

The Northwest Environmental Training Center presents:

Introduction to Aquatic Toxicology Understanding Impacts of Organic Chemicals and Metals on Aquatic Ecosystems

Course ID: ETOX - 410 (2 days)
August 26-27, 2009, 8:30 A.M. to 5 P.M.
NWETC Headquarters
650 South Orcas Street, Suite 220
Seattle, Washington

Instructor: Ruth M. Harper, Ph.D.

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

What to Bring: Pen or pencil, coffee mug, and a water bottle (to reduce waste). Please wear comfortable clothes appropriate for the prevailing weather. Lunch will be on your own. There are numerous restaurants within walking distance. Drinks and snacks will be provided each day.

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.

Cancellation Policy: Registration fees are fully refundable up to 30 days prior to the event and 50 percent refundable (or 100% credit) thereafter up to the day prior to the event. Registration may occur up to the day prior to the event provided that space is available.

Disability Accommodations: To request disability accommodations, please contact us at info@nwetc.org or (206) 762-1976 at least 30 days prior to the event.

Northwest Environmental Training Center

A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
650 S. Orcas Street, Suite 220, Seattle, Washington 98108
Phone: (206)762-1976, Fax: (206)762-1979
www.nwetc.org



Accommodations near:
The Northwest Environmental Training Center

HEADQUARTERS
 650 South Orcas Street, Suite 220
 Seattle, WA 98108
 PHONE: (206) 762-1976 | FAX: (206) 762-1979
www.nwetc.org

Georgetown Inn 6100 Corson Ave S Seattle, WA <i>0.25 mi</i>	(206) 762-2233	La Hacienda Motel 5414 1st Ave S Seattle, WA <i>0.93 mi</i>	(206) 762-2460
Westmark Hotels 4742 42nd Ave Sw # 626 Seattle, WA <i>3.05 mi</i>	(206) 281-9977	Seattle Hotel 315 Seneca St Seattle, WA <i>3.85 mi</i>	(206) 623-5110
Munson Motel 7060 E Marginal Way S Seattle, WA <i>0.44 mi</i>	(206) 762-6684	Silver Cloud Hotel Stadium 1046 1st Ave S Seattle, WA <i>2.56 mi</i>	(206) 204-9800
Airline Motel 7070 E Marginal Way S Seattle, WA <i>0.44 mi</i>	(206) 766-9807	The Edgewater 2411 Alaskan Way Pier 67 Seattle, WA <i>4.35 mi</i>	(206) 728-7000

Northwest Environmental Training Center
 A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
 650 S. Orcas Street, Suite 220, Seattle, Washington 98108
 Phone: (206)762-1976, Fax: (206)762-1979
www.nwetc.org



Directions to:

Northwest Environmental Training Center

HEADQUARTERS

650 South Orcas Street, Suite 220

Seattle, WA 98108

PHONE: (206) 762-1976 | FAX: (206) 762-1979

www.nwetc.org

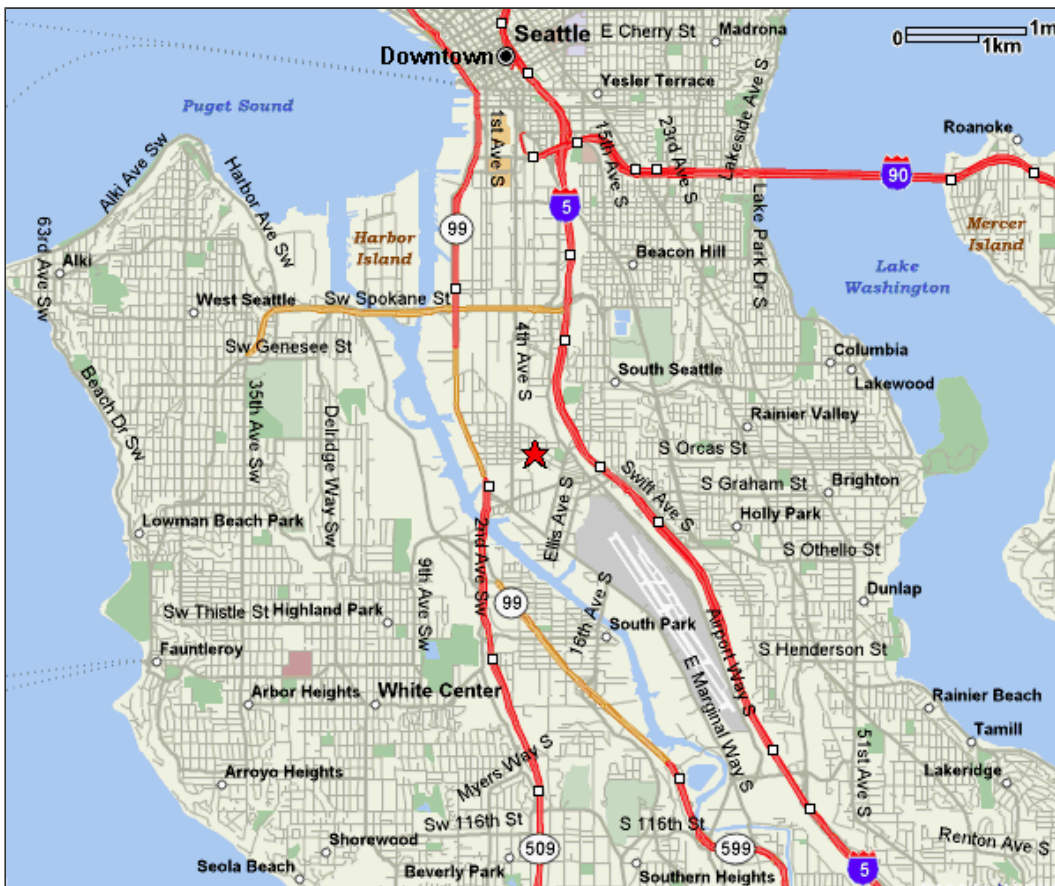
From I-5 (Northbound or Southbound):

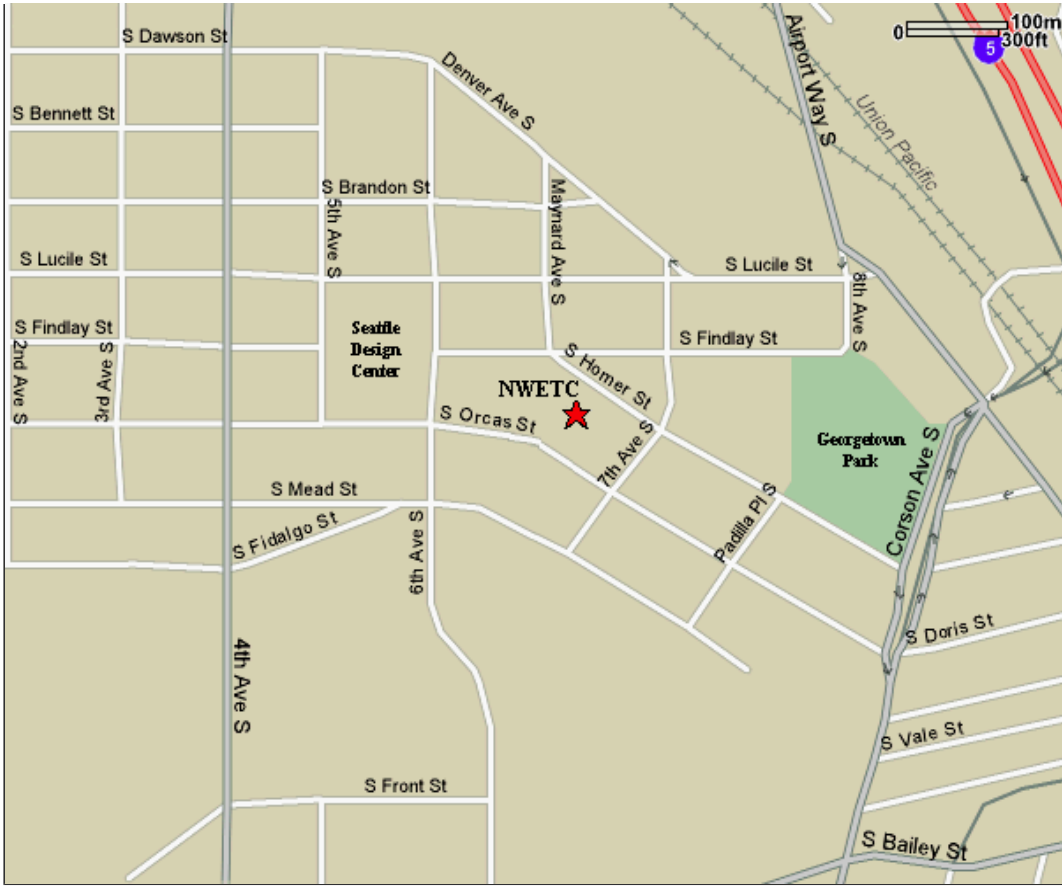
- Take the Michigan/Corson Street Exit
- Stay in right lane
- Right on Michigan Street (first light)
- Right on 6th Avenue South
- Right on Orcas Street
- Orcas Business Park is on the left next to the Post Office
- NWETC Headquarters is on the second floor at the north end of the building
- Parking is free on the street and in the triangular lot north of the building on S. Homer Street

From 99 (Northbound or Southbound):

- Go east on Michigan Street
- Turn left on 4th Avenue South
- Turn right on Orcas Street
- Orcas Business Park is on the left next to the Post Office
- NWETC Headquarters is on the second floor at the north end of the building
- Parking is free on the street and in the triangular lot north of the building on S. Homer Street
- Feel free to call us if you need directions in route or have any questions about parking: (206)762-1976.

MAPS:





Northwest Environmental Training Center

A nonprofit 501(c)(3) program of the Northwest Environmental Education Council
650 S. Orcas Street, Suite 220 | Seattle, Washington 98108
Phone: (206)762-1976 | Fax: (206)762-1979
www.nwetc.org



NORTHWEST ENVIRONMENTAL TRAINING CENTER

650 S Orcas Street, Suite 220, Seattle, Washington 98108

Ph: (206)762-1976, Fax: (206)762-1979

www.nwetc.org

REGISTRATION FORM

Name: _____ Today's Date: _____

Agency/Organization: _____

Street Address: _____

Street Address (cont'd): _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____ Title: _____

Intro to Aquatic Toxicology

\$ _____

Course ID: ETOX-410 (2 days)

August 26-27, 2009, 8:30 A.M. to 5 P.M.

NWETC Headquarters

650 South Orcas Street, Suite 220

Seattle, WA 98108

Registration: \$495 (\$395*)*Reduced rates for Native American Tribes; nonprofits; government; students; and NEBC, NAEP and NWAEP members.

Payment Method: Check PO Credit Card (Visa Mastercard) Total: \$ _____

Credit Card or PO #: _____ Exp: _____

Notes: Please make checks payable to Northwest Environmental Training Center.

Cancellation Policy: Registration fees are fully refundable up to 30 days prior to the event and 50 percent refundable (or 100% credit) thereafter up to 3 business days prior to the event. No refunds are issued for cancellations occurring less than 3 business days before the start day.