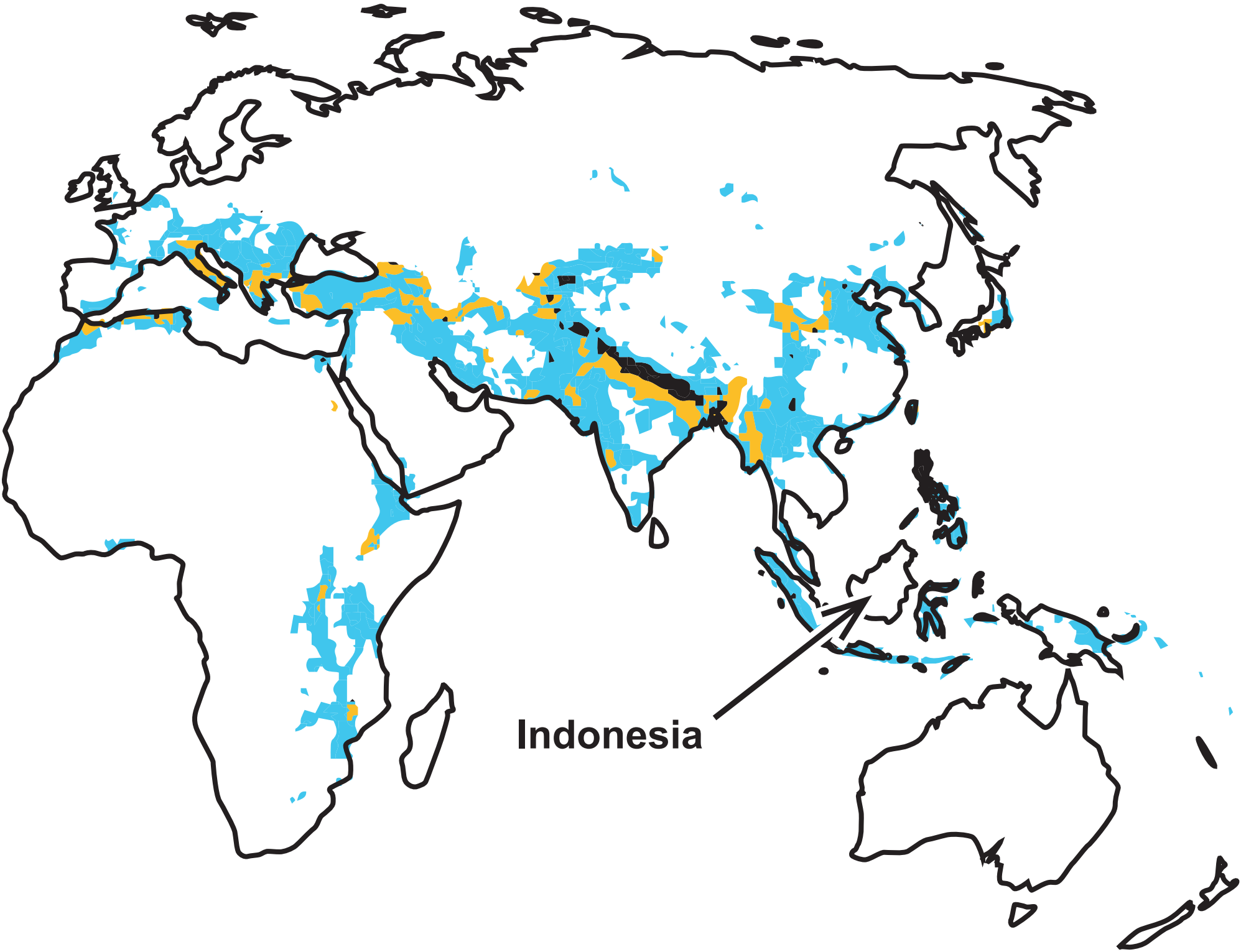


Figure 3c – Colour (Part 3)

Distribution of people killed by seismic hazard
2010–2020

KEY: Average annual number of fatalities

 <5	 5–24	 25–50	 >50
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Distribution of people killed by seismic hazard 2010–2020

Map shows the average annual number of people killed by seismic hazards 2010–2020

KEY: Average annual number of fatalities

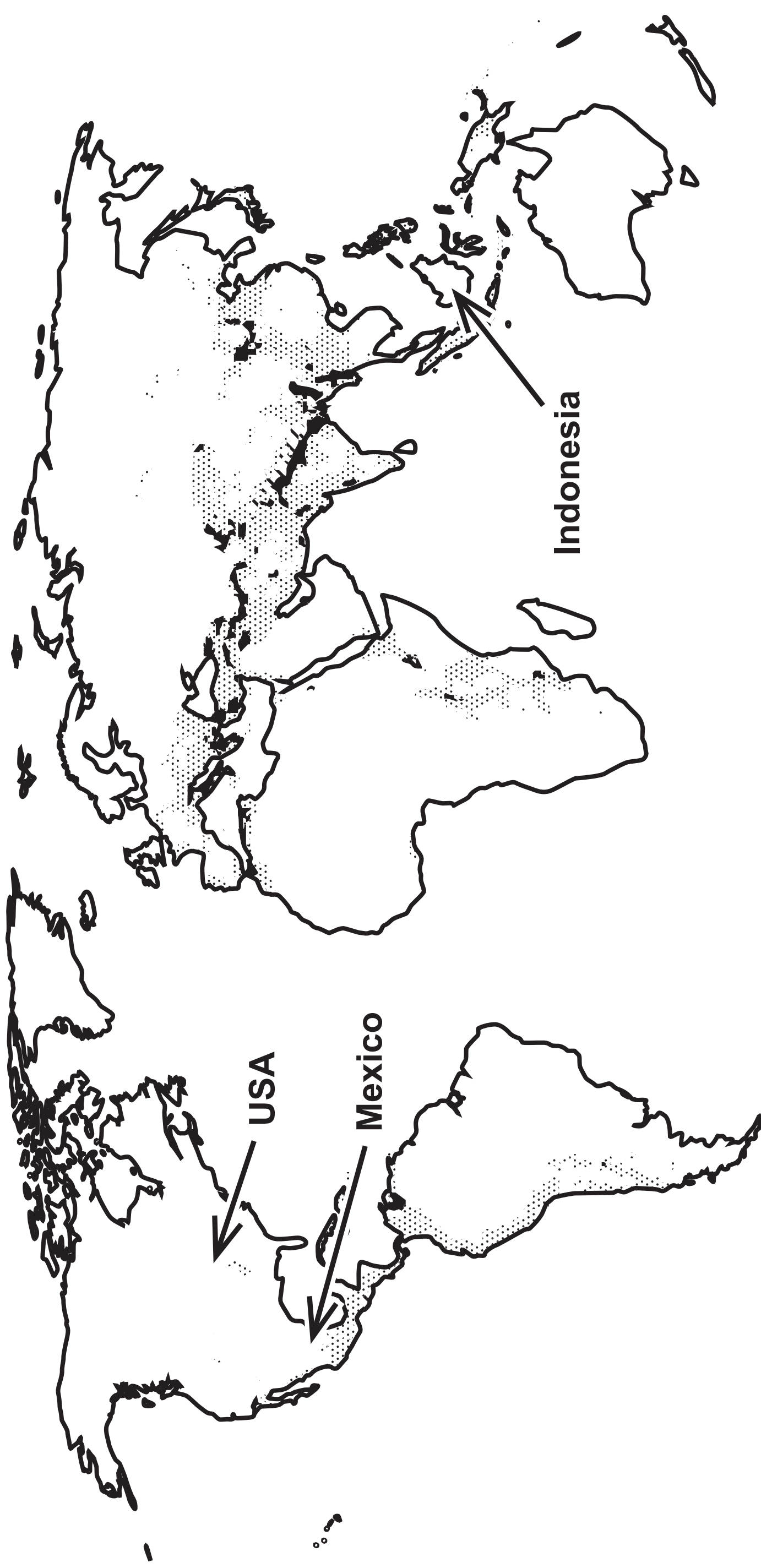


Figure 3c – Black and White (Part 2)**Distribution of people killed by seismic hazard
2010–2020****KEY: Average annual number of fatalities**

<5



5–24



25–50



>50

**Turn over**

Figure 3c – Black and White (Part 3)

Distribution of people killed by seismic hazard 2010–2020

KEY: Average annual number of fatalities



<5



5–24



25–50



>50

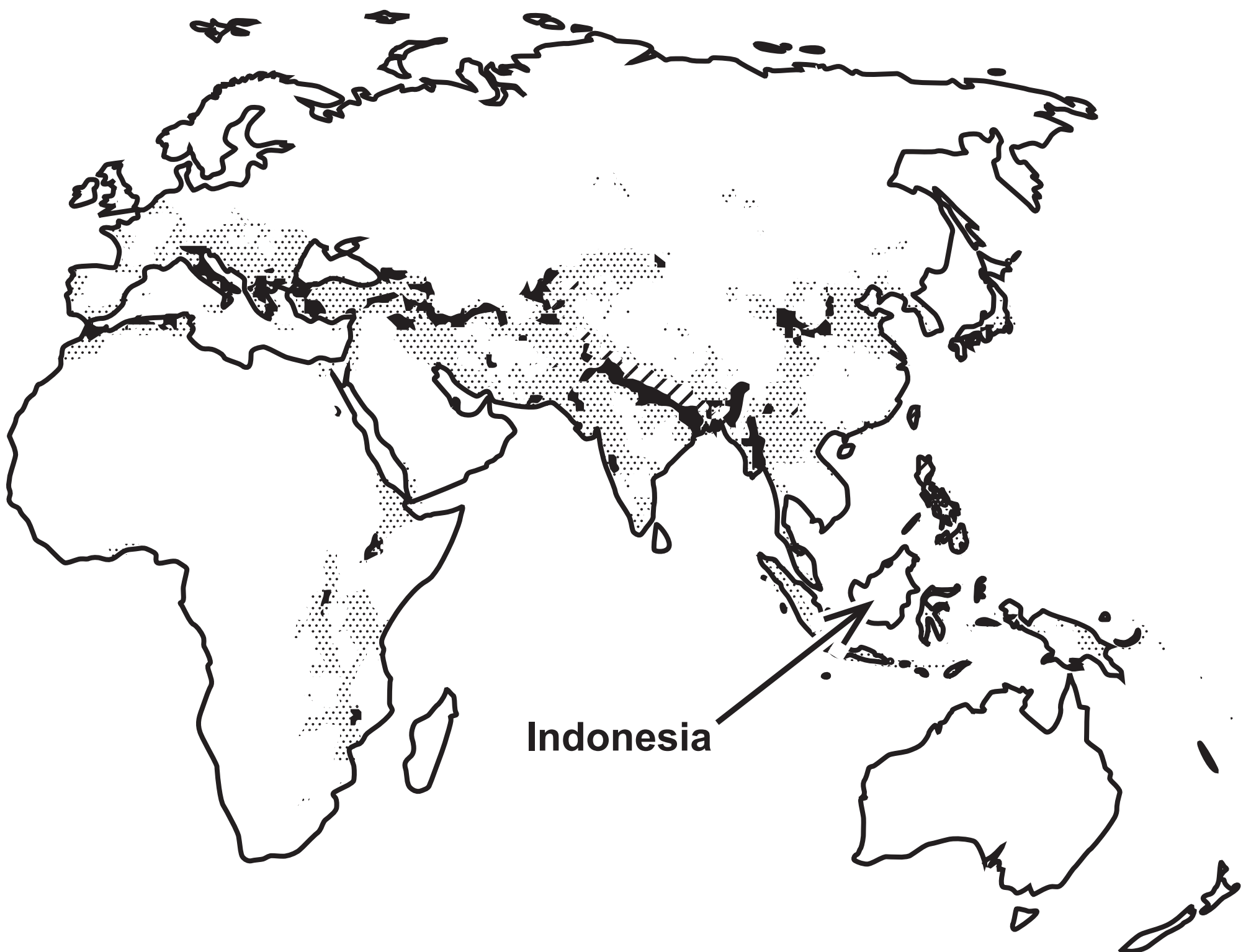


Figure 3d

Information on selected earthquake events 2017–2021

Earthquake event	Mexico, Mexico City
Year	2017
Magnitude	7·1
GDP per capita (US\$)	9,287
Deaths	370
Injuries	6,011
Doctors per 1,000 people	2·4
Corruption Perception Index Score (higher score is less perceived corruption)	31
Other details	Epicentre was near Atecingo, around 120 km from Mexico city.

(continued on the next page)

Turn over

Figure 3d continued.

Earthquake event	United States, California
Year	2019
Magnitude	6·4
GDP per capita (US\$)	65,297
Deaths	1
Injuries	20
Doctors per 1,000 people	2·9
Corruption Perception Index Score (higher score is less perceived corruption)	67
Other details	Epicentre was in a remote region in the Mojave desert.

(continued on the next page)

Figure 3d continued.

Earthquake event	Indonesia, Sulawesi
Year	2021
Magnitude	6·2
GDP per capita (US\$)	4,450
Deaths	105
Injuries	3,369
Doctors per 1,000 people	0·4
Corruption Perception Index Score (higher score is less perceived corruption)	37
Other details	Epicentre was around 70 km from town of Bukittinggi in West Sumatra.

Figure 4a

Extract from student’s data presentation

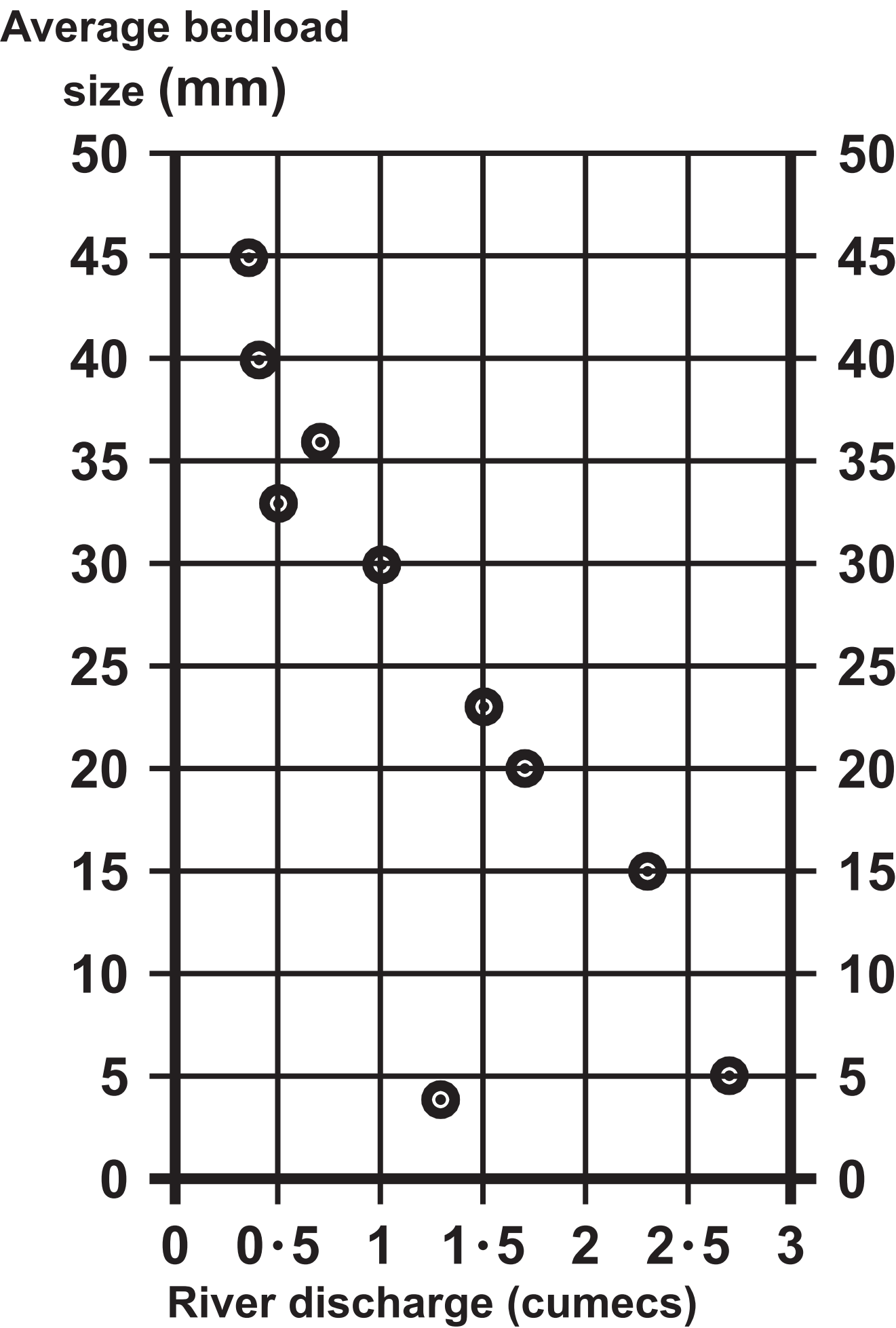


Figure 4b
Extract from student's data presentation

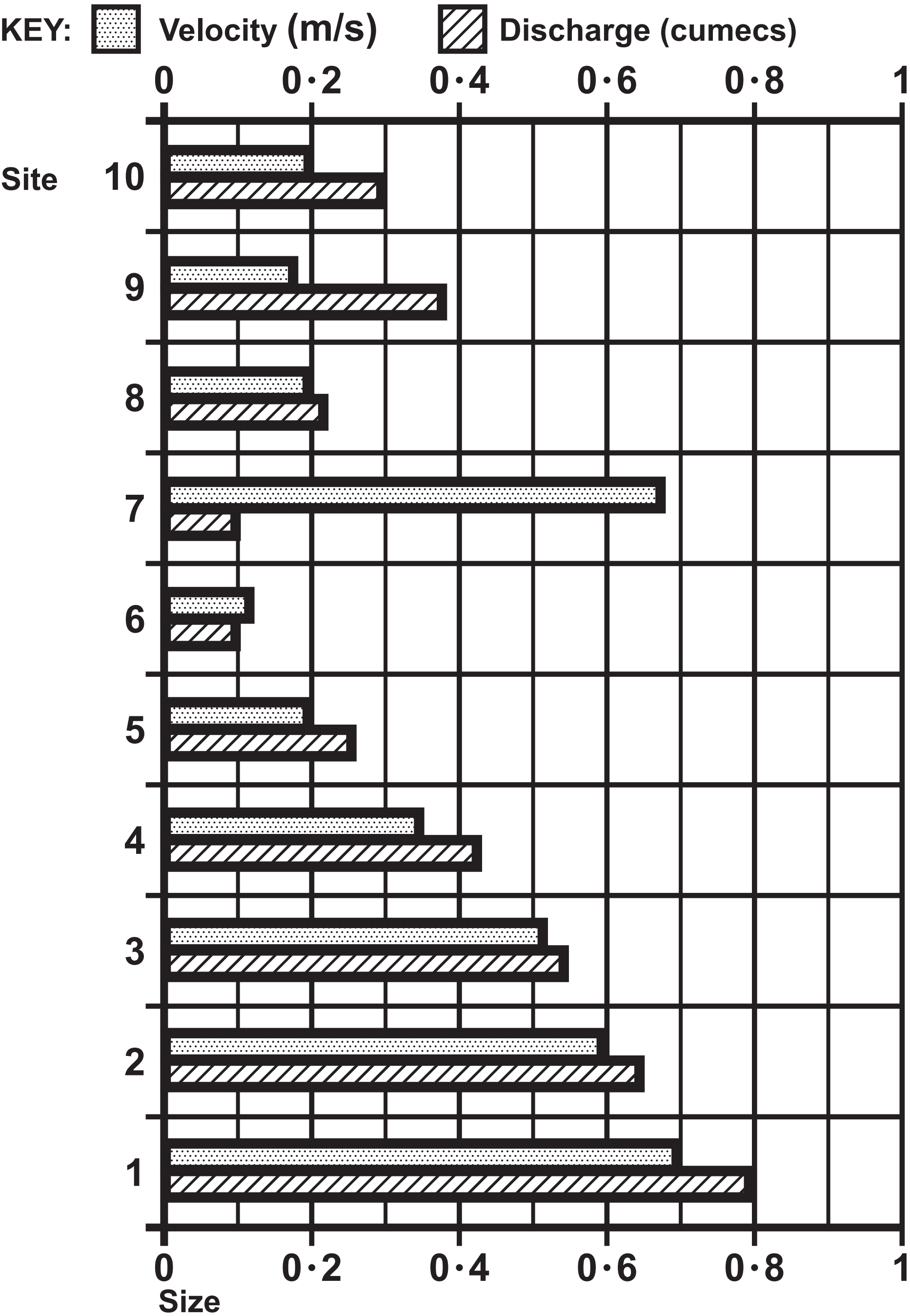


Figure 5a

Extract from student's data presentation

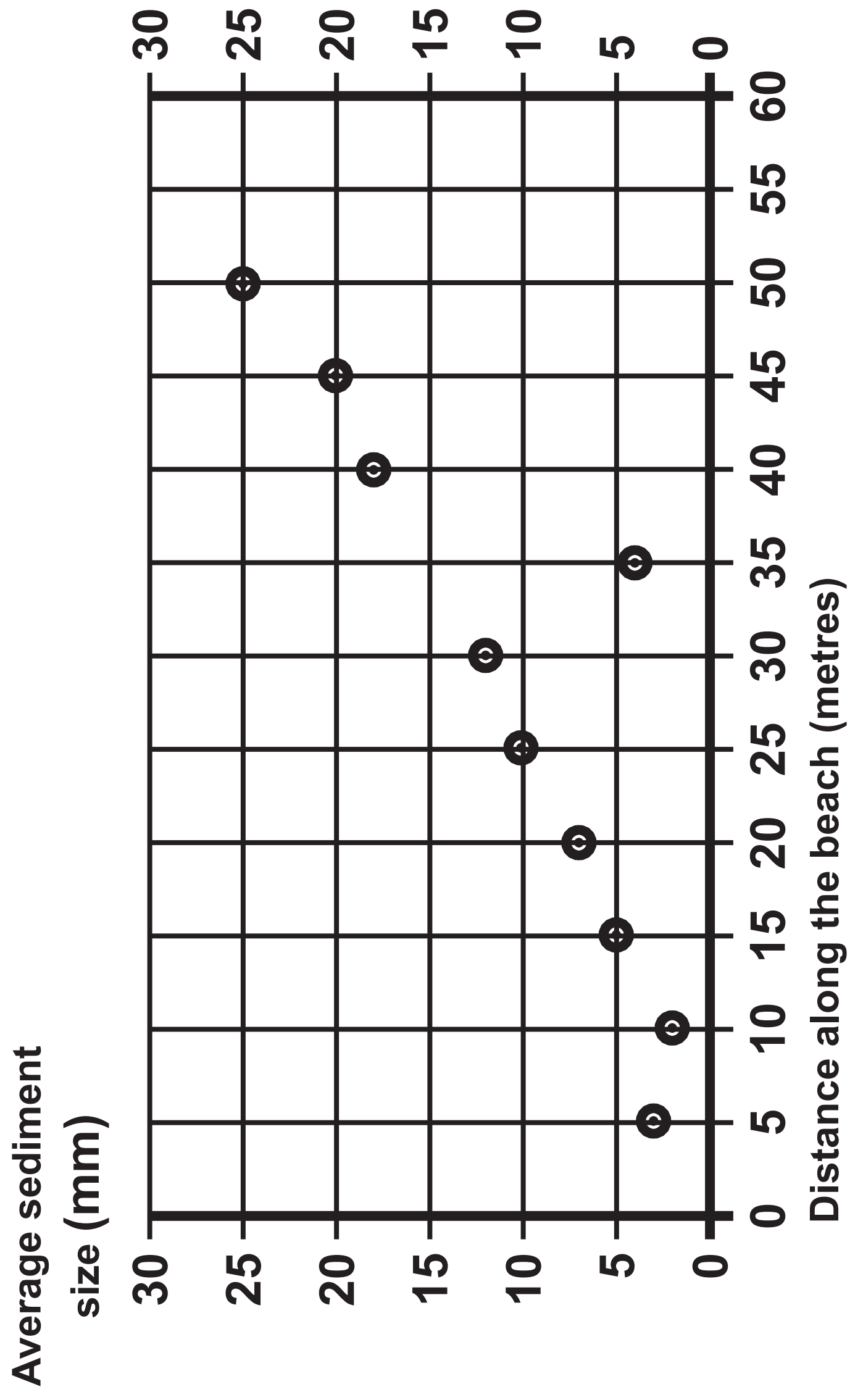


Figure 5b

Extract from student's data presentation

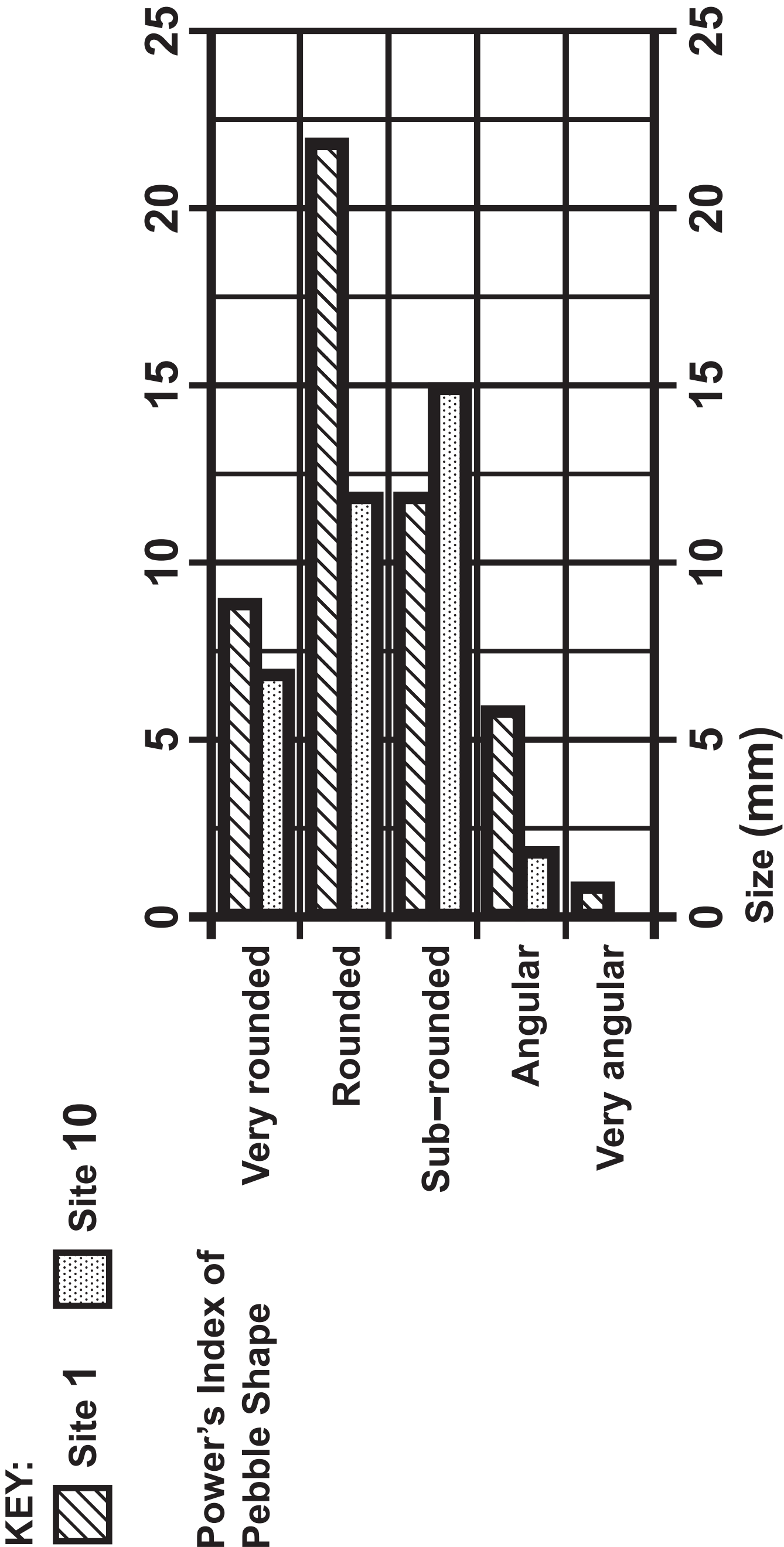


Figure 6a

Extract from student's data presentation

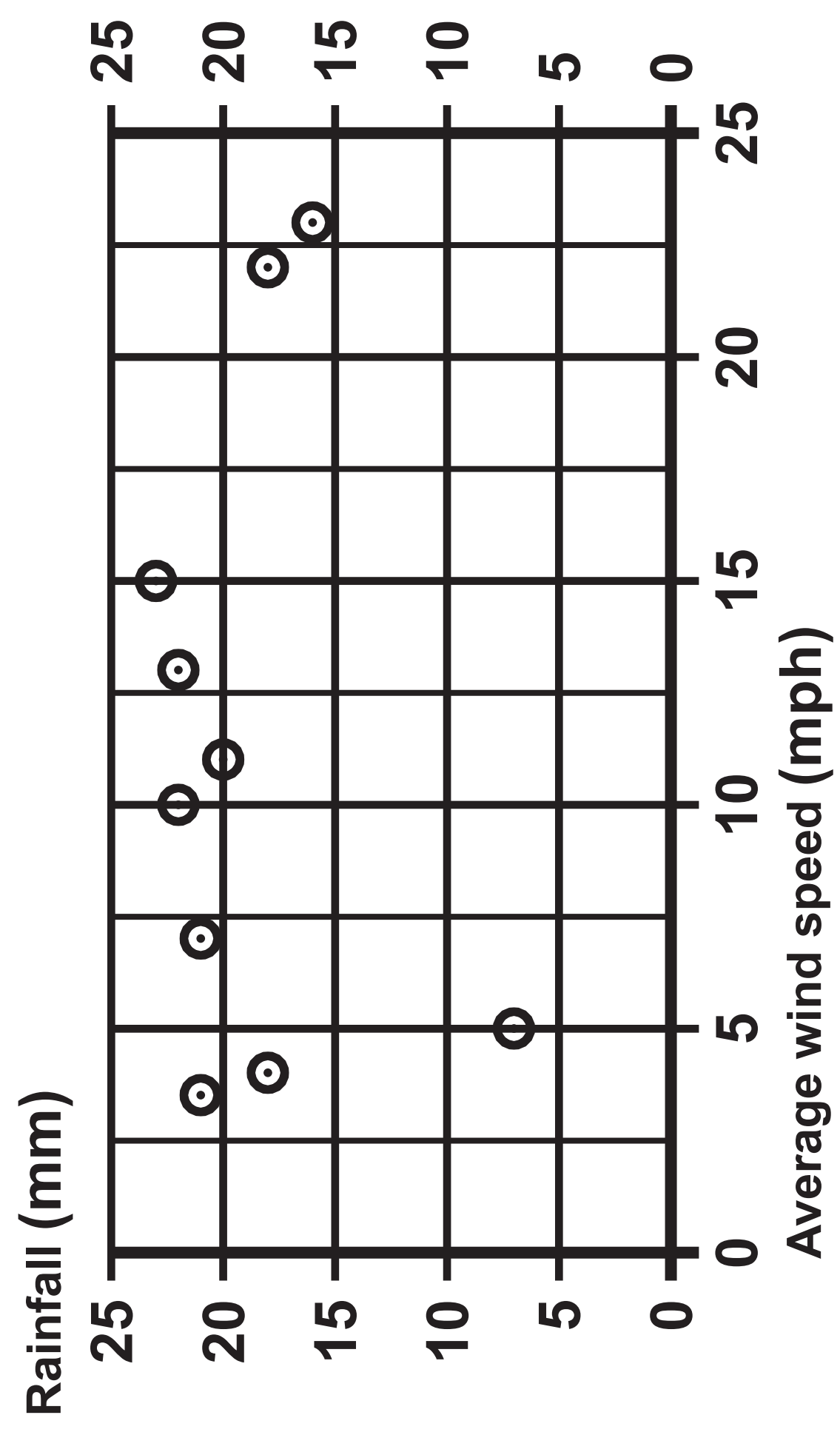
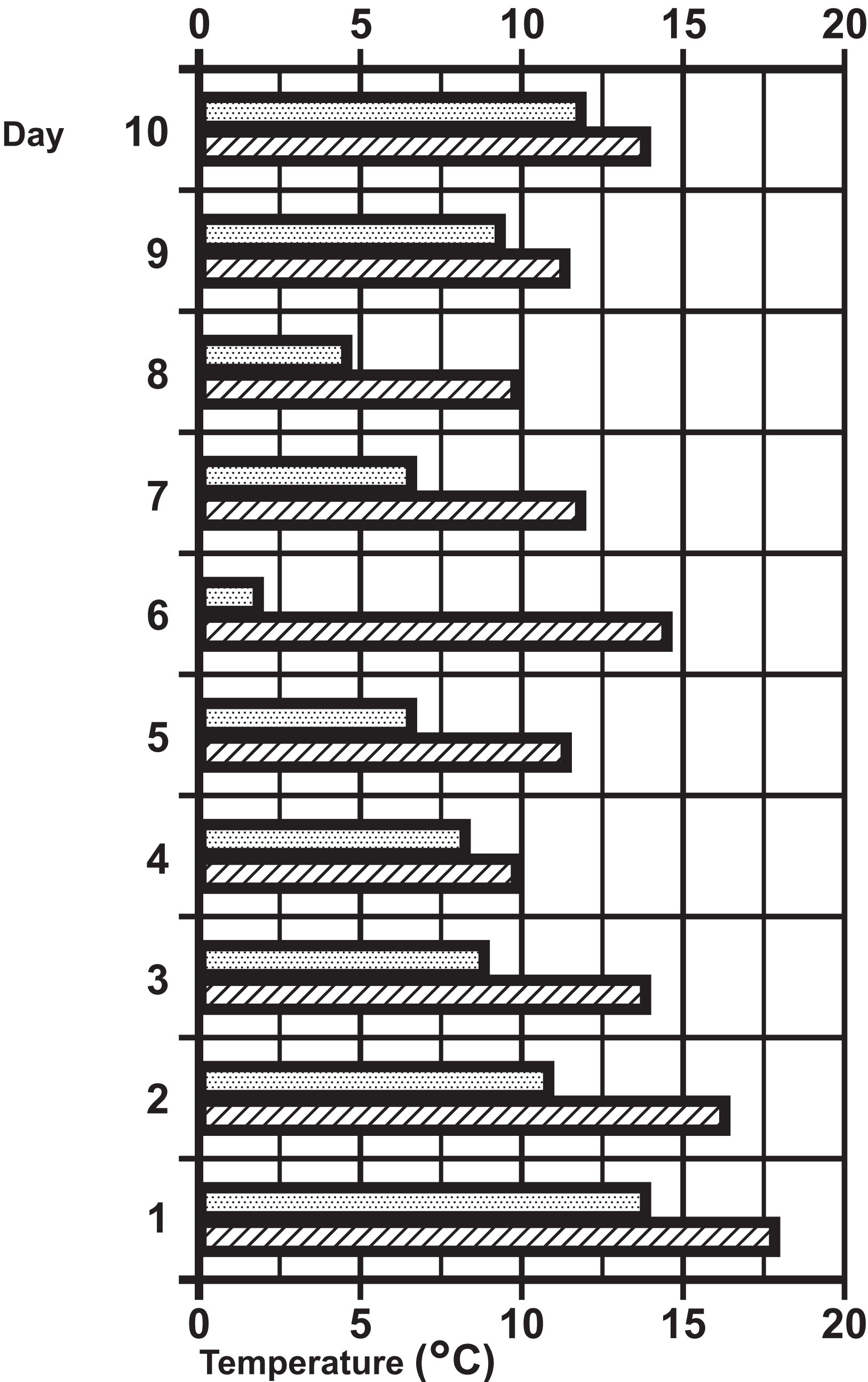


Figure 6b
Extract from student's data presentation

KEY:  Site 2  Site 1



Acknowledgements:

Pearson Education Ltd. gratefully acknowledges all following sources used in preparation of this paper:

Figure 1a has been adapted from: <https://slideplayer.com/slide/6353692/>

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Figure 2c image 3 has been adapted from: <https://www.flickr.com/photos/usacehq/5350247185>

Figure 2c map is adapted from: [https://coast.noaa.gov/floodexposure/#-10090786,3505213,8z/](https://coast.noaa.gov/floodexposure/#-10090786,3505213,8z/eyJiljoic3RyZWV0liwicil6dHJ1ZX0=)

Figure 2c map is adapted from: <https://coast.noaa.gov/floodexposure/#-10090786,3505213,8z/eyJiljoic3RyZWV0liwicil6dHJ1ZX0=>

Figure 3b adapted from: © NASA