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## **Appendix 1.1 Western Carolina University Mission Statement**

### **Statement of Educational Mission**

A member of the University of North Carolina, Western Carolina University offers courses in the arts, sciences, technologies, humanities, and professions. Students can elect degree programs at the bachelor's or master's level, or doctoral level study in educational leadership. As a regional comprehensive institution, it serves the people of North Carolina from its residential campus at Cullowhee and through off-campus instruction in Asheville and other locations.

Teaching and learning constitute the central mission of Western Carolina University. The University seeks to create a community of scholarship in which the activities of its members are consistent with the highest standards of knowledge and practice in their disciplines. The commitment of the community to service, research, and creative activities complements the central mission and extends the benefits of its scholarship to society. As a major public resource for western North Carolina, the university promotes regional economic development through its teaching, research and service. Western Carolina University seeks to provide an environment in which students, faculty, and staff jointly assume responsibility for learning, where free exchange of ideas, intellectual challenge, and high standards of scholarship prevail.

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Approved by Board of Governors : November 10, 2006

## **Appendix 1.2 College of Arts and Sciences Mission Statement**

The College of Arts and Sciences operates under the Office of Academic Affairs at Western Carolina University. Its constituent members include the Departments of Anthropology and Sociology; Biology; Chemistry and Physics; Communication; English; Geosciences and Natural Resources; History; Mathematics and Computer Science; Modern Foreign Languages; and Political Science and Public Affairs. The college also houses the Associated Area of Philosophy and Religion, and the following programs: Arts and Sciences Interdisciplinary, and Social Sciences.

The role of the College of Arts and Sciences is to implement the University's Mission through exploration of a broad range of human experience, knowledge, and expression.

The most significant activity is the learning/teaching process that takes place in classrooms, laboratories, studios, field locations, and offices, which engages students, staff, and faculty in a common effort to provide an environment where intellectual challenge, the free exchange of ideas, and high standards of scholarship and creativity prevail.

The College fulfills the University's declared aspirations through its curricula in the following ways:

- Programs in the fine arts, humanities, and sciences
- General Education courses that provide the basic skills and perspectives essential for preparing all university students for effective participation in contemporary life
- Support for the Honors College and Honors course options
- Specialized courses that serve the baccalaureate and graduate degree programs of the College and its sister colleges
- Courses and programs that support teacher preparation
- Appropriate and responsible integration of technology as a tool for learning
- Faculty advisement of students

The College supports the University's declared aspirations through discipline-related activities that benefit the University, region, state, nation, and the international community, in the following ways:

- Research, creative activity, and scholarly pursuits
- Faculty and student activities that reach beyond the classroom to a wider audience
- Faculty and student participation in university governance through involvement in departmental, college, and university activities.

## WCU's Quality Enhancement Plan Executive Summary

### *Western Carolina University*

Western Carolina University (WCU), a constituent institution of the University of North Carolina, has a current student enrollment of almost 8,900 students. Established in 1889, the university offers more than 120 undergraduate and 50 graduate programs in the arts, humanities, sciences, education, business, engineering, and health professions. WCU is located in Cullowhee in western North Carolina, near the Blue Ridge Parkway and the Great Smoky Mountains.

### *The Quality Enhancement Plan*

#### **1. Overview**

*Synthesis: A Pathway to Intentional Learning at Western Carolina University* initiates new and enhances current connections among existing programs to create a more holistic approach to educating students. WCU faculty and staff recognize that a major challenge of higher education is the need for students to synthesize their curricular and co-curricular (outside of courses) college experiences. The Quality Enhancement Plan (QEP) uses *synthesis* – the ability to integrate knowledge from different areas into an original whole – as the driving framework for teaching and learning. This emphasis on synthesis enhances students' educational journey and helps prepare them for life beyond college. Many students may view their courses and co-curricular experiences as isolated activities to be approached in check-list fashion. The QEP fosters synthesis across the disciplines, coordinating curricular and co-curricular experiences to facilitate students' development of a clearer purpose at the university. The plan's implementation will impact academics, residential life, service learning, student leadership, study abroad, and career planning/education. The outcome of the plan will be students who are intentional participants in their own educational journey.

#### **2. Learning Goals/Outcomes of the QEP**

The overarching learning goal of the QEP is one where students will synthesize knowledge and skills from their academic and co-curricular experiences to become intentional participants in their own learning. Specifically, students will:

1. Identify their aptitudes, abilities, and interests and articulate their future goals and aspirations;
2. Modify behaviors and values in response to knowledge and skills gained from their academic and co-curricular experiences; and
3. Recognize the synthesis of their university experiences and evaluate those experiences relative to their future education and career goals.

#### **3. Implementation**

The successful implementation of the QEP will rely on a coordinated university effort centered on the principles of synthesis. The key elements of the plan's implementation are:

1. The creation of a QEP oversight structure that will implement, coordinate, and monitor the plan;

2. The development of a pilot study that will enable the university to implement, assess, and fund the QEP as it expands over time;
3. An enhancement of services offered by the Coulter Faculty Center for Excellence in Teaching and Learning to train faculty and staff to integrate the QEP into their teaching and university work;
4. An integration of the synthesis concepts into admissions, orientation, and other early academic/co-curricular services offered to students;
5. The coordination of advising, service learning, international programs, undergraduate research, and career education through the synthesis concept; and
6. The development of the “Education Briefcase”: an electronic portal through which students will be able to interact with faculty, advisors, and career counselors; it is the manifestation of the student’s learning plan.

### ***Conclusion***

*Synthesis: A Pathway to Intentional Learning at Western Carolina University* intends to diminish barriers that inhibit students’ abilities to identify and benefit from the interrelationships of their curricular and co-curricular experiences. The plan’s knowledge base is derived from research on learning conducted by Bloom (1956) and his successors and reflected in his taxonomy of learning and D. A. Kolb’s (1984) model of experiential learning. The plan also incorporates many precepts presented in *Learning Reconsidered: A Campus-wide Focus on the Student Experience* (Keeling, 2004), *Learning Reconsidered 2: A Practical Guide to Implementing a Campus-wide Focus on the Student Experience* (Keeling, 2006), and *Greater Expectations: A New Vision for Learning as a Nation Goes to College* (Association of American Colleges and Universities, 2002)

## Appendix 1.4 NRCM Mission Statement

### Natural Resources Management Program

#### Mission Statement

(Adopted Fall 2005)

#### *Mission*

##### *Fundamental purpose for the unit*

The Natural Resources Management Program offers students an interdisciplinary education that promotes the understanding, conservation, and sustainable use of natural resources. Because of WCU's role as a regional comprehensive university, we view western North Carolina and the Southern Appalachians as our primary areas of focus. However, our broad goal is to serve society through our students and through involvement in our community, region, state, nation, and beyond.

##### *Relative emphasis on teaching, research, and service*

The Natural Resources Management (NRM) Program is based on a traditional tripartite model of teaching, research, and service. Our primary area of emphasis is teaching, recognizing the role of WCU as a regional comprehensive university. Our secondary area of emphasis is research, recognizing the role of research in complementing teaching and providing faculty development. NRM's record of external funding illustrates our ability to secure research projects and thus the necessity to dedicate the needed time and effort to this endeavor. Our tertiary area of emphasis is service, recognizing the need to serve the WCU community at multiple levels, and the region.

##### *Constituencies to be served*

The NRM Program will:

(1) Continue to provide high-quality education to all of our students. Undergraduate education will remain our primary focus, though we recognize the need to develop direct involvement in graduate education. This may include strengthening ties to other graduate programs or developing an NRM graduate program;

(2) Broaden our service to the University through a commitment to liberal studies and freshman education. We believe we can achieve this goal by increasing the number and diversity of liberal studies courses that we offer;

(3) Recognize the benefit of both formal and informal service learning. We will strive to take advantage of these opportunities through curricular activities associated with the courses we teach and extracurricular activities such as the NRM Club;

(4) Continue to have service and outreach as a major component of what we do. The curriculum and skills offered by our program are needed by many sectors of the local community. We envision building and maintaining relationships within the region including non-profit organizations, the Eastern Band of the Cherokee Indians, and government agencies. Our mission provides excellent opportunities for building bridges with the local community and providing our students and faculty with hands-on opportunities to address issues and problems related to natural resources; and

(5) Develop opportunities to serve "non-degree seeking" (i.e., off-campus, continuing education, and professional development) students through short courses in Geographic Information Systems (GIS), Global Positioning Systems (GPS), and other areas of expertise related to NRM.

##### *Geographic service areas and distance education*

Because WCU is a regional comprehensive university we view western North Carolina and the Southern Appalachians as our primary areas of service. Our focus will remain on delivering high-quality education to "residential" students (i.e., students who receive their education on campus). However, as demand evolves we see increased opportunities to participate in some forms of distance education to reach other types of students.

## **Clientele**

### *Students*

Our main focus will continue to be on delivering high-quality education to undergraduate residential students. However, we see an opportunity to increase our capacity to educate adult and non-degree seeking students through short courses and workshops. We also see a critical need to incorporate M.S. level graduate students into our program.

### *Enrollment and growth*

The percentage of students enrolled in the NRM program at WCU is already well below that of our peer institutions (see environmental scan). We expect that our enrollments will more closely reflect those of our peer institutions as we begin to implement the changes outlined in this vision statement. Thus, we anticipate that the rate of growth in the NRM Program will exceed the rate for the university as a whole. This growth will occur as a result of changes to curriculum in the NRM major, development of an NRM minor, enhanced offerings for freshmen education, direct involvement in graduate education, and service to non-degree seeking students. Additionally, we recognize the long-term benefits of enhanced teaching and research facilities resulting from the renovation of Stillwell Building. However, we also recognize the near-term potential for negative impacts to enrollment resulting from disruption created by construction.

### *Other clientele*

We envision providing additional educational opportunities for non-degree seeking students. For example, establishing continuing education/professional development courses for natural resource professionals, teachers, and others. We specifically envision providing professional development opportunities and short-courses using GIScience technologies.

## Appendix 2.1 NRCM Strategic Vision

### Natural Resources Management Program Strategic Vision Statement

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- 3. Recognize the benefit of both formal and informal service learning. We will strive to take advantage of these opportunities through curricular activities associated with the courses we teach and extracurricular activities such as the NRM Club;**
- 4. Continue to have service and outreach as a major component of what we do. The curriculum and skills offered by our program are needed by many sectors of the local community. We envision building and maintaining relationships within the region including non-profit organizations, the Eastern Band of the Cherokee Indians, and government agencies. Our mission provides excellent opportunities for building bridges with the local community and providing our students and faculty with hands-on opportunities to address issues and problems related to natural resources; and**
- 5. Develop opportunities to serve "non-degree seeking" (i.e., off-campus, continuing education, and professional development) students through short courses in Geographic Information Systems (GIS), Global Positioning Systems (GPS), and other areas of expertise related to NRM.**

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### *Other clientele*

We envision providing additional educational opportunities for non-degree seeking students. For example, establishing continuing education/professional development courses for natural resource professionals, teachers, and others. We specifically envision providing professional development opportunities and short-courses using GIScience technologies.

## **Program and services (programs and services offered; new programs planned that will serve a new clientele)**

### *Major programs*

Although there is considerable variation in Natural Resources Management curricula offered throughout the country, there are common suites of resource disciplines that are typically represented. These include forest resources, water resources, soil resources, and wildlife resources. In addition, geographic information systems and remote sensing technology are commonly included because of their power in assessing resource conditions over space and time. We are currently redesigning the NRM curriculum to more completely include and integrate all of these disciplines. At the same time, we are modifying our curriculum so that students can move through it more efficiently.

The NRM Program will continue to offer a B.S. in Natural Resources Management with a series of concentrations. Existing concentrations that we will continue to offer include Forest Resources and Water Resources (which will be renamed and revised to Soil and Water Conservation). New concentrations will include:

(1) Interdisciplinary Studies in Natural Resources – This concentration will appeal to a broader cross-section of students such as students who are interested in natural resources but who are not interested in existing concentrations and Environmental Science students who want to refocus their education; and

(2) Geographic Information Science (GIScience) – This concentration will appeal to students interested in working in geographic information management and analysis aspects of NRM. GIScience, which includes GIS, GPS, and remote sensing, provides use of high-technology tools that lead to well-paying jobs in a number of areas of NRM including planning, recreation, forestry, watershed management, soil conservation, ecology, and wildlife management in both the private and public sectors. In addition, we envision offering special topics courses for our majors (and non-majors alike) as needs arise.

### *Minor programs*

We plan to develop an NRM minor. We believe an NRM minor will provide students in other majors a way to formally develop their interests in the natural resources. For example, we see meaningful connections with students majoring in Business, Parks and Recreation Management, Biology, and Geology.

### *Service courses*

We anticipate offering courses that will benefit freshman education through liberal studies, as well as courses that would satisfy requirements in Environmental Science and other programs.

### *Services to external communities*

There are many opportunities to provide services and develop collaborative partnerships with communities external to the university including assisting entities to plan and effectively manage their resources. Examples of such communities include the Eastern Band of the Cherokee Indians, local municipalities that manage significant resources (e.g., Waynesville, Sylva, Bryson City), Counties, Regional planning entities, large property ownerships (e.g., Balsam Mountain Preserve, Thomas Family lands), governmental agencies, NGO's, land trusts, non-profits, and others. We envision that many of these entities will look to the NRM Program as a critical resource and knowledge base.

### *Interdisciplinary linkages*

The NRM Program is interdisciplinary by nature. As such, we will continue to promote linkages whenever possible. We anticipate developing strong ties with other natural science disciplines, as well as with other departments that are related to management of information or people. We currently maintain linkages with Geology. Additionally, core requirements in the NRM major include courses in Biology, Economics, Management, Math, Chemistry, and Geography. Likewise, the Environmental Science major requires courses taught in NRM. There is room to strengthen relationships with departments/programs with which we already have linkages. However, there are likely other programs on campus, for example Emergency Management, with which we may be able to create new linkages especially through the use of GIS.

### *Student advising*

Undergraduate advising is most effectively accomplished when there is close interaction between students and faculty. This can best be accomplished when there is a low ratio of students to faculty. Our goal is to increase faculty so that we can achieve a student to faculty ratio that is typical of other programs on campus.

### *Proposed new programs*

We do not anticipate developing any new degree programs other than the minor in Natural Resources Management.

## **Appendix 2.2 Summary of NRCM Strategic Vision Statement**

### **Summary of Strategic Vision Statement**

#### **National Resources Management Program**

**(February 2004)**

The Natural Resources Management Program at Western Carolina University is well positioned to play a vital role in the future of both the University and the region. At a time when Western Carolina University is actively trying to integrate itself more closely with the surrounding community, there is a growing awareness that many of our region's most important challenges are directly related to the use and conservation of our natural resources. The NRM program can play a critical role in helping our region meet those challenges by educating the next generation of natural resource managers, providing continuing education opportunities to current resource professionals, and by providing expertise and guidance in the evaluation and resolution of resource management issues. In order to better meet these objectives, the Natural Resources Management Program is in the process of revising its strategic vision for the next 5-10 years. Key elements of this vision include:

- (1) Substantive curriculum revisions to increase the breadth of the NRM major and to provide greater educational and employment opportunities to students interested in natural resources. We will restructure our program to include the following concentrations in order that our curriculum will more completely cover the fields of study that are integral to natural resources management: Interdisciplinary Studies in Natural Resources, Forest Resources Management, Geographic Information Science, and Soil and Water Conservation;
- (2) Increasing the size of the NRM program, both in terms of the number of majors and the number of faculty in order to become a more cohesive and comprehensive program;
- (3) Creation within the NRM Program of a Geographic Information Science center that will provide expertise and services in Geographic Information Systems and related technologies. This expertise will be available to the WCU community and to the region;
- (4) Development of an M.S. degree, either on our own, or in conjunction with another academic discipline, such as the new Environmental Science degree.
- (5) Maintaining and developing linkages with individuals and organizations actively involved in all levels of natural resources management, and incorporating those interactions into our education, research, and service activities.

## Appendix 2.3 Natural Resource Conservation & Management Curriculum

### NRM Core Courses (48 credits) – required of all majors

CHEM 132 or 140 (4) – Introductory Chemistry or Advanced General Chemistry  
 MATH 146 (4) – Algebra and Pre-calculus  
 BIOL 140 (4) – Principles of Biology I  
 BIOL 141 (4) – Principles of Biology II  
 GEOG 150 (3) – Environmental Geography  
 GEOG 324 (4) – Remote Sensing  
 GEOG 402 (3) – Conservation of Natural Resources  
 GEOL 305 (4) – Soils and Hydrology  
 NRM 210 (4) – Methods in Natural Resources Management  
 NRM 344 (4) – Introduction to GIS  
 NRM 351 or BIOL 304 (3) – Forest Ecology or General Ecology  
 NRM 440 (4) – Integrated Resource Management  
 NRM 442 (3) – Natural Resources Policy and Administration

Students must choose one of the areas of concentration listed below:

<b>Forest Resources</b>	<b>Soil and Water Conservation</b>	<b>Landscape Analysis</b>
<p><b>Required courses:</b>  <b>NRM 351</b> – Forest Ecology (3)  <b>NRM 352</b> – Forest Resource Measurements (3)  <b>NRM 451</b> – Foundations of Silviculture (4)  <b>NRM 452</b> – Forest Management (4)  <b>BIOL 254</b> – Dendrology (4)  <b>ECON 310</b> – Natural Resource Economics (3)</p> <p><b>Choose a minimum of 6 credit hours from:</b>  <b>NRM 330</b> – Introduction to Wildlife Management (3)  <b>NRM 371</b> – Landscape Ecology (4)  <b>NRM 460</b> – Watershed Management (3)  <b>NRM 483</b> – Applications in Forest Management (3)</p>	<p><b>Required courses:</b>  <b>NRM 420</b> – Soil Genesis and Classification (3)  <b>NRM 460</b> – Watershed Management (3)  <b>CHEM 133</b> – Organic Biochemistry (4)  <b>GEOG 300</b> – Weather and Climate (4)  <b>MGT 300</b> – Introduction to Management</p> <p><b>Choose a minimum of 7 credit hours from:</b>  <b>NRM 320</b> – Soil Conservation (3)  <b>BIOL 435</b> – Aquatic Ecology (4)  <b>BIOL 476</b> – Fisheries (3)  <b>CHEM 330</b> – Aquatic Chemistry (3)  <b>GEOL 455</b> – Wetlands</p>	<p><b>Required courses</b>  <b>NRM 371</b> – Landscape Ecology (3)  <b>NRM 444</b> – Applied GIS (4)  <b>NRM 472</b> – Ecosystem Structure and Analysis (4)  <b>GEOG 424</b> – Advanced Remote Sensing (3)  <b>MGT 300</b> – Introduction to Management</p> <p><b>Choose a minimum of 6 credit hours from:</b>  <b>NRM 351</b> – Forest Ecology (3)  <b>NRM 420</b> – Soil Genesis and Classification (3)  <b>NRM 460</b> – Watershed Management (3)  <b>NRM 470</b> – Land Suitability Classification (3)</p>

## **Appendix 2.4..NRCM minor**

### **Minor in Natural Resource Conservation & Management (Approved Fall 2007)**

The minor requires 18 hours, including NRM 210, GEOG 150; and 11 hours from the following: NRM 320, 330, 344, 351, 371, 420, 442, 451, 452, 460, GEOG 324, or 424.

Appendix 2.5..NRCM Community College 2+2 plan

<b>Western Carolina University</b>		
2+2 Plan for the B.S. in Natural Resources Management		
72 hours are required in the major, as outlined below:		
<u>WCU Requirement</u>	<u>NCCC Equivalent Courses</u>	
CHEM 132 Intr Chem or CHEM 140 Adv Gen Chem(4 hours)	CHM 135	
MATH 146 Alg and Pre Calc (4 hours)	MAT 171	
BIOL 140 Prin Biol I(4 hours)	BIO 111 or BIO 120	
BIOL 141 Prin Biol II (4 hours)	BIO 112 or BIO 130	
GEOG 150 Environmental Geog (3 hours)	GEO 131	
GEOG 324 Remote Sensing (4 hours)	**	
GEOG 402 Cons of Nat Resources (3 hours)	**	
GEOL 305 Soils and Hydro (4 hours)	**	
NRM 210 Methods in NRM (4 hours)	**	
NRM 344 Intro to GIS (4 hours)	**	
NRM 440 Integrated Res Mgmt(4 hours)	**	
NRM 442 Nat Res Policy and Admin (3 hours)	**	
Forest Resources Concentration:		
	NRM 351 Forest Ecology (3 hours)	**
	NRM 352 Forest Res Meas (3 hours)	**
	NRM 451 Found of Silviculture (4 hours)	**
	NRM 452 Forest Mgmt (4 hours)	**
	BIOL 254 Dendrology (4 hours)	**
	ECON 310 Nat Res Econ (3 hours)	**
Concentration electives (6 hours):		
	Choose from: NRM 330 Int to Wildlife Mgmt, NRM 371 Landscape Ecol,	**
	NRM 460 Watershed Mgmt, NRM 483 Applications in Forest Mgmt	
Soil and Water Conservation Concentration:		
	NRM 420 Soil Gen and Class (3 hours)	**
	NRM 351 Foest Ecol (3 hours)	BIO 145
	NRM 460 Watershed Mgmt (3 hours)	**
	CHEM 133 Org Biochem (4 hours)	CHM 132
	GEOG 300 Weather and Clim (4 hours)	**
	MGT 300 Intr to Mgmt or ECON 310 Nat Res Econ (3 hours)	**
Concentration electives (7 hours):		
	Choose from: NRM 320 Soil Conserv, BIOL 435 Aquatic Ecol,	**

	BIOL 476 Fisheries, CHEM 330 Aquatic Chem, GEOL 455 Wetlands	
Landscape Analysis Concentration:		
	NRM 351 Forest Ecol (3 hours)	BIO 145
	NRM 371 Landscape Ecol (3 hours)	**
	NRM 444 Applied GIS (4 hours)	**
	NRM 472 Ecosys Struc and Anal (4 hours)	**
	GEOG 424 Adv Remote Sensing (4 hours)	**
	MGT 300 Intro to Mgmt or ECON 310 Nat Res Econ (3 hours)	**
Concentration electives (6 hours):		
	Choose from: NRM 351 Forest Ecol, NRM 420 Soil Gen and Class,	**
	NRM 460 Watershed Mgmt, NRM 470 Land Suit Class	
		** Must be taken at WCU
1. 128 total hours are required for the B.S. degree in Natural Resources Management		
2. The Liberal Studies program must be completed or waived (see separate checklist for the WCU Liberal Studies program).		
<b>Notes:</b>		
	This fact sheet assumes that student completed all possible course equivalents at NCCC. Student needs to take additional elective courses in order to reach 128 credit hours. It is critical that students enroll in NRM 210 during their first semester at WCU. Not all WCU courses are offered every year.	

### Appendix 3.1..Courses taught by NRCM faculty

#### Courses offered by NRCM faculty

Course	Description
NRM 140 - Natural Resource Conservation and Management	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. (C5) Credits: (3)
NRM 150 - Career Opportunities in Natural Resources Management	Exploration of varied career opportunities; career and program planning advisement; professional values and requirements; exposure to professionals in field. 2 lab/discussion/ demonstration. Credits: (1)
NRM 210 - Methods in Natural Resources Management	Introduction to the data collection, analysis and presentation techniques used in Natural Resources Management. 3 Lecture, 3 Lab. Credits: (4)
NRM 320 - Soil Conservation	Preservation, improvement, and utilization of soil resources for environmental management and productivity. 2 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (3)
NRM 330 - Introduction to Wildlife Ecology and Management	Presents foundations of wildlife ecology and management. Topics include history and legislation, population dynamics, habitat, conservation, and sampling techniques. 2 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (3)
NRM 344 - Introduction to Geographic Information Systems	Introduction to and applications of geographic information systems in natural resources management. 2 Lecture, 4 Lab. Credits: (4)
NRM 351 - Forest Ecology	The study of forests as integrated ecological systems; energy transfer; nutrient cycling; communities; succession; disturbance; and their roles in productivity and management. 2 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (3)
NRM 352 - Forest Resource Measurements	Principles of applications in measuring forest resources. Measurements of trees and stands for volume, quality, growth, land areas, and other forest resources. 2 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (3)
NRM 371 - Landscape Ecology	The causes, development, quantification, and ecological consequences of spatial patterning on the landscape. Importance of scale; organism response to landscape patterns; natural- and human-caused disturbance. 3 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: BIOL 140 and 141, NRM 210 or 340, or permission of instructor. Credits: (4)
NRM 389 - Cooperative Education in NRM	See Cooperative Education Program. Credits: (1 or 3, R15)
NRM 420 - Soil Genesis and Classification	Students will study the formation and classification of soils and relate their importance to resource management. 2 Lecture, 2 Lab. Credits: (3)
NRM 440 - Integrated Resources Management	Natural resources management exercises; project and strategic planning; map and quantitative integration techniques; group dynamics. 2 Lecture, 4 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, 442, or permission of instructor. Credits: (4)
NRM 442 - Natural Resources Policy and Administration	Policy and administrative principles; case studies on the evolution of policy in the United States; current issues. <b>Prerequisites &amp; Notes</b> PREQ: Junior standing or permission of instructor. Credits: (3)
NRM 444 - Applied Geographic Information Systems	Enchances knowledge in the areas of data capture, database management, spatial analysis, and cartographic display. Project-based course capitalizing on the benefits of experiential learning. 3 Lecture, 3 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 344 or permission of instructor. Credits: (4)

NRM 451 - Foundations of Silviculture	Principles of silviculture and their applications to the major forest types of the United States. Site and management requirements of important tree species. 3 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (4)
NRM 452 - Forest Management	Principles of forest management at stand and forest levels; forest growth, regulation, harvesting, and multiple-use management. 3 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (4)
NRM 460 - Watershed Management	Principles of watershed management for analysis and control of water yield, timing, and quality in single- and multiple-use situations. 2 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (3)
NRM 470 - Land Suitability Classification	Study and application of land suitability classifications systems. 2 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 210 or 340, or permission of instructor. Credits: (3)
NRM 472 - Ecosystem Structure and Analysis	Integrative, interdisciplinary investigation into the structure and function of ecosystems. Interactions and movement of energy, materials, and organisms into, out of, and within ecosystems. 3 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: BIOL 140, 141, NRM 210 or 340, and 344 or permission of instructor. Credits: (4)
NRM 480 - Independent Study	<b>Prerequisites &amp; Notes</b> PREQ: NRM major and permission of instructor. Credits: (1-3, R6)
NRM 483 - Applications in Forest Management	Students will participate in actual forest management activities in order to gain practical, hands-on experience in the design and implementation of forest management treatments. S/U grading. Credits: (1-3, R6)
NRM 493 - Topics in NRM	<b>Prerequisites &amp; Notes</b> PREQ: Permission of instructor. Credits: (1-4, R12)
NRM 593 - Topics in NRM	<b>Prerequisites &amp; Notes</b> PREQ: Permission of instructor. Credits: (1-4, R12)
<b>Geography courses taught by NRCM faculty</b>	
<b>Course</b>	<b>Description</b>
GEOG 150 - Environmental Geography	Survey of man's physical habitat, including weather and climate, soils, vegetation, and landforms; emphasis on phenomena that most influence man. Credits: (3)
GEOG 300 - Weather and Climate	Meteorology (temperature, humidity, pressure, precipitation, winds, radiation); global heat budget, CO <sub>2</sub> cycle, jet stream, air masses, fronts, storms; global distribution of climate. 3 Lecture, 2 Lab. Credits: (4)
GEOG 324 - Introduction to Remote Sensing	Interpretation and applications of remote sensing; satellite and aerial imagery, elementary photography, stereoscopic viewing, and photomapping. 3 Lecture, 2 Lab. <b>Prerequisites &amp; Notes</b> PREQ: 150 or permission of instructor; GEOL 150 desirable. Credits: (4)
GEOG 424 - Advanced Remote Sensing	Interpretation and application of remotely sensed data on the earth's physical and cultural environments; major project required. <b>Prerequisites &amp; Notes</b> PREQ: Permission of instructor. 6 Lab. Credits: (3)

### **Appendix 3.2..NRCM course syllabi placeholder**

#### NRCM Course Syllabi Placeholder

Recent course syllabi for NRCM and Geography courses taught by NRCM faculty are presented in Supplemental Materials I, located at the end of this document.

### **Appendix 3.3..4-year course sequences for each NRCM concentration**

#### **Curriculum Guide for Natural Resources Management (Forest Resources Concentration) B.S.**

##### Freshman Year

###### Fall Semester (Hours 13)

- \* 190 Series First Year Seminar Credits: (3)
- \* JS 101 Jumpstart Credits: (0)
- \* BIOL 140 - Principles of Biology I Credits: (4)
- \* ENGL 101 - Composition I Credits: (3)
- \* MATH 146 - Precalculus Credits: (4)

###### Spring Semester (Hours 17)

- \* Liberal Studies Credits: (3)
- \* BIOL 141 - Principles of Biology II Credits: (4)
- \* CHEM 132 - Survey of Chemistry I Credits: (4)
- \* CMHC 201 - Introduction to Speech Communication Credits: (3)
- \* ENGL 102 - Composition II Credits: (3)

##### Sophomore Year

###### Fall Semester (Hours 17)

- \* Liberal Studies Credits: (6)
- \* BIOL 254 - Dendrology Credits: (4)
- \* GEOG 150 - Environmental Geography Credits: (3)
- \* NRM 210 - Methods in Natural Resources Management Credits: (4)

###### Spring Semester (Hours 16)

- \* Concentration Elective Credits: (3)
- \* General Elective Credits: (3)
- \* Liberal Studies Credits: (3)
- \* ECON 231 - Introductory Microeconomics and Social Issues Credits: (3)
- \* GEOL 305 - Soils and Hydrology Credits: (4)

##### Junior Year

###### Fall Semester (Hours 16)

- \* Liberal Studies Credits: (3)
- \* General Elective Credits: (3)
- \* ECON 310 - Natural Resource Economics Credits: (3)
- \* NRM 344 - Introduction to Geographic Information Systems Credits: (4)
- \* NRM 352 - Forest Resource Measurements Credits: (3)

###### Spring Semester (Hours 15)

- \* Liberal Studies Credits: (3)
- \* General Elective Credits: (6)
- \* GEOG 402 - Conservation of Natural Resources Credits: (3)
- \* NRM 351 - Forest Ecology Credits: (3)

## Graduation Fee

After earning ninety hours, the student must file an application form with the Dean after paying a \$30 graduation fee to the University Cashier.

## Senior Year

### Fall Semester (Hours 17)

- \* Liberal Studies Credits: (3)
- \* Concentration Elective Credits: (3)
- \* GEOG 324 - Introduction to Remote Sensing Credits: (4)
- \* NRM 442 - Natural Resources Policy and Administration Credits: (3)
- \* NRM 451 - Foundations of Silviculture Credits: (4)

### Spring Semester (Hours 17)

- \* General Elective Credits: (6)
- \* Concentration Elective Credits: (3)
- \* NRM 440 - Integrated Resources Management Credits: (4)
- \* NRM 452 - Forest Management Credits: (4)

Total Hours for Degree: 128

## Additional Information

Students may finish earlier if they attend summer school at WCU or another approved institution. Western's Natural Resource Management program is housed in the Department of Geosciences and Natural Resources Management within the College of Arts and Sciences.

## Curriculum Guide for Natural Resources Management (Landscape Analysis Concentration) B.S.

### Freshman Year

#### Fall Semester (Hours 13)

- \* 190 Series First Year Seminar Credits: (3)
- \* JS 101 Jumpstart Credits: (0)
- \* BIOL 140 - Principles of Biology I Credits: (4)
- \* ENGL 101 - Composition I Credits: (3)
- \* MATH 146 - Precalculus Credits: (4)

#### Spring Semester (Hours 17)

- \* Liberal Studies Credits: (3)
- \* BIOL 141 - Principles of Biology II Credits: (4)
- \* CHEM 132 - Survey of Chemistry I Credits: (4)
- \* CMHC 201 - Introduction to Speech Communication Credits: (3)
- \* ENGL 102 - Composition II Credits: (3)

### Sophomore Year

#### Fall Semester (Hours 16)

- \* Liberal Studies Credits: (6)
- \* General Elective Credits: (3)
- \* GEOG 150 - Environmental Geography Credits: (3)
- \* NRM 210 - Methods in Natural Resources Management Credits: (4)

#### Spring Semester (Hours 16)

- \* Liberal Studies Credits: (3)
- \* General Elective Credits: (3)
- \* ECON 231 - Introductory Microeconomics and Social Issues Credits: (3)
- \* GEOG 300 - Weather and Climate Credits: (4)
- \* GEOL 305 - Soils and Hydrology Credits: (4)

### Junior Year

#### Fall Semester (Hours 17)

- \* Concentration Elective Credits: (3)
- \* Liberal Studies Credits: (3)
- \* General Elective Credits: (3)
- \* GEOG 324 - Introduction to Remote Sensing Credits: (4)
- \* NRM 344 - Introduction to Geographic Information Systems Credits: (4)

#### Spring Semester (Hours 17)

- \* Liberal Studies Credits: (3)
- \* General Elective Credits: (7)
- \* GEOG 424 - Advanced Remote Sensing Credits: (3)
- \* NRM 371 - Landscape Ecology Credits: (4)

### Graduation Fee

After earning ninety hours, the student must file an application form with the Dean after paying a \$30 graduation fee to the University Cashier.

#### Senior Year

##### Fall Semester (Hours 16)

- \* General Elective Credits: (3)
- \* Liberal Studies Credits: (3)
- \* ECON 310 - Natural Resource Economics Credits: (3)
- \* NRM 442 - Natural Resources Policy and Administration Credits: (3)
- \* NRM 472 - Ecosystem Structure and Analysis Credits: (4)

##### Spring Semester (Hours 16)

- \* General Elective Credits: (6)
- \* Concentration Elective Credits: (3)
- \* NRM 440 - Integrated Resources Management Credits: (4)
- \* NRM 444 - Applied Geographic Information Systems Credits: (4)

Total Hours for Degree: 128

#### Additional Information

Students may finish earlier if they attend summer school at WCU or another approved institution.

Western's Natural Resources Management program is housed in the Department of Geosciences and Natural Resources Management within the College of Arts and Sciences.

## **Curriculum Guide for Natural Resources Management (Soil and Water Resources Concentration) B.S.**

### Freshman Year

#### Fall Semester (Hours 14)

- \* 190 Series First Year Seminar Credits: (3)
- \* JS 101 Jumpstart Credits: (0)
- \* BIOL 140 - Principles of Biology I Credits: (4)
- \* ENGL 101 - Composition I Credits: (3)
- \* MATH 146 - Precalculus Credits: (4)

#### Spring Semester (Hours 17)

- \* Liberal Studies Credits: (9)
- \* BIOL 141 - Principles of Biology II Credits: (4)
- \* CHEM 132 - Survey of Chemistry I Credits: (4)

### Sophomore Year

#### Fall Semester (Hours 17)

- \* Liberal Studies Credits: (6)
- \* NRM 351 Forest Ecology Credits: (3) or BIOL 304 General Ecology Credits: (3)
- \* GEOG 150 - Environmental Geography Credits: (3)
- \* NRM 210 - Methods in Natural Resources Management Credits: (4)

#### Spring Semester (Hours 17)

- \* Liberal Studies Credits: (3)
- \* CHEM 133 - Survey of Chemistry II Credits: (4)
- \* GEOG 300 - Weather and Climate Credits: (4)
- \* GEOG 305 - Soils and Hydrology Credits: (4)

### Junior Year

#### Fall Semester (Hours 17)

- \* Concentration Elective Credits: (3)
- \* Liberal Studies Credits: (3)
  
- \* GEOG 324 - Introduction to Remote Sensing Credits: (4)
- \* MGT 300 - Introduction to Management Credits: (3)
- \* NRM 344 - Introduction to Geographic Information Systems Credits: (4)

#### Spring Semester (Hours 15)

- \* Liberal Studies Credits: (3)
- \* General Elective Credits: (3)
- \* Concentration Elective Credits: (3)
- \* GEOG 402 - Conservation of Natural Resources Credits: (3)
- \* NRM 460 - Watershed Management Credits: (3)

### Graduation Fee

After earning ninety hours, the student must file an application form with the Dean after paying a \$30 graduation fee to the University Cashier.

#### Senior Year

##### Fall Semester (Hours 15)

- \* General Elective Credits: (6)
- \* Concentration Elective Credits: (3)
- \* NRM 420 - Soil Genesis and Classification Credits: (3)
- \* NRM 442 - Natural Resources Policy and Administration Credits: (3)

##### Spring Semester (Hours 16)

- \* General Elective Credits: (12)
- \* NRM 440 - Integrated Resources Management Credits: (4)

Total Hours for Degree: 128

#### Additional Information

Students may finish earlier if they attend summer school at WCU or another approved institution.

Western's Natural Resource Management program is housed in the Department of Geosciences and Natural Resources Management within the College of Arts and Sciences.

## Appendix 3.4..NRCM outcomes assessment plan

### **OUTCOMES ASSESSMENT PLAN** **NATURAL RESOURCES MANAGEMENT PROGRAM**

#### **ROLE AND MISSION**

The Natural Resources Management Program, in the School of Arts and Sciences at Western Carolina University exists to provide undergraduate majors with instruction in an interdisciplinary, problem solving approach to the conservation and utilization of the natural resources of America and the World. The Program offers the Bachelor of Science Degree with concentrations in Forest Resources Management, Water Resources Management and Land Use Planning. The program emphasizes high quality undergraduate instruction in preparation for entry level natural resources management positions or for further graduate study. The program supports the university role and mission of teaching by providing instruction in the intellectual and technical skills of a disciplined study in the science and art of managing our nation's natural resources. The program supports the university role and mission of research and service through involvement of faculty and students in independent and sponsored research with federal, state and local agencies. The program supports the university role and mission by providing training to support a commitment to stewardship of the natural environment.

#### **STATEMENT OF GOALS FOR NATURAL RESOURCES MANAGEMENT MAJORS**

#### **OUTCOME AREAS AND GOALS**

##### *GOAL AREA: KNOWLEDGE*

Instruction is organized and delivered so that students will acquire a reasonable degree of understanding of the principles, theories, methodologies and skills used in current approaches to natural resources management.

General objectives:

Students will demonstrate the following:

- A. A reasonable degree of understanding of the basic tenets and concepts of forest resource management, water resources management or land use planning.
- B. A reasonable proficiency in the application of generally accepted field data collection and analysis techniques used in forest resource management, water resources management and land use planning.
- C. An ability to use current literature to find information on topics not previously presented to or researched by the student.
- D. An ability to communicate technical information in both oral and written form, and an ability to discuss this information with peers and others.

##### **GOAL AREA: PROBLEM SOLVING**

The instructional system is designed so that students will develop abilities in problem identification and definition, data collection and analysis, and the design and evaluation skills needed to develop problem solutions in forest resources management, water resources management or land use planning.

General Objectives:

Students will demonstrate the following:

- A. An ability to evaluate and analyze natural resource problems logically and systematically using accepted principles of silviculture, forest resource management, water resource management, or land use planning.
- B. An ability to use current problem solving techniques including computerized analysis and geographic information systems used in forest resources management, water resources management, or land use planning.

#### GOAL AREA: EMPLOYABILITY

Instruction is designed so that students will develop the knowledge, technical skills and attitudes that are required by employers within the natural resources management fields.

General Objectives:

Students will demonstrate the following:

- A. The professional skills and technical competence employers expect from entry level natural resource management professionals, or the academic abilities to be eligible for further study.
- B. A demonstrated ability to present information in both written and oral forms of communication.

#### MEASUREMENT OF OUTCOMES

Measurement of the level of attainment of these goals by Natural Resources Management student will be accomplished through the combination of the successful completion of specified courses along with an individual exit interview. The exit interview will be conducted by one or more faculty from within the Department of Geosciences and Natural Resources Management, but outside the Natural Resources Management program.

##### Knowledge:

The level of attainment of the knowledge goals will be measured by the successful completion of NRM 350 - Silviculture, and NRM 450 - Forest Management, and/or NRM 460 - Watershed Management and/or Geog 462 - Industrial location and Community Development with a grade of "C" or better. The particular combination of courses is dependant upon the student's selected area of concentration. The use of grades as an outcome measure is appropriate because grades provide a significant measure of a student's abilities with respect to specific technical skills required for the successful completion of the courses and which are required knowledge in the chosen professions. Specifically, the areas within these courses that are the focus of grading evaluation are:

review and interpretation of relevant literature

Collection and analysis of data

Field collection techniques and equipment use

Oral and written presentation of results

These skill and knowledge areas are directly linked to the objectives specified in the goal and general objective statements above.

##### Problem Solving:

The level of attainment of the problem solving goals will be measured by the successful completion of NRM 440 - Integrated Resources Management and NRM 344 - Introduction to Geographic Information Systems with a grade of "C" or better in each course. The GIS course requires proficiency in the following areas:

Collection and analysis of data

Field data collection techniques and equipment use

Oral and Written presentation of results

The Integrated Resources Management course is a senior-level capstone class. Students are assigned to project teams and are required to produce a draft Environmental Impact Statement and Management Plan for a resource management proposal. Successful completion of this project includes:

Problem definition

Identification of goals and objectives

Thorough search of appurtenant literature

Team management

Data collection and analysis

Resource management decision-making

Oral presentation of project proposal and impacts in a public meeting

Written presentation of a final report

The problem solving skills are directly linked to the goal and general objective statements above.

#### Employability:

The level of attainment of the employability goals will be measured by a survey of graduates in the third year following graduation to determine their employment status related to their chosen concentration.

### **OUTCOMES REPORTING:**

A report of outcomes will be generated at the end of each spring semester (to include summer and fall graduates) that will assign a single number score for each graduate based on the cumulative grade point average attained in each of the specified courses. The number score will be reported for each graduate and the average score will be reported for the combination of all graduates. Scores reported will not be linked to particular graduates by name or any other identifier.

### **USE OF THE OUTCOMES ASSESSMENT:**

The student grades for each of the specified classes can be reviewed by the course instructor and modifications can be made in the class content or presentation as needed.

NATURAL RESOURCES MANAGEMENT PROGRAM

STUDENT OUTCOMES ASSESSMENT REPORT

Term of graduation (Spring, Summer, Fall & Year) \_\_\_\_\_

Declared Concentration (Forest Res., Water Res, Land Use):\_\_\_\_\_

Forest Resource Management Assessment Courses:

NRM 451 - Silviculture (4 hours) Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

NRM 344 - Intro to GIS (3 Hours)Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

NRM 440 - Int. Res. Mgt.(4 Hours)Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

NRM 452 - Forest Mgt. (4 hours) Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

Water Resources Management Assessment Courses:

NRM 344 - Intro to GIS (3 Hours)Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

Chem 330 - Aquat. Chem. (3 hours)Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

NRM 440 - Int. Res. Mgt.(4 hours)Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

NRM 460 - Watershed Mgt.(3 hours)Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

Land Use Planning Assessment Courses:

NRM 344 - Intro to GIS (3 hours) Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

NRM 440 - Int. Res. Mgt. (4 hours)Grade:\_\_\_\_\_ Quality Points:\_\_\_\_\_

Geog 462 - Ind. Loc. (3 hours)Grade: \_\_\_\_\_ Quality Points:\_\_\_\_\_

Cumulative Grade: Grade:\_\_\_\_\_ Quality Points: \_\_\_\_\_

Natural Resources Management Program

Alumni Survey

1. Are you currently employed in the Natural Resources field?  Yes  No

2. If you are not currently employed in Natural Resources, did your natural resources training prepare you for your current field?  Yes  No

3. What is your current field? \_\_\_\_\_

4. Indicate your function in your current position. List the number from below \_\_\_\_\_

- |                                 |                        |
|---------------------------------|------------------------|
| (1) Technician                  | (5) Research           |
| (2) Supervision                 | (6) Planning           |
| (3) Management/Administration   | (7) Education/Training |
| (4) Policy Development/Analysis | (8) Other              |

5. Indicate the auspice of your current position. List the number from below. \_\_\_\_\_

- |                          |                        |
|--------------------------|------------------------|
| (1) Public-Local Gov't   | (4) Private-Nonprofit  |
| (2) Public-State Gov't   | (5) Private for profit |
| (3) Public-Federal Gov't |                        |

6. Indicate the practice area of your current position .List the number from below. \_\_\_\_\_

- |                          |                             |
|--------------------------|-----------------------------|
| (1) Silviculture         | (8) Comprehensive Planning  |
| (2) Forest Management    | (9) Zoning                  |
| (3) Forest Ecology       | (10) Subdivision Regulation |
| (4) Forest Inventory     | (11) Geog. Info. Systems    |
| (5) Hydrology            | (12) Data Analysis          |
| (6) Watershed Management | (13) Research               |
| (7) Water Quality        |                             |

7. Number of different employers since graduation: \_\_\_\_\_

8. Length of time in current position (months): \_\_\_\_\_

9. Have you been promoted with present employer?  Yes  No  
Number of promotions \_\_\_\_\_

10. Completion of additional Degrees since graduation?

- |                 |                           |                             |
|-----------------|---------------------------|-----------------------------|
| _____ Have M.S. | _____ Enrolled in program | _____ Planning on enrolling |
| _____ Have PhD  | _____ Enrolled in program | _____ Planning on enrolling |

11. Have you attended any educational programs/short courses since graduation?  Yes  No

12. Are there continuing education workshops, conferences that you think you need?  Yes  No

List Needs: \_\_\_\_\_



**Outcomes Assessment Report  
Academic Year 2004/2005  
Natural Resources Management Program**

Graduate Average Scores:

<u>Fall 2004</u>		<u>Spring 2005</u>	
Forest	2.13	Forest	3.05
Forest	2.49	Water	2.49
Forest	2.80	Water	2.87
Forest	1.67		
Forest	2.98		
Water	2.77		
Forest Average:	2.41	Forest Average:	3.05
Water	2.77	Water Average	2.68
Grand Average:	2.47	Grand Average:	2.80
Std. Dev.:	0.449	Std. Dev.:	0..233

Assessment Findings

Assessment information of 2004/2005 indicate that students graduating from the NRM program are continuing to meet the goals defined in the assessment plan document. There seems to be a small decrease in overall student averages; but this may be in some part due to the smaller number of total graduates than in previous years. The knowledge goals, as defined by a student's attainment of a grade of "C" (2.00 quality points) or better in the specified courses was met 86.6% of the time for the current student cohort. Of the 14.4% (4 out of 30) below "C", 50% were a grade of C-, and 50% were a grade of D. There were no grades below D. The grades of below "C" were not concentrated in any particular course. Cumulative score averages (average of three or four courses upon which the assessment is based) ranged from 1.67 to 3.05 over the 2 semesters.

Program Changes

Faculty in the NRM program are continuing to increase reading, writing and speaking assignments in many of the current courses. This is a result of this and previous assessment findings. Peer reviewed journals and technical articles pertinent to each class are assigned and discussed in many of the existing courses with the expectation that student's proficiency in critical evaluation of written information and analytical data will continue to improve with experience. An additional objective resulting from this assessment is to increase the number writing assignments in each NRM class. Writing competency seems to be on the decline in many of our upper level classes and was evident in the Spring, 2005 NRM 440 capstone class. Short to medium length writing assignments will be increased in each NRM class and every written assignment, including laboratory exercises, will be graded for writing as well as content and analytical procedures.

A major curriculum change is was proposed in Fall, 2004 and approved in Spring, 2005. This change deleted the Land Use Planning Concentration due to the retirement of the geography

faculty responsible for delivering the majority of the upper division courses and the placement of the Geography major on inactive status. These changes include a small reduction in the total number of credit hours required for the major, which will allow students greater flexibility in choosing elective courses that will better prepare them for successful post-graduate employment. A reorganization of the introductory and lower level courses will implement more basic reading, writing, speaking, and analytical skills into courses much earlier in the program than does the current curriculum. The proposed curriculum modified the current Water Resources concentration to a Soil and Water concentration which will prepare students for employment by the federal Natural Resources Conservation Service and state Soil Conservation Districts. A new concentration has been approved in Landscape Analysis. This concentration focuses on the use of remote sensing and geographic information systems for the analysis, planning, and application of land based information in natural resources management.

**Outcomes Assessment Report  
Academic Year 2005/2006  
Natural Resources Management Program**

Graduate Average Scores:

Fall 2005		Spring 2006	
Forest	2.77	Forest	1.98
Forest	2.67	Forest	1.65
Forest	2.27	Forest	3.15
Forest	2.58	Forest	3.32
Forest	2.05	Forest	2.34
Forest	3.36	Forest	2.58
Water	3.69	Forest	2.00
		Water	3.90
		Water	3.60
Forest Average:	2.62	Forest Average:	2.43
Water Average	3.69	Water Average	3.75
Grand Average:	2.77	Grand Average:	2.72
Std. Dev.:	0.536	Std. Dev.:	0.751

Assessment Findings

Assessment information of 2005/2006 indicate that students graduating from the NRM program are continuing to meet the goals defined in the assessment plan document. The knowledge goals, as defined by a student's attainment of a grade of "C" (2.00 quality points) or better in the specified courses was met 75.5% of the time for the current student cohort. Of the 24.5% (11 out of 45) below "C" grades, 81.8% (9) were a grade of C-, and 9.1% (1) was a grade of D and 9.1% (1) was a grade of D-. There were no grades below D-. The grades of below "C" were not concentrated in any particular course. Cumulative score averages (average of three or four courses upon which the assessment is based) ranged from 1.64 to 3.90 over the 2 semesters.

Program Changes

Faculty in the NRM program continue to increase reading, writing and speaking assignments in many of the current courses as a result of this and previous assessment findings. Peer reviewed journals and technical articles pertinent to each class are assigned and discussed in many of the existing courses with the expectation that student's proficiency in critical evaluation of written information and analytical data will continue to improve with experience. An additional objective resulting from this assessment is to increase the number of writing assignments in each NRM class. Writing competency seemed to be on the decline in many of our upper level classes and was evident in the spring, 2005 NRM 440 capstone class. Short to medium length writing assignments were increased in each NRM class and every

written assignment, including laboratory exercises, was graded for writing as well as content and analytical procedures. Students with particular problems are referred to the Writing Center and in general students appear to be using this resource more often than in the past. Faculty report that this increased focus on writing competency is successful and was evidenced in a general overall improvement in the quality of written reports submitted in the spring, 2006 capstone class.

A major curriculum change was adopted in spring, 2005 to take effect with the fall, 2005 semester. The Land Use Planning Concentration was deleted due to the retirement of the geography faculty responsible for delivering the majority of the upper division courses and the placement of the Geography major on inactive status. These changes include a small reduction in the total number of credit hours required for the major, which allows students greater flexibility in choosing elective courses that will better prepare them for successful post-graduate employment. A reorganization of the introductory and lower level courses implemented more basic reading, writing, speaking, and analytical skills into courses much earlier in the program than previously. The new curriculum modified the Water Resources concentration to a Soil and Water concentration which prepares students for employment by the federal Natural Resources Conservation Service and North Carolina Soil Conservation Districts. A new concentration was added in Landscape Analysis. This concentration focuses on the use of remote sensing and geographic information systems for the analysis, planning, and application of land based information in natural resources management. This annual assessment report and future reports for the next 2 years will likely only include data from the Forest Resources Concentration and the Soil and Water Resources Concentration until there are graduates from the Landscape Analysis Concentration.

**Outcomes Assessment Report  
Academic Year 2006/2007  
Natural Resources Management Program**

**Assessment Findings:**

<b>Employment status and grade point average in critical courses for NRM students who graduated during the 2006/07 academic year.</b>						
Concentration	Knowledge courses			Problem solving courses		Employed in field
	451/452	460	472	344	440	
FR	4.00			4	3.33	Yes
FR	1.34			3	3.33	No
FR	2.00			2	3.67	No
FR	2.33				3.67	Yes
FR	3.17			3	3	Yes
<b>FR ave</b>	<b>2.57</b>			<b>3.00</b>	<b>3.40</b>	<b>60%</b>
SW		2.67		4	3.33	?
SW		2.67		3	3.67	Yes
SW		3.33		4	3.67	Yes
SW		3.33		2.33	3	?
SW		2.67		4	3.67	?
<b>SW ave</b>		<b>2.93</b>		<b>3.47</b>	<b>3.47</b>	<b>100%</b>
<b>OVERALL AVE</b>	<b>2.75</b>			<b>3.33</b>		<b>71%</b>

Assessment information from the 2006/07 academic year indicate that a large majority of students graduating from the NRM program met or exceeded the goals defined in the assessment plan document.

Overall the students performed better in problem solving areas than they did in knowledge areas. The knowledge goals, as defined by a student's attainment of a grade of "C" (2.00 GPA) or better in the specified courses was met by 90% of the current student cohort; and the students had an average GPA of 2.75 in these courses. Our goals for problem solving were met by 100% of the current cohort, and they achieved an overall GPA of 3.33 for these courses.

Our recent graduates appear to be successful in gaining employment soon after graduation. We were able to survey 70% of the students who graduated during the past year. Of those, 71% were gainfully employed in their field.

## **Program Changes:**

While we are satisfied with the competencies that our graduating students are achieving, we are always looking for ways to improve. The assessment results suggest that our students do very well in areas related to problem solving, but they are not as strong in areas of discipline specific knowledge. In order to address this, the faculty in the NRM program continue evaluate and modify course content and teaching methods. The NRM faculty are in the process of identifying and evaluating the course expectations for all courses in our curriculum. One initial goal of this effort will be to better design NRM-210 Methods in Natural Resources Management and GEOG 150 Environmental Geography, which are the major prerequisite courses for our upper level courses. Our goal is to better identify the knowledge and skills that our students need to be successful throughout our curriculum and to better coordinate when and how they will be exposed to that information.

We are fortunate that we have been able to add 2 new faculty to our program during the past 2 years. These faculty teach some of the critical courses used in our assessment plan, and they bring new ideas and insights into these classes.

In addition to modifying course content and structure, we feel that one of the most effective ways to improve student outcomes is through experiential learning. This is the process by which traditional classroom education with is supplemented with experiential opportunities outside of the classroom that allow students to apply knowledge in a real world setting. Faculty in the NRM Program are increasing both the scope and number of these opportunities by expanding the number of internship opportunities that we sponsor. We continue to offer paid Forestry Internships for students interested in participating in sustainable forest management projects throughout the region. We are also adding a new group of paid Conservation Internships that allow students to become involved in a wide range of natural resource conservation activities.

**Appendix 3.8..Preliminary learning outcomes matrices for selected NRCM courses**

COURSE: NRM-352 Forest Measurements 3 cr.; 2 lecture, 1lab

<b>Outcome</b>	<b>Competence level</b>	<b>Method</b>	<b>Assessment</b>
Navigate in remote locations using maps and compasses	competent		
Collect data for, create, and close a boundary traverse using clinometer, 100-foot tape, compass, graph paper, protractor, straight edge, and map scale	competent		
Estimate the diameter, height, and volume of standing trees using clinometers, haga hypsometers, D-tapes, and Biltmore sticks	competent		
Be able to define and quantify common forest products including sawtimber, cordwood, and pulpwood	competent		
Design and conduct standard forest inventories using both fixed area and variable radius plots	competent		
Summarize standard forest inventory data into stand and stock tables	competent		
Enter and summarize data using Excel spreadsheets	experience		
Summarize data using hand-held calculator	experience		
Work in small groups to complete projects	experience		
Grade standing trees using USFS tree grading rules	experience		

COURSE: NRM-420 Soil Genesis and Classification 3 cr.; 2 lecture, 1lab

<b>Outcome</b>	<b>Competence level</b>	<b>Method</b>	<b>Assessment</b>
Describe a soil profile in the field	competent		
Identify the 5 factors of soil formation	competent		
Explain basic soil forming processes	competent		
Accurately predict the soils that will occur at different positions on the landscape	competent		
Identify the 12 soil orders and their key attributes	competent		
State the important characteristics of a soil by deconstructing its Soil Taxonomy classification	competent		

COURSE: NRM-451 Foundations of Silviculture. 4 cr; 3lecture, 1lab

<b>Outcome</b>	<b>Competence level</b>	<b>Method</b>	<b>Assessment</b>
Become conversant in the terminology of silviculture	competent		
Apply forest ecological principles to patterns of forest stand development including stand initiation, stem exclusion, understory reinitiation, and old growth	competent		
Explain the clearcutting, seed tree, shelterwood methods of forest regeneration and describe their relative strengths and weaknesses	competent		
Explain high thinning, low thinning, selection thinning, geometric thinning, and free thinning, and describe the goals of each.	competent		
Explain crop tree release, timber stand improve, sanitation cuttings, and other intermediate stand treatments and their appropriate application	competent		
Conduct forest stand exam using fixed area and variable radius plots	experience		
Identify common forest pests in western NC	competent		
Develop silvicultural prescriptions that are consistent with sustainable resource management	competent		
Explain the differences between even-aged management and uneven-aged management	competent		
Read and interpret scientific literature related to silviculture	experience		
Work in small groups to complete assigned tasks	experience		

**Appendix 4.1..Overview of NRCM faculty training and specialties**

**NRCM Program Faculty**

<b>Tenure track Faculty</b>	<b>Terminal degree</b>	<b>Year(s) of appointment</b>	<b>Title</b>	<b>Teaching load</b>	<b>Specialties</b>
Peter Bates	PhD (Forestry) University of MN	1993	Associate Professor and Director	¾ teaching, ¼ administration	Sustainable forest management, soil science
Joni Bugden Storie	PhD University of Waterloo (CA)	2005	Assistant Professor	Full	Remote sensing, environmental geography
Ron Davis	PhD University of Illinois	2006	Assistant Professor	Full	GIS, wildlife management
Laura DeWald	PhD (Forestry) Virginia Polytechnic Institute	2004	Associate Professor	¼, (position shared with Environmental Science and Biology)	Forest genetics, conservation biology
Larry Kolenbrander	PhD Colorado State University	1985	Associate Professor	Full	Policy and administration, watershed management
<b>Part-time Faculty</b>					
Rob Lamb	MS Forestry Yale University	NA	Instructor	Part time	Sustainable forest management
<b>Former Faculty</b>					
John DiBari	PhD University of Arizona	2003-2005	Assistant Professor	Full	GIS, landscape ecology

**Appendix 4.2 FTE's generated by NRCM faculty for 2006-07**

Prefix	Last Name	First Name	Funding Category	Fall 2006 Total SCH	Fall 2006 Total FTE generated	Spring 2007 Total SCH	Spring 2007 Total FTE generated	2006-07 Total SCH	2006-07 Total FTE generated	
<b>Geog</b>	Bugden	Joni	1	99	0.14	60	0.08	159	0.22	
<b>NRM</b>	Bates	Peter	3	126	0.31	108	0.27	234	0.58	
	Bugden	Joni	3	60	0.15	144	0.35	204	0.50	
	Davis	Ronald	3	135	0.33	160	0.39	295	0.73	
	DeWald	Laura	3	0	0.00	144	0.35	144	0.35	
	Kolenbrander	Lawrence	3	134	0.33	166	0.41	300	0.74	
	Lamb	Rob	3	0	0.00	21	0.05	21	0.05	
				<b>Total</b>	<b>554</b>	<b>1.26</b>	<b>3025</b>	<b>6.54</b>	<b>3,579</b>	<b>7.80</b>
				<b>Geog</b>	<b>99</b>	<b>0.14</b>	<b>867</b>	<b>1.23</b>	<b>966</b>	<b>1.36</b>
				<b>NRCM</b>	<b>455</b>	<b>1.12</b>	<b>743</b>	<b>1.83</b>	<b>1,198</b>	<b>2.95</b>

**Appendix 4.3..Frequency of NRCM course offerings by semester 2001 - 2007**

Fall Term

	2001	2002	2003	2004	2005	2006	2007
Course	# of Sections						
NRM 140	0	0	1	1	3	4	4
NRM 150	1	1	1	1	1	1	1
NRM 210	0	0	0	0	0	0	1
NRM 330	0	0	0	0	0	0	1
NRM 340	3	2	2	2	2	Deleted	Deleted
NRM 342	1	0	1	1	Deleted	Deleted	Deleted
NRM 344	2	0	2	2	2	2	1
NRM 352	2	2	2	2	2	2	1
NRM 389	0	1	2	2	2	0	0
NRM 442	1	1	1	1	1	1	1
NRM 451	2	2	2	2	2	0	1
NRM 480	2	1	2	0	0	0	0
NRM 483	0	0	0	0	0	0	1
NRM 493	2	0	1	2	2	1	0

Deleted = Removed from curriculum

Spring Term

	2002	2003	2004	2005	2006	2007
Course	# of Sections					
NRM 140	1	0	2	3	3	5
NRM 210	0	0	0	0	2	0
NRM 320	0	0	0	0	0	1
NRM 342	1	0	0	Deleted	Deleted	Deleted
NRM 344	2	0	2	2	0	1
NRM 351	2	2	2	2	2	1
NRM 420	0	0	0	0	0	1
NRM 440	2	2	2	2	2	1
NRM 452	2	2	2	2	2	1
NRM 460	2	2	2	2	2	0
NRM 483	0	0	0	0	1	1
NRM 493	1	0	3	3	0	0

Planned Frequency of course offerings.

Every semester, multiple sections = NRM 140

Every Fall = NRM 150, 210, 389, 442

Fall, 2, years = NRM 330, 352, 451

Every Spring = NRM 351, 440

Spring, 2 years = NRM 320, 420, 452, 460

3 of 4 semesters = NRM 344

1 of 4 semesters = NRM 444

## Frequency of Geography course offerings by Semester 2001 - 2007

### Fall Term

	2001	2002	2003	2004	2005	2006	2007
Course	# of Sections						
<b>GEOG 150</b>	1	1	1	1	1	1	0
<b>GEOG 324</b>	1	1	1	1	1	1	0

### Spring Term

	2002	2003	2004	2005	2006	2007
Course	# of Sections					
<b>GEOG 300</b>	0	0	1	0	1	0
<b>GEOG 424</b>	0	0	0	0	0	0

Planned Frequency of course offerings.

Fall, 2, years = GEOG 150, 324

Spring, 2 years = GEOG 300

1 of 4 semesters = GEOG 424

**Appendix 4.4..Placeholder for NRCM faculty CV's**

**NRCM faculty CV's are located in Supplemental Materials II, located at the end of this document**

## Appendix 4.5...Job ad for current faculty search

**ASSISTANT/ASSOCIATE PROFESSOR  
SOIL AND WATER CONSERVATION  
NATURAL RESOURCE CONSERVATION & MANAGEMENT PROGRAM  
DEPARTMENT OF GEOSCIENCES AND NATURAL RESOURCES  
WESTERN CAROLINA UNIVERSITY  
CULLOWHEE, NORTH CAROLINA**

Western Carolina University is seeking a 9-month, tenure-track, Assistant/Associate Professor in Natural Resource Conservation & Management with a disciplinary background including some combination of watershed management, natural resource policy, and soil science. The position begins August 2008. The successful candidate is expected to be active in undergraduate teaching and experienced in applying the principles of watershed science to natural resources management. We are particularly interested in candidates with experience in teaching at the undergraduate level and a demonstrated interest in developing innovative education and research programs in the southern Appalachian region, and who can compliment existing departmental strengths.

The successful candidate must be committed to undergraduate education, as well as, developing an active research program and engaging in professional service. Specifically, the incumbent will develop and deliver undergraduate courses in watershed management, the University's liberal studies program, and other areas depending on the candidate's background. These areas may include natural resource policy and administration, soil science, or integrated resource management. Preference will be given to candidates who have applied experience in natural resource conservation, and who desire to include students in their scholarly activities. Additionally, the incumbent will be involved in student advising and will be expected to participate in University governance and regional service. A Ph.D. from an accredited institution is required by date of appointment.

The Natural Resource Conservation & Management Program has 4 full time faculty and offers a BS degree with concentrations in Forest Resources, Landscape Analysis, and Soil and Water Conservation. We currently have about 60 majors and expect that number to increase significantly in the next few years. The successful candidate will actively participate in that enrollment growth.

Western Carolina University is located in the heart of the southern Blue Ridge Mountains; the most biologically diverse temperate ecoregion in the eastern United States. This area is home to the Great Smoky Mountains National Park, as well as the Nantahala and Pisgah National Forests making it an exceptional laboratory for natural resources education and research. Faculty in the Department of Geosciences and Natural Resources are active in both applied and basic research related to natural resource conservation and management issues. The University has recently created an interdisciplinary Institute for Watershed Research and Management to further foster these activities.

Apply online at <https://jobs.wcu.edu/applicants/Central?quickFind=51044>. For more information, contact Dr. Peter Bates, Department of Geosciences and Natural Resources, Western Carolina University, Cullowhee, NC 28723. 828-227-7367 (email: [bates@email.wcu.edu](mailto:bates@email.wcu.edu)). Review of applications will begin February 1st, 2008 and will continue until the position is filled.

*Western Carolina University is an Affirmative Action/Equal Opportunity Employer that conducts background checks. Proper documentation of identity and employability are required at the time of employment.*

**Appendix 4.6..GNR Department TPR document**

Date Prepared: 5/05/06

Date Provost Approval: \_\_\_\_\_

**DEPARTMENT OF GEOSCIENCES AND NATURAL RESOURCES MANAGEMENT**

**DEPARTMENTAL TENURE, PROMOTION, AND REAPPOINTMENT CRITERIA AND FOR ANNUAL FACULTY EVALUATION GUIDELINES AND PROCEDURES**

Year(s) Effective: 2006-2007

**Section I: Appointment, Reappointment, Promotion, and Tenure**

**A. Introduction**

The criteria, guidelines, and procedures contained herein are supplementary to Volume 2 of the current Faculty Handbook and the WCU Tenure Policies and Regulations as approved by the Board of Governors, the provisions of which shall prevail on any matter not covered herein by further allowable specification or on any point wherein this department document is inconsistent with those provisions.

**B. Criteria for Appointment, Reappointment, Promotion, and Tenure**

**1. Earned Academic Degree**

The departmental requirements are the same as those stated in the Faculty Handbook 4.02.02, Section IV (A).

**2. Professional Preparation and Experience**

**a. Years of College-level Teaching Experience**

**(1) For appointment/re-appointment, or promotion in rank**

The minimal departmental requirements are the same as those stated in the Faculty Handbook 4.02.02, Section IV (B).

**(2) For Tenure**

The maximum number of years of continuous full-time probationary service shall be seven years except as provided by 4.02.02, Section X, of the Faculty Handbook.

**b. Other Experience and Professional Preparation**

Same as provided in the Faculty Handbook.

### 3. Quality and Effectiveness of Teaching

Competence and Proficient Teaching will be evaluated by peers and the department head based on a combination of teaching load and activities and quality and effectiveness of teaching.

a. teaching load and activities for the academic year will be documented in a list or table form by the faculty member, and shall include the following information as applicable.

- (1) List of courses taught
- (2) Total number of credit hours
- (3) Total number of contact hours
- (4) Total number of students taught
- (5) Number of different lecture preparations
- (6) Number of different lab preparations
- (7) List of courses or labs that were new or involved significant new preparation or new textbook
- (8) List of independent studies supervised and brief statement of faculty role
- (9) Teaching award considerations (nominated, finalist, awarded)
- (11) Participation in pedagogy-related courses or workshops
- (12) Brief documentation of use or development of new, creative, or innovative techniques, content or materials
- (13) List of student professional presentations supervised

b. We recognize that teaching is a complex and multi-dimensional activity that is difficult to define and evaluate, though it is possible to define some of the major elements of teaching. For the purposes of this document, teaching quality and effectiveness will be defined and evaluated in terms of the following 7 dimensions.

- (1) Content expertise – Instructor displays adequate knowledge of the subject, including the body of skill, competencies, and knowledge in a specific subject area in which the faculty member has received advanced training or education.
- (2) Instructional delivery skills – Instructor communicates information clearly; creates environments conducive to learning; uses an appropriate variety of teaching methods.
- (3) Instructional design skills – Instructor designs course objectives, syllabi, materials, activities, and learning experiences that are conducive to student learning.
- (4) Course management skills – Instructor gives timely feedback to students; makes effective use of class time; handles classroom dynamics. Interactions, and problematic situations effectively.
- (5) Evaluation of students – Instructor designs assessment procedures appropriate for course objectives; ensures fairness in student evaluation and grading; provides adequate constructive feedback on student work.
- (6) Faculty/student relationships – Instructor displays a positive attitude toward students, shows concern for students by being approachable and available; presents an appropriate level of intellectual challenge along with sufficient support for students learning; has respect for diversity.

- (7) Student learning outcomes – Instructor maintains high academic standards; prepares students for professional work and development; facilitates student achievement; provides audiences for student work.

c. Evaluation Instruments

- (1) Each faculty member will prepare a brief (maximum 3 pages) self-report stating his or her overall teaching philosophy and objectives. The purpose of this statement is to provide a context within which to consider each faculty member's record of teaching.
- (2) Each faculty member will prepare a teaching load/activities list or table (see B. 3. a. above)
- (3) Student evaluation questionnaires will be completed near the end of the semester for each class offered in the previous 2 semesters and will be included in the TPR documentation. These questionnaires contain a core set of questions common to all faculty and course sections within the department (attached). These core questions provide the basis for student evaluation of the 7 dimensions.
- (4) Each faculty member will compile and submit a brief portfolio of materials and activities for each different class or lab taught in the previous 2 semesters. These materials should include, but are not limited to syllabi, quizzes and/or examinations, and selected examples of materials that exemplify the course learning environment.
- (5) Classroom observation of all non-tenured faculty will be conducted in accordance with mandated requirements. Forms and evaluations completed during this procedure will be forwarded to the faculty member being evaluated and the department head and will be included as part of the TPR documentation.

(See Section II (D) of this document for further details concerning criteria for quality and effectiveness of teaching).

4. Evidence of Scholarship

a. Research and Publications

- (1) publications
- (2) oral presentations
- (3) grants applied for and funded
- (4) innovative teaching methods and new curriculum development
- (5) research in progress

b. Professional Activities, including Participation, Contributions, and Recognition of Achievement

- (1) Consulting
- (2) Indication of keeping current in the field, workshop or short course attendance, formal academic course completion.
- (3) Membership and participation in professional organizations

c. Other Evidence of Professional Growth and Leadership

- (1) Unpublished research and manuscripts,
- (2) Organizing and leading non-course field trips, lectures presented at non-professional meetings, etc.

(See Section II (D) of this document for further details concerning criteria for scholarship.).

5. Quality of Role in, and Special Contributions to Institutional Affairs

- a. Off-campus Instruction and Regional Service
- b. Role in Community Development and Instruction
- c. Work with Students

- (1) Availability to students
- (2) Academic advising and counseling
- (3) Faculty advisor to student organizations

d. Activities at the Departmental, School, and University Levels

- (1) Committee memberships and offices held
- (2) Administrative duties
- (3) Assigned responsibilities
- (4) Other service activities

(See Section II (D) of this document for further details concerning special contributions to institutional affairs).

6. Promise for Sustained Future Professional Achievement

In its consideration of each candidate, the department shall assess and be guided by the individual's promise for sustained future professional achievement based upon the cumulative record in all of the categories listed above. Recommendations for appointment/re-appointment and promotion to a rank shall be consistent with the provisions of 4.02.02, Section III and IV of the Faculty Handbook. A recommendation for the conferral of permanent tenure must be based on a thorough assessment of the candidate's cumulative record and promise for sustained achievement.

7. Institutional Needs and Resources

All recommendations on appointment/reappointment, promotion, and tenure shall be consistent with the needs and resources of the department.

C. Composition of the Department Reappointment, Promotion, and Tenure Committee

The departmental advisory committee shall be constituted in a manner consistent with the provisions of 4.02.02, Section VI (A), of the Faculty Handbook. At least one representative from each of the disciplines in the department must be included on the committee.

#### D. Procedures

1. Preparation of the Files of the Candidate  
Files on each candidate shall be prepared according to university guidelines.
2. Procedures of the Departmental Advisory Committee on Reappointment, Promotion and Tenure (supplementary to 4.02.02, Section VI (A), of the Faculty Handbook).
  - a. The department head will be the non-voting chairperson of the committee. Should the department head be unavailable, the committee members will elect from their group a chairperson, pro tem, who shall have a vote on all matters.
  - b. Committee members will not serve for their own evaluations.
  - c. The committee will solicit the candidate's statement of activities in writing at least two weeks prior to the start of the evaluation process.
  - d. The committee will evaluate and make recommendations to the department head concerning the candidate's request for tenure, promotion, or reappointment. The committee shall designate one member to serve as secretary to record the vote.
3. Other Procedures During and at the End of the Annual Consideration Process

The department head will informally notify the candidate of his/her and the committee's recommendations. If the head and/or the committee recommendations are negative, the following procedures will be followed.

- a. After the consideration process is complete, the department head shall discuss privately the general reasons for the Head's negative recommendations with respect to early tenure and promotion, and suggest ways to correct deficiencies.
- b. An appeal of a negative decision (request for reconsideration) may be initiated at the conclusion of the consideration process as provided in 4.02.01, Section VI, of the WCU Tenure Policies and Regulations.

### SECTION II: Annual Faculty Evaluation

#### A. Purposes

1. To provide a framework for faculty evaluation.
2. To assist faculty members to bring their work to a higher level of professional quality.
3. To promote the continued development of faculty members in teaching and professional scholarship.
4. To provide a professional basis for the assessment of faculty regarding reappointment, tenure, and promotion decisions.

#### B. General Guidelines

1. The department shall complete an annual evaluation of its faculty members each spring semester, to include all tenured, tenure-track, and fixed-term personnel. This

evaluation is supplemental to the process of faculty for reappointment, tenure, or promotion.

2. The primary evaluation period is the preceding calendar year (January to December), to be supplemented by the faculty member's AFE report from the previous year.
3. All faculty who teach in the Department will be evaluated annually. The nature, extent, and criteria for evaluation of faculty will be specific to their appointments as described in the AFE document associated with their position.

#### C. Criteria for the Evaluation

1. The criteria by which the faculty members will be evaluated are:
  - a. Effectiveness and contribution as a teacher
  - b. Effectiveness as a researcher and producer of scholarly works
  - c. Service to the Department, the University, and students
  - d. Service to the region
  - e. Service to their profession
  - f. Other skills, abilities, contributions, or roles that are highly valued by the department.

#### 2. Criteria Emphases

The Department of Geosciences and Natural Resources Management will evaluate faculty members primarily on teaching, then scholarship and service, and then other skills or talents.

#### D. Methods or approaches to be used for evaluation of the faculty member on each of the criteria.

##### 1. Design of the evaluation plan

Teaching, scholarship, service and other activities will be evaluated to include the following:

##### a. Teaching

Teaching will be evaluated by peers and the department head based on a combination of teaching load, activities, quality, and effectiveness of teaching.

(1) Teaching load and activities for the academic year will be documented in a list or table generated by the faculty member, and shall include the following information as applicable.

- (a) List of courses taught
- (b) Total number of credit hours
- (c) Total number of contact hours
- (d) Total number of students taught
- (e) Number of different lecture preparations
- (f) Number of different lab preparations
- (g) List of courses or labs that were new or involved significant new preparation or new textbook
- (h) List of independent studies supervised and brief statement of faculty role
- (i) Teaching award considerations (nominated, finalist, awarded)

- (j) Participation in pedagogy-related courses or workshops
  - (k) Brief documentation of use or development of new, creative, or innovative techniques, content or materials
  - (l) List of student professional presentations supervised
  - (m) Educational experiences created for students by the faculty member, such as research and internship experiences.
- (2) We recognize that teaching is a complex and multi-dimensional activity that is difficult to define and evaluate, though it is possible to define some of the major elements of teaching. For the purposes of this document, evaluation of teaching quality and effectiveness will include the following 7 dimensions.
- (a) Content expertise – Instructor displays adequate knowledge of the subject, including the body of skill, competencies, and knowledge in a specific subject area in which the faculty member has received advanced training or education.
  - (b) Instructional delivery skills – Instructor communicates information clearly; creates environments conducive to learning; uses an appropriate variety of teaching methods.
  - (c) Instructional design skills – Instructor designs course objectives, syllabi, materials, activities, and learning experiences that are conducive to student learning.
  - (d) Course management skills – Instructor gives timely feedback to students; makes effective use of class time; handles classroom dynamics; interactions, and problematic situations effectively.
  - (e) Evaluation of students – Instructor designs assessment procedures appropriate for course objectives; ensures fairness in student evaluation and grading; provides adequate constructive feedback on student work.
  - (f) Faculty/student relationships – Instructor displays a positive attitude toward students, shows concern for students by being approachable and available; presents an appropriate level of intellectual challenge along with sufficient support for students learning; has respect for diversity.
  - (g) Student learning outcomes – Instructor maintains high academic standards; prepares students for professional work and development; facilitates student achievement; provides audiences for student work.
- (3) Evaluation Instruments
- (a) Each faculty member will prepare a brief (maximum 3 pages) teaching self-report to include statements on teaching philosophy and objectives, a description of how the philosophy is reflected in their courses, and assessment of and goals for their teaching. The purpose of this statement is to provide a context to consider each faculty member's record of teaching.
  - (b) Each faculty member will prepare a teaching load/activities list or table (see D. 1. a. 1. above)
  - (c) Student evaluation questionnaires will be completed near the end of the semester for each class offered and will be included in the TPR documentation. These questionnaires contain a core set of questions common to all faculty and course sections within the department (attached). These core questions provide the basis for student evaluation of the 7 dimensions.
  - (d) Each faculty member will compile and submit a brief portfolio of materials and activities for each different class or lab taught in the previous 2 semesters.

These materials should include, but are not limited to syllabi, quizzes and/or examinations, and selected examples of materials that exemplify the course learning environment.

- (e) All non-tenured faculty must arrange to include a written evaluation of at least one classroom observation that has been completed by a tenured member of the Department during the previous two semesters. A copy of this evaluation should be given to the Department Head and the faculty member to be included as part of the AFE documentation.
- (f) Posting and maintenance of regular office hours
- (g) Organization and participation in class field trips if applicable
- (h) Any additional data a faculty member wishes to submit.

b. Scholarship

- (1) Evaluation of research in progress. Write a brief (one page maximum) research statement to describe and evaluate research in progress, and to state goals for future research and scholarship.
- (2) Publications - number of manuscripts, quality and publication medium will be examined (clearly state dates and status of manuscript, ex. submitted, in review, accepted, in press, etc. and whether it is peer reviewed or not)
- (3) Papers presented at professional meetings. Number, audience, and nature of subject material.
- (4) Grants and contracts in hand plus the number submitted.
- (5) Evidence of keeping current in the field. Workshop and short course attendance, or academic course completion.
- (6) Innovative teaching methods and new curriculum development. Significance, usefulness, success of the program and effort of the candidate.
- (7) Unpublished research and manuscripts
- (8) Consulting (if it constitutes scholarship)
- (9) Attendance at professional meetings
- (10) Any additional information

c. Service to the University

- (1) Academic advising and counseling
- (2) Committee memberships and offices held
- (3) Administrative duties
- (4) Special assignments in department, school, or university
- (5) Faculty advisor to student organizations
- (6) Off-campus instruction
- (7) Other

d. Service to the Region

- (1) Role in community development (e.g. consulting)
- (2) Workshops
- (3) Presentations to non-professional organizations
- (4) Other

e. Professional Service

- (1) Offices held in professional organizations
- (2) Peer review of grants, manuscripts, and programs
- (3) Other

## 2. Instruments to be used in the Annual Faculty Evaluation

- a. Written AFE document from each faculty member that addresses each of the criteria in Section II D.1 and supplementary materials.
- b. Student evaluations for all classes using the student evaluation form developed for the department. Each faculty member then submits evaluation results to the department head. Faculty shall not alter, delete from, or add to the information and data contained in the completed student evaluation forms.
- c. Department Head and AFE Peer Review Committee evaluation using information received from a and b above. A written report will be given to each faculty member.

## E. Procedures for the Annual Faculty Evaluation

1. The Department Head and AFE Peer Review Committee will evaluate and write a report for all faculty members based on the information received from a and b above. The written reports will be given to each faculty member.
2. Composition of the AFE Peer Review Committee.
  - a. The committee will consist of three permanent faculty. The committee composition will be two tenured persons plus one untenured person and will include at least one person from each of the degree granting programs. The untenured person must have completed at least two full years of instruction at WCU. If no untenured person is eligible, then a third tenured faculty will become a member. The untenured member shall not be either the committee chair or secretary. The Department Head shall not be a member nor an observer of this committee.
  - b. The committee shall be appointed by the Department Head in consultation with the faculty.
  - c. The length of service is three years with staggered appointments. For the initial appointments, one person will have a one year appointment, one a two year appointment, and the third a three year term. Rotation will then replace one person per year.
  - d. When a member of this committee is being reviewed, the Department Head shall appoint an Alternate faculty member with prior committee experience to sit for the evaluation. It is likely that this Alternate will be a tenured faculty member that most recently served on the committee.
  - e. The expectation is that all faculty in permanent positions within the Department shall serve on this committee on a rotating basis.
3. Process:
  - a. Faculty will first submit their AFE documents to the AFE Peer Review Committee. The deadline for submission will be February 15.
  - b. The Committee will examine the current year's AFE document plus that of the previous year – a window to better assess faculty contributions to the University, especially in the area of scholarship and service where productivity and activity is likely to be variable.
  - c. The Committee will review the AFE materials and make comments regarding teaching, scholarship, and service. A single written statement will be prepared by the committee and forwarded to the Department Head. The Committee will decide

- how to put the letter together. In the future, it is likely that a common format will be developed. The letter will be signed by the tenured Chairperson of the Committee.
- d. The Department Head will use both the information provided in the faculty member's AFE document plus the AFE Peer Review Committee's statement in preparing his/her letter.
  - e. The faculty member will be given statements from the Head and the Committee.

#### F. Consultation with the faculty member about the AFE results

The faculty member will be allowed to study the Committee and Department Head reports for one week. The Department Head will consult with each member of the faculty to review his/her evaluation and discuss ways to improve performance. The faculty member must sign the reports to indicate receipt, but has the right to add a written statement of acceptance, clarification, or rebuttal to be included with the Department Head's report. The Head shall, following the meeting with the individual and receipt of any additional written statement from the faculty member, reconsider his/her report and either change, amend, or forward it as previously written.

In the case of the AFE Peer Review Committee report on the Department Head, the Chair of the Committee will submit the evaluation to the Head for review. The Chair will subsequently meet the Head to discuss the Committee evaluation.

- G. A summary of the year's departmental AFE results from the Department Head, the Peer Review Committee, and any written statements by the faculty member shall be prepared and submitted to the Dean by the end of the spring semester by the Department Head.

### Section III: Preparation and Implementation

#### A. Preparation and Approval

1. These departmental criteria, guidelines, and procedures shall be prepared or reviewed and revised each spring semester for the next academic year.

The Annual Faculty Evaluation procedure will be revised each year (if needed) by the whole of the department. The head shall serve as a non-voting chairperson.

2. On the timetable announced by the dean, the departmental document shall be submitted to the dean for review. The dean shall endorse the document or recommend revisions. The dean shall forward the approved documents to the Provost for review only when the dean is satisfied as to the quality and completeness of the document. The Provost will approve the document or recommend revisions and return it to the dean and department head. When revisions are needed, the department head will resubmit the revised document for approval through channels as before.

#### B. Implementation

1. This document becomes effective for the 2006-07 academic year immediately following its preparation or revision upon endorsement by the dean and approval by the Provost.

2. This document shall guide the department's consideration of candidates during the year within the framework of the timetable announced by the Provost.

Approved:

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Department Head Date

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Dean Date

---

Provost Date

**Appendix 4.7 Summary of sponsored research activity for NRCM faculty**

**NRCM Sponsored Research Activities**

<b>Proposal Year</b>	<b>Investigators</b>	<b>Amount (\$)</b>	<b>Title</b>	<b>Sponsor</b>
2002	Bates	339,000	Southern Appalachian Forest Conservation Initiative	Doris Duke Charitable Foundation
2003	Miller, Lord, Kolenbrander, Yurkovich	39,851	Multivariate, geochemical fingerprinting techniques...in the mountains of North Carolina	NCSU Water Resources Research Institute (WRRRI)
2003	Bates	10,000	Land Trust for the Little Tennessee Balsam Gap Forest Property Project	The Conservation Fund, Land Trust for the Little Tennessee
2004	Bates	7,000	Strategic Forest Management Plan for Waynesville, NC	Town of Waynesville, NC
2004	Bates	3,000	Cherokee Cane Culture: A study of the disbursement of Arundinaria gigantea and Cherokee cane crafting	Eastern Band of the Cherokee Nation
2004	Bates	3,600	Sustainable Forest Management Demonstration Project and Small Mammal Research	Balsam Mountain Trust
2004	Bates	10,000	Sustainable Forest Management in the Upper Little Tennessee River Basin	Land Trust for the Little Tennessee
2005	Bates	75,000	Southern Appalachian Wildlife Conservation Initiative	Doris Duke Charitable Foundation, The Conservation Fund
2005	Bates	5,000	Survey and timber assessment of Blue Ridge Parkway Buffer	The Conservation Fund
2005	Bates	3,000	Fisher Creek Forest Assessment	Town of Sylva, NC
2005	Bugden	21,213	Prototype River Cane Geographic Information System	Eastern Band of Cherokee Indians
2005	DiBari	10,986	Edge Detection Along the Administrative and Wilderness Boundaries of the Kenai National	US DOI US Fish and Wildlife Service
2005	Kolenbrander, Miller, Lord, Martin	31,800	Cullowhee Creek Enhancement Monitoring Proposal	Cashiers Resort Community, LLC
2006	Bates	12,725	Licklog Forest Stewardship Project	Balsam Mountain Preserve
2006	Bates	3,990	Waldee Forest Stewardship Project	Calhoun, Smith, Smith & Smith
2006	Bates	35,000	Western Carolina Community Forestry Project	National Forest Foundation, Home Depot Foundation, Land Trust for the Little Tennessee
2006	Davis	1,000	Collaboration with local secondary science teacher to develop student research projects.	WCU Dept. of Education
2006	Bates / Brown / Lord	50,000	Development of Forest Management Plan for the Waynesville Watershed	Town of Waynesville, NC
2007	Bates	13,000	Monitoring Forest Sustainability: A Process Approach to Selecting and Testing Sustainable Forest Management Indicators in the Waynesville Watershed of WNC	Lyndhurst Foundation, National Forest Foundation, Land Trust for the Little Tennessee
2007	Bates & Davis	38,400	Designing a Sustainable Forest Management Plan for the Balsam Mountain Preserve	Balsam Mountain Preserve

**TOTAL: 713,565**

**Appendix 4.8 NRCM student participation in local, regional, and national conferences**

<b>Last</b>	<b>First</b>	<b>Graduation date</b>	<b>National conference venue</b>
Austin	Johnathan	current	2007 SAF National Convention
Beck	Erin	current	2007 SAF National Convention
Burda	Carey	current	American Association of Geographers 2007
Davis	Charles	Dec-05	2005 SAF National Convention
Elliott	Christoher	current	2007 SAF National Convention
Evans	David	Dec-05	2005 SAF National Convention
Griffin	Kevin	current	2007 SAF National Convention
Kunzig	Henry	May-06	2005 SAF National Convention
Mozeley	Jennifer	current	2007 SAF National Convention
Nergart	Torry	May-07	American Association of Geographers 2006
Phillippi	Stephen	current	2007 SAF National Convention
Slagle	Jennifer	Dec-07	2005 SAF National Convention
Stewart	Jessica	May-06	2005 SAF National Convention
Van Denabeele	David	current	2007 SAF National Convention
Woodby	Jason	Dec-05	2005 SAF National Convention
			<b>Local conference venue</b>
Burda	Carey	current	GIS Day @ WCU
Elliott	Chris	current	GIS Day @ WCU
Griffin	Kevin	current	GIS Day @ WCU
Howell	Charlie	current	GIS Day @ WCU
Larrimore	Andrew	current	GIS Day @ WCU
McDaniels	Darrell	current	GIS Day @ WCU
McKibben	Jenny	current	GIS Day @ WCU
Miller	Chris	current	GIS Day @ WCU
Moore	Kevin	May-07	NCGIA 2006
Moore	Kevin	May-07	Undergraduate
Mozeley	Jenny	current	GIS Day @ WCU
Nergart	Torry	May-07	NCGIA 2006
Nergart	Torry	May-07	Undergraduate Expo
Phillippi	Stephen	current	GIS Day @ WCU
Shearl	Allen	current	GIS Day @ WCU
Slagle	Jennifer	Dec-07	Undergraduate Expo
Slagle	Jennifer	Dec-07	Undergraduate Expo
Taunton	John	current	GIS Day @ WCU
Van Denabeele	Weston	current	GIS Day @ WCU

**Appendix 4.9..NRCM student participation in internships and enrichment activities**

<b>Last</b>	<b>First</b>	<b>Graduation date</b>	<b>Activity</b>	<b>Support</b>
Arcano	Rick	2003	Sustainable forest management	WCFSI intern
Childers	Chris	2003	Sustainable forest management	WCFSI intern
Linker	Will	2003	Sustainable forest management	WCFSI intern
Rabby	Shannon	2003	Sustainable forest management	WCFSI intern
Avis	Scott	2004	Sustainable forest management	WCFSI intern
Peeler	Jerrine	2004	Sustainable forest management	WCFSI intern
Ramsey	Phil	2004	Sustainable forest management	WCFSI intern
Farmer	amantha	2005	Sustainable forest management	WCFSI intern
Davis	Robb	2006	Sustainable forest management	WCFSI intern
Davis	Nick	2006	Sustainable forest management	WCFSI intern
Kunzig	Henry	2006	Sustainable forest management	WCFSI intern
Stewart	Jessy	2006	Sustainable forest management	WCFSI intern
Woodby	Jason	2006	Sustainable forest management	WCFSI intern
Moore	Kevin	2007	Sustainable forest management	WCFSI intern
Slagle	Jenn	2007	Sustainable forest management	WCFSI intern
Nergart	Torry	2007	Rivercane restoration	RTCAR (Research grant)
Slagle	Jennifer	2007	Rattlesnake habatat modeling	Volunteer
Slagle	Jennifer	2007	Wetlands investigation	RTCAR (Research grant)
Austin	John	current	Sustainable forest management	WCFSI intern
Burda	Carey	current	Rivercane restoration	RTCAR (Research grant)
Burda	Carey	current	Wetlands investigation	RTCAR (Research grant)
Elliott	Chris	current	Black-tailed deer habitat	Volunteer
Elliott	Brad	current	Sustainable forest management	WCFSI intern
Griffin	Kevin	current	Rattlesnake habatat modeling	Volunteer
Kerfonta	Matt	current	Conservation based GIS mapping	Conservation Internship
McDaniels	Darrell	current	Stream Monitoring	Volunteer
McKibben	Jenny	current	Rivercane restoration	Volunteer
Miller	Chris	current	Forest Watershed Management	Volunteer
Mozeley	Jenny	current	Rattlesnake habatat modeling	Volunteer
Phillippi	Stephen	current	Forest Watershed Management	Volunteer
Price	Robert	current	Sustainable forest management	WCFSI intern
Shearl	Allen	current	Forest Watershed Management	Volunteer
Taunton	John	current	Stream Monitoring	Volunteer
Van Denabeele	Weston	current	Black-tailed deer habitat	Volunteer
Vandenabeele	Weston	current	Sustainable forest management	WCFSI intern
Willard	Emily	current	Nature Center aid	Conservation Internship

Appendix 5.1 Summary demographic information for NRCM students

NRCM student demographic information for recent years

NRCM majors by citizenship, ethnicity, gender, and class											
	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Fall 2006
	Number	Number	Number								
Non-resident Alien	1	0	0	0	0	0	0	0	0	0	0
Resident Alien	0	1	1	1	1	1	0	0	0	0	0
U.S. Citizen	56	60	50	48	42	51	60	49	58	47	43
American Indian	3	2	2	1	2	3	1	3	1	0	0
Asian/Pacific Islander	0	0	0	0	0	0	0	0	0	0	1
Black (non-Hispanic)	0	0	1	0	0	0	0	0	0	0	0
Other	1	2	1	1	1	1	0	0	0	0	0
White	53	57	47	47	40	48	59	46	57	47	42
Female	6	9	8	8	8	8	12	6	7	6	6
Male	51	52	43	41	35	44	48	43	51	41	37
Freshman/Sophomore	11	20	10	13	9	16	26	17	25	19	20
Junior/Senior	46	41	41	36	34	36	34	32	33	28	23
<b>Total</b>	<b>57</b>	<b>61</b>	<b>51</b>	<b>49</b>	<b>43</b>	<b>52</b>	<b>60</b>	<b>49</b>	<b>58</b>	<b>47</b>	<b>43</b>

Application and acceptance rates for NRCM majors											
	Fall 2001	Spring 2002	Fall 2002	Spring 2003	Fall 2003	Spring 2004	Fall 2004	Spring 2005	Fall 2005	Spring 2006	Fall 2006
	# of Applicants										
Accepted	6	5	10	3	5	4	18	3	17	4	8
Rejected	2	0	1	0	1	2	0	0	0	1	0
<b>Total</b>	<b>8</b>	<b>5</b>	<b>11</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>18</b>	<b>3</b>	<b>17</b>	<b>5</b>	<b>8</b>

Academic quality of admitted NRCM students							
Semester	# of Admits	Average HS Rank	Average HS GPA	Average SAT Math	Average SAT Verbal	Average Total SAT	Average ACT
Fall 2001	6	42	2.75	518	564	1082	99
Spring 2002	5	65	3.21	507	543	1050	99
Fall 2002	10	52	2.82	496.67	503	1000	99
Spring 2003	3	0	0	0	0	0	99
Fall 2003	5	52	2.86	560	507	1067	99
Spring 2004	4	31	2.66	370	520	890	99
Fall 2004	18	63	3.4	492	484	976	86
Spring 2005	3	42	2.45	450	465	915	99
Fall 2005	17	57	3.28	515	525	1040	99
Spring 2006	4	0	3.89	485	590	1075	99
Fall 2006	8	60	2.93	496	544	1040	89

Number and cademic quality of NRCM students who graduated							
Year	# of graduates	Average HS Rank	Average HS GPA	Average SAT Math	Average SAT Verbal	Average Total SAT	Average ACT
2001	24	68	3.52	450	450	900	--
2002	19	64	3.18	512	503	1014	47
2003	23	60	3.14	499	510	1008	59
2004	11	55	2.80	519	533	1051	61
2005	10	69	3.41	513	483	996	73
2006	16	57	3.19	480	459	939	79

Comparison of academic quality of NRCM graduates versus NRCM admits between 2001 and 2006						
	Average HS Rank	Average HS GPA	Average SAT Math	Average SAT Verbal	Average Total SAT	Average ACT
Grads	62	3.21	495	490	985	53
Admits	42	2.75	444	477	921	97

## Appendix 5.2 Examples of handouts used at open houses and distributed to prospective students

### Natural Resource Conservation and Management Program Western Carolina University

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#### **Degree and basic requirements**

The program offers a BS in Natural Resource Conservation and Management with concentrations in Forest Resources, Landscape Analysis, or Soil and Water Conservation. The degree requires 128 hours

#### **What makes this program special?**

The Natural Resource Conservation and Management program trains students in the conservation and sustainable use of natural resources. NRCM students at Western learn by doing. Western Carolina University is located in the heart of the southern Appalachian Mountains, and is surrounded by one of the most biologically diverse, temperate ecoregions in the world. In addition to having 2 National Forests and 2 National Parks located in our back yard; NRM faculty and students actively partner with landowners throughout the region and the world in the assessment and management of their properties. In addition to an exceptional outdoor laboratory, the NRCM program maintains a state-of-the-art computer, GIS, and remote sensing lab. The NRCM program at Western is listed in *Education for the Earth, a Guide to top Environmental Studies Programs* (Peterson's Guides, Princeton, NJ) as 1 of only 17 degree programs in Natural Resource Conservation and Management in the US.

#### **What are the 3 concentrations?**

The *Forest Resources* concentration provided students with training related to the stewardship and conservation of forested lands and the resources that those lands support.

The *Landscape Analysis* concentration trains students in the use of GIS, remote sensing, and related technologies that are used in the assessment and management of a vast array of natural resources.

The *Soil and Water Conservation* concentration trains students in the assessment, description, of soil and water resources and in methods to protect or restore soil and aquatic systems.

#### **Are there any additional admission requirements?**

There are no additional admission requirements, though students interested in pursuing careers natural resource conservation and management are encouraged to talk with NRCM faculty soon after they arrive at Western. Faculty advisors can steer undecided students toward courses that can help them test the waters. For students who have already decided to major in NRCM, it is important to plan proper course sequences early.

#### **Are coops or paid internships available for undergraduate students?**

Faculty and staff in the NRM program are actively involved in a number of ongoing research, resource assessment, and management projects. Most of these projects offer paid internship positions for our students. In addition, the NRCM program is an active participant in WCU's cooperative education program.

#### **What will I be able to do with this degree when I graduate?**

The NRCM program trains students for front line positions in the conservation and wise use of our natural resources. When students leave the program they qualify for entry level positions with companies or organizations directly involved in the conservation and management of renewable natural resources. These include both public and private entities such as the US Forest Service, the Peace Corps, Land Trusts and other conservation organizations, the Natural Resource Conservation Service, timber companies, environmental consulting firms, the US Fish and Wildlife Service, as well as many state and local land management agencies. The NRCM curriculum also gives students a solid background to pursue advanced graduate study, if they choose.

The demand for students trained natural resource conservation and management continues to rise as society struggles to balance economic growth and increased development with resource conservation and protection.

**What are the professors in this program like?**

The NRCM faculty all hold PhD's in resource management disciplines, and they are all active in their professions and in applied research in their fields. However, NRCM faculty are not just academics, they have also accumulated many years of experience as professional resource managers. NRCM faculty develop classes that are highly field oriented, and students spend considerable time working in outdoor settings.

**What are the students in the program doing?**

- Six students recently presented posters at the Society of American Foresters National Convention in Fort Worth, TX
- Students constructed a weather station on campus that provides real-time weather information via the internet
- Watershed Management students are monitoring the impacts of campus construction on Cullowhee Creek, which runs through campus
- Undergraduate forestry interns are evaluating the impacts of deer and turkey populations on oak regeneration at the Biltmore Estate in Asheville

**Will I be able to participate in clubs and other extracurricular opportunities?**

Students are encouraged to join the natural resource conservation and management club. There are also opportunities for students to participate as interns or research assistants in faculty research projects. A number of resource management agencies regularly post cooperative education experiences with the career center on campus. The office of international studies offers opportunities for studies abroad. Service learning opportunities are available in a number of classes.

**Things you should know about this program:**

<ul style="list-style-type: none"> <li>• Bachelor of Science Degree with 3 concentrations               <ul style="list-style-type: none"> <li>○ Forest Resources</li> <li>○ Landscape Analysis</li> <li>○ Soil and Water Conservation</li> </ul> </li> <li>• Paid research and internships available to motivated students</li> <li>• Learn from faculty with real world experience</li> </ul>	<ul style="list-style-type: none"> <li>• Many opportunities to learn and ultimately work outdoors</li> <li>• Natural resource managers have high job satisfaction</li> <li>• Be on the front lines of resource conservation and protection</li> <li>• State of the art GIS and Remote Sensing laboratories</li> </ul>
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**Careers associated with this degree:**

<ul style="list-style-type: none"> <li>• Forest steward</li> <li>• GIS technician</li> <li>• Remote sensing technician</li> <li>• Procurement forester</li> </ul>	<ul style="list-style-type: none"> <li>• Soil conservationist</li> <li>• Land stewardship manager</li> <li>• Wildlife technician</li> <li>• Soil erosion control officer</li> </ul>
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**Whom do I contact for more information about the Natural Resource Conservation and Management Program?**

**Name: Dr. Peter Bates**  
**E-mail: [bates@email.wcu.edu](mailto:bates@email.wcu.edu)**  
**Ph: 828-227-3914**  
<http://www.wcu.edu/as/GeosciencesNRM/NRM/index.html>

# Is Natural Resource Conservation and Management the major for you?

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## **Do you love the outdoors?**

Few professions can match natural resource conservation and management in terms of amount of time that you spend studying and working outdoors.

## **Do you want to actively participate in the conservation and wise-use of our wild and semi-wild natural resources?**

The NRCM program at western focuses on the conservation and management of resources that occur in our surrounding environment. These include forest and wildlife, soil and water, aesthetics, habitat preservation and more.

## **Are you ready to get to work?**

The NRCM program is an applied program that prepares students for entry-level positions in resource management fields. Our students are qualified to enter the workforce immediately after graduation, though others go on for advanced study.

## **Is job satisfaction important to you?**

The US department of labor reports that natural resource professionals have some of the highest job satisfaction ratings of any group in the country.

## **Are you a decision-maker?**

The design and implementation of effective natural resource management strategies requires assessing the available information and then making a decision.

## **Do you like working with maps, computers, and cutting edge technology?**

Natural resource professionals often use the most advanced technologies to map and assess resource conditions across the landscape. Whether it is computers, global positioning systems, geographic information systems, or remote sensing, we utilize the most up-to-date equipment and information that is available.

## **Do you want to assist landowners with the management of their properties?**

It can be argued that natural resource conservation happens one landowner at a time. The NRCM program trains our students to work with these concerned landowners, whether they be families, corporations, or government agencies.

## **Do you want apply what you learn as you learn it?**

Faculty in the NRCM program at Western actively engage in resource management projects throughout western North Carolina and around the world. Our faculty provide paid internships and other hands-on opportunities for our students that enable them to practice natural resources management as they learn.

## **Do you like to get your hands dirty?**

If you answer yes, then Natural Resource Conservation and Management might be the major for you.

**Appendix 7.1..GNR Department budget**

**GNR budget for academic fiscal years 2003-04 through 2007-08**

	<b>2003-04</b>	<b>2004-05</b>	<b>2005-06</b>	<b>2006-07</b>	<b>2007-08</b>
Recurring Operational <sup>1</sup>	\$8,163	\$9,545	\$9,946	\$9,946	\$10,571
Faculty travel <sup>2</sup>	\$1,322	\$4,022	\$6,000	\$6,000	\$4,000
Student enrichment fund	\$0	\$445	\$2,000	\$2,000	\$1,700
Geology <sup>3</sup>	\$500	\$1,000	\$2,500	\$2,500	\$2,200
NRCM <sup>3</sup>	\$500	\$1,000	\$2,500	\$2,500	\$2,200
Geography <sup>3</sup>	\$500	\$1,000	\$1,000	\$1,000	\$880
<b>Total</b>	<b>\$10,985</b>	<b>\$18,779</b>	<b>\$23,946</b>	<b>\$23,946</b>	<b>\$21,551</b>
Total faculty	10	11	12	13	14

<sup>1</sup> Copying, paper, phone, postage, class travel, instructional supplies, maintenance, etc.

<sup>2</sup> Total for all faculty

<sup>3</sup> Prorated division of budget after first three items removed

## Appendix 7.2 GNR Department facilities

### GNR Department Facilities Lists and Floor Plans (next pages)

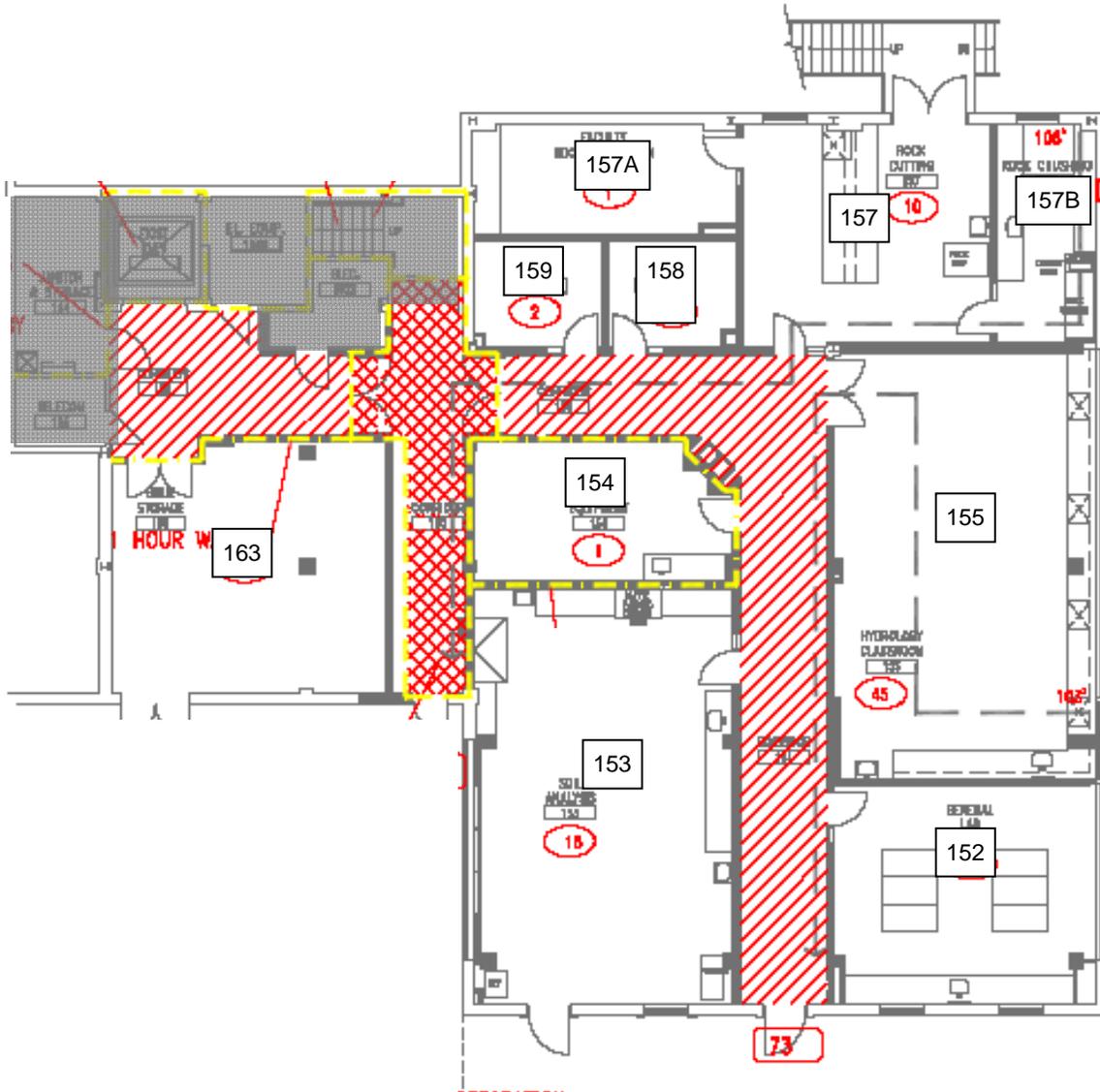
#### Stillwell Science Building

<u>Room</u>	<u>USE</u>
152	General Instructional Lab.
153	Sediment Core Analysis Lab
155	Hydrology Instructional Lab
154	Field Equipment storage
158	Office
159	Office
157	Rock Cutting
157A	Rock & Specimen Collections
157B	Rock Crushing/ Sediment Sieving
163	Bulk Storage
302	Faculty Office
303	Faculty Research Lab--Petrographic & Tect.
304	Fac. Research Lab-Whitmire Research (Miller)
305	Fac. Research Lab-Water Quality & Hydrology
306	Fac. Research Lab--Soil, Sediment, & Wetland
307	Faculty Office
308	Faculty Office
309	Fac. Research Lab--Paleobiology, Paleoenviron.
310	Faculty Office
312	Chemical Prep. & Storage
313	Introductory Lab--Teaching
314	Geochemistry Lab--Teaching
315	Analytical Equipment Lab (XRAY, CNS)
317	Faculty Office
318	Faculty Office
319	Faculty Office
320	Faculty Office
322	Introductory Lab--Teaching
323	Faculty Research Lab--Landscape Analysis, GIS
331	Dept. Office
335	Faculty Office
336	Faculty Office
337	Faculty Office
339	Faculty Office
341	Faculty Office
353	Computing peripherals/storage
354	GNR GIS-Computing Instr. Lab
355	Microscope Instructional Lab
356	AV Storage
322A	Storage
322B	Rock and Mineral Storage
331A	Department Head
331B	Dept office--Files
331C	Dept office--supplies
331D	Dept. office--records/files

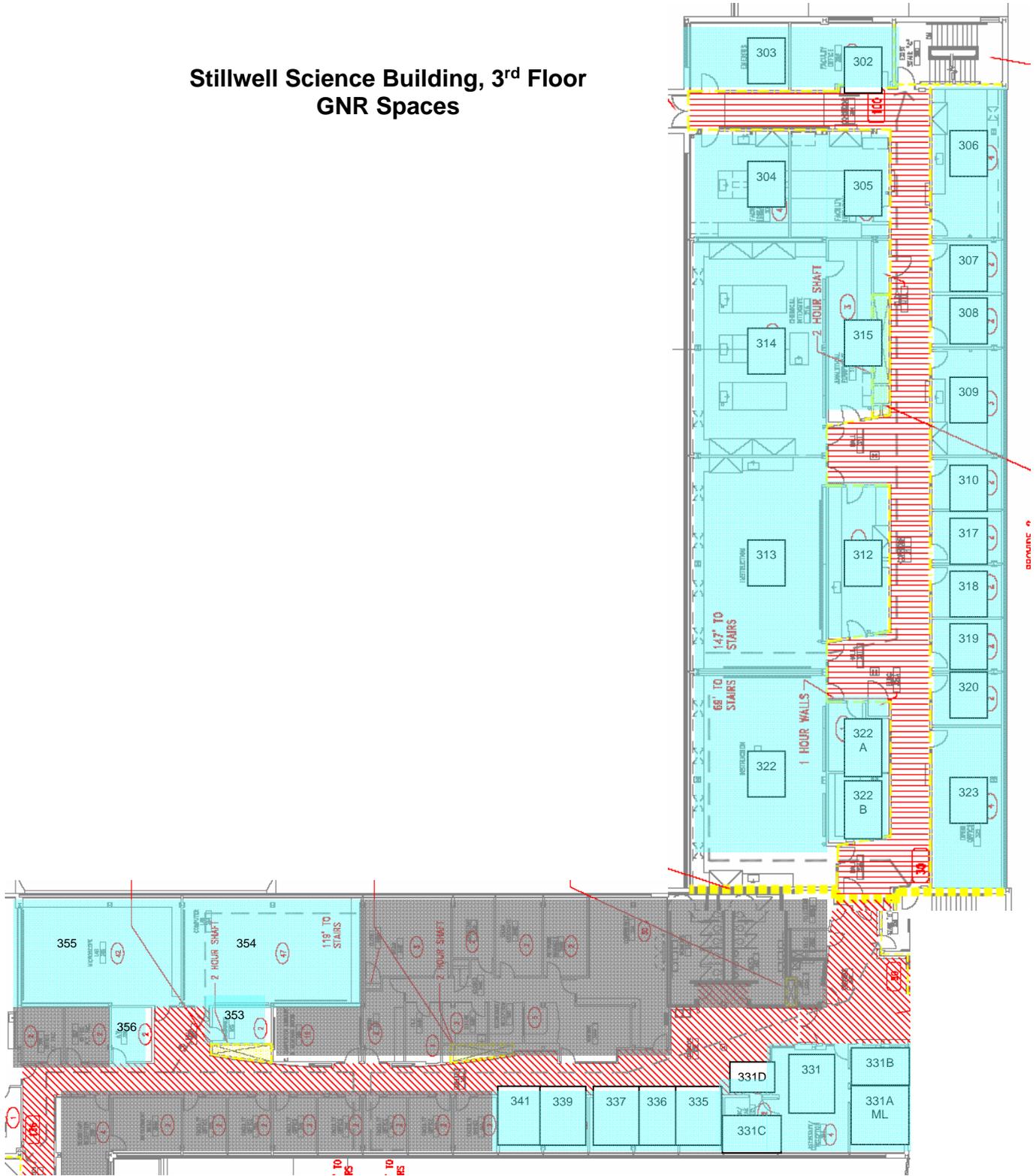
#### Natural Science Building

<u>Room</u>	<u>USE</u>
G03	Office
G05	Lab/Student Research--Whitmire work lab
G14	Long-term Storage with Chem & Biol.
314	Faculty Research Lab--Geophysical - Coasts
316	Faculty Research Lab--Hydrologic Sci. & Resources
319	Faculty Research Lab--So. Appalachians

# Stillwell Science Building, 1<sup>st</sup> Floor GNR Spaces



# Stillwell Science Building, 3<sup>rd</sup> Floor GNR Spaces



## Appendix 7.3 GNR Department equipment

### GNR Major Equipment and Software (Includes equipment used primarily other programs in the department)

<b>Equipment</b>	<b><u>Date of Purchase</u></b>
<b>Field sampling equipment</b>	
Sony Digital Camera	2000
Nikon E5700 Digital Camera	2003
Trimble 17319-32 GPS	1999
Trimble 17319-32 GPS	1999
Bushnell Spacemaster spotting scope	1994
Planix 6 Planimeter	1997
Planix 6 Planimeter	1995
Planix 6 Planimeter	1995
Gordon Stereoscope w/ 4x binoculars	1986
2 GeoExplorer III with Pathfinder software	2002
Garmin Etrex Legend CX GPS NRCM1	2006
Garmin Etrex Legend CX GPS NRCM2	2006
Garmin Etrex Legend CX GPS NRCM3	2006
Garmin Etrex Legend CX GPS NRCM4	2006
Garmin Etrex Legend CX GPS NRCM5	2006
Garmin Etrex Legend CX GPS NRCM6	2006
Garmin Etrex Legend CX GPS NRCM7	2006
Thermodyne 37900 Culture Incubator	1995
Thermodyne 37900 Culture Incubator	1995
Hach Bacterial Incubator	1996
Hach Bacterial Incubator	1997
Set Plastic Soil Sieves	1988
Hach DR 2010 Spectrophotometer	1997
Flow Probes (4)	1996
Kick Nets (4)	1998
"D" Nets (4)	1998
Lazer Mark CST/Berger Laser Level & Tripod	2005
CST Magna Trak 200 Metal Detector	2005
Depth Integrating Suspended Sed Samplers	1996
Bed Load Sampler	1999
Pygmy Meter staff gages	various
CST/Berger Optical Level & Tripod	1999
Hach Conductivity/TDS meter	1995
La Motte Conductivity/TDS Meter	1993
SI Price 1205 "Mini" Current Meter	1998/2002/2006
Rickly Price Current Meter	2004
SI 921 Revolution Counter	1996
6" Soil Tensiometer	1990
12" Soil Tensiometer	1990
18" Soil Tensionmeter	1990
Extech ExStik ph Meter	2006/07
IQ Sci. Inst. ph meter	2002/03
IQ Replacement ph probes	2004/05

Oakton Conda 401 - Conductivity meters	2006/07
Hach 2001P Turbidimeter	2001-2003
Hach DR 890 Spectrophotometer	2002
YSI 55 DO Meter	2001
YSI 55 DO Meter	2000
YSI 55 DO Meter	2006
YSI 55 DO Meter	2005
YSI Model 57 DO Meter w/25' probe	1992
YSI Model 54A DO Meter w/6' probe	1990
YSI Model 54A DO Meter w/6' probe	1987
Hach Digital Titrator Kits (2)	1990
Canon EOS Rebel Digital Camera	2004
Sony Digital Camera Mavica	2000
Garmin GPS III plus	2004
Oakton Conda 401 - Conductivity meters	2006/07
Canon 15 mm Fish eye lens	2006
Gateway Laptop Computer	2005
Tamaya Digital Area/line planimeter	2003
Olympus LMS 225R Dissecting Microscope	2000
Gateway Laptop Computer	2005
Olympus Stylus 800 Digital Cameras	2005
Davis GroWeather Weather Station + 2 Consoles	2007
HP Designjet 130 nr	2006
Gateway Desktop E-45000	2007
Trimble GeoXM Model PN60950-50	2006
HP Officejet 9100	2006
Gateway Laptop Computer M460	
Landsat Data (1995, 2000, 2003)	1995/2000/2003
Radarsat-1 scenes (x3)	?
Abrams CB-1 Stereoscope	1987
Spiegel Relaskop	1988
Increment Hammers (4)	Various
Bark Thickness Gages (2)	various
Polar Compensating Planimeters (2)	various
Sling Psychrometer	1987
Haglof Electronic Clinometer (2)	2003
Haga Altimeter (2)	1998
Logger's Tapes (4)	1995
Suunto Clinometers (18)	various
DBH Tapes (16)	various
Suunto Field Compass (16)	various
Cruz-All (13)	various
10 BAF Prism (21)	various
20 BAF Prism (2)	various
Stopwatches (4)	various
Scalex Digital Map Wheels (6)	various
Dial Map Measurers (7)	various
Thermometers (3)	various
Hand Lens (3)	various
Pen Dot Counter	2003

Extech Digital Light Meters (3)	various
Licor PAR Light Meter	2001
WK Foresters Compass	1988
Foresters Staff	1988
Abney Level (3)	various
Tree Calipers (3)v	various
Increment Borers (7) 10", 12", 16"	various
Digital Thermometers (2)	1995
Munsell Soil Color Books (6)	various
Globe earth color books (2)	various
N.C.S.F.S Biltmore stick (7)	various
Surveyor's Ropes (6)	various
5' Sectional Soil Sampler	1986
Nova Dissecting Microscope	1995
100 foot tapes (2)	various
200 foot tapes (2)	various
50 Meter Tape (1)	2004
Hach DR2010 Field Spectrophotometer	1994
Hach DR2000 Field Spectrophotometer	1987
Hach DR2000 Field Spectrophotometer	1988
Hach DR2000 Field Spectrophotometer	1990
Aquascope (2)	1994
Nasco Water Sampling Poles	2007
25" Round Fiberglass Stadia rods (3)	1995
Bridge Board with winch	2001
Cable Mount Suspended Sediment Sampler	2002
Bronze weight for Price meter	2001
Remote Water Samplers (2)	2000
Wildco Surber Samplers (4)	various
Wildco Pond/Lake Water Sampler	1999
Trimble GeoXM Model PN60950-50	2006

## Chemistry

	<u>Purchase</u>
Fisher Scientific Centrifuge (Model 225)	2005
Fisher Scientific Muffle Furnace (Fisher Isotemp Basic - 240V)	2007
Eijkelkamp Dutch Coring Apparatus (2)	2006
Fisher Scientific Hotplate (Barnstead/Thermolyne)	2005
Fisher Scientific Desiccator (Wheaton Dry Seal)	2005
Fisher Scientific Salinity Refractometer	2006
Fisher Scientific Vacuum Filtration Pump (KNF Laboport)	2005
Rockware Geochemists Workbench v. 6 Software (2)	2006
Fisher Scientific Soxhlet Extraction Apparatus (Kilmax) (3)	2005
Fisher Scientific Multiprobe, YSI 556 (for pH and ORP)	2005
Lowrance Ultrasonic Cleaner	2005
Lowrance H2O GPS Unit	2006
Water Filtration Unit (Cole-Parmer) (2)	2005
Ward's Lab Oven (VWR/Sci-Ed)	2005
Fisher Scientific Denver Instrument Balance (APX-200) 0.1mg	
- 200g	2005
Fisher Scientific Denver Instrument Balance (APX-1502) 0.01g	2005

- 1500g		
	Fisher Scientific Pitetter set with rack	2005
	Fisher Scientific Low Pressure Liquid Chromatography Column	
(3)		2005
	Elementar Vario EL CNS Analyzer with Gateway Computer	2006

### **Soil, hydrology, and climatology**

	Gravity Convection Oven	
	Box Furnace	
	Mettler M310 Analytical Balance	
	AQTESOLV Pro software (groundwater)	
	ORIGIN software (statistics)	
	Sears freezer	
	Hobo Mini-weather station logger	2007
	Hobo pressure sensors 0-30 ft of water (3) with base station	2007
	RG-2 Hobo tipping bucket rain gages with loggers (7)	2007
	Box Car Pro v. 4.3 Hobo software for data downloading	2007
	Hoboware software for data downloading	2007
	Constant well head permeameter (Ammoozemeter)	2007
	Ech2o soil moisture sensors (3)	2007
	RiverTools 3.0 Software	2007
	IDL 6.3 Windows software	2007
	Decagon Mini-Disc Infiltrimeters (3)	2007
	<i>X-ray diffraction</i>	
	Rigaku MiniFlex XRD	2006
	Dell Computer for XRD with Jade Software	2006

### **Computer/GIS facility**

	15 PCs	2006
	HP DraftPRO Plotter (largeformat)	
	Summagraphics Digitizing Tablet	
	Numonics 2200 Digitizing Table	
	Calcomp 3348 Digitizing Tablet	
	Complete ESRI software group site liscence	2007

**Appendix 7.4 NRCM Library resources available at WCU's Hunter Library**

<b>Journals</b>	<b>Electronic databases</b>
American Forests	Academic Search Premier
Forest Science	Agricola
I.S.P.R.S. Journal of Photogrammetry and Remote Sensing	American Chemical Society Publications
Journal of Forestry	America's Newspapers: North Carolina
Journal of Soil and Water Conservation	Applied Science and Technology Abstracts
Natural Hazards	Biological Abstracts
Natural Resources Journal	Biological and Agricultural Index
Photogrammetric Engineering and Remote Sensing	CQ Researcher Online
Remote Sensing of Environment	GeoBase
Sierra	GeoRefS
Soil Science	LexisNexis Congressional
Soil Science Society of America Journal	MasterFILE Premier
Water Resources Research	ProQuest Newspapers
Wildlife in North Carolina	ScienceDirect
Wildlife Monographs	Scirus
	Scitation
	WestLaw