Water pollution assignment

Over two thirds of Earth’s surface is covered by water; less than a third is taken up by land. As Earth’s population continues to grow, people are putting ever-increasing pressure on the planet’s water resources. In a sense, our oceans, rivers, and other inland waters are being “ squeezed” by human activities?? not so they take up less room, but so their quality is reduced. Poorer water quality means water pollution.

We know that pollution is a human problem because it is a relatively recent development in the planet’s history: before the 19th century Industrial Revolution, people lived more in armory with their immediate environment. As industrialization has spread around the globe, so the problem Of pollution has spread with it. When Earth’s population was much smaller, no one believed pollution would ever present a serious problem. It was once popularly believed that the oceans were far too big to pollute. Today, with around 7 billion people on the planet, it has become apparent that there are limits.

Pollution is one of the signs that humans have exceeded those limits. How serious is the problem? According to the environmental campaign organization WFM: “ Pollution from toxic chemicals threatens life on this lane. Every ocean and every continent, from the tropics to the once-pristine polar regions, is contaminated. ” [pick] Photo: Detergent pollution entering a river. Photo courtesy of IIS Fish & Wildlife Service Photo Library. . What is water pollution? Water pollution can be defined in many ways. Usually, it means one or more substances have built up in water to such an extent that they cause problems for animals or people.

Oceans, lakes, rivers, and other inland waters can naturally clean up a certain amount of pollution by dispersing it harmlessly. If you poured a cup of black ink into a river, the ink would quickly disappear onto the river's much larger volume of clean water. The ink would still be there in the river, but in such a low concentration that you would not be able to see it. At such low levels, the chemicals in the ink probably would not present any real problem. However, if you poured gallons of ink into a river every few seconds through a pipe, the river would quickly turn black.

The chemicals in the ink could very quickly have an effect on the quality of the water. This, in turn, could affect the health of all the plants, animals, and humans whose lives depend on the river. Thus, water pollution is all about quantities: how such of a polluting substance is released and how big a volume of water it is released into. A small quantity of a toxic chemical may have little impact if it is spilled into the ocean from a ship. But the same amount of the same chemical can have a much bigger impact pumped into a lake or river, where there is less clean water to disperse it.

Water pollution almost always means that some damage has been done to an ocean, river, lake, or other water source. A 1971 United Nations report defined ocean pollution as: " The introduction by man, directly or indirectly, of substances or energy into the urine environment (including estuaries) resulting in such deleterious 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. Fortunately, Earth is forgiving and damage from water pollution is often reversible. [Pick] Photo: Pollution means adding substances to the environment that don't belong

there?? like the air pollution from this smokestack. Pollution is not always as obvious as this, however. Photo courtesy of US Department of Energy/National Renewable Energy Laboratory (US DOE/UNREEL) II. What are the main types of water pollution? When we think of Earth’s water resources, we think of huge oceans, lakes, and rivers. Water resources like these are called surface waters.

The most obvious type of water pollution affects surface waters. For example, a spill from an oil tanker creates an oil slick that can affect a vast area of the ocean. Not all of Earth’s water sits on its surface, however. A great deal of water is held in underground rock structures known as aquifers, which we cannot see and seldom think about. Water stored underground in aquifers is known as groundwater. Aquifers feed our rivers and supply much of our drinking eater. They too can become polluted, for example, when weed killers used in people’s gardens drain into the ground.

Groundwater pollution is much less obvious than surface-water pollution, but is no less of a problem. In 1 996, a study in Iowa in the United States found that over half the state’s groundwater wells were contaminated with weed killers. Surface waters and groundwater are the two types of water resources that pollution affects. There are also two different ways in which pollution can occur. If pollution comes from a single location, such as a discharge pipe attached to a factory, it s known as point-source pollution.

Other examples of point source pollution include an oil spill from a tanker, a discharge from a smoke stack (factory chimney), or someone pouring oil from their car down a drain. A great deal of water pollution happens not from

one single source but from many different scattered sources. This is called nonprofit-source pollution. [pick] Photo: Above: Point-source pollution comes from a single, well-defined place such as this pipe. Below: Nonprofit-source pollution comes from many sources. All the industrial plants alongside a river and the ships that service hem may be polluting the river collectively.

Both photos courtesy of IIS Fish & Wildlife Service Photo Library. When point-source pollution enters the environment, the place most affected is usually the area immediately around the source. For example, when a tanker accident occurs, the oil slick is concentrated around the tanker itself and, in the right ocean conditions, the pollution disperses the further away from the tanker you go. This is less likely to happen with nonprofit source pollution which, by definition, enters the environment from many different places at once.

Sometimes pollution that enters the environment in one place has an effect hundreds or even thousands of miles away. This is known as turnarounds pollution. One example is the way radioactive waste travels through the oceans from nuclear reprocessing plants in England and France to nearby countries such as Ireland and Norway. Ill. How do we know when water is polluted? Some forms of water pollution are very obvious: everyone has seen TV news footage of oil slicks filmed from helicopters flying overhead. Water pollution is usually less obvious and much harder to detect than this.

But how can we measure water pollution when we cannot see it? How do we even know it’s there? There are two main ways of measuring the quality of water. One is to take samples of the water and measure the concentrations

of different chemicals that it contains. If the chemicals are dangerous or the concentrations are too great, we can regard the water as polluted. Measurements like this are known as chemical indicators of water quality. Another way to measure water quality involves examining the fish, insects, and other invertebrates that the water will support.

If many different types Of creatures can live in a river, the quality is likely to be very good; if the river purports no fish life at all, the quality is obviously much poorer. Measurements like this are called biological indicators of water quality. IV. What are the causes of water pollution? Most water pollution doesn’t begin in the water itself. Take the oceans: around 80 percent of ocean pollution enters our seas from the land. Virtually any human activity can have an effect on the quality of our water environment.

When farmers fertilize the fields, the chemicals they use are gradually washed by rain into the groundwater or surface waters nearby. Sometimes the causes of water pollution are quite surprising. Chemicals leased by smokestacks (chimneys) can enter the atmosphere and then fall back to earth as rain, entering seas, rivers, and lakes and causing water pollution. That’s called atmospheric deposition. Water pollution has many different causes and this is one of the reasons why it is such a difficult problem to solve.

Sewage With billions of people on the planet, disposing of sewage waste is a major problem. According to 2004 figures from the World Health Organization, some 1. 1 billion people (16 percent of the world’s population) don’t have access to safe drinking water, while 2. 6 billion (40 percent of the

world’s population) don’t have proper sanitation (hygienic toilet facilities); the position hasn’t improved much since. Sewage disposal affects people’s immediate environments and leads to water-related illnesses such as diarrhea that kills 3-4 million children each year. According to the World Health Organization, water-related diseases could kill 135 million people by 2020.) In developed countries, most people have flush toilets that take sewage waste quickly and hygienically away from their homes. Yet the problem of sewage disposal does not end there. When you flush the toilet, the waste has to go somewhere and, even after it leaves the sewage reattempt works, there is still waste to dispose of. Sometimes sewage waste is pumped untreated into the sea. Until the early 1 9905, around 5 million tons of sewage was dumped by barge from New York City each year.

The population of Britain produces around 300 million gallons of sewage every day, some of it still pumped untreated into the sea through long pipes. The New River that crosses the border from Mexico into California carries with it 20-25 million gallons (76-95 million liters) of raw sewage each day. Even in rich nations, the practice of dumping sewage into the sea continues. In early 2012, t was reported that the tiny island of Guernsey (between Britain and France) has decided to continue dumping 1 6, 000 tons Of raw sewage into the sea each day.

In theory, sewage is a completely natural substance that should be broken down harmlessly in the environment: 90 percent of sewage is water. In practice, sewage contains all kinds of other chemicals, from the pharmaceutical drugs people take to the paper, plastic, and other wastes they flush down their toilets. When people are sick with viruses, the sewage

they produce carries those viruses into the environment. It is possible to catch illnesses such as hepatitis, typhoid, and cholera from river and sea water. [pick Photo: During crop-spraying, some chemicals will drain into the soil.

Eventually, they seep into rivers and other watercourses. Photo courtesy of LOS Department of Agriculture Agricultural Research Service (EARS). Nutrients Suitably treated and used in moderate quantities, sewage can be a fertilizer: it returns important nutrients to the environment, such as nitrogen and phosphorus, which plants and animals need for growth. The trouble is, sewage is often released in much greater quantities than the natural environment can cope with. Chemical fertilizers used by farmers also add nutrients to the soil, which drain into rivers and seas and add to the fertilizing effect of the sewage.

Together, sewage and fertilizers can cause a massive increase in the growth of algae or plankton that overwhelms huge areas of oceans, lakes, or rivers. This is known as a harmful algal bloom (also known as an HAP or red tide, because it can turn the water red). It is harmful because it removes oxygen from the water that kills other forms of life, leading to what is known as a dead zone. The Gulf of Mexico has one of the world’s most spectacular dead zones. Each summer, it grows to an area of around 7000 square miles (1 8, 000 square kilometers), which is about the same size as the state of New Jersey.

Waste water A few statistics illustrate the scale of the problem that waste water (chemicals washed down drains and discharged from factories) can

cause. Around half of all ocean pollution is caused by sewage and waste water. Each year, the world generates 400 billion tons of industrial waste, much of which is pumped untreated into rivers, oceans, and other waterways. In the Lignite States alone, around 400, 000 factories take clean water from rivers, and many pump eluted waters back in their place. However, there have been major improvements in waste water treatment recently.

For example, in the united States over the last 30 years, the Environmental Protection Agency (EPA) has spent $70 billion improving treatment plants that now serve about 85 percent of the IIS population. Factories are point sources of water pollution, but quite a lot of water is polluted by ordinary people from nonprofit sources; this is how ordinary water becomes waste water in the first place. Virtually everyone pours chemicals of one sort or another down their drains or toilets. Even detergents used in washing mach ones undernourished eventually end up in our rivers and oceans. So do the pesticides we use on our gardens.

A lot of toxic pollution also enters waste water from highwayman. Highways are typically covered with a cocktail of toxic chemicals?? everything from spilled fuel and brake fluids to bits of worn tires (themselves made from chemical additives) and exhaust emissions. When it rains, these chemicals wash into drains and rivers. It is not unusual for heavy summer rainstorms to wash toxic chemicals into rivers in such concentrations that they kill large numbers of fish overnight. It has been estimated that, in one year, the highway runoff from a single large city leaks as much oil into our water environment as a typical tanker spill.

Some highway runoff runs away into drains; others can pollute groundwater or accumulate in the land next to a road, making it increasingly toxic as the years go by. Chemical waste Detergents are relatively mild substances. At the opposite end of the spectrum are highly toxic chemicals such as polycarbonate phenols (BPCS). They were once widely used to manufacture electronic circuit boards, but their harmful effects have now been recognized and their use is highly stricter in many countries. Nevertheless, an estimated half million tons of BPCS were discharged into the environment during the 20th century.

In a classic example of turnarounds pollution, traces of BPCS have even been found in birds and fish in the Arctic. They were carried there through the oceans, thousands of miles from where they originally entered the environment. Although BPCS are widely banned, their effects will be felt for many decades because they last a long time in the environment without breaking down. Another kind of toxic pollution comes from heavy metals, such as lead, cadmium, and mercury. Lead was once commonly used in gasoline (petrol), though its use is now restricted in some countries.

Mercury and cadmium are still used in batteries (though some brands now use other metals instead). Until recently, a highly toxic chemical called tribunal (TTT) was used in paints to protect boats from the ravaging effects of the oceans. Ironically, however, TPTB was gradually recon seized as a pollutant: boats painted with it were doing as much damage to the oceans as the oceans were doing to the boats. The best known example Of heavy metal pollution in the oceans took place in 1938 when a Japanese factory

discharged a significant mount of mercury metal into Inanimate Bay, contaminating the fish stocks there.

It took a decade for the problem to come to light. By that time, many local people had eaten the fish and around 2000 were poisoned. Hundreds of people were left dead or disabled. Radioactive waste People view radioactive waste with great alarm?? and for good reason. At high enough concentrations it can kill; in lower concentrations it can cause cancers and other illnesses. The biggest sources of radioactive pollution in Europe are two factories that reprocess waste fuel from nuclear power plants: Clarified n the north-west coast of Britain and Cap La Hogue on the north coast of France.

Both discharge radioactive waste water into the sea, which co of Britain and Cap La Hogue on the north coast of France. Both discharge radioactive waste water into the sea, which ocean currents then carry around the world. Countries such as Norway, which lie downstream from Britain, receive significant doses of radioactive pollution from Clarified. The Norwegian government has repeatedly Com planned that Clarified has increased radiation levels along its coast by 6-10 times. Both the Irish and

Norwegian governments continue to press for the plant’s closure. Oil pollution When we think of ocean pollution, huge black oil slicks often spring to mind, yet these spectacular accidents represent only a tiny fraction of all the pollution entering our oceans. Even considering oil by itself, tanker spills are not as significant as they might seem: only 12% of the oil that enters the

oceans comes from tanker accidents; over 70% of oil pollution at sea comes from routine shipping and from the oil people pour down drains on land.

However, what makes tanker spills so destructive is the sheer quantity of oil hey release at once ?? in other words, the concentration of oil they produce in one very localized part of the marine environment. The biggest oil spill in recent years (and the biggest ever spill in IIS waters) occurred when the tanker's Valued broke up in Prince William Sound in Alaska in 1989. Around 12 million gallons (44 million liters) of oil were released into the pristine wilderness?? enough to fill your living room 800 times over!

Estimates of the marine animals killed in the spill vary from approximately 1 000 sea otters and 34, 000 birds to as many as 2800 sea otters and 250, 000 sea birds. Several billion salmon and herring eggs are also believed to have been destroyed. [pick] photo: Oil-tanker spills are the most spectacular forms Of pollution and the ones that catch public attention, but only a fraction of all water pollution happens this way. Photo courtesy of IIS Fish & Wildlife Service Photo Library.

Plastics f you've ever taken part in a community beach clean, you'll know that plastic is far and away the most common substance that washes up with the waves. There are three reasons for this: plastic is one of the most common materials, used for making virtually every kind of manufactured abject from clothing to automobile parts; plastic is light and floats easily so it can travel enormous distances across the oceans; most plastics are not biodegradable (they do not break down naturally in the environment), which means that things like plastic bottle tops can survive in the marine

environment for a long time. A plastic bottle can survive an estimated 450 years in the ocean and plastic fishing line can last up to 600 years.) While plastics are not toxic in quite the same way as poisonous chemicals, they nevertheless present a major hazard to seabirds, fish, and other marine creatures. For example, plastic fishing lines and other debris can strangle or choke fish. (This is sometimes called ghost fishing.) One scientific study in the sass estimated that a quarter of all seabirds contain some sort of plastic residue.

In another study about a decade later, a scientist collected debris from a 1. 5 mile length of beach in the remote Patrician islands in the South Pacific. His study recorded approximately a thousand pieces of garbage including 268 pieces of plastic, 71 plastic bottles, and two dolls heads. Alien species Most people’s idea of water pollution involves things like sewage, toxic teals, or oil slicks, but pollution can be biological as well as chemical. In some parts Of the world, alien species are a major problem.

Alien species (sometimes known as invasive species) are animals or plants from one region that have been introduced into a different ecosystem where they do not belong. Outside their normal environment, they have no natural predators, so they rapidly run wild, crowding out the usual animals or plants that thrive there. Common examples of alien species include zebra mussels in the Great sakes of the LISA, which were carried there from Europe by ballast water (waste water flushed from ships). The Mediterranean Sea has been invaded by a kind of alien algae called Cellular taxation.

In the Black Sea, an alien jellyfish called Nepotisms elided reduced fish stocks by 90% after arriving in ballast water. In San Francisco Bay, Asian clams called Petrolatum enuresis, also introduced by ballast water, have dramatically altered the ecosystem. In 1 999, Cornell University's David Pimento estimated that alien invaders like this cost the US economy $123 billion a year. [pick Photo: Invasive species: Above: Water hyacinth crowding out a waterway around an old fence post. Photo by Steve Hildebrand. Below: Non-integrative useless clumped on a native mussel.

Both photos courtesy of US Fish & Other forms of pollution These are the most common forms of pollution?? but by no means the only ones. Heat or thermal pollution from factories and power plants also causes problems in rivers. By raising the temperature, it reduces the amount of oxygen dissolved in the water, thus also reducing the level of aquatic life that the river can support Another type of pollution involves the disruption of sediments (fine-grained powders) that flow from rivers into the sea. Dams built for hydroelectric power or water reservoirs can reduce the sediment flow.

This reduces the formation of beaches, increases coastal erosion (the natural destruction of cliffs by the sea), and reduces the flow of nutrients from rivers into seas (potentially reducing coastal fish stocks). Increased sediments can also present a problem. During construction work, soil, rock, and Other fine powders sometimes enters nearby rivers in large quantities, causing it to become turbid (muddy or silted). The extra sediment can block the gills of fish, effectively suffocating them. Construction firms often now take precautions to prevent this kind of pollution from happening. V.

What are the effects of water pollution? Some people believe pollution is an inescapable result of human activity: they argue that if we want to have factories, cities, ships, cars, oil, and coastal resorts, some degree of pollution is almost certain to result. In other words, pollution is a necessary evil that people must put up with if they want to make progress. Fortunately, not everyone agrees with this view. One reason people have woken up to the problem of pollution is that it brings costs of its own that undermine any economic benefits that come about by polluting. Take oil spills, for example.

They can happen if tankers are too poorly built to survive accidents at sea. But the economic benefit of compromising on tanker quality brings an economic cost when an oil spill occurs. The oil can wash up on nearby beaches, devastate the ecosystem, and severely affect tourism. The main problem is that the people who bear the cost of the spill (typically a small coastal community) are not the people who caused the problem in the first place (the people who operate the tanker). Yet, arguably, everyone who puts gasoline (petrol) into their car?? or uses almost any kind of petroleum- fueled transport?? contributes to the problem in some way.

So oil spills are a robber for everyone, nitrous people who live by the coast and tanker operates. Sewage is another good example of how pollution can affect us all. Sewage discharged into coastal waters can wash up on beaches and cause a health hazard. People who bathe or surf in the water can fall ill if they swallow polluted water?? yet sewage can have other harmful effects too: it can poison shellfish (such as cockles and mussels) that grow near the shore. People who eat poisoned shellfish risk suffering from an acute?? and sometimes fatal?? illness called paralytic shellfish poisoning.

Shellfish is no longer caught long many shores because it is simply too polluted with sewage or toxic chemical wastes that have discharged from the land nearby. Pollution matters because it harms the environment on which people depend. The environment is not something distant and separate from our lives. It’s not a pretty shoreline hundreds of miles from our homes or a wilderness landscape that we see only on TV. The environment is everything that surrounds us that gives us life and health. Destroying the environment ultimately reduces the quality of our own lives?? and that, most selfishly, is why pollution should matter to all of us.

VI. How can we stop water pollution? There is no easy way to solve Water pollution; if there were, it wouldn’t be so much of a problem. Broadly speaking, there are three different things that can help to tackle the problem?? education, laws, and economics?? and they work together as a team. Education Making people aware of the problem is the first step to solving it. In the early sass, when surfers in Britain grew tired of catching illnesses from water polluted with sewage, they formed a group called Surfers Against Sewage to force governments and water companies to clean up their act.

People who’ve rowan tired of walking the world’s polluted beaches often band together to organize community beach-cleaning sessions. Anglers who no longer catch so many fish have campaigned for tougher penalties against factories that pour pollution into our rivers. Greater public awareness can make a positive difference. Laws One of the biggest problems with water pollution is its turnarounds nature. Many rivers cross countries, while seas span whole continents.