



Passaic River Institute
*environmental research
and education to help solve
environmental problems*

Statement of Qualifications

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Statement of Qualifications

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Overview of the Passaic River Institute

Environmental Assessment and Investigation Services

*Comprehensive Expertise * Extraordinary Credentials * Academic Credibility * University Facilities*

The Passaic River Institute (PRI) of Montclair State University has broad and deep expertise to study environmental issues facing northern New Jersey and the New York metro area. Established in 2003, the Institute's multidisciplinary personnel, strong credentials, academic credibility, and university facilities provide unique advantages in investigating the region's complex environmental challenges.

Personnel. The PRI brings together over 45 physical, biological and social scientists and engineers from Montclair State and other universities. Many PRI members are renowned experts in their fields and nearly all hold doctoral degrees.

Discipline Expertise. We cover the spectrum from ecology, microbiology, geochemistry, hydrogeology, hydrology, environmental engineering and analytical chemistry to remote sensing, geospatial analysis, geographic information systems, applied math and information technology to environmental planning, policy, anthropology, communications and education.

Regional Experience. PRI members have conducted field and lab-based projects throughout the region, in particular focusing on the Passaic River Basin, Hackensack Meadowlands, Barnegat Bay, NJ/NY Highlands, Delaware River Basin, Long Island Sound, Hudson River, and the Bronx River.

The University Advantage. PRI has access to a wide array of state-of-the-art facilities and equipment (detailed below) available only at a large, comprehensive university like Montclair State. The University environment also provides a large cadre of capable and eager undergraduate and graduate students, technicians and postdoctoral researchers.

Granting Agencies and Clients. PRI members have successfully competed for well over \$10 million dollars in grants and completed projects for many federal and states agencies including the

US EPA, US Dept. of Energy, US Fish and Wildlife Service, National Science Foundation, NASA, NOAA, National Park Service, NJ DEP, NJ Meadowlands Commission, and NJ Board of Public Utilities. Several members have private sector and/or subcontracting experience with firms such as Birdsall Engineering, Inc., Matrix New World Engineering, Inc. and Metcalf & Eddy, Inc.

National and Regional Recognition. The expertise embodied by our membership is recognized by service on many advisory committees include the NJ Highlands Council, NJ Water Monitoring Coordinating Council, New Jersey Office of Sustainable Business, Barnegat Bay National Estuary Program, NASA, National Science Foundation, Intergovernmental Panel on Climate Change, and the United States National Center for Atmospheric Research.

Types of Services. PRI experts are eager to work with government agencies and private firms, to provide a host of services including

- water/sediment sampling and chemical analysis
- geochemical contamination investigation
- hydrologic and hydrogeologic monitoring and modeling
- benthic biodiversity studies
- wetland assessment
- vegetation and wildlife studies, including threatened and endangered species
- landscape characterization
- environmental data management
- computerized mapping
- air quality and climate modeling
- environmental planning
- site investigations
- brownfields consulting: assessment, acquisition, financing, and redevelopment
- designing and assessing the effectiveness of environmental outreach programs
- technical writing.

Contact PRI Director Dr. Kirk R. Barrett, PE, PWS, at 973-655-7117 or pri@montclair.edu to discuss how PRI can help on your projects.

FACILITIES AND EQUIPMENT

Montclair State University houses over 50 teaching and research labs outfitted for biology, chemistry, geology, geochemistry, hydrology, ecology, microbiology, molecular biology, marine and aquatic biology, organic chemistry, analytical chemistry, and biochemistry. Specialized facilities and equipment include:

Biological

- polymerase chain reaction (PCR) instrument
- two greenhouses
- bioassay laboratory, with temperature/flow controlled aquaria
- capillary electrophoresis instrument
- temperature-controlled Aquaria with associated plumbing
- hemocytometer for cell count
- scanning electron microscope with environmental chamber and XRF
- transmission electron microscope
- dissecting scopes
- DNA sequencer
- research-based collection of marine, estuarine and freshwater fauna

Chemical/geochemical

- gas chromatograph/mass spectrometer (GC/MS)
- inductively couple plasma mass spectrometer (ICP-MS)
- inductively couple plasma optical emissions spectrometer (ICP-OES)
- nuclear magnetic resonance (NMR) lab,
- IR/UV/Visible spectrometer
- high performance liquid chromatograph (HPLC)
- collections of New Jersey, New York and Pennsylvania rock and sediment samples

Geophysical

- 3-D ground resistivity profiling device
- digital X-ray powder diffractometer
- digital ground penetrating radar
- standard field surveying equipment
- surface and down-hole resistivity logging equipment
- digital shallow seismic exploration equipment.

Computer/GIS/Remote Sensing

- remote sensing and geographic information systems (GIS) computer labs for teaching (36 stations) and research
- large format plotter
- flat-bed scanner
- large format, high resolution drum scanner.
- hyperspectral radiometer
- statistical and graphic software
- videoconferencing equipment

General Purpose

- digital still and video cameras
- soil and water sampling and field-testing equipment
- Trimble Navigation global positioning systems (GPS) and hand-held GPS units
- quantitative electron microprobe analysis (EMPA) scanning electron microscopy
- standard light microscopy

LIST OF FEATURED PROJECTS

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FEATURED PROJECT #1

Distributions and Inferred Sources of Heavy Metal and PCBs in Surficial Sediments of the lower Hudson River and Estuary

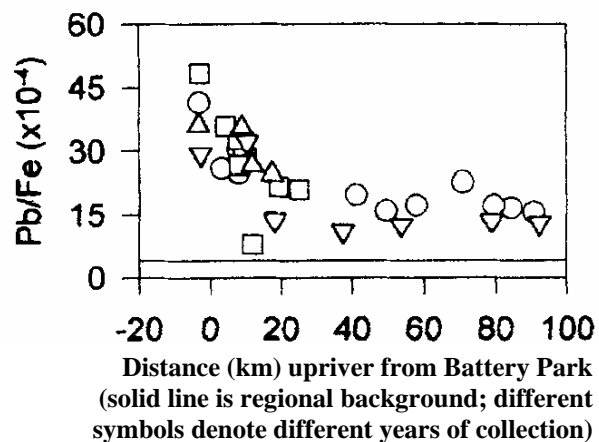
PRI Investigator: Dr. Huan Feng

Funder/client: Hudson River Foundation

The goal of this project was to determine whether the presumed sources of heavy metals and PCBs were reflected in their distributions in bottom sediments of the lower Hudson River. Multivariate statistical analysis was employed to further test these presumptions. Surficial sediments (0-3cm) were collected at 31 sites from along the axis of the lower Hudson, from near Governors Island in New York Harbor to nearly 100km upstream at the Newburg Bridge. Samples were analyzed for heavy metals (Ag, Cd, Cu, Pb, Zn) and PCBs. To better compare site-to-site variations in the trace metal concentrations, the investigators needed to eliminate variations due to solely to sediment grain size differences (ie, smaller particles tend to be more highly contaminated). So, they normalized the trace metal contaminants by dividing by iron concentration, because a previous study had shown that iron varied only with grain size.

Measured metal/Fe ratios exceeded those of reference Hudson estuary sediments by factors of 2 to 10, implying that all sites sampled have elevated concentrations of Ag, Cd, Cu, Pb and Zn. The investigators discovered two types of trends in contaminant concentrations with respect to distance:

1) Ag, Cu and Pb showed an increasing trend moving downstream with maximum values in New York Harbor sediments (see figure at right); this suggests that these trace metals are mainly input from urban runoff or municipal wastewater treatment effluents within the New York City metropolitan area, whose effects drop off about 40km upstream. Silver (Ag) is often considered a tracer/indicator of municipal wastewater effluent; in this study, the finding of significant correlations of Cu and Pb with Ag suggest that wastewater is a significant source of Cu and Pb to the Hudson River system. Cd and Zn were also significantly correlated with Ag in New York Harbor (also suggesting wastewater inputs), but not elsewhere in the River.



2) Cd, Zn and total PCBs displayed a decreasing trend moving down-estuary, suggesting upriver sources of these contaminants. (In New York Harbor itself, however, sediments were enriched in Cd, Zn, and PCBs.) Indeed, there is a large, well known source of PCBs upriver, two General Electric plants, and a large Cd source from a battery manufacturer about 80km upstream. There were significant changes in the composition of PCB congeners along the axis of the lower estuary, with relative importance of higher chlorinated congeners increasing down-estuary. This finding supports the premise that there is an important urban source of higher molecular weight PCBs.

A multivariate statistical analysis (factor analysis) was performed. The first factor, interpreted as representing the urban source input to the lower estuary, accounted for 36% of the variance; the second factor, representing the up-river sources, accounted for 30%; the third, representing the sediment grain size, for 27%. These findings bolstered the previous interpretations of contaminant sources.

Publication: Feng, H., J. K. Cochran, H. Lwiza, B. Brownawell and D. J. Hirschberg. 1998. Distribution of Heavy Metal and PCB contaminants in the sediments of an urban estuary: the Hudson River. Marine Environmental Research, 45, 69-88.

FEATURED PROJECT #2

Variability of plant and animal populations within eelgrass (*Zostera marina*) beds in Barnegat Bay, NJ. PRI Investigator: Dr. Paul Bologna

This investigation addressed faunal relationships with habitat structure within a *Zostera marina* community targeting differences between seagrass bed edge and interior. *Z. marina* biomass was significantly higher from the interior portions of the bed compared to the edge, but shoot density did not vary. Additionally, leaf width and length were significantly greater in the interior of the bed, suggesting greater total leaf area. Densities of larger organisms (> 0.85 mm) were significantly greater in vegetated samples (*Z. marina* edge and interior) compared to unvegetated, but an analysis of similarities demonstrated significant faunal community differences among each of the identified habitats. Densities of small organisms (0.25-0.85 mm), however, were significantly greater at *Z. marina* edge compared to unvegetated samples and *Z. marina* interior. Additionally, secondary production was estimated based on the size distribution of taxa and showed significantly greater production from samples gathered in *Z. marina* compared to unvegetated samples. The relative size distribution of taxa was assessed using regression analysis and results showed that the size distribution was similar for samples collected at edge and interior *Z. marina*, but these distributions differed significantly when compared to unvegetated samples. The results of this study suggest that although similarities exist between edge and interior portions of *Z. marina* beds, especially compared to unvegetated habitats, noteworthy differences in faunal density, species composition, size distribution, and secondary production exist between edge and interior *Z. marina*.



Dr. Bologna (far right) with his field research team

Publication: Bologna, Paul AX. 2006. Assessing within-habitat variability in plant demography, faunal density, and secondary production in an eelgrass (*Zostera marina* L.) bed . *Journal of Experimental Marine Biology and Ecology*. Vol. 329, no. 1, pp. 122-134. Feb 2006.

FEATURED PROJECT #3

Inventory of Freshwater Mollusks and Crayfish at the United States Military Academy (West Point, NY) and Comparative Regional Biodiversity of Gastropods.

PRI Investigator: Dr. Robert S. Prezant

Funder/client: U.S. Military Academy at West Point, NY through Matrix New World Engineering, Inc.

Many water systems within the 64 km² (25 mi²) property of the United States Military Academy (USMA) at West Point, NY are heavily used and manipulated for military maneuvers. Mollusks, crayfish and other macroinvertebrates are often used to help assess ecological quality of freshwater ecosystems. Given this, Dr. Prezant was hired to conduct an inventory of freshwater mollusks and crayfish in the various aquatic habitats on the Academy properties and to use the results to assess relative environmental health. His team conducted an extensive sampling program on the site from July 2000 through November 2001. All major aquatic systems were sampled, including 12 lakes/ponds and 11 stream and various off-road drainage sites. Dip nets, sieves, minnow traps, and hand collections via SCUBA were all used to collect specimens from the various habitats. To avoid oversight of smaller specimens, aquatic vegetation samples were also collected for examination under a dissecting microscope in the laboratory. Standard environmental measurements (pH, temperature, turbidity) were taken using field meters and stations were localized via a Garmin GPS unit.

A total of 34 species of mollusks were found, 22 gastropods (snails, etc.) and 12 bivalves (clams and mussels) plus two species of crayfish. Slightly more species of mollusks were found in lakes and ponds (27) than in streams and brooks (23), probably reflecting a preference for habitat stability and sediment type. The most abundant species (*Amnicola limosus*, a small hydrobiid snail) comprised nearly 50% of the 1,117 individuals collected, whereas the 11 least abundant species comprised only 2%. An expert taxonomist, Dr. Prezant was able to identify two gastropod species considered rare: *Aplexa elongate*, listed in the New York Natural Heritage Program (2002) as “very vulnerable in New York State” (i.e., “Typically 6 to 20 occurrences, few remaining individuals”) and *Probythinella lacustris*, which was thought to be extirpated from New York State.

Findings were compared to two previous studies in the broader New York region. Despite the fact that both other studies covered a much larger area than this study, the total number of gastropod taxa found were similar (22 vs 20 and 25). Similarities between all three studies, using a Bray-Curtis Similarity index, was 63%.

The fact that gastropod diversity at USMA is comparable to the other studies and the communities are relatively similar, suggests that aquatic environments at USMA are not severely degraded. Two lakes with particularly heavy military exercise activity showed taxa counts comparable to other sites on the USMA property. Evidently, the lakes are large enough that any impacts from disturbance are highly localized with only minimal impact to the relatively large populations of the more common molluscan taxa.



A technician and student from Dr. Prezant's lab wash benthic samples through a sieve.

Publication: Prezant, Robert S. and Eric J. Chapman. Freshwater Mollusks of the United States Military Academy Drainages (West Point, NY) and Comparative Regional Biodiversity of Gastropods. Northeastern Naturalist 2004 11(3):273–294

FEATURED PROJECT #4

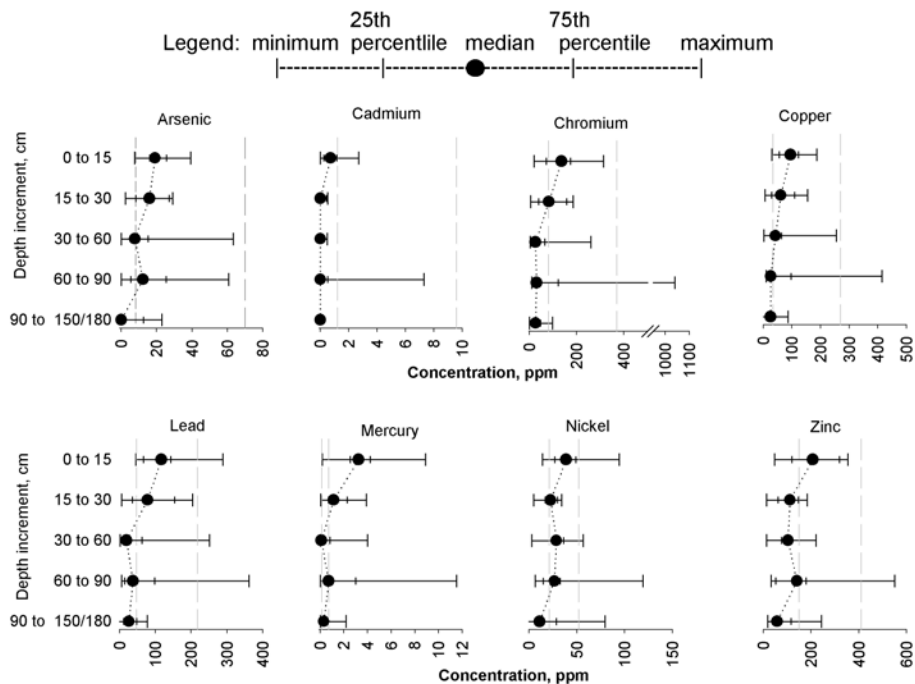
Chemical and Biological Assessment of An Urban, Estuarine Marsh In Northeastern New Jersey, USA

PRI Investigator: Dr. Kirk Barrett

Funder/Client: New Jersey Meadowlands Commission

Oritani Marsh in the Hackensack Meadowlands of urbanized northeastern New Jersey USA was assessed by The Louis Berger Group, Inc. in 2000 for vegetation, soil/sediment chemistry, abundance/diversity of benthic invertebrates, and bird and mammal usage. Data was subsequently analyzed by Dr. Barrett with assistance by others. Vegetatively, both marsh and uplands are dominated by tall, dense *Phragmites australis*. Small patches (less than 2 hectares total) dominated by *Spartina* spp. were found at the lowest elevations. Soil/sediment cores from 15 locations were sliced into up to 5 intervals and analyzed for metals, pesticides and volatile/semivolatile organic compounds. Thirteen locations had at least one chemical above Long et al.'s (1995) "Effects Range-Median" (ERM); see figure below. Seven metals and nine organics exceeded ERM in at least one sample, with mercury showing the most exceedances. The surface 15cm interval was generally more contaminated with metals than the 15 to 30cm interval; the reverse was true for semivolatile organic compounds. Twenty taxa of benthic macroinvertebrates were collected, with each location producing from 1 to 9 taxa. Abundance ranged from 11 to 3,889 individuals/m². Number of taxa was moderately (r^2 between 0.40 and 0.70) negatively correlated with zinc, beryllium, nickel and arsenic concentrations; no other chemical's r^2 was above 0.25. Diversity was moderately negatively correlated with arsenic and beryllium. These correlations were unexpected: zinc, beryllium, nickel and arsenic were not the chemicals found at the highest concentrations relative to benchmarks. Number of taxa, abundance and diversity were moderately (negatively) correlated with elevation; organic carbon was moderately (positively) correlated with abundance. All other correlations were weak ($r^2 < 0.35$). Live traps captured only one mammal species, the meadow jumping mouse. Bird observations revealed 39 species, dominated by a few common species

Concentration distribution for 8 metals by depth interval, all 15 sites combined
(vertical lines denote Long et al's "Effects Range - Low" and "Effects Range -Median")



Publication: Barrett, K. R., and M. A. McBrien. 2006. A Chemical and biotic assessment of a degraded brackish marsh in the Meadowlands of northeastern NJ. Environmental Monitoring and Assessment.

FEATURED PROJECT #5

Polycyclic aromatic hydrocarbons (PAHs) and petroleum biomarker compounds in sediments of Harrison Reach, Passaic River, New Jersey **PRI Investigator: Dr. Michael Kruge**

As part of the Lower Passaic River Restoration Project, fifteen cores of the top 1.2 m of river bottom sediment were collected on an 80 by 50 m grid in July, 2004, within the Harrison Reach of the Passaic River, downriver from the Diamond Alkali Superfund site at 80 Lister Avenue, Newark, NJ. The cores were vertically subdivided into quarters and each quarter core was homogenized. Five of the cores (A3, B3, C2, D2, E1), tracing a 100 m long diagonal across the grid from southwest to northeast, were chosen for organic molecular analysis. Aliquots of the quarter cores from each of these five cores were subjected to thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS). This technique offers a practical alternative for rapid, inexpensive analysis, simply employing milligram quantities of dry, disaggregated sediment, avoiding the use of hazardous organic solvents. For each sample, a total of 182 organic compounds were quantitated, including petroleum hydrocarbons (e.g., hopanes, steranes) and detergent marker compounds (linear alkylbenzenes or LABs), as well as parent and alkylated 2 to 6 ring PAHs. The NIST reference standard NY/NJ waterways sediment sample 1944 was also analyzed for comparative purposes. An environmental forensics approach was taken, that is, relative quantitation results were used to differentiate possible sources of the organic contaminants. As a guide in the interpretation of the results, principal components analysis (PCA) was employed.

All samples analyzed showed high levels of organic contamination. The isomer distributions within classes of compounds (e.g., dimethylphenanthrenes) tend to show little difference from sample to sample, indicative of similar sources or (post)depositional homogenization. The significant differences occur primarily in the relative proportions of compound classes. The deeper core segments tend to exhibit similar distributions, with higher relative concentrations of alkylated naphthalenes, phenanthrenes and dibenzothiophenes, as well as isoprenoid Ikanes and LABs. These indicate contamination by petroleum products, coal tar and detergents. There is more diversity in the distributions seen in the upper core samples. The PAHs in these samples tend to show a predominance of the parent compounds, implying a relatively greater importance of combustion product input. There is also a greater proportion of natural organic matter.

While contamination by 2,3,7,8-tetrachlorodibenzo-*p*-dioxin is of concern in these sediments, PAHs, LABs, and petroleum hydrocarbons are present in concentrations that are up to several orders of magnitude greater.

Publication: Kruge, M. A. 2006. Polycyclic aromatic hydrocarbons (PAHs) and petroleum biomarker compounds in sediments of Harrison Reach, Passaic River, New Jersey. Abstracts, Second Passaic River Symposium. Passaic River Institute, Montclair State University.



Dr. Kruge collects a sediment samples from an urban river for subsequent analysis

FEATURED PROJECT #6

Effects of Fiddler Crabs and Ribbed Mussels on the Growth of *Spartina Alterniflora* in Urban Salt Marsh Restoration PRI Investigator: Dr. Paul S. Mankiewicz, Executive Director, The Gaia Institute

During the field seasons of 2003 and 2004, the Gaia Institute carried out an extensive salt marsh monitoring program within the salt marsh habitats in the Southern and Eastern Bronx. The purpose of this research was to document the growth and development of *Spartina alterniflora* from the lowest portion of low marsh edge to the high marsh or high tide mark above which cordgrass no longer grew. The results of this work will be used to evaluate the interaction of ecology and hydrology for the purposes of enhancing restoration efforts in the region.

Several forms of *Spartina* growth are typically characteristic within a salt marsh. Prior research (by Mark Bertness) has shown that taller cordgrass grows along the marsh edge and extends into the marsh flat, and a short-form occurs at higher elevations. This work has shown that cord grass growth is stunted by substrate texture, nutrient availability, and the overall energy supply to these plants. Higher growth is seen in portions of the marsh inhabited by ribbed mussels and fiddler crabs. Our research aims to discern if the systems in the Eastern Bronx depend on similar ecological controls, and how this may be impacted by combined sewers, the age of the marsh, and its elevation.

Because it has already been shown that that fiddler crab and ribbed mussel densities greatly and positively contribute to the overall energy supply of salt marsh system, our aim was to see if these symbionts had similar effects in urban marshes. Preliminary results of our study indicate that *Spartina* growth is roughly correlated with fiddler crab and mussel density. In general, high densities of fiddler crabs and mussels were correlated with greater cord grass biomass. This data, along with the previous work of Bertness, supports the hypothesis that *Spartina* growth is enhanced by these keystone biological components, even in zones of expected high nutrients around combined sewer outfalls.

This work suggests that salt marsh restoration in and around the Bronx River and the City should couple planting stands cordgrass with colonization by fiddler crabs and ribbed mussels. This approach would better ensure that such marshes would function better in terms of ecological productivity, and most probably also as active filters of local waters and support systems for biological diversity. By ensuring that restored marshes are populated with mussels and fiddler crabs, the crab burrows will increase oxygen which is carried into the sediments, increasing the marshes' ability to breakdown pollutants and remove excess nutrients. Ribbed mussels greatly increase the quantity of water that moves through the marsh, removing plankton and bacteria, and making nitrogen-rich deposits available to sustain plant growth.

At present, the Gaia Institute is working with the NYC Department of Environmental Protection and the NYC Department of Parks and Recreation to explore the effects of the establishment of this biologically diverse assemblages of marshes and oyster reefs in terms of potential impacts on water quality and biodiversity at the mouth of the Bronx River and near the outlet of the Hunts Point Wastewater Treatment Plant.

FEATURED PROJECT #7

The importance of metal storage in prey and digestion in predators on metal trophic transfer in estuarine food chains

PRI Investigator: Dr. William G. Wallace,

Dept of Biology, College of Staten Island, CUNY

Funder/Client: New York Sea Grant

Due to the proximity to industrial facilities, landfills, heavy shipping traffic, and sewage treatment plants, the Arthur Kill, part of the New York-New Jersey (NY-NJ) Harbor Estuary, has been highly contaminated with potentially toxic trace metals. Since the Arthur Kill provides ecologically important habitats for many fish and shellfish in New York State, elucidating the factors influencing dietary exposure to metals in this area is crucial to understanding potential toxicological consequences to resident and migratory organisms inhabiting this estuarine system.

Because of their abundance and ecological importance in estuarine food webs mummichogs (*Fundulus heteroclitus*) play an essential role as an intermediate predator linking benthic invertebrates to higher trophic level organisms. Thus, understanding what determines the extent of metal trophic transfer to mummichogs would provide much needed information on the ecological impacts of trace metals on economically and recreationally important predators (e.g., summer flounder) in this ecosystem.

The dietary ingestion of trace metals is known to be the predominant route of metal exposure to many aquatic organisms including fish. Despite a number of studies conducted on the trophic transfer of metals in aquatic food webs, there are still uncertainties in our ability to estimate food chains effects of bioavailable metals in the natural environment. Recent studies have shown that the subcellular compartmentalization of trace metals into certain cellular compartments (e.g. proteins and organelles – trophically available meals, TAM) within a variety of invertebrate prey organisms is largely responsible for the extent of metal bioaccumulation in their predators. Additionally, digestive processes are also likely to influence the bioavailability of trace metals from food. However, there is only a limited understanding of the effects of a predator's digestive processes on the bioavailability of metals from prey after ingestion. The relationship between the subcellular partitioning of metal in prey organisms and metal solubilization in the gut of a predator before assimilation is therefore not clear.

In order to understand the mechanisms involved in the bioaccumulation of dietary metals in a predator, it is necessary to investigate how prey-dependent (i.e., subcellular compartmentalization of metals) and predator-dependent (i.e., solubilization of metals in the gut) processes interact to influence metal trophic transfer. This one year project will rely on field as well as laboratory studies to elucidate the factors/processes controlling metal trophic transfer to a resident fish inhabiting the Arthur Kill, the mummichog, *Fundulus heteroclitus*.

FEATURED PROJECT #8

Using GIS to integrate pollution data and study pollutant source in the Lower Passaic River, New Jersey

PRI Investigator: Huan Feng

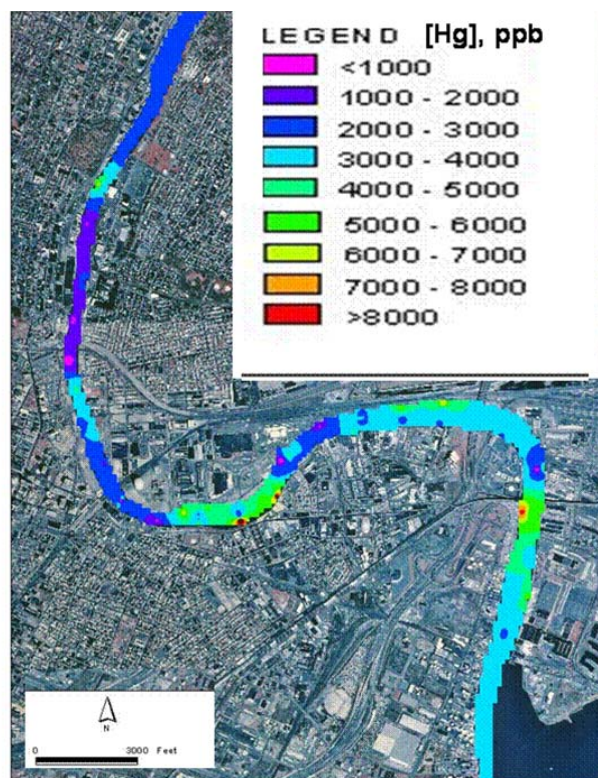
Funder: National Sea Grant College Program, NOAA Grant # NA6RG1047.

The Passaic River is located in the New Jersey-New York metropolitan area. This river has been heavily polluted by dioxins, PAHs, PCBs and heavy metals due to agricultural, industrial activities, and urbanization. Contaminated sediments in the Passaic River have received considerable attention because contaminants (metals, PCBs, PAHs, dioxins) in the sediments have potential to release into the aquatic system and air through diffusion and/or volatilization, causing human health hazards. Identification of high concentration areas of these contaminants in the river-estuarine system is critical to the Passaic River environmental restoration and watershed protection. In this study, we analyzed portion of 10 years (1991-2000) data using Geographic Information Systems (GIS) as a tool to study the distributions of contaminants in the sediments. The results from this study provide important information for developing environmental management strategies for the lower Passaic River system.

Analyzing the existing large data sets, our research shows that the six miles of the lower Passaic River is still one of the nation's most polluted rivers and estuaries. Remediation and restoration actions are needed to recover the system. This study demonstrates that Geographic Information System (GIS) analysis of contaminant data not only enhances the characterization of the contaminant spatial distribution, but also serves as an informative management tool to provide important information for the strategic development of environmental management and restoration.

For the future work, our preliminary data analysis suggests that an in-depth understanding of the source, transport and fate of these contaminants be necessary for effective environmental management and ecosystem restoration of the lower Passaic River. As found in this study, some critical data at depths are missing. These data are important and useful for precise analysis of contaminant focusing sites and accurate estimate of contaminant loads. Therefore, a comprehensive review, analysis and assessment of contaminant data, including further data collection, are recommended by this study. After a more comprehensive study is done, an integrated information and better understanding of the lower Passaic River environmental status will be achieved.

Mercury concentration in surficial sediments of the Lower Passaic River



Feng, H., et al. 2006. Application of a Geographical Information System to Lower Passaic River Sediment Pollution Study, New Jersey, USA. *in* Urban Dimensions of Environmental Change - Science, Exposure, Police, and Technologies, Feng, H., et al, eds. Science Press USA. pp. 275-282.

FEATURED PROJECT #9

Summer educational program in environmental science, ecology and computer technology

PRI Investigators: Dr. Kirk Barrett and Dr. Nicholas J. Smith-Sebasto

Funders: Victoria Foundation, BMW America, Port Authority of NY/NJ, Landsberger Foundation

The Passaic River Institute organized and carried out three sessions of a two-week (10-day) summer program involving a total of 58 7th/8th-grade students, all from Newark. The morning of each of the program (except for the final two days) consisted of a guided field trip to a notable natural site or important environmental infrastructure (e.g., water, sewage, trash), with science lessons and/or recreational activities incorporated into the visit. Each student was given a low-cost digital camera to use during the tours. Tours sites included:

- Newark's Drinking Water Treatment Plant, West Milford, NJ
- Biological and chemical water sampling and analysis, Branch Brook Park and Weequahic Park, Newark
- Garbage incinerator and electricity generating facility, Newark
- Sewage treatment plant, Newark
- Estuary and tidal wetlands of the Hackensack Meadowlands
- Floodplain wetlands of the Passaic River, Roseland
- Hiking and forest ecology in South Mountain Reservation, Maplewood.



Afternoons were spent in a computer lab at Montclair State. Students learned computer software and applied it to investigate the sites they visited and related environmental issues. Software included Internet browser, Excel spreadsheet for managing, analyzing and graphing data, managing digital photographs manipulation, web page development, and PowerPoint presentation software. On the final day of each session, the students presented their work to parents and classmates. Scientists and engineers from academia and industry were also invited to discuss their academic and career path and their present work.

The goals of the program were to

- expose Newark students to fascinating and beautiful natural features within their watershed and to the environmental infrastructure that supports their life
- stimulate curiosity and excitement in the students about ecology, environmental science and computer technology
- introduce the substance and tools of a career in ecology or environmental science/engineering
- encourage students regarding a career in these fields
- place students in a university environment to encourage students regarding the feasibility of attending college.

The program was evaluated by administering pre- and post-questionnaires regarding attitudes toward the environment and knowledge of the local environment sites which were visited.

Comparison of pre and post scores on the attitudinal questionnaire revealed, at 98% statistical confidence, the students held more positive attitudes toward the environment after the program. The percentage of students answering 10 knowledge questions correctly increased dramatically (between 76 and 30 percentage points) for 8 of the 10 questions. A general post-program questionnaire asked whether the program increased the participants' interests in science, the environment, computer technology, attending college, and pursuing a career in science. Large majorities of the participants reported increases in all categories except one, a strong indication that the program met these objectives; 49% reported an increase in interest in pursuing a career in science.



LIST OF PERSONNEL

(faculty/staff of Montclair State unless indicated; **bold indicates one-page CV included**)

Name	Expertise	Pg
1. Dr. Kirk R. Barrett, Director	Surface hydrology, hydraulics and water quality, ecological engineering, environmental monitoring and modeling, research administration, project management	15
2. Dr. Paul Benzing (Fairleigh Dickinson University)	Biogeochemistry, Wetland and aquatic ecology, limnology, phosphorus dynamics and analysis	16
3. Dr. John M. Berger	Isolation and characterization of organic chemical compounds, microbiological assays, chemical instrumentation	
4. Dr. Paul Bologna	Freshwater & marine ecology, sea grasses, submerged aquatic vegetation, habitat restoration	17
5. Dr. Stefanie Brachfeld	Marine geology and geophysics; rock-magnetism and paleomagnetism	
6. Dr. Mark Chopping	Remote sensing of vegetation, geographic information systems	18
7. Dr. Huan Feng	Environmental geochemistry	19
8. Dr. Matthew Goring	Geochemistry, petrology, inorganic analytical chemistry (minerals and metals)	
9. Dr. Lisa Hazard	Ecological physiology, especially reptiles	
10. Dr. Katherine Herbert	Bioinformatics, data mining and knowledge discovery, data integration, data cleaning	20
11. Dr. Haci-Murat Hubey	Non-linearity, chaos logic, linguistics, data mining	
12. Yuxia Huang	Web-based geographic information systems, spatial analysis	
13. Dr. Keith Jones (Brookhaven National Lab)	Materials characterization by x-ray and ion beams to develop sediment decontamination technologies	
14. Dr. Michael Jones	Game theory, functional analysis, geometry, combinatorics, and other mathematics applied to the physical and social sciences	
15. Dr. Scott L. Kight	Behavioral ecology, reproductive ecology	21
16. Dr. John Korky	Ecology, biogeography, morphology, and systematics of amphibians, especially frogs and tadpoles	
17. Dr. Michael Kruge	Marine, estuarine and lacustrine biogeochemistry, especially organics in sediments; gas chromatography/mass spectrometry	22
18. Dr. Phil LeBel	Environmental Economics	
19. Dr. Lee H. Lee	Microorganisms as indicators of heavy metal contamination, antibiotic/antiviral substances from bacteria in marine algae	
20. Dr. Michael Levandowsky, Pace University	Microbial ecology of algae and protozoa; Mathematical modeling	23
21. Dr. Bonnie Lustigman	Antibiotic production by marine algae, effect of metals on same	
22. Dr. Paul Mankiewicz (The Gaia Institute)	Ecological engineering, natural treatment systems, ecosystem restoration	24
23. Dr. Marion McClary (Fairleigh Dickinson University)	Behavioral/physiological ecology, ecology of salt marsh and estuarine animals	25
24. Dr. Kirsten Monsen	Conservation genetics, molecular ecology	
25. Kevin Olsen	Analytical chemistry, geochemistry, environmental history	

LIST OF PERSONNEL (continued)

(faculty/staff of Montclair State unless indicated; **bold indicates one-page CV included**)

Name	Expertise	Pg
26. Dr. Duke Ophori	Groundwater flow, hydrogeology	26
27. Dr. Richard Pardi (William Paterson U)	Urban watershed monitoring, stormwater, nonpoint pollution	27
28. Dr. Sandra Passchier	Sedimentary geology and geochemistry, especially glacial and marine depositional environments, paleoclimatology	
29. Dr. Gregory Pope	Geomorphology, soil science, climate change	28
30. Dr. Robert Prezant	Marine and freshwater invertebrates, marine ecology, malacology	29
31. Dr. Stefan A. Robila	Computer modeling and simulation, hypers/multi-spectral image processing, multivariate data processing, data security	30
32. Yoko Sato	Geographic information systems, data visualization & communication	
33. Dr. Harbans Singh	Environmental law, natural resource management, environmental policy	
34. Dr. John Smallwood	Ecology of birds, especially raptors	
35. Dr. Nicholas J. Smith-Sebasto	Wildlife management, environmental education	
36. Eric Stern (US EPA)	Environmental management, management and decontamination of contaminated sediments	
37. Dr. John G. Stevens	Mathematical modeling of chemical reactors and fluid and particle dynamics	
38. Dr. Robert Taylor	Environmental and economic policy and planning, urban development and environmental issues, environmental communications, public outreach and education, brownfields	31
39. Dr. William Thomas	Ethno-ecology, traditional knowledge and conservation, community - based conservation	
40. Dr. Jeffrey H. Toney	Microbiology, antibiotic resistance of pathogens	
41. Dr. Dirk Vanderklein	Plant physiology, forest ecology	32
42. Dr. Neeraj Vedwan	Anthropology of human-environment interaction, social science research methods and techniques	33
43. Dr. Quinn Vega	Molecular biology, DNA sequencing	
44. Dr. William Wallace Coll. of Staten Island, City U. NY)	Aquatic ecotoxicology, trophic transfer and tissue portioning of contaminants	34
45. Dr. Mike Weinstein (NJ Marine Science Consortium)	Estuarine and marine ecology, especially fish and salt marsh	35
46. Dr. Judith Weis, (Rutgers U.)	Estuarine ecotoxicology, salt marsh ecology, behavioral ecology	36
47. Dr. Peddrick Weis (UMDNJ)	Estuarine Ecotoxicology and analytical chemistry, especially mercury and other metals	37
48. Dr. Danlin Yu	Geographic information systems, spatial data analysis, remote sensing urban environmental modeling and management	38

Dr. Kirk R. Barrett, PE, PWS
Director, Passaic River Institute
<http://www.csam.montclair.edu/~barrettki>

- Summary** Dr. Barrett has nearly 20 years experience in environmental science and engineering, participating in and supervising numerous complex environmental studies. He has won funding and successfully completed grant projects from major governmental agencies. His work has been published in national and international journals. In addition to academic and research positions, Dr. Barrett has several years experience working in industry. As chair of multiple regional professional conferences, Dr. Barrett serves in the leadership of in his profession.
- Expertise**
- Surface hydrology, hydraulics and water quality, especially wetlands
 - Ecological engineering and restoration, especially wetlands and rivers
 - Environmental monitoring, modeling and data analysis
- Education**
- PhD, Civil/Environmental Engineering, Northwestern University, 1996
 - MS, Computer Science, Kansas State University, 1985
 - BS, Chemical Engineering, Kansas State University, 1982
- Licenses & Certifications**
- Professional Engineer, Wisconsin and Massachusetts
 - Professional Wetland Scientist, Society of Wetland Scientists
- Professional Experience**
- Director, Passaic River Institute, Montclair State University, NJ, 2004-
 - Research Director, Meadowlands Env. Research Inst., Rutgers Univ., 1999-2004
 - Hydrologic Engineer, The Bioengineering Group Inc., Salem, MA, 1997-1999
 - Environmental Engineer, Hey and Associates, Inc. Chicago, IL, 1987-1993.
- Professional Service, Awards and Leadership**
- Chair of the Organizing Committee, Meadowlands Symposium. October, 2003.
 - Chair, Mid-Atlantic Conference of the American Water Resources Assoc., 2006
 - Named “Man of the Year” by the South Orange (NJ) Lions Club, 2003, for efforts to rehabilitate the Rahway River corridor in South Orange
- Representative projects and grants**
- Principal Investigator. Effects of Urbanization on Stream baseflow on Rural, Urbanizing Watershed. US Dept. of Agriculture. 2005-2006. \$47,00
 - Co-Investigator. Invasive Plant Species in wetlands along the Passaic River. USEPA. 2006-2009. \$48,000
 - Co- Principal Investigator. Summer Program in Environmental Science and Computer technology for 7th and 8th graders from Newark. Victoria Foundation, Landsberger Foundation, BMW America, Port Authority of NY/NJ. \$40,000. 2006
- Representative publications**
- Weis, P., Barrett, K. R., T. Proctor, and R. Bopp. 2005. Studies of a contaminated brackish marsh in the Hackensack Meadowlands of northeastern NJ: An assessment of natural recovery. Marine Pollution Bul. v50, p 1405–1415.
 - Barrett, K. R. 1999. Ecological engineering in water resources: The benefits of collaborating with nature. Water International, Journal of the International Water Resources Association. v 24, p182-188.
 - Artigas, F. J., K. R. Barrett, and R. Holowczak. 2001. Digital Meadowlands: A Web-Based Decision Support System for an Urban, Estuarine Watershed. Proceedings, Integrated Decision-Making for Watershed Management Symposium. Virginia Tech Publishing. pp 1-8

Dr. Paul Benzing
Assistant Professor of Biology, Fairleigh Dickinson University
<http://view.fdu.edu/default.aspx?id=3233>

- Summary** Dr. Benzing specializes in biogeochemistry and ecology of wetlands, streams and ponds. Since joining FDU in 2002, he has extensively studied phosphorus dynamics within the watershed of the Great Swamp in Morris County, NJ, including chemical analysis of soil and water samples.
- Expertise** Biogeochemistry, wetland and stream ecology, phosphorus dynamics
- Education**
- Ph.D., Applied ecology and environmental science, Duke University Nicholas School of the Environment, May 2001
 - B.S., Biochemistry and Biology, Virginia Polytechnic Institute, May 1990
- Selected Professional Experience**
- Assistant Professor of Biology, Fairleigh Dickinson University, 2002 to current
 - Visiting Assistant Professor, University of Puget Sound, Fall 2001-Spring 2002
 - Laboratory Assistant, Pesticide Residue Analysis Laboratory, Virginia Polytechnic Institute, 1989-1991
 - Research Assistant, Center for Environmental and Hazardous Materials Studies, Virginia Polytechnic Institute, 1989-1991
- Professional Service, and Leadership**
- Secretary of the New Jersey Academy of Sciences (NJAS), 2004-current
 - Co-chair, NJAS Annual Meeting, 2004; Microbiology Session, 2006; Biochemistry Session, 2005
- Representative projects**
- Phosphorus dynamics in Loantaka Brook, watershed of the Great Swamp, NJ.
 - Sediment buffering of soluble reactive phosphate in Kitchell pond in the watershed of the Great Swamp, NJ.
 - Ecological effects of variable phosphorus loading on riparian ecosystems
 - The role of iron and redox in the distribution and dynamics of phosphorus in Histosols of the Florida Everglades.
- Representative publications**
- Benzing, P, W. O'Brien, and D. Italo. submitted 2006. Concentrations and loads of soluble reactive phosphate in Loantaka Brook. The Bulletin of the NJAS.
 - Lynch, Louise, and P. Benzing. 2006. The role of Hydropsychidae genera in nutrient cycling of the Great Swamp watershed. Abstracts, New Jersey Academy of Science, 51st Annual Meeting.
 - Benzing, P. and C. J. Richardson. 2005. CaCO₃ causes underestimation of NaOH extractable phosphorus in sequential fractionations. Soil Science. Volume 170, Issue 10, pp 802-809
 - Santoro, M and P. Benzing. 2003. A budget for total reactive phosphorus (TRP) loads in a eutrophic pond. Abstracts, Metropolitan Association of College and University Biologists Conference.
 - Benzing, P. and C.J. Richardson. 2001. The effects of available C and P on Eh and pH in an Everglades Histosol. Abstracts, Wetlands Biogeochemistry Conf.
 - Benzing, P. and C.J. Richardson. 1997. Calcium resorption during sequential fractionation of artificial soils. Abstracts, Phosphorus Biogeochemistry in Florida Ecosystems.

Dr. Paul A. X. Bologna
Assistant Professor, Department of Biology and Molecular Biology
<http://csam.montclair.edu/biology/bioweb/faculty.html>

Summary

Dr. Bologna specializes in coastal and aquatic research. With his background in oceanography and marine science, he has developed a strong inter-disciplinary research program, including recent collaborations in molecular biology. Dr. Bologna has authored thirteen articles in national and international journals. Currently, he is a member of the Doctoral Faculty and the Chair of the Aquatic and Coastal Sciences Program.

**Expertise
Education**

- Marine ecology; habitat restoration, especially sea grasses; freshwater ecology
- Ph.D., Marine Science, University of South Alabama, 1998
- M.S., Oceanography, University of Maine, 1992
- B.S., Zoology, Michigan State University, 1988

**Professional
Experience**

- Assistant Professor and Chair of the Aquatic and Coastal Sciences Program, Department of Biology and Molecular Biology, Montclair State University, Montclair, NJ, 2003- Present
- Assistant Professor and Director of the Marine Biology Program, Biology Department, Fairleigh Dickinson University, 2000-2003
- Post-Doctoral Scientist, Institute of Marine and Coastal Science, Rutgers University 1998-2000

**Professional
Service, Awards
and
Leadership**

- New Jersey Department of Environmental Protection, Environmental Excellence Award 2002, Healthy Ecosystems
- New Jersey Department of Environmental Protection Brown-Tide Task Force
- Barnegat Bay Estuary Program, Science and Technical Advisory Committee
- Watershed Management Area 4, Technical Advisory Committee
- New Jersey Academy of Sciences, Executive Committee

**Representative
projects and
grants**

- Assessing Harmful Algal Blooms on Submerged Aquatic Vegetation in Barnegat Bay. Barnegat Bay Estuary Program. 2004-2005. \$26,268.
- Restoration and Spatial Assessment of Submerged Aquatic Vegetation in Barnegat Bay, New Jersey Phase II. New Jersey Department of Environmental Protection (EPA Section 319H), 2003-2005. \$152,731.
- Submerged Aquatic Vegetation Restoration as a Technique for Increasing Water Quality and Reducing NPS Pollution. New Jersey Department of Environmental Protection (EPA Section 319H), 2001-2003. \$156,249.

**Representative
publications**

- Bologna, P. In Press. Assessing within habitat variability in plant demography, faunal density, and secondary production in an eelgrass (*Zostera marina*) bed. J. Exp. Mar. Biol. Ecol.
- Bologna, P. A. X. and M. S. Sinnema. accepted. Assessing the Success of Eelgrass Restoration in New Jersey. Proceeding of a workshop on Seagrass Restoration.
- Bologna, P., Fetzer, M., Moody, E. and McDonnell, 2005. Assessing the potential benthic-pelagic coupling in episodic blue mussel (*Mytilus edulis*) settlement events within eelgrass (*Zostera marina*) communities. J. Exp. Mar. Biol. Ecol.
- Bologna, P. and Heck, K. 2002. Impact of habitat edges on density and production of seagrass associated fauna. Estuaries.

Dr. Mark Chopping
Associate Professor, Department of Earth and Environmental Studies
<http://www.csam.montclair.edu/~chopping>

- Summary** Dr. Chopping has 12 years experience in remote sensing and geographic information systems, participating in 555 numerous field campaigns, conferences and workshops in the US, Europe, and Asia. He is principal investigator in a NASA Earth Observing System / North American Carbon Program project, a member of the NASA MISR and the NASA Land Cover Land Use Change Science Teams, and a PI in the European Space Agency's CHRIS/Proba program. His work is published in top international journals.
- Expertise**
- Remote sensing of vegetation with focus on arid and semi-arid environments.
 - Multiangle remote sensing; canopy reflectance and BRDF modeling.
 - Geographic Information Systems; programming for science applications.
- Education**
- Ph.D., Remote Sensing, University of Nottingham, 1998
 - M.Phil., GIS and Remote Sensing, University of Cambridge, 1995
- Professional Experience**
- Assistant/Associate Professor, Department of Earth and Environmental Studies, Montclair State University, 2002-. NASA Principal Investigator (Earth Observing System and North American Carbon Program); member of the NASA MISR and the NASA Land Cover Land Use Change Science Teams.
 - Physical Scientist GS12, US Department of Agriculture, Agricultural Research Service Jornada Experimental Range, Las Cruces, NM, 2001-2002
 - Physical Scientist GS11, US Department of Agriculture, Agricultural Research Service, Hydrology Laboratory, Beltsville Agricultural Research Center-W, Beltsville, MD, 1999-2001.
- Professional Service, Awards and Leadership**
- NASA peer reviewer since 2000.
 - Peer reviewer for the National Science Foundation and the Space Research Organization of the Netherlands.
 - USDA, ARS Certificate of Merit For Outstanding Performance: '99,'00,'01.
 - The Remote Sensing Society Best M.Sc. Paper 1996.
 - Peer reviewer for multiple science journals.
 - Lead organizer: NASA/MISR Workshop on Ecological Modeling using Multiangle Remote Sensing, Greenbelt, Maryland, September 20, 2005.
- Representative projects and grants**
- Quantifying Changes in Carbon Pools with Shrub Invasion of Desert Grasslands using Multi-Angular Data from EOS Terra and Aqua. NASA. 2004– 07. \$481 k.
 - Principal Investigator. Physical Structure and Composition of Desert Grasslands and Shrublands via Hyperspectral Multiple View Angle Reflectance Data from CHRIS/Proba (European Space Agency). June 2000-. Data grant.
- Representative publications**
- Chopping, M. J., Su, L., Laliberte, A., Rango, A., Peters, D.P.C., and J. V. Martonchik, J.V., 2006., Mapping woody plant cover in desert grasslands using canopy reflectance modeling and MISR data, *Geophys. Res. Lett.*, 33, L17402.
 - Chopping, M., Su, L., Rango, A., and Maxwell, C. 2004. Modelling the reflectance anisotropy of Chihuahuan Desert grass-shrub transition canopy-soil complexes, *International Journal of Remote Sensing*, 25(14): 2725–2745.
 - Chopping, M.J., Rango, A., and Ritchie, J.C. 2002. Improved semi-arid community type differentiation with the NOAA AVHRR via exploitation of the directional signal, *IEEE Trans. Geosci. Remote Sens.* 40(5): 1132-1149.
 - Chopping, M.J. 2000. Large-scale BRDF retrieval over New Mexico with a multiangular NOAA AVHRR data set, *Remote Sens. Environ.* 74(1): 163–191.

Dr. Huan Feng
Associate Professor, Department of Earth and Environmental Studies
<http://frontpage.montclair.edu/fengh/>

- Summary** Dr. Huan Feng is a coastal/marine environmental geochemist. His broad research interests include riverine, estuarine and marine environmental quality, laboratory QA/QC procedures, sediment decontamination technology development, synchrotron-based technique application in characterization of chemical compound composition and geological material microstructures.
- Expertise**
- environmental geochemistry
 - chemical oceanography
 - radionuclide tracers
 - heavy metal contamination
- Education**
- Ph.D., State University of New York at Stony Brook, 1997
 - MS, Florida Institute of Technology, 1992
 - BS, Xiamen University, China, 1982
- Professional Experience**
- Associate Professor, Montclair State University, Montclair, NJ, 2000-
 - Assistant Scientist, Brookhaven National Laboratory, Upton, NY, 1998-2000
 - Visiting Professor, Xiamen University, Xiamen, China, 2004-
 - Guest Assistant Scientist / Guest Scientist, Brookhaven National Laboratory
- Representative projects and grants**
- Co-Investigator, New York/New Jersey Harbor contaminated sediment processing and decontamination technologies, Federal Water Resources Development Act (WRDA)
 - Principal Investigator. Application of GIS to Integrating pollution data and studying pollutant source function in Passaic River system, New Jersey; New Jersey Sea Grant
 - Co-Principal Investigator. Natural radionuclides as tracers for studying fate and seasonal variations of contaminants in the intertidal zones of the Yangtze River Estuary
- Representative publications**
- Feng, H., et al. 2004. A Preliminary Study of Heavy Metal Contamination in Yangtze River Intertidal Zone Due to Urbanization. *Marine Pollution Bulletin*, 49, 910–915.
 - Onwueme, V., H. Feng, M. Chopping, W. J. Jaslanek and E. A. Stern. 2005. Heavy Metal Contaminated Sediments of Lower Passaic River, New Jersey, USA. In: *Urban Dimensions Of Environmental Change—Science, Exposure, Police, And Technologies*. H. Feng, L. Yu and W. Solecki (eds). Science Press USA Inc., p. 34-43.
 - Cochran, J. K., D. J. Hirschberg and H. Feng. 2005. Reconstructing Sediment Chronologies in the Hudson River Estuary. In: *The Hudson River Ecosystem*, Jeffrey S. Levinton (ed). Oxford University Press.
 - Feng, H., J. Kirk Cochran and D. J. Hirschberg. 2002. Mechanisms and Behavior of Metal Contaminants over the Course of a Tidal Cycle in the Turbidity Maximum Zone of the Hudson River Estuary. *Water Research*, 36, 733 –743.
 - Feng, H., J. K. Cochran and D. J. Hirschberg. 1999. ²³⁴Th and ⁷Be as tracers for transport and sources of particle-associated contaminants in estuaries. *The Science of the Total Environment*, 237/238, 401-418.
 - Feng, H., et al. 1998. Distribution of Heavy Metal and PCB contaminants in the sediments of an urban estuary: the Hudson River. *Marine Env. Res.*, 45, 69-88.

Dr. Katherine G. Herbert
Assistant Professor, Department of Computer Science
<http://www.csam.montclair.edu/herbert>

- Summary** Dr. Herbert has both theoretical knowledge and demonstrated practical experience in fields of information technology, specifically in the subfield of bioinformatics. She has developed sophisticated software applications for data mining.
- Expertise**
- Bioinformatics
 - Data Mining and Knowledge Discovery
 - Data Integration, Data Quality
- Education**
- B.S. Saint Peter's College, 1999
 - M.S. New Jersey Institute of Technology , 2001
 - Ph.D. New Jersey Institute of Technology, 2004
 - Assistant Professor, Montclair State University, Department of Computer Science, Fall 2004 – Present
- Professional Experience**
- Research Associate, New Jersey Institute of Technology, Data and Knowledge Engineering Lab, Summer 2004 - Present
 - Graduate Student Research Associate, New Jersey Institute of Technology, Department of Computer Science, 2000
- Professional Service, Awards and Leadership**
- Reviewer for VLDB Journal and Information Sciences (Elsevier Publishing)
 - Upsilon Pi Epsilon (The ACM International Computer Science Honors Society)
 - Who's Who Among America's University and College Students, 2003
 - Pi Mu Epsilon (The National Mathematics Honors Society)
 - Computer Science Award, Saint Peter's College, Jersey City, New Jersey, 1999
- Representative projects and grants**
- BIO-AJAX for Lineage Paths, Dissertation research, 2005.
 - BIO-AJAX for TreeBASE, Dissertation research, 2003.
 - An automated annotation tool for courseware development. NJ-ITOWER, project, 2001
 - Summer Research Assistantship Award, National Science Foundation, 2001,2002,2003
- Representative publications**
- Katherine G. Herbert and Jason T.L. Wang. 2005. Phylogenetic Information Integration: Research Issues and Techniques. Proceedings, 6th International Symposium on Computational Biology and Genome Information Systems & Technology.
 - Katherine G. Herbert, et al. 2005. Lineage Path Integration for Phylogenetic Resources. Proceedings of 17th International Conference on Scientific and Statistical Database Management. pp 117-120.
 - Katherine G. Herbert, et al. 2004. BIO-AJAX: An Extensible Framework for Biological Data Cleaning. ACM SIGMOD Record, Special Issue on Data Engineering for the Life Sciences.
 - Jason T. L. Wang, Qicheng Ma and Katherine G. Herbert. 2001. Software Engineering and Knowledge Engineering Issues in Bioinformatics. Handbook of Software Engineering and Knowledge Engineering, Vol. 1 (S. K. Chang, ed.) World Scientific Publishing Company, pp. 719-732.

Dr. Scott L. Kight
Associate Professor, Department of Biology and Molecular Biology
<http://csam.montclair.edu/biology/bioweb/faculty.html>

- Summary** Dr. Kight is a behavioral ecologist with 15 years of experience working with aquatic insects in lentic and lotic environments. His extramural funding record includes grants from the National Science Foundation and the National Institutes of Health. Dr. Kight publishes regularly in national and international research journals. From 2002-2006, he served as Chair of the Biology and Molecular Biology department.
- Expertise**
- Behavioral ecology of aquatic insects
 - Reproductive ecology, animal evolutionary biology and behavior
- Education**
- PhD, Biology, Indiana University, 1996
 - MS, Zoology, Eastern Illinois University, 1991
 - BS, Zoology, Southern Illinois University, 1989
- Licenses & Certifications**
- Doctoral Area Certificate in Animal Behavior
- Professional Experience**
- Department Chair, Department of Biology and Molecular Biology, Montclair State University, Montclair, NJ, 2002-2006
 - Assistant/Associate Professor, Department of Biology and Molecular Biology, Montclair State University, Montclair, NJ, 1997-
 - Visiting Assistant Professor, Skidmore College, Saratoga Springs, NY, 1996-1997.
- Professional Service, Leadership**
- External program evaluator, Essex County College
 - Grant review panelist, National Science Foundation
 - Regular review for multiple professional journals
- Representative projects and grants**
- Principal Investigator, BRIDGES to the Baccalaureate, National Institutes of Health, \$175,517.
 - Principal Investigator, Undergraduate Research Communities, National Science Foundation, \$135,850.
- Recent publications**
- Houghtaling, K. & Kight, S.L. 2006. Turn alternation in response to substrate vibration by terrestrial isopods, *Porcellio laevis* (Isopoda: Oniscidea) from rural and urban habitats in New Jersey, USA. *Entomological News*. 117: 149-154.
 - Castillo, M.E. & Kight, S.L. 2005. Response of terrestrial isopods, *Armadillidium vulgare* and *Porcellio laevis* (Isopoda: Oniscidea) to the ant *Tetramorium caespitum*: Morphology, behavior and reproductive success. *Invertebrate Reproduction and Development*. 47:183-190.
 - Kight, S.L., Eadie, C., Lynch, D., Coelho, J. & DeWera, A. 2005. Classical conditioning of red-backed salamanders, *Plethodon cinereus*. *Bulletin of the Maryland Herpetological Society*. 41:68-84.
 - Kight, S.L. & Nevo, M. 2004. Female terrestrial isopods, *Porcellio laevis* Latreille (Isopoda: Oniscidea) reduce brooding duration and fecundity in response to physical stress. *Journal of the Kansas Entomological Society*. 77:285-287.

Dr. Michael A. Kruge
Associate Dean, College of Science & Mathematics
Professor, Dept. of Earth and Environmental Studies
<http://www.csam.montclair.edu/earth/eesweb/kruge/krugeindex.html>

Expertise

- Marine, estuarine and lacustrine biogeochemistry
- Geochemistry of organic contaminants in sediments
- Geochemistry of peat
- Fossil organic matter as indicator of environmental change
- Applications of analytical pyrolysis-gas chromatography/mass spectrometry
- Biological marker compounds and polycyclic aromatic hydrocarbons in, petroleum, petroleum source rocks, oil shales, coal and sediments.

Education

- Ph.D. 1985 Geology - University of California, Berkeley
- M.A. 1982 Geology - University of California, Berkeley
- B.A. 1980 Geology - San Francisco State University

Professional Experience

- Associate Dean, College of Science & Mathematics, MSU 2002-present
- Professor of Environmental Geochemistry, Earth and Environmental Studies Dept., MSU 2002-present

Professional Service, Awards and Leadership

- Professor, Dept. of Geology, Southern Illinois Univ., Carbondale 1987-2002
- Member, Geochemical Society, American Chemical Society (Division of Geochemistry), American Geophysical Union, American Society for Limnology and Oceanography

Representative projects and grants

- Member, Editorial board of International Journal of Coal Geology 1988-2002
- Associate Editor of Organic Geochemistry, 1999-2000
- Co-Principal Investigator. Separation and Characterization of Separated Coal Macerals and Kerogen. Granted by the PG Research Foundation. 1 June 2000-31 May 2002, \$170,635
- Co-Principal Investigator. Analysis of Organic Sulfur and Nitrogen in Coal via Tandem Degradation Methods. Granted by the Illinois Clean Coal Institute. 1 Sep. 1992 - 31 Aug. 1993, \$107,051
- Co-Principal Investigator. Analysis of Organic Sulfur and Nitrogen in Coal via Tandem Degradation Methods. Granted by the Center for Research on Sulfur in Coal. 1 Sep. 1991 - 31 Aug. 1992, \$119,125

Representative publications

- Kruge M.A. and Permanyer A. 2004. Application of pyrolysis-GC/MS for rapid assessment of organic contamination in sediments from Barcelona harbor: *Organic Geochemistry* **35**:1395-1408.
- Kuder T. and Kruge M.A. 2001. Carbon dynamics in peat bogs - insights from substrate macromolecular chemistry. *Global Biogeochemical Cycles* **15**:721-728.
- Kruge M.A. 2000. Determination of thermal maturity and organic matter type by principal components analysis of the distributions of polycyclic aromatic compounds. *Int. J. Coal Geol.* **43**:27-51.
- Kruge M. A. 1999. Molecular organic geochemistry of New York Bight sediments. Sources of biogenic organic matter and polycyclic aromatic hydrocarbons. *Northeastern Geology and Environmental Sciences*. **21**:121-128.

Dr. Michael Levandowsky
Research Scientist, Haskins Labs, Pace University, NY, NY

- Summary** Dr. Levandowsky is a marine microbial ecologist, specializing in protistan microorganisms (algae and protozoa). He has studied these populations in various habitats in the New York-Raritan estuary system.
- Expertise**
- Identification of protists using microscopy and DNA analysis
 - Behavior and sensory biology of protists
 - Mathematical modeling
- Education**
- B.A., mathematics, Antioch College, OH 1961
 - M.A., zoology, Columbia University, NY 1965
 - Ph.D., biological sciences, Columbia University, NY 1970
 - M.S., applied mathematics, New York University, NY 1973
- Selected Professional Experience Professional Service, and Leadership**
- Research Scientist, Haskins Laboratories, Pace University, 1970-present
 - Adj. Professor, Biology & Chemistry, Pace University, NY, 2001-present
 - Executive Committee, International Society of Protistologists, 2004 -
 - Editorial Advisor, J. Eukaryotic Microbiology, 1999-2001
 - Editorial Advisor, Marine Ecology Progress Series, 1979-95
 - Board of Directors, Treasurer, The River Project, 1988-present
- Representative projects**
- Analysis of Community DNA samples of plankton in the lower Hudson and East Rivers, 2004 – present
 - Monitoring Phytoplankton Populations in the Lower Hudson and the East River, 1989 – present
- Representative publications**
- Kaneta PJ, Levandowsky M, Esaias W. 1985 Multivariate analysis of the phytoplankton community in the New York Bight. Mar. Ecol. Progr. Ser. 23, 231-239
 - Fisher, NS, Breslin VT, Levandowsky, M. 1995 Accumulation of silver and lead in estuarine microzooplankton. Mar.Ecol. Progr. Ser. 116, 207-15
 - Benoit, G., Nieder, C., Levandowsky, M., Breslin, V. 1999 Sources and history of heavy metal contamination and sediment deposition in Tivoli South Bay, Hudson River, NY. Estuaries 22, 167-178.
 - Anderson, O.R., Gorrell, T., Bergen, A., Kruzansky, R., Levandowsky, M. 2001. Naked amoebas and bacteria in an oil-impacted salt-marsh community. Microb. Ecol. 42, 474-481

Dr. Paul S. Mankiewicz
Executive Director, The Gaia Institute
<http://www.gaia-inst.org/staff.html>

Summary

As the founding Director of the Gaia Institute, Dr. Mankiewicz has taken on challenging problems in applied and theoretical biogeochemistry and ecology, from urban watershed restoration to landfill and mine remediation. Solutions to these problems in all cases involve the transformation of elements of the waste stream into ecological resources.

Expertise

- Ecological engineering
- Interaction of plants, water, nutrients, and pollutant uptake
- Enhancing, restoring and constructing wetland and terrestrial ecosystems

Education

- City University of New York, Ph.D. in Biology, 1987.
- City University of New York, M. Phil in Biology, 1979.
- Lehman College of CUNY, M.A. in Biology, 1976.

Professional Experience

- Executive Director, The Gaia Institute, Bronx, NY 1987-
- Director of Ecological and Biogeochemical Engineering, Ecoterra, Inc., Chadds Ford, PA 1995-1996

Professional Service, Awards and Leadership

- Finalist for International Saint Andrews Prize for "Putting Waste to Work, Compost Utilization in the Reconstruction of Wetland Habitat for Storm Water Treatment in Urban Areas," 2000
- Good Earth Earthling Award, City Club of New York, April 1995
- Environmental Quality Award (to the Gaia Institute), US EPA Region 2, 1994
- Past President, Torrey Botanical Society
- Former member and chair of the Solid Waste Advisory Board of the Bronx

Representative projects and grants

- Ecological Engineering and Stormwater Capture Design Development for the Henry Hudson Parkway 2003-Present
- Feasibility Study for Biogeochemical Acid Mine Drainage Mitigation South Stafford, Vermont, 2000- 2001
- Pelham Bay Landfill Ecologically Based Remediation Plan, Bronx, NY 1993- 94
- Metals Removal from the Wastewater Stream of an Industrial City, 1992- 1993
- Salt Marsh Restoration and Development of On-Site Bioremediation, 1991

Representative publications

- Mankiewicz, P.S., et.al., 1998. "Should salt marshes be constructed with dredged material?" Poster presented at Concepts & Controversies in Tidal Marsh Ecology, Vineland, NJ.
- Mankiewicz, P.S., 1996. "A theoretical exploration of biological surfaces and metabolic capacitance: Thermodynamic, economic, and material efficiencies in fluid purification systems." Ecological Engineering for Wastewater Treatment, 2nd ed., Trosa, Lewis Publishers.
- Mankiewicz, P.S., 1992. The macromolecular matrix of plant cell walls as a major Gaian interfacial regulator in terrestrial environments. Scientists on Gaia, ed. by S. H. Schneider & P. J. Boston, MIT Press.
- Mankiewicz, P.S., 1987. "The low pressure field porometer: A new, low cost technique for characterizing external capillary water conduction in whole colonies of bryophytes and other small plants." The Bryologist, 90(3): 253-262.

Dr. Marion McClary, Jr.
Associate Professor of Biological Sciences, Associate Director of Biological Sciences
Fairleigh Dickinson University, Teaneck, NJ
<http://inside.fdu.edu/pt/mcclary.html>

- Summary** Dr. McClary is a behavioral/physiological ecologist who studies how behavior and physiology influence ecology and how the environment influences behavior, physiology and ecology.
- Expertise**
- Assessments of habitat selection, feeding behavior, benthic/planktonic ecology
 - Measurements of oxygen uptake/respiration and osmotic pressure change
- Education**
- Ph.D. Zoology, Duke University, Durham, North Carolina, 1997
 - B.S. Marine Science, Richard Stockton State College, Pomona, New Jersey, 1990
- Professional Experience**
- Associate Director, Biological Sciences, Fairleigh Dickinson University, 2004-
 - Associate/Assistant Professor, Biological Sciences, Fairleigh Dickinson University, 2000- present
 - Assistant Professor, Biology, Bloomfield College, 1998-2000
 - Postdoctoral Fellow, Biology, Georgia State University, 1997-1998
- Professional Service, Awards and Leadership**
- Topic Editor, Encyclopedia of Earth
 - Reviewer, Environmental Monitoring and Assessment, Estuaries and Coasts, Editorial Advisory Board Member, Scientific Journals International, 2006-
 - Member, I BOAT NJ Program Selection Committee, 2006-
 - Commissioner, Environmental Protective Commission (Clifton), 2003-2005
 - Technical Advisory Committee, Watershed Management Areas 4 and 5, 2001-
 - Advisory Board Member, Teaneck Creek Conservancy, 2002-
 - Advisory Board Member, Hackensack River Greenway (Teaneck), 2002-
- Representative projects and grants**
- Co- Principal Investigator, Capping of Contaminated Sediments in Kearny Marsh, New Jersey Meadowlands Commission, 2004-2008, \$96,996
 - Principal Investigator, *Spartina alterniflora* and *Phragmites australis* as Habitat for the Ribbed Mussel, *Geukensia demissa*, N.J. Marine Sciences Consortium, N.J. Sea Grant College Program, 2003-2004, \$4,565
 - Co- Principal Investigator, Wetland Plant Roles in Uptake and Transport of Heavy Metals and Remediation, National Science Foundation Research Opportunity Award (ROA), 2000-2001, \$7,614
- Representative publications**
- McClary Jr., Marion. 2004. *Spartina alterniflora* and *Phragmites australis* as Habitat for the Ribbed Mussel, *Geukensia demissa*, in Saw Mill Creek of New Jersey's Hackensack Meadowlands. Urban Habitats. Volume 2, Number 1 (web publication).
 - Holm, ER, Marion McClary Jr, Daniel Rittschof. 2000. Variation in attachment of the barnacle *Balanus amphitrite*: sensation or something else? Marine Ecology Progress. v 202, pp p153-162.
 - Clare, A. S., R. K. Freet, M. McClary Jr. 1994. On the antennular secretion of the cyprid of *Balanus amphitrite* amphitrite, and its role as a settlement pheromone. Journal of the Marine Biological Association of the United Kingdom. vol. 74, no. 1, pp. 243-250.

Dr. Duke Ophori
Associate Professor, Department of Earth and Environmental Studies
<http://www.csam.montclair.edu/earth/eesweb/ophori>

- Summary** Dr. Ophori is a hydrogeologist with expertise in groundwater flow and contamination using both laboratory and numerical simulation methods.
- Expertise**
- Hydrogeology, groundwater hydrology
 - Numerical modeling and simulation methods
- Education**
- Ph. D., University of Alberta, Edmonton (Canada)
 - M.S., University of Waterloo
 - B.Sc., University of Ibadan (Nigeria)
- Selected Professional Experience**
- Associate Professor, Department of Earth and Environmental Studies, Montclair State University, 1995-Present
 - Research hydrogeologist/scientist, Whiteshell Laboratories, Pinawa, Manitoba, 1989-1995
 - Postdoctoral Fellow, University of Alberta, Edmonton, Alberta, 1987-1989
 - Hydrogeological Consultant, Edmonton, Alberta, Canada, 1980-1986:
- Representative projects and grants**
- Principal Investigator, Vulnerability of Groundwater to Pollution, Long Island, NY US EPA, 1995, \$73,092
 - Principal Investigator, Hydrogeology of Northeastern New Jersey, Margaret and Herman Sokol Award, Montclair State U., \$2,000
 - Co-Investigator, Modeling of groundwater flow and Contaminant transport in the Canadian Nuclear Fuel Waste Management Program. Atomic Energy of Canada Limited, 1989-1995, \$40,000,000.
- Representative publications**
- Ophori, D.U. A simulation of large-scale groundwater flow and travel time in a fractured rock. 2004. Hydrological Processes. v18, pp 1579 - 1593
 - Ophori, D.U. 2000. Simulating large scale groundwater flow for waste disposal purposes. Földtani közlöny, vol. 130, no. 2, pp. 263-273.
 - Ophori, D.U. and B. Maharjan. 2000. First approximations of soil moisture retention curves using the filter-paper method, Long Island, New York Hydrological Processes, vol. 14, pp. 1131-1138.
 - Ophori, D.U. and M. McGill. 2000. Alternative conceptual models of groundwater flow and contaminant transport, Northeastern New Jersey. Northeastern Geology & Environmental Science, vol. 22, no. 2, pp. 130-141.
 - Ophori, D.U. 1999. Constraining permeabilities in a large-scale groundwater system through model calibration. Jour. of Hydrology, Vol. 224, pp. 1-20.

Dr. Richard R. Pardi
Professor and Chair, Department of Environmental Science, William Paterson University
<http://euphrates.wpunj.edu/faculty/pardir>

- Summary** Dr. Pardi was trained as a geochemist. Over the last several years, he has been heavily involved in studying urban watersheds of the lower Passaic River, including wet weather sampling for water quality.
- Expertise**
- urban watershed processes, stormwater and nonpoint pollution
 - radiocarbon dating
- Education**
- Ph. D., Geology, University of Pennsylvania, 1983
 - MA, Geology, Queens College, CUNY, 1974
 - BA, Geology, Queens College, CUNY, 1967
- Selected Professional Experience**
- Associate and Full Professor & Chair, Dept. of Environmental Science & Geography, William Paterson University, Wayne, New Jersey, 1984-present
 - Visiting Scientist, Biomedical and Environmental Assessment Group, Brookhaven National Laboratory, 1991-1994
 - Director, Radiocarbon Laboratory, Research Foundation of the City University of New York and Queens College, New York, 1975-1984
 - Engineering Geologist, Gerard Engineering Inc., Jersey City, New Jersey, 1967-1968
- Professional Service, and Leadership**
- Member, Technical Advisory Committee , Lower Passaic and Saddle River Alliance, 1998-
 - Sigma Xi (Club President, 1999-present, Vice-President, 1993 1994, Treasurer, 1996-present)
- Representative projects**
- Co-Principal Investigator, Preakness Brook Watershed Restoration and Protection. NJ Department of Environmental Protection. \$408,586, 2006-2007
 - Principal Investigator, Priority Stream Segments in Watershed Management Area 4, NJ Department of Environmental Protection, \$25,000 2004-2005
- Representative publications**
- Pardi, R. 2006. The Preakness Brook Restoration and Protection Project. Abstracts, Second Passaic River Symposium. Passaic River Institute, Montclair State University.
 - Pardi, R. 2004. Priority Stream Segment: Watershed Management Area #4 - Non-tidal segment of the Passaic River from Two Bridges to Elmwood Park. Abstracts, Passaic River Symposium. Passaic River Inst., Montclair State U.
 - Pardi, R. and McWatters, A. 2002. Water Quality in Two Urban Streams – Molly Ann and Goffle Brooks, Northern New Jersey. Technical Report No. 140, Center for Research, William Paterson University.
 - Moskowitz, P.D, Pardi, R., et al. 1996. An evaluation of three representative multimedia models used to support cleanup decision-making at hazardous, mixed, and radioactive waste sites. Risk Analysis. v16, n2, pp279-287.
 - Pardi, R. and Newman, W.S., 1987. Late Quaternary Sea Levels along the Atlantic Coast of North America. J. of Coastal Research. v3, n3, pp325-330.
 - Ibe, R., and Pardi, R.R. 1985. A radiocarbon dated pollen diagram of Heart's Content Bog. Catskill, New York, Northeastern Geology, v7, n3/4, pp201-208.

Dr. Gregory Pope
Associate Professor, Department of Earth and Environmental Studies

- Summary** Dr. Pope is a physical geographer, with research and teaching interests in the synergistic earth sciences and their interface with society. His research projects, funded by federal agencies, range from geomorphology to geoarchaeology to climatology. He has published in the most prominent journals in his field, as well as flagship journals of the profession.
- Expertise**
- Geomorphology, soil science,
 - Climate change
- Education**
- PhD, Geography, Arizona State University, 1994
 - MA, Geography, Arizona State University, 1991
 - BA, Distributed Studies (Geography + Geology), University of Colorado-Colorado Springs
- Selected Professional Experience**
- Assistant and Associate Professor, Montclair State University, 1996-
- Professional Service, Awards and Leadership**
- Councilor, Assoc. of American Geographers, 2003-2006
 - Chair, Geomorphology Specialty Group, Assoc. of American Geographers, 2004
 - President, Middle States Division, Assoc. of American Geographers, 2002
 - College of Science and Math Faculty Service Award, Montclair State University, 2004
- Representative projects and grants**
- National Science Foundation, Forest fire impacts on soils, 2002-04, \$17,000 (PI).
 - National Science Foundation, Paloesol indicators of interglacial climate change, China, 2000-2004, \$160,000 (co-PI).
 - National Science Foundation, CCLI instrument grant for ICP-OES, 1999, \$135,000 (co-PI)
- Representative publications**
- Pope, Gregory A., and Vera C. Miranda. 2004. Weathering of megaliths – evidence for rapid adjustment to new environmental conditions. In *Stone Decay: Its Causes and Controls*. Proceedings, Weathering 2000, Belfast, Northern Ireland, June 26-30. Donhead Publishing Ltd., pp. 199-223.
 - Pope, Gregory A., Thomas C. Meierding, and Thomas R. Paradise. 2002. Geomorphology's role in the study of weathering of cultural stone. *Geomorphology*, 47(2-4): 211-226.
 - Pope, Gregory A., John M. Stavash, and Jean C. Walker. 2002. Spatial variability of acid precipitation at the local scale. In *Understanding and Managing Stone Decay – Proceedings, Stone Weathering and Atmospheric Pollution Network International Conference*, May 7-11, Prachov Rocks, Czech Republic, Prague: Karolinum Press, pp. 131-150.
 - Pope, Gregory A. 2000. Weathering of petroglyphs: Direct assessment and implications for dating methods. *Antiquity*, 74(286): 833-843.

Dr. Robert Steven Prezant
Dean, College of Science and Mathematics
Professor, Department of Biology and Molecular Biology
<http://csam.montclair.edu/biology/bioweb/faculty.html>

- Summary** Dr. Prezant is a recognized expert in the field of benthic invertebrate ecology, especially mollusks. He has completed numerous biodiversity surveys of invertebrates in fresh, brackish and marine environments. An active researcher, he has (co)authored over 40 peer-reviewed scientific publications.
- Expertise**
- Marine ecology
 - Marine and freshwater invertebrates, especially mollusks (malacology)
 - biomineralization
- Education**
- Ph.D. Marine Studies, College of Marine Studies, University of Delaware
 - M.S. Biology, Marine Science Institute, Northeastern University
- Selected Professional Experience**
- Dean, College of Science and Mathematics; Professor, Department of Biology and Molecular Biology, Montclair State University, 2001- Present
 - Dean, Division of Mathematics and Natural Sciences; Professor, Biology, Queens College, City University of New York January 1991-March 2001
- Professional Service, Awards and Leadership**
- Editor-In-Chief, American Malacological Bulletin, 1989-1993 and 1982-1989
 - President, American Malacological Society, 1998-1999
 - Chair of Habitat and Living Resources subcommittee, N.J. Department of Environmental Protection Coastal Research Agenda Coordination and Implementation Committee 2002-2003
 - Board of Directors, New Jersey Marine Science Consortium, 2002-
- Representative projects and grants**
- Distribution of *Corbicula fluminea* in New Jersey. N.J. Sea Grant. 2005-2006.
 - Benthic invertebrates of the Bronx River Estuary. NOAA via Gaia Inst., 2003-04
 - Freshwater mollusk and crayfish survey on West Point Military Reservation. Matrix New World Engineering, Inc. 2000- 2001
 - Comparative biodiversity of Long Island's North Shore. PSC-CUNY, 2000-01
 - Inventory of marine/estuarine benthic invertebrate communities, Assateague Island National Seashore, Maryland. National Park Service. 1994-1997
- Representative publications**
- Prezant, R.S. 2005. Can we save the urban river? Urban Dimensions Of Environmental Change - Science, Exposure, Police, And Technologies. H. Feng, L. Yu and W. Solecki (eds). Science Press USA Inc.
 - Prezant, R.S. and E. J. Chapman. 2004. Mollusks of the U.S. Military Academy Drainages (West Point, New York) and comparative regional biodiversity of gastropods. Northeast Naturalist. 11: 273 - 294.
 - Prezant, R.S. and C.L. Counts. 2002. Mollusca of Assateague Island, Maryland and Virginia: Additions to the fauna, range extensions, and gigantism. *The Veliger* 45: 337-355.
 - Keating, S.T. and R.S. Prezant. 1998. Effects of stream chemistry on the distribution, growth and colonization of diatoms on the freshwater limpet *Ferrissariivularis*. Journal of Freshwater Ecology 13: 67-77

Dr. Stefan A. Robila
Assistant Professor, Computer Science
<http://www.csam.montclair.edu/~robila>

- Summary** Dr. Robila has five years experience in working with complex data sets within the environmental sciences, in particular on the development of efficient hyperspectral / multispectral image processing methods. He has published 21 journal, conference papers and book chapters and is collaborating top research labs in the field.
- Expertise**
- Computer modeling and simulation; data security
 - Hyperspectral / multispectral image processing, remote sensing
 - Multivariate data processing
- Education**
- PhD, Computer Information Science, Syracuse University, 2002
 - MS, Computer Science, Syracuse University, 2000
 - BS, Mathematics / Computer Science, University of Iasi, 1997
- Professional Experience**
- Director, Center for Imaging and Optics, Montclair St. Univ., NJ, 2004-
 - Assistant Professor, Montclair State University, NJ, 2003 –
 - Assistant Professor, University of New Orleans, LA, 2002 - 2003
- Professional Service, Awards and Leadership**
- Chair of the Organizing Committee: “Imaging and Optics: Research and Education Workshop”, Montclair, NJ, November 2004
 - Chair of the Special Session: “Advances in Hyperspectral Imagery Processing”, ASPRS Annual Conference, Baltimore, MD, March 2005
 - Invited Panelist, “Future of Imaging: What Comes Next?”, Advanced Imaging Magazine, vol. 20, No. 1, 2005, pp. 34-36.
 - Wilbur LePage Scholarship for Outstanding Doctoral Candidate in Engineering, Syracuse University, 2002.
- Representative projects and grants**
- Principal Investigator, Promoting Optics and Imaging Through Outreach Activities, SPIE – The International Society for Optical Engineers, 2005-2006, \$2000
 - Principal Investigator, Center for Imaging and Optics, SPIE – The International Society for Optical Engineers, 2004-2005, \$3000
 - Principal Investigator, Employment of Multimedia and Internet in Teaching Computer Science, University of New Orleans – Faculty Initiative for Technology in Teaching, 2002 - 2003, \$3250.
- Representative publications**
- Robila, S. A., A. Gershman. in press. Spectral Matching Accuracy in Processing Hyperspectral Data. Proceedings IEEE ISSCS 2005.
 - Robila, S. A. in press. Using Spectral Distances for Speedup in Hyperspectral Image Processing. International Journal of Remote Sensing.
 - Robila, S. A. 2004. Independent Component Analysis (ICA), in P.K. Varshney, M.K. Arora editors. Advanced Image Processing Techniques for Remotely Sensed Hyperspectral Data, Springer, New York, 2004, pp. 109 - 132.
 - Robila, S. A., P. K. Varshney. 2004. Extracting Features from Hyperspectral Data Using ICA”, in P.K. Varshney, M.K. Arora eds. Advanced Image Processing Techniques for Remotely Sensed Hyperspectral Data, pp. 199 - 216.

Dr. Robert W. Taylor
Professor, Department of Earth & Environmental Studies
<http://frontpage.montclair.edu/taylor/>

- Summary** Dr. Taylor specializes in urban environmental management and planning; conducting research in environmental management and environmental policy; and developing and managing applied research grants. He has worked extensively in New Jersey, cooperating with groups from the Board of Public Utilities to churches.
- Expertise**
- Environmental public policy
 - Regional Planning and Urban Development
 - Urban Environmental issues
 - Environmental communications and business policy
- Education**
- Ph.D - Washington University, St. Louis, Missouri
 - B.A. – Saint Louis University, St. Louis, Missouri
- Licenses & Certifications**
- Member, American Planning Association
 - Licensed Property Professional, State of New York
- Professional Experience**
- Professor, Dept of Earth & Environmental Studies, Montclair State University 1996-Present; Associate Professor, 1978-1995
 - Visiting Professor, Graduate Faculty, Dept. of Biology, De La Salle University (Manila, Philippines,) 2000
 - Fulbright Research Professor, Nigeria
- Professional Service, Awards and Leadership**
- Service Award, NJ Dept. of Community Affairs, Brownfield Investigations
 - Chaired and managed the Presidential Task Force for Parking at Montclair State
 - Convened and led conference with New Jersey Office of Sustainable Business and Trade Mission of New Jersey Environmental Companies to the Philippines
- Representative projects and grants**
- Project Director for a Project on Brownfield Property Site Investigation in Paterson, New Jersey. Project is sponsored by the New Jersey Dept. of Community Affairs, Brownfields Sitemart Program and the City of Paterson, Office of Brownfields.
 - Awarded Grant for \$150,000 from the New Jersey Board of Public Utilities for Applied Project with the Partners for Environmental Quality to establish an energy conservation program.
- Representative publications**
- Robert W. Taylor. 2005. Environmental Management Regimes for Emerging Asian Markets: What Works and What Doesn't. Management Challenges in Times of Global Change and Uncertainty (Charkraborty, C., et al. eds.), pp. 1948-1958.
 - Robert W. Taylor and J. Hollander. 2003. The New Environmentalism and the City-Region. Recent Trends in Urban and Regional Studies, Studia Regionalia, Vol. 10, Ryszard Domanski, ed. Polish Academic of Sciences, Warsaw.
 - Robert W. Taylor. 1996. Sustainable Environmental Policies for Regional Planning. Preservation of Our World in the Wake of Change (Y. Steinberger, ed). ISEEQS, Jerusalem. pp. 324-327.

Dr. Dirk Vanderklein
Associate Professor, Department of Biology and Molecular Biology
<http://csam.montclair.edu/biology/bioweb/faculty.html>

- Summary** Dr. Vanderklein is a plant physiological ecologist focusing on the interactions between plant physiology, growth and the environmental conditions under which these occur. Most of his work has focused on physiology of trees and herbaceous plants. Dr. Vanderklein has also recently initiated an urban forestry project studying the invasion and control of non-native plant species in an urban wetland.
- Expertise**
- Forest ecology, plant physiology
- Education**
- PhD. Forest Ecology, University of Minnesota, 1995.
 - MSc. Forestry, University of Washington, 1985.
 - BSc. Forestry, University of Washington, 1982.
- Professional Experience**
- Visiting Scientist, School of GeoSciences, University of Edinburgh, Edinburgh, UK, 2002-2003.
 - Associate Professor, Montclair State University, 2001-present.
 - Assistant Professor, Montclair State University, 1996-2001.
 - Research Associate, Boyce Thompson Institute, Cornell University, Ithaca, NY. 1994-1996.
- Professional Service, Awards and Leadership**
- Chair, Mid-Atlantic Chapter of the Ecological Society of America, 2005-2006.
 - Graduate Advisor, Department of Biology and Molecular Biology, 1997-2002.
 - Greenhouse Manager, Department of Biology and Molecular Biology, 1996-present.
- Representative projects and grants**
- Assessing the effect of age versus size on Scots pine growth.
 - Assessing the physiological ecology of Bear oak and Pitch pine in the Long Island, NY Pine Plains.
 - Co-Investigator, Assessment of leaf removal on woody plant growth and function, U.S. Dept. of Interior, Fish and Wildlife Service. \$15,000. 2002-2003.
 - Principle Investigator, Short-term Variation in Productivity of Edaphic Algae, New Jersey Marine Sciences Consortium, New Jersey Sea Grant College Program. \$4,500. 1997.
- Representative publications**
- Vanderklein, D., et. al. 2006. Effects of age and leaf area on gas exchange and growth of grafted Scots pine seedlings. *Tree Physiology*. 27: 71-79.
 - Mencuccini, M., J. Martinez-Vilalta, D. Vanderklein, et. al. 2005. Size-mediated ageing reduces vigour in tall trees. *Ecology Letters* 8 (11): 1183-1190..
 - Wilkens, R. T., D. W. Vanderklein, R.W. Lemke II. 2005. Plant architecture and leaf damage in Bear oak. II: Insect usage patterns. *Northeastern Naturalist* 12: 153-168.
 - Vanderklein, D.W., et. al. 2004. Plant architecture and leaf damage in Bear oak. I: Physiological responses. *Northeastern Naturalist* 11: 343-356.

Dr. Neeraj Vedwan
Assistant Professor, Department of Anthropology

- Summary** Dr. Vedwan is an environmental anthropologist and his areas of specialization include urban environmentalism, human dimensions of climate change, and institutional aspects of water resources management. Dr. Vedwan has worked in diverse geographic areas including Florida and northwestern India, studying human-environment interactions for eight years.
- Expertise**
- Ethnographic studies of human-environment interaction
 - Social science research methodology and techniques: Surveys, focus groups, interviews
- Education**
- PhD, Anthropology, University of Georgia, 2001
 - BS, Dairy Technology, National Dairy Res. Inst., India, 1995
- Professional Experience**
- Assistant Professor, Department of Anthropology, Montclair State University, 2003-
 - Postdoctoral Research Associate, Rosenstiel Institute of Marine and Atmospheric Sciences,
 - University of Miami, 2001-2003
- Representative projects and grants**
- Participant on a successful grant proposal entitled “Climate information system for agriculture and water resources management in the southeastern USA,” submitted to the National Oceanic and Atmospheric Administration (NOAA), 2002-2003
 - Awarded the National Science Foundation’s (NSF) Ethnographic Research Training Grant
- Representative publications**
- Vedwan, Neeraj. 2005. Culture, climate, and the environment: Local knowledge and perception of climate change among apple growers in northwestern India. *Journal of Ecological Anthropology* (Accepted)
 - Vedwan, Neeraj. 2001. Climate change in the western Himalayas of India: A study of local perception and response, (Senior author with Robert Rhoades) *Climate Research* 19: 109-117.
 - Vedwan, N., K. Broad, D. Letson, K.T. Ingram, G. Podestá, N.E. Breuer, J.W. Jones, and J.J. O’Brien. 2005. Assessment of climate information dissemination efforts by the Florida Climate Consortium. Southeast Climate Consortium Technical Report Series: SECC-05-01. Gainesville, FL

Dr. William G. Wallace
Associate Professor, Department of Biology
The College of Staten Island/City Univ. of New York, Staten Island, NY
www.library.csi.cuny.edu/dept/biology/Wallace.html

Summary

Dr. Wallace is an ecotoxicologist who studies trophic transfer and bioaccumulation of contaminants, metal bioavailability, the role of metal detoxification in trophic interactions, trace metal cycling and behavioral effects of metals.

Expertise

- Ecotoxicology, behavioral toxicity, benthic ecology
- Radio-tracer studies, metal accumulation and absorption

Education

- Ph.D. Coastal Oceanography, Marine Sciences Research Center, SUNY, Stony Brook, New York, 1996
- M.Sc. Marine Environmental Sciences, MSRC, SUNY Stony Brook, NY, 1992
- B.Sc. Marine Biology, Stockton State College, Pomona, New Jersey, 1989

Professional Experience

- Assistant/Associate Professor, Department of Biology, The College of Staten Island/CUNY, 2000 - present
- Postdoctoral Researcher, United States Geological Survey, 1996 – 2000

Professional Service, Awards and Leadership

- Editor of Endangered Species Research, 8/04 – present
- Proposal reviewer for National Science Foundation, NJ Sea Grant, NY Sea Grant
- Scientific journal article reviewer for Archives of Environmental Contamination and Toxicology, Bulletin of Environmental Contamination, Ecological Society of America, Environmental Science and Technology, Environmental Toxicology and Chemistry, Estuaries, Marine Environmental Research

Representative projects and grants

- Principal Investigator (PI), The importance of metal storage in prey and digestion in predators to metal trophic transfer in estuarine food chains, New York Sea Grant, 2005-2006, \$88,660
- PI, Comparison of bioavailability, trophic transfer and effects of copper, lead and zinc among metal contaminated estuaries, EcoTox, 2003-2005, \$10,000
- PI, The importance of a predator's digestive processes in controlling metal trophic transfer, PSC-CUNY, 2005-2006, \$2,825

Representative publications

- Seebaugh, D.R., Goto, D., Wallace, W.G. 2005. Bioenhancement of cadmium transfer along a multi-level food chain. *Marine Environ. Research.* 59:473-491
- Seebaugh, D.R., Wallace, W.G. 2004. The importance of metal-binding proteins in the partitioning of Cd and Zn as trophically available metal (TAM) in the brine shrimp *Artemia franciscana*. *Marine Ecology Progress Series.* 272:215-230
- Cain, D.J., Luoma, S.N., Wallace, W.G. 2004. Linking metal bioaccumulation of aquatic insects to their distribution patterns in a mining-impacted river. *Environmental Toxicology and Chemistry.* 23 (6):1463-1473
- Perez, M.H., Wallace, W.G. 2004. Differences in prey capture in grass shrimp, *Palaemonetes pugio*, collected along an environmental impact gradient. *Archives of Environmental Contamination and Toxicology.* 46(1): 81-89

Dr. Michael P. Weinstein
President & CEO, New Jersey Marine Sciences Consortium
Director - New Jersey Sea Grant College Program
www.njmssc.org/NJMISC_Research/FacultyandStaff.html

- Summary** With 30+ years experience, Dr. Weinstein is a true luminary in the field of estuarine and coastal ecology and management in New Jersey. He is an international expert in these areas, delivering many keynote addresses, and serving on many advisory councils. He has been an invited speaker on countless occasions, organized many symposia and authored more than 180 journal articles, abstracts, books and chapters.
- Expertise** Coastal/estuarine ecology and management, ecological engineering and restoration ecology, sustainability science, fisheries science, and wetland ecology focused on salt marshes and sea grass meadows.
- Education**
- Ph.D., Marine and Environmental Science, Florida State University, 1975
 - M.S., Zoology, Rutgers University, 1969
- Selected Professional Experience**
- President/CEO New Jersey Marine Sciences Consortium; Director, New Jersey Sea Grant College Program, 1996-
 - Visiting Professor, Institute of Marine and Coastal Sciences, Rutgers U. 1996-
 - President & Principal Owner, TEVA Environmental Associates, Inc.
 - Assistant Professor of Biology, Virginia Commonwealth University, 1979 - 1984
- Selected Professional Awards, Service, and Leadership**
- Coastal America Award - *Habitat Initiative*, long-term comprehensive research, education and outreach addressing coastal habitat conservation and restoration.
 - The National Academies, National Research Council, Steering Committee/Session Chair for the Workshop on Environmental Windows for Dredging Projects. National Academy of Science, Washington, DC.
 - National Working Group, Development of a National Strategy for Coastal Habitat Restoration, Estuarine Habitat Restoration Act, implementation phase.
 - Editorial Board, Transactions of the American Fisheries Society, Restoration Ecology 2004-
 - Proposal Reviewer for NSF, EPA, Sea Grant, EPRI, U.S. Fish and Wildlife Service, Hudson River Foundation, NOAA, NMFS Restoration Center
- Representative projects**
- Ecological engineering, design, and construction for large-scale marsh restorations in Delaware Bay
 - Linkage between primary and secondary production of finfish and shellfish in salt marshes and other estuarine habitats using stable isotope and biochemical condition analysis.
 - Trophodynamics and food web support of marsh resident and transient species in undisturbed and restored New Jersey salt marshes
- Highlighted publications**
- Weinstein, M.P. et al. 2006. Managing coastal resources in the 21st century *Frontiers Ecol. Environ.*, in press.
 - Weinstein, M.P., S.Y. Litvin and V.G. Guida. 2005. Consideration of habitat linkages, estuarine landscapes and the trophic spectrum in wetland restoration design. *J. Coast. Res. Special Issue* 40:51-63.
 - Weinstein, M.P. and D.A. Kreeger (co-editors). 2000. Concepts and controversies in tidal marsh ecology. Kluwer. Academic. Publ., 875 pp.
 - Weinstein, M.P. and L. L. Weishar. 2002. Beneficial use of dredged material to enhance the restoration trajectories of formerly diked lands. *Ecol. Engineering* 19:187-201.

Dr. Judith S. Weis
Professor, Dept. of Biological Sciences, Rutgers University, Newark, NJ
<http://newarkbiosci.rutgers.edu/Faculty/weis.html>

- Summary** Dr. Weis has nearly 40 years experience in estuarine ecology and ecotoxicology, focusing on Newark Bay and New York/New Jersey Harbor complex. A recognized expert in the field of ecology, she has served on national technical review panels and on the leadership of major professional societies. She has authored over 100 publications and won funding from leading research agencies, including the National Science Foundation.
- Expertise** Estuarine ecotoxicology, salt marsh ecology, behavioral ecology, ecological effects of mercury and chromated copper arsenate treated wood.
- Education** PhD, MS, New York University, 1967 and 1964
BA, Cornell, 1962
- Selected Professional Experience**
- Asst., Assoc. and Full Professor, Dept. of Biological Sciences, Rutgers University, Newark, NJ, 1967-present
 - Associate Dean for Academic Affairs, Rutgers University, Newark, 1985-86.
 - Congressional Science Fellow, U.S. Senate Environment and Public Works Committee, 1983-84.
 - Program Director, Undergraduate Education, National Science Foundation, 1988-1990
- Selected Professional Service, and Leadership**
- Fellow, American Association for the Advancement of Science (AAAS)
 - Chair, Biology section, AAAS, 1999
 - President, American Institute of Biological Sciences, 2001
 - Marine Board, National Research Council 1991-94
 - NSF Graduate Fellowship Panel 1976,77; Panel Chair 1978-79 & 1982
 - EPA Endocrine Disruption Screening & Testing Advisory Comm. 1996-98
 - NOAA National Sea Grant Review Panel 1998-2001
 - NJ Drinking Water Quality Institute, 1984-87.
- Representative projects**
- Fish as a Model System for Behavioral Teratology, National Institutes of Health Minority Biomedical Research Support Program
 - Pollution and Predator/prey Interactions in Estuaries. US Geological Survey Water Resources Research Program, 1996-2000
 - Wetland Plants' Roles in Uptake & Transport of Heavy Metals and Remediation National Science Foundation, 1998-2001
- Highlighted publications**
(from over 100 total)
- Weis, J.S., et al. 2000. Effects of contaminants on behavior: Biochemical mechanisms and ecological consequences. *BioScience* 51: 209-218.
 - Weis, J.S., et al. 2002. Growth, survival and metal content of marsh invertebrates fed detritus from *Spartina alterniflora* and *Phragmites australis* from metal-contaminated and clean sites. *Wetlands Ecology and Management* 10: 71-84.
 - Weis, J.S., N. Mugue and P. Weis 1998. Mercury tolerance, population effects and population genetics in the mummichog, *Fundulus heteroclitus*. In: *Genetics and Ecotoxicology* ed. V. Forbes. Taylor and Francis Pub. pp 31-54.
 - Weis, J.S., Weis, P. and Wang, F. Developmental effects of tributyltin on the fiddler crab, *Uca pugilator*, and the killifish, *Fundulus heteroclitus*. In: *Proc. Oceans '87 Conf.*, Halifax, N.S., Canada, 28 Sept. 1987, 4:1456-1460, 1987.

Dr. Peddrick Weis
Adj. Professor, UMDNJ - NJ Medical School, Dept. of Radiology
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- Summary** With 40 years experience, Dr. Weis is a leading researcher on the effects of heavy metals on aquatic organisms in the New York/New Jersey Harbor complex, focusing on lead, copper, chromium, and especially mercury and the wood preservative chromated copper arsenate. He has authored dozens of publications, which have appeared in many leading journals. His expertise has been recognized through his invitations to participate in many national workshops.
- Expertise** Estuarine ecology and ecotoxicology, inorganic analytical chemistry
- Education**
- BS, Zoology, Cornell University, 1959
 - DDS, New York University, 1963
- Selected Professional Experience**
- Assistant, Associate, Full Professor, Dept. of Anatomy, Cell Biology & Injury Science, 1967-2004
 - Adj. Prof., Dept. of Radiology, and Grad. Sch. Biomed. Sci., UMDNJ - New Jersey Medical Sch Newark, N.J., 2004-
 - National Research Council Sr. Research Fellow, USEPA Gulf Breeze Lab, 1992
- Professional Service, and Leadership**
- Fellow, American Association for the Advancement Science
 - Editorial Boards: Archives of Environmental Contamination and Toxicology, Aquatic Toxicology
- Representative projects**
- Assessment of heavy metal contamination and benthic biodiversity in Eight Day Swamp, Meadowlands Environmental Research Institute, 2002-2003
 - Contaminants in Fish of the Hackensack Meadowlands, New Jersey Meadowlands Commission, 2003-2005
 - Pollution and Predator/Prey Interactions in Estuaries, USGS Water Resources Research Program, 1996-2000
 - Wetland Plants' Roles in Uptake & Transport of Heavy Metals and Remediation, National Science Foundation, 1998-2002
- Highlighted publications**
- Weis, P., and Ashley, J.T.F. (in press). Contaminants in fish of the Hackensack Meadowlands, New Jersey - size, sex, and seasonal relationships as related to health risks. Arch. Environ. Contam. Toxicol.
 - Weis, P., et al. 2005. Studies of a contaminated brackish marsh in the Hackensack Meadowlands of northeastern New Jersey: An assessment of natural recovery. Mar. Poll. Bull. 50:1405–1415.
 - Weis, P., Weis J.S., and Couch, J. Histopathology and metal uptake in oysters (*Crassostrea virginica*) living on wood preserved with chromated copper arsenate. Dis. Aquat. Org. 17:41-46, 1993.
 - Espina, N.G., and Weis, P. DNA repair in fish from polluted estuaries. Mar. Environ. Res. 39:309-312, 1995.
 - Weis, J.S. and Weis, P. Effects of methylmercury on prey capture by larval mummichogs. Env.on. Toxicol. Chem. 14:153-156, 1995.

Dr. Danlin Yu
Assistant Professor, Dept. of Earth and Environmental Studies

- Summary** Dr. Yu has recently joined the faculty of Department of Earth and Environmental Studies. He received his Ph.D. from the Department of Geography, University of Wisconsin – Milwaukee. He specializes in Geographic Information Science/Systems, Spatial Data Analysis and Urban/Regional Studies. In particular, he applies geographic techniques in urban development, environment management and planning.
- Expertise**
- Geographic information science/systems and spatial data analysis
 - Urban and regional geography/studies
 - Urban remote sensing, environmental modeling and management
- Education**
- PhD, Geography, University of Wisconsin – Milwaukee, 2005
 - MS, Geography, Lanzhou University, China, 1997
 - BS, Geography, Changsha Electric Power University, China, 1994
- Professional Service, and Leadership**
- 2004 – 2005: member of the technical committee of Geography Dept, U Wisc.
 - 2004: University Consortium for Geographical Information Science (UCGIS) 2004 Annual Assembly Travel Award
- Representative projects**
- Increasing residential development activity on urban brownfields: An examination of redevelopment trends, developer perceptions, and future prospects. Sponsored by National Academies: HUD (Housing and Urban Development) Urban Scholars Postdoctoral Fellowship
 - The transit user survey of the automatic vehicle location (AVL) system at Manitowoc and Racine. Sponsored by the Wisconsin Department of Transportation.
- Representative publications**
- Yu, Danlin; Wu, Changshan, 2004: Understanding population segregation from Landsat ETM+ imagery: a geographically weighted regression approach. *GIScience and Remote Sensing*, 41 (3): 187-206.
 - Yu, Danlin; Wei, Yehua, Dennis, 2003: Analyzing regional inequality in post-Mao China in a GIS environment. *Eurasian Geography and Economics*. 44 (7): 514-534.
 - Peng, Zhong-Ren; Yu, Danlin; Edward A. Beimborn, 2002: Transit user's perceptions of automatic vehicle location benefits. *Journal of the Transportation Research Board: Transportation Research Record*, No. 1791:127-132.
 - Yu, Danlin; Wu, Changshan, Incorporating Remote Sensing Information in Modeling House Values: A Regression Tree Approach. Accepted for publication in *Photogrammetric Engineering & Remote Sensing*.
 - Yu, Danlin, Spatially Varying Development Mechanisms in the Greater Beijing Area: A Geographically Weighted Regression Investigation. Accepted for publication in *Annals of Regional Science*.
 - Wei, Yehua, Dennis; Yu, Danlin, State Policy and the Globalization of Beijing: Emerging Themes. Accepted for publication in *Habitat International*.