

# LOCAL THREATS TO CORAL REEFS

## WATERSHED POLLUTION



Local watersheds, also known as drainage basins, carry water and whatever can float on or be carried within the water from higher ground to lower, eventually reaching the ocean. Along many reefs, where coastal populations were historically smaller than present day, there tended to be little ongoing disturbance to corals and reefs. In more recent times, though, coastal populations have increased and even formerly remote places have urbanized. Watersheds are becoming affected in more ways than they once were.

One form of watershed pollution is called sedimentation. This is the increase in small particles in the water from soil, silt, and sand. Weathering of rocks and land during rainstorms are natural sources of sedimentation, and natural buffers, like estuaries, coastal

wetlands, and mangrove forests, help to slow the flow of water as it reaches the ocean and filter out sedimentation. A combined reduction of natural buffers and increased sources of sedimentation have intensified this type of watershed pollution. Sources include roads, deforestation and forest fires, mining, and agricultural uses such as animal grazing and tilling or plowing. Large amounts of sedimentation entering the ocean cloud the water and cover the coral, blocking the zooxanthellae's ability to photosynthesize, thereby starving the coral.

Increased human populations also lead to a risk in pollution from untreated wastewater that gets into the watershed. The most common sources of wastewater pollution are from agriculture or human sewage. Both types of wastewater are high in toxins and nutrients, which are bad for corals. Untreated sewage includes bacteria, along with endocrine disruptors, heavy metals, pathogens, and other toxins like antibiotics from pharmaceuticals. Antibiotics can damage the protective mucus coating on corals, which is home to a diverse host of bacteria that function similarly to microbes in the guts of humans. Agricultural wastewater can have issues similar to sewage, especially if the farm has a lot of animals, but it can also include chemicals like fungicides and pesticides used on crops or golf courses/lawns.

Excess nitrogen, for example, is a common component of high-nutrient wastewater and can lead to a surge in phytoplankton in the normally low-nutrient water where coral lives. This, in turn, may spawn algal blooms. These blooms will compete with coral for space on the reef, and while herbivorous fish that eat algae can help, nutrient overload will tip the scales in favor of algae.

Runoff from modern human inhabitation can also include a host of chemicals toxic to the aquatic ecosystems, from fuel and oil, to detergents used in cleaning automobiles, to chemicals found in certain types of sunscreen.