

Biomes, biodiversity, and deforestation

Lesson Map: <http://esriaustralia.com.au/education/SpatialActivity7>

Engage

How significant is deforestation in Brazil?

- Click on the lesson map link above to commence the lesson.
- Zoom in to view the state of Rondonia in Brazil.
- ? What evidence of deforestation can you see? *[Distinct patches of deforestation, in mostly linear patterns]*
- In the 'details' pane, under the 'content' tab, tick the checkboxes to turn on the 3 layers for Rondonia, Brazil. This shows aerial imagery for 2000, 2004 and 2008.
- ? Investigate the size of the cleared area. How has this changed from 2000 to 2008? *[Deforestation area has extended around the peripheries of the cleared area, most significantly in the North and North-East]*
- You can use the 'measure' tool to determine the area of deforestation in Rondonia in square kilometers, by selecting the 'sq Kilometers' option in the dropdown box.
- Click on the 'bookmarks' icon and view the 'Rondonia, Brazil'. Click the 'note' icon to open a window. Click the image to enlarge it. This shows hotspots of vegetation reduction in Rondonia from 2000 to 2008. The legend is available at the bottom of the window.

Explore

What is the pattern of global biome distribution?

- Tick the checkbox to turn on the layer 'biomes'. Then, open the legend. Investigate global biome distribution.
- ? Zoom in to view the general area of land clearing in Rondonia, Brazil. What biome does this region sit within? *[Tropical rainforest]*
- Zoom out for global view. Click on the area of light green tropical rainforest that

Download student worksheet [here](#).

Time
30 minutes

Activity

Investigate global biodiversity, including biodiversity and deforestation in tropical rainforests

Learning Outcome

Students will be able to:

- Identify the geographical conditions which sustain different biomes
- Understand reasons for high biodiversity in tropical rainforests
- Recognise spatial trends in biodiversity hotspots

ACARA Curriculum Links

[Year 9 Geography - Unit 1: Biomes and food security](#)

[ACHKG060](#) | [ACHKG061](#) | [ACHGS067](#) | [ACHGS069](#) | [ACHGS071](#)

[Year 9 Science – Biological sciences](#)

[ACSSU175](#) | [ACSSU176](#) | [ACSIS169](#) | [ACSIS172](#)

[Year 10 Geography - Unit 1: Environmental change and management](#)

[ACHGK070](#) | [ACHGK071](#) | [ACHGK073](#) | [ACHGK074](#) | [ACHGS078](#) | [ACHGS079](#)

[Senior secondary Curriculum-Geography – Unit 3: Land cover transformations](#)

[ACHGE065](#) | [ACHGE066](#) | [ACHGE079](#)

you have just investigated in Brazil. This will highlight the global distribution of all tropical rainforests.

- ? Globally, where are tropical rainforests located? *[South America, Gulf of Guinea and Eastern African coast, South-East Asia, North-Eastern Australia]*
- ? What does this suggest about the environmental conditions required to sustain tropical rainforest? Hint: Turn on the layer titled 'geographic lines' to assist your answer. *[Tropical rainforests are equatorial, situated between the Tropic of Cancer and the Tropic of Capricorn]*
- Repeat this process to investigate the distribution, and environmental conditions required for deserts, temperate deciduous forests, tundra and boreal forests/taiga.

Explain

What is a biodiversity hotspot, and where are they located?

- In the 'contents' pane of the map, click the checkbox to turn on the layer 'biodiversity hotspots.' Turn off all other layers.
- ? What is a biodiversity hotspot? *[A biogeographic region with a high level of biodiversity. To be classified as a 'hotspot', the area must have lost 70% or more of its original land area]*
- ? How do regions become biodiversity hotspots? *[Loss of 70% land area caused by growing population, and deforestation]*
- There are currently 25 biodiversity hotspots. Investigate their global distribution.
- ? Is there a pattern in biodiversity hotspot location? Hint: Turn on the layers 'geographic lines' to assist your answer. *[Located between 45°N and 45°S]*
- ? Given what we know about biome distribution, in what biome would you suggest biodiversity hotspots are most common? After you have made a guess, turn on the layer 'biomes' to check your answer. *[Answers will vary, but most commonly students hypothesis tropical rainforests, given the equatorial nature of distribution]*

Extend

Why are rainforest biomes so important?

[| ACHGE080 | ACHGE081](#)

Senior secondary Curriculum-
Biology – Unit 1: Biodiversity and the
interconnectedness of life

[ACSBL015 | ACSBL016 | ACSBL012 |
ACSBL028](#)

Senior secondary Curriculum- Earth
and environmental science – Unit 3:
Living on Earth

[ACSE076 | ACSES077 | ACSES078 |
ACSES081](#)

Acknowledgements:

This lesson map uses data sourced
from an Esri GeoInquiry.

Accompanying lesson material has
been amended to align with the
Australian National Curriculum.

Teacher Feedback:

To share your feedback on this, or
any Spatial Activity, please contact
education@esriaustralia.com.au

- Tropical rainforest have the highest biodiversity level of all global biomes.
- ? What is biodiversity? *[Biodiversity is the total number of species living in a geographical area. More species are an indication of a healthier region]*
- Turn on the 'Biomes' layer and turn off all other layers. Click on a region within the 'tropical rainforest' biome to highlight all tropical rainforests globally.
- ? We previously investigated the environmental conditions required to sustain tropical rainforest. Given these conditions, why would tropical rainforests have the highest level of biodiversity? *[Answers will vary. Some answers may include: equatorial environment means consistent warm temperatures year-round; high level of rainfall sustains more species; lower population density in most global areas of tropical rainforest]*
- Turn on the 'map notes' layer and zoom in to Rondonia, Brazil.
- ? Given what you know about tropical rainforest biomes, what are the reasons for such high levels of deforestation in Rondonia? *[Rondonia has a high rate of deforestation because of the dense and diverse range of vegetation that exists in this biome]*

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