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The HDC-SETAC Board of Directors and our membership would like to thank our Corporate Sponsors for their generous support.

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Hudson/Delaware Chapter of SETAC Fall 2005 Newsletter

Editor's Pen

By Jon Doi
Aqua Survey, Inc.
doi@aquasurvey.com

I want to first state that the prayers of the Board go out to all the people that were affected by Hurricane Katrina. Although it first looked like New Orleans was going to be spared from the main brunt of Katrina (as it took a slight easterly turn upon hitting land), the devastation wrought by this hurricane was almost beyond belief. The Board decided that we would help out the recovery effort in a small way by allocating all net income from the Fall Workshop to organization involved in these efforts. We hope you consider going to the Fall Workshop because it is a great program, but also because part of your registration fee will help the victims of Hurricane Katrina.

We had another successful spring Annual Meeting this last April and I want to thank all those people that helped contribute to the meeting by planning, lecturing, and attending the meeting. Our new format of having short courses on both days and having members of the Hudson-Delaware Chapter of SETAC give presentations seemed to be well liked by the attendees. We will continue this new format in our 2006 spring Annual Meeting at West Chester University in West Chester, PA. Chuck Shorten, Professor at West Chester University and I will be co-chairing that meeting. If you have suggestions of topics or want to get involved in the planning of this meeting, feel free to email Chuck or myself with your suggestions. They will be most welcome.

I want to thank our outgoing President, Chris Nally and welcome our new President, Amanda Maxemchuk. Our organization are in good hands because of the efforts of these two Presidents.

We look forward to seeing you at our 2005 Fall Workshop and 2006 spring Annual Meeting!

Once again, I wish to thank Aqua Survey, Inc. for the time, manpower, and equipment to produce this newsletter. I want to congratulate Angela Domanico as she had a very early birth (28 week pregnancy) of her son, Alexander Michael on May 1, 2005. However, I am happy to say that both mother and child are doing well. We wish you all the best, Angela!!

IN THIS ISSUE

President's Corner

Once again, the torch has been passed. The HDC has had some great leaders, and I hope that I will be able to contribute as successfully to the growth of our chapter as they have. As all board members have said at one point or another, the Board of Directors functions amazingly well together, and the success of the chapter is not based on leadership, but rather team effort.

That being said, I am happy to announce that Dr. Carolyn Bentivegna

Hudson/Delaware Chapter of SETAC

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Jessica Duffy (**Student Board Member**)
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New York, NY
jessd2000@yahoo.com

Job Postings from our Corporate Sponsors

Aqua Survey, Inc.

Project Manager -- Aqua Survey, Inc. provides on-water sampling, geophysical, surveying and coring/geotechnical services internationally. Each project has a field project manager and an office project manager (OPM). Available immediately is an office project manager position. This individual works with ASI's clients and field teams to coordinate client needs with company resources (personnel, vessels and equipment). OPMs are responsible for reviewing requests for proposals, meeting with clients, scheduling tasks, reviewing deliverables and offering landside project support. This is a professional position with full benefits. Some travel will be required. Contact Tom Dolce (dolce@aquasurvey.com) or Ken Hayes (hayes@aquasurvey.com).

Aquatic Culture Scientist -- Aqua Survey's ecotoxicology laboratory is increasing its ability to produce up to 15,000 *Daphnia magna* neonates per day. The culture of two support algae cultures and this number of *D. magna* has become a specialized endeavor. To expand the culture to meet a homeland security driven need will require established invertebrate, preferably daphnid, culturing skills. Visit www.KingwoodDiagnostics.com to better understand this need. Contact Jon Doi (doi@aquasurvey.com) or Ken Hayes (hayes@aquasurvey.com).

Field Crew -- Aqua Survey owns and operates over a dozen research/survey/work vessels. ASI is looking for two safety-oriented technicians to assist with: sediment coring, on-water drilling, bathometer, side scan sonar, sub-bottom, magnetometer, pulse induced metal detection, ADCP, fisheries, coral reef monitoring seagrass monitoring, water sampling and other vessel based research. This position requires: travel (regional/national/international), the ability to withstand the rigors of life at sea and a willingness to pitch-in (e.g., swabbing the decks to tinkering with electronics). Due to the often physical nature of this work, this isn't a position for everyone. Contact Ken Hayes (hayes@aquasurvey.com), Bob Fristrom (fristrom@aquasurvey.com) or Tom Dolce (dolce@aquasurvey.com).

(Continued from page 3)

in the Department of Environmental Medicine, working with Dr. Judith Zelikoff. My project involves studying the impact of PCB exposure on the immune system of bluegill sunfish and examining possible AhR-independent mechanisms of PCB-induced immunotoxicity.

As student representative, I hope to bring new ideas to the Board as well as increase student interest and participation in the Chapter.

(Continued from page 21)

5. The student's current enrollment (institution, department degree program, and expected date of completion)
6. A statement from the major advisor identifying the research presented as predominantly that of the student

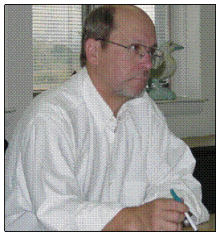
Submit the required items to:

Charles V. Shorten
Dept. of Health
West Chester University
West Chester, PA 19383
(610) 436-2360 (phone)
(610) 436-2860 (fax)
cshorten@wcupa.edu

Please forward this announcement to any and all students who may be interested.

Thanks to the 2005 Corporate Sponsors

Larry Lyons, Lockheed Martin/REAC



A "round of applause" is in order to our "2005 Corporate Sponsors" acknowledged on the back page of this newsletter. Our continued success and growth is made possible with the generous support of our "Corporate Sponsors". The funding allows our chapter to provide quality conferences and workshops at a reduced cost to our members, and aids in paying for many behind-the-scene operating expenses. This funding also permits us to offer an attractive student award program for undergraduate and graduate students. It also sponsors awards at the Delaware Valley Science Fair, a regional science fair for high school students.

We have added a new category of Corporate Sponsor to our program—Sustaining Corporate Sponsor. This category is for sponsors that make an extraordinary contribution to the Hudson-Delaware Chapter—an amount greater than $1,000. We want to thank both Aqua Survey and ExxonMobil for being the first two members of this truly special category in our Corporate Sponsorship Program!

If you would like to join this distinguished list of "Corporate Sponsors," please feel free to contact me at 732-494-4075 or by E-mail (lalyons@comcast.net). You can choose to be a Sustaining Corporate Sponsor with a minimum contribution of $1,000, a Full Corporate Sponsor with a contribution of $500, or an Associate Corporate Sponsor with a contribution of $250.

Larry A. Lyons, Treasurer

has accepted the Vice President position on the Board. Carolyn has already made several contributions to the HDC, including co-chairing the 2004 Annual Meeting and did an excellent job of handling this year's election. I would also like to welcome new team members, Peter Brussock of Environmental Liability Management, Inc. and Ron MacGillivray of the Delaware River Basin Commission, to the Board. As always, candidates for this year's election were stellar and I'm sure it was difficult for voting members to choose. Peter and Ron will share more about the work that they do in their contributions to this newsletter.

Peter has jumped right in to things by volunteering to be Steve Brown's co-chair for the Fall Workshop. This year's workshop topic is "Tools for improved natural resource management: damage assessment, habitat enhancement and environmental restoration." The workshop will again be held at the Rutgers EcoComplex in Bordentown, NJ on October 14th. Steve and Peter have lined up exciting, dynamic speakers to cover this very current topic. More details are provided in their contributions to this newsletter. Save the date! You don't want to miss this one!

Preparations are also underway for the 2006 Annual Meeting. It appears by popular vote that next year's spring meeting will be held at West Chester University in Pennsylvania. The annual meeting has been held at WCU in the past and was quite successful. Seasoned Board Members Chuck Shorten and Jon Doi will be co-chairs for the meeting. To find out a bit more, see Chuck Shorten's contribution to this newsletter and look for details in future publications.

Finally, the HDC has developed a position for a Student Board Member. This position is currently being filled by Jessica Duffy, who is a graduate student at New York University. To learn more about Jessica and the work she is doing, see her contribution to this newsletter (below). SETAC NA is also in the process of developing a student council which will include student representatives from each of the regional chapters. The purpose of student board members and a student council is to provide input and recommendations to SETAC NA and the regional chapters to encourage meaningful participation in the society.

These are the ways in which we are moving forward. It will be difficult to top the success the HDC achieved in the 2004-2005 term with great attendance at our fall workshop and spring meeting and the development of our new annual meeting format. But we will continue to strive to bring the support needed and desired to our colleagues in the environmental field.

Amanda Maxemchuk
HDC President 2005-06
Lockheed Martin/REAC

…. and now a word (or two) from our newly appointed Student Board Member, Ms. Jessica Duffy.

As the newly appointed graduate student representative to the HDC, I would like to take this opportunity to introduce myself. I am a fourth year Ph.D. student at New York University

(Continued on page 23)

Upcoming Meetings

Hudson Delaware Chapter of SETAC Fall Workshop, October 14, 2005

Rutgers EcoComplex Bordentown, New Jersey

"Tools for Improved Natural Resource Damage Assessment, Habitat Enhancement and Environmental Restoration"

is the title of this year's Fall Workshop. This workshop will provide participants with an understanding of existing and developing tools and approaches used to assess damages to natural resources, and plan and implement habitat enhancement and environmental restoration projects. The morning session will focus on Natural Resource Damage Assessment policy and practice, scaling resource injury to restoration, and the application of Habitat Equivalency Analysis. The afternoon session will begin with a presentation on practical goals for ecological restoration and means for achieving them, followed by a series of presentations showcasing various enhancement and restoration projects. These case study presentations will illustrate different experiences in different kinds of environments. They will not necessarily focus on NRDA cases, but will help identify keys to success (or failure) in habitat enhancement and environmental restoration planning, implementation, monitoring and maintenance. These cases may address enhancement/restoration in response to chemical and/or physical stressors, the need to consider invasive species, structural and functional measures of success, and other issues. The interactive presentations throughout the day will combine to illustrate the application of tools for improved natural resource management.

Speakers will include representatives from NOAA, DOI, Rutgers, Louis Berger, URS, BBL and Entrix.

Note: All proceeds (after expenses) will go to the relief effort in the wake of Hurricane Katrina, so a portion of your registration fee will be helping this worthwhile cause!!

A full meeting program will be available shortly. To register in advance of receiving the program, send your Name, Address, Phone, E-mail Address, and Affiliation to Hudson / Delaware Chapter of SETAC, P.O. Box 506, Thorofare, New Jersey 08086. Registration fees prior to October 7, 2005 are $100 for members and $125 for nonmembers; after October 7 or at the door they are $140.00. The student registration fee is $45.00. Registration and payment by credit card can also be done at our website, www.hdcsetac.org. Checks should be made payable to: HDC-SETAC.

Any questions regarding the meeting, please contact the meeting co-chairs, Dr. Steven Brown at 215-619-5323, stevenbrown@rohmhaas.com or Mr. Peter Brussock at 215-794-6920, ppbrussock@elminc.com. We look forward to seeing you there!!

Student Forum

2006 Student Research Awards Program

Chuck Shorten, West Chester University

The Hudson/Delaware Chapter (HDC) of the Society of Environmental Toxicology and Chemistry is pleased to once again sponsor student research awards. The purpose of these awards is to both recognize outstanding young scholars and to encourage active participation in SETAC and the HDC.

Two different categories of awards are offered:

1. Graduate Student Poster Awards: Up to three cash awards ($300, $200 and $100) will go to the best graduate student poster presenters at the Chapter meeting.
2. Undergraduate Student Poster Awards: Up to three cash awards ($150, $100 and $50) will go to the best undergraduate student poster presenters at the Chapter meeting.

New this year, HDC-SETAC and its sponsors will cover travel expenses, up to $1,000, to send the first place graduate student poster award winner to the National SETAC Meeting in November. The winning student must agree to present his/her award-winning poster at the meeting. The awardee must also agree to provide acknowledgement of the award from HDC-SETAC and its sponsors on the poster and in subsequent published manuscript(s) of the work.

Eligibility:

- All students must be currently enrolled in an environmental toxicology or chemistry-related undergraduate or graduate program with the following exception: those within one year of graduation may also compete, if the work being evaluated was completed while a student.
- Students and/or their faculty advisors must be HDC members, or must apply for membership at the time of award application. The academic program must be located in the HDC area (NY/NJ/PA/DE).
- To be considered for any poster prize, a research poster relevant to environmental science must be presented at the annual HDC meeting.
- The HDC Board of Directors will review all posters and reserves the right, based on scientific merit, to reject any and all materials submitted.

To apply for the award, students must submit the following by April 21, 2006:

1. A letter of application from the student.
2. A 250-word abstract by Email. Abstracts should indicate all authors and affiliations with clear indication of presenting author.
3. The student's campus and permanent address, phone number and email address.
4. The major advisor's name, address, phone number, and email address.

(Continued on page 22)

DECLASSIFIED: BERMUDA TRIANGLE EXPOSED

Ken Hayes, Aqua Survey, Inc.

On an early December day in 1945, now almost sixty years ago, a training mission of five Avenger bombers left Florida, disappeared off radar out over the Atlantic Ocean, as did the PBM Mariner rescue plane sent out to find them. This gave birth to the legend of the Bermuda Triangle. "SCI FI Channel continues its ongoing commitment to demystifying areas where science fiction meets science fact in a brand new special hosted by NBC News Anchor Lester Holt ('The Today Show' & 'Lester Holt Live')," in a NBC press release. Aqua Survey was retained by David Bright, President of the Nautical Research Group to provide and operate several state-of-the-art geophysical survey instruments such as side scan sonar and a magnetometer to try to locate the plane wreckage. ASI's Mark Padover, a seasoned veteran of many successful archeological missions, led the ASI technological effort supported by Kelly Rankin, Ken Hayes and Garrett Hayes to locate the missing military hardware presumed to be on the ocean's floor or buried. In addition to this NBC mission, ASI is working closely with the Nautical Research Group to solve two other regional mysteries.

Avenger Bombers

Mariner seaplane

NBC cameraman filming Mark Padover and Kelly Rankin

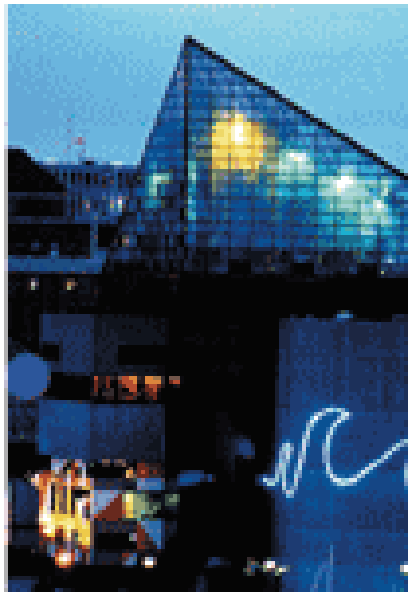
Sponsored by NBC News, Bright assembled a team of advanced divers and cameramen to dive on targets of interest identified by Padover's team. In need of a key diver/underwater photographer, Bright invited Larry Lyons to join the team.

Larry Lyons - HDC Treasurer, prepares to dive on a target of interest

We can't tell you what we found (we all had to sign an NBC Non-Disclosure Agreement). What we can tell you is a two-hour program will air on the SCI FI Channel on November 27, 2005 and the two dozen of us that put out to sea will be planted in front of our TV's that night!

SETAC North America 26th Annual Meeting, November 13-17, 2005

A Message from the Program Committee Chairs: Lisa Baron, Bill Goodfellow and David Kent



Mark your calendars: November 13th is right around the corner! Check the Baltimore meeting website (www.setac.org/baltimore) for up-to-date information about the technical program, registration, exhibitor information, career center, student info, and social activities. The technical program is sure to stimulate your mind with 83 platform sessions (747 presentations), 7 interactive platform sessions (51 presentations), and 83 poster sessions (977 posters) relating to Environmental Policy, Management, Chemistry, Toxicology, Assessment, Life-Cycle Assessment, Sustainability, and Contaminated Sediments. Special Symposia and regional issues include sessions on Pollution Prevention in the New York/New Jersey Harbor, Chesapeake Bay Restoration, and Nanotechnology (remediation, fate/transport, health impacts, etc.) to name a few. Another exciting Special Symposium to fit our meeting theme, "Environmental Science in a Global Society: SETAC's Role in the Next 25 Years" will feature former SETAC Founders Award recipients debating the "State of the Science: Visions for the Future," led by our most recent honoree, Glenn Suter. The many interesting technical sessions and symposia will be sure to satisfy the "Professional Development" box most of us have to check off on our travel authorization request forms!

To enhance professional development further, there are currently 14 short courses scheduled for Sunday. Short courses include Environmental Fate, Transport, and Exposure Assessments; Probabilistic Risk Assessment, Contaminated Sediments (Characterization, Chemodynamics, Assessment, and Remediation); Water Quality Standards and Criteria; Analytical Chemistry; Food-Chain Modeling; Modeling and Simulation of Ecotoxicology; Advanced Mass Spectrometric Analysis for Endocrine Disruptors in the Environment; Environmental Risk Assessment of Pharmaceuticals; Identifying Causes of Biological Impairments Using the U.S. EPA's Stressor Identification Process; and more. The Plenary Sub-Committee has also been working hard on an excellent, diverse lineup of plenary speakers. We have invited such speakers as Stephen Johnson (U.S. EPA administrator), Peggy Noonan (best-selling author and po-

(Continued on page 6)

(Continued from page 5)

litical commentator), Richard Linnehan (Astronaut), Stan Waterman (Emmy Award-winning underwater cinematographer), and Col. John O'Dowd (U.S. Army Corps of Engineers). The student program is also sure to delight future scientists with a special student workshop on Sunday, Career Experiences exchange and the Mentor Dinner on Monday, and a networking by scientific topic on Wednesday. Again we'll have a Silent Auction to raise money for the student program. Please think about donating your handiwork or items to the Auction. Check out the details of the program and how to donate on the website!

Although we all go to the SETAC meeting to enhance our knowledge, we all have a great time at the meeting because of the social program. The Committee and Pensacola Office staff are busy arranging tours of Annapolis, Maryland, spousal activities, pub crawls, and the main social event to be held Tuesday night at the National Aquarium. Those who attended the Aquarium function in 2001 know why we're going back to this magnificent location for our main social event. Strolling with friends through the four levels of award-winning exhibits, sipping wine, eating hors d'oeuvres, and observing thousands of captivating aquatic plants and animals will surely result in a memorable occasion. In addition to the Aquarium, Baltimore has so many exciting sites to see. Baltimore perfectly blends traditional, small-town charm with modern, big-city excitement. From the sports fanatic to the avid shopper, culinary enthusiast to cultural aficionado, Baltimore is sure to excite all of us. Visit **www.baltimore.org** to discover all this wonderful city has to offer.

Finally, we have to thank so many of the HDC members that are involved on the Meeting Program Committee (that I have roped in!). THANK YOU Chuck Shorten (Poster Co-Chair), Ken Hayes, Pat McIsaac (Plenary Co-Chairs), Larry Lyons, Don Nazario (Fund Raising Co-Chairs), Amanda Maxemchuck, Betty Jane Boros-Russo (Social Co-Chairs) and Lisa Totten (Short Course Co-Chair)!

See you November 13th!
Lisa Baron

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technology used by artisanal miners in many developing countries has hardly changed over the centuries. Gold in the ore sludge is mixed with mercury into an amalgam, which is then separated by heating into mercury vapor and gold. An estimated two grams of mercury are released into the environment for each gram of gold recovered." Water used in the retorting operation is often released to local streams untreated, leading to widespread fish and sediment contamination with mercury. When consumption of mercury-contaminated fish (such as

that shown in (**Figure 3**), from the market in Puerto Maldonado) from these rivers is combined with mercury exposure from home-based retorting, body burdens many times greater than those seen in developed countries often result. Fish consumption advisories are in place but improvements in public education efforts to protect people from multiple mercury sources are still needed (United Nations Environment Programme, 2003. Global Mercury Assessment, available: http://www.chem.unep.ch/mercury/Report/Final%20Assessment%20report.htm, accessed 7/2005).

WCU and ACEER have scheduled a workshop for March 2006 designed to investigate water quality issues in and around Southeastern Peru. This workshop will include specific stops at Lima; Machu Picchu in the upland Andes; Cuzco; Puerto Maldonado; the Refugio Lodge, Tambopata Research Center and Posada Amazona on the Tambopata River; Reserva Amazonica and ACEER-Tambopata at Inkaterra on the Madre de Dios River; and other community sites in the region. Samples of surface water, ground water, drinking water, sediment and local fish (from fishermen, small markets and residents) will be collected and analyzed. Mercury contamination will be a focal point of water quality studies to be conducted by WCU students and faculty in Peru, but general water quality parameters including pH, temperature, dissolved oxygen, turbidity, conductivity and basic nutrient chemistry will also be examined.

Students and environmental professionals are invited to participate in the upcoming workshop. Students should concurrently enroll in a special Spring Semester 2006 course for three semester hours of WCU credits. Professionals are invited to contribute their expertise to the project. All participants will have the opportunity to visit Machu Picchu, one of the world's most significant historic sites, observe Peruvian culture and immerse themselves in the diversity of flora and fauna of the Amazon Basin. The approximate cost per person is $3,210, all-inclusive from Philadelphia (subject to change, dependent upon international airfare). A $500 deposit, due November 21, 2005 will hold a slot open for you. Student scholarships may be available, pending grant approval. For additional information, contact Chuck Shorten at 610-436-2931 or **cshorten@wcupa.edu**.

Tropical Water Quality: A Workshop in Peru

Chuck Shorten, West Chester University

The region of lowland rainforest at the confluence of the Madre de Dios and Tambopata rivers at Puerto Maldonado in Southeastern Peru is experiencing increasing ecological pressure as the area's population grows and demands for arable land and mineral resources continue to expand. Communities along these rivers are dependent on them for food, transportation, drinking water, mineral resources and commerce. (See **Figure 1**.) These

same communities rely heavily on the surrounding forest for crops, building supplies and medicines. Any damage to these ecosystems has an immediate impact on the health and welfare of local community residents; education and research efforts to help mitigate these impacts are ongoing.

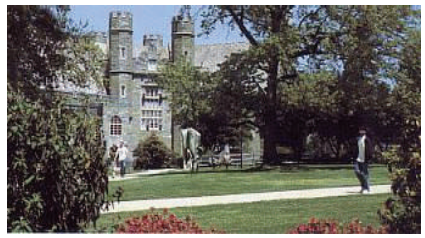
West Chester University (WCU), in association with the Amazon Center for Environmental Education and Research (ACEER), has sponsored over a dozen 10-day academic workshops in the Amazon regions of Peru since the mid 1990's. Programs examining tropical water quality issues, habitat definition and protection, mapping, pollutant transport and modeling have been the primary environmental themes for these workshops; public health topics including social and transcultural health for indigenous populations, botanical medicine and tropical epidemiology have also been examined. Meanwhile, research facility resources there are continuously expanding in number and scope; they now include extensive trail and transportation networks, laboratory space, field research sites, canopy towers/walkways and lodging for investigators. (See **Figure 2**.)

Water quality in developing parts of the world is often compromised by well-understood, easily controllable contaminants including infectious organisms, sediments, excessive nutrients and pesticides. Additional threats can be site-specific; in the case of the rivers of southeastern Peru, mercury contamination from large-scale and localized, small-scale artisanal gold mining operations is a significant problem. Gold-containing ore is panned and dredged from sediments along many of the rivers of the Amazon Basin, including the Tambopata and the Madre de Dios. Back in the homes of the chichiqueros, or informal miners, family members are exposed to mercury used in the gold extraction process. "The

Hudson Delaware Chapter of SETAC 22nd Annual Spring Meeting, May 04-05, 2006

Make plans now to join HDC-SETAC for its 22nd Annual Spring Meeting, planned for May 4 - 5, 2006 on the campus of West Chester University. As always, the meeting will feature two days of informative sessions, networking opportunities and professional collegiality. The picturesque University, with its tree-shaded walks and mix of architectural styles, occupies 388 acres in and near the borough of West Chester. This rapidly growing suburban community combines the pleasant aspects of a small town, yet it's only 25 miles west of Philadelphia.

Sykes Student Union, located on Rosedale Avenue near the center of the main campus, will be the predominant meeting site for all activities. Two large ballrooms will provide the main venue for our posters, platforms and plenary while smaller, computer-equipped breakout rooms and laboratories will be available for workshops. Our plan is to repeat the successful format of the 2005 meeting, with poster socials on both days (both student/competition and professional), submitted platforms on Thursday morning, workshops on Thursday afternoon and Friday morning and invited presentations after lunch. We'll close the meeting Friday afternoon with our business session and student awards.



The meeting will also feature outdoor activities, such as an eco-system tour of the local area, a geologic tour, an early morning bird walk and a little volleyball to get some exercise. [Note: the HDC Board is undefeated in volleyball and will take on all comers!] Breakfast, lunch and dinner are provided.

Graduate and undergraduate students will once again be invited to submit posters of their research for judging and prizes, courtesy of our HDC sponsors who make the awards program possible.

If you have an idea or proposal for a workshop at the upcoming meeting please contact co-chairs Chuck Shorten (610-436-2360; cshorten@wcupa.edu) or Jon Doi (908-788-8700; doi@aquasurvey.com). Speaker/presenter suggestions for these workshops are always welcome as well.

Regulatory Updates

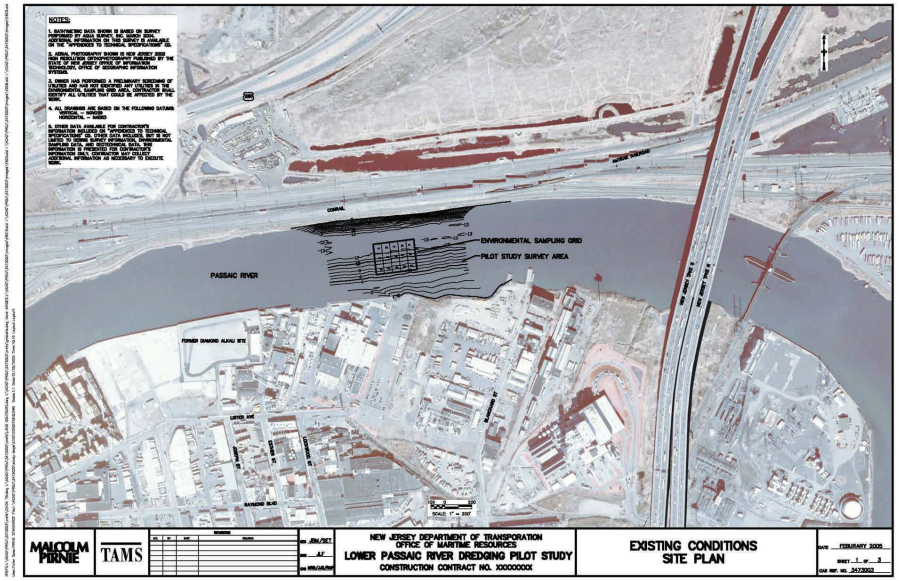
Lower Passaic River Environmental Dredging and Decontamination Pilot

Lisa Baron, Office of Maritime Resources/ NJDOT

FINALLY! The Lower Passaic River Ecosystem Restoration Team, lead by NJDOT, is about to implement the Environmental Dredging and Decontamination Pilot in the Harrison Reach of the Passaic River. Almost 2 years in the planning - we HOPE to put a dredge in the water in just over a month. The pilot will provide necessary information for the evaluation of remedial alternatives, specifically a removal action, for the Feasibility Study. The pilot will provide data on dredging technology performance, productivity, sediment resuspension and decontamination technologies.

NJDOT pre-qualified two dredgers – Jay Cashman and D.A. Collins – in a new DOT category "Environmental Dredging". The two dredgers have responded to the recently advertised bid package posted on the NJDOT website on August 18th. The Project's multi-agency evaluation committee will be evaluating technical proposals that arrived on September 15th. Hopefully the stars will align and the lucky winner will be out in the field dredging 5,000 cyd of sediment in a 1.5-acre area (3-ft depth dredge prism) the week of October 24th.

The dredger will transport the excavated sediment to Bayshore Recycling (located on the Raritan River in Keasbey NJ) where the sediment will be offloaded to a 700-ft compartmentalized

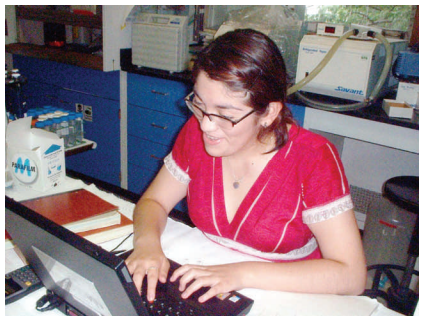


Project SEED

Carolyn S. Bentivegna, Seton Hall University

Do you know about Project SEED? Many local colleges, companies and governmental agencies in the north NJ area open their laboratory doors to high school students during the summer. The American Chemical Society (ACS) supports this outreach program to encourage minor students to pursue science in college. The SEED program provides students with summer stipends while the scientific community provides hands-on research activities. In recognition of this outstanding program, the ACS received the 2003 Presidential Award of Excellence in Science, Mathematics and Engineering Mentoring.

Susan Farenholtz is the dedicated individual who matches students from local high schools with mentors in the scientific community. The mentor writes a brief abstract on the activity in which the student will participate, and then interested students interview with the mentor to insure a match. Students may partake in SEED during the summers of their sophomore to junior and/or junior to senior years. They work for eight weeks and present posters on their projects at the end of the summer. If you are interested in attending this year's poster session, it will be held at Seton Hall University on September 26th. Although supported by the ACS, research projects are not limited to chemistry and biochemistry, but can include microbiology, molecular biology, environmental science and my own interests, molecular ecology and toxicology. The goal is to get high school students excited about doing research and careers in science.



Daniela Cordova, rising high school senior at William L. Dickenson High School, Jersey City, NJ, is analyzing data on chironomid genetic diversity

SEED students typically have few lab skills and very basic courses in science. They make up for this inexperience with enthusiasm and dedication. I have had about 10 SEED students over the past 9 years. Several got up at 6:00 AM and traveled up to 2 hours each way on public transportation to reach my lab. Remember that this is during their summer break. I also had one student who continued to come to lab after breaking his leg in a mountain bike accident. The quality of work is very good. They needed personal training at first, but my students quickly became independent when given well defined projects.

The value of this program is huge. A 25 year assessment of minority students participating in SEED shows that 85% completed college. This type of experience and letters of recommendation from mentors also improves a student's ability to get into the college of their choice and receive academic scholarships. If you would like more information on mentoring a SEED student, please send me an e-mail (bentivca@shu.edu).

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New York Republican Gov. George Pataki brokered the deal. Pataki spokesman Andrew Rush said no final deal had been reached but, "We've made a lot of progress and we look forward to reaching a final agreement." A regional emissions control program would likely cause higher energy prices for power company customers in the Northeast, but Delaware's Cherry said the states had not yet decided on a method to combat rising costs.

Miscellaneous

Sampling River Sediments: Can We Make The Process More Relevant?

Peter Brussock, Environmental Liability Management

River sediments are sampled with increasing frequency to evaluate potential impacts from surface water and ground water discharges. Samples are often collected robotically at prescribed locations with limited consideration of a site-specific conceptual model. Some of this stems from guidance on sampling procedures, equipment and strategies that often lack perspective on how sampling can be made decision-relevant. A primary question that must often be answered is: if contamination is found, does it warrant any remedial action? To answer that question, key factors that seem under-evaluated in many instances include:

- Identification of ecologically-relevant species in streams and rivers;
- Measurement of concentrations at the exposure points for ecologically-relevant species;
- The role of sediment screening criteria in location-specific assessments;
- The primary habitat components and how they are defined;
- Determining if a significant (how is significant defined?) population impact has occurred; and
- What is the probability that source removal and natural remediation will not restore the contaminated area in a reasonable timeframe?

Numerous parties have met to discuss these factors and prepare guidance. Yet, guidance from agencies in the Mid-Atlantic States is inconsistent for similar geographic areas and geomorphologic conditions. However, if they are based on sound technical analysis of the relevant ecological factors, they should probably be more similar. Maybe a significant issue is the lack of discourse among the parties involved in river sediment assessments. Consequently, the question arises; can a workshop sponsored by HDC serve to stimulate improvements in existing protocols and more consistency throughout the region? Let me know your thoughts on this issue and I will compile the input and make a recommendation the HDC Board regarding a future workshop. Email me at ppbrussock@elminc.com.

ore carrier. The dredged material will be treated via two demonstration decontamination technologies, sediment washing and thermal destruction. BioGenesis Inc, a sediment washing technology also located at Bayshore, will produce manufactured soil. The other 2,500 cyd will be dewatered and transported to Endesco located at IMTT in

Bayonne where the material will be thermally destroyed creating cement.

During the dredging pilot, NJDOT, USACE, USEPA, USFWS, Earthtech/TAMS, Malcolm Pirnie, Rutgers University, USGS and AquaSurvey will be out in the field participating in the water quality monitoring program. Intensive near field (300 meters upstream and downstream) sampling will take place to measure the sediment plume using 6 mooring structures and shipboard surveys. Acoustic Doppler Current Profiler, Conductivity Temperature Density meters, Optical Backscatter Sensors, and Laser In-Situ Scattering and Transmissometry probes will be mounted on nearby mooring structures to collect data (conductivity, temperature, pressure, depth, suspended solids, turbidity, and current velocities) for 24 hours a day for at least eight days (*i.e.*, prior to, during, and after the five-day pilot dredging event). In addition to these instruments, shipboard Trace Organics Platform Sampler (TOPS) and ISCO automatic samplers will be used to collect samples for chemical analysis. This highly orchestrated event will surely yield invaluable data on plume generation from the dredging activity.

Please go to www.ourpassaic.org to download all the documents for details: Dredging Technologies Review Report, Data Summary and Evaluation Report (all data collected in support of pilot), Hydrodynamic Modeling, and Project Plans for the Pilot.

If you have any questions about the pilot, please contact me at 609-530-4779 or via email lisa.baron@dot.state.nj.us.

Testing the Waters: Toxicity Testing of Ambient Water in the Delaware Estuary

A. Ronald MacGillivray, Delaware River Basin Commission

The Delaware River Basin Commission was formed in 1961 when President Kennedy and the governors of Delaware, New Jersey, Pennsylvania, and New York for the first time signed concurrent compact legislation into law creating a regional body with the force of law to oversee a unified approach to managing a river system without regard to political boundaries. Since its formation, the Commission has worked to protect water quality, resolve interstate water disputes without costly litigation,

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allocate and conserve water, manage river flow, and provide numerous other services to the signatory parties. The Commission serves as policy maker, regulator, planner, manager and mediator on behalf of the signatories to the Delaware River Basin Compact and the residents of the Basin. The 35,065 Km^2 (13,539 square miles) of the Delaware River Basin contain stretches of the National Wild and Scenic River System as well as highly urbanized and industrialized areas. The Basin provides water for nearly 15 million people or roughly five percent of the U.S. population. While the Delaware Bay is a principal breeding ground for American horseshoe crabs and is among the largest staging areas for shorebirds in North America, it is also home to many industries and one of the largest petroleum ports in North America. The Delaware River Port Complex (including docking facilities in Pennsylvania, New Jersey, and Delaware) is the largest freshwater port in the world. According to testimony submitted to a U.S. House of Representatives subcommittee in 2005, the port complex generates $19 billion in annual economic activity. Nearly 42 million gallons of crude oil are moved on the Delaware River on a daily basis. A special session on the Delaware River and Bay at the SETAC-NA Annual Meeting in Baltimore will include studies conducted throughout the Basin. I encourage you to attend.

As an Environmental Toxicologist at the DRBC, I have participated in a number of activities. One that may be of interest to HDC-SETAC members is the DRBC Chronic Toxicity Workgroup. The Workgroup includes DRBC staff, EPA, state, municipal, and industry representatives as well as other interested parties working toward developing a scientifically sound sampling and analysis plan to determine if ambient toxicity occurs in the estuary. Potential sources of toxicity and water quality impairment in the Delaware Estuary include point and non-point sources, contaminated sites, tributaries, the Chesapeake and Delaware Canal, and atmospheric deposition (Delaware Estuary Program, 1996). However, the Clean Water Act mandates that there should be no toxic effects in ambient waters. Currently, toxicity in the estuary is determined with test species used to assess receiving (ambient) water (USEPA, 2002). Toxicity tests are run on composite water samples. The test organisms are exposed to water samples in the laboratory and any resulting effects are observed. Data on survival, growth and reproduction are collected as part of the tests. Physical-chemical data also are collected as specified in the respective test methods.

Figure 1 is a map of the Delaware Estuary with sample site locations marked for the year 2005 surveys. Within the sample area changes in salinity from 1 to 10 ppt occur due to river flow and tidal conditions. The selection of test species and appropriate controls for toxicity testing is complicated by this changing salinity gradient. Furthermore, efforts to study and characterize toxicity in the Delaware Estuary have been hampered by the limited number of EPA-approved test species that are tolerant of low salinity levels present in the estuary (USEPA, 2002).

In addition to the euryhaline fish *Menidia beryllina*, a number of test spe-

Regional Greenhouse Gas Initiative In The Works For Northeast

Chris Nally, American Aquatic Testing, Inc.

Nine northeastern U.S. states are working on a plan to cap and then reduce the level of greenhouse gas emissions from power plants; the first U.S. deal of its kind and one that would see the region breaking with President Bush who refused to sign the Kyoto Protocol. Under the plan being worked on, New York, New Jersey, Connecticut, Delaware, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont would cap carbon dioxide emissions at 150 million tons a year -- roughly equal to the average missions in the highest three years between 2000 and 2004. Starting in 2015, the cap would be lowered, and emissions would be cut by 10 percent in 2020.

According to Dennis Schain, a spokesman for Connecticut's Department of Environmental Protection, "This is a process that would be an agreement among states and to really implement it and have a firm commitment, the states will each have to approve legislation and regulations to meet these conditions."

"The draft is being circulated among industries, power companies and environmental groups for feedback," he said. The group hopes to reach a final agreement in September. Phil Cherry, policy director at Delaware's Department of Natural Resources, also confirmed details of the pact in an interview with Reuters.

Many scientists believe carbon dioxide and other greenhouse gases may cause or contribute to global warming, a phenomenon that is affecting coastal areas, icebergs and wildlife. Around 40 percent of U.S. carbon dioxide emissions come from fossil fuel power plants.

The United States is the world's largest emitter of carbon dioxide. The Bush administration wants cuts to be voluntary and resists mandatory measures it says would hurt economic growth.

Many international leaders have criticized Bush's refusal to sign Kyoto, which is meant as a first step toward slowing a rise in global temperatures from a build-up of gases from fossil fuels emitted by power plants, factories and cars.

In the absence of national control on emissions, Schain said: "This seems to be the appropriate course of action."

The so-called Regional Greenhouse Gas Initiative would explore a market-driven cap-and-trade system where businesses must trim emissions under set limits or buy credits from companies that have complied with the limits.

Kert Davies of Greenpeace in Washington, D.C. said, "It moves the United States further toward doing something about the problem. That eventually allows us back into the global solving of this problem."

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sional-stage wetlands where woody vegetation eventually matures and closes the canopy, making the habitat unsuitable for the turtles.

The habitat requirements of the bog turtle are very specific. Their distribution is generally limited to shallow, spring-fed fens, sphagnum bogs, marshy meadows and pastures with soft, muddy bottoms, open canopies and cool slow-flowing water. Small discrete populations are found in suitable wetlands throughout New Jersey, eastern Pennsylvania and southern New York. Populations are often found in the Great Lakes Region of New York, northern Maryland, Delaware, Virginia and North Carolina.

If bog turtles are known to occur near a project site, the U.S. Fish & Wildlife Service (USFWS) will require a Phase I bog turtle survey for any emergent and/or scrub shrub wetlands on the property. During a Phase I survey, biologists that are familiar with the habitat requirements of the bog turtle search the site for suitable habitat. If suitable habitat is found, two options are available to the property owner. The owner can assume that the bog turtle is present and can avoid all possible indirect and direct impacts to the bog turtle habitat. If the owner can not show that no impacts will occur, a Phase II visual or trap survey is required.

The bog turtle is a secretive species that spends much of its time underwater or burrowing in the substrate. It is one of the smallest turtles in North America, reaching a maximum length of 4.5 inches. Because the bog turtle is difficult to find, and thus easy to harm unknowingly, USFWS has strict requirements on who can conduct a Phase II survey. In New York and New Jersey the USFWS field offices keep a list of biologists deemed qualified to conduct these surveys. The requirements to be considered qualified are different for each state. New Jersey requires that a biologist find multiple bog turtles and multiple sites over multiple years. They also require that the biologist has found bog turtles in both north and south New Jersey. To be considered for the list, biologists must submit their resumes, three references, and a discussion of their bog turtle experience to the USFWS. Currently

there are only 29 people on the USFWS list of biologists qualified to conduct Phase II bog turtle surveys in New Jersey.

The task of finding numerous individuals of an endangered species is daunting. Although the New Jersey Division of Fish and Wildlife's Endangered and Non-game Species Program offers opportunities to gain experience finding bog turtles, the process of gaining enough experience to be placed on the USFWS list takes several years.

Figure 1

cies are under consideration by the Chronic Toxicity Workgroup for use in testing ambient estuarine water. The mysid *Americamysis bahia* has been selected as a test species because mysids play an important role in the estuarine environment. *A. bahia* has a history of use in standardized tests, and the test organism is commercially available. However, based on data from long-term chronic toxicity tests, current EPA guidance is to conduct *A. bahia* tests at salinities between 20 to 30 ppt. This requires salinity adjustment in many samples from the estuary that may potentially alter the toxicity profile of the samples. If the test species can be acclimated to the salinity of the river water to be tested, salinity adjustment can be avoided or limited. This should make interpretation of the test results easier. In an effort to modify the standard test method, supportive data was generated for acclimating *A. bahia* to low salinities (≥ 10 ppt) for use in 7-day tests by American Aquatic Testing Inc. If you are interested in learning more about that study be sure to stop by the poster on the topic at SETAC-Baltimore or contact me (Ronald.MacGillivray@drbc.state.nj.us). Another example of a candidate organism that has a number of the desired criteria and is proposed for use is *Hyalella azteca*, an amphipod that is often used for sediment toxicity testing and is increasingly used for water column testing in a 10-day duration test. Importantly, *H. azteca* is recommended for testing in low salinities between 0 to 15 ppt. (USEPA, 2000). All three species (*M. beryllina*, *A. bahia*, and *H. azteca*) are scheduled for use in year 2005 surveys. The goal is to develop a scientifically defensible set of toxicity tests to aid in the assessment of water quality and facilitate environmental management of the estuary.

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What's Going on in Our Region?

Cobbles with Guts and Gills: Conserving Freshwater Mussels

Rich Henry, U.S. Fish and Wildlife Service

The Pennsylvania Department of Transportation (PennDOT) is replacing the Route 68 bridge, which traverses the Allegheny River at East Brady, Pennsylvania. As part of the environmental permitting process, PennDOT is required to remove all endangered mussels from the construction area. Scientific divers from the Fish and Wildlife Service and the Environmental Protection Agency surveyed the river bottom and collected all the mussels they encountered and I was lucky enough to be part of that team. The endangered species were transported to the White Sulphur Springs National Fish Hatchery for long term captive care, juvenile propagation, and later reintroduction, while the common species were relocated to suitable habitat by the PA Fish and Boat Commission.

Why, you may ask, is the permitting associated a major construction project - a project initiated to protect and enhance public safety - being predicated on a few individuals of a few species of mussels in a small reach of river such a large river? Well, there are a lot of reasons. First, according to the Nature Conservancy, freshwater mussels are the most imperiled taxonomic group in North America. Of the 297 species in North America, approximately 30 percent are endangered, 15 percent are threatened and 25 percent are imperiled. It is suspected that around 8 percent are extinct.

Well, 'so what' you say - mussels are pretty boring animals. Hmmmm..... not true, freshwater mussels have the coolest life history of any other critter in the river. Although highly variable, a typical life history starts when the males release sperm into the water column. The sperm are pulled into the female's gills, where they encounter and fertilize the eggs. The female then incubates the eggs until the larvae mature. At this point, the female may display a lure, which is actually a specially adapted portion of the mantle tissue, to attract a host fish. When a fish of the appropriate species nibbles on the mantle tissue lure, the female releases larvae, which attach to the fish hosts gills and fins. There, they encyst and become benign parasites. After a period of time, the larvae drop off, settle to what is hopefully appropriate benthic habitat, and begin their sedentary live stage as filer feeders. It is suspected that this strategy decreases the likelihood of the population ultimately being swept downstream.

The most interesting part of this life history is the relationship between the mussel and the host fish. Some mussels will release the larvae to any species of fish that takes a bite, but many are fairly picky and will only release larvae to a specific species. Others, are even more specific, and will release the larvae only to fish of a specific population of a specific species.

Still not convinced, you say, OK.... that is cool, but still, mussels are inanimate, rock-like animals and do not come even close to Nemo in terms of character and cuteness.... why should I care? Well, mussels provide significant ecosystem services. In a reach of river 200 yards long, an average bed of 100,000 freshwater mussels is filtering 600,000 gallons of water per day - FOR FREE - no electricity, no fancy filters, no scrubbers, no chemical treatments. Mussels also enhanced streambed stability and sediment oxygen content through biotransformation of particulate organic matter and bioturbation. All that translates to increased water quality.... and better water quality means better fishing and swimming for you!

Alright, by now I know you are convinced that freshwater mussels are a very cool animal indeed, they provide some critical ecosystem services, and yes, they may even be considered keystone species. You are also hot to learn more about mussels as well as the conservation and propagation efforts underway. The FWS has a mussel hatchery in White Sulphur Springs, WV and that, campers, will be the subject of a future newsletter article.

What are Bog Turtles and Why are They Important???

Jennifer Curran, HDR/ LMS

The northern population of the bog turtle (*Clemmys muhlenbergii*) was listed as a federally threatened species in 1997 pursuant to the Endangered Species Act of 1973. The species is listed as endangered in New York, New Jersey and Pennsylvania. The two most commonly stated reasons for the decline and threatened existence of the bog turtle is the loss, alteration and fragmentation of habitat, and the illegal trade of the species as pets. Bog turtle habitat is exceptionally vulnerable to alterations from development and changes in land use patterns. Groundwater regime, which is a critical component of the turtle habitat, is easily changed by increases in impervious surfaces and installation of wells. Farm ponds and reservoirs are created by impounding shallow open wet meadows and fens that are suitable habitat for bog turtles. Also, bog turtles are generally found in intermediate succes-

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