Environmental Science/Regional Planning 490/590
Water Resources Economics and Management
Thursday, 3:25-5:05 p.m.
Washington State University-TC Campus

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(Office hours by appointment)

WATER RESOURCES ECONOMICS AND MANAGEMENT

Water resources management is at the heart of the Pacific Northwest, and water resources use and development are pivotal to the economic well-being of Eastern Washington. The river and groundwater system is subject to complex federal/state regulations and policy; and its management is the subject of extensive scientific and economic scrutiny, as well as formidable litigation. This overall complexity makes water resources management subject to many masters, often incompatible demands, and often resistant to fact-based change.

Course Objectives:

- The course will introduce class participants to fundamentals of water resource economics and management—basic economic concepts and theory, the key resource agencies and actors, the specific issues, the litigation process, the federal and state legislative direction, and fundamental resource management tools. The course will rely heavily on primary documents and the perspectives of resource managers/policy makers to reveal how water resources management "works" and is governed. Significant emphasis will be placed on the Columbia-Snake River system.

- Specifically, the course is designed to: 1) highlight technical/policy issues suitable for graduate thesis topics and offer an opportunity for preparing formal thesis proposals; 2) develop real-world legislative or administrative briefing papers; or 3) provide resource managers or policy makers with informed comment papers (technical or policy reviews/recommendations). Class participants will be expected to produce a relevant technical or policy "product."

Class Schedule/General Outline:

- August 27, 2009, Course Overview: course review and requirements, and general background for the topics covered—big picture economics; who and what manages the water use; some initial issues to consider. The principle of "*opportunity costs*" affecting water resource management.

- September 3, 2009, Water Management and Hydro System Operations: Some basics--the Federal Columbia River Power System; Bonneville Project Act; hydro project

operations and the Federal operators; Northwest Power Planning and Conservation Act; regional power demands and requirements; power operation and water management constraints—the Endangered Species Act (ESA) and the biological opinion (BiOp); flow augmentation and the "no net loss" water policy; and the regional costs of ESA; what does the Federal Energy Regulatory Commission (FERC) require for relicensing; FERC economics, dealing with third parties in project management.

- September 10, 2009, Water Management and Hydro System Operations: The Perspective from USACE, Reservoir Control--the Federal Columbia River Power System; hydro project operations and the Federal operators; irrigation, navigation, flood control, and recreation; Northwest Power Planning and Conservation Act; regional power demands and requirements; power operation and water management constraints—the Endangered Species Act (ESA) and the biological opinion (BiOp); flow augmentation.

- September 17, 2009, Water Resources Litigation: NOAA Fisheries and the ESA BiOp litigation, 1994-2009; legal issues; who are the litigants and interests; how has the litigation changes river operations and control; the BPA Administrator's settlement with Lower Columbia River Tribes; what are now the standing issues; the "renewed" BiOp litigation filed in June-July 2008; the September 2009 settlement?

- September 29, 2009, Fundamental Concepts of (Water) Resource Economics: Social welfare economics theory applied to resources economics and water management, opportunity costs and optimality; benefit-cost analysis, direct net value, regional economic value, benefit transfers, and other key nomenclature attached to applied resource economics.

- October 1, 2009, Columbia River Fish Passage Survival, and Harvest Management: The origin of the "no net loss" water policy and NOAA Fisheries "flow targets;" the great flow-survival debate 1993-2006; 2001 low water-year conditions and fish survival; ocean conditions and survival; the impact of harvest; recent review of harvest's influence on salmon recovery.

- October 8, 2009, State Water Management, 1992-2008: The 2002-2005 Columbia River water right litigation and the "no net loss" water policy; Columbia River Initiative; the NAS study, fact or fiction; RCW 90.90 (2006); new water supply options; CSRIA-Ecology Voluntary Regional Agreements; 2009 water conservation and use proposal.

- October 15, 2009, Fundamental State Water Law Provisions (and Economics) Affecting Columbia River Water Rights: Water law basics for water rights; what is a water right; what are claims, permits, certificates; junior vs. senior rights on the Columbia River; flow regulations and reserves; measuring beneficial use of a water right and re-calibration under the VRA; the great water right relinquishment debate; water right change/transfers; Conservation supply estimates for the Columbia River Basin; the conservation debate (diversions vs. use vs. return flows); conservation

under RCW 90.90; the application of best management practices; the Irrigation Water Management Program; the 2009 conservation O&M proposal for "new" water use.

- October 22, 2009, Fundamental State Water Law Provisions (and Economics) Affecting Columbia River Water Rights: Continuation--water law basics for water rights; water supply and demand; flow regulations and reserves; measuring beneficial use of a water right and re-calibration under the VRA; the great water right relinquishment debate; water right change/transfers.

- October 29, 2009, Columbia River New Water Storage Projects/Proposals and the Yakima Basin Water Supply Strategies: Lake Roosevelt drawdown operation; review of new storage projects (>1 MAF); costs and timeline for project development; operational constraints; other potential reservoir changes for re-timing water releases; water for Odessa Sub-Area and mainstem withdrawals; matching supple and demand. Water supply and demand in the Yakima Basin; the Yakima River Basin storage project review—water from the Columbia River?; Black Rock vs. Wymer and/or other projects and approaches; current Ecology and USBR direction.

- November 5, 2009, Applications of Water Resource Economics and Management: Applied water resources economics; the value of water; measuring market and non-market values of water use; water values per acre-ft.; water markets and water banking on the Columbia River and elsewhere—how effective? The 2009 legislative initiatives for new water resources management.

- November 12, 2009, Applications of Water Resource Economics and Management: The KID water permit application for a new water right; water for Red Mt. and current District lands; configuring the "new" water right—Yakima and Columbia River water exchange; the Umatilla Project (Walla Walla River) water transfer review.

- November 19, 2009, Review of Student Projects: Students will have prepared two-page discussion papers of their proposed course project with informal class presentation; opportunity to describe/outline project and receive feedback from the class and instructor before completing project.

- November 23-27, 2009, THANKSGIVING VACATION: No Class activity this week.

- December 3, 2009, Presentation of Course Projects: Student projects will be distributed to class participants and formally presented before the class. The class will provide a critique of each presentation. Presentations will be limited to available time and number of projects. Projects may be modified per class feedback (or submitted as final form).

- December 10, 2009, Presentation of Course Projects: Student projects will be distributed to class participants and formally presented before the class. The class will provide a critique of each presentation. Presentations will be limited to available time and number of projects. Projects may be modified per class feedback (or submitted as final form).

- December 17, 2008, Last Day to Provide Final Course Projects. Final student projects must be completed and received by this date.

Course Readings/Background Material:

- Selected course readings/background materials will be available on website access at least two weeks prior to the scheduled review topic. Guidance for additional data/sources for specific course projects will be provided by the instructor.
- Readings/background materials website address: CSRIA.org at the sub-heading Water Resources Economics and Management 490/590; or as designated otherwise.

Requirements:

- Attendance and substantive class participation are required; each unexcused absence reduces a course grade by 2.5 points. Class participation will be recorded.
- A "discussion paper" (2-pages) outlining the course project—for general class distribution/review and discussion with instructor (by appointment) the week of November 19, 2009.
- Course project: Grades are heavily weighted toward a student's course project, and the course project must be a useful "product," such as:
    - A well-focused, formal graduate thesis proposal (instructor guidance will be provided for format).
    - Formal technical/policy comments to a state or federal agency officer on a topic under active agency review—detailed, substantive comments (six to eight pages); and a letter to the editor (200 words) to an established newspaper summarizing the formal comments for public review.
    - A detailed technical/policy briefing paper prepared for a state representative or congressman, or other elected official (six to eight pages); and a letter to the editor (200 words) to an established newspaper summarizing the formal comments for public review.
    - Other types of projects per instructor approval.
    - Professional level presentation (20 minutes) on the course project to the class for peer review and critique.

Potential Course Projects:

- Is the Columbia River over-allocated? What are the key impacts of new water withdrawals—do they prohibit issuing new water rights? What level of new withdrawals should be allowed?
- What should be the primary focus of new water resources projects for the Yakima Bain or the Columbia-Snake River system?

- ESA vs. harvest—should we manage for both? Review history of harvest on Columbia River stocks and ESUs, and provide new proposal.
- Legislative proposal for changing the water code on relinquishment—specific water code changes.
- Formal comments on 2009 legislative proposals for water resources management.
- Summary review of the economic (market) value of water in Eastern WA ($/acre-ft.) based on existing literature and actual cases.
- Case example of a water right recalibration/drought permit under the CSRIA-Ecology Voluntary Regional Agreement.
- What recommendations/criteria should be provided to the state for the review and development of new storage projects?

Disability Services Reasonable Accommodations:

- Reasonable accommodations are available for students who have a documented disability. Classroom accommodation forms are available through the Disability Services Office.
- If you have a documented disability, even temporary, make an appointment as soon as possible with the Disability Services Coordinator, Cherish Tijerina, Room 269D West Building. You will need to provide your instructor with the appropriate classroom accommodation form. The form should be completed and submitted during the first week of class. Late notification can delay your accommodations or cause them to be unavailable. All accommodations for disabilities must be approved through the Disability Services Coordinator.