

Causes and effects of water pollution in lake huron essay sample

[Environment](#), [Pollution](#)



Introduction

This paper examines the multiple causes of pollution adversely affecting the waters of Lake Huron, the world's third largest freshwater lake, having almost 4, 000 miles of shoreline (Scharfe, 2008). As well as evaluating and describing the pollution's causes, the paper also details the impacts of the pollution on the economy and people, so that those responsible for taking action to improve the situation have this important information available.

Causes of the Pollution

According to “ Water Pollution in the Great Lakes” (n. d.), the three main sources of pollution are “ point source, nonpoint source and atmospheric pollution.” Point source pollution, as its name implies, emanates from a specific point such as an industrial discharge pipe draining straight into a waterway. Nonpoint source pollution comes from many different sources making it difficult to tackle and reduce or eradicate. According to the article, that makes it the main hazard to the water in the Great Lakes. Then the third type - atmospheric or air pollution - comprises pollutants carried in the air for great distances by wind and rain. Those pollutants include mercury, phosphorus and PCBs (polychlorinated biphenyls).

According to “ Lake Huron's Nearshore Water Quality” (2004), the high bacterial pollution levels in Lambton and Huron counties and in the southern section of Bruce County were a major concern. The article reported that E. coli levels exceeded recommended safe levels, causing several beaches to be provided with notices advising against swimming, and noted also that there was no formal tracking of possible illness cases arising from these

nonpoint pollution effects.

(Image Source: <http://lakehuron.ca/index.php?page=working-toward-clarity>)

The same article reported that high concentrations of nutrients such as nitrates and phosphorus cause heavy algae blooms. The sources of the pollution had been identified as predominantly emanating from agricultural activities and faulty septic tank sewage systems, but also from plants where waste water is treated. The amount of bacterial pollution increased after rainfall, indicating that surface runoff is the leading method of the pollution reaching the lake. Lending credence to the view that agricultural activity is a primary cause of the pollution, the article noted that Huron County is not only Ontario's most productive agricultural county, but also leads the production of manure, at over 7,600 kg per hectare.

"Nonpoint Source Pollution" (n.d.) was the title of another article published on the subject of the pollution of Lake Huron. It defined nonpoint source pollution as runoff that is polluted, which may come from such diverse sources as rain or snowfall, washing cars, watering gardens, etc. That polluted runoff gathers contaminants en route that may include oils, salts, chemicals used in agriculture and various toxic materials and nutrients. The following image (reproduced from the referenced article) provides a representation of what it calls "the pathways of pollution" and which the article claimed is "the cumulative result of our everyday personal actions and our local land use policies."

(Image retrieved from: <http://lakehuron.ca/index.php?page=nonpoint-source-pollution>)

The “ Nonpoint Source Pollution” article categorized runoff pollutants as follows:

- Pathogens: Bacteria and viruses, etc originating in human and/or animal fecal waste. They can come from the land or faulty septic tanks, leaking sewers, etc.
 - Nutrients: Compounds used to improve plants (e. g nitrogen and phosphorus) which can damage both the environment and health if highly concentrated. In the lake waters they may have come from farm fertilizers, and other sources.
 - Toxic Contaminants: Substances that can adversely affect aquatic and human health. Many of them are difficult to break down, so pass up the food chain to reach maximum concentrations in the higher predatory species.
- Urban growth has also contributed to the pollution of the lake. Lakeshore town developments and strip developments have proliferated over the last 30 years along the southern part of Lake Huron’s shores, attracting considerable numbers of tourists. As an example, the beach at Grand Bend can attract up to 25, 000 visitors in a day at peak periods.

Another contributory factor to the lake pollution noted in that article was the type of soil along the lake shoreline. Whole sections of the coastal strip known as the “ Huron Fringe” comprise sandy soils that allow easy passage of the nutrients in runoff into the groundwater. In another area known as the “ Huron Slope” heavy clay soils high above the lake are divided by a number of deep ravines through to the lake. The hydraulic head created in the ravines carries a great quantity of nutrients into the lake water, as well as quantities of bacteria and protozoa. Wave action on Lake Huron can cause

barrier beaches to form across the mouths of small waterways, creating stagnant water that in turn causes algae and pollution buildup, usually released by rainfall breaching the barrier and discharging the now concentrated pollutants into the lake. A secondary issue with the barrier beach formations is that the calm waters behind them attract children to swim there – in water that has higher pollution levels.

Economic Impacts of Pollution

According to “ Testing the Waters” (2012), the Great Lakes system (including Lake Huron) is linked to a total of around 1. 5 million American jobs, of which 200, 000 are associated with “ recreation and tourism.” As a consequence, pollution damage to the lakes ecosystems has effects on the economy as well as on the environment and on human health. Economic effects arise from a variety of causes including the water intakes of industrial plants (power plants, municipal water works, factories, etc) becoming clogged by the invasive zebra and quagga mussels. The local fish businesses have been hit by the decrease in native fish stocks such as the Chinook salmon due to the proliferation of invasive fish species. Another economic impact is in the touristic sector. Reductions in the number of tourists due to swimming restrictions, limited fish stocks, algae blooms, etc, can cause a massive reduction in tourist spending throughout the local economy.

Impacts of Pollution on People

As mentioned earlier in this paper, the algae blooms that clog many of the beaches and make them not only unusable but smelly have a clear negative effect on tourist numbers, plus the dramatic reduction in fish stocks affects

the fishing and boat charter and other businesses. The high bacterial levels (such as E. coli) in the polluted waters also pose a serious health risk to humans (“ Pollution's Effects on the Great Lakes Ecosystem.”, n. d.), even when not entering the water but simply spending time on the beach. Diseases such as typhoid and other gastrointestinal problems are a real possibility in such situations.

Conclusions

Of the various sources of pollution reported, point source pollution has to be the easiest to deal with, by clamping down on industrial and sewage plant discharges. Nonpoint sources pollution can be reduced by systematically monitoring and rectifying faulty septic tank systems and placing strict controls on farm practices, to reduce the amount of manure and fertilizers, etc reaching the groundwater. Clearly the most difficult to deal with is the atmospheric pollution – at least on a local level – due to the fact that contaminants in the air can emanate from hundreds of miles distant; even from sources outside the control of U. S. and/or Canadian authorities.

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