



Impact of Human Activities on Marine Water Quality

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DESCRIPTION

Marine water, encompassing the vast bodies of saltwater that cover over 70% of the Earth's surface, is a significant and dynamic component of our planet. These vast oceans, seas, and coastal waters are not only interesting in their beauty but also play a fundamental role in shaping our climate, ecosystems, and even the evolution of life itself. In this article, we will explore the multifaceted nature of marine water, its importance to life on Earth, the challenges it faces, and the role it plays in our global environment. Marine water, also known as saltwater, contains a mixture of dissolved salts and minerals, primarily sodium chloride (table salt). This saline composition makes it distinct from freshwater found in rivers, lakes, and underground aquifers. Marine water has an average salinity of about 35 parts per thousand, which translates to approximately 3.5% salinity. Salinity can vary in different parts of the world's oceans and seas, influenced by factors like temperature and evaporation rates. The oceans, which hold about 97.5% of Earth's water, play a pivotal role in regulating our planet's climate. Oceans have an enormous heat capacity, which means they can absorb and store vast amounts of heat from the sun. This heat absorption helps regulate temperature variations and mitigates extreme climate fluctuations. The movement of ocean water is driven by variations in temperature and salinity. This circulation, known as the thermohaline circulation, helps transport warm water toward polar regions and cold water back to the equator, influencing regional and global climates. Oceans also act as carbon sinks, absorbing and storing large amounts of atmospheric carbon dioxide. This process helps mitigate the greenhouse effect, although it can have detrimental consequences in the form of ocean acidification. The release of water vapor from the ocean surface contributes to cloud formation. Clouds play a vital role in reflecting sunlight and regulating temperatures, further affecting Earth's climate. Marine water supports an incredible array of life. From the tiniest plankton to the largest whales, marine ecosystems are teeming with diverse organisms. Oceans and

seas provide habitat for countless species, including coral reefs, kelp forests, and underwater canyons. These habitats support a wealth of marine biodiversity. The oceanic food web begins with microscopic phytoplankton, which are primary producers that form the base of the marine food chain. They are consumed by zooplankton, small fish, and continue up the chain to apex predators like sharks and whales. Many species of fish and invertebrates use coastal waters as nursery grounds, where juveniles find protection, food, and suitable conditions for growth before venturing into deeper waters. Marine water is vulnerable to pollution from various sources, including industrial runoff, plastic waste, oil spills, and nutrient discharges. These pollutants can harm marine life and ecosystems. Overfishing and illegal, unreported, and unregulated (IUU) fishing practices can deplete fish stocks and disrupt marine food webs. Rising sea temperatures, ocean acidification, and extreme weather events are all associated to climate change. These impacts can harm marine ecosystems, particularly coral reefs and polar environments. Coastal development, coral bleaching, and habitat degradation from destructive fishing practices can lead to the loss of critical marine habitats. The introduction of non-native species to marine environments can disrupt local ecosystems and outcompete native species. Establishing Marine Protected Areas (MPAs), where fishing and other potentially harmful activities are restricted or prohibited, can help protect critical marine habitats. Implementing sustainable fishing practices, including regulations on catch limits, gear types, and seasonal closures, can support the health of fish stocks and marine ecosystems. Reducing land-based pollution through improved waste management and stricter regulations can safeguard marine water quality. Addressing climate change is essential. Efforts to reduce greenhouse gas emissions and protect vulnerable ecosystems, such as coral reefs, are vital components of climate mitigation. Increasing public understanding of marine water's importance and the threats it faces can foster a sense of stewardship and inspire positive actions.

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