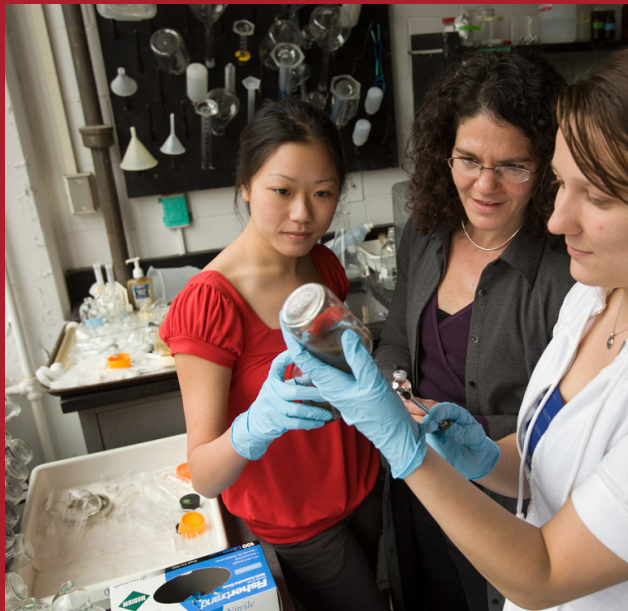


EP CONCENTRATION

The phenomena, concepts, and technology essential for maintaining the quality of the air-land-water environment are the concerns of environmental engineers. Specialization in Environmental Engineering requires an understanding of the **biological, chemical, and physical** phenomena that affect the behavior and fate of contaminants in natural systems as well as the planning, design, and operation of the engineering facilities needed to ensure effective control of environmental quality.

Faculty members concentrate their efforts on the mechanisms of pollutant transformation in nature, contaminant transport and biodegradation in the environment as well as water quality control engineering for sustainable water treatment in developing countries.



WHERE TO APPLY:

www.gradschool.cornell.edu/admissions/applying/apply-now

HOW TO VISIT:

www.cee.cornell.edu/academics/graduate/visit.cfm

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Civil and Environmental Engineering



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ENVIRONMENTAL PROCESSES

Master of Science/
Doctor of Philosophy

FACULTY RESEARCH

Graduate students collaborate with Environmental Processes faculty on research that pushes the boundaries of our knowledge. Our faculty has always represented the best the field has to offer—engineers and scholars of the highest caliber, internationally recognized for their research and the quality of instruction they offer.

DAMIAN HELBLING



Research Interests: Chemical contaminants in the aquatic environment. His research group seeks to: assess exposure to and the corresponding human and ecological effects of chemical contaminants; develop cost-effective and sustainable water treatment technologies for removal of trace organic contaminants; and develop pollution prevention strategies to minimize the flux of chemicals into water resources.

MATTHEW REID



Research Interests: The use of engineered and managed ecosystems as sustainable tools for water quality protection. His research is focused on the coupled biological, chemical, and physical processes that govern contaminant fate in soils, and on how these natural processes can be harnessed to preserve water quality and reduce greenhouse gas emissions from nutrient cycling.

RUTH E. RICHARDSON



Research Interests: Application of molecular biological tools to improve basic understanding of microbes relevant to bioremediation, wastewater treatment, sustainable bioenergy, and greenhouse gas cycling, and to subsequently develop diagnostic tools for natural and engineered systems that rely upon these microbes.

MONROE WEBER-SHIRK



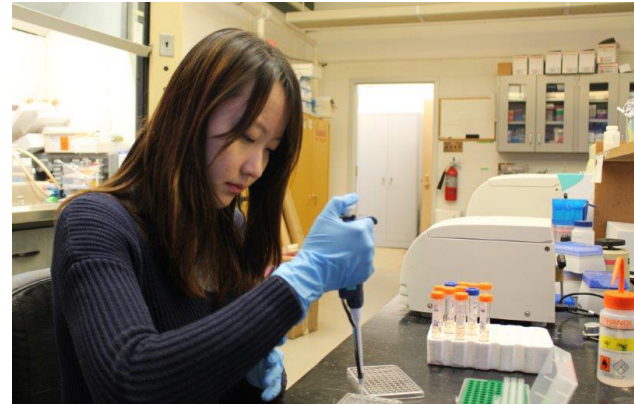
Research Interests: Founded the AguaClara Program to address the need for a sustainable municipal scale water treatment in resource poor communities. He has guided this team to invent a series of technologies that together make it possible to produce safe drinking water without using any electricity.

FACILITIES & LABS

In addition to highly versatile, sensor-enabled teaching lab facilities, EP also has specialty research labs in the areas of Applied Microbiology, Environmental Chemistry, Ecological Engineering, and Sustainable Water Treatment technologies (the AguaClara Project team space). EP lab equipment includes state-of-the-art tools in molecular microbiology including PCR/qPCR and multiwell platereaders, environmental mass spectrometry for sensitive analysis of organic molecules, gas chromatography with multiple detectors for the analysis of biogenic gases and volatile organic molecules, and infrastructure for laboratory-scale or pilot-scale testing of drinking water treatment processes.



STUDENT RESEARCH



Graduate Students in the M.S. and Ph.D. programs are expected to demonstrate mastery of knowledge in a specific subject area in Civil and Environmental Engineering and to synthesize and create new knowledge, making original and substantial contributions to their discipline.

CRISTINA FERNANDEZ-BACA



“The research team I advise is investigating sustainable wastewater treatment designs for the ‘Global South’ (also known as developing nations). Our goal is to produce a robust, high-rate system that requires little to no energy input. Using AguaClara as our model, we are focusing on smaller communities with existing distribution systems. Our current

treatment scheme includes using an anaerobic, biogas producing process. This biogas can then be captured and used as an energy source at the plant itself or in households around the community. Our hope is to create a system that can be implemented in small communities throughout the Global South.”

MARIKA NELL



I focus on water quality issues that stem from unconventional shale gas extraction operations. When hydraulic fracturing is used, water is injected into the subsurface as high pressures with a mixture of chemical additives. A portion of this water returns to the surface and contains the chemical additives, high levels of salts, and high levels of total dissolved solids. My research focuses on using analytical chemistry techniques such as high resolution liquid chromatography-mass spectrometry to analyze the organic compounds that are in this wastewater.

<http://www.cee.cornell.edu/research/>