

Marine pollution

Marine pollution occurs when substances used or spread by humans, such as [industrial](#), [agricultural](#) and [residential waste](#), [particles](#), [noise](#), excess [carbon dioxide](#) or [invasive organisms](#) enter the [ocean](#) and cause harmful effects there. The majority of this waste (80%) comes from land-based activity, although [marine transportation](#) significantly contributes as well.^[1] Since most inputs come from land, either via the [rivers](#), [sewage](#) or the atmosphere, it means that [continental shelves](#) are more vulnerable to pollution. [Air pollution](#) is also a contributing factor by carrying off iron, carbonic acid, nitrogen, silicon, sulfur, [pesticides](#) or dust particles into the ocean.^[2] The pollution often comes from [nonpoint sources](#) such as agricultural [runoff](#), wind-blown [debris](#), and dust. These nonpoint sources are largely due to runoff that enters the ocean through rivers, but wind-blown [debris](#) and dust can also play a role, as these pollutants can settle into waterways and oceans.^[3] Pathways of pollution include direct discharge, land runoff, [ship pollution](#), atmospheric pollution and, potentially, [deep sea mining](#)

Ways of pollution

Direct discharge

[Sewerage](#), [Industrial waste](#), and [Environmental impact of mining](#).

Pollutants enter rivers and the sea directly from urban [sewerage](#) and [industrial waste](#) discharges, sometimes in the form of [hazardous](#) and [toxic wastes](#), or in the form of plastics.

Land runoff

[Urban runoff](#), [Stormwater](#), and [Nutrient pollution](#)

[Surface runoff](#) from farming, as well as [urban runoff](#) and runoff from the construction of roads, buildings, ports, channels, and harbours, can carry soil and [particles](#) laden with carbon, nitrogen, phosphorus, and minerals. This nutrient-rich water can cause fleshy algae and [phytoplankton](#) to thrive in coastal areas; known as [algal blooms](#), which have the potential to create [hypoxic](#) conditions by using all available oxygen. In the coast of southwest Florida, harmful [algal blooms](#) have existed for over 100 years.^[10] These algal blooms have been a cause of species of fish, turtles, dolphins, and shrimp to die and cause harmful effects on humans who swim in the water

Ship pollution

Ships can pollute waterways and oceans in many ways. [Oil spills](#) can have devastating effects. While being toxic to marine life, [polycyclic aromatic hydrocarbons](#) (PAHs), found in [crude oil](#), are very difficult to clean up, and last for years in the [sediment](#) and marine environment.

Atmospheric pollution

Another pathway of pollution occurs through the atmosphere. Wind-blown dust and debris, including [plastic bags](#), are blown seaward from [landfills](#) and other areas. Dust from the [Sahara](#) moving around the southern periphery of the [subtropical ridge](#) moves into the [Caribbean](#) and [Florida](#) during the warm season as the ridge builds and moves northward through the subtropical Atlantic. Dust can also be

attributed to a global transport from the [Gobi](#) and [Taklamakan](#) deserts across [Korea](#), [Japan](#), and the Northern [Pacific](#) to the [Hawaiian Islands](#).

Deep sea mining

As with all mining operations, deep sea mining raises questions about potential environmental damages to the surrounding areas. Because deep sea mining is a relatively new field, the complete consequences of full-scale mining operations are unknown.

Types of pollution

Marine debris pollution

[Marine debris](#), also known as marine litter, is human-created [waste](#) that has deliberately or accidentally been released in a [sea](#) or [ocean](#). Floating oceanic debris tends to accumulate at the center of [gyres](#) and on [coastlines](#), frequently washing aground, when it is known as *beach litter* or tidewrack. Deliberate disposal of wastes at sea is called *ocean dumping*. Naturally occurring debris, such as [driftwood](#) and [drift seeds](#), are also present.

Plastic pollution

[Marine plastic pollution](#) (or plastic pollution in the ocean) is a type of [marine pollution](#) by [plastics](#), ranging in size from large original material such as bottles and bags, down to [microplastics](#) formed from the fragmentation of plastic material. [Marine debris](#) is mainly discarded human rubbish which floats on, or is suspended in the ocean. Eighty percent of marine debris is [plastic](#).

Ocean acidification

[Ocean acidification](#) is the ongoing decrease in the [pH](#) value of the [Earth's oceans](#), caused by the uptake of [carbon dioxide](#) (CO₂) from the [atmosphere](#).^[50] The main cause of ocean acidification is the [burning of fossil fuels](#). Ocean acidification is one of several [effects of climate change on oceans](#). Seawater is slightly [basic](#) (meaning pH > 7), and ocean acidification involves a shift towards pH-neutral conditions rather than a transition to acidic conditions (pH < 7)

Nutrient pollution

[Eutrophication](#) is an increase in chemical [nutrients](#), typically compounds containing [nitrogen](#) or [phosphorus](#), in an [ecosystem](#). It can result in an increase in the ecosystem's [primary productivity](#) (excessive plant growth and decay), and further effects including lack of oxygen and severe reductions in water quality, fish, and other animal populations

Toxins

Apart from plastics, there are particular problems with other [toxins](#) that do not disintegrate rapidly in the marine environment. Examples of [persistent toxins](#) are [PCBs](#), [DDT](#), [TBT](#), [pesticides](#), [furans](#), [dioxins](#), [phenols](#), and [radioactive waste](#). [Heavy metals](#) are metallic chemical elements that have a relatively high density and are toxic or poisonous at low concentrations. Examples are [mercury](#), [lead](#), [nickel](#), [arsenic](#), and [cadmium](#). Such toxins can accumulate in the tissues of many species of aquatic life in a process

called [bioaccumulation](#). They are also known to accumulate in [benthic environments](#), such as [estuaries](#) and [bay muds](#): a geological record of human activities of the last century.

What are the effects of marine pollution?

Marine creatures feel the repercussions of human pollution. Our oceans provide thriving, diverse habitats to thousands of species. But unwanted rubbish invades these habitats and disrupts their natural habits.

Harm to Wildlife

Animals may ingest plastic items, leading to illness or death. Still more get trapped in nets and bags, never again to enjoy a normal life.

Acidification of the Ocean

As the ocean takes in more pollutants and absorbs more carbon dioxide, the pH levels fundamentally change and become more acidic.⁴ This change in acidity has negative repercussions, such as:

- Bleaching of coral reefs

- Habitat loss

- Lack of calcium carbonate mussels and clams need for strong shells

- Disruption of food chains

- Damage to fishing-based economies around the world

Changes in the ocean's acidity are escalating faster than ever before in history. Without intervention, these problems will only worsen.

How You Can Prevent Marine Pollution?

The problems facing our ocean are real. And they may seem insurmountable. But don't give up hope because the challenges are intimidating. You can still make a significant difference in the fight against marine pollution.

Reduce, Reuse, and Recycle

Most of us have heard these words since childhood. As we seek to prevent pollutants from entering our oceans, these Three Rs are crucial. Here are a few ways you can apply them:

- Reduce:** cut down on your plastic use, especially single-use disposables.

- Reuse:** use products more than once or switch to more durable reusable items.

- Recycle:** learn more about recycling in your area, and be sure to recycle plastic properly.

Beginning with something as simple as buying a reusable water bottle or lunch kit is a great way to gain momentum. And every small change creates a positive impact.

Clean Up Rubbish

When you see litter in your day-to-day life, do what you can to move it to a receptacle. To go further, organize or participate in a group cleanup project in your area! Every piece of rubbish you remove helps decrease marine pollution worldwide.

Ocean Pollution

Causes

- Industrial waste
- Oil platforms
- Ocean mining
- Illegal dumping
- Lack of regulation
- Surface runoffs
- Cargo transportation
- Lack of expertise
- Tanker leaks
- Carelessness
- Marine accidents
- Low quality control mechanisms
- Consumption behavior
- Excessive waste production

Effects

- Biodiversity loss
- Water pollution
- Destruction of habitats for water animals
- Harm to coral reefs
- Endangerment and extinction of species
- Effects on aquatic plants
- Public health issues
- Visual pollution
- Drop in tourism
- Decrease in fish populations
- Loss of livelihood for locals

Solutions

- Global collaboration regarding ocean protection
- Higher local regulatory standards
- Higher fines for illegal ocean dumping
- More sophisticated controls
- Improvement of knowledge
- Adjustment consumption behavior
- Avoidance of waste
- Education
- Raise awareness
- Convince family and friends