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EVST 540.01: Environmental Field Study - Watershed CPR (Conservation, Preservation, Restoration)

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EVST 540 Watershed CPR (Conservation, Preservation, Restoration) Fall 2008

Vicki Watson, 101 Bot, 243-5153, Vicki.watson@umontana.edu office hrs: 10-noon Wed

GOALS: To increase student understanding of watershed science, policy, actions & organizing with a view to increasing citizen participation in the stewardship of watersheds & training watershed professionals.

Sept. Introduction – 7 C's of Watershed CPR, Watershed CPR plans; grading/projects
1st day Assignment: see Clark Fork Slide show (www.umn.edu/clarkforkslideshow)

Watershed Science – Connections, Capacity, Changes, Condition

Reading: *Postel & Richter 03. Rivers for Life. Island Press. Ch 1 & 2.*

Refs: From most basic: **Streamkeepers Guide** Ch 1 & 2 (assessments ch 3-7)

To increasingly advanced – Entering the Watershed 93 (esp. exec sum & ch 3)

Naiman 92 Watershed Management (esp chs. 1, 3, 6)

Rosgen 96 Applied Stream Morphology (esp. ch 3 & 4) & Field Guide

Williams 97 Watershed Restoration (esp: chs 1, 5-8, 25)

Naiman 99 River Ecology & Mgt (esp: chs 1, 2-4, 5, (11,12,16), 18,24,26

Online: **Stream Restoration Manual** (chs 1-3) www.nrcs.usda.gov/technical/stream_restoration

EPA's online watershed courses at www.epa.gov/watertrain

Clark Fork papers: www.umn.edu/clarkforksymposium

Watershed Clinic web site: www.umn.edu/watershedclinic

National River Restoration Science Synthesis (NRRSS) <http://nrrss.nbio.gov>

"Synthesizing U.S. River Restoration Efforts," E.S. Bernhardt, et al, Science, 29 April 2005:

www.sciencemag.org/cgi/content/full/308/5722/636

Oct – **Watershed CPR – Actions** – (Field trips also serve to illustrate this – see field trip list)

References – see many web sites on web list (emailed)

Stream Restoration Manual (planning & design 4-8, implement 9, actions A)

On e-reserve: Aikens article (Blackfoot case study) from Watershed Restoration

Frissell's articles in Watershed Restoration & Naiman 99 (also ch 26)

In Watson lab: file of pamphlets & booklets on BMP's, restoration & management

Nov 1st half – **Watershed Law/Policy**--US & MT water laws/regs, water rights, nondegradation, TMDL law, definition of impairment & sufficient credible evidence of use support

References: US law: *Postel & Richter, Ch 3.* Ch 22 of Naiman 99 (River Law)

River Network's Understanding the Clean Water Act – www.cleanwateract.org

ELI, 2008. State Wetland Protection: Status, Trends & Model Approaches

www.elistore.org/reports_detail.asp?ID=11279

Brown, et al. 1993. Laws controlling nonpoint sources. Water Res Bull. 29(1):1-13. e-reserve

MT Law: Mt DEQ web site: www.deq.state.mt.us/wqinfo see Laws & Rules

Guide to Stream Permits <http://dnrc.mt.gov/permits/streampermitting/default.asp>

More guides -- Guide to MT WQ Regulations, MT Water Rights, Index of env permits,

SEE <http://leg.mt.gov/css/Publications/Environmental/default.asp>

Nov, 2nd half – **Watershed Organizing/Funding – Communities, Choices, Commitment**

References: Chs. 21 & 25 of Naiman 99; Consensus Manual of MT Consensus Council;

Getting in Step—a Guide to Effective Outreach in your Watershed; Funding calendar

Dec – **Student Presentations** Final meeting – Dec 10 (Wed) 10 - noon

Guest Speakers/field trip leaders include: watershed coordinators, land trust managers,

Planners, fish biologists, mining reclamation engineers, restoration scientists

Field trips: sign up lists in class; listed on www.umn.edu/conservationcalendar

References – Above references are at library, online &/or available from me. Citations on ref list (emailed)

Many educational pamphlets/booklets are free or cheap (see examples in 102 Botany).

Grading –1 or 2 papers [proposal(s) 10 pts, outline(s)/biblio(s) 40pts, paper(s) 100 pts, presentation(s) 50 pts]

attend meeting of a conservation district, watershed group, or water quality district & summarize for class: 50 pts

participation in class and go on at least 2 field trips: 100 pts. Total possible points = 350 pts

1-2 papers & presentation worth 200 pts (10 for proposal, 40 for progress report, 100 for paper, 50 for presentation)
100 pts for **participation in class/field trips** ; 50 pts for **report on relevant public meeting**. 350 total.

1) An academic paper (sort of a mini-**thesis**) that attempts to be an original creative work. It may involve carrying out an original study designed by you that collects data to answer a question or test a hypothesis. It may instead involve analyzing data collected by others, once again to answer a question or test a hypothesis. These data may come from government data files or appear in the open literature. Often you will be pulling together data from several sources and using it to answer a new question. The paper could also be a review paper on some topic, but it is often a challenge to be really creative and original with this approach.

Your goal is to advance our understanding of a subject (try to teach me & other academics something).

The paper should be publishable. You should identify a target publication and write the paper in its style.

It is wise to identify a model paper that accomplishes a similar goal to yours and ask if a paper with a similar goal/format/sophistication, etc is appropriate. Make use of refereed literature as well as other sources.

2) A more applied paper aimed at an off campus target audience (sort of a mini **professional paper**). You will act as a consultant to some off campus target audience. Identify a need and fill it. You might: investigate a subject and develop a position paper or action plan for them (based on scientific info and group's values); critique an EIS or other government decision; conduct a survey or other study that gathers/analyzes data; develop a curriculum or exercise for a teacher. Often this paper will address an issue that may be of local interest only; or address very site-specific questions (ie analyzing local data to address how a site should be managed, restored, etc). The level of sophistication depends on the target audience (but the science must be scientifically defensible).

The two papers can be on the same or different subjects. Either can be produced first. Often the timing needs of the applied paper may dictate this (there may be a deadline for comments, for example). THE TWO PAPERS MAY BE COMBINED INTO A SINGLE PAPER IF IT CAN SATISFY THE GOALS OF BOTH.

Length of paper(s): About 20 pages total (+/- 5) of original, well written, tightly crafted, no-wasted-words prose. These pages may be allocated between the two papers as you see fit. (Two 10 pp papers or one 15 pp and one 5 pp). Don't worry about the exact number of pages. It should be as long as it needs to be to address the question, explore the relevant literature, & treat the subject at the agreed upon level of sophistication. Don't put in unnecessary words or explanation to fill up space and don't cut it shorter than you feel necessary to fit into some length. The page guidance given above is to help you establish the scope of the paper. And also to remind you that not much that is longer than 10-20 pages ever gets read or published. If you wish to emphasize one paper over the other, you may negotiate for reapportioning points.

Suggested Milestones (negotiable). Can email me all assignments but the paper—that I need in hard copy & e-copy. Note: I will need at least a week to provide feedback after receiving something in writing.

Week of course: if writing 2 papers, observe these milestones:

3rd —Proposal for first paper 6th — Progress Report 8th —First paper due

10th —Proposal for 2nd paper 12th — Progress Report 14th —2nd paper due

1 paper: 3rd —Proposal; 8th —progress report; 12th —~~draft paper~~; 14th —~~final~~ paper

14-15th —Presentation on one of the two papers (you can negotiate for an earlier time)

Proposal: Explain need for the project/paper; explain questions/hypotheses to be addressed.

Who is the target audience or target publication?

How will you address this question/hypothesis? What study design & methods?

What do you plan to produce and how can it be used?

What relevant resources have you located so far? What problems do you anticipate?

What is your timeline for milestones? (be specific to your project—don't give me my timelines)

Optional – but good practice: Discuss your qualifications for doing this work. Give a budget.

Progress Report: Explain any changes from original proposal; **provide detailed outline of paper.**

And a bibliography of the sources collected to date (use the CBE citation style; guide emailed on request).

Paper: Single space (double space between paragraphs). Double-sided preferred. Provide 2 copies: one to mark up & return; one for me to keep. Also an e-copy. **DO NOT EMBED** tables, figures, in text. Put them all at the end. If they are large, put them in a separate file. Keep formatting simple and easy to edit. NUMBER PAGES. If you write a single paper, a double spaced draft is due at least 2 weeks before final is submitted. Revise based on my comments.

EVENTS schedule for EVST 540/360/101 classes Fall 2008

Unless a different place is specified, EVST field trips leave from the parking lot north of UM's UC (by the tennis courts). Students in EVST 101, 360 & 540 may register for a space in a UM van on a sign up list at Rankin Hall room M-2. Other UM students can ride in the UM van if there is space. Non-students need to provide their own transportation. Community group or government agency or other department field trips that can count as field trips (or meetings) are shown in () – you will need to arrange your own transportation with them. If no UM vehicle is going, & 2 or more students share a ride, the UM Watershed Health Clinic will pay gas costs. For more info (time, location, contacts) on field trips, see -- www.umt.edu/conservationcalendar

(Aug 26, T – water/weed plantings along creeks near Ovando. contact Ryen Aasheim at ryen@montanatu.org) all day
(Aug 26, 7pm, Clearwater Resource Council meets in Seeley Lake)
(Aug 27, W, 3pm, Streamside Technical Advisory Committee meets at Health Dept)

Sept 3, W, – **sampling on the Clark Fork** -- bike to sites. Led by VW (meet at 102 Bot at 2 pm)
Sept 5-7, Fri-Sun, – **sampling on Clark Fork continues.** arrange to ride with VW on any of these days.
(Sept 6 (Sat) – annual Bitterroot River cleanup (from Sula to Missoula.)
(Sept. 7-11 -- 2008 [National Summit of Mining Communities, Butte.](http://www.miningsummit.com/index.htm)) <http://www.miningsummit.com/index.htm>
Sept 15, M, 2-5pm – **Stream assessments in Montana 360/540** (local creek) -- demo by 2nd year grad students
Sept 15, M, 7pm – Keynote of CF Coalition's 'Revisiting Water Use in the Clark Fork basin', UC – conference is Sept 15-17

(Sept 19-20 Missoula Household Haz Waste Collection Days)

Sept 20, Sat, **Blackfoot Restoration Tour** – meet at 8am at north end of Van Buren Br. (East Gate parking lot). return about 6pm.
Led by Blackfoot Challenge representatives and ASARCO's chief mining engineer at Mike Horse Mine

(Sept 22-24 – Public Land Law Conference)
(Sept 23- Milltown Superfund Redevelopment Working Group monthly meeting. 6:30-9 p.m. Lutheran Church in Bonner.)
(Sept 23-24 – Richard Hayes Phillips ELS lecture and workshop)
Sept 24, W, 2-5pm – **Lake assessments in MT 360/540** (McCormick Park pond) – demo by 2nd year students
(Sept 24 (Wed) MT DEQ water monitoring work group meets, Helena)

Sept 24-25 – Mansfield Center conference --Climate Change in Asia: Security Implications and Prospects for International Cooperation

(Sept 25 Protecting Streams with Streamside setbacks. Victor)

Sept 26 Fri – UM River Restoration Conference in UC see www.umt.edu/rivercenter

Oct 4, Sat – **Clark Fork Superfund tour.** meet at 8am at north end of Van Buren br. (East Gate parking lot). return 6pm.
Led by Superfund project managers, ranch operators, and Watson

(Oct 2-3 **Water Sustainability: Challenges for Montana.** Annual conference of the Montana chapter of the [American Water Resources Association](http://www.americanwaterresources.org). WHERE: Big Sky Resort)

See also field trips offered by Audubon, Sierra, Native Forest Network, etc on www.umt.edu/conservationcalendar

Others field trips that will be organized (in Oct or Nov).

Missoula Wastewater Treatment tour. Then tour Ekocompost – this business composts Missoula's sewage sludge and was started over 30 years ago by an EVST student! Leave UM at 1pm. Return to UM about 4pm.

Frenchtown pulp mill wastewater treatment system. Meet at 12:30 at UM's UC tennis courts for vanpool. Or meet at the pulp mill entrance at 1pm. Return to UM by 4:30-5pm. Tour led by Terry McLaughlin, head wastewater plant operator.

540 students must attend one public meeting & report back to class. Some meeting possibilities are:

Montana Watershed Coordination Council meetings, any watershed group's meeting,
Milltown planning group (Sept 23, meets monthly)
Msl Conservation district meetings – 2nd Mondays of each month
Msl Water Quality Advisory Council – 2nd Tuesdays of each month