Environmental Science (EVS) 610
Multidisciplinary Problem Solving in Coastal Ecosystems
A Coastal Institute IGERT Project Class
Fall 2009

3 credits of lecture and lab

Time:
Wednesdays 9:00 a.m. to 12 noon;
Fridays as noted 9:00 a.m. to 12 noon;
Field trips constitute the remaining 3 hours each week as an aggregate over the course of the semester.

Location: Room 201 Coastal Institute Kingston Campus.
Occasionally, alternate meeting sites will be announced in advance.

INSTRUCTORS:

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COURSE OVERVIEW: As an overview, this course was developed specifically for the CIIP program and has typically consisted of two components: (1) lectures by visiting scholars on integrated research/policy in estuarine, watershed, climate and fisheries research, and (2) training and exercises in case studies of science and policy in coastal management.

In the training and exercise component, URI faculty have coordinated project teams mixing interests in natural science and social science. Work has consisted of analyzing a case study or a book featuring a coastal resource management problem. Humanities scholars, natural scientists, social scientists and external guests from a variety of perspectives alternately facilitated the discussion and introduced specific skills in framing issues, e.g., communication, integrating policy and science, framing basic scientific questions and working in multidisciplinary teams. We used traditional sources of information (journals and books) as well as non-traditional environmental science and policy information sources, e.g., Green Wire, Land Letter, and Policy News Updates from the Ecological Society of America.

Each semester has involved some permutation of this framework but this semester we will focus on a specific project. We will partner with The Nature Conservancy (TNC) to develop a framework and guidelines for conserving coastal ecosystems in the context of climate change. The core question is simple – what areas on the landscape should the land protection community (TNC, State, Feds, Land Trusts) be attentive to now that will be critical in 2100 when sea level is 2 m higher and temps are 5-7 degrees warmer? There it is: A simple question with a complex answer.

Our IGERT class is well postured to take this on with TNC. Among you, we have economists, business, biology, ecology, and water resource expertise. It is a bite size problem and the results of our research have many potential audiences – land conservation groups, academics, the public, etc. We will engage in topics such as salt marsh restoration, shellfish restoration, biogeochemistry, and economic ramifications.

The final outcome of this semester will be a workshop designed for an invited audience of frontline stakeholders who are responsible for policy and public conveyance of answers to this basic question. Throughout the semester we will work with TNC and RI Coastal Resources Management Council (RI CRMC), collecting and interpreting work done to date in this field, in preparation for the upcoming workshop. We will also assist

with planning and hosting the workshop. This is a wonderful opportunity to work with these organizations and to be involved in the development of policy that has immediate management implications.

OUTCOMES: Each class in the CIIP curriculum will serve to introduce new skills and reinforce others. It is not expected that you will have mastered all of the skills following the completion of one class; rather, you should demonstrate some evidence of initial mastery. Second-year trainees will be expected to demonstrate deeper mastery of skills.

Upon the completion of EVS 610, you should have the burgeoning ability to:

- Determine audiences that are relevant to an issue
- Identify core principles of natural and social sciences that bear on an issue
- Articulate action steps and next steps
- Develop basic strategy based on decision points
- Present a case clearly and succinctly
- Identify barriers to change
- View Issues from different perspectives

You should have an emerging ability to:

- Frame a problem in all of its dimensions
- Articulate scales of an issue and the information required to address the issue
- Engage in critical analysis as an individual and within a team
- Make decisions through extrapolation
- Identify all disciplinary expertise relevant to an analysis
- Demonstrate mastery of the process of the scientific method and how scientists approach solving a problem.

You should demonstrate an increasing ability to:

- Write for and present to different audiences
- Work effectively individually and in teams
- Apply criticism in a constructive manner toward professional growth
- Anticipate challenges and take initiative in meeting them
- Demonstrate leadership

Trainee-led Synopsis and Reflection: In the past, trainees have individually prepared a list of open, unanswered questions or issues that they have identified for each of the topic areas. There were also some meta-questions that arose. As a group we suggest that you collectively gather the individual questions and consolidate them into a single list. You should repeat this process for each topic area. At the end of the semester, you will consolidate the lists into a single “package” paying special attention to identifying overarching themes, ideas, concepts, issues, uncertainties and/or patterns that have emerged. This collection will be the basis for your preparation for the final presentation. You will present this information to us in whatever context, form, or format that you see

fit, e.g., in writing, as oral and/or visual presentations, interactive audience or lecture format, or a combination of these. You may use both quantitative and qualitative methods as organizing principles. It is your decision as to how you make the groups of questions informative and useful beyond sheer reflection - not that reflection in and of itself is not useful. It worked for Einstein and Emerson among others. To that point, we will have focused on topical units and each one is content based. However, most important to the goals of this course are the overarching patterns that emerge. We will evaluate whatever you elect to do. This assignment is deliberately surrounded with uncertainty. You have the opportunity to set the agenda paying careful attention to the words "synopsis" and "reflection." You will report your discoveries made through reflection either on exam day, or another mutually convenient day.

There are two distinct classes of what are called thoughts: those that we produce in ourselves by reflection and the act of thinking, and those that bolt into the mind of their own accord.

- Thomas Paine

Communication Skills: Each of you in the 2008 cohort will have a one-hour assessment meeting with Judith on your presentation skills. We will both assess your current state and write a prescription for growth. Available times will be emailed to you and you can select one that is most convenient.

And finally, be sure you have a good virus checker on your computer. You can download good protection from the IT site on the URI web page.

GENERAL NOTES: This syllabus is an outline of proposed events. **It is subject to change.** We will never change it to make anything due earlier for you. You as teams -- or we faculty in consultation with you -- may change the order of things to allow for a special opportunity or to allow additional exploration on a particular topic. Supplementary readings may be added along the way by unit leaders, external guests or the faculty. Any of the above may suggest readings as we develop a greater sense of the learning agenda. For the most recent updates, continue to check EVS 610 online.

This course is a dynamic design in order to provide the best possible series of learning opportunities.

GROUND RULES FOR THIS CLASS: It is expected that you will resolve the distribution of team assignments – in this case the entire class is a team project despite specific individual responsibilities assigned by the team. Moreover, any additional team assignments should be discussed early on so project leaders are assigned and a timeline agreed upon. Everyone is expected to carry his/her share of class discussion and to respect the right and time for others to speak. Needless to say, electronic telecommunications devices should remain shut off during class unless you are a member of a SWAT team or essential to national security.

GRADING: This class is graded on an S/U basis. You will be graded on the work you present both in class and as written assignments. At all times, you will be evaluated for the quality of your analytical thinking and the skill of your verbal and written communication. For information on grading for graduate students, see the Graduate Student Manual.

The breakdown is as follows but we are not slavish about its application; rather, this is a guideline:

In-class participation and IGERT.org postings..... 40%
In-class / workshop team presentations / organization..... 30%
Individual writing (creation of posters, informational supplements, etc.)..... 30%

ROLES People Play in the Class

Visiting Scholar Teams: This team will lead the interaction with visiting scientists when we meet in the class. This is a chance for all trainees (and faculty) to learn from a national expert. Have good questions prepared. Remember – and we all need to be reminded of this – the point of the questions is to learn, not to demonstrate what you know. Take some risks. You will also bring to class local experts (the discussants) who will provide critique and insight as well. The critique is important as a tool for growth so be prepared to accept criticism as part of our collective endeavor to get to some meaningful findings, which may prove to be even more questions.

CIIP Trainees: Much of the learning in this class will come from your work and scholarly contributions. You have top priority access with our visiting scholars. When arranging their visits, you should create opportunities to meet and chat with them. They are here to work with you, not the faculty. We encourage you to take them out socially at the end of the day. Great learning can happen at Starbucks or The Ocean Mist. You are also the front line of critical review of module team reports. In the vernacular of the day, you are being empowered. Good leadership begins with the wise use of authority. Use it well.

Discussants: You are the local experts on the topics we have invited you to participate in discussing. You should attend the sessions with our visiting scholars. On the meeting where the trainees review the dimensions of an issue, you should be prepared to reflect upon your experience with the topic and identify domains of an issue that in your personal experience are extremely important. Please comment on the trainee's review of the issue as well. Your contributions will provide a big slice of reality or life in the trenches. We expect that some of your comments will reflect conflict, uncertainty and even examples of failures. We invite you to expose the underbelly of your work. If you wish personal time with our visiting scholar, please let Q Kellogg know in advance.

Faculty Participants: You are an important component of this process. You will be viewing the issues through your own distinct disciplinary lens of bias. Share those

perspectives in class discussion. Among us we can formulate a very comprehensive assessment of the issues we are discussing. Please read the assigned readings before classes.

Visiting Scholars: Please provide any readings you want the trainees to have gone through prior to your visit. E-mail your list to the trainee contact that is coordinating your trip. Your audience will be from very different disciplines but can handle technical complexity. The more you can weave the different dimensions – ecological, biological, economic, social, political, policy ... – of your work into your seminar, the better.

You will be meeting with the class to answer trainee questions about your research or the issues on which you work. The CIIP trainees will be providing you with the parameters of your discussion, but in general the meta-questions are:

- Who you are, what you work on, and why it is important;
- Your approach in developing solutions to the problems you work on;
- Challenges and successes you have had in melding science with decision-makers or resource managers;
- Risks you have taken, the result and what you learned.

The trainees will arrange private meetings to interact with you one-on-one or in small groups. We are encouraging the trainees to monopolize your time so please do not see our absence from some informal gatherings as disinterest; rather, it is part of our commitment to give the trainees full and free access to the great minds on these issues. If possible, we would appreciate it is you could bring reprints of some of your recent publications.

COMMUNICATION: We have various forms of communication, electronic storage sites and critique functions in the CIIP. Among these are the blog, the e-portfolio, the website, listserv, email and face-to-face meetings. To prevent confusion, here is a brief guideline as to the purpose and use of each communication mechanism.

CIIP Web site: This is our interface with the world and the place to provide information about our activities and opportunities for future students. It will also assist alumni in staying connected with the CIIP. Perhaps most importantly, the website is our PR for the CIIP and should show our best thinking and accomplishments to the larger community including scientists, our funding agency, NGOs, elected officials and the lay public. We also actively use it for all classes and this is the place to find the latest and most complete information on the curriculum.

IGERT.org Web site: The IGERT Resource Center (IGERT.org) provides comprehensive information about IGERT and each of its actively funded projects. The Resource Center provides an e-community for current IGERT students and faculty to share resources, research, presentations, challenges and best practices. The Center provides a vehicle for national dissemination of program models, materials and

accomplishments. Within IGERT.org we have created a group for this class. We will use this site for communication among ourselves in planning EVS 610 activities, sharing documents and distributing readings. This site is funded by the National Science Foundation. Opinions expressed are those of the contributors and not necessarily those of the Foundation.

E-mail: E-mail is to be used when there is a need for interpersonal or small group communication that need not go to the whole listserv. Since e-mail is a very challenging medium in the absence of face-to-face (f2f) communication, e.g., the nonverbal communication is missing and emoticons just don't fill that void (in fact, some of us loathe emoticons), it is essential to be wary and wise in determining when e-mail is the best mechanism for communication. If someone down the hall is providing you with a challenging difference of opinion, walk down the hall and engage f2f. If you need to tell someone that you'll meet her at 5:15 a.m. for that trip to watch phragmites grow, send an e-mail. It is largely a matter of personal preference combined with sensitivity for the communication needs and styles of others.

Face-to-face communication: This may seem apparent as something that is employed in the classroom, in a meeting with a major professor or a peer, but it is not to be taken lightly. While we all have developed the greatest skill set in this area, there is still plenty of room for miscommunication; however, it is the preferred method to discuss and resolve any disagreement, to put forth suggestions or criticisms, to mentor, to listen, to praise and to provide support.

ATTENDANCE: Timely attendance is expected. You are graduate students and we know you want the stimulation of class discussion with a phalanx of professors, experts, and your peers. In the case of a graduate program, there is a tremendous opportunity to learn from fellow classmates. If the class is functioning as it should, we professors will serve as informed moderators and participants more than traditional instructors. If you have an emergency and will not attend on a given day, please call or e-mail a member of your team. (A contact sheet will be circulated during orientation.) Class participation is a crucial aspect of our evaluation of your work. If you are part of a presenting team, your absence would be justifiable only if you cannot fog a mirror. We place tremendous value on teamwork and expect you to all to join us in building a culture of learning free of gender-bound behavior and respectful of everyone's point of view.

Illness Due to Flu

The H1N1 Flu Pandemic may impact classes this semester. If any of us develop flu-like symptoms, we are being advised to stay home until the fever has subsided for 24 hours. So, if you exhibit such symptoms, please do not come to class. Notify one of the instructors of your status, and we will communicate through the medium we have established for the class. We will work together to ensure that course instruction and work is completed for the semester.

The Centers for Disease Control and Prevention have posted simple methods to avoid transmission of illness. These include: covering your mouth and nose with a tissue when coughing or sneezing; frequently washing your hands to protect from germs; avoiding touching your eyes, nose and mouth; and staying home when you are sick. For more information, please view www.cdc.gov/flu/protect/habits.htm. URI information on the H1N1 will be posted on the URI website at http://www.uri.edu/news/h1n1.html, with links to the www.cdc.gov site. Please remain on the alert for updates as the flu season unfolds.

Honor Code: We expect each of you to contribute your own work; however, we also expect you to work together as part of the team process to solve problems, achieve solid analysis, discuss cases, and even to prepare and explore the theses of your papers. We also expect that you will be direct about crediting yourself and/or others about completed work. Assisting each other is a major part of this learning experience. The only caveat is to acknowledge that assistance. With regard to group work, you are responsible for disclosing the extent of your work and to be forthright about how much you did or did not contribute. This saves each of you from ever having to be in the awkward position of reporting or covering for another student. Fairness is a core value. We also know each of you wants to be honorable in your individual or group projects. As you know, you must always include citations of any research. Faculty are asked to inform all students that the University of Rhode Island has very clear rules pertaining to plagiarism. See The University Manual, 8.27.10-8.27.19 and The Graduate Student Manual, 4.95.

Special Needs: If you have any special circumstances arising from a disability, please let me know how I can assist you. As stated in the University Manual: "The student with a disability shall be responsible for self-identification to the Disability Services for Students in the Office of Student Life, providing appropriate documentation of disability, requesting accommodation in a timely manner, and follow-through regarding accommodations requested." In other words, it is your responsibility to make arrangements for any special needs and my responsibility to accommodate them with the assistance of the Office of Disability Services for Students.

PHILOSOPHY OF TEACHING/LEARNING: We look forward to lively debate, difference of opinion, shared experience, willing acknowledgment of what one does not know – faculty included, and a passion for learning. We expect that we will all engage in debate with respect for differing opinions. We will also provide ongoing critiques of your work and will offer them in the spirit of constructive criticism. We strongly urge you to evaluate any critique you receive as objectively as possible. This is critical preparation for the world of peer reviewed work as well as the interaction you will have with public entities, e.g., NGO's, elected officials, the media, etc. We faculty will not always agree when we provide critiques; you will need to sort through the opposing comments and determine their value. Do not hesitate to contact any of us if you find a bit of commentary confusing but do make an effort to decode it with the person who wrote the criticism. Through the varied layers of faculty and peer criticism, you will learn to sort

through qualitative and quantitative data to determine their value and applicability. In Fall 2005, we launched this “lively experiment” – an homage to Rhode Island’s history of innovation and open-minded discovery. As we embark on our fifth year, we expect an even richer experience for everyone involved.

You might find the following web links useful:

Speaking Anxiety: A Primer on Alleviating the Horrors of Public Address

PowerPoint: Advice on the Design of PowerPoint presentations

Writing Tips: A Guide to Avoiding the Most Common Errors or How to Write Good

Brainstorming: A Process to Release Suppressed Creativity