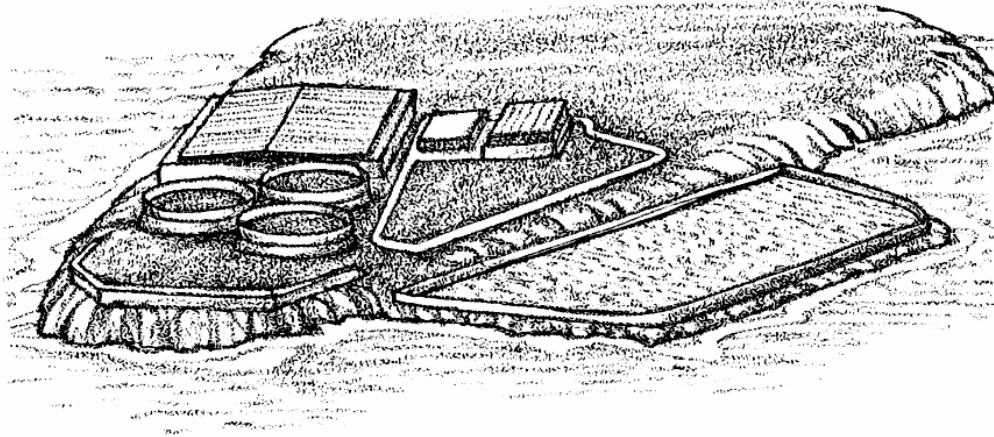


# The Effects of Sewage on Estuaries

by Kenn Oberrecht

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*Sewage usually degrades the waterway where it's dumped. Municipal sewage can be directly toxic to organisms it comes in contact with and can cause oxygen depletion*

*through nutrient enrichment in the waters where it is introduced. The smaller those waters or the poorer their circulation, the worse the effects of sewage will be on the organisms living there.*

*Despite the seeming abundance of sewage-treatment plants in the United States, raw sewage is frequently discharged into our waterways, especially during storms and periods of peak runoff and snowmelt.*

Depending on its content and level of treatment, sewage can wreak havoc all the way up the food chain to humans. Raw, untreated sewage, for example, may contain harmful chemicals, hazardous compounds, heavy metals, and viruses.

Despite the seeming abundance of sewage-treatment plants in the United States, raw sewage is frequently discharged into our waterways, especially during storms and periods of peak runoff and snowmelt. Equipment malfunction and human error also lead to raw-sewage discharges. At treatment plants, sewage might undergo only minimal treatment or be subjected to an array of purification steps. The various levels are known as primary, secondary, and tertiary treatment.

In primary treatment, sewage is screened to remove large particles, then sent to settling chambers. Sludge is raked from the bottom of settling chambers for disposal, and the liquid may be aerated before chlorination and release.

Chlorine is added to kill bacteria. The problem is that it is non-discriminating, killing both the disease-causing bacteria and those that would help break down the sewage after its release.

*Most communities in the United States depend on primary-treatment systems.*

In secondary treatment, the liquid is aerated and sometimes planted with fresh bacteria. It might also be run through a filter system and sprinkled on a bed of coal or gravel over a broad area conducive to bacterial growth and oxidation. It's usually chlorinated before release. Sludge is removed from settling tanks and treated. It might then be burned or turned into some useful product, such as fertilizer, soil conditioner, or fill material.

Tertiary treatment attempts to remove all contaminants from sewage, which is both difficult and expensive. In some tertiary plants, though, the final product is purer than tap water.

Most communities in the United States depend on primary-treatment systems. Some use a combination of primary and secondary treatment; few employ tertiary treatment. In too many coastal communities, especially the more remote ones, sewage gets only cursory treatment, if it gets anything at all. The rest is left to tidal currents.

*Despite the pressures of increasing populations on our overburdened estuaries, there is some promising technology already working at the seemingly overwhelming task of safe sewage treatment and disposal.*

In addition to toxins and other pollutants and an abundance of oxygen-depleting organic matter, sheer bulk is another problem sewage creates, especially where population is dense. For example, it's estimated that during the summer months, by the time New York's Hudson River reaches its estuary, 15 to 20 percent of its entire volume consists of municipal sewage.

Despite the pressures of increasing populations on our overburdened estuaries, there is some promising technology already working at the seemingly overwhelming task of safe sewage treatment and disposal.

In one system, after primary treatment, sewage is diverted to a series of ponds and marshes where biological processes remove much of the remaining organic material by decomposition and plant growth. Not only is the sewage effectively treated, but the newly created marshes, lush with vegetation, attract birds, waterfowl, and other animals, as well as people who enjoy nature.

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