

58th Annual Meeting of the Delaware Water Resources Center

**Trabant Student Center
University of Delaware**

Newark, Del.

May 11, 2023

Gerald McAdams Kauffman, Ph.D.
Director and Associate Professor
University of Delaware
Water Resources Center

Martha B. Narvaez
Associate Director & Policy Scientist
University of Delaware
Water Resources Center



JOSEPH R. BIDEN, JR. SCHOOL OF PUBLIC POLICY & ADMINISTRATION

www.bidenschool.udel.edu

MEMORANDUM

TO: Advisory Panel of the University of Delaware Water Resources Center
Undergraduate/Graduate Water Research Students and Advisors

FROM: Gerald J. Kauffman, Director
Martha B. Narvaez, Associate Director
University of Delaware Water Resources Center

DATE: March 20, 2023

SUBJECT: 58th Annual UDWRC Advisory Panel Meeting, May 11, 2023, 10 am-1 pm

You are invited to the 58th Annual Meeting of the Advisory Panel of the University of Delaware Water Resources Center on Thursday, May 11, 2023 at 10 am to be held at the Trabant Center, Room 219 on the campus of the University of Delaware, 17 W. Main St. Newark, Delaware 19716. The purpose of this meeting is to present the FY23 undergraduate and graduate water resources research projects, discuss upcoming FY24 research projects, discuss the DOI/USGS Water Resources Research Act (WRRRA) FY24 budget appropriation, and establish water research priorities in Delaware for the upcoming year. The detailed meeting agenda is provided below.

Agenda Delaware Water Resources Center 58th Annual Advisory Panel Meeting

10:00 am
May 11, 2023

Trabant Student Center, Room 219
University of Delaware
Newark, Del.

- | | |
|---------------------------------------------------------------|----------|
| 1. Introductions | 10:00 am |
| 2. DWRC 5-yr Strategic Plan | 10:10 am |
| 3. FY23 Undergraduate/Graduate Research Presentations | 10:30 am |
| 4. DOI/USGS WRRRA FY24 Budget Request | 11:30 am |
| 5. FY24 Undergraduate Water Internship Proposals | 11:40 am |
| 6. DWRC Advisory Panel Membership | 11:55 am |
| 7. Federal/State/Local/Foundation Water Finance Opportunities | 12:10 pm |
| 8. Luncheon | 12:30 pm |

DWRC Faculty and Scientists



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The Delaware Water Resources Center (DWRC) is a unit of the Institute for Public Administration (IPA), a research center within the Biden School of Public Policy & Administration at the University of Delaware.

Directions

DWRC has two Delaware offices its main office on the University of Delaware's Newark campus, between Penny Hall and the Perkins Student Center, and on the Hugh R. Sharp campus of the University of Delaware in Lewes. Detailed directions for both locations are at www.wrc.udel.edu.



DWRC Newark Office
DGS Annex
261 Academy Street
University of Delaware
Newark, Delaware 19716

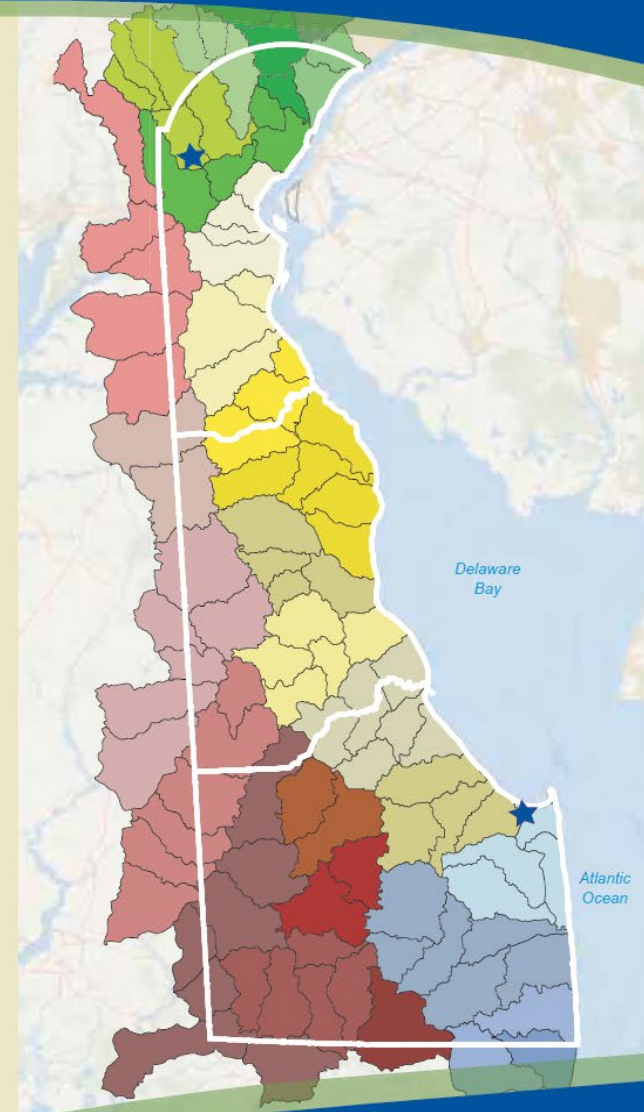
DWRC Lewes Office
805 Pilottown Road
Pollution Ecology Lab, Room 109
Lewes, Delaware 19958



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The University of Delaware is committed to assuring equal opportunity to all persons and does not discriminate on the basis of race, color, gender, religion, ancestry, national origin, sexual orientation, veteran status, age, or disability in its educational programs, activities, admissions, or employment practices as required by Title IX of the Education Amendments of 1972, Title VI of the Civil Rights Act of 1964, the Rehabilitation Act of 1973, the Americans with Disabilities Act, other applicable statutes and University policy. Inquiries concerning these statutes and information regarding campus accessibility should be referred to the Affirmative Action Office, 305 Hullen Hall, (302) 831-2835 (voice), (302) 831-4563 (TDD).

Water Resources Center



Mission

The University of Delaware Water Resources Center (DWRC), established in 1965, is one of the 54 National Institutes for Water Resources (NIWRs) at land-grant universities in the 50 states, District of Columbia and island territories of Guam, Puerto Rico, and U.S. Virgin Islands. The DWRC receives funding through Section 104 of the Water Resources Research Act of 1984, which was originally signed into law by Lyndon Baines Johnson in 1964. The U.S. Geological Survey administers the provisions of the Act and provides oversight of the nation's Water Resources Centers through the National Institute of Water Resources (NIWR).

As a member of the NIWR, the DWRC has two key missions related to Delaware's water resources – our precious groundwater aquifers and our streams, ponds, lakes, and coastal waters to: (1) support research, education, and public outreach programs that focus on water management issues of importance to Delaware citizens and (2) to foster and support training and education programs for the future water scientists, engineers, managers, and policy-makers.



Education

DWRC provides an important role in water resources education at the University of Delaware and to the greater public. The DWRC carries out its education role through participating in outreach activities; offering courses, seminars and forums with a water resources focus; and advising undergraduate and graduate students through funded assistantships.



Courses Offered

- UAPP 611: Regional Watershed Management
- GEOG 432: Environmental Hydrology
- CIEG 440: Water Resources Engineering
- UAPP 667: GIS Applications in Public / Nonprofit Sectors
- UAPP 652: GIS in Public Policy

Conferences

- Water Policy Forum
- Delmarva GIS Conference

Community Events

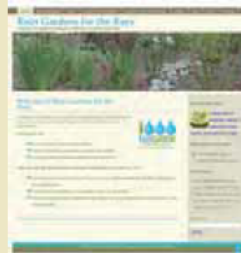
- Delaware Clean Water Rally
- Delaware GIS Day
- University of Delaware Ag Day
- University of Delaware Coast Day



Public Service

DWRC provides water policy assistance to governments in Delaware and the surrounding region. This public service role is significant to the mission of the College of Arts & Sciences and the School of Public Policy & Administration (SPPA). DWRC takes a regional, intergovernmental approach to water management since watersheds and aquifers cross many political jurisdictions.

The Water Resources Agency, a project of the DWRC, receives support from Delaware, New Castle County, and the cities of Wilmington and Newark to provide water resources assistance to the public with regard to water supply, water quality, and watershed planning and management.



Water Supply

- Delaware's Water Supply Coordinating Council
- Office of the State Water Coordinator
- New Castle County Water Resource Protection Areas, Technical Advisory Committee
- Delaware Source Water Assessment and Protection Program

Watershed Management and Planning

- Christina Basin Clean Water Partnership
- White Clay Creek Wild and Scenic Management Committee
- Nonpoint Education for Municipal Officials (NEMO)
- Floodplain/Stormwater Management

Mapping and Data Services

- Comprehensive Plan Mapping
- Mapping Applications
- Public and Private Education (K-12) Assistance
- Regional Watershed Mapping, Data Creation, and Analysis



Research

DWRC seeks opportunities to collaborate with University faculty, scientists, and students to fund, conduct, and publish water-resources research.

University of Delaware Experimental Watershed

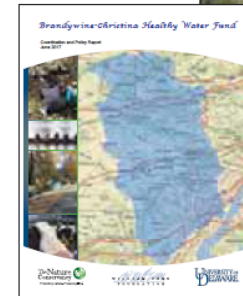
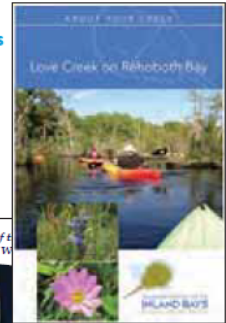
Development of an experimental watershed as an on-campus education and research laboratory.

Geospatial Analysis and Information Management

Repository of core DWRC data and information collaboration in water research with other groups on campus and beyond. Advancement of GIS and remote-sensing technologies for water resources management.

Publications and Presentations

Research on topics such as water policy, watershed management, water rates, and public-private water management at regional and national conferences.



Delaware Water Resources Center (DWRC)

A unit of the *Institute for Public Administration*
in the *Joseph R. Biden, Jr. School of Public Policy & Administration*



DWRC Staff

Gerald J. Kauffman, Ph.D.
Director/Associate Professor

Andrew R. Homsey
Policy Scientist
(GIS Services Manager)

Nicole M. Minni
Associate Policy Scientist
(GIS Laboratory/Lewes Office)

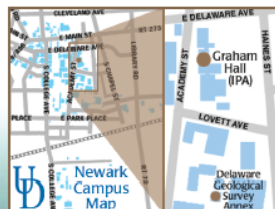
Martha C. Narvaez
Associate Director/Policy Scientist

Sherri D. Martinez
Senior Grants Analyst

Sophie Phillips
M.S. Energy & Environment Policy

Hayley Rost
MPA Master of Public Admin.

Undergraduate and Graduate Research Fellows



What is DWRC?

Established on campus in 1965, the University of Delaware Water Resources Center (DWRC) is one of the 54 National Institutes for Water Resources (NIWRs) at land grant universities in the 50 states, District of Columbia, and island territories of Guam, Puerto Rico, and U.S. Virgin Islands. The DWRC is supported by the U.S. Geological Survey through Section 104 of the Water Resources Research Act signed into law by Lyndon Baines Johnson in 1964. The mission of the DWRC is to: (1) support water resources research, education, and public outreach programs in Delaware and (2) sponsor training of future water scientists, engineers, managers, and policy-makers in the First State.

What is WRA?

Established in 1977 and modified in 1990 and 1997, the Water Resources Agency (WRA) is a program of the DWRC and provides regional water resources assistance to governments in Delaware and the Delaware Valley through the University of Delaware's land-grant public service, education, and research role. The WRA is supported by federal, state, and local government partners, including the State of Delaware, New Castle County, City of Newark, and City of Wilmington.

Where is DWRC?

The DWRC is located in Newark, Delaware, on UD's main campus at 261 Academy Street in the Delaware Geological Survey (DGS) Annex, behind Penny Hall and the UD Rain Garden.

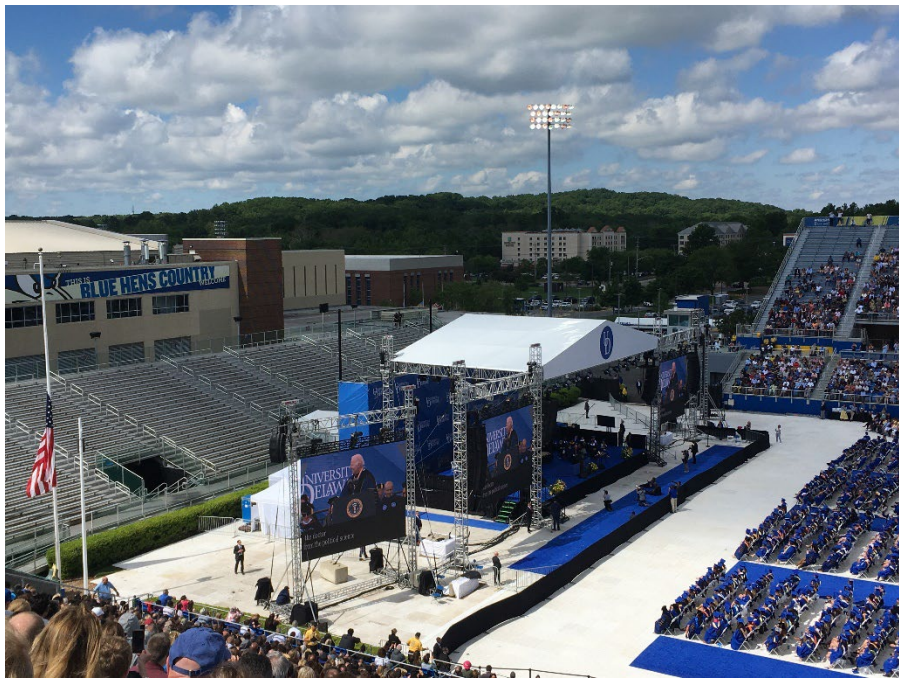
DWRC Partners

Brandywine Conservancy
Brandywine Valley Association
City of Wilmington
City of Newark
Delaware Nature Society
Delaware Center for Horticulture
Delaware Greenways
Delaware Department of Transportation
Delaware River Basin Commission
Delaware Department of Natural Resources and Environmental Control
FishAmerica Foundation
New Castle Conservation District
New Castle County
National Oceanic and Atmospheric Administration
National Park Service
Partnership for the Delaware Estuary
SUEZ Water Delaware
The Nature Conservancy (Delaware)
UD Colleges
U.S. Environmental Protection Agency
U.S. Geological Survey
William Penn Foundation

DWRC is involved with...

- Christina Basin Clean Water Partnership
- City of Wilmington Green Jobs Program
- Delaware Flora Database
- Delaware Source Water Assessment and Protection Program
- Delaware Water Supply Coordinating Council
- Delaware Watersheds
- Economic Value of Watersheds
- GIS Services/Education/Outreach
- Sussex Economic Development Action Committee
- Sustainable Coastal Community Initiative
- White Clay Creek Wild and Scenic Management Committee





The UDWRC is recognized as a national leader in water resources research, education, and public service:

1. **UDWRC is a Congressionally-charted water research institute:** Established on-campus in 1965 in the year after Lyndon Baines Johnson signed the Water Resources Research Act (WRRRA) of 1964, the UDWRC is one of the 54 Congressionally-chartered National Institutes for Water Resources (NIWR) supported by the Department of Interior and U.S Geological Survey at land grant universities in the 50 states, D.C., and three island territories of Guan, Puerto Rico, and U.S. Virgin Islands.
2. **UDWRC top ranked in the nation by USGS:** The UDWRC is recognized as "exceptional" in support of our students at Delaware universities. In accordance with the Water Resources Research Act of 1984, the Secretary of Interior and Director of the U.S. Geological Survey informed the President of the University of Delaware by letter that the UDWRC is "unique nationally" and its collaborations are "impressive" amounting to a "high" rating and top 12 ranking nationwide among the 54 land grant universities. The five-year evaluation of the 54 National Institutes for Water Resources (NIWR) at land grant universities that stretch from Maine to Micronesia noted that our institute: (1) engages with universities/colleges around the state, (2) has strong leadership on the part of the Institute Director, and (3) facilitates research and information transfer closely tied to the water resources needs/issues of Delaware.
3. **UD AWRA voted national student chapter of the year:** Our national prominence in water is further cemented with news that the University of Delaware student section of the American Water Resources Association (UDAWRA) was voted for the 4th time as the national chapter of the year, a feat matched only by the University of Wisconsin and University of Florida. Martha Narvaez is faculty advisor of the nationally prominent UD student section of the AWRA.
4. **American Water Resources Association (AWRA) 51st President:** In 2015 Martha B. Narvaez was elected as the 51st President of the American Water Resources Association (AWRA) established in 1964 and with 25,000 members is the largest water resources professional organization in the world.
5. **Brandywine Red Clay Alliance (BRC) 77th President:** In 2021 Andrew R. Homsey was elected as the 77th President of the Brandywine Red Clay Alliance of West Chester, Pennsylvania which was established in 1945 as the oldest small watershed association in the United States.
6. **Universities Council on Water Resources (UCOWR) 59th President:** In 2022 Gerald J. Kauffman was elected as the 59th President of the Universities Council on Water Resources (UCOWR) which represents the 80 water resources research and degree-granting institutions of higher learning in America. Established in 1964, the UCOWR board is composed of faculty from the University of Delaware, Texas A&M, Minnesota, Oklahoma State, Mississippi State, Penn State, Purdue, Virginia Tech, Kansas State, University of Hawaii, University of California Berkeley, Washington State, and Southern Illinois University.



Figure 1. Map of Newark and environs (source: Water Resources Agency, Institute for Public Administration, University of Delaware*, 2008)

The University of Delaware is fortuitously situated on campuses ideally suited by hydrology and geography to study water resources.



JFK signs 1961 DRBC Compact

LBJ signs 1964 Water Resources Research Act



LYNDON B. JOHNSON

XXXVI President of the United States: 1963-1969

461 - Statement by the President Upon Signing the Water Resources Research Act.

July 17, 1964

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THE Water Resources Research Act of 1964, which I have approved today, fills a vital need.

Abundant, good water is essential to continued economic growth and progress. The Congress has found that we have entered a period in which acute water shortages are hampering our industries, our agriculture, our recreation, and our individual health and happiness.

Assuming a continuation of current practices, by the year 2000 there will not be enough usable water to meet the water requirements of parts of the States of Arizona, California, Colorado, Delaware, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Michigan, Minnesota, Montana, Nebraska, Nevada, New Jersey, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Dakota, Texas, Utah, Wisconsin, and Wyoming.

This legislation will help us solve this problem. It will create local centers of water research. It will enlist the intellectual power of universities and research institutes in a nationwide effort to conserve and utilize our water resources for the common benefit. The new centers will be concerned with municipal and regional, as well as with national water problems. Their ready accessibility to State and local officials will permit each problem to be attacked on an individual basis, the only way in which the complex characteristics of each water deficiency can be resolved. The bill contemplates a high degree of interstate cooperation, and I urge that this be encouraged.

In large measure, this legislation is a tribute to the vision and wisdom of Senator Clinton P. Anderson of New Mexico. He has long recognized the problems. He developed the program. He guided it through Congress. He has been in the forefront of the effort to see that adequate supplies of water are available in all parts of the Nation.

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*Public Papers
of the Presidents*



Lyndon B. Johnson
1963-64: Book II

Font Size:



(d) Mails

The Board may use the United States mails in the same manner and under the same conditions as other departments and agencies of the United States.

(e) Experts and consultants

Subject to such rules as may be prescribed by the Board, the Chairman may procure temporary and intermittent services under section 3109(b) of title 5, but at rates for individuals not to exceed the daily equivalent of the maximum annual rate of basic pay payable for GS-18 of the General Schedule.

(Pub. L. 97-425, title V, § 507, as added Pub. L. 100-202, § 101(d) [title III], Dec. 22, 1987, 101 Stat. 1329-104, 1329-121; Pub. L. 100-203, title V, § 5051, Dec. 22, 1987, 101 Stat. 1330-250.)

CODIFICATION

Pub. L. 100-202 and Pub. L. 100-203 added identical sections.

REFERENCES IN OTHER LAWS TO GS-16, 17, OR 18 PAY RATES

References in laws to the rates of pay for GS-16, 17, or 18, or to maximum rates of pay under the General Schedule, to be considered references to rates payable under specified sections of Title 5, Government Organization and Employees, see section 629 [title I, § 101(c)(1)] of Pub. L. 101-509, set out in a note under section 5376 of Title 5.

§ 10268. Report

The Board shall report not less than 2 times per year to Congress and the Secretary its findings, conclusions, and recommendations. The first such report shall be submitted not later than 12 months after December 22, 1987.

(Pub. L. 97-425, title V, § 508, as added Pub. L. 100-202, § 101(d) [title III], Dec. 22, 1987, 101 Stat. 1329-104, 1329-121; Pub. L. 100-203, title V, § 5051, Dec. 22, 1987, 101 Stat. 1330-250.)

CODIFICATION

Pub. L. 100-202 and Pub. L. 100-203 added identical sections.

TERMINATION OF REPORTING REQUIREMENTS

For termination, effective May 15, 2000, of provisions of this section relating to reporting to Congress 2 times per year, see section 3003 of Pub. L. 104-66, as amended, set out as a note under section 1113 of Title 31, Money and Finance, and the last item on page 186 of House Document No. 103-7.

§ 10269. Authorization of appropriations

Notwithstanding subsection (d) of section 10222 of this title, and subject to subsection (e) of such section, there are authorized to be appropriated for expenditures from amounts in the Waste Fund established in subsection (c) of such section such sums as may be necessary to carry out the provisions of this subchapter.

(Pub. L. 97-425, title V, § 509, as added Pub. L. 100-202, § 101(d) [title III], Dec. 22, 1987, 101 Stat. 1329-104, 1329-121; Pub. L. 100-203, title V, § 5051, Dec. 22, 1987, 101 Stat. 1330-251.)

CODIFICATION

Pub. L. 100-202 and Pub. L. 100-203 added identical sections.

§ 10270. Termination of Board

The Board shall cease to exist not later than 1 year after the date on which the Secretary begins disposal of high-level radioactive waste or spent nuclear fuel in a repository.

(Pub. L. 97-425, title V, § 510, as added Pub. L. 100-202, § 101(d) [title III], Dec. 22, 1987, 101 Stat. 1329-104, 1329-121; Pub. L. 100-203, title V, § 5051, Dec. 22, 1987, 101 Stat. 1330-251.)

CODIFICATION

Pub. L. 100-202 and Pub. L. 100-203 added identical sections.

CHAPTER 109—WATER RESOURCES RESEARCH

Sec.	
10301.	Congressional findings and declarations.
10302.	Congressional declaration of purpose.
10303.	Water resources research and technology institutes.
10304.	Research concerning water resource-related problems deemed to be in national interest.
10305.	Development of water-related technology.
10306.	Administrative costs.
10307.	Types of research and development.
10308.	Patent policy.
10309.	New spending authority; amounts provided in advance.

§ 10301. Congressional findings and declarations

The Congress finds and declares that—

(1) the existence of an adequate supply of water of good quality for the production of materials and energy for the Nation's needs and for the efficient use of the Nation's energy and water resources is essential to national economic stability and growth, and to the well-being of the people;

(2) the management of water resources is closely related to maintaining environmental quality, productivity of natural resources and agricultural systems, and social well-being;

(3) there is an increasing threat of impairment to the quantity and quality of surface and groundwater resources;

(4) the Nation's capabilities for technological assessment and planning and for policy formulation for water resources must be strengthened at the Federal, State, and local governmental levels;

(5) there should be a continuing national investment in water and related research and technology commensurate with growing national needs;

(6) it is necessary to provide for the research and development of technology for the conversion of saline and other impaired waters to a quality suitable for municipal, industrial, agricultural, recreational, and other beneficial uses;

(7) the Nation must provide programs to strengthen research and associated graduate education because the pool of scientists, engineers, and technicians trained in fields related to water resources constitutes an invaluable natural resource which should be increased, fully utilized, and regularly replenished; and¹

(8) long-term planning and policy development are essential to ensure the availability

¹ So in original. The word "and" probably should not appear.

Page 2441**§ 10303**

of product water, considering the amortization of all components of the demonstration plant and ancillary facilities. Such report shall be accompanied by a proposed contract (or cooperative agreement) between the Secretary and a duly authorized non-Federal entity, in which such entity shall agree to provide not less than 15 per centum and not more than 35 per centum of the total cost of the demonstration; such cost to include, without being limited to, necessary water rights, water supplies, rights-of-way, power source interconnections, brine disposal facilities, land, construction, ancillary facilities, and the operation and maintenance costs for a period of four years following final acceptance of the construction of the plant from the plant contractor. The contributions of the non-Federal entity under such proposed contract may be in-kind. During the participation by the Secretary in the construction and the operation and maintenance of such demonstration, access to the demonstration and its operating data will not be denied to the Secretary or his representatives. The period of participation by the Secretary in the operation and maintenance of any such demonstration shall be four years. The Secretary is authorized to include in the proposed contract a provision for conveying, as appropriate, and in such amounts as are appropriate, rights, title, and interest of the Federal Government in the demonstration project to the non-Federal public entity.

"(c) There is authorized to be appropriated, to remain available until expended, for the fiscal year ending September 30, 1978, and thereafter, the sum of \$50,000,000 to finance the total Federal share of the cost of the demonstration plants authorized by this section; such cost to include, without being limited to, necessary water rights, water supplies, rights-of-way, power source interconnections, brine disposal facilities, land, construction, ancillary facilities, and the operation and maintenance costs for the four-year period of Federal participation in such costs.

"(d) When appropriations have been made for the commencement or continuation of design, construction, or operation and maintenance of any demonstration plant authorized under this Act [this note], the Secretary may, in connection with such design, construction, or operation and maintenance, enter into contracts and cooperative agreements for miscellaneous services, for materials and supplies, as well as for construction, which may cover such periods of time as the Secretary may consider necessary but in which the liability of the United States shall be contingent upon appropriations being made therefor."

[For termination of Trust Territory of the Pacific Islands, see note set out preceding section 1681 of Title 48, Territories and Insular Possessions.]

§ 10302. Congressional declaration of purpose

It is the purpose of this chapter to assist the Nation and the States in augmenting their water resources science and technology as a way to—

(1) assure supplies of water sufficient in quantity and quality to meet the Nation's expanding needs for the production of food, materials, and energy;

(2) discover practical solutions to the Nation's water and water resources related problems, particularly those problems related to impaired water quality;

(3) assure the protection and enhancement of environmental and social values in connection with water resources management and utilization;

(4) promote the interest of State and local governments as well as private industry in research and the development of technology that will reclaim waste water and to convert saline and other impaired waters to waters

suitable for municipal, industrial, agricultural, recreational, and other beneficial uses;

(5) promote more effective coordination of the Nation's water resources research program;

(6) promote the development of a cadre of trained research scientists, engineers, and technicians for future water resources problems; and

(7) encourage long-term planning and research to meet future water management, quality, and supply challenges.

(Pub. L. 98-242, title I, § 103, Mar. 22, 1984, 98 Stat. 97; Pub. L. 101-397, § 1(a), Sept. 28, 1990, 104 Stat. 852; Pub. L. 104-147, § 2, May 24, 1996, 110 Stat. 1375.)

REFERENCES IN TEXT

This chapter, referred to in text, was in the original "this Act", meaning Pub. L. 98-242, Mar. 22, 1984, 98 Stat. 97, known as the Water Resources Research Act of 1984. For complete classification of this Act to the Code, see Short Title Note set out under section 10301 of this title and Tables.

AMENDMENTS

1996—Par. (5). Pub. L. 104-147, § 2(1), struck out "to" before "promote" and "and" after "program"; Par. (6). Pub. L. 104-147, § 2(2), substituted "; and" for period at end.

Par. (7). Pub. L. 104-147, § 2(3), added par. (7). 1990—Par. (5). Pub. L. 101-397 substituted "to promote more effective coordination of" for "coordinate more effectively".

§ 10303. Water resources research and technology institutes**(a) Establishment; designation of site by State legislature or Governor**

Subject to the approval of the Secretary of the Interior (hereafter in this chapter referred to as the "Secretary") under this section, one water resources research and technology institute, center, or equivalent agency (hereafter in this chapter referred to as the "institute") may be established in each State (as used in this chapter, the term "State" includes the Commonwealth of Puerto Rico, the District of Columbia, the Virgin Islands, Guam, American Samoa, the Commonwealth of the Mariana Islands and the Federated States of Micronesia) at a college or university which was established in accordance with the Act approved July 2, 1862 (12 Stat. 503) [7 U.S.C. 301 et seq.], or at some other institution designated by act of the legislature of the State concerned. If there is more than one such college or university in a State established in accordance with such Act of July 2, 1862, the institute in such State shall, in the absence of a designation to the contrary by act of the legislature of the State, be established at the one such college or university designated by the Governor of the State. Two or more States may cooperate in the establishment of a single institute or regional institute, in which event the sums otherwise allocated to institutes in each of the cooperating States shall be paid to such single or regional institute.

(b) Scope of research; other activities; cooperation and coordination

Each institute shall—



The University of Delaware Water Resources Center, established on campus in 1965 at the 8th oldest institution of higher learning in the nation (est. 1743), is now a research center within the Joseph R. Biden School of Public Policy & Administration.

Water Resources Research Act Program



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[AUTHORIZATIONS](#)

[PERFORMANCE
MEASURES](#)

Authorizations

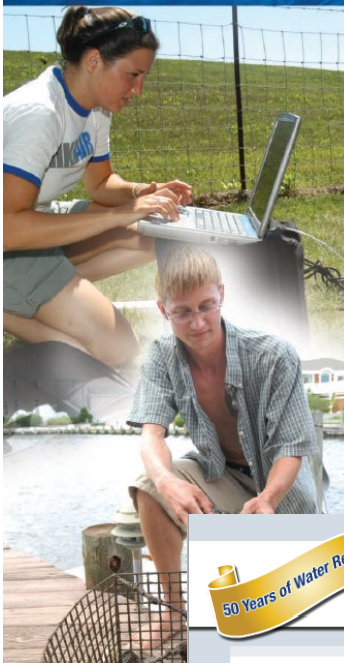
Water Resources Research Act Program (WRRRA) activities are conducted under the authority of various pieces of authorizing legislation. Many of the primary authorizations that allow the USGS and WRRRA to serve the American people are listed below, along with descriptions of either how the authorization relates to USGS or what WRRRA activities are performed under a particular authorization.

General USGS Authorizations

The **ORGANIC ACT OF MARCH 3, 1879**, (43 U.S.C. 31 et seq.) that established the Geological Survey, as amended (1962); and restated in annual appropriation acts. This section provides, among others, that the Geological Survey is directed to classify the public lands and examine the geological

Delaware Water Resources Center at the University of Delaware DWRC

Undergraduate Internships In Water Resources 2015



UNIVERSITY OF
DELAWARE
College of Agriculture
& Natural Resources

Delaware Water Resources Center (DWRC) Undergraduate Internships in Water Resources provide a unique opportunity for undergraduate students and faculty to become directly involved in research and education projects addressing water resource related issues of critical importance to Delaware and the Mid-Atlantic region.

Eligibility

All undergraduate students enrolled at an institution of higher learning in Delaware may apply, except for those graduating at the end of the spring semester. All students must have the active support of a faculty advisor and a minimum GPA of 3.0. (If a student applies for any other UD-sponsored summer research experience s/he must indicate this on the DWRC application. The DWRC intends to award internships to only those students who have not been awarded another internship within a calendar year.)

Program Details and Deadline

The DWRC provides \$3500 in financial support for each undergraduate intern. Students typically work ten weeks full-time during the summer and additional hours during the fall and winter. Interns must submit a written report on their project and participate in a poster session at the UD spring undergraduate research conference. The application deadline for 2015 DWRC internships is March 27, 2015. See second page for more information. For details on past projects, current faculty advisors, application materials to submit, and requirements for reports and posters, visit the DWRC website: <http://ag.udel.edu/dwrc/>

Delaware Water Resources Center (DWRC) interns

experience a complete research or education project. Students, in cooperation with faculty advisors, identify a topic of interest, develop

The DWRC Internship Program

All DWRC interns conduct a project consistent with the DWRC's research and educational interests (listed below in the green box) with the support of a faculty advisor from one of our co-sponsor organizations. Internships may be available in sponsorship with the following:

University of Delaware (UD) Water Resources Agency (<http://www.ipa.udel.edu/wra/>): Internships are supported which focus on water resource policy and management.

UD College of Agriculture and Natural Resources (<http://canr.udel.edu/>): Projects are supported to work with faculty in the departments of Animal and Food Sciences, Entomology and Wildlife Ecology, Applied Economics and Statistics, or Plant and Soil Sciences. For example, an internship in the Department of Plant and Soil Sciences could relate soils, plants, and land management to water use and quality.

UD College of Arts and Sciences (<http://www.cas.udel.edu/>): Students can conduct internship projects in Biological Sciences, Chemistry, Political Science, Public Policy, or other subjects closely related to water resources.

UD College of Earth, Ocean, and Environment (<http://www.ceoe.udel.edu/>): Internships are supported in the areas of Geography, Geology, Marine Biology and Biochemistry, Marine Policy, Oceanography, or Physical Ocean Science and Engineering.

UD College of Engineering (<http://www.engr.udel.edu/>): Projects can be developed in areas such as Chemical Engineering, Civil and Environmental Engineering, or Mechanical Engineering.

Delaware Geological Survey (<http://www.dgs.udel.edu/>): Researchers offer internships focusing on hydrogeology, ground water supply, and water quality.

Delaware State University (<http://cars.desu.edu/>): Faculty support internships in the areas of agriculture, natural resources, aquaculture, and aquatic ecology.

Delaware Department of Natural Resources and Environmental Control (<http://www.dnrec.delaware.gov/>): Staff in DNREC offices related to water resources occasionally offer internships on topics such as soil and water conservation, water quality, and climate change.

Topics in water resources research and education of interest to the DWRC:

- Water pollutants - their sources, fate, cycling, and transport
- Water supply, demand, and conservation
- Groundwater identification and protection
- Nutrient management and water quality
- Management and control of storm water runoff

How to Apply for a DWRC Internship

Select your topic: DWRC internships are for students from a wide variety of backgrounds and research interests. Titles of past projects can be found at <http://ag.udel.edu/dwrc/interns.html> and <http://ag.udel.edu/dwrc/publications/DWRCInternshipSpotlight2009.pdf> and include: White Clay Creek Shad Restoration Project (Water Resources Agency); Developing Scientifically-Based Food Safety Metrics for Water Management and Irrigation Methods (Animal and Food Sciences); The Returns to Best Management Practices: Evidence from Early Proposals for Nutrient Trading in the Chesapeake Bay Watershed (Applied Economics and Statistics); Water Quality Management in Urban Ecosystems (Plant and Soil Sciences); The Impacts of Redefining Navigable Waters under the Clean Water Act (Political Science); Sediment Transport through Historic Mill Dams of the Christina River Basin (Geology); Characterization of Viral Diversity within the Mantle Fluid of the Eastern Oyster, *Crassostrea virginica* (Marine Biology); Preventing Formation of Toxic Chlorination Byproducts in Water Using Zerovalent Iron (Civil and Environmental Engineering); Hydraulic Properties of the Columbia Aquifer (Delaware Geological Survey); and Aquatic Health near Wastewater Discharge in Delaware Inland Bays Tidal Canal (Delaware State University).

Find a Faculty Advisor and Apply to the DWRC: Faculty contacts and their research interests are also listed on the DWRC website, under "Faculty and Staff". Contact the DWRC program coordinator, Maria Pauler (mpauler@udel.edu; 302-831-0847), to say that you are interested. Students should contact potential faculty advisors to discuss and identify a project topic of mutual interest and then submit their application to the DWRC by the deadline **March 27, 2015**. Faculty may not advise more than two interns concurrently and must provide matching funds consistent with DWRC guidelines, usually by committing a percentage of their time to the intern's project.



Delaware Water Resources Center

Gerald J. Kauffman, Ph.D., Director
DGS Annex 261 Academy Street
Newark, DE 19716
Phone: 302-831-4929
E-mail: jerryk@udel.edu



NIWR & USGS A Model Partnership

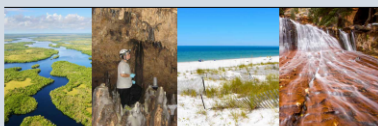
NIWR
THE NATIONAL INSTITUTES
FOR WATER RESOURCES

USGS
science for a changing world

us by Danielle Quigley

PARTNERSHIP WITH USGS

- The National Institutes for Water Resources (NIWR) partners with the U.S. Geological Survey (USGS) through the provisions of the Water Resources Research Act (WRRA) to address water-related concerns by providing a national platform for research, training and collaboration.
- USGS provides each institute with a grant to target local priorities, recruit researchers and leverage federal funds with state money and private funding.
- 54 NIWR member institutes are housed in the country's land-grant universities in all 50 states, three U.S. territories and the District of Columbia.
- NIWR is the only federally mandated research program that focuses on applied water resource research, education, training and outreach.



Housed in the nation's leading research universities, NIWR

MAXIMIZING FEDERAL IMPACT

NIWR's ability to attract and match non-federal funds to USGS grant-sponsored research multiplies the federal investment in local water projects. The NIWR-USGS partnership also strengthens USGS's own funding model, as NIWR institutes often allow funds to pass through the institutes to USGS State Water Science Centers. The NIWR institutes open doors for the USGS at the state-level to other funding sources that may require non-federal matching funds. In recent years, the USGS State Water Science Centers have benefitted from funds that have flowed through NIWR institutes from external sources for technical assistance and scientific expertise on large-scale, multi-partner projects that address emerging water research needs.

WANTED: INTERNS

The USGS is encouraging NIWR institutes to take advantage of its nationwide internship program, details of which follow:

- The interns are hired by the NIWR institute but work with USGS Water Science Center researchers.

IMPACT & COLLABORATION

- NIWR member institutes assist public and private sector groups in their mission to protect human health, environmental resources and economic sustainability.
- Last year, NIWR member institutes sponsored more than 1,200 groundbreaking research projects.
- Grants from USGS and other sponsors are awarded through a competitive, peer-reviewed process.
- NIWR member institutes collaborated on projects with over 200 universities, 150 state agencies, 180 federal agencies, departments and divisions, and more than 165 local and municipal offices.



SUCCESS FROM THE GROUND UP

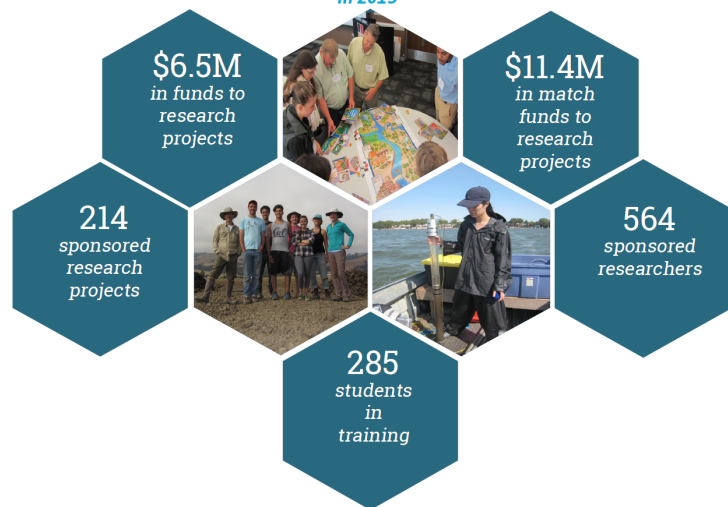
in water-related practices and policies

The National Institutes for Water Resources (NIWR) plays a major role in addressing water-related concerns by providing a platform for research, training, and collaboration at the state level. Housed in the nation's land-grant universities and four U.S. territories, the 54 NIWR member institutes leverage university expertise in research, education, and outreach to find solutions for the water management challenges we face. With our funding and educational services, water-related professionals and researchers receive support for the creation of local tools and policies to better manage our water. These successes start at the local level and have the ability to grow and make an impact across the United States.

In FY 2015, Congress appropriated \$6.5 million dollars in WRRRA grant funding, enabling cutting-edge research on the nation's most pressing water issues. This financial source requires matching from non-federal sourced funds from the public and private sector. This local financing significantly leverages the available federal dollars for water research.

NIWR BY THE NUMBERS

in 2015



Photos, starting clockwise at top: 2016 North Carolina Watershed Stewardship Network workshops
2016 Iowa State University PhD student holding a sediment core at East Okoboji Lake in Iowa.
2016 University of California field team assessing improvements in water quality during groundwater recharge

Our history started in 1964

Water Resources Research Act, USGS, and NIWR

The 1964 Water Resources Research Act (WRRRA) established the nation's Water Resources Research Institutes. Pursuant to the WRRRA of 1964 as amended, the United States Geological Survey (USGS) within the U.S. Department of the Interior assumed responsibility for administering WRRRA funding, which targets local, regional, and national water priorities, helps train and recruit researchers, and aids in the transfer of technology and best practices.

Coordination and interaction between the Institutes and USGS is facilitated by NIWR. A volunteer-led organization, the NIWR network represents the only authorized federal-state program that focuses on applied water resource research, education, training, and outreach.

NATIONAL INSTITUTES FOR WATER RESOURCES

NIWR Board Officers

President: Dr. Stephen H. Schoenholtz, Virginia Tech • stephen.schoenholtz@vt.edu

Secretary-Treasurer: Dr. John C. Tracy, Texas A&M • john.tracy@ag.tamu.edu

President Elect: Dr. Alexander Fernald, New Mexico State University • afernald@nmsu.edu

Past President: Dr. Richard Cruse, Iowa State University • rnc@iastate.edu

Visit us at niwr.info

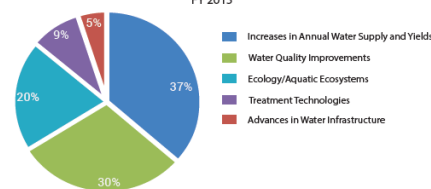
Fact Sheet 2017

TOOLS FOR

Annual Base Grants

The largest of the USGS-NIWR research grant programs is the 104(b) Annual Base Funding grant program. Approximately \$5 million in 104(b) grants are awarded annually to NIWR member institutes to help each institute plan and conduct applied and peer-reviewed research, education, and outreach activities on water.

Annual Base Grants Research Areas
FY 2015



National Competitive Grants

The 104(g) National Competitive Grants program funds research in water issues that are of a regional or interstate nature or relate to a specific program priority identified by the Secretary of the Interior and the Institutes.

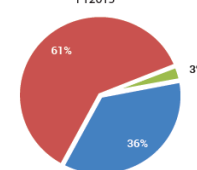
Approximately \$1 million is available each year. In 2015, 104(g) funding was awarded to four research projects studying important national priority issues in water quality and quantity. These projects were:

- "Trace Organic Contaminants in Urban Stormwater and Performance of Urban Bioretention Systems: a Field and Modeling Study" in Colorado
- "Using bioavailability to assess pyrethroid insecticide toxicity in urban sediments" in Illinois
- "Human and Ecological Health Impacts Associated with Water Reuse: Engineered Systems for Removing Priority Emerging Contaminants" in South Carolina
- "Hydrologic Life Cycle Impact of Mountain Pine Bark Beetle Infestations" in South Dakota

TRAINING OUR FUTURE LEADERS IN WATER

The National Institutes for Water Resources supports learning opportunities for students with funded research projects. Both undergraduate and graduate students explore new ideas and learn new skills. This fosters successful entry into a competitive water resources job market and allows them to make life-long positive water resource impacts.

Student Support
FY2015



Undergraduate Graduate Post Doc

Total Students: 285

The Network of Water Resources Research Institutes



State	NIWR	University	Department	City	Director	Rank
Alabama	Water Resources Research Institute	Auburn	Forestry and Natural Resources	Auburn	Dr. Eve Brantley	Professor
Alaska	Water & Environmental Research Center	Alaska	Institute for Northern Engineering	Fairbanks	Dr. Nicole Misarti	Associate Professor
Arizona	Water Resources Research Center	Arizona	Agriculture and Resource Economics	Tucson	Dr. Sharon Megdal	Neely Endowed Professor
Arkansas	Water Resources Center	Arkansas	Agriculture/Coop Extension	Fayetteville	Dr. Brian Haggard	Professor
California	Institute for Water Resources	California	Agriculture/Natural Resourc.	Oakland	Dr. Doug Parker	Professor
Colorado	Water Institute	Colorado	Engagement & Extension	Fort Collins	Dr. John Tracy	Professor
Connecticut	Institute of Water Resources	Connecticut	Agric./Coop Extension	Storrs	Dr. Michael Dietz	Director
Delaware	Water Resources Center	Delaware	Biden School of Public Policy and Administration	Newark	Dr. Gerald Kauffman	Associate Professor
District of Columbia	Water Resource Research Institute	D.C.	Agriculture/Environment	D.C.	Dr. Tolessa Deksissa	Associate Professor
Florida	Water Resources Research Center	Florida	Civil and Environmental Engineering	Gainesville	Dr. Kirk Hadfield	Professor
Georgia	Water Resources Institute	Georgia Tech.	Civil and Environmental Engineering	Atlanta	Dr. Aris Georgakakos	Professor
Guam	Water Research Institute Western Pacific	Guam	Environmental Geology	Mangilao	Dr. John Jenson	Professor
Hawaii	Water Resources Research Center	Hawaii	Geography & Environment	Honolulu	Dr. Thomas Giambelluca	Professor
Idaho	Water Resources Research Institute	Idaho	Exotoxicology	Boise	Dr. Alan Kolok	Professor
Illinois	Water Resources Center	Illinois	Illinois State Geol. Survey	Champaign	Dr. Yu-Feng Lin	Principal Hydrogeologist
Indiana	Water Resources Research Center	Purdue	Natural Resources	West Lafayette	Dr. Linda Stalker Prokopy	Professor
Iowa	Water Center	Iowa State	Agronomy	Ames	Dr. Rick Cruse	Professor
Kansas	Water Resources Institute	Kansas State	Agricultural Resources and the Environment	Manhattan	Dr. Daniel Devlin	Director
Kentucky	Water Resources Research Institute	Kentucky	Civil and Environmental Engineering	Lexington	Dr. Lindell Ormsbee	Raymond-Blythe Professor
Louisiana	Water Resources Research Institute	Louisiana State	Civil and Environmental Engineering	Baton Rouge	Dr. Frank Tsai	Associate Professor
Maine	Water Resources Research institute	Maine	Senator G. Mitchell Center for Environ. Research	Orono	Dr. David Hart	Professor
Maryland	Water Resources Research Center	Maryland	Civil and Environmental Engineering	College Park	Dr. Kaye Brubaker	Associate Professor
Massachusetts	Water Resources Research Center	Massachusetts	Agriculture	Amherst	Dr. Marie-Francoise Hatte	Director
Michigan	Institute of Water Research	Michigan State	Agriculture, Recreation and Resource Studies	East Lansing	Dr. Dana M. Infante	Professor
Minnesota	Water Resources Center	Minnesota	Humphrey School of Public Affairs	St. Paul	Dr. Jeffrey M. Peterson	Professor
Mississippi	Water Resources Research Institute	Mississippi State	Agriculture/Coop Extension	Starkville	Dr. Larry J. Krutz	Professor

Missouri	Water Resources Research Center	Missouri	Civil & Environ. Eng'g.	Columbia	Dr. Baolin Deng	C.W. LaPierre Professor
Montana	Water Center	Montana State	Ecology	Bozeman	Dr. Wyatt Cross	Associate Professor
Nebraska	Water Center	Nebraska	Civil Engineering	Lincoln	Dr. Chittaranjan Ray	Professor
Nevada	Water Resources Research Institute	Desert Res. Inst.		Reno	Dr. Charles Russell	Professor
New Hampshire	Water Resources Research Center	New Hampshire	Environmental Science	Durham	Dr. William McDowell	Professor
New Jersey	Water Resources Research Institute	Rutgers	Environmental Resources	New Brunswick	Dr. Christopher Obropta	Professor
New Mexico	Water Resources Research Institute	New Mexico State	Agriculture	Las Cruces	Dr. Alexander Fernald	Professor
New York	Water Resources Institute	Cornell	Earth & Atmospheric Sciences	Ithaca	Dr. Brian Rahm	Associate Professor
North Carolina	Water Resources Research Institute	North Carolina St.	North Carolina Sea Grant	Raleigh	Dr. Susan White	Executive Director
North Dakota	Water Resources Research Institute	North Dakota St.	Civil and Environmental Engineering	Fargo	Dr. Xuefeng Chu	Walter B. Booth Distinguished Professor
Ohio	Water Resources Center	Ohio State	Civil and Environmental Engineering	Columbus	Dr. Linda Weavers	Professor
Oklahoma	Water Resources Research Institute	Oklahoma State	Environmental/Natural Resources	Stillwater	Dr. Kevin Wagner	Orville and Helen Buchanan Chair
Oregon	Institute for Water and Watersheds	Oregon State	Water Resources Science	Corvallis	Dr. Todd Jarvis	Assistant Professor
Pennsylvania	Water Resources Research Center	Penn. State	Forest Resources	University Park	Dr. Andrew Warner	Associate Professor
Puerto Rico	Water/Environmental Research Institute	Puerto Rico	Environmental Science	Mayaguez	Dr. Jorge Rivera Santos	Director
Rhode Island	Water Resources Center	Rhode Island	Civil and Environmental Engineering	Kingston	Dr. Vinka Oyanedel-Craver	Associate Dean
South Carolina	Water Resources Center	Clemson	Strom Thurman Institute	Clemson	Dr. Jeffrey Allen	Assistant Professor
South Dakota	Water Resources Research Institute	South Dakota State	Agricultural Engineering	Brookings	Dr. Van Kelley	Associate Professor
Tennessee	Water Resources Research Center	Tennessee	Institute for Secure and Sustainable Environment	Knoxville	Mr. Tim Gangaware	Associate Director
Texas	Water Resources Institute	Texas A&M	Institute of Renewable Resources	College Station	Dr. Allen Berthold	Associate Professor
Utah	Center for Water Resources Research	Utah State	Civil and Environmental Engineering	Logan	Dr. David Tarboton	Professor
Vermont	Water Resources and Lake Studies Center	Vermont	George D. Aiken Center for Natural Resources	Burlington	Dr. Breck Bowden	Patrick Professor of Watershed
Virgin Islands	Water Resources Research Institute	Univ. of Virgin Islands	Marine & Environmental Science	St. Thomas	Dr. Kristin Wilson	Associate Professor
Virginia	Water Resources Research Center	Virginia Tech.	Forest Resources	Blacksburg	Dr. Kevin McGuire	Associate Professor
Washington	Water Research Center	Washington State	Economic Studies	Pullman	Dr. Jonathan Yoder	Professor
West Virginia	Water Research Institute	West Virginia	National Research Center for Coal and Energy	Morgantown	Dr. Melissa O'Neal	Director
Wisconsin	Water Resources Institute	Wisconsin	UW Aquatic Sciences Center/Sea Grant	Madison	Dr. James Hurley	Director
Wyoming	Office of Water Programs	Wyoming	Research/Economic Development	Laramie	Dr. Greg Kerr	Director/Lecturer

2018-2019

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COMMITTEE CHAIRS / LIAISONS

2019 Awards – Sharon Megdal
2019 Conference – David Stevens
2019 Tech Program – Kevin Wagner
2019 Tech Apprentice – Kelly Cobourn
Board Elections – Kevin Wagner
Warren Hall Medal – Kevin Wagner
Strategic Planning – Jeff Johnson
NIWR Liaison – Doug Parker
NIDIS Representative – Jeff Johnson

April 3, 2019

Dr. Gerald Kauffman
University of Delaware
Water Resources Center
DGS Annex, 261 Academy St
Newark, DE 19716

Dear Jerry:

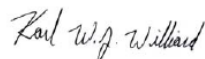
I am pleased to announce that you have been elected by the delegates of the Universities Council on Water Resources to serve as a member of the Board of Directors. On behalf of the entire Board, congratulations!

Your term will commence with the UCOWR Board meeting to be held on Thursday, June 13 at 7:00 am, at the 2019 UCOWR/NIWR Conference at Snowbird, Utah. There will be an earlier Board meeting held the day before the conference begins, on Monday, June 10 at 9:00 am, which you are encouraged to attend as a guest. Your term will extend for a period of three years, ending with the 2022 Annual Conference.

We hope that you will be able to attend this year's conference in order to formally meet the other Board members, be introduced to the delegates at the Delegate Luncheon on June 11, and attend both of the Board meetings that will be held at the conference. Registration for the conference is available at <https://ucowr.org/2019-conference/registration/>. If you have questions regarding the conference, please contact Staci Eakins at seakins@siu.edu.

Thank you for your willingness to assume the responsibility of serving on our Board. We look forward to working with you to further the mission of UCOWR.

Sincerely,



Karl W.J. Williard
Executive Director

KW:se

2023-204 NIWR Board

Name	Email	Affiliation/Institute	Board Position	Term	Regional Association
Nicole Misarti	nmisarti@alaska.edu	Alaska	Past President	2021-24	
Jeff Peterson	jmpeter@umn.edu	Minnesota	President	2022-25	
Gerald Kauffman	jerryk@udel.edu	Delaware	President Elect	2023-26	
Todd Jarvis	todd.jarvis@oregonstate.edu	Oregon	Secretary-Treasurer	2022-25	
Linda Weavers	weavers.1@osu.edu	Ohio	At-Large Representative	2023-26	
Yu-Feng Lin	yflin@illinois.edu	Illinois	Regional Representative	2023-24	Great Lakes
Stephanie Ewing	stephanie.ewing@montana.edu	Montana	Regional Representative	2023-26	Great Plains
Christopher Obropta	obropta@envsci.rutgers.edu	New Jersey	Regional Representative	2023-24	Mid-Atlantic
Thomas Giambelluca	thomas@hawaii.edu	Hawaii	Regional Representative	2023-26	Oceania and Islands
Michael Dietz	michael.dietz@uconn.edu	Connecticut	Regional Representative	2023-26	New England
Jon Yoder	yoder@wsu.edu	Washington	Regional Representative	2021-24	Pacific Northwest
Karen Schlatter	karen.schlatter@colostate.edu	Colorado	Regional Representative	2023-26	Powell Consortium
Jason Krutz	j.krutz@msstate.edu	Mississippi	Regional Representative	2023-26	South Atlantic-Gulf
<i>Ex-officio members:</i>					
Leslee Gilbert	lgilbert@vsadc.com	Van Scoyoc Associates			
Laurie Katz	lkatz@vsadc.com	Van Scoyoc Associates			
Tanja Williamson	tnwillia@usgs.gov	USGS			
Robert Joseph	rjoseph@usgs.gov	USGS			
Elizabeth Wells	well0277@umn.edu	Minnesota	Administrative staff		

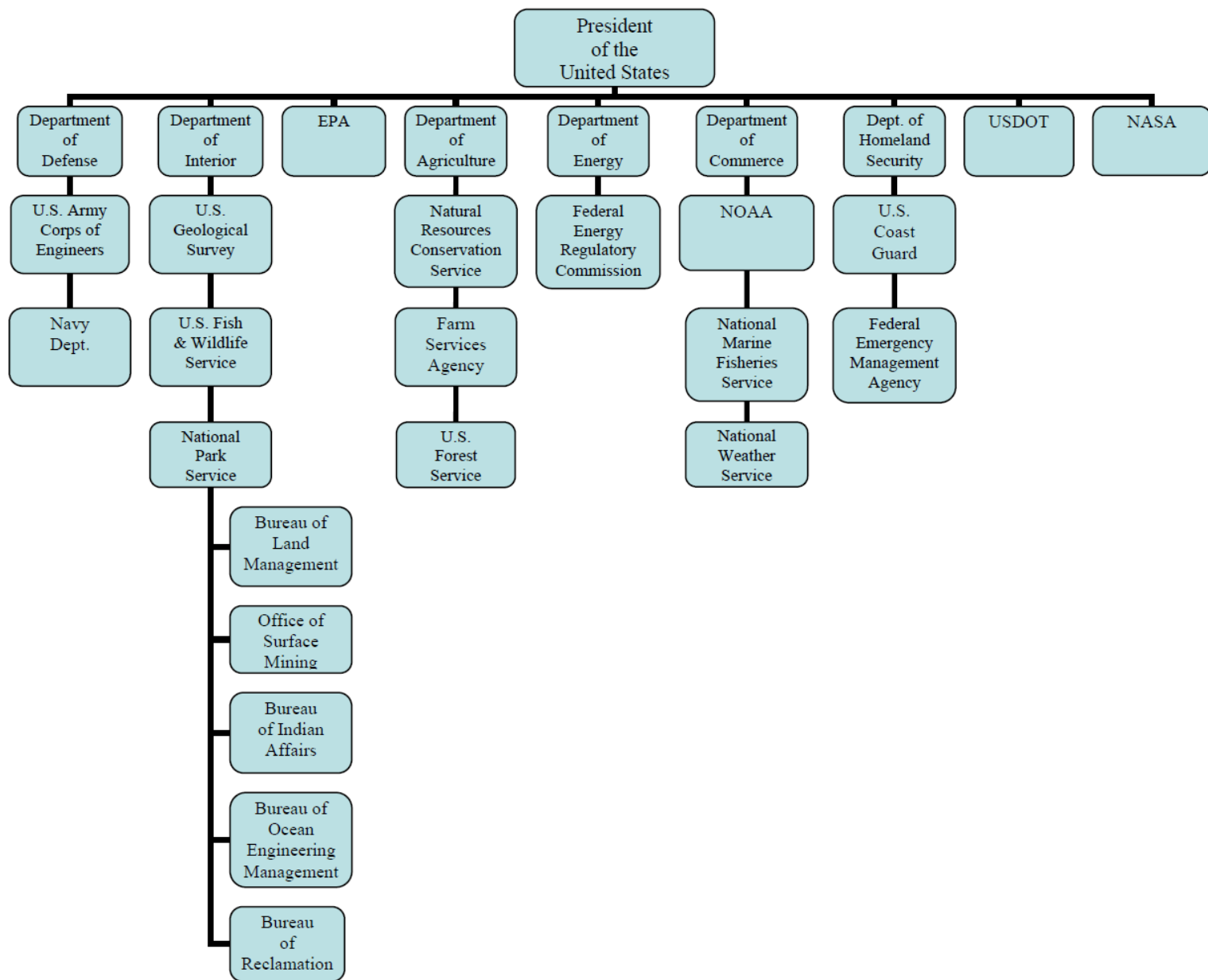


Figure 3. Federal water and climate agencies

FY2023

Appropriations

- Increased to \$15.5 million in FY 2023
- Report Language provides for continued research on aquatic invasive species in the Upper Mississippi River region and PFAS research, while directing program growth toward annual base grants (104b)
- Funding History

Fiscal Year	Budget Request	Enacted
FY 2020	0	10,000,000
FY 2021	0	11,000,000
FY 2022	11,000,000	14,000,000
FY 2023	15,000,000	15,500,000

WRRRA Reauthorization Efforts

- The 2022 Bipartisan Infrastructure Law included reauthorization of the *Water Resource Research Act (WRRRA)*
 - 1:1 match basis, 5-year evaluations
 - Authorizes \$12 million for 401b and \$3 million for 401g for fiscal years 2022 through 2025.

Sponsors:

H.R. 3510- Reps. Josh Harder (D-CA) and Rob Wittman (R-VA))

S.2164- Sens. Cardin (D-MD) and Boozman (R-AR)

118th Congress

- **New Members**
 - 7 Senators, 77 Representatives
- **Divided Government**
 - House: Republican Majority (222/213)
 - Senate: Democrat Majority (51/49)
 - Three Independents included in Majority count

Authorization

Legislation establishing or extending a program and setting funding limits and policy

Appropriation

Legislation that provides annual funding for agencies and programs

118th Congress, First Session

Senate: Environment & Public Works

Chair- Tom Carper, (D-DE) *
Rnk Mem.- Shelly Moore Capito (R-WV)*

House: Natural Resources

Chair: Bruce Westerman (R-AR-4)*
Rnk. Mem: Raul Grijalva (D-AZ-3) *

Senate: Appropriations

Chair: Patty Murray (D-WA)
Rnk Mem:: Susan Collins (R-ME)

House: Appropriations

Chair: Kay Granger (R-TX-12)
Rnk. Mem: Rosa DeLauro (D-CT-3)

Subcmte: Transportation and Infrastructure

Chair, Ben Cardin (D-MD) *
Rnk. Mem. Kevin Cramer (R-ND)*

Subcmte: Water, Oceans and Wildlife

Chair: Cliff Bentz (R-OR-2)*
Rnk. Mem., Jared Huffman (D-CA-2)*

Subcmte: Interior, Environment, and Related Agencies

Chair, Jeff Merkley (D-OR) *
Rnk. Mem., Lisa Murkowski (R-AK)*

Subcmte: Interior, Environment, and Related Agencies

Chair: Mike Simpson (R-ID-02)*
Rnk. Mem., Chellie Pingree (D-ME-01)*

Programmatic request
\$18 million

Programmatic request
\$ 18 million

FY2024 Advocacy

- **FY2024 NIWR Appropriations' Request: \$18 million**
- **Language Request:** *Water Resources Research Act—the Committee provides \$18,000,000 for the Water Resources Research Act program at USGS and directs that at least \$14,500,000 to fund the 104b annual base grants and the remaining funds to support 104g national grants, including special research topics such as AIS and PFAS.*
- **President's FY24 Budget expected release by mid-February**
- **Begin making meeting requests**
 - To be completed by mid-March
- **Target Members**
 - Your State Delegation – House and Senate
 - Committee members – Appropriation and Authorization

United States Geological Survey

WATER RESOURCES RESEARCH ACT PROGRAM ANNUAL BASE GRANTS FISCAL
YEAR 2023 REQUEST FOR APPLICATIONS

<https://water.usgs.gov/wrri/>



Notice of Funding Opportunity - Fiscal Year 2023
Funding Opportunity Number (FON) G23AS00486

Closing Date: 05/18/2023

(3) "cooperate closely with other institutes and other organizations in the region to increase the effectiveness of the institutes and for the purpose of promoting regional coordination."

Applications submitted under this Announcement are to be in furtherance of these objectives and promote the national mission and objectives of the U.S. Geological Survey which are focused on providing water-quality and -quantity information, understanding water availability, addressing the influence of climate on water resources, and responding to water-related emerging needs. Specific areas of emphasis are at the discretion of the individual Institute or Center Directors.

B. Federal Award Information

B1. Total Funding

Estimated Total Funding

\$8,370,000

B2. Award Amount

Maximum Award

\$440,520

Minimum Award

\$146,840

The amount available to each Institute or Center in FY 2023 will be \$146,840. A total of \$440,520 will be available to the regional Institute in Guam, which serves Guam, the Federated States of Micronesia and the Commonwealth of the Northern Mariana Islands. A total of \$293,680 will be available to the regional Institute in Hawaii, which serves Hawaii and American Samoa. The Government's obligation under this program is contingent upon the availability of appropriated funds.

B3. Anticipated Award Funding and Dates

Anticipated Award Date

September 01, 2023

B4. Number of Awards

Expected Number of Awards

54

WATER RESEARCH GRANTS

The state water resources research institutes authorized by section 104 of the [Water Resources Research Act of 1984](#) are organized as the National Institutes for Water Resources. The NIWR cooperates with the U.S. Geological Survey to support, coordinate and facilitate research through the Annual Base Grants, National Competitive Grants, Coordination Grants, and in operating the [NIWR-USGS Student Internship Program](#). The Annual Base Grants, 104(b), and National Competitive Grants, 104(g), make up the backbone of the USGS 104 program. Below is a brief explanation of these two similar, but different grants.



State Water Research Grants - USGS 104(b) Program

These grants provide competitive seed grant funding opportunities for faculty members or affiliates at institutions of higher education. Applications must be submitted through your State Water Research Institute or Center. The Institutes or Centers may only consider project proposals from faculty members or affiliates at institutions of higher education in its State. To find out where your state's Institute or Center is located visit the Institutes webpage [here](#) and click on your state.

Unique characteristics of this program include:

- Research priorities are set by each institute in consultation with its state advisory board.
- Research focuses on state and regional water resources problems that can be addressed by researchers at academic institutions in states with common problems.
- All federal funds must be matched by at least two non-federal dollars for each federal dollar.

For more information on the USGS 104 program visit the USGS Water Resources Research Institutes website [here](#).



National Water Research Grants - USGS 104(g) Program

The goals of the National Competitive Grants program are to promote collaboration between the USGS and university scientists in research on significant national and regional water resources issues; promote the dissemination and results of the research funded under this program; and to assist in the training of scientists in water resources. The USGS 104(g) Program provides the major mechanism to meet the growing needs not filled by state or federal research programs.

Unique characteristics of this program include:

- Research priorities are set jointly by the National Institutes for Water Resources and the U.S. Geological Survey.
- The program focuses on regional and interstate water resources problems beyond those of concern only to a single state.
- All federal funds must be matched by at least one non-federal dollar for each federal dollar.

For more information on the USGS 104 program visit the USGS Water Resources Research Institutes website [here](#).

Program Name: Water Resources Research Act Program (WRRRA)

- **Program Purpose:** The Water Resources Research Act (32 USC 109 et seq.) established university-based institutes to research water and water-related phenomena, aid the entry of new research scientists into the water resources fields, train future water scientists and engineers, and distribute the results of sponsored research to water managers and the public. The U.S. Geological Survey administers the program that provides valuable support for water research that is critical to local, state and regional communities. In turn, these state programs match the federal funding—in some cases with a 2:1 match—that leverages federal support to address regional needs. These funds support superior long-term water planning and management, and foster the next generation of water scientists, managers and engineers.
- **Fiscal Year 2019 Funding Received:** \$6.5 million
- **Fiscal Year 2020 Funding Received:** \$9.0 million
- **Fiscal Year 2022 Funding Received:** \$15.0 million
- **Level of Funding Requested for Fiscal Year 2023: \$ 18 million**
-



184 Graham Hall
Newark, DE 19716-7380
Phone: 302-831-1687
Email: bidenschool@udel.edu



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Newark, DE 19716-7380
Phone: 302-831-1687
Email: bidenschool@udel.edu

April 7, 2023

Senator Tom Carper
513 Hart Senate Office Building
Washington, DC 20510

Re: Water Resources Research Act (WRRA)
Fiscal Year 2024 Interior, Environment and Related Agencies Appropriations Bill

Dear Senator Carper:

At the University of Delaware Water Resources Center, we wish to thank you for your continuing support of the Water Resources Research Act (WRRA) program and respectfully request your support of the Senate Subcommittee to provide \$18 million for the Water Resources Research Act program in the Fiscal Year 2024 Interior, Environment, and Related Agencies Appropriations Bill.

The Water Resources Research Act, signed by Lyndon Baines Johnson in 1964, establishes the National Institutes for Water Resources (NIWR) at 54 land grant universities (such as the University of Delaware) in the 50 states, Washington D.C., and three island territories of Guam, Puerto Rico, and Virgin Islands. Through the U.S. Geological Survey in the Department of Interior, these institutes provide a Federally supported and state-based network dedicated to solving problems of water supply and quality in partnership with universities, local governments, water industry, and the public. Each state contributes a minimum of a 1:1 match, thus ensuring that local, state, and regional priorities are addressed, and the impact of federal dollars is maximized. The University of Delaware Water Resources Center was established on campus in 1965 and since then we have supported the education, training, and research of thousands of students (many from Delaware high schools) who have focused on the significant water resources issues of the day in Delaware, the Delaware Valley, and the United States.

Please don't hesitate to contact us at mcorrozi@udel.edu or 302-438-0389 if you have any questions about this important appropriation concerning our state and national water resources.

Respectfully,

Gerald J. Kauffman, Jr., Director
Institute for Public Administration
Biden School of Public Policy & Administration
Newark, DE 19716

Martha B. Narvaez, Associate Director
Institute for Public Administration
Biden School of Public Policy & Administration
Newark, DE 19716

CC: Amy E. Schwartz, Dean, Biden School of Public Policy & Administration
Jerome R. Lewis, Director, Institute for Public Administration

JOSEPH R. BIDEN, JR. SCHOOL OF PUBLIC POLICY & ADMINISTRATION

www.bidenschool.udel.edu

April 7, 2023

Senator Chris Coons
218 Russell Senate Office Building
Washington, DC 20510

Re: Water Resources Research Act
Fiscal Year 2024 Interior, Environment and Related Agencies Appropriations Bill

Dear Senator Coons:

At the University of Delaware Water Resources Center, we wish to thank you for your continuing support of the Water Resources Research Act (WRRA) program and respectfully request your support of the Senate Subcommittee to provide \$18 million for the Water Resources Research Act program in the Fiscal Year 2024 Interior, Environment, and Related Agencies Appropriations Bill.

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Phone: 302-831-1687
Email: bidenschool@udel.edu

April 7, 2023

Congresswoman Lisa Blunt Rochester
1724 Longworth House Office Building
Washington, DC 20515

Re: Water Resources Research Act
Fiscal Year 2024 Interior, Environment, and Related Agencies Appropriations Bill

Dear Congresswoman Blunt Rochester:

At the University of Delaware Water Resources Center, we respectfully request your support of the House Subcommittee to provide \$18 million for the Water Resources Research Act program in Fiscal Year 2024 Interior, Environment, and Related Agencies Appropriations Bill.

The Water Resources Research Act, signed by Lyndon Baines Johnson in 1964, established the National Institutes for Water Resources (NIWR) at 54 land grant universities (such as the University of Delaware) in the 50 states, Washington D.C., and three island territories of Guam, Puerto Rico, and Virgin Islands. Through the U.S. Geological Survey in the Department of Interior, these institutes provide a Federally supported and state-based network dedicated to solving problems of water supply and quality in partnership with universities, local governments, water industry, and the public. Each state contributes a minimum of a 1:1 match, thus ensuring that local, state, and regional priorities are addressed, and the impact of federal dollars is maximized. The University of Delaware Water Resources Center was established on campus in 1965 and since then we have supported the education, training, and research of thousands of students (many from Delaware high schools) who have focused on solving the significant water resources issues of the day in Delaware, the Delaware Valley, and the United States.

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Respectfully,

Gerald J. Kauffman, Jr., Director
Institute for Public Administration
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Martha B. Narvaez, Associate Director
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JOSEPH R. BIDEN, JR. SCHOOL OF PUBLIC POLICY & ADMINISTRATION

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April 7, 2023

Senator Jeff Merkley
Chairman
Interior and Environment Subcommittee
Appropriations Committee
50-131 Dirksen Senate Office Building
Washington, DC 20510

Senator Lisa Murkowski
Ranking Member
Interior and Environment Subcommittee
Appropriations Committee
50-131 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Merkley and Ranking Member Murkowski:

Thank you for the Subcommittee's continuing support for the Water Resources Research Act (WRRA) program. I write to urge your continued support for the WRRA program in FY24 and a request for an FY24 appropriation of \$18 million. The WRRA is a proven and effective program since 1964 and is a vital resource for many constituencies, regional water managers, and local business leaders. The WRRA (32 USC 109 et seq.) established National Institutes for Water Resources (NIWR) at 54 land grant universities in the 50 states, District of Columbia, and island territories of Guam, Puerto Rico, and Virgin Islands to research water-related phenomena, aid the entry of new research scientists into water resources fields, train future water scientists and engineers, and distribute the results of sponsored research to water managers and the public.

The U.S. Geological Survey administers the program that provides valuable support for water research critical to local, state, and regional communities. These state programs match federal funds with a 1:1 match that leverages federal support to address regional needs. These funds support long-term water planning and management and foster the next generation of water scientists, managers, and engineers. The WRRA program is responsive to the water needs of states and regions, and addresses major national concerns related to drought, harmful algal blooms, flooding, and water contamination. The institutes collaborate with over 150 state agencies, 180 federal offices, and more than 165 local and municipal offices. Each year, Federal dollars are leveraged to support over 350 students in training, over 200 research projects, and more than 550 researchers. Such support fosters successful entry into the STEM job market regionally and nationally.

We appreciate the Subcommittee's support for the Water Resources Research Act and request that you continue funding this program in the FY24 Interior, Environment, and Related Agencies bill.

Respectfully,

Gerald J. Kauffman, Jr., Director
Institute for Public Administration
Biden School of Public Policy & Administration
Newark, DE 19716

Martha B. Narvaez, Associate Director
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April 7, 2023

Hon. Mike Simpson, Chairman
Interior, Environment, & Related Agencies Subcommittee
House Committee on Appropriations
U.S. House of Representatives
1016 Longworth House Office Building
Washington, DC 20515

Hon. Chellie Pingree, Ranking Member
Interior, Environment, & Related Agencies Subcommittee
House Committee on Appropriations
U.S. House of Representatives
2007 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Simpson and Ranking Member Pingree:

Thank you for the Subcommittee's continuing support for the Water Resources Research Act (WRRA) program. We write to urge your continued support for the WRRA program in FY24 and a request for an FY24 appropriation of \$18 million. The WRRA is a proven and effective program since 1964 and is a vital resource for many constituencies, including regional water managers and local business leaders. The WRRA (32 USC 109 et seq.) established National Institutes for Water Resources (NIWR) at 54 land grant universities in the 50 states, District of Columbia, and island territories of Guam, Puerto Rico, and Virgin Islands to research water-related phenomena, aid the entry of new research scientists into water resources fields, train future water scientists and engineers, and distribute the results of sponsored research to water managers and the public.

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We appreciate the Subcommittee's support for the Water Resources Research Act and request that you continue funding this program in the FY24 Interior, Environment, and Related Agencies bill.

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STRATEGIC PLAN
for the
UNIVERSITY OF DELAWARE
WATER RESOURCES CENTER
July 4, 2022

Mission Statement

Established in 1965 as one of the 54 National Institutes for Water Resources (NIWR) in the United States, the mission of the University of Delaware Water Resources Center (UDWRC) is to provide water science and policy assistance to governments and the public through the University's land-grant public service, education, and research role. The UDWRC is a research unit of the Institute for Public Administration within the Joseph R. Biden, Jr. School of Public Policy & Administration.

Water Resources Center

The UDWRC was established on campus in 1965 as one of the 54 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 UDWRC is Congressionally-mandated by Section 104 of the Water Resources Research Act (WRRRA) of 1984 administered by the U.S. Department of the Interior and U.S. Geological Survey. As part of the national NIWR network at land grant universities throughout the nation, the mission of the UDWRC is to: (1) support research, education, and public outreach programs that focus on water supply, water management, and water quality issues of importance 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 the First State.

Water Resources Agency

The Water Resources Agency (WRA) provides water assistance to governments in Delaware through the land-grant public service, education, and research role of the University of Delaware. Since the passage of the Federal Clean Water Act amendments in 1977 and then in 1990 and 1997, the WRA is sponsored by a board of the State of Delaware, New Castle County, City of Newark, and City of 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 the Piedmont plateau of Maryland and Pennsylvania provides drinking water to $\frac{2}{3}$ of the population of Delaware, $\frac{3}{4}$ of New Castle County, and 100% of Newark and Wilmington. Public and private water purveyors deliver drinking water from sole source aquifers in the Atlantic Coastal Plain to $\frac{1}{3}$ of Delaware 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.

Goals

The goal of the University of Delaware Water Resources Center is to be one of the preeminent water resources institutes in America through contributions in the trifold public service, education, and research role of a land grant university. This model of cooperation is known nationally as the "Delaware Model."

Goal #1 - Sharpen the Focus of Public Service and Engagement: Provide water-science and policy assistance to governments and the public.

Significance

The UDWRC is supported by governments and foundations to provide water outreach and translate research to the public. This public service/engagement role is significant to the UD land-grant mission.

Challenges

Expand and diversify revenue sources to continue providing water-resources assistance to governments in Delaware, the Delaware Valley and along the Atlantic seaboard.

Future Steps

Seek opportunities to pursue more supported work with governments and foundations in the Delaware River and Chesapeake Bay watersheds in Delaware, Pennsylvania, New Jersey, New York. Expand the capacity of GIS laboratory (the first water resources-based GIS lab in the U.S. established in 1977) to conduct more outreach with federal, nonprofit, and business partners.

Goal #2 – Enhance the Quality of Education and Learning: Offer courses, seminars, and forums with a water-resources focus and advise and mentor undergraduate and graduate students with funded internships and assistantships.

Significance

Water resources learning at the University is significant to the UDWRC interdisciplinary science and policy education mission. The UDWRC strives to educate students who will thrive and build careers as future leaders in water resources with public-, private-, and nonprofit-sector partners.

Challenges

The challenge is to participate in water resources education opportunities on campus while expanding UDWRC support from funding federal, state, and local government and foundation partners.

Future Steps

Strengthen courses for water-resources specializations in the undergraduate majors of environmental studies/science, public policy, civil/environmental engineering, geology, geography, environmental humanities and partner with the graduate programs of Water Science and Policy Public Administration, Urban and Regional Planning, Disaster Research, Water Resources Engineering, Geography, and Marine Science and Policy. Co-sponsor courses and seminars in water science and policy.

Goal #3 - Strengthen Programs of Research and Scholarship: Collaborate with University faculty, scientists, and students to fund, conduct, and publish supported water-resources research.

Significance

Research and scholarship, the search for new knowledge, is central to the mission of the University.

Challenges

The challenge is to obtain federal, state, private, and foundation support to carry out water-science and -policy research while maintaining a focus on the public service and education role of the UDWRC.

Future Steps

Pursue funded research and partnerships in emerging water-resources areas of GIS-based watershed modeling, climate change, water economics, water quality, and flood/drought management.

UD Strategic Initiatives

The University of Delaware Strategic Plan (May 2022) stresses that UD is an institution engaged in addressing the critical needs of the state, nation and global community. UD's goal is to be a pre-eminent learner-centered research university led by exceptional faculty and staff dedicated to excellence. Faculty effort, long defined in terms of teaching, research and service, will emphasize learning, scholarship and engagement, reaffirming that this work must have a meaningful impact for UD students and the world. The University of Delaware Water Resources Center seeks to contribute to these initiatives through the five strategic pillars of the **Forever and Beyond** planning process.

Strategic Pillar 1. Expanding Student Access & Success

- Teach multidisciplinary courses based in the Biden School, College of Engineering, and Geography Department such as CIEG 440 Water Resources Engineering, UAPP 411/611 Regional Watershed Management, UAPP 225 Public Policy, UAPP 655 GIS in Public Policy, GEOG 432/632 Environmental Hydrology.
- Sponsor an annual Delaware water-and policy forum on campus.
- Partner with the Delaware State chapter (DEAWRA) and the UD student section (UDAWRA) of the American Water Resources Association (AWRA).
- Coordinate the Wilmington Green Jobs program for high school students.
- Provide service-based and problem-based learning opportunities for undergraduate students within the White Clay Creek National Wild and Scenic River watershed.
- Serve in leadership positions with the AWRA, NIWR, and Universities Council on Water Resources (UCOWR).

Strategic Pillar 2. Building a Social Justice Foundation to Support a Diverse, Inclusive & Intercultural Campus

Diversity is essential in civil society and in the scientific mission at the University of Delaware. The UDWRC will redouble efforts to reach out and recruit talented minority and economically disadvantaged students and researchers. In accordance with the UDWRC mission as designated by Congress under the Water Resources Research Act of 1984, the UDWRC 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 UDWRC 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. UDWRC will focus on:

- Correspond directly with the presidents of University of Delaware, Delaware State University, and Delaware Technical and Community College requesting nominations of diverse students for UDWRC undergraduate water research internships beginning with Fall 2021 semester.
- Examine the composition of the UDWRC Advisory Panel and request feedback from the UDWRC Advisory Panel on ways UDWRC may increase diversity and inclusiveness among its students, board and project work.
- Look at the UDWRC student alumni and celebrate their stories and their background, see <https://www.wrc.udel.edu/about-wra/student-research-assistants/>.
- Continue UDWRC's K-12 STEM education programs which provide opportunities to learn about advancing fields in science and technology. Prioritize the programs that reach the State's most vulnerable populations, such as the City of Wilmington Green Jobs Program and Delaware's GIS Day.

- 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.
- Utilize University of Delaware and Coalition for the Delaware River Watershed (CDRW) resources to increase DEIJ at UDWRC, for example: University of Delaware Office of Diversity and Inclusion (<https://sites.udel.edu/diversity/>) and CDRW (<http://www.delriverwatershed.org/equity>).

Strategic Pillar 3. Expanding Interdisciplinary and Global Opportunities

- Increase collaboration with DE Sea Grant (DESG), UD Environmental Institute (DENIN) and UD Climate Hub.
- Partner on research with philanthropic organizations such as the William Penn Foundation.
- Develop a study-abroad program in water science and policy and advise international students interested in water resources (e.g., Uzbekistan, Kyrgyzstan, Brazil, Portugal, Germany, New Zealand, Georgia, Ukraine, China, and South Korea).
- Work with the International Joint Commission between the United States and Canada.

Strategic Pillar 4. Redefining Creativity, Innovation & Entrepreneurship

- Utilize USGS NIWR funding with faculty advisors from colleges throughout Delaware to support a cohort of 10-15 undergraduate students in a water research internship program.
- Advise and support graduate research students through the UDWRC and IPA research assistantship program.
- Partner with the State of Delaware, New Castle County, City of Newark, and City of Wilmington in funded support to conduct regional water resources planning and management.
- Serve as technical advisor to the Delaware Water Supply Coordinating Council as per state law.
- Serve as watershed coordinator of the Christina Basin Clean Water Partnership among Delaware and Pennsylvania, Delaware River Basin Commission, and USEPA.
- Serve as watershed coordinator of the White Clay Creek Wild and Scenic River Committee with the National Park Service.

Strategic Pillar 5. Reimagining Intellectual/Physical Capital for a Sustainable & Boundless Campus

- Develop a strategic plan to raise capital to construct a new building/GIS lab for the UDWRC as a center for innovation for the UD campus community.
- Continue partnerships in Sussex County with the College of Earth, Ocean, and Environment at the Pollution Ecology Lab at the UD Lewes campus.
- Expand the GIS laboratory to serve the Biden School and IPA in the new home at Biden Hall.

The Genius of Earth Day

How a 1970 Teach-In

Unexpectedly Made

the First Green Generation

Adam Rome

 **Hill and Wang** A division of Farrar, Straus and Giroux New York

The New York Times

SCIENCE | Pictures From the March for Science

 Give this article



Marchers taking to the streets in Washington. Hilary Swank for The New York Times

 NATIONAL
GEOGRAPHIC

PLANET POSSIBLE

LOGIN 



Some 20 million people took part in the first Earth Day protests held across the United States on April 22, 1970. In New York City, the streets near Union Square Park were turned into an "ecological carnival" in one of the largest demonstrations the city had seen in decades.
PHOTOGRAPH BY SANTI VISALLI, GETTY

 Northeast Wilmington Community Plan

 community@reachriverside.org

 wrkgroup.org

★ Not yet rated (0 Reviews) 

Photos

[See all photos](#)



Posts

 Filters

 Northeast Wilmington Community Plan
May 23, 2022 · 



 REACH Riverside
May 23, 2022 · 
Delaware just issued an historic \$300 relief rebate check to every Delawarean who filed state

White Paper
U.S. Water and Climate Change Policy
 Draft January 20, 2021 (rev. March 17, 2021)
 Gerald Joseph McAdams Kauffman, Jr.
 Newark, Del.

Climate Change is Water Change

In Barcelona during the November 2009 negotiations for the Copenhagen climate conference, the executive director of the Stockholm Water Institute said precisely that “climate change is water change.” This is explained in thermodynamics by the Clausius-Clapeyron relationship that for every 2 degrees F rise in temperature the atmosphere can hold 7% more water vapor. That is, global warming causes more evaporation, higher humidity, and water saturation in the atmosphere resulting in more wild fires, damaging storms and floods, searing drought, burying blizzards, and melting of the glaciers leading to dwindling water supplies and sea level rise. With a new President on January 20, 2021 and the 117th Congress, climate change is once again a top priority of the Federal government and we are about to see a brand new age - a 4th era of environmentalism - in the United States. The actions and deliberations on climate change ought to be apolitical and nonpartisan because after all to adapt an adage from my colleague at the University of Minnesota Water Resources Center: “clean water (and air) is neither red or blue, it is clear.”

In this dawn of a new decade the four great challenges of the day are: (1) fight the pandemic, (2) revive the economy, (3) combat climate change, (4) and achieve racial justice. All of these issues are intertwined in the disciplines of sustainable water and environmental policy. Clean water provides necessary hygiene to control the spread of coronavirus. Clean water programs stimulate the economy and support high paying green jobs. Innovative economic investment in clean low carbon energy combats climate change. Investment in polluted neighborhoods provides the environmental justice to fight racism and provide good jobs for people of all races, creed, or color. The following white paper on U.S. water and climate change policy recommends priority actions in (1) science, (2) policy, (3) governance, and (4) finance to restore the economy and environment of America.

White House Water Summit

Five years ago on March 22, 2016, we were 200 scientists invited by President Obama to the White House Water Summit at 1600 Pennsylvania Avenue in Washington, D.C (Figure 1). On UN World Water Day, the White House hosted this first-ever national water summit to shine a spotlight on cross-cutting, creative solutions to solving the water problems of the day and announced \$4 billion in private capital committed to investment in water-infrastructure projects nationwide, over \$1 billion from the private sector to conduct research and develop new technologies, and nearly \$35 million a year in Federal grants from EPA, NOAA, NSF, and USDA to support cutting-edge water science. We heard from WH officials such as Ali Zaidi, Associate Director for Natural Resources, Energy, and Science at OMB and five U.S. Congress members that water science and policy research at universities such as the University of Delaware is especially pertinent because water is one of America's top domestic public policy challenges and the push is on to invest more in this economic and environmental resource to reduce the chances of future disasters on the Flint River, the California drought, or coastal Delaware flood emergencies. It's been five years now and we're looking forward to the next White House summit that could be a “Bretton Woods” of water and climate modeled on the 1944 economic summit where the 75 allied nations assembled in the White Mountains of New Hampshire to plan a new world order.



Figure 1. White House Water Summit on World Water Day (March 22, 2016) a model for a “Bretton Woods” of Water

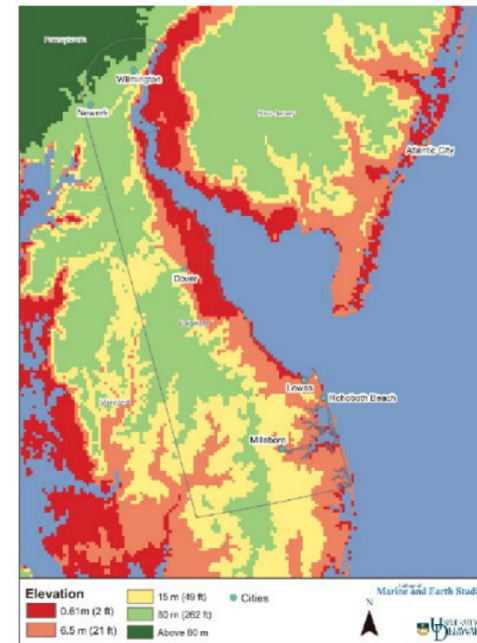


Figure 7. Areas of Delaware inundated by expected sea level rise in this century (red), Greenland (orange), and by the West Antarctic (yellow). Light green are the areas that would be inundated by additional loss of the entire Antarctic, but the probability and

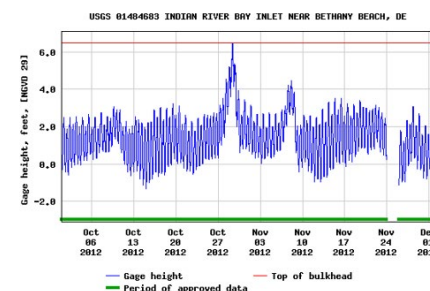
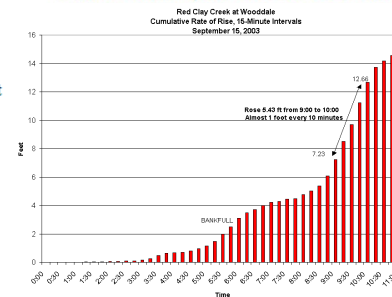
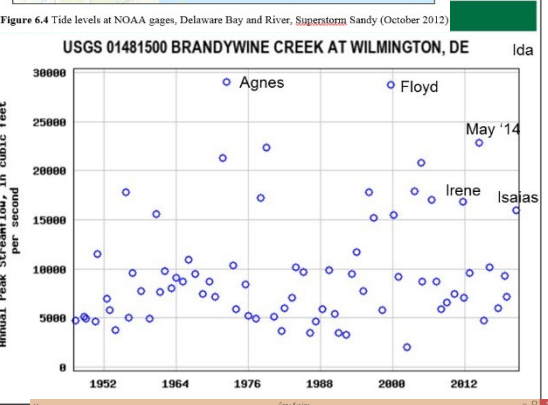
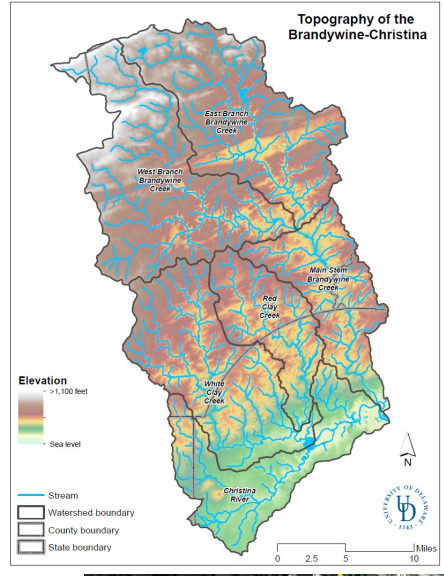
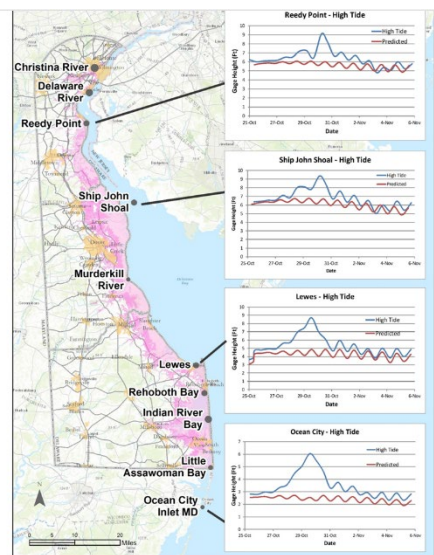
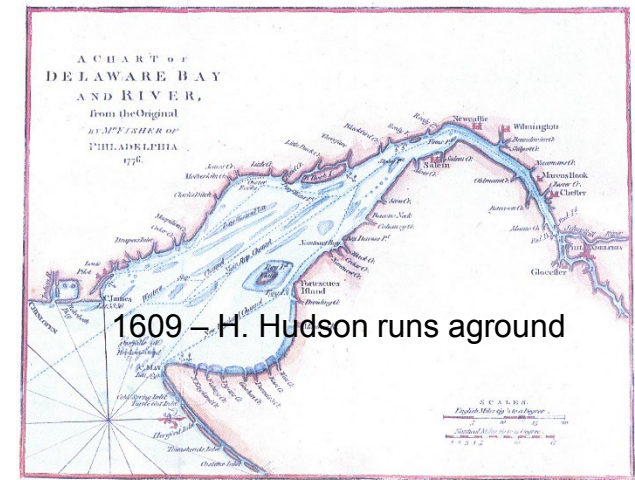
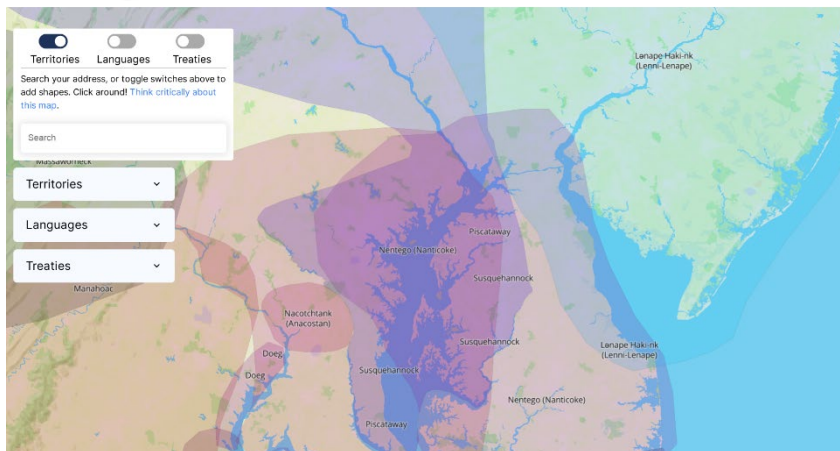


Figure 3.5 Historic peak flood tide at Indian River Bay inlet, Superstorm Sandy October 29, 2012



Gerald Joseph McAdams Kauffman, Jr.
 Director and Associate Professor
 University of Delaware
 Water Resources Center
 DGS Annex 261 Academy St.
 Newark, Del.





1609 – H. Hudson runs aground



FOUR STATES SIGN DELAWARE PACT

President Joins in Approving Vast Program for Basin Backed by Governors

COMMISSION IS SET UP

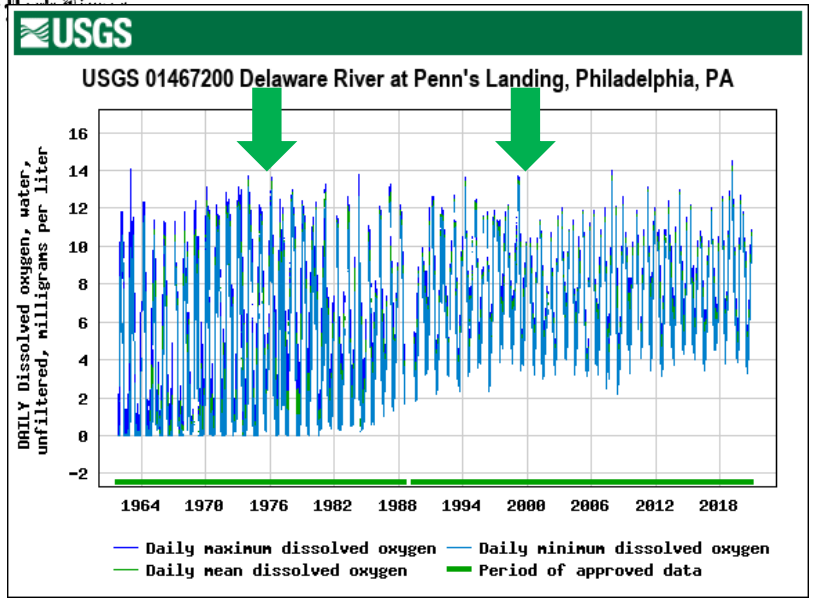
Developing of River Valley Will Use, Conserve and Protect Vital Supply

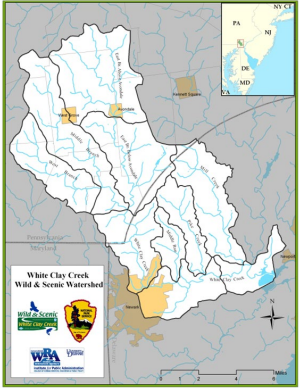
By RUSSELL BAKER
Special to The New York Times.



FRIDAY, NOVEMBER 8, 1961

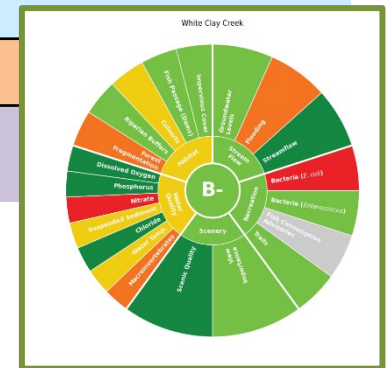
The New York Times





White Clay Creek State of the Watershed Report (2023)

STREAMFLOW	1. Streamflow	2. Flooding	3. Groundwater				
HABITAT	4. Impervious Cover	5. Terrestrial Connectivity (Buffers/Riparian)	6. Terrestrial Connectivity (Forest Fragmentation)	7. Aquatic Connectivity (Culverts and Pipes)	8. Aquatic Connectivity (Dams/Fish Passage)		
WATER QUALITY	9. Water Temperature	10. Dissolved Oxygen	11. Phosphorus	12. Nitrogen	13. Total Suspended Sediment	14. Chloride/Conductivity	15. Macroinvertebrates
SCENERY	16. Scenic Quality	17. View Importance					
RECREATION	18. Trails	19. Fish Consumption Advisories	20. Bacteria				

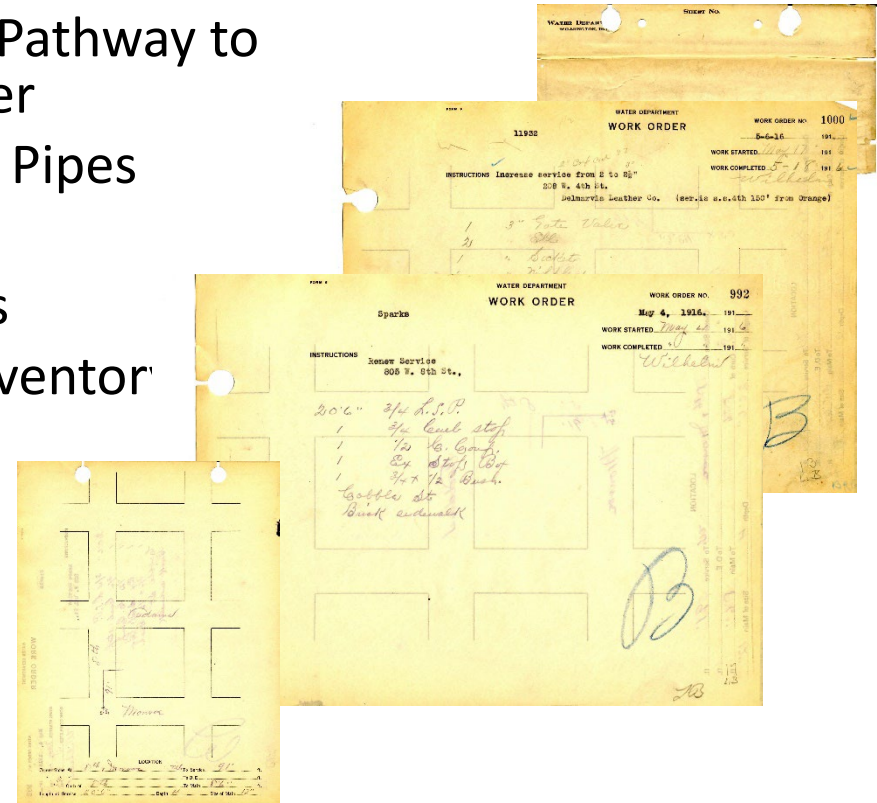


City of Wilmington lead inventory



- 1900s Lead Pipes – Pathway to Clean Drinking Water
- 1986 – Ban on Lead Pipes
- \$15 Billion (BIL)
- 70,000 Work Orders
- Wilmington Lead Inventor

Folder Name	File Name	WO Number	Work Completed Date	Street Address	Sanitized Address	Work Type	Material	Size	Lead on date	Galvanization	WO on Ticket?	WO on WILNET?	Need further review	Comment	Drawing w/ dimensions?	Keyword	Instructions
1	0000-0000	WO-00001	7	10/1/1915			Other	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
2	0000-0000	WO-00002	10	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
3	0000-0000	WO-00003	11	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
4	0000-0000	WO-00004	12	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
5	0000-0000	WO-00005	13	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
6	0000-0000	WO-00006	14	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
7	0000-0000	WO-00007	15	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
8	0000-0000	WO-00008	16	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
9	0000-0000	WO-00009	17	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
10	0000-0000	WO-00010	18	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
11	0000-0000	WO-00011	19	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
12	0000-0000	WO-00012	20	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
13	0000-0000	WO-00013	21	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
14	0000-0000	WO-00014	22	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
15	0000-0000	WO-00015	23	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
16	0000-0000	WO-00016	24	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
17	0000-0000	WO-00017	25	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
18	0000-0000	WO-00018	26	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building
19	0000-0000	WO-00019	27	10/1/1915	1000 Franklin St.	1000 Franklin St.	High-pressure	Unknown	No	No	No	No	No	Replacement of lead	No		Replace one service for building



FY23 Delaware Water Resources Center - Water Research Internships

Name	School	Major	Research Project
Theodora Bertneski	UD	Food Science	A One-Health Approach to Surveillance of Antimicrobial Resistance Genes Across Delaware Urban and Agricultural Watersheds
Andrew Blackburn	UD	Chemical Engineering	Use of Enhanced Evaporative Flux to Treat Soils Contaminated by Produced Waters
Francesca Discenza	UD	Environmental Engineering	Red Clay Water Quality (RCWQ)
Owen Donnelly	UD	Biology	Vibrio Parahaemolyticus Bacteriophage VPMS1 DNA Polymerase I is Active at a Diverse Range of Temperatures
Cooper Feeny	UD	Economics and Public Policy	Observational Study of Student Water Consumption at the University of Delaware
Sydney Iredell	UD	Biology	Optimal Activity Conditions of the Chesapeake Bay Viral Metagenome-Assembled DNA Polymerase I L1_S67 Reflect Environmental Conditions in Vitro
Brian Kennedy	UD	Environmental Engineering	Assessment of Renewable Energy at the Newark Reservoir
Nathaniel Levia	UD	Insect Ecology and Conservation	The Effects Water and Soil Salinity Have on Macroinvertebrates and Ground Beetles (Coleoptera: Carabidae) in Aquatic and Riparian Ecosystems
Elizabeth Manning	UD	Environmental Engineering	Standardizing Wilmington Service Line and Inventory Records through Analysis of Historical Documentation
Jake Marren	UD	Environmental Engineering	Red Clay Water Quality (RCWQ)
Kylee McGinness	UD	Biology	Highly Efficient DNA Polymerase I From <i>Cellulophaga Baltica</i> Phage Phi38:1 is Active at Temperatures Ranging from 9°C to 53°C
Adam Smith	UD	Political Science and Criminal Justice	Comparative Analysis of Climate Policy in Delaware, New Jersey, Pennsylvania, and Maryland
Sophia Talley	UD	Environmental Engineering	The Tidal Christina River in Wilmington, DE: How Water Quality is Impacted by the Tides within the Christina River
Megan Wassil	UD	Environmental Engineering	The Tidal Christina River in Wilmington, DE: How Water Quality is Impacted by the Tides within the Christina River
Alyssa Wentzel	UD	Energy and Environmental Policy	A Comparative Analysis on Delaware's Microplastic Strategy
Lydia Franks	UD	Master of Water Science & Policy	Recreation Survey of the Musconetcong River Watershed
Alex Makowski	UD	Master of Public Administration	Nutrient Discharge into the Inland Bays Watershed
Elizabeth Shields	UD	Master of Public Policy	Reconnaissance Study of Potentially Eligible National Wild & Scenic Rivers in Delaware

2023 DWRC Undergraduate and Graduate Research Interns

Name	School	Major	Research Advisor	Proposed Research
Undergraduate Water Research Interns				
Ambre Crawford	UD	Marine Science	Martha Narvaez and Andrew Homsey	Water Quality and Quantity Trends along the Nanticoke River in Delaware and Maryland
Cooper Feeny	UD	Economics and Public Policy	Dr. Gerald Kauffman	Taste, Odor, Water Quality and Public Perception of Drinking Water Supplies in Delaware
Catherine Gilman	UD	Energy and Environmental Policy	Dr. Casey Taylor	Evaluating the Effectiveness of Reimplementing a Bottle Bill for Cleaner Waterways in Delaware
Brian Kennedy	UD	Environmental Engineering	Dr. Gerald Kauffman	Hydroelectric Power Potential as a Renewable Resource in the Brandywine Christina River System in Delaware and Pennsylvania
Elizabeth Manning		Environmental Engineering	Dr. Gerald Kauffman	Watershed Characterization Along the Tributaries of the Red Clay Creek
Summer Moals	DSU	Agriculture	Dr. Ozbay Gulnihah	The Effectiveness of Artificial Floating Wetlands with Different Aquatic Plants to Remove Water Nutrients: A Case Study at Delaware State University Aquaponics Research Facility
Cole Palmer	DSU	Fisheries Management	Christopher Heckscher	Consolidation of Delaware's Insects of Greatest Conservation Need and associations nontidal freshwater wetlands
Brayden Rochester	UD	Environmental Engineering	Dr. Paul Imhoff	Soil Remediation Through Advanced Evaporative Treatment Technologies
Jordan Rosales	UD	Geological Sciences	Dr. Gerald Kauffman	Introduction of Heavy Metals in the Christina
Dmitriy Rybin	UD	Civil Engineering	Martha Narvaez	Wilmington Lead Project
Graduate Student Assistantships				
Lydia Franks	UD	MS Water Science & Policy	Dr. Gerald Kauffman	Comparative Analysis of Interstate Governance and Policy Initiatives in the Chesapeake & Delaware Bay Basins
Megan Wassil	UD	MS Water Science & Policy	Dr. Gerald Kauffman	Alosine Survey and Return of Fishable Water Quality Standards to the Red Clay Creek Watershed in Delaware

DWRC Water Resources Research and Education Priorities

- Water quality (nutrients, pathogens, public health), harmful algal blooms, PFOA contamination
- Storm water runoff (management and control)
- Water supply, demand, and conservation (infrastructure/technology)
- Water policy (governance and economics)
- Climate change, sea level rise, riverine/coastal flooding
- Groundwater (remediation and treatment)
- Watershed management
- Wetlands (protection and restoration)
- Wastewater management (treatment and reuse)
- Water, food, and energy nexus

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

February 22, 2023

Dear Asia:

As Director and Associate Director of the University of Delaware Water Resources Center, we are pleased to invite you to serve on the UDWRC Advisory Panel for a two-year term through January 1, 2025 based on your expertise in water issues of importance to Delaware and the Mid-Atlantic region. Established on campus in 1965, the UDWRC is one of the 54 National Institutes for Water Resources (NIWR) supported by the U.S. Geological Survey at land grant universities in the 50 states, District of Columbia, and three island territories of Guam, Puerto Rico, and U.S. Virgin Islands. Responsibilities of the UDWRC in the NIWR include: (1) innovative research that fosters entry of new research scientists into water resources fields, training of future water scientists and engineers, exploration of new ideas that address water issues, dissemination of research to water managers and the public and (2) cooperate with other colleges to develop a statewide program designed to resolve state/regional water problems.

We are proud of the water research program begun by our predecessor Deputy Dean Dr. Tom Sims that has supported over 350 undergraduate interns and graduate research fellowships since 2000. In accordance with the Water Resources Research Act of 1964 and as amended in 1984, the UDWRC Director appoints an advisory panel to assist in the review and ranking of research projects and establish priorities for center activities. We meet annually in May where our research students present the results of their research projects. In your role as an advisory panel member, you would have responsibilities to: (1) provide input to the Director regarding the successful mission of the UDWRC, (2) assist in review of UDWRC graduate fellowship and undergraduate internship applications, and (3) help promote interaction of the UDWRC with other organizations in the state, region, and nation.

Please let us know if you wish to serve on the UDWRC Advisory Panel and don't hesitate to contact us at 302-893-1571 or at jerryk@udel.edu and mcorrozi@udel.edu. Thank you for considering.

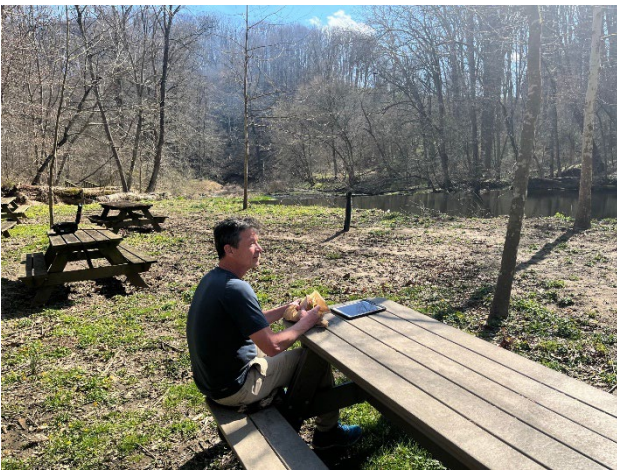
Warmly,

Gerald J. Kauffman, Director
University of Delaware
Water Resources Center
Newark, DE 19716

Martha B. Narvaez, Associate Director
University of Delaware
Water Resources Center
Newark, DE 19716

2023 DWRC Advisory Panel

<p>Ms. Stefanie Baxter Scientist, Geologist 257 Academy Street Delaware Geological Survey University of Delaware Newark, DE 19716</p>	<p>Ms. Betzaida (Betzy) Reyes Physical Scientist U.S. Geological Survey 1289 McD Drive Dover, DE 19901</p>
<p>Dr. Asia Dowtin Assistant Professor Department of Forestry Natural Resources Building Michigan State University 480 Wilson Rd. East Lansing, MI 48824</p>	<p>Mr. Ethan Robinson Department of Public Works City of Newark 220 S. Main Street Newark, DE 19711</p>
<p>Dr. Dewayne Fox Assistant Professor, Fisheries College of Agriculture and Related Sciences Delaware State University Agriculture Annex Room 123 1200 N. DuPont Hwy, Dover, DE 19901</p>	<p>Ms. Erica Rossetti Urban Water Coordinator Partnership for the Delaware Estuary 110 S. Poplar Street Wilmington, DE 19801</p>
<p>Mr. Christian Hauser Associate Director Delaware Sea Grant College Program College of Earth, Ocean, and Environment University of Delaware 102 Robinson Hall Newark, DE 19716</p>	<p>Mr. Kash Srinivasan KS Group, LLC 603 E. Matson Run Wilmington, DE 19802</p>
<p>Ms. Stacy McNatt Department of Special Services New Castle County 87 Reads Way New Castle, DE 19720</p>	<p>Ms. Kristen Travers Director of Conservation Delaware Nature Society P.O. Box 700 Hockessin, DE 19707</p>
<p>Ms. Shane Morgan Management Plan Coordinator White Clay Creek Wild and Scenic River Program 182 Sawmill Road Landenberg, PA 19350</p>	<p>Dr. Caroline Voter Assistant Professor Civil and Environmental Engineering University of Delaware 203 Ocean Engineering Lab Newark, DE 19716</p>
<p>Dr. Miling Li School of Marine Science & Policy University of Delaware 102 Robinson Hall Newark, DE 19716</p>	<p>Mr. Steve Williams Environmental Program Administrator Division of Watershed Stewardship Delaware DNREC89 Kings Highway Dover, DE 19901</p>
<p>Ms. Chris Oh Assistant Water Division Director Department of Public Works City of Wilmington City/County Building 800 N. French St. Wilmington, DE 19801</p>	



Biden School Excellence in Water Resources Scholarship Medal (2023)

Welcome to the 2023-24 NIWR Board

External



Inbox x



Jeffrey Peterson

Thu, May 4, 10:01AM (1 day ago)



Reply



to Christopher, Michael, Elizabeth, Leslee, Robert, Laurie, me, Larry, Yu-Feng, Linda, Nicole, Karen, Stephanie, Thomas, Todd, Tanja, Jonath: ▼

Dear 2023-24 NIWR Board,

Congratulations to Jerry Kauffman, our new President-elect, and congratulations/welcome to several new board members! I am attaching our board roster effective 5/1/23 - 4/30/24. I am really looking forward to working with this group over the next year.

Continuing board members already had this time on your calendar, but we will soon be sending a new invitation and Zoom link to all of you for our next board meeting on **Tuesday, May 16, 3-4pm Eastern**. If you have a conflict with this time, just let me know; we understand not everyone can make every meeting and we will be discussing our preferred meeting times going forward.

I'd like to e-introduce you all to Liz Wells from the MN Water Resources Center. Liz will be working with me to arrange meetings and capture minutes, so you will be hearing from her with board materials and invitations. She will be sending you the particulars of the May meeting shortly and will also poll you for the June meeting. If we can pull off the logistics and find a time that works, we are considering doing a hybrid meeting during the UCOWR conference as a number of board members will be there in person.

All the best,

Jeff

--

Jeffrey M. Peterson

Director | Water Resources Center | wrc.umn.edu | [@MinnesotaWater](https://twitter.com/MinnesotaWater)

Professor | Department of Applied Economics | apec.umn.edu

President | National Institutes for Water Resources

University of Minnesota | umn.edu | 612.624.9282

he, him, his

Discussion

