

RESEARCH PORTFOLIO

Water Resources Research Exchange

September 23, 2011

Temple Gallery, Tyler School of Art

9AM-1PM

-Announcement

-Survey

-Individual Faculty Responses (Alphabetical Order)

-Analysis of Responses

September 2011

Draft

Announcement

The Office of the Senior Vice Provost for Research and Graduate Education will host a Research Exchange on Water Resources on September 23, 2011 from 9:00 a.m. - 1.00 p.m. This event is being organized by a faculty steering committee and will be held on Temple's main campus at the Tyler School of Art (Temple Gallery).

The objective of this research exchange is to foster interdisciplinary engagement and to attract external funding of water resources research at Temple University through sharing information about ongoing activities and discussing future directions and opportunities. Water resources research includes a number of topics, including: basic scientific research, stormwater management and flood hazard mapping, green infrastructure, water quality and pollution control, water and wastewater treatment, investigation and prevention of waterborne diseases, water conservation and allocation, legal/institutional arrangements for water management, water finance and pricing, and sea level rise.

Faculty currently engaged in some aspect of water resources research or interested in water resources research are invited to attend. Come hear about the range of water resources research being conducted at Temple University, share your work with others, meet new colleagues, and participate in discussions about building Temple's interdisciplinary research capacity and impact in water resources research.

Faculty research profiles will be compiled in a booklet and distributed at the research exchange. Please click on the following link to access a brief form to provide information for your research profile:

http://templecsc.qualtrics.com/SE/?SID=SV_6mpAaZwxg2Ueplq

Even if you cannot attend the research exchange, we encourage you to complete this form by September 2, 2011, so that your work can be included in the research booklet and so we can notify you of future events.

Survey

1. Faculty Name (First and Last)

2. Degrees

3. Faculty Title:

- Professor
- Associate Professor
- Assistant Professor
- Adjunct Faculty
- Other

4. Office Location

5. Telephone

6. Email

7. Research Interests in Water Resources (Please do not exceed 400 characters)

8. Please indicate the area of your research (check as many as apply):

- Environmental Chemistry (basic or applied)
- Geochemistry, Water- rock Interaction
- Transport Processes
- Groundwater
- Stormwater Management
- Green Infrastructure
- Flood Hazard Mitigation
- Water Quality
- Water Supply, Water Treatment, Distribution, Infrastructure
- Wastewater Treatment, Pollution Control
- Waterborne Diseases, Investigation, Prevention
- Land Use Impacts (e.g. agriculture, development, Marcellus Shale Drilling...)
- Habitat, Species Populations
- Ecosystem Restoration (e.g. aquatic, streambank, upland...)
- Water Allocation, Water Budgets, Water Rights
- Drought, Conservation, Reuse
- Water Finance and Pricing
- Water Markets
- Regulations, Permits, Water Policy
- Climate Change Impacts, Sea Level Rise
- Integrated Water Resources Management, Adaptive Management
- Institutions for Water Resources Management (e.g., compacts, commissions, voluntary partnerships...)
- Water Ethics, Values, Aesthetics
- Other

9. Please indicate the scale of your research (check as many as apply):

- Laboratory
- Sites
- Local, Municipal
- Regional
- National
- International
- Lakes
- Rivers
- Oceans
- Wetlands
- Estuaries
- Groundwater
- Other

10. Please indicate the types of research methods used in your work (check as many as apply):

- Field Surveys, Sampling and Data Collection
- Site Assessments
- Monitoring
- Laboratory Analysis
- Modeling, Mapping, GIS
- Policy Analysis
- Impact Analysis
- Case Studies
- Surveys (paper or web-based)
- Interviews
- Document Content Analysis
- Social Network Analysis
- Marketing, Economic Analysis
- Other

11. Please list up to 3 reports or publications that are representative of your research in water resources:

12. Please list up to 3 recent or currently funded projects in the area of water resources:

13. Please describe one finding from your research that you would consider to be of most interest to other water resources researchers: (Please describe in no more than 2 sentences):

14. Please list any special access that you might have to facilities, resources, organizations, or special populations that might provide a locus for future water resources research projects and collaborations:

15. If you have NOT already been involved in water resources research, but would like to be in the future, what are your areas of interest that might relate to future collaborations?

16. Please list specific locations of your research: (For example, Colorado River Basin, Marcellus Shale...)

17. If you have ideas for future interdisciplinary research that could be addressed in a roundtable discussion, please briefly describe them below. Topics might include for example interdisciplinary research questions, technology needs, TU hosted conferences or workshops, external collaborators, forming external partnerships, upcoming RFPs...

18. Following the Research Exchange what level of engagement would you like to maintain in the TU Water Research Exchange? (check as many as apply)

- Listserv member
- Steering Committee
- Working Group
- Organize a Roundtable
- Proposal Development
- Other

19. Send me a copy of my responses.

Eric Borguet

Ph.D.

Professor

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Research Interests: We're interested in how the world works on a molecular scale, and believe that some of the most interesting and challenging phenomena occur on surfaces. The goal of this research program is to advance our understanding of interfacial science and to develop technical abilities so that we can address the challenges posed. We used our fundamental research as a support for development of sensors. Our group focuses on the how (and why) of Single molecule transport of electrical current. Redox chemistry at the single molecule level. Surface chemistry of carbon materials, including carbon nanotubes, determines their interactions with the molecular world. Control of molecular self-assembly at charged interfaces. Ultrafast vibrational energy flow at aqueous interfaces Acid base chemistry aqueous/mineral interfaces

Research Areas: Environmental Chemistry; Geochemistry, Water- Rock Interaction; Groundwater; Wastewater Treatment, Pollution Control; Waterborne Diseases, Investigation, Prevention

Research Scales: Laboratory

Research Methods: Laboratory Analysis

Reports and Publications: Effect of Electric Fields on the Ultrafast Vibrational Relaxation of Water at a Charged SolidLiquid Interface as Probed by Vibrational Sum Frequency Generation, Ali Eftekhari, and Eric Borguet, Journal of Physical Chemistry Letters 2, 13531358 (2011).

Linking Surface Potential and Deprotonation in Nanoporous Silica: second harmonic generation and acid/base titration, R. Kramer Campen, Allison K. Pymer, Satoshi Nihonyanagi and Eric Borguet, Journal of Physical Chemistry C, 114 (43), 18465-18473 (2010).

Thin polymer film based rapid and reversible wireless surface acoustic wave humidity sensors

Funded Research: A Molecular Resolution Investigation of Electron Transfer at Electrochemical Interfaces NSF (CHE 0809838); Acid-base chemistry at the aqueous-mineral interface (ACS-PRF); Passive Wireless SAW Humidity Sensors and System (NASA)

Interesting Research Finding: The rate at which water molecules redistribute thermal (vibrational) energy is a factor of three slower than in bulk water. This is a consequence of reduced hydrogen bonding. Effect of Surface Charge on the Vibrational Dynamics of Interfacial Water Ali Eftekhari-Bafrooei and Eric Borguet Journal of the American Chemical Society 131 (34), 12034-12035 (2009).

Special Access/ Resources: Tools to probe aqueous interfaces (vibrational sum frequency spectroscopy, second harmonic generation, atomic force microscopy, scanning tunneling microscopy, ...). More details are available at our website <http://www.temple.edu/borguet>

Research Locations:

Future Involvement in Water Interests:

Future Research Interests: Acid Base Chemistry at Aqueous Mineral Interfaces; Implications for pollution control, geochemistry, etc Water Interfaces in Extreme Conditions; Implications for a Fundamental Understanding of Hydrofracking

Future Engagement Interests: Listserv member; Steering Committee; Working Group; Organize a Roundtable; Proposal Development

Michel Boufadel

PhD

Professor

530 Architecture and Engineering

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Research Interests: Contaminants in natural systems, rivers, groundwater, streams. Water treatment of contaminants.

Research Areas: Geochemistry, Water- Rock Interaction; Transport Processes; Groundwater; Flood Hazard Mitigation; Water Quality; Water Supply, Water Treatment, Distribution, Infrastructure; Wastewater Treatment, Pollution Control; Waterborne Diseases, Investigation, Prevention; Ecosystem Restoration; Climate Change Impacts, Sea Level Rise

Research Scales: Laboratory; Sites; Regional; National; Lakes; Rivers; Oceans; Wetlands; Estuaries; Groundwater

Research Methods: Field Surveys, Sampling and Data Collection; Site Assessments; Monitoring; Laboratory Analysis; Modeling, Mapping, GIS; Impact Analysis; Case Studies

Reports and Publications: Li, H. (Postdoctoral Fellow), M. C. Boufadel, Long-term persistence of oil from the Exxon Valdez spill in two-layer beaches, NATURE geosciences, 3, 96-99, 2010.

Boufadel, M. C., Y. Sharifi, B. Van Aken, B. A. Wrenn, and K. Lee, Nutrient and oxygen concentrations within the sediments of an Alaskan beach polluted with the Exxon Valdez oil spill, Environmental Science and Technology, 44 (19), p 7418–7424, 2010.

Graf, T. and M. C. Boufadel, Effect of viscosity, capillarity and grid spacing on thermal

Funded Research: Bioremediation of the Exxon Valdez; Ecological assessment of the Delaware River banks; Impact of natural gas extraction from the Marcellus Shale

Interesting Research Finding: The usage of naturally occurring micro-organisms to remediate water.

Special Access/ Resources:

Research Locations: Philadelphia, the Gulf of Mexico, and Alaska.

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Steering Committee; Organize a Roundtable

Ilya Buynevich

PhD

Assistant Professor

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Research Interests: My research addresses geophysical (georadar) imaging of rocks and sediments, which allows rapid mapping of the water table depth in a variety of environments dominated by freshwater. This method has been also used to map saltwater intrusion into coastal aquifers. Another research topic addresses sea-level research using coastal sands and mollusks.

Research Areas: Climate Change Impacts, Sea Level Rise; Other

Research Scales: National; International; Oceans; Estuaries

Research Methods: Field Surveys, Sampling and Data Collection

Reports and Publications: Buynevich, I.V., et al, 2009. Coastal Environments/GPR: Radar Theory and Applications

Funded Research: Coastal Ocean Institute, WHOI, #GG11226.00. Evans and Buynevich, \$19,556

Interesting Research Finding: The effect of moisture retention on dielectric changes that produce distinct reflections in geophysical images - this will allow estimates of water content using subsurface imaging.

Special Access/ Resources: High-resolution ground-penetrating radar system

Research Locations: New England coastal barriers and glacial sandplains, North and South Carolinas, White Sand Dunes (New Mexico), Brazil, Lithuania

Future Involvement in Water Interests:

Future Research Interests: Groundwater exchange (freshwater outflow or saltwater intrusion) through relict tidal inlet and river paleo-channels along the coast.

Future Engagement Interests: Working Group; Proposal Development

Erik Cordes

Ph.D. Biology, M.S. Marine Science
Assistant Professor, Biology Department
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Research Interests: I am interested in the deep-sea communities that live near natural hydrocarbon seeps, on deep-water coral reefs and near hydrothermal vents. I have studied all aspects of these communities including the microbial processes that dominate them, microbial-metazoan interactions, the physiology of chemosynthetic organisms, deep-sea coral biology, population modeling, habitat associations, and community ecology. Recently, I have become heavily involved in the impact assessment of the Deepwater Horizon oil spill in the Gulf of Mexico with respect to deepwater benthic communities.

Research Areas: Environmental chemistry, Habitat, Species populations, Ecosystem restoration, Climate change impacts, adaptive management

Research Scales: Laboratory, Regional, National, International, Oceans.

Research Methods: Field surveys, sampling and data collection, Monitoring, Laboratory analysis, Modeling, Mapping, GIS, Impact Analysis

Reports or Publications: Baker MC, Ramirez-Llodra E, Tyler PA, German CR, Boetius A, Cordes EE, Dubilier N, Fisher CR, Levin L, Metaxas A, Rowden A, Santos RS, Shank T, Van Dover C, Young C, Waren A. (2010) Biogeography, Ecology and Vulnerability of Chemosynthetic Ecosystems in the Deep Sea. Chapter 9. In: McIntyre AD (ed) *Life in the World's Oceans*. Blackwell Publishing Ltd.

Cordes EE, Bergquist DC, Fisher CR (2009) Macro-ecology of Gulf of Mexico cold seeps. *Ann Rev Mar Sci* 1: 143-168. doi:10.1146/annurev.marine.010908.163912

Lunden JJ, Georgian SE, Cordes EE. Low aragonite saturation states at cold-water coral reefs in the northern Gulf of Mexico. Submitted to *Nature Climate Change*.

Funded Research: 2010-2011: NSF Rapid program (P.I.): *Collaborative Proposal: Acute response of benthic hardbottom communities to oil exposure in the deep Gulf of Mexico*
2010-2012: NOAA Natural Resources Damage Assessment (co-P.I.): *Mississippi Canyon 252 Incident NRDA Tier 1 for Deepwater Communities*

2008-2012: Minerals Management Service and NOAA Office of Ocean Exploration Contract Award (co-P.I.): *Deepwater Program: Exploration and Research of Northern Gulf of Mexico Deepwater Natural and Artificial Hard Bottom Habitats with Emphasis on Coral Communities: Reef, Rigs and Wrecks*

Interesting Research Finding: 1. Evidence of ongoing ocean acidification in the deep Gulf of Mexico and its impact on the growth of deep-sea corals. 2. Direct evidence of the impact and damage caused by the Gulf oil spill on deepwater coral communities in the Mississippi Canyon area.

Special Access/Resources: Aquaria facilities for the maintenance of deep-sea organisms, precise determination of carbonate chemistry of seawater.

Research Locations: Gulf of Mexico, Pacific margin of Costa Rica, Juan de Fuca Ridge off the coast of Washington.

Future Engagement Interests: Listserv member, Steering Committee, Working Group, Proposal Development

Shih-Jiun "Jim" Chen

Ph.D.

Professor

College of Engineering

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Research Interests: Waste water heat recovery; Water cooling technologies; Hydraulic turbines.

Research Areas: Transport Processes, Wastewater Treatment, Pollution Control

Research Scales: Laboratory, Sites

Research Methods: Monitoring, Case Studies

Reports and Publications: Wastewater Heat Extraction for Commercial HVAC Applications: A U.S. Pilot Project, presented at the 2011 Energy and Water Conference (Proceedings).

Chen, S.J. and Tseng, A.A., 1992, "Spray and Jet Cooling in Steel Rolling," International J. Heat and Fluid Flow, Vol. 13, No. 4, pp. 358-369.

Funded Research:

Interesting Research Finding:

Special Access/ Resources:

Research Locations: Philadelphia Southeastern Wastewater Treatment Plant.

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member, Proposal Development

Peter d'Agostino

Professor of Film & Media Arts
MA, San Francisco State University
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Research Interests: Art / Science collaborations. I served as Fellow at the Center for Advanced Visual Studies, MIT, and as a visiting artist / scholar at UCLA Art | Sci Center which is dedicated to pursuing and promoting collaborations between the art and sciences.

My World-Wide-Walks / between earth & water / Rivers, video /web project-in-progress, was previewed at the GRID + Flow symposium at Temple University, Philadelphia, and Society for Cinema and Media Studies, New Orleans, 2011. A new Rivers project proposal was a finalist for the Future of WATER exhibition organized by the Science Gallery, Trinity College Dublin, Harvard University and a number of partners throughout Europe.

Research Areas: Green Infrastructure; Ecosystem Restoration; Climate Change Impacts, Sea Level Rise; Water Ethics, Values, Aesthetics

Research Scales: Local, Municipal; Regional; National; International; Lakes; Rivers; Oceans; Wetlands; Estuaries;

Research Methods: Field Surveys, Sampling and Data Collection; Modeling, Mapping, GIS; Interviews;

Reports and Publications: http://www.olats.org/fcm/artclimat/artclimat_eng.php
<http://www.temple.edu/institutes/gridflow/>

Funded Research: http://www.olats.org/fcm/artclimat/artclimat_eng.php
<http://www.temple.edu/institutes/gridflow/>

Special Access/ Resources:

<http://www.sciencegallery.com/blog/2011/03/future-water-initiative-launched-science-gallery>

Adding to the research links that includes my Leonardo Art & Climate change award for a project in Ireland, the one above on the Future of Water initiative is a useful model for new endeavors. "A major collaboration between Science Gallery, Trinity College Dublin, European Partners and Harvard University. Dr Mary Robinson, President of the Mary Robinson Foundation – Climate Justice, Former President of Ireland and former United Nations High Commissioner for Human Rights, today delivered an address on 'What is Climate Justice' to an invited audience at Trinity College's Science Gallery on the day marking UN World Water Day." This event also saw the formal launch of the FUTURE OF WATER initiative.

Research Locations: Rivers: Delaware, Mississippi, Sacramento, and Nile.

Future Involvement in Water Interests: Continuation of rivers project.

Future Research Interests: Art and Science collaborations.

Future Engagement Interests : Listserv member; Proposal Development

Alexandra Davatzes

PhD

Assistant Professor

Beury 315A

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Research Interests: I am interested in diagenesis- what can we tell about the chemistry of water on our early Earth and on other planets (Mars) by looking at the diagenetic reactions that have occurred in the sediments.

Research Areas: Geochemistry, Water- Rock Interaction

Research Scales: Laboratory; International

Research Methods: Field Surveys, Sampling and Data Collection; Laboratory Analysis; Modeling, Mapping, GIS

Reports and Publications: Krull-Davatzes, A., Lowe, D., & Byerly, G. (submitted to Precambrian Research) Mineralogy and diagenesis of 3.24 Ga meteorite impact spherules.

Funded Research:

Interesting Research Finding: My research has largely focused on the mobility of different elements in the diagenetic environments; i.e. the fate of various lithophile and siderophile (and to a lesser extent chalcophile) elements in aqueous solutions.

Special Access/ Resources:

Research Locations: Barberton greenstone belt, South Africa

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member

Nicholas C. Davatzes

Ph.D.

Professor

Beury, Rm. 307

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Research Interests: My research includes the role of fractures, faults, and stress on the movement of water in the earth. I apply this research in geothermal systems, petroleum systems, and earthquake faults. The research includes the mechanics of fracturing, direct measurements and modeling of the stress state, stimulation through hydraulic fracturing and hydroshearing, and some water-rock interactions in their role of healing fracture porosity or altering the mineral assemblage in fractures.

Research Areas: Geochemistry, Water- Rock Interaction

Research Scales: Laboratory; Sites; National; International; Groundwater

Research Methods: Field Surveys, Sampling and Data Collection; Laboratory Analysis; Modeling, Mapping, GIS; Case Studies

Reports and Publications:

Funded Research:

Interesting Research Finding:

Special Access/ Resources:

Research Locations:

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests:

Jeffrey Featherstone

Ph.D. Public Policy

Professor

211 West Hall, Ambler

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Research Interests: I direct the Center for Sustainable Communities. Over half of our 30+ research projects involve some aspect of water. I serve as PI for watershed studies funded by the Philadelphia Water Department and other federal, state, and local agencies. Specifically I'm interested in stormwater management and water budget analyses, both technical studies and implementation strategies. I'm also interested in global climate change and sea level rise, particularly as to how they impact water resources. While most of my research has been conducted in the Philadelphia region, I also have international experience in China. I teach a graduate course in Water Resources Planning and Management for the Department of Community and Regional Planning.

Research Areas: Groundwater; Stormwater Management; Green Infrastructure; Flood Hazard Mitigation; Water Quality; Water Supply, Water Treatment, Distribution, Infrastructure; Wastewater Treatment, Pollution Control; Land Use Impacts; Ecosystem Restoration; Water Allocation, Water Budgets, Water Rights; Drought, Conservation, Reuse; Water Finance and Pricing; Regulations, Permits, Water Policy; Climate Change Impacts, Sea Level Rise; Integrated Water Resources Management, Adaptive Management; Institutions for Water Resources Management

Research Scales: Local, Municipal; Regional; National; International; Rivers; Estuaries; Groundwater

Research Methods: Monitoring; Modeling, Mapping, GIS; Policy Analysis; Impact Analysis; Case Studies; Document Content Analysis

Reports and Publications: Pennypack Creek Watershed Stormwater Management Plan Fort Washington Flooding and Transportation Improvement Study "Conservation Induced Wastewater Flow Reductions Improve Nitrogen Removal: Evidence from New York City." Journal of the American Water Resources Association, Vol. 43, No. 6 (December 2007).

Funded Research: Pennypack Creek Watershed Stormwater Management Study - Philadelphia Water Department Wissahickon Creek Watershed Stormwater Management Study - Philadelphia Water Department Temple-Villanova Sustainable Stormwater Initiative - William Penn Foundation

Interesting Research Finding: Base data for conducting detailed studies of flood hazard zones and water resources often are crude, requiring time consuming research to create an accurate baseline. Many flood hazard areas mapped for FEMA are not accurate. Data in emerging countries like China are in worse shape, requiring use of remote sensing to create baselines and evaluate conditions over time.

Special Access/ Resources: The Center for Sustainable Communities has engaged most environmental groups in the region, including both nonprofit and for-profit organizations that are involved in water resources projects.

Research Locations: Philadelphia Region; New York City Region; Delaware River Basin; Pennsylvania; China

Future Involvement in Water Interests:

Future Research Interests: Most CSC projects involve interdisciplinary research. I have found it is critical to develop partnerships with other organizations and universities as funders are mandating collaboration. And since they have less funding now, they will encourage even more partnerships to leverage their limited funding.

Future Engagement Interests: Listserv member; Steering Committee; Working Group; Organize a Roundtable; Proposal Development

Amy Freestone

Ph.D

Assistant Professor

453B Bio-Life

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Research Interests: I study the ecology and conservation of marine, estuarine, and wetland ecosystems. My interests also include the ecology of invasive species. My research focuses on marine invertebrates and wetland plants, although I work on a variety of taxonomic groups in both terrestrial and aquatic habitats.

Research Areas: Habitat, Species Populations

Research Scales: Laboratory; Sites; Regional; National; International; Oceans; Wetlands; Estuaries

Research Methods: Field Surveys, Sampling and Data Collection; Monitoring; Laboratory Analysis

Reports and Publications: Freestone, A.L., Osman, R.W., Ruiz, G.M., Torchin, M.E. 2011. Stronger predation in tropics shapes species richness patterns in marine communities. *Ecology* 92(4): 983-993.

Ruiz, G.M., Freestone, A.F., Fofonoff, P.W., Simkanin, C. 2009. Habitat distribution and heterogeneity in marine invasion dynamics: the importance of hard substrate and artificial structure. pp. 321-332. In Wahl, M. (Ed.), *Hard Bottom Communities: Patterns, Scales, Dynamics, Functions, and Shifts*. Ecological Studies, Springer Verlag.

Freestone, A.L. 2006. Facilitation drives local abundance and regional distribution of a rare plant in a harsh environment. *Ecology* 87: 2728-2735.

Funded Research: Smithsonian Institution Postdoctoral Fellowships for research on latitudinal patterns of marine biodiversity

Interesting Research Finding:

Special Access/ Resources: I am a Research Associate at the Smithsonian Environmental Research Center in Edgewater, MD, which supports several laboratories focused on the ecology of marine and estuarine systems. I also have ongoing research at marine labs along the East Coast of the US, Belize, and Panama.

Research Locations: Long Island Sound (Connecticut), New Jersey estuaries, Eastern Shore of Virginia, Indian River Lagoon (Florida), Mesoamerican Reef in Belize, Bocas del Toro archipelago in Panama.

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member; Working Group; Proposal Development

David Grandstaff

Ph.D.

Professor

Beury Hall Room 322B

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Research Interests: Water quality. Controls on concentration and speciation of aluminum, lead, uranium, rare earth, and other elements in natural waters. Nuclear waste disposal. Compositions of geothermal waters.

Research Areas: Water Quality

Research Scales: Laboratory; Sites

Research Methods: Field Surveys, Sampling and Data Collection; Laboratory Analysis

Reports and Publications:

Funded Research:

Interesting Research Finding:

Special Access/ Resources:

Research Locations:

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests:

Michael Klein

B.Sc. Ph.D.

Professor

BL 113

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Research Interests: Molecular level understanding of water, especially its physical properties via computer modeling. Understanding the interaction of water molecules with natural and synthetic systems (proteins, minerals, polymers and drugs etc)

Research Areas:

Research Scales: Laboratory

Research Methods: Laboratory Analysis

Reports and Publications:

Funded Research:

Interesting Research Finding:

Special Access/ Resources:

Research Locations:

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests:

Lynn Mandarano

MBA and PhD

Associate Professor

Ambler

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Research Interests: evaluation of water resources management, policy, institutions (governance capacity, effectiveness, social networks...) adaptive management conflict resolution (negotiation, collaboration...).

Research Areas: Regulations, Permits, Water Policy, Integrated Water Resources Management, Adaptive Management, Institutions for Water Resources Management

Research Scales: Local, Municipal, Regional, National, Rivers, Estuaries

Research Methods: Policy Analysis, Impact Analysis, Surveys, Interviews, Document Content Analysis, Social Network Analysis

Reports and Publications: Governance Capacity of Collaborative Watershed Partnerships. Forthcoming 2001. Journal of Environmental Planning and Management.

Mandarano, L. 2009. "Social Network Analysis of Social Capital in Collaborative Planning." Society and Natural Resources, 22:3, 245-260, March 2009. DOI: 10.1080/08941920801922182

Mandarano, L., J. Featherstone and K. Paulsen. 2008. "Institutions for Interstate Water Resources Management." Journal of American Water Resources Association, 44:1, 136-147, February, 2008. DOI: 10.1111/j.1752-1688.2007.00143.x

Funded Research: Evaluation of Philadelphia's Regional Watershed Partnerships, Temple-Villanova Sustainable Stormwater Partnership

Interesting Research Finding: Federal-interstate compacts, such as the Delaware River Basin Compact, federal-state partnerships, such as the National Estuary Program, and regional watershed partnerships are also effective and complementary approaches to managing water resources. While these approaches provide forums for ongoing collaboration, development of agreements and management plans, increased understanding and creation of social capital, they offer limited improvements to managing water resources given the complicated and fragmented nature of federal, state and local systems of government.

Special Access/ Resources:

Research Locations: Philadelphia region, Delaware River basin, Hudson River Estuary

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member, Steering Committee

Robert Mason

PhD

Professor

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Research Interests: Adaptive management in Delaware River basin, with emphasis on cyclical floods and drought (with Lynn Mandarano) Interests in water resources management in Japan, SE Asia (especially seasonal fluctuations of Mekong River)--but no active research project Interest in Philadelphia stormwater management

Research Areas: 5Stormwater Management; Flood Hazard Mitigation; Water Supply, Water Treatment, Distribution, Infrastructure; Land Use Impacts; Water Allocation, Water Budgets, Water Rights; Drought, Conservation, Reuse; Regulations, Permits, Water Policy; Climate Change Impacts, Sea Level Rise; Integrated Water Resources Management, Adaptive Management; Institutions for Water Resources Management

Research Scales: Regional; International

Research Methods: Policy Analysis; Case Studies; Interviews; Document Content Analysis; Social Network Analysis

Reports and Publications:

Funded Research:

Interesting Research Finding: NGOs are empowered by access to watershed information--e.g. real-time flow data, watershed models. Dominant narratives regarding watershed management can shift dramatically over time, as hazards change.

Special Access/ Resources: Possibly Delaware River Basin Commission and some NGOs involved with Delaware River issues. Some research contacts in Japan

Research Locations: Delaware River Basin Japan SE Asia

Future Involvement in Water Interests:

Future Research Interests: I am interested in learning more about Marcellus Shale regionally--a more comprehensive assessment of attitudes of those living in affected areas toward exploration and production (Quinnipiac has just done polling in New York State--this is the first).

Future Engagement Interests: Listserv member; Steering Committee; Working Group; Organize a Roundtable; Proposal Development

Michele Masucci

B.S., M.A., Ph.D. in Geography

Associate Professor

401 Conwell Hall

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Research Interests: Water Resources Planning, GIS, International River Basins, ACF basin, Tiete Basin

Research Areas: Drought, Conservation, Reuse, Regulations, Permits, Water Policy, Integrated Water Resources Management, Adaptive Management, Institutions for Water Resources Management, Water Ethics, Values, Aesthetics

Research Scales: Laboratory, Sites, Regional, International, Rivers

Research Methods: Field Surveys, Sampling and Data Collection, Modeling, Mapping, GIS, Policy Analysis, Impact Analysis, Case Studies, Surveys, Interviews, Document Content Analysis

Reports and Publications: Masucci, M. and Perritt, R. 1997. Human Environmental Interchange: Managing the Effects of Recent Droughts in the Southeastern U.S. Harcourt Brace/Saunders: Philadelphia, PA.

Masucci, M. 2000. Institutional Partnerships in Using and Developing Information Technology for Community Environmental Monitoring. In: Viadana, I. and M. Lombardo (eds), Universidade e Comunidade na Gestão do Meio Ambiente, pp. 65-75. UNESP (State University of São Paulo) Press, São Paulo, Brazil.

Masucci, M. 1996. Developing GIS for Citizen Environmental Monitoring and Hazards Mitigation in Alabama and São Paulo, Brazil. GIS/LIS '96 Proceedings, pp 250-265. Bethesda: ACSM/ASPRS, AAG, URISA, AM/FM, 1996.

Funded Research: PYN - Saving Philadelphia Waters

PENN - Marcellus Shale Initiative

State of PA - Health GIS Lab Implementation

Interesting Research Finding: My interest in water resources research lies in the use of information by NGOs to monitor and track changes in water quality. My focus is on the organizational decision making processes and how that leads to policy development, implementation, and scalability.

Special Access/ Resources: I am developing a state of the art GIS and Geovisualization lab in the Department of Geography and Urban Studies, located on the 3rd floor of Gladfelter Hall.

Research Locations: ACF River Basin, Southeastern U.S.; Chesapeake Bay system on Delmarva Peninsula, Tiete River Basin in Brazil (part of Parana system)

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member, Steering Committee, Working Group, Organize a Roundtable, Proposal Development

Mahbubur Meenar

Masters in Urban Planning, Bachelor of Architecture

Adjunct Faculty

West Hall 212, 580 Meetinghouse Rd, Ambler, PA 19002

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Research Interests: The connection between land use and watershed management; Use of GIS, Internet, and other digital technologies in watershed management; Green infrastructure and urban greening; Water related disasters and disadvantaged population

Research Areas: Stormwater Management, Green Infrastructure, Flood Hazard Mitigation, Land Use Impacts

Research Scales: Laboratory, Local, Municipal, Regional, Lakes, Rivers, Wetlands, Estuaries

Research Methods: Site Assessments, Laboratory Analysis, Modeling, Mapping, GIS, Policy Analysis, Impact Analysis, Case Studies, Surveys, Interviews, Social Network Analysis

Reports and Publications: Impact Assessment of Projected and Alternative Land Use Development Patterns in Pennypack Creek Watershed

Upper Dublin Environmental Resources Inventory

Pennypack Creek Watershed Study (Editor)

Funded Research: Impact Assessment of Projected and Alternative Land Use Development Patterns in Pennypack Creek Watershed

3D GIS Visualization: Fort Washington Office Park Revitalization Project

Upper Dublin Environmental Resources Inventory

Interesting Research Finding:

Special Access/ Resources: Organizations - Center for Sustainable Communities, Philadelphia Water Department, New Kensington Community Development Corporation, Transition Group of Upper Dublin and Ambler, and a number of community gardens and urban farms in Philadelphia. Resources - GIS and other digital resources

Future Collaborations Interests:

Research Locations: Delaware River Estuary, Pennypack Creek Watershed, Wissahickon Creek Watershed, Philadelphia Metro Region

Future Research Interests: The relationship of urban greening/urban agriculture/urban land use with water resources management

Future Engagement Interests: Listserv member, Working Group, Proposal Development

Megan Mullin

Ph. D

Associate Professor

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Research Interests: water governing institutions; water policy

Research Areas: Water Quality; Water Supply, Water Treatment, Distribution, Infrastructure; Wastewater Treatment, Pollution Control; Waterborne Diseases, Investigation, Prevention; Drought, Conservation, Reuse; Water Finance and Pricing; Regulations, Permits, Water Policy; Integrated Water Resources Management, Adaptive Management; Institutions for Water Resources Management

Research Scales: Local, Municipal; Regional; National

Research Methods: Policy Analysis; Case Studies; Surveys; Interviews; Marketing, Economic Analysis; Other

Reports and Publications: Governing the Tap: Special District Governance and the New Local Politics of Water (MIT Press, 2009)

The Conditional Effect of Specialized Governance on Public Policy (American Journal of Political Science, 2008)

California Water: A Case Study in Federalism (Governing California, Institute of Governmental Studies Press, 2006)

Funded Research: Protecting the Nation's Water Supplies: Multilevel Governance and the Development of Water Infrastructure (unfunded)

Interesting Research Finding: The design of water governing institutions has different policy effects depending on the severity of problems the institutions are trying to address, including the scarcity of water resources and the rate of development in the region.

Special Access/ Resources:

Research Locations: United States

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member; Working Group; Proposal Development

John W. Munro

BA Biology

Professor

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Research Interests: Stream and river bank stabilization using eco-structural design and locally native plants Structure design for maximum vegetation component and reduced levels of non-natural materials Re-elevation of deeply incised streams to restore adjacent floodplain and wetland hydrology Nutrient reduction in ponds and perched waters via active and passive grading and planting methods Pumped-reed bed nutrient removal systems for ponds Application of ecological principles in design of restoration landscapes Alternative devices and practices for stormwater retention/percolation at the home and municipal level Water re-use Waterway restoration design for reduced maintenance Working with volunteer crews in ecological restoration work in waterways Restoration of the "organic mat" in forest systems as water an essential absorption interface Design, construction and use of plant community salvage equipment small and large (moves marsh and shrub comm.)

Research Areas: Stormwater Management; Water Quality; Habitat, Species Populations; Ecosystem Restoration; Regulations, Permits, Water Policy

Research Scales: Sites; Regional; Rivers; Wetlands; Estuaries; Other

Research Methods: Field Surveys, Sampling and Data Collection; Site Assessments; Monitoring; Modeling, Mapping, GIS; Impact Analysis; Case Studies

Reports and Publications: Floodplain Study and Conceptual Plan for Colwyn, Sharon Hill, and Darby Boroughs, in Delaware County, PA 1997

Issues and alternatives Related to use of Treated Wood in Streambank Protection in Ecological Restoration Projects, Co-Product Determination background material. 2003

Ecological Restoration Plan for two Sections of the Proposed Lackawanna River Heritage Trail, Lackawanna County, PA. 1996

Funded Research: None; I primarily work in applied mode; learn from projects and apply learned data to new design. Waiting on funding for three stream bank stabilization projects

Interesting Research Finding: Use of native riparian vegetation in stream restoration following Ecological Restoration protocols and eco-structural design is; possible, reliable, ecologically-based, and largely ignored.

Special Access/ Resources: Have long association with many senior Ecological Restoration professionals across the continent through the society for Ecological Restoration International. Have collected a substantial library of Ecological Restoration topic material

Research Locations: Northeast US stream and river restoration, Design of wetlands- NJ, PA, OH, WV
Forest Restoration - PA, NJ, NY, WV, OH Endangered species plant community salvage CT, PA, FL
Wetland & reedbed water treatment systems; mine drainage, nutrients, polishing; PA, WV

Future Involvement in Water Interests: Have worked in water resource planning and design for 30+ years

Future Research Interests: How to convert a largely impervious groundcover Township to one that retains, recycles, stores, and recharges stormwater to the level of the original forest cover condition. Establishment of original forest cover as the true standard for how much percolation / runoff should be the target in municipal, county, state, and federal level development design. Update to appropriate standards. Re-growing, restoring the organic mat in natural vegetation communities in the region.

Future Engagement Interests: Listserv member; Steering Committee; Working Group

Mary Myers

Ph.D., Master of Landscape Architecture, Bachelor of Science in Landscape Architecture, Associate of Art
- English and Anthropology

Associate Professor

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Research Interests:

Research Areas: Stormwater Management; Green Infrastructure; Ecosystem Restoration; Water Ethics, Values, Aesthetics

Research Scales: Sites; Local, Municipal; Regional; National; Wetlands

Research Methods: Site Assessments; Modeling, Mapping, GIS; Case Studies; Surveys; Interviews

Reports and Publications: Landscape performance assessment - case study Cusano Environmental Education Center, John Heinz State Park, Philadelphia

Landscape Performance Assessment - Salvation Army Kroc Community Center, North Philadelphia

Landscape Performance Assessment - Thomas Jefferson University Lubert Plaza

Funded Research: Landscape Performance Assessment; Fort Washington Office Park Master Plan contributor

Interesting Research Finding: In a survey of users of TJU's Lubert Plaza, (which is designed to mitigate stormwater in Philadelphia) it was found that a majority of respondents felt more capable of dealing with the stresses of work and classes after spending time in the plaza. However, it was also found that a majority of respondents were unaware of the stormwater benefit of the plaza. This can effect change to the plaza design to make the processes more visible or to incorporate educational signage.

Special Access/ Resources: Landscape Architecture Foundation (LAF)

Research Locations: Philadelphia brown field site restoration(s); Philadelphia rain garden and storm water retention projects in the urban setting; North Carolina Stream Restoration; Pennsylvania stream restoration

Future Involvement in Water Interests:

Future Research Interests: designing, building and monitoring storm water best management practices

Future Engagement Interests: Listserv member; Proposal Development

Jonathan Nyquist

PhD Geophysics; MS Physics; BA Physics

Professor

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Research Interests:

Research Areas: Transport Processes; Groundwater; Stormwater Management; Water Quality; Wastewater Treatment, Pollution Control; Land Use Impacts; Ecosystem Restoration; Drought, Conservation, Reuse; Other

Research Scales: Sites; Local, Municipal; Regional; National; Lakes; Rivers; Groundwater

Research Methods: Field Surveys, Sampling and Data Collection; Site Assessments; Monitoring; Laboratory Analysis; Modeling, Mapping, GIS; Case Studies

Reports and Publications: Toran, L, B. Hughes, J. E. Nyquist, R. Ryan (2011) Using hydrogeophysics to monitor change in hyporheic flow around stream restoration structures. Accepted, Special Issue of Environmental & Engineering Geoscience

Nyquist, J. E., M. J. Heaney, and L. Toran (2009) Characterizing lakebed seepage and geologic heterogeneity using underwater resistivity and temperature measurements, Near Surface Geophysics, Near Surface Geophysics, 7(5-6) 487-498. doi: 10.3997/1873-0604.2009022.

Nyquist, J.E., P. A. Freyer, and L. Toran (2008) Stream bottom resistivity tomography to map groundwater discharge, Ground Water, 46(4): 561-569. (July-Aug)

Funded Research: Geophysical characterization of groundwater/surface water interaction (NSF). Shale Hills Critical Zone Observatory; Mapping Spatial and Temporal Heterogeneity of Lake Seepage Agency: NSF; Geophysical monitoring of groundwater-lake interactions Agency: NSF

Interesting Research Finding: The work involves underground imaging using geophysical methods. Recent examples recent examples include the use of electrical resistivity to monitor the hyporheic zone in streams, and the 3D imaging of groundwater/surface water interaction in lakes.

Special Access/ Resources: A fairly extensive collection of geophysical tools: land and underwater resistivity imaging systems, induced potential, ground penetrating radar, magnetometer, magnetic susceptibility, terrain conductivity, and seismic.

Research Locations: Valley Forge, PA; Mirror Lake, NH; Lake Lacawac, PA; Marcellus Shale

Future Involvement in Water Interests:

Future Research Interests: I'd like to make others aware of the potential for hydrogeophysical methods to support surface and groundwater investigation. I'm also highly interested in remote sensing methods and GIS.

Future Engagement Interests: Listserv member; Steering Committee; Working Group; Organize a Roundtable; Proposal Development

Michael Olszewski

BS, MS, PhD

Assistant Professor

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Research Interests: I am interested in plant responses to soil water deficits. From 1996 to 2001 I worked at Aquatrols Corporation, a company specializing in managing water in the rootzones of plants. Mostly, the company markets horticultural surfactants to the turfgrass (i.e. mostly golf), nursery, and greenhouse industries for purposes of enhanced hydration of hydrophobic soils and soilless media. While at Temple University, I have published three research papers dealing with the wettability and/or physical characteristics of bark-based (used by the nursery industry), heat-expanded slate, and heat-expanded clay (used by the green roof industry). I am on the Stewardship Committee at Pennypack Ecological Restoration Trust (PERT), which contains 771 acres of protected meadow and forest fifteen miles from Philadelphia, PA. Like many suburban areas close to urban areas, invasive plants in this park require significant management to prevent their dominance. On-going restoration efforts by PERT have been partially successful for a grass-wildflower meadow and successful for tall-grass meadows within the park. PERT managers have assisted my research efforts in spring 2011 research trials that attempted to hydroseed a wildflower meadow onto small areas. In the past, I have tried to incorporate infiltration rates and soil moisture content into my field research at Pennypack Ecological Restoration Trust in Huntingdon Valley. However, monitoring moisture levels in a meadow-sized system would require more equipment and staff/student workers than I have had in the past. Newer water content sensors use centralized units and multiple sensors at different soil depths where data is continually or periodically downloaded. An additional study at Temple University included generating moisture release curves (water potential vs media moisture content) for a compost system that could potentially be used for commercial seed treatments (a provisional patent is being prepared by the Temple's Office of Transfer Technology).

Research Areas: Ecosystem Restoration; Other

Research Scales: Laboratory; Sites;

Research Methods: Field Surveys, Sampling and Data Collection; Laboratory Analysis

Reports and Publications:

Funded Research:

Interesting Research Finding:

Special Access/ Resources:

Research Locations:

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests:

Christina Rosan
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Research Interests: Current research examines the Philadelphia Water Department's Green Infrastructure plan, policies, and implementation strategies.

Research Areas: Groundwater; Stormwater Management; Green Infrastructure; Ecosystem Restoration

Research Scales: Local, Municipal; Regional

Research Methods: Case Studies; Interviews; Document Content Analysis

Reports and Publications:

Funded Research:

Interesting Research Finding: We are examining the politics of moving from a centralized gray infrastructure system to a more decentralized GI approach.

Special Access/ Resources:

Research Locations: Philadelphia, PA

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member; Steering Committee; Working Group; Organize a Roundtable; Proposal Development

Robert Ryan

B.S., Env. Eng, Penn State Univ., 1985; M.S., Eng. Man., Widener Univ., 1996 ; Ph.D., Env. Eng., Drexel Univ., 2004

Assistant Professor

Engineering and Architecture 515

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Research Interests: My research interests are focused on urban stream hydrology. I am particularly interested in how watershed and riparian land use and other physical stream characteristics affect the interaction between surface water and ground water and how this surface-subsurface exchange influences nutrient uptake and contaminant removal.

Research Areas: Geochemistry, Water- Rock Interaction, Transport Processes, Groundwater, Stormwater Management, Water Quality, Land Use Impacts, Habitat, Species Populations, Ecosystem Restoration

Research Scales: Sites, Local, Municipal, Regional, Rivers, Groundwater

Research Methods: Field Surveys, Sampling and Data Collection, Monitoring, Laboratory Analysis, Modeling, Mapping, GIS

Reports and Publications: Ryan, R.J., C. Welty, P.Larson, 2010, Variation in surface water-groundwater exchange with land use in an urban stream, Journal of Hydrology 392, 1-11, doi:10.1016/j.jhydrol.2010.06.004

Ryan, R.J., M.C. Boufadel, 2007, Lateral and longitudinal variation of hyporheic exchange in a piedmont stream pool, Environmental Science and Technology, 41, 4221-4226, doi:10.1021/es061603z.

Ryan, R.J., A.I. Packman, S.S. Kilham, 2007, Relating phosphorus uptake to changes in transient storage and streambed sediment characteristics in headwater tributaries of Valley Creek, an urbanizing watershed, Journal of Hydrology, 336, 444-457, doi:10.1016/j.jhydrol.2007.01.021.

Funded Research:

Interesting Research Finding: There is a seasonal variation in transient storage (surface-subsurface exchange) that appears to be correlated with riparian land use and canopy cover

Special Access/ Resources:

Research Locations: Southeast PA (Valley Creek, Indian Creek, Chester Creek), Baltimore MD (Dead Run)

Future Involvement in Water Interests:**Future Research Interests:**

Future Engagement Interests: Listserv member, Working Group, Proposal Development

Robert Sanders

Ph.D.

Professor

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Research Interests: Aquatic microbial food webs; mixotrophy; protists (phytoplankton, protozoa); zooplankton; UV radiation, biodiversity (protists).

Research Areas: Habitat, Species Populations, Climate Change Impacts, Sea Level Rise

Research Scales: Laboratory, Sites, Regional, International, Lakes, Oceans, Estuaries

Research Methods: Field Surveys, Sampling and Data Collection, Laboratory Analysis, Case Studies

Reports and Publications: Sanders, R.W. 2011. Alternative nutritional strategies in protists: symposium introduction and a review of freshwater protists that combine photosynthesis and heterotrophy. *Journal of Eukaryotic Microbiology* 58:181-184.

Moorthi S.D., D.A. Caron, R. Gast, and R.W. Sanders. 2009. Mixotrophy: a widespread and important ecological strategy for planktonic and sea-ice nanoflagellates in the Ross Sea, Antarctica. *Aquatic Microbial Ecology* 54:269-277.

Sanders, R.W., A.O. Macaluso, T.J. Sardina and D.L. Mitchell. 2005. Photoreactivation in freshwater ciliates: differential responses to variations in UV-B flux and temperature. *Aquatic Microbial Ecology* 40:283-292.

Funded Research: Collaborative Research: Alternative nutritional strategies in Antarctic protists. National Science Foundation, Antarctic Organisms & Ecosystems, 2009-2012. R.J. Gast (Co-PI).

Interactive effects of UV radiation and temperature on pelagic food webs. National Science Foundation: Integrated Research Challenges in Environmental Biology, 2002-2008. With 10 co-investigators.

Planning Grant for Program and Facility Enhancement at Lacawac Sanctuary. NSF: Improvements in Facilities, Communications, & Equipment at Biological Field, 2009-2011. J.M. Fischer, Franklin & Marshall (PI).

Interesting Research Finding:

Special Access/ Resources:

Research Locations: Arctic Ocean, Antarctic Ocean, Atlantic Ocean, Gulf of Maine, lakes in Pocono Mountains (Pocono Plateau).

Future Involvement in Water Interests: Eutrophication (somewhat), climate change

Future Research Interests:

Future Engagement Interests: Listserv member

John Sorrentino

BBA, MS & PhD

Associate Professor

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Research Interests: Water quality impacts of land use; economic valuation of non-market water-related ecosystem goods & services

Research Areas: Green Infrastructure, Water Quality, Wastewater Treatment, Pollution Control, Land Use Impacts, Ecosystem Restoration, Water Finance and Pricing, Water Markets, Regulations, Permits, Water Policy, Integrated Water Resources Management, Adaptive Management

Research Scales: Local, Municipal, Regional, Rivers

Research Methods: Policy Analysis, Impact Analysis, Case Studies, Surveys, Marketing, Economic Analysis

Reports and Publications: Final Report, "Applying the EPA's Regional Vulnerability Assessment (ReVA) Approach to the Pennypack Creek Watershed," for the PA DEP, co-editor with Md. M.R. Meenar & J. Featherstone, January 2007

"Suitable Housing Placement: A GIS-Based Approach," (with Md M. R. Meenar & Bradley J. Flamm), Environmental Management, Vol. 42, No. 5, November 2008

Funded Research: "Applying the EPA's Regional Vulnerability Assessment (ReVA) Approach to the Pennypack Creek Watershed," for the PA Department of Environmental Protection (DEP), & funded by Grant # CR-83084001-1, Office of Science Policy, Office of Research and Development, US EPA, Fall 2003 to Summer 2006

Interesting Research Finding: With respect to housing placement, some goals of sustainability may conflict with water quality improvement. For example, placing housing in highly impermeable areas also puts it in lower-WQ sub-basins.

Special Access/ Resources: Affiliation with the Center for Sustainable Communities, & access to the GIS studio at Ambler.

Research Locations: The Pennypack Creek & Wissahickon Creek Watersheds

Future Involvement in Water Interests:

Future Research Interests: Using social & management science methods to bring natural science to water policy.

Future Engagement Interests: Listserv member, Working Group, Proposal Development

Daniel Strongin

Ph.D.

Professor

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Research Interests: In particular my research group is currently interested in understanding the role minerals surfaces play in controlling chemistry in the environment. We are most interested in understanding this chemistry on a molecular-level and to apply this understanding to potentially help ameliorate outstanding environmental issues. Current areas that we are interested in are acid mine drainage and the removal of toxic metalloids such as arsenic from aquatic systems. We use a variety of techniques that include infrared spectroscopy, photoelectron spectroscopy, electron microscopy, probe force microscopy, X-ray scattering and diffraction, and a whole host of solution phase analytical techniques.

Research Areas: Environmental Chemistry; Geochemistry, Water- Rock Interaction; Ecosystem Restoration

Research Scales: Laboratory

Research Methods: Laboratory Analysis

Reports and Publications: "Photoinduced oxidation of arsenite to arsenate on ferrihydrite," Bhandari, Narayan; Reeder, Richard J.; Strongin, Daniel R. *Environmental Science & Technology* (2011), 45(7), 2783-2789.

"Adsorption of Phospholipids on Pyrite and Their Effect on Surface Oxidation," Zhang X., Borda M. J., Schoonen M. A. A., and Strongin D. R. *Langmuir* 19(21) (2003) 8787-8792.

"Effects of phospholipid on pyrite oxidation in the presence of autotrophic and heterotrophic bacteria," J. Hao, R. Murphy, E. Lim, M.A.A. Schoonen, D. R. Strongin, *Geochimica et Cosmochimica Acta* (2009) 73, 4111-4123.

Funded Research: Inhibiting Oxidation of Metal Sulfide-Containing Material Using Nano Bilayers of Phospholipids, 1/1/2010 - 12/31/2011, Nano Technology Institute (NTI).

CRC: Structure-sorption relationships for iron oxyhydroxides , 8/2007-7/2012, National Science Foundation (NSF).

Reactivity of Iron-bearing minerals and supercritical CO₂, 11/2008-12/2011, Department of Energy (DOE).

Interesting Research Finding: We have developed technology to suppress acid mine drainage in coal mining areas. Acid mine drainage is a major environmental problem in PA.

Special Access/ Resources: The Strongin laboratory contains instrumentation to determine the composition of environmentally relevant mineral surfaces. The Department of Chemistry houses a state-of-the-art Transmission Electron Microscope.

Research Locations: Laboratory Based

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member; Proposal Development

Rominder Suri

PhD in Environmental Engineering

Professor

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rsuri@temple.edu

Research Interests: Water and Wastewater Treatment, Emerging Contaminants, Advanced Oxidation Processes (Sonolysis, Ozonation, Photocatalysis), Nanomaterials, Industrial Waste Treatment, Environmental Monitoring, Adsorption/Desorption, Reactor Engineering and Process Combination, Fate and Transport of Organic contaminants, analytical chemistry and sensors.

Research Areas: Environmental Chemistry; Transport Processes; Groundwater; Water Quality; Water Supply, Water Treatment, Distribution, Infrastructure; Wastewater Treatment, Pollution Control; Waterborne Diseases, Investigation, Prevention; Land Use Impacts; Water Allocation, Water Budgets, Water Rights; Climate Change Impacts, Sea Level Rise; Integrated Water Resources Management, Adaptive Management; Other

Research Scales: Laboratory; Sites; Local, Municipal; Regional; National; International; Rivers; Groundwater; Other

Research Methods: Field Surveys, Sampling and Data Collection; Site Assessments; Monitoring; Laboratory Analysis; Modeling, Mapping, GIS; Impact Analysis; Case Studies; Other

Reports and Publications: Suri, R.P., T. Singh, S. Abburi, "Influence of Solution Alkalinity and Salinity on the Sonochemical Degradation of Estrogen Hormones in Aqueous Solution", Environmental Science and Technology, 44 (4), pp. 1373-1379, 2010

Suri, R.P.S., Singh, T.S., Chimchirian, R.F., and H. Fu. Effect of Process Conditions on the Analysis of Free and Conjugated Estrogen Hormones by Solid Phase Extraction - Gas Chromatography/Mass Spectrometry (SPE- GC/MS). Environmental Monitoring and Assessment (Accepted for publication 2011)

Andaluri, G., Suri, R.P.S., Kumar, K. (2011) Occurrence of estrogen hormones in biosolids, animal manure and mushroom compost, Environmental Monitoring Assessment (accepted)

Funded Research: Water and Environmental Technology Center - a NSF Center and Industry (up to 15 years); Water Technology Innovation Ecosystem - funded by NSF; Pennsylvania Environmental Technologies for Pharmaceutical Industry - funded by Commonwealth of Pennsylvania

Interesting Research Finding: Novel methods of decontaminating industrial wastewater, including Marcellus shale fracking water

Special Access/ Resources: Research Centers

Research Locations: current research in Ireland, UK, USA, TU labs

Future Involvement in Water Interests:

Future Research Interests: Industry -University cooperative research, interdisciplinary environmental research

Future Engagement Interests: Steering Committee; Working Group; Organize a Roundtable; Proposal Development; Other

Laura Toran

Ph. D. Geology

Professor

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Research Interests: I conduct research on groundwater contamination and urban hydrology. Particular areas of interest are urban hydrology, groundwater transport in karst, groundwater-surface water interactions in streams and lakes, stormwater monitoring, and hydrogeophysics. In the past I have worked on a variety of waste sites, but my current emphasis is systems stressed by urban impacts. I conduct field research (including intense monitoring), and follow up with lab analysis and computer modeling. I have expertise in a variety of groundwater models from standard flow to coupled transport and geochemistry models. I teach graduate and undergraduate courses in hydrology, an undergraduate climate change class, and a graduate class on groundwater models.

Research Areas: Environmental Chemistry, Transport Processes, Groundwater, Stormwater Management, Water Quality, Land Use Impacts, Habitat, Species Populations

Research Scales: Laboratory, Sites, Regional, National, Lakes, Rivers, Wetlands, Groundwater

Research Methods: Field Surveys, Sampling and Data Collection; Monitoring; Laboratory Analysis; Modeling, Mapping, GIS

Reports and Publications: Toran, L., Hughes, B., Nyquist, J., and Ryan, R. Using hydrogeophysics to monitor change in hyporheic flow around stream restoration structures. In press Environmental and Engineering Geology

Toran, L., Lipka, C., Baehr, A., Reilly, T., and Baker, R. 2003. Seasonal and daily variations in concentrations of methyl-tertiary-butyl ether (MTBE) at Cranberry Lake, New Jersey. Water Research. 37: 3756-3766.

Herman, E.K., Toran, L., and White, W.B., 2009. Quantifying the place of karst aquifers in the groundwater to surface water continuum: a time series analysis study of storm response in Pennsylvania water resources. Journal of Hydrology, 376 (1-2), 307-317.

Funded Research: Temple-Villanova Stormwater Initiative (William Pen Foundation); Currently I am a program officer at the National Science Foundation; I gave up my NSF funding to become a program officer

Interesting Research Finding: People recognize that each field site is different, but my stormwater monitoring has shown considerable variation at a single site when sampling over time. Most stormwater structures don't seem to work as planned; water doesn't go where we want it to go.

Special Access/ Resources: I have a lot of stormwater monitoring equipment and often volunteer time and resources to evaluate storm control structures. I was a founding member of the Consortia of Universities for the Advancement of Hydrologic Science (CUAHSI) and have represented Temple in the association for the past 10 years. I am currently one of two Program Directors for Hydrology at NSF.

Research Locations: Pennypack Creek, Valley Creek, Lake Lacawac (PA), Shale Hills Observatory (central PA), Mirror Lake (NH), karst springs in PA, stormwater structures on Ambler and Temple campuses

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Listserv member, Steering Committee, Working Group, Organize a Roundtable, Proposal Development, Other

Benoit Van Aken

Ph.D.

Assistant Professor

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Research Interests: My area of expertise is the use of molecular biology techniques (gene expression analysis) to understand biodegradation of organic pollutants. Specific research projects include: 1. Uptake and metabolism of pharmaceuticals by aquatic plants in constructed wetlands. 2. Biodegradation of pharmaceuticals and other emerging contaminants in wastewater treatment systems. 3. Microbial source tracking in surface and groundwater using molecular biology methods.

Research Areas: Environmental Chemistry; Groundwater; Wastewater Treatment, Pollution Control; Waterborne Diseases, Investigation, Prevention; Ecosystem Restoration

Research Scales: Laboratory; Sites; Local, Municipal; Wetlands; Groundwater

Research Methods: Field Surveys, Sampling and Data Collection; Site Assessments; Laboratory Analysis

Reports and Publications: Van Aken B, Lin L (2011). Effect of disinfection processes on DNA: Implication for the dispersion of antimicrobial resistance. *Wat Sci Technol*. In press.

Brentner LB, Mukherji ST, Merchie KM, Yoon JM, Schnoor JL, Van Aken B (2008). Expression of glutathione S-transferases in poplar trees (*Populus trichocarpa*) exposed to 2,4,6-trinitrotoluene (TNT). *Chemosphere*. 73:657-662.

Van Aken B, Moon Yoon, Schnoor JL (2004). Biodegradation of Nitro-Substituted Explosives TNT, RDX, and HMX by a Phytosymbiotic *Methylobacterium* sp. Associated with *Populus* (*Populus deltoides* × *nigra* DN34). *Appl Environ Microbiol*. 70:508-517.

Funded Research: Assessing the Vulnerability of Sensitive Karst Habitats Containing RTE Species in CHOH. National Park Service. 2011-2013.; Assessing the Effects of Antiviral Drugs and Antibiotics on the Activated Sludge during an Influenza Pandemic. WET Center. 2011-2012; Phytoremediation to Degrade Airborne PCB Congeners from Soil and Groundwater Sources. NIH. 2010-2015.

Interesting Research Finding: I conducted gene expression studies in order to understand the metabolic routes and catabolic enzymes involved in the biodegradation of explosives by plants. For instance, I demonstrated that 2,4,6-trinitrotoluene (TNT) was metabolized by poplar plants by a stepwise process involving glutathione S-transferase-mediated conjugation with reduced glutathione. Using a whole-genome microarray, we also identified several catabolic genes and enzymes involved the metabolism of hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) by *Arabidopsis* plants, including cytochrome P-450 monooxygenases, 12-oxophytodienoate reductases, glutathione S-transferases, and glycosyltransferases.

Special Access/ Resources: The Environmental Microbiology Laboratory is a 600-sqft facility located in Department of Civil and Environmental Engineering. The laboratory is provided with microbiology and molecular biology equipment (class II biosafety cabinet, anaerobic glove box, real-time thermocycler, electrophoresis, UV-imaging, fluorescence microscopy) and analytical equipment (GC/MS and HPLC/PDA, spectrophotometer, microplate spectrofluorometer, luminometer, TOC analyzer).

Research Locations: South Chicago (IN) Delaware River basin Different areas in WV and Western PA

Future Involvement in Water Interests:

Future Research Interests: The utilization of plants and/or microalgae for sustainable wastewater management, including 1. the removal of nutrients and emerging contaminants from wastewater, 2. the mitigation of CO₂ emission, and 3. biofuel production.

Future Engagement Interests: Listserv member; Working Group; Proposal Development

Xifan Wu

Assistant Professor

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Research Interests: Theoretical studies of Hydrogen bond by molecular dynamics by advanced hybrid density functional theory. Theoretical studies of x-ray absorption of liquid water and ice.

Research Areas: Environmental Chemistry

Research Scales: Laboratory

Research Methods: Modeling, Mapping, GIS

Reports and Publications: Physics Review Letters, 105, 017802

Funded Research:

Interesting Research Finding: more accurate water molecule structure

Special Access/ Resources:

Research Locations:

Future Involvement in Water Interests:

Future Research Interests:

Future Engagement Interests: Proposal Development

Huichun (Judy) Zhang

Ph. D.

Assistant Professor

Engineering and Architecture 529A

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hjzhang@temple.edu

Research Interests: Reduction-oxidation processes · Transformation and fate of emerging contaminants in natural and engineered environment · Interfacial reactions of organic contaminants with natural minerals and novel nanomaterials · Reaction mechanisms, kinetics and reaction product identification of organic contaminants · Polymeric sorbents for the removal of emerging contaminants

Research Areas: Environmental Chemistry, Water Quality, Water Supply, Water Treatment, Distribution, Infrastructure, Wastewater Treatment, Pollution Control

Research Scales: Laboratory

Research Methods: Laboratory Analysis, Modeling, Mapping, GIS

Reports and Publications: Zhang, H. and Weber, E. J. 2009. "Elucidating the Role of Electron Shuttles in Reductive Transformations in Anaerobic Sediments", *Environmental Science and Technology*. 43(4), 1042-1048.

Zhang, H., Chen, W.-R. and Huang, C.-H. 2008. "Kinetic Modeling of Oxidation of Antibacterial Agents by Manganese Oxide", *Environmental Science and Technology*. 42(15), 5548–5554.

Zhang, H. and Lemley A. T. 2006. "Reaction Mechanism and Kinetic Modeling of DEET Degradation by Flow-Through Anodic Fenton Treatment (FAFT)", *Environmental Science and Technology*, 40(14), 4488-4494.

Funded Research: Redox Noninnocent Ligands – Application in the Reductive Transformation of Veterinary Pharmaceuticals

The fate of nanoparticles in natural and engineered environments

Interesting Research Finding: Predictive tools are and will be developed in my lab to 1) estimate fate and transformation of emerging contaminants in natural and engineered environments and 2) identify the type and quantity of polymeric resins towards the treatment of a given water matrix.

Special Access/ Resources: Collaborators from University of Maryland, Johns Hopkins University, New Jersey Institute of Technology, and US EPA national lab

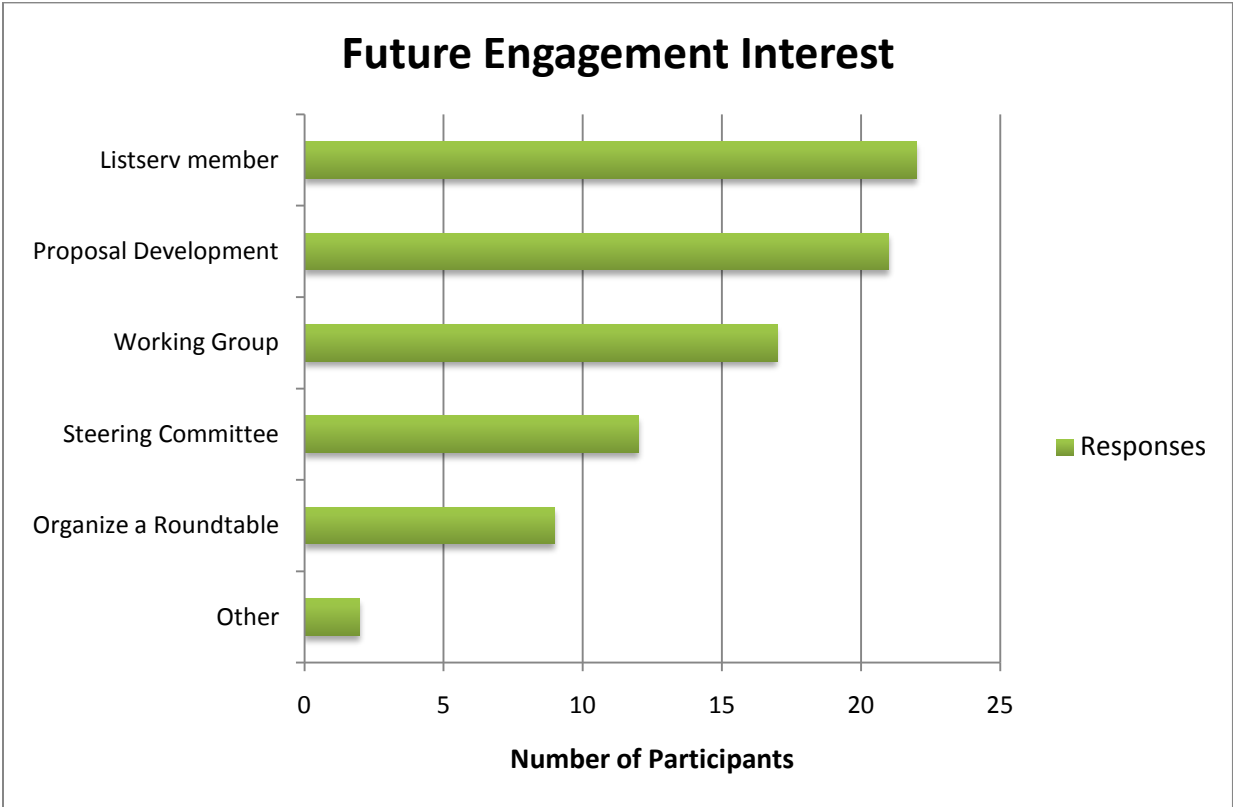
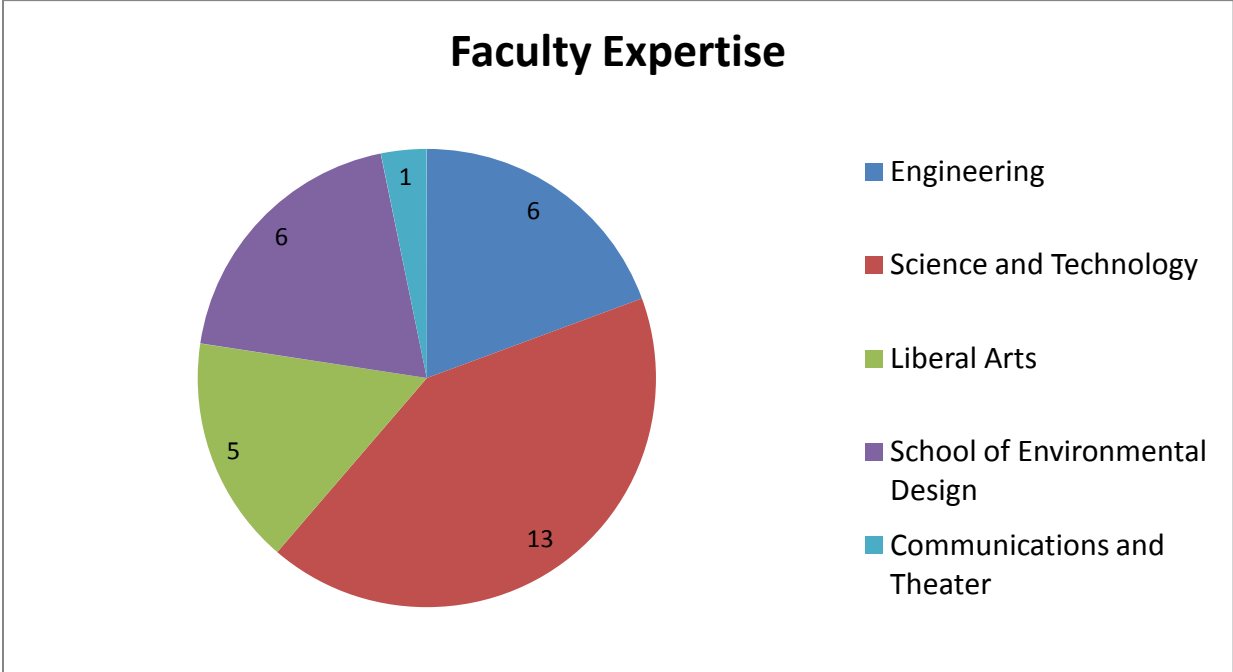
Research Locations: laboratory

Future Involvement in Water Interests:

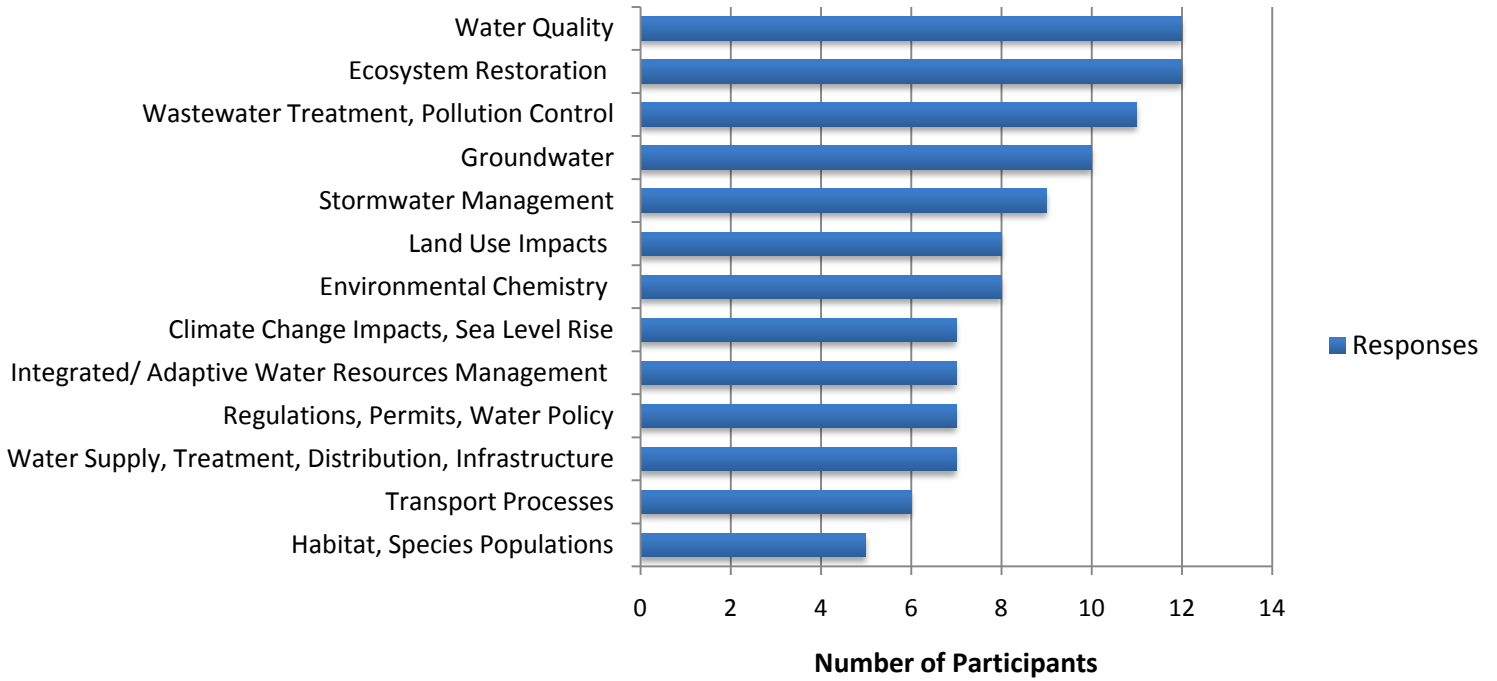
Future Research Interests:

Future Engagement Interests: Listserv member, Steering Committee, Working Group, Proposal Development

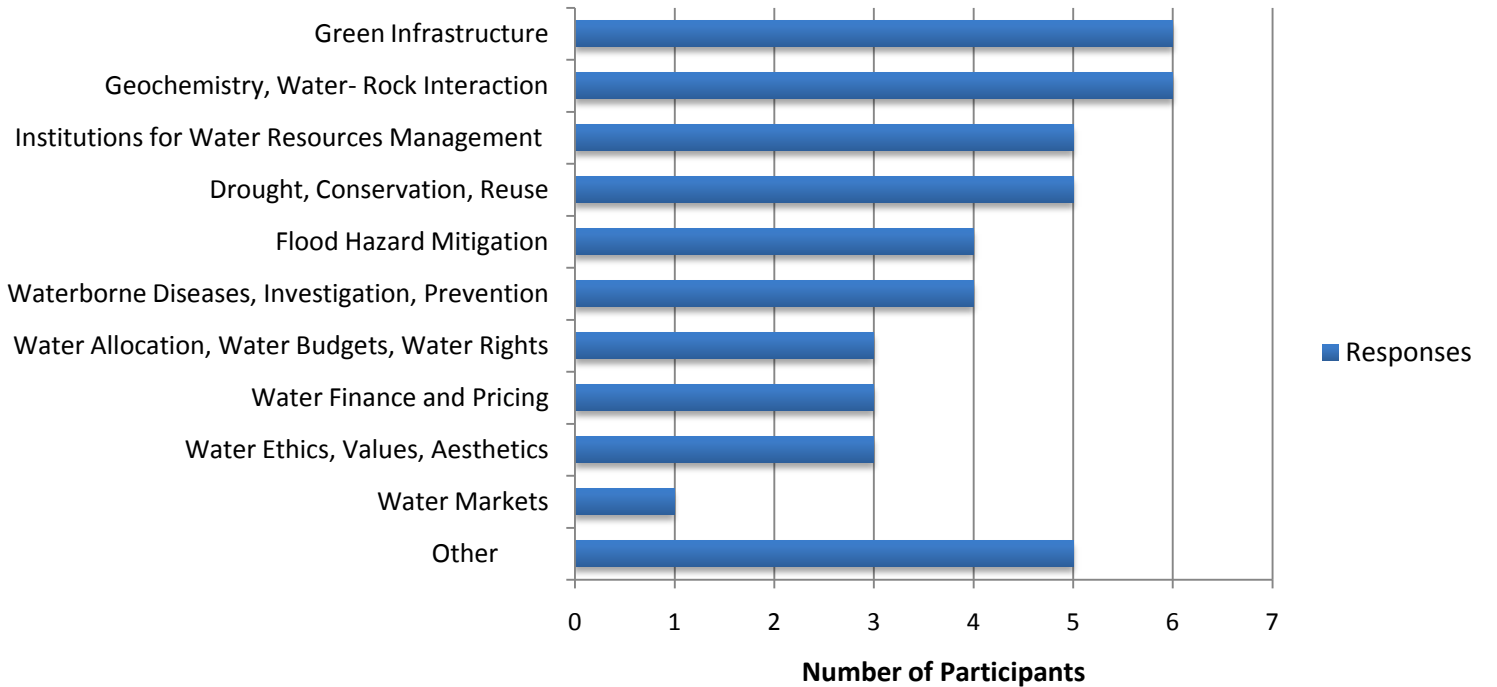
Analysis of Responses



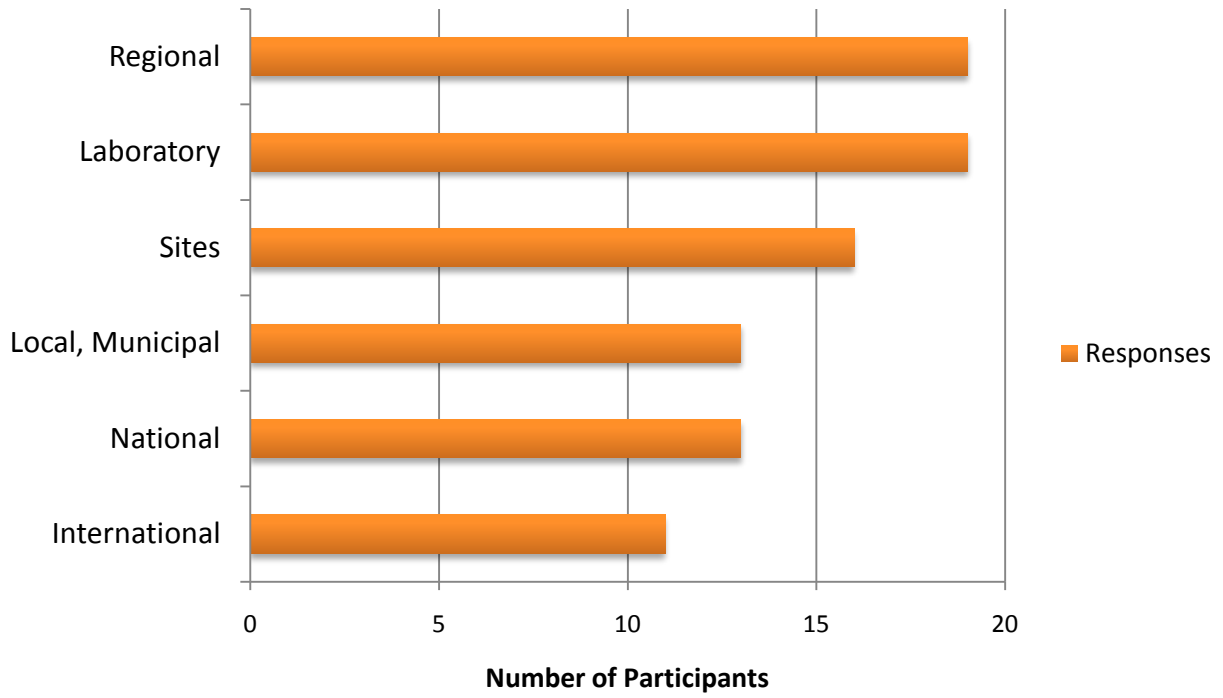
Areas of Research



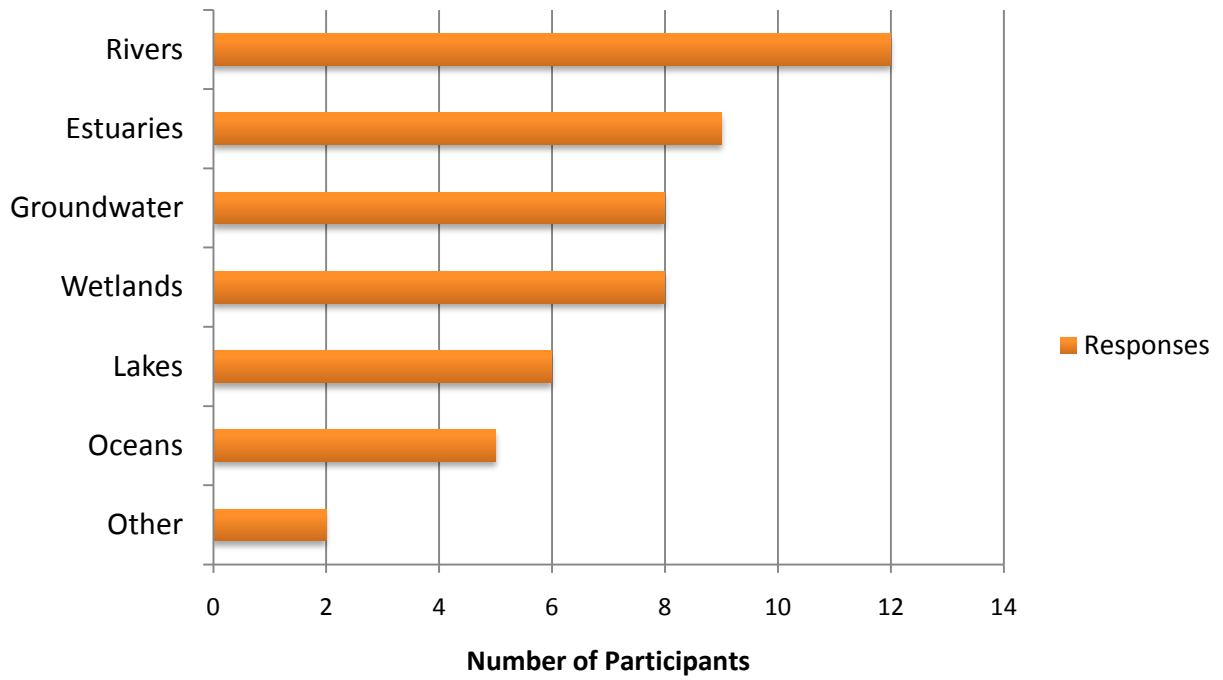
Areas of Research



Scale of Research: Location



Scale of Research: Type



Methods of Research

