

ACCREDITATION VISITING TEAM REPORT

SCHOOL OF FORESTRY NORTHERN ARIZONA UNIVERSITY APRIL 8-11, 2003

INTRODUCTION

A Society of American Foresters (SAF) team visited Northern Arizona University (NAU) on April 8-11, 2003 to review the undergraduate curriculum in Forestry. The visiting team members were:

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The following report presents the observations of the team based on a review of the self evaluation report prepared by the School of Forestry, visits with faculty, students, administrators, alumni, and external partners, and a review of the University, College, and School teaching, research, library, and computing facilities, and a review of collaborative relationships with other forestry and natural resource organizations.

P.J. Daugherty, Interim Chair of the School of Forestry, and Rachel Crawford, Administrative Assistant, ably managed the visit. They made excellent arrangements and Dr. Daugherty was candid in conversation and discussion.

PROGRAMMATIC COMMENDATIONS

- Clear recognition of the School's responsibility to the Colorado Plateau.
- Establishment of a significant program in Native American Forestry in recognition of the place of Native American populations in the southwestern US.
- Development of an explicit outcomes assessment structure for curricula and individual courses.
- Commitment to a curriculum model and instruction strategy that emphasizes integration, communication, and human relations.
- Extensive involvement of both students and faculty in the natural resources life of Flagstaff and the surrounding region.

STANDARD I—FORESTRY PROGRAM MISSION, GOALS, AND OBJECTIVES

The University has a strategic plan published in 2003. The University's goals are the following:

- To provide regional and national leadership in the development, use and assessment of technologies to enhance and deliver superior educational programs
- To be a premiere undergraduate residential learning community emphasizing superior undergraduate programs
- To be recognized regionally, nationally, and internationally for selected creative endeavors, research and graduate programs especially those that build on their base on the Colorado Plateau
- To foster a culture of diversity visible in academic programming and in the recruitment of faculty, staff and students
- To be the nation's leading non-tribal university in affording educational opportunities for Native American students, in providing service and applied research to Native American tribes, and in advancing research concerning the history, culture and contemporary issues of Native American people
- To increase private support and research funding to supplement state funding and tuition, in order to guarantee an operating budget that supports academic excellence.

The School of Forestry is one of three units of the College of Ecosystem Science and Management and its goals show strong links to, and logical development from, the University's goals. The forestry unit's mission, goals and objectives for its forestry degree programs are clearly defined, consistent, and publicly stated. In 1996, the faculty approved the School's *Strategic Plan: A Working Document for 1996-2001*. In 1998, the Professional Curriculum Review Committee issued a report entitled *Report of the Professional Curriculum Review Committee to the School of Forestry Faculty – Maintaining Leadership in Innovative Forestry Education*. The mission includes the intellectual and personal development of well-rounded students at both the undergraduate and graduate level.

The School's mission, goals and objectives reflect that forestry is an interdisciplinary profession and that they respond to the needs of the constituencies that the program seeks to serve. The goals reflect sensitivity to the role of professional foresters in meeting diverse and changing social, cultural, economic, and environmental needs and values. The program seeks to produce graduates with high competence in transferable skills, such as oral and written communication, working in teams, dispute resolution and negotiating, business and organizational management, and ethics. The addition of an emphasis area to the professional program allows students to expand their knowledge in a particular area, such as international forestry, forest health or ecological restoration. Graduates have subject competencies in areas such as wildlife, ecology, silviculture, pest management, economics, and multi-subject competencies such as valuation, integrated resource

planning, and conflict resolution. There is an emphasis on “trans-disciplinary” learning through a unique combination of team teaching, sequential teaching, integrated teaching and immersion teaching. There also is a stated goal of becoming a repository of knowledge of ecosystem science and management for the Colorado Plateau, and maintaining the School’s status as the leading educational/research academic institution for Native American forestry.

The School of Forestry does not have an established schedule or methodology for measuring its performance in meeting its mission and goals. There have been periodic surveys conducted of past alumni and employer groups – one in 1996 and again in 2002. There is an opportunity to more frequently collect information from alumni to gauge program effectiveness, perhaps by polling recent graduates on an annual basis. Both alumni and employer surveys could be institutionalized through an update of the School’s strategic plan. Thus, the School might articulate and implement a more explicit process for linking its actions to its mission and goals, including regular assessments of alumni and employers.

STANDARD II—CURRICULUM

Re-accreditation is sought for the Bachelor of Science in Forestry (extended major). “Extended major” is a NAU designation for concentrations of 53 or more credits; students in standard majors must also take a minor. A minimum of 120 semester credits is required for graduation.

Over the past several years, the School has developed a rather elaborate set of educational targets for its curriculum and courses in the form of transferable skills (pages 7 and 58 of the self evaluation report); desired outcomes, activities, and assessment measures for the pre-professional (page 25) and professional (page 38) portions of the curriculum; and course goals and objectives for the upper-division, professional course blocks (page 28). This documentation appears to be a summary of at least two efforts to examine and revise the curriculum, and even the faculty was a little vague in our discussions about how it all fits together. But, clearly, a great deal of research, discussion, and analysis has gone into the structure of the curriculum and the courses, and the faculty should be commended for this effort. A systematic effort is made at the end of each upper-division semester to reevaluate the effectiveness of that professional course block (explained below), and (because each block consists of 6-13 credits) this amounts to a continual process of curriculum (as opposed to course) revision.

Professional ethics is explicitly listed as a target “transferable skill” in the curriculum. Although this subject is subsequently listed as a “desired outcome” only for the FOR 323-326 course block, it was evident in our discussions with both faculty and students that professional ethics receives substantial coverage throughout all the upper division semesters. Regardless of documentation, it appeared to us that faculty members share and pursue a common and carefully considered vision for the curriculum.

General education requirements comprise 9 credits in Communications, 23 credits in Science and Mathematics, 3 credits in Social Science and Humanities, and 19 credits of electives (Table 1). Nine “elective” credits are to be taken from a restricted list of courses, most of which would qualify as social science or humanity courses, so actual exposure to that realm of study is typically larger than Table 1 suggests. Mathematics instruction extends only through pre-calculus topics, but statistics, biology, chemistry, economics, and written and oral communication appear to be adequately covered. In general, course titles and descriptions indicate appropriate coverage and balance across the four areas of general education.

Written and oral communication skills are further emphasized through graded practice in FOR 313-316 (Forest Ecology and Silviculture), FOR 323-326W (Forest Management, a university-designated writing course), FOR 413-414C (Forest Ecosystem Assessment), and FOR 423-424C (Forest Ecosystem Planning). Significantly, the School of Forestry has for several years hired a graduate student from the English Department, on a half-time basis through the academic year, to provide writing assistance to students and help the faculty design and evaluate writing assignments. We were impressed with this program and with the quality of the assistance provided by the writing consultant, who appears to be the only program-specific writing consultant on campus. There is some current feeling within the faculty that writing across the curriculum needs to be better articulated. However, it was apparent to us in discussions with faculty, students, and alumni that writing is heavily emphasized in all upper division courses. Students described their surprise, early in the fifth semester, at the level and quantity of writing that was demanded of them.

Table 1. – General education requirements in the Bachelor of Forestry curriculum.

	Communications	Science & Mathematics	Social Science & Humanities	Electives
ENG 105 (Critical Reading & Writing) or ENG 101/102 (freshman English), and ENG 205 (Writer’s Works.), SC 111 (Fund. Publ. Speak.) ¹	9	-	-	-
MAT 125 (Pre-calculus Math), STA 270 (Applied Stat.), CIS 120 (Intro. Computer Syst.)	-	10	-	-
BIO 181 (Life of the Cell) and BIO 182 (Multicellular Organisms) ²		8		
CHM 130 (Fund. Chem.), CHM 151L (Gen. Chem. Lab)	-	5	-	-
ECO 284 (Principles of Economics)	-	-	3	-

Free electives	-	-	-	7
Aesthetic & Human Inquiry and Cultural Understanding restricted electives				9
University Colloquium	-	-	-	3
TOTAL	9	23	3	19

¹ Fundamentals of Public Speaking is listed under Social Sciences in the Self Evaluation Report.

² Not listed in Document A.

The distribution of forest resources education credits among the four areas of required study is shown in Table 2. The curriculum is in two distinct parts: a pre-professional, lower-division segment and a professional, upper-division segment. Pre-professional courses consist of general education courses plus 13 credits of forestry courses: introduction to forestry (FOR 101), forest measurements (FOR 211), dendrology (FOR 212), forest soils (FOR 213), and forest and range plants (FOR 220).

Table 2. – Forest resources education requirements in the Bachelor of Forestry curriculum.

	For. Ecol. & Biol.	Meas. of For. Res.	Mgmt. of For. Res.	For. Res. Policy & Admin	Total
Pre-professional forestry courses (FOR 211, FOR 212, FOR 213, FOR 220)	7.0	3.0	-	-	10
Fifth-semester, ecology and silviculture block (FOR 313-316)	7.5	-	5.5	-	13
Sixth-semester, management block (FOR 323-326W)	-	1.0	7.0	5.0	13
Seventh and eighth semester, assessment and planning blocks (FOR 413-414C and FOR 423-424C)	-	4.3	5.6	2.1	12

Additional courses: FOR 101 (3 cr.), Emphasis Area (12 cr.), POS 344 or POS 359 (3 cr.)¹

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TOTAL	14.5	8.3	18.1	7.1	66
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¹ The School declined to assign these credits to areas of study.

The upper-division “professional core” is uniquely well-known for its integrated, team-taught course blocks in each semester of the last two years. The fifth semester block (FOR 313-316, 13 credits) deals with forest ecology and silviculture, the sixth semester block (FOR 323-326, 13 credits) with forest management, the seventh semester block (FOR 413-414, 6 credits) with forest assessment, and the eighth semester (FOR 423-424, 6 credits) with forest planning. In addition to these 48 credits, the professional core contains a 3-credit policy-related course in the Political Science department, and it contains a 12-credit “emphasis” requirement. The six areas of emphasis that a student may choose from are conservation biology, ecological restoration, forest health, indigenous forestry, international forestry, and general forestry (additional emphases are under development). Table 2 does not reflect emphasis requirement credits, but many of the course choices for this requirement are forestry courses, with the result that every student receives more instruction in one or more areas than is shown in Table 2.

The current forestry curriculum at NAU was revised beginning with the current academic year. A Professional Curriculum Review Committee began the planning that led to this revision in 1998. The report of that committee, an examination of the recent literature on forestry education, and recommendations by students, alumni, and forestry professionals led to the current curriculum. The principal changes appear to be that a geology requirement has been dropped, a macroeconomics course dropped, a forest soils requirement added, and the professional core has been reduced by 10 credits to allow for emphasis area courses. With few exceptions (*e.g.*, moving soils coverage to a separate course), subject matter in the professional core is the same as before, but less time is given to each topic.

These changes appear to be identical to the changes described in the Substantive Change Report of 2001. In the view of the review team, the changes represent enhancements to the curriculum. Although the integrated block course approach to professional education has obvious merit, the cost of integration is that some subjects are covered in less depth than would be the case if they were dealt with in stand-alone courses: wildlife ecology (1.0 credits), entomology/pathology (1.2 credits), wood products (0.4 credits), recreation management (1.5 credits), watershed management (0.5 credits), and forest economics (1.5 credits). Some of the faculty and one employer mentioned this weakness to the NAU approach to forestry education, but all felt that the integration was a net advantage. The new 12-credit emphasis requirement represents a compromise because it will allow each student much more opportunity to pursue special interests and experience some

subjects on their own merits, apart from their relationship with forestry. Everyone (faculty, students, and this team) believes that this is a distinct enhancement to the curriculum.

Within the professional core, strong emphasis is placed on the flow and integration of material, and each semester course block is programmed to impart specified outcomes, skills, and abilities, each of which is matched with an activity and means of assessment. The two 6-credit blocks in the senior year have a university “capstone” designation. These courses emphasize active learning through projects that involve inventory design, data collection, data analysis, modeling, mapping, interaction with stakeholders, planning, and the preparation of management plans. It seems clear that students get first-hand, supervised experience in analysis, critical thinking, problem solving, and decision-making. The courses are also designed to strengthen skills in teamwork and task management. Fieldwork is a substantial component of the curriculum, comprising approximately 30% of the fifth-semester block and 50% of the seventh-semester block and significant portions of other courses such as mensuration. The team was satisfied that NAU students receive a good education in the professional portion of their curriculum.

STANDARD III—ORGANIZATION AND ADMINISTRATION OF THE FORESTRY PROGRAM

Northern Arizona University has evolved from a State Normal School into a full university with undergraduate, graduate, research, and outreach programs in over 100 disciplines and fields. It has a strong focus on undergraduate education and the School of Forestry is an important part of that focus.

At present, the School of Forestry is one of three academic units within the College of Ecosystem Science and Management. A Dean administers the College and a Chair administers the School.

Over the past few years there has been considerable change in leadership at the University, College, and School. This has created an unstable environment. University leadership has stabilized with a new President, Executive Vice President, and Provost. For the School, however, there is unease about the direction these new administrators will take the institution. The College has an Interim Dean, and the School has an Interim Chair.

The structural location of the School and the interim nature of its leadership should soon be settled. It has been proposed that the College of Ecosystem Science and Management be dissolved with the School of Forestry set apart as a stand-alone school administered by a Dean. The other units of the College will be dispersed to the colleges of Arts and Sciences and Social and Behavioral Sciences and the Parks and Recreation Management Program of the School of Forestry will move to the College of Arts and Sciences. We assume that this reorganization will require a substantive change submission once it is implemented and can be assessed.

This reorganization will allow the School to focus its attention and resources on forestry and natural resource issues, and give it flexibility unencumbered by a larger college structure. As a small school in number of students among several larger academic units, there is the danger of not being appropriately noticed, however the central administration has indicated that programs of the School of Forestry are premier programs of the University and thus they will not be forgotten. Based upon comments of the President, Provost, and Executive Vice President one gets the impression that the School of Forestry clearly fits into the mission of the University and that its future and vitality is of considerable interest to the Administration.

Faculty participation in decision making, especially regarding curricular issues, occurs at two levels: within Semester A, B, and C-D groups, and at the School level. At both levels curriculum change is on going and it is informed by interaction with students and others. However, there does not appear to be a well-defined process for collecting and assessing information from outside the School, but periodic surveys of employers and alumni are used and these surveys are supplemented by frequent contact with professionals outside the University. The extensive interaction of both students and faculty with members of the Flagstaff community helps to provide input to curricular issues and change.

Administrative Support, while lean, appears to be adequate. Since faculty members have word processing and other capabilities in their offices, the main function of administrative support personnel is serving the administrative and communication needs of the School administration, and there appear to be adequate numbers of personnel for these needs.

Program Planning and Outcomes Assessment occur in many ways and are addressed in other sections of this report. Based upon what is presented in the self-study and on observations during the on-site visit, there is a commitment among both the administration and the faculty to quality education and continuous improvement. However, a more explicit program planning process that is invoked on a regular basis could more readily implement this commitment.

STANDARD IV—FACULTY

There are 22 faculty members involved in instruction in the School. Appointment distributions over instruction, research, and service vary among the faculty members, reflecting their talents and the needs of the School.

On several dimensions there is good diversity among the faculty members. A variety of disciplines are represented, as is geographic diversity in their experience and training. The School has been successful in attracting and retaining gender diversity with five female faculty members demonstrating that the School has been more successful in attracting female faculty members than many larger programs. The variety of schools

from which the faculty obtained their terminal degrees is quite good and the racial/ethnic diversity of the faculty is better than many other forestry schools.

The School is less well represented in the assistant professor rank than in the associate and professor ranks. Only 13 percent of the faculty members are assistant professors, suggesting that the faculty is beginning to become mature in age structure.

Teaching loads vary considerably even for those with the same proportion of salary assigned for teaching. However, on a credit basis it appears that the average number of credits per faculty FTE is within the norm for similar programs in US public universities.

Students, alumni, and those who employ the graduates give the faculty high marks for preparing graduates well. The faculty appears to be highly committed to undergraduate education and to ensuring up--to--date and rigorous education of the students. A lot of faculty effort goes into teaching and curriculum development, and it appears that that this effort is recognized and appreciated by students, colleagues, administrators, and clientele.

There are several ways that faculty development occurs and sabbaticals appear to have been used frequently for this purpose. Over the past six years nine faculty members have been awarded sabbaticals. The frequent work that faculty members do with professionals in the community also provides special opportunities for developing skills and abilities.

STANDARD V—STUDENTS

Undergraduate recruitment into the School of Forestry consists of participation in the standard recruitment activities of NAU, responses to individual requests for information with prepared recruitment packets, and unsolicited mailings to ACT summary lists. Articulation agreements with all Arizona community colleges and with Haskell Indian Nations University also serve as recruiting devices.

Students apply for the upper-division, professional forestry program normally in the spring semester of their sophomore year. Admission is limited to 40 students, each of whom must have achieved a grade point average of 2.5 or greater in pre-professional courses and have met certain other course and grade requirements. We commend the fact that the School of Forestry has retained the power of admission into the forestry major since 1974. However, the program has not regularly succeeded in filling the 40-student quota in recent years.

Graduation class sizes have averaged 27 students per year over the past five years. This is not low, but it falls short of the program's goal of 36 students based upon a 10% attrition rate. As we found out first-hand in discussions with them, students from rather distant locations are attracted by the reputation of NAU's forestry program, the environment of northern Arizona, and the relatively low out-of-state tuition at NAU. Only 6 of 13 students with whom we met were from Arizona; the others hailed from New York (2 students), Connecticut, Michigan, Kansas, Colorado, and Washington. We suspect that the School's potential to recruit out-of-state students to its forestry program

is greatly underutilized. Admittedly, there is little growth potential in the program for student credit hour production, at least without damaging fundamental program strengths, but the opportunity for selective admissions to the upper division should be extremely attractive. Targeted recruitment for the program might be in order.

Total forestry enrollments over the past five years have averaged 166, of which an average of 28% has been female and 14% racial minority. Female enrollment in forestry is traditionally low, and NAU's percentage is good in relative terms, perhaps even a little higher than average. Minority enrollment is strong compared with the national norm. An average of nearly 9% of the enrollment has been American Indian. From everything we saw, the School strives to be a comfortable environment for both women and minorities. The School and the University place considerable emphasis on recruitment and retention of American Indians and Hispanics, and intensive counseling and advising services are available to those students. American Indian and Hispanic enrollments have fallen off considerably in the past year, to below the mean for the University as a whole, and the decline may be explainable by random fluctuation. However, the Native American decline also might be attributable, at least in part, to the loss of critical recruitment and retention services provided by the Native American Forestry Education Coordinator, a position that has been vacant for some months.

Undergraduate student advising, in general, is considered to be an important component of a faculty member's responsibilities. The faculty has a formal policy on advising that defines responsibilities and outlines the procedure by which advising is organized within the School. All faculty members advise undergraduate students. Announcements for internships, volunteer positions, and permanent jobs are sent to all students via an email list serve, and the College maintains an employment office staffed by a capable graduate student whose half-time responsibility is to help students find temporary or professional employment. Unfortunately, the School has no data on the employment success of its graduates. Apparently, these data are now being gathered through a survey of all alumni since the class of 1961. We strongly suggest that this survey be completed and kept up-to-date in the future.

We spoke to a group of 13 undergraduate students. Most were juniors, but a few were seniors or sophomores. Most or all of the students had already arranged jobs for the summer. They were complimentary of the services of the employment office. It was evident that the students genuinely *liked* the program and the faculty. They praised the quality of advising and the personal attention they were able to get from their faculty, in or out of class. They expressed some disappointment that the system of integrated, block courses made it difficult to schedule other courses, but they liked the curriculum and – importantly – felt confident in their preparation for professional employment. Upper division students essentially spend the entire day at the Southwest Forest Science Complex (the forestry building), and they commented on the *esprit de corps* that develops within each class because of their shared experiences.

Students have opportunities for extracurricular, professional activities through participation in the Forestry Club, a student chapter of the Society of American Foresters.

About one-third of the forestry students belong to this organization, which appears to be quite active. The club sponsors a special program every semester for the SAF Northern Arizona Chapter, and at least six members of the club have attended the National Convention each year for the past five or six years. Non-faculty members of the Arizona forestry community and non-alumni employers with whom we met complimented the involvement of the Forestry Club with the local professional community. About half of all upper division students belong, also, to Xi Sigma Pi. Of course, there are many other extracurricular activities on campus in which students may participate according to their interests.

The faculty has identified five categories of “transferable skills” on which to focus in the professional curriculum: teamwork, public speaking, dispute resolution, organizational management, and ethics. It is clear that professional core courses place a great deal of emphasis on teamwork, leadership, communications, and task management, in addition to the acquisition of professional knowledge and skills. As mentioned above, the students with whom we spoke feel prepared for professional work, with the possible exception of timber management. Employers, also, regarded the students as well educated and trained, and one or two who had hired students from other institutions expressed a distinct preference for NAU graduates because of their broad perspective developed through the integrated curriculum. Somewhat surprisingly, many of the graduate students with whom we talked in a group meeting also remarked on the competence of the undergraduate students, as well on their devotion and enthusiasm for the program.

STANDARD VI—PARENT INSTITUTION SUPPORT

Northern Arizona University is one of three state affiliated universities in Arizona. It is the only one in the northern, and forested, part of the state. It has a student population of a little over 19,000 students, with about 90 percent undergraduate and 80 percent resident students. A Board of Regents that is responsible for all three state universities governs it. At the University level the administrative chain includes a President, Provost, Dean, and Chair. The Chair of the School of Forestry reports directly to the Dean of the College of Ecosystem Science and Management, who in turn reports to the Provost, the chief academic officer of the University.

The administration of the University appears to be very supportive of the School of Forestry, including the proposal to reorganize the School into a stand-alone unit to be headed by a dean. Both the Executive Vice President and the Provost appeared to be very knowledgeable about the School’s programs. They clearly recognize the important role that the School plays in forestry on the Colorado Plateau and the opportunities that it presents for both the University and for the people of northern Arizona. They see the School fitting well within the mission of the University as a niche program that helps define the character and strengths of the University, especially as a university focused on undergraduate education. Forestry is perceived as a potential growth area to which progressive marketing strategies might be applied. This is particularly possible since two neighboring states, New Mexico and Nevada, do not have forestry programs within them, and since there is a huge market in Southern California, about a day’s drive away.

The University administration has recognized that a more strategic and targeted recruitment program is needed for the whole University. Given that recognition, the School of Forestry has an opportunity to help the University develop such a program that will benefit both the University and the School by attracting top students including those from Native American and Hispanic communities.

Minority recruitment and retention, especially of Native Americans and Hispanics, has long been a concern and priority of both the School of Forestry and NAU, and intensive counseling and advising services have been available to those students. The development of a University recruitment plan would provide the School of Forestry with an opportunity to develop a step-down, strategic document for the recruitment of minority and out-of-state students, thus enhancing its opportunity to meet both University and School goals regarding minorities, to capitalize on its location, and to fill its professional program annual cohorts.

As is being experienced in nearly every state in the US, state funding for higher education is declining as a proportion of the total budget. Northern Arizona University is undergoing the same kinds of funding pressures as many other state affiliated universities, but with an aggressive new President it seems to be coping with the declines. The internal funding allocation model might be described as base-plus (in recent years base-minus) giving the administration flexibility to provide differential funding for programs. This is very important for the School of Forestry since it strives to have a very high quality and relatively small undergraduate program and a more robust graduate and research program than many other units on campus.

The institutional budget for the School of Forestry appears to be roughly comparable to that of several other units on campus, though it seems low in the operations category for the number of faculty that are being supported. It also shows a decline over the past several years that reflects the decline of state support for higher education. Moderating some of the relatively modest budget lines in the School's budget is the College budget. Several activities are supported by the College budget, such as a reasonably well-funded information technology program, thus relieving those items from the School's responsibility.

Faculty salaries are a major concern. The University is in the bottom five percent of salaries of identified peer institutions and there has been little adjustment in salaries over the past several years. The new President is aware of the situation and is developing a plan to address it, but it potentially creates a problem in retention and it certainly has led to a compression of salaries across ranks. While new faculty members are hired at market rates, the rates of continuing faculty are stagnant and new faculty salaries are moving toward surpassing the salaries of more seasoned colleagues.

Library resources have improved over the last few years with the addition of electronic access to many journals. Both faculty and students voiced support for the library and the services it provides. Special mention needs to be made of the interest of the archives

section of the Library in forestry and the work that they are doing on restoration and scanning of historical maps dealing with forests.

Information Technology support in the School appears to be progressive and responsive. Modern computers are available to students, staff, and faculty and planning has been made for the replacement and upgrading of IT equipment. The School has allocated both space and equipment to several computer laboratories to ensure student access. In addition, all of the classrooms under the control of the College have been equipped with multimedia instructional equipment.

In reviewing administration of the University and the School, several times it was noted that the University has several comparator universities. We noted that the set of comparators for the University might not be the same as those for the School of Forestry. Given the universities that have forestry programs in the US, most of the School's western comparators are programs in research universities such as Colorado State and Oregon State or other programs with large forestry and natural resource doctoral programs such as Idaho and Montana.

STANDARD VII—PHYSICAL RESOURCES AND FACILITIES

All forestry courses are taught in the Southwest Forest Science Complex. This building was constructed in 1991 to house the School of Forestry and the USDA Forest Service's Rocky Mountain Research Station. Although 50 percent of the building was designed as School of Forestry space, The Department of Geography and the Parks and Recreation Management Program (PRM) have occupied space in the building since 1992. More recently the small Department of Applied Indigenous Studies also has had space in the building. All teaching space is currently shared with the two other academic units in the College of Ecosystem Science and Management. With the entire College currently occupying the forestry building, classroom space is tight but adequate. If PRM, Geography and Applied Indigenous Studies move to another building, as currently planned, then classroom space will become more available. All classrooms have been updated to include the latest available technology.

Computer facilities are excellent, and computer equipment is on a 4-year replacement cycle. Students commented that access to computers is good. There is currently one dedicated undergraduate computer lab, 2 dedicated graduate student labs and one GIS lab available to both groups.

In 2001, NAU acquired a major asset when the Governor of Arizona signed an intergovernmental agreement creating the Centennial Forest to serve as a nationally-recognized forest and model for the entire United States. The 75-year agreement between the Arizona State Land Department and NAU specifies education, forest health, maintenance of natural forest assets and values, reduction of the risk of wildfire, and long-term ecological research as stewardship objectives for the 47,000 acres of land. The Centennial Forest serves as the primary outdoor laboratory for the professional forestry

program at NAU. Nearly all Forestry field classes, or modules of team-taught field classes, are taught on the Forest.

STANDARD VIII—RESEARCH, EXTENSION, CONTINUING EDUCATION, AND PUBLIC SERVICE

The School of Forestry has an active research program. In Fiscal Year 2002, the School received \$928,360 in new extramural funds from 31 projects, excluding the several million dollars in the collaborative, but separate, Ecological Restoration Institute. The co-location of the USDA FS Rocky Mountain Research Station has offered additional opportunities for collaborative research and student exposure to research through part-time employment (about 20-25 at any one time).

Faculty research is used effectively to enhance classroom teaching. Through the annual evaluation process, faculty members are expected to demonstrate how their research activities are used in, and useful for, classroom instruction. Several research projects by individual faculty have resulted in text materials for both the undergraduate and graduate programs. In addition, approximately 25% of the students are exposed to ongoing University research through part-time University employment. Most students felt that there is good access to research opportunities for those who are interested.

NAU does not have a formal extension or continuing education role. However, some continuing education is offered in the form of occasional workshops, short courses and a regular Forestry seminar program. More significant is the amount of faculty outreach/service that takes place in the community. Through the Greater Flagstaff Forest Partnership, NAU's input has been pivotal in changing public attitudes about actively treating the forest to reduce risks and improve forest health. A great deal of technology transfer seems to take place from NAU through the partnership to the community. Outside groups, alumni and graduate students all commented that faculty outreach was significant and highly visible in the community. The local forestry partnership also affords students positive educational opportunities through attendance at public fora and exposure to outside professionals (e.g., Flagstaff Fire Department) in the classroom.

FINAL OBSERVATIONS

The School of Forestry at Northern Arizona University has a strong and progressive undergraduate program that is supplemented by solid graduate, research, and outreach programs. While there is more to be done, the faculty, staff, and students of the School have demonstrated many accomplishments while they look toward greater contributions in the future. A few specific ideas they might consider are the following.

- Develop a more explicit process of planning and evaluation to connect programs to the mission and goals, and include more frequent surveys of alumni and employers.
- Anticipate submitting a substantive change document to describe and assess the proposed structural change for the School once it has been implemented.

- Develop and implement a strategic recruiting program to attract the best students that will fill the annual cohort quota and lead to 38-40 graduates per year.
- Reaffirm commitment to a strong Native American forestry program and ensure that it has the resources to succeed.