

South East Queensland seagrasses

What are seagrasses?

Seagrasses are flowering plants that have adapted to living in the ocean in temperate and tropical regions. There are about 60 species of seagrasses worldwide. They often grow in large 'meadows' that can, at first glance, look like the grass in your backyard. Seagrasses grow in sheltered coastal waters and bays. They anchor their roots in sand or mud in areas with good light.

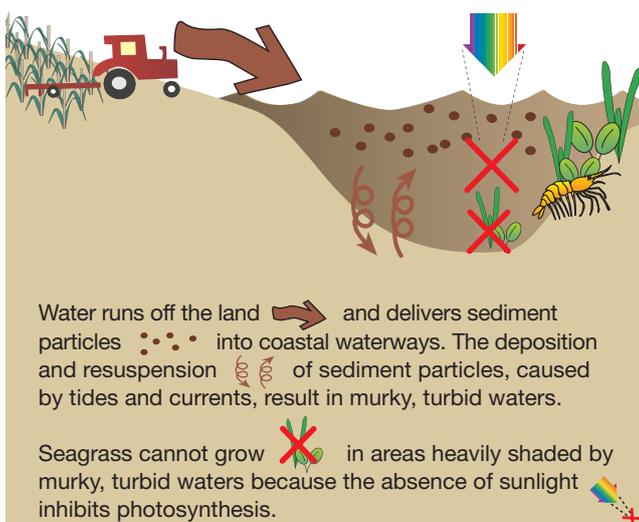
Seagrasses complete their entire life cycle, including flowering and pollination, under water. Seagrasses need sunlight to produce energy and oxygen (photosynthesis). Seagrass distribution—or how many hectares of seagrass grow from year to year—is highly dependent on the amount of light that can reach the seagrasses.

“Seagrasses are similar to the grass that grows in your backyard, only it grows on the bottom of the ocean.”



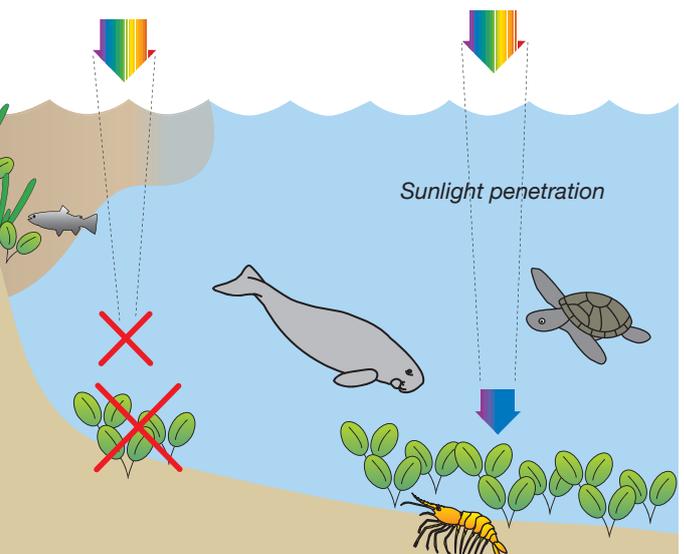
Coastal areas

Seagrasses grow in estuaries and close to the coast where sediment from the land can affect their distribution.



Deepwater

Seagrasses can also grow in deepwater areas if the water is clear and sunlight can penetrate.



Three things affect the amount of light available to seagrasses:

1. Sediment, or soil and dirt particles in the water, can make the water murky or 'turbid'. Sunlight cannot easily filter through turbid water.
2. The amount of phytoplankton in the water can also reduce the amount of sunlight that reaches seagrasses. Phytoplankton are microscopic floating plants.
3. Epiphytes or algae that cling to seagrass leaves can also restrict the amount of sunlight that actually reaches the leaves of the seagrasses.

Why are seagrasses important?

Seagrasses play an important ecological role as habitats and nursery areas for young fish. Dugongs and sea turtles also feed on seagrasses. Seagrasses trap and stabilise sediments, preventing erosion in estuaries and providing shelter for fish and invertebrate fauna such as snails and sea urchins.

Seagrass habitat in South East Queensland

Seagrasses are widespread in Moreton Bay and where they grow, or their patterns of distribution, depend on the disturbance caused by water movement, wind, light, overall water quality, and grazing by dugongs and turtles. Boat moorings, anchorages, and damage from boat propellers can also affect patterns of seagrass distribution. Slow growing seagrass species are found in areas with relatively low disturbance, while species that grow rapidly and produce large numbers of seed are more often found in highly disturbed areas. Moreton Bay contains hundreds of dugongs and thousands of green sea turtles. Turtles eat the seagrass leaves, whereas dugongs remove the whole plant. Dugongs prefer the succulent root stalks (rhizomes) of the



Dugong grazing encourages the growth of faster growing *Halophila ovalis* and *Halodule* species (left) but in ungrazed areas, *Zostera* and *Syringodium* dominate (right).



CHRIS ROELFSEMA

Halophila ovalis is a rapid growing seagrass species, found in the Eastern Banks of Moreton Bay and is the preferred food of dugongs.

species known as *Halophila* and *Halodule*, which are found growing primarily over the Eastern Banks of Moreton Bay.

Dugongs and seagrasses

As dugongs graze on seagrasses, organic matter is stirred up, aerating the sediment. This creates good conditions for the fast growing, pioneer seagrass species, which dugongs prefer. The pioneer species are the first species to grow back after a disturbance and they are the fastest growing species. The more dugongs graze, the more disturbance they create and the more the seagrasses grow. This pattern is called 'cultivation grazing'.

Mapping seagrasses in Moreton Bay

As turbidity increases and light penetration is reduced, the depth at which seagrass can grow declines. Measuring the depths where seagrasses are growing over time provides a good indicator of water quality. Changes in seagrass distribution can be used to map and track changes in environmental characteristics and conditions.

In recent decades there have been substantial changes in the distribution of seagrasses in central and southern Moreton Bay. Since mapping started, there are about 2300 fewer hectares of seagrasses in South East Queensland (SEQ). This is the size of over 300 Suncorp Stadiums! In some areas, such as around the mouth of the Logan River, the distribution of seagrass meadows is



highly variable from year to year, but the overall amount of seagrass does not really change in size. However, there are many areas where seagrasses have declined significantly. These areas include Peel Island; Banana Banks, near Victoria Point; Pelican Banks at Scarness; the north-west of Coochiemudlo Island; in the southern Broadwater on the Gold Coast; and in the Nerang River.

Research shows that if the amount of sediment entering South East Queensland waterways is not reduced, excessive turbidity will continue to cause loss of seagrass habitat in large areas of Moreton Bay. This will have a huge impact on the commercial fisheries in the region and will also impact on the marine species which rely on seagrasses for their survival.

The SEQ Healthy Waterways Strategy

The SEQ Healthy Waterways Partnership is a collaboration between government, industry, researchers, and the community. *The SEQ Healthy Waterways Strategy 2007–2012* contains over 500 actions, committed to by the Partners, to improve the health and protect the values of our waterways. A number of these actions are directly aimed at reducing sediment and nutrient loads in waterways to improve conditions to allow seagrasses to thrive.



Mother dugong and her calf.



Strong winds and wave action can deposit seagrass on the shore.



Training at Moreton Island for Seagrass-Watch, a seagrass monitoring program involving the government, scientists, and the community.



Seagrass-Watch collects data on South East Queensland seagrass species.

Key Fact

Dugongs are the only marine mammal herbivore—that's why they are also called a 'sea cow'. Dugongs are almost entirely dependent on seagrasses for their food source.



Key Learning Area

By the end of Year

Essential Learnings

Science	7	<p>Ways of working—Students are able to collect and analyse first- and second-hand data, information, and evidence.</p> <p>Knowledge and understanding—Science as a human endeavour:</p> <ul style="list-style-type: none"> Ethical considerations are involved in decisions made about applications of science. Scientific knowledge can help to make natural, social, and built environments sustainable, ranging from local to global scales. <p>Knowledge and understanding—Life and living:</p> <ul style="list-style-type: none"> Survival of organisms is dependent on their adaptation to their environment. Different feeding relationships exist within an ecosystem.
	9	<p>Ways of working—Students are able to research and analyse data, information, and evidence.</p> <p>Knowledge and understanding—Life and living:</p> <ul style="list-style-type: none"> Changes in ecosystems have causes and consequences that may be predicted. In ecosystems, organisms interact with each other and their surroundings. <p>Knowledge and understanding—Science as a human endeavour:</p> <ul style="list-style-type: none"> Immediate and long-term consequences of human activity can be predicted by considering past and present events.
SOSE	7	<p>Ways of working—Students are able to collect and analyse information and evidence from primary and secondary sources.</p> <p>Knowledge and understanding—Place and space:</p> <ul style="list-style-type: none"> Sustainability requires a balance between using, conserving, and protecting environments, and involves decisions about how resources are used and managed.
	9	<p>Ways of working—Students are able to research and analyse data, information, and evidence from primary and secondary sources.</p> <p>Knowledge and understanding—Place and Space:</p> <ul style="list-style-type: none"> Interrelationships between human activity and environments result in particular patterns of land and resource use, and can cause environmental problems.

Source: Queensland Studies Authority, Essential Learnings and Standards, Years 1–9
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