JAMAICA FIELD COURSE

ERS 375 (Winter 2015)

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Course Overview

The Jamaica field course offers a unique opportunity to examine the linkages among ecology, conservation and development and environmental policy issues in a rapidly changing coastal-marine context. Current threats to Jamaica's coastal-marine environment include overfishing, invasive species, poverty, and tourism development, along with the impacts of climate change (e.g., sea level rise, coral bleaching). Innovative strategies are required to protect Jamaica's ecosystems, maintain the livelihoods and wellbeing of coastal people, and help individuals and communities adapt to change.

The course has an in-class component in addition to the field component (see schedule). We will meet several times in advance of our departure to Jamaica to: 1) discuss course logistics, expectations and responsibilities; 2) engage with major themes in the course, including the human and biophysical dimensions of coastal-marine change, management and governance, and social and ecological sustainability; and 3) lay the groundwork for individual research projects and course assignments.

The field course component will involve visits to selected sites on both the north and south coast of Jamaica, and includes opportunities to interact with fisherman and coastal tourism operators, decision makers, and marine managers and researchers engaged in coastal-marine initiatives. We will also have an opportunity to snorkel among the sea grass beds and observe first-hand the state of coral reefs and fisheries.

We will be based in Bluefields Bay and then subsequently at the Discovery Bay Marine Lab. Accommodation will be comfortable but modest, and meals will be based on locally available products. Active participation is essential for a successful course, and you will be engaged in multiple ways: developing an individual research project, maintaining a field journal, and designing and producing a short podcast. Stringent guidelines about course expectations and codes of conduct while in the field are non-negotiable. We will work hard, learn a great deal and do so in a collegial and professional manner.

Course Objectives

At the end of this course, you should be able to:

- Understand the major challenges and drivers of coastal-marine change and the implications for management and governance;
- Consider and assess various applications (e.g., ecosystem-based management, marine protected areas, development of living shorelines, community conservation schemes) applied at local to national scales to deal with coastal-marine change;
- Critically assess the assumptions underlying these applications, their limitations and the opportunities they provide for a transition to more social and ecologically sustainable coastal-marine contexts; and
- Apply an understanding of course material to a research project of interest.

Required readings

Required readings are listed in the course schedule (below) and they are accessible via TRELLIS or on the course LEARN site. Readings emphasize selected themes, concepts and strategies that are particularly conducive to transdisciplinary coastal-marine research and practice. Course materials and lectures will be augmented as appropriate (e.g., videos, guest speakers). There is no required course text. However, for those interested in having a source text for future reference, a good option is: Ray et al. 2013. Marine Conservation: Science, Policy, and Management (Wiley-Blackwell).

Course requirements and evaluation

This is a 1.0 credit weight course. Evaluation in this course is based on: (i) class engagement; (ii) maintaining a field/learning journal; (iii) designing and producing a short podcast; and (iv) completion of an individual major research paper and accompanying poster. A summary of each expectation is provided below:

i) Class engagement (10%)

Assigning marks for class participation and engagement is intended to encourage you to approach the course in a professional and committed manner. The overall mark for engagement is based on your attendance and participation in discussions and course activities (both in the field and in-class). The mark is also linked to the code of conduct for behaviour to which all course participants are expected to adhere.

ii) Individual field / learning journal (30%)

You will be responsible for maintaining an individual learning journal / log. The purpose of the journal is to help you highlight and critically reflect on what you think are the key ideas and concepts addressed in the class, and following each of the field study visits/activities. Approximately 8-10 journal entries are required, and additional guidelines on the field/learning journal will be provided.

iii) Designing and producing a short podcast (15%)

You will produce and record a 4-5 minute podcast. The purpose of the podcast is two fold: i) to develop your science communication skills and ii) to serve as a building block for your research paper. We would encourage you to use this as an opportunity to clarify your thinking and clearly communicate the essence of your research paper to a broader audience. Further details will be provided.

iv) Major research paper (30%) and poster (15%)

A key course outcome is the preparation of a major research paper (approximately 4000 words) on a topic you explore before, during and after the field course component. The paper must address in some manner the course themes, although you are free to incorporate other material and topics provided you have discussed this with the course instructors ahead of time. You are expected to incorporate class readings in your research paper, although you are encouraged to integrate other readings and sources of information as appropriate. Additional details on the research paper will be provided. In regards to your paper, keep in mind the following:

- A reasonably well-developed research proposal must be submitted for comments/feedback prior to our departure for Jamaica, and should include a clear thesis or problem statement, an indication of general organization of the paper, and a working bibliography (see class schedule).
- You will present your research (via a poster) in a class towards the end of the term (details to follow). You must be available for this class.
- Your final research paper is due on Friday March 27thth, 2015 (4:00pm).

All assignments must be completed to receive a mark for the course. Requests for extensions of any assignment must be done so in writing in advance of the assignment due date. In the event of an illness, a supporting medical certificate completed by a physician must be provided. Extensions may be granted for significant emergencies at the discretion of the Instructor. Please consult the University's policy on plagiarism and academic misconduct. Please ensure you are aware of what constitutes academic integrity, to avoid committing academic offenses, and to take responsibility for your actions. If you are unsure whether an action constitutes an offense, or you need help in learning how to avoid offenses (e.g., plagiarism, cheating) or about "rules" for group work/collaboration, please see me. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to Policy 71 - Student Discipline: http://www.adm.uwaterloo.ca/infosec/Policies/policy71.htm

Within ENV, those committing academic offences (e.g. cheating, plagiarism) will be placed on disciplinary probation and will be subject to penalties which may include a grade of 0 on affected course elements, 0 on the course, suspension, and expulsion. Students who believe that they have been wrongfully or unjustly penalized have the right to grieve; refer to Policy #70, Student Grievance:
http://www.adm.uwaterloo.ca/infosec/Policies/policy70.htm

Personal Conduct and Safety

Safety is our first concern on an international field course. We conceive of safety broadly, including its physical, emotional, and intellectual aspects. We rely on you (i.e. the students) to help contribute to a safe atmosphere for the courses. Behavior that threatens any aspect of your safety, or that of other students or instructors, will not be tolerated. We expect students to abide by the following rules and standards of personal conduct.

- Students will travel with the group unless otherwise directed by instructors.
- Climbing that requires the use of hands is not allowed (e.g. cliffs, rocks, trees, etc.)
- Abide by the laws of the host country and all applicable policies, procedures and requirements of the University of Waterloo and other institutions involved in the program
- Be aware of local conditions and customs that may present health or safety risks. Promptly express any health or safety concerns to the instructors.
- Use of illegal drugs and/or irresponsible consumption of alcohol is prohibited.
- Students and instructors must respect norms of conduct and help maintain the University of Waterloo's good reputation in the places we visit, whether this is a community, a government office, or a hotel. We build relationships in these communities and our local contacts are vital to future courses.

All students and instructors shall treat oneself and others with respect at all times. Group dynamics and friendships require honest and open communication. Please communicate your feelings or requests early, before a minor issue becomes a distraction. If you are sensitive, mindful and self-aware throughout our time in the field, we are bound to have a successful course.

2014 Course Schedule Overview

Class Date	Theme	Notes
Jan 7th	Course introduction, logistics, expectations and requirements;	
Jan 14th	Overview of coastal-marine change and governance in Jamaica; Developing your research project	
Jan 21rd	Vulnerability and adaptation issues in Jamaica;	Guest Speaker
Jan 28th	Research project discussion	
Feb 4th	No meeting	Research paper proposal due by end of week
Feb 11th	Pre-departure meeting	
Field Course Component – See Detailed Schedule Below		
Feb 25th	No meeting	Submit field/learning journal by end of week (Feb 28th)

Mar 4th	Post-trip meeting	Submit Podcast by end of week (March 7th)
Mar 11th	No meeting	
Mar 18th	No meeting	Research posters due
Mar 25th	Class presentations and social event	Final research paper due March 28th (4pm)

Detailed Field Schedule (in Jamaica)

Day	Location	Activities/ Topics	Course Themes and Example Readings
1 *(Feb.13)*	• Meet at Pearson Int. Airport • Group Flight to Montego Bay • Transfer to Bluefields Bay	• Orientation, Overview in Bluefields; walkabout	
2 *(Feb.15)*	Bluefields Bay	• Mini-lecture: Sustainable Livelihoods • Hiking tour (uplands, lowlands) and transect	Carney 1998; Bene 2003; Aiken & Ennis (In Press); Kittinger et al. 2012; Kong 2005; Burke and Kushner 2011
3 *(Feb.16)*	Buefields Bay	• Mini-lecture: Special Fisheries Conservation Areas / Marine Protected Areas • Boat Tour of Bluefields Bay SFCA (with snorkeling) • Focus group discussion with w/ Bluefields Bay Fisherman's Friendly Society and Fish Fry	McLeod et al 2009; Mills et al 2010; Cinner et al 2012
4 (Feb.17)	Whitehouse	• Mini-lecture: Commons and Institutions • Visit with Fisheries Department and Cooperative; tour of fish market • Afternoon meeting with spear fisherman	Agardy 2005; Lemos and Agrawal 2006; Berkes 2010; Cudney-Bueno, & Basurto 2009; Mills et al. 2010
5 (Feb.18)	Negril, Westmorland	• Mini-lecture: Climate Change Adaptation • Partial transect of 7-mile beach	Pulwarty et al 2010; Cinner et al 2013; Bernhardt & Leslie 2013
6 (Feb.19)	Bluefields Bay	• Work day – research papers • Feedback on journals	
7 (Feb.20)	Discovery Bay Marine Lab	• Travel in morning – south coast to north coast • Mini-lecture: Coastal Ecology • Snorkeling in/around DBML	Hughes 1994; CFRAMP 2000; Hardt 2009; Cote et al 2013; CARSEA 2007
8 (Feb.21)	Oracabessa/ Boscobel	• Mini-lecture: coral reef restoration • Boat tour and snorkeling visit of coral restoration project • Discussion with fisherman and wardens	Hughes 1994; CFRAMP 2000; Hardt 2009; Cote et al 2013; CARSEA 2007
9 (Feb.22)	Discovery Bay Marine Lab	• Synthesis day – project time and preliminary presentations • Final dinner	
10 (Feb.23)	Return to Toronto	• Depart for Montego Bay mid-morning	

READINGS (ALL AVAILABLE ON TRELLIS OR WWW; ADDITIONAL READINGS AND/OR CHANGES TO READINGS TO REFLECT COURSE PARTICIPANT INTERESTS IS EXPECTED)

Agardy, T. 2005. Global marine conservation policy versus site-level implementation: the mismatch of scale and its implications. *Marine Ecology Progress Series 300*, 242-248.

Aiken, K. & Ennis, Z. (In Press). 'Spearfishing in Jamaica: An Emerging Concern" *Revista de Biologia Tropical*.

Bene, C. 2003. When Fishery Rhymes with Poverty: A First Step Beyond the Old Paradigm on Poverty in Small-Scale Fisheries. World Development. 31(6): 949–975.

Berkes, F. 2010. Linkages and multilevel systems for matching governance and ecology: Lessons from roving bandits. *Bulletin of Marine Science 86*(2), 235-250.

Berkes, F. 2011. Ch. 2 Restoring unity: The concept of marine social-ecological systems. In: Ommer, R., Perry, R., Cochrane, K., & Cury, P. (Eds.) *World fisheries: A social-ecological analysis*. UK: Wiley-Blackwell. (additional reading)

Bernhardt, J. & Leslie, H. 2013. Resilience to climate change in coastal marine ecosystems. *Annual Review of Marine Sciences 5*, 371-92.

Burke, L. & Kushner, B. 2011. *Coastal Capital: Jamaica – The economic contribution of Jamaica's coral reefs.* Washington, DC: World Resources Institute.

CARSEA. 2007. Caribbean Sea Ecosystem Assessment: A sub-global Component of the Millennium Ecosystem Assessment. *Caribbean Marine Studies*, Special Edition.

CFRAMP. 2000. Jamaica National Marine Fisheries Atlas. CARICOM Fishery Report No. 4: 53 p. (additional reading)

Cinner JE, Huchery C, Darling ES, Humphries AT, Graham NAJ, et al. (2013) Evaluating Social and Ecological Vulnerability of Coral Reef Fisheries to Climate Change. PLoS ONE 8(9): e74321. doi:10.1371/journal.pone.0074321

Cote, I. *et al.* 2013. Predatory fish invaders: Insights from Indo-Pacific lionfish in the western Atlantic and Caribbean. *Biological Conservation 164*, 50-61.

Cudney-Bueno, R. & Basurto, X. 2009. Lack of cross-scale linkages reduces robustness of community-based fisheries management. *PLoS ONE 4*(7), e6253.

Gardner, T. *et al.* 2003. Long-term region-wide declines in Caribbean Corals. *Science 301*, 958-960. (additional reading)

Hardt, M. 2009. Lessons from the past: the collapse of Jamaican coral reefs. *Fish and Fisheries 10*, 143-158.

Hughes, T. 1994. Catastrophes, phase shifts, and large-scale degradation of a Caribbean coral reef. *Science 265*(5178), 1547-1551.

Hughes, T. *et al.* 2005. New paradigms for supporting the resilience of marine ecosystems. *TRENDS in Ecology and Evolution 20*(7), 380-386. (additional reading)

Kittinger, J., Finkbeiner, E., Glazier, E., *et al.* 2012. Human dimensions of coral reef social-ecological systems. *Ecology and Society 17*(4): 17. [online]

Kong, G. A. 2005. The consideration of socio-economic and demographic concerns in fisheries and coastal area management and planning: Jamaica Case Study. FAO.

Lemos, M.C. and A. Agrawal. 2006. Environmental governance. Annual Review of Environment and Resources. 31: 297–325.

McLeod, E., Salm, R., Green, A., & Almany, J. 2009. Designing marine protected area networks to address the impacts of climate change. *Frontiers in Ecology and the Environment 7*, 362-370.

Mills, M., Pressey, R., Weeks, R. *et al.* 2010. A mismatch of scales: Challenges in planning for implementation of marine protected areas in the Coral Triangle. *Conservation Letters 3*, 291-303.

Pulwarty, R., Nurse, L., & Trotz, U. 2010. Caribbean islands in a changing climate. *Environment: Science and Policy for Sustainable Development* 52(6), 16-27.

UNEP. 2006. *Marine and coastal ecosystems and human well-being: A synthesis report based on the findings of the Millennium Ecosystem Assessment.* UNEP.

Waite, R., Cooper, E, Zenny, N. *et al.* 2011. *Coastal Capital: Jamaica – The economic value of Jamaica's coral reef-related fisheries.* Working Paper. Washington, DC: World Resources Institute and the Nature Conservancy. (additional reading)

Watson, R. & Howell, B. 2013. Closing the coral commons to support reef restoration in Florida. *Conservation Leadership Council.* (additional reading)