

Title: WHAT'S AT THE BOTTOM OF A BAY?

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Environmental Education Team

Grade Level: 3-5

Concepts:	Disciplines:
2. Ecosystem	1. Language Arts
9. Change	2. Science

Objective:

Students will become familiar with the basic components of a bay marine ecosystem by the completion of the word puzzle.

Rationale:

The challenge of a word puzzle in language arts can supplement the science approach to marine plant life in the bays of the Virgin Islands.

Directions:

1. Distribute the activity sheet, allow 10 minutes for completion.
2. Discuss or- distribute the DCCA Fact Sheet No. 9, and have students check their words for the correct answer to the activity question.
3. Discuss or have students write a short paragraph on the general value of sea grasses to a marine ecosystem.

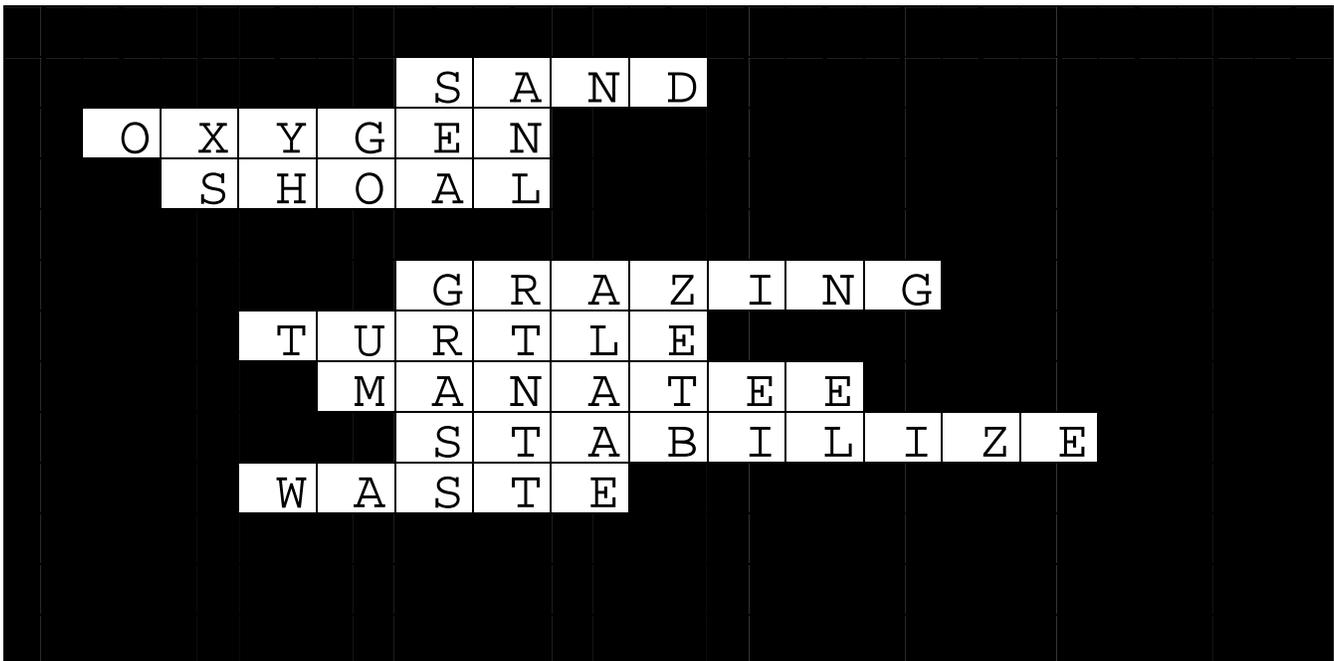
Resources:

Coastal Habitats. Grass Beds, DCCA Environmental Fact Sheet No. 9.

KEY**WHAT'S AT THE BOTTOM OF A BAY?**

The statements below are clues or definitions for the words you must identify in order to solve the word puzzle. This will answer the question "What's at the bottom of a bay?"

1. One of the types of soil in a bay or beach, sometimes used for masonry.
2. A chemical component that- all living things need.
3. One of the types of marine plants sometimes found in a bay.
4. A word that describes animals or sea creatures feeding on green plants.
5. A name for a very common type of marine plant, as well as that of a sea creature.
6. One of the fairly abundant/common types of marine plants.
7. A word that means keeping things the same; under control.
8. A word that is the opposite of to save or conserve.

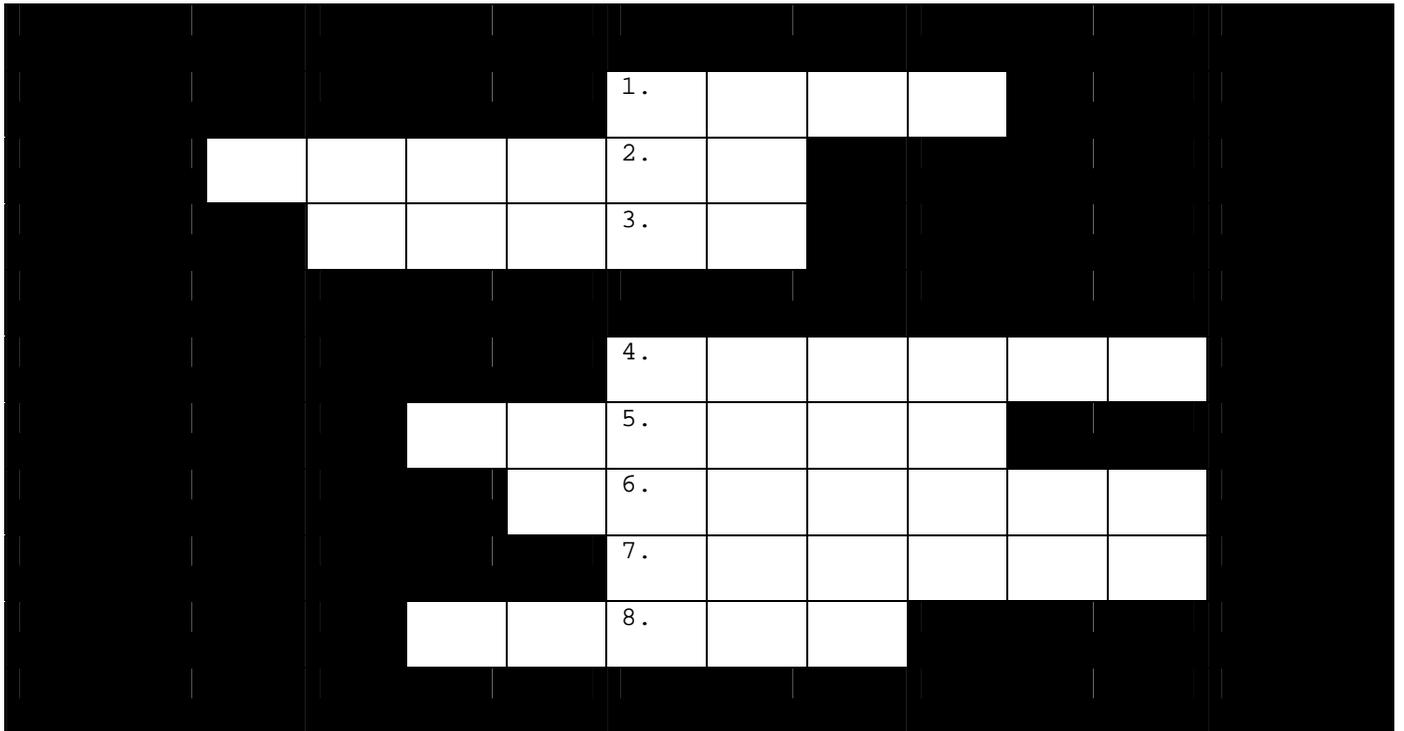
Key

Name:
School:

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What Lives There?

These areas are not really barren. They usually support scattered algae (marine plants) and the flowering plant *Halophila*. Occasional sponges and small solitary corals are present, especially where there is some solid object -- usually a piece of debris -- for attachment. Bottom fishes are few, but lizard fish and file fish are not uncommon. Conch, especially the small fighting conch, and hermit crabs may sometimes be numerous. The preponderance of animals in this habitat is infauna-- burrowing or tube dwelling forms in the sand. Among the most numerous are several kinds of worms which may occur in densely packed beds. A large variety of mollusks, crabs and shrimp live in the sand. Many are nocturnal feeders and when they emerge at night, fish, lobsters, rays, sharks, and other predators from adjacent areas move in to feed on them.

Major Attributes

These large sand deposits may be a good source of sand for construction materials.

Use Limitations

These areas are relatively tolerant of development and human activities.

Island Resources Foundation, V.I. Marine Environments, VICZM Program, Tech. Supplement No. 1, 1976.

(Editor: Marsha McLaughlin, Policy and Planning Unit, DCCA). Further info: Environmental Specialist, DCZM).

Marine pastures produce a significant amount, perhaps most, of the oxygen generated in local inshore waters. On a bright day, dissolved oxygen over a healthy grass. Bed will exceed the saturation value (i. e. , the water becomes supersaturated), and small bubbles rise from the leaves to the surface.

Several species of small fish live in the pastures and a larger variety of others come here to feed on the plants and myriad creatures that live here. This is the habitat of the queen conch and feeding, grounds of the sea turtles. A diverse group of animals live in the sand between the plants, and the bottom is often heaped into mounds marking the burrow entrances of large worms and shrimp.

There is a very close knit relationship between the plants and animals in this habitat, both spatially and physiologically. The pasture is a low profile environment. The plants usually do not exceed eight inches in height, and all but a few of the associated animals live within this zone or in the sediment. Thus, except for visiting foragers and predators, the majority of community energy cycling goes on in close quarters. Wastes from the animals are utilized by the plants which produce oxygen and forage. Mild enrichments of t@ water as by small continuous sewage discharges can cause affected areas of grass to grow extremely rapidly and produce long leaves. Prolonged enrichment usually encourages a typical species of algae, indicative of pollution.

Grass beds help to stabilize the sand, and where they front a beach it has been postulated that they act as a "footing" to retard seaward loss of sand from the beach.

For unexplained reasons, patches of grass removed by various means (dredging, boat anchors) may not be replaced for years. In most bays which have been dredged, the marine pasture has not become re-established in the dredged areas for many years. In the case of Lindberg Bay, St. Thomas 40 years have elapsed, -and a barren hole remains off the western portion of the beach. Even small swatches cut by an anchor, a dredge, or a boat's propeller may remain bare for a year or longer.

Major Attributes	Use Limitations
High oxygen and biological productivity.	Once destroyed, marine pastures usually require a long time to recover Deep holes may never recover. Anchoring, and dredging should be avoided
Usually are associated with clear water, but can tolerate some increased turbidity	Since the community is dominated by plants, a certain minimum amount of light is needed. Can't tolerate heavy turbidity.
Associated animals can remove silt from periodic flooding, incorporate it in sediment and "cleanse" the bottom. Some ability to assimilate other wastes stabilizes sandy bottoms and absorbs wave energy.	
Protects beaches.	

DCCA ENVIRONMENTAL FACT SHEET NO. 9
COASTAL HABITATS: GRASS BEDS

What Are They?

Grass beds are frequently referred to as marine pastures or meadows. This is because they are areas of thick growth of sea grasses and algae resembling pastures on land and serving essentially the same purpose. Most inshore (near to shore) bay bottoms are covered with such pastures, as are some extensive areas outside of bays.

The location of grassbeds is controlled by a number of factors including the character and stability of the bottom, depth, water clarity, currents, and grazing by herbivores. Grasses prefer sand bottoms to hard ones, but do not do well in areas of high wave energy where sand movement is great. Their growth is also interrupted in channels or other areas with swift current. Since the grasses require a lot of light, they usually do not grow below 60-70 feet deep. There is usually a band of bare sand between grass beds and a coral reef or rubble pile. This is because the fish and sea urchins that live there forage on the edge of the pasture.

The dominant plant in local marine pastures is turtle grass. The second most abundant is manatee grass, a grass with thin cylindrical blades. A third, less frequently encountered grass, is called shoal grass or eel grass. On some shallow banks with fine sand, shoal grass may form large beds, as on the south coast of St. Croix. The three plants are usually referred to as sea grasses. They are unlike the majority of marine plants, which are algae, in that they are true flowering plants. Annually, they produce flowers and seeds.

