

How abiotic factors affect the biota



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The variation of abiotic factors in both the beach and the salt pond greatly affect the biota in those areas. At the beach there was a rocky landscape that rounded the water, while at the salt pond, there was more of a wet grassy area allowing different life forms or biota to thrive in each. Also, physical factors such as temperature, salinity, or dissolved oxygen levels allow for different life forms to prosper in the separate intertidal zones. Lastly, the water layout of an open area with waves at the beach verses a skinnier smaller water areas at the salt pond can determine which animals prefer to live in each place.

Overall, there are many abiotic factors that greatly affect and determine the life of the biota in both the beach and the salt pond intertidal zones. The rocky landscape that surrounds the water allows different biota to thrive and live at the beach than the wet salty salt pond. For example, at the beach there were many different spiders crawling around the rocks. This may be because the rocky area allows for many hiding spots for the spiders from their predators. Also, Lastly, at the salt marsh, there was a lot of muddy area allowing many ribbed mussels to live there.

The ribbed mussel uses the mud to partially bury themselves and they use organic matter and process it into inorganic matter to put it back in the mud and enrich the surrounding mud in the salt pond. In conclusion, the various differences in the landscape of the salt pond and beach caused many different animals to live in each intertidal zone. Multiple physical abiotic data such as temperature, salinity, and dissolved oxygen allowed for different animals to prosper in both the beach and the salt pond.

For example, the temperature of the beach water was 20 °C while the salt pond temperature was 17.3 °C. Since both places have relatively the same temperature, they can tolerate some of the same animals such as hermit crabs, Japanese crabs, and mussels. Also, the two different intertidal zones have different levels of CO₂ causing animals that can or can't tolerate carbon dioxide to move to or from places that have it. The beach water has 12ppm CO₂ while the salt pond has 26ppm CO₂. The more CO₂, the more plant life success because carbon dioxide is needed in the process of photosynthesis.

Carbon dioxide can also be a sign of a lot of animal life because animals release it when they exhale. There are many more plants such as grass in the salt pond than the beach partly because of the high CO₂ levels. Lastly, the dissolved oxygen at the beach and the salt pond vary greatly. At the beach the salt pond DO levels are about 3.3ppm while the DO level at the edge of the salt pond is about 5.4. These numbers make a large difference because a 3-5ppm range of DO allows for 12-24 hours of survival for fish while the 5-6ppm range allows for spawning and reproduction.

The edge of the ocean is not where many fish want to be, even though many of them get washed with the current there anyways. The salt pond levels allow for reproduction of animals such as mummichogs, but it is not high enough to grow a large population of that species in the salt pond area. Overall, there are many physical variations of both the beach and the salt pond which affect which organisms or biota live in each place. Another large abiotic factor that affects the biota is the water formation and set up of both the beach and the salt pond.

For example, in the salt pond there is a lot of salty water, so only animals or plants that can tolerate salt can easily thrive there. Some of the salt-tolerant animals include plants like *Spartina alterniflora* which is a type of grass that dominated the ground area. Also, in the salt marsh, there were many small areas of water slightly separated from the main source. In these small areas of water, many mosquitoes roamed around because it allowed an easy escape from predators. Since mosquitoes need water to complete their life cycle, these small water areas in the salt pond are the perfect place to be.

Lastly, the rocky and multicultural society at the shoreline of the beach allows for a great abundance and variation of crabs. These crabs include the hermit crab, horseshoe crab, japanese crab, spider crab, and green crab. Since crabs love to hide under rocks and have a strong shell, they can survive the harsh conditions at the shoreline. In conclusion, the water formation and set up of both the beach and the salt pond affects the biota of each different intertidal zone. Each organism or biota needs a particular habitat based on the abiotic factors in that area.

Some aspects that may depict this certain habitat include climate, food, shelter, gases, minerals, nutrients, and predators. The beach and the salt pond had two very different habitats that supported some similar, but mostly a lot of different species. Each species determined where it lived based on history, geography, preferences, and also mainly resources. Overall, there are many abiotic factors that greatly affect and determine the life of the biota in both the beach and the salt pond intertidal zones.