

Population growth is a threat multiplier – it makes other problems worse and more difficult to combat. As more people join the planet, they affect the world around them and the world affects them too. More people also means some of the world’s most pressing issues become harder to solve and at the same time, impact more communities worldwide.

The following topics all have connections to both **population growth and ocean health**. Each is accompanied by bullet points of information on a variety of issues within the topic and **links to continue your research**.

OCEAN HEALTH

Oceans cover the majority of the world’s surface and are teeming with species and ecosystems. In fact, [over 80% of the world’s oceans](#) are undocumented by scientists, leaving a vast swath of the world still unknown to humanity.

Humans rely on oceans for food, work, pleasure, and many other foundational needs. In fact, [nearly half of the world’s population](#) lives in coastal communities. At the same time that humans’ need for ocean resources is increasing, the health of our oceans is rapidly declining. Global climate change and pollution alter the chemistry of ocean systems, threatening ocean species and harming biodiversity. Overfishing has decimated the world’s fish populations. Aquaculture, or the farming of aquatic species for consumption, is gaining strength as an alternative but faces a number of environmental challenges of its own.

People have developed a much better understanding of ocean health in the last decade, but the world is still searching for solutions to protect ocean health now and in the years to come.

Aquatic Pollution

Aquatic pollution is more than just littered trash from a beach picnic. Human activity thousands of miles away from the nearest seashore can create waste that ends up in the oceans, which alters the ocean landscape in ways big and small. Pollution can change the chemistry of the ocean’s water or come together in a garbage patch double the size of Texas. Researchers today seek ways not just to clean up the ocean, but to stop pollution from getting there in the first place.

- Ocean pollution primarily occurs in six forms: plastic waste, oil spills, mercury, manufactured chemicals, pesticides, and nutrients. [Read more](#)
- Agricultural runoff and untreated sewage account for about 80% of global ocean pollution. [Read more](#)
- When runoff contains nutrients like phosphorus and nitrogen, algal blooms form and harm ocean ecosystems. [Read more](#)
- Mining and coal combustion both emit large amounts of mercury which is then washed into ocean systems by rain. Mercury in the oceans is a threat to both human and marine life. [Read more](#)
- Plastics are the vast majority of solid debris found in oceans worldwide. [Read more](#)
- Plastic does not degrade naturally and instead is broken down into smaller and smaller microplastics, which are invisible to the eye and impossible to remove from water. [Read more](#)

Impacts of Climate Change (sea level rise, ocean acidity, etc)

Rising global temperatures threaten the world's oceans. Changes in global weather patterns along with heat are fundamentally changing the composition of the oceans, creating environments that are increasingly hostile to marine life and the 40% of the human population that lives in coastal areas.

- Carbon emissions are absorbed by oceans, which changes the pH of surface waters and could lead to oceans that are 150% more acidic by the end of this century. [Read more](#)
- Ocean acidification kills plankton, which are the fundamental basis for ocean food webs, and may create environments that corrode the shells of animals like oysters. [Read more](#)
- Rivers counter ocean acidification by introducing natural chemicals that balance ocean pH, but ocean acidification is increasing too quickly for natural systems to keep up. [Read more](#)
- As the world's oceans grow warmer, marine life including fish and seabirds face deadly conditions and have more trouble finding functional breeding grounds. [Read more](#)
- Rising sea levels flood coastal ecosystems and contaminate fresh water with salt. [Read more](#)

Mangrove Destruction

Mangroves are complex ecosystems anchored by large numbers of mangrove trees, which thrive in swampy areas where fresh water and salt water mix. Mangroves absorb [huge amounts of carbon](#) relative to their sizes and protect against [natural disasters and coastal erosion](#), but they are increasingly weakened and destroyed both directly and indirectly by human activity.

- More than a quarter of mangroves have been lost over the past fifty years, caused particularly by farming and aquaculture. [Read more](#)
- Invasive species threaten biodiversity in mangroves. [Read more](#)
- Ocean pollution, urban development, and tourism are other ways humans harm mangroves. [Read more](#)
- Mangrove loss has dramatically slowed in the last few decades, but escalating consequences of climate change and human land-use could reverse any progress. [Read more](#)
- Erosion makes mangroves more vulnerable to destructive events like storms and makes it harder for mangroves to protect coastal communities from natural disasters. [Read more](#)

Ocean Biodiversity

Oceans contain the [vast majority of spaces](#) where organisms can live on Earth, and many types of ocean creatures can't be found anywhere else. Though new species are discovered in the ocean every day, the threat of extinction looms large for more and more marine life. This variety of species helps provide the oxygen we breathe and the food we eat, but human activities threaten to drastically reduce the biodiversity of oceans worldwide.

- Coastal development and offshore oil production pose two of the greatest threats to ocean biodiversity. [Read more](#)
- Marine Protected Areas (MPAs) are helpful for preserving biodiversity, but only 2% of the world's oceans are fully protected. [Read more](#)
- Over 90% of large predators in oceans have been lost to overfishing, and phytoplankton populations have dropped 40% compared to 1950. [Read more](#)
- Ecosystems on the oceans' floor are especially vulnerable to habitat destruction. [Read more](#)

- Marine life is moving far out of their usual ranges in response to changing ocean conditions, which changes ecosystems and leaves organisms more vulnerable. [Read more](#)

Overfishing

The ocean is a hugely important protein source for people all over the world, and [fish make up over 50%](#) of people's diets in many of the world's poorest countries. The demand for fish has sharply reduced global fish populations, and these populations don't have enough time to regrow before they are fished from again. Despite global pledges for sustainable fishing, the fishing industry struggles to comply.

- To attain sustainable fishing levels, humans need to reduce the number of fish caught by 50%, but demand for fish is rapidly increasing. [Read more](#)
- Ninety percent of the world's fish stocks are overfished or entirely depleted by fishing. [Read more](#)
- By-catch, or fish that were caught unintentionally and are thrown dead back into the oceans, accounts for nearly a quarter of all fish caught. [Read more](#)
- Tropical ecosystems, especially in southeastern Asia, have the world's most overextended fish populations. [Read more](#)
- Illegal, unregulated, and unreported fishing makes it much harder to hit sustainability goals. [Read more](#)

Aquaculture

Aquaculture, or the cultivation of fish, shellfish, algae, and other marine life for food, is increasingly popular as an alternative to catching wild fish populations. The practice has increased over 500% worldwide since 1990. Current practices in aquaculture may produce a lot of food in the short-term but ultimately cause significant health problems for ocean ecosystems as a whole.

- More than 35% of global aquaculture harvests is lost during the manufacturing process. [Read more](#)
- The crowded conditions of farmed fish increase disease transmission and antibiotic use. Disease and antibiotic runoff then spread to wild populations and the rest of the oceans as a whole. [Read more](#)
- Aquaculture produces large amounts of waste from human-made structures and from fish excrement, both of which create deadly conditions in nearby ecosystems. [Read more](#)

- Over 60 million people worldwide are employed by aquaculture operations, and that number is expected to increase as more and more fish are derived from fisheries. [Read more](#)
- Subsidies for fisheries disproportionately go to large commercial operations, which fuel overconsumption and only account for 10% of fishery jobs worldwide. [Read more](#)

Dying Coral Reefs

Coral reefs are the basis of the most diverse ecosystems on Earth, and 500 million people worldwide [rely on reefs for food and employment](#). Unfortunately, these sensitive ecosystems are increasingly unable to withstand the changing ocean environments, and as corals die, they have a cascading effect on the many species that call coral their home. Without proactive coral protection and management, corals worldwide are at risk of permanent destruction.

- When ocean temperatures become too warm, coral expels the algae that lives in its tissues and becomes bleached. Bleached corals are not dead, but they are much more vulnerable than healthy coral. [Read more](#)
- Between 2014 and 2017, more than 75% of the world's coral reefs experienced temperatures high enough to cause bleaching, and 30% of the world's coral reefs died. [Read more](#)
- Bleaching events are becoming more frequent and more destructive. A bleaching event in 2016 and 2017 killed 50% of corals in Australia's Great Barrier Reef. [Read more](#)
- Invasive species like lionfish threaten to overwhelm coral, and coastal erosion can cloud and suffocate coral ecosystems as well. [Read more](#)
- Though coral reefs are primarily threatened by global temperature rise, research shows that coastal communities can take action to mitigate the consequences for their local reefs. [Read more](#)