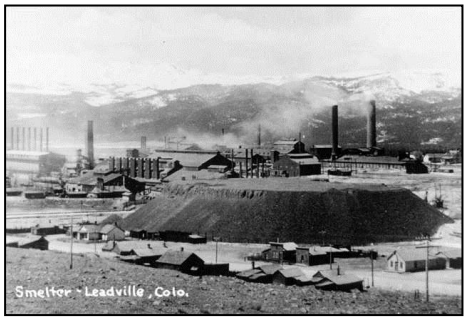
Syllabus
Disease and the Environment
Geography 532



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*Text**: GIS and Public Health**, by Ellen Cromley and Sara McLafferty*

Course Objectives

This course is designed to give the student insight into the use of a geographical approach to assessing health and environmental risks. The spatial expression of environmental risk is an important tool for studying community health, but effective utilization of this tool is often hampered by its observational nature. In this course we will utilize analytical geographical methods to examine real-world public health issues. Upon completion of this course students will:

1. Use advanced geographical analysis methods to examine health data.
2. Understand the interactions among the environment, public health, and public policy.
3. Become familiar with the problems of spatial techniques and methods use to overcome these problems.
4. Perform scientifically rigorous analysis.

Course Outline

		Pages	Exercises
Week 1	Introduction	1-37	
Week 2	Rates, Modifiable Units, Spatial Data	38-66	1, 2
Week 3	Public health data, Direct age adjustment	67-97	3, 4
Week 4	Data organization (GIS lab)	A, B, C*	
Week 5	Mapping health data, Indirect age adjustment	98-129	5, 6
Week 6	Environmental hazards, Contingency analysis	158-187	7
Week 7	Chi^2 mapping	D, E, F*	8
Week 8	Midterm		
Week 9	Normal probabilities	210-232	9, 10
Week 10	Diffusion, Poisson probabilities	188-209	12
Week 11	Cluster Analysis	130-157	13
Week 12	Poisson mapping	G, H, I*	14
Week 13	Seasonality		15, 16
Week 14	Geographic centers		17
Week 15	Bench model: Disease analysis		
Week 16	Final		

* Letters refer to specific online readings, see attachment.

Grading

Grading for this course will be weighted heavily on the research project and tests. In class and out of class exercises, and readings will also be factors in determining your grade. Notice that there are 30 points for class participation. This grade is composed of attendance, preparedness, and discussion participation.

	Points
Midterm	100
Final	100
Research Paper	100
Exercises	170
Participation	30
TOTAL	500

If you MUST miss class please notify me ahead of time. Some in-class work cannot be made up.

Research Project

The research project will allow you to develop a more complete understanding of the spatial distribution, spread, or etiology of a specific disease. The project will include a report that should be a minimum of 5 and a maximum of 8 pages text (excluding maps, etc…), include any pertinent maps or figures, and all research materials must be cited. The report should follow this general format:

Introduction (≈ .5-1 pg)
- General description of the disease / illness.
- Clearly stated research problem / question.

Past and Current Research ((≈ 1-2 pgs)
- A short review of past or current work concerning this disease.

Results (≈ 3-5 pgs)
- What has the scientific community determined regarding this disease?
- How does geography influence this disease?

Conclusions (≈ .5-1 pg)

References Cited (as needed)

These reports will be graded on content, style, grammar, writing ability, and thoroughness of research. Please have someone proof read you report before handing it in to me. This will save you many points. This is an graduate level course and you will be expected to write well. If you have any questions regarding the project please see me ahead of time. Coming to me at the last minute with problems is not a good idea. Please refer to the Research Paper Requirements document for specific information concerning how to develop your report, although some of the information is not pertinent, much of this document is worth reading. Please note that you must limit the number of Internet citations in your references. Citing only Internet sources will reduce your grade by 5%. Since this a geography course, please include maps of the disease you are researching. Papers are due on the Wednesday of week 15.

Exercises

In class exercises are due at the end of class unless otherwise noted. Late exercises receive no grade unless you have seen me before hand and I have agreed to give you an extension (a rare event... $p<0.001$). Please make sure that they are legible and that all work is shown. Working together on these exercises is fine, but you WILL be responsible for the material on the tests.

Tests

Tests are of the combination type, meaning that there will be a variety of question types. Expect multiple choice, fill in the blanks, definitions, calculations, essays, etc... The test will be written to be completed in 2 hrs but you will have the entire class time to work on them. Most of the time will be devoted to the calculations (working on them and checking them for errors) and the essay questions. Do not panic. I like to give lots of time for tests, but it doesn’t mean that you will need it.

Readings

Please have all of the reading done BEFORE class. We will be discussing the readings during class and your input is expected. Certain classes depend wholly on your have completed the readings, so be aware!

Week 4:

[A] Snacken, Rene et al. 1999. The Next Influenza Pandemic: Lessons from Hong Kong, 1997. *Emerging Infectious Diseases*. Volume 5, Number 2.
http://www.cdc.gov/ncidod/eid/vol5no2/snacken.htm

[B] Satcher, David. 1995. Emerging Infections: Getting Ahead of the Curve. *Emerging Infectious Diseases*. Volume 1, Number 1.
http://www.cdc.gov/ncidod/eid/vol1no1/satcher.htm

[C] Farmer, Paul. 1996. Social Inequities and Emerging Infectious Diseases. *Emerging Infectious Diseases*. Volume 2, Number 4.
http://www.cdc.gov/ncidod/eid/vol2no4/farmer.htm

Week 7:

[D] Wilson, Mary E. 1995. *Travel and the Emergence of Infectious Diseases*. Emerging Infectious Diseases. Volume 1, Number 2.
http://www.cdc.gov/ncidod/eid/vol1no2/wilson.htm

[E] Martens, Pim and Lisbeth Hall. 2000. *Malaria on the Move: Human Population Movement and Malaria Transmission*. Emerging Infectious Diseases. Volume 6, Number 2.
http://www.cdc.gov/ncidod/eid/vol6no2/martens.htm

[F] Morse, Stephen. 1995. Factors in the Emergence of Infectious Diseases. *Emerging Infectious Diseases*. Volume 1, Number 1.
http://www.cdc.gov/ncidod/eid/vol1no1/morse.htm

Week 12:

[G] Murphy, Frederick. 1998. Emerging Zoonoses. *Emerging Infectious Diseases*. Volume 4, Number 3.
http://www.cdc.gov/ncidod/eid/vol4no3/murphy.htm

[H] Sanchez, Anthony et al. 1995. Reemergence of Ebola Virus in Africa. *Emerging Infectious Diseases*. Volume 1, Number 3.
http://www.cdc.gov/ncidod/eid/vol1no3/sanchez.htm

[I] Navin, T. R., S. McNabb, and J. Crawford. 2002. The continued threat of tuberculosis. *Emerging Infectious Diseases*. Volume 8, Number 11.
http://www.cdc.gov/ncidod/eid/vol8no11/02-0468.htm