



The Cycling of Matter and Flow of Energy in Aerobic and Anaerobic Conditions

Ecosystems are composed of many different types of organisms, some which require oxygen to live and others which thrive in the absence of it. A tidal wetland is a perfect example of an ecosystem which has organisms living in both aerobic and anaerobic conditions. The aerobic conditions constitute the water and land around the marsh, whereas the muddy soil is highly anaerobic.

Model Practice

1. Use the following information to construct a food web of a tidal wetland ecosystem:
 - Gulls and otters feed on fish and crabs.
 - Vegetation and algae is eaten by fish and snails.
 - Fish feed on shrimp, crabs, snails, and benthic invertebrates.
 - Snails eat algae and vegetation.
 - Crabs eat snails and vegetation.
 - Shrimp eat algae.
 - Detritus, formed from dead vegetation, is consumed by bacteria and benthic invertebrates that live in the thick muddy bottom.
 - Bacteria break down detritus and create nutrients for the vegetation.
 - Benthic invertebrates also eat bacteria and algae.

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Interpret

1. What organisms live in aerobic conditions? In anaerobic conditions?

2. What organisms are the primary producers? What organism are the consumers?
What organisms are the decomposers?

3. What are the two major biological processes which drives the growth of the primary producers?

Apply

1. If there was a giant oil spill in this tidal marsh and the majority of the algae died, what would be the consequences to the rest of the food web?

2. If the algae survived the oil spill but many of the benthic invertebrates and bacteria species in the soil were hurt, how would this affect the food web?
