



CASE STUDY

Community Life-Cycle Analysis for Stormwater Infrastructure Costs



Photo by: Moore Engineering ©

Harvey North Dakota

CLASIC Case Studies showcase the variety of ways that the online tool can assist communities with stormwater project planning and decision-making.

CASE STUDY HIGHLIGHTS

- ➔ CLASIC can help communities “right size” projects and identify projects that meet water quality goals.

Background

Harvey, North Dakota is small (1,700 pop.) community located in an area with unique natural resources. Harvey sits at the headwaters of the Sheyenne River amidst rolling hills, highly productive agriculture and nearby the Lonetree Wildlife Management Area.

The Challenge

Today, small communities are expected to provide the same public services as larger communities – police, fire, drinking water, street maintenance, stormwater management, etc. However, the ability of small communities to generate the same levels of revenue to meet these expectations is limited. In this CLASIC Case Study we will look at whether construction of small diffuse wetponds or one large wetpond provides the best value and most water quality benefits for the City of Harvey.

CLASIC INPUTS

(targets, data, technologies, default adjustments, etc.)

All wetponds are planted with seed and include routine mowing for 6 months every year.

Scenario 1

- Five small wetponds (5,000 ft² permanent pool surface area) that capture 10% of the impervious area. Total volume captured is 62,500 ft³.

Scenario 2

- One medium wetpond (10,000 ft²) that capture 10% of the impervious area. Total volume captured is 100,000 ft³.

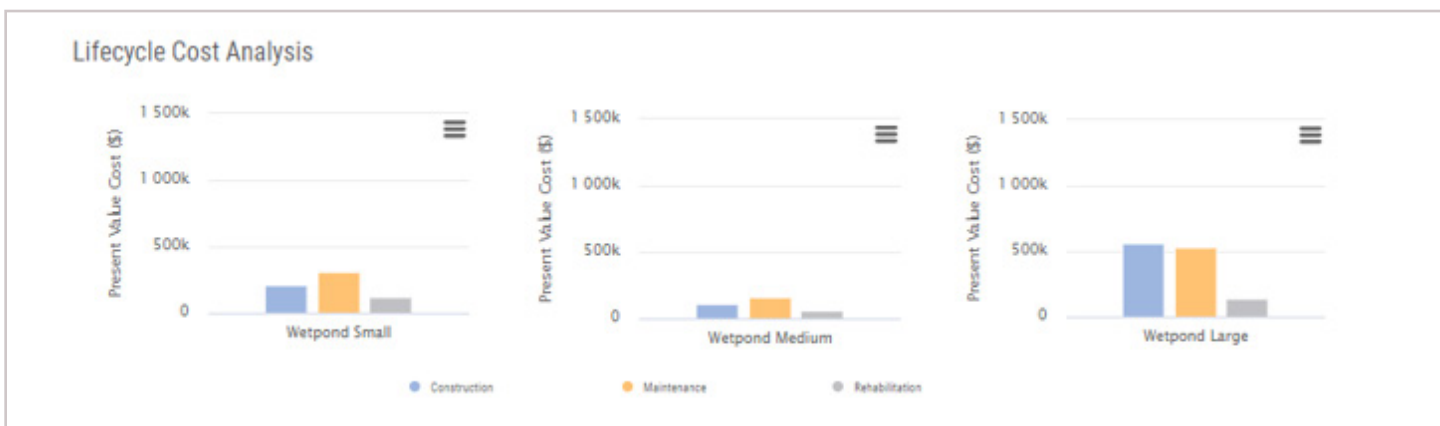
Scenario 3

One large wetpond (80,000 ft²) that capture 10% of the impervious area. Total volume captured is 805,000 ft³.

CLASIC OUTPUTS

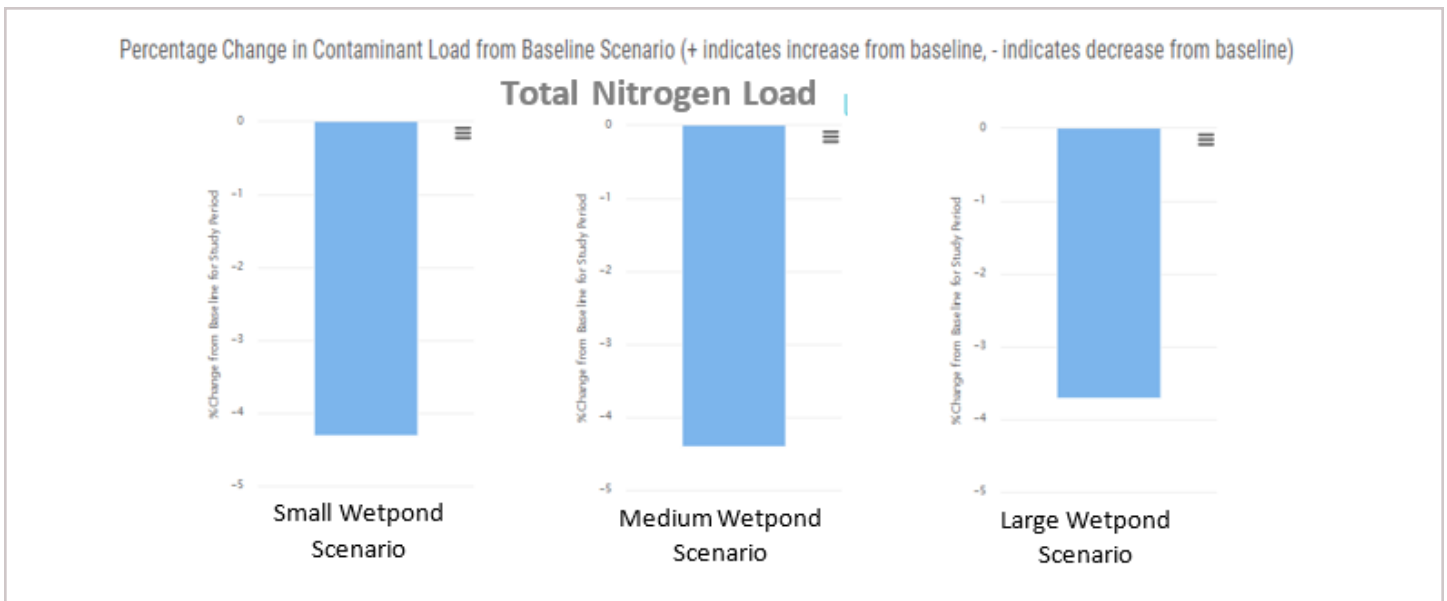
Cost

Like “Goldilocks and the Three Bears,” it’s the middle scenario, not too small and not too big, that is the least cost scenario. The medium-size wetpond scenario is the least lifecycle cost.



Despite being able to capture eight times more runoff than the medium wetpond, the large wetpond does not provide water quality benefits that justify the cost of such a large project. The large wetpond is simply oversized for the project area.

Due to Harvey's location near significant water sources and key wildlife areas, water quality is important. In this project scenario, the medium-size wetpond scenario indicates that it will provide the largest reduction in total TSS, nitrogen and phosphorous load.



SUMMARY

CLASIC can help communities “right size” projects and identify projects that meet water quality goals.

This case study is based on a hypothetical project in a real-world location. The project and results do not represent any actual construction or spending in the city listed.