

The Northwest Environmental Training Center presents:

[Introduction to Aquatic Toxicology](#)
[Understanding Impacts of Organic Chemicals and Metals on Aquatic Ecosystems](#)

August 12-13, 2008, 8:30 A.M. to 5 P.M. (2 Days)
Courtyard Marriott - Old Pasadena, 180 North Fair Oaks Avenue
Pasadena, California

Instructor: Ruth M. Harper, Ph.D.

[Course Description](#) | [Register Online](#) | [Course Brochure PDF](#) / [Course Catalog](#)

Description: This introductory course provides participants with an understanding of the foundations of aquatic toxicology and how these concepts are applied to managing pollutants in aquatic environments. The course covers terminology, common test designs, and endpoints such as lethality, cancer, and endocrine disruption. Important legacy and emerging pollutants of concern such as heavy metals, organic pesticides, PAHs, PCBs, PBDEs, pharmaceuticals, and personal care products will also be presented. Fate and transport will be discussed as it relates to bioavailability and pollutant partitioning in aquatic environments. Water Quality criteria from the Clean Water Act will be discussed with an emphasis on, and examples of, site specific criteria for metals using hardness correction, water effects ratio (WER), and the biotic ligand model (BLM), which has been included in the 2007 EPA updates for Aquatic Life Copper Criteria.

Course Topics:

Classes of toxic chemicals (carcinogens, mutagens, teratogens, and others).

Sources of toxic chemicals entering the aquatic environment.

Exposure pathways for aquatic organisms.

Biological, physical, and chemical factors affecting bioavailability and toxicity.

Bioaccumulation, bioconcentration, and biomagnification.

Modes of toxic chemical action, including enzyme inhibition and endocrine disruption.

Types of toxic effects: biochemical, molecular, physiological, behavioral, population, and community.

Toxicity testing methods – acute and chronic, single and multiple species.

Laboratory assessment of toxicity – LC50, EC50, NOEC, LOEC, MATC, and dose-response curves.

Development and use of water quality standards.

Field application of toxicology using the biomarkers.

About the instructor: Ruth Harper is an Assistant Professor of Environmental Toxicology and Chemistry in the Huxley College of the Environment at Western Washington University. She has worked on projects ranging from genetically based tolerance to pollutant exposure in marine systems with the NOAA Ecotoxicology Branch, CCHEBR, development of groundwater WET tests with photoactive pollutants with the Washington State DOE, and metal contamination and effects in mining systems in Colorado, Idaho, Washington, and British Columbia with agencies that include the USGS and USEPA.

After completing this course, participants will be able to:

- Apply toxicology principles to environmental issues.
- Understand how aquatic organisms are exposed to toxic chemicals.
- Identify factors affecting toxicity, and understand the similarities and differences between the toxicity of metals and organic chemicals.
- Understand modes of action of toxic chemicals, types of effects from the molecular to the ecosystem level, and detoxification processes.

- Assess toxicity in terms of LC50 and EC50, and develop dose-response curves.
- Identify the advantages and disadvantages of various toxicity testing methods.
- Understand the scientific basis for and limitations of water quality standards.
- Describe the principles of ecological risk assessment.

Prerequisites: Some college-level biology and chemistry coursework is required (even if it was a long time ago). A fundamental understanding of aquatic ecology is also helpful.

Education level: Introductory/Refresher

Course Materials: Attendees will receive a binder containing workshop proceedings and reference material.

Continuing Education Units: 1.3

Registration: **\$495** (***\$395** reduced tuition is available for Native American tribes; government employees; nonprofits; students; and NAEP, NEBC, NWAEP members). You may register via the link below or by calling the Northwest Environmental Training Center at 206-762-1976.

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Northwest Environmental Training Center

A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
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