Changing Nature: Intervening in the New Ecological World Order
ES 482/582 │ Spring Term 2015

Tuesdays 4:30-7:20
Turpin B247

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Consultations by appointment

"A novel ecosystem is a system of abiotic, biotic and social components (and their interactions) that, by virtue of human influence, differ from those that prevailed historically, having a tendency to self-organize and manifest novel qualities without intensive human management. Novel ecosystems are distinguished from hybrid ecosystems by practical limitations (a combination of ecological, environmental and social thresholds) on the recovery of historical qualities."

from "Defining novel ecosystems," in Richard Hobbs, Eric Higgs, and Carol Hall (eds.), Forthcoming 2013. *Novel ecosystems: When and how do we intervene in the new ecological world order.* New York: Wiley-Blackwell.

Changing Nature is driven by a defining question: What is responsible intervention in ecosystems undergoing rapid change? Essential ecosystems (aka wild spaces, protected areas, nearby nature & etc.) are being dramatically and rapidly altered by land conversion, climate change, human-induced shifts in nutrient flows and entrenchment of non-native species. These monumental ecological changes will in turn affect the provision of services these ecosystems provide for people, and how people interact recreationally, spiritually and in other ways with "new" ecosystems outside of their

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[*]I moved my office and research group recently to University House 4, which is the easternmost frontier of the UVic campus. The School of Environmental Studies is expanding! I'm happy to host visitors, but you'll need a map and walking shoes to find it. It's worth it for the walk along or through Mystic Vale. If this proves daunting, I'm happy to meet for coffee somewhere more central.

historical experience. As ecosystems move outside historical state-space boundaries into novel dynamics, environmental scholars and practitioners, as well as policy specialists, planners and managers, need to understand how these "new natures" sustain us, how they challenge us, and how we can steward them while respecting both people and nature.

This seminar covers a wide range of contemporary issues from barcoding biodiversity to rewilding, all with the aim of pushing against boundaries of received knowledge about preservation, conservation and restoration of nature. These issues are playing out in real time around the world in field settings, labs, offices and classrooms, and we will peer at them from a variety of perspectives.

Three course objectives define the learning experience:

1. Expand fluency with rapidly emerging concepts about nature from a variety of disciplines and perspectives.
2. Enhance skills in critical reading of advanced texts, including scientific and technical articles.
3. Collaborate effectively with peers in creating creating a "changing nature" case study.
4. Produce challenging and creative responses in the form of short reflections, case studies and essays on the rapidly changing natures and their shifting meaning in contemporary culture.

CourseSpaces learning support

The CourseSpaces website is the definitive repository for course information, readings, and notice. Please make sure to log into this site, and to familiarize yourself with the contents.

Readings

Books
The following two books are available from the UVic Bookstore:

Emma Marris, 2011. *Rambunctious garden: Saving nature in a post-wild world.* New York: Bloomsbury.

J.B. MacKinnon. *The once and future world: Nature as it was, as it is, as it could be*. Boston: Houghton Mifflin Harcourt; 2013.

Selections from the following book will be available in CourseSpaces:

Richard Hobbs, Eric Higgs, and Carol Hall (eds.), 2013. *Novel ecosystems: When and how do we intervene in the new ecological world order.* Oxford: Wiley-Blackwell. [The book will be shared electronically.]

Articles
A variety of scholarly and popular articles will be made available via CourseSpaces or as a link to Library resources.

Course Themes (subject to modification)

January 6th: Introduction to the course.
Explaining the background of the course, the urgency of the subject matter and the objectives for the course.

January 13th: The once and future world
Using J.B. MacKinnon's provocative articulation of human memory of ecological change, we begin an exploration of changing natures.

January 20th: Directional climate change and other environmental drivers of change

Climate change receives central billing as a major environmental driver of ecological change, but it isn't the only one. Elevated deposition of nitrogen, for example, is changing what plants will grow where and placing new constraints on ecological restoration.

January 27th: Globalization of species

The invasion of ecosystems by exotic organisms is a central worry for restoration and conservation ecologists. Species invasions are an aspect of cultural and economic globalization, and central tenets, including the metaphor of 'invasion' are being challenged.

February 3rd: Big tech: biodiversity barcoding, GMOs and synthetic biology

Advanced technological processes, including the design of new organisms, are shaping future natures. We are familiar with genetically-modified organisms (GMOs), but less so with new identification and surveillance techniques such as biodiversity barcoding and synthetic biology.

February 17th: The changing role of history

Modern accounts of nature are rooted in ideas of wilderness, which at least in North America have defined a profoundly historical view of ideal natures. Indeed, the science and practice of ecological restoration are bound by history. Rapidly changing natures suggest the demise of historical references in ecology, but recent work suggests the opposite might be true.

February 24th: Novel ecosystems

In the past decade a growing group of scientists, environmental practitioners and policy makers propose that the fact of historically discontinuous, or 'novel,' ecosystems compels the development of new ideas about how to restore or intervene responsibly.

March 3rd: Rewilding

In the mid-2000s scientists proposed a radical proposal for bringing back long-lost keystone species or their homologues as an act of 'rewilding." Some proposals have been decried—elephants in Australia to manage invasive-dominated savannas—but the idea caught the popular imagination. What does is mean for ecosystems to go wild?

March 10th: Assisted migration

An emerging strategy for redressing ecological implications of climate change is to move species deliberately along attitudinal and latitudinal gradients to where they are better positioned to flourish. What works for horticulture might not be such an easy or successful approach for conservation and restoration.

March 17th: Designer ecosystems, green infrastructure and ecosystem services

How far is it appropriate to go in designing ecosystems to meet particular human needs and wants? What principles should guide us?

March 24th: Managing the whole landscape: rambunctious gardens?

Especially in urban and peri-urban regions, proposals for creative conservation and restoration involve seeing the 'whole landscape' as having ecological value. This is a turn away from more austere concepts that focus on areas that already have higher ecological value to those that will benefit from restoration and regeneration. We finish with Emma Marris' provocative term to describe the future of progressive conservation and restoration. Are we happy with the idea of "rambunctious gardens?' What are our collective ideas for coping with new natures, or for 'changing nature'?

March 31st: Changing nature case study presentations and course wrap-up

Assignments

Components	Percent of mark		Due date
Class participation	40%		
Seminar participation		10%	weekly
Reflection questions		20%	weekly (x9); due 12 noon on day of class
Presentation		10%	once; sign up second class
Case study	60%		
Code of cooperation		no grade	January 27th
Individual assignment #1		20%	February 24th, before class
Individual assignment #2		20%	March 10th, before class
Group report		10%	March 24th, before class
Web integration		5%	March 27th
Presentation		5%	March 31st, in class

1. **Seminar participation**. This is a seminar course and you will be expected to come prepared to discuss readings and to participate in all aspects of the course. This means in practice that you engage in small and large group conversations. I'm aware that this is more difficult for some of you than others. It's not in the end about quantity as much as it is about the quality of your contributions. Individually and collectively you are at least partly responsible for making this seminar vital and interesting.

2. **Reflection questions**. Good questions are essential to critical and effective inquiry. This assignment helps build the skills of good questioning. Please submit a well-formed and reflective question no later than 12 p.m. before each class that you have formulated based on one or more of the assigned readings. Each question much be accompanied by a paragraph (200-250 words) explaining why you chose the question (e.g., significance of the question to your unfolding understanding of the subject). Submission is via CourseSpaces. You are responsible for nine reflections over the course of the term, each one worth 2 points. The deadline for the first submission is January 20th, although you can get a head start, and thereby leave yourself a bit of grace period, by submitting on January 13th. A bonus two points will be given to those who complete all nine.

3. **Presentation**. 10%. Based on one of the assigned readings (you'll have a choice, but each person will present on a separate chapter) *and* engaging at least one additional book or article cited in your chosen reading, lead the class with a presentation of 5-7 minutes with up to 10 minutes of discussion. The use of visual materials is strongly encouraged, and I'll provide some background orientation to the use of Powerpoint-style presentations.

4. ***Changing nature* case studies**. This is a group project, and the major assignment for the course. We will collectively build a website that will host a series of case studies that feature changing natures. You are responsible for identifying and researching in groups between 2 and 4 people (the

smaller the group, the more individual components will need to be tackled), the one that captures your imagination.

The project has **six parts**:[†] a code of cooperation, two individual assignments, a group report, web integration, and presentation.

Code of cooperation: Your group is to agree on and write a code of cooperation. Your team's code of cooperation should include all actions and items that you have all agreed to that will allow your team to successfully work together. Consider how you will arrange to meet, how you will approach the work involved for your project and, importantly, how you will deal with any conflict that arises or with members that are not abiding by the Code of Cooperation to which you have all agreed. You should consider how you will go about deciding who does what for the two individual assignments. Your code of cooperation should be approximately 1-3 pages double-spaced. This is teamwork. Each team needs to turn in only ONE hardcopy, and you should all sign the copy.

Individual assignment #1: Within each group, divide key components of your case study. Each person picks one of:
• geographic and ecological context;
• history of the site/case;
• interventions and adaptive management approaches;
• actors, governance and social dimensions;
• conditions that define its "changing nature;"
• likely future trajectory of the site/case.
Each person will write a well-researched and well-referenced short (700 words maximum; references are extra) paper that summarizes your focal aspect of the case. More detail about this assignment and what content to include will be provided in class. You will receive an individual grade for this assignment.

Individual assignment #2: Again each group will pick up components that were not tackled in Assignment #1, and write a well-researched and well-referenced short (700 words maximum; references are extra) paper that summarizes a focal aspect of the case. There will be some adaptation required at this stage in the process, and we will discuss in class. You will receive an individual grade for this assignment.

Group report: Your group report serves to synthesize the findings of your case study. This means piecing together the individual components members of your group have already written, editing them to be a coherent piece of writing, and synthesizing the key findings. Maps, photos, summary information common to all cases, and references are to be included at this stage. Your group will be expected to revise and integrate the individual pieces, based on feedback you will have received on these for your previous assignments. More detail will be provided in class about components to include in the group report. You will receive a group grade for this report (i.e., every group member will receive the same mark for this component). Maximum 3000 words, references are extra.

Web integration: Each team will be responsible to loading the entire case studies (final formatted version) along with summary data common to all projects, onto the website that will be developed for this purpose.

Presentation: During the last day of class, each group will present its case study and findings. The presentation will be in the format of an academic conference presentation. Each group will have

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[†] I am indebted to Dr. Natalie Ban for the general schematic of this assignment, which she uses to build case studies of social-ecological resilience.

10-15 minutes for the presentation (the time allocation will be finalized based on the total number of groups).

I anticipate very high quality submissions, and will work with select groups and individuals to see about publishing select cases in peer-reviewed academic journals.

Graduate student evaluation. For the changing natures case study project, you have two options:
- Option 1: Work individually on a case study project. This would be more work because you would need to do all aspects of the research yourself, but give you flexibility to pick your own case study (potentially related to your thesis).
- Option 2: Work in groups (a group of 3 or 5 may be necessary) to carry out in-depth case study research. Groups will likely contain graduate and undergraduate students, and you would be expected to provide guidance to undergraduates. Topics will be chosen from a list of possibilities, and based on student interest.

Course Policies

All the usual policies of the University of Victoria apply, some of which are shown below.

Grading scale
The following correlation of letter grade and numerical score will be used in the class. Final grades will be recorded as percentages.

Grades	Percentage	Description
A+ A A-	90 – 100 85 – 89 80 – 84	An A+, A, or A- is earned by work which is technically superior, shows mastery of the subject matter, and in the case of an A+ offers original insight and/or goes beyond course expectations. Normally achieved by a minority of students.
B+ B B-	77 – 79 73 – 76 70 – 72	A B+, B, or B- is earned by work that indicates a good comprehension of the course material, a good command of the skills needed to work with the course material, and the student's full engagement with the course requirements and activities. A B+ represents a more complex understanding and/or application of the course material. Normally achieved by the largest number of students.
C+ C	65 – 69 60 – 64	A C+ or C is earned by work that indicates an adequate comprehension of the course material and the skills needed to work with the course material and that indicates the student has met the basic requirements for completing assigned work and/or participating in class activities.
D	50 – 59	A D is earned by work that indicates minimal command of the course materials and/or minimal participation in class activities that is worthy of course credit toward the degree.
F	0 – 49	F is earned by work, which after the completion of course requirements, is inadequate and unworthy of course credit towards the degree.
N	0 – 49	Did not write examination or complete course requirements by the end of term or session; no supplemental.

Description of term paper grades:
"A" paper: An "A" paper displays a mastery of the topic and its theoretical context. It contains original thought and is written with no significant stylistic or grammatical errors. The argument is sound, substantive, organized; other points of view are introduced where appropriate, and sources are used

and cited appropriately. Exceptional, outstanding and excellent performance. Normally achieved by a minority of students. These grades indicate a student who is self-initiating, exceeds expectation and has an insightful grasp of the subject matter.

"B" paper: A "B" paper demonstrates familiarity with the topic, is well-written with no serious presentation or grammatical flaws. The argument is above-average in organization and analysis, it competently meets the objective of the assignment, but probably does not contain much original thought. Very good, good and solid performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area.

"C" paper: Writer has a reasonable grasp of the material and the paper is logically organized. The paper is descriptive rather than analytical and the ideas expressed are superficial and undeveloped. Some important themes may be overlooked. Satisfactory, or minimally satisfactory. These grades indicate a satisfactory performance and knowledge of the subject matter.

"D" paper: Writer has a familiarity but not an understanding of the subject. Paper is disorganized, lacks structure and ideas are undeveloped and superficial. There are serious grammatical and presentation flaws. Marginal Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.

Failing grades: Poor writing skills, grammar and spelling errors dominate. There is a lack of organization and the ideas are unrelated to the subject. Fails to meet the requirements of the assignment.

Course Evaluations
I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). The survey provides vital feedback to me regarding the course and my teaching, as well as helping the School improve the overall program for students in the future. When it is time for you to complete the survey you will receive an email inviting you to do so. Please ensure that your current email address is listed in MyPage (http://uvic.ca/mypage) . If you do not receive an email invitation, you can go directly to http://ces.uvic.ca. You will need to use your UVic netlink ID to access the survey, which can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please keep your ideas for constructive feedback in mind throughout the course.

Students with disabilities
Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the Resource Centre for Students with a Disability (RCSD) as soon as possible. The RCSD staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations http://rcsd.uvic.ca/. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.

NOTE: *The University of Victoria is committed to promoting, providing and protecting a positive and safe learning and working environment for all its members. Student evaluation forms now include questions on the respect shown by the instructor for students, particularly those of diverse origins, orientation and physical abilities.*

Plagiarism
Plagiarism is copying other peoples' words, illustrations, or innovations without giving credit or indicating that you are quoting someone else. This is not allowed at UVic. If you copy information or even ideas from a book, article, or from the internet, you must provide a full citation of the source, and

if you use exact words, you should use quotation marks and cite the page reference. Also, students are not allowed to submit a term paper written as an assignment for one course for credit on another course without permission of the instructor. Please be advised that in some circumstances the Turnitin system may be used to detect plagiarism (see: http://turnitinhelp.uvic.ca/guidelines/stuguidelines.php)

Academic integrity
Academic integrity is intellectual honesty and responsibility for academic work that you submit individual or group work. It involves commitment to the values of honesty, trust, and responsibility. It is expected that students will respect these ethical values in all activities related to learning, teaching, research, and service. Therefore, plagiarism and other acts against academic integrity are serious academic offences.

The responsibility of the institution
Instructors and academic units have the responsibility to ensure that standards of academic honesty are met. By doing so, the institution recognizes students for their hard work and assures them that other students do not have an unfair advantage through cheating on essays, exams, and projects.

The responsibility of the student
Plagiarism sometimes occurs due to a misunderstanding regarding the rules of academic integrity, but it is the responsibility of the student to know them. If you are unsure about the standards for citations or for referencing your sources, ask your instructor. Depending on the severity of the case, penalties include a warning, a failing grade, a record on the student's transcript, or a suspension.

It is your responsibility to understand the University's policy on academic integrity: http://web.uvic.ca/calendar2014-09/FACS/UnIn/UARe/PoAcI.html