

Welcome Statement

Dear prospective graduate student,

Thanks for your interest in the School of Forest Resources and Environmental Science's graduate programs at Michigan Technological University. Our school offers graduate programs leading to seven different degrees:

- **Master of Science in Forestry (M.S.)**
- **Master of Science in Forest Ecology and Management (M.S.)**
- **Master of Science in Applied Ecology (M.S.)**
- **Master of Science in Forest Molecular Genetics and Biotechnology (M.S.)**
- **Master of Forestry (M.F.)(Professional MS degree)**
- **Doctor of Philosophy in Forest Science (Ph. D.)**
- **Doctor of Philosophy in Forest Molecular Genetics and Biotechnology (Ph. D.)**

The following information serves as a general guideline for prospective Masters and Ph.D. students. Basic academic requirements for each degree program are presented along with the information on the past theses and dissertations written by our graduate students. We also have included description of research interests of our faculty members.

For those of you who plan on entering our graduate programs, we welcome you and wish you all the best in your graduate studies. Please do not hesitate contacting me if you have any questions.

Chandrashekhar P. Joshi

Professor and Graduate Program Director

School of Forest Resources & Environmental Science

Michigan Technological University

Tel: 906-487-3480; Fax: 906-487-2915; E-mail: cpjoshi@mtu.edu

Graduate studies web site: <http://forest.mtu.edu/gradstudies/>

Modified on January 9, 2009

Table of Contents

Welcome Statement	1
Table of Contents	2
General Information for Prospective Students	3
Admission Requirements	4
General Program Information	5
MASTERS DEGREE PROGRAMS	8
Recent Master’s Thesis and Reports	10
DOCTORATE DEGREE PROGRAMS	17
Recent Ph.D. Dissertations	18
List of Graduate Faculty from SFRES	19
Code of Conduct	21
Course Work Offerings	23

General Information for Prospective Graduate Students

Master's and Ph.D. Applicants

Thank you for your interest in our graduate degree programs. We presently have over 75 students in our graduate programs.

Applicants admitted to our graduate programs typically have a 3.0 or better undergraduate grade point average (GPA) on a 4.0 scale and Graduate Record Exam (GRE) scores above 500 in each of verbal and quantitative sections. They also have a score of 3.5 or higher in the analytical section.

International student applicants must also have completed the Test of English as a Foreign Language (TOEFL) exam. A TOEFL score of 550 (213 on the computer-based test or 79 on the internet-based test) is recommended by the Graduate School. Applicants who have completed a degree in the US may have the TOEFL requirement waived by the Dean of the Graduate School so such applicants are advised to contact MTU's Graduate Program Dean Dr. Jacqueline Huntoon directly for such a waiver (jeh@mtu.edu). Please contact our Graduate Program Director, Dr. C.P. Joshi if you have any questions about these minimum admission requirements (cpjoshi@mtu.edu).

FUNDING: There are a number of research assistantships available within the School of Forest Resources and Environmental Science. Students who are **highly recommended** by our faculty members have a higher chance of getting such assistantships. Therefore, most preferred way of inquiring about such assistantships is to **directly contact a faculty member working in your area of interest** and inquire whether 1) they are accepting new students in their programs, 2) they have a project of interest for you, and 3) they have any funding to offer. Alternatively, we will also try to match your interests with a faculty member. Research assistantship awards are based on your past academic credentials, GRE scores, TOEFL scores (for international students), areas of interest, prior research experience, recommendation letters and availability of funds in your area of interests. University Ph.D. fellowships are also available on a competitive basis. All students are automatically considered for funding when their applications are reviewed. We accept applications on a rolling basis so there is **no set deadline** for applications but it is advised that you apply at least a semester in advance of your projected admission to improve your chances of receiving funding.

It is strongly recommended that prospective graduate students should directly contact SFRES faculty members working in their areas of interests to discuss possible research topics and funding opportunities and **include the names of such faculty members in their letter of intent.**

The School's seven graduate degree programs are:

- **Master of Science in Forestry (MS)**
- **Master of Science in Forest Ecology and Management (MS)**
- **Master of Science in Applied Ecology (MS)**
- **Master of Science in Forest Molecular Genetics and Biotechnology (MS)**
- **Master of Forestry (MF) (Professional degree)**
- **Doctor of Philosophy in Forest Science (Ph. D.)**
- **Doctor of Philosophy in Forest Molecular Genetics and Biotechnology (Ph. D.)**

We also have a directed program for potential Peace Corps volunteers:

- **Master's International Program in Forestry (Any student in this directed program can elect to get a degree in one of the MS degree programs listed above.**
www.peacecorps.mtu.edu)

Admission Procedures for Prospective Students

There are **TWO** sets of **required materials** you need to submit in order to apply to our graduate programs. This procedure is common to all our programs as listed below:

Set 1 goes to: Michigan Technological University's Graduate School

Required materials:

- Graduate Application
- **Original** transcripts of all college work
- TOEFL scores (international students only)
- Application fee: **No application fee!**

Send these materials from set 1 to:
The Graduate School
Michigan Technological University
1400 Townsend Drive
Houghton, Michigan 49931-1295

Or apply online at <http://www.admin.mtu.edu/rgs/graduate/apply.html>

Set 2 goes to: School of Forest Resources and Environmental Science

Required materials:

- GRE scores (all students) – Note: Only the general GRE scores are needed. Test results should be sent directly to us by ETS. Our code number is **1464**.
- Personal Résumé
- One to two-page description of your anticipated area of study/research. Please do indicate the name(s) of the desired faculty advisor(s) and the name of the program and general area of your research interest. (Peace Corps/MI and MF program students need not include this)
- Statement of purpose outlining your motivation for joining our graduate program (1-3 pages)
- Three (3) confidential letters of recommendation. Please visit http://www.gradschool.mtu.edu/applyonline/recommendation_form.pdf, print one form each for each of your references, sign and give it to your references for direct mailing to Dr. Joshi or give it back to you in a sealed envelope and you could send it to us along with other materials in set 2.

Send these materials from set 2 to:
Dr. C. P. Joshi
Graduate Program Director
School of Forest Resources and Environmental Science
Michigan Technological University
1400 Townsend Drive
Houghton, Michigan 49931-1295

PLEASE NOTE: Your application **CANNOT** be reviewed until **ALL** of the required materials listed above are received. Applications will be accepted throughout the year. However, it is recommended that for fall enrollment, apply by May 1 and for spring enrollment apply by September 1. Please contact Dr. Joshi if you have any questions.

Your application will be processed in a timely manner, provided all of the pre-enrollment requirements have been met [If you believe that an excessive amount of time has elapsed without a response from MTU, please contact the Dr. Joshi in the School of Forest Resources and Environmental Science at 1-800-WOODS-MI or (906) 487-3480 (or E-mail cjoshi@mtu.edu) or the MTU Graduate School Office (906) 487-2327.

General Program Information for All Graduate Students

There are two general areas of research interests within our graduate programs:

- 1) Forest Sciences including Forestry, Forest Ecology and Management, and Wood Science**
- 2) Forest Molecular Genetics and Biotechnology**

The following is a description of these two areas and degrees offered within each of these areas.

- Forest Sciences -

Students interested in forest sciences come from a wide variety of backgrounds, including areas such as biology, zoology, agricultural sciences, wildlife, geology, entomology, pathology, soil science, microbiology, applied mathematics, physics, and chemistry. They are interested in working in either the public or private sector with rewarding careers in such areas as forest ecology, forest soils, silviculture, tree improvement, forest wildlife ecology and management, economics, inventory, geographic information systems, growth and yield, wood science and forest biology.

Individual student programs vary according to the backgrounds and career objectives of the students. Programs of study are developed to include courses in a particular career area coupled with a strong quantitative background. While in graduate school, students are encouraged to attend national conferences, local seminars, and to interact with scientists from the nearby USDA Forest Service research station and Isle Royale National Park.

We offer four Masters degree programs and one PhD degree program in the area of Forest sciences. They are as follows:

- **Master of Science in Forestry**
- **Master of Science in Forest Ecology and Management**
- **Master of Science in Applied Ecology**
- **Masters of Forestry (Professional degree)**
- **Doctor of Philosophy in Forest Science**

We also have a directed program for potential Peace Corps volunteers:

- **Master's International Program in Forestry**

Note: Any student in these directed programs can elect to get a degree in one of the MS degree programs listed above.

Potential topic areas within our degree programs are:

Agroforestry
Biogeochemistry
Biometrics
Community Forestry
Conservation Biology
Ecological Modeling
Ecophysiology
Ecosystem Ecology
Ecosystem Science
Environmental History
Environmental Policy
Environmental Studies

Forest Ecology
Forest Entomology
Forest Management
Forest Pathology
Forest Soils
Forestry and International Development
Geographic Information System (GIS)
Global Change Biology
Landscape Ecology
Plant Ecology
Microbiology
Molecular Biology
Molecular Ecology
Mycorrhizal Community Dynamics
Mycorrhizal Ecology
Ornithology
Remote Sensing
Restoration Ecology
Silviculture
Soil Ecology
Tropical Ecosystems
Wetland Ecology
Wildlife Ecology and Management
Wood Chemistry
Wood Composites
Wood Decay and Preservation

- Forest Molecular Genetics and Biotechnology (FMGB) -

Graduate students interested in Forest Molecular Genetics and Biotechnology come from a wide variety of backgrounds, including such areas as forestry, biology, zoology, microbiology, agricultural sciences, wildlife, entomology, pathology, soil sciences, applied mathematics and statistics, computer science, physics, and chemistry. These graduate degrees emphasize intensive hands-on molecular biology research matched with excellent laboratory, greenhouse, and field trial facilities, producing a student with a solid understanding of growth and developmental processes in trees and other life forms. Study prepares students for leadership in either the public or private sector with career development in the fields of biotechnology, molecular medicine, molecular genetics, forest and ecological genetics, and forest bioinformatics.

Individual student programs vary according to the backgrounds and career objectives of the students. Programs of study are developed to include courses in a particular career area coupled with a strong background in laboratory methods. While in graduate school, students are encouraged to attend national conferences, local seminars, and to interact with scientists from the nearby USDA Forest Service research station and Isle Royale National Park. Most of our faculty are also members of Biotechnology Research Center, a campus-wide biotechnology research network.

Graduate studies in *Forest Molecular Genetics and Biotechnology* research leads to the following degrees:

- **Master of Science in Forest Molecular Genetics and Biotechnology**
- **Doctor of Philosophy in Forest Molecular Genetics and Biotechnology**

Potential topic areas within our programs are:

Bioinformatics

Biotechnology

Cellulose biosynthesis

Climate Change and forest productivity

Demographic and genetic elements of population biology

Phenylpropanoid metabolism

Functional genomics

Gibberellins metabolism and signal transduction pathways

Molecular regulation of growth and defense tradeoffs

Lignin biosynthesis

Microarray and metabolite profiling

Molecular biology of adventitious and lateral root formation

Molecular ecology

Mycorrhizal community dynamics

Small RNA (microRNA) regulation of wood formation

Wood Formation

Woody plant tissue culture and transformation

MASTERS DEGREE PROGRAMS

The School of Forest Resources and Environmental Science at Michigan Technological University offers a variety of Master of Science degrees in forest sciences and molecular genetics, which services students who desire Plan A (thesis option), B (report option), and C (course work only option) Masters degree programs.

Master of Science in Forestry (Plan A, B and C)

The School of Forest Resources and Environmental Science at Michigan Technological University presently offers a Master of Science in Forestry, which services students who desire Plan A, B, and C Masters degree programs in forest ecology, forest management, molecular genetics, wildlife ecology and wood science. Contact: Dr. Linda Nagel (lmnagel@mtu.edu)

Master of Science in Forest Ecology and Management (Plan A, B, C)

The Master of Science in Forest Ecology and Management degree program (Plans A, B, and C) will be directed at students doing research projects or acquiring a course work-only degree in the fields of forest ecology and forestry. The program will encompass students studying in the areas of forest ecology, forest soils, entomology, silviculture, forest management, biogeochemistry and nutrient cycling, forest productivity, wetland and riparian ecology, forest policy, forest protection, and remote sensing and geographic information systems. Contact: Dr. Chris Webster (cwebster@mtu.edu)

Master of Science in Applied Ecology (Plans A, B, and C)

The Master of Science in Applied Ecology degree program (Plans A, B, and C) will be directed at students doing research projects or acquiring a course work-only degree in the fields of forest ecology and forestry. The program will focus on the study of forest biodiversity, invasive species, conservation biology, wildlife management, avian and mammalian ecology, population dynamics, and wildlife habitat. Contact: Dr. David Flaspohler (djflaspo@mtu.edu) for more information on this program.

Master of Forestry (Plan B and C)

The Master of Forestry (M.F.) degree program is intended for students who have completed a bachelors degree in another field, but wish to redirect their career to forestry. The entire curriculum for this program is required courses, although electives can be selected if a student enters with credit for some of the classes. This program is designed as a course work program (Plan C), but students can elect to include a limited research project with the associated report (Plan B). Contact: Dr. Jim Pickens (jpickens@mtu.edu) for more information on this program.

Master of Science in Forest Molecular Genetics and Biotechnology (Plans A, B, C)

The Master of Science in Forest Molecular Genetics and Biotechnology degree program (Plans A, B, and C) will be directed at students doing research projects or acquiring a course work-only degree in the fields of forest ecology and forestry. The program will provide skills and knowledge in the areas of genetic engineering of trees, lignin and cellulose biosynthesis, tree genomics and bioinformatics, genetic control of flowering and pollution tolerance in trees and molecular ecology. Please contact Dr. Victor Busov (vbusov@mtu.edu) for further information on this program.

Peace Corps Masters International Directed Programs

LORET MILLER RUPPE MASTER'S INTERNATIONAL PROGRAM

The Master's International Program is a partnership between Michigan Tech and the Peace Corps, which affords students the opportunity to incorporate Peace Corps service into a graduate program in forestry or forest ecology and management. The program involves nine months of intensive forestry education at Michigan Tech and two years of fieldwork with Peace Corps. The first fall semester (commonly known as Integrated Field Practicum) is located at the Ford Center and Research Forest in Alberta, Michigan and focuses on fundamental field skills in forestry or applied ecology. The spring semester is spent at the Michigan Tech campus in Houghton, Michigan. Students then take part in three months of Peace Corps technical, cross-cultural and language training in the country where they will work. This is followed by two years of Peace Corps service working to improve the environment with people who use and depend upon a healthy ecosystem for their livelihoods and that of their children. Students will return to Michigan Tech to complete their degree, typically in one additional academic semester.

The Master's International Program is designed for students who hold an undergraduate degree and demonstrate an interest in the environment, international development, and community service. The program will consider applicants with any undergraduate major. The only class prerequisite is one semester or one quarter of college-level chemistry. Students may be accepted contingent upon completion of a chemistry course. One course in introductory statistics is recommended, but not required. Students without a statistics course will be required to take an introductory statistics course as part of their program of study. A second language, especially French, followed by Spanish, is considered desirable from the applicant's perspective. If you have one year of college-level or two years of high school-level language, it will open up a wider set of possible placements within Peace Corps. If you haven't taken a language course and are still in an undergraduate program, you should consider taking a year of French, Spanish, or Arabic.

Students must also apply to and be accepted by the Peace Corps. Students should indicate their interest in the Master's International Program on the Peace Corps application. Once the application is received, the student will be assigned a recruiter who will guide him/her through the Peace Corps application process.

Students participating in the Master's International Program at Michigan Tech receive a Master of Science in Forestry or a Master of Science in Forest Ecology and Management as well as all of the benefits associated with Peace Corps service. Peace Corps benefits include transportation to and from the assigned country, a monthly living allowance, a \$6,000 readjustment allowance disbursed when the student completes two years of Peace Corps service, medical care and coverage while a Peace Corps volunteer, and noncompetitive eligibility for federal jobs. In addition, students do not pay tuition or fees to Michigan Tech for academic credit earned while in the Peace Corps. Please contact Dr. Blair Orr (bdorr@mtu.edu or 1-800-966-3764) for more information on this program.

Further information about the Peace Corps is available by calling 1-800-424-8580, option "1" after you connect, or by accessing the Peace Corps web site (<http://www.peacecorps.gov>). The Michigan Tech Peace Corps URL is <http://peacecorps.mtu.edu/>

Recent Master Theses & Reports (Updated 1/9/2009)

Butler Patricia. 2008. Composition of Solid Waste in the Municipal Dump in Berd, Armenia. MS Forestry (Orr)

Rhoades Jason. 2008. Impacts of Deforestation and Land Cover Change on Mountain Soils in Hrazdan, Armenia MS Forestry (Orr)

Vital, Jessie. 2008. Land Use/Cover Change Using Remote Sensing and Geographic Information Systems: Pic Macaya National Park, Haiti. MS Forest Ecology and Management (Maclean).

Rouse, Lisa. 2008. Characterizing Ozone Tolerance in Poplar: Implications for Carbon Sequestration. MS Forest Molecular Genetics and Biotechnology (Burton)

Frederick, Janet. 2008. Ash Resources Threatened by the Emerald Ash Borer (*Agrilus planipennis* Fairmaire) in Recreational Areas throughout Michigan. MS Forest Ecology and Management (Storer)

Carpenter, Rachel. 2008. Assessment of Motivation and Performance in an Integrated Field Practicum for Ecologists and Foresters. MS Forestry (Nagel)

Chen Han-Yi. 2008. Characterization of Two Distinct 4-coumarate:CoA ligase Genes in Loblolly Pine (*Pinus taeda*). MS Forest Molecular Genetics and Biotechnology (Tsai)

Potvin, Lynette. 2008. An Investigation of Mosaic Stunting in Jack Pine Nursery Seedlings. MS Forest Ecology and Management (Jurgensen)

Roosien, Bryan. 2007. Plant Communities Associated with Native Monterey Pine (*Pinus radiata*) Forests. MS Forestry (Storer and Orr)

Rosengarden, Casey. 2007. Land Management Strategies and Fuelwood Collection in the Indigenous Ngäbe Village of Hato Horcón, La Comarca Ngäbe-Buglè, Panamá. MS Forestry (Orr)

Shartell, Lindsey. 2007. Risk Assessment for Invasive Exotic Plants using Predictive Modeling. MS Forest Ecology and Management (Nagel)

Satterlee, Brian. 2007. Maize Yield and Soil Properties Response to *Entada abyssinica* Cuttings in the Adamawa Lowlands, Cameroon. MS Forestry (Orr)

Kenny, Amber. 2007. Resource Allocation of Teak (*Tectona grandis*) for Small Landholders in Togo West Africa. MS Forestry (Orr)

Colling, Trisha. 2007. Discovery of an Activation Tagged Auxin Transporter in Poplar. MS Forest Molecular Genetics and Biotechnology (Busov)

Hancock, Jessica. 2007. Plant Growth Biomass Partitioning and Soil Carbon Formation in Response to Altered Lignin Biosynthesis in *Populus tremuloides*. MS Forest Ecology & Management (Pregitzer and Giardina)

Szczechowski, Bruce. 2007. Polychlorinated Biphenyl (PCB) Trends in Common Tern (*Sterna hirundo*) Eggs from the Detroit River and Michigan Great Lakes: 1972-2004. MS Applied Ecology (Gale)

Mason, Lacey. 2007. GIS Modeling of Riparian Zones Utilizing Digital Elevation Models and Flood Height Data. MS Forestry (Maclean)

Eberhart Tara. 2007. Emerald Ash Borer: Host Preferences of a Newly Established Population and Development of Silvicultural Management Tools. MS Forest Ecology & Management (Storer)

Gahagan, Adam L. 2007. Carbon Cycling and Storage after 60 Years of Stand Development in Red Pine (*Pinus resinosa*) Plantations and Mixed Hardwood Stands in Northern Michigan Old Fields. MS Forestry (Giardina)

Janowiak, Maria. 2007. Stand Structure and Diameter Distributions in Uneven-aged Northern Hardwoods. MS Forest Ecology & Management (Nagel)

McClure, Jason D. 2006. Hydrologic Contributions to Baseflow for a Northern Old-Growth Riparian Ecotone. MS Forest Ecology & Management (Giardina)

Paulete, Francisca E. 2006. The Gambia All Schools Tree Nursery Competition: Promoting Conservation in the Gambia through Grassroots Environmental Education. MS in Forestry (Orr)

Joshua L. Reed. 2006. Stand age and overstory effects on wood decomposition in Northern Great Lakes red pine and aspen. MS Forestry (Jurgensen).

Joshua Shields. 2006. Initial Effects of Group Selection with Seed-Tree Retention on Biodiversity in Northern Hardwoods. MS Forest Ecology & Management (Webster)

Rewati R. Potkar. 2006. Populus Micro-RNA and their Regulatory Role In Vegetative Dormancy. MS Forest Molecular Genetics and Biotechnology (Busov)

Rachel Tarpey. 2006. The Long-Term Effects of Silvicultural Thinning on Soil Physical Properties, Carbon, and Nitrogen Pools in a Red Pine (*Pinus resinosa* Ait.) Forest. MS Forest Ecology and Management (Jurgensen)

Asha Latha Lakkavaram. 2006. Comparative Bioinformatics Analysis of Cellulose Synthases in *Arabidopsis thaliana* and *Populus trichocarpa* Genomes. MS Forest Molecular Genetics and Biotechnology (Joshi)

Robin M. Johnson. 2006. Concentration of sugars, phenolic acids, and amino acids in the soil of forests exposed to elevated atmospheric CO₂ and O₃. MS Applied Ecology (Pregitzer)

Janet Bandeff. 2006. Understory ¹⁵N Acquisition and Methods for Determining δ¹³C of Soil Respiration: Two Stable Isotope Studies. MS in Forest Ecology and Management (Pregitzer)

Fanny Lys Casado Pena. 2006. Tradeoffs between Growth and Condensed Tannins-Phenolic Glycosides Levels in Foliar Tissues of Salix. MS Forest Molecular Genetics and Biotechnology (Tsai/Harding).

Pilon, Crystal. 2005. Effectiveness of a Nondestructive Evaluation Technique for Assessing Standing Timber Quality. MS in Forestry (Erickson/Gale)

Lund, Jennie M. 2005. Garlic Mustard (*Alliaria petiolata*) Germination at Different pH Levels and Detection and Control in the Upper Peninsula of Michigan. MS Forest Ecology & Management (Nagel)

Zumstein, Matthew D. 2005. The USDA Forest Service, Public Participation and Content Analysis. MS Forestry (Halvorsen)

Huntzinger, Brett. 2005. Winter Wolf Kill Rates of White-Tailed Deer in the Upper Peninsula of Michigan. MS Applied Ecology (Vucetich/Peterson)

Manarolla, Michelle. 2005. Breeding bird community structure in developed and undeveloped areas along the Lake Superior shoreline. MS in Applied Ecology (Flaspohler)

Ely, Marjorie D. 2005. Analysis of Renewable Energy Project Implementation: Biogas and Improved Cook Stoves in the Village of Chhaling, Bhaktapur District, Nepal. MS in Forestry (Orr)

Henry, Brian P. 2005. Monterey Pine (*Pinus radiata* D. Don) in California: Variation Among Native Forests and Forest Health as a Predictor of Tree Removal in Urbanized Forests MS Forestry (Storer)

Zerbock, Olaf. 2005. Land Use and Water Quality in El Corpus, Choluteca, Honduras. MS Forestry (Orr)

Calhoon, Emily. 2005. Nitrogen, Carbon, and Vegetation Dynamics in Subsurface Water of a Managed Forested Wetland. MS Forest Ecology and Management (Gale)

Robinson, Sara Craig. 2005. Fungal Interaction in Sugar Maple: The Development of Spalting and its Impact on Machinability. MS. (Laks/Richter)

Griggs, Jennifer. 2005. Simplified Floral Diversity and the Legacy of a Protected Deer Herd in the Agricultural Woodlots of Cade Cove, Great Smoky Mountains National Park. MS. (Webster)

Kruger, Laura. 2005. Evaluation of Stable Isotopes as a Tool to Delineate Geographic Catchment Areas of Little Brown Bat Hibernacula in Western Upper Michigan. MS. (Peterson)

Neuendorff, Jonathan. 2005. Stand Structure and Composition in a Northern Hardwood Forest After 40 Years of Single-Tree Selection. MS. (Nagel)

Powers, Matthew. 2005. Causal Mechanisms and Impacts of Pennsylvania Sedge Dominance in Wisconsin's Northern Hardwood Forests. MS. (Nagel)

- Zanin, Daniella.** 2005. Feasibility of Teak Production for Smallholders in Eastern Panama. MS. (Orr)
- Vehring, Jon.** 2005. Effect of Manufacturing Variables on Mold Susceptibility of Wood-Plastic Composites. MS. (Laks)
- Desantis, Ryan.** 2004. Post-harvest Effects of Mechanical Treatment and Prescribed Fire on Jack Pine (*Pinus banksiana*) Forest Biodiversity. MS. Applied Ecology (Storer)
- Brodeur-Campbell, Sarah.** 2004. Insect Herbivory on Low-Lignin Transgenic Aspen. MS. (J. Vucetich)
- Durham, Andrea.** 2004. Social Network Analysis of Women, Resources, and Community in Angia, Ecuador. MS. (Orr)
- Eikenberry, Jennifer.** 2004. Chronic Nitrate-Addition Alters Northern Hardwood Root and Leaf Litter Chemistry. MS. (Pregitzer)
- Filius, Kara.** 2004. 100% Inventory Methods for Urban Parks in Khimelnitsky, Ukraine. MS. (Orr)
- Graham, Elizabeth.** 2004. Disruption of the Response of Bark Beetles (Coleoptera: Scolytidae) to Compounds that Elicit Adult Aggregation in the Upper Peninsula of Michigan. MS. (Storer)
- Gurganus, Greer.** 2004. A Study of the Farming System and Technology Adoption in Yade-Bohou, Togo. MS. (Orr)
- Hubscher, Sandra.** 2004. Cryopreservation of Transgenic *Populus Tremuloides* Using a Vitrification Protocol. MS. (Tsai)
- Johansen, Angela.** 2004. Ammonium and Nitrate Uptake by *Populus tremuloides* in an Elevated carbon Dioxide and Ozone-Atmosphere. MS. (Friend)
- Judd, Matthew.** 2004. Introduction and Management of Neem (*Azadirachta indica*) in Smallholder's Farm Fields in the Baddibu Districts of the Gambia, West Africa. MS. (Orr)
- Keinath, Sara.** 2004. Environmental Education and Perceptions in Eastern Nepal: Analysis of Student Drawings. MS. (Orr)
- Lincoln, Kathryn.** 2004. The Use and Potential of the Pita Plant, *Aechmea Magdalenae* (André) André Ex. Baker, In a Ngõbe Village: A Case Study of Chalite, Bogas Del Toro, Panama. MS. (Orr)
- Musolf, Joseph.** 2004. Multi-dimensional Density Management Diagrams and Stand Structure Influence on Ground Flora for Jack Pine in the Sandy Outwash Plains of Michigan's Upper Peninsula. MS. (Nagel)
- Marshall, Jordan.** 2004. Biological Control and Ecological Impacts of Spotted Knapweed (*Centaurea Maculosa*) in the Upper Peninsula of Michigan. MS (Storer)

- Schwartz, Joseph.** 2004. Stand Dynamics and Silvicultural Recommendations for Uneven-Aged Northern Hardwoods in Upper Michigan. MS. (Nagel)
- Snively, Marian.** 2004. A Comparative Study of Cadmium and Copper in Ruffed Grouse (Bonasa Umbellus) From the Keweenaw Peninsula and Northern Wisconsin. MS. (Orr)
- Slatton, Russell.** 2004. An evaluation of Agricultural Adoption by Ngöbe Farmers in Chalite, Panama. MS. (Orr).
- Taylor, Jennifer.** 2004. Wetland Development and Genetic Diversity of *Sarracenia purpurea* L. (pitcher plant) in the Western Lake Superior Basin. MS. (Gale)
- Tischler, Keren.** 2004. Aquatic Plant Nutritional Quality and Contribution to Moose Diet at Isle Royale National Park. MS. (Peterson)
- Wangen, Steven.** 2004. Spatial and Temporal Dynamics of an Introduced Tree Species as it Invades a Temperate Forested Island. MS. (Webster)
- Aragona, Franklyn.** 2003. A Case Study of Onion Production in the Tipajara Watershed, Mizque Bolivia. MS. (Orr)
- Downs, C. Michael** 2003. Hearth Fuel Acquisition and Use in Morocco's Imnane Valley. MS. (Orr)
- Jones, Michael.** 2003. Evaluation of Honduran Forest Cooperatives: Five Case Studies. MS. (Orr)
- Joyce, Susan.** 2003. Pleasing All of the People None of the Time: The Challenges of Forest Planning. MS. (Halvorsen)
- Kaplan, Joseph.** 2003. Human Recreation and Loon Productivity in a Protected Area, Isle Royale National Park. MS. (J. Vucetich)
- Karberg, Noah.** 2003. Influence of Soil pCO₂ on Dissolved Inorganic Carbonate Chemistry Under Elevated CO₂ and O₃ MS. (Pregitzer)
- Kinouchi, Michiko.** 2003. The Relative Abilities of Northern Conifers to Sequester Carbon in the Upper Peninsula of Michigan. MS. (Karnosky)
- Nakoulima, Angela.** 2003. Public Participation in National Forestland and Resource Management Planning. MS. (Halvorsen)
- Owens, Kristina.** 2003. Genetic Diversity of Annona cherimola Mill in South Central Bolivia. MS. (Orr)
- Owens, Wendy A.** 2003. Riparian Buffer Zones of the Ybytyruzú Mountain Range, Paraguay. MS. (Orr)
- Potvin, Marcel J.** 2003. A Habitat Analysis for Wolves in Michigan. MS. (Peterson)

- Wright, Gregory J.** 2003. An Analysis of the Northern Yellowstone Elk Herd: Population Reconstruction and Selection of Elk by Wolves and Hunters. MS. (Peterson)
- Amend, Joshua D.** 2002. Risk and Coffee Production in Mhaji, Tanzania. MS. (Orr)
- Blumer, Sara.** 2002. Characterization of a *Populus tremuloides* 5-Hydroxyconiferaldehyde O-methyltransferase (AsdOMT) Gene Promoter. MS. (Tsai)
- Campbell, Madeline I.** 2002. Spatial Variation in Stand Structure and the Role of Moose Herbivory at Isle Royale National Park, Michigan. MS. (Peterson)
- Cohen, Matthew E.** 2002. Utilizing Microcatchment Systems to Increase Tree Establishment Rates in the Bolivian High Plains. MS. (Orr)
- Crawford, Jeffrey N.** 2002. The Effects of Nitrogen Amendments on Belowground Carbon Cycling in Second Growth Sugar Maple Forests Along a Climatic and N-Deposition Gradient in Michigan, USA. MS. (Pregitzer)
- Fox, Susan G.** 2002. Analysis of Ecotourism: The Municipal Reserve "Curichi Cuajo" Buena Vista, Bolivia. MS. (Orr)
- Jarvis, Alec J.** 2002. Paraguayan Tung (*Aleurites fordii hensl.*): An Important Small Farmer Crop Diversification Strategy. MS. (Orr)
- Manty, Terry.** 2002. A Geographic Information System for Use in Making Management Decisions at the Ford Center Research Forest. MS. (Mroz)
- Mark, Phaik Yin.** 2002. Identification of Amino Acid Sequences that Determine Substrate Utilization by 4-Coumarate:Coenzyme A Ligase (4CL) Proteins in Aspen (*Populus tremuloides* Michx.) MS. (Tsai)
- Martinson, Tammie J.** 2002. Winter Bird Feeding and Localized Predation on Simulated Bark-Dwelling Arthropods. MS. (Flaspohler)
- Pregitzer, Maria I.** 2002. Forests of Eastern North America. MS. (Gale)
- Seablom, Thomas J.** 2002. Evaluation of Mechanized Logging Damage in Western UP Northern Hardwoods. MS. (Reed)
- Shao, Margaret.** 2002. *Parkia biglobosa*: Changes in Response Allocation in Kandiga, Ghana. MS. (Orr)
- Anderson, Heidi M.** 2001. Vascular and Non-Vascular Plant Community Responses to Created Microtopographies in a Managed Forested Wetland. MS. (Gale)
- Bub, Brian R.** 2001. Riparian and Upland Breeding Bird Communities in Northern Hardwood Forests Logged Using the Selection Method. MS. (Flaspohler)
- Chavli, Rajesh.** 2001. Molecular Cloning of Hypervariable Region II of Cellulose Synthase, Cellulose Synthase-like Genes in *Populus tremuloides* (aspen) MS. (Joshi)

- Cookman, Becky E.** 2001. Inventory of Habitat Critical to Juvenile Lake Sturgeon in the Lake Superior Basin Using Aerial Photographs. MS. (Maclean)
- Fox, Jennifer E.** 2001. Stress Physiology and Movement Behavior of Gray Wolves in Voyageurs and Isle Royale National Parks. MS. (Peterson)
- Gundale, Kelley Bassett.** 2001. Communicating Science to Fourth Grade Students at Hancock Elementary School in Hancock, Michigan. MS.(Orr)
- Heist, William L.** 2001. Community Tree Nurseries in Ghana, West Africa: A Case Study of the Collaborative Community Forestry Initiative (CCFI). MS. (Orr)
- Jones, Wendy S.** 2001. Selected Hybrid Larch Clones for Northern Regions: Evaluation of Growth, Frost and Soil Tolerances and Vegetative Propagation. MS. (Karnosky)
- Kane, Evan S.** 2001. Soil CO₂ Efflux Along a Diverse Environmental Gradient in Olympic National Park, Washington. MS. (Pregitzer).
- Ketchum, Blake.** 2001. Five Methods of Particle Size Analysis Used to Determine the Silt Content of Soil: A Comparison. MS. (Jurgensen/Gale)
- Rahn, Kristen E.** 2001. Cultural Assessment of Reforestation Practices in Rural Eastern Paraguay. MS. (Orr)
- Schnobrich, Katrina M.** 2001. An Ethnographic Study of Tree Planting Successes by Small Farmers in Paraguay. MS. (Orr)
- Steinbrecher, Rebecca J.** 2001. Characterization of Transgenic Aspen (*Populus tremuloides* Michx.) With Altered Expression of Two 4-Coumarate:CoA Ligase Genes and Field Study of Transgenic Aspen (*Populus tremuloides*) with Altered Lignin. MS. (Tsai)
- Tirocke, Joanne M.** 2001. Mycorrhizal Colonization of Red Pine and Jack Pine by Commercial Spore and Agar Slurry Inocula of Native Fungi in an Unfumigated Bare-Root Nursery. MS. (Richter)
- Bergert, Daniel.** 2000. Management Strategies of *Elaeis Guineensis* (oil palm) in Response to Localized Markets in Southeast Ghana, West Africa. MS. (Orr)
- Bodine, Jason T.** 2000. The Effects of Eight Silvicultural Treatments on Quality Development, Financial Returns and Regeneration Following 42 Years of Management. MS. (Mroz)
- Brower, Andrew M.** 2000. Honduras: An Ethnographic Study of El Armado National Wildlife Refuge and Guayape, Olancho. MS. (Orr)
- Collins, Mary E.** 2000. Age Structure, Growth and Regeneration of *Fraxinus nigra* Populations in the Upper Great Lakes States. MS. (Pregitzer)
- DeForest, Jared L.** 2000. Description of the Fine Roots of Nine North American Trees. MS. (Pregitzer)

- Jacobs, Amy.** 2000. Leadership Behavior in Dominant Breeding, Subordinate Breeding, and Non-Breeding Wolves (*Canis lupus*) in Yellowstone National Park, WY. MS. (Peterson)
- Jaidee, Kongjak.** 2000. Application of Digital Image Processing and 3-D GIS for Evaluating the Ecological Regions of the Little Carp River Watershed. MS. (Maclean)
- Johnson, Jamie S.** 2000. The Return of the Gray Wolf (*Canus lupus*) to Upper Michigan. MS. (Peterson)
- Ploetz, Jeffrey D.** 2000. Implementation and Effectiveness of a Traveling Nature Display for Environmental Education in Central Balkan National Park, Bulgaria. MS. (Orr)
- Ploetz, Kerry L.** 2000. An Ethnobotanical Study of Wild Herb Use in Bulgaria. MS. (Orr)
- Risch, Anita.** 2000. Vegetation-Environment Relationships within Small Tributary Watersheds of an Old-Growth Forest in Upper Michigan, United States. MS. (Pregitzer)
- Schaefer, Carrie L.** 2000. Spatial and Temporal Variation in Wintering Elk Abundance and Composition and Wolf Response on Yellowstone's Northern Range. MS. (Pregitzer)
- Schmidt, Katrin.** 2000. Effects of Elevated CO₂ and Soil Fertility on Fungal Biomass and Root Litter in Decomposing Pine Roots of Trembling Aspen (*Populus tremuloides Michaux*). MS. (Pregitzer)
- Schmierer, James M.** 2000. Growth and Development of Tamarack (*Larix laricina* (Du Roi) K. Koch) Following Bucket Mounding Site Preparation in an Upper Michigan Mineral Wetland. MS. (Reed)
- Watkins, Radley.** 2000. Road Effects on Understory Vascular Plants in a Managed Forest Landscape. MS. (Chen)
- Wells, Christie J.** 2000. The Effect of Potassium Oleate on the Bioremediation of a Petroleum Product and Volatile Organic Compounds. MS. (McGinnis)

DOCTORAL DEGREE PROGRAMS

The School of Forest Resources and Environmental Science at Michigan Tech offers graduate programs leading to Doctor of Philosophy (Ph. D.) degrees in Forest Science and Forest Molecular Genetics and Biotechnology. Here is a brief description of each of these programs:

Ph. D. in Forest Science

The Ph. D. in Forest Science is intended to be a research degree where the candidate demonstrates advanced ability in course work and innovative research work related to forest sciences in the areas of forest ecology, soils, silviculture, tree improvement, forest wildlife ecology and management, economics, inventory, geographic information systems, growth and yield, wood science and forest biology. It is awarded in recognition of demonstrated mastery of subject matter in forest science area and demonstrated competence in the conduct of individual research investigations that represent a significant contribution to the cumulative knowledge of this field.

Ph. D. in Forest Molecular Genetics and Biotechnology

The Ph. D. in forest molecular genetics and biotechnology is intended to be a research degree where the candidate demonstrates advanced ability in course work and innovative research work related to molecular genetics of a forest species and/or application of that knowledge to the development of industrial products and processes. It is awarded in recognition of demonstrated mastery of subject matter in molecular genetics area and demonstrated competence in the conduct of individual research investigations that represent a significant contribution to the cumulative knowledge of this field.

Please contact our faculty members to discuss potential research topics and funding availability.

Recent Ph.D. Dissertations (Updated 1/9/2009)

Van Diepen, Linda. 2008. Role and Diversity of Arbuscular mycorrhizal Fungi in Acer saccharum Dominated Forest Ecosystems Under Natural and N-amended Conditions. PhD Forest Science (Lilleskov and Pregitzer)

Powers Matthew. 2008. Physiological Performance and Stand Dynamics in Managed Red Pine Forests with Complex Stand Structures. PhD Forest Science (Webster and Pregitzer)

Anton Fernandez, Clara. 2008. Towards Greater Accuracy in Individual-Tree Mortality Regression. PhD Forest Science (Froese)

Bassett-Touchell, Audra C. 2008. Anthropogenic Influences on the Ecology of Forest Songbirds at Sleeping Bear Dunes National Lakeshore: Focusing on Roads. PhD Forest Science (Flaspohler)

Windels, Steven. 2008 The Ecology of Canada Yew (*Taxus canadensis* Marsh.), a Declining Species. PhD Forest Science (Flaspohler)

Anino, Edward. 2008. Characterization of *Populus tremuloides* 4CL1, 4CL2 and COMT Gene Promoters to Identify Regulatory Elements. PhD Forest Molecular Genetics and Biotechnology (Tsai)

Gleason, Mark. 2008. The Potential Use and Impacts of Underwater Remotely Operated Vehicles in Public Natural Resources Education. PhD Forest Science (Gale)

Pokharel, Bharat. 2008. A Critical Evaluation of Diameter Increment Modelling in the Great Lakes Region. PhD Forest Science (Froese)

Brodeur-Campbell, Sarah. 2008. Ash (*Fraxinus* spp.) in Upper Michigan: Current Conditions and Short Term Changes of a Resource Threatened by the Exotic Emerald Ash Borer (*Agilus planipennis*) PhD Forest Science (Storer)

Karberg, Jennifer M. 2008. Restoration, Genetic Diversity and Adaptation of Carnivory in Response to Environment in *Sarracenia purpurea* (the Northern Pitcher Plant). PhD Forest Science (Gale)

Bump, Joseph, 2008. Large predators, prey carcasses, resource pulses, and heterogeneity in terrestrial ecosystems. PhD Forest Science (Peterson and Vucetich).

Thammannagowda, Shivegowda. 2007. Molecular Genetic Analysis of Cellulose Biosynthesis in Poplars. PhD in Forest Molecular Genetics and Biotechnology (Joshi)

Fissore, Cinzia. 2007. Biotic and Abiotic Controls on Soil Organic Carbon Quality Along a Paired Pine and Hardwood Climosequence. PhD Forest Science (Giardina)

Darbah, Joseph. 2007. Impacts of Elevated Atmospheric CO₂ and/or O₃ on Carbon Gain and Reproductive Capacity in Northern Forest Ecosystems. PhD Forest Science (Karnosky)

Hurley, Peter. 2007. White-tailed Deer (*Odocoileus virginianus*) Overabundance and the Ecology of Forest Understory Communities in Protected Areas. PhD Forest Science (Flaspohler)

Corace, Gregory III. 2007. Geographic Assessment Methodologies for Openland Cover Types and Bird Species: From 12 Midwest States to the Upper Peninsula of Michigan, What are the Conservation Implications? PhD Forest Science (Flaspohler).

Rajinikanth Mohan. 2006. Cloning and characterization of glycine decarboxylase complex and serine hydroxymethyltransferase genes involved in one-carbon metabolism in *Populus tremuloides*. PhD in Forest Molecular Genetics and Biotechnology (Tsai)

Rosemier, Justin. 2006. Beech Bark Disease: Assessing the Potential Impacts of an Exotic Forest Pest Complex on Native Small Mammal Communities in the Upper Peninsula of Michigan. Ph. D. Forest science (Storer)

Opuni-frimpong, Emmanuel. 2006. Improving productivity and conservation of African mahogany: genetic selection propagation and silvicultural management of *Hypsipyla robusta* (Moore). Ph. D. Forest Science (Karnosky/Storer)

Ranjan, Priya. 2005. Analysis of Expressed Sequence Tags in *Populus* Tissues and Characterization of Copia Elements in Arabidopsis Genome. Ph. D. Forest Molecular Genetics and Biotechnology (Joshi/Tsai)

Wu Yun. 2005. Fungal Associates of Mile-A-Minute Weed (*Polygonium perfoliatum* L.) and the Potential as Biological Control Agents. Ph. D. Forest Science (Gale)

Lung, Jrhau. 2004. Molecular Characterization and Expression Analysis of Taxadiene Synthase and 10-Deacetyl Baccatin III Acetyltransferase From *Taxus mairei*. PhD (Tsai)

Euskirchen, Eugenie S. 2003. Carbon Fluxes in Managed Forest Landscapes: An Empirical and Model-Based Approach. PhD (Pregitzer)

Kalluri, Udaya. 2003. Comparative Expression Analysis of Cellulose Biosynthesis Related Genes from Aspen Trees (*Populus tremuloides*). PhD (Joshi)

Samuga, Anita. 2003. Molecular Characterization of Four Members of Cellulose Synthase Gene Superfamily in Aspen (*Populus tremuloides*). PhD (Joshi)

Sharma, Pooja. 2003. Moderation of CO₂-induced Gas Exchange Responses by Elevated Atmospheric CO₂ in Trembling Aspen and Sugar Maple. PhD (Karnosky)

Stark, Nicole. 2003. Photodegradation and Photostabilization of Weathered Wood Flour Filled Polyethylene Composites. PhD (Matuana)

Li, Qingxiu. 2002. Extrusion Foaming of Polyblefin/Wood-Flour Composites. PhD *(Matuana)

- Verhey, Steven A.** 2002. The Effect of Manufacturing Variables, Fungal Exposure, and Moisture Cycling on the Durability of Wood Fiber/thermoplastic Composites. MS (Laks)
- Wang, Yuh-Shuh.** 2002. Isolation and Characterization of cDNAs Involved in Vascular Development of Quaking Aspen (*Populus tremuloides*). Ph.D. (Tsai)
- Blickenderfer, Mary M.** 2001. Adaptations of *Andropogon gerardii* and *Schizachyrium scoparium* in Disjunct Populations Northeast of Their Contiguous Range. Ph.D. (Gale)
- Kao, Yu-Ying.** 2001. Genetic Transformation of *Acacia magium x auriculformis* and Molecular Characterization of Phenylalanine Ammonia-Lyase in Quaking Aspen (*Populus tremuloides*) PhD (Tsai)
- Goebel, Patrick C.** 2001. Hydrogeomorphic Controls on Riparian Areas of the Northern Lake States. Ph.D. (Pregitzer)
- Mengeloglu, Fatih.** 2001. Rigid Polyvinyl Chloride/Wood-Flour Composites and Their Foams. Ph.D. (Matuana)
- Noormets, Asko.** 2001. The Effect of Interacting CO₂ and O₃ on the Carbon Balance of Aspen (*Populus tremuloides Michx.*) Grown in an Open-Air CO₂ and O₃ Enrichment System. Ph.D. (Karnosky)
- Owens, Karen E.** 2001. Development and Analysis of Current and Presettlement Forest Cover Mapping Methods for the Eastern Upper Peninsula of Michigan, Luce District. Ph.D. (Maclean)
- Pechter, Priit.** 2001. Characterization of Transgenic Aspen (*Populus tremuloides Michx*) Harboring a Homologous Cinnamate 4-Hydroxylase (*C4H*) Transgene and Analysis of Two Aspen 4-Coumarate: CoA Ligase (*4CL*) Gene Promoters. Ph.D. (Tsai)
- Vucetich, Leah.** 2001. Genetics, Fitness, and Mercury Exposure in Isle Royale Deer Mice (*Peromyscus maniculatus*). Ph. D. (Peterson)
- Brown, Shannon E.** 2000. Production Dynamics and Climate in Four Northern Hardwood Stands Located in Michigan. Ph.D. (Pregitzer)
- Jaiteh, Malanding S.** 2000. The Dynamics of Human-Induced Land Cover Change in Miombo Ecosystems of Southern Africa. Ph.D. (Chen)
- Londo, Andrew J.** 2000. Effects of Bucket Mounding Site Preparation on the Processes and Functions of A Subboreal Mineral Wetland. Ph.D. (Mroz)

List of SFRES Graduate Faculty Members

- Dr. Andrew Burton.** Research interests: Forest responses to global change factors, belowground processes, carbon and nutrient cycling, physiological ecology of tree roots, ecosystem ecology, undergraduate involvement in research. Email: ajburton@mtu.edu
- Dr. Victor Busov.** Research interests: Tree functional genomics; activation tagging for functional gene discovery in trees; hormonal regulation of tree growth and development; micro RNAs role in regulation of woody plant development. Email: vbusov@mtu.edu
- Dr. Rod Chimner.** Research interests: Applied wetland ecology, Riparian and wetland restoration, Peatlands, Mountain wetlands, Tropical peatlands, Ecosystem carbon cycling, Wetland ecohydrology. Email: rchimner@mtu.edu
- Dr. Paul Doskey.** Research interests: Atmospheric Sciences, Environmental Engineering, Environmental Biogeochemistry and Sustainability. Email: pvdoskey@mtu.edu
- Dr. David J. Flaspohler.** Research interests: Conservation biology, ornithology, reproductive ecology and forest management, forest and openland songbird habitat use and demography, seabird habitat use, amphibian ecology, tropical ecology. Email: djflaspo@mtu.edu
- Dr. Robert E. Froese.** Research interests: Forest vegetation simulation modelling. Modelling tree height growth and yield. Site quality estimation using methods based on tree physiology. Applied statistical tools to support quantitative resource analysis and modelling. Measurement error models. Email: froese@mtu.edu
- Dr. Margaret R. Gale.** Research interests: wetland ecology, plant ecology, root ecology. Email: mrgale@mtu.edu
- Dr. Kathleen E. Halvorsen.** Research interests: Sociology of natural resources; natural resource and environmental policy; ecosystem management. Email: kehalvor@mtu.edu
- Dr. Chandrashekhar P. Joshi.** Research interests: Plant molecular genetics, genetic engineering of cellulose and lignin in trees, regulation of gene expression during fast growth, tree genomics and forest bioinformatics. Email: cpjoshi@mtu.edu
- Dr. Martin F. Jurgensen.** Research interests: Forest soils/soil biology; organic matter decomposition/soil carbon relationships; management effects on soil chemical, physical, and microbiological properties; soil/forest productivity relationships. Email: mfjurgen@mtu.edu
- Dr. Peter E. Laks.** Research interests: Wood preservation, the development of low mammalian toxicity wood preservatives based on agricultural chemistries, the use of chemical additives to improve the properties of wood composites, phytochemistry. Email: plaks@mtu.edu
- Dr. Erik Lilleskov.** Research interests: Mycorrhizal communities at the stand level--examining the spatial structure of ectomycorrhizal fungal communities and, through experimental lab and field studies, determining the effect of small-scale alteration of nutrient availability on mycorrhizal community dynamics. elilleskov@fs.fed.us
- Dr. Ann L. Maclean.** Research interests: Remote sensing, digital image processing, geographic information systems. Email: amaclean@mtu.edu
- Dr. Linda M. Nagel.** Research interests: Silviculture; forest vegetation dynamics; physiological processes of forest stand structures; tree ecophysiology. Email: lmnagel@mtu.edu

Dr. Blair D. Orr. Research interests: International forestry (particularly arid areas in developing countries), economic modeling of forest management and industries. Email: bdorr@mtu.edu

Dr. Rolf O. Peterson. Research interests: Ecology and population dynamics of mammals; carnivore ecology; predator-prey relationships; wolf-prey dynamics and other ecological studies at Isle Royale National Park. Email: ropeters@mtu.edu

Dr. James B. Pickens. Research interests: Management science, harvest scheduling, operations research, mathematical models. Email: jpickens@mtu.edu

Dr. Thomas Pypker. Research interests: Forest Hydrology, micrometeorology, ecohydrology, carbon cycling, stable isotopes. Email: tgypker@mtu.edu

Dr. Dana L. Richter. Research Interests: Forest mycology, pathology, fungal ecology; tree and forest disease diagnosis and assessment; wood decay and mold/stain testing of wood, composites, coatings, preservatives and fungicides; fungus isolation and identification; mycorrhizae; mushrooms. drichte@mtu.edu

Dr. Andrew J. Storer. Research interests: Forest insect ecology; insect/fungus/plant interactions; impacts of exotic species on forest ecosystems; interaction among fire, insects and disease; urban forest health. Email: storer@mtu.edu

Dr. John A. Vucetich. Research interests: Quantitative ecology, demographic and genetic aspects of population biology (e.g., predation and management of genetic diversity), and the application of population models to management. Email: javuceti@mtu.edu

Dr. Leah M. Vucetich. Research interests: Molecular ecology, laboratory and statistical analysis of genetic data, analysis of survival data, and the effect of moose herbivory on forest dynamics. Email: lmvuceti@mtu.edu

Dr. Christopher R. Webster. Research interests: Quantitative ecology and forest management; stand dynamics and silviculture in structurally complex, mixed-species forests; plant community ecology; ecological restoration; dendrochronology; plant herbivore interactions. Email: cwebster@mtu.edu

Dr. Hairong Wei. Research interests: Plant Bioinformatics, Systems biology and Genomics. Email: Hairong@mtu.edu

Dr. Xiaohong Zhu. Research interests: Plant molecular biology and biochemistry, Amino acid metabolisms, VIGS, cellulose biosynthesis. Email: xzhu1@mtu.edu

Code of Conduct For All Graduate Students

The quality of a graduate education depends in part on the quantity and quality of interactions between students and advisors (and students and students!). Each person's experience in graduate education is unique, and advising expectations need to be developed through discussions between the student and advisor. This prospectus gives a general view of graduate education, and is intended as a starting point for developing programs that suit each student.

Philosophy:

Graduate education deals with developing knowledge, the ability to use knowledge, and the ability to think with creativity and skepticism. A Masters level education aims to develop a student's ability to participate in research, typically at the level of applying research (to natural resource issues, for example). A doctoral level education aims to produce researchers (professional or vocational). There are high expectations for student accomplishments, and time invested to help students achieve their goals.

A doctoral program is qualitatively different from a masters program – not just more of the same. Differences include greater rigor for a PhD -- not just in hours expended, but in accomplishments and abilities as a researcher. Students gain knowledge and understanding from many parts of a university -- by hanging out with fellow students, in classes, in journals, and in research projects.

The advisor serves a double role in graduate programs. As a mentor, the advisor supports, encourages and nurtures each student's development. As a professor, the advisor also judges the accomplishment and potential of each student. Students should expect support from advisors, but this support may sometimes include uncomfortable criticism and challenges. Some students begin graduate work with a vision that turns out not to match the real program – such as the program requiring greater dedication, sharper thinking, broader knowledge, more skills in math, writing, analysis, logic, or chemistry. The advisor is responsible for helping students develop their visions and accomplishments to meet the demands of the program. On rare occasion, the match just doesn't come, and the student and advisor need to discuss a transition out of the program. **(Binkley, Personal Communication)**

WORK AND VACATION

Students with half-time research assistantships are required to fulfill a work requirement averaging 20 hours per week. How these hours are spent and to whom they are owed must be worked out between the individual graduate student and your Advisor. Teaching assistantships (not FW6980) normally require 16 to 20 hours per week assisting in the conduct of assigned classes. These hours may include classroom teaching, preparation and clean up for class and or laboratory, grading, office hours, and generally helping out in lectures and/or labs when needed. The specific details of each teaching assignment must be worked out between the teaching assistant and the principal instructor for each course. Students without assistantships owe their time to no one but themselves. *However*, all students, regardless of whether they have an assistantship or not, are encouraged to associate with other graduate students and to lend a hand when needed. Students on graduate assistantships are not entitled to many fringe

benefits, including vacation, which permanent employees receive. However, time off can usually be arranged as needed by proper planning and coordination with their Advisor. In other words – **plan ahead!** In general, it is best you give your Advisor a copy of your class schedule at the beginning of each semester. It tends to minimize confusion.

ETHICS

Each student will be expected to maintain an ethical conduct throughout his or her graduate program in the School of Forest Resources and Environmental Science. Ethical conduct is conforming to well-accepted and well-established professional standards of conduct. Unethical conduct is considered: (1) cheating on examinations and other assignments; (2) plagiarism, the presentation of ideas and exact words of another person as one's own (e.g., copying verbatim passages, tables and figures from books and articles); and (3) falsification or misrepresentation of ideas or research data. Copyright laws in the United States allow the use of limited quotes from books and research articles. Students should confer with their Advisor and Advisory Committee for procedures and limitations associated with citing published material. Unethical conduct by a student will be brought to the attention of student's Advisory Committee and the School's Dean for disciplinary action.

PUBLICATIONS

With assistance of their Advisor, students are strongly encouraged to prepare papers based on their thesis, report or dissertation to be submitted for publication or for public presentation.

GRIEVANCES

Any student who has a grievance with his or her Advisory Committee or Advisor may do so using established School procedures as outlined in the Charter of the School of Forest Resources and Environmental Science or by talking with the Dean or Graduate Program Director of the School.

COURSE WORK OFFERINGS

Course Work offerings for graduate degrees in forest Science areas

Forestry

- FW 3010 - Practice of Silviculture
- FW 3012 - Survey of Silviculture
- FW 3020 - Forest and Landscape Ecology
- FW 3075 - Introduction to Biotechnology
- FW 3080 - Engineered Wood Products
- FW 3082 - Solid Wood Products
- FW 3098 - Wood Processing and Manufacture
- FW 3110 - Natural Resource Policy
- FW 3150 - Timber Harvesting
- FW 3170 - Land Measurements and GPS
- FW 3180 - Geomorphology, Landscapes and Ecosystems
- FW 3190 - Multi-resource Assessment
- FW 3200D - Introduction to Outdoor Recreation and Parks, and Tourism
- FW 3202 - Lake Superior Field Course
- FW 3203 - Conservation Communication
- FW 3204 - Environmental Interpretation
- FW 3205 - Wilderness Leadership
- FW 3206 - Outdoor Skills
- FW 3208 - Internship Isle Royale National Park
- FW 3300 - Introduction to Genomics
- FW 3330 - Soil Science
- FW 3376 - Forest & Environmental Resource Management (The FERM)
- FW 3410 - Conservation Biology
- FW 3540 - An Introduction to Geographic Information Systems for Natural Resource Management
- FW 3600 - Wildlife Habitat
- FW 3610 - Ornithology
- FW 3620 - Field Ornithology
- FW 3630 - Wildlife Habitat and Population Ecology
- FW 3760 - Human Dimensions of Natural Resources
- FW 3800 - Insect Ecology
- FW 3840 - Forest Health
- FW 3900 - Conservation Biology and Ecology in Vera Cruz
- FW 3910 - Mushrooms of Vera Cruz
- FW 4080 - Forest Economics and Finance
- FW 4087 - Molecular Genetics of Trees
- FW 4089 - Bioinformatics
- FW 4110 - Tree Seedling Production and Greenhouse Management
- FW 4120 - Tree Physiology and Genetics
- FW 4130 - Biometrics
- FW 4140 - Vegetation Modeling
- FW 4150 - Forest Resource Management
- FW 4220 - Wetlands
- FW 4240 - Mammalogy
- FW 4300 - Introduction to Wildland Fire
- FW 4360 - Forest Soils and Watershed Management
- FW 4400 - Urban Forestry
- FW 4500 - Independent Study
- FW 4540 - Remote Sensing of the Environment
- FW 4610 - Wildlife Ecology

FW 4630 - Isle Royale Field Ecology Camp
FW 4632 - Southwest Field Ecology Camp
FW 4750 - Forest Diseases and Fungal Ecology
FW 4810 - Integrated Resource Assessment
FW 4850 - Environmental Education Methods
FW 5020 - Identification & Biology of Forest Vegetation
FW 5024 - Advanced Wood Preservation
FW 5030 - Forest Measurement & Assessment
FW 5050 - Current Topics in Forest Biotechnology
FW 5068 - Advanced Wood Composites
FW 5070 - Developmental and Ecological Genetics
FW 5080 - Gene Profiling Analysis
FW 5085 - Functional Genomics and Biotechnology
FW 5088 - Forest Finance & Economics
FW 5089 - Tools of Bioinformatics
FW 5100 - Advanced Terrestrial Ecology
FW 5110 - Advanced Natural Resource Policy
FW 5115 - Restoration Ecology
FW 5120 - Ecophysiology of Forest Productivity
FW 5130 - Forest Vegetation Dynamics
FW 5150 - Advanced Natural Resource Policy Analysis
FW 5160 - Operations Research in Natural Resource Management
FW 5221 - Advanced Wetland Science
FW 5350 - Soil Biology
FW 5376 - Advanced Forest and Environmental Resource Management
FW 5400 - Advanced Conservation Biology
FW 5410 - Analysis of Natural Resource Data
FW 5411 - Applied Regression Analysis
FW 5510 - Special Topics in Natural Resources
FW 5550 - Geographic Information Systems for Resource Management
FW 5560 - Digital Image Processing: A Remote Sensing Perspective
FW 5600 - Advanced Insect Ecology
FW 5641 - Global Change Institute for Teachers
FW 5700 - Graduate Field Forestry
FW 5701 - Graduate Field Applied Ecology
FW 5710 - Trees in Agricultural Systems
FW 5720 - International Forestry Seminar
FW 5730 - Field Work in International Forestry
FW 5740 - Overseas Research
FW 5760 - Graduate Tropical Forestry
FW 5770 - Rural Community Development Planning and Analysis
FW 5800 - Master's Graduate Seminar
FW 5810 - Research Methods in Natural Resources
FW 5850 - Effective Grantsmanship Workshop
FW 5998 - Forest Resources and International Forestry Master's Research
FW 5999 - Forest Resources and Environmental Science Master's Research
FW 6800 - Doctoral Graduate Seminar
FW 6980 - Graduate Teaching
FW 6999 - Forest Resources and Environmental Science Doctoral Research

Computer Science

CS4421 Database Systems

Biological Science

BL4010 Biochemistry I

BL4020 Biochemistry II

BL4140 Plant Physiology
BL4220 Applied and Industrial Microbiology
BL4430 Biological Simulation Techniques
BL4450 Limnology
BL4470 Analysis of Biological Data
BL4740 Introduction to Mycology
BL4810 Plant Taxonomy
BL4820 Biochemical Lab. Techniques I
BL5150 Advanced Plant Physiology
BL5160 Plant Biochemistry & Molecular Biology
BL5460 Advanced Ecology: Ecosystems
BL5750 Advanced Ecology: Communities

Civil Engineering

CE4502 Wastewater Treatment and Collection
CE3610 Hydrology
CE4630 Hydraulic Structures

Economics

EC3400 Economic Decision Analysis

Geology

GE4760 Eng. Evaluation of Mineral Deposits

Humanities

HU4625 Risk Communication
HU6060 Special Topics in Philosophy

Mathematics

MA4760 Mathematical Statistics I
MA4770 Mathematical Statistics II
MA5510 Ordinary Differential Equations
MA4710 Regression Analysis
MA4720 Design and Analysis of Experiments
MA4730 Non-parametric Statistics
MA4330 Linear Algebra I
MA2720 Statistical Methods I

Mechanical Engineering

ME4610 Advanced Machining Processes
ME4660 Data Based Modeling

Mining Engineering

MG4600 Geostatistics I

Course Work offerings for degrees in Forest Molecular Genetics and Biotechnology

Forestry

FW 3075 - Introduction to Biotechnology
FW 3300 - Introduction to Genomics
FW 3410 - Conservation Biology
FW 4087 - Molecular Genetics of Trees
FW 4089 - Bioinformatics
FW 4110 - Tree Seedling Production and Greenhouse Management
FW 4120 - Tree Physiology and Genetics

FW 4130 - Biometrics
FW 5050 - Current Topics in Forest Biotechnology
FW 5070 - Developmental and Ecological Genetics
FW 5080 - Gene Profiling Analysis
FW 5085 - Functional Genomics and Biotechnology
FW 5089 - Tools of Bioinformatics
FW 5800 - Master's Graduate Seminar
FW 5850 - Effective Grantsmanship Workshop
FW 5999 - Forest Resources and Environmental Science Master's Research
FW 6800 - Doctoral Graduate Seminar
FW 6980 - Graduate Teaching
FW 6999 - Forest Resources and Environmental Science Doctoral Research

Mathematics

MA4550 Math Models in Biomathematics
MA4710 Regression Analysis
MA4720 Design/Analysis of Experiments
MA4760 Mathematical Statistics I
MA4770 Mathematical Statistics II
MA5405 Complex Variables
MA5504 Mathematical Modeling I
MA5505 Mathematical Modeling II
MA5524 Functional Analysis
MA5545 Applied Integral Equations
MA5701 Statistical Methods
MA5711 Mathematical Statistics I
MA5712 Mathematical Statistics II
MA5750 Statistical Genetics
MA5731 Linear Models
MA5741 Multivariate Statistical Methods
MA5791 Categorical Data Analysis
MA6701 Probability

Metallurgical & Materials Engineering

MY5200 Scanning Electron Microscopy

Chemistry

CH4212 Instrumental Analysis
CH4272 Process Analytical Chemistry
CH4412 Spectroscopy of Organic Chemistry
CH4430 Intermediate Organic Chemistry
CH 4710 - Biomolecular Chemistry I
CH 4720 - Biomolecular Chemistry II
CH 4790 - Current Topics in Biochemistry
CH5210 Analytical Separations
CH/CE5509 Env. Organic Chemistry
CH5520 Chemical Kinetics
CH5530 Molecular Spectroscopy
CH5570 Biophysical Chemistry

Computer Science

CS4321 Introduction to Algorithms
CS4421 Database Systems
CS4611 Introduction to Computer Graphics
CS5321 Advanced Algorithm

Biological Science

BL 3190 - Evolution
BL 3210 - General Microbiology
BL 3240 - Cell Biology
BL 3300 - Introduction to Genomics
BL 3640 - General Immunology
BL 4010 - Biochemistry I
BL 4020 - Biochemistry II
BL 4030 - Molecular Biology
BL 4040 - Environmental Biochemistry
BL 4140 - Plant Physiology
BL 4220 - Applied and Industrial Microbiology
BL 4470 - Analysis of Biological Data
BL 4500 - Critical Discussions in Bioinformatics
BL 4820 - Biochemical Laboratory Techniques I
BL 4830 - Advanced Biochemical Techniques
BL 4840 - Molecular Biology Techniques
BL 5030 - Molecular Biology
BL 5040 - Electron Optical Methods of Analysis I
BL 5050 - Electron Optical Methods of Analysis II
BL 5060 - Biological Ultrastructure
BL 5150 - Advanced Plant Physiology
BL 5160 - Plant Biochemistry and Molecular Biology
BL 5170 - Plant Cell & Development
BL 5431 - Population Ecology

Biomedical Engineering

BE 4440 - Introduction to Genetic Engg
BE5440 Genetic Eng. and Molecular Medicine

Business Administration

BA4590 Environmental Law

Civil and Environmental Engineering

CE4501 Environmental Engineering Chemical Processes
CE4506 Application of Environmental

Suggested Course work for Loret Miller Ruppe Peace Corps Master's International Program (Special requirements)

The Master's International Forestry Curriculum is a blend of traditional forestry courses, several ecology courses, and several courses and seminars specifically created for this program. All are applicable to your work as a Peace Corps Volunteer.

The sequence of courses is also designed to leave the student the option of developing a Master's Degree program as a thesis degree, a project degree, or a course-work only degree.

Graduate committees routinely substitute other appropriate courses for students who have completed any of the required courses during their undergraduate program.

Courses for Students Entering in Fall.

Fall Semester

- FW5700 Graduate Field Forestry - 8 cr. Two options are available for this course. Option A (Forestry Emphasis) covers Silviculture, Insects and Diseases of Forest Ecosystems, Multi-Resource Assessment, Global Positioning Systems, Timber Harvesting, and Wildlife Habitat. Option B (Ecology Emphasis) covers a Insects and Diseases of Forest Ecosystems, Multi-Resource Assessment, Global Positioning Systems, Insect Ecology, Wildlife Habitat, Vegetation and Geomorphology, and a survey of Silviculture.
- FW5760 Graduate Tropical Forestry - 2 cr.
- FW5740 Overseas Research - 1 cr.

Spring Semester

- FW5710 Trees in Agricultural Systems - 2 cr.
- FW5770 Rural Community Development Planning and Analysis - 2 cr.
- FW3540 Remote Sensing and Geographic Information Systems in Natural Resource Management - 4 cr. (Students are not required to take FW3540 during this semester but must take either FW3540 or FW 5550 - Geographic Information Systems for Resource Management when they return from Peace Corps service.)
- CE5993 Civil & Environmental Engineering in the Developing World - 2 cr.
- MA2720 or equivalent. Principles of Statistics 4 cr. Required of students who do not have an undergraduate statistics course.
- 3 credits of electives.

Peace Corps Service

- FW5730 International Forestry Practicum 1 cr. per academic semester including the summer. (Tuition paid by Michigan Tech.)

Upon Return from Peace Corps Service

- FW5999 Graduate Research in Forestry. variable credits.
- FW5720 Seminar in International Forestry 1 cr.
- FW5800 Graduate Seminar in Forestry 1 cr.

30 credits required to graduate. No more than 12 credits in 3000 and 4000 level courses.

This set of courses was designed cooperatively with the US Peace Corps. It will provide a set of skills for both forestry and environmental education placement in Peace Corps and work in forestry and environmental sciences in the United States.

The School of Forest Resources and Environmental Science at Michigan Tech is one of 48 accredited forestry programs in the United States.

Suggested Course Work for Master of Forestry (MF) Professional degree only (Special requirements)

Master of Forestry (Plan B and Plan C)

The Master of Forestry (M.F.) degree program is Plans B and C only, and is intended for students who want a course work-only professional degree or who may be interested in working on a small project with a report. This program is for students who lack a forestry background at the bachelors level, and wish to change their career to forestry. The structure of this program is significantly different from our other Master of Science Degree programs. In addition to a Bachelors degree, students applying for this program are expected to have had 1 semester of Chemistry, and 1 semester of Elementary Statistics. The curriculum for the M.F. is listed below. Students completing plan B may choose to take 2-6 research credits in addition to the required course work listed below, upon consultation with their advisor. Curriculum: 34 credits, depends on previous course work (at a minimum 30 credits)

Fall Semester (11 credits)

FW3020 Forest and Landscape Ecology (3 cr)

FW3330 Soil Science (4 cr)

FW5020 Identification and Biology of Forest Vegetation (2cr)

FW5030 Forest Measurement and Assessment (2 cr)

Spring Semester (13 credits)

FW3110 Natural Resource Policy (3 cr)

FW3540 Remote Sensing/GIS (4 cr)

FW4130 Biometrics (2 cr)

FW5080 Advanced Forest Economics and Finance (3 cr)

FW5800 Master's Graduate Seminar (1 cr)

Fall Semester (10 credits)

FW5700 Graduate Field Forestry (8 cr)

FW5760 Graduate Tropical Forestry (2 cr)