

Water quality: **POINT SOURCE POLLUTION**

Via: <http://oceanservice.noaa.gov/education/kits/pollution/03pointsource.html>

The U.S. Environmental Protection Agency (EPA) defines point source pollution as “any single identifiable source of pollution from which pollutants are discharged, such as a pipe, ditch, ship or factory smokestack” (Hill, 1997).

Factories and sewage treatment plants are two common types of point sources. Factories, including oil refineries, pulp and paper mills, and chemical, electronics and automobile manufacturers, typically discharge one or more pollutants in their discharged waters (called effluents). Some factories discharge their effluents directly into a water body. Others treat it themselves before it is released, and still others send their wastes to sewage treatment plants for treatment. Sewage treatment plants treat human wastes and send the treated effluent to a stream or river.

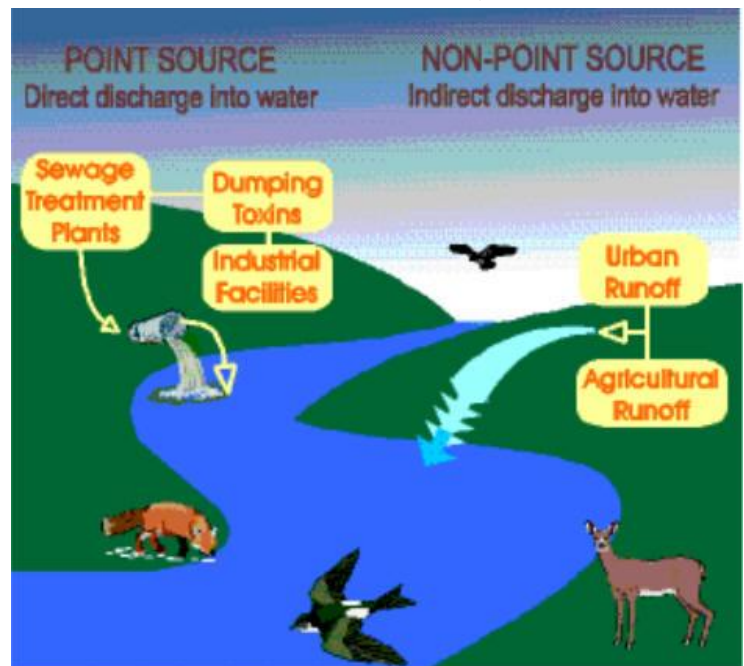
Another way that some factories and sewage treatment plants handle waste material is by mixing it with urban runoff in a combined sewer system. Runoff refers to storm water that flows over surfaces like driveways and lawns. As the water crosses these surfaces, it picks up chemicals and pollutants. This untreated, polluted water then runs directly into a sewer system.

When it rains excessively, a combined sewer system may not be able handle the volume of water, and some of the combined runoff and raw sewage will overflow from the system, discharging directly into the nearest water body without being treated. This combined sewer overflow (CSO) is considered point source pollution, and can cause severe damage to human health and the environment.

Unregulated discharges from point sources can result in water pollution and unsafe drinking water, and can restrict activities like fishing and swimming. Some of the chemicals discharged by point sources are harmless, but others are toxic to people and wildlife. Whether a discharged chemical is harmful to the aquatic environment depends on a number of factors, including the type of chemical, its concentration, the timing of its release, weather conditions, and the organisms living in the area.

Large farms that raise livestock, such as cows, pigs and chickens, are other sources of point source pollution. These types of farms are known as concentrated animal feeding operations (CAFOs). If they do not treat their animals' waste materials, these substances can then enter nearby water bodies as raw sewage, radically adding to the level and rate of pollution. To control point source discharges, the Clean Water Act established the National Pollutant Discharge Elimination System (NPDES).

Under the NPDES program, factories, sewage treatment plants, and other point sources must obtain a permit from the state and EPA before they can discharge their waste or effluents into any body of water. Prior to discharge, the point source must use the latest technologies available to treat its effluents and reduce the level of pollutants. If necessary, a second, more stringent set of controls can be placed on a point source to protect a specific water body.



Water quality: **NON-POINT SOURCE POLLUTION**

<http://oceanservice.noaa.gov/education/kits/pollution/04nonpointsource.html>

Most nonpoint source pollution occurs as a result of runoff. When rain or melted snow moves over and through the ground, the water absorbs and assimilates any pollutants it comes into contact with (USEPA, 2004b). Following a heavy rainstorm, for example, water will flow across a parking lot and pick up oil left by cars driving and parking on the asphalt. When you see a rainbow-colored sheen on water flowing across the surface of a road or parking lot, you are actually looking at nonpoint source pollution. This runoff then runs over the edge of the parking lot, and most likely, it eventually empties into a stream. The water flows downstream into a larger stream, and then to a lake, river, or ocean. The pollutants in this runoff can be quite harmful, and their sources numerous. We usually can't point to one discreet location of nonpoint source pollution like we can with a discharge pipe from a factory.

Nonpoint source pollution not only affects ecosystems, it can also have harmful effects on the economy. U.S. Coastal and marine waters support 28.3 million jobs, generate \$54 billion in goods and services through activities like shipping, boating, and tourism, and contribute \$30 billion to the U.S. economy through recreational fishing alone (Leeworthy, 2000). If pollution leads to mass die-offs of fish and dirty-looking water, this area and others like it will experience deep financial losses.

Nonpoint source pollution affects the beauty and health of coastal lands and waters. If the physical and environmental well-being of these areas is diminished, people will naturally find it less appealing to visit the coast. Beaches will not provide the tranquility and leisure activities many people expect to experience. You can see how nonpoint source pollution plays an indirect, though powerful role in tourists' contributions to a coastal community's economic status.

The population in many coastal communities is also increasing at a rapid rate, and the value of waterfront property often relies on environmental and aquatic conditions. Excess nonpoint source pollution impacts the overall quality of life, and subsequently can drive property values down. If nonpoint source pollution continues to plague the waters surrounding coastal communities, their economies and social conditions may rapidly deteriorate.

Although the concentration of some pollutants from runoff may be lower than the concentration from a point source, the total amount of a pollutant delivered from nonpoint sources may be higher because the pollutants come from many places. With increased control over point source pollution, scientists have begun to focus on nonpoint source pollution, how it affects the quality of the environment, and, even more importantly, how it can be controlled. Nonpoint source pollution is difficult to control because it comes from multiple locations. It also varies over time in terms of the flow and the types of pollutants it contains.



Nonpoint source pollution can severely affect many aspects of a community especially the commercial fishing industry.

Water quality: **ASSIGNMENT**

1. Write your one sentence summary of each paragraph of this article (11).
2. Create a Venn diagram that compares and differentiates between point and nonpoint source pollutions. Make sure your Venn has 3 similarities and at least 4 differences.
3. Describe some of the legislation set up to combat point source pollution.
4. Describe the economic repercussions (impacts) of non-point source pollution.
5. Why is it important for people to know what type of pollution is happening? Explain, citing information from this article and writing at least 4 sentences.
6. Evaluate if knowing the type of the source of the pollution helps make clean-up easier. Justify your opinion in 4-6 sentences and using at least 3 direct quotes from the article.