2021 ANNUAL REPORT
The New York State Water Resources Institute at Cornell University works to identify and address the critical water resource issues facing the state of New York.

At NYSWRI, we support robust science and dialogue between researchers, managers, policymakers, and the general public to improve water resources management through:

- Original research and outreach on topics of local, state, and national importance
- Grant and funding opportunities
- Student training in the water resource field
- Relationship-building with state agencies, professional organizations, and citizen stakeholder groups
FEDERAL
At the federal level the Water Resources Research Act of 1984 authorizes a water resources research institute in each state and territory to, in summary:

“plan, conduct, or otherwise arrange for competent research that fosters (a) the entry of new research scientists into the water resources fields, (b) the training and education of future water scientists, engineers, and technicians, (c) the preliminary exploration of new ideas that address water problems or expand understanding of water and water related phenomena, and (d) the dissemination of research results to water managers and the public,” and

“cooperate closely with other colleges and universities in the State...”

STATE
The New York State legislature established WRI under state law as the New York State Water Resources Institute at Cornell University in 1987 with the purpose of addressing critical problems of water resource quality and management.

The legislation directs WRI to, among other things:

“pursue and sponsor, both at Cornell and elsewhere, investigations and experiments of either a practical or basic nature, the education and training of scientists and specialists, and outreach activities for the dissemination of information and the provision of technical assistance relating to the state's water resources,”
WHAT’S NEW in 2021

ITHACA-BASED STAFF

Seth, Val and Rewa joined the Ithaca-based team. Seth supports NYSWRI research and extension efforts and is working on a literature review of social science related to dam removals. Val’s research interests are in agricultural water resources management, hydrological modeling, environmental justice, and the Food-Energy-Water nexus. Rewa is working on assessing barriers to flood adaptation along the Lake Ontario Shoreline, and a Social Network Analysis of existing governance networks.

HUDSON RIVER ESTUARY PROGRAM (HREP)

Lyndsey and Tom joined the Hudson Estuary team. Lyndsey works on outreach for the Climate-adaptive Design Studio and incorporating equity into the Climate Smart Communities Program. Tom is the Coordinator of the Hudson River Estuary Program’s Monitoring Unassessed Stream Segments (MUSS) Program.

GREAT LAKES WATERSHED PROGRAM (GLWP)

NYSWRI will support the NYSDEC Great Lakes Watershed Program with an emphasis on the water resources elements of NY’s Great Lakes Action Agenda and affiliated Action Agendas for watersheds of the larger Great Lakes ecosystem within New York State. Ryan and Emily make up the NYSWRI Great Lakes team.

Ryan works to implement the Great Lakes Action Agenda with a focus on the Eastern Lake Erie and Southwest Lake Ontario basins. Emily manages educational projects in Great Lakes literacy and stewardship, and conducts watershed management planning and implementation.

AQUATIC INVASIVE SPECIES CONTRACT

NYSWRI will support the NYSDEC Invasive Species Coordination Section in meeting the objectives of the NYS Aquatic Invasive Species Management Plan in NYSDEC regions 7 and 9. An Aquatic Invasive Species Coordinator in each of these regions will provide oversight, coordinate with stakeholders, and conduct projects for AIS prevention and control.
SUPPORT and FUNDING

NYSWRI appreciates the support we receive from federal, state, and Cornell University sources. We are committed to securing funds in a collaborative manner, working with an array of partners to benefit Cornell, our partners, and NY’s academic community in general to advance our mission of improving the state’s water resources.

WRI SUPPORT IN 2021:
COLLABORATING TO ACHIEVE RESULTS
• Participated in TWELVE EXTERNAL FUNDING PROPOSALS
• Participated in ONE INTERNAL FUNDING PROPOSAL

$643 k
NYSDEC GREAT LAKES WATERSHED PROGRAM

$2.1 M
NYSDEC HUDSON RIVER ESTUARY PROGRAM

$125 k
BASE FUNDING plus $163K of pass through DEPT OF THE INTERIOR (USGS)

$232 k
NYSDEC INVASIVE SPECIES COORDINATION SECTION

$104 k
COLLEGE OF AGRICULTURE & LIFE SCIENCES

$66.5 k
OTHER

FOR THEIR SUPPORT, NYSWRI WOULD LIKE TO THANK:

Cornell CALS
USDA
FEMA

NEW YORK STATE OF OPPORTUNITY
Department of Environmental Conservation

science for a changing world
HOW do we ORGANIZE OUR WORK?

URBANIZATION AND INFRASTRUCTURE
NYSWRI works on management, planning, and policy related to sustainable water infrastructure. Infrastructure to collect, treat and distribute drinking water, wastewater and stormwater is critical to maintaining public health, economic vitality, and healthy well-being.

WATERSHED MANAGEMENT
Topics for NYSWRI watershed management research and outreach include dam removal, culvert rightsizing, riparian buffers, roadside ditches, and watershed planning/modelling.

WATER QUALITY MONITORING AND ASSESSMENT
NYSWRI conducts and funds research and communication related to the source, transport, and fate of contaminants in NYS waterways.

CLIMATE CHANGE AND RESILIENCE
As climate change progresses, warmer and more variable climate will make many communities more susceptible to flooding, drought, and heat. NYSWRI works on climate change science, adaption, and mitigation.

AQUATIC INVASIVE SPECIES
NYSWRI staff and funded projects direct management efforts, research, and outreach on aquatic invasive plants and animal species, which are a challenge for water resources across New York State.

WATER LITERACY
NYSWRI is involved in engaging, educating, and informing local decision-makers and the public about water resources, water infrastructure, and conservation of aquatic species and habitats.

NYSWRI WOULD LIKE TO THANK OUR PARTNERS, INCLUDING:
SUPPORT for RESEARCH ACROSS NY

NYSWRI supports research, outreach and education on critical water resource issues facing New York. This support is available to all academic institutions across the state and allows NYSWRI to leverage the expertise of NY’s broad academic community.

In 2021, NYSWRI:

- Funded EIGHT COMPETITIVE PROJECTS
- Collaborated with FOUR INSTITUTIONS ACROSS NEW YORK STATE
- Trained 8 HIGH SCHOOL, 12 UNDERGRADUATE, AND 6 GRADUATE STUDENTS

Examples of note

Anne Weber at Cornell University explored the site-specific and community-engaged design of blue-green and living infrastructures in the rural Black Dirt region in the southern Wallkill River watershed.

Matt Reid at Cornell University, in partnership with the City of Ithaca Water Treatment Plant, created a predictive model to characterize spatial and temporal variations of Manganese in the Ithaca Reservoir during periods of summer stratification.

Chris Lowry and colleagues from the University at Buffalo partnered with PUSH (People United for Sustainable Housing) Buffalo to evaluate how recently established urban rain gardens mitigate stormwater movement into the Buffalo combined sewer network.
SUPPORT for NYS WATERSHED PROGRAMS

With the support of state agency staff, NYSWRI and Cornell partners support watershed programs with applied research and outreach targeted to regional stakeholders. We work in the Mohawk River, Hudson Estuary, and NY Great Lakes watersheds with the primary objective of bringing innovative science to watershed planning, management, and policy.

Ithaca-based faculty are engaged with state agency staff and priorities to develop applied research and effective outreach in pursuit of watershed Action Agenda goals.

Examples of note:

Staff worked with Cornell researchers Suresh Sethi, Pat Sullivan, Jeremy Dietrich, and Alex Flecker, NYSDEC staff, and partners at groups such as Riverkeeper to investigate unused and derelict dams in the Hudson River watershed. A peer-reviewed paper was published in the Journal of Environmental Management, which demonstrated that existing dam inventories under-estimated the number of dams on the landscape by ~80–94%.

NYSWRI staff in the DEC Hudson Estuary Program delivered direct educational programs that reached over 10,000 students, teachers and members of the public. Highlights included a new “Women In Science” webinar series and a “Day in the Life of the Hudson and Harbor” event.
Staff with the Climate Change Program at the DEC Hudson Estuary Program released two new videos on the History and Future Climate Resilience Vision of the Hudson. These videos highlight the importance of environmental justice, equity, and representation of diversity in planning for climate change impacts along the Hudson River. NYSWRI also supports regional Cornell Cooperative Extension, NGO’s and private firms to deliver place-based solutions, outreach and technical assistance.

Supported **FIVE CORNELL COOPERATIVE EXTENSION OFFICES**
Supported **THREE NGOS OR PRIVATE CONTACTORS**

**Examples of note:**

NYSWRI continued to fund Cornell Cooperative Extension to reach local communities in the watershed. Altogether support was given to five CCEs, who worked with 20 communities across six counties providing technical assistance associated with certification in NY’s Climate Smart Community program.

Support was given to local artists and designers to create strategies, exhibits, and murals for the Norrie Point Environmental Education Center to enhance visitor and classroom experiences.

“**Our partnership with the New York State Water Resources Institute at Cornell has been a great way to bring state-of-the-art science to our management efforts supporting the Hudson Estuary and Mohawk River watersheds and their ecosystems**”

Fran Dunwell, NYSDEC Hudson River Estuary Program Coordinator
NYSWRI supports and trains students in a variety of water resource disciplines in order to create and empower the next generation of water resource professionals and stewards.

The NYSWRI Internship Program trains undergraduate and graduate students to understand and address a wide range of NY's water resource issues. Students work in an interdisciplinary environment with faculty, extension staff and program partners to create original research and outreach products, and to gain experience in the water resource profession.

**INTERNS GET RESULTS:**

**Examples of note**

**Trends of Regulated Disinfection By-Products (DBPs) in a NYS Drinking Water System**

The formation of disinfection by-products (DBPs) in drinking water due to disinfection has become a public health concern in recent decades. In this study, we explored the correlations between various water quality parameters and the sum of trihalomethanes (THMs) and haloacetic acids (HAAs) for a water treatment plant in Albany County.

**Biological Acoustics in the Hudson Estuary**

Biological acoustics (or bioacoustics) is the study of the sounds of nature. This project studied underwater soundscapes of the Hudson River and connecting water bodies, creating an interactive exhibit about bioacoustics for the Norrie Point Environmental Center.
NYSWRI STAFF LOCATIONS and ACTIVITY

1. Ithaca
Brian Rahm Director
Kristen Hychka
Rassil Sayess Research Support Specialist
Val Schull Research and Outreach Specialist
Seth Lutter Program Extension Aide III
Rewa Phansalkar Research and Outreach Specialist

2. Buffalo
Ryan Elliott Western Great Lakes Watershed Coordinator

3. Watertown
Emily Fell Eastern Great Lakes Watershed Coordinator

4. New Paltz
Beth Roessler Tributary Conservation Specialist
Libby Zemaitis Climate Change Program Coordinator
Lyndsey Cooper Climate Outreach Specialist
Scott Cuppitt Watershed Management Lead
Sherri Mackey Administrative Assistant
Thomas Niekrewicz Water Resource Specialist

5. Norrie Point
Christopher Bowser Education and Community Science Program Coordinator
Maija Liisa Niemisto Education and Community Science Specialist

6. Albany
Katherine Czajkowski Mohawk Watershed Coordinator

In 2021:

Staff authored THREE PEER-REVIEWED PUBLICATIONS
NYSWRI issued FIFTEEN PUBLICATIONS

NYSWRI staff produce and contribute to peer-reviewed literature, outreach and technical publications, and commentary on policy and governance.

A full list of WRI Staff Activity in 2021, including publications, presentation, and extension work can be found on our website at the following link: https://bit.ly/3cRY10i. Scan the QR code to view.
NYSWRI supported local designers to create exhibits at the Norrie Point Environmental Education Center, pictured here.