

Syllabus
Psychology of Environmental Issues

Course goals:

1. Learn about some of the ways in which environmental hazards influence psychological functioning.
2. Learn about how our own attitudes, beliefs, values, decision processes, and actions directly and indirectly create pollution or damage the sustainability of the natural environment.
3. Improve written and oral communication skills. This is a writing-intensive course.
4. Improve library and electronic research skills as a citizen-scholar; learn to distinguish among and critically evaluate different sources of information.
5. Improve your ability to weigh research evidence, understand and critique the aspects of research designs that influence the interpretation of the results, and identify ambiguity in the possible interpretations of results.
6. Understand ethnic, racial, and socio-economic differences in exposure to pollutants.

Required readings will be from the book *Children & Pollution*, and from journal articles posted in Learn@UW. You will also be required to both find and read other original research articles on the topics that we are covering. You will locate some of those articles yourself using library databases.

Grading

30% of the course grades will be based on completing the written and oral presentation assignments. I expect written work that is top quality. Work that does not meet these standards will need to be re-written (I will give you a slightly modified assignment for the re-write). I give extensive feedback on each assignment so that you can improve your writing skills. Most are graded 'credit or no credit'. Some written assignments will be point-graded, and will count proportionately in the 30% to be determined by the written assignments. Assignment #6 is a mid-term that will count 25% of the grade. The other 45% of the grade will be based on the term paper. The term paper will be on a topic chosen by the student, but must be relevant to the course and must be approved by me. There are several written assignments leading up to the term paper. These assignments count the same as the other written assignments, but your term paper will not be accepted unless these preliminary assignments are completed. An oral term paper presentation is required. The term paper presentations will allow the whole class to share the new knowledge created through the term paper assignment, and are a fun part of the course.

Class attendance and participation is required. Up to 10% may be deducted from your point total for unexcused absences.

Plagiarism will be dealt with under the UW rules. Here is the Writing Center statement on acknowledging sources: http://writing.wisc.edu/Handbook/Acknowledging_Sources.pdf

The syllabus lists 7 writing assignments and 4 term paper writing assignments. I may modify the 7 writing assignments as the course proceeds. All students are required to complete all term paper assignments, and Writing Assignments #1, #3, and #6 (#6 is the midterm and counts 25% of the grade). Each student will complete just one of Writing Assignments 2, 4 or 5.

Course Procedures

The course will be a seminar in which we discuss the readings. You will be responsible for brief oral presentations on original research articles, usually with a partner. Sometimes the articles will be in the course website, but sometimes you will be required to locate material yourself.

Central Theme and Issues

Scientists can disagree about the importance or strength of the impact of events (for example, a type of pollution, negative effects of extraction of a natural resource, etc.) on both humans and the natural environment. The organizing themes of this course will be: Why do scientists disagree about environmental impacts? What decision criteria and ethical issues are implicitly and explicitly involved in those scientific differences and in environmental regulations? We will emphasize the roles of human judgment and decision processes in both scientific research and environment regulation, as well as in avoiding environmental hazards to oneself, and avoiding negative impacts on wildlife and ecosystems.

Part A. Human environmental behavior toxicology

Readings in this section will be primarily from my book, *Children and Pollution: Why Scientists Disagree*. We will include some of the readings on wildlife listed in Part B as we go through these topics.

NOTE: specific writing assignments subject to slight modification as the course proceeds !!

1. Background. Read Prologue, *Children & Pollution*.

Writing assignment #1. Find a news item that covers a scientific finding about an environmental issue (newspaper, magazine, radio, tv, web newspaper, etc.). Write a brief synopsis of the news item. Are different scientific findings or scientific controversies considered? Is there any mention of ethical or decision issues? (1-2 pp.) (We will discuss these in class.)

2. *Children & Pollution*, Ch. 1., “Lead exposure and the roots of environmental controversy”

Writing assignment #2 (1-2 pp): Choose topic a, b or c. a) Ernhart and Needleman disagreed partly because they took different stances on whether it was legitimate to interpret results that did not quite meet the $p < .05$ cutoff. Write a commentary on the implications of interpreting research findings that do not quite meet the .05 standard. Are there some research topics for which a strict p-level should be used (say, .01) and others for which a lax standard (say, .10) should be used? (Make sure you include the issue of statistical power). b) Kehoe and Patterson differed in their points of view on what level of lead exposure should be considered to be “normal”. Write a commentary on how assumptions about what is “normal” impact the research process. You may use any area of psychology with which you are familiar for this assignment, or an environmental issue. c) Choose either the “chicken or egg” issue for restlessness and inattention (does restlessness/inattention in a child cause the child to have higher lead exposure, or vice versa), or the issue of whether race/ethnicity and income should be considered to be covariates or causes of lead exposure. Write a commentary in which you logically present the issues in distinguishing cause and effect.

3. *Children & Pollution*, Ch. 2: “Mercury, not just a fish story”.

Oral Presentation Assignment. Find an original research article on how mercury exposure

affects some aspect of psychological functioning or behavior. The article can be about wildlife, lab animals or humans, children or adults, something I covered in my chapter, or something I didn't cover. Working with a partner you will give a presentation of the article in class. The presentation should give us a good summary of the article, and a commentary on it. (We will have 2 or 3 presentations.)

Writing assignment #3. Risk assessment. Choose one. a) Choose one type of judgment call that is part of the risk assessment process. Write a 1-2 page commentary in which you argue logically about the importance of that one type of judgment call. Illustrate your points with examples from the readings, class presentations, or another environmental risk that you find information about on your own. What ethical issues are implicitly involved, and how might people differ in their viewpoints on the ethical issues? b) Analyze the risk assessment presented in the article by Gochfeld & Burger. Describe two types of judgment calls that are embedded in their risk analysis.

4. *Children & Pollution*, Ch.3, "PCBs, another global pollutant"

Oral Presentation Assignment. Find an original research article on how PCB exposure affects some aspect of psychological functioning or behavior. The article can be animal research or human research, wildlife, children or adults, something I covered in my chapter, or something I didn't cover. Working with a partner you will give a presentation of the article in class. The presentation should give us a good summary of the article, and a commentary on it. (We will have 2 or 3 presentations.)

Writing assignment #4. Choose topic a, b or c. a) The Michigan study has been the center of policy decisions and controversy. Find a recent article on PCB exposure in children and compare the results to those of the Michigan study. b) Choose a PCB controversy (Fox River, Hudson River, POP treaty, fish consumption warnings, or find another). Present a synopsis of both sides of the cleanup controversy. Find the best quality of information you can – official EPA or DNR website, environmental impact or environmental assessment reports, corporation websites, environmental organization websites, community declarations on the issue, etc. c) Write a summary and critique of a research paper on the behavioral effects of PCBs or organochlorines on wildlife. (2-3 pp).

5. *Children & Pollution*, Ch. 4, "Neurotoxins influence neurodevelopment"

Oral Presentation Assignment. Find an original research article on either how pesticide exposure affects some aspect of psychological functioning and behavior, or a decision making issue in pesticide use. The article can be lab animal research, human research, wildlife, children or adults, something I covered in my chapter, or something I didn't cover. Working with a partner you will give a presentation of the article in class. The presentation should give us a good summary of the article, and a commentary on it. (We will have 3 presentations). (You will need to search a database other than PsychInfo in order to do this assignment.)

Writing assignment #5. Write a 2-3 pp. paper one of the following: a) Outline the design of a long term study of the effects of exposure to pesticides on children's behavioral development. Justify your choices of sample and outcome measures based on what is already known about pesticide exposure or the effects of smoking on children's development; b) Write a summary and commentary of an empirical research study on the effects of pesticides on wildlife; c) Write a summary and commentary of a behavioral neuroscience article on how pesticide exposure affects behavioral development in lab animals; d) Choose a pesticide controversy. Present a synopsis of both sides of the controversy. Find the best quality information you can – official EPA or DNR website,

environmental impact reports filed by agencies conducting spraying, journal articles on the disease, pesticide resistance of host insects, public health agency declarations, etc.; e) read Rachel Carson's *Silent Spring* and write a book review as if it were 1962 and the book were just being published.

6. *Children & Pollution*, Ch. 7. "The Best Science, Values, and the Precautionary Principle to Protect Children"

Writing Assignment #6. Write a 4-5 pp. essay. "How much pollution is too much" is the central question of environmental policy. Use a research example of human impacts on wildlife and outline the sources of scientific uncertainty, judgment calls and ethical issues that are involved in deciding whether to regulate the pollutant more strictly. (This assignment will be **point-graded**, and we will likely do a **peer feedback** exercise with it.)

7. *Children & Pollution*, Ch. 5, "Noise: A barrier to children's learning"

Oral Presentation Assignment. Choose one of the following options and, working with a partner, prepare a 10 minute oral presentation. Make sure your presentation shows cognizance of the major noise issues raised in Ch. 5. a) Interview a person who is hard of hearing about issues related to hearing speech in daily life situations, or other issues of daily life; b) Interview a public official about a noise issue on campus, in Madison, or your home town (e.g., in Madison you might contact someone at the airport, or someone in the state highway department); c) Interview an elementary school teacher about noise from inside and outside the school. Visit the school. d) Identify a campus or downtown Madison noise issue and propose potential solutions; e) Visit a campus natural area (Arboretum, Lakeshore path, Picnic Point, Frautschi Point) at two different times of the week (perhaps a weekday during the afternoon rush hour and a Sunday morning). What differences in noise do you notice, and are there noise issues that need attention? f) Find a research article on the effects of noise on wildlife and present and summary and critique of the paper, as well as an assessment of whether noise is a problem for whatever species of wildlife was studied in the article.

8. *Children & Pollution*, Ch. 6. "It isn't fair: Environmental pollution disasters and community relocations"

Writing Assignment #7. Choose one of the following options and write a 2-3 pp. essay. a) Consider ethical claims based on procedural justice. To what extent could (or did) the residents at Love Canal have based their arguments on need for procedural justice? Would the residents' claims about procedural justice have conflicted with the NY Dept of Health's interpretation of procedural justice? b) A central issue in pollution disasters is that there is psychological harm even if the pollutants themselves do not directly cause psychological effects. Outline a plan for decreasing the psychological impacts of pollution disasters. You may draw on your knowledge of all areas of psychology. You can choose a specific pollution disaster or you may describe your plan in more general terms. c) Take a position on the following issue and argue for or against it. Support your position with research findings or psychological theory. "Communities near nuclear installations in the U.S. should practice emergency procedures including evacuations." d) Propose your own topic related to pollution disasters, and ask me to approve it prior to writing it (other possibilities are reading about atomic veterans, biographies of key figures in controversies over radio-nuclides such as Karl Z. Morgan or Alice Stewart, effects on wildlife).

Part B. Human decision making processes and human impacts on nature

We will choose several of these topics as a class, as we near the end of Part I. Articles listed below are examples, and we may read other papers that are similar. Also, articles listed below can also be used for some of the writing assignments above, where they are relevant. Articles in this section can also be used as a starting point in formulating a term paper topic.

1. Risk perception

Freudenburg, W. R. (1988). Perceived risk, real risk: Social science and the art of probabilistic risk assessment. *Science*, 242, 44-49.

Flynn, J., Slovic, P. & Mertz, C. K. (1994). Gender, race, and perception of environmental health risks. *Risk Analysis*, 14, 1101-1108.

2. Valuing the costs of pollution vs. the benefits of clean-up or environmental preservation

Brandt. (1993, June/July). How much is a gray wolf worth? *National Wildlife*, 4-12.

3. Effects of human activities and pollution on wildlife

a. Lead exposure

Fisher, I. J. et al. (2006). A review of lead poisoning from ammunition sources in terrestrial birds. *Biological Conservation*, 131, 421-432.

Roodbergen, M. et al. (2008). Transfer of heavy metals in the food chain earthworm Black-tailed godwit (*Limosa limosa*): Comparison of a polluted and a reference site in The Netherlands. *Science of the Total Environment*, 406, 407-412.

b. Mercury

Nocera, J. J., Taylor, P. D. (1998). In situ behavioral response of common loons associated with elevated mercury (Hg) exposure. *Conservation Ecology*, 2(2).

<http://www.ecologyandsociety.org/vol2/iss2/art10/>

Hinck, J. E. et al. (2006). Environmental contaminants in fish and their associated risk to piscivorous wildlife in the Yukon River Basin, Alaska. *Archives of Environmental Contamination and Toxicology*, 51, 661-672.

Saint-Amour, D. (2006). Alterations in visual evoked potentials in preschool Inuit children exposed to methylmercury and polychlorinated biphenyls from a marine diet. *NeuroToxicology*, 27, 567-578.

c. PCBs

Bustnes, J. O. et al. (2001). Patterns of incubation and nest-site attentiveness in relation to organochlorine (PCB) contamination in glaucous gulls. *The Journal of Applied Ecology*, 38(4), 791-801.

d. Insecticides

Vyas, N. B. (1999). Factors influencing estimation of pesticide-related wildlife mortality. *Toxicology and Industrial Health*, 15, 186-191.

Lesica, P. & Atthowe, H. E. (2000). Should we use pesticides to conserve rare plants? *Conservation Biology*, 14(5), 1549-1550.

Hart, J. D. et al. (2006). The relationship between yellowhammer breeding performance, arthropod abundance and insecticide applications on arable farmland. *Journal of Applied Ecology*, 43, 81-91.

El Hassani, A. K. et al. (2005). Effects of sublethal doses of fipronil on the behavior of the honeybee (*Apis mellifera*). *Pharmacology, Biochemistry and Behavior*, 82, 30-39.

Brunet, R. et al. (1997). Comparative study of the signs of intoxication and changes in activity level of red-winged blackbirds (*Agelaius phoeniceus*) exposed to dimethoate. *Agriculture, Ecosystems and Environment*, 64, 201-209.

e. Noise

Goudie, R. I. & Jones, I. L. (2004). Dose-response relationships of harlequin duck behaviour to noise from low-level military jet over-flights in central Labrador. *Environmental Conservation*, 31(4), 289-298.

Bee, M. A. & Swanson, E.M. (2007). Auditory masking of anuran advertisement calls by road traffic noise. *Animal Behaviour*, 74, 1765-1776.

Schlundt, C. E., Finneran, J. J., Carder, D. A. & Ridgway, S. H. (2000). Temporary shift in masked hearing thresholds of bottlenose dolphins, *Tursiops truncatus*, and white whales, *Delphinapterus leucas*, after exposure to intense noises. *Journal of the Acoustical Society of America*, 107(6), 3496-3508.

Weilgart, L.S. (2007). The impacts of anthropogenic ocean noise on cetaceans and implications for management. *Canadian Journal of Zoology*, 85, 1091-1116.

f. Radiation and DU

Zach, R. & Mayoh, K. R. (1982). Breeding biology of tree swallows and house wrens in a gradient of gamma radiation. *Ecology*, 63(6), 1720-1728.

Briner, W. & Murry, J. (2005). Effects of short-term and long-term depleted uranium exposure on open-field behavior and brain lipid oxidation in rats. *Neurotoxicology and Teratology*, 27, 135-144.

Oleksyk, T.K. et al. (2002). Frequency distributions of 137-Cs in fish and mammal populations. *Journal of Environmental Radioactivity*, 61, 55-74.

g. Impacts of tourism and recreation

de la Torre, S. et al. (2000). Effects of human activities on wild pygmy marmosets in Ecuadorian Amazonia. *Biological Conservation*, 94, 153-163.

Creel, S. et al. (2002). Snowmobile activity and glucocorticoid stress responses in wolves and elk. *Conservation Biology*, 16(3), 809-814.

Burger, J. & Gochfeld, M. (1998). Effects of ecotourists on bird behaviour at Laxahatchee National Wildlife Refuge, Florida. *Environmental Conservation*, 25(1), 13-21.

Burger, J. et al. (2004). The effect of human activities on migrant shorebirds: Successful adaptive management. *Environmental Conservation*, 31(4), 283-288.

h. Boating

Mikola, J. et al. (1997). The effects of disturbance caused by boating on survival and behaviour of velvet scoter *Melanitta fusca* ducklings. *Biological Conservation*, 67, 119-124.

Gerstein, E. R. (2002). Manatees, bioacoustics and boats. *American Scientist*, 90(2), 154-163.

Williams, R., Trites, A. W. & Bain, D. E. (2002). Behavioural responses of killer whales (*Orcinus orca*) to whale-watching boats: opportunistic observations and experimental approaches. *Journal of Zoology*, London, 256, 255-270.

Moore, M. J. C. & Seigel, R. A. (2006). No place to nest or bask: Effects of human disturbance on the nesting and basking habits of yellow-blotched map turtles (*Brachemys flavimaculata*). *Biological Conservation*, 130, 386-393.

i. Roads and power lines and infrastructure

Rabin, L. A., Coss, R. G. & Owings, D. H. (2006). The effects of wind turbines on antipredator behavior in California ground squirrels (*Spermophilus beecheyi*). *Biological Conservation*, 131, 410-420. (this article also deals with noise)

Philcox, C. K. et al. (1999). Patterns of Otter (*Lutra lutra*) road mortality in Britain. *The Journal of Applied Ecology*, 36(5), 748-762.

Clevenger, A. P. & Waltho, N. (2000). Factors influencing the effectiveness of wildlife underpasses in Banff National Park, Alberta, Canada. *Conservation Biology*, 14(1), 47-56.

Bevanger, K. & Broseth, H. (2001). Bird collisions with power lines – an experiment with ptarmigan (*Lagopus* spp.). *Biological Conservation*, 99, 341-346.

j. War and Wildlife

Dudley, J. P., Ginsberg, J. R., Plumptre, A. J., Hart, J. A. & Campos, L. C. (2002). Effects of war and civil strife on wildlife and wildlife habitats. *Conservation Biology*, 16(2), 319-329.

MMPA Bulletin (2000). Update on the mass stranding in the Bahamas. Issue 19/20, p. 3. (available online at http://www.nmfs.noaa.gov/prot_res/PR2/MMPA_Bulletin/mmpabulletin.html).

h. Light pollution

Chepesluk, R. (2009). Missing the dark: Health effects of light pollution. *Environmental Health Perspectives*, 117, A20-A27.

Horvath, G. et al. (2009). Polarized light pollution: A new kind of photopollution. *Frontiers in Ecology and the Environment*, 7, pp.

Term Paper Assignments

These assignments will be interwoven with the other assignments. My goal is make the term paper project an integral part of the course rather than a last minute panic job. The sequence of assignments is designed to help you develop your project systematically over the course of the semester. It is never too early to begin thinking of a term paper topic. One way to get ideas for topics is to browse the readings in the course website, browse abstracts of articles, or go to the library (electronically or in person) and browse recent issues of journals.

Term Paper Assignment #1. Submit your topic. Write at least a sentence or two about a topic on which you would like to write your paper. Some students have several ideas and are undecided about which one to pursue. It is fine to give a couple of different ideas. I will give you feedback that might help you find some direction.

Term Paper Assignment #2. Submit a paragraph on your term paper topic, and a bibliography of at least a few references. The paragraph should include a thesis statement describing the main theme of your paper. Of course, as you develop the paper the thesis will evolve. Also, write a reflective paragraph that explains to me what barriers you have encountered in working on your topic, and how you feel about your progress. Where are you stuck or confused?

Term Paper Assignment #3. Submit a 2-3 page section of your term paper and a bibliography with more than you had for Assignment #2. The section can be: a) the introduction, describing the thesis and laying out the background for the rest of your paper, b) a summary and critique of an empirical research paper that will be incorporated in your term paper, c) a one page abstract or summary of your entire paper, plus an outline of the paper and an annotated bibliography (a bibliography with a bout two sentences summarizing each item in the list). As #2, write a reflective paragraph that tells me where you are encountering problems. At this point, I hope you are dealing with different problems such as how to discuss conflicting research findings, or how to best organize your paper to establish a logical progression of the ideas.

Term Paper Assignment #4. Draft and peer feedback. You will turn in a draft of your entire paper.

Each student will provide feedback to another student on the term paper draft. I will give you further information on the peer feedback exercise later. My classes in the past have found it very helpful.

Final Paper Due: The final term paper is due on the scheduled date of the final exam in the Timetable. Term paper presentations will occur during the last 2 1/2 weeks of classes.

Notice from the Department of Psychology:

Occasionally, a student may have a complaint about a TA or course instructor. If that happens, you should feel free to discuss the matter directly with the TA or instructor. If the complaint is about the TA and you do not feel comfortable discussing it with him or her, you should discuss it with the course instructor. If you do not want to approach the instructor, make an appointment to speak to the Department Chair, Professor Patricia Devine, chair@psych.wisc.edu.

If your complaint has to do with sexual harassment, you may also take your complaint to Vicky Lenzlinger, Undergraduate Program Coordinator, phone 262-0512 or email her at vlenzlinger@psych.wisc.edu. Her office is located on the second floor of the Psychology building, room 222.

If you believe the TA or course instructor has discriminated against you because of your religion, race, gender, sexual orientation, or ethnic background, you also should take your complaint to the Office of Equity and Diversity, room 179-A Bascom Hall, <http://www.oed.wisc.edu>

