

The Great Southern Reef

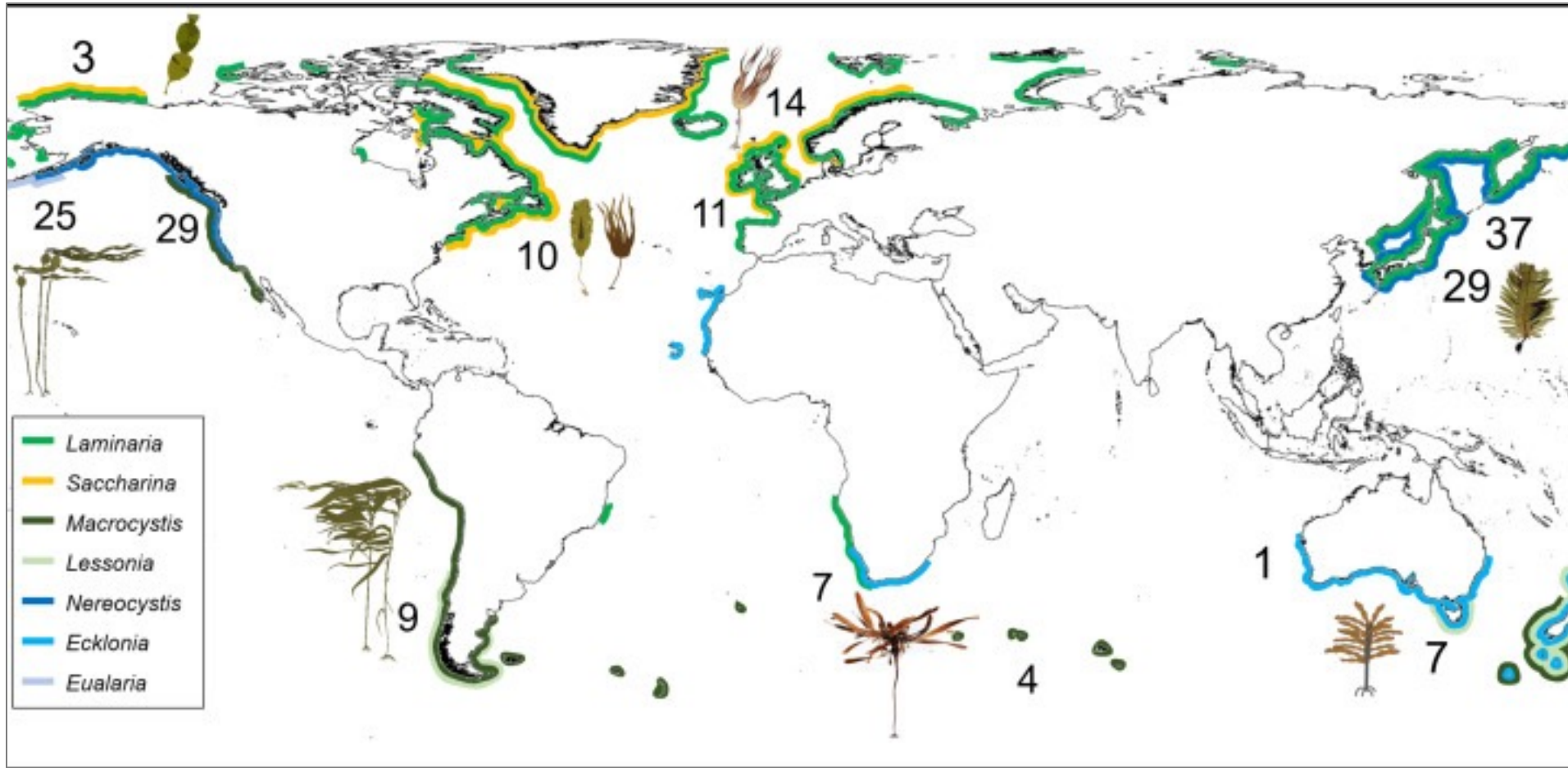
An Ecosystem at risk

Review questions using
stimulus from
Geography Bulletin Volume
53, No 4, 2021.



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Kelp forests are found globally in temperate latitudes.
What does this mean?



Source: From: Status and Trends for the World's Kelp Forests. Rightslink licence 5131200204971.

Thomas Wernberg, Kira Krumhansl, Karen Filbee-Dexter, Morten F. Pedersen, – <https://doi.org/10.1016/B978-0-12-805052-1.00003-6>

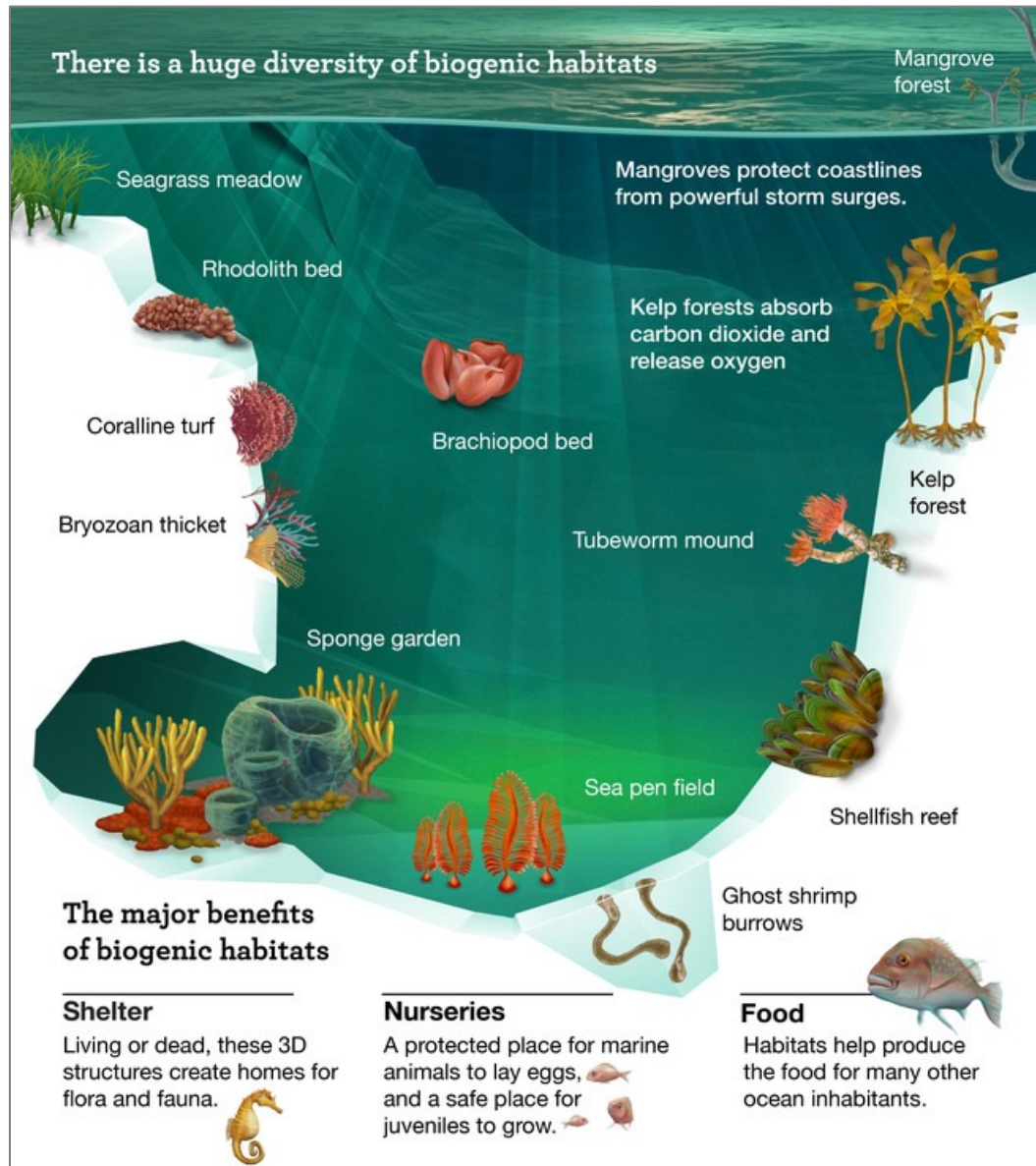
1. Describe the location and dimensions of the Great Southern Reef.

2. What is the common feature that gives the Great Southern Reef its identity?



An aerial photograph of a rocky reef system. The water is clear, showing a gradient from deep blue in the distance to vibrant green and yellow near the rocks. Dark, dense kelp forests cover the submerged rocks. Two divers are visible in the lower center of the frame, swimming over the reef. In the background, a large, isolated rock formation stands in the ocean with waves breaking against its base. The sky is a clear, pale blue.


Kelp forests are found on rocky reefs. Explain the connection.



What is a biogenic habitat?

What makes a kelp forest a biogenic habitat?

Diagram source: Science Learning Hub – Pokapū Akoranga Pūtaiao, University of Waikato, <https://www.sciencelearn.org.nz/images/4599-biogenic-engineers-and-architects>

An aerial photograph of a rugged coastline. The water is a vibrant turquoise color, with white foam from waves crashing against a rocky shore. The rocks are brown and tan, with some green algae or seaweed visible. A paved road runs along the top right of the image, with a few cars and a pedestrian visible. The overall scene is bright and sunny.

The Great Southern Reef is often described as a mosaic
of rocky outcrops.
Explain what this means.

Photo : John Turnbull / Marine Explorer



What features of kelp forest ecosystems on rocky reefs can you see in this illustration?

Sea lettuce

Ci

Purple urchin

Black and white

White bellied sea eagle

What role does water depth play in a kelp forest ecosystem ?

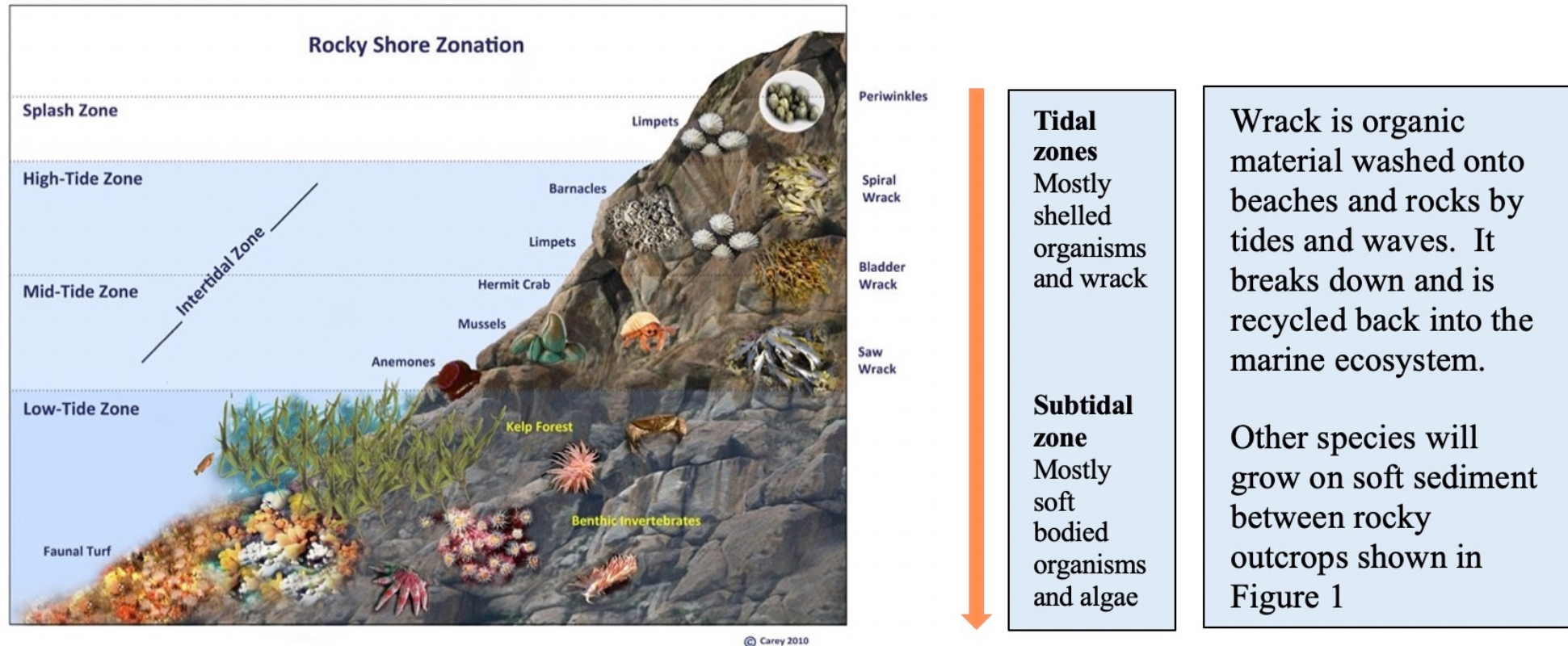


Figure 2: Rocky shore zonation

Source: Retrieved from <https://gcs.instructure.com/courses/37951/assignments/115556>

A vibrant underwater scene of a kelp forest. Sunlight rays penetrate the clear blue water, creating a dramatic effect. The kelp stalks are tall and slender, with large, green, leaf-like blades that sway gently. The overall atmosphere is serene and natural.

What role does sunlight play in a kelp forest ecosystem?

What interactions occur between the atmosphere and hydrosphere in a kelp forest ecosystem?



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Identify key features of kelp in these photographs?



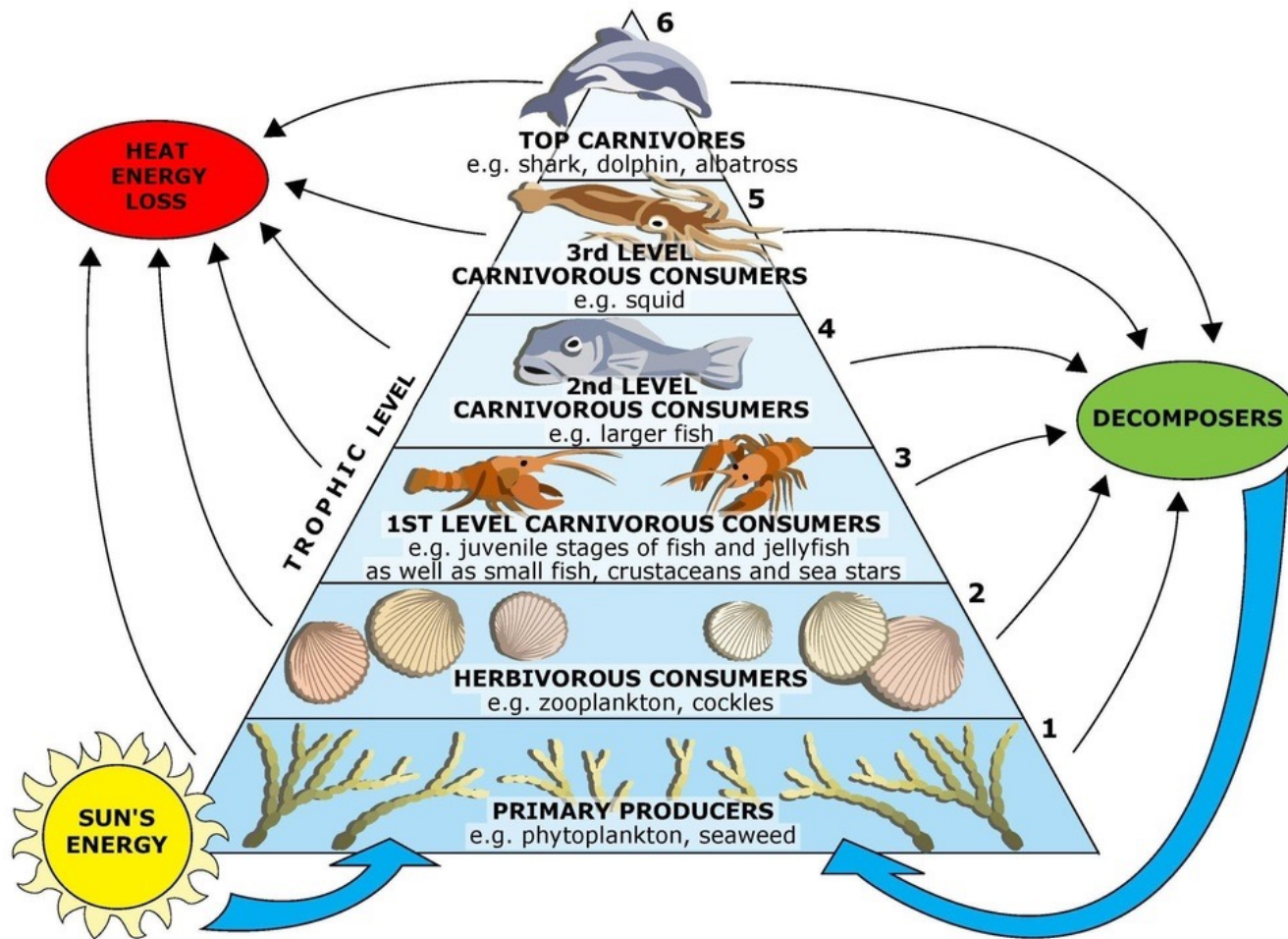
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John Turnbull / Marine Explorer



Ocean Imaging / GSR



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Science Learning Hub – Pokapū Akoranga Pūtaiao, University of Waikato,
Source: <https://www.sciencelearn.org.nz/images/144-marine-trophic-pyramid>

Explain the high primary productivity of kelp forests?

Why is kelp called a foundational species and a keystone species?

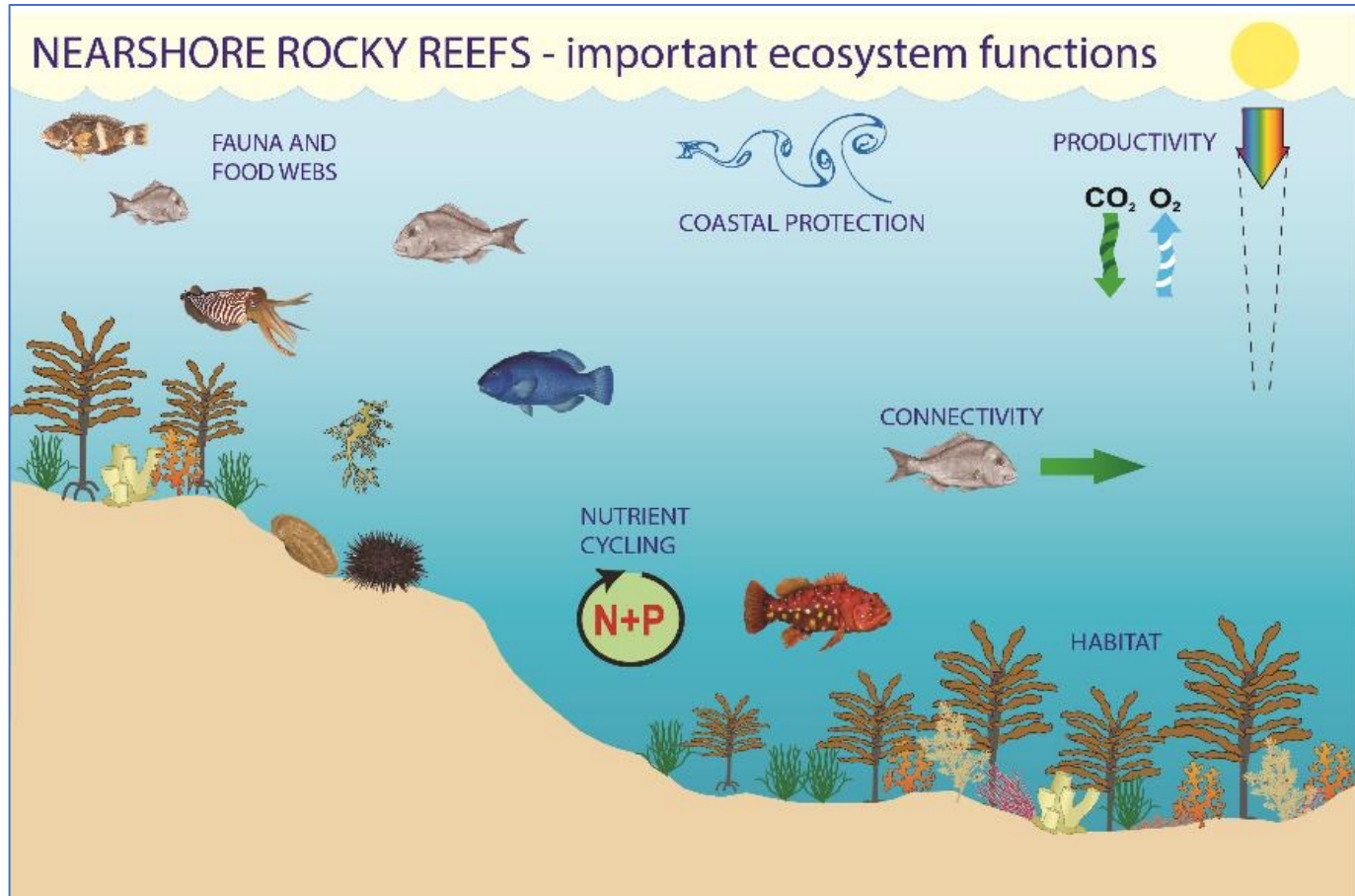


Photographs Ocean Imaging / Great Southern Reef

The Great Southern reef is
a biodiversity hotspot.

Explain what this means.

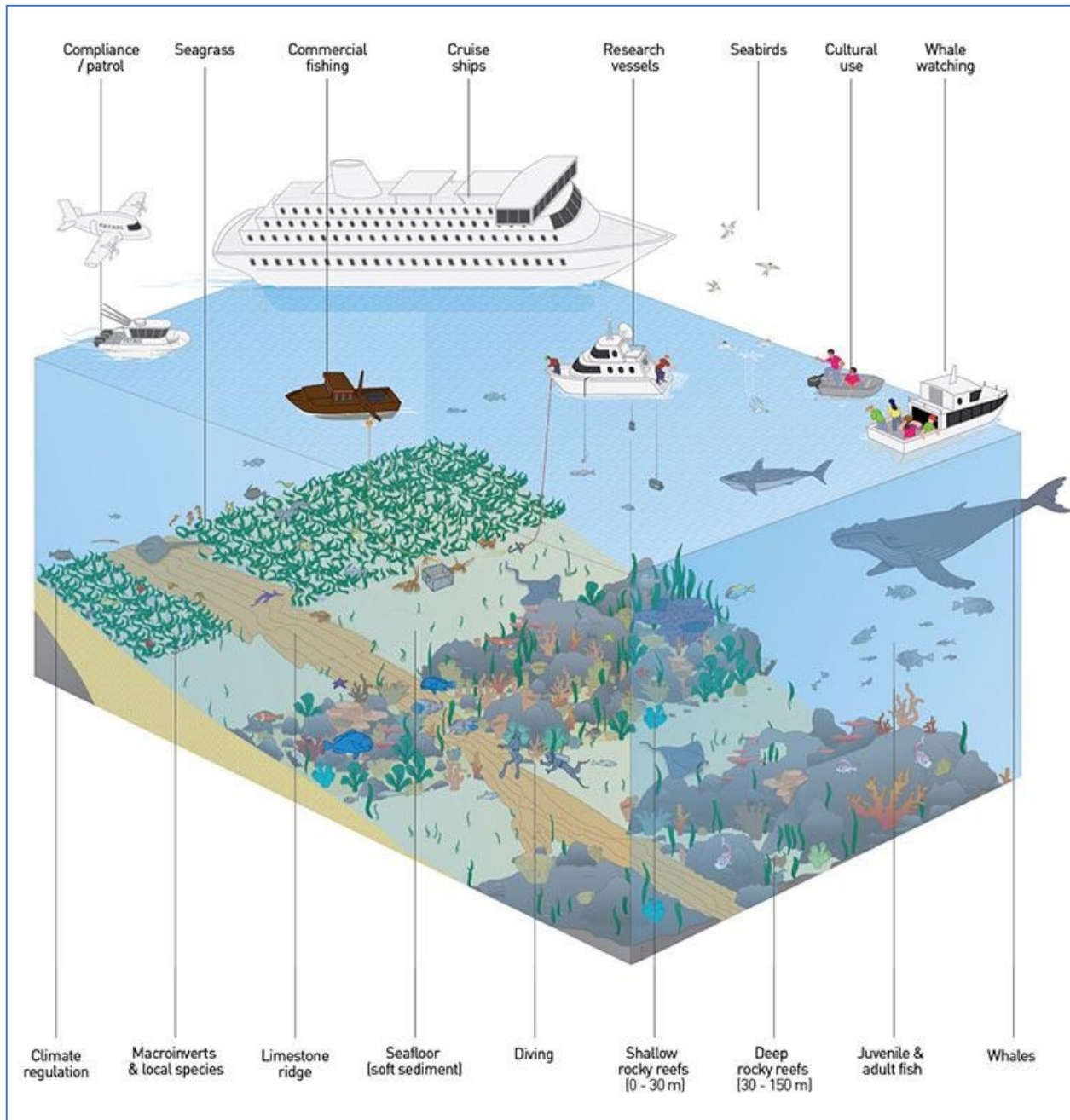
Why is this important?



List 5 ecological functions of kelp forest ecosystems on the Great Southern Reef.

What human activities threaten these functions ?

Source: Imgraben, S., Peters, K. and Brock, D. (2019). Conceptual models of nearshore reefs in the Adelaide and Mount Lofty Ranges region. DEW Technical note DEWTER-2018-10, Government of South Australia, Department for Environment and Water, Adelaide - <https://data.environment.sa.gov.au/Coast-and-Marine/Ecosystems/Pages/home.aspx>



List FIVE contemporary strategies used to manage and protect the kelp forest ecosystems of the Great Southern Reef.

Provide ONE example of each.



Use the following images to explain and evaluate Operation Crayweed ?

How does Operation Crayweed compare to help the Green Gravel restoration project in Western Australia?

The process



John Turnbull / Marine Explorer

The result



John Turnbull / Marine Explorer



Explain why monitoring reefs over time is an important party of contemporary management. ?