Course Syllabus

Course Title: **Adaptive Management**  
Course Number: **NRM 694/ Biol 694/ ECON 694/ ANTH 694**  
**Class time:** Tu. Th. 9:45 – 11:15  
**Room:** 208 Irving 1  
**Web page:** All enrolled students will be signed on to a course Blackboard page.

**Course Instructors**

<table>
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<tr>
<th>Name</th>
<th>Department affiliation</th>
<th>Phone numbers</th>
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| Gary Kofinas | Natural Resource Management Department and Institute of Arctic Biology | O: 474-7078  
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**Prerequisites:** (A) Participation in Resilience and Adaptation Program with good standing, or (B) approval of instructional team based on potential to function effectively in a graduate-level interdisciplinary environment.

**Course Objectives:**

This course has two objectives:

1) Provide a foundational understanding of the theoretical and applied aspects of the adaptive management approach,

2) Develop skills for conducting single and comparative case study research to assess the dynamics and effectiveness of adaptive management systems.

**The Course:**

The outcome of contemporary issues related to sustainability is determined by the interaction of multiple user and societal goals and values, legal mandates, resource production capabilities, impacts to and condition of ecosystems, cultural perspectives on risk, and direct and indirect costs and benefits. In many situations, a decision must be made. Even the inability to select and implement a particular decision amounts to a default decision to accept certain consequences.

Because of the controversial nature of decisions and the complexity of systems ever changing and integrating complex social and biological elements, inputs from many foundational areas must be integrated if
decisions are to be efficient and gain an adequate level of acceptance that will allow for implementation.

Adaptive management is a new approach or framework developed for dealing with decision making in complex systems. Adaptive Management strives towards intentional learning by comparing the outcomes of past decisions to previously predicted outcomes or goals and desires, followed by systematic analysis of that experience in order to improve current and future decision making. The adaptive management approach attempts to build a holistic accounting of the inherent dynamics of ecosystems, changing markets, and evolving public conceptions and values. Consequently, adaptive management suggests the need to apply the principles of scientific experimentation, while focusing on institutional drivers of decision making, culture and history, underlying management assumptions, and the practical implications of uncertainty. Adaptive management also requires the consideration at several scales of space and time to address problems in a comprehensive manner...

Today we find agency managers, NGOs, academics, and members of the public espousing the need for "Adaptive Management Systems" on the local, regional, and large-scales. What do we make of this call? Is it the flavor of the day? Or is it a novel approach including important elements that are critical for meeting today’s sustainability challenges? As we think you will find through our study, adaptive management approach is more easily understood as idealized approach; implementation of the adaptive management approach presents as many challenges as it does opportunities. Yet, we believe that the assemblage of ideas represented in an "adaptive management approach" is of value in building resilience and working towards sustainability.

This course is an exploration of the theoretical dimensions of adaptive management and its practical applications as related to achieving sustainable social, economic, and ecological systems. Here we survey a broad set of conceptual foundations for professional-level decision-making, using the case-study method to ground our analysis and develop a better understanding of its potential and overall conditions for success.

Curriculum / Course Topics
The presentation of principles and theory of adaptive management is interspersed with case study accounts and in-class discussions with decision makers who provide first-person accounts of management situations in action. Students work as individuals and in teams to undertake in depth case studies with relevance to elements of adaptive management. Collectively, the class builds a portfolio of case studies that are used for a final overview analysis. Topics to be addressed include:
Methods and diagnostic tools for conducting single and multiple case study analysis
- The history, paradigms, cultures of resource and environmental management.
- Perspectives on knowledge from philosophy of science.
- Problems and opportunities in integrating local knowledge and science in management.
- Method of accounting for uncertainty in decision making.
- Applying experimental methods in management decisions.
- Organizational and institutional dimensions of adaptive management.
- Processes of Social learning.
- Collective Action and Collaboration Theory.
- Self-organizing and self regulating systems.
- Limitations to Cost/Benefit Analysis.
- Alternatives to Risk Analysis.
- The interface of science and politics in adaptive management.
- Environmental Impact Assessment as a decision tool.
- Public participation in public decision making.
- Ecological monitoring in Adaptive Management.
- Intro to linking monitoring, models, and policy making for management of dynamic systems.
- Chaos Theory, reductionism, and emergence.
- Elements of successful Adaptive Management systems.

Examples of cases we hope draw on in our study of adaptive management and sustainability decision making.

- Northwest Forest Old Growth and the spotted owl?
- Columbia River restoration and management?
- Learning sobriety in small indigenous communities.
- North Slope Hydrocarbon Development science initiative.
- The Challenger and Columbia accidents.
- The North Pacific Fisheries Management Council.
- Co-Management of Small-Scale Fisheries in Chile.
- Long-term Everglades Ecosystem Management.
- Mega-scale development projects in the Third World.
- Intensive Caribou Management in Yukon.

Grading Policy: The final case study presentation will be evaluated as a team product, with team members noting individuals' respective contributions.

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<tr>
<td>25</td>
<td>Mid-term</td>
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<td>20</td>
<td>4 mini case study papers/reflection papers</td>
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<tr>
<td>55</td>
<td>Individually completed case study</td>
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<td>55</td>
<td>Written Final Group Case Study</td>
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<tr>
<th>Points</th>
<th>Description</th>
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<tbody>
<tr>
<td>20</td>
<td>Group Oral presentation of Final Case Study</td>
</tr>
<tr>
<td>35</td>
<td>Class preparation and participation</td>
</tr>
<tr>
<td>200</td>
<td>Total points awarded</td>
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NOTE: This syllabus is a work in progress and subject to change by instructors, after discussion with the class.

**Selected Readings from:**


(and select journal articles TBA).

Electronic course reader will be posted at the beginning of the semester.
Notes on conducting Individual and Group Case Study Research:

Case study research represents an important part of our course curriculum. Students will work as individuals and in teams to identify and undertake an in-depth case study analysis that focuses on the adaptive and or maladaptive qualities of a decision making. Teams will be selected by instructors and will be heterogeneous (i.e. interdisciplinary) in composition. Case study analyses will be undertaken in the following steps:

1. Identification of the case study: Each team is to conduct background research and identify an appropriate case study, worthy of research. The criteria for case selection should include:
   - Merit of the case study to illustrate adaptive or maladaptive aspects of decision making.
   - Availability of resources (documentation and resource people) to provide necessary background information for the research.
   - Appropriateness of focus and scope to make the analysis manageable.

   Once the case is selected, each team writes a two to three page proposal justifying the selection of a topic and indicating the group’s proposed division of labor. The team will also outline criteria it will use to evaluate individual team members' contribution. Each team prospectus needs to be approved by the course instructors. Each team will be assigned a faculty advisor, with other course instructors serving as support to meet the needs of the group.

2. Overview Brief: After an initial review of case study resources, each team will present a briefing on facts of the case and what it identifies as relevant problem areas. Briefs will be presented in written and oral form to the class, allowing time for feedback from other teams and faculty.

3. Research: Student teams will undertake their respective case study research, and produce an in-depth research paper. The analyses should consider the following basic questions:
   - What happened?
   - What are the issues?
   - Functional or dysfunctional, and why?
   - Why are they happening? Not clear. I take it to refer to the causes of function/ dysfunction; and that’s above.
   - What needs to change?
   - How do you change them

Papers should relate theory to interpretation and should make recommendations by commenting both on the decision making process as well as the utility of theory in explaining the practice of adaptive management. Paper length should be no more than 30 pages in text length (double spaced/10 point Arial), plus figures and tables, and bibliography with proper citations. Papers should also be tailored to allow for submission to a special issue of Conservation Ecology journal, focusing on challenges of adaptive management in Alaska.

4. Colloquium: Presentations of case study analyses will be made at a special Adaptive Management colloquium to be scheduled during class time at the end of the semester for students, faculty, and an invited management professionals.

   Presentations should be 20 minutes in length with 10 minutes for q and a.

(Additional instructions of the case study analysis will follow)
Our first goal is to get a better handle on the concepts of “adaptation” and “management.” We ask that you explore these concepts through a review of available literature. You are free to draw on the theory presented in “Panarchy” as one source, but we would like you to go beyond the thinking of Gunderson and Holling to understand how these words have been applied by other thinkers and practitioners. We encourage you to go beyond simple definitions, and look at their historical evolution, some of the debates related to their uses, and their various dimensions. We ask that you write an essay, no more than five pages (1250 words) max. Submit your essay to the Blackboard Drop box before Tuesday 9:45 AM. Bring your essay to class and come prepared to talk about your discoveries. Remember that we are not interested in the more contemporary idea of “adaptive management” at this point, but ask that you focus on the two concepts independently: “adaptation” and “management.”