

Water Resources Engineering

CEEatGT
2019-2020
GRADUATE
STUDIES

MASTER'S DEGREE REQS*

NON-THESIS OPTION

THESIS OPTION

SPECIALIZATION REQUIREMENT**	18 CREDITS	12 CREDITS
APPROVED ELECTIVES	12 CREDITS	12 CREDITS
THESIS	0 CREDITS	6 CREDITS
TOTAL REQUIRED CREDITS	30 CREDITS	30 CREDITS

Degree requirements** for the MSCE and MSENVE degrees. Requirements for the MSBIOE, MSCSE, and MSESME degrees differ – please contact gradinfo@ce.gatech.edu for more information. *Specializations include:** Construction and Infrastructure Systems Engineering; Environmental Engineering; Geosystems Engineering; Structural Engineering, Mechanics and Materials; Transportation Systems Engineering; Water Resources Engineering.

PH.D. DEGREE REQS

The Ph.D. program includes research and approximately 50 credits beyond the Bachelor's degree. Doctoral students, in concert with their advisor and thesis committee, construct an individualized program of study tailored to the student's research interests. Major elements of the program include:

- Comprehensive exam
- Minor
- Research Proposal
- Thesis
- Oral defense

THE Water Resources Engineering program at the Georgia Institute of Technology focuses on water, atmosphere and land systems, with emphasis on the science and engineering applications of hydroclimatology, environmental transport processes and integrated resource management. The program's mission is to educate scientists and engineers through well-integrated and stimulating courses; create new knowledge through innovative experimental, computational and analytical research; and develop new technologies and tools that benefit engineering practice in fluid mechanics, hydraulics, hydrology, hydroclimatology, wave mechanics, ocean and coastal engineering, and integrated water resources management.

FACILITIES

Research and teaching are supported by state-of-the-art experimental, computational and data-acquisition facilities.

The Dalton Family Environmental Fluid Mechanics Laboratory includes a large constant-head tank, a 4.3-meter-wide sediment scour flume, a 24-meter-long tilting flume, a recirculating flume for cohesive sediment resuspension, a recirculating saltwater flume, and a density-stratified towing tank. Each of the flumes is also equipped with cutting-edge instrumentation, including ADVs, 3D LIF and PIV.

RESEARCH AREAS

Hydroclimatology and Water Resources

- Terrestrial and atmospheric water/energy processes and fluxes.
- Decision support systems promoting integrated, equitable, and sustainable water use.

Environmental Fluid Mechanics and Hydraulic Engineering

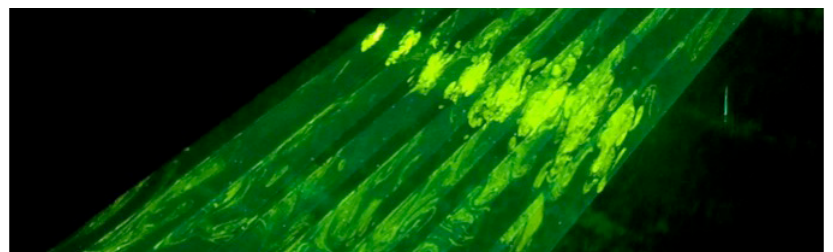
- Turbulent entrainment, transport, and mixing processes in natural and engineered environments.

Coastal and Ocean Engineering

- Waves, currents and transport from the ocean to the intertidal zone.



MEASURING WAVES GENERATED BY A PASSING CONTAINER SHIP



LIF IMAGING OF A TURBULENT JET

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Georgia Tech School of Civil and Environmental Engineering
College of Engineering

FACULTY

RAFAEL L. BRAS, SC.D. *Provost and Executive Vice President for Academic Affairs, K. Harrison Brown Family Chair*
Biophysical processes (radiation, heat fluxes, and evapotranspiration), hydrological processes; biochemical processes and vegetation dynamics; and complex and self-organizing systems.

FRANCESCO FEDELE, PH.D. *Associate Professor*
Nonlinear water waves; rogue waves; oceanic turbulence; probability and statistics of nonlinear random wave fields.

HERMANN M. FRITZ, PH.D. *Professor*
Coastal hazards; tsunamis and hurricane storm surges; subaerial and submarine landslides and volcanoes; hydropower and marine renewable energy; hydraulic and coastal structures; laser measurement techniques; numerical simulation of multiphase flows; natural hazard mitigation and risk analysis.

ARIS P. GEORGAKAKOS, PH.D.
Director, Georgia Water Resources Institute & Professor
Remote sensing of hydrologic variables; flood and drought management; hydrothermal scheduling; agricultural planning; decision support systems for river basin planning, management, and climate change adaptation.

KEVIN HAAS, PH.D. *Associate Chair for Undergraduate Programs & Associate Professor*
Coastal engineering; numerical modeling and video observations of near-shore processes; coastal morphodynamics; hydrodynamics of tidal marshes and creeks; marine hydrokinetic energy.

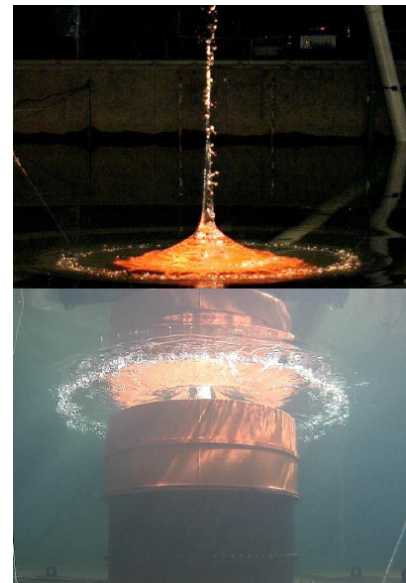
CHRIS C.K. LAI, PH.D. *Assistant Professor*
Environmental fluid mechanics; turbulent mixing; fundamental turbulence theories and modeling; variable-density flows; multiphase flows; fluid-solid interactions; experimental fluid mechanics

JIAN LUO, PH.D. *Associate Professor & Group Coordinator*
Groundwater contamination and remediation; reactive transport in porous and fractured media; water resources management and policy; stochastic hydrogeology; geostatistics; linear and nonlinear systems; inverse modeling.

TERRY STURM, PH.D., P.E. *Professor*
Hydraulic engineering; open channel flow resistance; compound channel hydraulics; sediment transport; scour around bridge abutments; cohesive sediment resuspension.

JINGFENG WANG, SC.D. *Associate Professor*
Water-energy-carbon cycles, evapotranspiration, remote sensing of land-ocean-atmosphere processes, Bayesian probability and statistics.

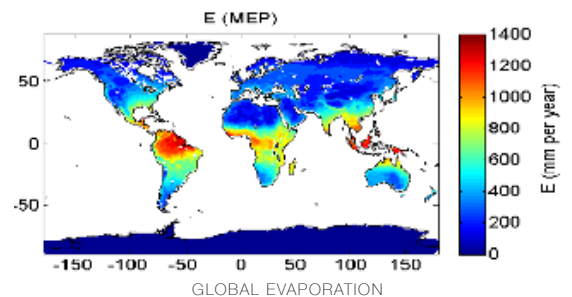
DONALD WEBSTER, PH.D., P.E.
Karen and John Huff School Chair & Professor
Fluid mechanics; turbulence; turbulent and chaotic mixing; biological, ecological, and environmental flow applications; experimental methods.



TSUNAMI GENERATED BY SUBMARINE VOLCANIC ERUPTION IN THE LABORATORY



FLUX MEASUREMENT TOWER AT THE CALHOUN CRITICAL ZONE OBSERVATORY



EMERITUS FACULTY

PHILIP J. ROBERTS, PH.D., P.E.

RESEARCH FACULTY

MARTIN KISTENMACHER PH.D. *Research Engineer II*