

REPORT OF THE
SOCIETY OF AMERICAN FORESTERS
REACCREDITATION VISITING TEAM

Department of Forest Sciences
School of Natural Resources and Agricultural Sciences
University of Alaska Fairbanks

by

Keith A. Blatner, Washington State University
Richard B. Standiford, University of California (chair)
James Youtz, USDA Forest Service

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EXECUTIVE SUMMARY

A Visiting Team of the Committee on Accreditation of the Society of American Foresters (SAF) reviewed undergraduate programs in the School of Natural Resources and Agricultural Sciences at the University of Alaska Fairbanks, during the period from April 18 to 21, 2006. General findings are summarized below; additional detail is contained in the body of this report.

STANDARD I: FORESTRY PROGRAM MISSION, GOALS, AND OBJECTIVES

- The School carried out a comprehensive strategic planning exercise and updated its mission, goals and objectives.
- The School's mission is appropriate for a land grant institution.
- The goals and objectives are consistent with SAF policies.

STANDARD II: CURRICULUM

- SAF reaccreditation is being sought for the Forestry Option within the Natural Resource Management major.
- The professional courses are well integrated and require systematic problem solving and decision-making.
- Students receive an unusually high level of one-on-one personalized instruction.

STANDARD III: FORESTRY PROGRAM ORGANIZATION AND ADMINISTRATION

- The forestry program has general leadership through the Department of Forest Sciences, although the formal evaluation of all the faculty involved in the program, and the actual curriculum, is the direct responsibility of the Dean of SNRAS.
- The chief executive officer is a dean who reports to the university provost and president.
- Support staff appears to be adequate for the School's goals and objectives, both in number and in training.
- The School faculty has responsibility for determining degree requirements, establishing, and revising curricula, subject to review and approval by the campus Curriculum Committee and Provost Office. The School's Curriculum Committee appears to be proactive and responsive to proposals for course and curriculum changes.
- The School has an excellent Recruitment Coordinator and has good networks with the campus admissions office and campus outreach coordinators. NRM has been classed as a "priority program" by the campus to reach out to highly qualified high school prospects.
- The low number of minority students, especially Native American students, is an issue that will require a dedicated academic preparation for science and math effort by UA central administration at the early secondary school level.
- The School has a well-designed outcomes assessment strategy that is a model for others.

STANDARD IV: FACULTY

- The number of full-time equivalent School of Natural Resources faculty, including regular Forestry Department faculty plus those who directly support the forestry teaching program but have appointment in other departments, exceed the accreditation requirement of eight full-time faculty.
- The faculty represents a diversity of disciplines and come from a wide variety of institutions located in various regions of the United States and in other countries.
- The faculty takes pride in the undergraduate program and shows a genuine interest in teaching and student success.
- The prevailing "open-door policy" for faculty access and student counseling is exemplary and greatly contributes to student success.
- The faculty demonstrates a sense of collegiality and high esprit de corps.

- The faculty has willingly developed and taught undergraduate courses beyond general disciplinary specialization.
- The diversity of faculty disciplines is mostly sufficient but often not replicated, sometimes resulting in a shallow pool of specialized knowledge and research.
- All interviewed faculty expressed high satisfaction with the overall program and work environment, and indicated a preference for long-term employment with this institution. Employment statistics reflect these preferences.
- A high percentage of the forestry faculty are members of the Society of American Foresters.

STANDARD V: STUDENTS.

- Undergraduate enrollment averaged 71 students/ year with approximately 43% female, and 8% percent U.S. minority, during the last three years. Near-future enrollment is projected to moderately increase.
- Undergraduate enrollment reflects gender diversity, but ethnic diversity is limited. Student representation of Native American Alaskans is far lower than the proportional population distribution in the State.
- All of the interviewed students were very positive and openly pleased with their academic experiences in the Department, however all also offered up suggestions for program enhancement.
- All students mentioned the advantages of the program's small class sizes and opportunities for individualized instruction.
- Students indicated that educational instruction in biometrics/ modeling, fire ecology/ management and other disturbance ecology concepts is lacking or insufficient.
- Students perceived that University recruitment efforts for forestry and other natural resource disciplines are minimal or lacking.
- All interviewed employers were very pleased with the overall quality and educational preparation of program graduates, however most offered up suggestions for specific skills enhancements.
- Concerns were expressed by both students and employers regarding the perceived lack of sufficient opportunity for field study and demonstrations, and development of field skills.
- Employers expressed concerns that the overall quantity of enrolled students is insufficient to meet anticipated employment demand.
- Opportunities for undergraduate scholarship funding are below-average, comparable to similar peer institutions.

STANDARD VI: PARENT INSTITUTION SUPPORT

- Good support for forestry program by Chancellor and President's office.
- Concerns about future of federal formula funds for maintenance of support for salaries and research.
- Poor space is currently available for the program, with faculty spread over several buildings, and labs generally in poor condition.
- Salaries of faculty in the Department are comparable to average salaries at comparable forestry programs.
- The Department has invested heavily in computer facilities, and good GIS equipment and software is available
- There is a good opportunity to more effectively utilize UA forested land grants for research, teaching and outreach.

OTHER ISSUES:

- Opportunity to expand development scope of forestry program to provide scholarships, travel support, and endowed chairs.
- Need to develop new mechanisms to expand the thrust of the program to cover all forested areas of Alaska through regional linkages with other UA campuses and properties.

- Look for mechanisms to foster closer integration with Cooperative Extension to formally spread research programs throughout the state.

APPENDIX

- Supplemental documentation provided by UAF with respect to forest measurement instruction within the curriculum.



INTRODUCTION

During the period of April 18 to 21, 2006, an SAF Accreditation Visiting Team composed of Richard B. Standiford (chair), Keith A. Blatner, and James Youtz, visited the School of Natural Resources and Agricultural Sciences at the University of Alaska Fairbanks. The Team had received the Self-Evaluation Report from the School's Department of Forest Sciences in a timely manner, and was expeditiously supplied with any supplementary material requested by the team. The program seeking accreditation by SAF is the Forestry Option of the undergraduate BS degree in Natural Resource Management within the University's School of Natural Resources and Agricultural Sciences (SNRAS). This represents minor modifications to the previously-accredited program.

The purpose of the SAF site visit was to verify factual information contained in a self-study report prepared by the University of Fairbanks Alaska faculty and to offer other observations from interviews conducted during the site visit. In general, the site visit team found the documentation to be thorough and clearly presented. During the visit the team talked with UAF Chancellor Steven Jones and Provost Paul Reichardt, systemwide University of Alaska Vice President for Academic Affairs Dorman, CNRAS Dean Carol Lewis, Forestry Sciences Department Chair John Yarie and faculty, staff and students from the School and Department. In addition, the team had an opportunity to meet and interact with members of the CNRAS Board of Advisors, as well as employers of graduates and alumni of the forestry program. We were accorded open access to all facets of the program. The site visit team wishes to thank the faculty of the School and Department and the administration and staff at University of Alaska Fairbanks for their warm hospitality and free exchange of information during the visit.

STANDARD I: FORESTRY PROGRAM MISSION, GOALS, AND OBJECTIVES

The forestry program mission draws from the School of Natural Resources and Agricultural Sciences strategic planning exercise which was adopted by the faculty and administration in 2004. The instruction, research, and public service goals and objectives are directly derived from the SNRAS mission statement.

The School's strategic plan had important input from the Dean's standing Board of Advisors (BOA), composed of a diverse array of professionals from most resource management agencies (both state and federal) as well as representatives of private industry, non-governmental organizations, policy makers, and alumni.

The general mission guided the development of specific teaching, research and service goals and objectives that are central to all academic planning as well as curriculum development of SNRAS. The SNRAS website, and the description of the Natural Resource Management major in the University Course Catalog, reflect the general tone of the mission statement. The course catalog also reflects specific goals and objectives of the Forestry Option of the NRM major. SAF Accreditation figures prominently in these general descriptions.

Overall, the mission and goals as stated are consistent with SAF Standards for Accreditation; reflect that forestry is an interdisciplinary profession; recognize the needs of the constituencies that the program seeks to serve; reflect sensitivity to the role of foresters in meeting diverse and changing social, cultural, economic, and environmental needs and values; and emphasize the professionalism necessary to manage and use forest resources for the benefit of society.



STANDARD II: CURRICULUM

Continued accreditation is sought for the Bachelor of Science in Natural Resources Management with an option in Forestry. This requires a minimum of 130 semester credits for a degree from the University of Alaska Fairbanks.

The curriculum has been relatively stable since the previous site visit in 1996 with relatively modest adjustments in the names and content of the courses. The school has an active curriculum committee which regularly reviews course content issues and has also been active in the development of learning outcomes for the different degree options. The learning outcomes are presented in the self-evaluation report and are consistent with those of the Society of American Foresters. The learning outcomes were developed with input from the faculty, the university administration and other interested parties. The faculty are in the first year of actively compiling data on learning outcomes and are looking forward to seeing the results of their efforts and how well the various measures work.

General Education

The general education requirements for the forestry option are documented in the self-evaluation report (Volume I, pages 9-24). Each of the general education components is covered and there is a good balance across communications, science, mathematics, social sciences and humanities (Table 1). All of the general university core courses are required with students having no restricted electives in this area. All students completing a Bachelor of Science degree at UAF are required to complete math through "Calculus for the Life Sciences."

Table 1. General Education Requirements

Communications	Science & Mathematics	Social Sciences & Humanities
10	31	15

Although there was no evidence of a specific course requirement in computer science among the general education requirements, it is clear that the students receive a solid education in this area as a part of their coursework throughout the overall program. The school has two computer labs for teaching. Employers remarked very positively about the students' GIS skills.

Professional Education

The forestry major has a reasonable distribution of credits across the four professional areas. Course syllabi were provided for all of the courses and the visiting team was well satisfied that courses for which credits were spread across two or more areas, did in fact, address the respective areas (Table 2).

Table 2. Professional Forest Resource Education

Ecology & Biology	Measurement of Forest Resources	Management of Forest Resources	Policy, Economics & Administration
24.5-25.5	10	23-24.5	11.5

Of the 130 semester hours required for a degree, no credits are allowed as "free electives." The self-evaluation report indicated that a high degree of faculty/course interrelation occurs and a discussion of curricular structure was provided. Discussions with faculty also indicated a high degree of interaction and discussion among the faculty, with some courses being team-taught. It needs to be emphasized that this is a relatively small faculty, who have a long history of working together on both teaching and research. In some sense the faculty appear to interact like an extended family. The faculty within the school also have a high degree of interaction with faculty on the rest of the campus as well as other locations in Alaska.

There appear to be numerous examples of integration in the required course work. The senior project (a capstone course spanning two semesters) requires a high degree of coursework integration. The course sequence involves the development of a project of the students' own choosing with data collection and analysis. The final project consists of a detailed (lengthy) written document and an oral presentation of the project. Writing is emphasized throughout the program

The core curriculum (university and forestry) emphasizes analytical and critical thinking. Courses use basic knowledge to examine forestry issues/problems while providing alternative solutions. As noted above, the senior project also plays a major role in this aspect of the students' education.

Similarly, ethics is covered in a variety of courses and students are expected to complete a university core curriculum course in Ethics.

Concerns

The Visiting Team was very concerned about the limited amount of course work related to forest measurements in general and specifically to forest/environmental sampling and growth and yield projection competencies.

Standard II requires the following competencies for the measurement of forest resources.

Measurement of Forest Resources:

Competencies must be documented as an:

1. Ability to identify and measure land areas and conduct spatial analysis.
2. Ability to design and implement comprehensive inventories that meet specific objectives using appropriate sampling methods and units of measurement.
3. Ability to analyze inventory data and project future forest, stand, and tree conditions.

Based on the information provided to the team in their self study report, it appears that UAF students receive an adequate background with respect to the first competency and some background with respect to the second and third competencies. However, we felt the self study document did not provide sufficient evidence to assure the team members that all three areas were adequately addressed by their curriculum. The students' training in growth and yield modeling appeared to be limited. Similarly, the student background in environmental sampling also appeared to be limited to three weeks in one course.

Employers interviewed during the site visit also expressed concerns about the limited measurement/field skills of UAF graduates. We also found that students frequently completed their forest measurements course prior to completing a basic course in probability and statistics and in some cases prior to completing their general math requirements.

It should be noted that the previous accreditation team also noted that student training in the measurements was limited.

In response to our initial oral report to the faculty, the faculty under the leadership of John Yarie, Chair, provided the team with a supplemental document summarizing additional forest measurement instruction not listed in Document B-1 of the self study report shortly after the site visit. This supplemental document is included in the Appendix to this document for completeness.

The supplemental materials presented demonstrate that competencies 2 and 3 under forest measurements subcategory are addressed in more detail than we originally understood and appear to meet the minimum requirements for the standard. It must be further stressed that students receive a great deal of one-on-one instruction within the program due the limited number of students in the program and the University of Alaska Fairbanks' emphasis on personalized instruction in all aspects of the curriculum. In addition, the quality of instruction appears to be very high. Conversely, the team feels the faculty needs to pay a high degree of attention to this issue given the concerns of the employers interviewed and that a further strengthening of the curriculum in this area may be needed.

Another area of concern was the lack of fire ecology course within the program. Historically, their students have taken a forest protection course, although, this course is not going to be offered due to a faculty retirement at the present time. The faculty at UAF has acknowledged this issue and are working aggressively to address it.

Potential Opportunities

The School of Natural Resources and Agricultural Sciences at UAF has the potential to expand its student body dramatically over the next decade given their relatively limited student numbers. The school is also well positioned to take advantage of the growing interest in the Arctic regions of the world as a result of global warming.

STANDARD III: FORESTRY PROGRAM ORGANIZATION AND ADMINISTRATION

Administrator

The School is one of seven colleges at the University of Alaska Fairbanks. SNRAS is composed of four departments, namely Forest Sciences, Resources Management, Plant, Animal and Soil Sciences, and Geography. SNRAS is administered by a Dean, who also functions as the Director of the Agricultural and Forest Experiment Station. All faculty workload assignments, annual reviews for untenured faculty, and a formal post-tenure review are carried out by the Dean.

The Dean has formal responsibility for ensuring that the teaching curriculum for the two majors in the School, namely Natural Resource Management and Geography, are carried out. The Dean has designated an Associate Dean for Academic Affairs with responsibility for the day to day management of the curriculum.

A Department Chair leads each of the four Departments. The Chairs have budgetary and faculty administrative authority, but do not conduct annual faculty evaluations. The Chair of the Forest Sciences Department has an important role in implementing the Forestry Option of the NRM degree.

The faculty of the University of Alaska Fairbanks are part of a faculty union. The union contract determines many of the employment policies and procedures for the faculty. Faculty participate in the selection of new faculty and in recommendations regarding tenure and promotion of their peers.

Student Recruitment, Admissions and Transfers

The School's Recruitment Coordinator is especially active in recruitment. The office is well-coordinated with the campus career counselors, and regularly provides updated materials on the NRM major and career opportunities in forestry and natural resource management for use by career counselors. Basic high school preparation requirements are presented in recruiting materials distributed to prospective students. Recruitment includes direct mail, presentations on and off campus, advertisements and personal visits to community colleges. NRM has been classed as a "priority program" within UAF, which allows it to directly reach out to highly qualified high school prospects. The School has developed articulation standards with various state 2-year institutions.

The School and Department web sites provide updated major requirements and general descriptions of the major. Procedures and standards for evaluating and accepting students are clearly outlined in the General Catalog. Student admission standards for the Department are the same as those for other programs on campus.

The low number of Native American students in the program is a concern to administration and faculty. There will likely be needed a systemwide academic preparation effort by UA at the very early secondary school level in rural villages to develop math and science skills for successful entrance to the program. State efforts are underway to develop tribal colleges to increase success in four year institutions, which will require new articulation requirements as these develop. With the large acreage of forest ownership and important natural resource stewardship of Native American Corporations in Alaska, development of forestry leaders in this community is a key priority.

Lessons

The School places high importance on the teaching program. Typical faculty teaching assignments are 40 to 50 percent, with the remainder in research and service (through appointment in the Agricultural and Forest Experiment Station). There are systematic campus standards to evaluate faculty performance in teaching. All faculty members interviewed took their role in teaching very seriously, and made themselves readily available to students for advising and mentoring. Comments by the Dean, Department Chair, Provost, and Chancellor suggest that quality teaching is an important value at UAF.

Administrative Support

SNRAS has a Business Office which provides support in budget, accounting, purchasing and personnel matters of the various departments. The Business Office provides support for the Cooperative Extension Service program of UAF as well. The Dean's office also provides staff support for academic programs and contract and grants administration. The system appears to function efficiently for the School.

Program Planning and Outcomes Assessment

The School had a well-developed outcomes assessment to critically evaluate their success in teaching. This involved a survey of all students in the entry level survey class required of all NRM students (NRM 101), and a follow-up survey in a late upper division class (NRM 304). The Senior Thesis project, required of all students in the program, provides an excellent overview of the student's success in integrating all material in their undergraduate career into an independent, comprehensive project in an area of natural resource management. The Dean personally interviews all graduating seniors as the final stage in the outcomes assessment. The Dean also consults with her Board of Advisors for their input on the success of the program in meeting educational needs of the natural resource community.

SNRAS has a standing Program Review Committee with faculty members of each department to review and approve course and curriculum changes. The entire department is proactive in planning and updating course and curriculum changes.



STANDARD IV: FACULTY

Academic and Professional Competency

The faculty background summary and academic summary information were provided in the Self-Evaluation Report and budgeted time and specific assignments for teaching in the forestry program clearly specified. The number of full-time-equivalent forestry faculty, regular forestry faculty plus those who directly support the forestry teaching program but have appointments in other departments, are in excess of the accreditation standard of eight full-time faculty.

A review of the educational backgrounds of faculty shows that they come from a wide variety of institutions, regions of the country and represent a diversity of disciplines. There is considerable gender and some cultural diversity reflected in the current faculty team. A low rate of staff turnover has presented few opportunities to change the current demographics. Over the next five to seven years there may be

several opportunities to add cultural diversity to the ranks of the faculty due to retirements and refilling of positions and some new position development.

The faculty helps to maintain the visibility of the Department by serving on University committees, teaching courses with other schools such as Fisheries and Biology, and conducting regional, national and international continuing education programs and conferences, and public service activities. Most faculty have published in peer reviewed or other journals in the past five years. Faculty have participated in workshops for professionals with many giving papers. Faculty members generally teach in their areas of expertise, or allied disciplines. Breadth of faculty disciplines is adequate, with some notable exceptions (biometrics, resource statistics, and disturbance ecology). Although the diversity of faculty disciplines is mostly sufficient, disciplinary specialization is often not replicated, resulting in a shallow depth of specialized knowledge and research.

Teaching Skills

All indications are that the faculty provide a high quality of instruction in forestry courses and the other critical natural resource areas that support the forestry curriculum. During interviews, the administrators characterized the Department as being “student friendly.” Interviews with faculty and students indicated that faculty take pride in the undergraduate program and shows a genuine interest in teaching and student success. The prevailing attitude for all interviewed faculty indicated that they operate on an “open-door policy” for student access. As a result of this operational mode and the low student to faculty ratios, student counseling is exemplary and greatly contributes to student success. The faculty overall demonstrate a sense of collegiality and high esprit de corps.

Teaching assignments appear to be reasonably well balanced with other responsibilities. The course-load per teaching FTE appears to be slightly less to roughly equivalent to forestry programs across the country. Department faculty present the results of their research to appropriate audiences including their undergraduate and graduate students.

Most interviewed faculty indicated they are teaching in the areas for which they were trained. However, some faculty members have demonstrated their willingness to develop and teach undergraduate courses beyond general disciplinary specialization, when necessary. The Self-Evaluation Report details the sabbaticals taken by teaching faculty over the past five years and how these experiences have enhanced the teaching and research programs. The faculty support one another by accepting teaching overloads while others are on sabbatical leave. The faculty views their small size as an opportunity to work together as a team to make the best use of their expertise, mentor new faculty, and develop responsive curriculum, that serve the larger School of Natural Resources in addition to the Forestry Department.

The faculty acknowledge that climatic factors (extreme cold and short day lengths) limit opportunities for field training and hands-on practical applications during the academic year. In response, they encourage students to obtain practical on-the-job summer experience.

STANDARD V: STUDENTS

The Visiting Team held discussions with a group of current undergraduate and graduate students, and past graduates who are now employed in various aspects of forestry and natural resources management. All of the interviewed students were very positive and openly pleased with their academic experiences in the Department, especially the small class sizes and opportunities for individualized instruction, however

all also offered suggestions for program enhancement. Concerns were expressed by students regarding a perceived lack of sufficient opportunity for field study and demonstrations, and development of field skills. Students indicated that educational instruction in biometrics/ modeling, fire ecology/ management and other disturbance ecology concepts is lacking or perceived to be insufficient. Students also perceived that University student recruitment efforts for forestry and other natural resource disciplines are minimal or lacking.

Employers were complimentary of student's abilities and preparedness for the workplace, citing spatial-analysis, communication, and problem solving skills as good. However, these employers also cited needs for strengthened training of students in fire and fuels management concepts, and field sampling techniques. The overall job market remains good. Most students (80%) are employed within 6 months of graduation in either forestry or other natural resource management positions.

Forestry students attend classes with students in the other School of Natural Resources programs and the general University, giving them the opportunity to interact with individuals of differing perspectives. Interested students have some opportunity for hands-on experience through volunteer and internship opportunities in faculty research as their schedule permits. Many students participate actively in the Student Resource Management Club, and/or other extracurricular natural resources clubs and organizations in the School. The Resource Management Club is viewed as a leader in resource issues on campus, and during the review team visit, the club sponsored a gubernatorial candidates' debate forum on resource issues, attracting statewide visibility.

Recruitment and Retention

Undergraduate enrollment in the School of Natural Resources and Agricultural Sciences averaged 71 students/ year with approximately 43% female, and 8% percent U.S. minority, during the last three years. Undergraduate enrollment reflects gender diversity, but ethnic diversity is limited. In the current year, various minorities were represented in total enrollment as follows: American Indian 2%, Hispanic 2%, Asian 2% and 2% other. Student representation of Native American Alaskans is far lower than the proportional population distribution in the State. Program outreach staff acknowledged that there are opportunities for increasing enrollment of Alaskan Natives, and that greater emphasis will be made to do so in the future.

Natural Resource majors who graduate with a Forestry degree option typically compose approximately one-third of total enrollment of this program. Near-future enrollment of Natural Resource majors is targeted to increase by 5% annually. By 2009, total Natural Resources program enrollment is projected to be 17% greater than the current year.

An average of \$8,000 to \$10,000 per year is available specifically for undergraduate forestry major scholarships. This level is substantially lower than other institutions of similar size, and represents an opportunity for future increases through a more aggressive development campaign. However, other opportunities are available for student financial assistance. A much larger amount of non major-specific scholarships are available through the general University of Alaska programs.

Local employers expressed concerns that the overall quantity of enrolled students is insufficient to meet anticipated employment demand. Difficulty with recruitment of employees from other states enhances expectations that the University of Alaska system should strive to increase student enrollment in forestry and other natural resources disciplines.

Advising

Student and faculty alike recognized the School's Placement Services as a valuable resource. The Department provides academic advisors who play a key role in locating both professionally acceptable summer jobs for students while in school, as well as full-time employment following graduation. However, the faculty play an important supplemental role in career planning and job placement. Faculty are interested that students receive clear academic advice and they make themselves available for consultation on the classes they teach or on academic and professional issues. All Department students met by the visiting team were pleased with the quality and availability of faculty advising.



STANDARD VI: PARENT INSTITUTION SUPPORT

Forestry Program Support

The Department is funded with a combination of both state general funds and federal formula forms through the Agricultural Experiment Station. National level issues related to the long-term stability of formula funds from USDA for both Hatch and McIntire-Stennis funds are of major concern to the future support for the programs of the School.

Support appears to be similar to other programs at the University. There appears to be good support for the importance of the forestry program at the Offices of the President and Chancellor, and by other high level campus administration.

The low rate of turnover in faculty in the Department would suggest that salaries are not an impediment to retaining faculty. Salaries are competitive with other similar forestry programs in the West. There is very limited start-up support from the campus level, with small campus pools for equipment and instructional equipment. The school is expected to assume the major role for start-up funds for new faculty. There is a 50 percent return of indirect cost funds to individual units, which is higher than many institutions. However, many forestry-related contracts and grants operate with low overhead rates, meaning returns to the School are much lower than to units on campus with higher rates. This may lead to differential support over time for laboratory renovation and infrastructure enhancements when compared to other units on campus.

Supporting Programs

Supporting programs at the university seem to be of high quality and readily available. Faculty in SNRAS interact with the various arctic, marine, and atmospheric institutes on campus. Wildlife and fisheries programs in other colleges and schools are important links with the forestry program in SNRAS.

Physical Resources and Facilities

The faculty in the forestry program in SNRAS are in several physically separated buildings on the western edge of campus. The faculty have been positive about the soil chemistry facilities on campus and at the AES facility in Palmer. There appears to be a good collaborative use of analytical chemistry equipment by the soils faculty. The GIS lab is located in two rooms in O'Neill Hall. There is good equipment and software support for the GIS lab, although the physical location of one of the rooms in a converted wet lab facility is not ideal. Much of the lab, office and classroom space is inadequate for modern science, and substantial infrastructure upgrade is needed. Many graduate student offices are

located in trailers located some distance from their faculty advisors. It is clear that there is a strong need for a modern natural resources building to house the lab, classroom, and offices of the School.

University library facilities are good and are easily accessed by forestry students and faculty. The library system at UAF is the largest in the state, and is located in a main location in the eastern campus, and two satellite locations near the SNRAS faculty on the western part of campus. Faculty and students felt that most of their needs were met with the collection on campus, and they were very pleased by the responsiveness of the interlibrary loan program which could deliver most any material within several days.

The forestry program benefits from land grant forest property held by the University of Alaska immediately adjacent to the north end of campus, and a large watershed area approximately 30 miles northeast of campus. The program also relies on lab and field facilities at AES field locations in Palmer and Delta. A 5000 acre Long-term Ecological Reserve (LTER) operated by the USDA Forest Service, located at Bonanza Creek, is heavily used by faculty and graduate student research, undergraduate senior papers, and various class field trips.

The systemwide University of Alaska has recently added new land grants of over 200,000 acres throughout the state, including 50,000 acres of forest land in the Tannana River Basin, immediately adjacent to Bonanza Creek. There is a very good opportunity for these lands contributing to the forestry research, teaching and outreach programs of UAF. Many forestry programs rely on university forests to provide research and demonstration sites, as well as generating income streams to support the forestry programs of their institutions. These new land grants, plus the existing forest properties, should have an integrated forest management plan developed to look at income possibilities and unique research, teaching and outreach opportunities.

OTHER ISSUES:

Development

The program appears to have substantial opportunity to increase gift support of the program. There has been only limited alumni and other donor cultivation, and opportunities for student support, scholarships, endowed chairs could enhance the overall forestry program.

Service Reach of Program

The program's main impact has been in the interior boreal forest region of Alaska. There are only limited student opportunities in the southwestern coast forest regions. The forestry program at UAF appears to be in a position to provide statewide leadership through closer coordination with field locations and other UA campus sites. We learned about the Integrated Geography program of the systemwide University of Alaska, with leadership by SNRAS. A similar effort could be follow for the forestry and natural resource program, cultivating faculty ties at the Anchorage, Southeastern and Anchorage campuses, as well as at two year campus locations.

Coordination with Cooperative Extension Programs

UAF is somewhat unique when compared to other agricultural and forestry programs in the country, with the Cooperative Extension (CE) program being programmatically delinked from the teaching and research programs. There is only one CE specialist with a formal forestry assignment in UAF, although there are widely dispersed Extension faculty with responsibilities for natural resource and community development programs throughout the state. The reach of the research program, and opportunities for teaching could be enhanced by a more formal link with CE.

APPENDIX: Specific response to SAF accreditation team review of the Forestry Program at the University of Alaska Fairbanks (UAF) – School of Natural Resources and Agricultural Sciences (SNRAS)

This specific response is in reply to the review comments presented to SNRAS at UAF following the site visit of the SAF accreditation review team. The following comments are specifically addressed to the comment of the review team that the current curriculum was weak in addressing items 2 and 3 under the “Measurement of Forest Resources” category. We will address this comment from two perspectives. First we will present a number of courses that include some measurements course work that were not indicated in the credit hour category presented in Document B-1, and second we will present potential options that can be considered in the future that could help to strengthen the forest measurements category.

The following listed courses do include specific parts of the forest measurements instruction but were not specifically included in the measurements category (I have not included any of the courses listed in Document B-1 that were shown to include credits in the Measurements area):

- 1) NRM375 – Forest Ecology: Specific measurement exercises are incorporated into both the general ecology and forest ecology classes. In the laboratory portion of the forest ecology class students use the standard FIA inventory techniques to survey a number of plots in the Endowment Lands on campus. Additional information is collected on tree growth and ecosystem chemistry. During the remaining weeks students perform a standard inventory analysis of the timber volume and biomass on the sampled plots in addition to growth measurements and simple chemical analysis of tree foliage and forest floor and soil samples. Finally a final report is prepared that brings together all information collected on standing timber, growth and yield, and indicator chemistry into a single comprehensive report.
- 2) NRM450 – Forest Management: A number of measurements topics are included in the Forest Management class. These include chapters 4 and 5 in Forest Management (Davis et al. 4th edition) and specifically forest growth and yield concepts, measurement of forest growth, density and stocking, and an overview of a number of growth and yield models. Utilization of inventory data in the design and analysis of management practices is a key part of the material presented in this course.
- 3) NRM452 – Forest Health and Protection: This course is composed of three separate units, forest insects, forest diseases, and fire and other biotic disturbance agents. A section of this class will be devoted to developing a tree inventory that will be used to assess tree risk and tree condition. A direct application of specific measurement techniques to forest health.
- 4) NRM277 – Introduction to Conservation Biology. This course utilizes a number of different measurements related to endangered species. These measurements techniques result in a class project that is designed to develop recommendations for preserving habitat for a selected endangered species. The primary emphasis with regards to forest measurements in this case is the actual use of data that has been collected.
- 5) It should also be stated that students take a specific course in planning, NRM430 that complements the forest management course in its coverage of stand and forest level planning.
- 6) In document B-2 there is also a requirement that one of the restricted electives must be completed in a Forest Measurements class. This group of classes ranges from NRM341 – GIS Analysis, to STAT 402 – Scientific Sampling. There are a total of 15 credits (5 different classes) in this group from which the students are required to take at least one.

The above group of classes, in addition to the course work listed in Document B-1, represents the competencies for items 2 and 3 under the Measurement of Forest Resources grouping. First under item 2 (ability to design and implement comprehensive inventories that meet specific objectives using appropriate sampling methods and units of measurement) the material presented in STAT200, BIOL271, NRM290, NRM338, NRM340, NRM370, NRM375 plus one of the electives that include NRM341 and STAT402 would lead to a sound background in inventory development. Developing an actual inventory would be an extremely difficult project in our educational setting, and would be dependent on the overall objectives and the land area to be inventoried. Second under item 3 (ability to analyze inventory data and project future forest, stand and tree conditions) the material presented in and required reports and thesis for NRM340, NRM370, NRM375, NRM450, NRM452, NRM405W, and NRM406W all require the ability of the student to analyze data actually collected for the class or analysis of information gathered from outside sources. The final result of the knowledge gained in the range of required course work will be a broad based presentation of techniques and outcomes of measurement for a large number of components of the forest resource.

Most, if not all, of our forestry students obtain valuable summer employment in which measurements are a major component. In addition, senior thesis projects for forestry students usually involve the design, implementation, and analysis of field data in conjunction with a specific objective. Considerable guidance and informal instruction is given the student by their thesis committee chair and other committee members.

There is limitation to the future directions that could be implemented due to the large number of required courses that are currently in the curriculum. Future directions that might help to strengthen the measurement background of the students could include:

- 1) Inclusion of an emphasis in current classes that material currently presented is a key part of the whole forest measurements spectrum.
- 2) We expect changes to the Forest Management class material with the hiring of a new faculty member. A strong suggestion of inclusion of a measurements section related to forest management can be suggested for restructuring the course. Dependent on the changes to the course material this class may be viewed as an additional "Capstone course" that would heavily rely on the analysis of measurements data to design and analyze the appropriate silvicultural techniques for management of a defined forest area.
- 3) A required summer position that has a direct relationship to some part of the forest measurements spectrum.
- 4) A long range solution could include the development of a summer field camp in interior Alaska or the potential of using an existing field camp at one of the western forestry schools.

In summary it is felt that a broad range of measurement techniques and class options are currently available to our students.