

How Climate Change Impacts Wastewater Systems

Wastewater treatment is affected by population growth, technology and policy changes, and floods and heavy storm events. Climate change will bring new challenges as more frequent extreme storms can overwhelm our wastewater treatment systems.

Climate change is not just about changes in temperature; the whole water cycle is also affected. A warmer world means the atmosphere has the capacity to hold greater moisture, creating changes in the amount of water vapor, rainfall, and circulation of water in the atmosphere. Precipitation patterns are changing, and stronger rainfall events and increased flooding are expected with climate change. The frequency and magnitude of extreme storm events is expected to increase.

Flooding can result in increases in inflow and infiltration and more frequent sanitary sewer overflow events. In addition, wastewater plants, onsite septic systems, (as well as hog waste open lagoons) can become inundated and release pollutants which would be controlled under normal conditions. Sewer lines often occur in low-lying areas and may be susceptible to inflow and infiltration. When an area is flooded, water can enter sewer systems through manholes and cracks in lines resulting in the treatment plant being overwhelmed with the additional load. Sewage can also leak from sewer lines in parts of the system away from flooded areas or cause a sanitary sewer overflow (SSO) at manholes or treatment plants. Unanticipated releases of pollutants can also occur from inundation of onsite septic systems, often located in floodplains.

The result of this inundation of treatment facilities is that surface waters receive a wide variety of pollutants that result in exceedances of the state water quality standards for human health and aquatic life including levels of fecal coliform, E-coli and other pathogens. Increased nutrient loading from sewer or septic system overflows also creates additional environmental and public health concerns over the potential influx of harmful algal blooms, exacerbated by warming water temperatures.

Future droughts, population increase and limited fresh water supplies may also increase the need for use of wastewater. So, whether the cause is too much or too little precipitation in the future, both impacts of climate change can cause increased costs for wastewater treatment facilities. Many of these systems, both private and public, are already dealing with aging infrastructure that needs replacing. We must continue to flood-proof and rehabilitate sewer infrastructure to reduce the risk of inflow and infiltration and sanitary sewer overflow. This work should be prioritized before the next big storms inundate these systems and pollute our waters.