Hydrologic Modeling of the Effects of Stormwater Runoff in Plaster Creek Watershed

Ryan DeGroot  
*Calvin University*

Julie Wildschut  
*Calvin University*

Robert Hoeksema  
*Calvin University*

Follow this and additional works at: https://digitalcommons.calvin.edu/pcs_student-papers

**Recommended Citation**

https://digitalcommons.calvin.edu/pcs_student-papers/18

This Poster is brought to you for free and open access by the Plaster Creek Stewards at Calvin Digital Commons. It has been accepted for inclusion in Student Papers and Reports by an authorized administrator of Calvin Digital Commons. For more information, please contact dbm9@calvin.edu.
Hydrologic Modeling of the Effects of Stormwater Runoff in Plaster Creek Watershed
Ryan DeGroot, Professor Julie Wildschut and Professor Robert Hoeksema, Calvin College

Introduction

A major detriment to the health of Plaster Creek is stormwater that brings a large volume of warm, polluted water into the creek. Stormwater is water that runs off of impervious surfaces like pavement and rooftops. A significant amount of the Plaster Creek Watershed is urban with a lot of roads and parking lots which results in too much stormwater entering the creek at an unnatural speed. A common way to decrease the impact of stormwater is to install best management practices (BMPs) that capture the stormwater and give it a chance to percolate into the ground. A few examples of BMPs are:
• Rain gardens
• Detention basins
• Planter boxes

To understand where and what types of BMPs are most needed, a hydrologic model is necessary. The model is also able to measure BMP effectiveness which aids in future BMP implementation.

Methods

The model was developed in HEC-HMS, a program designed by the Army Corps of Engineers to simulate how watersheds react to storms. To gather the information needed for HEC-HMS, we worked with other programs including GIS (a mapping software) and HY-8 (a culvert analysis software).

We also strategically installed 16 leveloggers in streams throughout the watershed. Leveloggers show us how much water is flowing at a particular location which allows us to calibrate the HEC-HMS model, improving its accuracy. The calibration process involves choosing an actual rain event and comparing how the real watershed and model watershed respond to the rain event.

Results & Conclusion

This research was a part of an ongoing effort to make an accurate model of the watershed. We created a model this summer and have calibrated it using a rain event in June. Future calibrations will help improve the model’s accuracy, making it a useful tool for quantifying BMP effectiveness to improve the health of Plaster Creek.