

The Great Barrier Reef: zoning, land use and other issues

Lesson Map: <http://esriaustralia.com.au/education/SpatialActivity40>

Engage

Rainforests of the sea

- ➔ Coral reefs are underwater structures made from reef building coral polyps. Although they only cover less than one percent of the earth's surface, they are home to more than one quarter of all marine life.
- ➔ Australia is home to the largest coral reef in the world, the Great Barrier Reef, which stretches over 2,300 kilometers and is made from 2,900 individual reefs.
- ➔ The Great Barrier Reef is one of the seven natural wonders of the world and is a World Heritage Site. The reef also plays a major role in the spiritual and culture life of Indigenous Australians and Torres Strait Islanders.
- ➔ Despite this, the Great Barrier Reef continues to face wide scale risk from a variety of human and environmental issues.

Explore

A perfect recipe

- ➔ In the Details pane, under the heading Content, tick the checkbox to turn on the layer called 'Coral Reef Area'.
- ? What is the spatial distribution of coral reefs? **Coral reefs are found in higher proportions close to the equator.**
- ? What does this tell you about the conditions in which coral reefs need to grow in? **Coral reefs need warm water to grow in, with an optimum temperature of 26-27 degrees.**
- ? What other conditions do coral reefs need to flourish? **Coral reefs cannot grow in water deeper than 50 metres and the water must be clear, clean saltwater that is reached by the sun.**
- ? Knowing these conditions, what made the Queensland coast the perfect location

Download student worksheet [here](#).

Time
20 minutes

Activity

Investigate some of the issues facing the GBR.

Learning Outcome

Students will be able to:

- Identify spatial distribution of coral reefs
- Look at the way the GBR has been zoned and managed
- Identify the impact of shipping on the GBR
- Explore common coral disease
- Look at the impact of land use

ACARA Curriculum Link

Year 10 Geography – Unit 1:
Environmental change and
management

[ACHKJ070](#) | [ACHKJ073](#)

Teacher Feedback:

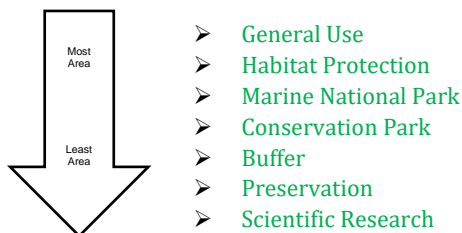
To share your feedback on this, or any Spatial Activity, please contact education@esriaustralia.com.au

for the Great Barrier Reef to flourish? The east coast of Queensland is relatively shallow due to changing sea levels and newly submerged land was the perfect breeding ground for coral.

? The Great Barrier Reef Marine Park Authority manage the reef; however, the park is so large that it is split into smaller management areas. Turn on the layer 'GBRMPA Data – Management Areas.' What are the four management areas?

- Far Northern Management Area
- Cairns/Cooktown Management Area
- Townsville/Whitsunday Management Area
- Mackay/Capricorn Management Area

? Within each of these management areas is a range of zones. Zoning ensures that animals, plants and habitats are protected where appropriate. There are eight major types of zones, including Habitat Protection, Marine National Park, Conservation Park, Commonwealth Island, General Use, Buffer and Scientific Research. Rank the zones below by the amount of area they take up (not including Commonwealth Islands):



Explain

A Shared Space

? Coral reefs face a wide range of threats. What are some of these threats?
Student's own answer.

? Turn on the layer 'NOAA – Coral Reef Disease Observation'. Disease can wipe out entire colonies of coral and can be amplified during poor water conditions. What are three different types of disease that have been found on the Great Barrier Reef? Black band disease, white syndrome, black and white syndrome and Acropora hyacinthus.

? What is the spatial distribution of coral disease? More diseases have been identified in the north, where the water is warmer.

➔ Another major threat to individual reefs is anchorage or other damage from vessels. Turn on the layers 'Cruise Ports' and 'Commercial Ports'.

? There are large commercial ports located near the reef. Based on your knowledge of the reef, what do these ports mostly ship? **These ports ship large quantities of coal, such as Hay Point (near Mackay), which is one of the largest coal ports in the world.**

→ There is also a wide variety of cruise ports located off the east coast as millions flock to swim at the Great Barrier Reef. These are most common at the northern reef and the Whitsunday islands.

? Cruise ports and commercial ports pose different risks to the reef. Name some of these risks below:

Cruise	Both	Commercial
<ul style="list-style-type: none"> ➤ Greywater pollution ➤ Waste pollution ➤ Tourist damage i.e. sunscreen 	<ul style="list-style-type: none"> ➤ Damage from vessel ➤ Damage from anchorage ➤ Potential fuel pollution 	<ul style="list-style-type: none"> ➤ Leakage from cargo during transit or portside i.e. coal ➤ Anti-fouling paints

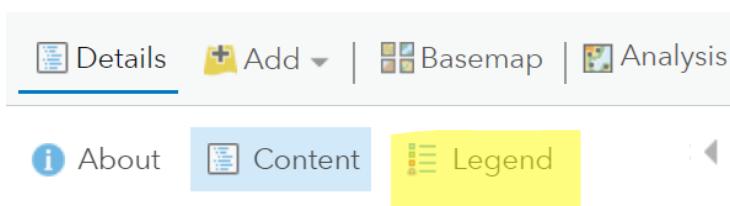
? Turn off all layers. Turn on the layer 'Designated Shipping Areas of the GBRMP'. Although the space between the Queensland coast and the reef is narrow, 75% of ships decide to use these inner channels to navigate. Why do you think this is? **The inner shipping channel is safer for ships as the reef provides shelter from rough seas.**

? Why do high numbers of ships navigating the inner reef have a negative impact on the reef? **Ships can collide or ground along the Great Barrier Reef shipping route, which has a detrimental impact on the coral.**

Extend

Land and stars

→ Turn on the layer 'Land Use' and turn off all other layers. What are the major ways land is used on the Queensland coast? Remember, to see the Legend press the Legend button as seen below.



The most common land use includes residential, irrigated cropping, native

grazing, production forestry, conservation park, mining, and services.

- ? How could this land use impact the Great Barrier Reef? *Students own answer.*
- ? Is there any land use that you believe to be more particularly harmful than others? *Students own answer.*
- ? Crown of Thorns (COTS) are a huge threat to the Great Barrier Reef and the number of these predators are expatiated by poor water quality. How does human activity decrease water quality in the reef? *Students own answer.*

Next Steps:

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