Altered food webs: farming and sediment runoff

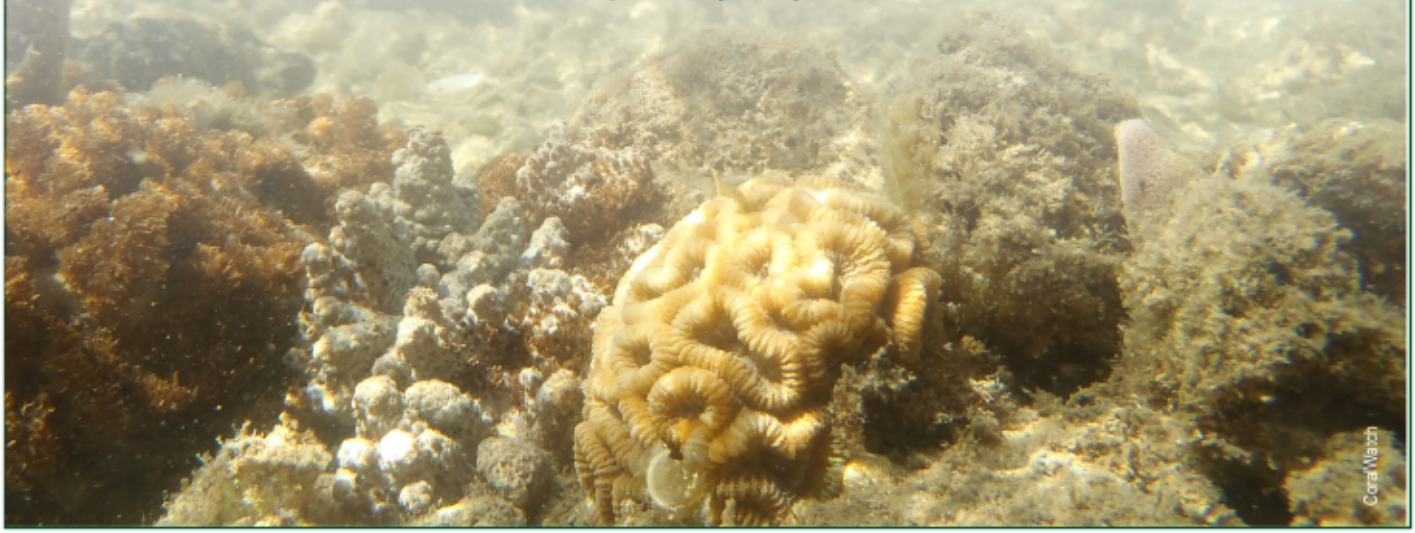
Coastal areas are often famous for their extensive seagrass meadows which provide food for large populations of green sea turtles and dugongs. Unknown to most people, these areas are important habitats for corals. Corals are important because they provide food and shelter for fish and other marine creatures. A coral's health is extremely susceptible to changes in the environment. This makes coral an important species to monitor and use to indicate environmental conditions. Coastal areas are part of a precious environment which needs to be protected from environmental damage caused by humans and their activities.

High levels of sediment entering waterways are a major environmental concern. The main cause of high sediment levels is from soil erosion from creeks and rivers, farming land and building construction sites. Sediment is composed of soil particles that are washed off the land into creeks and rivers. Sediment can be a range of different sizes including large sand particles and smaller fine mud particles. The increased amount of soils particles suspended in the water causes the water to become cloudy which is called water turbidity. High water turbidity can have impact to species inhabiting the water by blocking sunlight and smothering seagrasses and corals that require light to grow, consequently reducing the amount of food available for turtles, dugongs and fish.

Using the food web produced in Worksheet FW2 examine the effects on a food web when the community structure and biodiversity in the ecosystem is altered.

Questions

1. Using the food web constructed previously for Worksheet FW2, consider what would happen to the food web in the event of large amounts of rain. Choose a coastal area near you and focus on sediment and how it may affect the system. Look at the food web you have constructed and place a cross through plants and animals that may be affected directly by this event.
2. Describe what effect this would have to other organisms that consume this organism in the same food web? What about organisms at higher orders of consumption? Would anything happen to those organisms?
3. Draw a new food web for the ecosystem based on the alterations you have described for the first food web. How has the large amount of rain falling on the city effected biodiversity?
4. In groups of three, consider some ways to help reduce the sediment running into the area. Describe what this may do in the short, medium and long term and report this back to the class.
5. Consider what your area may have looked like prior to European settlement. Especially think about any coral skeletons observed in Worksheet FW5. Can you think of any events that may have caused coral bleaching and or smothering with sediment that may have been observed by indigenous groups in the area at the time? Are these events still a possibility today?



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Altered food web template

Tertiary consumers

Secondary consumers

Primary consumers

Primary producers

Decomposers