

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)

June 19 - 20, 2008, 8:30 A.M. to 5 P.M.

Emerald Bay at the Bellingham Yacht Club

2625 S Harbor Loop Drive

Bellingham, 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 or AFS 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 3 business days prior to the event. No refunds are issued for cancellations occurring less than 3 business days before the start day.

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



Bellingham
Washington

Directions to:

Emerald Bay at the Bellingham Yacht Club

2625 S Harbor Loop Drive
Bellingham, Washington 98225
(800) 449-4393
<http://emeraldbayevents.com/>

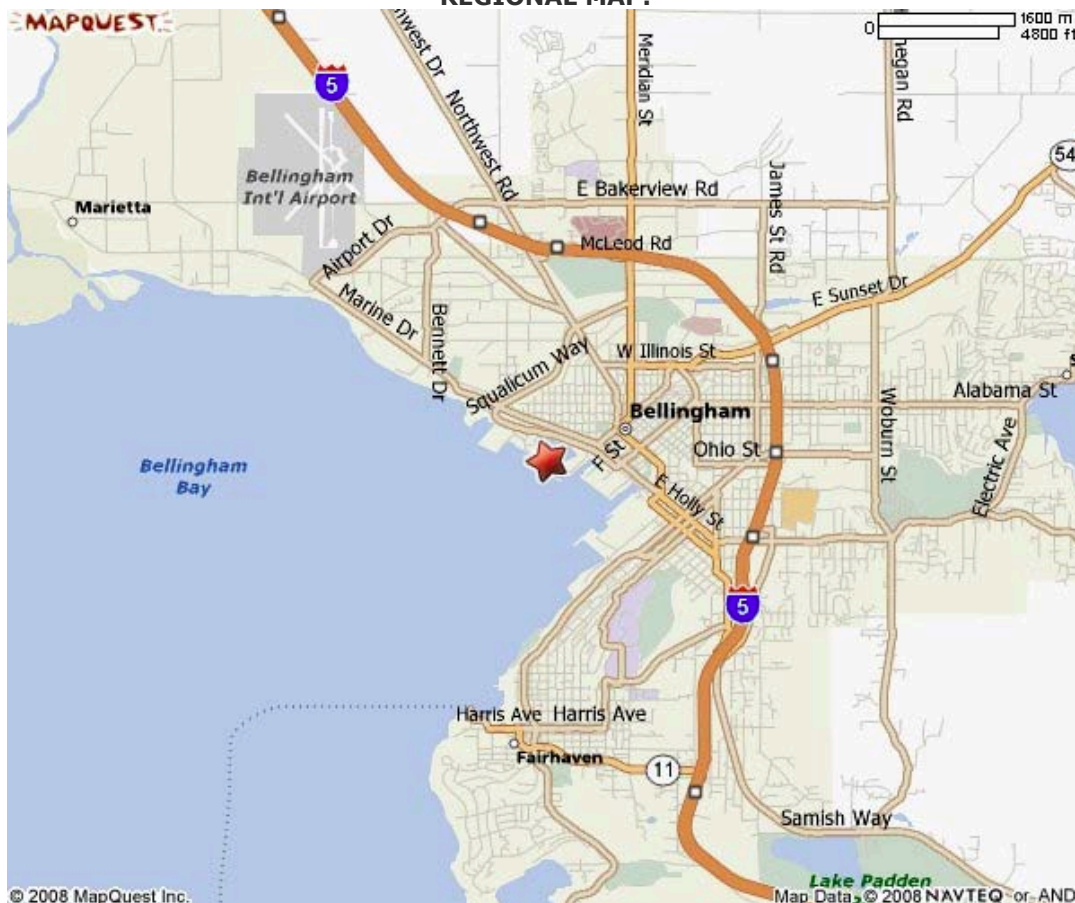
AMTRAK CASCADES: station is approximately 5 miles away: <http://www.amtrak.com/>
INTERCITY BUS: <http://www.greyhound.com/> or <http://www.airporter.com/>

FROM I-5 (North or South)

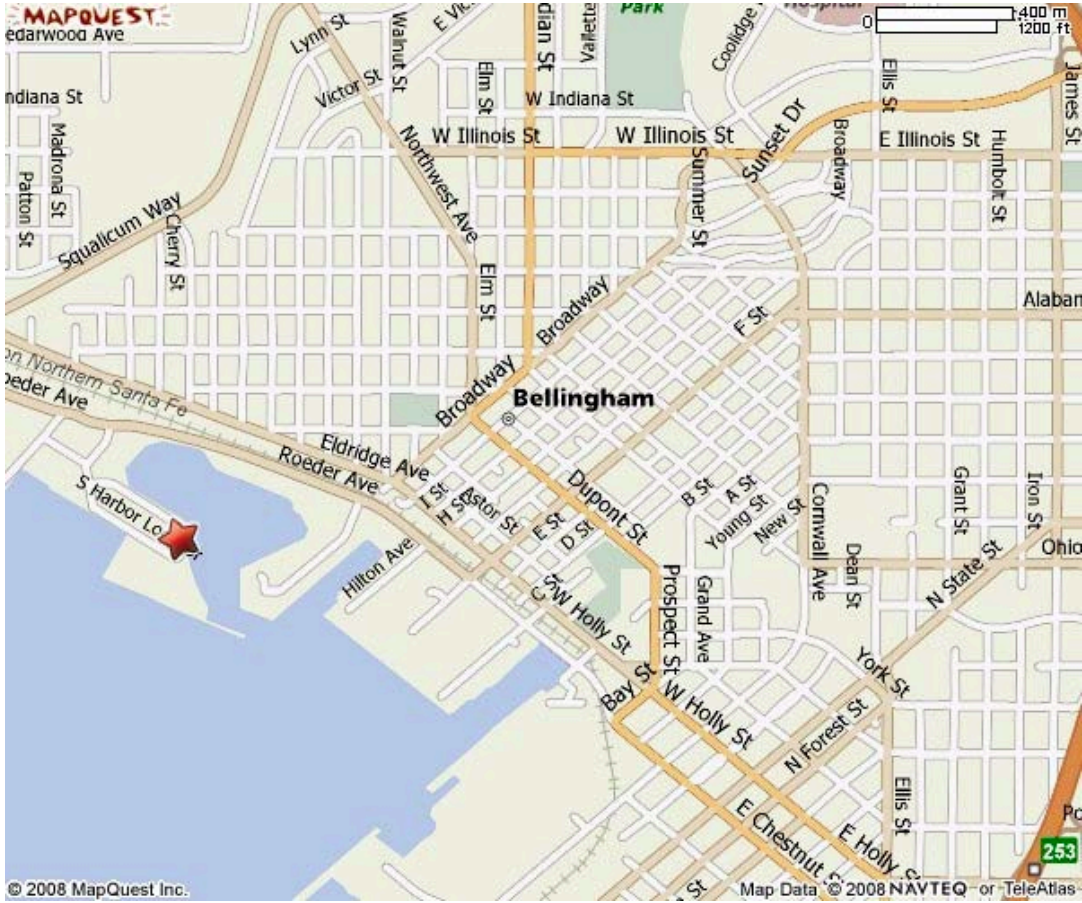
Take exit 256 (Meridian Street)
Turn right on Meridian Street (southbound)
Turn right on Squalicum Parkway
Slight left at Roeder Avenue
Turn right at Coho Way
Turn left at S Harbor Loop Drive

Bellingham & surrounding county busses: <http://www.ridewta.com/>

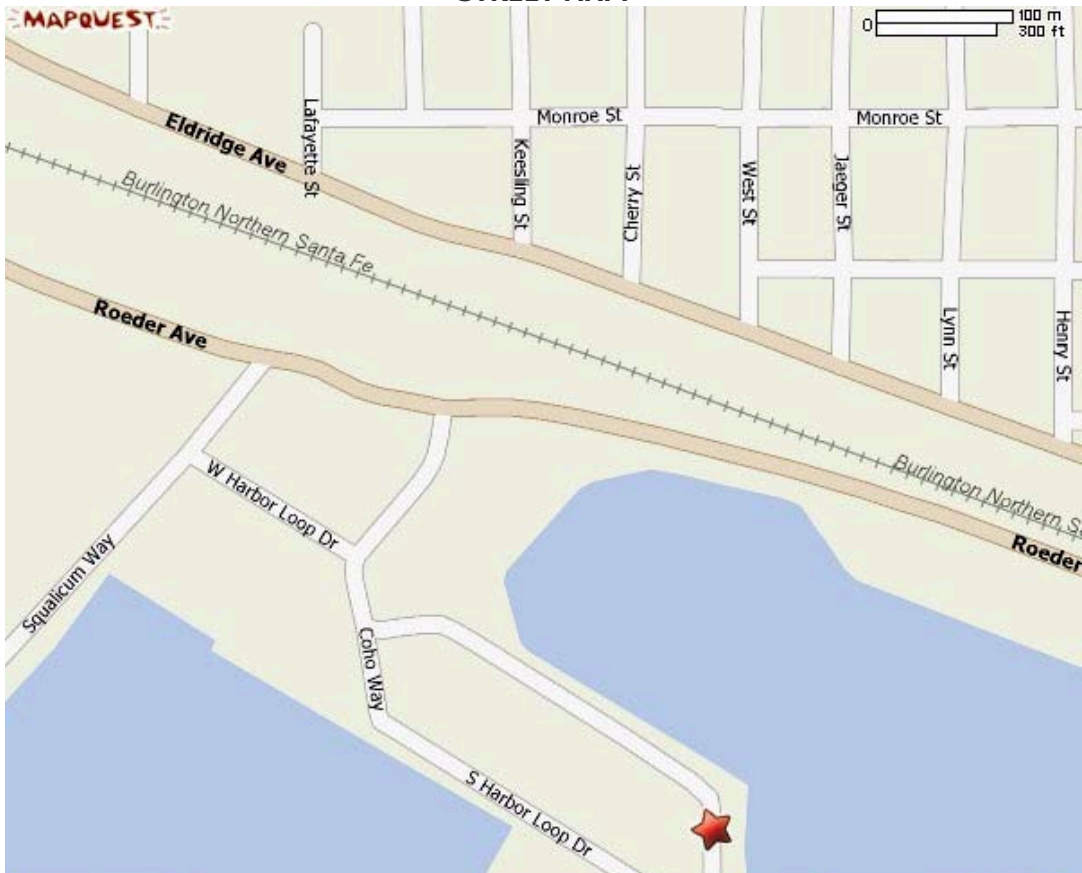
REGIONAL MAP:



CITY MAP:



STREET MAP:





Bellingham
Washington

ACCOMMODATIONS near Emerald Bay at the Bellingham Yacht Club

Workshop location: [2625 Harbor Loop Drive, Bellingham, WA 98225](#)

<p>Hotel Bellwether 1 Bellwether Way Bellingham, WA 98225</p>	(877) 411-1200	<p>Lions Inn Motel 2419 Elm Street Bellingham, WA 98225</p>	(360) 733-2330
<p>Best Western Lakeway Inn 714 Lakeway Drive Bellingham, WA 98229</p>	(360) 671-1011	<p>Rodeway Inn 3710 Meridian Street Bellingham, WA 98225</p>	(360) 738-6000
<p>Days Inn Bellingham 215 North Samish Way Bellingham, WA 98225</p>	(360) 734-8830	<p>Val-U Inn 805 Lakeway Drive Bellingham, WA 98229</p>	(800) 443-7777
<p>Travelodge 101 North Samish Way Bellingham, WA 98225</p>	(360) 733-8280	<p>Chrysalis Inn 804 10th Street Bellingham, WA 98225</p>	(888) 888-0005

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REGISTRATION FORM

Name: _____ Today's Date: _____

Agency/Organization: _____

Street Address: _____

Street Address (cont'd): _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____ Title: _____

Introduction to Aquatic Toxicology \$ _____

Course ID: ETOX-410, June 19 - 20, 2008

Emerald Bay at the Bellingham Yacht Club

2625 S Harbor Loop Drive, Bellingham, WA

Registration: \$495 (\$395*)

*Reduced rates for Native American Tribes; nonprofits; government; students; and NEBC, NAEP, NWAEP or AFS 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.

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