

# PATRICK CENTER FOR ENVIRONMENTAL RESEARCH

## 2009 ACTIVITY REPORT



THE  
ACADEMY  
OF NATURAL  
SCIENCES

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## **PATRICK CENTER STAFF (2009)**

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### **ADMINISTRATION**

Dr. David J. Velinsky (PCER Director; VP for Environmental Science)  
Lori McCole; Science Administrator  
Kristen Kepics; Office Manager  
Daniel H. Snyder (*retired May 2009*)

### **ASIA CENTER**

Dr. Clyde Goulden (Director)  
Tuya Goulden

### **ENVIRONMENTAL BIOGEOCHEMISTRY**

Dr. David Velinsky (Section Leader)  
Paul Kiry  
Mike Schafer  
Linda Zaoudeh  
Paula Zelanko

### **CENTER FOR ENVIRONMENTAL POLICY**

Roland Wall (Director)  
Erin Johnson  
Dr. Richardson Dilworth III (Visiting Scholar)

### **FISHERIES**

Dr. Richard J. Horwitz (Section Leader)  
David Keller  
Shane Moser  
Paul Overbeck

### **WATERSHED AND SYSTEMS ECOLOGY**

Dr. Jerry Mead (Section leader)  
Dr. James Bedison (UPENN, Visiting Investigator)

### **FRANCIS BOYER CHAIR**

Dr. Ruth Patrick  
Susan O'Connell

### **MACROINVERTEBRATES**

Recruitment in future

**PHYCOLOGY**

Dr. Donald F. Charles (Section Leader)

Frank Acker

Patrick Boylen

Dr. Mihaela Enache

Sara Mays

Dr. Eduardo Morales

Pat Palmer

Dr. Ling Ren

Dr. Babs Rinkel

Judith Marie Roszek

Andrew Tuccillo

**PROJECT SUPPORT**

Roger L. Thomas (Section Leader)

Robin Davis

Sylvan Klein

Dr. Danielle Kreeger

Rosemary L. Malfi

Zoe Ruge

**QUANTITATIVE POPULATION BIOLOGY**

Dr. James N. McNair (*resigned February 2009*)

**SUMMER RESEARCH INTERNS**

Woody Cyr

Paul Thomas

Marcell Vasquez

**RESEARCH ASSOCIATES**

Dr. Jeffery Ashley, Philadelphia University

Dr. Jonathan Fingerhut, St. Josephs University

Dr. James Pizzuto, University of Delaware

Dr. Christopher Sommerfield, University of Delaware

**VOLUNTEERS**

Michelle Brannin

Bill Frezel

Roland Harper

Kate Rack

Paulina Rojas

David Schogel

Tina Stonefield

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## HIGHLIGHTS

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### DEPARTMENTAL HAPPENINGS

- **Ruth Patrick** was inducted in the National Woman's Hall of Fame in Seneca Lakes, NY in October, 2009.
- **Jerry Mead** (Watershed and Systems Ecology) and **Roger Thomas** (Project Support) explored various locations in Chile for field sites in the development of a multi-institution National Science Foundation proposal.
- **David Velinsky** (Environmental Biogeochemistry) presented a lecture entitled "Back to the Future: A Historical Perspective of Ecological Change in the Delaware Estuary using Sediment Cores" at Saint Joseph's University's 8<sup>th</sup> Annual McGroddy Frontiers in Science Seminar Series.
- **Clyde Goulden** (Asia Center) and **Jerry Mead** (Watershed and Systems Ecology) presented multiple seminars at two meetings in China. **Richard Horwitz** (Fisheries) was an author on papers that were presented.
- **Patrick Center** hired a Ruth Patrick Post-doctoral Scholar (**Dr. Tracy Elsey Quirk**; Ph.D., University of Delaware) to assist in various wetlands projects.

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### ASIA CENTER

- **Clyde Goulden** continued his NSF\_PIRE-supported research in Mongolia where he interviewed nomadic herders about their perception of the changing climate. He returned via South Korea where he gave two talks at Kangwon National University.
- **Clyde Goulden** attended two international meetings in China: the International Limnology Society in Nanjing, where he gave a talk on the effects of climate change on lakes and rivers, and the 13<sup>th</sup> World Lake Conference in Wuhan, China where he discussed the need for training students to monitor lakes and rivers throughout Asia. He, along with **Jerry Mead**, presented results from various PCER studies.
- The **Asia Center** developed and exhibited materials at these meetings highlighting the research being conducted by Academy scientists in Asia.

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### CENTER FOR ENVIRONMENTAL POLICY

- **Roland Wall** received a renewal of the grant from the William Penn Foundation to continue the programs in the Center.
- The Center started a new group for low tech companies called *Profitable Pathways for the Future* to help companies learn and transfer ideas on sustainable practices.
- The **Environmental Associates/Center for Environmental Policy** sponsored 44 public events in 2009, with a total audience of ~5,700 attendees.

See list of Town Square events and Center for Environmental forums below.

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## ENVIRONMENTAL BIOGEOCHEMISTRY

- **Paul Kiry**, and **Paula Zelanko** completed water quality analyses for monitoring studies in NY, NJ, and PA sponsored by NY DEC and DRBC.
- **David Velinsky, Sylvan Kline, Jerry Mead and Roger Thomas** completed field sampling trips to various tidal marsh systems in Barnegat Bay (NJ) to collect sediment cores and map marsh elevations.
- **David Velinsky, Paul Kiry, Mike Schafer and Roger Thomas** completed field sampling trips to various tidal marsh systems in the Delaware estuary to collect sediment cores.
- **David Velinsky and Paula Zelanko**, along with Nate Rice (CSBE), are analyzing Osprey feathers, collected between ~1860s to the present from birds frequenting Delaware Bay, to assess ecosystem changes in the estuary.
- **David Velinsky and Roger Thomas** are initiating a tidal wetlands monitoring program in the Delaware Estuary in conjunction with researchers at the Partnership for the Delaware Estuary, Rutgers University, Villanova University and Wetlands Services, Inc.

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## FISHERIES

- **Rich Horwitz, Paul Overbeck, Shane Moser and David Keller** were successful in sequencing of mitochondrial DNA from historical specimens (early 20<sup>th</sup> Century) of bridle shiner from the ANS Ichthyology collection.
- **Rich Horwitz** was awarded an EPA project to confirm identification of stream survey fish vouchers collected throughout the United States.
- **Rich Horwitz and Jerry Mead** initiated the Lake Chautauqua Watershed Comprehensive Management and Monitoring Plan Study.

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## PHYCOLOGY

- **Don Charles** organized a workshop of seven diatom ecologists at the Academy to review, and help develop, diatom indicators for New Jersey streams using US EPA Tiered Aquatic Life Use / Biological Condition Gradient approach. Results are being used by NJ Department of Environmental Protection to revise state nutrient criteria standards.
- Phycology Section biologists (**Frank Acker, Eduardo Morales, and Ling Ren**) analyzed algal samples for states of Delaware, Maine, Virginia, New Mexico, and Montana, and provided algal data and analyses to help these states assess the ecological conditions of their rivers and streams.
- **Mihaela Enache** completed a US EPA-sponsored paleolimnological study of New England lakes to assess long-term water quality changes.

- **Jerry Mead** and **David Velinsky** were awarded a grant from the PA Coastal Zone Management program (PA DEP) to study the impacts of land use and climate change on Tinicum Marsh, a Delaware River tidal freshwater wetland.
- **Jerry Mead** and **Roger Thomas** went to Southern Chile and identified 5 stream study sites that had temperate old growth forests in their watersheds. The pilot study was aimed at locating study sites to test Mead's hypothesis that the relationship between stream channel width and riparian forest cover in the northeastern U.S. is largely an artifact of human disturbance within the watershed.
- **Jerry Mead** and summer interns mapped riparian forest cover in the Piedmont and Coastal plain of the Delaware River basin to test model estimates of riparian forest cover. The research was presented at the 13th World Lake Conference and was published in the meeting's proceedings.
- **James Bedison** and **Jerry Mead** measured the concentration of carbon in stream bank soils in the Coastal Plain of the Delaware Basin. They developed a model that predicts concentrations of carbon as a function of land cover and soil type.

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## FIELD WORK

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**Fisheries** – High Lonesome Ranch Stream Restoration (CO); Delaware River (NY, NJ, PA); SE PA Eel Studies (PA, DE); Black River (NY), Chautauqua Lake Watershed Water Quality (NY), Bridle Shiner Studies in upper Delaware River.

**Environmental Biogeochemistry** – Tidal wetlands in the Delaware Estuary: Sediment Coring (NJ, PA, DE); Tinicum Marsh Monitoring and Bioaccumulation (PA); Barnegat Bay Sediment Coring (NJ), Chautauqua Lake Watershed Water Quality (NY).

**Watershed Ecology** – High Lonesome Ranch Restoration (CO); Black River (NY), Chautauqua Lake Watershed Water Quality (NY), Old Growth Forest Research in Chile (SA).

**Project Support** – Oyster Population Health Assessment (TX); Chautauqua Lake Watershed Water Quality (NY); Old Growth Forest Research in Chile (SA); Delaware and Barnegat Bays sediment coring.

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## OUTREACH

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**Patrick Center Scientists** maintain memberships on a number of local and regional resource management committees such as:

- 1) Toxics Advisory Committee; Delaware River Basin Commission
- 2) Science and Technical Advisory Committee (STAC); Delaware Estuary Program
- 3) Diatom Taxonomic Consistency Workgroup; United States Geological Survey
- 4) Subcommittee on Ecological Flows; Delaware River Basin Commission
- 5) Fishes Technical Advisory Committee, PA Biodiversity Program.
- 6) Board of Directors, Partnership for the Delaware Estuary
- 7) North American Benthological Society's Science and Policy Committee

Patrick Center staff has either participated in, or moderated, various forums, workshops and classes including those hosted by the Center for Environmental Policy's Town Square, Pennypack Farm and Education Center and Delaware River Keeper.

They have also participated in various advisory roles for students of all levels including high school, undergraduate and graduate programs.

Various public outreach activities:

Academy Membership Night

Earth Day at the Academy

Highlight of Delaware Coring Program in Philadelphia Inquirer (Health and Science)

Interviews and Articles in local newspapers

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## PROPOSALS & GRANTS *(Italic is source: Submitted; Not all proposals listed)*

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### CENTER FOR ENVIRONMENTAL POLICY

- *William Penn Foundation* (renewal): Town Square and forums.

### ENVIRONMENTAL BIOGEOCHEMISTRY

- *Delaware River Basin Commission*: Water Quality Monitoring Project
- *US EPA and Delaware Estuary Program*: Wetlands Monitoring Studies
- *ERC Endowment Funds*: Wetlands Monitoring
- *New Jersey Department of Environmental Protection*: Mercury Bioaccumulation Study
- *Cotswold Foundation Endowment Funds*: Wetlands Monitoring

## FISHERIES

- *Tennessee Eastman*: Holston River Survey
- *Tennessee Eastman*: Sabine River survey
- *Chautauqua County Planning Dept*: Lake Chautauqua Watershed Comprehensive Management Plan
- *Chautauqua County Planning Dept*: Lake Chautauqua Pre-implementation Monitoring Study
- *National Science Foundation*: Collaborative Research: The effects of riparian forests on the energetic ecology of brook trout: a multi-regional study of food availability, growth, density and production.
- *US Environmental Protection Agency (US EPA)*: Identification of QA/QC vouchers from National Stream Surveys, Phase II.
- *National Park Service*: Status of Bridle shiner in Upper Delaware River, 2009 work.
- *Cotswold Foundation Endowment Funds*: Molecular genetics of bridle shiner in Susquehanna and adjacent drainages.

## PHYCOLOGY

- *United States Geological Survey (USGS)*: National Water-Quality Assessment Program (NAWQA)
- *US EPA*: National River and Stream Assessment (NRSA)
- *State of Maine Department of Environmental Protection*: Algal Monitoring
- *Commonwealth of Virginia Department of Environmental Quality*: Algal Monitoring
- *State of Delaware*: Algal Monitoring
- *Philadelphia Renewable Energy*: Algal Biofuels
- *USGS*: Cascade Lakes paleo-ecology
- *National Science Foundation*: development of Paleoecology database, NEOTOMA
- *State of New Jersey Department of Environmental Protection*: TALU

## PROJECT SUPPORT

- *Dow Chemical and Seadrift Coke*: San Antonio Bay Oyster Population Health Assessment
- *US Army Corps of Engineers*: Delaware Estuary Seston Study Year 2
- *Eastman Chemicals*: Sabine River Survey
- *Eastman Chemicals*: Holston River Survey
- *National Fish and Wildlife Foundation*: Freshwater Mussel Restoration Program.
- *Commonwealth of Pennsylvania: Growing Greener*: Freshwater Mussel Restoration
- Program Partnership for the Delaware Estuary NOAA Delaware Estuary Bivalve Restoration

## WATERSHED AND SYSTEMS ECOLOGY

- *National Science Foundation*: Legacy sediments and the response of channel morphology to riparian forests.
- *National Fish and Wildlife Foundation*: Stream-lined Watershed Integration Model (SWIM)



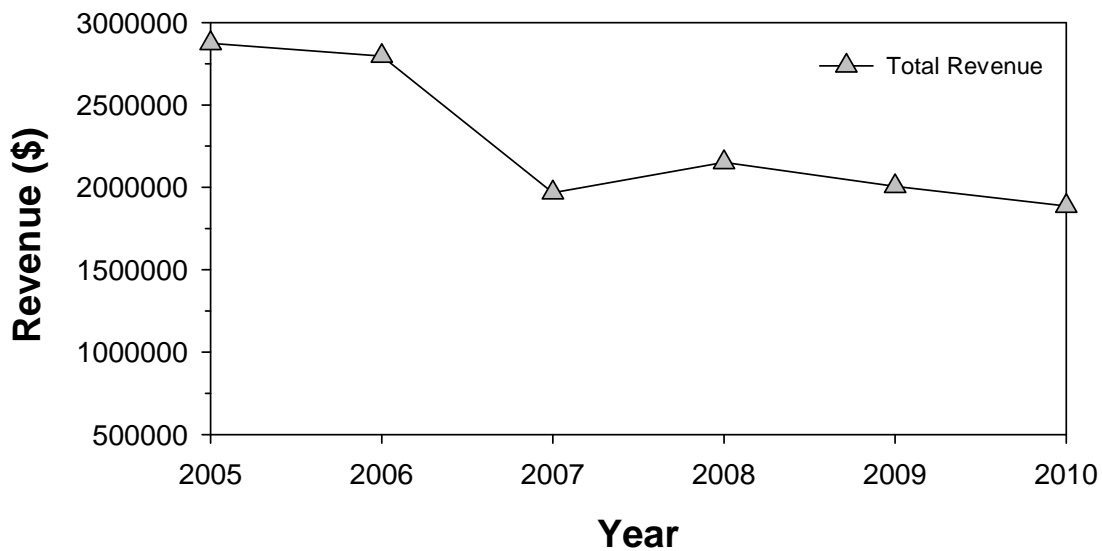
- *Delaware Valley Planning Commission*: Quantify the Economic Value of Protected Open Space in Southeastern Pennsylvania
- *US EPA (Regions III)*: SWIM Model Development for Community Outreach

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## GRANT AND CONTRACT REVENUE

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Below is the grant and contract revenue for the Patrick Center from 2005 to 2009. Values for 2010 are projected.




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## PUBLICATIONS

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Ashley, J.T.F., M.L. Webster, J.E. Baker, R. Horwitz, and D.J. Velinsky. 2009.

Polychlorinated biphenyls in sediment and biota from the Delaware River estuary. *Proceedings of the Academy of Natural Sciences of Philadelphia* 158: 89-105.

Acs, E, E.A. Morales, K.T. Kiss, B. Bolla, A. Plenkovic-Moraj, M.N. Reskone and L. Ector.

2009. *Staurosira grigorszkyi* nom. Nov. (Bacillariophyceae) and araphid diatom from Lake Balaton, Hungary, with notes on *Fragilaria hungarica* Pantocsek. *Nova Hedwigia* 89: 469-483.

**Enache, M.D.** and **M. Potapova.** 2009. A new species of *Sellaphora* (SELLAPHORACEAE) from Hannaberry Lake, Arkansas, U.S.A. *Acta Botanica Croatica* 68: 231-237.

**Enache, M.D.** and B.F. Cumming 2009. Extreme fires under warmer and drier conditions inferred from sedimentary charcoal morphotypes from Opatcho Lake, central British Columbia, Canada. *The Holocene* 19: 835-846

**Flinders, C.A.** and **D.D. Hart.** 2009. Effects of pulsed flows on nuisance periphyton growths in rivers: a mesocosm study. *River Research and Applications* 25: 1320-1330.

McGee, B.L., A.E. Pinkney, **D.J. Velinsky, J.A. Ashley,** D.J. Fisher, L.C. Ferrington and T.J. Norberg-King. 2009 Using the sediment quality triad to characterize baseline conditions in the Anacostia River, Washington, DC. *Environmental Monitoring and Assessment* 156: 51-67.

**McNair, J. N.** 2009. Comparison of two methods for predicting effects of landcover-related stressors on stream biotic integrity at the catchment scale. *Proceedings of the Academy of Natural Sciences of Philadelphia* 158: 61-88.

**Mead, J.V.,** F.N. Scatena, R. Birdsey, Y. Pan, and R. Wall. 2009. Developing SWIM: A Stream-lined Watershed Integration Model for prioritizing stream restoration and conservation. In: *Proceedings from the Global Water Conference in Wuhan, China.* 2009.

**Morales, E.A.,** E. Fernandez, and P.J. Kociolek. 2009. Epilithic diatoms (Bacillariophyta) from cloud forest and alpine streams in Bolivia, SA 3: Diatoms from Sehuencas, Carrasco National Park, Department of Cochabamba. *Acta Botanica Croatica* 68: 263-283.

**Morales, E.A.** and K.M. Manoylov. 2009. *Mayamaea cahabaensis* sp. nov. (Bacillariophyceae), a new freshwater diatom from streams in the United States. *Proceedings of the Academy of Natural Sciences of Philadelphia* 158: 49-59.

**Morales, E.A.,** R. Lücking, and R. Anze. 2009. Una introducción al estudio de los líquenes de Bolivia [*An introduction to the study of the lichens from Bolivia*]. *Universidad Católica Boliviana San Pablo. Serie Ecología No. 1.* 58 pp. ISSN 2076-779X.

**Ren, L.,** N.N. Rabalais, R.E. Turner, W. Morrison, and W. Mendenhall. 2009. Nutrient limitation on phytoplankton growth in the Upper Barataria Basin, Louisiana: Microcosm bioassays. *Estuaries and Coasts* 32: 958-974.

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## PRESENTATIONS

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**Ashley J.T.F., M. Vasquez,** H. Stapleton, **M. Schafer, R. Horwitz** and **D.J. Velinsky.** 2009. Bioaccumulation of PCBs and PBDEs within a tidal freshwater marsh. Presented at the 2009 Delaware Estuary Science Conference, Cape May, NJ.

**Charles, D.F.** 2009. Diatoms as ecological indicators: Acid lakes to nutrient enriched streams. Celebration of 100 Years of Limnology at Cornell. Cornell University, Ithaca, NY, April 17 - 19, 2009. (Invited speaker).

**Charles, D.F.** 2009. Documentation of undescribed diatom taxa in survey and monitoring programs. 20th North American Diatom Symposium, Iowa Lakeside Lab, Milford, IA, 23-27 September 2009.

**Enache, D., D.F. Charles, and A. Tuccillo.** 2009. Diatom-based transfer functions developed within the National Lake Assessment project, U.S.A.: Inferring post-industrial changes at national and regional scales. North American Lake Management Society, 29th International Symposium, October 27-31, 2009, Hartford, CT.

**Enache, M., D. Velinsky, D.F. Charles, C. Sommerfield, et al.** 2009. Diatom-based reconstruction of past environmental changes in the Delaware River tidal region along a north-

south transect. 20th Biennial Conference of the Coastal and Estuarine Research Federation, 1-5 November 2009, Portland, OR.

**Enache, M.D., D.F. Charles, and A. Tuccillo.** 2009. Diatom-based transfer functions developed within the National Lake Assessment project, U.S.A.: Comparing the predictive power of WA and WAPLS models developed at national and regional scales. 11th International Paleolimnology Symposium, Guadalajara, Mexico, December 16, 2009.

**Horwitz, R.J., J. Mead, A. Raus, J. Babcock-Stiner, J. McNair and D.J. Velinsky** 2009. Comprehensive watershed management planning in Chautauqua Lake (New York, USA). Proc. Of 13th World Lakes Conference. Wuhan. November 1-4, 2009.

Nierzwicki-Bauer, S.A., **F.A. Acker**, R. Bombard, **D.F. Charles**, R. Daniels, L.W. Eichler, J. Farrell, J.P. Harrison, B. Momen, S. Percent, W.H. Shaw, J.W. Sutherland, D. Winkler, and **C.W. Boylen.** 2009. A fifteen year dataset on chemistry and biota in Adirondack lakes: trends and future directions. NYSERDA Environmental Monitoring, Evaluation, and Protection Conference, Oct 14-15, Albany, NY.

**Mead, J.V.** 2009. Developing SWIM (Stream-Lined Watershed Integration Model): a new technique for using digital maps to assess riparian forest cover for entire river basin. 13<sup>th</sup> World Lake Conference, Wuhan, China. 1-6 November 2009.

**Mead, J.V.** 2009. Has the U.S. economy bagged the American sportsperson? Annual meeting of the Wildlife Society. Monterey, California (invited). 20<sup>th</sup>-22<sup>nd</sup> September 2009.

**Mead, J.V.** 2009. Scenarios of Global Energy Usage and Climate Change: Impacts on Water Temperature and Fish Growth Potential. Annual meeting of the North American Benthological Society. Grand Rapids, Michigan. (invited), 16-23 May 2009.

**Mead, J.V.** 2009. Scenarios of Global Energy Usage and Climate Change: Impacts on Water Temperature and Fish Growth Potential. Annual meeting of the NY/PA American Fisheries Society. Owego, NY (plenary presentation), 4-5 February 2009.

**Mead, J.V.** 2009. Fish growth potential as affected by water temperature: Linkages to environmental conditions at multiple spatial scales. Partnership for the Delaware Estuary bi-annual meeting. Cape May, New Jersey. 11-14 January 2009.

**Schafer, M., D.J. Velinsky, J. Ashley, H. M. Stapleton and C.K. Sommerfield.** 2009. Detection and Assessment of PBDEs in Delaware River Estuary Cores. SETAC North America 30th Annual Meeting, New Orleans, LA.

**Thomas, R.L., D.J. Velinsky, D.F. Charles, and C.K. Sommerfield.** 2009. Tidal Marshes in the Delaware Estuary: Historical reconstruction of chemical loadings and ecosystem effects. 20th Biennial Conference of the Coastal and Estuarine Research Federation, 1-5 November 2009, Portland, OR. (Poster)

**Velinsky, D.J. and C.K. Sommerfield.** 2009. Rates of sediment accumulation and marsh accretion in tidal wetlands of the Delaware River Estuary. Presented at the 2009 Coastal and Estuarine Research Federation Meeting, Portland, OR.

Weston, N.B., M.A. Vile, S.C. Neubauer, and **D.J. Velinsky.** 2009. Sea Level Rise and Salt-Water Intrusion Limit Vertical Accretion Potential in Tidal Freshwater Marshes of the Delaware River. Presented at the 2009 Coastal and Estuarine Research Federation Meeting, Portland, OR.

Weston, N.B., M.A. Vile, S.C. Neubauer and **D.J. Velinsky.** 2009. The impact of climate change and sea level rise on tidal freshwater marshes of the Delaware River Estuary. Presented at the 2009 Delaware Estuary Science Conference, Cape May, NJ.

**Zelanko, P., E. McKinley, J.T.F. Ashley, M. Vasquez, R. Horwitz, and D.J. Velinsky.** 2009. Trophic Relationships within Tinicum Marsh, Philadelphia, PA: Insights from the Stable Isotopes of Carbon and Nitrogen. Presented at the 2009 Delaware Estuary Science Conference, Cape May, NJ. (Poster)

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## **TOWN SQUARE AND CENTER FOR ENVIRONMENTAL POLICY FORUMS**

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January 15: Green Economy: Economy and Environment Working Hand-in-Hand

January 22: Bike Sharing in Philadelphia

January 29: How to Live Sustainably  
(Panel discussion with members of Young Involved Philadelphia)

February 5: The Dominant Animal: Human Evolution and the Environment in the Obama Administration (Featuring Paul Ehrlich)

February 11: How can the federal government support cities?  
(Mayor's Institute on City Design - Featuring Mayor Nutter - Cosponsored with Penn Praxis, Penn School of Design)

February 12: Green Condo Initiative – Organizational Meeting

February 19: Sustainability and the City Budget: Choices and Trade-offs for Philadelphia.  
(Featuring Deputy Mayor Altman, City Budget Director Dubow, City Director of Sustainability Hughes)

February 26: Completing the Schuylkill River Trail to Create the Region's First Green Transportation Corridor

March 10: Focus Group on Philadelphia Greenworks.  
(Partnered with faculty from Drexel, Penn, Villanova; staff from Rohm & Haas; Mayor's Office of Sustainability)

March 10: Informational Meeting on "The Future of the Parkway."  
(With Logan Square Neighborhood Association)

March 19: Green Vibrant Philly Neighborhoods: What to do In Your Community  
(Urban Sustainability Forum)

March 23: Informational Meeting on New Recycling Ordinances  
(Cosponsored with Recycle Now)

March 30: Teaching Evolution in Elementary School

April 13: Legislative Hearing: Republican State Policy Caucus – Watershed Modeling

April 16: Delaware Valley Greenhouse Gas Inventory  
(Urban Sustainability Forum)

April 18: The Enduring Wilderness: Earth Day Program at ANSP

April 23: The State of our Nation's Endangered Wildlife  
(Silverman Memorial Lecture)

April 30: Reducing the Carbon Footprint of Museums.  
(Special Program for American Association of Museums)

May 4: Condominium Energy Use  
(Program for the Green Condominium Initiative)

May 14: The Future of Cities: The World, The Nation, Philadelphia.  
(Cosponsored by Penn Design, Penn Praxis, Penn Institute for Urban Research)

May 18: U.S. Congressional Field Hearing - Green Infrastructure and Federal Policy  
(Featuring Rep. Schwarz, Rep. Fatah; Cosponsored by Northeast-Midwest Institute)

May 21: Urban Agriculture: How can we feed Philadelphia?  
(Urban Sustainability Forum)

May 26: Kick Off: New Voice of Business  
(Introduction by Mayor Nutter)

May 27: The History of Global Warming Research  
(Collaboration with Philadelphia Area Committee on the History of Science)

June 10: Information meeting on advocating for recycling in commercial bldgs.  
(Cosponsored by the Recycling Alliance)

June 16: Special Screening – The End of the Line  
(Film on marine fisheries depletion/Introductory lecture by Dr. David Velinsky)

June 18: Greenworks Philadelphia  
(Urban Sustainability Forum - Featuring Director Mayor's Office of Sustainability)

July 9: Introduction to Transition Communities

July 16: Protecting Parklands  
(Urban Sustainability Forum - Featuring City Director of Parks and Recreation)

July 21: Health Care, Food Safety and Antibiotics  
(Cosponsored with Pew Charitable Trusts)

September 9: Investing in the Planet - Part 1 (Global Warming and Investment)

September 17: Urban Sustainability Forum "No Vacancy": Reimagining Vacant Land in Philadelphia

September 21: Energy Use in Condominiums  
(Second Town Square for Green Condo Initiative)

September 24: An Evening with Explorer Richard Wiese

October 14: Investing in the Planet – Part 2

October 20: Awakening Green IT (Featuring Joe Tait, CIO, NMS Labs)

October 22: Investing in Green Infrastructure (Urban Sustainability Forum)

October 26: Forum on Street Furniture and Bus Shelters  
(Cosponsored with City Office of Transportation and Utilities; featuring Mayor Nutter, Deputy Mayor Cutler)

November 9: Federal Policy Briefing on Climate Change  
(Cosponsored with PEC, Clean Air Council, Natural Resources Defense Council)

November 15: First Annual Wild and Scenic Film Festival  
(Fund Raiser - Cosponsored with Greener Partners)

November 17: An evening with polar explorer Lonnie Dupre

November 19: Public Transit: The way back into the city  
(Urban Sustainability Forum)

December 7: Investing In the Planet - Part 3 (Featuring former PA DEP Secretary McGinty and Dave Stengis, VP for Sustainability, Campbell Soup)

December 15: International Sustainability Conference – Cosponsored by the Asia Center of the Academy, the City of Philadelphia, the World Trade Center, and the Philadelphia Global Sustainability Association of Business Students. Featuring officials from Henan Province, China.