



Water: Systems, Science, and Society (WSSS)

An Interdisciplinary PhD and MS Program

Tufts University, Medford, MA USA

“...in the 21st Century we have to develop an integrated approach across the disciplines to understand the complexity of water issues worldwide.” -Dr. Rita Coldwell, NSF Director

To meet this challenge, Tufts University has launched the **Water: Systems, Science, and Society (WSSS)** Ph.D. and MS Program. The purpose of the WSSS program is to provide the multidisciplinary perspectives and tools to manage water related problems.

Students participating in the WSSS program enroll in and fulfill the requirements of a graduate degree within one of the participating departments to ensure a strong knowledge base in their chosen field as well complete WSSS requirements. WSSS students work in one of five Research Areas on interdisciplinary, problem-focused projects. The WSSS curriculum provides students the necessary tools and skills to address the multidimensional problems inherent in water resource issues. WSSS students take four core courses and participate in cross-cutting seminars. WSSS students also participate in field research or internships and skill workshops while completing their research.

WSSS Research Areas

Water, Climate, and Environmental Change

Impacts of climate change on water resources in metropolitan and rural areas and adaptation strategies; integrated assessment modeling; and effects of precipitation and streamflow changes on food production, and human and animal health in the developing world.

Water and Public Health

Links between waterborne diseases and water quality characteristics and the effects of climate variability and change; delineation of relationships among watershed ecosystems, animal life and human health; and integrative system-wide studies in developed and developing countries.

Watershed Restoration and Management

Development of models, monitoring methods, and decision support system tools to facilitate assessment, management, and restoration of brown fields, watersheds, wetlands, and rivers in industrialized and developing nations.

Water, Food and Livelihood Security

Focus on how water availability, access, and use affect agricultural production, other income-generating activities, and household food and livelihood security in developing countries, uses of seasonal climate forecasting, water issues in famine relief.

Water and National and International Security

An emerging area of research that includes technology monitoring, smart sensor development, managing vulnerable populations and infrastructure, and responses of social and governance systems to threats on water quality, supply and distribution.

Core Courses

Systems Analysis

Basics of system evaluation, optimization modeling, statistical analysis, simulation modeling, decision analysis, risk assessment, multi-criteria analysis, and the development of indicators and metrics for analyzing problems.

Water Science and Engineering

Scientific and engineering principles required to understand and solve problems related to water quality and supply. Topics include hydrology, hydraulics, water resources and environmental engineering, contaminant fate and transport, water management.

Biological Aspects of Water, Health and Nutrition

Identification and classification of water-borne health related contaminants, demonstration of how contaminants are detected, and critical assessment of the appropriateness of specific interventions in ameliorating impacts of these agents. Also includes pathophysiology and epidemiology of selected human diseases and roles of adequate hydration in ensuring viable nutrition.

Water Resources Planning and Policy

Exploring the roles of planning and policy in managing and protecting water resources. Topics include institutions, regulations, economics, social impact assessment, ethics, and the principles and practice of integrated water resources management.

Additional Program Elements

In addition to the four core course requirements for the WSSS program, students will participate in the following integrative activities:

- **Seminar**
- **Field Internships**
- **Skill Workshops**
- **Interdisciplinary Research**

Application Process

- Applicants sought from a variety of graduate and undergraduate degree programs.
- Applications are submitted to participating departments and students specify their interest in WSSS. Students receive their degree from the participating department.
- Application forms available online at:

www.tufts.edu/source/gradprog.html

WSSS

A partnership among:

Tufts School of Arts and Sciences
Tufts School of Engineering
The Fletcher School of Law and Diplomacy
Tufts Medical School
**The Friedman School of Nutrition
Science and Policy &**
Tufts School of Veterinary Medicine

www.tufts.edu/WSSS

WSSS Faculty – Research Areas

School of Arts and Sciences

Jonathan Kenny*	Characterization of organics
Frank Ackerman	Environmental Economics
Astier Almedom	Bio-medical Anthropology
Lawrence Bacow	Environmental Economics & Policy
Scott Horsley	Water Resources Policy & Planning
Sheldon Krinsky	Environmental Policy & Ethics
David O’Leary	Comparative Religion & Ethics
Ann Rappaport	Environmental Science & Management
Michael Reed	Ecology, Conservation
Albert Robbat	Speciation, Detection, Instrumentation
Rhonda Ryznar	Environmental Planning and GIS
Jay Shimshack	Environmental Economics & Policy
David Walt	Sensors & Pathogen Detection
Jon Witten	Land Use Planning

School of Engineering

Richard Vogel*	Hydrology, Water Resources
Paul Kirshen*	Water Resources Systems
Linda Abriola	Groundwater Pollution/Remediation
Steven Chapra	Water Quality, Mathematical Modeling
John Durant	Environmental Fate & Transport
David Gute	Epidemiology & Public Health
David Kaplan	Environmental Microbiology

Fletcher School of Law and Diplomacy

William Moomaw*	Environmental Policy & Negotiations
Leila Fawaz	Interstate Disputes in the Middle East

Medical School

Jeffrey Griffiths*	Water-born Disease
Elena Naumova	Public Health, Mathematical Modeling

Veterinary School

Christine Jost*	Ecosystem Health Assessment
Saul Tzipori	Waterborne Pathogens
Mark Pokras	Ecology & Disease

Friedman School of Nutrition Science and Policy

Patrick Webb*	Household Water Security
Beatrice Rogers*	Economics/Food Policy
Peter Walker	Natural Disaster Relief

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For More Information Contact:

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