

# Civil + Environmental Engineering

CORNELL ENGINEERING

## Primary Area of Education and Degree Programs

The CEE school offers undergraduate and graduate education in the Civil Engineering field with broadly defined missions that focus on: Environment, Engineering Systems and Management, and Civil Infrastructure.

## Undergraduate Degree

Civil Engineering and Environmental Engineering

## Graduate Degrees

MS/PhD and Master of Engineering professional degree programs in Civil and Environmental Engineering and Engineering Management (MEng only)

## Primary Areas of Research

Environmental Fluid Mechanics and Hydrology, Environmental Processes, Environmental and Water Resources Systems Engineering, Remote Sensing, Transportation Systems, Geotechnical Engineering, Civil Engineering Materials, and Structural Engineering.

## Significant Trends (past 5-10 years)

Societal change is increasingly driven by population growth, climate change, globalization, urbanization, scarcity of non-renewable resources, and aging infrastructure. Demand is high for design of sustainable engineered systems. Research is progressively more augmented by numerical models to predict results outside the spatial and temporal scales accessible to experiment. The interdisciplinary character of research has dramatically increased.

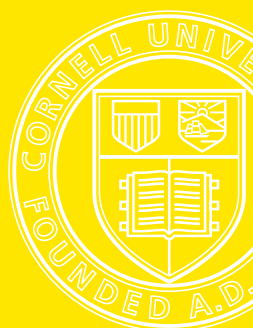
Programs and related course offerings that support design of sustainable drinking water treatment systems in Honduras have attracted students to both undergraduate and graduate programs.

## School and Faculty Achievements (last 5 years)

Major renovations in the school's laboratories for civil infrastructure and fluid mechanics and hydrology have been undertaken. Five new faculty have been hired. The faculty have completed a plan for directions in research that will guide future hiring by the School. In conjunction with BEE, the CEE School has developed and begun offering a new major in Environmental Engineering.



Agua Clara water treatment plant in Marcala Honduras designed by CEE students.



### Priority Goals (next 5 years)

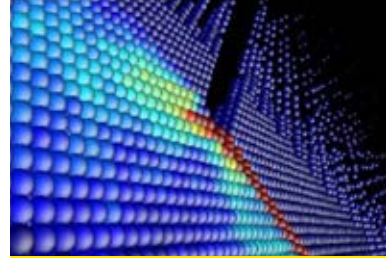
Planning for evolution of the School's undergraduate and graduate course offerings. Planning for renovation/replacement of Hollister Hall.

### Challenges (next 5 years)

Faculty demographics suggest that there will be a significant number of retirements, and loss of senior faculty may impact the perceived stature of the School. There is a widening gap between conventional Civil Engineering practice and research; CEE is challenged to offer courses that prepare students for the both the work place and graduate school. Fundamental tools are rapidly evolving and include applications of molecular biology, distributed computing, and analysis of complex systems.

### Opportunities (next 5 years)

CEE expects to make a substantive contribution to the design of sustainable engineered systems. Strategic emphasis will be given to new hires working in the following areas: Engineering of mega cities, energy and environmental impact, water resources, coastal issues, innovations in materials, and hazards risks and reliability. Planning for the renovation/replacement of Hollister Hall provides a once in decades chance to guide the infrastructure that houses CEE.



**CEE Asst. Prof. D. Warner's atomistic simulation of crack tip formation in aluminum (warm colors represent high strain).**



**CEE Prof. O. Gao carries out research related to diesel retrofit programs to reduce emissions from trucks and buses.**