# WATER INNOVATION FOR THE FUTURE

The UVM CEE **Water Innocation for the Future** Initiative seeks to address grand challenges in water sciences including new technologies for treating of drinking water, recovery and treatment of wastewater, surface water management, characterizing groundwater and subsurface conditions, and harnessing the data revolution emerging across the water sciences. The ambitious challenge of leveraging engineering knowledge and systems thinking to understand how humanity can optimally change our infrastructure and lifestyles to respond to climate change is a driving force across our water research agenda.

Our faculty and student's research is at the forefront of developing technology and strategies to address water quantity and quality challenges that threaten maintaining healthy societies and healthy environments. We welcome researchers and students from a variety of backgrounds and disciplines to join us in addressing this 21st century challenge.
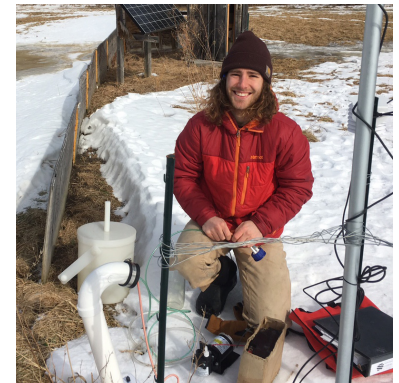
## HEALTHY WATERS
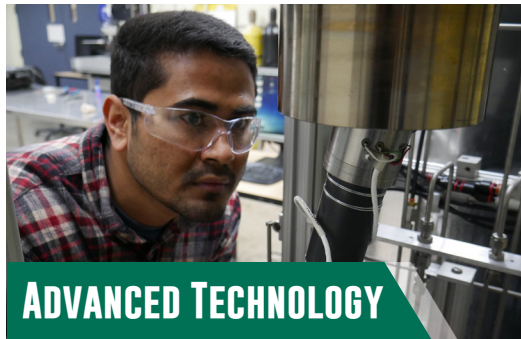
## ADVANCED TECHNOLOGY

## COMMUNITY IMPACT

## HARNESSING DATA

### Faculty

Appala Raju Badireddy
Arne Bomblies
Mandar Dewoolkar
Elizabeth Doran
Joshua Faulkner
Luis Garcia
Courtney Giles
Scott Hamshaw
Bree Mathon
Clelia Marti
George Pinder
Donna Rizzo
Eric Roy
Matthew Scarborough
Kristen Underwood

Nationally ranked graduate programs in
**Civil & Enviormental Engineering**

*Engineering for the people and our planet*

THE UNIVERSITY OF VERMONT
CIVIL & ENVIRONMENTAL
ENGINEERING

learn more at uvm.edu/cems/cee

Students and faculty in CEE address both basic and applied research to secure our water resources and promote a healthy environment and healthy society. Our researchers and collaborators also are committed to fulfilling the land grant mission of UVM through extensive community-based research and graduate study.

### Graduate Programs

Ph.D. in Civil & Environmental Engineering

M.S. in Civil & Environmental Engineering - thesis, project, and coursework-only options available

Students also work with CEE faculty while pursuing graduate programs in **Complex Systems and Data Science** and **Natural Resources.** Students will typically take a range of courses across engineering, statistics, computer science, complex systems, and natural resources.

Highlighted Courses:

- CE260 - Hydrology
- CE262 - Advanced Hydrology
- CE263 - Applied River Engineering
- CE265 - Groundwater Hydrology
- CE255 - Physical/Chemical Processes of Water/Wastewater
- CE256 - Biological Processes of Water/Wastewater Treatment
- CE359 - Applied Artificial Neural Networks

# RESEARCH AREAS



**APPLIED DATA SCIENCE & SENSING**

Applied water data science and sensing address key needs for data visualization, analysis products and tools for management, low-cost and real-time sensing, and aquatic remote sensing.



**WATER & HUMAN/ECOLOGICAL HEALTH**

Research at the intersection of water and human/ecological health seeks to understand ecohydrological resilience, ecosystem services, socio-hydrological interaction, and interaction with diseases



**CLIMATE CHANGE IMPACTS ON NATURAL & BUILT INFRASTRUCTURE**

Research on infrastructure risk from water hazards (flooding & erosion), dam assessment, water resource structural monitoring, precipitation and extreme event modeling



**WATER TREATMENT, REUSE, & ENVIRONMENTAL BIOTECHNOLOGIES**

Research on drinking water treatment, filtration, emerging contaminants, groundwater remediation, wastewater resource recovery, material recovery and reuse, agricultural runoff management, water use efficiency, nanotechnology, solid and organic waste management, and microplastics.



**ADVANCED COMPUTATIONAL METHODS IN WATER RESOURCES MANAGEMENT**

Advanced computational methods for water reseources management address research in numerical methods, optimization, Bayesian techniques, machine learning and deep learning algorithm development



**ENGINEERING HYDROLOGY & FLUVIAL GEOMORPHOLOGY**
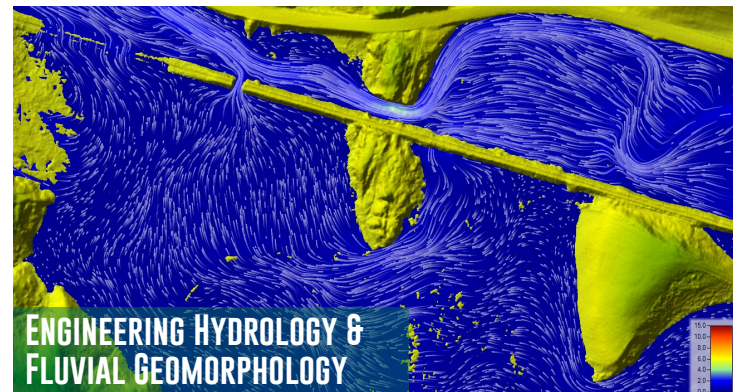
Research in engineering hydrology and fluvial geomorphology address key needs in hydrogeology, groundwater hydrology, surface water hydrology, stormwater management, and wetland & floodplain conservation.