



## 2014-15 TWRI Mills Scholarship Application

### 1. Student Name and UIN

Name: Hyun Woo Kim

### 2. Contact Information

Address:

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### 3. Faculty Advisor Contact Information

Name: Dr. Ming-Han Li, Associate Professor

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### 4. Description of the Student's Proposed Research

#### **The role of low impact development practices in mitigating stormwater runoffs in urbanized watershed landscapes: SWAT simulation approach**

According to the recent U.S. census, from 1950 to 2010, urbanized areas expanded by almost 210 percent, and population in urban areas has increased by more than 130 percent. Especially, in the recently developed suburban areas increasing imperviousness caused by growing urbanization has led into severe urban drainage issue. Traditional urban stormwater drainage systems may exacerbate surface runoff because of their designs, which typically route overflow directly to streams. In an effort to cope with this problem, numerous local governments are currently adopting and implementing low impact development (LID) performances. As one of new decentralized stormwater management techniques, LID can be used to effectively managing the quantity as well as quality of stormwater runoff. Along with the above background, this study attempts to answer the following research questions: (1) what is the impact of suburban sprawl on runoff change? (2) what is the relationship between land cover change and runoff? (3) how much runoff volume can be reduced by implementing LID practices?

The selected watershed for this study area is located within Cypress, Texas. One of rapidly urbanized areas, the study area is adjacent to Houston metropolitan area. By employing the Soil and Water Assessment Tool (SWAT), a hydrologic model, this study will investigate the quantity of runoff from different land covers (2001, 2006, and 2011 NLCD land covers). In addition, in an attempt to address the association between developed land cover and stormwater runoffs, regression model will be used. Specifically, based on the LID guideline derived from Prince George's County in Maryland, this study will examine the effectiveness of LID practices



in the study area. This study is expected to provide local water professionals and land use planners with useful guideline about LID practices on stormwater management.

Since Texas is the fastest growing states in the United States and suburban areas are rapidly expanding from the existing urban areas, the results of this study will provide insights and solutions for other fast growing cities in Texas to mitigate excessive stormwater runoffs caused by increased impervious land cover.

**5. Academic Qualifications of the Student**

Year	Degree	Major	School	GPR
2009	B.E.	Urban Planning & Engineering	Yonsei University, South Korea	
2011	M.S.	Community & Regional Planning	University of Texas at Austin, Texas	
Present	Ph.D.	Urban and Regional Science	Texas A&M University, Texas	
<b>GRE Scores</b>		<b>Total:</b>	Verbal: Quantitative: Writing:	

**Relevant Courses Taken**

Courses	Grade	Courses	Grade
Modeling Small Watershed		Quantitative Methods	
Water Resources Planning		Analytic Methods I & II	
Directed Studies (Special Topic in Design and Planning for Soil & Water Management)		Sociological Research: Quantitative Methods	
Environmental Planning Administration		Geographic Information System	
Disaster Recovery and Hazard Mitigation		Advance GIS in Landscape Architecture and Planning	

**6. Proposed Use of Funds**

This scholarship will be primarily used for the costs related to the proposed research, which include field trip costs, software and material purchase fees, and conference travel expenses. In addition, since my assistantship contract with the department finishes after this semester, I desperately need the TWRI Mills Scholarship to pay my tuition fees.

**7. Career Path**

After the graduation, I hope to work in academic field in order to teach and research water resources related issues in urban areas. Specifically, I pursue to keep study on sustainable stormwater management in Texas by examining the implication of both structural measures (LIDs and BMPs) and non-structural approaches (land-use planning and regulatory tools).

**8. Letter of Recommendation**

The letter of recommendation from the faculty advisor (Dr. Ming-Han Li) is attached in this mail.