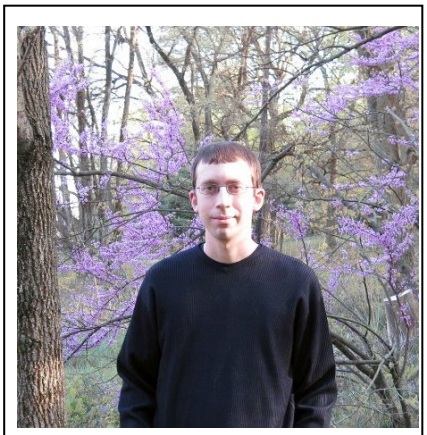
Ecological Sciences and Engineering
Agricultural and Biological Engineering
MS Thesis Defense



After receiving a Bachelor's of Science in Landscape architecture from Purdue University in 2007, I worked for almost three years in the land planning industry for Ragan-Smith Associates in Nashville, TN. While working at Ragan-Smith I had the opportunity to work on projects that involved low impact methods for stormwater management and contribute to the design of some of these methods. These experiences sparked my interests in Low Impact Development and stormwater management, which I then elected to study in depth when I returned to Purdue in 2011 in order to work towards my Master's degree.

Speaker:	Timothy Wright
Title:	Retrofitting LID Practices Into Existing Neighborhoods: Is It Worth It?
Major Professor:	Dr. Bernie Engel
Date:	Monday, April 14, 2014
Time:	1:30
Location:	ABE 301

Abstract:

Low impact development (LID) practices are gaining popularity as a way to manage stormwater close to the source. This reduces infrastructure requirements and helps maintain hydrologic processes close to predevelopment conditions. Studies have shown LID practices are effective in reducing runoff and improving water quality. However, little has been done to aid decision makers in selecting the most effective practices for their needs and budgets.

To this end, the L-THIA LID model has been applied. Using readily available data sources, multiple scenarios can quickly be examined, and then analyzed to determine the cost of implementation and the approximate period needed to see a return on the investment. This has been demonstrated by modeling four neighborhoods in greater Lafayette, Indiana to estimate runoff reduction that could be achieved through retrofitting LID practices. Based on LID practice cost of implementation, the payback period was determined for each practice. Depending on the LID practice and adoption level, 10 to 70 percent reductions in runoff volumes could be achieved. Cost per cubic meter of runoff reduction was highly variable depending on the LID practice and the land use it was applied to, ranging from around $3.00 to almost $600.00. In some cases the savings from reduced runoff volumes paid back the LID practice cost with interest in less than 3 years, while in other cases it was not possible to generate a payback. This information can help decision makers establish realistic goals and make informed decisions regarding LID practices before moving into detailed designs, thereby saving time and resources.

Application:

This research is meant to provide information and methods that can be used by decision makers to make informed high level decisions about the costs, benefits, and performance of LID practices as an alternative to traditional stormwater management methods.