

Combined Sewer Overflows and Fecal Coliform Concentrations in the Charles River Watershed

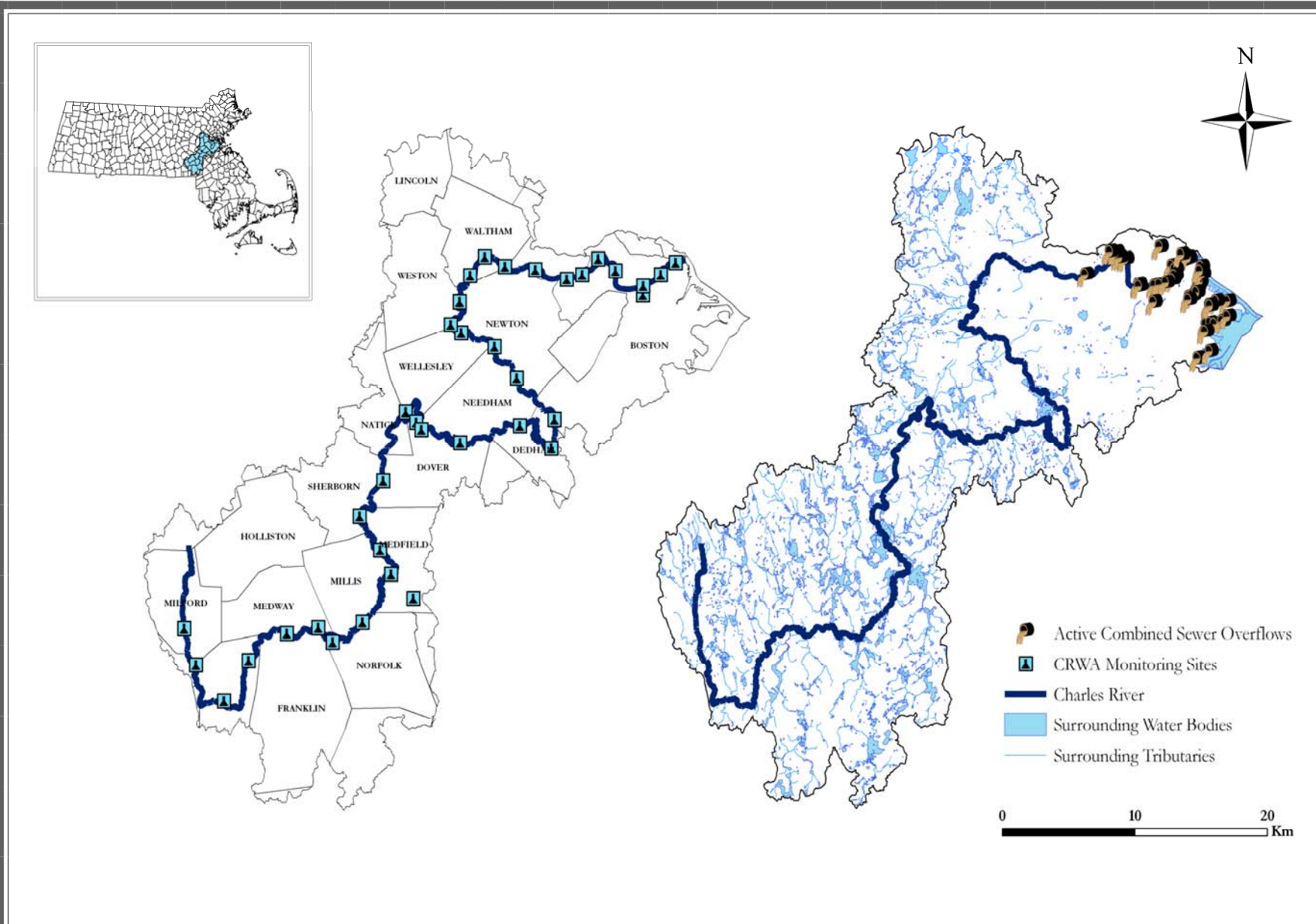
Objectives

Using GIS, this project investigates the relationship between improved combined sewer overflow management practices and fecal coliform concentrations in the lower basin of the Charles River Watershed.

Methods

Using monthly coliform sampling data for each year, a geometric mean of concentrations of fecal coliform was mapped along the watershed. Only samples within 24 hrs of 0.2 inches of rain at Logan Airport were used. Spatial interpolations, using radial basis functions, were run to create a map concentrations along the river. These maps were then analyzed to determine if bacteria concentrations have been declining over time.

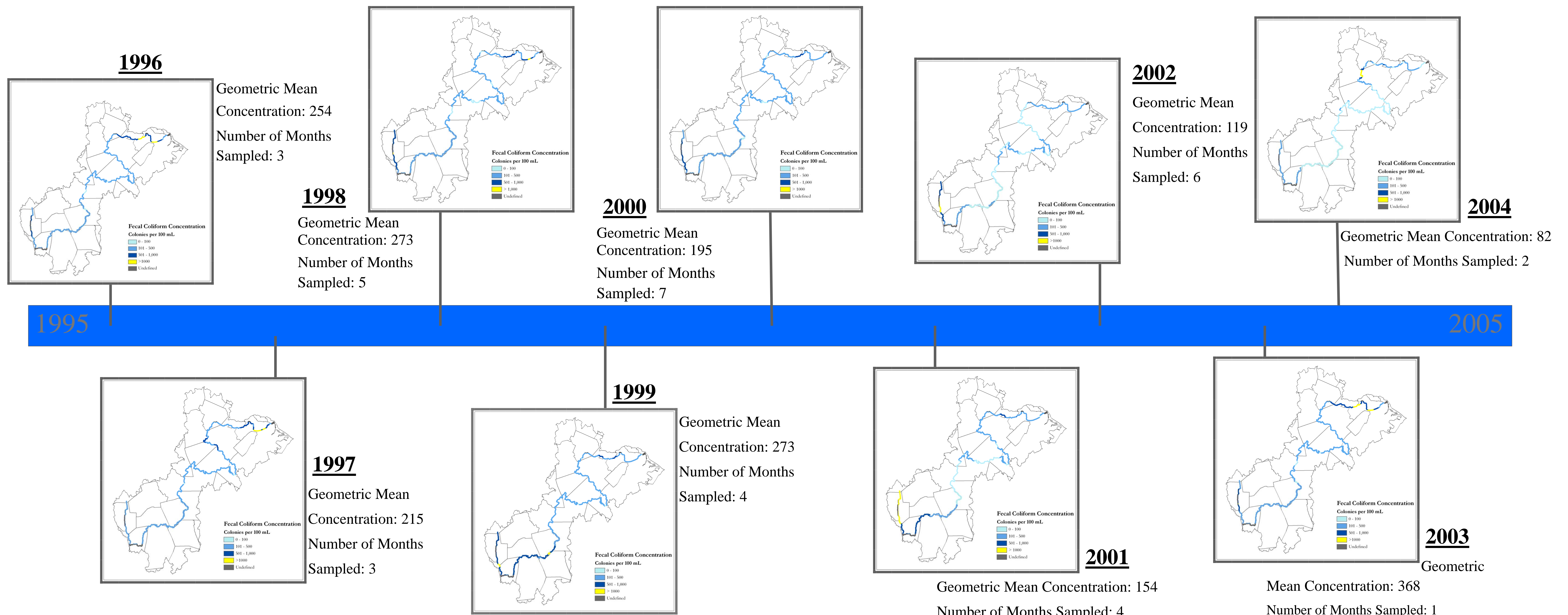
CSO History and The Charles River Watershed



Active Combined Sewer Overflows
CRWA Monitoring Sites
Charles River
Surrounding Water Bodies
Surrounding Tributaries

CSOs, built as part of sewer collection systems, were designed to carry both sewage and stormwater in the same pipe and to respond to large fluctuations in rainfall. After heavy rainfall or snowmelt, the stormwater and sewage overload the system, allowing overloaded systems, containing untreated industrial and human waste to discharge into rivers, lakes and coastal areas. The pollution arising from these outfalls is a major concern for the 772 US cities that have the systems.

The lower basin of the CRW currently has 36 active CSOs along the Charles River, in addition to 39 active CSOs throughout the watershed. Specific to the CRW, the MWRA has implemented various projects to reduce the impact of CSOs on the watershed.



The Rivershed's Progress

Ultimately, the geometric mean concentration of coliform concentrations appears to be declining with time. The spike of mean concentration in 2003 is most likely attributed to a lack of sampling data. But, when comparing 1996 to 2004, the river appears to be in significantly better shape.

References

- MWRA. 2007. Combined Sewer Overflow Control Plan: Annual Progress Report
- MassDEP. CSOs Frequently Asked Questions.
- Sampling data was provided by David Kaplan of the Charles River Watershed Association