

2009-10 TWRI Mills Scholarship Program Application Package

1. Name of Student and TAMU Student ID Number.

Name: Yixiao Liu	UIN:
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2. Contact Information (Address, E-mail and Phone number) for the Student.

Address:	E-mail:	Phone Number:
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3. Name and Contact Information (Address, E-mail and Phone number) for Faculty Advisor or Committee Chair.

Name: Bruce Dvorak (ASLA, RLA Assistant Professor)	Address: A305 Landford Bld, 3137 TAMU Texas, 77843-3137	E-mail: bdvorak@archmail.tamu.edu	Phone Number: 979-458-0628
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4. Description of the student's proposed research, emphasizing how it will address water resources-related concern (particularly how, if possible, it will benefit Texas).

The Project

Typically, suburban and urban landscapes are covered by building footprints from 30 to up 70 percent. . , Rainwater draining from rooftops generally ranges from 90 to 98 percent. This condition contributes to localized flooding and rain water pollution. Europe pioneered green roof technology 50 years ago to delay and reduce storm water runoff, but North America is just starting to explore and apply this technology, including Texas. Guided by Professor Bruce Dvorak, the research project will explore green roof technology in its effectiveness to mitigate storm water runoff from rooftops at Texas A&M University. It is a field experiment with 12 existing green roof modules located on top of the Langford Architecture Building located on east campus. Storm water runoff quality and quantity draining from the modules will be investigated after plants become fully established across the modules.

Methods

The modular green roof trays (donated by Tecta America) exhibit four different green roof treatments. Three green roof designs have succulent plants and one set of modules will not be planted and used as a control. Precipitation runoff will be monitored with tipping bucket rain gauges mounted under the drain of each tray. Runoff quantity and runoff rate data will be recorded periodically. Statistical analysis will be conducted to analyze mean percent retention of runoff for treatments, plant growth rate, and temperature changes between modules and the conventional roof deck. Water quality samples will be lab tested to measure nutrient and other soluble constituents detected in the water.

Research Benefits

Green roofs are known to retain up to 80% of the average annual storm water volume in Florida, as a way to reduce flooding and water pollution. Using storm water to irrigate green roof saves the consumption of potable water and energy for other quality use. However, the research of this win-win sustainable development strategy has just been launched in Texas, more systematic and comprehensive study, especially field experiments need to be accomplished in order to develop the Texas-localized green roof application model. The hydraulic condition, soil type, regional climate, and native and other adaptable plants, are key factors affecting the effectiveness of green roof function. Texas currently calls for more effective ways to manage storm water, and this proposed should help shed insights on modular green roof component. Seeing the well recognized long term benefits from green roofs across Europe. It is necessary to investigate their potential storm water benefits in Texas as well.

5. Academic Qualifications of the Student, including undergraduate and graduate GPR, GRE scores, courses taken and grades. A transcript is not required; rather a simple relative course listing is adequate.

Undergraduate GPR (B.S. in Biology):	Relative Courses Name	Credit	Grade
	Ecology		
Graduate GPR (M.S. in Genetics):	Botany		
	Statistics I		
1 st year Graduate GPR (current M.L.A program):	Landscape Architecture Design Theory		
	Landscape Architecture Site Development		
	Practice Diversity		
GRE scores:	Landscape Architecture Communication		
	Landscape Architecture Design Application		
	Landscape Architecture Construction		
	Research Method in Landscape Architecture		
	Investment Management		

6. Proposed use of funds resulting from this Scholarship (for example, to pay tuition, conduct research, etc.). There are no matching requirements for TWRI Mills Scholarships.

If awarded, the scholarship funds would help to pay tuition and support research needs as maintaining the green roof plots, collecting data, transferring data to statistical outputs, preliminary statistical analysis.

7. Intended career path the student anticipates pursuing.

I am interested in developing practical knowledge and skill set in ecological and sustainable design field. I am strongly concerned about the disturbance of urban development to natural ecosystem and over consumption of limited natural resource. I consider that the sustainable design with ecological consciousness should be universal professional practices in landscape architecture. Beside originality and acute artistic vision, one should also establish sophisticated research skill and solid background theory and knowledge to be able to solve nowadays design challenges. Also, I believe the limitation of natural resources is globally acknowledged, more guidelines and techniques are needs in land use planning and development in developing countries. I am willing to work internationally with holistic view in design practice.

More specifically, I am interested in forest conservation and water body conservation in process of landscape design. Exploring new techniques in storm water management and grey water recycling, developing effective and efficient planting pattern with native plants to lower irrigation need and form natural habitat, practicing new land use development scheme for better conservation of existing natural ecosystem, and recovering and recreating new eco system within urban area. Taking advantage of my B.S in Biology, and research training in M.S in Genetics, I am competent in research and comprehensive analysis of land use problems as required in evidence based-design practice. With the systematic training along my MLA program, I am confident and looking forward to embrace the upcoming challenge in the professional practice.

8. The signed letter of recommendation on letterhead from a TAMU faculty advisor or chair.

Signed recommendation letter has been submitted by Prof. Bruce Dvorak.