2023-2024 UF WATER INSTITUTE

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Research

During 2023-2024, faculty affiliated with the Water Institute led active research projects totaling more than $170 million and received new sponsored research awards totaling approximately $47 million. During this time, the Water Institute coordinated interdisciplinary faculty teams conducting 10 interdisciplinary projects (~$12.2M) and supported 6 additional interdisciplinary projects ($9.2M). These projects supported faculty, post-docs, and graduate students from 4 UF Colleges and 13 partner Universities as well as scientists from 4 local agencies.

In 2023-2024 we completed three of our featured projects: the 7-year USDA NIFA-funded Floridan Aquifer Collaborative Engagement for Sustainability (FACETS) Project ($5M); the 5-year NSF-funded Carbonate Critical Zone Research Coordination Network ($500K); and the 3-year U.S. Army Corps of Engineers funded project Coupling Lake, Estuarine and Watershed, Models for the Caloosahatchee Estuary ($2.3M). We completed year 2 of the 3-year U.S. Army Corps of Engineers funded project Integrating Modeling Tools and Observations for Prediction and Management of Harmful Algal Blooms in the St. Lucie Estuary ($2.5 M). Extensions to the Tampa Bay Water funded Florida Water and Climate Alliance, the USGS funded Southeast Climate Adaptation Science Center, and the Florida Water Resources Research Center Ph. D. Student Fellowships funding continue to be awarded on an annual basis.

2023-2024 Active Water Institute Projects

Water Institute Coordinated Projects					
Principal Investigator	**Dates**	**Title**	**Amount**	**Co-PIs**	**Agency**
Graham, Wendy, WI	1/2023-12/2024	Coordination of Collaborative Stakeholder-scientist Partnership: Florida Water and Climate Alliance (Website)	$25,000	Irani, T., Judge, J, Velez, D., plus faculty from FSU and personnel from Tampa Bay Water, Peace River Manasota Water Supply Authority, SFWMD, and SJRWMD	Tampa Bay Water Authority
Kaplan, David, ESSIE	9/2021-9/2024	Florida Water Resources Center, Ph. D. Student Fellowships	$69,434	Graham, W.	USGS 104(b)

Graham, Wendy, WI	10/2016-9/2023	Department of the Interior Southeast Climate Adaptation Science Center Consortium (Website)	$96,800	Allen, M., plus faculty from NCSU, Duke U, Auburn U, and U Tenn	North Carolina State University/ USGS
Graham, Wendy, WI	7/2017-6/2023	Agricultural Water Security through Sustainable Use of the Floridan Aquifer: An Integrated Assessment of Economic and Environmental Impacts (Website)	$4,918,926	Adams, D., Aue, K., Bartels, W., Court, C., de Rooij, R, Dukes M, Hundemer, S., Hochmuth, B, Kaplan, D., Lai, J., Monroe, M., Reaver, N., Sidhu, S., plus faculty from Auburn U, ASU & UGA	USDA-NIFA
Martin, Jonathan, GLY	6/2019-5/2024	Carbonate Critical Zone Research Coordination Network (Website)	$499,121	Graham, W., Carton de Grammont, P., plus faculty from Oregon State U, U Arkansas, Temple U, Penn State U, and Duke U	NSF
Graham, Wendy, WI	9/2020-8/2024	Evaluating Potential Risks of Climate Change on Surface Water Quality in the Hillsborough and Alafia River Watersheds (Website)	$176,971	Reisinger, AJ	Tampa Bay Water Authority
Kaplan, David ESSIE	9/2021-12/2023	Coupling lake, watershed, and estuarine models to better understand the role of engineered freshwater discharges in driving the severity, location, and timing of harmful algal blooms (Website)	$2,278,153	Olabarieta, M., Morrison, E., Phlips, E., Carton de Grammont, P., Graham, W. plus faculty from FSU and NCSU	US Army Corps of Engineers, ERDC
Arias, Mauricio, USF	1/2023-1/2025	Integrating Modeling Tools and Observations for Prediction and Management of Harmful Algal Blooms in the St. Lucie Estuary and Watershed (Website)	$2,485,935	Carton de Grammont, P., Kaplan, D., Krimsky, L, Graham. W., Morrison, E., Olabarrieta, M., Phlips, E., Velez, D. Plus staff from SFWMD, Faculty from USF, FIU	US Army Corps of Engineers, ERDC
Water Institute Supported Projects					
Allen, Micheal, FFGS	2020-2024	Ecological and Economic Impacts of Land-Use and Climate Change on Coastal Food Webs and Fisheries (Website)	$1,107,499	Court, C., Chagaris, D., Graham, W., Grogan, K., Kaplan, D, Scheffers, B., Telg, R., Xiang, B.	National Academy of Sciences, Engineering and Medicine Gulf of Mexico Program
Martin, Jonathan, GLY	2020-2024	Significance of Ice-loss to Landscapes in the Arctic: SILA (Website)	$2,211,570	Barnett, C., Christner, B., Cohen, M., Jawitz, J, Martin, E., McDaniel, S.	National Science Foundation

The FLoW Center Proposal Development

The Water Institute, in partnership with the Center for Coastal Solutions and IFAS Extension, spearheaded development of a groundbreaking proposal in response to the Florida Council of 100's solicitation (February 2024) for a center of excellence focused on the preservation, development, and delivery of Florida's water resources. The proposed Florida Water (FLoW) Center aims to be a holistic solution for comprehensive water data and information management. This proposal represents an unprecedented alliance across 10 institutions within the Florida State University System: University of Florida, Florida International University, Florida State University, University of Central Florida, University of South Florida, Florida Atlantic University, Florida A&M University, Florida Polytechnic University, University of North Florida, and University of West Florida.

Proposal development involved coordinating over 100 thought leaders from these institutions, along with national partners Deloitte, Consortium of Universities for the Advancement of Hydrologic Science (CUAHSI), GeoSpatial Centroid, and the Everglades Foundation. UF participants accounted for half of the participants, with representation from 25 different academic units.

If funded, the FLoW Center will introduce several innovative capacities to enhance water resource management across the state:

- **Data Science and Data Services**: Establishing an integrated catalog for evergreen data access across multiple providers, pipelines for curated data products to maximize machine learning readiness, and tools for data-model fusion, all accessed using a generative hallucination-free AI interface to simplify and expand data discovery.
- **Information Services**: Creating the state's first AI Assistant to enable users to pose their water questions as natural language queries and immediately access librarian and water expert-curated research reports, water studies, funding opportunities, water laws and regulations, and governance documents.
- **Technical Assistance**: Connecting stakeholders and their water questions with Regional Librarians, Regional Liaisons, and relevant experts and empowering them to explore research projects and share actionable information via an online discussion platform.
- **Convocation**: Convening water resource expertise across the state in both issue-focused and cross-cutting events and catalyzing new partnerships across sectors to support actionable science.
- **Education**: Integrating innovative workforce development from across existing university centers of excellence in water resources and data science and promoting public education and outreach programming.
- **Thought Leadership**: Assembling and charging state university and partner experts with synthesis and decision support around key water resource topic areas prioritized by the FLoW Center's Advisory Council and statewide decision makers.

To build and sustain the FLoW Center and its six core functions, we requested $10-18 million per year over the next ten years, totaling $175,491,347. Of this funding, 39% would remain at the University of Florida. If funded, the FLoW Center will create over 80 new full-time positions across the 10 partner universities, with more than 30 new positions at UF. Funding decisions will be made by the Florida Council of 100 in August 2024.

Graduate Education Programs

The Water Institute's priority is to foster, support, and synergize innovative interdisciplinary water-related graduate education. Although the Water Institute is not a degree-granting entity, its research and education activities contribute substantially to graduate education at UF.

Graduate Fellows Programs

The **Water Institute Graduate Fellows (WIGF) Program** was established in 2011 to support faculty-graduate teams to conduct innovative interdisciplinary research in emerging areas of water science, including the social, natural, and engineering science; provide students with a comprehensive understanding of the multidimensional challenges to sustaining water resources; equip them with a broad range of interdisciplinary skills; and promote the establishment of diverse and inclusive research teams with long-lasting research connections that result in development of externally sponsored research.

Funding for the program came from the Deans of the UF/IFAS College of Agricultural and Life Sciences, UF College of Liberal Arts and Sciences, and the Director of the School of Natural Resources and Environment. In addition, participating faculty brought additional students to the WIGF cohorts using other acquired grant funds. The Water Institute leveraged the UF investment in the WIGF program using gifts provided by the Carl S. Swisher Foundation and the Sherwood L. Stokes Foundation. These funds support integrative activities for the cohort.

The last cohort (from 2019) of the WIGF program "High Latitude Hydrology: Water in a Changing World" is in its fifth year. This cohort received a $2.2M award from the NSF Arctic System Science Program to support their project "Significance of Ice-Loss to Landscapes in the Artic" which funds the research of 6 WIGF Fellows along with 4 other graduate students, an undergraduate student, and a postdoctoral associate. During Summer 2023, the WIGF cohort completed their second and final deployment to conduct field research in Greenland and received final line funds from the Office of Graduate School to ensure they could analyze results from this field season and complete their dissertations.

WIGF Cohort 2019: High Latitude Hydrology: Water in a Changing World

Student	Degree	Faculty Advisor	Department/College
Megan Black *	PhD	Jon Martin & Ellen Martin	Geological Sciences, CLAS
Tatiana Salinas	PhD		
Madison Flint	Postdoctoral Associate		
*Izuchukwu Ezukanma**	PhD	Stuart McDaniel	Biology, CLAS
Quincy Faber *	PhD	Brent Christner	Microbiology and Cell Sciences, CALS
Justin Ellena	PhD		
*Jaehyeon Lee**	PhD	Jim Jawitz	Soil and Water Sciences, CALS
Yuseung Shin *	PhD	Matt Cohen	Natural Resources and Environment
*Fernanda Gastelu**	PhD (graduated in 2023)	Arnoldo Valle-Levinson	Engineering School of Sustainable Infrastructure & Environment
*Michael Munroe**	Masters		Journalism and Communications

*Denotes funding from WIGF program including the Office of Graduate School

A key aspect of this WIGF cohort is their engagement in environmental civic activities. This year the team participated in the Florida Museum of Natural History - Geology Department Open House: "Can You Dig It?" and the "Science on Tap: Cheers from the Arctic" event co-hosted by the Water Institute Biannual Symposium, UF Thompson Earth Systems Institute and the Florida Museum of Natural History. This year, cohort members presented their work at the Water Institute Biannual Symposium and the Annual Meeting of the American Geophysical Union, published two papers, and received seven awards. Cumulatively, the 2019 WIGF Cohort has produced 12 collaborative publications, given 68 presentations, and received 22 awards.

After five years on hold, we successfully revamped the Graduate Fellows Program in 2024. The new funding strategy involves matching funds from the UF Office of Research, participating department Chairs and Deans, and faculty to support students' fellowships. It continues to provide Water Institute funds for integrative activities. The program has been rebranded as the ***UF Water Scholars Program*** to highlight its university-wide scope.

The inaugural cohort consists of a team of faculty originally selected for WIGF funds in 2021, which were lost due to budgetary issues at the Graduate School level. This team aims to develop integrative solutions to wastewater disposal and reuse challenges, working at the disciplinary interfaces of aquatic ecology, soil science, hydrology, geochemistry, contaminant chemistry, public health, toxicology, resource economics, and STEM learning through their collaborative project, "BREW: Beneficial Reuse of Wastewater: Overcoming

Barriers and Identifying Opportunities". The team has already recruited 7 students that will join the cohort in Fall 2024 and is actively seeking extramural funding to support the research.

The team:

Dr. Mary Lusk, School of Natural Resources and Environment, urban nutrient management and sustainable reuse in sensitive watersheds.
Student: Oluwasegun Olubisi

Dr. Andrew Zimmerman, Geological Sciences, College of Liberal Arts and Sciences, expert in organic geochemistry and use of biochar and reactive media for contaminant removal from environmental media.
Student: Nishika Samarakoon

Dr. Alexander Reisinger, Soil, Water and Ecosystem Sciences, College of Agriculture and Life Sciences, the export and effects of pollutants (including pharmaceuticals and personal care products) to aquatic ecosystems, and how these aquatic ecosystems respond to pollutants.
Student: pending formal acceptance into graduate program for Spring 2025

Dr. Davie Kadyampakeni, Soil, Water and Ecosystem Sciences, College of Agriculture and Life Sciences, integrated nutrient and water management to enhance horticultural and row crop production.
Student: Tunde Samuel Oluwatuyi

Dr. Joseph Bisesi, Department of Environmental and Global Health, College of Public Health and Health Professions, environmental toxicology with a focus on studying the effects of waterborne toxicants in humans and aquatic organisms.
Student: Jeantel Cheramy

Dr. Kent Crippen, School of Teaching and Learning, College of Education, providing an inclusive and robust science, technology, engineering, and mathematics (STEM) workforce.

Dr. Katherine Deliz Quiñones, School of Sustainable Infrastructure and Environment at the College of Engineering, fate & transport of pollutants and pathogens; sustainable remediation technologies; resilience of ecosystem and human communities to anthropogenic activities and extreme weather events.
Students: Fabiola Y. Rodríguez Rodríguez and Amanda Sillsw

Dr. Kotryna Klizentyte, School of Forestry, Fisheries and Geomatics Sciences, College of Agriculture and Life Sciences, economic valuation to inform natural resource policy and management decisions.
Student: Forrest East

Hydrologic Sciences Academic Concentration

The UF Water Institute coordinates the Hydrologic Sciences Academic Concentration (HSAC), an interdisciplinary program aimed at broadening the skills of science and engineering students interested in all aspects of water. Nine departments from four colleges and the School of Natural Resources and Environment participate in this program. Currently, there are 31 active students pursuing this concentration, and as of Summer 2024, 226 students have graduated from it.

Graduate Student Award Programs

In response to the 2022-2027 Strategic Plan, the Water Institute launched four new award programs in 2023. These awards recognize the achievements and contributions of graduate students working to understand and solve complex interdisciplinary water issues; create a platform to enhance the participation of graduate students in Water Institute Programs; and provide graduate students with financial resources as well as engagement, mentoring, networking, and professional opportunities to promote inclusive excellence.

Graduate Student Travel Awards provide financial support to UF graduate students to present their water-related research at national or international conferences.

2023- 2024 Travel Award Recipients		
Name	Department	Conference
Airin Akter	Geography	American Association of Geographers (AAG)
Prakhin Assavapanuvat	Geological Sciences	Organic Geochemistry Gordon Research Conference 2024
Lindsey Cromwell	School of Forest, Fisheries, and Geomatics Sciences	American Geophysical Union
Nicholas Haley	Food and Resource Economics	Agricultural and Applied Economics Association
John Howe	Agricultural and Biological Engineering	Society of Environmental Toxicology and Chemistry
Love Kumar	Soil, Water and Ecosystem Science	SFS 2024 Annual Meeting - Connecting to Enhance Freshwater Science
Meng Lin	Agronomy	12th U.S. Symposium on Harmful Algae
Jenna Reimer	School of Natural Resources and Environment	Coastal and Estuarine Research Federation 27th Biennial Conference
Yasmeen Saleem	Soil, Water, and Ecosystem	2023 ASA, CSSA, SSSA International Annual Meeting
Varshitha Prasanna	Agricultural and Biological Engineering	ASABE 2024- Annual International Meeting
Juan Torres	Civil and Coastal Engineering	Physics of Estuaries and Coastal Seas (PECS) - 2024

The Water Institute Ambassadors program aims to build a graduate student community, foster greater student participation in Water Institute programs, and provide mentoring, networking, and leadership opportunities for UF Water Institute graduate students. Ambassadors, selected through a competitive process, collaborate with Water Institute staff to design and implement activities supporting the graduate student community. They can serve for up to two years (renewable annually), receive an annual stipend supplement, and enjoy complimentary attendance at the Biennial Water Institute Symposium.

Paul Donsky, School of Forest, Fisheries, and Geomatics Sciences (Term:2023-2024)
Gabrielle Quadrado, Geography (Term: 2023-2025)

This year the ambassadors inaugurated the successful "Lunch by the Water" monthly seminars, providing a platform for graduate students to present their ongoing research to a diverse audience of water scientists. They also planned and hosted the pre-symposium student event "Navigating Waters: A Career Panel for Graduates in Water Science".

The Graduate Student Research Awards provide financial support to UF graduate students researching terrestrial water systems. These awards enable students to explore research beyond the confines of their existing funding, fostering new capacity, diversity, and collaborations. In 2023, four awards were granted:

- *Alexis Jackson* (Environmental Engineering): Focuses on the role of hydrology, connectivity, and plant community characteristics on wetland soil carbon storage, aiming to understand how wetland soil carbon responds to climate and land cover changes.
- *Emory Wellman* (Fisheries and Aquatic Sciences): Investigates the ability of mussels to promote marsh stability in nutrient over-enriched salt marshes.
- *Mallory Llewellyn* (Physiological Sciences): Studies contaminants in water affecting human health, specifically PFAS and microplastics, and will test neurobehavioral and developmental outcomes of ingesting these contaminants.
- *Sanneri Santiago Borrés* (Environmental Engineering): Examines the potential use of urea-iron modified quantum carbon dots as photocatalysts to break down PFAS in contaminated waters.

The Dissertation Awards elevate the national visibility of the water-related research conducted by graduate students at UF by recognizing outstanding water-related Ph.D. dissertations and nominating them for the Universities Council on Water Resources (UCOWR) Ph.D. Dissertation Awards.

- *Dr. Fei He* was honored in the Water Policy and Socioeconomics category for her dissertation, "*Farm-Scale and Regional Economics Implications of Agricultural Land Management Decisions in the Floridan Aquifer Region*". Dr. He earned her Ph. D. in Food and Resource Economics with Dr. Court and Dr. Borisova.
- *Dr. Fernando Aristizabal* was recognized in the category of Natural Science and Engineering for his dissertation titled "*High Resolution Flood Inundation Mapping from Remote Sensing Observations and Hydrology Models at Continental Scales*". Dr. Aristizabal earned his Ph. D. in Agricultural and Biological Engineering with Dr. Judge.