

**AC 2008-557: GRADUATE LEARNING THROUGH ENGAGEMENT:
EXPERIENCE IN ENVIRONMENTAL REMOTE SENSING STATION DESIGN**

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Graduate Learning through Engagement: Experience in Environmental Remote Sensing Station Design

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Abstract

The application of remote sensing, especially in the field of environmental monitoring, has been a relatively new topic. This paper reports progress and results of two real-world environmental sensing projects and the impact on graduate learning.

The first project is the design and development of a microclimate system. This is a system for use on the land and incorporates sensors that can detect temperature, light, soil moisture, and soil temperature. The design with Crossbow motes, daughter sensor board, and powering methods will be discussed in the paper.

The second related project is a water quality monitor. The project is through the support and collaboration with a local non-profit organization, WATR. The water quality monitor has the capabilities to sense temperature, pressure, turbidity, and conductivity. In the area of Western Carolina, the turbidity of the water is very important due to the constant erosion of the mountains. WATR has asked us to build a public turbidity billboard that will be deployed in a local park in Sylva, North Carolina. This will work in unison with the water quality monitor.

This paper also reports the impact of these projects on graduate learning experience. A variety of real-world skills including infrastructure design, programming, protocol selection, data acquisition and analysis, and project management have been greatly improved through these engagement projects.