

Ecosystem dependence

Lesson Map: <http://esriaustralia.com.au/education/SpatialActivity1>

Engage

How can aerial imagery be used to access ecological health?

- Click on the lesson map link above to commence the lesson.
- ? What major features of the earth can be identified? [*Clouds, desert, oceans*]
- More detail is required to gain a more complete picture of processes on the earth's surface.

Explore

How does the global vegetation type and distribution vary?

- In the 'details' pane, open the 'content' tab. Tick the checkbox to turn on the layer 'Leaf Area Index March 2016'. Turn off other layers.
- Find your school using the search bar at the top of the map. If you have a free ArcGIS Online account, add a bookmark to this site by clicking the 'bookmark' icon.
- ? What is the approximate leaf cover in your area? Hint: You may need to zoom in.
- ? Zoom out. What patterns of vegetation do you notice in your region at a larger scale? What about your entire State?

Explain

How have patterns of vegetation related to seasonal change?

- In the 'content' tab, click back and forward between the layers titled 'Leaf Area Index for March 2016 and September 2015'.
- ? What differences do you notice between these two layers, and why would this be the case? [*Increased vegetation from spring into Summer, reduced vegetation through Autumn and Winter*]
- Turn on the layers 'Leaf Area Index September 2015' and 'Rainfall, September

Download student worksheet [here](#).

Time
20 minutes

Activity

Explore the relationship between vegetation and abiotic factors, and the resulting primary productivity.

Learning Outcome

Students will be able to:

- Describe how living and non-living entities interact within an ecosystem
- Understand the relationship between vegetation and abiotic factors
- Interpret the spatial distribution of global vegetation

ACARA Curriculum Link

[Year 9 Science – Biological sciences](#)
[ACSSU175](#) | [ACSSU176](#) | [ACSI169](#) |

[Year 9 Geography – Unit 1: Biomes and food security](#)
[ACHGK060](#) | [ACHGS065](#) | [ACHGS067](#) | [ACHGS068](#)

[Senior Secondary Biology – Unit 1: Biodiversity and the interconnectedness of life](#)
[ACSBL019](#) | [ACSBL020](#) | [ACSBL021](#) | [ACSBL022](#) | [ACSBL023](#) | [ACSBL004](#) | [ACSBL001](#)

[Senior Secondary Earth and Environmental Science – Unit 1: Introduction to Earth Systems](#)
[ACES027](#) | [ACES005](#) | [ACES004](#)

2015'

- ? How does rainfall affect vegetation? *[More rainfall indicates areas of higher leaf density.]*

Extend

How is vegetation related to abiotic factors like carbon dioxide?

- ? What is the relationship between vegetation and atmospheric carbon dioxide?
[More vegetation leads to less atmospheric CO₂, via the process of respiration]
- Net primary productivity is the difference between CO₂ absorbed by plants, and CO₂ released by plants.
- Turn on the layers 'Net Primary Productivity' and 'Leaf Area Index September 2015' by ticking these two checkboxes in the 'details' pane under the heading 'content'. Turn off all other layers.
- ? By switching between these two layers, what generalizations about cause and effect can be made? *[More vegetation leads to a higher net primary productivity]*
- ? What factors affect primary productivity? *[Rainfall, temperature, sunlight, and soil type]*
- ? Using the layers 'Forest Fires' and 'Rainfall', what evidence do you have to support an explanation of a positive or negative impact on net primary productivity? *[Answers will vary]*

Next Steps:

Request a free ArcGIS Online Account for your school:

Australian schools can request a free ArcGIS Online account as part of Esri Australia's Classroom GIS Initiative. A school account provides additional mapping tools, content, features and privacy.

Learn more, or request a school account at
<http://esriaustralia.com.au/education>

Senior Secondary Geography – Unit
3: Land cover transformations
[ACHGE063](#) | [ACHGE065](#) | [ACHGE066](#)

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