

UW-Platteville Faculty engaged in Sustainability Research, Spring 2017 Inventory



Dr. Mohammad Rabbani, College of EMS, Department of Chemistry

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Dr. Rabbani research entails the design and synthesis of porous organic polymers (POPs) and metal organic-frameworks (MOFs) for use in multidimensional applications which include gas separation and storage, heterogeneous catalysis, drug release, etc. His research project on POPs in carbon dioxide separation from gas mixture is particularly important to purify landfill gas (approximately 50/50 mixture of carbon dioxide and methane) and thus making the landfill gas a source of renewable energy. His catalytic project involves the preparation of recyclable and reusable heterogeneous catalysts using porous architectures for the conversion of carbon dioxide to useful chemicals.



Dr. Swagata Banerjee, College of BILSA, School of Agriculture

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When natural causes (such as droughts), non-natural causes (such as competing uses), or government policies limit the supply of water for agriculture in general and irrigating crops in particular, existing physical models reduce irrigation proportionally among crops in the farmer's portfolio, disregarding temporal changes in economic and/or institutional conditions, thus ignoring changes in crop mix resulting from expectations about risks and returns. The forecasting method we developed (using surface water data in Georgia and Alabama, and ground water data in Mississippi) considers those changes and accounts for economic substitution and expansion effects demonstrating the relative strength of our econometric modeling vis-à-vis physical methods. Results from policy-induced simulation scenarios indicate water savings of 12% to 27% using the innovative method developed. Although better irrigation water demand forecasting in crop production was the key objective of this line of research, conservation of a valuable natural resource (water) has turned out to be a key consequence.



Dr. Christopher Baxter, College of BILSA, School of Agriculture

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My research and extension activities relates to sustainability in a variety of ways. I have conducted research in the use of industrial byproducts and bio-based fertilizers in midwestern cropping system, evaluated land-use in watersheds to determine the impact of agricultural practices on water quality, and am currently testing methods to remediate soils impacted by historic mining activities in Southwest Wisconsin. My extension activities relate primarily to training producers and agronomy professionals in developing nutrient management plans and research related to improving nutrient recommendations for crops.



Dr. Gretchen Bohnhoff, College of EMS, Civil and Environmental Engineering

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My research interests include geoenvironmental engineering with a common theme of sustainable and novel solutions to waste containment and fate and transport of contaminants in the geoenvironment. My multidisciplinary background as both a geological and geoenvironmental engineer provides me the ability to develop sustainable solutions to a wide range of environmental issues including those

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resulting from both point (e.g., waste containment) and non-point (e.g., agricultural) source pollution and energy considerations, such as carbon sequestration and radioactive waste disposal.



Dennis Busch, College of BILSA, Department of Agriculture
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Dennis Busch is the Research Leader at the University of Wisconsin-Platteville Pioneer Farm, an applied agricultural research facility located in the driftless area of southwest Wisconsin. Dennis is responsible for directing research activities at UW-Platteville Pioneer Farm related to the Wisconsin Agricultural Stewardship Initiative, the United States Department of Agriculture's Long-Term Agroecosystem Research Project, and the Global Farm Platform. Dennis' research is focused on monitoring surface-water runoff from agricultural landscapes to determine the impact of farming practices on the environment. In addition, Dennis is developing and testing alternative, low-cost methods for monitoring edge-of-field surface-water runoff.



Dr. Jorge Camacho, College of EMS, Mechanical Engineering
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I am conducting research in the production of hydrogen from algae. The work consists on developing an efficient process to extract hydrogen utilizing microfluidic technology. Microfluidics allows precise control of the cellular environment to reduce the time in microalgae culture and improve hydrogen production. Hydrogen gas could be an ideal energy carrier because it is easily converted to electricity in fuel cells that generates no air pollutants and yields a large amount of energy per unit mass. This work is part of a current mechanical engineering senior design and it will be part of my Microfluidics class that I am going to teach next semester, Fall 2017.



Dr. Andrew Cartmill, College of BILSA, School of Agriculture
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My research interests focus on a variety of sustainable production and ecological topics, including mycorrhizal associations during production, plant response to environmental and production stresses, water quality, plant nutrition, and below ground responses (root dynamics, soil respiration) to climate change drivers, grazing, and production. Current Projects: 1. Establishment of a hydrologic observatory to support long-term agro-ecosystem research, education, and outreach in the upper Mississippi river basin. 2. Incorporating dairy livestock into agroecosystem research: Grazing responsibly for a sustainable tomorrow. 3. Effect of different production practices on soil respiration, plant water potential, and leaf level gas exchange.



Dr. Donita Cartmill, College of BILSA, School of Agriculture
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My research interests include nursery production practices, landscape establishment of woody ornamentals, and sustainable horticultural practices.

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Dr. Kristina Fields, College of EMS, Civil and Environmental Engineering

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My work focuses in the area of sustainable transportation, specifically creating safe and convenient community cycling infrastructure for all ages. The goal is creating connections between home, school, work, shopping, library, and parks which is attempted through pre-college outreach and work with the City of Platteville Community Safe Routes Committee. Additionally, I am researching sustainable safety, the Dutch's approach to creating safe transportation design (the Dutch version of Vision Zero or goal for zero transportation fatalities) and have compared their principles to local designs. I collaborate with our university's partner institution Windesheim University in Zwolle, The Netherlands and in Summer 2017, I will lead a short term study abroad course, Cycling Infrastructure in The Netherlands in which students and I will explore all things that make cycling infrastructure awesome in Holland.

Dawn Freese College of LAE, Humanities

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Dawn Freese's interest in issues of sustainability began with her graduate work at Marquette University, where she studied the literature of great naturalist and regionalist writers like Muir, Audubon, Twain and Wisconsin's own Leopold. Her purpose as a teacher of writing at the University of Wisconsin-Platteville, is twofold: to teach students to be effective writers throughout their university coursework, into their professions; and to encourage lifelong engagement with global issues that will likely shape their futures. Effective writing and global engagement intersect in her College Writing II course, where she guides students to make strong written arguments for cutting-edge solutions to the problems of global sustainability.



Dr. Jeff Huebschman, College of BILSA, Biology

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Since 2004 I have conducted bat mist-net surveys in Grant County, Wisconsin with the objective of collecting baseline data on species richness and relative abundance, reproduction patterns, and other life history data. In 2014, white-nose syndrome -a disease that is decimating North American bat populations was detected in Wisconsin, specifically in Grant County. It has subsequently been found throughout southwest Wisconsin and beyond. Through annual surveys, my students and I continue to monitor bat populations in southwest Wisconsin, which are showing declines for some species. Declining North American bat populations will have broad-scale ecological and economic impacts.



Dr. Evan Larson, College of LAE, Department of Geography

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My research focuses on reconstructing past environments to gain a more complete understanding of the range of conditions we have experienced in the past in order to better prepare for the future. A few examples of the projects my students and I have worked on including reconstructing changes in rainfall and drought conditions and their relationship to water resources, the historical occurrence of forest fires and their implications for modern conservation efforts, and variability in the water levels of the Great Lakes over

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the past 400 years. All of these projects enable a more holistic understanding of environmental change and how these changes affect and are related to human activities in order to help create a more sustainable future.



Dr. Philip Parker, College of EMS, Civil and Environmental Engineering

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Dr. Philip Parker teaches a course titled "Site Design with Stormwater Applications" (CIVILENG4640) that introduces students to concepts of sustainability as it relates to land development. He also directs the Center for Infrastructure Transformation and Education (www.cit-e.org), which is creating a model introduction to infrastructure course; one of the outcomes of this course is to "Explain how infrastructure solutions affect society, the environment, and finances (i.e. the "triple bottom line")"



Dr. Michael Penn, College of EMS, Civil and Environmental Engineering

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Teaching, research and consulting interests include: economic, social and environmental impacts of infrastructure; water conservation and reuse; infiltration and inflow of "clear water" into wastewater collection systems; quantity and quality of urban and agricultural stormwater; solid waste minimization and beneficial reuse; K-12 outreach and education.



Dr. Kurt Rolle, College of EMS, Mechanical & Industrial Engineering

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I am involved with renewable/sustainable issues. I have been developing these on my property: Photovoltaics, Geothermal heating/cooling, evacuated tube heat pipe solar collector for hot water, super insulations, and biomass heating. I have been doing Wind and solar energy (Energy SystCollege of EMS Design) here at UWP since 1980.



Scott Sandholm, College of EMS, Department of Chemistry

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Dr. Staci Strobl, College of BILSA, Criminal Justice

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The Isle de Jean Charles, an island off the coast of Louisiana, is steadily disappearing into the sea. The Biloxi-Chitimacha-Choctaw, a Native American community living on the island and dependent on it for fishing and crabbing, is the first community in the United States who will collectively relocate due to sea-

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level rise resulting in coastal land loss. My colleagues (Dr. Lieselot Bisschop and Dr. Julie Viollaz) and I have been conducting a series of community and expert interviews about perceptions of the multitude of ecological, social, political, and economic drivers of the harm faced by the Biloxi-Chitimacha-Choctaw community in order to holistically understand the problem and proposed solutions, drawing on green criminology, state-corporate crime, and sustainability theories and practices.



Dr. Chris Underwood, College of LAE, Department of Geography

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One of the most intriguing aspects of paleoecology is deciphering ecosystem change over time and, thus, developing a better understanding of the relationship between environmental change and life. A more thorough understanding of past global change can then be used to inform modern conservation and sustainability efforts.



Dr. Muthu Venkateshwaran, College of BILSA, School of Agriculture

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My ongoing research focuses on understanding the molecular mechanisms of plant-microbe symbiotic signaling (legume-rhizobia symbiosis, arbuscular mycorrhization and ectomycorrhization) and plant defense signaling for crop improvement, with an aim to promote sustainability in agriculture.



Dr. Scott White, College of BILSA, School of Business

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I am interested in environmental regulatory compliance issues and alternative financing for sustainability projects.



April White Feiden, College of LAE, Humanities

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My research relates to the social side of sustainability, the foundation of which is to question stereotypical thinking patterns as they converge with literacy and civility. I'm especially interested in how this convergence affects students' academic and professional life trajectories.

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Dr. Scott Wright, College of BILSA, School of Business

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My research interests focus on residential point-of-use renewable energy technologies for off-grid, exo-home applications that include small-scale solar harvesting, water-powered turbines, and vertical wind turbines. Other interests include business models that embrace sustainability without leading to bankruptcy; and scholarly research in project time estimation versus actual time requirements to complete student led projects in a time-constrained project lifecycle.



Dr. Kris Wright, College of BILSA, Biology

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My research involves assessing the restoration of trout streams in SW Wisconsin. Land-use practices of the past compromised habitat and trout populations in streams throughout the upper Midwest. Recently, conservation groups and resource agencies have made significant efforts to ensure the sustainability of these valuable resources. My research monitors and assesses the long-term impacts of those efforts.