

**FY 2023 Work Plan (9/21/22)**  
University of Delaware  
Water Resources Center  
Institute for Public Administration  
Joseph R. Biden, Jr. School of Public Policy & Administration  
Newark, Del.

**Statement of Purpose:** The University of Delaware Water Resources Center (DWRC) is dedicated to addressing the pressing issues of today including the global pandemic and challenges in achieving true racial equality. These issues are fundamentally important in researching and protecting the waters of Delaware and watersheds across the region. A healthy watershed that serves the needs of our citizens requires a focus on both public health and a healthy diversity of culture, race, viewpoints, and interests. A crosscutting focus on these issues can help ensure the DWRC's continued fulfillment of the University's land grant mission of research, education, and public service, through scientific study, outreach, and the training of future environmental scientists, engineers, policy experts, managers and other leaders in the field of water resources. The DWRC intends to address these concerns in the following ways.

**Public Health:** In accordance with the Governor's and UD administration's directives concerning the pandemic and with the effectiveness of vaccinations, the DWRC moved toward a phased reopening of the office by the fall semester in September 2022 through a 2-3-2 hybrid work arrangement or 2 or 3 days office and 3 or 2 days remote. During the pandemic DWRC was able to maintain a high degree of efficiency and efficacy conducting the work. Most of the work undertaken has been achieved from remote locations, using technology to remain in contact with co-workers, funders, colleagues, and students. All components of the phased reopening with regard to the pandemic will be closely guided by the University's own policies and time table published here with advice to (1) get vaccinated, (2) stay home when sick, and (3) work from home when you can. <https://www.udel.edu/home/coronavirus/ud-campus-phased-reopening/guidelines/>

**Diversity:** Diversity is essential in civil society and in our scientific mission at the University of Delaware. The DWRC will redouble efforts to reach out and recruit talented minority and economically disadvantaged students and researchers. In the scientific world diversity is necessary for the evolution of knowledge and thus the protection of the environment on which everyone's well-being depends. The DWRC has long been dedicated to this ideal taking a leadership role in the development of youth in Wilmington through the Green Jobs program which develops the skills of tomorrow's leaders. Certainly more can and needs to be done.

Through the recruitment of an increasingly diverse population of faculty, policy scientist, and undergraduate/graduate research students, this diversity can be strengthened. In accordance with our mission as designated by Congress under the Water Resources Research Act of 1984, the DWRC will reach beyond the University of Delaware to strengthen partnerships across the state at research institutions of higher-learning at Delaware State University and Delaware Technical and Community College. In this way DWRC will strengthen and broaden its research and scientific reach and enhance its ability to serve the needs of Delaware and all Delawareans, to whom water is a crucial resource and a prerequisite to health and happiness. We will focus on:

1. Correspond directly with presidents of University of Delaware, Delaware State University, and Delaware Tech requesting nominations of diverse students for DWRC undergraduate water research internships beginning with Fall 2021 semester.
2. Examine composition of DWRC Advisory Panel for diversity and request feedback from the DWRC Advisory Panel on ways DWRC may be increase diversity and inclusiveness among its students, board and project work.
3. Look at our DWRC student alumni and celebrate their stories and their background, see <https://www.wrc.udel.edu/about-wra/student-research-assistants/>.
4. Incorporate demographics of race, ethnicity, gender, and income of the study area into every research report including the rights of people of color and indigenous people. Assess how existing and future projects may be enhanced to improve diversity and inclusiveness.
5. Utilize Univ. of Delaware and Coalition for the Delaware River Watershed (CDRW) resources to increase DEI/ at DWRC.
  - University of Delaware Office of Diversity and Inclusion <https://sites.udel.edu/diversity/>
  - Coalition for the Delaware River Watershed (CDRW) <http://www.delriverwatershed.org/deij>

**Mission**

**Delaware Water Resources Center (DWRC):** Established in 1965 as one of the 54 National Institutes for Water Resources (NIWR) at land grant universities in the 50 states, District of Columbia, and three island territories of Guam, Puerto Rico, and U.S. Virgin Islands. The DWRC is Congressionally-mandated by Section 104 of the Water Resources Research Act of 1984 and 1964 administered by the U.S. Department of the Interior and U.S. Geological Survey. As part of the NIWR network, the mission of the DWRC is to: (1) support research, education, and public outreach programs that focus on water supply, water management, and water quality - issues important to Delaware citizens and (2) foster/support training and education programs for future water scientists, engineers, managers, and policy-makers who will lead the water resources research, planning, and management efforts in our state.

**Water Resources Agency:** Since 1977, the Water Resources Agency has provided water assistance to governments in Delaware through the land-grant public engagement (service), learning (education), and scholarship (research) role of the University of Delaware. Since 1977 and amended in 1990/1997, the Water Resources Agency has been sponsored by a board of the State of Delaware, New Castle County, and Newark and Wilmington to provide for clean and plentiful water supplies in Delaware. A regional, intergovernmental approach is essential for water management since watersheds and aquifers cross many political jurisdictions. The Brandywine-Christina watershed in northern Delaware with headwaters in Maryland and Pennsylvania provides drinking water to a half million people and 2/3 of the population of Delaware, 3/4 of New Castle County, and all of Newark and Wilmington. Public/private water purveyors deliver drinking water from sole source aquifers to 1/3 of the State in southern New Castle, Kent, and Sussex counties. Delaware watersheds contribute \$6 billion annually to the First State economy and support 70,000 jobs and \$2 billion in wages.

**Staff:** The DWRC employs the following faculty, scientists and students to fulfill our mission:

- Gerald J. Kauffman            Director/Associate Professor
- Andrew R. Homsey            Policy Scientist/GIS Manager
- Nicole M. Minni               Associate Policy Scientist/GIS Laboratory Lewes Campus
- Martha C. Narvaez            Policy Scientist/Associate Director
- Sherri Martinez               Senior Grants Supervisor
- Lydia Franks                   Graduate Research Fellow (M.S. Water Science & Policy)
- Alex Makowski                Graduate Research Fellow (Master of Public Administration)
- Elizabeth Shields              Graduate Research Fellow (Master of Public Policy)

**FY23 Budget:** The intergovernmental water partnership cost-effectively leverages public/private contributions. Since watersheds cross political boundaries, these investments provide benefits to many stakeholders and each State dollar is matched by these sources.

| <b>DWRC FY23 Budget</b>  |
|--|
| <b>Operating Budget</b>  |
| State of Delaware  |
| New Castle County  |
| City of Newark   |
| City of Wilmington   |
| USGS NIWR Delaware Water Resources Center                        |
| <b>Grants</b>  |
| White Clay Creek National Wild & Scenic River (NPS)              |
| Brandywine/Christina Cluster Phase 2, Year 5 (WPF)               |
| White Clay Creek State of the Watershed (BC, BRCA, TNC, Stroud)) |
| NJ Watersheds Economic Valuation                                 |
| Del. Clean Water Campaign (DNS)                                  |
| DESG Red Clay Creek and Alosine NFWF                             |
| DELDOT South Bowers Flood Study                                  |

| <b>Project (FY21)</b>   | <b>Description</b>   |
|---|--|
| <b>State of Delaware</b>  |  |
| Brandywine Christina Clean Water Partnership                                      | Co-chair CB Clean Water Partnership. Implement Pollution Control Strategy. Define water quality trends ('95-'14).                        |
| Chesapeake Bay Watershed Improvement Plan (WIP)                                   |  |
| Source Water Assessment and Protection Program (SWAPP)                            | Maintain SWAPP website. Update source water assessments Wilmington, Newark, and Veolia DE. Create story maps for source water plans.     |
| Delaware Water Supply Coordinating Council  | 14 <sup>th</sup> Report to Governor/General Assembly to update water demands to 2030. Drought guidelines for KC & SC w/DGS.              |
| DNREC Delaware Watersheds   | Maintain Delaware Watersheds website, create story maps for whole basins, updating subbasin pages w/ new maps & updated census/land use. |
| IPA Grant Assistance Program (GAP) Program (                                      | ARPA, IJJA, Clean Water Act, etc   |
| <b>City of Wilmington</b>   |  |
| Brandywine/Hoopers Reservoir Source Water Plan                                    | Assist City with implementation of source water protection plan in Delaware and Pennsylvania.  |
| Wilmington Green Jobs Program/Wilmington Youth Environmental Corps Program (WYEC) | Sponsor watershed-based summer internship and training program for high school students that are City residents.                         |
| Brandywine Creek Brownfields Plan   | Work with EPA, UD, Sea Grant, and City of Wilmington to clean up Brownfields along the Brandywine Creek.                                 |
| Wilmington water system lean service line survey and replacement                  | UD engineering student survey of water supply system lead service lines for replacement and rehabilitation.                              |
| Brandywine Creek Water Quality Analysis   | Work with the City of Wilmington to compile and analyze water quality sampling data.   |
| <b>City of Newark</b>   |  |
| Municipal Separate Storm Sewer MS4 NPDES Permit                                   | Assist w/implementation of EPA/DNREC NPDES MS4 stormwater permit to meet Federal Clean Water Act.  |
| Stormwater Utility  | Conduct research to assist Newark with implementation of the stormwater utility.   |
| Upper Christina River Stream Restoration Project                                  | Clean Water Grant w/DNREC. Monitoring & public outreach for stream restoration (West Branch and Christiansted)                           |
| Water and Stormwater System Models  | Update EPANET2 water distribution and SWMM wastewater collection system models for Newark.   |
| Water Rate Survey   | Update and prepare water rate survey for utilities in Delaware and surrounding states.   |
| White Clay Creek Source Water Protection Plan                                     |  |
| <b>New Castle County</b>  |  |
| Municipal Separate Storm Sewer MS4 NPDES Permit                                   | Assist implement EPA/DNREC stormwater permit meet Clean Water Act.   |
| Water Resource Protection Area Program (WRPA)                                     | Update WRPA mapping on GIS. RPATAC, review land development applications for WRPA impacts.   |
| Floodplain/Stormwater Mapping   | Assist New Castle County with floodplain/stormwater mapping assistance   |
| Southern New Castle County Wastewater Plan  |  |
| <b>Federal</b>  |  |
| USGS NIWR Delaware Water Resources Center   | Direct the Delaware Water Resources Center and manage undergraduate/graduate water resources research program                            |
| <b>Grants</b>   |  |
| White Clay Creek National Wild & Scenic River (NPS)                               | Staff/student assistance to implement WCC watershed management plan.   |
| Brandywine/Christina Cluster Phase 2, Year 5 (WPF)                                | Conduct market-based funding financial feasibility study for the Brandywine/Christina watershed cluster                                  |
| White Clay Creek State of the Watershed (BC, BRCA, TNC, Stroud))                  | Develop in coordination with White Clay Wild and Scenic River and the Brandywine-Christina cluster.                                      |
| NJ Watersheds Economic Valuation  | Assist NJ Environment on economic valuation of the Musconetcong Watershed Association.   |
| Del. Clean Water Campaign (DNS)   | Work with Delaware Nature Society on clean water funding and governance initiatives for Delaware and the Delaware River watershed.       |
| DESG Red Clay Creek and Alosine NFWF  | Work with Delaware Sea Grant on alosine and shad survey in the tidal Red Clay and White Clay creeks.                                     |
| DELDOT South Bowers Flood Study   | Assist DELDOT with coastal flood resilience study along the Delaware Bay in Kent County  |

**DWRC Advisory Panel**

Mr. Ethan Robinson  
City of Newark, Dept. of Public Works  
Newark, DE 19711

Dr. Asia Dowtin  
Michigan State University Department of Forestry, Natural Resources Building.  
East Lansing, MI 48824

Dr. Mingxin Guo  
Department of Agriculture and Natural Resources, Delaware State University  
Dover, DE 19901

Ms. Kate Hutelmeyer  
Partnership for the Delaware Estuary 110 S. Poplar St., Suite 202  
Wilmington, DE 19801

Ms. Stacey McNatt  
Dept. of Special Services  
New Castle, DE 19720

Dr. Paul Imhoff  
Department of Civil and Environmental Engineering, University of Delaware  
Newark, DE 19716

Dr. Thomas McKenna  
University of Delaware, Delaware Geological Survey  
Newark, DE 19716

Ms. Kristin Travers  
Delaware Nature Society  
Hockessin, DE 19707

Ms. Chris Oh  
City of Wilmington, Dept. of Public Works  
Wilmington, DE

Ms. Betzaida (Betzy) Reyes  
U.S. Geological Survey  
Dover, DE 19901

Mr. Kash Srinivasan  
KS Group, LLC  
Wilmington, DE 19802

Mr. Jim Jordan  
Brandywine Red Clay Alliance  
West Chester, PA 19382

Ms. Jennifer Volk  
Kent County Cooperative Extension, University of Delaware  
Dover, DE 19904

Mr. Steve Williams/Ms. Jennifer Walls  
Delaware DNREC, Division of Watershed Stewardship  
Dover, DE 19901

Mr. Christian Hauser, Associate Director, Delaware Sea Grant College Program  
College of Earth, Ocean, and Environment, University of Delaware  
Newark, DE 19716

## **UDWRC Students**

### **2022**

Lydia Franks (M.S. Water Science & Policy)  
Alex Makowski (Master of Public Administration)  
Elizabeth Shields (Master of Public Policy)

### **2021**

Sophie Philips (M.S. Energy and Environmental Policy)  
Hayley Rost (Master of Public Administration)  
Elizabeth Shields (Master of Public Policy)

### **2020**

Sophie Philips (M.S. Energy and Environmental Policy)  
Hayley Rost (M.S. Energy and Environmental Policy)  
Hana Mra Mra (M.S. Water Science and Policy)  
Kelly Slabicki (M.S. Water Science and Policy)

### **2019**

Kelly Jacobs (M.S. Energy and Environmental Policy)  
Matt Kirchoff (M.S. Energy and Environmental Policy)  
Polly Ni (Environmental Engineering)  
Justin Leary (Environmental Engineering)  
Mary Kegelman (Environmental Engineering)

### **2018**

Jillian Young (M.S. Water Science and Policy)  
Kelly Jacobs (M.S. Energy and Environmental Policy)  
Karice Redhead (M.S. Energy and Environmental Policy)  
Alyssa Cortese (B.S. Environmental Science)  
Natalie Zimmerman (B.S. Geological Sciences)

### **2017**

Jillian Young (M.S. Water Science and Policy)  
Briana Diacopoulos (M.S. Water Science and Policy)  
Jordan Martin (M.S. Water Resources Engineering)

### **2016**

Chelsi Cambell (B.S. Civil and Environmental Engineering)  
Matthew Ludington, (M.S. Water Science and Policy)  
Andrea Miller, (B.A. Environmental Studies)  
Maya Kassoff, (B.S. Environmental Science)

### **2015**

Laura Askin (Public Administration)  
Samantha Brucker (Urban Affairs and Public Policy)  
Kristen Molfetta (Water Science and Policy)  
Matthew Ludington (Water Science and Policy)

### **2014**

Jillian Allen (Civil and Environmental Engineering)  
Matt Bachman (Water Science and Policy)  
Hannah Diehl (Civil and Environmental Engineering)  
Asia Downtin (Geography)  
Andrew Colletti (Civil and Environmental Engineering)  
Tobias Muller (Civil and Environmental Engineering)  
Danielle Notvest (Civil and Environmental Engineering)  
Kelli Platt (Civil and Environmental Engineering)

Radhika Samant (Civil and Environmental Engineering)  
Julie Swanson (Civil and Environmental Engineering)  
Sara Veale (Civil and Environmental Engineering)

**2013**

Kevin Archibald (Biology)  
Emily Baumbach (Natural Resources Management)  
Joe Brown (Urban and Regional Planning)  
Asia Dowtin (Geography)  
Caren Fitzgerald (English and Environmental Studies)  
Kate Miller (Water Science and Policy)  
Thomas Santangelo (Water Science and Policy)  
Kelsey Wentling (Environmental Studies)

**2012**

Devika Banerjee (Environmental Studies)  
Catherine Cruz-Ortiz (Energy and Environmental Policy)  
Kaitlyn Cyr (Environmental Studies)  
Jordan Deshon (Civil and Environmental Engineering)  
Ian Kaliaken (Civil and Environmental Engineering)  
Seth Olsen (Natural Resources Management)

**2011**

Erica Addonizio (Chemical Engineering)  
Dustin Briggs (Civil and Environmental Engineering)  
Sarah Chatterson (Urban Affairs and Public Policy)  
Chelsea Halley (Natural Resources Management)  
Lawrence Latour (Civil and Environmental Engineering)  
Stacy Mack (Urban Affairs and Public Policy)  
Erin McVey (Urban Affairs and Public Policy)  
David Specht (Civil and Environmental Engineering)

**2010**

Kayla Iuliano (Geography)  
Audrey Yorke (Civil and Environmental Engineering)

**2009**

Kaci Angeline (Geography)  
Erika Farris (Urban Affairs and Public Policy)  
Maureen Seymour (Urban Affairs and Public Policy)  
Kelly Wolfe (Urban Affairs and Public Policy)

**2008**

Jonathan Barton (Electrical and Computer Engineering)  
Kyle Campbell (Civil and Environmental Engineering)  
Christi DeSisto (Civil and Environmental Engineering)  
Erin Dilworth (Natural Resources Management)  
Kiersten Joesten (Natural Resources Management)  
Angelina Micheva (Urban Affairs and Public Policy)  
Mary Kate O'Brien (Natural Resources Management)  
Julie Trick (Civil and Environmental Engineering)  
Laura Yayak (Natural Resources Management)

**2007**

Andrew Belden (Energy and Environmental Policy)  
Priscilla Cole (Energy and Environmental Policy)  
Jyoti Karkhi (Energy and Environmental Policy)

**2006**

Molly Hesson (Energy and Environmental Policy)

Kevin Vonck (Urban Affairs and Public Policy)  
Melissa Zechiel (Urban Affairs and Public Policy)

**2005**

Steven Ernest (Natural Resources Management)  
Elaine Grehl (Horticulture Administration, Longwood Graduate Program)  
Andrew Kauffman (Civil and Environmental Engineering)  
Laura Robinson (Civil and Environmental Engineering)  
Lori Schnick (Geology)

**2004**

Amy Dolan (Energy and Environmental Policy)  
Sarah Wozniak (Energy and Environmental Policy)

**2002**

Justin Bower (Urban Affairs and Public Policy)  
Martha Corrozi (Urban Affairs and Public Policy)  
Jarod Doucette (Electrical Engineering)  
Tara Harrell (Natural Resources Management)

**2001**

Jennifer Campagnini (Natural Resources Management)

**2000**

Nigel Bradly (Marine Policy)  
Anne Kitchell (Marine Policy)

**1999**

Tammy Brant (Marine Policy)  
Jennifer Egan (Geology)  
Maryjane Middelkoop (Marine Policy)

**1998**

Kareem Ali (Civil and Environmental Engineering)  
Rose Marie Alicea (Education)  
Suzanna Donohue (Marine Policy)

**1997**

Annemarie Cinaglia (Geography)  
Katie Miller (Geography)  
Tammy Nguyen (Geography)

**1996**

Daniel Blevins (Geography)  
Erin Guire (Geography)  
Marcia Horner (Geography)  
Matt Kennedy (Geography)  
Bryan Lennon (Civil and Environmental Engineering)

**1995**

Carin Cataldi (Geography)  
Ty Fitzpatrick (Geography)  
Leon Palermo (Civil and Environmental Engineering)

**1994**

Lori Blackburn  
David Mannering (Geography)  
Gail Slevin (Geography)  
Anne Welsh  
Toby Wolf (Geography)