INVOLVING UNDERGRADUATES IN RESEARCH PROJECTS AS A WAY OF RECRUITING STUDENTS INTO STEAM FIELDS

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Make research part of your courses

Abstract

Environmental-related projects are amendable to undergraduate research; the projects can be designed to have all the elements of any basic learning style (auditory, visual, verbal/logical and kinesthetic). Undergraduate research is a practical way to recruit students into the Science, Technology, Engineering, Arts, & Mathematics (STEAM) fields. Instructors can involve students in field/lab work by embedding research projects as part of the course work requirement. Also, have the students participate in the professor's own research projects.

Water-related topics are assigned to students, or the student can pick a topic of choice to work on, subject to the instructor's approval. Most of the assigned water research projects involve measurements in the field with or without a lab component. Some of the research projects could be as short as a weekend or as long as the entire semester. However, a few of the projects span over a semester.

Most students express satisfaction with the field and or lab experience(s). Students present their result(s) in classroom setting to their peers and/or at local, regional, national, and professional conferences. This is a win-win situation for the students, institutions, professors, and the professions.

If you want

"1 year of prosperity, grow grain
10 years of prosperity, grow trees, and
100 years of prosperity, grow people"

Require most courses to have some research component

Flexibility of topic … allow students select …subject to instructor's approval

Require students to present their findings to their peers

"Optional" students presentation in local, regional or national meetings (if project is deemed appropriate).

Travel fund for outside campus presentation

Some plausible topics

(Water/Environmental related issues)

Anthropogenic effect on nearby wetland/lakes/rivers

Effects of Quarry Operations on landfill hydrogeology

Using Substrate to Predict Fish Assemblages in creek/rivers

Best Management Practices & Soil Water Quality

Small town water quality & health concerns

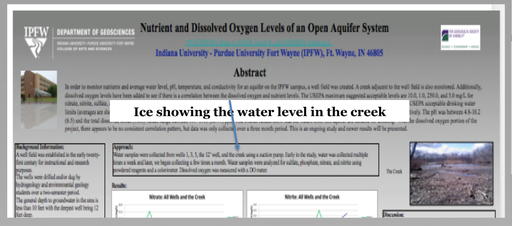
The Biodiversity of a County Park

Microplastics in rivers/lakes

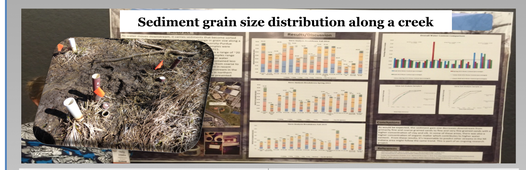
Some student presentations

Students in the field collecting data

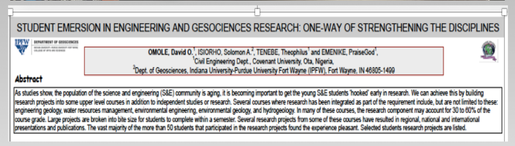
PFW Campus & Well field



Ice showing the water level in the creek

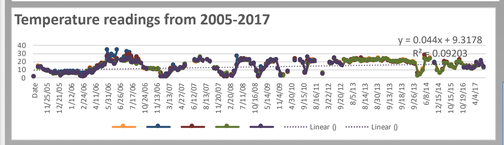


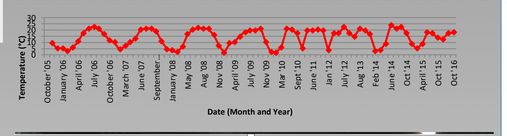
Sediment grain size distribution along a creek

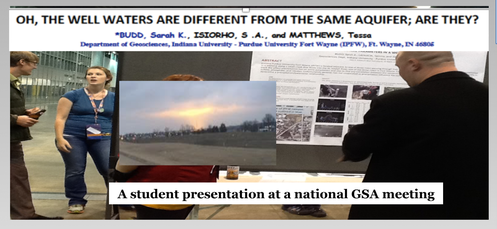


Monitoring Wells

Student data (Oct 2005 - May of 2017) shows an increase in groundwater temperature within the well field with a rise in water level (WL) (WL is not shown in the graph).







A student presentation at a national GSA meeting

Student learning outcomes

ID problems/issues, develop ideas, design, collect, analyze, report

Collect relevant data that may be useful…baseline studies

Foster collaborative learning

Students cultivate interests and excited about STEAM fields

Students performing research in Atlantic Ocean, wetlands, and river environments

Conclusions

Students learn methods, use instruments, develop design ideas, collect, analyze, prepare report, & get published and or present their findings

Faculty gets rewarded through recognition/promotion

Some students have been known to change their field of study

Support student learning …the highest TL

It's a win-win- for students, professor, college, and the professions

Acknowledgements

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