

Ocean Acidification: Climate Change's Partner in Crime

What is Ocean Acidification?

Ocean Acidification (OA) is the decrease in the pH of the Earth's oceans primarily caused by the uptake of carbon dioxide from the atmosphere. The CO₂ when absorbed by the seawater causes chemical reactions that reduce carbonate ion concentration and the saturation of calcium carbonate minerals.

Biological Impacts

OA is estimated to impact many species to various degrees. The main group of animals impacted by the decrease in pH is the class Bivalvia. Bivalves (clams, oysters, etc.) are soft-bodied marine organisms that produce external shells utilizing calcium carbonate minerals. With OA decreasing the saturation of the building blocks for their shells, many juvenile bivalves are unable to form a shell and those that do are weak and eventually lose the shell later. Bivalves aren't the only species affected by OA, sea urchins, shallow sea and deep-sea corals, and even calcareous plankton species are experiencing its impacts.

Why is this a problem?

Many of the species being affected by OA are key members of ecosystems. Bivalves specifically play a role in maintaining the balance of entire ecosystems. They serve as prey for a variety of marine lifeforms and act as a filter service for the Earth's oceans. Without their shells, bivalves will become more susceptible to over predation, pathogens and a decrease in reproduction. Since bivalves are at the bottom of the food chain, once their population numbers begin to decrease, the entire food chain will be affected. With their primary food source gone, many marine species we use to produce medicine will disappear.

How does this affect you?

Many medical institutions are looking into using marine life to create new medicines for treating human diseases including cancers. Some have already been placed into circulation. Acyclovir, an antiviral drug that treats herpes was reported to be a product of compounds collected from a Caribbean sponge. This isn't the only drug that comes from marine life; some other common drugs are:

- Prialt- Used as a pain killer for chronic pains and is synthesized from the venom of the cone snail.
- Halavan- A common drug used to fight breast cancer which is also synthesized from a sea sponge.

Within Colorado, it's estimated that 1 in 7 women will experience breast cancer in their lifetime. The loss of access to Halavan and similar synthetic drugs from the marine environment would be a tragic loss for the medical field and patients. And with OA becoming more potent, these compounds may disappear soon and no longer be available for human use.