UNDERGRADUATE ENROLLMENT TRENDS IN NATURAL RESOURCES AT NAUFRP INSTITUTIONS: AN UPDATE

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Undergraduate Enrollments in Natural Resources by Region for NAUFRP Institutions, 1980-2009

- Similar trends across all regions
- Peaks in early 1980s & mid 1990s
- Increasing since 2003-2004
- Overall decrease of 13% since 1980
Undergraduate Enrollments in Natural Resources by Field of Study for NAUFRP Institutions, 1980-2009

- “Natural Resources & Environment” eclipsing more traditional programs
Undergraduate Enrollments in Low-enrollment Fields, NAUFPRP Institutions, 1980-2009
Proportion of Undergraduate Enrollments by Field of Study

Proportion of undergraduate enrollments in various fields of study in natural resources for 1980, 1990, 2000 and 2009

- Undeclared (UND)
- Soils and Geology (SG)
- Natural Resources and Environment (NR/ENV)
- Range (R)
- Water (W)
- Recreation (REC)
- Wildlife and Fisheries (WF)
- Wood
- Forestry (FOR)

1980:
- WF: 17.7%
- NR/ENV: 13.3%
- FOR: 46.7%

1990:
- WF: 24.2%
- NR/ENV: 19.7%
- FOR: 31.8%

2000:
- WF: 21.1%
- NR/ENV: 23.4%
- FOR: 32.6%

2009:
- WF: 29.1%
- NR/ENV: 32.3%
- FOR: 22.5%
Degree Classifications

- **Forestry** (forestry, forest science, forest ecosystem science, forest resources, forest management, urban forestry, forest engineering/operations)
- **Wood Science/Products** (wood science, wood products, wood technology, forest products, paper science)
- **Fisheries & Wildlife**
- **Recreation** (recreation, tourism, parks, interpretation, communications)
- **Watershed Science/Management** (watershed science, watershed management, hydrology)
- **Range Science/Management** (range science, range management, rangeland resources)
- **Natural Resources/Environmental Management** (natural resources management; planning, policy, and economics; environmental management and science; environmental conservation; environmental studies; conservation management; conservation biology; restoration ecology/management; applied ecology; geography)
- **Soils & Geology**
- **Other** (landscape architecture, GIS, land surveying, spatial science, biotechnology, etc.)
- **Undeclared**
Range & Frequency of NRE Degree Names at NAUFRP Institutions (B.S. & Masters), March 2010

**Natural Resources/Management/Studies**
- Natural Resources (17)
- Natural Resources Management (7)
- Natural Resources Ecology & Management (1)
- Natural Resources Science & Management (1)
- Natural Resources Development (1)
- Natural Resource Studies (1)
- Natural Resources Stewardship (1)

**Natural Resources & Conservation**
- Natural Resources Conservation (1)
- Natural Resources Conservation & Management (1)
- Resource Conservation (2)
- Resource Conservation & Restoration Ecology (1)
- Conservation & Resource Studies (1)

**Conservation & Environment**
- Forest Conservation & Environmental Studies (1)
- Environmental Conservation Studies (1)

**Ecology & Environment/Natural Resources/Conservation**
- Applied Ecology & Environmental Studies (1)
- Conservation & Restoration Ecology (1)

**Ecosystems**
- Ecosystem Management (1)
- Terrestrial Ecosystems (1)
- Forest Ecosystem Science & Conservation (1)
- Ecosystem Science (1)

**Environmental Science/Management/Studies**
- (34)
Factors affecting Overall Trends in Natural Resource Enrollments

- Complex (multivariate)
- Trends differ from overall higher ed enrollments (which tract college age population)
Gender and Enrollment

U.S. enrollment, male and female
Total U.S. college age population male and female (age 20-24)

Year

Population (millions)
34 36 38 40 42 44

Enrollment (millions)
3.0 3.5 4.0 4.5 5.0 5.5

Legend:
- Undergraduate fall enrollment¹
- U.S. college age population²
- male
- female

¹ U.S. Department of Education 2010
² U.S. Department of Education 2010
Enrollment & Unemployment

Enrollment trends may be associated with larger trends in the economy...

[Graph showing total enrollments, total NAUFRP enrollments, and U.S. national unemployment rate from 1980 to 2009.]

Relativized:
- Undergraduate enrollment in U.S. degree-granting institutions
- NAUFRP Enrollment
- Unemployment rate

Sources:
1. U.S. Department of Education 2010
Possible Reasons for 1995-2003 Decline in Natural Resource Enrollments

1. Weak & uncertain job market
2. Low salaries compared to other professions
3. Increasing “disconnect” between natural resources & an urbanizing society (especially among young adults)
4. Tendency of minorities to avoid academic programs perceived as tangential to important issues affecting their communities
5. Negative public perceptions of forestry & related natural resource professions
6. Perception of curricula being too narrow & rigid
7. Increased “science phobia” on the part of students
8. Increasing number of similar degree programs outside colleges of forestry & natural resources
9. Relatively long period beyond a B.S. degree needed to obtain a terminal professional degree
10. Lack of intellectual leadership & charisma nationally in forestry & related natural resources areas
11. Limited public awareness regarding social benefits of forestry & related natural resource professions

Surveys of undergraduate forestry students lend some support for hypotheses 1, 2, 5, 7 & 11 (Sharik & Frisk 2008, 2010).
Reasons for Especially Sharp Declines in Forestry Enrollments

- Diversification of degree offerings in Natural Resources Colleges due to:
  - Changing public values towards forests (shift from utilitarian/economic view, to a broader array of ecosystem values) (Xu & Bengston 1991, MEA 2005)
  - Association of forestry with the utilitarian/economic perspective (Wellman 1987, Luckert 2006, Sharik & Frisk 2008 and 2010)
  - Inflexible curricula bound by accreditation standards compared to other natural resource fields
  - Declining harvest levels on National Forests – a resource typically managed by foresters
Forestry Enrollments & Logging Employment

Relativized NAUFRP forestry undergraduate fall enrollments, average annual logging employment, 1980-2009

Year

Relativized
Forestry enrollment
Logging employment

Conclusions

- Enrollments have varied significantly across time, but overall have decreased since 1980
- Trends experienced across all U.S. regions
- Reasons for changes in NR enrollments over time are complex, likely involving a number of demographic, economic & social factors
- NAUFRP institutions and public & private sector employers need a better understanding of the factors affecting:
  - Undergraduate & graduate enrollments
  - Job & career opportunities, both now and over the long-term
References Cited

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