

NAUFRP Undergraduate Educational Enhancement Strategy

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NAUFRP Undergraduate Education Enhancement Strategy

Mission: Our Mission is to produce the quality, diversity and number of forest and related natural resources (FRNR¹) students needed for a sustainable future.

Rationale

The National Research Council issued a report that stated "*Many of today's major challenges — including energy security, national security, human health, and climate change — are closely tied to the global food and agriculture enterprise*. Academic institutions with programs in agriculture are in a perfect position to foster the next generation of leaders and professionals needed to address these challenges*" (The National Academies, 2009).

"Failure to respond to the changes affecting agriculture and education will place many aspects of the nation's universities, agriculture system, and society at risk... Failure could mean that the U.S. will fall behind other nations in agriculture-based science and stewardship. And failure could contribute to the loss or pollution of our land, water, and natural resources" (National Research Council, 2009).

*This includes FRNR professions as defined in the report

The National Association of University Forest Resources Programs (NAUFRP) Strategic Plan envisions forests as "*a constant source of learning about the relationship between humans and natural resources that simultaneously benefits both people and nature*" (Forests for a Richer Future, NAUFRP 2006). Universities are prepared to make commitments to build an ever-improving body of science and science-based technologies that, together with local knowledge, contribute to sustaining forest ecosystems and ensuring that they are productive, diverse, and resilient in the face of constant change. Similarly, they are prepared to educate future managers who are committed to advancing the sustainability of forests in order to enhance human well-being, provide needed and desired goods and services,

¹ FRNR students are those in majors such as forestry, natural resource management, fish and wildlife management, wood science and technology, and outdoor recreation. See Figure 2 for the fields of study that are considered to be within the purview of this strategy.

and protect the intrinsic values of forests. Development and implementation of the strategic plans for the McIntire-Stennis Program for research and graduate education (Keathley 2003, NAUFRP 2007) were the first two parts of fulfilling this vision. Now it is time for third part – defining FRNR undergraduate education for the future. This strategy outlines the steps necessary for NAUFRP to accomplish this task, which will help ensure that our member’s FRNR help to meet the needs of employers and society as a whole well into the future.

NAUFRP’s Strategic Plan includes this education goal: “to educate future managers who are committed to advancing the sustainability of forests in order to enhance human well-being, provide needed and desired goods and services, and protect the intrinsic values of forests” (NAUFRP 2006). NAUFRP members are dedicated to this goal in a time of reduced budgets, with enrollments that are beginning to increase but not necessarily in the traditional majors we have focused on before. Sharik and Layton (2010) show that NAUFRP enrollments have risen since a low in 2005 (Figure 1), but the increases have come in degrees that are more often termed “Natural Resources and Environment” rather than “Forestry” or “Wildlife and Fisheries” (Figure 2).

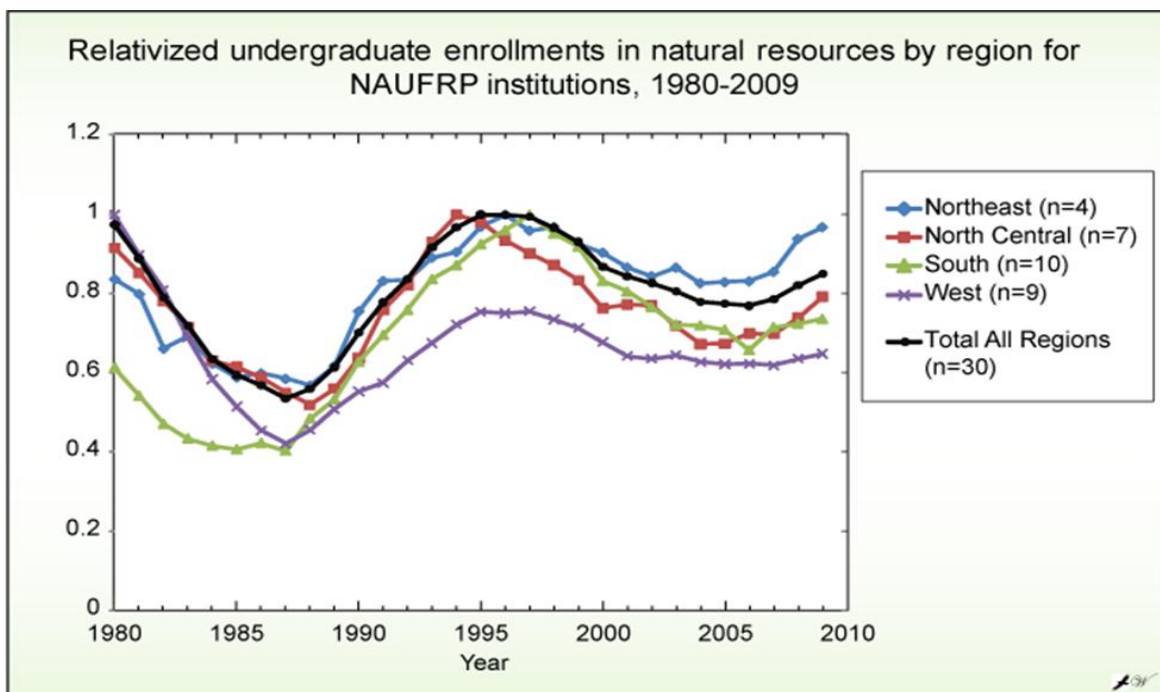


Figure 1. Undergraduate enrollments in natural resources by region for NAUFRP Institutions, 1980-2009. (Sharik, T. L. and P. A. Layton. 2010.

Forestry Education in the USA in a Changing Social Climate. Presented to the International Symposium on Forestry Education, Vancouver, BC, May 18, 2010.)

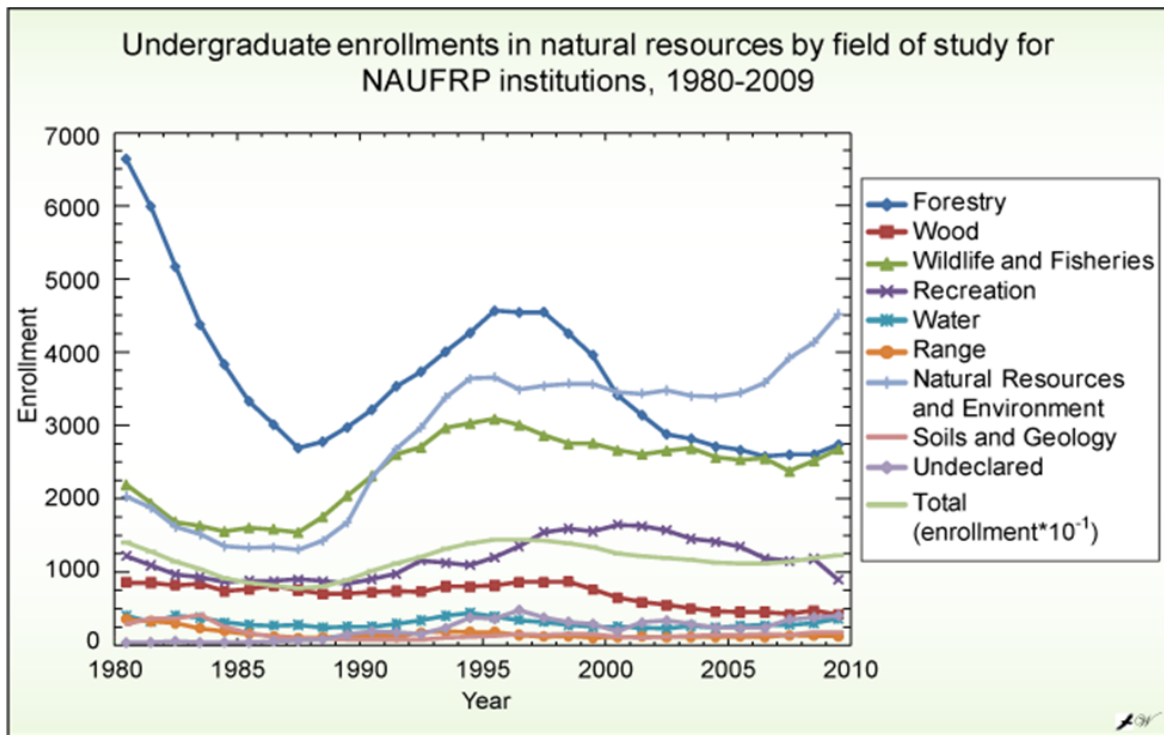


Figure 2. Undergraduate enrollments in natural resource by field of study for NAUFRP Institutions, 1980 – 2009 (Sharik, T. L. and P. A. Layton. 2010. Forestry Education in the USA in a Changing Social Climate. Presented to the International Symposium on Forestry Education, Vancouver, BC, May 18, 2010.)

Meanwhile, other authors such as Millenbah and Wolter (2009) have recognized that the “millennial students” are different and we may need new methods to teach them. They also found that there are different workplace demands and changes in employer expectations for what our students are learning. And finally, they suggest that faculty are becoming more specialized and may need to cultivate the ability to teach effectively in generalized undergraduate courses.

The challenges that we face in NAUFRP are evident across a wide range of disciplines. The Association of Public and Land-Grant Universities (APLU) and The Wildlife Society (TWS) are examples of organizations with similar studies and/or strategic planning efforts parallel to NAUFRP. We face these

challenges in a time of economic constraint in most public universities. Thus, we must seek to accomplish the educational goal of NAUFRP's Strategic Plan in a way that optimizes our educational resources. Accordingly, we must look to each other and to our partners, including professional societies, government agencies, environmental non-governmental organizations, foundations, and industry, to help with this effort. This strategy, designed to enhance undergraduate education, is written with NAUFRP and its partners as the audience.

To develop this strategy, the NAUFRP Education Committee has:

- 1) Created a searchable literature database on the scholarship of teaching and learning in natural resources that is now available to members on line;
- 2) Attended or reviewed processes in other organizations of similar nature;
- 3) Hosted an educational roundtable at the Cooperative Ecosystem Science Unit national meetings held in Washington, DC in June 2010;
- 4) Reviewed the NAUFRP diversity study; and
- 5) Met as a group to develop the following goals, objectives and action steps for the executive committee's review and input.

Educational Enhancement Strategy: Goals and Action Steps

Goal 1

Understand the supply of and demand for FRNR professionals in a way that allows us to more efficiently utilize our educational resources.

FRNR practices are rapidly changing as technology and research results are put into place that guides our future work. As a public good, albeit owned by both public and private owners, the demands for goods and services from our forested lands also have changed rapidly in the last two decades. With that, our professions must change to meet these new practices and expectations. Our academies must understand these changes and adapt our curriculum, teaching methods, recruiting strategies and placement efforts.

Objective A

Create and institutionalize an effective national system for determining levels of interest among high school students in pursuing degrees and careers in FRNR.

Action Steps:

- 1) Develop a survey instrument (or utilize existing ones) for periodic administration to high school students.
- 2) Utilize the results of the survey to determine projected undergraduate enrollments by field of study and levels of resources needed to accommodate these enrollments.

Objective B

Create and institutionalize an effective national system to collect and analyze data on student enrollments.

Action Steps:

- 1) Seek support for the collection of primary data on student enrollments via a web based system.
- 2) Seek support for the analysis of these data periodically for publication.

- 3) Investigate the potential cooperation and linkage for USDA's Food and Agriculture Education Information System (FAEIS) to strengthen natural resource education data bases.

Objective C

Create and institutionalize an effective national system to collect and analyze information on demand for FRNR professionals.

Action Steps:

- 1) Develop a broad-based employer survey for FRNR professionals (administered every 5 years).
 - a. Determine needs.
 - b. Determine competencies.
 - c. Determine importance of accreditation and certification in hiring decisions.
- 2) Develop a broad-based recent alumni survey for FRNR professionals (administered every 5 years).
 - a. Determine needs.
 - b. Determine competencies.
- 3) Perform an analysis (e.g., Sample, V.A. et. al (2000)) every 5 years with systematic data and analysis that identifies the gaps in general and technical knowledge, skills/abilities, and behaviors. This can be accomplished in partnership by professional societies –TWS and Society of American Foresters (SAF) and educational groups –NAUFRP and the National Association University Fish and Wildlife Programs (NAUFWP) by utilizing results of Action Steps 1 and 2 and summarizing the results for curriculum development.
- 4) Disseminate broadly, including to NAUFRP and NAUFWP institutions, partners/stakeholders, and accreditation and certification bodies.

Objective D

Develop effective methods to recruit the numbers, quality, and diversity of students needed in FRNR.

Action Steps:

- 1) Nationalize and institutionalize the Southern NAUFRP Recruiting Survey for foresters and add other natural resource majors –

automate via web with appropriate Institutional Review Board approvals within participating universities.

- a. Determine factors that influence students to choose a major.
 - b. Assess and disseminate techniques for effective recruiting.
 - c. Analyze demographic data.
- 2) Share survey results among NAUFRP member institutions so that they can more efficiently target recruiting efforts.
 - 3) Encourage the development of formal joint programs between and among 2- and 4-year institutions.
 - 4) Strengthen educational pathways into our university degree programs through strategic partnerships with K-12 systems.
 - 5) Market experiential learning opportunities in recruiting efforts.

Objective E

Develop effective methods to retain students in FRNR majors.

Action Steps:

- 1) Develop a survey and institutionalize the collection and analysis of data aimed at understanding why students remain in and leave FRNR programs.
- 2) Share survey results among NAUFRP member institutions so that they can more efficiently retain students.
- 3) Develop, implement, and share best practices for retention of students.

Goal 2

Enhance the educational process in a way that recognizes needed attributes of our students and provide faculty resources so that we produce the best student possible (effect positive change in the educational system).

Thirty years ago, many of us graduated with 150 semester credit hours, sometimes in 4 years but more often in more than 4 years. Today many universities are moving to 120 hours degree programs where students are strongly encouraged to graduate in 4 years or less. Faculty numbers are declining in many traditional areas due to early retirement programs and the elimination of positions as the result of budget-related problems. Most natural resource departments have many fewer faculty members now than 20 years ago. Combined with

the results of Goal 1, we must understand these changes and adapt our curriculum and teaching methods to these changes.

Objective A

Design curricula that provide the opportunity for students to acquire the knowledge, skills/abilities, and behaviors that reflect employer, societal, and environmental needs.

Action Steps:

- 1) Define, develop, and share core competencies.
- 2) Define, develop, and share specializations (links to certificate programs).
- 3) Ensure global perspectives within curricula:
 - a. Enhance and share "Study Abroad" opportunities
 - i. Agreements on transfer of credits
 - ii. Agreements on fees and tuition sharing
 - b. Encourage faculty exchanges
- 4) Provide new information gained from meetings such as the Biennial University Education in Natural Resources (UENR) conference. Proceedings should be continued at least as archived materials and linked to the NAUFRP web page.
<http://digitalcommons.usu.edu/cuenr/Sessions/>
<http://www.cnr.usu.edu/quinney/htm/publications/uenr>.
- 5) Work closely with accreditation and certification bodies to ensure that degree programs meet emerging societal needs.
- 6) Create FRNR*STEM Programs (see A.P.L.U. recommendations on AG*STEM). (National Research Council, 2009)

Objective B

Improve instructional practices, methods, and strategies that enhance learning (Pedagogy).

Action Steps:

- 1) Integrate experiential learning to include internships, field-based learning, service-learning, and undergraduate research.
- 2) Encourage non-credit internships, summer jobs, co-ops etc.
- 3) Support faculty professional development to enhance teaching skills.

- a. Enhance faculty understanding of student learning styles and instructional theory.
 - b. Mentor new faculty in the teaching arena.
 - c. Support faculty attendance at teaching conferences.
 - d. Recognize and reward effective teaching.
- 4) Support a national consortium for distance learning in natural resources (Ag*IDEA model).
 - 5) Share new technologies and best practices via communications on the NAUFRP website (includes UENR conference, etc).

Objective C

Develop an effective and efficient means of assessing outcomes related to teaching for continued improvement of degree programs and student learning

Action steps:

- 1) Fund study to determine what works well in FRNR outcomes assessment, which may involve alumni and employers, capstone courses and other vehicles to evaluate. Communicate results.
- 2) Consider national exit exam, e.g., SAF certified forester exam, as a tool for outcome assessment with results being annually communicated to individual schools to identify weaknesses and strengths by subject areas.
- 3) Fund studies to identify and communicate best practices to determine and accurately evaluate teaching effectiveness.

Goal 3

NAUFRP should develop and strengthen educational partnerships (e.g., CEDD, NAUFWP, Ecological Society of America (ESA), APLU, TWS, SAF, USDA, USDOJ, American Fisheries Society (AFS)) regarding undergraduate education with all stakeholders in natural resources in a way that leverages our mutual interests so that we produce the numbers, quality, and diversity of natural resource professionals needed for the future.

It will take a coordinated effort among colleges and universities, K-12 schools, professional societies, industry, government, and civil society to produce natural resource professionals capable of addressing the challenges

of the 21st century. This coordinated effort also will be necessary to build political support for this education agenda.

Objective A

Create a national Blue Ribbon Panel from partner organizations to develop a common agenda and leverage support for recommendations common to strategies being developed by partners.

Action Steps:

- 1) Obtain funding for Blue Ribbon panel to meet and develop ongoing dialogue and share strategic plans.
- 2) Develop common strategies and seek implementation support.

Objective B

Effectively engage agencies and other partners in the NAUFRP teaching mission.

Action Steps:

- 1) Develop professional mentoring programs with partners for our students
- 2) Eliminate barriers to participation of agency personnel in teaching activities such as leading undergraduate research projects and/or courses
- 3) Develop agency-sponsored internships with continuous funding that are tied to member schools.

Objective C

Develop a clearinghouse/portal for sharing the advancement of FRNR educational excellence.

Action Steps:

- 1) Obtain funding to develop and maintain clearinghouse.
- 2) Develop the content of a clearinghouse to include best practices for teaching, webinars, blogs, case studies, bibliographic database, etc.
- 3) Play a lead role in developing a clearinghouse with APLU, TWS, AFS, ESA, NAUFWP, and Council of Environmental Deans and Directors

(CEDD), as initial partners.

Objective D

Become active in organizations fostering FRNR education at the global level.

Action Steps:

- 1) NAUFRP education or international committee chair should participate in international activities and meetings of organizations such as the International Forestry Students' Association (IFSA), International Union of Forestry Research Organizations (IUFRO)-education committee, and International Partnership for Forestry Education (IPFE), and prepare a report for NAUFRP membership.
- 2) Invite international organizations to address NAUFRP general meeting to foster educational dialogue.
- 3) Determine potential for joint actions.

Goal 4

Promote research related to undergraduate education in FRNR programs.

Objective A

Obtain increased funding for educational research in FRNR to provide for continual improvement.

Action Steps:

- 1) Encourage the use of McIntire-Stennis funds for research projects involving teaching and learning in FRNR disciplines.
- 2) Encourage faculty to seek competitive funding for educational research.

Objective B

Ensure that faculty members receive appropriate recognition for the scholarship of teaching and learning.

Action Steps:

- 1) Encourage department heads and deans of programs that make up the NAUFRP membership to place appropriate weight on teaching

activities during annual performance reviews, promotion and tenure reviews, and the allocation of merit raises.

- 2) Encourage department heads and deans for programs that make up the NAUFRP membership to submit qualified candidates to university and national teaching award programs.
- 3) Develop and disseminate best practices for recognizing excellence in the scholarship of teaching and learning.

Objective C

Enhance faculty interaction on research relating to undergraduate education.

Action Steps:

- 1) Become a cooperating organization to the Journal of Natural Resources and Life Sciences Education.
- 2) Foster the publication of special issues of peer-reviewed journals on the scholarship of teaching and learning in FRNR.
- 3) Seek expansion of professional society sessions on education at national meetings.

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