

# Water Experts at University of Wisconsin – Milwaukee

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## Main Media Contacts

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## Contents – Who Should I Contact About...?

Main Media Contacts .....	1
Water Experts Guide .....	2
Great Lakes and Ecosystems .....	2
Nutrients/algae .....	5
Fish & fisheries/aquaculture & aquaponics .....	6
Invasive species .....	7
Water and cities .....	7
Lake levels, climate, weather .....	9
Water and Public health .....	10
Groundwater .....	12
Water policy .....	12
Water technology/industry .....	13

## **Water Experts Guide**

The following experts are listed by general area of expertise. They represent faculty and scientists from the School of Freshwater Sciences and other schools and colleges at UWM.

### **Great Lakes and Ecosystems**

#### **J. Val Klump, Dean, School of Freshwater Sciences**

[vkump@uwm.edu](mailto:vkump@uwm.edu) | (414) 382-1715

Klump is a leading expert on the Great Lakes with specific emphasis on the impacts of nutrient contamination and hypoxic “dead zones.” This work has taken him from the deepest soundings in Lakes Superior and Michigan aboard a research submersible, to the largest and oldest lake in the world—Lake Baikal in eastern Siberia. His recent research highlights the presence and dynamics of “dead zones” in Green Bay including the impact climate change has on their extent and duration. He is currently focused on developing nutrient contamination models that will allow policy makers to restore the Green Bay ecosystem.

Klump serves on the boards of the International Joint Commission’s Science Advisory Board Research Coordination Council, the NOAA Integrated Ocean Observing System Federal Advisory Committee, the National Association of Marine Laboratories Executive Board, the Wisconsin Sea Grant Advisory Council, and the Discovery World Board of Directors.

Contact him with questions about: Great Lakes, "dead zones," algal blooms, hypoxia, Green Bay, Lake Erie, nutrient contamination.

#### **Carmen Aguilar, Associate Scientist, School of Freshwater Sciences**

[aguilar@uwm.edu](mailto:aguilar@uwm.edu) | (414) 382-1755

Aguilar is an expert on biogeochemical cycles in aquatic environments. From small kettles like Elkhart Lake to coastal and open-water Lake Michigan, she specializes in plankton ecology and the effects of invasive species including quagga and zebra mussels. Aguilar is also involved in numerous outreach and science education efforts, working with community members, teachers, and K-12 students.

Contact her with questions about: Great Lakes, invasive species, nutrient contamination such as phosphorus, food webs, ecosystems, algae, quagga and zebra mussels, Science Education.

#### **Harvey Bootsma, Associate Professor, School of Freshwater Sciences**

[hbootsma@uwm.edu](mailto:hbootsma@uwm.edu) | (414) 382-1717

Bootsma is focused on large lake systems, including Laurentian Great Lakes, the African Great Lakes, and lakes in South America. His specific expertise includes nutrient dynamics, algal ecology, invasive species, and ecosystem response to land use and climate change. This research is facilitated in part by the development of sensors and instruments that allow for continuous, in situ measurements of physical, chemical and biological properties. Bootsma’s research on the African Great Lakes has been used to guide management policy within the region, and his research on the North American Great Lakes has provided insight into the causes and consequences of nuisance algal blooms, and helped to define nutrient management goals such as Total Mass Daily Loads (TMDLs).

Contact him with questions about: General Great Lakes, Tropical Great Lakes, nutrient contamination such as phosphorus, TMDLs, invasive species, food webs, quagga and zebra mussels.

## Water Experts at University of Wisconsin - Milwaukee

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### **Russell Cuhel, Senior Scientist, School of Freshwater Sciences**

rcuhel@uwm.edu | (414) 382-1711

A trained oceanographer with vast experience on Lake Michigan and elsewhere, Cuhel's focus is on complex lake systems and how they change due to invasive species and climate change. He has particular expertise on how nutrients are cycled through the system, affecting plankton productivity and algal growth, as well as how invasive species such as quagga and zebra mussels alter those cycles and impact the ecosystem. Cuhel is also involved in outreach and science education.

Contact him with questions about: changes in Lake Michigan over time, invasive species, zebra and quagga mussels, algae and bacteria, plankton, and hydrothermal vents.

### **Laodong Guo, Professor, School of Freshwater Sciences**

guol@uwm.edu | (414) 382-1742

Guo's major research focus is on aquatic biogeochemistry at river-lake and land-ocean interfaces, with an emphasis on the fate, transport and reactivity of carbon, nutrients and other chemicals. He also has interests in oil pollution and toxicity of nanoparticles. Guo has published over 150 peer-reviewed papers and book-chapters in the fields of earth and environmental sciences. He currently serves as an editorial board member of Scientific Reports and the Journal of Riparian Ecology and Conservation.

Contact Guo with questions about: natural organic matter, water quality, phosphorus and carbon cycling, impacts of invasive quagga mussels, oil pollution, transport of organics and nutrients along the river-lake continuum.

### **Jerry Kaster, Associate Professor, School of Freshwater Sciences**

jlk@uwm.edu | (262) 949-0842

Kaster is an expert on benthic (mud and the bottom of aquatic systems) ecology and the invertebrates that live there. He has spent decades looking at how chemicals and other contaminants have impacted benthic systems and resulting altered ecosystems and fisheries. He is currently focused on the reintroduction of mayflies to the Green Bay ecosystem, which will provide an important step in the development of a world-class sport fishery in the bay. Jerry is also an expert on river systems and spent many years conducting research on Yellowstone Lake.

Contact him with questions about: aquatic invertebrates, mayflies, sediment and mud, impacts of legacy contaminants, river systems.

### **Ryan Newton, Assistant Professor, School of Freshwater Sciences**

newtonr@uwm.edu | (414) 382-1747

Newton is a microbial ecologist who studies the microorganisms (bacteria & archaea) that inhabit aquatic ecosystems. His research focuses on how human activity influences change in microbial community composition, activity, and genomic content. Current research projects include the microbial composition of wastewater and stormwater systems, microbial genomics in the Laurentian Great Lakes, fish microbiomes, and groundwater microbiology.

Contact him with questions about: bacteria, microbiomes, DNA sequencing, bacterial genomics, urban water microbiology, fecal contamination.

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### **James Waples, Assistant Professor, School of Freshwater Sciences**

[jwaples@uwm.edu](mailto:jwaples@uwm.edu) | (414) 382-1741

Waples uses naturally occurring radioactive elements to investigate aquatic systems. His work focuses on developing new methods for measuring radioactive elements and new applications for employing these elements as tracers of age and transport. Recent work includes developing a new methodology for measuring radioactivity that was released to the Pacific Ocean after the Fukushima Daiichi nuclear disaster, and the use of naturally occurring radioactivity in water to measure: (1) the retention time of drinking water in an urban distribution system, (2) the transport of treated sewage effluent in Lake Michigan, and (3) the delivery of food to mussels living on the bottom of Lake Michigan.

Contact him with questions about: naturally occurring radioactivity.

### **John Berges, Professor, Biological Sciences**

[berges@uwm.edu](mailto:berges@uwm.edu) | (414) 229-3258

Berges tackles questions in ecology and cell biology in aquatic organisms using a range of biophysical, physiological, biochemical and molecular tools. They have a specific emphasis in planktonic systems, but also does work in benthic and near-shore processes, and he works across the spectrum of living things, from bacteria to fishes. His lab moves freely between the laboratory and the field. Our efforts have been informed by new genome sequence information becoming available, and we have been involved in several genome annotations of algal species.

Contact him about ecology and cell biology in aquatic organisms, phytoplankton and zooplankton.

### **Hector Bravo, Professor, College of Engineering and Applied Science**

[hrbravo@uwm.edu](mailto:hrbravo@uwm.edu) | (414) 229-6756

Bravo conducts research on computational hydraulics, including transport of pollutants and heat in surface water and groundwater, and two-phase flow. His recent research has focused on hydrodynamic modeling, spectral analysis of time series and climate variability.

Contact him with questions about pollutants in surface water and groundwater, climate change and surface water, Great Lakes modeling and dynamics.

### **Erica Young, Associate Professor, Biological Sciences**

[ebyoung@uwm.edu](mailto:ebyoung@uwm.edu) | (414) 229-3257

The research in Young's lab focuses on photosynthesis, nutrient acquisition and nutrient limitation in plants, algae and microbes in ecosystem scales from coastal oceans to large lakes to small ponds. Young also looks at the use of natural algal assemblages to strip nutrients from wastewater and produce biomass for biofuels production.

Contact her with questions about aquatic plants and algae, nutrients such as phosphorus, genetic and genomics of aquatic plants.

### **Timothy Ehlinger, Associate Professor, Biological Sciences**

[ehlinger@uwm.edu](mailto:ehlinger@uwm.edu) | (414) 229-4358

Ehlinger's research examines the cause and effect relationships between human-induced stressors and the ecological integrity of lakes, streams and rivers. His work incorporates landscape and watershed level processes, as well as detailed investigations of the habitat requirements, ecology and reproduction of fishes and aquatic invertebrates. These projects are often linked to the restoration or remediation of damaged ecosystems. Since 2001, he has also been working closely with collaborators in Romania and Costa Rica using watershed ecology as a foundation for planning sustainable development.

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## Water Experts at University of Wisconsin - Milwaukee

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**Michelle Johnson** (414) 229-7490 | **Laura Otto** (414) 229-6447

Contact him with questions about Aquatic Ecology, Stream Restoration and Sustainable Development.

### **Rudi Strickler, Shaw Distinguished Professor, Biological Sciences**

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Strickler's work in imaging microscopic aquatic zooplankters as they navigate and manipulate their watery habitats has reversed previous scholarship that asserted the tiny creatures survived by chance encounters. His research proved the tiny transparent relatives of shrimp, which populate both the sea and freshwater by the sextillions, act selectively in choosing their food, avoiding predators, and successfully pursuing a mate. It has redirected the course of inquiry in the field. Strickler uses high-speed video with optical systems including laser beams, animated GIFs files and high-magnification equipment has allowed him to track and compare the behavior of copepods, the main constituent of zooplankton. Strickler is applying the technique to the development of a tool that can detect invasive species in ballast.

In 2000, the National Science Foundation recognized Strickler in its bound report, "50 Years of Ocean Discovery," citing his research on zooplankton as one of four landmark achievements in biological oceanography. Nine years later, he was recognized by the American Society of Limnology and Oceanography (ASLO) with the John Martin Award for research published in 1981 with Mimi Koehl, a professor at the University of California, Berkeley. The award is reserved for papers at least 10 years old that have led to fundamental shifts in subsequent research.

Contact Strickler with questions about zooplankton ecology, invasive species in ballast water.

## Nutrients/algae

### **Todd Miller, Associate Professor, Zilber School of Public Health**

[millertr@uwm.edu](mailto:millertr@uwm.edu) | (414) 229-5097

Miller's research is multi-disciplinary in scope bridging the fields of microbiology, environmental chemistry, and ecology. His primary research is focused on understanding the physiology, ecology, and human health effects of cyanobacterial (i.e. blue green algal) toxins in freshwater lakes. In addition, his research group is characterizing the distribution of organic "man-made" chemicals in water, drinking water, and waste water including pharmaceuticals, personal care products, and other emerging chemicals of concern. Dr. Miller's research group is actively involved in monitoring Milwaukee beaches for hazardous microorganisms in partnership with the Milwaukee Health Department.

Contact with questions about algae, algal toxins in drinking water, water quality monitoring, microorganisms in drinking water.

### **Carmen Aguilar, Associate Scientist, School of Freshwater Sciences**

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See full bio on page 2.

### **Harvey Bootsma, Associate Professor, School of Freshwater Sciences**

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See full bio on page 2.

### **Russell Cuhel, Senior Scientist, School of Freshwater Sciences**

[rcuhel@uwm.edu](mailto:rcuhel@uwm.edu) | (414) 382-1711

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**Michelle Johnson** (414) 229-7490 | **Laura Otto** (414) 229-6447

**J. Val Klump, Dean, School of Freshwater Sciences**

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**John Berges, Professor, Biological Sciences**

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See full bio on page 4.

**Erica Young, Associate Professor, Biological Sciences**

ebyoung@uwm.edu | (414) 229-3257

See full bio on page 4.

## Fish & fisheries/aquaculture & aquaponics

**Fred Binkowski, Senior Scientist, School of Freshwater Sciences**

sturgeon@uwm.edu | (414) 382-1723

A fisheries and lake sturgeon expert, Binkowski is working to improve urban fish farming and create a sustainable aquaculture industry in the Midwest. His recent research is aimed at improving nutrition for farmed fish, better breeding and reproduction and improvements to aquaculture technology. As part of his work, he has established partnerships with the Milwaukee County Zoo, Chicago's Shedd Aquarium and Growing Power, an urban farm. Binkowski is also looking at naturally reproducing populations of Lake White Fish and has been involved with Lake Sturgeon conservation efforts for three decades.

Contact him with questions about: fish and fisheries, lake sturgeon, Great Lakes fishes, aquaculture, urban aquaculture.

**John Janssen, Professor, School of Freshwater Sciences**

jjanssen@uwm.edu | (414) 382-1733

Janssen is one of the leading experts on lake fishes, with particular expertise in mapping out nursery and forage habitat that allows for productive populations of desirable fishes. His work is instrumental in fisheries management decisions made by the Wisconsin Department of Natural Resources and other regional agencies. Recently he has collaborated with the U.S. Army Corps of Engineers on the design and construction of a "Green Breakwall" in Milwaukee's outer harbor that has created productive habitat. He is currently mapping the aquatic habitat of Milwaukee's entire Harbor District and providing that information to stakeholders looking to create a vibrant sport fishery and delist the harbor from the EPA's Areas of Concern list.

Contact him with questions about: fisheries biology, Great Lakes fishes, stocking and management, aquatic habitat, invasive fishes, Asian carp, habitat restoration/revitalization.

**Oswaldo Jhonatan Sepulveda Villet, Assistant Professor, School of Freshwater Sciences**

sepulveo@uwm.edu | (414) 382-1740

Villet focuses his research on urban and intensive aquaculture of Great Lakes fish species, population genetics of native species in the context of climate change, and the development of novel therapeutic and probiotic agents to reduce the incidence of early-life mortality and disease of cultured fishes used in fish farming.

## Water Experts at University of Wisconsin - Milwaukee

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Contact him with questions about: aquaculture, using DNA to identify fishes, fish genetics, population genetics.

### **Dong-Feng Deng, Senior Scientist, School of Freshwater Sciences**

dengd@uwm.edu

Deng is a fish nutritionist with expertise in both salt and freshwater fishes. Her main research focus is on the development of sustainable sources of fish food that maximizes growth rates and nutritional value of fish uses in aquaculture systems. She is currently developing non-traditional fish diets for specific life stages of aquaculture fish as well as exploring new ways to feed lake sturgeon as part of conservation efforts.

Contact her with questions about: fish nutrition, fish diets, development of fish food in commercial settings.

## Invasive species

### **Harvey Bootsma, Associate Professor, School of Freshwater Sciences**

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### **Russell Cuhel, Senior Scientist, School of Freshwater Sciences**

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### **Carmen Aguilar, Associate Scientist, School of Freshwater Sciences**

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### **John Janssen, Professor, School of Freshwater Sciences**

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See full bio on page 6.

### **Jerry Kaster, Associate Professor, School of Freshwater Sciences**

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See full bio on page 3.

## Water and cities

### **Rebecca Klaper, Professor, School of Freshwater Sciences and Director, Great Lakes Genomics Center**

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Klaper looks at the impacts of emerging contaminants from pharmaceuticals to agricultural run-off to urban run-off on aquatic organisms. Her works seeks to identify which of thousands of contaminants are potentially most harmful in the environment, and which are instead relatively benign. As director of the Great Lakes Genomics Center, she employs DNA sequencing and genomic methods to look at changes that are occurring in organisms at the molecular level. Klaper is also co-principal investigator

## Water Experts at University of Wisconsin - Milwaukee

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in the Center for Sustainable Nanotechnology, an NSF-funded, multi-university collaboration that working to develop nanomaterials that do no environmental harm.

Contact her with questions about: chemical contaminants in the water, water pollution, impacts of emerging contaminants such as pharmaceuticals, pesticides, herbicides, hormones, estrogens, endocrine disruptors, nanomaterials, urban and agricultural run-off, contaminants in wastewater, DNA sequencing/genetics/genomics and applications to aquatic and life sciences, policy questions related to water quality and regulations.

### **Sandra McLellan, Professor, School of Freshwater Sciences**

mclellan@uwm.edu | (414) 382-1747

A microbiologist, McLellan is looking for methods that better identify sources of fecal contamination in urban waters and at beaches, and to use those methods to improve public health. Her aim is to replace *E. coli* as the standard indicator organism and instead to use source specific indicators. In pursuit of this goal McLellan partners with the Milwaukee Metropolitan Sewerage District, the Milwaukee and Racine Health Departments, Milwaukee Riverkeepers, the Microbiology Lab at Woods Hole Oceanographic Institution, and many other organizations. Her work has been used to successfully clean up urban beaches in the Great Lakes, to identify leaky storm- and wastewater infrastructure in cities, and to determine whether “cleaned” beaches were free of oil after the Gulf Oil Spill.

Contact McLellan with questions about: urban water quality, fecal contamination, water pollution beach health, microbial communities in urban infrastructure, combined sewer overflow (CSO) events, *E. coli*.

### **Woosup Choi, Associate Professor, Geography**

choiw@uwm.edu | (414) 229-2671

Choi’s research activities emphasize understanding of the effects of climate change and urbanization on water-related environmental problems. In this context, he has conducted research on the potential impacts of climate change and land use change on the hydrology and water quality for several regions in the United States and Canada. Currently, his work focuses on the effect of urban areas on future climate scenarios and how it is going to affect the results from hydrological simulations. As preliminary work, he analyzed the spatial and temporal patterns of urban climate in the Midwest with financial support from the UWM Graduate School Research Committee. He also embarked on research fieldwork in Seoul, Korea to examine water quality in small streams that recently underwent restoration projects.

Contact him with questions about the effects of climate change and urbanization on water-related environmental problems, impacts of climate change on land use and water quality.

### **Nancy Frank, Interim Director, Center for Water Policy, Associate Professor, Urban Planning**

frankn@uwm.edu | (414) 229-5372

Frank has expertise in urban planning, brownfield reclamation, land use and watershed management. She is co-founder of the Southeast Wisconsin Watershed Trust (SWWT Water).

Contact her with questions about land use policies to protect the natural environment and ecosystem services, brownfield cleanup and redevelopment, and public participation in policy making.

### **Jim Wasley, Professor, Architecture, Director, Institute for Ecological Design**

jwasley@uwm.edu | (414) 229-4045



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## Water Experts at University of Wisconsin - Milwaukee

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Wasley's current research is in the creation of ecological urban waterscapes at a variety of scales. He has been designing and building stormwater demonstration projects on the UWM campus since 2005. Since 2011 he has led the school-wide Milwaukee Inner Harbor Project, which has explored the redevelopment and ecological restoration of the 200+ acres of brownfields surrounding the Port of Milwaukee. This has in turn led to a suite of ten demonstration projects on the harbor at the UWM School of Freshwater Sciences that are moving towards implementation. Other ongoing research interests include carbon neutral design, the evolution of environmental ratings systems, architectural daylighting, and the creation of 'extreme case' healthy environments.

He is the Past-President of both the Society of Building Science Educators and the Wisconsin Green Building Alliance: An Affiliate of the United States Green Building Council. He was a founding member of WGBA in 1997.

Contact Wasley with questions about sustainability, creation of ecologically sound buildings through site and climate responsive design relative to building type, stormwater, green infrastructure.

### **Sammis White, Professor Emeritus, Urban Planning**

sbwhite@uwm.edu | (414) 227-3203

White's research focuses on issues in public policy, economic development, education, and housing. He has specific interests in job creation and education in central cities. Dr. White was instrumental in the formation of the Milwaukee water cluster and positioning the region as a global leader of water technology and policy. More recently, he led a team of graduate students to complete a detailed analysis of the water issues and markets for capital expenditures in the U.S. and some 30 other countries. They identified current and near future issues that will be the focus of researchers and businesses in developing new solutions. Dr. White also has worked with Anhui Province, a large water market in China. The primary challenge of the provincial government is reducing the pollution in the region's largest lake and the source of its drinking water. The province is interested in working with both industry and universities in Wisconsin to develop appropriate solutions for their Chao Lake basin and potentially for application elsewhere.

Contact him with questions about public policy, water business/industry, water cluster, and water as an economic development tool.

### **Jenny Kehl, Associate Professor, School of Freshwater Sciences**

kehl@uwm.edu | (414) 382-1700

Kehl specializes in the political economy of water scarcity, with a focus on conflict resolution in transboundary water systems. She examines government negotiations with foreign investors in water and natural resource extraction, as well as water-use efficiency, water and food security, climate change in the Great Lakes, and water equity issues in urban areas. Her work has ranged from Colorado River water rights to the Great Lakes Compact to Nile River water disputes in Sudan and Egypt, as well as other water disputes across the world.

Contact her with questions about: water policy, Great Lakes Compact, international political economy and comparative development, water scarcity, transboundary water conflict and government negotiation, resolution of water resource allocation issues in Africa and Asia.

## Lake levels, climate, weather

### **Paul Roebber, Distinguished Professor, Atmospheric Sciences**

roebber@uwm.edu | (414) 229-3950

## Water Experts at University of Wisconsin - Milwaukee

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Roebber is regarded as one of the leading forecasting experts in the United States and the world, and his research has affected how future weather is determined today. Roebber's research has led to an improved method for forecasting snowfall which has recently been adopted as the standard methodology by the National Oceanic and Atmospheric Association's Hydrometeorological Prediction Center. In addition, his research group was the first to show that high-resolution weather prediction models can reliably predict the occurrence, mode and timing of thunderstorms within a region 24 to 48 hours in advance.

Roebber has applied his expertise in metrological processes and forecasting to issues of Great Lakes water levels, as well as flood and draught predication. His program Innovative Weather at UWM serves clients throughout southeast Wisconsin such as the Milwaukee Metropolitan Sewerage District, WE Energies, and the Milwaukee Brewers.

Contact him with questions about climate change, weather forecasting, lake levels, effects of climate change on Great Lakes, precipitation and flooding.

### **Sergey Kravtsov, Professor, Mathematical Sciences**

kravtsov@uwm.edu | (414) 229-4863

Kravtsov's work is directed towards understanding the Earth's climate variability, with an emphasis on the interactions between processes acting on small (synoptic) scales with larger-scale (regional-to-global) processes affect the overall climate behavior. This includes Earth's surface temperature trends, climate variability in the tropical Pacific and Southern Ocean, and variability of atmospheric jet streams. He approaches these problems via a combination of statistical data analyses and dynamical studies that employ a hierarchy of climate models.

Contact him about climate change and impacts on environment.

### **Woonsup Choi, Associate Professor, Geography**

choiw@uwm.edu | (414) 229-2671

See full bio on page 8.

## Water and public health

### **Michael Carvan, Professor, School of Freshwater Sciences**

carvanmj@uwm.edu | (414) 382-1706

Carvan uses genomic technologies to determine impacts of legacy contaminants such as mercury on aquatic organisms and human health. This includes how genes interact with their environment and how chemicals in the environment can affect behavioral development, physical development, and gene expression. His recent focus has been on the impacts of methyl mercury on human development, especially when a mother is exposed through her diet. This work explores how contamination in a mother can have impacts on her children and future generations through a process called epigenetics.

Contact him with questions about: contaminates and their impacts on aquatic organisms and human health, water pollution, mercury contamination, genetics, and genomics.

### **Reinhold Hutz, Professor, Biological Sciences**

rjhutz@uwm.edu | (414) 229-5416

Hutz' research has focused upon the reproductive effects of estrogens (natural and environmental pollutants with estrogenic activity) and pollutants that modulate the estrogen-receptor signaling pathway (e.g., dioxins). Such molecules can inhibit ovarian function and fertility in several mammals,

## Water Experts at University of Wisconsin - Milwaukee

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fish, and aquatic invertebrate species. The following is a more detailed synopsis of my research efforts.

Contact him about reproductive effects of estrogens and other pollutants.

### **Shangping Xu, Associate Professor, Geosciences**

xus@uwm.edu | (414) 229-6148

Xu's research focuses on the protection and sustainable use of groundwater resources. He explores and predicts the transport of contaminants such as bacteria and nanoparticles within the groundwater systems. Policy makers, scientists, engineers and concerned citizens can use the information to develop management, protection and remediation plans. Furthermore he looks at developing novel and inexpensive filters to remove contaminants from water. Finally, he explores how global climate change could potentially influence groundwater resources.

Contact him with questions about groundwater, contaminants in soil and groundwater, water filtration, and impacts of climate change on groundwater resources.

### **Yin Wang, Assistant Professor, College of Engineering**

Wang292@uwm.edu | (414) 229-4228

Wang's major research focus is to apply chemistry principles to develop innovative and sustainable solutions for water-related grand challenges. Some specific focuses include the development of material-based technologies for water and wastewater treatment, groundwater remediation, and resource recovery. He has published over 40 journal articles and conference presentations in the field of environmental science and engineering. He currently serves in the reviewer panel for RSC Advances.

Contact with questions about: drinking water supply and treatment, wastewater treatment and reclamation, water purification, environmental chemistry, advanced materials, and water energy nexus.

### **Jin Li, Professor, Civil & Environmental Engineering**

li@uwm.edu | (414) 229-6891

Li has taken on the challenge of incorporating rigid engineering standards into the ever-changing world of biology. She has researched storm water pollutants as well as the nanocatalysts for wastewater purification. She has also evaluated methane production from waste water systems and has written a number of articles on how E-Coli is contained and transported.

Contact with questions about: water and wastewater treatment, microbial biofilm, hazardous waste treatment, fate and transport of microbial pollutants in the environment.

### **Tim Grundl, Associate Dean of Academics, School of Freshwater Sciences/ Professor of Geosciences**

grundl@uwm.edu | (414) 229-4765

Grundl has a joint appointment in the School of Freshwater Sciences and the Department of Geosciences. His work explores the dynamics of the deep sandstone aquifer of the upper Midwest. He also looks at the effects on shallow aquifers if treated effluent is used to recharge the aquifer either directly or indirectly using riverbank filtration, as well as the development of a suite of in-situ probes for the rapid, screening-level detection of contamination in submerged sediments, such as those in harbors.

## Water Experts at University of Wisconsin - Milwaukee

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Contact him with questions about: groundwater contamination, groundwater regulation and policy, aquifers, groundwater depletion, impacts of wells, sediments and contamination in harbors, water quality monitoring, Great Lakes Compact, water diversions.

### **Rebecca Klaper, Professor, School of Freshwater Sciences and Director, Great Lakes Genomics Center**

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See full bio on page 7.

### **Sandra Mclellan, Professor, School of Freshwater Sciences**

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See full bio on page 8.

### **Ryan Newton, Assistant Professor, School of Freshwater Sciences**

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See full bio on page 3.

### **Todd Miller, Associate Professor, Zilber School of Public Health**

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See full bio on page 5.

### **Hector Bravo, Professor, College of Engineering and Applied Science**

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## Groundwater

### **Tim Grundl, Associate Dean of Academics, School of Freshwater Sciences/ Professor of Geosciences**

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### **Shangping Xu, Associate Professor, Geosciences**

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See full bio on page 11.

### **Hector Bravo, Professor, College of Engineering and Applied Science**

hrbravo@uwm.edu | (414) 229-6756

See full bio on page 4.

## Water policy

### **Peter McAvoy, Adjunct Professor, School of Freshwater Sciences**

mcavoy@uwm.edu

An environmental attorney by training, McAvoy has held several senior management and consulting positions with federal, state and local governments and the private sector on air, land and water quality issues over the past thirty-five years. This has ranged from VP of Sixteenth Street Community Health

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## Water Experts at University of Wisconsin - Milwaukee

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Center's Environmental Program on Milwaukee's near south side to the Great Lakes and Pacific Regional Administrator for the National Oceanic and Atmospheric Administration's U.S. Coastal Management Program, and many others. He currently is working with partners from the private sector, government and the academic community to shape new water resource policies and programs for Wisconsin and the Great Lakes Region including the effective implementation of the landmark Great Lakes Compact.

Contact him with questions about: water policy, water law, Great Lakes Compact, community health, coastal management.

### **Itziar Lazkano, Assistant Professor, Economics**

lazkano@uwm.edu

Lazkano explores economic growth, environmental and resource issues, and macroeconomics. She looks at sustainable growth over generations, economic growth and environmental policy with short-lived governments, and the capacity and non-compliance in quota regulated industries.

Contact her with questions about water economics, sustainability, natural resource management and economics.

### **Matthew McGinty, Associate Professor, Economics**

mmcginty@uwm.edu

Contact McGinty with questions about international environmental agreements, public policy, environmental economics and industrial organization. and Environmental Economics, Game Theory and Industrial Organization.

### **Nancy Frank, Interim Director, Center for Water Policy, Sustainability, preservation of open space**

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See full profile on page 8.

### **Jenny Kehl, Associate Professor, School of Freshwater Sciences**

kehl@uwm.edu | (414) 382-1700

See full bio on 9.

### **Sammis White, Professor Emeritus, Urban Planning**

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See full bio on page 9.

## Water technology/industry

### **David Garman, Associate Vice Chancellor, Water Technology Research, Development, and Commercialization**

garmand@uwm.edu

Garman is an international expert on water treatment technologies. At UWM he coordinates the efforts to develop and commercialize water technologies across Schools and Colleges, working with faculty and scientists from the School of Freshwater Sciences, College of Engineering and Applied Science, College of Letters and Sciences, and others. He runs the UWM Water Technology Accelerator (WaTA) on the 7<sup>th</sup> floor of Milwaukee's Global Water Center and is chief technology officer for the Water Council and its new ICE Institute.

## Water Experts at University of Wisconsin - Milwaukee

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**Michelle Johnson** (414) 229-7490 | **Laura Otto** (414) 229-6447

Contact him with questions about: water technology, water industry, water infrastructure, wastewater treatment, novel technologies applied to water, aquaculture, commercialization efforts.

### **Matthew Smith, Assistant Professor, School of Freshwater Sciences**

smith926@uwm.edu | (414) 382-1700

Smith's focus is on instrumentation and sensor development to monitor water conditions and to improve health and safety. Recently his focus has been on the automation of molecular biological methods that allow for the collection of DNA samples in aquatic environments over a long period. He has also partnered with the School of Public Health and the City of Milwaukee Health Department to install monitoring buoys at key area beaches.

Contact Smith with questions about: instrumentation and sensor development, detection of contaminants, water-quality and monitoring.

### **Ryo Amano, Professor, College of Engineering**

amano@uwm.edu | (414) 229-2345

Amano's research is on both water and energy that includes water treatment, multi-phase flow, hydro energy, and wind energy. Amano has published over 600 peer-reviewed research papers and four books and many book chapters on these research areas. Most of his research projects are funded by NSF and US Department of Energy (DOE). He currently serves as an editor for ASME Journal of Energy Resources Technology, Renewable Energy Journals, and several others.

Contact with questions about: water, aeration, wastewater treatment, and two-phase flow.

### **Qian Liao, Associate Professor, College of Engineering**

liao@uwm.edu | (414) 229-4228

Contact with questions about environmental fluid mechanics, quantitative imaging based flow measurement techniques, turbulent dispersion and mixing, fate and transport of chemical and biological constituents in environmental flows, lake circulation and dynamics, sediment transport, numerical simulation of environmental flows.

### **Junjie Niu, Assistant Professor, Materials Science & Engineering**

niu@uwm.edu | (414) 229-2424

Niu's major research focus is on Nanomaterials and Nanotechnology in Energy Storage and Energy-Water Nexus, including Superhydrophobicity in water self-cleaning, water purification and catalysis in energy-water nexus. Niu has published over 60 papers in peer-reviewed journals including three nature series journals and filed over three US patents. He currently serves as Associate Editor of RSC Advances.

Contact with questions about: self-cleaning water, heavy metal removal, anti-corrosion, anti-organics/biofilms, and energy storage.

### **Nidal Abu-Zahra, Associate Professor, College of Engineering**

nidal@uwm.edu | (414) 229-2668

A primary research activity of Abu-Zahra's group is the development of low cost, high efficiency, water filtration media using functionalized organic and inorganic materials; such as polymer foams and zeolites. Recent research projects are focused on the removal of heavy metals; such as lead and arsenic, from drinking water as well as industrial waste water. Dr. Abu-Zahra's water research has resulted in over twenty journal publications and several PhD and Master's theses.

Contact with questions about: Water applications of polymer nanocomposites.

## Water Experts at University of Wisconsin - Milwaukee

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Michelle Johnson (414) 229-7490 | Laura Otto (414) 229-6447

### **Junhong Chen, UWM Distinguished Professor, Mechanical Engineering**

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Chen's current research focuses on nanocarbon-based hybrid nanomaterials for sustainable energy and environment. Chen is a world-renowned expert on nanomaterials-based water sensors for real-time detection of various analytes in water (e.g., heavy metals and bacteria as contaminants and phosphates and nitrates as nutrients). Chen's research has led to 200 peer-reviewed journal papers that have been widely cited for over 6,000 times, 5 issued patents, 6 pending patents, and 9 licensing agreements. He is also a pioneer in technology commercialization through exemplary industrial partnership and the university start-up company.

Contact with questions about: nanomaterial innovations for sustainable energy and environment. Gas sensors (e.g., NO<sub>2</sub>, CO, NH<sub>3</sub>, H<sub>2</sub>S), water sensors (e.g., heavy metals), and biosensors (e.g., E. coli bacteria, proteins, Ebola virus).

### **Woo-Jin Chang, Assistant Professor, College of Engineering**

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Chang's major research focus is on water sensors, with an emphasis on the rapid, on-site, low-cost detection of contaminants from various water resources, such as heavy metals, pH, phosphate, sulfate, and pesticides. Chang has published over 56 peer-reviewed papers in the fields of bionanotechnology, microfluidics, sensors, bioseparation, and biomedical engineering.

Contact with questions about: water sensor, microfluidics, bioseparation, bionanotechnology, biomedical engineering, biochemical engineering, BioMEMS, and biosensor.

### **Rebecca Klaper, Professor, School of Freshwater Sciences and Director, Great Lakes Genomics Center**

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See full bio on page 7.

### **Shangping Xu, Associate Professor, Geosciences**

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### **Sammis White, Professor Emeritus, Urban Planning**

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### **Jin Li, Professor, Civil & Environmental Engineering**

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### **Yin Wang, Assistant Professor, College of Engineering**

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See full bio on page 11.