

UNIVERSITY of WISCONSIN GREEN BAY

College of Science, Engineering and Technology Newsletter

Summer/Fall 2021

Highlights

New Faculty Tiny Earth Rocket Club Win Competition Dairy Nutrition Videos Moss Discovery **Faculty Recognitions Convocation** Awards **Chemistry Faculties Meeting Faculty Spotlights** Concussion Facts MAT Accreditation Wearable Concussion Detector Water Bird Research NERR Update UWGB and Bay College Water Science Student Sponsored Research Donor Spotlight Student Spotlight

The Dean's Message, John Katers

With the 2021-22 academic year now well underway, it has been refreshing to see CSET students taking the majority of their classes face-to -face and fully utilizing the outstanding facilities at UW-Green Bay. There has once again been enrollment growth at UW-Green Bay, clearly demonstrating the positive impacts of a new mission and the many new programs being offered to meet the needs of the region. This fall has also been marked by significant work on accreditation, including a universitywide site visit completed by the Higher Learning Commission, as well as program-specific visits completed by ABET for the three engineering technology programs and planned visits by ACEND for the undergraduate and graduate programs in nutrition and dietetics. This follows the accreditation of the Master of Athletic Training program earlier this year, with accreditation being an important step in demonstrating the quality of the programs being offered in CSET. We have once again added many new faculty and staff members, including our first tenure-track faculty member in mechanical engineering at the Sheboygan campus—a much needed position for the Resch School of Engineering, while noting that there are nearly 20 students enrolled in the new electrical engineering program that started this fall. There will also be some exciting developments in the Cofrin Arboretum, as several bridges will be replaced in the coming months, thereby enhancing the value of this important campus and community resource. Please review the newsletter, as much continues to be accomplished in CSET through our focus on People, Programs, and Partnerships.

Check out the College of Science, Engineering and Technology website! uwgb.edu/cset

Welcome New Faculty & Staff



Tina Tackmier Academic Department Associate BA: UW-Green Bay



Rizwen Rahman Assistant Professor Mechanical Engineering PhD: UW-Milwaukee



Carlos Gonzalez-Valle Assistant Professor Mechanical Engineering PhD: Pennsylvania State University

High School Females from Green Bay West High School Become Researchers Through Tiny Earth Program

UW-Green Bay Associate Professor, Brian Merkel, has been working on a high-impact community project with Green Bay West High School's, Serious About STEM program. The Serious About Stem program and UW-Green Bay's College of Science, Engineering and Technology, are forming a partnership to educate at-risk female high school students in the Tiny Earth curriculum.

During the summer, Merkel and his team ran a skill-development camp for two weeks. This camp helped prepare them to conduct Tiny Earth research—identifying bacteria in the ground that can cure antibiotic-resistant diseases—over 14 weeks at UWGB during the fall. These students will be presenting their findings at the Tiny Earth winter symposium at the Lambeau Field Atrium in December of 2021.



Sheboygan Campus Wins Collegiate Rocket Competition

Congratulations to Patrick Isken, Owen Rubenis, Dylan Schmidt and Ryan Bucholz, UW-Green Bay, Sheboygan Campus students, and advisor, Associate Professor Bill Dirienzo (Physics, NAS), on winning this year's Collegiate Rocket Competition!

The competition is open to Wisconsin Space Grant Consortium (WSGC) member schools for teams of 4-6 students. There are no other requirements. The teams design and build a custom high-powered rocket according to the competition guidelines, including a challenge unique to each year's competition. Team members build the rocket and its internal electronics. They use software like CAD and RockSim to design and simulate the rocket design before building.

Eight colleges and universities participated in the program. The overall winners received a cash prize and are invited to Sierra Space Badger Army Ammunition plant in North Freedom, Wisconsin for a VIP tour.

According to Dirienzo, the team had to write three reports over the course of the year, do a low-powered test flight on campus with a tiny model rocket, give a presentation, and successfully launch the rocket at Bong Recreation Area in Kenosha County in April. The students presented their rocket at the annual Wisconsin Space Conference in August, held at MSOE.

Dirienzo said he would like to thank technical advisors Randy & Carol Lutz, campus members who supported the team, and WSGC for funding the program.



Wisconsin Ag Connection: Dairy Nutrition Videos Available

The Dairy Farmers of Wisconsin have partnered with the University of Wisconsin Green Bay Dietetics Program to develop a 'Dairy Nutrition 101' training series to help equip Champions of Dairy with a basic understanding of nutrition terms and topics relevant to dairy and dairy promotion. These three training modules provide quick and easy to understand nutritional background information and terms that are relevant to dairy nutrition. The videos will help you answer the question 'Why is dairy good for me?' Modules provide basic dairy nutrition background, such as background info on nutrition for Americans, nutrition about dairy, why you should consume dairy, health benefits of dairy, and how much dairy to include in your diet. To access the files, go to: <u>https://wisconsindairy.org</u>

UW-Green Bay Faculty Member Makes a 'Moss' Exciting Discovery

In the average lawn, moss is rarely a welcomed sight. (Usually indicating poor soil nutrient levels and drainage issues.) But in Keir Wefferling's world, as curator of the Fewless Herbarium within UW-Green Bay's Cofrin Center of Biodiversity, encountering moss is not only welcomed but occasionally transformational. That was the case one morning this fall when he, along with a couple of eager volunteers, Joan Berkopec and Ron Eicchorn, went trekking through a sedge meadow in northeastern Wisconsin, happened upon *Paludella squarrosa* or "tufted fen moss". To any passing hiker with an

untrained eye—just another plant. But this expedition's mission was to perform a preliminary bryological (mossy things) survey of the region. And even to Wefferling's well-trained eyes, this was a mossy thing he had never seen before. "When I saw it, I didn't know what it was. I knew it was a moss and I knew it was a moss I'd never seen before. It was just unique looking."

Wefferling knows his plants. In fact, that's why he's here starting in August 2020 as an assistant professor and Herbarium curator. Since then, an interest in moss has grown on him. "I started my studies with the flowering plants and then got into ferns. Only in the past year, while exploring Wisconsin, have I really begun to appreciate mosses. I would say moss is under-appreciated and not just in its usefulness to humans. They're cool and valuable in their own right."

What's also underappreciated is the Fewless Herbarium's

wealth of about 45,000 painstakingly dried, cataloged plant specimens tucked away in the basement of Mary Ann Cofrin Hall next to the Richter Museum of Natural History (also part of the Cofrin Center for Biodiversity, housing animal specimens). As Wefferling explains, much like the plants themselves, this is a museum that leads a quiet existence. "All the specimens are in cabinets. To look at a specific plant you go to that cabinet and pull out the folder, bring it to a table and open it up to look at that plant." But that doesn't mean that the work going on, or the plants collected inside, aren't important. "The museum isn't just to hold specimens, just to sit there. Herbarium specimens are actively used for research; borrowed and loaned to other herbaria, potentially all over the world. We ship specimens to other herbaria, and somebody may borrow them for one or two years."

Internship opportunities also exist for graduate students in Environmental Science and Policy— a flourishing program with currently more than 30 students. And as for any undergraduate student who enjoys collecting and time spent with pressed plants, work-study opportunities are also available.

Plans are in the works to photograph, digitize and upload the collection to a free and open portal to make the collection more accessible. That information would help clarify the understanding of the geographic and ecological relationships of plants throughout the region. And that effort aligns with one of the University's core strategic priorities to make a profoundly positive impact on the environment of our region.

As far as the impact of discovering *Paludella squarrosa* in Wisconsin? Wefferling will be presenting his findings at the Wisconsin Wetland Association meeting next February. Plus the exact location of the moss remains as closely held as a coveted morel mushroom patch. For those who ask the inevitable "so what?" Wefferling's answer rings true to the mission of all universities—that making a fresh discovery, even of a humble moss, and creating new knowledge is always eventful. "It's never been found—at least not by botanists—in the State over all the years of exploration and scientific study. And it's presumably been here the whole time. Of course it may be known by people of First Nations, and is therefore not a "discovery" so much as a "discovery to Western Science." Whatever the case, the recorded knowledge of our regional flora is apparently—and excitingly—incomplete."

Stay tuned for the next chapter in search of the lost moss.



Welcome New Faculty & Staff



Cassie Groeschl Lecturer Nutrition MS: University of Illinois at Chicago



Andrea Davidson Lecturer Human Biology DC: Plamer College of Chiropractic



William Jacobson Lecturer Geoscience PhD: UW-Milwaukee

Welcome New Faculty & Staff



Mahmoud Hammouri Assistant Professor Physics PhD: New Mexico State University



Gaoci Lo-Yang Academic Advisor MS: Kutztown University of Pennsylvania



Alex Kurowski Academic Advisor MS: UW-Oshkosh



Amy Van Oss Academic Advisor BA: Concordia University

Faculty Recognition/Achievements

Congratulations to the following faculty on receiving the Student Nominated Teaching Recognition award: Devin Bickner, Vanessa Brotske, Jared Dalberg, Greg Davis, Terrisa Deprez, Ruth Hayden, Michael Hencheck, Georgette Heyrman, Maruf Hossain, Woo Jeon, James Kabrhel, Amy Kabhrel, Carly Kibbe, Mark Klemp, Jillian Kurovski, John Luczaj, Daniel Meinhardt, Steve Meyer, Mai Moua, Amanda Nelson, Kiel Nikolakakis, Mark Norfleet, Renee Richer, Wesley Shroeder, Tracy Smith-Leiker, Sara Wagner, Kenneth Webb, and Amy Wolf.

Congratulations to **Dean John Katers** on receiving the William C. Boyle Educator of the Year award. This award recognizes accomplishments in



education and development of future water environment professionals by educators at all levels.

Congratulations to **Maruf Hossain** on his publications in the reputed Institute of Electrical and Electronics Engineer



d Electronics Engineer (IEEE) Transactions on Power Electronics, IEEE Transactions on Industrial Informatics, and IEEE Transactions on Instrumentation and Measure-

ment. The latter publication is an international collaborative work led by Hossain.

Congratulations to **Michael Holly** on publishing a paper in the Journal of Cleaner Production. The article was an

effort of the USDA's Dairy Agro-ecosystems Working Group and was facilitated by characterization of United States dairy farming by Professor Holly.



Congratulations to **Patrick Forsythe** on publishing a paper on juvenile pike



ecology in Green Bay. A co-author on the paper includes former undergraduate, Amy Cottrell (biology).

Congratulations to **Mo**hammad Upal Mahfuz on his contribution to the Editorial section entitled "Editorial: Biologically inspired com-



puting and networking" in Mobile Networks and Applications journal.

Congratulations to **John Luczaj** on coauthoring an article in the Geological



Society of America Bulletin. The article documents the ages and conditions of the mineral calcite that when water formed percolated into a fault zone near the Dead

Sea region of Israel between 20 million and 13 million years ago. Luczaj's contribution was fluid-inclusion microthermometry of the calcite crystals.

Congratulations to **Mandeep Singh Bakshi** on his publication in Journal Molecular Liquids titled "Solubilization of surfactant stabilized gold nanoparticles in oil-in-water and water-

in-oil microemulsions" and his publication in American Chemical Society "Langmuir" that describes the potential applications of magnet-



ic nanomaterials for extracting pollutants from contaminated water.



Congratulations to **Jian Zhang** on being selected to receive the Best Paper Award— Second Place at the 2021 ASME 15th

International Conference on Energy Sustainability.

CSET Faculty and Staff Receive Awards at 2021 Fall Convocation

The College of Science, Engineering and Technology Dean John Katers presented Professor and Chair of the Richard School of Engineering, Patricia Terry, with the first Wisconsin Public Service Professorship in Engineering at the 2021 Fall Convocation. In his introduction, Dean Katers said Professor Terry's "breadth, depth, and ongoing record of achievement is remarkable, in particular her leadership in the development of the Resch School of Engineering. Patricia has worked tirelessly to advance engineering programs at UW-Green Bay and is an outstanding example of someone with a record of achievement necessary for a named professorship."





This year's recipient of the University Staff Award for Excellence was Amy Ibuaka, Dean Assistant. The letter of nomination for the recipient of the University Staff Award for Excellence began by saying, it "was a fortuitous day for everyone in the college" when this nominee joined the College of Science, Engineering, Technology. Colleagues enthusiastically and described her work ethic, patience, thoughtfulness, and ability to communicate. She holds a great amount of institutional knowledge and is the go-to person for questions on a wide range of topics. She has a great ability to anticipate issues that might arise, and find solutions for them. Her nominators noted that these qualities were especially valuable as CSET integrated many new faculty members from

Marinette, Manitowoc and Sheboygan, established the Resch School of Engineering, and opened the STEM Innovation Center. They believe that her effort shows she is incredibly deserving of this award.

This year's recipient of the Faculty Award for Excellence in Teaching was Brian Merkel. He was recognized for his outstanding teaching all the way from high school students in summer programs at UW-Green Bay, through general education courses, upper level courses in the major, as an internship and undergraduate research supervisor, right through to graduate-level courses. Students have especially noted his enthusiasm for the topics he is teaching, and his ability to draw students into what can be challenging material. Students also greatly appreciate his mentorship abilities, as one alumnus stated, "Brian has proven that mentoring students does not end at the completion of the class or upon graduation, as he continues to actively work with students to help them succeed in their careers." In



fact, many viewers of this newsletter can say that this person has also taught them through his COVID-19: Why It Matters to You video series. You can watch the video series here: https://www.youtube.com/watch?v=M-yYPSPk30Q

UWGB Hosts 45th Annual University of Wisconsin System Chemistry Faculties Meeting



The faculty and staff of the University of Wisconsin—Green Bay hosted the 45th annual University of Wisconsin System Chemistry Faculties Meeting virtually on November 4th and 5th.

This annual meeting, which rotates around the state, allows chemists throughout the UW System to gather and discuss teaching, research, learning, and scholarship.

The two-day event, which was attended by more than 80 people, kicked off with a presentation Nicoletta from Dr. Faraone (Acadia University) on Natural Products Chemistry. Workshops, breakout sessions and networking opportunities filled the remainder of the time before ending the meeting with a presentation by Kristen Intemann (Montana State University) called *Is there a war* on science? Understanding and addressing resistance to scientific claims and policy.



Interesting Facts About Concussions

The CDC estimates that between 1.6-3.8 million sport and recreation related concussions occur in the United States each year (CDC)

An athlete who sustains a concussion is 4-6 times more likely to sustain a second concussion (Brain Injury Research Institute)



Concussions can be treated with rehabilitative exercises under the care of a medical provider such as an athletic trainer, physician, or physical therapist



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Schools that employ athletic trainers are 4 times more likely to recognize, diagnose, and appropriately treat concussions compared to schools that do not employ athletic trainers (ImPact)

Faculty Spotlight: Dr. Douglas Brusich

Dr. Douglas Brusich is in his fifth year as an Assistant Professor in Human Biology. He received his Bachelor's in Biology from St. Ambrose University and his PhD in Anatomy and Cell Biology from the University of Iowa.

Prior to coming to UWGB, he spent two years as a Visiting Assistant Professor of Biology at Wartburg College. He was also a Postdoctoral Research Fellow in the FUTURE program at the University of Iowa. He currently resides in the Green Bay area with his wife, Whitney, and their child, Alden.



He has, so far, published two articles from his research at UWGB alongside six different UWGB undergraduates.

His lab is in the process of finalizing and submitting a third research article, which will feature four student authors. This article will showcase his lab's development of a simple posttraumatic epilepsy model. They found that screening flies at 30 minutes post-injury was most effective for identifying seizure activity. They will use this screening model in future studies intended to determine the importance of injury conditions, and both environmental and genetic factors on rates and severity of posttraumatic seizures. His lab is also actively conducting studies aimed at determining the importance of neurotransmission at the time of injury on traumatic brain injury (TBI) outcomes. They are using a set of mutant flies which paralyze for many minutes after brief exposure to high temperature to test their hypothesis. They will further use targeted expression of a version of this mutant gene to identify neuronal populations important for changes in TBI outcomes.

A third notable project is a collaboration with Dr. Ryan Mohan at UMKC. They are pairing TBI from their lab with cell biology techniques from Mohan's lab to investigate changes in a protein complex following injury. This complex is important for aging and neurodegeneration, but has so far not been linked to TBI.

UWGB Master of Athletic Training Program Earns Valuable Accreditation

UWGB's Master of Athletic Training (MAT) program earned valuable accreditation by the Commission on Accreditation of Athletic Training Education (CAATE). CAATE is the current standard for professional athletic training programs as recognized by the Council for Higher Education.

"This is a very important achievement for the UW-Green Bay MAT," said Program Chair William Gear, "Accreditation from the CAATE allows graduates of the MAT to sit for the certification exam administered through the Board of Certification for the Athletic Trainer (BOC). The Green Bay region provides a multitude of clinical education experiences for our students that prepare them for employment in a variety of healthcare settings."

At UW-Green Bay, motivated students can earn an accredited MAT degree in only two years. In addition, the Greater Green Bay area is a sports-rich community, offering a wealth of clinical opportunities. Students can gain experience from a range of professional, minor league, collegiate and high school sports franchises or market-leading medical systems.

To become an athletic trainer, candidates must graduate with a degree in Athletic Training from an accredited athletic training program and successfully pass the Board of Certification (BOC) Exam. To practice as an athletic trainer in Wisconsin, the student must also be licensed by the state.

According to the U.S. Bureau of Labor Statistics, employment of athletic trainers is projected to grow 16 percent in the next decade as demand for athletic trainers is expected to increase as people become more aware of the effects of sports-related injuries, and as the middle-aged and older population remains active.



contact the Office of Graduate Studies at gradstu@uwgb.edu

"Accreditation" is review of the quality of higher education institutions and programs. In the United States, accreditation is a major way that students, families, government officials, and the press know that an institution and/or program provides a quality education.

To learn more about the Master of Athletic Training program please visit the website at <u>https://www.uwgb.edu/athletic-training/</u> or



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UW-Green Bay students will help study a wearable concussion detector thanks to \$2 million from DoD and TitletownTech Investment

Jeff Bollier Green Bay Press-Gazette

University of Wisconsin-Green Bay students will help develop and test a wearable concussion detection device thanks to a TitletownTech investment, an email and \$2 million from the Department of Defense.

Oculogica Inc.'s device advances its original EyeBOX, a U.S. Food and Drug Administrationapproved device that uses eye movements to quickly identify symptoms of a potential concussion. The new grant will help the NYC-based company bring the technology from a tabletop medical device to a series of sensors that could be embedded in an athlete's hat or a soldier's helmet, Oculogica CEO Rosina Samadani said.

The grant from medical research programs under the DoD's umbrella funds preliminary tests on a prototype device that could rapidly detect a concussion. "The idea is that it's something the user is wearing and when they get a concussion, the test will begin," Samadani said. "They can know without even taking a test that something's wrong. It's actually a concussion detection test, though you would always want to confirm that with a physician."

The prototype UW-GB students will help study and test will be embedded in a pair of eyeglasses. The final version for hats and helmets is "two generations ahead of where we are," Samadani said.

The EyeBOX's potential for advancing concussion detection caught the attention of the staff at TitletownTech, an innovation hub and venture fund led by the Green Bay packers and Microsoft, that became the lead investor in an \$8 million funding round Oculogica closed toward the end of 2019.

And it was TitletownTech's investment that led Sadie Buboltz-Dubs, a coordinator of clinical education for UW-GB's new master's degree program in athletic training, to email Samadani 18 months ago and ask if there was a chance for her students to partner with Oculogica on research projects.

"I just emailed her to get my students involved in research. If our students can take part in concussion research and study, it sets them up for success. It's a valuable experience I want our students to have."

Oculogica founders Rosina and Uzma Samadani grew up in Beaver Dam. Rosina said she was excited to see the email from her home state and agreed to look for opportunities, although the coronavirus pandemic stalled initial plans to collaborate.

But the delay also created a new opportunity: UWGB students will now be working with Oculogica and physicians at Children's Hospital of Philadelphia and at a military hospital in West Point, New York.

"We are thrilled Sadie reached out to us. The other institutions are some of the best in the nation doing concussion research. It's a phenomenal opportunity for UW-GB," Samadani said.

Concussion research is a major focus of athletic medicine studies right now, Buboltz-Dubs said. Most people probably connect concussions to athletics, but the DoD has called mild traumatic brain injury one of the "invisible wounds of war" and a signature injury sustained by troops wounded in Afghanistan and Iraq.

Buboltz-Dubs and Samadani both said it feels great to partner with other women scientists on the project. "Green Bay is important to me. Wisconsin is important to me. And women scientists are

important to me. I'm very supportive. It's so cool there are more women leading this project than on the average grant," Samadani said.

Buboltz-Dubs said she and three students in UWGB's athletic training program will begin work on the study in November. The university's efforts will use athletes on two sports teams at a northeastern Wisconsin college.

The initial phase in November will tests the prototype device's form and function to make sure it works and can provide the necessary data. "We have to get the form right and



refine the algorithm for the concussion diagnosis. Then we have to validate it," Samadani said.

Validation will come in the second and third phases, which involve getting the baseline readings of healthy and concussed people and testing to see if the device does what it's supposed to do. For that, research at UWGB, West Point, and the Children's Hospital of Philadelphia will use the device to collect baseline readings, see if it detects concussions shortly after they're sustained, and then test again three days later.

"This is very early-stage, " Buboltz-Dubs said. "It's good for us to figure out if it works first instead of jumping in."

Faculty Spotlight: Dr. Sadie Buboltz-Dubs



Sadie Buboltz-Dubs is the Coordinator of Clinical Education for the Athletic Training program at UWGB. She came to UWGB in April of 2019 after working for Prevea where she was contracted to provide sports medicine services to the men's basketball team at UWGB.

She wanted to become an athletic trainer (AT) after having to do a presentation on what she wanted to be when she grew up. Her high school's AT encouraged her to do a presentation on athletic training. Research for this presentation determined that she wanted to be an AT! Sadie has her Bachelor's in Athletic Training and Master's in Educational Leadership from Carthage College, and a Doctorate of Athletic Training from University of Idaho.

areas of interest (outside Her of concussion research) are focused on therapeutic interventions novel for patients who are experiencing pain. She is currently working on a protocol for a project examining the relationship between breathing, functional movement, and low back pain.

Sadie's favorite part about being an educator is connecting with her students and teaching them to look beyond the symptoms of injuries and conditions and find the root cause to better treat their patients. Her favorite part about being an AT is connecting with her patients and identifying and treating their injuries to help them be pain free and functional in their life.

Sadie resides in De Pere with her husband and their two-year-old son.



Researchers Investigate the Impact of Water Birds on Green Bay

When Amy Wolf and Bob Howe with the University of Wisconsin-Green Bay bring new research partners or students out to the restored Cat Island chain in lower Green Bay, their reactions are memorable. "To see people's expressions when they enter the midst of thousands of loud, often smelly and sometimes defecating birds is pretty amazing and gratifying," said Wolf, biology professor with the Department of Natural and Applied Sciences.

This avian abundance is relatively new, made possible by habitat restoration projects in the bay coupled with pollution remediation and control. For instance, the number of American white pelicans nesting has increased from about 250 in 2005 (<u>State of the Bay report</u>), to more than 3,000 now.



Wolf and Howe are coordinating a small army of students and government agency researchers to

count and observe the behavior of birds that eat fish (piscivorous birds) in the lower Green Bay area around <u>Cat Island</u>, an area that Howe likens to the "Serengeti of Lake Michigan" due to the sheer abundance of wildlife. With two years of funding through Wisconsin Sea Grant, they are working to gain basic information about populations of pelicans, cormorants, terns, egrets, herons and gulls in the lower bay, including information about what the birds eat and where they spend their time.

Howe, professor and director of the Cofrin Center for Biodiversity, explained, "We want to know what impact these large numbers of fish-eating birds have on the lower Green Bay ecosystem in general, and specifically on the fishery, which is so important for public recreation and commercial harvesting."

Every two weeks during the spring and summer, Howe, Wolf, UW-Green Bay research specialist Erin Giese, and a team of undergraduate and graduate students surveyed all the piscivorous birds from southern Door County down to the DePere Dam on the Fox River, and then up the lakeshore to Oconto, Wisconsin. Graduate students Jacob Woulf and Brandon Byrne flew drones down the Cat Island causeway to count the thousands of birds there. Additionally, the students conducted firsthand observations of what the birds eat, where they catch fish and what other bird species they associate with.

In concert with the bird surveys, Howe said the U.S. Fish and Wildlife Service is conducting fish surveys in the lower bay. They are also tracking double-crested cormorants with two types of technologies: one uses the cellular phone network and the other uses radio telemetry. For the cellular tracking, the birds are fitted with a lightweight harness that contains a solar-powered transmitter. The device provides information about a bird's position every hour, even if it leaves Green Bay. Birds with the radio transmitters are tracked through special towers stationed around Green Bay and in a growing network across eastern North America. They plan to track pelicans next year.

Preliminary findings: The researchers are only beginning to crunch numbers from their first season of data, but Howe and Wolf already have preliminary findings to share. In terms of tracking, they've found that some of the cormorants move much farther than they anticipated. Wolf said, "They hang around Cat Island, they feed around Cat Island, but they definitely range widely; one bird flew 75 kilometers south to Lake Butte Des Morts and returned to Green Bay during the same day. Another went over 110 kilometers north toward Gills Rock, where it stayed for days before returning to lower Green Bay."

Their feeding observers have noted that the cormorants and pelicans are foraging with each other. Howe suspects their social nature might be why they are the dominant piscivorous species in the Green Bay system. "Social foraging behavior might give them a leg up on exploiting the fish in the lower bay."

Howe said their counting surveys have provided a good estimate of how many piscivorous birds are in lower Green Bay. By mid-summer 2021, well over 4,000 pelicans and 2,000 cormorants were present. "We know that a pelican can eat up to three pounds of fish per day. A cormorant can eat about a pound of fish per day. You start doing the math and realize that these birds take tens of thousands of pounds of fish every week. They're significantly shifting the biomass from one place to another," Howe said.

They've also noted that pelicans, and cormorants to a lesser extent, have developed a relationship with recreational fishermen. The birds hang around the boats and feed on fish that the fisherman don't want and throw overboard. "The pelicans have learned there's free food there," Howe said. "We didn't anticipate this relationship and it's very obvious from the data that we're seeing."

They expect their research will be helpful for agencies working on management decisions about the abundance of piscivorous birds, including gulls.

Additional partner agencies aiding the project include the Wisconsin Department of Natural Resources, the U.S. Fish and Wildlife Service, Bird Studies Canada, the U.S. Army Corps of Engineers, the U.S. Department of Agriculture's Wildlife Services Program, Brown County Port Authority and Mississippi State University. The research team has also received cooperation and support from landowners and marinas along the shores of lower Green Bay.

"We're learning about what kinds of fish these birds are taking and where they're taking them," he said. "We're really excited about this information so far."

Story by Marie Zhuikov, Wisconsin Sea Grant

Check out the Cofrin Center for Biodiversity's website! <u>uwgb.edu/biodiversity</u>





Updates on the NERR

What is a National Estuarine Research Reserve (NERR)?

The University of Wisconsin-Green Bay is leading the designation of a National Estuarine Research Reserve (NERR) for the Bay of Green Bay. The <u>NERR system</u> is a non-regulatory national network of 29 sites across the U.S. designed to study, preserve, and educate about our coastal resources. The Bay of Green Bay NERR will focus on research, place-based education, stewardship, and training. Plans for the NERR include a visitor center with water-focused exhibits, meeting and conference spaces, a laboratory and classrooms, and a boat launch. Below are updates on the Bay of Green Bay NERR designation.

NERR Site Selection and Nomination Process

The University of Wisconsin-Green Bay kicked off the site selection and nomination process in the fall of 2020. <u>Three committees</u> have been assembled to execute the process - the Site Development Committee, which is tasked with drafting criteria to be used in selection of a site; the Site Evaluation Committee, which is tasked with applying site selection criteria through an agreed-upon process to recommend a site, or collection of sites, for nomination; and the Site Coordination



Committee, which oversees the work of all other committees and compiles a Site Nomination Document once a site has been selected. These committees have membership from UW-Green Bay faculty and staff, local, state, federal government partners, Tribal governments and agencies, representation from the business community, northeast Wisconsin citizens, and other UW institutions.

The site selection process is non-competitive and there will be no call for proposals. The site selection committees will review land and water areas, apply site selection criteria, and recommend a site, or collection of sites, for nomination. This process will be done collaboratively with federal, state, local, and Tribal governments. Once a site has been determined, the University, in conjunction with the National Oceanic and Atmospheric Administration (NOAA), will hold at least one public meeting in the vicinity of the site preliminarily recommended for nomination. Interested parties can share their comments orally and in writing during the meeting, and for a set period of days after the meeting. Comments will be considered by the state when formally nominating a site to NOAA. We tentatively expect that public meetings will be held in late Summer 2022, with a site nomination put forth in early Fall 2022. Overall, we are working towards a goal of NERR designation by the end of 2024.

Updates from the NERR Site Development Committee

The NERR Site Development Committee has completed two major tasks in the site selection process:

Defined the relevant coastal geography. The relevant coastal geography is the area of the Bay of Green Bay most influenced by the estuarine conditions resulting from the interactions between Lake Michigan water inputs in the north, and river and stream inputs occurring along the West Shore and Lower Green Bay. These are the geographic bounds around the land and water areas that will be considered during the site selection process. These are not the boundaries of the NERR; those will be established after a site has been selected. Contact Emily Tyner (tynere@uwgb.edu) for a map of the relevant coastal geography and further information on how it will be used in selecting a site.

Drafted the criteria to be used for selecting a site. Criteria fall into seven major categories: (1) Environmental Representativeness (2) Values of the Site for Research, Monitoring, and Resource Protection (3) Suitability of the Site for Education and Interpretation (4) Management Considerations (5) Natural Resource and Infrastructure Resilience to Climate Change (6) Partnership Building and (7) Institutional Commitment. The criteria was sent to NOAA's Office for Coastal Management for review and final approval. Once approved, the criteria will be applied by the Site Evaluation Committee.

Updates from the NERR Site Evaluation Committee

The Site Evaluation Committee has been formed and will meet for the first time in mid-October. A list of committee members is below. This team will agree upon a process for applying the site selection criteria and use that process to evaluate potential land and waters areas for inclusion within the Bay of Green Bay NERR. The committee will then recommend a site for designation. The site nomination will go to the Site Coordination Committee for review.



Award from the Wisconsin Coastal Management Program

The Bay of Green Bay NERR designation process was recently <u>awarded a grant</u> from the Wisconsin Coastal Management Program. Thank you to Secretary Brennan (Department of Administration) for officially presenting us with the award and to Mike Friis for his contributions to the designation process. The WCMP award will be used to: (1) Support community engagement about the designation (2) Mapping and GIS support for the determining the site boundaries and (3) Assistance in selecting a site for nomination.

If you are interested in becoming involved in the NERR designation process, please contact Emily Tyner (<u>tyner@uwgb.edu</u>), Director of Freshwater Strategy at University of Wisconsin-Green Bay. Opportunities for involvement include hosting a virtual or in-person presentation about the NERR to your local community or community groups, or joining a working group to help us develop a NERR management plan. Work on the management plan will begin in early 2023. We look forward to hearing from you!

Check out the NERR website! https://www.uwgb.edu/national-estuarine-research-reserves/

Faculty Spotlight: Dr. Kelly Deuerling



Kelly Deuerling is an Assistant Professor in the Natural and Applied Science Department at UWGB.

She has Bachelors of Science in Geology from the University of Florida, a Masters of Science in Geology from The Ohio State University, and a PhD in Geology from the University of Florida.

When asked why she chose this field of study she said "That's a funny (to me) story, actually. I promised my younger self that I would never be a teacher or a geologist those were my parents' jobs and obviously I couldn't be like them. Then I started undergrad in environmental engineering at UF and was told to take senior level courses my freshman year and that just was not on my agenda, either. So I started taking classes and gave in to taking Physical Geology and just fell in love. I started working in an aqueous geochemistry and hydrology lab by sophomore year studying groundwater surface water interactions between Florida springs and surface rivers and have never looked back.

She came to UWGB in August 2020 after her post-doc at the University of Nebraska where she studied groundwater and surface water quality in agricultural versus natural prairie landscapes.

Her primary focus is on the groundwater surface water interactions and how minerals dissolve into water in different landscapes. She is currently comparing how quickly water enters the soil and recharges groundwater in different land uses (cornfields vs restored prairies) and trying to understand how the engineered drawdown of a reservoir—the Forestville Millpond—has affected sediment and nutrient dynamics on the lower Ahnapee River.

Kelly's favorite thing about her job is doing research with students! Her research group is small but they are making their way and working with some locally impactful issues like the drawdown of the Forrestville Millpond in Door County. She's looking for new students to help out with high resolution sensor date analysis and a collaboration with Washington University in St. Louis on stable isotopes of precipitation.

UWGB and Bay de Noc Community College: Enter Agreement to Provide More Environmental Engineers to the Region

Leaders from the University of Wisconsin-Green Bay's College of Science, Engineering and Technology (CSET) and Bay College (Escanaba, Wis.) have created a pathway for students who complete their Water Resource Management associate's degree from Bay College to transfer seamlessly to earn a bachelor's degree from UW-Green Bay in Environmental Engineering Technology.

"This partnership creates a smooth transition for students to continue their education after Bay College," says Cindy Carter, dean at Bay College. "The College sees so many students looking to relocate to the Green Bay area and this partnership now makes it easier for them to do so."

It's been a year in the making for Dean Carter, Bay College instructor Troy Gallagher (a UW-Green Bay alumnus '95, Environmental Science), UW-Green Bay Dean John Katers, and faculty members in UW-Green Bay's Richard J. Resch School of Engineering. It is the first transfer agreement between the two institutions and another important step as UW-Green Bay works to meet the needs of the region through its access mission and "One university, four-campus model." UW-Green Bay has campuses in Green Bay, Marinette, Manitowoc and Sheboygan.

"We are very excited about this articulation agreement and the opportunity to partner in meeting the needs of the students," Dean Katers said. "Both Bay College and UW-Green Bay have worked with organizations like <u>NEW Water</u> (a wholesale provider of services to 15 municipal customers, serving 236,000 residents in a 285-square-mile area. It collects and treats an average of 41 million gallons a day from its two facilities.) "This agreement will allow us to continue to

meet the needs for skilled employees in these important careers."

After a visit to the Bay College campus, Katers noted, "It has a very similar feel to UW-Green Bay and I think students would find UW-Green Bay to be a great place to transition as they pursue their goals in environmental engineering technology."



Gallagher, the Bay Water Treatment Instructor, says he is looking forward to this new partnership as it opens alternative doors within the industry for students.

"The area of study focuses on more than just 'general environmental' studies," Gallagher says. "It allows students to explore other opportunities in the field like higher-level management, consulting, and even industrial water positions, all of which require a four-year degree."

Educated and trained professionals in this field are in high demand throughout the country, especially in the Midwest.

Article by Sue Bodilly

First UWGB Water Science Undergraduate Heads to Graduate School



(Reprinted with permission from the <u>Freshwater Collaborative of Wis-</u> <u>consin</u>)—Tyler Kunze never anticipated a career as a water scientist. Yet in May, he became the first student to earn a bachelor's degree in water science from UW-Green Bay. He's now a graduate student in UW-Milwaukee's School of Freshwater Sciences (SFS).

"It's been a long and winding road getting here," says Kunze, who grew up on a dairy farm an hour's drive from the nearest body of water. "I never would have thought graduating high school that I would be in this position today." Kunze's path exemplifies how opportunities to conduct undergraduate research and to build a professional network can lead to more water scientists — the primary goal of the Freshwater Collaborative of Wisconsin.

On the family farm, Kunze developed a strong appreciation for the natural environment. He also really liked math and chemistry. A bachelor's degree in environmental sciences sounded like a perfect way to combine his interests. He chose UW-Green Bay's program based on its reputation and ideal setting for studying the outdoors.

While at UW-Green Bay, he particularly enjoyed his classes in hydrodynamics. Toward the end of his sophomore year, Kunze took a course with Christopher Houghton, an assistant scientist and graduate of UWM's School of Freshwater Science, who suggested graduate school. The idea began to take hold after Kunze interned with New Water in Green Bay, where he met people who managed the watershed. "The gears were turning in my head that grad school was a possibility," he says. "When I started my undergrad research, it jumpstarted my passion for conducting research and discovering new things about different processes in the science field."

That research involved working with his adviser Dr. John Luczaj to determine whether Lake Michigan water was leaking into the aquifers in Door County. Kunze spent the summer before his senior year knocking on people's doors to collect water samples from their wells. Although, they didn't find water from Lake Michigan, they used the samples to create the first isoscape — a geologic map of isotope distribution — for northeast Wisconsin groundwater. Kunze analyzed the data and presented it at the 2021 American Water Resources Association Conference.

"It gave me a head start on what I'd be doing at the School of Freshwater Sciences. Professor Luczaj really prepared me for it," Kunze says. Luczaj also encouraged Kunze to add the water science degree when UW-Green Bay launched the program in 2019. Kunze was on track to graduate early and decided earning the double degree would prepare him for graduate school.

In September, he began his master's in freshwater sciences at UWM, and he was able to begin working with his advisor and UWM professor Harvey Bootsma in June. Kunze spent the summer studying invasive mussels at Sleeping Bear Dunes National Lakeshore with Bootsma; Ben Turschak, an SFS alumnus who is now a fisheries research biologist with the Michigan Department of Natural Resources; and scientists from the National Parks Services.

"What I'm most looking forward to at the SFS is meeting these amazing scientists and learning from them," Kunze says. "It also will be really fun to do my own research, to figure out a problem and to try to find a solution that can help people."

Kunze isn't sure where his future in water will take him: water chemistry, water quality, invasive species mitigation, maybe a PhD? For now, he's leaving his options open. "If you would have asked me even two years ago if I was going to get my master's degree, I probably would have had some doubts," he says. "I don't want to put myself in a box. I want to see the different opportunities and see where I fit."

One thing is certain: Wisconsin has itself another freshwater scientist.

Sponsored Research Programs

The College of Science, Engineering and Technology has received \$1,762,459 in total support for research and sponsored programs for the 2021 Fiscal Year! A few of these supported programs include:



Patrick Forsythe *Water Research* Interior, U.S. Fish & Wildlife Service: Contributions of sturgeon passage to annual lake sturgeon recruitment in the Upper Menominee River, \$142,264

WE Energies: Contributions of sturgeon passage to annual lake sturgeon recruitment in the Upper Menominee River, \$147,929

Green Bay Metropolitan Sewage District: Biological data collection plan for the Dutchman and Ashwaubenon Creeks Watershed, \$113,177

Fox River Navigational System Authority: Spiny water flea and round goby sampling and monitoring project, \$71,277

Emily Tyner NERR

Greater Milwaukee Foundation (Fund for Lake Michigan), National Estuarine Research Reserve, \$150,000

U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Green Bay National Estuarine Research Reserve, \$60,000

Mike Holly *Environmental Engineering* WiSys and Fund for Lake Michigan, \$187,999

Shawn Malone *Geoscience* American Philosophical Society, \$6,000

John Luczaj *Geoscience* National Science Foundation, \$163,905

https://www.uwgb.edu/UWGBCMS/media/ Foundation/UWGB_Grant-Report_OnlineVersion.pdf

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UW-Green Bay College of Science, Engineering and Technology

Donor Spotlight: The Sandmires



An award-winning doctor of obstetrics and gynecology, the late Dr. Herbert Sandmire was a UW-Green bay community lecturer in Human Biology from 1968 to 1989. his wife, Crystal Sandmire, a University alumna who earned her Communication and Arts degree in 1980, was a charter member and officer of the UWGB Founders Association. In 2006, they received UWGB's highest community honor, the Chancellor's Award.

Established in 1987, the Herbert F. and Crystal J. Sandmire Endowed Scholarship and Research Award supports UWGB students who intend to pursue a career in medicine or related medical fields. In 2014, the Sandmires enhanced their decadeslong legacy of generosity with a \$1 million scholarship gift. This gift tied a record for the University's largest-ever single scholarship donation. The Sandmires are listed as having the longest uninterrupted string of annual giving—nearly 50 years!

Student Spotlight: Ben Gilles

One of those students who benefitted directly from the Sandmire's generous donation is Ben Gilles, member of the Sandmire Scholars program (2017-2021) - a program that awards two incoming freshman in the Department of Human Biology \$1,000 per fall and spring semester.

Ben graduated from UWGB in May 2021 with a degree in Human Biology with a health sciences emphasis and a chemistry minor.

He is originally from Madison, Wisconsin, but has relocated to Iowa City where he is a student at the University of Iowa College of Dentistry. His current goals are to graduate from dental school, serve in the US Navy as a Lieutenant Officer, and eventually own his own dental practice.

When asked how the Sandmire Scholarship helped

him get to where he is today, he said "I think the Sandmire Scholar program helped me significantly throughout my undergraduate experience. One aspect of the scholarship that I thought was extremely beneficial was being paired with a human biology faculty member as a mentor. Within my first week of school, my faculty member contacted me and wanted to meet with me. In that first meeting, the faculty member and I discussed what my plans were for the future and how I was going to accomplish my goals at UWGB. Ever since that first meeting, I felt like I have had somebody by my side rooting for my success. Additionally, my faculty member sent me weekly emails about the different health related opportunities in the Green Bay Area, which was beneficial in building my resume. Finally, as a Sandmire scholar, I was fortunate to participate in research, which was a valuable learning experience. I cannot say enough good things about the UWGB Human Biology Department, and I am so fortunate to have participated in such a collaborative environment."

To learn more about the Sandmire Scholars program, visit <u>https://www.uwgb.edu/</u> <u>human-biology/scholarships/sandmire-scholars-program-for-incoming-freshman/</u>

