

FY 2022 Work Plan (7/1/21)
University of Delaware
Water Resources Center
Institute for Public Administration
Biden 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 will move toward a phased reopening of the office by the fall semester in September 2021 through a 2-3-2 hybrid work arrangement or 2 days office and 3 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, (3) work from home when you can, and (4) at office work socially distant with masks on. <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 DEIJ 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
Sophie Phillips	Graduate Research Fellow (M.S. Energy and Environmental Policy)
Hayley Rost	Graduate Research Fellow (Master of Public Administration)
Elizabeth Shields	Graduate Research Fellow (Master of Public Policy)

FY22 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.

DWRC FY22 Budget
Operating Budget
State of Delaware
New Castle County
City of Newark
City of Wilmington
USGS NIWR Delaware Water Resources Center
Grants
White Clay Creek National Wild & Scenic River (NPS)
Brandywine/Christina Cluster Phase 2, Year 4(WPF)
White Clay Creek State of the Watershed (BC, BRCA, TNC, Stroud))
NJ Watersheds Economic Valuation
Del. Clean Water Campaign (DNS)
Brandywine Shad 2020 (USFWS)
Delaware River Economic Benefits Research (DRBC)
Youth Conservation Corps Impact Study (DNREC DPR)
State of the Inland Bays (DCIB)
Technical Report for the Estuary and Basin (PDE).

Project (FY21)	Description
State of Delaware	
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 SUEZ DE. Create story maps for source water plans.
Water Supply Coordinating Council	14 th Report to Governor/General Assembly to update water demands to 2030. Drought guidelines for KC & SC w/DGS.
DNREC Delaware Watersheds	DNREC Delaware Watersheds: revamp/develop/maintain Delaware Watersheds website by creating story maps for each of the whole basins, updating all subbasin pages with new maps and updated census/land use
City of Wilmington	
Brandywine/Hoopers Reservoir Source Water Plan	Assist City with implementation of source water protection plan in Delaware and Pennsylvania.
Wilmington Green Jobs Program	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.
Water Rate Survey	Update and prepare water rate survey for utilities in Delaware and surrounding states.
Brandywine Creek Water Quality Analysis	Work with the City of Wilmington to compile and analyze water quality sampling data.
City of Newark	
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.
White Clay Creek Source Water Protection Plan	
New Castle County	
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
Hercules Golf Course Watershed Plan/Red Clay Cr.	
Southern New Castle County Wastewater Plan	
Federal	
USGS NIWR Delaware Water Resources Center	Direct the Delaware Water Resources Center and manage undergraduate/graduate water resources research program
Grants	
White Clay Creek Wild & Scenic River, NPS	Staff/student assistance to implement WCC watershed management plan.
William Penn Foundation (Ph 2, Yr 2) Brandywine/Christina	Conduct market-based funding financial feasibility study for the Brandywine/Christina watershed cluster
White Clay Creek State of the Watershed Report	Develop in coordination with White Clay Wild and Scenic River and the Brandywine-Christina cluster.
DNS Clean Water Campaign	Research and outreach in public opinion and advocacy of clean water investment re: House Bill 200
Brandywine Shad 2020 (NFWF)	
NJ Watersheds Economic Study	
DRBC Delaware River Economic Benefits Research	
Recon Study National Wild & Scenic Rivers in Delaware	
Indigenous Names of Streams and Waters in Delaware	
Youth Conservation Corps Impact Study DE State Parks	Creation, implementation, data analysis for a study of the impact of the Delaware State Parks Youth Conservation Corps (YCC) from 2014 -2109.
State of the Inland Bays (CIB)	
Technical Report for the Estuary and Basin (PDE).	

DWRC Advisory Panel

Jayne Arthurs
USDA Natural Resources Conservation Service
Dover, DE 19904

Mr. Chris Bason
Center for the Inland Bays
Rehoboth, DE 19971

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

Mr. Jeff Downing
Mt. Cuba Center, 3120 Barley Mill Rd.
Wilmington, DE 19707

Dr. Asia Downtin
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. Andrea Trabelsi
Dept. of Planning, New Castle County
New Castle, DE 19720

Dr. Shreeram Inamdar
Department of Plant & Soil Science
University of Delaware, Townsend Hall
Newark, DE 19716

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
603 E. Matson Run
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

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 Dowtin (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)