

TIDE POOLS

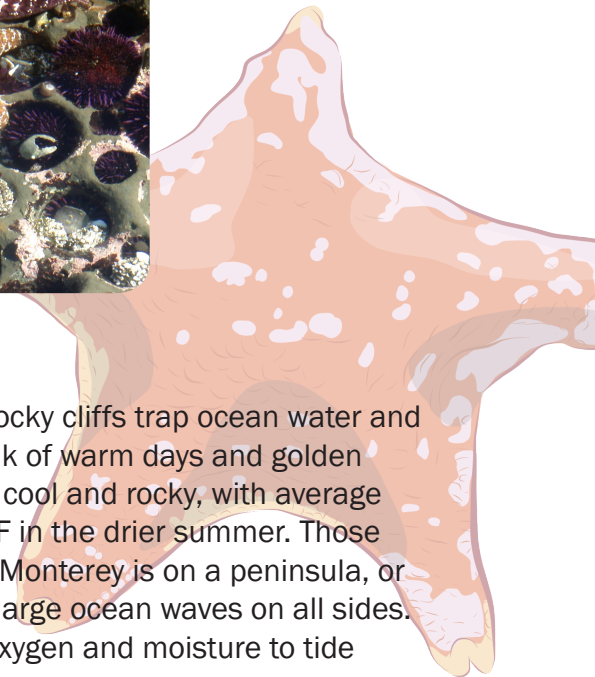
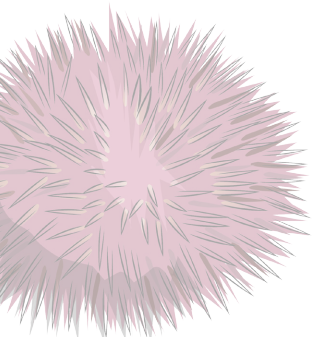
What Is a Tide Pool?

Tide pools are like nature's aquariums, formed when seawater gets trapped in rocky pools and puddles by a lowering tide. These pools are home to some seriously tough creatures. Sun, wind, and waves are constantly interacting with tide pool organisms and shifting their living conditions. Tide pool plants and animals have to adapt to a life where nothing is certain except change.



Monterey, California: A "Tidey" Spot

The coast of Monterey, California is a perfect place for tide pools. Rocky cliffs trap ocean water and create shelter for thousands of marine organisms. Most people think of warm days and golden sand when they picture a California beach, but Monterey is actually cool and rocky, with average temperatures from 44 °F during the rainy winter to just around 70 °F in the drier summer. Those low temperatures mean cold water, usually between 52 °F to 57 °F. Monterey is on a peninsula, or an area of land that sticks out into the water, and gets pounded by large ocean waves on all sides. These waves can be dangerous to humans, but provide important oxygen and moisture to tide pools.



Tide Pool Tactics

Tide pool animals have a lot of great adaptations to help them survive their ever-changing environment.

Slimy Seaweed: Seaweed is built for tough tide pool life with a special slimy coating that keeps it from drying out when the water is low. Seaweed also has built in life vests called air bladders that help it float to the water's surface where the sunlight is. Seaweed provides important food, shelter, and oxygen for tide pool animals.



Strong Mussels: These one inch shelled organisms are from a group of animals called bivalves that includes clams, oysters, and scallops. Marine mussels have a special foot that makes a super sticky fiber called byssal thread that helps them attach to tide pool rocks. Some mussels even use their byssal threads to trap their predators like Spiderman catching a crook!

Sticky Sea Stars: Do not call them fish because sea stars do NOT have fins, gills, or scales. Sea stars are part of a group of animals called echinoderms. All echinoderms have special sticky tube feet that allow them to cling to rocks when the waves rush in. These slow-moving predators eat snails, clams, mussels, and anything else they can catch. Sea stars eat their food by exerting part of their stomach onto their prey and digesting them alive.



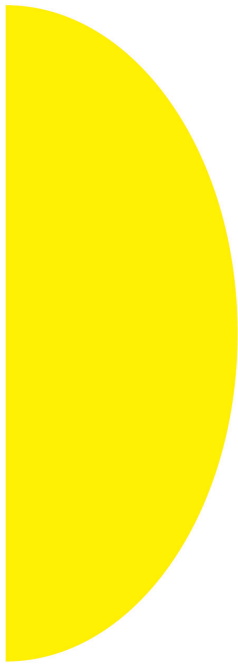
Mobile Home Hermit Crabs: You many have seen hermit crabs with funny painted shells in a pet store. Hermit crabs, unlike their other crab relatives, have soft bellies, so they rely on empty shells they find for shelter. Like all crabs, hermit crabs have eight legs, but two are used to hold onto the hermit's borrowed shell and usually are not visible. The hermit crab's ability to quickly crawl from one place to another helps it find what it needs—shelter, water, food, and a comfortable place to hide.

Sneaky Sculpin: Sculpin are hunters, searching for small crabs, sea snails, and sea slugs when the water is high. These fish are often found hiding under rocks or logs. Spotting one is tough since these tricky hunters have excellent camouflage. Amazingly, this little fish can breathe air—a handy trick when you live in a pool where oxygen levels can get low.

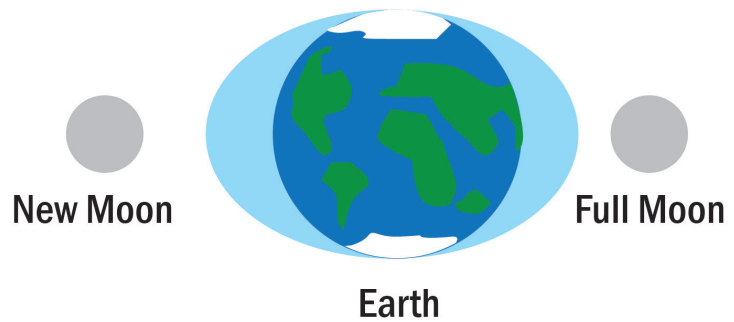


What Makes a Tide?

Tides are caused by the force of gravity from the moon and the sun pulling on the ocean. When water is pulled up onto the beach, it's called high tide. Low tide happens when the waves are pulled back down towards the ocean. As the earth rotates, the position of the moon and its gravitational pull changes. This movement makes two high tides and two low tides each day.



Sun



High Tide



Low Tide

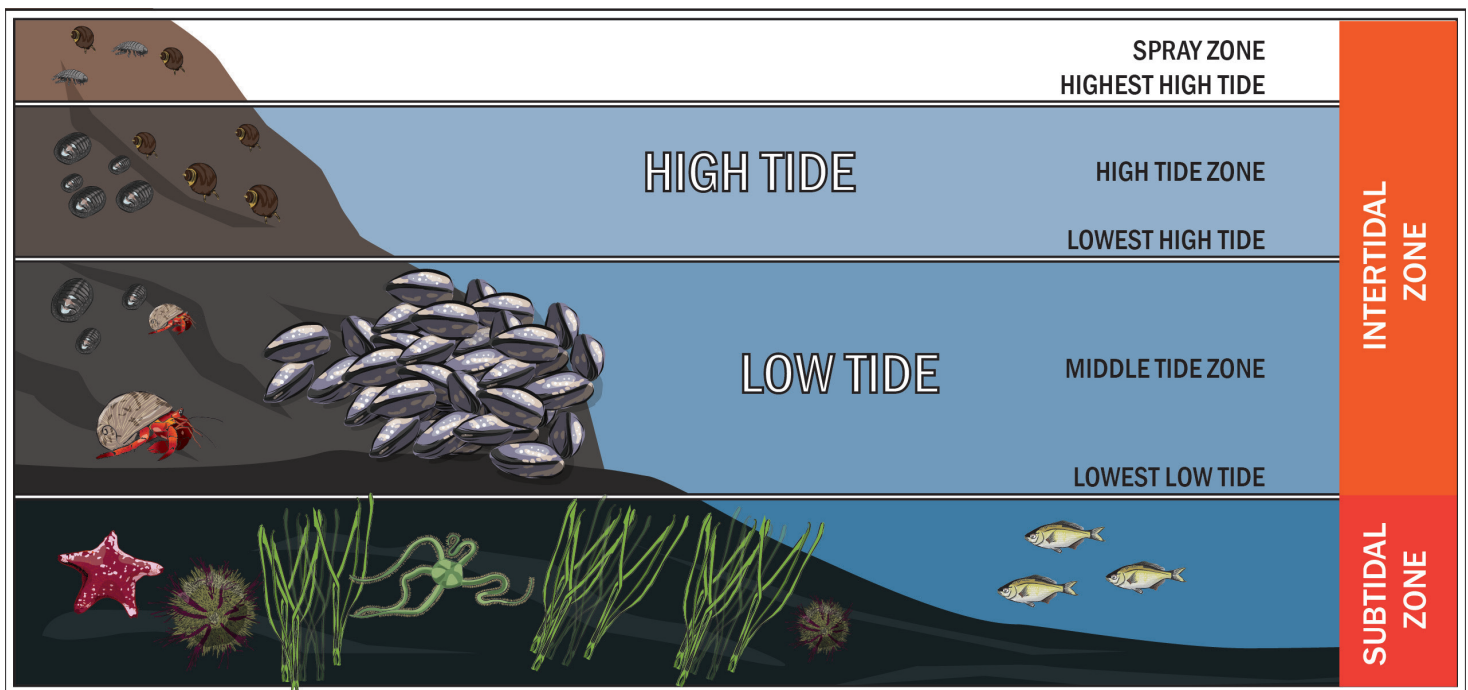
Tidal Zones

Rocky coastlines that are home to tide pools have four different zones. The splash zone is never fully covered by water and is home to animals that like to be moist but not underwater.

The **high tide zone** is only covered for a few hours each day during high tide. Animals that live in this zone have adaptations like shells that close to keep them from drying out.

The **middle tide zone** is covered by water most of the time, but spends part of the day exposed to the sun. Animals that live here can tolerate changes in temperature, salinity, oxygen levels and moisture throughout the day.

Water usually covers the **low tide zone**, but during low tide, this zone is exposed for a few hours each day. This zone has the most kinds of animals and plants and is what people usually picture when they think of a tide pool.



Life in a Tide Pool

There are a lot of advantages to living in a tide pool. Because the water is usually shallow and clear, there is a lot of sunlight for plants. Plants provide food and shelter for animals, as well as oxygen to the water. Tide pools protect small animals by giving them a safe shelter from ocean predators. There is usually plenty of food in a tide pool, with all kinds of organisms living in a small amount of space. When waves are rushing over the tide pool, there is plenty of oxygen and nutrients added to the water.



Tide Pool Challenges

A lot of the good things about life in a tide pool can also cause problems for the creatures that live there. Plenty of sun means lots of plants, but it also means evaporation. As the water dries up, tide pool animals are forced to compete for space, oxygen, and other resources. Tide pools also have big changes in salinity (or how much salt is in the water) and temperature throughout the day. When the tide is high and ocean water is constantly covering the area, salinity levels and temperature are low. At low tide when the pools are exposed to the sun, salt gets left behind by evaporation and temperatures rise. Depending on how dry the tide pools get, land predators may have an easier time catching the tide pool inhabitants.



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