



OPINION ARTICLE



## Various Kinds of Surface Water Pollution

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### Description

River, lake, and ocean contamination are all examples of surface water pollution. Ocean-related marine pollution is a subcategory of surface water pollution. The term “nutrient pollution” describes contamination caused by excessive nutrient inputs. As of 2017, the Joint Monitoring Project for Water Supply and Sanitation estimated that around 4.5 billion people worldwide lacked access to safely managed sanitation. Lack of access to sanitation is alarming and frequently causes water pollution, such as when people practice open defecation, which causes human waste to be carried into surface waterways during storms or floods. Small pit latrines might potentially flood when it rains.

### Marine pollution

When materials utilised or disseminated by humans, such as industrial, agricultural, and residential trash, particles, noise, too much carbon dioxide, or invading creatures, enter the water and have a negative impact there, that is when marine pollution happens. Although marine transportation also makes a substantial contribution, land-based activity accounts for the majority (80%) of this waste [1]. Since most inputs come from land, whether through rivers, sewage, or the atmosphere, continental shelves are more prone to contamination. Air pollution also contributes to the issue by introducing iron, carbonic acid, nitrogen, silicon, sulphur, pesticides, or dust particles into the water. Nonpoint sources include dust, wind-blown debris, and agricultural runoff are common causes of pollution [2]. Although wind-borne dust and debris can settle into waterways and oceans, they can also contribute to these nonpoint sources, which are usually brought on by runoff from rivers that flow into the ocean. Examples of pollution channels include

direct discharge, land runoff, ship pollution, atmospheric pollution, and maybe deep sea mining.

### Nutrient pollution

Water contamination caused by excessive nutrient inputs is referred to as nutrient pollution. It is a major factor in the eutrophication of surface waterways, such as lakes, rivers, and coastal waters, where an overabundance of nutrients, typically nitrogen or phosphorus, encourages the growth of algae [3]. Surface runoff from agricultural fields and pastures, septic tank and feedlot discharges, and combustion emissions are all sources of nutrient pollution. Due to the high nutritional content of sewage, it plays a significant role in cultural eutrophication. Sewage dumping, or the discharge of raw sewage into a major body of water, is still a problem worldwide [4]. Several serious environmental issues are linked to the presence of too much reactive nitrogen molecules in the environment.

### Thermal pollution

The degradation of water quality brought on by any process that raises or reduces the temperature of the surrounding water is referred to as thermal enrichment, also known as thermal pollution [5]. The term “thermal pollution” refers to changes in water temperature brought on by human activity. Unlike chemical pollution, thermal pollution alters the physical characteristics of water [6]. The use of water as a coolant by industrial enterprises and power plants is a frequent contributor to thermal pollution. Thermal pollution can also come from urban runoff rainfall that is released to surface waters from rooftops, highways, parking lots, and reservoirs. The spilling of extremely cold water into warmer rivers from reservoir bases can also result in thermal pollution [7].

As gases are less soluble in warmer liquids, elevated

water temperatures result in lower dissolved oxygen levels, which can kill fish and cause them to rot. They can also change the makeup of the food chain, limit species biodiversity, and encourage the invasion of new thermophilic species [8].

### Biological pollution

The effect of human activity on the quality of the aquatic and terrestrial environment is known as biological pollution (also known as bio pollution or effects). The introduction of non-native and invasive species, often known as invasive alien species or IAS, is an example of biological pollution. Water pollution is caused when biological pollution is introduced to an aquatic ecosystem.

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