

A Stormwater Best Management Practice Demonstration Park at the Illinois Institute of Technology

A progress report to the Illinois Association for Floodplain and Stormwater Management

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The Illinois Institute of Technology (IIT) has set forth the aggressive goal of becoming the most sustainable urban campus in the United States. The university has created the Office of Campus Energy and Sustainability (OCES), charged with achieving this end. IIT is aware of the adverse effects of urban stormwater and understands that a Chicago campus cannot be considered sustainable without addressing the quantity of water it removes from the watershed and the quality of the water being returned into the environment. In response, the OCES has formed a committee of students, faculty, staff, and professionals to draft a stormwater management action plan.

The focus of my research project is to investigate the possibility of reducing IIT's stormwater footprint to a level that might be considered stormwater neutral. To accomplish this, I am in the process of building a campus model that will allow us to understand the location and volume of stormwater entering the sewers. This model will provide data that the OCES can use to set goals and understand how to make the greatest impact with infrastructure investment. I will then use the model to assess the effects of different best management practices (BMPs) and other engineering options at various locations, in an attempt to collect data on the impacts of a range of scenarios. The end goal is to understand the economic and physical feasibility of reducing runoff levels to pre-development levels, which is defined by the Chicago Metropolitan Agency for Planning (CMAP) as 10%⁽¹⁾.

The Metropolitan Water Reclamation District of Greater Chicago (MWRDGC) has drafted an ordinance that will put limits on stormwater runoff on future construction in Cook County⁽²⁾. To create a model of campus, I have decided to use USACOE HEC-GeoHMS coupled with ESRI ArcView/ArcHydro because it is a GIS-based tool that complies with this ordinance mandate. Not only does GIS software provide us with a tool to generate accurate stormwater flow patterns, but it can be integrated with other data, such as internal water use or energy consumption, to create a complete water management model or sustainability plan geodatabase. While IIT offers a basic GIS course, advanced courses are not currently available. I have used published material to independently learn how to develop this model.

Collecting data for the model has been one of the great challenges thus far. One of the key pieces of data, surveying plans of the campus, has been difficult to pinpoint. While much of the data has been received and is being digitized, we are also requesting LIDAR data from the county as a potential means to fill in some of the gaps. Additionally, the university has a high-precision GPS that can be used to conduct any necessary manual data collection. Other necessary data have already been received. The OCES has sponsored an undergraduate Interprofessional research project that will investigate sustainable landscape options. Their work will be incorporated in this project, and vice versa.

Literature reviews have been continuing throughout. Our understanding of the effectiveness of BMPs will be solely based on theoretical data collected by others. The hope is that the future installation of BMPs on campus will serve as a real-life research lab for future students interested in stormwater management. Thus, the project is seen as planting the initial seeds of a long-term commitment to better water management on IIT's campus. Training engineers needed to solve urban stormwater issues is an important aspect of becoming a sustainable university. This process must begin with addressing stormwater in our own backyard, and how it affects our city.

References

1. Stormwater Management Strategy. Rep. Chicago: Chicago Metropolitan Agency for Planning, 2008.
2. Cook County Watershed Management Ordinance. Metropolitan Water Reclamation District of Greater Chicago, 24 Sept. 2009. Web. 1 Dec. 2009.
<<http://www.mwrdd.org/irj/portal/anonymous/WMOPublicReview>>.