

# Stormwater Management in Chicago waterways: Basement Flooding and Water Quality

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## 1 Introduction

Recently, Chicago area is suffered from urban flooding because of localized heavy rainfall with high intensity. Their local sewer system is quite old which cannot hold that heavy amount of rainfall causing flooding. The urbanization is one of the factors of flooding in Chicago. Land use has been changed a lot from green areas to paved road and urban area which is impermeable; therefore, the impervious area is acting like a barrier for rainfall not to infiltrate into the ground. It causes surface runoff and flooding that the huge volume of runoff fills stream and rivers exceeding their capacity.

The Tunnel and Reservoir Plan (TARP) is a deep underground tunnels and huge reservoirs to store combined sewer overflows (CSOs) of Chicago area to prevent frequent flooding and improve water quality. This project has been started from 1970's and it is currently on the final stage. In this term project, it would be explore how TARP impluences Chicago waterways in terms of storm water management and improvement of water quality in chicago area using a geographic information system (GIS). It is a great tool for visualizing the TARP facilities, output and its impact.

## 2 Methodology and Questions

The particular extent of this term project is on the effectiveness of the Tunnerl and Reservoir Plan: capture more flow before a construction, store the rainfall and prevent flooding in Chicago area and improve water quality. There are 6 main tunnel elements in the project area and these tunnels provide 2.5 billinons gallons of storage for CSOs and flood waters with an 85 percent for all CSOs. In this project, it will focus on one or two tunnels and analyze it controls enough CSOs not to occur a flood. For water quality, this project will discuss dissolved oxygen and sediment quality among many factors.

## 3 Data

There are relevant and tons of GIS map data available online provided by the Chicago Metropolitan Agency for Planning, the Metropolitan Water Reclamation District of Chicago and the City of Chicago Data Portal. Rainfall Flow data will be provided by The Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI), USGS and NHDPlus.