# Environmental Science and Engineering

UNT researchers work across the natural sciences, social sciences, and engineering to solve the world's most pressing environmental problems and develop stewarding strategies that safeguard earth's resources and improve living conditions Interdisciplinary approaches yield innovative solutions. UNT offers outstanding environmental science programs across multiple departments to address issues such as habitat restoration and watershed ecology, compost and toxicology, water resources, wastewater management, air quality, alternative energy applications based on solar, wind and geothermal sources, renewable bioproducts, risk assessment and conservation biology. The combined assets of collaborative faculty expertise, an extensive network of affiliated local, national and international partners, and an investment in state-of-the-art laboratories, field stations and advanced instrumentation, reflect UNT[1]s commitment to advance environmental solutions for a healthier future.

- **One of the best aquatic toxicology laboratories in the Southwest, and one of the only field-based facilities to assess the effects of chemicals and pesticides on aquatic ecosystems**
- **Advanced environmental modeling integrates technologies such as satellite remote sensing, GPS, optical sensors, data acquisition electronics, and high performance computers to assess stress on ecological systems**
- **At the forefront of developing and implementing novel, renewable energy programs and technologies for buildings, environments and consumer goods**
- **Superior resources for interactive visualization of scientific data include the UNT Simulation Chamber, high performance computers for predictive modeling with a 20 ft X 7 ft, 3-dimensional projection system**

## Representative Faculty

**Miguel Acevedo**, Regents Professor of Geography and Electrical Engineering: *sensors and environmental monitoring*

**Samuel Atkinson**, Director of the Institute of Applied Science; and Regents Professor of Biological Sciences: *remote sensing analysis and modeling*

**Baird Callicott**, Distinguished Research Professor; and Regents Professor of Philosophy and Religion Studies: *environmental philosophy; and environmental ethics*

**Nandika D'Souza**, Professor of Mechanical and Energy Engineering, and Materials Science and Engineering: *renewable bioproducts, including "green" biodegradable packaging, engineered polymers, and sensor textiles*

**David Hoeinghaus**, Assistant Professor of Biological Sciences: *responses of species, communities, and ecosystems to environmental change*

**Duane Huggett**, Assistant Professor of Biological Sciences: *computational toxicology; bioconcentration of contaminants; and comparative pharmacology*

**Kuruvilla John**, Associate Dean of the College of Engineering; and Professor of Mechanical and Energy Engineering: *air quality modeling and monitoring*

**Jeff Johnson**, Assistant Professor of Biological Sciences: *evolution and conservation biology; and genetic diversity*

**James Kennedy**, Director of the Elm Fork Education Center; and Regents Professor of Biological Sciences: *ecotoxicology; biodiversity of aquatic organisms in playa lakes; and the ecology of benthic invertebrates*

**Irene Klaver**, Associate Professor of Philosophy and Religion Studies: *philosophy of water and the issues that affect watersheds, rivers, and other water bodies*

**Aaron Roberts**, Assistant Professor of Biological Sciences: *molecular ecology and toxicology and the effects of environmental stressors on aquatic organisms*

**Yong Tao**, Director of the PACCAR Technology Institute; PACCAR Chair; Chair and Professor of Mechanical and Energy Engineering: *innovative, high performance building construction and alternative methods of heating and cooling*

**Barney Venables**, Associate Professor of Biological Sciences: *environmental chemistry and toxicology focusing on wastewater, bioactive lipids, watershed protection, and terrestrial toxicity*

**Steve Wolverton**, Assistant Professor of Geography: *environmental archaeology and conservation paleozoology; cultural ecology; and datasets from zooarchaeology and paleontology*

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## Select Research Resources

### IAS: Institute of Applied Science

*www.ias.unt.edu*

IAS fosters, facilitates and conducts science-based interdisciplinary environmental research that seeks to understand how human actions impact the environment. A network including biologists, ecologists, geologists, engineers, computer scientists, chemists, geographers, archeologists, policy experts, and philosophers work to address some of the world's most pressing environmental puzzles.

### CRS: Center for Remote Sensing

*www.ias.unt.edu/crs/CRShome.htm*

The Center utilizes the rapidly evolving technology of satellite imaging to advance scientific knowledge of land and water resources, ecosystems and human communities. It has a fully equipped Earth Resources Data Analysis System (ERDAS), and ARC/INFO capabilities with powerful computer facilities to conduct research on remote sensing data collection, image enhancement, classification and analyses.

### Aquatic Toxicology and Reservoir Limnology

UNT has one of the best aquatic toxicology laboratories in the Southwest. The lab conducts acute and chronic toxicity tests with freshwater and marine organisms, water quality research on rivers and reservoirs throughout Texas, and research for a variety of industries and municipalities on the effects of chemicals on aquatic life.

### Office of Sustainability

*sustainable.unt.edu*

The Unt-based Office promotes environmental sustainability through four primary action areas: research, outreach, operations, and teaching. Developments include the Climate Action Plan, which seeks to reduce greenhouse gas emissions, curb energy consumption, and reach carbon neutrality; power grid infrastructures based on wind and electrical energy technologies; sustainable green spaces; an active recycling program; and tech transfer assistance to commercialize new technologies.

### Water Research Field Station

One of the only facilities in the Southwest designed to assess, under controlled field conditions, the effects of pesticides on aquatic ecosystems prior to their general use in the environment. Research is supported with affiliated greenhouse nurseries, outdoor ponds and streams, and a biological and residue analysis laboratory.

### Center for Watershed Reservoir Assessment and Management

*www.geog.unt.edu/~hunter/files/cwram*

The Center conducts research on techniques and best management practices for assessing and managing watersheds and reservoirs, and addresses current and emerging problems and issues.

### CEP: Center for Environmental Philosophy

*www.cep.unt.edu/centerfo.html*

CEP promotes an understanding of environmental ethics by publishing journals and books, and advancing research through workshops, conferences, and education. CEP publishes the respected journal *Environmental Ethics*, the first of its kind in the discipline.

### Contributing Research Clusters:

#### Renewable Energy and Conservation

*reac.unt.edu*

#### Renewable Bioproducts

*renewablebioproducts.unt.edu*