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Marine Pollution, Sources, Effect and Management

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Abstract: *Marine pollution is the harmful effect caused by the entry into the ocean of chemicals or particles. E Many particles combine chemically in a manner highly depletive of oxygen, causing estuaries to become anoxic. This article explains the causes, consequences and cure of Marine pollution. Three different kinds of marine pollution have been categorised- caused through land, caused through air and caused by means of transportation. The pollutants from the land like industrial wastes and other wastes are discharged into sewerage and more untreated waters of from fertilizer and pesticide run off from agricultural lands that further is disposed into the waterways. Daily use of plastics is also contributing to the marine pollution. Oil spills and negligent acts of the transporters of the oil have a hazardous impact on marine life. Microorganisms and other animals eat the plastic assuming it as food and die off. There are many different enacted legislations which have provided for the prevention of the environment. This paper shall chalk out the steps to prevent the pollution that has been caused by endless pollutants. the present knowledge on pollutant impacts on marine viruses, virus-host systems and their. This short review summarizes potential ecological implications. Excess nutrients from sewage and river effluents are a primary cause of marine eutrophication and mucilage formation, often related to the development of large viral assemblages. At the same time, hydrocarbons, polychlorinated biphenyl and pesticides alter ecosystem functioning and can determinate changes in the virus-host interactions. thus increasing the potential of viral infection. All these pollutants might have synergistic effects on the virus-host system and are able to induceprophage, marine ecosystems. Thus increasing the impact of viruses on marine ecosystem.*

Keywords: Marine pollution

I. INTRODUCTION

Marine pollution occurs when harmful effects result from the entry into the ocean of chemicals, particles, agricultural and residential waste, noise, or the spread of invasive organisms. Eighty percent of marine pollution comes from land. Air pollution is also a contributing factor by carrying off pesticides or dirt into the ocean. Land and air pollution have proven to be harmful to marine life and its habitats. The pollution often comes from nonpoint sources such as agricultural runoff, wind-blown debris, and dust. Pollution in large bodies of water can be aggravated by physical phenomena like the biological effects of Langmuir circulation. Nutrient pollution, form of water pollution, refers to contamination by excessive inputs of nutrients. It is a primary cause of eutrophication of surface waters, in which excess nutrients, usually nitrates or phosphates, stimulate algae growth Many potentially toxic chemicals adhere to tiny particles that are then taken up by plankton and benthic animals. most of which are either deposit feeders or filter feeders. In this way, the toxins are concentrated upward within ocean food chains. Many particles combine chemically in a manner highly depletive of oxygen, causing estuarics to become anoxic. When pesticides are incorporated into the marine ecosystem they quickly become absorbed into marine food webs. Once in he food webs, these pesticides can cause mutations, as well as diseases, which can be harmful to humans as well as the entire food web Toxic metals can also be introduced into marine food webs. These can cause a change to tissue matter, biochemistry, behaviour, reproduction, and suppress growth in marine life. Also, many animal feeds have a high fishmeal or fish hydrolysate content. In this way, marine toxic can be transferred to land animals, and appear later in meat and dairy products.

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Types of Marine Pollution

Eutrophication :

When there is an excess of chemical nutrients mainly nitrates and phosphates in the water, it leads to eutrophication or nutrient pollution. Eutrophication decreases the level of oxygen, reduces the quality of water, makes the water inhabitable for fish, affects the breeding process within the marine life and increases the primary productivity of the marine ecosystem.

Acidification:

Oceans act as a natural reservoir for absorbing the carbon dioxide from the Earth's atmosphere. But, due to rising level of carbon dioxide in the atmosphere, he oceans across the world are becoming acidic in nature, as a consequence, it leads to acidification of oceans. Researches and scientists have not been able to uncover the potential damage ocean acidification may have on the Earth's atmosphere. But there is a strong concern that acidification might lead to dissolution of calcium carbonate structures, that can affect the shell formation in shellfish and also the corals.

Toxins:

There are persistent toxins that do not get dissolved or disintegrate ith the marine ecosystem rapidly. Toxins such as pesticides, DDT,PCBs, furans, TBT, radioactive waste, phenols, and dioxins get accumulated in the tissue cells of the marine lifeforms and lead to bioaccumulation hampering the life underwater and sometimes leads toa mutation in aquatic life forms.

Plastics

The ever-growing dependence of human population on plastic has filled the oceans and the land, it consists of 80 percent of the debris found in the oceans. Plastic dumped and found in the oceans are dangerous for the marine life forms and wildlife, as sometimes it strangles and chokes them to death. The rising levels of plastic dumps found in the oceans are suffocating, ingesting, and entangling the life underwater as well as above it.

Indian Ocean

Indian Ocean is the third largest ocean surrounding a densely populated region. It contains additional 20% of water on Earth's surface

It broader India at the North, East Africa, Australia and the Southern Ocean. Because if higher water temperature, it has limited marine life.

Since about 800 A.D. the Indian Ocean has played an important role in trading. For centuries, navigators have sailed along major ocean currents for shipment routes.

It is bounded by 4 tectonics plate boundaries and may include an additional plate boundary. It is the geologically youngest of the$ oceans with spreading ridges at divergent plate boundaries.

Sources of Marine Pollution

Marine pollution is a growing problem in today's world. Our ocean is bcing flooded with two main types of pollution: chemical and trash Chemical contamination. Or nutrient pollution, is concerning for health, environmental, and economies reasons This type of pollution Occurs when human activities, notably the use of fertilizer on farms, lead to the runoff of chemicals into waterways that ultimately flow Into the ocean. The increased concentration of chemicals, such as nitrogen and phosphorus, in the coastal ocean promotes the growth Of algal blooms, which can be toxic to wildlife and harmful to humans The negative effects on health and the environment caused by Algal blooms that hurt local fishing and tourism industries.

From Land

non-biological marine pollution comes from land based activities (sewage, industrial, ,chemical and food processing wastes) 80% of 1Most obvious inputsvia pipes discharging directly into marine waterRiverine flows into the sea carry pollutants from the entire catchment area

From Air

Global atmospheric inputs to the sea from air discharges.

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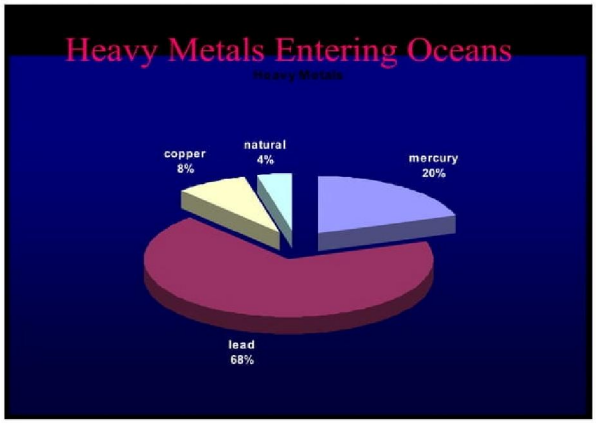
Challenges:

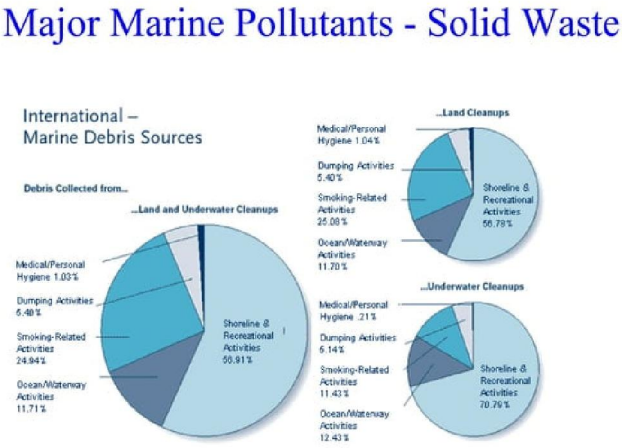
Major Marine Pollutants- Metals

Introduced dangerous metals include mercury, lead, and copper great concern because they enter the food chain
Copper is dangerous to marine organisms and has been used in marine anti-fouling paints
Mercury and lead poisoning cause brain damage and behavioral disturbances in children Contaminated land runoff, rain of pollutants from the air, and fallout from shipwrecks pollute the ocean with dangerous metals
Human activities release 5 times as much mercury and 17 times as much lead as is derived from natural sources



Major Marine Pollutants – Solid Waste

Solid Waste a large portion and great danger is non- biodegradable plastic 46,000 pieces of floating plastic/sq. mile of ocean surface off the N.E U.S.coast
Sea turtles mistake plastic bagsfor jellyfish and die form interalblockages
Seals and sea lions starve after being entangled by nets or muzzled by six-pack rings (decomposition time 400ycars)
Plastic debris kills 100,000 marine mammals and2 million sea birds die annually



Major Marine Pollutants- Biological

International Maritime Organization top ten: Cholera, Cladocera Water Flea, Mitten Crab, toxic algae (R,G,B tides), Round Goby, European Green Crab, Asian kelp, Zebra Mussel, North Pacific Sea star, North American Comb Jelly. Spreading infestation of Jamaican waters by a Green mussel.

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Impacts of Marine Pollution

Generally marine pollution affects ecosystem health, public health, recreational water quality and economic viability in the Following ways:

Mechanical

Eutrophication

Saphrogcnic

Toxicity

Mutagenic and Carcinogenic

Cost of Marine Pollution

3.25 million metric tons of oil waste dvs.

3.4 million tons used by Jamaica annually100,000 mammal and 2 million bird deaths annually

Reduction of GDP by decreasing fishery resource (11.9% tonnes-7.7k landed 1960-97)and decreased tourism canings

Loss of bio-diversity and potential life-saving medicines (for AIDS &Cancer)

II. METHODOLOGY

Solutions to Pollution

Two main methods

Correction-costly and time intensive

Prevention= requires atitude changes

Coastal Scientists believe that prevention is better than cure since the effects of marine pollution may be irreversible and we may therefore be creating everlasting damage to the marine ecosystem. “An ounce of preventions worth a pound of cure"

Marine Pollution Conventions

There are no less than 6 international marine pollution conventions. Some are listed below:

Convention for the Prevention of Marine Pollution by Dumping from Ships and Air craft(1972) The Oslo Convention for the prevention of pollution from ships (1973)MARPOL

Convention for the Prevention of Marine Pollution from Land-based Sources (1974)The Paris Convention

Convention for the Protection of the Marine Environment of the North-East. Atlantic (1992) The OSPAR Convention

III. CONCLUSION

Although the ocean-and the resources within-s -seem limitless, there is clear evidence that human impacts such as overfishing, habitat destruction, and pollution disrupt marine ecosystems and threaten the long-term productivity of the seas. Declining yields in many fisheries and decay of treasured marine habitats, such as coral reefs, has heightened interest in establishing a comprehensive system of marine protected areas (MPAs)-areas designated for special protection to enhance the management of marine resources

Therefore, there is an urgent need to evaluate how MPAs can be employed in the United States and internationally as tools to support specific conservation needs of marine and coastal waters.Marine Protected Areas compares conventional management of marine resources with proposals to augment these management strategies with a system of protected areas. The volume argues that implementation of MPAs should be incremental and adaptive, through the design of areas not only to conserve resources, but also to help us learn how to manage marine species more effectively

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