Marine Pollution – Affecting Tomorrow’s World Essay, Research Paper

Marine Pollution:

Affecting Tomorrow’s World

Marine pollution, can be defined as:

“The introduction of man, directly or indirectly, of substance or energy into the marine environment, resulting in such effects as harm to living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water and reduction of amenities (Johnston, 1976).”

The ocean has been calculated to be about 2.5 billion years old, nearly half the age of the earth. It covers 71% of the earth’s surface. Together, the ocean and the atmosphere form a single system, which affects nearly every aspect of life on the planet. Because they are so interrelated, any substance we humans put into the air almost always ends up in the sea, in one form or another. And, what goes into the ocean often winds up in our food thorough ocean evaporation and rainfall. Thus, as we affect the oceans and seas, they in turn may have an affect in some way or another on all life, especially human beings, on the planet.

The ocean serves as the basic foundation of the entire Earth’s food chain. “Plankton (phytoplankton) is the collective term used to describe the microscopic plants and marine animals (zooplankton) that exist in huge quantities in the sea and which form the basis of the earth’s complex food chain (Gorman, 1993).”

The phytoplankton are responsible, whether it be directly or indirectly for providing food for most of the earth’s organisms, including human beings. These organisms as little as they may seem, through Phytoplankton activity are also responsible for generating 70% of the Earth’s oxygen.

Therefore, the ocean is actually a much more integral part to everyday life for human beings. It does not only serve as a means for recreation or obtaining food, but rather it is the home of one of the most essential necessities for species survival on our planet. For this reason, marine pollution awareness has increased dramatically in the past couple of decades. And great strides have been taken to ensure the cleanup and survival of our planet’s oceans.

The actual term, “marine pollution,” was not a widely used term until 1967, when the tanker the Torrey Canyon spilled more than 36 million gallons of oil 20 miles off the coast of Cornwall, England. After this catastrophe, an official definition of what exactly marine pollution meant, was formed by the United Nations Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). The term has been used ever since. Until that time, pollution was actually a pretty unknown term. Pollution actually began with the rise of agricultural civilizations. As communities began to form, “animal and human waste that had once been returned to the land was now being concentrated in the nearest bodies of water, either as runoff or sewage (Johnston, 1976).” Thus, the problem of marine pollution began.

After the establishment of its definition, scientists began to differentiate between marine contamination and marine pollution. Contamination, defined as, “the presence of elevated concentrations of substances in the water, sediments or organisms.” Contamination was only seen as a warning sign of possible pollution (Gorman 1993).”

All marine pollution, must originated from one of two places, the land or the sea. And although the term is marine pollution, it has been found that in actuality most marine pollution is actually generated from the air and from land. Airborne pollutants suffer from physical, chemical and biological changes before entering the seawater causing them to be much worse. Once these pollutants have entered the oceans, when compounded with the organic and inorganic matter already in the seawater, they have even more of a negative effect on the sea and its inhabitants. “The most important aspects of the contamination of the marine environment are the hazards to man caused by consuming contaminated fishery products and the damage inflicted on marine organisms and ecosystems (Pearson, 1975).”

Marine pollutants can generally be divided into three broad categories: (1) Natural (man is not involved);

(2) Generated (exploited by man, but not created by him) and (3) Synthetic (created by man).

Natural pollution in the oceans has been occurring basically from the beginning of the planet earth. There are always natural disasters occurring, such as volcanic eruptions, which contribute to pollution by producing high levels of toxic metal salts and floods, which leads to erosion of land. As long as there have been animals to contribute their waste products, or plants to fall into the water and decay, or meteorites to crash from the sky with strange metals and minerals that dissolve in the sea. Even something as normal as the natural process of rain can erode land and bring sediment and dissolved salts to the ocean contributing to its pollution.

These natural processes, which contribute to pollution, cannot be prevented. However, when other types of pollution are added to the natural pollutants of the earth, it creates for a bad situation in regard to the state of our oceans.

Generated pollution is strictly a problem due to the exploitation of our planet’s resources by human beings. Whether it be through mining, farming, water usage, or forestry we are slowly depleting the natural resources of the earth, which until is brought to the public’s attention are things that are taken for granted. Islands nations, which have limited inland sources of building materials, turn to coastal sand and gravel and surrounding coral reefs, but mining these resources can erode beaches, diminish water quality and ruin coastal habitats. Therefore, exploiting the resources, which are such an important part of our everyday lives.

Synthetic pollution is the pollution, which is most detrimental not only to marine life, but to human beings as well. Ironically, the very people that are endangered by the effects of synthetic pollution are the people that in actuality create this type of pollution. There are many different types of synthetic pollution, ranging from marine debris and toxic materials to oil pollution. All of which, are very hazardous on numerous levels.

Marine debris is material such as plastics, glass and metal, which decompose extremely slowly, or in some cases if even at all. “The term marine debris now is primarily used to describe plastic litter, which is particularly hazardous because, unlike glass and metal, it floats (Pearson, 1975).”

Our trash kills! When odds and ends of life on land, particularly plastic, end up in the sea, they pose hazards to marine life. Animals drown, are strangled and even die from getting caught in or ingesting plastics and other garbages. Whether getting tangled in discarded or lost fishing gear, soda can rings or old fishing nets or, eating balloons, plastic bottles, broken plastic pieces and other trash their own home has become a hazard for them to live in. Medical waste and trash are constantly washing up on beaches; the oceans have become a human dumping ground. Medical waste and trash such as Styrofoam cups, condoms, disposable diapers, broken glass, shredded tires, soda tops and beer cans have been known to wash up on beaches and shores, creating hazardous situations not only for the marine life, which inhabits the area, but also for the humans who frequent these places.

The debris enters the oceans, in many ways, intentional dumping from ships, accidental discharge from ships or garbage barges on their way to offshore landfills, as part of sewage, by being swept from the land by wind or storms, from polluting rivers and streams and from runoff from beaches littered with trash. These unsanitary conditions are not only disgusting to see, but are also harmful to our well being as a species.

Another main part contributing to synthetic debris, are toxic materials. “Metals and slowly degrading chemicals threaten inland and coastal waters. Toxic materials settle into sea-floor sediments where they accumulate as hazards to organisms that live in and feed on bottom muds. Eventually, long lasting chemicals may enter the food chain and contaminate the fish and shellfish we eat (Ocean Planet, 2000).”

Toxins such as Mercury, Dioxins, PCBs, and low-level radioactive materials all contribute to the marine pollution problems, which have lasting effects on us. Seafood contaminated by mercury causes birth defects and nervous system damage in humans. Mercury can enter the ocean through air pollution, manufacturing and actual natural sources of it. Dioxins and related compounds degrade slowly and are very toxic to marine life. They cause genetic chromosomal abnormality in marine life and are suspected of causing cancer in humans. Dioxins can enter the water from untreated wastewater that paper mills discharge into rivers and streams and also through the atmosphere when dioxin-containing compounds are sprayed.

PCBs (polychlorinated biphenyls) originated from some electrical equipment and hydraulic fluids causing developmental problems in children and reproductive problems in some other animals. And finally, low-level radioactive materials such as nuclear waste, reactor leaks, fallout and natural radioactivity have lasting consequences on humans and marine life.

A third contributor to synthetic pollution is oil pollution. “When it comes to missing oil and water, oceans suffer from far more than an occasional devastating spill. Disasters make headlines, but hundreds of millions of gallons of oil quietly end up in the seas every year, mostly from non-accidental sources (Ocean planet, 2000).”

Every year, millions of gallons of oil are seeped into the earth’s oceans. Whether by big catastrophic oil spills (Exxon Valdez, Torrey Canyon), routine maintenance (bilge cleaning and ship operations), used engine oil and road runoff that eventually can seep into the sea, air pollution, natural seeps from the ocean floor or offshore drilling the oil eventually ends up in our waters, killing marine life and making it impossible for us to use these oceans.

All of these pollutants, whether natural, generated or synthetic in one way or another make our waters unsafe and hazardous to our health and the health of its inhabitants.

Government attention to marine pollution over the past years has increased the concerns for cleanup and prevention of further pollution. However, the government has not always been met with approval and agreement in regards to legislation.

“The earlier historical overview of the evolution of American concern with the oceans and of the making of U.S. ocean policy suggests a number of recurrent tensions that have tended to underlie thinking and practice in this are: U.S. interests as a coastal power versus as a maritime nation; internationalism versus unilateralism; federal versus state control over ocean resources; development versus environmental protection; private versus governmental role in resource development (Cicin-Sain, 2000).”

Constantly the battle between government and state and environmental groups is at hand. However, with the formation of such groups as the Environmental Protection Agency and other councils agencies fighting for the rights of the environment and the protection of our resources such policies as the “Clean Water Act, Coastal Zone Management Act, Fishery Conservation and Management Act, the Marine Mammal Protection Act, etc. (Cicin-Sain, 2000)” have been able to be adopted. And, are adhered to by countries, states, cities and towns in the world today.

Pollutants introduced either accidentally or on purpose into the marine environment, after human activities, may cause consequences at different levels. In the short term and at high concentrations some species may even disappear. In the long term, pollutants may gradually destroy marine ecosystems and my even affect the health of humans feeding on contaminated food.

Any move toward rescuing the sea from death requires cooperation among individuals, between industry and government, and among nations. We must stop destroying the world by destroying its water; we have only one planet, one planet, which we must protect for the survival of all the species, which inhabit it now, and in the many generations and years to come.