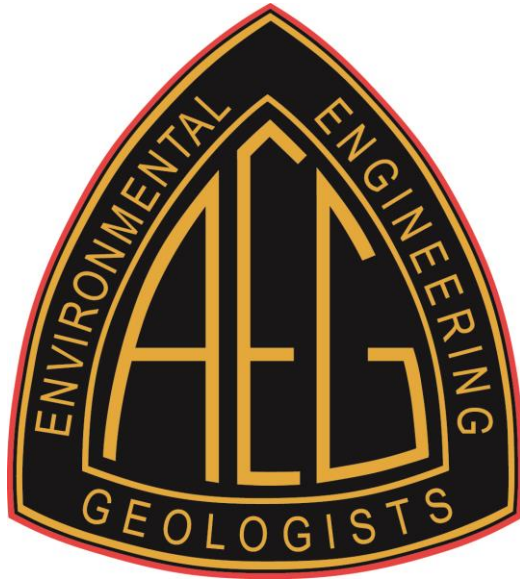


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Third Annual Student Night

Clarion Hotel, Somerset, NJ

Thursday, March 30, 2017

***Connecting students
and practicing professionals.***

Oral Presentation

“The Effects of Tide Gates on the Distribution of Heavy Metals in Sediment”

**Presented by Alexander A. Cid, Hudson County
Community College**

Heavy metal distribution within sediment is studied to understand where pollution is gathering or spreading due to tides and floods. Tide gates restrict the flow of the river inland during high tide and open during low tide to even the water levels. The study was to assess the effects of two different types of tide gates and with two different land areas which are associated with each tide gate. Acorn Road Creek Tide Gate is a simple metal flap tide gate which affects an area around 91 acres and is mostly residential. Losen Slote Tide Gate is a three-pump system tide gate which affects an area of around 671.4 acres and is a complex system of industrial wetlands commercial and residential land use. Twelve samples were collected from each Tide Gate, six on the landside and six on the riverside. The samples were then put through an ICP-MS to calculate the concentration levels of 27 heavy metals. Out of the 27 metals 12 were studied as the Priority Metal. The data showed that the concentration of these Priority Metals were all higher on the landside for both Tide Gates, Losen Slote showing a greater variant of difference. Regression analysis showed that Losen Slote’s landside has a negative slope for almost all the metals, starting at the Tide Gate and moving inland. This suggests that there is a buildup of heavy metals in the landside of some Tide Gates, concluding that Tide Gates have an effect on heavy metal distribution in sediment. While this study compared two different Tide Gates and areas, further studies of similar tide gates and/or of similar area land usage while show the levels of variants found with in this study.

Oral Presentation

“The Relationship Between Dune Morphodynamics and Economic Values Along the New Jersey Shoreline”

Presented by Jesse Kolodin, Montclair State University

Since Superstorm Sandy, The US Army Corps of Engineers has constructed several dune and berm features along the New Jersey coastline to protect barrier island communities from future storm impacts. A basic management question is whether the benefits generated by these projects justify the costs. To tackle this question, we have developed a morphodynamic model of the evolution of coastal dunes that accounts for both sediment erosion and overwash during storm events. The model investigates two coastal protection measures: dune nourishment to control erosion and sediment relocation to control overwash. In the model, the levels of protection measures reflect choices made by a coastal property owner, where property value is positively correlated with both a proximate dune's height and its distance from the property. We derive mathematical expressions for optimal dune size and location as a function of geologic and economic parameters. Model results suggest that both the costs of nourishment and baseline property values can play key roles in determining the optimal cross-sectional area that a dune system should maintain in the long-term. In a case where a group of coastal townships with different nourishment costs and property values need to coordinate their protection measures to maintain the same dune geometry along a common coast, this framework could be used to develop formulas for sharing total project costs or for allocating government subsidies. Future work will explore the “geo-economic” effects on ocean views that may be diminished by a dune system of particular size and location.

Oral Presentation

“Magnetic Susceptibility (MS) and X-Ray Diffraction (XRD): A Geophysical Way to Track Microbial Activities in a Bio-remediated Polluted Site”

Presented by Yonesha Donaldson, Rutgers University - Newark

From an unknown date until 1955, the Brandywine facility (Maryland) was a Department of Defense owned storage yard for surplus equipment, drums of waste solvents, and polychlorinated biphenyl (PCB) products. Due to the uncontrolled and abandoned wastes, Brandywine was recognized as a National Priority and eligible for federal cleanup funds.

One treatment employed at this site consists of an anaerobic reductive dehalogenation where molasses was injected into the ground to grow microorganisms that can convert the Volatile Organic Compounds (VOCs) to non-hazardous ethene. Indeed, such microorganisms can act as catalysts of chemical reactions occurring at the interface between the electrolyte and the grains, creating iron as a bi-product.

Magnetic susceptibility (MS) is a geophysical method that can detect these bi-products as it is particularly sensitive to the presence of magnetic metallic particles. X-Ray diffraction (XRD) is a destructive technique used for phase identification of a crystalline material. Together, both magnetic susceptibility and X-Ray Diffraction identify and confirm the presence of Iron-bearing minerals resulting from microbe-mediated redox reactions. By tracking these bio-products of microbial activity, we have assessed the efficiency of the bioremediation technique used in Brandywine to detect the extent of the treatment area.

Poster Session

“Using Remote Sensing Techniques to Assess Rockfall Risks at Delaware Water Gap” – Presented by William Akin, University of Pennsylvania

“Comparing Adsorption of (NH₄⁺)(aq) and NH₃(g) onto Struvite and its Heat-Treated Decomposition Products” – Presented by Dayana Arrue, Rutgers University-Newark

“Extent of Heavy Metal Contamination in an Urban Community Garden in Newark, New Jersey” – Presented by Erika Damacela, Rutgers University-Newark

“Phytoremediation of Zinc (Zn) using Poplar Deltoides Plants” – Presented by Tricia Defreitas, Rutgers University-Newark

“Hydrology of the Tarkhill Creek in Pike County, Pennsylvania” – Presented by Brooke Durnin, Widener University

“Long Term Changes of Above- and Below-ground Biomass in Natural and Restored Salt Tidal Wetlands (2009-2016)” – Presented by Michael Kirtz, Jr., Rutgers University-Newark

“Magnetic Susceptibility: Correlations with Clay Content and Apparent Diffusion Coefficients Controlling Electrical Double Layer Polarization” – Presented by Tonian Robinson, Rutgers University-Newark

Poster Session

“A Targeted Approach to Identifying Land Suitable for Green Stormwater Infrastructure Projects to Decrease Combined Sewer Overflows in the City of Chester, Pennsylvania” – Presented by Sara Labrum, University of Pennsylvania

“Using Ground Penetrating Radar to Quantify Vegetation Volume in a Eutrophying Lake in the Poconos” – Presented by Taylor Mantey, University of Pennsylvania

“SP Signals Response to Water Table Change in Hydrocarbon Contaminated Soil Media” – Presented by Mina Soliman and Youssef Rizk, Rutgers University – Newark

“The Assessment of Phosphate, Nitrate, and Ammonium Concentrations within Urban Water Setting” – Presented by Allison Waldron, Rutgers University - Newark

“The Sorption of Tetracycline and Sulfamethazine by Struvite” – Presented by Ann Walker, New Jersey Institute of Technology

“What’s in your water?” – Presented by Brittany Washington, Rutgers University - Newark

“Combining Geographic Information Systems Technology and Rock Mechanics to Analyze the Spatial Distribution of Abandoned Coal Mines and Their Risk of Mine Subsidence in Scranton, Pennsylvania” – Presented by Taunee Werts and James Riggs, University of Pennsylvania

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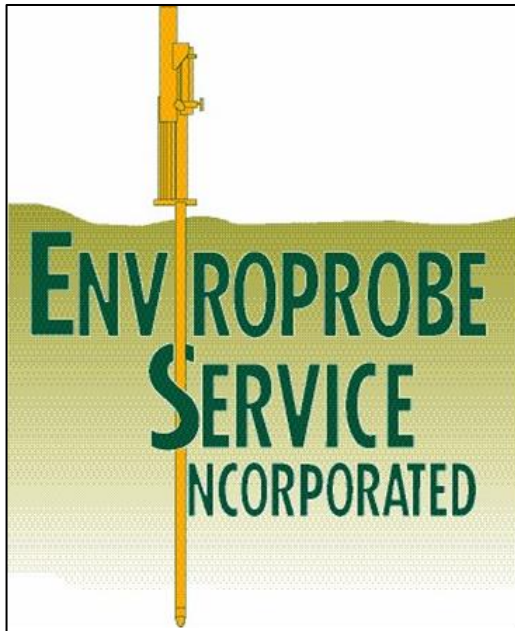
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AEG NY-P Thanks You!

Thank you to everyone who contributed their time and effort to coordinate a successful Student Night!

A BIG THANK YOU to the students who presented this evening!

Remember: Students join for FREE.

AEG offers many opportunities for students, including: online resources, publications, annual meetings, section meetings, seminars, networking, scholarship and career resources. Participating in meetings enables students to interact with practicing professionals and is a great way for students to learn more about applied geology. Visit "Join/Renew" at www.aegweb.org and fill out the Complimentary Student Membership application.

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