

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)
July 10-11, 2008, 8:30 A.M. to 5 P.M.
Courtyard Marriott - Denver Downtown
934 16th Street
Denver, CO 80202

Instructor: Ruth 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.

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



Denver, Colorado

Directions to:

Courtyard Marriott - Denver Downtown

934 16th Street
Denver, CO 80202
(303) 571-1114
www.marriott.com/denccd

Denver Regional Public Transit: <http://www.rtd-denver.com>

Greyhound: <http://www.greyhound.com>

Amtrak: <http://www.amtrak.com>

FROM DENVER INTERNATIONAL AIRPORT (DEN)

Take Pena Blvd. to I-70 West to I-25 South
Take I-25 south to Speer Blvd. (South) exit
Proceed to Lawrence Street turn left
Proceed to 14th Street turn right
Proceed to Curtis Street turn left

Drive straight 1 1/2 blocks The Courtyard by Marriott will be on your right hand side at 934 16th Street
The drive in entrance is located on the west side of the building

FROM POINTS WEST (via I-70 E)

From I-70 E
Take exit 261 to merge onto W 6th Ave / US-6 E
Take the exit onto I-25 N toward Ft Collins
Take exit 210C to merge onto Auraria Pkwy / CO-33 N
Continue to follow CO-33 N
Turn right at 14th Street
Turn left at Lawrence Street
Turn right at 17th Street
Turn right at Champa Street
End at 934 16th Street, Denver, CO

FROM POINTS EAST (via I-70 W)

From I-70 W
Take exit 274 for I-25 S toward Colo Springs
Take exit 213 for Park Ave
Merge onto Park Ave
Continue on 22nd Street
Turn right at Larimer St
Turn left at 19th Street
Turn right at Champa Street
End at 934 16th Street, Denver, CO

FROM POINTS NORTH (via I-25 S)

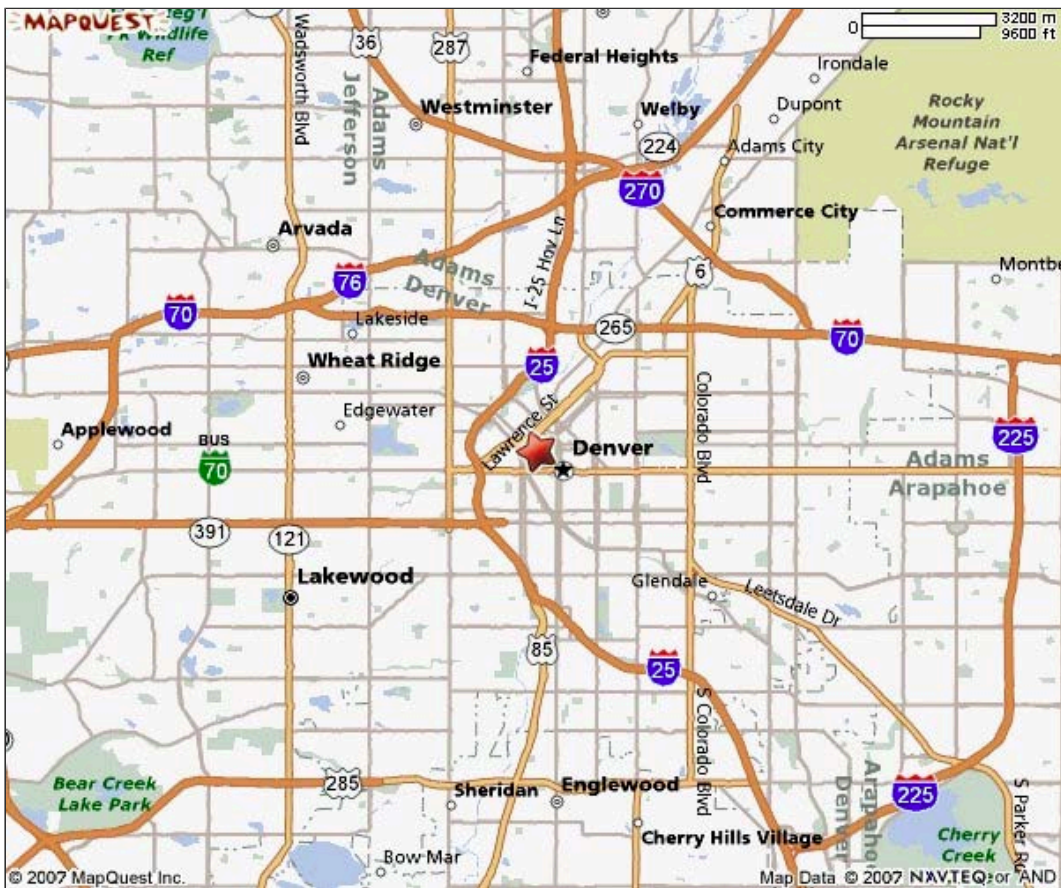
Take I-25 S
Take exit 213 for Park Ave
Merge onto Park Ave W
Continue on 22nd Street
Turn right at Larimer Street
Turn left at 19th Street
Turn right at Champa Street
End at 934 16th Street, Denver, CO

FROM POINTS SOUTH (via I-25 N)

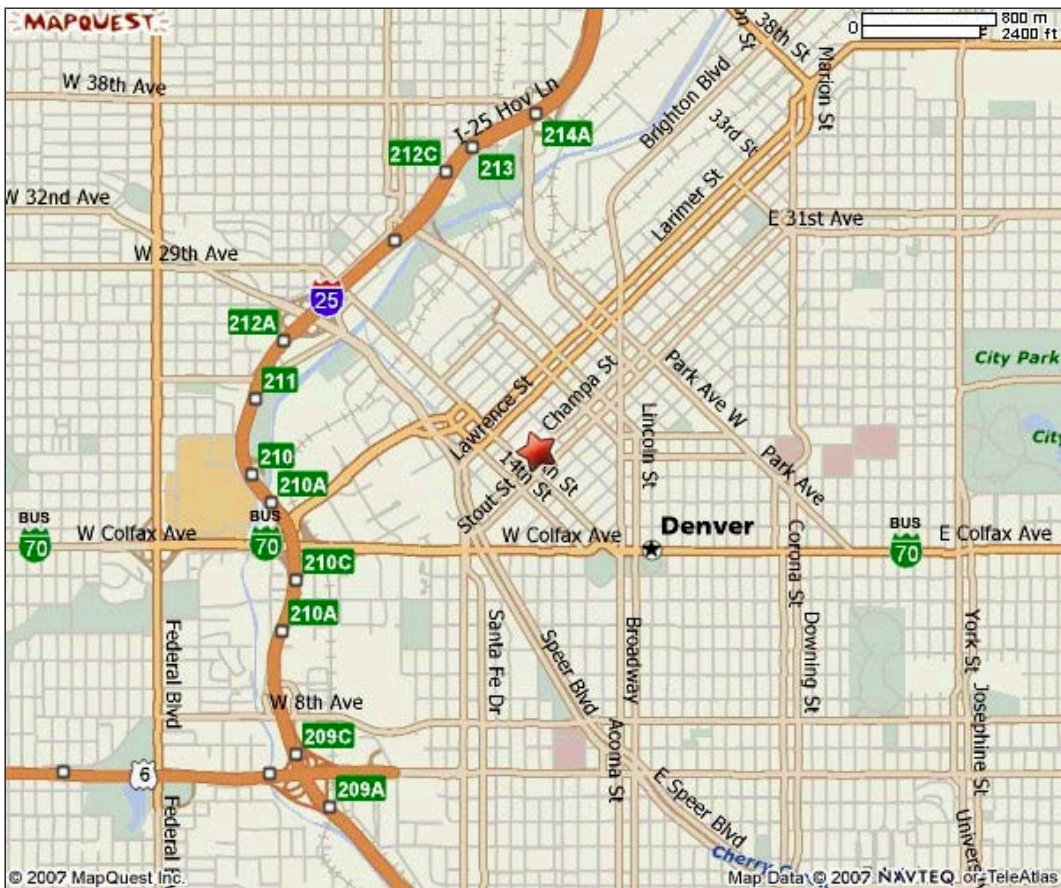
Take I-25 N
Take exit 210C to merge onto Auraria Pkwy/CO-33N
Continue to follow CO-33 N
Turn right at 14th Street
Turn left at Lawrence Street
Turn right at 17th Street
Turn right at Champa Street
End at 934 16th Street, Denver, CO

Parking: \$20 per day at Courtyard Marriott - Downtown Denver

REGIONAL MAP:



CITY MAP:



STREET MAP:



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Denver, CO | ACCOMMODATIONS near the Courtyard Marriott - Downtown Denver

Courtyard Marriott - Downtown Denver

(Workshop Location)

934 16th Street

Denver, Colorado 80202

(303) 571-1114

www.marriott.com/dencd

<p>Hotel Monaco Denver 1717 Champa Street Denver, CO</p> <p>www.monaco-denver.com</p>	(303) 296-1717	<p>Magnolia Hotel - Denver 818 17th Street Denver, CO</p> <p>www.magnoliahoteldenver.com</p>	(303) 607-9000
<p>Denver Marriott - City Center 1701 California Street Denver, CO</p> <p>www.marriott.com/dendt</p>	(303) 297-1300	<p>Westin Tabor Center 1672 Lawrence Street Denver, CO</p> <p>www.westin.com</p>	(303) 572-9100
<p>The Curtis Hotel 1405 Curtis Street Denver, CO</p> <p>www.thecurtis.com</p>	(303) 571-0300	<p>Crowne Plaza Downtown Denver 1450 Glenarm Place Denver, CO</p> <p>www.crowneplaza.com</p>	(303) 573-1450
<p>Brown Palace Hotel 321 17th Street Denver, CO</p> <p>www.brownpalace.com</p>	(303) 297-3111	<p>Oxford hotel 1600 17th Street Denver, CO</p> <p>www.theoxfordhotel.com</p>	(303) 628-5400

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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: _____ Mail Code: _____

Street Address (cont.): _____

City: _____ State: _____ Zip: _____

Phone: _____ Fax: _____

Email: _____ Title: _____

Course:

Introduction to Aquatic Toxicology \$ _____

Understanding Impacts of Organic Chemicals and Metals on Aquatic Ecosystems

Course ID: ETOX-410, July 10-11, 2008

Courtyard Marriott - Downtown Denver

934 16th Street, Denver, Colorado

Registration: \$495. \$395 reduced rates for Native American Tribes; nonprofits; government; students; and NEBC members.

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

Credit Card or PO #: _____ Exp: _____

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

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