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)
January 31 - February 1, 2008, 8:30 A.M. to 5 P.M.
Lacey Community Center
6729 Pacific Avenue SE
Lacey, WA 98503

**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. Course topics will be integrated and applied with a summary of federal risk assessment guidelines. Federal regulations, such as the Clean Water Act will be discussed with an emphasis on, and examples of, site specific criteria for metals using the water effects ratio (WER), hardness correction, and the biotic ligand model (BLM), which has been included in the 2007 EPA updates for Aquatic Life Copper Criteria. Finally, sediment quality guideline approaches for a range of pollutants, including equilibrium partitioning, ERL/ERM, TEL/PEL, and AET will also be presented with examples.

**Course Topics:**

| Classes of toxic chemicals (carcinogens, mutagens, teratogens, and others) | Detoxification, biotransformation, and biodegradation |
| Sources of toxic chemicals entering the aquatic environment | Assessment of toxicity – LC50, EC50, and dose-response curves |
| Exposure pathways for aquatic organisms and humans | Toxicity testing methods – acute and chronic, single and multiple species |
| Biological, physical, and chemical factors affecting toxicity | Development and limitations of water quality standards |
| Bioconcentration, biomagnification, and persistence | Overview of ecological risk assessment |
| Modes of toxic chemical action | Toxicity of metals overview |
| Types of toxic effects: biochemical, molecular, physiological, behavioral, population, community, and ecosystem | Toxicity of organic chemicals overview including persistent organic pollutants and endocrine disrupters |

**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
Lacey Community Center
Located in the Woodland Creek Community Park
6729 Pacific Ave SE
Lacey, Washington 98503
360.491.0857

Nearby Hotels:

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<thead>
<tr>
<th>Hotel Name</th>
<th>Address</th>
<th>Phone Number</th>
<th>Reservations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Inn &amp; Suites</td>
<td>120 College Street SE</td>
<td>(360) 493-1991</td>
<td>(reservations)</td>
</tr>
<tr>
<td>Lighthouse Bungalow</td>
<td>1215 E Bay Dr NE</td>
<td>(360) 754-0389</td>
<td>(reservations)</td>
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<td>Ameritel Inn - Olympia</td>
<td>4520 Martin Way E</td>
<td>(360) 459-8866</td>
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<td>Phoenix Inn Suites - Olympia</td>
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<td>Red Lion Hotel - Olympia</td>
<td>2300 Evergreen Park Dr SW</td>
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<td>Comfort Inn of Lacey</td>
<td>4700 Park Center Ave NE</td>
<td>(360) 456-6300</td>
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<td>Quality Inn</td>
<td>1211 Quince Street SE</td>
<td>(360) 943-4710</td>
<td>(reservations)</td>
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<tr>
<td>Super 8 Motel</td>
<td>112 College Street SE</td>
<td>(360) 459-8888</td>
<td>(reservations)</td>
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From I-5:
Take Exit 109 to Martin Way
Go east on Martin Way one mile to Carpenter Road
Turn right on Carpenter Road
Proceed one mile to Pacific Avenue
Turn left at Pacific Avenue
Proceed 0.3 mi to the Woodland Creek Community Park

MAPS:
REGISTRATION FORM

Name: ___________________________________  Today's Date: ____________________

Agency/Organization: _______________________________________________________

Street Address: ___________________________________  Mail Code: _______________

Street Address (cont.): ___________________________________________________

City: ___________________  State: ___________  Zip: ___________________________

Phone: ___________________  Fax: ___________________  

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Course:

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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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