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T.20 Embedded Research Projects in Upper Level Undergraduate Courses: A Plausible Panacea for the Dwindling Science and Engineering (S&E) Researchers Community (Posters)

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ABSTRACT: A group of young students were engaged in researching into some of South Africa's water problems. Being a semi-arid country with huge deficits in water supply, both surface and groundwater resources in the country are critical and have been fully allocated. However, it was found that pollution activities are putting additional strain on the already sparse water resources, thereby effectively reducing available fresh water in the country. The identified sources of pollution of surface waters in South Africa are agricultural drainage and run-off (irrigation return flows, fertilizers, pesticides and runoff from feedlots), urban wash-off and effluent return flows (bacteriological contamination, salts and nutrients), industries (chemical substances), mining (acids and salts) and areas with insufficient sanitation services (microbial contamination). Pollution of groundwater results from mining activities, leachate from landfills, human settlements and salt water intrusion from the surrounding oceans. The undergraduate students' hands on experience in this research work involved both field work and class presentations. This experience stimulated an interest in the students which was not in them ab initio. The students had a better understanding of the problems in their environment. Many of them also indicated interest in furthering their studies at graduate level in the identified environmental and geological areas.

BACKGROUND: South Africa is a semi-Arid country. All ground and surface water resources are precious. Pollution arising from mining and other industrial activities pollute freshwater resources:



METHOD: Young researchers were taken to the field to take measurements and samples for analysis in the laboratories. They also made presentations of their findings in the classroom.



RESULTS 1: It was observed that human interference with natural stream flows accounted for much of the water pollution in South Africa.



RESULT 2: The students showed immense interest and suggested solutions to the environmental problems, including prosecution of offenders, standards enforcement, and advocacy programs.



An aerial view of Daasport Wastewater treatment plant at close proximity to Skannerspruit stream

CONCLUSION: 1. Pollution activities need to be checked if the freshwater resources of South Africa must reach everyone. 2. The young generation has a lot of ideas that can be tapped in solving society's problems. They only need to be shown how it is done.



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