



University of Nevada, Reno

ENVIRONMENTAL SCIENCES

INTERDISCIPLINARY GRADUATE PROGRAM



Pursue an Environmental Science Ph.D. or Masters Degree

The Environmental Sciences (ES) Interdisciplinary Graduate Program links the areas of chemistry, biology, ecology, physics, and human health and environmental policy. Students may select a concentration in Environmental Processes or Environmental Health for Master's of Science and Doctor of Philosophy studies and research.

ES graduates emerge with competitive laboratory experience and insight into the complexities of environmental science. The graduates are prepared for careers in academia, consulting, the chemical industry, and state and federal agencies.

The ES Graduate Program is administered by the University of Nevada's Academy for the Environment and is part of the Graduate School at the University of Nevada, Reno. Course offerings are diverse and include advanced study in biology, chemistry, engineering, resource management and physics.



Environmental Sciences Interdisciplinary Graduate Program

The Environmental Sciences Interdisciplinary Graduate Program was founded in 1994. It is administered by the University of Nevada Academy for the Environment (UNAE). The program has two tracks: Environmental Processes and Environmental Health.

Program Tracks:

Environmental Processes

The primary emphases of this track are environmental processes and analytical chemistry.

Research projects range from determining long range transport of trace contaminants such as mercury in the atmosphere to determining remediation methods for acid mine drainage. Students need a sound understanding of chemical and physical principles that affect chemical movement in the environment. This includes chemicals from anthropogenic and natural sources.

Environmental Health

This track emphasizes the impact of contaminants on humans. Examples of projects include response of human tissues to oxidative stress, impacts

of selenium on developing embryos and the effects of indoor air contaminants on human health. Students should have a strong background in biochemistry and cellular biology. This track also includes the disciplines of wildlife toxicology and conservation biology, with a goal of understanding how a variety of contaminants affect populations and ecosystems. Projects include determining the effect of low levels of cyanide on migratory waterfowl, the effect of rising carbon dioxide on plants, and how wetlands are affected by contaminants.

Environmental Sciences Student Research Accomplishments:

CFC Replacements

Trifluoroacetic Acid (TFAA) is a stable breakdown product of various new compounds that have replaced the ozone-depleting CFC's. New methods for measuring TFAA in waters of the western United States show increasing amounts of this chemical in lakes and stream systems, particularly in the Great Basin.

MTBE and Lake Tahoe

Significant amounts of chemicals found in gasoline, including benzene, xylene, and MTBE, were found in marinas at Lake Tahoe during the summer. The monitored chemicals were found to be associated with use of recreational watercraft. Regulation based on this research resulted in dramatic reductions of chemicals from gasoline being added to the lake.

Plutonium & Nevada Test Site

Traces of plutonium and radiocesium detected in attics of homes surrounding the Nevada Test Site were attributed to radioactive fallout from above-

ground weapons tests during the 1950's and 1960's. While the amounts of these radionuclides were not a significant health risk, they were useful for assessing the migration of these substances from the nuclear weapons testing area to surrounding communities.

Wood combustion and cooking

Meat cooking and heating with wood fires produces unique by-products that can be found in the air. These by-products can be used as marker compounds in atmospheric source/receptor models. Researchers from the ES program used these chemicals to assess the relative contributions

of each of these sources to the overall air pollution problem in Denver, Colorado.

Second hand tobacco smoke

A study on the effect of urban air and second-hand tobacco smoke revealed that mitochondrial DNA is a target for quinine-containing compounds. Exposure to second-hand tobacco smoke decreased energy production in human cells and affected mitochondrial integrity.



Photo Courtesy of Jean Dixon

Students interested in the Environmental Science Graduate Program should contact the Program Director for more information

**Program Director
Mark Walker, Ph.D.**

University of Nevada, Reno
Environmental Sciences
Graduate Program/Mail stop 370
Fleischmann Agriculture, 132
Reno, NV 89557

Phone (775) 784-1938
Fax (775) 784-4789

E-mail: mwalker@cabnr.unr.edu
<http://www.unr.edu/idgrad/esh/>