Instructor: Peter Bates
341 Stillwell
227-3914
bates@email.wcu.edu

Office hours: 11:00 to 12:00 Monday
3:30 to 4:45 Tuesday
or by appointment

Meeting place and times:
Lecture: Tuesday and Thursday 11:00 to 12:15 in ST 143

Course Overview:
The conservation and management of natural resources is a wide-ranging and complex discipline. This course will provide students with a basic introduction to conserving and sustaining some of our more important natural resources. This will be accomplished through textbook readings, class lectures, and other supplemental information. We will use case studies and various in-class activities to apply a subset of these issues in more detail, and to hone students' critical thinking skills.

As a liberal studies course in the physical sciences, it is expected that students will increase their proficiency and gain experience in a number of areas, including the following:
  • critical thinking, reading and writing
  • applying scholarly information and methods to understand complex issues
  • defining and solving problems involving the character of dynamic systems
  • reading and using published information
  • oral communication
  • integrating concepts from diverse academic disciplines
  • working collaboratively with others

Restating some of the points listed above, it is hoped that students will improve their ability to (1) develop arguments based on logic as opposed to emotion, (2) understand the use scientific study to appreciate the tentative character of scientific conclusions; and that repeated experimental testing is needed in order to confirm assertions or reject hypotheses, (3) support positions with arguments that are rational and defensible, and (4) clearly express their point of view in both oral and written formats.

Required Text:
Evaluation:

<table>
<thead>
<tr>
<th>Evaluation Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm exams (Feb. 22 and Apr. 12)</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam (Tuesday, May 1: 12:00-2:30)</td>
<td>15%</td>
</tr>
<tr>
<td>Class assignments and quizzes</td>
<td>30%</td>
</tr>
<tr>
<td>Citizenship and class participation</td>
<td>5%</td>
</tr>
<tr>
<td>Case studies</td>
<td>30%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

For all practical purposes, the following final percentages will guarantee the corresponding grades: \( > 93 = A, > 90 = A-, > 87 = B+, > 83 = B, > 80 = B- \), etc.

**Exams** will concentrate on material covered since the previous exam, though students will be responsible for major concepts presented earlier. **The final exam will be comprehensive.** Exams will consist primarily of short answer and essay questions that are designed to evaluate your understanding of the material presented. In many cases you will be asked to assimilate and apply the material covered during class – not just regurgitate random facts. Make-up exams will only be given under extreme circumstances for documented absences accepted by the instructor. Students will be responsible for materials covered during lectures and labs and for assigned readings.

**Case studies** are designed to let students apply specific concepts of natural resources conservation and management to real world situations. Students will work in groups to collect, synthesize, and interpret scientific data in order to develop specific resource management strategies. Students will prepare both written and oral summaries of their work.

**Class assignments and quizzes** will be assigned at various points during the semester. These assignments will come in a wide variety of forms, and in most cases they will be un-announced. Students who are not present for in-class assignments will receive a 0 for those assignments. Students who are not present when take-home assignments are made are responsible for getting those assignments and completing them on time.

**General class guidelines:**

- **Attendance:** This is important. Poor attendance will guarantee a low or failing grade in the class. Remember, students who are not present for in-class assignments will receive a 0 for those assignments. There are no exceptions.

- **Classroom environment:** It is expected that students will be respectful and courteous to others at all times. This behavior includes listening when others are talking, respecting the opinions of others, and avoiding language and physical gestures that might be viewed as offensive.

- **Late work policy:** Late assignments will not be accepted. If you will miss class on a day that an assignment is due, either turn the assignment in early, arrange for another student to turn it in for you, or email it to me **by the due date and time** as an appropriate MS Office attachment (i.e., a Word document).

- **Cell phones:** Keep them turned off.

- **Writing format:** All written assignments prepared outside of class must be generated on a
word processor with 1-inch margins, double spaced, and a 12-point font that is easy to read.

- **Writing assistance**: There will be a lot of writing in this class. I encourage you to utilize the resources available at the Writing Center. For more information, see their website at: [http://www.wcu.edu/WritingCenter/](http://www.wcu.edu/WritingCenter/)

- **Academic dishonesty**: It is your responsibility as a student at this university to understand the policies and consequences associated with academic integrity and dishonesty. These are spelled out in the Student Handbook, available online at [http://www.wcu.edu/univcenter/handbook/index.html](http://www.wcu.edu/univcenter/handbook/index.html)

- **Students with disabilities**: Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234; E-mail: kmarcus@email.wcu.edu.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic</th>
<th>Reading in text</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 8</td>
<td>Introductions: People and the course</td>
<td></td>
</tr>
<tr>
<td>Jan 15</td>
<td>History of natural resource conservation and management</td>
<td>Ch. 1</td>
</tr>
<tr>
<td>Jan 22</td>
<td>Populations, economics, and ethics</td>
<td>Ch 2, 4</td>
</tr>
<tr>
<td>Jan 29</td>
<td>Wetlands and riparian areas</td>
<td>Ch. 9</td>
</tr>
<tr>
<td>Feb 5</td>
<td>The water cycle</td>
<td>Ch. 10, 11</td>
</tr>
<tr>
<td>Feb 12</td>
<td>Case Study #1</td>
<td></td>
</tr>
<tr>
<td>Feb 19</td>
<td>Water pollution (cont.)</td>
<td></td>
</tr>
<tr>
<td>Feb 26</td>
<td>Soil Resource</td>
<td>Ch. 6</td>
</tr>
<tr>
<td>Mar 5</td>
<td>SPRING BREAK</td>
<td></td>
</tr>
<tr>
<td>Mar 12</td>
<td>Soil erosion</td>
<td>Ch 7</td>
</tr>
<tr>
<td>Mar 19</td>
<td>Forest ecology and forest resources</td>
<td>Ch. 14</td>
</tr>
<tr>
<td>Mar 26</td>
<td>Forest resources (cont.)</td>
<td></td>
</tr>
<tr>
<td>Apr 2</td>
<td>Case study #2</td>
<td></td>
</tr>
<tr>
<td>Apr 9</td>
<td>Forest resources and wildlife</td>
<td>Ch. 16</td>
</tr>
<tr>
<td>Apr 16</td>
<td>Global and large-scale threats</td>
<td>Ch. 18, 19</td>
</tr>
<tr>
<td></td>
<td>Climate change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Air pollution</td>
<td></td>
</tr>
<tr>
<td>Apr 23</td>
<td>Course wrap up and review</td>
<td></td>
</tr>
</tbody>
</table>
I. Rationale/Purpose
Students will develop a basic understanding of natural resources, and will investigate relationships between those resources and society while exploring issues related to their management.

II. Course Aims and Objectives:
- The aim of this course is to introduce students to topics related to natural resource conservation and management. Understanding the natural resources through history, economics, water, forest, ecology, wildlife, etc. By the end of this course, the student will:
  - Demonstrate the ability to locate, analyze, synthesize, and evaluate natural resource information.
  - Demonstrate the ability to interpret and use numerical, written, oral and visual data;
  - Demonstrate the ability to read with comprehension, and to write and speak clearly, coherently, and effectively as well as to adapt modes of communication appropriate to an audience.

III. Course Materials
Course readings:
IV. Faculty Expectations of Students/Course Policies

- Statement on Accommodations for students with disabilities:
  
  Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Carol Mellen for more information. Phone: (828) 227-7127; E-mail: mellen@email.wcu.edu.

- Statement on Academic Integrity (including plagiarism):
  
  **Academic Honesty Policy**
  Western Carolina University, as a community of scholarship, is also a community of honor. Faculty, staff, administrators, and students work together to achieve the highest standards of honesty and integrity. Academic dishonesty is a serious offense at Western Carolina University because it threatens the quality of scholarship and defrauds those who depend on knowledge and integrity.
  Academic dishonesty includes:
  a. **Cheating**—Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
  b. **Fabrication**—Intentional falsification of information or citation in an academic exercise.
  c. **Plagiarism**—Intentionally or knowingly representing the words or ideas of someone else as one’s own in an academic exercise.
  d. **Facilitation of Academic Dishonesty**—Intentionally or knowingly helping or attempting to help someone else to commit an act of academic dishonesty, such as knowingly allowing another to copy information during an examination or other academic exercise.
  
  The procedures for cases involving allegations of academic dishonesty are:
  1. Instructors have the right to determine the appropriate sanction or sanctions for academic dishonesty within their courses up to and including a final grade of “F” in the course. Within 5 calendar days of the event the instructor will inform his/her department head, and the Associate Dean of the Graduate School when the student is a graduate student, in writing of the academic dishonesty charge and sanction.

  [http://www.wcu.edu/UnivCatalog/Catalog/acadreg/acadreg.htm#AHP](http://www.wcu.edu/UnivCatalog/Catalog/acadreg/acadreg.htm#AHP)

- Attendance Policy: As with many of your courses, the content in this course is cumulative so constant lateness or absence will significantly impact your knowledge and subsequently, your grade. Please inform me (the instructor) if there are extenuating circumstances that cause you to be absent from class.

- Guidelines for classroom behavior: no use of cell phones during class time. You will need a calculator (not a cell phone) periodically through the term including for some quizzes.

V. Grading Procedures:

<table>
<thead>
<tr>
<th>Percentage of Grade</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercises/Assignments</td>
<td>30% To develop skills and apply theoretical knowledge on the subject of environmental geography</td>
</tr>
<tr>
<td>Group Project</td>
<td>10% To interpret course information, to communicate that knowledge in an oral presentation + written report</td>
</tr>
<tr>
<td>Quizzes</td>
<td>60% To retain theory and show a more in-depth understanding of environmental geography</td>
</tr>
<tr>
<td>Attendance</td>
<td>5% To value your participation in the class and show</td>
</tr>
</tbody>
</table>

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Exercises
Although most exercises will be conducted in the classroom, occasionally we will meet elsewhere (see syllabus) to complete assignments.

Group Project
There will be a sign-up sheet passed around in class after the first week of classes on various topics related to natural resources (e.g., economics, world population, water, coastal environments, forest, ecology, soils, wildlife). Presentations will occur throughout the term so you can choose topics that both interest you and be timed to adapt to other class work. In the past presentations, students have designed Jeopardy-style games, conducted water tasting tests, taken the class outside to study campus trees, built models to show water erosion on different soils, etc. Group size is 3 individuals. In addition to giving a presentation, your group will also hand in a report on the same day. The report is the group’s opportunity to show how information was (a) organized, (b) synthesized, (c) incorporated from various sources, (d) and presented professionally.

Quizzes
There will be three quizzes throughout the term plus your final exam – each worth 15%.

Letter grades will be assigned according to the following:

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-100</td>
<td>A</td>
</tr>
<tr>
<td>90-92</td>
<td>A-</td>
</tr>
<tr>
<td>86-89</td>
<td>B+</td>
</tr>
<tr>
<td>83-85</td>
<td>B</td>
</tr>
<tr>
<td>80-82</td>
<td>B-</td>
</tr>
<tr>
<td>76-79</td>
<td>C+</td>
</tr>
<tr>
<td>73-75</td>
<td>C</td>
</tr>
<tr>
<td>70-72</td>
<td>C-</td>
</tr>
<tr>
<td>63-69</td>
<td>D+</td>
</tr>
<tr>
<td>56-62</td>
<td>D</td>
</tr>
<tr>
<td>50-55</td>
<td>D-</td>
</tr>
<tr>
<td>50 and below</td>
<td>F</td>
</tr>
</tbody>
</table>

VIII. Tentative Course Schedule
*May change to accommodate guest lectures & student needs.*

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tues, Aug 21</td>
<td>Introduction, Syllabus</td>
<td></td>
</tr>
<tr>
<td>2 Thurs, Aug 23</td>
<td>History of Conservation</td>
<td>Chapter 1</td>
</tr>
<tr>
<td></td>
<td>Hand out Assignment #1</td>
<td></td>
</tr>
<tr>
<td>3 Tues, Aug 28</td>
<td>Economics &amp; Ethics</td>
<td>Chapter 2</td>
</tr>
<tr>
<td>4 Thurs, Aug 30</td>
<td>In-class Writing Exercise (Science Essay)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Assignment #1 Due</td>
<td></td>
</tr>
<tr>
<td>5 Tues, Sept 4</td>
<td>World Populations</td>
<td></td>
</tr>
<tr>
<td>6 Thurs, Sept 6</td>
<td>Quiz #1 (15%)</td>
<td></td>
</tr>
<tr>
<td>7 Tues, Sept 11</td>
<td>Student Presentations: Economics &amp; Ethics</td>
<td></td>
</tr>
<tr>
<td>8 Thurs, Sept 13</td>
<td>Water Resources (Film)</td>
<td></td>
</tr>
<tr>
<td>9 Tues, Sept 18</td>
<td>Water Resources</td>
<td>Chapter 10</td>
</tr>
<tr>
<td>10 Thurs, Sept 20</td>
<td>Water Resources</td>
<td></td>
</tr>
<tr>
<td>11 Tues, Sept 25</td>
<td>Student Presentations: Water Resources</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Hand out Assignment #2</td>
<td></td>
</tr>
</tbody>
</table>

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12 Thurs, Sept 27  Forest Management  Chapter 14
13 Tues, Oct 2  Forest Management

**Assignment #2 Due**

14 Thurs, Oct 4  Student Presentations: Forest Management
15 Tues, Oct 9  **Quiz #2 (15%)**
   Thurs, Oct 11  FALL BREAK-NO CLASSES
16 Tues, Oct 16  Ecology  Chapter 3
17 Thurs, Oct 18  Ecology
18 Tues, Oct 23  ADVISING DAY-NO CLASSES
19 Thurs, Oct 25  Student Presentations: Ecology
   Hand out Assignment #3

20 Tues, Oct 30  Wildlife  Chapter 16
21 Thurs, Nov 1  Wildlife
22 Tues, Nov 6  Student Presentations: Wildlife
23 Thurs, Nov 8  **Quiz #3 (15%)**
24 Tues, Nov 13  Soils  Chapter 6
25 Thurs, Nov 15  Soils
26 Tues, Nov 20  Student Presentations: Soils
   Thurs, Nov 22  THANKSGIVING
27 Tues, Nov 27  Extinction  Chapter 15
28 Thurs, Nov 29  Extinction
29 Tues, Dec 4  Student Presentations: Extinctions
30 Thurs, Dec 6  Review for Final

<table>
<thead>
<tr>
<th>Final Semester Examinations</th>
<th>Saturday-Friday</th>
<th>December 8-14</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Final Exam 15%</strong></td>
<td><strong>Wednesday 12-2:30 pm</strong></td>
<td><strong>December 12</strong></td>
</tr>
</tbody>
</table>
I. Purpose

Students will develop a basic understanding of natural resource conservation, and will investigate relationships between those resources and society and issues related to their management.

II. Course Objectives:

In addition to increased knowledge of natural resource management concepts students will be able to apply critical thinking skills to the understanding of ecologic, economic, and ethical aspects of natural resource management and conservation.

This course is a Liberal Studies course. The learning goals of the Liberal Studies Program are for students to:

- Demonstrate the ability to locate, analyze, synthesize, and evaluate information;
- Demonstrate the ability to interpret and use numerical, written, oral and visual data;
- Demonstrate the ability to read with comprehension, and to write and speak clearly, coherently, and effectively as well as to adapt modes of communication appropriate to an audience;
- Demonstrate the ability to critically analyze arguments; demonstrate the ability to recognize behaviors and define choices that affect lifelong well-being;
- Demonstrate an understanding of
  - Past human experiences and ability to relate them to the present;
  - Different contemporary cultures and their interrelationships;
  - Issues involving social institutions, interpersonal and group dynamics, human development and behavior, and cultural diversity; scientific concepts and methods as well as contemporary issues in science and technology;
  - Cultural heritage through its expressions of wisdom, literature and art and their roles in the process of self and social understanding.

This course partially satisfies the C5 science requirement of the WCU liberal studies program and contains a laboratory component. In the physical sciences, students will
• Be directed toward the definition and solution of problems involving the character of matter, energy, motion, or mechanical/dynamic systems;

• Use scientific study to appreciate the tentative character of scientific conclusions: repeated experimental testing is needed in order to confirm assertions, and revision (even rejection) of hypotheses is allowed.

III. Course Materials


• Other readings will be provided as needed.

IV. Expectations of Students/Course Policies (Amendments will be announced in class)

• Attend and be engaged in class. Attendance is not mandatory but some activities will be completed in class and so excessive absences will impact your grade.

• Complete assignments on time. Late work will be penalized 20% of the total points possible for each day late. After $5$ days the assignment will receive a grade of zero.

• Exams, in class-exercises and quizzes are not available for make up. If you MUST miss an exam make arrangements ahead of time to take it early.

• Be COURTEOUS to other students AND the instructor. This includes but IS NOT LIMITED TO getting to class on time, avoid excessive talking, keeping cell phone OFF etc. Put simply, avoid things that interfere with my teaching or student learning.

• Academic Integrity: You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own and reference all citations. See the University Writing Center website for information regarding plagiarism. Failure to comply with the University policy on academic integrity can result in a zero for the specific assignment, a failing grade for the course, University disciplinary action or any combination thereof.

What you should expect from me:

• I am readily available to answer questions and help with assignments. I have office hours but feel free to stop by at any time or call/email to set up an appointment. NOTE: Talk to me as soon as you are having problems or questions. If you wait until the day before something is due or the end of the semester to ask for help there will be little I can do for you.

• I will strive to get your graded work back to you in a timely fashion. Handing assignments in ON TIME and in a presentable fashion will help with this tremendously.

• Expectations (i.e. such as what you need to “know” for a test or quiz) are clear. Grading and course policies are implemented fairly.
Class Environment: It is likely some issues we cover in this class will be controversial. I encourage respectful disagreement and debate. Keep an open mind and resist the urge to immediately dismiss a view with which you disagree. This class is a forum where we can have open discussion and where everyone has the opportunity to participate and feels comfortable participating. Everyone should be polite and tolerant of divergent viewpoints. Please listen and do not talk when others are talking. Be respectful of your fellow students and me.

Writing Assistance: The Writing Center which is located on the first floor of Hunter Library assists students with papers and written assignments. See their website for additional information at www.wcu.edu/WritingCenter

Individuals with Disabilities Statement: Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234; Email:kmarcus@email.wcu.edu.

V. Grading Procedures: With the exception of some in class exercises used for discussions, all work will be graded and returned to you. Assignments will be designed to provide a variety of approaches to learning.

<table>
<thead>
<tr>
<th>Percentage of Grade</th>
<th>Hourly Exams (3)</th>
<th>Class Project</th>
<th>Quizzes &amp; Assignments</th>
<th>Final Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>45</td>
<td>20</td>
<td>20</td>
<td>15</td>
</tr>
</tbody>
</table>

Grading Scale: Grades will be assigned according to the scale shown below.

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Letter grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-100</td>
<td>A</td>
</tr>
<tr>
<td>90 - 92</td>
<td>A-</td>
</tr>
<tr>
<td>87 - 89</td>
<td>B+</td>
</tr>
<tr>
<td>83 - 86</td>
<td>B</td>
</tr>
<tr>
<td>80 - 82</td>
<td>B-</td>
</tr>
<tr>
<td>77 - 79</td>
<td>C+</td>
</tr>
<tr>
<td>73 - 76</td>
<td>C</td>
</tr>
<tr>
<td>70 - 72</td>
<td>C-</td>
</tr>
<tr>
<td>67 - 69</td>
<td>D+</td>
</tr>
<tr>
<td>63 - 66</td>
<td>D</td>
</tr>
<tr>
<td>60 - 62</td>
<td>D-</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
</tr>
</tbody>
</table>

➢ NOTE: I do not disclose/discuss grade information by email or phone so if you need to discuss your grade please see me in person.
VI. **Tentative** Course Schedule

<table>
<thead>
<tr>
<th>Week/Topic</th>
<th>Reading</th>
<th>Comments/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 20–24</td>
<td><strong>PART I: Introduction to NRM</strong></td>
<td></td>
</tr>
<tr>
<td>August 27–31</td>
<td>Chapter 1–4</td>
<td></td>
</tr>
<tr>
<td>Sept 3–7</td>
<td>Chapter 1–4</td>
<td>September 3: Labor Day—no class</td>
</tr>
<tr>
<td>Sept 10–14</td>
<td>Chapter 1–4</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>PART II—The Physical Environment</strong></td>
<td></td>
</tr>
<tr>
<td>Sept 17–21</td>
<td>Chapter 6-7 Soils and Agriculture</td>
<td></td>
</tr>
<tr>
<td>Sept 24–28</td>
<td>Chapter 9-11 Water Resources</td>
<td></td>
</tr>
<tr>
<td>Oct 1–5</td>
<td>Chapter 9-11 Water Resources</td>
<td></td>
</tr>
<tr>
<td>Oct. 15–19</td>
<td></td>
<td>FALL BREAK October 11-15.</td>
</tr>
<tr>
<td>Oct. 22–26</td>
<td><strong>PART III: The Living Environment</strong></td>
<td>Test 2 Friday Oct 19</td>
</tr>
<tr>
<td>Oct. 29–Nov 2</td>
<td>Chapters 12-16</td>
<td></td>
</tr>
<tr>
<td>Nov 5–9</td>
<td>Chapters 12-16</td>
<td></td>
</tr>
<tr>
<td>Nov 12–16</td>
<td>Chapters 12-16</td>
<td>Test 3 12-16 November 16</td>
</tr>
<tr>
<td>Nov. 19–23</td>
<td><strong>Part IV: Problems and Solutions</strong></td>
<td>Nov. 21–25 Thanksgiving Holiday.</td>
</tr>
<tr>
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</tr>
<tr>
<td>Nov. 26–30</td>
<td>Chapter 21, 22 and supplemental</td>
<td></td>
</tr>
<tr>
<td>Dec. 3–7</td>
<td></td>
<td>Last week of regular classes</td>
</tr>
<tr>
<td>Dec. 10–14</td>
<td>Final Exam: Tuesday Dec. 11 at 8:30 am</td>
<td>FINALS WEEK</td>
</tr>
</tbody>
</table>
Professor: Dr. Laura E. DeWald

Contact Information:
Office: 240 Stillwell  Phone: 227-2478  E-mail: ldewald@wcu.edu
Office Hours:  T 11:00-1: pm, Th 11:00 - 12:00 or by appointment.

Course Description
The conservation and management of natural resources is a complex task. In this course, students will develop a basic understanding of natural resource conservation and management, and we will investigate relationships role society plays in this process. We will examine ecologic, economic, government and governance, legal, ethical, and cultural aspects of natural resource conservation and management through a mixture of discussions, group activities, case studies, readings, and research.

Learning Outcomes
Using in-class work, homework assignments and examinations, students will practice:
- critical thinking, reading and writing, and oral communication;
- applying scholarly information and methods to understand complex issues;
- reading and using published information, and integrating concepts;
- teamwork involved with solving natural resource problems

Students will gain knowledge about strategies that may facilitate a more sustainable relationship between humanity and the (rest of the) natural world
Students will have increased understanding of how natural resource issues are related to each other as well as to other complex social issues and forces
Students will gain an understanding of the motivation and history involved in natural resources conservation and management

This course is a Liberal Studies course. The learning goals of the Liberal Studies Program are for students to demonstrate:
- the ability to locate, analyze, synthesize, and evaluate information;
- the ability to interpret and use numerical, written, oral and visual data;
- the ability to read with comprehension, and to write and speak clearly, coherently, and effectively as well as to adapt modes of communication appropriate to an audience;
- the ability to critically analyze arguments; demonstrate the ability to recognize behaviors and define choices that affect lifelong well-being;
- an understanding of:
  - Past human experiences and ability to relate them to the present:
  - Different contemporary cultures and their interrelationships;
  - Issues involving social institutions, interpersonal and group dynamics, human development and behavior, and cultural diversity; scientific concepts and methods as well as contemporary issues in science and technology;
  - Cultural heritage through its expressions of wisdom, literature and art and their roles in the process of self and social understanding.

This course partially satisfies the C5 science requirement of the WCU liberal studies program and contains a laboratory component. In the physical sciences, students will
- Be directed toward the definition and solution of problems involving the character of matter, energy, motion, or mechanical/dynamic systems;
- Use scientific study to appreciate the tentative character of scientific conclusions: repeated experimental testing is needed in order to confirm assertions, and revision (even rejection) of hypotheses is allowed. Laboratory work will be central to theoretical discussions as an experience in the character of scientific work, and will provide an opportunity to experience the environment in which scientific study is conducted.

Expectations
I will:
- present useful information in an understandable format
create assignments that help you synthesize information
return assignments in a timely fashion
be fair to all students

I expect you to:
attend and come to class prepared to be actively involved in what is going on each day
work to your potential
live up to the academic honesty policy in the student handbook
take an active role in your education: asking questions, studying, completing assignments, and
taking responsibility for your performance

Required Text

Assessment of Learning Outcomes

- **Attendance** - In this class as in most, your performance (i.e., your grade) is positively related to attendance. The learning outcomes listed above can not be achieved unless you are in class. Although attendance is not mandatory, graded in-class assignments are turned in nearly every class period so absences will significantly lower your grade.

- **Writing Assignments** - There will be a number of writing assignments based on readings, current events, discussions, etc. These assignments will help you achieve each of the learning outcomes listed above. This is a writing-intensive course and those of you who seek assistance from the Writing Center will end up with higher grades than those who do not.

- **In-Class Work** - Natural resource conservation and management challenges can not be solved if we only work as individuals. Therefore, there will be a number of in-class group assignments related to the course material to help achieve learning outcomes related to team-work. This in-class work counts toward your participation grade and, therefore, can not be made up!

- **Being a Responsible Citizen** - You will volunteer for a minimum of four hours or attend a public meeting of your choosing but your choice must be related to natural resources conservation and management. Your grade is based on a two-page summary of your experience. You must obtain prior approval from your instructor before you do this assignment.

- **Research Paper** - You will write a five-page research paper on an exotic species or an endangered species. A grading rubric will be handed out in class.

- **Exams** - Exams will assess your understanding and ability to apply your knowledge to natural resource conservation and management challenges. Students who have additional exams on the same date as an exam in this course may take the NRM140 exam early by prior arrangement. Students who miss exams will receive a zero (0) for the exam.

**Final grade**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
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<tbody>
<tr>
<td>Writing Assignments: 4 @ 20 points each</td>
<td>80</td>
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<tr>
<td>In-Class Assignments</td>
<td>100</td>
</tr>
<tr>
<td>Responsible Citizen Assignment</td>
<td>20</td>
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<tr>
<td>Research Paper</td>
<td>50</td>
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<tr>
<td>Exams: 3 @ 50 points each</td>
<td>150</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
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</tbody>
</table>

A = 93-100%, A- = 90-92%, B+ = 87-89%, B = 83-86%, B- = 80-82%, C+ = 77-79%,
C = 73-76%, C- = 70-72%, D+ = 67-69%, D = 63-66%, D- = 60-62%, F = below 60%.

**Late Work Policy**

I do not accept late assignments because it is unfair to your classmates who turn in assignments on time. If you will not be able to attend class on a day an assignment is due, you can submit the
assignment early or submit it by class time on the date it is due as an MS Word attachment via email. All writing assignments must be typed, double-spaced, and in 12pt font. Please proof read your work.

**Class Environment**

It is likely some issues we cover in this class will be controversial. I encourage respectful disagreement and debate. Listening to different opinions is one of the best ways to learn. Keep an open mind and resist the urge to immediately dismiss a view with which you disagree. This class is a forum where we can have open discussion and where everyone has the opportunity to participate and feels comfortable participating. Everyone should be polite and tolerant of divergent viewpoints. Please listen and do not talk when others are talking. Be respectful of your fellow students and me.

**Writing Assistance**

The Writing Center which is located on the first floor of Hunter Library assists students with papers and written assignments. See their website for additional information at www.wcu.edu/WritingCenter I strongly encourage you to take a rough draft of each writing assignment to the Writing Center so they can help you improve your work!! A 10% bonus will be awarded to students who visit the writing center and revise their writing assignment prior to the due-date.

**Academic Integrity**

You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own and reference all citations. See the University Writing Center website for information regarding plagiarism. Failure to comply with University policies may result in a zero for the assignment, failure of the course, disciplinary action at the University level, or any combination of the three.

**Accommodations for Students with Disabilities**

Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234; E-mail: kmarcus@email.wcu.edu.

**Cell Phone Policy**

Cell phones must be turned completely OFF during class. If it rings, I get to answer your phone for you!
<table>
<thead>
<tr>
<th>Day</th>
<th>Month</th>
<th>Date</th>
<th>Topic</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>T</td>
<td>Jan.</td>
<td>9</td>
<td>Sustainability</td>
<td>Easter Island, Chapter 1</td>
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<td>16</td>
<td>Species Extinctions</td>
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<td>Biodiversity Conservation</td>
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<td>23</td>
<td>Soil Resources</td>
<td>Writing Assignment #1 DUE</td>
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<td>30</td>
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<td>Chapters 6 and 7</td>
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<td>Wildlife Ecology and</td>
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<td>T</td>
<td></td>
<td>13</td>
<td>Habitat Management</td>
<td>Chapter 16 and Handouts</td>
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<td>20</td>
<td>Rangeland Resources</td>
<td>Writing Assignment #2 DUE</td>
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<td>27</td>
<td></td>
<td>Videos: New Range Wars</td>
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<td>Th</td>
<td>March</td>
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<td>And Western Ranching</td>
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<tr>
<td>T-TH</td>
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<td>6-8</td>
<td>Spring Break – No Class</td>
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<td>13</td>
<td>Rangeland Resources</td>
<td>Writing Assignment #3 DUE</td>
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<td>Th</td>
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<td>15</td>
<td></td>
<td>Exam #2</td>
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<td>20</td>
<td>Fisheries and Water Resources</td>
<td>Chapters 10, 12 and Handouts</td>
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<td>April</td>
<td>3</td>
<td>Forest Resources</td>
<td>Easter Holiday – No Class</td>
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<td>T</td>
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<td>10</td>
<td>Forest Resources</td>
<td>Research Paper Due 5:00 pm</td>
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<td>12</td>
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<td>Videos: Forest Wars and</td>
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<td>Ready for Harvest</td>
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<td>24</td>
<td></td>
<td>Reading Day</td>
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<td>Th</td>
<td></td>
<td>26</td>
<td>Forest Resources</td>
<td>Writing Assignment #4 DUE</td>
</tr>
<tr>
<td>T</td>
<td>May</td>
<td>2</td>
<td></td>
<td>Final Exam: 12:00-2:30 pm</td>
</tr>
</tbody>
</table>
NRM 442
NATURAL RESOURCE POLICY AND ADMINISTRATION
GENERAL COURSE INFORMATION

LECTURE TIMES: 11:15 - 12:05 M, W, F ST 143
INSTRUCTOR: DR. LAWRENCE KOLENBRANDER
OFFICE: 336 STILLWELL
EMAIL ADDRESS: lkolenb@email.wcu.edu TELEPHONE: 227-3817
OFFICE HOURS: 11:00 - 12:00 T, R; 1:30 - 3:00 F, OR BY APPOINTMENT


ADDITIONAL READINGS WILL BE ASSIGNED FROM CLASS HANDOUTS AND MATERIALS PLACED ON CLOSED RESERVE IN HUNTER LIBRARY. STUDENTS ARE ALSO REQUIRED TO READ THE ASHEVILLE CITIZEN TIMES NEWSPAPER DAILY FOR POLICY, EDITORIAL, AND BUDGET ISSUES RELATED TO LOCAL, STATE, AND FEDERAL NATURAL RESOURCE ISSUES.

COURSE OBJECTIVES:

1. To introduce a model of the policy process that can be used in policy analysis. Students will be able to identify and describe the various elements of the policy process and will be able to analyze issues in terms of the policy process.

2. To explore the historical development of current natural resource policy in the United States. Students will be able to relate current issues in natural resources policy to their historical context.

3. To introduce the roles of various Federal and State agencies in the administration of natural resource policies, and explore current issues affecting natural resources management in the U.S. Students will be able to identify and describe the historical backgrounds of the various natural resource management agencies and relate these to current issues faced by these agencies.

COURSE POLICIES AND GRADING:

1. Attendance in lecture/discussions is required. Repeated absence will affect your performance in discussions, quizzes, and tests.

2. The class will have a lecture/discussion format. Reading assignments must be completed prior to class in order to facilitate discussions.

3. All cell phones must be turned completely OFF and PUT AWAY during class period.

4. NO use of tobacco products of any kind during class.

5. Unannounced and announced quizzes over previous lectures and reading assignments and periodic, short homework assignments will comprise 20% of your grade. This will include issue assignments for discussion.

6. A term paper on a selected topic will be worth 20% of your grade. Possible topics and paper requirements will be provided early in the term.

7. A team “issue presentation” will be worth 10% of your final grade. Each team member will receive
8. Two (2) - one hour examinations and the scheduled final examination will comprise 50% of the final grade. Make up examinations will be allowed only in the case of an excused absence for another class, documented (Doctor’s statement) illness or extreme extenuating circumstances. MY DECISIONS WILL BE FINAL.

9. Grades will be assigned according to the following:

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>95 to 100</td>
<td>A</td>
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<tr>
<td>91 to 94</td>
<td>A-</td>
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<td>88 to 90</td>
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<td>84 to 87</td>
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<td>81 to 83</td>
<td>B-</td>
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<tr>
<td>78 to 80</td>
<td>C+</td>
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<td>74 to 77</td>
<td>C</td>
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<td>71 to 73</td>
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<td>68 to 70</td>
<td>D+</td>
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<td>64 to 67</td>
<td>D</td>
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<tr>
<td>61 to 63</td>
<td>D-</td>
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<tr>
<td>60 or less</td>
<td>F</td>
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</table>

10. Accommodations for Students with Disabilities:

Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Carol Mellen for more information. Phone: (828) 227-7127; E-mail: mellen@email.wcu.edu.

11. Some of the topics we discuss in class are likely to be controversial. I encourage respectful disagreement and debate. Listening to different opinions is one of the best ways to learn and will be important for you to learn as future resource managers. Resist the urge to immediately dismiss a view with which you disagree; in fact, actively seek to clarify and understand the reasoning behind someone else’s opinion. I would like this class to be one where we can explore issues and that everyone feels comfortable participating. Please be polite and tolerant of different viewpoints; listen and do not talk when others are speaking; and be respectful of your fellow students and me.

12. Academic Integrity:

“All of us is smarter than one of us”. You are encouraged to share ideas, discuss questions, and work together with your classmates in ways that will further your individual and collective understanding of the materials covered in this class. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty includes: a. Cheating = Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise. b. Fabrication = Intentional falsification of information or citation in an academic exercise. c. Plagiarism = Intentionally or knowingly representing the words or ideas of someone else as one’s own in an academic exercise. d. Facilitation of Academic Dishonesty = Intentionally or knowingly helping or attempting to help someone else to commit an act of academic dishonesty, such as knowingly allowing another to copy information during an examination or other academic exercise.

Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own and reference all citations. See the student handbook for information regarding plagiarism and the procedures that will be followed in the event of academic dishonesty. Failure to comply with University policies may result in a zero for the assignment, failure of the course, disciplinary action at the University level, or any combination of the three.
13. Writing well is hard work but is one of the marks of a real professional. The University Writing Center exists to help you with your writing. They can help with almost any aspect of writing, from information gathering to final referencing and everything in between. However, it will take planning on your part to use their services effectively. Start any writing project early and take advantage of their help
<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>READING</th>
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<tbody>
<tr>
<td>Aug. 20</td>
<td>Course Introduction</td>
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</tr>
<tr>
<td>&quot; 22</td>
<td>Studying the Policy Process - An Overview</td>
<td>Jones Handout</td>
</tr>
<tr>
<td>&quot; 24</td>
<td>The Policy Process: Problem Perception, Definition, Aggregation, Organization</td>
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<tr>
<td>&quot; 27</td>
<td>The Policy Process: Representation</td>
<td>Forestry Prof’s - Congress</td>
</tr>
<tr>
<td>Sept. 3</td>
<td>NO CLASS - LABOR DAY HOLIDAY</td>
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<tr>
<td>&quot; 5</td>
<td>The Policy Process: Formulation Components: Symbols, Institutions</td>
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<td>&quot; 7</td>
<td>Kolenbrander Gone - No Class - Issue assignment.</td>
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<td>&quot; 10</td>
<td>Kolenbrander Gone - No Class - Issue assignment.</td>
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<tr>
<td>&quot; 14</td>
<td>Issue Assignment Due &amp; Issue Assignment Discussion</td>
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<tr>
<td>&quot; 17</td>
<td>The Policy Process: Policy Formulators: Actors: Intro., Individuals,</td>
<td></td>
</tr>
</tbody>
</table>
" 21  The Policy Process: Actors: Zealots, "Folks"
" 24  The Policy Process: Actors: Media
" 26  EXAMINATION 1
    TERM PAPER TOPICS DUE
" 28  The Policy Process: Activities

Oct.  1  The Policy Process: Activities
"  3  Hunter Library - Legislative Histories
"  5  The Policy Process: Budgeting & Issue Assignment - (NC Hog Waste)
"  8  The Policy Process: Implementation
" 10  The Policy Process: Evaluation
" 12  NO CLASS - FALL BREAK
" 15  NO CLASS - FALL BREAK
" 17  Policy Case Studies
" 19  Issue Assignment Due & Discussion
" 22  Historical perspectives
    OUTLINES & REFERENCES DUE
Kline - Introduction and Chapter 1, PP 1-12
" 24  1400's -1700's
    Kline, Chap. 2, pp. 13 - 22
" 26  1700's - 1800's
    Kline, Chap. 3, pp. 23 - 36
" 29  1860's - 1900's
    Kline, Chap. 4, pp. 37 - 50
" 31  1900's - 1930's
    Kline, Chap. 5, pp. 51 - 69
Nov.  2  1940's - 1969's
    Kline, Chap. 6, pp. 70 - 83
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<tr>
<th>Date</th>
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<td>1970's Kline, Chap. 7, pp. 84 - 100</td>
<td>Kline, Chap. 7, pp. 84 - 100</td>
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<tr>
<td>7</td>
<td>1980's Kline, Chap. 8, pp. 101 - 115</td>
<td>Kline, Chap. 8, pp. 101 - 115</td>
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<tr>
<td>9</td>
<td>Early 1990's Kline, Chap. 9, pp. 116-132</td>
<td>Kline, Chap. 9, pp. 116-132</td>
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<tr>
<td>12</td>
<td>Late 1990's + Conclusion</td>
<td>Kline, Chap. 10, pp 133-159</td>
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<tr>
<td>14</td>
<td>EXAMINATION TWO</td>
<td>Handouts</td>
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<tr>
<td>16</td>
<td>Spotted Owl Video Tape</td>
<td>Handouts</td>
</tr>
<tr>
<td>19</td>
<td>Forestry Issues</td>
<td>Handouts</td>
</tr>
<tr>
<td>21/23</td>
<td>NO CLASS - THANKSGIVING BREAK</td>
<td>Handouts</td>
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<tr>
<td>26</td>
<td>Range Management Issues</td>
<td>The War for the West</td>
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<tr>
<td>28</td>
<td>Future Issues</td>
<td>RPA Handouts</td>
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<td>30</td>
<td>Team Issue presentations</td>
<td>Handouts</td>
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<tr>
<td>Dec. 3</td>
<td>Team Issue presentations</td>
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<td>Team Issue presentations</td>
<td>Handouts</td>
</tr>
<tr>
<td>7</td>
<td>Team Issue presentations</td>
<td>Handouts</td>
</tr>
</tbody>
</table>
COURSE OBJECTIVES:

1. To introduce students to the people, curriculum and resources of the Natural Resource Conservation and Management program at WCU
2. To expose the student to a variety of career opportunities within the NRCM field
3. To answer student questions regarding the NRCM program
4. Ultimately, to help students determine whether or not they want to major in NRCM

EVALUATION:

Daily Class Participation 100%

Note that class attendance is EXTREMELY important. Students will receive a 0 for each class assignment that they miss. In addition, students will be allowed only 1 absence during the term. After that, their final grade will be reduced by 1 full letter grade for each additional absence. Be aware that missing class will have a major impact on your grade.

GENERAL:

We expect students to act professionally in both their assignments and their conduct.

Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Carol Mellen for more information. Phone: (828) 227-7127; E-mail: mellen@email.wcu.edu.

Western Carolina University, as a community of scholarship, is also a community of honor. Faculty, staff, administrators, and students work together to achieve the highest standards of honesty and integrity. Academic dishonesty is a serious offense at Western Carolina University because it threatens the quality of scholarship and defrauds those who depend on knowledge and integrity.

TENTATIVE COURSE OUTLINE:

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC/ACTIVITY</th>
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<tbody>
<tr>
<td>Aug 21st</td>
<td>Course Overview / Resume Builder</td>
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<tr>
<td>Aug 28th</td>
<td>Student and Faculty Introductions / Pizza Party</td>
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<tr>
<td>Sept 11th</td>
<td>Landscape Analysis</td>
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<tr>
<td>Sept 15th (Saturday)</td>
<td>Trail Clean Up &amp; BBQ/ Picnic</td>
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<tr>
<td>Oct 30th</td>
<td>Forest Resources</td>
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<td>Nov 14th</td>
<td>Water Resources</td>
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</tbody>
</table>

Class meets on Tuesdays - 4:00 pm to 6:50 pm in Stillwell 143

Addition Events:

- The NRCM Club organizes camping trips and events throughout the year.
Instructor: Lawrence Kolenbrander
Office hours: 11:00 to 12:00 T, R
336 Stillwell
1:30 to 3:00 F
Phone and voice mail: 227-3817 or by appointment
Email: lkolenb@email.wcu.edu

Class meeting times:
Lecture: T, R 9:30 to 10:45 Stillwell 143
Lab: 210-30 = W, 2:25 to 5:15, St 155
210-31 = M, 2:25 to 5:15, St 155

Course Objectives and role in the NRM curriculum:
This course is the first required course in the NRM curriculum, and serves as the prerequisite for all upper level NRM courses. The purpose of this course is to instruct students in some of the basic skills that are required to be successful in the NRM major. This course will cover material from each of the 3 NRM concentration areas, which include Soil and Water Conservation, Forest Resources, and Landscape Analysis. The following topic areas will be covered:
I. Natural resources management principles, definitions, and concepts
II. Measurement of key environmental properties
III. The operation of commonly used equipment and computer software
IV. Data collection, analysis, summarization, and reporting
V. Descriptive statistics and simple statistical analyses
VI. Research and technical writing
VII. Oral communication

Required Text:
There is no required text for this course; however material will be drawn from a number of other sources. It is required that each student purchase a yellow, rite-in-the-rain field notebook for this class. These are available from the WCU bookstore.

Evaluation:
Exam #1 (around September 18) 10%
Exam #2 (around October 18) 10%
Exam #3 (around November 15) 10%
Final Exam (Wednesday, Dec. 12, 12:00-2:30) 15%
Daily assignments 15%
Lab exercises 40%
100%

Grades will be assigned according to the following:
Exams will concentrate on material covered since the previous exam, though students will be responsible for major concepts presented earlier. The final exam will be comprehensive. Exams will consist primarily of definitions, short answer, and essay questions that are designed to evaluate your understanding of the material presented. This will require that students be able to apply the material covered to natural resource management situations. Make-up exams will only be given under extreme circumstances for documented absences accepted by the instructor.

Daily assignments will be short, in-class assignments that will be used to evaluate students’ understanding of course materials as it is being presented. These assignments might be in the form of a short quiz at the beginning of class, an open- or closed-note writing assignment during class, or a small group assignment. The purpose of these assignments is to encourage students to keep up with the material as it is being presented. Students will be able to drop the 2 lowest daily assignment grades. Students will not be able to make up daily assignment for any reason.

Lab exercises are intended to illustrate and reinforce some of the concepts discussed in class and to provide students with practical applications of natural resources management procedures and techniques. Labs will be conducted both inside and outside. In some cases it will be necessary for students to drive short distances off campus. Note that while much of the lab work will be done in teams, each individual must submit their own original lab report (unless specifically instructed otherwise). In addition, it is required that each individual do their own separate data analysis and presentation for each lab.

Reports for each lab exercise will be due at the beginning of the next lab period. Lab reports will be accepted within 24 hours of their due date & time, but will be assessed a 25% penalty. Reports will not be accepted after that time. Organization and legibility count significantly in the grading of lab reports. All lab reports must be computer generated.

The following guidelines will be used for evaluating lab reports:

1. Completeness
   1. Answer all questions that are asked.
   2. Discuss and present data in quantitative terms whenever possible.
   3. Avoid the use of vague terms such as "moderate", "good", etc. without some quantitative indication of what these terms mean.
   4. Analyze data in order to support arguments.
   5. Be sure that statements or arguments are documented with sound reasoning and/or cited authorities (include bibliography at end of paper for the latter using any standard format).

2. Organization and writing style
   1. Easy to follow.
   2. Data are presented in useful form (graphs and tables when
Terms are used appropriately.

16. Originality

4. Correctness of arguments – Though there will be a very minimal penalty (if any) for well-reasoned, but incorrect arguments.

**Attendance Policy:**
Students are responsible for all material presented during lecture and lab periods. Students who miss lecture must arrange to get lecture notes from other students. Attendance will not be taken during lecture, though students who miss a daily assignment will receive a 0 for that assignment.

Attendance during labs is required. Absences can cause severe disruptions since most labs cannot be made up, and many labs will require working in teams. Students who miss lab will be assigned a 0 for that lab exercise.

**Accommodations for Students with Disabilities:**
Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Carol Mellen for more information. Phone: (828) 227-7127; E-mail: mellen@email.wcu.edu.

**Writing assistance**
The Writing Center, located on the first floor of Hunter Library, assists students with papers and written assignments. See their website for further information. (Http://www.wcu.edu/WritingCenter)

**Academic integrity**
You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty includes:

- **Cheating** = Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
- **Fabrication** = Intentional falsification of information or citation in an academic exercise.
- **Plagiarism** = Intentionally or knowingly representing the words or ideas of someone else as one’s own in an academic exercise.
- **Facilitation of Academic Dishonesty** = Intentionally or knowingly helping or attempting to help someone else to commit an act of academic dishonesty, such as knowingly allowing another to copy information during an examination or other academic exercise. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own. Also be sure to reference all citations. See the University Writing Center website for information regarding plagiarism. Failure to comply with University policies may result in a zero for the assignment, failure of the course, disciplinary action at the University level, or any combination of the three. (http://www.wcu.edu/WritingCenter/isource/hyssplagiarizing.html)
General:
I expect students to reflect a certain degree of professionalism in both their assignments and their conduct. In addition to detracting from the overall grade, assignments that are deemed unprofessional can also be penalized up to 25% of the value of the assignment. Professional student conduct will include being prepared for class -- i.e., reading assigned materials and reviewing recent notes before each class, and acting professionally during class periods and lab exercises. All assignments must be neat, clearly legible, and well organized.

The use of ALL tobacco products is prohibited in ALL classrooms at ALL times.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 20</td>
<td>Introduction to natural resources management</td>
</tr>
<tr>
<td>Aug. 27</td>
<td><strong>Soil and Water Conservation Module</strong></td>
</tr>
<tr>
<td></td>
<td>Topography and landforms</td>
</tr>
<tr>
<td></td>
<td>Basic soil properties</td>
</tr>
<tr>
<td>Sept. 3</td>
<td>Soil formation</td>
</tr>
<tr>
<td></td>
<td>Soil surveys and soil interpretations</td>
</tr>
<tr>
<td>Sept. 10</td>
<td>Watershed science</td>
</tr>
<tr>
<td></td>
<td>The hydrologic cycle</td>
</tr>
<tr>
<td>Sept. 17</td>
<td>Stream characteristics</td>
</tr>
<tr>
<td></td>
<td>Water quality measurements</td>
</tr>
<tr>
<td></td>
<td><strong>EXAM 1</strong></td>
</tr>
<tr>
<td>Sept. 24</td>
<td><strong>Forest Resources Module</strong></td>
</tr>
<tr>
<td></td>
<td>Basic forest ecology</td>
</tr>
<tr>
<td></td>
<td>Tree and stand characteristics</td>
</tr>
<tr>
<td>Oct. 1</td>
<td>Measuring standing trees</td>
</tr>
<tr>
<td>Oct. 8</td>
<td>Basic forest surveying</td>
</tr>
<tr>
<td>Oct. 15</td>
<td>Introduction to forest inventory – fixed area plots</td>
</tr>
<tr>
<td>Oct 22</td>
<td><strong>EXAM 2 (Oct 23 – No Class = Advising Day)</strong></td>
</tr>
<tr>
<td>Oct. 29</td>
<td><strong>Landscape Analysis Module</strong></td>
</tr>
<tr>
<td></td>
<td>Basic landscape ecology</td>
</tr>
<tr>
<td></td>
<td>Air photo interpretation</td>
</tr>
<tr>
<td>Nov. 5</td>
<td>Introduction to GIS and GPS</td>
</tr>
<tr>
<td>Nov. 12</td>
<td>GIS and remote sensing</td>
</tr>
<tr>
<td>Nov. 19</td>
<td>Landscape characterization</td>
</tr>
<tr>
<td></td>
<td><strong>EXAM 3 (Nov. 23 – No Class = Thanksgiving)</strong></td>
</tr>
<tr>
<td>Nov. 26</td>
<td><strong>Final Project</strong></td>
</tr>
<tr>
<td></td>
<td>Watershed characterization, analysis and synthesis</td>
</tr>
<tr>
<td>Dec. 3</td>
<td>Watershed characterization (cont.)</td>
</tr>
</tbody>
</table>
NRM 320
SOIL CONSERVATION
GENERAL COURSE INFORMATION

Lecture Times: 10:00 - 10:50 M & W, 143 Stillwell
Lab Time: 1:30 - 3:25 W, 152 Stillwell
Instructor: Dr. Lawrence Kolenbrander
Office: 336 Stillwell
Telephone: 227-3817
E-Mail: lkolenb@email.wcu.edu
Office Hours: T - 1:30 - 2:45
R - 1:30 - 2:45
F - 10:00 - 12:00


Additional readings may be assigned from materials on closed reserve in the library and/or from class handouts.

Course Objectives:
1. To introduce the student to contemporary problems and techniques in the management and conservation of soil resources.
2. To develop a problem identification/problem solving approach for soil conservation.

Course Policies and Grading:
1. Class attendance in lectures and labs is required. Absences will certainly be reflected in your final grade.
2. Unannounced quizzes over previous lectures and labs or reading assignments and periodic daily assignments will comprise 10% of the final grade.
3. Two (2) - one hour examinations and the scheduled final examination will comprise 50% of the final grade.
4. Lab exercises will be worth 40% of the final grade.
5. I generally do not allow make up exams except in the case of documented illness or extreme extenuating circumstances and I must be notified prior to the absence. Students with scheduling conflicts may take exams early by prior arrangement. My Decisions Will be Final.
6. Lab exercises will be due the following week at the beginning of the lab period. I will accept lab exercises up to 24 hours late with a 25% penalty. I will not accept lab exercises more than 24 hours late.
7. I use the plus/minus grading system and grades will be assigned according to approximately the following percentages:
   94+ = A  
   90 - 93 = A-  
   87 - 89 = B+  
   84 - 86 = B  
   80 - 83 = B-  
   77 - 79 = C+  
   74 - 76 = C  

   70 - 73 = C-  
   67 - 69 = D+  
   64 - 66 = D  
   60 - 63 = D-  
   59 or less = F

Academic integrity
You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own. Also be sure to reference all citations. See the University Writing Center website for information regarding plagiarism. Failure to comply with University policies may result in a zero for the assignment, failure of the course, disciplinary action at the University level, or any combination of the three. (http://www.wcu.edu/WritingCenter/isource/hyssplagiarizing.html)

Students with disabilities

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NRM 340
Lecture Topics and Projected Schedule:

<table>
<thead>
<tr>
<th>Week #</th>
<th>General Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Current and Historical Perspectives on Soil Erosion &amp; Productivity</td>
<td>T, H, &amp; D Chap. 1</td>
</tr>
<tr>
<td>2</td>
<td>Magnitude and Significance of Soil Erosion</td>
<td>T, H, &amp; D Chap. 2</td>
</tr>
<tr>
<td>3</td>
<td>Mechanics of Soil Erosion - Water</td>
<td>T, H, &amp; D Chap. 4</td>
</tr>
<tr>
<td>4</td>
<td><strong>No Class Jan. 29 &amp; 31 - Kolenbrander gone - Assignment</strong></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Mechanics of Soil Erosion - Wind</td>
<td>T, H, &amp; D Chap. 5</td>
</tr>
<tr>
<td>6</td>
<td>Predicting Soil Loss</td>
<td>T, H, &amp; D Chap. 6</td>
</tr>
<tr>
<td>7</td>
<td>Cropping Systems</td>
<td>T, H, &amp; D Chap. 8</td>
</tr>
</tbody>
</table>

NRCM Supplemental Materials I Selected Course Syllabi Page 32 of 69
<table>
<thead>
<tr>
<th>Week #</th>
<th>General Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Soil Survey Exercise</td>
<td>T, H, &amp; D Chap. 7</td>
</tr>
<tr>
<td>2</td>
<td>Soil Interpretation Exercise</td>
<td>National Soils Handbook</td>
</tr>
<tr>
<td>3</td>
<td>NRCS Land Capability Classification</td>
<td>National Soils Handbook</td>
</tr>
<tr>
<td>4</td>
<td>No formal Lab - Kolenbrander gone</td>
<td>Assignment:</td>
</tr>
</tbody>
</table>

NRM 320

Laboratory Topics and Exercises:

No Class March 5 - 9 Spring Break

9 Conservation Structures T, H, & D Chap. 10

10 Vegetating Disturbed Areas T, H, & D Chap. 11

11 Water Conservation T, H, & D Chap. 13

12 Stream Classification & Description Rosgen paper

13 Stream “Restoration” Rosgen Materials

14 Streambank Protection Methods Handouts

15 Soil & Water Conservation Agencies in the U.S. T, H, & D Chap. 19
<table>
<thead>
<tr>
<th>No.</th>
<th>Course Title</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>Universal Soil Loss equation application and use</td>
<td>Handouts plus On-Line</td>
</tr>
<tr>
<td>7</td>
<td>Water Erosion Prediction Program (WEPP)</td>
<td>Handouts</td>
</tr>
<tr>
<td>7</td>
<td>WCU Drainage Ditch Measurements</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Conservation Implements field trip</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>NRCS Runoff Curve Method of Runoff Prediction</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>NC State Erosion &amp; Sedimentation Pollution Control Planning</td>
<td>NC State Sediment Manual</td>
</tr>
<tr>
<td>11</td>
<td>No Formal Lab - Prepare for field trip - March 30, 31, &amp; April 1</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Rosgen Classification Exercise</td>
<td>Rosgen Paper</td>
</tr>
<tr>
<td>13</td>
<td>Stream Structures Review</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Streambank Stabilization Methods</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>NRCS Farm Conservation Planning Exercise</td>
<td></td>
</tr>
</tbody>
</table>
# Syllabus

## Course Information

<table>
<thead>
<tr>
<th>Course title:</th>
<th>Introduction to Remote Sensing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course number:</td>
<td>GEOG324</td>
</tr>
<tr>
<td>Course discipline:</td>
<td>Geography</td>
</tr>
<tr>
<td>Course description:</td>
<td>The first half of this course will focus on air photo interpretation and the second half will introduce digital remote sensing techniques. Final: Wednesday December 13th, 2006 (3:00-5:30 pm)</td>
</tr>
<tr>
<td>Course date:</td>
<td>Wednesday, August 23, 2006 through Friday, December 8, 2006</td>
</tr>
<tr>
<td>Location:</td>
<td>ST 244 (lecture) ST 354 (lab)</td>
</tr>
<tr>
<td>Meeting day(s):</td>
<td>MWF (lecture) M (lab)</td>
</tr>
<tr>
<td>Meeting time(s):</td>
<td>1:25 - 2:15 pm (lecture) 2:30 -4:20pm (lab)</td>
</tr>
</tbody>
</table>

## Instructor Information

| Name: | Dr. Joni Bugden-Storie |
| Email: | use WebCT or jbugden@wcu.edu |
| Office location: | ST 343 |
| Office hours: | MWF 10-11:30 am or by Appointment or when my door is open |
| Phone: | 828-227-3819 |
| Biography: | Ph.D. in Geography (Environmental Studies) with a concentration in Geomatics and Natural Resource Management. |

## Course Goals

Course goals: The goal of this course is to introduce students to remote sensing analysis including airphoto interpretation and digital remote sensing. The first half of the course will focus on visual interpretation of aerial photographs while the second half of the course will incorporate digital and statistical analysis.

## Textbooks


## Evaluation and Grading


Evaluation: Student Poster Presentation with 3 page paper using Air Photos (30%) - Student Presentation with 6 page paper using Digital Remote Sensing (50%) - Final (20%)

## Policies

Introduction: Students with Disabilities: [http://www.wcu.edu/studentd/disabled/](http://www.wcu.edu/studentd/disabled/) Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234 ; E-mail: kmarcus@email.wcu.edu. ………………………………………. Academic Tutoring Center: The Catamount Academic Tutoring Center, located in 135 Killian Annex, offers FREE learning resources, academic skill workshops, and small-group tutoring for most 100 and 200-level courses. Tutoring sessions are facilitated by trained peer leaders in a relaxed, informal setting. Visit the CAT Center website at [www.wcu.edu/catcenter](http://www.wcu.edu/catcenter) to schedule tutoring appointments and find information about workshop offerings in areas such as Time Management, Note Taking, Reading Comprehension, and Exam Preparation.

Additional information: In your Undergraduate Catalog, review the Academic Regulations including class attendance policy and academic honesty policy. ([http://www.wcu.edu/UnivCatalog/Catalog/acadreg/acadreg.htm](http://www.wcu.edu/UnivCatalog/Catalog/acadreg/acadreg.htm)).

## Lab Materials and Policies
Materials: During the course of the year, you may need the following items: Ruler (fine scale); pencils and markers; calculator; digital storage (USB, CDs)

Policies: Show respect for all individuals and property (respect the five senses). Do not mark or damage air photos. Leave images and stereoscopes in the lab (unless permission is given to remove them). Use of ancillary data (reference) material for your interpretations is encouraged.
Fall 2006
Stillwell 152
Tues & Thurs 8:00–9:15

Instructor: Dr. Ron Davis
Office: Stillwell 344
Office Hours: MWF 10:30-11:30 am. NOTE: I have an open door policy and am generally in my office when not teaching. Please feel free to stop by my office any time if you have questions.

I. Purpose

To provide an introduction to the major ecological concepts involved in the management of natural resources for wildlife management.

II. Course Objectives:

Students will be able to apply critical thinking skills to the understanding of ecologic, economic, and ethical aspects of wildlife management and conservation.

III. Course Materials

- Other readings will be provided as needed.

IV. Expectations of Students/Course Policies (Amendments will be announced in class)

- Attend and be engaged in class. Attendance is not mandatory but some activities will be completed in class and so excessive absences will impact your grade.
- Complete assignments on time. Late work will be penalized 20% of the total points possible for each day late. After 5 days the assignment will receive a grade of zero.
- Exams, in class-exercises and quizzes are not available for make up. If you MUST miss an exam make arrangements ahead of time to take it early.
- Be COURTEOUS to other students AND the instructor. This includes but IS NOT LIMITED TO getting to class on time, avoid excessive talking, keeping cell phone OFF etc. Put simply, avoid things that interfere with my teaching or student learning.

- **Academic Integrity:** You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own and reference all
What you should expect from me:

- I am readily available to answer questions and help with assignments. I have office hours but feel free to stop by at any time or call/email to set up an appointment. NOTE: Talk to me as soon as you are having problems or questions. If you wait until the day before something is due or the end of the semester to ask for help there will be little I can do for you.

- I will strive to get your graded work back to you in a timely fashion. Handing assignments in on time and in a presentable fashion will help with this tremendously.

- Expectations (i.e. such as what you need to ‘‘know’’ for a test or quiz) are clear. Grading and course policies are implemented fairly.

Class Environment: It is likely some issues we cover in this class will be controversial. I encourage respectful disagreement and debate. Keep an open mind and resist the urge to immediately dismiss a view with which you disagree. This class is a forum where we can have open discussion and where everyone has the opportunity to participate and feels comfortable participating. Everyone should be polite and tolerant of divergent viewpoints. Please listen and do not talk when others are talking. Be respectful of your fellow students and me.

Writing Assistance: The Writing Center which is located on the first floor of Hunter Library assists students with papers and written assignments. See their website for additional information at www.wcu.edu/WritingCenter

Individuals with Disabilities Statement: Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234; Email:kmarcus@email.wcu.edu.

V. Grading Procedures: With the exception of some in class exercises used for discussions, all work will be graded and returned to you. Assignments will be designed to provide a variety of approaches to learning.

<table>
<thead>
<tr>
<th></th>
<th>Percentage of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hourly Exams (3)</td>
<td>60</td>
</tr>
<tr>
<td>Class Project*</td>
<td>20</td>
</tr>
<tr>
<td>Assignments</td>
<td>20</td>
</tr>
</tbody>
</table>

* There is no lab for this class at this time however since hands on experience is ESSENTIAL, I have arranged ‘volunteer’ opportunities in the area and will require you to participate in 2 of these (up to an 8 hour day). NOTE: This is flexible depending on your schedule as long as you are getting some varied experiences you can do this all in 1 day. A list of times/places and a sign up will be provided ASAP. Class release time will likely be provided. Since I’m making you “volunteer” I’ll give you a day off from class.
Grading Scale: Grades will be assigned according to the scale shown below.

<table>
<thead>
<tr>
<th>Percentage Grade</th>
<th>Letter Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93-100</td>
<td>A</td>
</tr>
<tr>
<td>90 – 92</td>
<td>A-</td>
</tr>
<tr>
<td>87 – 89</td>
<td>B+</td>
</tr>
<tr>
<td>83 – 86</td>
<td>B</td>
</tr>
<tr>
<td>80 – 82</td>
<td>B-</td>
</tr>
<tr>
<td>77 – 79</td>
<td>C+</td>
</tr>
<tr>
<td>73 – 76</td>
<td>C</td>
</tr>
<tr>
<td>70 – 72</td>
<td>C-</td>
</tr>
<tr>
<td>67–69</td>
<td>D+</td>
</tr>
<tr>
<td>63–66</td>
<td>D</td>
</tr>
<tr>
<td>60–62</td>
<td>D-</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
</tr>
</tbody>
</table>

- NOTE: I do not disclose/discuss grade information by email or phone so if you need to discuss your grade please see me in person.

VI. Tentative Course Schedule

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC/READING</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 20–24</td>
<td>Chapter 1 and 4</td>
<td></td>
</tr>
<tr>
<td>August 27–31</td>
<td>Chapter 5</td>
<td></td>
</tr>
<tr>
<td>Sept 3–7</td>
<td>Chapter 9: Predators and Predation</td>
<td></td>
</tr>
<tr>
<td>Sept 10–14</td>
<td>Chapter 10: Hunting and Trapping</td>
<td></td>
</tr>
<tr>
<td>Sept 17–21</td>
<td>Chapter 8: Diseases</td>
<td>Test 1: Population Ecology</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Wildlife Habitat</strong></td>
<td></td>
</tr>
<tr>
<td>Sept 24–28</td>
<td>Chapter 6: Animal Behavior</td>
<td></td>
</tr>
<tr>
<td>Oct 1–5</td>
<td>Chapter 7: Food and Cover</td>
<td></td>
</tr>
<tr>
<td>Oct. 8–12</td>
<td>Evaluation of Habitat: Supplemental</td>
<td>Fall break 10/11</td>
</tr>
<tr>
<td>Oct. 15–19</td>
<td>Evaluation of Habitat: Supplemental</td>
<td>TEST 2: Wildlife Habitat</td>
</tr>
</tbody>
</table>

Managing Resources for Wildlife
<table>
<thead>
<tr>
<th>Date</th>
<th>Chapter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 22–26</td>
<td>Chapter 11-12 Water and Soils</td>
</tr>
<tr>
<td>Oct. 29–Nov 2</td>
<td>Chapter 13 Farmlands and Rangelands</td>
</tr>
<tr>
<td>Nov 5–9</td>
<td>Chapter 15: Forests</td>
</tr>
<tr>
<td>Nov 12–16</td>
<td>Chapter 16: Parks, Refuges</td>
</tr>
<tr>
<td>Nov. 26–30</td>
<td>Chapter 21: Conservation Biology</td>
</tr>
<tr>
<td>Dec. 3–7</td>
<td>Project Presentations</td>
</tr>
<tr>
<td>Dec. 10–14</td>
<td>Final Exam: Thurs 12/13 12:00</td>
</tr>
</tbody>
</table>
Introduction to GIS  
NRM 344  
Spring 2007  
Stillwell 354  
Tues and Thurs 9:30-10:45  
Lab Tuesdays: 12:20-3:10

Instructor: Dr. Ron Davis  
Office: Stillwell 344  
Phone: x2726  
Office Hours: MWF 10:30-11:30

NOTE: I have an open door policy and am frequently in my office when not teaching. Please feel free to stop by my office.

***Given the amount of information, complexity of the software this course has proven frustrating to some. The best advice I can give is 1) Don’t let the work get ahead of you, 2) ASK for help when you need it, 3) In lab pay attention to what you’re doing and why—don’t just rush through the exercises to get them done, and 4) Don’t skip lectures. ***

I. Purpose

Students will develop basic understanding and skills required for applied GIS analyses in the study and management of natural resources or other fields.

II. Course Objectives:

Students will develop and apply skills in basic data management and spatial analyses using both raster and vector data sources in GIS. Specific Learning objectives will be provided at several points throughout the semester.

III. Course Materials

- Required text(s): Bettinger and Wing 2004 Geographic Information Systems: Applications in Forestry and Natural Resource Management.
- Other readings will be provided as needed.

IV. Expectations of Students/Course Policies (Amendments will be announced in class)

- Attend and be engaged in class.
- Complete assignments on time. Late work will be penalized 20% of the total points possible for each day late. After 5 days the assignment will receive a grade of zero.
- All written assignments completed outside of class MUST be typed using a standard font (times new roman, 12 pt).
- Exams are not available for make up. If you MUST miss an exam make arrangements ahead of time to take it early.
• Be COURTEOUS to other students AND the instructor. This includes but IS NOT LIMITED TO getting to class on time, avoid excessive talking, keeping cell phone OFF and not browsing the web during lectures etc.

• Put simply, avoid things that interfere with my teaching or student learning.

Academic Integrity: You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own and reference all citations. See the University Writing Center website for information regarding plagiarism. Failure to comply with the University policy on academic integrity can result in a zero for the specific assignment, a failing grade for the course, University disciplinary action or any combination thereof.

What you should expect from me:

• I am readily available to answer questions and help with assignments. I have office hours but feel free to stop by at any time or call/email to set up an appointment. NOTE: Talk to me as soon as you are having problems or questions. If you wait until the day before something is due or the end of the semester to ask for help there will be little I can do for you.

• I will strive to get your graded work back to you in a timely fashion. Handing assignments in on time and in a presentable fashion will help with this tremendously.

• Expectations (i.e. such as what you need to ‘know’ for a test or quiz) are clear. Grading and course policies are implemented fairly.

Use of the GIS Lab: Priority use of the GIS lab is for those students enrolled in the GIS or Remote Sensing courses. Occasionally, other classes will use the lab though it will be open regularly for you to work on class projects. Specific hours will be posted. NOTE: Use of the lab for other class work, email, internet etc. is fine UNLESS it interferes with someone else’s access for GIS or Remote Sensing related work.

Individuals with Disabilities Statement: Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234; Email: kmarcus@email.wcu.edu.

V. Grading Procedures: With the exception of some in class exercises used for discussions, all work will be graded and returned to you. Assignments will be designed to provide a variety of approaches to learning.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm</td>
<td>20</td>
</tr>
<tr>
<td>Lab Exercises</td>
<td>20</td>
</tr>
<tr>
<td>Projects (including GIS DAY)</td>
<td>40</td>
</tr>
<tr>
<td>Final Examination</td>
<td>20</td>
</tr>
</tbody>
</table>

NRCM Supplemental Materials I Selected Course Syllabi Page 42 of 69
Approximate point values—The proportions listed above will apply to whatever the final point total ends up to be, but the approximate breakdown (w/revised lab schedule) is as follows.

- Assignments will be graded on a percentage (0-100) and then weighted according to the scale above.
- For example, if your average score on labs is 85% then at the end of the course your lab grade will be 0.85*45 or 38.5% (of 30 possible)
- The same will be applied to all assignments, quizzes etc.

Grading Scale: Grades will be assigned according to the scale shown below.

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>93–100</td>
<td>A</td>
</tr>
<tr>
<td>90 – 92</td>
<td>A-</td>
</tr>
<tr>
<td>87 – 89</td>
<td>B+</td>
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<tr>
<td>83 – 86</td>
<td>B</td>
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<tr>
<td>80 – 82</td>
<td>B-</td>
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<tr>
<td>77 – 79</td>
<td>C+</td>
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<tr>
<td>73 – 76</td>
<td>C</td>
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<tr>
<td>70 – 72</td>
<td>C-</td>
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<tr>
<td>67–69</td>
<td>D+</td>
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<tr>
<td>63–66</td>
<td>D</td>
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<tr>
<td>60–62</td>
<td>D-</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
</tr>
</tbody>
</table>

**PLEASE NOTE: I do not disclose/discuss grade information by email or phone so if you need to discuss your grade please see me in person.

Tentative Course Schedule
<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC/READING</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 20–24</td>
<td><strong>INTRODUCTION</strong></td>
<td></td>
</tr>
<tr>
<td>August 20–24</td>
<td>What is GIS? Spatial Questions (Ch No Lab This Week)</td>
<td></td>
</tr>
<tr>
<td>August 27–31</td>
<td>The nature of GIS data (Ch 2)</td>
<td>Exercise 1</td>
</tr>
<tr>
<td>Sept 3–7</td>
<td><strong>Extracting Information</strong></td>
<td></td>
</tr>
<tr>
<td>Sept 3–7</td>
<td>Chapter 5, 4</td>
<td>Exercise 2</td>
</tr>
<tr>
<td>Sept 10–14</td>
<td>Chapters 6-7</td>
<td>Exercise 3</td>
</tr>
<tr>
<td>Sept 17–21</td>
<td>Chapters 6-7</td>
<td>Exercise 4 (PROJECT 1 Assigned)</td>
</tr>
<tr>
<td>Sept 24–28</td>
<td><strong>Integrating Data Layers</strong></td>
<td>Project 1 Due 9/27</td>
</tr>
<tr>
<td>Oct 1–5</td>
<td>Chapters 8-12</td>
<td>Exercise 5</td>
</tr>
<tr>
<td>Oct. 8–12.</td>
<td>Chapters 8-12</td>
<td>Exercise 6 (No Class 10/11)</td>
</tr>
<tr>
<td>Oct. 15–19</td>
<td>Chapters 8-12</td>
<td>MIDTERM 10/18</td>
</tr>
<tr>
<td>Oct. 22–26</td>
<td><strong>Raster Analysis</strong></td>
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</tr>
<tr>
<td>Oct. 22–26</td>
<td>Chapter 13</td>
<td>Exercise 7</td>
</tr>
<tr>
<td>Oct. 29–Nov 2</td>
<td>Integrating Raster and Vector Data</td>
<td>PROJECT 2 Assigned</td>
</tr>
<tr>
<td>Nov 5–9</td>
<td>Integrating Raster and Vector Data</td>
<td></td>
</tr>
<tr>
<td>Nov 12–16</td>
<td><strong>GIS DAY NOVEMBER 14!!!!!!!</strong></td>
<td>No Class 11/15</td>
</tr>
<tr>
<td>Nov. 19–23</td>
<td>Supplemental</td>
<td></td>
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<tr>
<td>Nov. 26–30</td>
<td>Supplemental</td>
<td>Project 2 Due 11/20 (PROJECT 3 Assigned)</td>
</tr>
<tr>
<td>Dec. 3–7</td>
<td>Project 3 Presentations</td>
<td></td>
</tr>
<tr>
<td>Dec. 10–14</td>
<td>Final Exam Wed Dec 12. 12:00-2:30</td>
<td></td>
</tr>
</tbody>
</table>
Instructor:
Laura E. DeWald  Office hours: T: 11:00 am – 1:00 pm, TH: 11:00 – Noon, or by appt.
240 Stillwell, 227-2478  ldewald@wcu.edu

Learning Outcomes:
By the end of the semester students will:
1. understand basic components and processes in forest ecosystems;
2. be able to apply forest ecology principles to other forest management disciplines;
3. evaluate forest management decisions in light of ecological principles;
4. practice written and oral communication as it relates to forest ecology;
5. have practiced:
   - critical thinking, reading and writing
   - applying scholarly information and methods to understand complex issues
   - reading and using published information
   - oral communication
   - integrating concepts
   - teamwork involved with solving forest ecological problems

Role of this course within NRM curriculum:
Prerequisite knowledge: Students are expected to have a basic science background (CHEM 132, BIOL 140, 141, 304), and it is expected that students have a sound understanding of forest measurement techniques (NRM-340, 352) and the mathematical skills to summarize and evaluate timber inventory data (MATH-130, 170). The information covered in this course will be critical to courses in Silviculture (NRM-451), Forest Management (NRM-452), and Integrated Resource Management (NRM-440).

Required Text:

Evaluation:
Exams: 3 @ 100 points each  300 points
Research Paper  100 points
Class participation  100 points
Lab Reports  100 points
Total  600 points

The following final averages correspond to the following final grades:
A = 93-100%, A- = 90-92%, B+ = 87-89%, B = 83-86%, B- = 80-82%, C+ = 77-79%, C = 73-76%, C- = 70-72%, D+ = 67-69%, D = 63-66%, D- = 60-62%, F = <60%
Exams will concentrate on material covered since the last exam, though students will be responsible for major concepts presented earlier. Exams will be take-home and essay question format. In most cases, questions are designed to evaluate the students' ability to assimilate and apply the material presented. Make-up exams will only be given under extreme circumstances for documented absences accepted by the instructor.

Research Paper: Each student will investigate some aspect of forest ecology, and relate its significance to forest management in the southern Appalachians. The final product will consist of a paper (7 to 10 double-spaced pages, 1-inch margins, 12-point font), and a presentation to the class. A visit to the writing center to help you edit your paper is STRONGLY advised!

Laboratory Exercises are intended to illustrate and reinforce concepts discussed in class. There will be several types of lab and class exercises.

Traditional labs will revolve around the collection and analysis of ecological data. Note that while much of the lab work will be done in teams, each individual must submit their own original lab report. Late reports will be accepted until 48 hours after they are due, but will be assessed a 25% penalty. Reports will not be accepted after that time. Writing quality counts significantly in the grading of lab reports and it is STRONGLY suggested you visit the writing center prior to turning your reports in. A rubric for lab report grades will be handed out in class but generally should have the following characteristics:

- Lab reports must be complete
  - Answer all questions that are asked.
  - Discuss and present data in quantitative terms whenever possible.
  - Avoid the use of vague terms such as "moderate", "good", etc.
  - Analyze and present data to support arguments.
  - Document all statements or arguments with sound reasoning and/or cited authorities (include references at end of paper for the latter). It is required that at least 2 sources other than the text book be cited for each “formal” lab report.
- Reports must be well-written and organized.
  - Easy to follow.
  - Data presented in useful form (graphs and tables when possible)
  - Terms are used appropriately.
- Correctness of arguments

Other labs will be organized as discussion/problem solving exercises. During these labs, students will be expected to read certain material before the lab period. Students will then discuss how that information should influence decision-making.

Class Participation: exercises will be randomly assigned during the semester. These will be designed to evaluate how well students are keeping up with readings and other materials covered. These may or may not be announced, and will be worth as much as a regular lab. Students who are not present or who do not complete these assignments will receive a 0.
**Attendance Policy:** Students are responsible for all material presented during lecture and lab periods and as per WCU policy, it is NOT the instructor’s responsibility to get materials, etc. to a student who has missed class. Attendance during labs is required. Absences can cause severe disruptions since many labs will require working in teams. **Students who miss lab will be assigned a 0 for that lab exercise.**

**General:** I expect students to reflect a certain degree of professionalism in both their assignments and their conduct. Professional student conduct will include being prepared for class -- i.e., reading assigned materials and reviewing recent notes before each class, and acting appropriately during lab exercises.

**I will:**
- present useful information in an understandable format
- create assignments that help you synthesize information
- return assignments in a timely fashion
- be fair to all students

**I expect you to:**
- attend and come to class prepared to be actively involved in what is going on each day
- work to your potential
- live up to the academic honesty policy in the student handbook
- take an active role in your education: asking questions, studying, completing assignments, and taking responsibility for your performance
- KEEP YOUR CELL PHONE TURNED OFF DURING CLASS

**Academic Integrity:** You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own and reference all citations. See the University Writing Center website for information regarding plagiarism. Failure to comply with University policies may result in a zero for the assignment, failure of the course, disciplinary action at the University level, or any combination of the three.

**Students with Disabilities:** Western Carolina University makes every effort to provide appropriate accommodations for students with documented disabilities in compliance with the Americans with Disabilities Act. To receive academic accommodations, students must be registered with the office of Student Support Services. The letter received from Student Support Services should be presented as documentation to the instructor as early in the semester as possible.

**Accommodations for Students with Disabilities:**
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<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture/Lab Topic</th>
<th>Assignment*</th>
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</thead>
<tbody>
<tr>
<td>Jan. 9</td>
<td>Introduction</td>
<td>Barnes et al. Chapter 6</td>
</tr>
<tr>
<td>Jan. 11</td>
<td>Adaptation – Genetics Lab: Adaptation</td>
<td>Barnes et al. Chapters 4 and 5</td>
</tr>
<tr>
<td>Jan. 16 &amp; 18</td>
<td>Adaptation – Light Lab: Transpiration Study Set-Up and Phenology Experiment</td>
<td>Barnes et al. Chapter 8</td>
</tr>
<tr>
<td>Jan. 30 &amp; Feb. 1</td>
<td>Adaptation – Temperature Lab: Transpiration Study: Conclusion</td>
<td>Barnes et al. Chapters 7 and 9</td>
</tr>
<tr>
<td>Feb. 6</td>
<td>Exam #1 due</td>
<td>Study Hard</td>
</tr>
<tr>
<td>Feb. 6 &amp; 8</td>
<td>Adaptation – Nutrients Lab: Site Quality</td>
<td>Barnes et al. Chapter 11</td>
</tr>
<tr>
<td>Feb. 13 &amp; 15</td>
<td>Soils Lab: Site Quality</td>
<td>Barnes et al. Chapter 11</td>
</tr>
<tr>
<td>Feb. 20 &amp; 22</td>
<td>Site Evaluation Lab: Site Quality</td>
<td>Barnes et al. Chapters 10 and 13</td>
</tr>
<tr>
<td>Feb. 27</td>
<td>No Class: Time Credit for Exam #1</td>
<td>Take a Break! 😊</td>
</tr>
<tr>
<td>March 1</td>
<td>Populations and Communities Lab: Plant Communities</td>
<td>Barnes et al. Chapters 14 and 15</td>
</tr>
<tr>
<td>March 6 &amp; 8</td>
<td>No Class: Spring Break</td>
<td>Relax and Have Fun</td>
</tr>
<tr>
<td>March 13 &amp; 15</td>
<td>Biodiversity Lab: Plant Communities</td>
<td>Barnes et al. Chapter 20</td>
</tr>
<tr>
<td>March 20</td>
<td>Exam #2 due</td>
<td>Study Hard</td>
</tr>
<tr>
<td>March 20 &amp; 22</td>
<td>Disturbance – Succession Lab: Plant Communities</td>
<td>Barnes et al. Chapter 17</td>
</tr>
<tr>
<td>March 27</td>
<td>Disturbance – Fire</td>
<td>Barnes et al. Chapter 12</td>
</tr>
<tr>
<td>March 29</td>
<td>No Class: Time Credit for Exam #2</td>
<td>Take a Break 😊</td>
</tr>
<tr>
<td>April 3</td>
<td>Disturbance – Insects and Diseases</td>
<td>Barnes et al. Chapter 16</td>
</tr>
<tr>
<td>April 5</td>
<td>No Class: Easter Holiday</td>
<td>Take a Break! 😊</td>
</tr>
<tr>
<td>April 10 &amp; 12</td>
<td>Ecological/Sustainable Forestry Lab: Plant Communities</td>
<td>Barnes et al. Chapter 21</td>
</tr>
<tr>
<td>April 17</td>
<td>Restoration and Forest Health</td>
<td>Handouts</td>
</tr>
<tr>
<td>April 19</td>
<td>No Class: Presentation Preparation</td>
<td>Presentation Preparation</td>
</tr>
<tr>
<td>April 24</td>
<td>No Class: Reading Day</td>
<td>Presentation Preparation</td>
</tr>
<tr>
<td>April 26</td>
<td>Student Presentations</td>
<td>Presentation Preparation</td>
</tr>
<tr>
<td>May 3</td>
<td>Noon - 2:30 Final Exam</td>
<td>Study Hard</td>
</tr>
</tbody>
</table>
NRM-352
FOREST RESOURCE MEASUREMENTS
Fall 2007

Instructor:
Pete Bates
Office hours: Tuesday 12:00 to 1:00
341 Stillwell
Friday 11:00 to 12:00
phone and voicemail: 227-3914
email: bates@email.wcu.edu

Course Objectives:
To become familiar with the basic principles of forest measurements and apply them to:
1. Forest land areas, including map and compass skills, basic surveying methods, and boundary traverses.
2. Individual tree measurements, including analysis of tree products, units of measure, and measurement techniques.
3. Determination of timber volumes in forest tracts – basic timber cruising methods

Role of this course within NRM curriculum: It is expected that students have had some experience with forest measurement equipment and techniques and possess the mathematical and computer skills to summarize and evaluate timber inventory data (NRM-210 and MATH 146).

Required Text and Supplementary Materials:

Materials and Supplies: Each student will need the following items:
- Calculator capable of doing basic statistical functions (mean, standard deviation, etc). You should bring your calculator to each class and lab session.
- Ruler or straight edge calibrated in 10ths of an inch
- Protractor
- Biltmore stick
- NC Forester’s Field Handbook
- Waterproof field notebook

Evaluation:
Weekly quizzes 30%
Exams (3) – Sept. 24, Oct. 31, and Nov. 19 15%
Lab exercises 25%
Class inventory project (Nov. 16 and 17) 10%
Final Exam (Monday, Dec. 10, 8:30-11:00) 20%

For all practical purposes, the following final percentages will guarantee the corresponding grades: > 93=A, > 90=A-, > 87=B+, > 83=B, >80=B-, etc.
Weekly quizzes are used to encourage students to keep up with the material. They will concentrate on material covered in the readings and during recent lectures, and lab periods. Quizzes will start promptly at the beginning of class every Wednesday, and will last approximately 10 minutes. I will drop the three lowest quiz scores. There will be no make-up quizzes given for any reason.

Exams will generally concentrate on material covered since the previous exam, though students will be responsible for major concepts presented earlier. Midterm exams will be closed book. The final exam will be comprehensive (students will be able to use some notes during the final). Make-up exams will only be given under extreme circumstances.

Exams and quizzes will consist of both word questions and problems, and will be designed to test your understanding of the material, and your ability to apply it.

Each student will need to bring a calculator, engineer’s rule, and protractor to all quizzes and exams. Students will not be allowed to share equipment during quizzes and exams.

Lab exercises are intended to illustrate and reinforce the concepts discussed in class. Labs will be conducted both inside and outside. In some cases it will be necessary for students to drive short distances off campus. Note that while much of the lab work will be done in teams, as a rule, each individual must submit their own original lab report. Teams can submit group field forms and data sheets when directed. DO NOT SUBMIT GROUP DATA SUMMARY FORMS UNLESS DIRECTED TO.

Reports for each lab exercise will have a due date corresponding to a lecture period. Lab reports will be due at the beginning of that lecture. Late reports will be accepted until the beginning of the next lecture period, but will be assessed a 25% penalty. Reports will not be accepted after that time. Organization and legibility count significantly in the grading of lab reports. Lab reports must be computer generated.

Class inventory project: Near the end of the semester the class will design and conduct a complete stand inventory. This will take place outside of normal class hours on Friday and Saturday, November 16 and 17. Participation in this exercise is mandatory; see me ASAP if you have a conflict.

Attendance Policy: Students are responsible for all material presented during class and lab periods. Attendance will not be taken during class periods. Students who miss class must arrange to get notes, etc. from other students. Students will receive a 0 on any assignments that they fail to complete due to absence.

Attendance during labs is required. Absences can cause severe disruptions since many labs will require working in teams. Students who miss lab will be assigned a 0 for that lab exercise. Make-up labs for pre-arranged, excused absences will be designed on a case-by-case basis.

Academic dishonesty: It is your responsibility as a student at this university to understand the policies and consequences associated with academic integrity and dishonesty. These are spelled out in the Student Handbook, available online at http://www.wcu.edu/univcenter/handbook/index.html
**Accommodations for Students with Disabilities**: Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234; E-mail: kmarcus@email.wcu.edu

**General**: I expect students to reflect a certain degree of professionalism in both their assignments and their conduct. In addition to detracting from the overall grade, assignments or conduct that are deemed unprofessional can also result in penalties of up to 25% of the value of the assignment. Professional student conduct will include being prepared for class (i.e., reading assigned materials and reviewing recent notes before each class, and acting professionally during lab exercises). All assignments must be neat, clearly legible, and well organized.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aug. 20</td>
<td>Introduction and scope of course</td>
<td>1.1 to 1.6</td>
</tr>
<tr>
<td></td>
<td>Land measurements</td>
<td>2.1 to 2.2</td>
</tr>
<tr>
<td></td>
<td>Distance</td>
<td>4.1 to 4.5</td>
</tr>
<tr>
<td>Aug. 27</td>
<td>Direction</td>
<td>4.6 to 4.9</td>
</tr>
<tr>
<td>Sept. 3</td>
<td>Boundary traverse</td>
<td>4.10 to 4.13</td>
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<tr>
<td></td>
<td>Area determination</td>
<td>4.16 to 4.23</td>
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<tr>
<td></td>
<td>Land surveying</td>
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<tr>
<td>Sept. 10</td>
<td>Measuring standing trees</td>
<td>7.1 to 7.6</td>
</tr>
<tr>
<td></td>
<td>Diameter</td>
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<tr>
<td>Sept. 17</td>
<td>Height</td>
<td>7.7 to 7.11</td>
</tr>
<tr>
<td></td>
<td>Form</td>
<td>7.12 to 7.14</td>
</tr>
<tr>
<td>Sept. 24</td>
<td>Units of measure</td>
<td>5.1 to 5.12</td>
</tr>
<tr>
<td>Oct. 1</td>
<td>Tree contents</td>
<td>8.1 to 8.3</td>
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<tr>
<td></td>
<td>Taper, volume, weight tables</td>
<td>6.17 to 6.30</td>
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<td></td>
<td>Tree grading and Specialty wood products</td>
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<tr>
<td>Oct. 8</td>
<td>Statistical review</td>
<td>2.5 to 2.17</td>
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<tr>
<td></td>
<td>Sampling and estimation</td>
<td>3.1 to 3.3</td>
</tr>
<tr>
<td>Oct. 15</td>
<td>Common sampling designs</td>
<td>3.4 to 3.11</td>
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<tr>
<td>Oct. 22</td>
<td>Timber inventories</td>
<td>9.1 to 9.11</td>
</tr>
<tr>
<td></td>
<td>Summaries of cruise data</td>
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<td>Oct. 29</td>
<td>Fixed area sampling</td>
<td>10.1</td>
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<td></td>
<td>line-plot cruising</td>
<td>10.6 to 10.11</td>
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<td>Nov. 5</td>
<td>(cont.)</td>
<td>11.1 to 11.27</td>
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<td>Nov. 12</td>
<td>Point sampling</td>
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<td>Nov. 19</td>
<td>(cont.)</td>
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<tr>
<td>Nov. 26</td>
<td>(cont.)</td>
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<tr>
<td>Dec. 3</td>
<td>Review and wrap-up</td>
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</tbody>
</table>
NRM-420  
SOIL GENESIS AND CLASSIFICATION  
SPRING 2007

Instructor:  
Peter Bates  
341 Stillwell  
227-3914  
bates@email.wcu.edu

Office hours:  
11:00 to 12:00 Monday  
3:30 to 4:45 Tuesday  
or by appointment

Meeting schedule:  
Lecture: Tuesday and Thursday from 8:00 – 9:15 in ST152  
Lab: Tuesday from 1:25- 3:15 in ST152

There will also be 1 weekend field trip tentatively scheduled for Friday, March 30 through Sunday, April 1. Participation in this field trip is mandatory. Please see me ASAP if you have a conflict with these dates.

Course objectives:  
The overall goal of this course is to provide students with a basic understanding of soil formation, and how soils occur on the landscape. This will include exploration of the following:  
1. The basic factors and processes that control the formation and key properties of soils.  
2. The recognition and description of soil morphological features, and the use of those features in the classification of soils using Soil Taxonomy and other major soil classification systems.  
3. The spatial relationships and patterns of soils as they occur on the ground, and how we use these relationships to map soils and interpret their uses.

Required text:  

Evaluation:  
3 midterm exams 30%  
Final Exam (Tuesday May 4, 12:00-2:30) 25%  
Lab exercises 25%  
Student project 10%  
Field trip report 10%  
100%

For all practical purposes, the following final averages will guarantee the corresponding grades: > 93=A, > 90=A-, > 87=B+, > 83=B, > 80=B-, etc.

Exams will concentrate on material covered since the previous exam, though students will be responsible for major concepts presented earlier. The final exam will be comprehensive. Exams will consist primarily of short answer and essay questions that are designed to evaluate
your understanding of the material presented. Note that memorization and regurgitation of material discussed in class will generally not be enough to score highly on exams. In many cases you will need to assimilate and apply the material. Make-up exams will only be given under extreme circumstances for documented absences accepted by the instructor. Students will be responsible for materials covered during lectures and labs and for assigned readings.

**Lab exercises** are intended to illustrate and reinforce some of the concepts discussed in class. Labs will be conducted both inside and outside. In some cases it will be necessary for students to drive short distances off campus. Note that while much of the lab work will be done in teams, each individual must submit their own *original* lab report. Teams should submit group field forms and data sheets only when directed.

Reports for each lab exercise will have a due date corresponding to a lecture period. Lab reports will be due at the beginning of that lecture. Late reports will be accepted until the beginning of the next lecture period, but will be assessed a 25% penalty. Reports will not be accepted after that time. Organization and legibility count significantly in the grading of lab reports. All lab reports must be computer generated.

The following guidelines will be used for evaluating lab reports:

1. **Completeness**
   - Answer all questions that are asked.
   - Discuss and present data in quantitative terms whenever possible.
   - Avoid the use of vague terms such as "moderate", "good", etc. without some quantitative indication of what these terms mean.
   - Analyze data in order to support arguments.
   - Be sure that statements or arguments are documented with sound reasoning and/or cited authorities (include bibliography at end of paper for the latter using any standard format).

2. **Organization and writing style**
   - Easy to follow.
   - Data are presented in useful form (graphs and tables when possible)
   - Terms are used appropriately.

3. **Originality**
4. **Correctness of arguments** – Though there will be a very minimal penalty (if any) for well-reasoned, but incorrect arguments.

**The student project** will consist of an individual research project or case study that considers an application of soil genesis and classification in western NC. We will discuss this project in more detail later in the semester.
Field trip report: There is a required class field trip tentatively scheduled for the end of March. Each student will be required to submit a report summarizing some component of the trip. More details will be provided later in the semester.

Attendance policy: Students are responsible for all material presented during lecture and lab periods. Attendance will not be taken during lecture. Students who miss lecture must arrange to get lecture notes from other students (any handouts, etc, will be provided by the instructor). Attendance during labs is required. Absences can cause severe disruptions since many labs will require working in teams. Students who miss lab will be assigned a 0 for that lab exercise. Make-up labs for excused absences will be designed on a case-by-case basis.

Academic dishonesty: It is your responsibility as a student at this university to understand the policies and consequences associated with academic integrity and dishonesty. These are spelled out in the Student Handbook, available online at http://www.wcu.edu/univcenter/handbook/index.html

Students with disabilities: Western Carolina University is committed to providing equal educational opportunities for students with documented disabilities. Students who require disability services or reasonable accommodations must identify themselves as having a disability and provide current diagnostic documentation to Disability Services. All information is confidential. Please contact Kimberly Marcus for more information. Phone: (828) 227-7234; E-mail: kmarcus@email.wcu.edu.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic</th>
<th>Reading in text</th>
</tr>
</thead>
</table>
| Jan 8   | Introduction  
Soil Morphology and composition | Ch. 1  
Ch. 2 |
| Jan 15  | Cont. | |
| Jan 22  | Cont. | |
| Jan 29  | Soil classification systems | Ch. 6 |
| Feb 5   | Soil Taxonomy | Ch. 7 |
| Feb 12  | Soil formation – biogeochemical processes | Ch. 3 |
| Feb 19  | Soils and landscapes | Ch. 4 |
| Feb 26  | Soil formation - time | Ch. 5 |
| Mar 5   | **SPRING BREAK** | |
| Mar 12  | The soil orders: Entisols, Inceptisols, and Molisols | Ch. 11, 14, 15 |
| Mar 19  | The soil orders: Ultisols, Histosols, and Spodosols | Ch. 18, 13, 17 |
| Mar 26  | The soil orders: Oxisols, Alfisols, Aridisols | Ch. 16, 8, 10 |
| Apr 2   | The soil orders: Andisols, Gelisols, and Vertisols | Ch. 9, 12, 19 |
| Apr 9   | Soils surveys | Ch. 20 |
| Apr 16  | Soil interpretations | Ch. 21 |
| Apr 23  | Wrap and review | |
INTEGRATED RESOURCE MANAGEMENT
GENERAL COURSE INFORMATION

Lecture Times: 11:00 - 11:50  T & Th       St 152
Lab Times: 3:30 - 5:20  T & Th       ST 143
Instructor: Dr. Lawrence Kolenbrander
Office: 336 Stillwell
Email Address: LKOLENB@WCU.EDU
Office Hours: M - 1:30 to 3:00
T - 1:00 to 2:00
R - 1:00 to 2:00
F - 10:00 to 12:00

There is NO course text for this class. Each student is required to purchase a xerox package of supplemental readings from the WCU Bookstore. Readings will be assigned from materials on closed reserve in Hunter Library, from class handouts and from the supplemental readings package.

Course Objectives:

1. To introduce the student to basic concepts and techniques of integrated resource management.

2. To simulate the "real World" environment of the processes and problems in integrated resource management; including but not limited to:
   a. Problem and issue identification,
   b. Goal & Objective setting,
   c. Natural Resource Inventory,
   d. Planning and Decision - making,
   e. Team Management,
   f. Alternatives Analysis, and
   g. Project Presentation.

Course Policies and Grading:

1. Attendance in lectures is required. Frequent absence will affect your personal performance as well as the performance of your team.
2. Short assignments, and unannounced quizzes over previous lectures or reading assignments will be worth 10% of the final grade.
3. One take home examination will comprise 40% of the final grade.
4. One major group project will comprise the remaining 50% of the final grade.
Academic integrity

You are encouraged to share ideas, discuss questions, and work together with your classmates in such a way as to further your individual and collective understanding and proficiency of the concepts and skills presented in this course. However, I expect each of you to submit original, independent work and adhere to the policies set forth in the University Catalog and Student Handbook. Academic dishonesty of any kind is not acceptable. Be sure to cite all work and ideas that are not your own. Also be sure to reference all citations. See the University Writing Center website for information regarding plagiarism. Failure to comply with University policies may result in a zero for the assignment, failure of the course, disciplinary action at the University level, or any combination of the three. (http://www.wcu.edu/WritingCenter/isource/hyssplagiarizing.html)

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NRM 440 LABORATORY

General Lab Information:

Two lab sessions per week have been scheduled. We will not have a formal lab during each scheduled session. During about the first part of the semester, the Tuesday lab periods will be used as formal lab periods. We will work on specific exercises during these times. The remainder of the Tuesday lab periods will be used for weekly progress reports where each team will meet with Dr. Kolenbrander. The 4 hours of lab were scheduled to provide you with 4 hours which you can use for project planning and management. It also guarantees you that I will be available for help with questions and problems during these hours.

Project Grading: 50% of the final course grade.

The major emphasis of this class will be the completion of an assigned team project. The teams will be formed by Dr. Kolenbrander and will be supplied with a detailed project description. Each team will develop a management plan and draft environmental impact statement for their project proposal. The teams will present their proposal and EIS at a public hearing and will submit a final written report including the management plan and EIS.

Project grading policies and procedures will be determined during the initial part of the class meetings.

NRM 440 INTEGRATED RESOURCES MANAGEMENT

LECTURE SCHEDULE

<table>
<thead>
<tr>
<th>DATE</th>
<th>TOPIC</th>
<th>READING</th>
</tr>
</thead>
<tbody>
<tr>
<td>JAN. 9</td>
<td>Course Introduction</td>
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</tr>
<tr>
<td>&quot; 11</td>
<td>IRM Planning Process</td>
<td>TVA Reading</td>
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<tr>
<td>&quot; 16</td>
<td>IRM Planning Process</td>
<td></td>
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<tr>
<td>&quot; 18</td>
<td>Intro. to EIS's</td>
<td>N.E.P.A. + Region 10 Guidelines</td>
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<tr>
<td>Date</td>
<td>Activity</td>
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<tr>
<td>Feb 1</td>
<td>A Procedure for evaluating Environmental Impact</td>
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<td>Feb 6</td>
<td>Population Projections</td>
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<tr>
<td>Feb 8</td>
<td>Population Projections</td>
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<td>Feb 13</td>
<td>Population Projections</td>
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<tr>
<td>Feb 15</td>
<td>Economic Analysis</td>
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<td>Feb 20</td>
<td>Economic Analysis</td>
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<td>Feb 22</td>
<td>Additional Legal Requirements</td>
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<td>Feb 27</td>
<td>Additional Legal Requirements</td>
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<td>Mar. 1</td>
<td>Additional Legal Requirements</td>
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<tr>
<td>Mar. 5-9</td>
<td>Spring Break</td>
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<tr>
<td>Mar. 13</td>
<td>Additional Legal Requirements</td>
<td></td>
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<td>Mar. 15</td>
<td>Public Involvement</td>
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<td>Mar. 20</td>
<td>Public Involvement</td>
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<tr>
<td>Mar. 22</td>
<td>Public Meetings</td>
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<td>Mar. 27</td>
<td>A. V. Presentations</td>
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<td>Apr. 3</td>
<td>Project Presentations</td>
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<td>Apr. 5</td>
<td>Easter Holiday</td>
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<td>Apr. 10</td>
<td>TAKE HOME EXAM</td>
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<td>Apr. 12</td>
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<td>Apr. 17</td>
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<td>Apr. 19</td>
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<td>Apr. 24</td>
<td>Reading Day</td>
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<td>Apr. 26</td>
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<td>Apr. 27</td>
<td>Project Reports Due - 5:00 pm</td>
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<td>Date</td>
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<tr>
<td>Jan. 9</td>
<td>Nominal Group Process - Barriers to Successful Team Projects</td>
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<tr>
<td>&quot; 11</td>
<td>No Meeting</td>
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<tr>
<td>&quot; 16</td>
<td>Team Assignments &amp; Project Descriptions</td>
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<tr>
<td>&quot; 18</td>
<td>Team Meetings</td>
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<tr>
<td>&quot; 23</td>
<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<td>&quot; 25</td>
<td>Team Meetings - Kolenbrander??</td>
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<td>&quot; 30</td>
<td>Team meetings - Kolenbrander out of town</td>
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<td>Feb. 1</td>
<td>Team Meetings</td>
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<td>&quot;  6</td>
<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<td>&quot;  8</td>
<td>Team Meetings</td>
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<td>&quot; 13</td>
<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<td>&quot; 15</td>
<td>Team Meetings</td>
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<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<td>&quot; 22</td>
<td>Team Meetings</td>
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<td>&quot; 27</td>
<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<td>Date</td>
<td>Event Description</td>
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<tr>
<td>Mar. 1</td>
<td>Team Meetings</td>
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<tr>
<td>Mar. 2</td>
<td>Detailed Project Outlines Due - 5:00 pm</td>
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<td>Mar. 6-9</td>
<td>Spring Break</td>
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<tr>
<td>&quot; 13</td>
<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<tr>
<td>&quot; 15</td>
<td>Team meetings</td>
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<tr>
<td>Mar. 20</td>
<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<tr>
<td>&quot; 22</td>
<td>Team meetings</td>
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<tr>
<td>&quot; 27</td>
<td>Project Discussions with teams/Dr. Kolenbrander</td>
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<tr>
<td>&quot; 29</td>
<td>Team Meetings</td>
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<tr>
<td>Apr. 3</td>
<td>Project Presentations/ Public Meetings</td>
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<tr>
<td>&quot; 10, 17, 24</td>
<td>Meet with Dr. Kolenbrander as needed</td>
<td></td>
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<tr>
<td>Apr. 27(Fri.)</td>
<td>FINAL PROJECT REPORTS DUE - 5:00 PM</td>
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</tbody>
</table>
NRM-451
FOUNDATIONS OF SILVICULTURE
Fall 2007

Instructor:
Pete Bates
Office hours: Tuesday 12:00 to 1:00
341 Stillwell
Friday 11:00 to 12:00
phone and voicemail: 227-3914
or by appointment
email: bates@email.wcu.edu

Course Objectives:
1. To introduce students to basic silviculture terminology and treatments.
2. To discuss the principles of forest reproduction, intermediate stand treatments, and silvicultural systems.
3. To relate silviculture to other forest management disciplines.
4. To illustrate the application of silvicultural principles within the context of sustainable forest management in the southern Appalachians.

Role of this course within NRM curriculum:
It is expected that students enter this course with a proficient knowledge of tree identification, a general understanding of ecological principles, and the ability to collect and summarize basic forest stand data (BIOL-254, NRM-210).

Required Text:

Supplementary Materials (online or on reserve in Hunter Library):
Others may be added during the semester.

Evaluation:
Exam #1 (around Sept. 19) 10%
Exam #2 (around Oct. 17) 15%
Exam #3 (around Nov. 14) 10%
Final Exam (Wednesday December 12, 8:30-11:00) 20%
Term project 15%
Lab exercises 30%
100%

For all practical purposes, the following final percentages will guarantee the corresponding grades: $\geq 93=A$, $\geq 90=A-$, $\geq 87=B+$, $\geq 83=B$, $\geq 80=B-$, etc.
Exams will concentrate on material covered since the previous exam, though students will be responsible for major concepts presented earlier. The final exam will be comprehensive. Exams will consist primarily of short answer and essay questions that are designed to evaluate your understanding of the material presented. Note that memorization and regurgitation of material discussed in class will generally not be enough to score highly on exams. In many cases you will need to assimilate and apply the material. Make-up exams will only be given under extreme circumstances for documented absences accepted by the instructor. Students will be responsible for materials covered during lectures and labs and for assigned readings.

Lab exercises are intended to illustrate and reinforce some of the concepts discussed in class. Labs will be conducted both inside and outside. In some cases it will be necessary for students to drive short distances off campus. Note that while much of the lab work will be done in teams, each individual must submit their own original lab report. Teams can submit group field forms and data sheets when directed. DO NOT SUBMIT GROUP DATA SUMMARY FORMS UNLESS DIRECTED TO.

Reports for each lab exercise will have a due date corresponding to a lecture period. Lab reports will be due at the beginning of that lecture. Late reports will be accepted until the beginning of the next lecture period, but will be assessed a 25% penalty. Reports will not be accepted after that time. Organization and legibility count significantly in the grading of lab reports. All lab reports must be computer generated.

The following guidelines will be used for evaluating lab reports:

1. Completeness
   - Answer all questions that are asked.
   - Discuss and present data in quantitative terms whenever possible.
   - Avoid the use of vague terms such as "moderate", "good", etc. without some quantitative indication of what these terms mean.
   - Analyze data in order to support arguments.
   - Be sure that statements or arguments are documented with sound reasoning and/or cited authorities (include bibliography at end of paper for the latter using any standard format).

2. Organization and writing style
   - Easy to follow.
   - Data are presented in useful form (graphs and tables when possible)
   - Terms are used appropriately.

4. Originality

4. Correctness of arguments – Though there will be a very minimal penalty (if any) for well-reasoned, but incorrect arguments.

The term project will consist of an individual research project or case study that considers an application of silviculture in western NC. We will discuss this project in more detail later in the semester.
**Attendance Policy:** Students are responsible for all material presented during lecture and lab periods. Attendance will not be taken during lecture. Students who miss lecture must arrange to get lecture notes from other students (any handouts, etc, will be provided by the instructor).

Attendance during labs is required. Absences can cause severe disruptions since many labs will require working in teams. Students who miss lab will be assigned a 0 for that lab exercise. Make-up labs for excused absences will be designed on a case-by-case basis.

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**General:** I expect students to reflect a certain degree of professionalism in both their assignments and their conduct. In addition to detracting from the overall grade, assignments that are deemed unprofessional can also be penalized up to 25% of the value of the assignment. Professional student conduct will include being prepared for class -- i.e., reading assigned materials and reviewing recent notes before each class, and acting professionally during class periods and lab exercises. All assignments must be neat, clearly legible, and well organized.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic</th>
<th>Reading ¹</th>
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<tbody>
<tr>
<td>Aug. 20</td>
<td>Course introduction</td>
<td>Sm ch. 1</td>
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<tr>
<td>Aug. 27</td>
<td>Silviculture overview</td>
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<td></td>
<td>I. The site</td>
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<td></td>
<td>Solar radiation</td>
<td>K 149-163, 166-174</td>
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<td>Temperature</td>
<td>K 175-191, 201-204</td>
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<td>D 171-175, 183-205</td>
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<td>Sept. 3</td>
<td>Soil, water, and nutrients</td>
<td>K 221-235, 245-263, 275-276, 283-286</td>
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<td>Sept. 10</td>
<td>Site quality</td>
<td>Sm 263-269, D 235-255</td>
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<td>Site classification</td>
<td>Sm ch. 9</td>
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<td>Sept. 17</td>
<td>II. Stand dynamics/development</td>
<td>Sm ch. 2</td>
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<td></td>
<td>Tolerance and competition</td>
<td>D 235-255</td>
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<td>Succession</td>
<td>K 163-164, 416-422, 424-428</td>
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<td>Sept. 24</td>
<td>III. Forest regeneration</td>
<td>Sm ch. 7</td>
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<td>Natural regeneration</td>
<td>Sm 320-327</td>
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<td></td>
<td>Seed</td>
<td>Sm ch. 13</td>
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<td></td>
<td>Vegetative</td>
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<tr>
<td>Oct. 1</td>
<td>Artificial regeneration</td>
<td>Sm ch. 10 &amp; 12</td>
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<tr>
<td></td>
<td>Direct seeding</td>
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<tr>
<td></td>
<td>Species selection/tree improvement</td>
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<td></td>
<td>Nursery operations</td>
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<td></td>
<td>Tree planting</td>
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<td>Oct. 8</td>
<td>IV. Site preparation</td>
<td>Sm ch. 8</td>
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<tr>
<td></td>
<td>Mechanical</td>
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<td></td>
<td>Fire</td>
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<tr>
<td>Oct. 15</td>
<td>V. Intermediate stand treatments</td>
<td>Sm ch. 3</td>
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<td></td>
<td>Release</td>
<td>Sm ch. 6</td>
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<td>Oct. 22</td>
<td>Thinning</td>
<td>Sm ch. 4 &amp; 5</td>
</tr>
<tr>
<td></td>
<td>Improvement cutting</td>
<td></td>
</tr>
<tr>
<td>Oct. 29</td>
<td>VI. Silvicultural systems</td>
<td>Sm ch. 11</td>
</tr>
<tr>
<td></td>
<td>Plantations</td>
<td>Sm ch. 12</td>
</tr>
<tr>
<td>Nov. 5</td>
<td>Double cohort/pure stands</td>
<td>Sm ch. 14</td>
</tr>
<tr>
<td></td>
<td>Pure uneven-aged stands</td>
<td>Sm ch. 15</td>
</tr>
<tr>
<td>Nov. 12</td>
<td>Mixed species stands</td>
<td>Sm ch. 16</td>
</tr>
<tr>
<td>Nov. 19</td>
<td>Silviculture and pests</td>
<td>Sm ch. 19</td>
</tr>
<tr>
<td>Nov. 26</td>
<td>Silviculture and wildlife</td>
<td>Sm ch. 20</td>
</tr>
<tr>
<td>Dec. 3</td>
<td>Wrap-up and Review</td>
<td></td>
</tr>
</tbody>
</table>

¹Sm=Smith, K=Kimmins, D=Daniel et al.
NRM-452
FOREST MANAGEMENT
Spring 2006

**Instructor:**

Peter Bates
235-A Stillwell
227-7367 or 227-3914
bates@email.wcu.edu

**Office hours:**
1:00 to 2:00 Wednesday
8:00 to 9:00 Friday
or by appointment

**Class meeting times:**

Lecture: T,R 9:30 to 10:45, Stillwell 247
Lab: R 12:30 to 2:20, Stillwell 327

Note: In many cases we will be working problems through during class, thus it is required that each student **bring a calculator** to each class period.

**Course Objectives:**

1. To introduce students to forest planning concepts.
2. To acquaint students with the principles and techniques of regulating forest growing stock within the context of sustained yield management.
3. To become familiar with how to carry out and interpret an economic analysis of simple forestry projects.

**Role of this course within NRM curriculum:**

Prerequisite knowledge: This is the final course in the Forest Resources concentration. Students are expected to have a working knowledge of Forest Measurements (NRM-352), Forest Ecology (NRM-351), and Silviculture (NRM-451). In addition students are expected to have completed the bulk of their General Education, Core, and Program requirements so that they have basic writing, math, and computer skills.

**Required Text:**

Evaluation:

- Exam #1 (Feb. 9) 10%
- Exam #2 (Mar. 16) 10%
- Exam #3 (Apr. 20) 10%
- Final Exam (Tuesday, May 2, 8:30-11:00) 20%
- Weekly quizzes 25%
- Term project 10%
- Lab 15%

For all practical purposes, the following final percentages will guarantee the corresponding grades: > 93=A, > 88=A-, > 85=B+, > 81=B, and > 78=B-, etc.

Exams will concentrate on material covered since the last exam, though students will be responsible for major concepts presented earlier. The final exam will be comprehensive. Make-up exams will only be given under extreme circumstances for documented absences accepted by the instructor.

Students will be responsible for materials covered during lectures and labs and for readings assigned in Davis and Johnson. Additional reading assignments may be assigned during the semester.

Quizzes will be used to encourage students to keep up on the material. They will concentrate on material covered during the preceding 3 or 4 lectures and 1 or 2 lab periods. Quizzes will be given at the beginning of class every Tuesday, and will last approximately 10 minutes. I will drop the 3 lowest quiz grades for each student. There will be no make-up quizzes given for any reason.

Lab exercises are intended to illustrate and reinforce some of the concepts discussed in class. Most labs will be conducted inside. Note that while some of the lab work will be done in teams, each individual must submit their own original lab report.

Reports for each lab exercise will have a due date corresponding to a lecture period. Lab reports will be due at the beginning of that lecture. Late reports will be accepted until 48 hours after the due date, but will be assessed a 25% penalty. Reports will not be accepted after that time.

Students are required to use computers whenever possible in the completion of lab exercises and the preparation of lab reports. Many labs will require numerous calculations that can be completed quickly and easily using spreadsheet programs. When creating spreadsheets, be sure that they are neat and well organized with columns and other data labeled so that I can follow what is going on. Also, save enough columns and provide enough formulas etc., so that I can determine where you might have gone wrong if you come up with the wrong answer. Each student must generate his or her own spreadsheets. Little is learned by submitting a spreadsheet largely created by someone else. Organization and legibility count significantly in the grading of lab reports. All written answers must be typed on a word processor.

Term project: Each student will be part of a team that will prepare a forest management plan during the semester. A description of the parcel and all relevant information will be provided.
when the project is formally assigned. In order that students might receive appropriate feedback, the project written report is due at 5:00 PM on Friday, April 21.

**Attendance Policy:** Students are responsible for all material presented during lecture and lab periods. Attendance will not be taken during lecture. Students who miss lecture must arrange to get lecture notes from other students.

**General:** I expect students to reflect a certain degree of professionalism in both their assignments and their conduct. Assignments that are deemed unprofessional may not be accepted. In addition to detracting from the overall grade, assignments that are deemed unprofessional can also be penalized up to 25% of the value of the assignment. Professional student conduct will include being prepared for class -- i.e., reading assigned materials and reviewing recent notes before each class, and acting appropriately during lab exercises.
<table>
<thead>
<tr>
<th>Week of</th>
<th>Topic</th>
<th>Reading (all in Davis)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/9</td>
<td>Introduction</td>
<td>Chapters 1&amp;2</td>
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<td></td>
<td>History and overview of Forest Management</td>
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<tr>
<td>1/16</td>
<td><strong>I. Timber management planning</strong></td>
<td>Chapter 10</td>
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<td>Forest regulation</td>
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<tr>
<td>1/23</td>
<td>Allowable cut</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>Normal forest model</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>Yield table summation method</td>
<td>&quot;</td>
</tr>
<tr>
<td></td>
<td>Von Mantel method</td>
<td>&quot;</td>
</tr>
<tr>
<td>1/30</td>
<td>Area control</td>
<td>&quot;</td>
</tr>
<tr>
<td>2/6</td>
<td>Volume control</td>
<td>&quot;</td>
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<tr>
<td></td>
<td>Modified barnes/Tabular check</td>
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<tr>
<td>2/13</td>
<td>Management plans</td>
<td>Chapter 3</td>
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<tr>
<td>2/20</td>
<td><strong>II. Forest Economics</strong></td>
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<td></td>
<td>Introduction</td>
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</tr>
<tr>
<td></td>
<td>The market economy</td>
<td></td>
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<tr>
<td>2/27</td>
<td>Financial analysis of projects</td>
<td>Chapter 7</td>
</tr>
<tr>
<td>3/6</td>
<td><strong>SPRING BREAK</strong></td>
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<tr>
<td>3/13</td>
<td>Interest and the time value of money</td>
<td>&quot;</td>
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<tr>
<td>3/20</td>
<td>Compounding/discounting</td>
<td>&quot;</td>
</tr>
<tr>
<td>3/27</td>
<td>Cash flow tables</td>
<td>&quot;</td>
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<tr>
<td></td>
<td>Measures of project worth</td>
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</tr>
<tr>
<td>4/3</td>
<td>Net present value</td>
<td>&quot;</td>
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<tr>
<td></td>
<td>Soil expectation value/Soil rent</td>
<td></td>
</tr>
<tr>
<td>4/10</td>
<td>Treatment of loans</td>
<td>&quot;</td>
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<tr>
<td></td>
<td>Treatment of uncertainty</td>
<td></td>
</tr>
<tr>
<td>4/17</td>
<td>Dealing with inflation</td>
<td>&quot;</td>
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<tr>
<td></td>
<td>Economics and project design</td>
<td></td>
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<tr>
<td>4/24</td>
<td>Operations research/Linear programming</td>
<td>Chapter 6</td>
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<tr>
<td></td>
<td>Social economics</td>
<td></td>
</tr>
</tbody>
</table>
SUPPLEMENTAL MATERIALS II
NRCM FACULTY CV’S

Peter Bates ................................................................. Page 2
Joni Bugden-Storie.................................................. Page 13
Ron Davis................................................................. Page 20
Laura DeWald......................................................... Page 27
Larry Kolenbrander................................................ Page 42
PETER CALDWELL BATES  
Associate Professor and Director  
Natural Resource Conservation and Management Program  
Department of Geosciences and Natural Resources  
Western Carolina University  
Cullowhee, North Carolina 28723  
828.227.3914  
bates@email.wcu.edu

EDUCATION

Ph.D. Forestry (minor Soil Science), 1990  
University of Minnesota  
Dissertation Title: Quaking aspen regeneration in northern Minnesota: Effects of  
harvest season and site conditions.

M.S. Soil Science, 1981  
Montana State University  
Thesis Title: Compaction by logging equipment of six soils in northwestern Montana  
as affected by soil water content, equipment type and number of passes.

B.S. (with honors) Forestry, 1977  
University of Montana

PROFESSIONAL APPOINTMENTS

August 2000 – present. Associate Professor of Natural Resource Conservation and  
Management (Program Director beginning Fall 2006), Department of  
Geosciences and Natural Resources, Western Carolina University, Cullowhee,  
North Carolina.

July 2006 – present. Adjunct Associate Professor, Department of Forestry and Natural  
Resources, Clemson University, Clemson, South Carolina.

August 1993 – July 2000. Assistant Professor of Natural Resources Management,  
Department of Geosciences and Natural Resources Management, Western  
Carolina University, Cullowhee, North Carolina.

September 1990 to August 1993. Post-doctoral Associate, Department of Soil Science,  
University of Minnesota.

January 1987 to September 1990. Graduate Research Assistant, Department of Forest  
Resources, University of Minnesota.

May 1981 to January 1987. Soil Scientist, Minnesota Agricultural Experiment Station,  
Beltrami County Soil Survey, Bemidji.
September 1978 to May 1981. Graduate Research Assistant, Plant and Soil Science Department, Montana State University, Bozeman.


June 1977 to December 1977. Range Technician, USDI Bureau of Land Management, Dillon, MT.

TEACHING EXPERIENCE

1993-present Western Carolina University
   NRM-140 Natural Resource Conservation and Management
   NRM-150 Introduction to Natural Resources Management
   NRM-210 Methods in Natural Resources Management
   NRM-342 Microcomputer Applications in Natural Resources Management
   NRM-344 Introduction to Geographic Information Systems
   NRM-351 Forest Ecology
   NRM-352 Forest Resource Measurements
   NRM-451 Foundations of Silviculture
   NRM-452 Forest Management
   NRM-483 Applications in Forest Management
   NRM-493 Applications in Silviculture
   BIOL-593 Topics in Biology
   ES-150 Introduction to Environmental Science (part of instruction team)

1991-1992 University of Minnesota
   FR 5140 Silviculture in North American Forest Types
   FR 5126 Silviculture: Soil-Site Relationships.

1997 (summer) NC Teaching Fellows Summer Enrichment Program: Man and the Environment


GRADUATE COMMITTEE MEMBERSHIP – Western Carolina University (1Director)

1D. Shannon Rabby, MS Biology, MS Biology 2005
   Small mammal community dynamics across a chronosequence of southern Appalachian mesic hardwood forests

Lisa Mazzarelli, MS Biology. 2002
   Ground-nesting bird response to land use history in mesic forests of the southern Blue Ridge Mountains

Grace E.W. Bockoven, MS Biology. 1999
   Peregrine falcon (Falco peregrinus) restoration in the southern Appalachians
Diana Ohongo, MS Chemistry. 1997
Highly oriented pyrolytic graphite as a platform for atomic absorption spectrometry for the determination of lead, copper, and aluminum

OFFICES HELD

Board of Directors, Southern Forestry Foundation. 2002-present
Chair, Nantahala Chapter of the Society of American Foresters. Fall 1996 - Fall 1998.
President, Xi Sigma Pi, University of Minnesota, 1988-1990.

PROFESSIONAL AND HONORARY SOCIETIES

Xi Sigma Pi
Phi Kappa Phi
Society of American Foresters
North Carolina Registered Forester #1292

HONORS/AWARDS

Boise Cascade Corporation Graduate Fellowship, 1989-1990.
USDA Forest Service Certificate of Merit (plus cash award), 1978.

PUBLICATIONS (*peer-reviewed)


PROFESSIONAL PRESENTATIONS AND ABSTRACTS


Bates, P.C, M. Forbis, and J. Abrams. Prescribed fire effects on oak regeneration in the southern Appalachians: First year results. (Poster). Society of American Foresters National Convention. September 13-17, 2001. Denver, Colorado. (Note: poster was accepted but the convention was canceled due to the events of September 11)


STUDENT-SUPERVISED ABSTRACTS AND PRESENTATIONS


Abrams, Jamie, Jonathan Creason, and Matt Cave. Response of planted black cherry to natural competition in a western North Carolina clearcut. (Poster). Society of American Foresters National Convention, Denver, Colorado. September 13-17, 2001. (Note: the convention was canceled due to the events of September 11)

Cave, Matt, Michael Forbis, and Jonathan Creason. Growth and grade response to thinning in a mixed oak stand in western North Carolina. (Poster). Society of American Foresters National Convention, Denver, Colorado. September 13-17, 2001. (Note: the convention was canceled due to the events of September 11)


PROFESSIONAL CONSULTING AND OTHER WORK EXPERIENCE:


1994 (summer). Visiting Professor, Department of Soil Science, University of Minnesota, St. Paul. Conducted research related to forest soil science.

1995 and 1996 (summer). Forest land classification using digital elevation models in the central Appalachians. Co-investigator: Dr. JC Bell, Department of Soil, Water and Climate, University of Minnesota. Client: WestVaco Corporation

1998 - present. Consulting forester serving private landowners in western North Carolina

PROFESSIONAL SERVICE ACTIVITIES

Papers and presentations


Conservation forestry in the Little Tennessee basin. Presentation to the southern Appalachian forest conservation project group, Rugby, Tennessee. October 1, 2002.

Report on sustainable forest management activities at the Balsam Mountain Preserve.  
Presentation to the Balsam Mountain Trust Board of Trustees Land Management Committee, Balsam, North Carolina.  May 19, 2003.


Report on sustainable forest management activities at the Balsam Mountain Preserve.  

GIS for the sciences:  The Little Tennessee sustainable forestry project, Presentation to the WCU community, Western Carolina University.  February 26, 2004.

Development of a strategic forest management plan for the Waynesville watershed.  
Recorded as Attachment C to the Conservation Easement to the Waynesville Watershed, Haywood County, North Carolina.  2004.

Other

Natural Resources Program Advisory Committee member.  Haywood Community College. 2002 to present.


FUNDED PROPOSALS


EDUCATION:

**Ph.D. (2002):** UNIVERSITY OF WATERLOO, Waterloo, Ontario. Faculty of Environmental Studies, Department of Geography. Specialization in Geomatics.

  Thesis Title: A Knowledge-Based Model for SAR-Crop Interactions: A Case Study in Norwich Township, Ontario. Advisor: Dr. Philip Howarth

**Masters (1996):** UNIVERSITY OF WATERLOO, Waterloo, Ontario. Faculty of Environmental Studies, Department of Geography. Specialization in Spatial Data Analysis and Resource Management.

  Thesis Title: Identification of Agro-Ecosystem Indicators using Integrated Remote Sensing Data. Advisor: Dr. Philip Howarth


  Thesis Title: Using GIS to Plan Canoe Routes in Algonquin Provincial Park. Advisor: Danny Patterson

TEACHING EXPERIENCE:

**Assistant Professor** Western Carolina University (North Carolina)
(2005 – Present)

  - Environmental Geography (Geog150), Introduction to Remote Sensing (Geog324), Natural Resources Conservation and Management (NRM140), Weather and Climate (Geog300)

**Adjunct Assistant Professor** UNIVERSITY OF WATERLOO (Ontario)
(2004/05)

  - [Fall 2004] Geography and Our Planetary Environment (GEOG 102), Advanced Environmental Research Methods (ENVS 278), Physical Climatology (GEOG 309)

**Lecturer** WILFRID LAURIER UNIVERSITY (Ontario)
(2002)

  - Cartography II (GG351)

**Teaching Assistant** UNIVERSITY OF WATERLOO (Ontario)
(2001)

  - Environmental Remote Sensing (GEOG-376)

**Lecturer** UNIVERSITY OF BUENOS AIRES (Buenos Aires, Argentina)
(April 2000)

  - Introduction to Synthetic Aperture Radar (SAR): 3-Day Seminar

**Lecturer** NATIONAL UNIVERSITY OF SAN JUAN (San Juan, Argentina)
(August 1999)

  - Introduction to Synthetic Aperture Radar (SAR): 2-Day Workshop

**Lecturer** YORK COLLEGE OF INFORMATION TECHNOLOGY (Ontario)
(Feb. 1997)

  - Research Statistics (STATS210)

**Lecturer** YORK COLLEGE OF INFORMATION TECHNOLOGY (Ontario)
(Dec. 1996)

  - Statistics Level I (STATS100)

**Teaching Assistant** UNIVERSITY OF WATERLOO (Ontario)
(May ’97 to Aug. ’98)

  - Advanced Remote Sensing (GEOG-471 and GEOG-603)
Teaching Assistant
(Jan. ’95 to Dec. ’97)
UNIVERSITY OF WATERLOO (Ontario)
Introduction to Environmental Research Methods (ES-178)

Teaching Assistant
(Sept. to Dec. ’94)
UNIVERSITY OF WATERLOO (Ontario)
Advanced Environmental Research Methods (ES-278)

PROJECT/WORK EXPERIENCE:

Visiting Fellowship
(Oct. ’02-Aug. ’04)
Agriculture & Agri-Food Canada (Eastern Cereal and Oilseed Research Centre)
Retrieval of biophysical crop and field descriptors and the delineation of homogenous field sub-units for crop management using polarimetric SAR data.

Research Assistant
(1994 to 2002)
University of Waterloo – Oxford County Radar Experiment
Funded by the Application Development and Research Opportunity (ADRO) program, CSA, NASA, RADARSAT International Inc., and the Centre for Research in Earth & Space Technology (CRESTech).

Coordinator/ Author
(March-Oct. 2000)
Agri Food Laboratories – Using IKONOS Data to Generate Products for Agricultural Retailers in Middlesex County
[$20,000]

Coordinator/ Author
(March-Oct. 2000)
Agri Food Laboratories – RADARSAT-1 Data for Commercial Agricultural Applications
[$20,000]

Coordinator
(April-Oct.2000)
Canada Space Agency – Application Development and Research Opportunity (ADRO-2) - RADARSAT Data for Commercial Agricultural Applications
[$16,000]

Principal Investigator
(1998 to 2001)
Universities of San Juan-Waterloo GlobeSAR-2 Project - Land-use/Land-cover Mapping of the Tulum Valley using RADARSAT-1 Data.
[$34,000]

Internship
(Dec. ’98 to Feb. ’99)
Insitut InterAmerican de Cooperation Pour L’Agriculture - Research, Education and Technology Transfer for Agriculture in Argentina
[$4,500 US]

Co-Investigator and Proposal Author
Data.
(Nov. ’98 to March ’99) [$17,000]

Coordinator
(May to Aug. ’98)
Agreco - Crop Monitoring using CASI Data
Coordinator    Agrisat – *Detection of Soil Moisture using RADARSAT-1 Data*  
(Feb. ‘98 to Mar. ‘99) Funded by the RADARSAT User Development Program (RUDP); Canadian Space Agency.

Coordinator    Agreco – *Crop Monitoring using CASI & RADARSAT Data*  
(Feb. to Oct. ‘97) Funded through the RADARSAT User Development Program (RUDP).

Participant    University of Waterloo – *Lake St. Clair Wetlands Project*  
(Jan. to Aug. ‘96) Funded through Application Development and Research Opportunity (ADRO) program.

Environmental Coordinator    Aqua-Terre Environmental Consulting – *Lake Lisgar Rehabilitation Project*  
(May to Aug. ‘94) Liaison person between Joint Services Coalition and the Town of Tillsonburg, Parks and Recreation, Long Point Conservation Authority and local media.
RESEARCH PUBLICATIONS:

THESES:

JOURNAL PUBLICATIONS:

CONFERENCE PAPERS:
Bugden, J.L. and P.J. Howarth, 1996. The detection of agro-ecosystem indicators using SAR and optical remote


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**CONFERENCE PRESENTATIONS/ ABSTRACT AND REPORTS:**


**WORKSHOPS:**

Participant, Geography Faculty Development Alliance workshop, funded by the National Science Foundation, University of Colorado at Boulder, July 2006.

______________________________________________________________
### Principal Investigator:

<table>
<thead>
<tr>
<th>Year</th>
<th>Project Description</th>
<th>Funding</th>
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<tr>
<td>2006-2008</td>
<td>Polarimetric SAR Feature Extraction for Land-Cover Mapping in Latin America: Developing Spatial Products for Environmental Decision Systems</td>
<td>$40,000</td>
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<tr>
<td>2005-2006</td>
<td>Prototype River Cane Geographic Information System for the Revitalization of Traditional Cherokee Artisan Resources</td>
<td>$35,808</td>
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<td>1998-2001</td>
<td>Land-use/Land-cover Mapping of the Tulum Valley (Argentina) using RADARSAT-1 Data</td>
<td>$34,000</td>
</tr>
<tr>
<td>1998-1999</td>
<td>Co-PI: Agricultural Crop Identification and Monitoring in Bolivia using RADARSAT-1 Data</td>
<td>$17,000</td>
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### Community Service:

- 2006: Great Smoky Mountain National Park – Student involvement in bird-banding demonstration
- 2006: Cullowhee Valley School Earth Day Event (Clean Air/Clean Water science projects & games)
- 2001: Graduate Student Representative Faculty of Environmental Studies Dean Nomination Committee
- 2000: Initiate and Organize “Laurier-Waterloo Graduate Student Brown Bag Sessions”
- 2000: Director Board of Directors: Graduate Student Association
- 1999-2000: Graduate Student Representative Senate Research Council
- 1999-2000: Department of Geography Representative Graduate Student Association
- 1996: Participant in Manulife Ride for Life: Heart Foundation Charity
- 1996: Chair D2 Session at CAG-ONT Trent University, Peterborough Ontario October 1996
- 1995 & 1996: Graduate Student Orientation Volunteer Faculty of Environmental Studies

### Awards:

- 2001: Student Poster Award, 23rd Canadian Symposium on Remote Sensing [$100]
- 2000: Ontario Graduate Scholarship [$12,000]
- 1999: Ontario Graduate Scholarship in Science and Technology [$15,000]
- 1996: Institute for Space & Terrestrial Science Poster Competition [$75]
- 1996: University of Waterloo Scholarship [$2,000]
- 1995: University of Waterloo Incentive Scholarship [$1,000]
- 1994: University of Waterloo Scholarship [$1,250]
- 1994: Carleton University Dean’s List: Undergraduate Academic Achievement Award

### Professional Affiliations:

- American Association of Geographers
- Canadian Remote Sensing Society
- Canadian Aeronautics and Space Institute
Ronald W. Davis  
Department of Geosciences and Natural Resource Management  
Western Carolina University  
Cullowhee, NC 28723  
Office: 344 Stillwell  
Phone: (828) 227–2726  
Email: rdavis@wcu.edu

EDUCATION

Ph.D., Natural Resources and Environmental Sciences, University of Illinois, December 2005.  
Dissertation: A GIS-Based Habitat Model Predicting Nutritional Condition of Free-Ranging Elk in the Pacific Northwest.

Master of Arts, Physical Geography, Indiana State University, December, 1999.  
Thesis: Black-Tailed Deer Habitat Changes in a Portion of the Mount St. Helens Blast Zone.

Bachelor of Science, Life Sciences and Science Education, Indiana State University, May, 1991.

ACADEMIC EXPERIENCE


University of Illinois/U.S. Army Civil Engineering Research Laboratory. July 2005–present. Red Cockaded Woodpecker habitat based population modeling. Duties: 1) Develop and evaluate data sets that will be used in Geographic Information System analysis, including an on-site evaluation of data collection; (2) assist in developing the population model for the Red Cockaded Woodpecker demographic analysis; and (3) serve as a member of the research team responsible for project development and reporting.

SEROS (Science Education and Research Opportunities for Students—a 501c3 organization) April 2004–June 2005, Acting Director: Coordinator and co-author for research and science education initiatives and funding proposals.

University of Illinois Fall 1999–Summer 2004, Graduate Research Assistant: Developed and implemented field sampling methods to measure understory forage conditions and forest overstory and environmental characteristics at three study sites in Oregon and Washington. Recruited and co-supervised field technicians and student interns participating in elk research during
summer 2000 and summer-fall 2001 and 2002. Cooperated extensively with state and federal agencies including the U.S. Forest Service, Washington Department of Natural Resources, Washington Department of Fish and Wildlife, as well as private companies to compile digital data layers and forest management information used in field sampling and habitat modeling.

**National Council for Air and Stream Improvement, La Grande Oregon, Summer 2003, GIS Consultant/Contract Employee:** Developed a GIS-based habitat evaluation model for elk as part of the re-licensing effort for the Baker Lake Reservoir in the Mt. Baker-Snoqualmie National Forest. Cooperated directly with U.S. Forest Service personnel and an environmental consulting firm (EDAW) to compile GIS layers and design a model to meet habitat mitigation needs.


**Indiana State University-NASA K-12 Technology Transfer Project 1995 to 1999, Education Consultant:** Co-author developer of educational and evaluation materials, and narrator of educational CD-ROMs designed to introduce remote sensing and GIS technologies to high school and middle school science students, and allow students to apply these technologies to the study of specific environmental problems including wetland restoration and the recovery of wildlife habitats following the 1980 eruption of Mount St. Helens, Washington.

**ADDITIONAL TEACHING EXPERIENCE**

**Ivy Tech State College, Indianapolis, Indiana Spring 2005, Science Department Adjunct Faculty:** Instructor for a 3-hour undergraduate lecture course in World Regional Geography.

**University of Illinois, Urbana, IL Spring 2004. Natural Resources and Environmental Sciences Graduate Instructor:** Developed and taught a 3-hour undergraduate course entitled “Wildlife Habitat Ecology and Management.”

**Vigo County School Corporation, Terre Haute, IN 1992 to 1999, Science Teacher:** Taught lecture/laboratory components of biology and physical sciences courses. Supervised numerous undergraduate science education students participating in field teaching experiences and student teaching.

**Danville High School, Danville, IL 1991-1992, Science Teacher.** Taught lab and lecture components at two levels of high school biology.

**PUBLICATIONS**

Extine, J. L., L E. DeWald, and Ronald W. Davis. 2007. Ability of
Golf Courses to Provide Landscape Connectivity in Western North Carolina. Abstract. Sixth Annual Southern Forestry and Natural Resources GIS Conference.


Davis, R. W., L. C. Bender, and R. E. Warner, In prep. A GIS-based habitat model relating landscape-scale habitat conditions to wild elk condition at three sites in Western Oregon and Washington.


OTHER PROFESSIONAL CONTRIBUTIONS


PROFESSIONAL PRESENTATIONS


GRANTS/FUNDING


TECHNICAL SKILLS

Experienced in applied geographic information systems (GIS), including raster and vector based modeling. Working knowledge of ArcView 3.3 and ArcGIS 9.0.

Experienced in the concepts and applications of environmental remote sensing in laboratory and field settings, particularly in western forested habitats. Working knowledge of the ERDAS Imagine analysis software program.

Knowledge of applied statistical methods including basic multivariate statistics, and a working knowledge of SAS, Systat and CART (Classification and Regression Tree) analytical software packages.

Experienced in field study design and data collection methods including the use of global positioning systems (GPS) technology, basic forest mensuration methods and the collection and analysis of hemispherical photos for canopy analysis.

PROFESSIONAL ASSOCIATIONS

National Chapter of The Wildlife Society.

NC Chapter of The Wildlife Society

Society for the Study of Amphibians and Reptiles

AWARDS AND HONORS

Jonathan Baldwin Turner Graduate Research Fellowship, College of Agricultural Consumer and Environmental Sciences, University of Illinois, 1999-2002

Graduate Fellows Recognition of Academic Excellence, Gamma Sigma

Gamma Sigma Delta: Honor Society of Agriculture, Induction Fall 2002

Phi Kappa Phi: Academic Honor Society, Induction Fall 2003

REFERENCES

Dr. Richard E. Warner, Associate Vice Chancellor for Research, University of Illinois
350 National Soybean Research Center, 1101 W. Peabody Drive, Urbana, Illinois 61801.
Phone: (217) 333-6444, Email: dickw@uiuc.edu

Dr. Peter Bates, Director, Natural Resource Management Program. Department of Geosciences and Natural Resource Management. 341 Stillwell. Western Carolina University. Cullowhee, North Carolina 28723. Phone (828) 227-3818. Email: bates@wcu.edu

Dr. Paul W. Mausel, Professor of Geography, Dept. of Geography, Geology, and Anthropology Indiana State University, Terre Haute, Indiana 47809.
Phone (812) 237-7929 (ISU), (812) 877-2185 (home), Email: gemause@isugw.indstate.edu

Dr. Phil C. Mankin, Research Coordinator, Illinois-Indiana Sea Grant and Illinois Water Resources Center 386 National Soybean Research Center, 1101 W. Peabody Drive, Urbana, Illinois 61801.
Phone: (217) 244-6916, Email: pmankin@uiuc.edu

Dr. John G. Cook, Wildlife Research Biologist, National Council for Air and Stream Improvement, Forestry and Range Sciences Lab, 1401 Gekeler Lane, La Grande, Oregon 97850.
Phone (541) 962-6536, Email: cookjg@eou.edu
LAURA E. DeWALD  
Environmental Science Program, 231 Natural Sciences, WCU, Cullowhee, NC  
828-227-2478  
ldewald@wcu.edu

EDUCATION
Ph.D., 1986, Forestry (genetics/tree physiology), Virginia Polytechnic Institute & State University, Blacksburg, VA  
Dissertation: Changes in Loblolly Pine Seedling Root Growth Potential Over Time, During Cold Storage, and Among Half-sib Families

M.S., 1982, Forest Resources (genetics), Pennsylvania State University, University Park, PA  

PROFESSIONAL EXPERIENCE
August 2007 - present: Director, Environmental Science Program, and Associate Professor: Biology Dept., Geoscience/Natural Resource Dept., and Environmental Science Program. Graduate Faculty, Biology Dept., Western Carolina University, Cullowhee, NC

August 2006 - August 2007: Director, Environmental Science Program, and Assistant Professor: Biology Dept., Geoscience/Natural Resource Dept., and Environmental Science Program. Graduate Faculty, Biology Dept., Western Carolina University, Cullowhee, NC

August 2004 - 2006: Assistant Professor: Biology Dept., Geoscience/Natural Resource Dept., and Environmental Science Program. Graduate Faculty, Biology Dept., Western Carolina University, Cullowhee, NC

July 2003 - July 2004: Associate Dean, School of Forestry, Northern Arizona University, Flagstaff, AZ. Administrative (70%), teaching and research appointment.

Program Director, AZ Bureau Forestry and USDA McIntire-Stennis Funds.

August 1998 - June 2003: Associate Professor of Genetics and Conservation Biology, School of Forestry, Northern Arizona University, Flagstaff, AZ. Teaching (65%), research (25%), service (10%) appointment.

August 1994 - July 1998: Assistant Professor of Genetics and Conservation Biology, School of Forestry, Northern Arizona University, Flagstaff, AZ. Teaching (65%), research (25%), service (10%) appointment.


July 1989 - August 1992: Forest Biology Faculty at Warren Wilson College, Asheville, NC. Forest Supervisor of 650-acre school forest and student forest technicians.

Supervisor of undergraduate student research projects.

November 1987 - June 1989: Post-Doctoral Research Associate, Department of Forestry, University of Florida, Gainesville, FL. Designed and implemented a study examining the role of ten levels of nitrogen on seedling carbon allocation in fast- and slow-growing half-sib families of slash pine.

July 1986 - November 1987: Post-Doctoral Research Associate, Forest Resources Department, University of Minnesota, St. Paul, MN. Designed and implemented studies on effects of soil aluminum on nutrition, water relations and growth of red and white spruce, and northern red oak seedlings.

September 1982 - June 1986: Research Assistant, Department of Forestry, Virginia Polytechnic Institute and State University, Blacksburg, VA. Responsible for dissertation research, provided support for other projects: Appomattox Court
Teaching Philosophy

My personal goal as an instructor is to get students to take responsibility for their education by having them be active learners in the classroom. Because the courses I teach are science-related, I also want my students to learn to think like scientists and, therefore, I use an inquiry-based approach in my classrooms in addition to a learner-centered structure, and I use outcomes-based assessment. My goal is to facilitate the learning and discovery process because I feel this is the most effective way to help students develop a passion for learning.

I feel strongly that students need to practice, practice, practice, when it comes to skills such as critical reading and writing, critical thinking, analysis, oral communication, and teamwork. I consider these skills to be "life skills" because they are independent of course content; students must have these skills to be successful in whatever path life takes them. Therefore, the in-class activities, homework assignments, examinations and writing assignments I use in my courses address one or more of these "life skills".

In addition to the content and life skills, I value "out of the classroom" educational experiences for students. I encourage students to attend public meetings and seminars, do research, and to do community service. I feel it is important for students to become proficient at presenting their work, therefore, I try to provide plenty of practice in classroom settings, but also encourage students to present their research at scientific meetings and conferences.
COURSES TAUGHT

**Western Carolina University** (2004 – 2007)
- **ES101**: Careers and Issues in Environmental Science
- **ES150**: Introduction and Approaches to Environmental Science
- **ES495**: Senior Seminar in Environmental Problems
- **BIOL103**: Environmental Biology
- **BIOL 254**: Dendrology
- **BIOL 305**: Genetics and Evolution
- **BIOL493/593**: Principles of Conservation Biology
- **BIOL 593/NRM493**: Principles of Restoration Ecology
- **NRM 140**: Conservation and Management of Natural Resources
- **NRM 351**: Forest Ecology

**Northern Arizona University** (2002 – 2004 only)
- **FOR101W**: Web-based Introduction to Forestry
- **FOR 240**: Introduction to Conservation Biology
- **FOR 313/314**: Forest Ecology
- **FOR 381**: Forest Ecosystem Management
- **FOR 611**: Forest Ecological Genetics
- **FOR 625**: Forest Conservation Biology
- **FOR 693**: Teaching Practicum (beginning Spring 1998)

PUBLICATIONS

**Peer Reviewed Journals**


DeWald, L.E. and M.F. Mahalovich. 1997. The role of forest genetics in managing
ecosystems. Journal of Forestry 95:12-16

grown in different nitrogen regimes. Tree Physiology 11:255-269.
storage. Forest Science 34:41-54.

potential from September to April. Canadian Journal of Forest Research 17:635-643.
DeWald, L.E. and K.C. Steiner. 1986. Phenology, height increment and cold tolerance of
Alnus glutinosa populations in a common environment. Silvae Genetica 35:205-211.

Books and Book Chapters
226-227 In: Peter Friederici (editor) Ecological Restoration of Southwestern
Ponderosa Pine Forests Island Press.
Biological, chemical and genetic approaches. Chapter 7 In: Geils, B.W., J.C.
Tovar and B. Moody (eds.) Mistletoes of North American Conifers. USDA Forest Service,

IN REVIEW
Steed, J.E. and L.E. DeWald. 2007. Relationships between environmental factors and
herbaceous vegetation patterns in southwest U.S. riparian meadows. Wetlands
Journal (in review).

CONFERENCE PRESENTATIONS (last 8 years only)
Meeting, Society of American Foresters, Asheville, NC 3/12/07
DeWald, L.E. 2006 (Invited). Using genetics to compare population structure and
movement of puma. Natural Science Seminar Series, Warren Wilson College,
Asheville, NC 11/27/06
DeWald, L.E. 2006 (Invited). Using genetics to compare population structure and
movement of puma. Paul Burton Seminar Series, Western Carolina University,
Cullowhee, NC 11/10/06
grasses in the ponderosa pine forests of northern Arizona: Implications for
restoration.
Annual Meeting of the American Bryological and Lichenological Society, American
Fern Society, American Society of Plant Taxonomists, Botanical Society of
America.
Cal. State, Univ., Chico. July 28-Aug. 2
Bell, S., K. Mathews, and L.E. DeWald. 2006. Restoring culture through biology: A
look at environmental and genetic factors of Arundinaria gigantea. Poster
presentation.
NCUR/Lancy Undergraduate Research Presentations. Western Carolina University,
Cullowhee, NC. August 2006.
DeWald, L.E. 2006. (Invited). Using biotechnology to improve productivity of
northern red oak: converting ideas into action. The Millennial Initiative: i7:Futures
Forum:
Molecular Biotechnology Symposium. Western Carolina University, April 5, 2006.
DeWald, L.E., D. McGinty, C. Carter and A. Dewanti. 2006. Rubrics: are they worth the
time it takes to develop them? 2nd Annual Scholarship of Teaching and Learning Faire. Western Carolina University, Cullowhee, NC, February 23, 2006.
DeWald, L.E. and E. Soller. 2004. (Invited) Using native seed for re-vegetation. Western Carolina University, Cullowhee, NC April 22, 2004
Leao, K. and L.E. DeWald. 2004. (Invited) The role of student services in recruitment and retention in the NAU School of Forestry. 5th Biennial Conference on University Education in Natural Resources. Flagstaff, AZ, March 14-17, 2004
DeWald, L.E. 2004. (Invited) Active learning in a web-based introductory course. 5th Biennial Conference on University Education in Natural Resources. Flagstaff, AZ, March 14-17, 2004
dalmatica) growth and reproduction increase after wildlife. 7th Biennial Conference of Research on the Colorado Plateau. Flagstaff, AZ 11/3-6/03.


Ecological Society of America, Madison WI, August 2001.


GRANT—PRINCIPAL INVESTIGATOR


2. Sciences: Seeking clear indicators for effective new changes in educating students. Co-PI with Kim Elliott (Director, Office for Rural Education, College of Education and Allied Professions), North Carolina State NC QUEST - continuation project. 2007-2008, $125,000


4. Sciences: Seeking clear indicators for effective new changes in educating students. Collaboration with Kim Elliott (Director, Office of Rural Education,


10. Genetic structure within and among four grasses native to ponderosa pine ecosystems. USDA McIntire-Stennis/AZ Bureau Forestry. 2002-2006, $76,900


17. Trees from the world’s continents at Northern Arizona University. AZ Urban and Community Forestry, Community Challenge Grant. AZ State Land Dept., Forestry Division. 1999-2000, $10,000.


27. Genetic variation among populations of Douglas-fir on the Navajo Reservation and implications for regeneration management. USDA McIntire-Stennis/AZ Bureau Forestry. 1995-1999, $56,000


ACADEMIC HONORS AND AWARDS
Appointed to Michigan Technological University’s Presidential Council of Alumnae (outstanding female alumni who advise the President of the University), 2005-present
Outstanding Professor of the Year: 2002-2003 College of Ecosystem Science and Management
Nominated for Teaching Scholar Award, Northern Arizona University, 1998
Nominated for American Association of State Colleges of Agriculture and Renewable Resources Outstanding Teacher Award: 1998
Highly Meritorious Annual Performance Evaluations - NAU (scale of 1-4 where 3.0 = meritorious, 4.0 = highly meritorious): 2001-2002 = 4.0, 2002-2004 = 4.0.

PROFESSIONAL ORGANIZATIONS
Society of American Foresters

SERVICE - Academic
Western Carolina University
1. University-Level
   Microgrants committee, Coulter Faculty Center for Excellence in Teaching and Learning (2005-2007), Chair 2006-2007
2. College of Arts and Sciences
   Science Education Faculty search committee (2007)
3. Service to Biology Department
   Community Ecologist Search Committee (2005)
   Terrestrial Zoologist Search Committee (2005)
4. Geoscience/Natural Resources Department
   GIS/Landscape Ecologist Search Committee (2006)
   Faculty Affairs Committee (2006-2007)
   Faculty Mentoring Committee (2006-2007)
5. Service to Environmental Science Program, Western Carolina University
   Environmental Science Program Committee (2004-2007)
   Representative at Open Houses and Majors Fairs (2004-2007)

Northern Arizona University
1. University-Level
   NASA Steering Committee (3 years, Chair in 2003)
University Curriculum Committee (1 year)
Advisory Committee for Graduate Certificate in Conservation Ecology (3 years)
NAU Commission on the Status of Women
(2-year Presidential appointment, Faculty co-chair)
NAU Intramural Grant Program Review Committee (4 years)
University Program Review Committee (3 years)
Women in Science, Engineering, and Technology Committee (1 year)
"UPTEAM" Mentor for Multicultural Student Center (2 years)
Academic Advisor for Environmental Management Emphasis
Environmental Science Department (5 years)
Incoming Freshman/Transfer Student "Previews" Advisor (3 years)
Summer Sessions Advisory Committee (1 year)
Distance Education Assessment Specialist Search Committee (1 year)
Committee on Faculty Effort and Expectations (1 year)

2. College of Ecosystem Science and Management
Environmental Management Curriculum Development committee (2 years)
Promotion and Tenure Committee (1 year, Chair)

3. School of Forestry
Writing Across the Curriculum Committee (1 year)
Curriculum Review Committee (2 years)
Scholarship Committee (2 years, Chair)
Manager, School of Forestry’s Arboretum (2 years)
Professional Forestry Program/Curriculum Review Committee (2 years)
Silviculture Faculty Search Committee (1 year)
Research Specialist Search Committee (1 year)
Recruitment, Retention and Placement Specialist Search Committee (1 year)
Forest Measurements Curriculum Revision Committee (1 year)
MacIntire-Stennis/AZ Bureau of Forestry Grant Proposal Evaluation Committee (3 years, Chair)
Faculty Status (promotion/tenure) Committee (2 years, Chair)
Representative to a Consortium (Virginia Tech., NAU, Univ. Montana, Univ. Idaho, USFS, BLM, NPS) on Long-Distance Education (2003-2004)
Dean Search Committee (2003)
Strategic Planning Committee (1 year, Chair)
Forest Management Search Committee (1 year, Chair)
Assisted School of Forestry’s Graduate Program Review by USDA/CSREES April 4-8, 2004

SERVICE - Reviewer
a) Research Proposals: US Civilian Research and Development Foundation (CRDF), National Science Foundation
b) Research Programs: USFS Rocky Mountain Research Station
d) Technical Reports: USFS General Technical Reports
e) Book Reviews:
   1) "Forest Ecology", J.P. Kimmins, Prentice Hall Biology Inc.,
   2) "Schoolyard Habitat Handbook", AZ Game and Fish Heritage Fund
   3) "Beyond Ponderosa", Flagstaff Community Tree Board
SERVICE - Community
Society of American Foresters:


b) Southwest Section: Chair (2002), Chair-Elect (2001) and Past-Chair (2003)

c) D1 working group: (Tree Improvement/Forest Genetics): Secretary (2001 & 2002), Chair-elect (2003), Chair (2004-2006)

d) National Committee on Professional Forestry Curriculum Accreditation (2003-2006)

e) Northern Arizona University’s representative to the National Office (1996-2004)

f) NC Division - Science and Technology Chair (2007 present)

g) Nantahala Chapter Chair (2007-present)

Western Forest Genetics Association: Treasurer (2004-2005)

Conference Planning and Organization:
TREEmendous NC Forestry -Society of American Foresters NC Division Summer Meeting. June 6-8, 2007 Waynesville, NC
Developed and Facilitated: Inquiry-based science instruction: A professional development workshop for Alleghany County elementary and middle-school teachers. Sparta, NC. July 10-14, September 1 and October 12, 2006
Organized (Co-Chair) and Host: Natural Resource Education for a Culturally Diverse Audience. 5th Biennial Conference on University Education in Natural Resources, Flagstaff, AZ, March 14-17, 2004.
Organized and conducted D1 working group technical sessions for the 2001, 2002 and 2003 SAF National Conventions
Organized and hosted July 1999 Western Forest Genetics Association Annual Meeting in Flagstaff, AZ
Organized/facilitated Arizona Riparian Council Annual meeting fieldtrip: April 30-May 1, 1999.
Planning and technical assistance for the 2nd Southwestern Rare and Endangered Plant Conference, Flagstaff, AZ February 1996.
Organized and conducted joint working group (D1 and D4) technical session, SAF National Convention, Albuquerque, NM, Nov.12, 1996

Other Professional Service Activities:
Western Carolina University “Public School Projects for Math and Science”
Collaborative work with a public school teacher to enhance science education (2006-2007)

Member of the USDA Forest Service East Clear Creek Ecosystem Collaborative Assessment and Planning Team, Coconino National Forest 1995-1999
Forest regeneration/restoration advisor for the Hopi Tribe, Arizona
Instructor for NSF-funded Summer Science Program for youth at NAU 1996 and 1997

Watershed prioritization development team, USDA Forest Service and Society of Ecological Restoration in collaboration with the Sonoran Institute and USGS
Biological Resources Division, University of Arizona 1997
Experts Conservation Panel for The Nature Conservancy’s Bioregional planning for the Arizona – New Mexico Mountains ecoregion 1997 and 1999
Tutor for Literacy Volunteers of Coconino County 1996-1998
Technical advisor/editor for 1996 National Geographic article (190[3]:80-97)
Elder Hostel Lecturer, Grand Canyon National Park: 1996
LAWRENCE G. KOLENBRANDER

1203 North Country Club Drive
Cullowhee, North Carolina  28723-7210
Home Telephone: (828) 293-3294

EDUCATION

Ph.D. Conferred: August, 1981 Major: Natural Resource Planning and Admin. Colorado State University, Fort Collins, CO 80526
Dissertation Title: A Method of Evaluating Landform Classification Systems for Renewable Resource Assessment and Planning.

M.S. Conferred: August, 1975 Major: Regional Resource Planning Colorado State University, Fort Collins, CO 80526
Thesis Title: Environmental Carrying Capacity, A Case Study of the Grand County Area, Colorado.

B.S. Conferred: June 1973 Grand Valley State University, Allendale, MI 49401 Major: Environmental Science, Regional Planning

PROFESSIONAL EXPERIENCE

Associate Professor, Geosciences and Natural Resources Management Department
August, 2005 to present. Responsibilities include full time instruction in the NRM department; including professional development and service components.

Associate Professor and Department Head, Geosciences and Natural Resources Management Department.
August 1997 to August, 2005. Responsibilities included the administration of the Geology, Geography, and Natural Resources Management programs, including nine full time faculty and 5 part time faculty.

Associate Professor and Coordinator, Natural Resources Management Program Western Carolina University.
Associate Professor August, 1985 to July 1997. Responsibilities included the development and implementation of a new B.S. degree program in Natural Resources Management in the College of Arts and Sciences; including teaching, recruiting, student advising, and general program administration.

Owner/Project Manager, Natural Resource Consultants, Loveland, CO

Research Associate, Dept. of Forest & Wood Sciences, Colorado State Univ. Fort Collins, CO
Feb. 1979 to Aug. 1981. Responsible for the development, funding, and execution of a Cooperative Aid Research Agreement with the U.S. Forest Service. This project was the basis for dissertation research and involved evaluating existing Landform Classification Systems for use in a Component Land Classification System being developed for federal interagency use in natural resource assessment and planning.

Conference Coordinator, Dept. of Forest & Wood Sciences, Colorado State Univ. Fort Collins CO
Fall, 1978 & Spring, 1979  Responsible for the planning, coordination, and operation of a planning conference conducted by the CSU Department of Forest and Wood Sciences for the Colorado State Forest Service and held in January, 1979. Duties included the preparation of conference proceedings for post-conference publication.

**Student Consultant, Colorado State Univ., Fort Collins, CO**

Spring, 1979.  As part of a "Graduate Seminar for Managers of Resource Affairs" the participants reviewed state and national policies on Natural Heritage Preservation Programs and made recommendations for the development and implementation of the Colorado Natural Areas Program.  Responsibilities included the review and recommendation of classification and inventory procedures for the CNAP.

**Partner and Project Manager, Environmental Consultants Inc., Fort Collins, CO**

June, 1976 - Dec, 1978  Responsibilities included general firm administration and project management for contracted work.  Project manager for the environmental assessment portions of a 201 Wastewater Treatment Facilities Plan for the Upper Fraser Valley, Grand County, Colorado.  Other projects included a Planning and Policy Formulation study for the Grand County Dept. of Development and Planning, as well as several subdivision development environmental assessments.

**Graduate Research Assistant, Dept. of Recreation Resources, Colorado State Univ., Fort Collins, CO**

1974 & 1975  Responsible for the Soils and Hydrologic components of a U.S. Environmental Protection Agency study of the application of the Carrying Capacity Concept to county level planning. Masters Degree Research Project

**Student Consultant, Dept. of Recreation Resources, Colorado State Univ., Fort Collins, CO**


**TEACHING EXPERIENCE**

22 years - full time - WCU NRM Program, including:
NRM 140 - Natural Resources Conservation and Management
NRM 150 - Career Opportunities in Natural Resources
NRM 320 - Soil Conservation
NRM 340 - Intro. to Natural Resource Measurements
NRM 342 - Computer Applications in Natural Resources
NRM 344 - Introduction to Geographic Information Systems
NRM 346 - Computer Applications in NRM
NRM 440 - Integrated Resources Management
NRM 460 - Watershed Management
NRM 470 - Land Suitability Classification

Group director and instructor for the Earth Sciences and Stream Hydrology section of the North Carolina Summer Ventures in Science and Mathematics at Western Carolina University. This is a four week, intensive (7 hours per day, 6 days per week) program in science and mathematics for high school juniors and seniors. Student teams are required to design and implement a research project on some aspect of stream hydrology and/or stream water quality. They are to collect the data, perform statistical analysis, and present an oral and written report of their findings. Instruction and student project management occurs as part of a 4 member team consisting of a college science and a mathematics professor and a high school science and mathematics teacher. 1990 to Present

- 2 years - part time - Natural Resource Planning classes, Colorado State U
- 2 years - part time - Soil Science, Lab Instructor, Colorado State U.
- 2 years - part time - Environmental Science, Lab Instructor, Grand Valley State U.
- 3 years - part time - Intro. Geology Lab. Instr., Grand Valley State U.

Grants Awarded:


Awarded three WCU Instructional Improvement Grants with Dr. Gary White, to purchase current satellite imagery coverage of the Cullowhee Creek Watershed Area. This award enhances instruction in remote sensing and resource management courses. Awarded 1991, 1994, & 1998

Applied for and awarded $1500.00 Grant from USDA - Forest Service. Cooperative Education Program to Promote Natural Resource Research/Administration. Renewed 1991 thru 1995


National Science Foundation, Instrumentation and Laboratory Equipment grant to implement a "Geographic Information Systems Laboratory for Undergraduate Instruction. $78,000 Awarded June, 1988

PROFESSIONAL ASSOCIATIONS

American Water Resources Association
North Carolina Water Resources Association
Xi Sigma Pi - Honorary Forestry Society


Short Course participant in a 3 day workshop entitled Innovative Stream Repair - The Application of Bio-engineering techniques in stream bank stabilization. NC Sea Grant program, NC State University, Raleigh, NC Oct. 31 - Nov. 2, 1995

Attended "North Carolina Surface Water Classifications Workshop" Review of current legal requirements pertaining to surface waters. Asheville, NC Sept. 15, 1992

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Planned, Co-sponsored, and Co-directed a two day workshop entitled "Geographic Information Systems in Archaeology". Attended by representatives from state and federal agencies and private consultants. March 10 & 11, 1992


Invited participant in WCU Teaching Effectiveness Seminar, May 15 - 19, 1989


GeoBased Systems Inc. Six days of training in Geographic Information Systems. Jan., and June, 1988 San Diego State University, Three day Training Session on Flood Control Hydrology. June, 1987


University and Regional Service

Panel discussion moderator for "GIS in Education in North Carolina". NC State GIS Conference. Feb, 1999

Member of the North Carolina State Geographic Information Systems Conference coordinating committee. Responsible for planning and implementation of biennial North Carolina Geographic Information Systems Conference March, 1997 to present.

Member of the Geographic Information Systems research proposal review team for The Universities Council on Water Resources. Aug., 1989 to Sept. 1998. This review team provides peer review for funding of water resources research proposals submitted to the United States Geologic Survey.


WCU representative on the Executive Board of the Southern Appalachians Research and Resource Management Consortium (SARRMC). August, 1987 to August, 1995. SARRMC was an organization of 8 Universities, and 4 Federal Natural Resource Agencies that coordinated natural resource research in 6 southern states.

Co-Director, Integrated Regional Resources Management Program. Aug., 1985 to July 1987, Director, IRRM Program, July, 1987 to Aug., 1989 The IRRM Program is a cooperative effort between the Tennessee Valley Authority and Western Carolina University providing a 5 week summer Institute for resource managers from third world, developing nations.

Member of Curriculum Advisory Committee, Haywood Community College, Fish & Wildlife and Forestry Associates Degree Programs. Aug., 1986 to Present

Research Director: WCU Poorhouse Mountain Research & Demonstration Area. May, 1986 to Present. This research area is used for Forestry, Watershed, and Wildlife research by the faculty and students in the Natural Resources Management Program at WCU


Member of Department Head’s Committee, College of Arts & Sciences, Western Carolina University, Aug. 1985 to present

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Invited reviewer: "Glossary of Selected Landform Terms" as part of "An Ecological Land Classification System for the United States." Resources Evaluation Techniques Program, Rocky Mountain Forest & Range Experiment Station, U.S. Forest Service, Fort Collins, CO 1982

Planning Committee Chairman, Immanuel Christian Reformed Church, Fort Collins Colorado, 1979 to 1984. Responsible for the planning and implementation of a Community Day Care Center. Center currently serves over 75 children with a staff of 6 and an annual budget of over $100,000.

Special Skills

Cartography, Environmental Impact Statement analysis and preparation, Delphi/Delbecq public involvement techniques, Geologic and soil hazard analysis, soil mapping, air photo interpretation, photography and media presentations, public hearing management, geomorphic mapping, land use and land classification, computerized linear and goal programming analysis, Geographic Information Systems.

Publications:


Colorado Natural Areas Program, 1979, A Report by the Graduate Seminar for Managers of Resource Affairs. College of Forestry and Natural Resources, Colorado State University, Fort Collins, Colorado
Environmental Assessment, Population, and Economic Projection sections in: Upper Fraser Valley 201 Wastewater Treatment Facilities Plan. Western Technical Services, Granby, CO.


Presentations:


“Preliminary results comparing water quality conditions prior to and following stream fencing to control cattle access.” Upper Hiawassee River Water Quality Project presentation. Murphy, NC Oct. 8, 1991.
