

Spring 2-1-2000

# BIOL 550.01: Pollution Ecology

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# **POLLUTION ECOLOGY (BIO/EVST 550)**

**Spring 2k, Mon&Wed 11-12:30, Botany 208**

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**OFFICE HRS: Wed 1-3 pm & by appointment**

**550 Goals: Understand sources, fate, & effects of pollutants on organisms and ecosystems; understand methods of measuring & predicting pollutant fate & effects, assessing risks & ecosystem assimilation capacity, preventing pollution and restoring ecosystems damaged by pollution. Understand relevant laws and policy.**

<b>WEEK</b>	<b>TOPICS</b>
1	Course purpose, mechanics What is Pollution Ecology? Ecotoxicology?
2	Ecosystem processes (connections, change) & health; kinds of pollution
3	Env. fate of pollutants -- Measuring & modeling
4-5	Biological Effects (kinds)-- Measuring & modeling Bioassays, biomonitors, bioindicators (eg., Index of Biotic Integrity) lab vs field studies
6	Relevant laws and policy (Clean Water & Air Acts, Safe Drinking Water Act, toxics laws)
7	Risk/impact assessment/reduction
8	Setting standards, estimating ecosystem assimilation capacity, TMDLs
9	Pollution prevention (conservation, changing processes/products, regulating use)
10	Ecosystem restoration/remediation/rehabilitation/reclamation
11-13	<b>SOURCES/FATE/EFFECTS/MGT OF SPECIFIC POLLUTANTS</b> Class chooses from: physical, chemical, biological pollution; natural substances (metals, pyrite, sediments, organic matter, nutrients) xenobiotics (pesticides, petroleum products, etc)
14-15	<b>STUDENT PRESENTATIONS</b> <b>FINAL meeting—Tues, May 9, 8-10 am</b>

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**References: classics: Connell & Miller—1984. Chemistry & Ecotoxicology of Pollution;**  
**Rand & Petrocelli—1985. Aquatic Ecotoxicology; Laws--Aquatic Pollution.**  
**Recent: Suter, G. 1993. Ecological Risk Assessment**  
**Rombke, J. & J. Moltman. 1996. Applied Ecotoxicology Chs 1-3**  
**Additional readings on reserve; notebook of references on reserve**

**FIELD TRIP choices: Superfund sites, wetlands tour**  
**if interested, you may organize: sewage plant, landfill, pulp mill, BMP/restoration projects**

**GRADING: 2 papers--40% each, one presentation--10%, Participation (class & trips)--10%**

1<sup>st</sup> assignment: Read intro chapter(s) of as many of the main references above as possible.

Read Boudon & Ribeyre article and Suter article on reserve/e-reserve

View the Clark Fork [slide show](http://www.ssrl.soc.umt.edu/evst) at [www.ssrl.soc.umt.edu/evst](http://www.ssrl.soc.umt.edu/evst)

### **Applied Project/paper ideas for EVST 550 spring 2000**

Comment on Clark Fork Ecological Risk Assessment ERA

Prepare your own ERA & Human health RA on phosphate dishwasher detergents vs alternative products

Develop appropriate monitoring plan and/or special study for pulp mill discharge

Evaluate toxic wastes in fertilizer (especially in Eastern Montana)

Is nonylphenol an adequate surrogate for the varied hormone disrupting alkyl-phenols

Assist Cabinet Resource Group with evaluating ongoing (potential) impacts of Troy (Rock Cr) Mine

Assist with putting on the Clark Fork Basin Symposium (assist someone in developing a poster)

Comment on Plum Creek's Habitat Conservation Plan EIS (comments due Feb 15).

Assist Greg Oliver, Msl Health Dept with environmental measures web page

Write proposal for non point source studies on Clark Fork Basin – due March 10)

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### **Academic paper ideas – usually a lit review or meta analysis**

Environmental fate and/or effects/risk analysis of your favorite chemical on your favorite ecosystem

Can also evaluate impacts of other types of degradation/disturbances besides chemical pollution (like dewatering or other flow modification; channel modification, watershed modification).

Can try to determine the assimilation capacity of a particular system for a particular pollutant or degrading activity. How to use this to develop a TMDL for that system.

Evaluate the impacts of a land use activity and how best to reduce those impacts and how to determine that changes are within acceptable limits.

A review of biological pollution of certain ecosystem types; what species have become problems; what do they have in common; which were intentionally introduced & why? Control measures that work?

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### **Events of Interest:**

Jan 25 – Volunteer monitor training workshop – Bot 202. Riparian assessment and biomonitoring

Jan 28—CRG Meeting with Forest Service on Troy mine water quality impacts; Regional office

Feb 8— Msl Water Quality Advisory Council (every 2<sup>nd</sup> tues of month) 7-9 pm, Health Dept conf room

Feb 24—EVST alum Scott Bosse, Idaho Rivers Council, Lower Snake River Dams & salmon recovery  
7-9 pm North ULH

March 2 – Salmon Recovery plan hearing – Double Tree Inn, 6 pm

April 10— Science Fair – judges needed—no class. Instead attend:

April 14-15—Clark Fork Symposium—Give presentation

April 16— Clark Fork Superfund Field Trip

April 17-18—Geological Society meets in Missoula

April 22 – Earth Day

April 25-26—Watershed Festival

April 28-29—Montana Academy of Sciences in Missoula – give presentation