Independent Research Project as an Integral Part of Geology Courses Provides Undergraduates the Opportunity to Solve Real World Problems

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INDEPENDENT RESEARCH PROJECT AS AN INTEGRAL PART OF GEOLOGY COURSES PROVIDES UNDERGRADUATES THE OPPORTUNITY TO SOLVE REAL WORLD PROBLEM

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Abstract

Undergraduate students provide valuable information that could be useful in solving water and environmental problems. Over the years, undergraduate students at Indiana University-Purdue University Fort Wayne (IPFW) have conducted independent research projects that have helped to address some water related problems in the campus, city, and in NE Indiana. Hydrogeology, Environmental Geology, Understanding Wetlands, and Environmental Conservation courses offered at IPFW, provide avenues for undergraduate students to conduct independent research projects. Here, we provide a brief description of one of such research projects that has proven useful in solving a water-related problem along with a list of other projects deemed useful in solving water related issues.

A water quality assessment of a distribution system in a Mid-western city, Fort Wayne, was undertaken to determine the water chemistry within the metropolitan area. For the study, the city was divided into four quadrants and 36 water samples were collected along the distribution system. The waters were tested for pH, temperature, chlorine, nitrate, nitrite, and dissolved oxygen. Eighty five percent of the 36 samples are below the US EPA water standard recommendations. However, 5% of the samples failed to meet the recommended standards and 10% of the samples are within the recommended standards. The results showed that the SW quadrant had some issues as the area appears to have had several leaks or breaks in the distribution system. The city has embarked on repairing, fixing, or replacing some of the old pipes. Other student research projects included looking at water quality issues in wetlands and rivers. Undergraduates should be involved in research projects that could provide solutions to water and environmental issues through the “research component” of regular course.

Background Information:

Undergraduates have the training and skills to solve real water and environmental problems. Projects may just have to be broken up in parts that students can handle.

Problems:

Increasing population creates an increasing demand on available water resources and compounds environmental issues. Insufficient resources for research with the current economy. Need to increase the number of new professionals to replace ageing professionals. Need to have undergraduates help address water and environmental issues. Need to have undergraduates help address water and environmental issues.

Approach:

Involves undergraduates in scientific research and be a mentor to students.

Selected Published Student research works:

*Isiorho, S.A. and *Moree, A. 2011. A campus based well field used to educate students on water and environment. Published in GSA Abstracts with Programs Vol.43, No.1, p. 101
*Flores, Nicholas, *Norris, Emily, and Isiorho, S.A. 2010. Sediment content of the Wetlands surrounding Indiana University-Purdue University Fort Wayne Indiana. Published in GSA Abstracts with Programs Vol. 42, No. 5, p. 163
*Isiorho, S.A. and *Daughdrill, G.F. 2007. Student observes the effect of construction on water levels in a nearby Creek. Published in GSA Abstracts with Programs Vol. 39, No. 3, p 21
*Budd, D. and Isiorho, S.A. 2006. A study of the water quality of the Eel River and its tributaries in Indiana. Published in the 51st Midwest Ground Water Conference, Program with Abstracts St. Louis MO Oct, 15-17, 2006

Discussions:

Several publications indicate that undergraduates are capable of solving environmental and societal problems through research as evident from the 777 GSA session of more than 30 posters.

Conclusions:

Undergraduates are competent to help solve some environmental issues within their communities. They are your students, help them become proficient by involving them in research projects.

Acknowledgement:

Our thanks to past, current and future undergraduate students at PFW who worked in research projects and will be involved in future research projects.