



Civil & Environmental Engineering

Degree Programs and Research Areas

Undergraduate Degree Titles:

- Civil Engineering
- Environmental Engineering

Graduate Degrees: MS/PhD and Master of Engineering professional degree programs in:

- Civil and Environmental Engineering
- Engineering Management

Primary Areas of Research:

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

Trends

Societal change is increasingly driven by:

- Population growth
- Climate change
- Globalization
- Urbanization
- Scarcity of non-renewable resources
- Aging infrastructure

High demand for design of sustainable engineered systems.

Research application of numerical models to spatial and temporal scales not accessible to experiment.

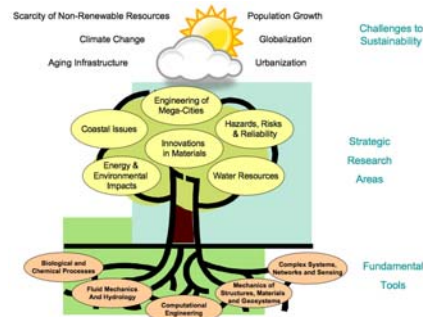
Increase in interdisciplinary research.



Dehalococcoides ethenogenes. The only bacterium known to completely dechlorinate tetrachloroethylene to non-toxic ethene. Co-discovered by CEE Prof. J. Gossett and Prof. S. Zinder (Microbiology).

Achievements

- Major renovation of the CEE's laboratories for civil infrastructure and fluid mechanics and hydrology.
- Hiring of five new faculty
- New major in Environmental Engineering (jointly offered by CEE and BEE)
- Strategic research plan for CEE School



Conceptual model for research thrust areas of CEE (from CEE strategic plan).

- 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.



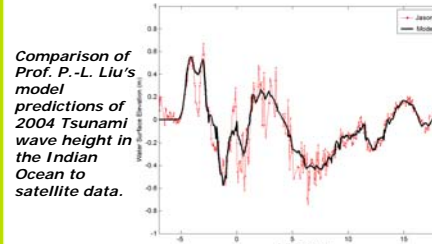
AguaClara water treatment plant in Marcala Honduras designed by CEE students.

Priority Goals

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



Simulation of an earthquake for lifeline testing in the CEE laboratory.

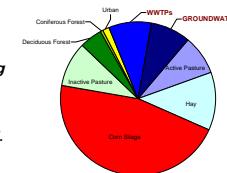


Comparison of Prof. P.-L. Liu's model predictions of 2004 Tsunami wave height in the Indian Ocean to satellite data.



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

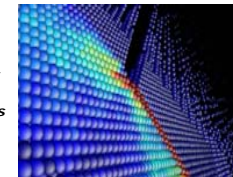
% Total P load to reservoir



CEE Prof. C. Shoemaker's model predictions of phosphorous loading from specific sources within the Cannonsville reservoir watershed.

Challenges

- Faculty demographics suggest that there will be a significant number of retirements.
 - CEE is challenged to replace these positions timely and effectively according to our strategic plan.
- Widening gap between conventional Civil Engineering practice and research.
 - CEE is challenged to offer courses that prepare students for 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.



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

Opportunities

- 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,
 - Hazards risks and reliability.
- Anticipated renovation/replacement of Hollister Hall allows us to develop innovative infrastructure consistent with CEE's strategic research & education plans.