Graduate Education for Future Foresters

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Changes Effecting Graduate Education

- Paradigm shift in natural resource management
- Professional graduate education as an outgrowth of, and linked to, undergraduate education
- New agenda for graduate education in 21st Century

Shifting Management Philosophy

- 20th Century
- Agricultural Model
- Utilitarian foundation
- Output oriented
- Stand level
- Timber primacy (sustained yield)
- Multiple use
- Fundamental research

- 21st Century
- Ecosystem Model
- Biocentric
- State oriented
- Landscape view
- Multi-resource (sustainability)
- Integrated use
- Integrative research

Why a Paradigm Shift?

- Changing societal values of a growing and urbanizing population
- Growing awareness of the ecological and environmental implications of climate change and population growth
- Concern over loss of biodiversity in managed forests, invasives, endangered species, wildfire, water, and forest health (insects and diseases)

Why a Paradigm Shift?

- Recognition that we live on a human dominated planet
- Man greatly influences our ecosystems in a complex fashion over many dimensions and scales and has done so for years
- Ecosystems do not attain a stable equilibrium but, instead, are open systems always in flux
- Both natural and man-caused disturbances play a significant role in ecosystem health

Why a Paradigm Shift?

- Affluent population with leisure time and disposable income
- Global economy and trade
- Societal preferences for:
  - protection vs. production forests
  - natural vs. plantations forests
  - preservation vs. conservation (for recreation and solitude)
  - desire for passive vs. active management

21st Century Environment

- Reducing risk of forest loss may replace productivity as the principal concern of managers
- Increasing forest resiliency for sustainability will grow more important
- Suggests that graduate education must change to keep pace

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Forestry Higher Education

- Basic undergraduate education in forestry started at Yale at beginning of 20th Century
- Followed the agricultural model (mensuration, fire protection, timber harvesting, economics, silviculture, soils, etc.)
- Heavy emphasis on technical field skills for entry-level positions
- Usually well structured programs (few electives)
- Curriculum content heavily influenced by employers and accrediting bodies

Forestry Higher Education

- Basic undergraduate forestry education served society well during most of the 20th Century
- Most forestry schools changing their curricula to meet the new challenges of the 21st Century

Forestry Higher Education

- Educate as team member, problem solver, and integrator
- Stress concepts, principles, and theories over facts (social, ecological, and economic)
- Reduce specialization at undergraduate level
- Prepare students for post-graduate education (if desired)
- Include global perspective throughout

Professional Graduate Education

- Linked undergraduate – professional Master's programs (a 4 -1 model)
- Provide a broader science-based undergraduate education followed by professional Master's education
- Develop more distance learning professional Master's modules for time/place bound students

Professional Graduate Education

- Professional (MF) vs. learned (MS, PhD) degree programs
- Eight schools have SAF accredited Master's programs (April 2007)
- Six offer a MF, one a MS and one a MFR in Forest Management
- Yale and Duke offer only a MF degree; University of Michigan offers only an MS; University of Washington offers an MFR
- Four schools also offer accredited BS degrees; University of Washington offers a BS (non-accredited)

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Possible Graduate Research Focus (MS, PhD)

- To discover and understand ecosystem processes, develop new approaches for the use and protection of natural resources and environmental services, and understand human behavior and decisions about natural resources

Source: Don DeHayes, President, NAPFSC, 2004

McIntire-Stennis Strategic Plan

- Major components
  - Foundation areas of knowledge
  - Emerging and integrative areas of knowledge
    - New science of integration
    - Forest ecosystem services
    - Human attitudes and behavior
    - Conflict, uncertainty and decision-making
    - Technology advancements and forest applications
    - New applications for forest products
    - Urban ecosystems

Source: Sustaining Healthy and Productive Forests, NAUFRP, 2007

Emerging Graduate Areas

- Landscape analysis
- Spatial analysis and information management
- Watershed science and planning
- Forest ecosystem health and restoration
- Risk analysis (ecological and economic components)
- Bio-resources science and engineering

Source: National Graduate Education Needs and Priorities, NAPFSC, 2003

Graduate Education in 21st Century

- Integrate social and ecological issues holistically
- Maintain disciplinary depth and provide greater breadth
- React to rapid change in an uncertain world
- Collaborate in an interdisciplinary environment
- Support development of a new science of sustainability to integrate ecological and economic approaches in a socially acceptable manner

The End