

# Master Programs eligible under the TRANSFOR-M dual degree program at the University of Alberta

- Master of Science

with an emphasis in the following subject areas:

- Enhanced Forest Management
- Environmentally Sustainable Agriculture
- Land Reclamation, Remediation, and Restoration
- Biodiversity Conservation

- Master of Forestry

More information about these programs at

<http://www.ales.ualberta.ca/rr/GraduateProgram.aspx>

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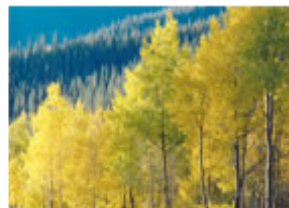
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## Graduate Programs

The Department offers programs leading to thesis-based MSc and PhD and course-based degrees of MAg and MF. This department and the School of Business also offer two course-based programs of joint study that enable students to earn both the MBA and MAg degrees or both the MBA and MF degrees, after two calendar years of full-time study.

### Degree programs

Graduate studies encompass a broad spectrum of scientific and management applications, in natural and managed landscapes. Various research opportunities exist within the key areas of focus in Renewable Resources. Graduate students may specialize in a field of study linked to these areas which fall within 4 major research themes.



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Management](#)



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[Land Reclamation,  
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## MSc Program

### Program requirements

Course requirements for the MSc are based on the student's previous training and the anticipated needs in the student's area of specialization. Minimum requirements are REN R 603 and 604 plus \*12 of course weight acceptable for graduate credit of which \*6 must be at the 500 level or above. Course work should include at least \*3 in research methods, statistics, and/or experimental design. Courses may be drawn from those listed for the Department, and from other departments within the University. Students in the MSc program are also expected to participate in the Renewable Resources seminar series each year. In addition, candidates for the degree of MSc must prepare an acceptable thesis presenting results of research conducted. Candidates will be examined orally on their thesis results by committees formed. The minimum period of residence is **two, four-month terms of full-time attendance** at the University of Alberta.

### Length of program

Normally, at least two academic years plus one summer of research are required to complete the MSc. Candidates must complete all the requirements within **four** years of the term in which they first register as probationary graduate students or as candidates in the master's program.

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## MF Program

### Master of Forestry (course-based)

This course based program is designed for practicing foresters. The normal admission requirement is a BSc in Forestry and applicants are expected to have completed 2 years of professional forestry-related experience. There is no residence requirement for the MF program nor is there a language requirement other than English. Normally, a minimum of 12 months of study and research is needed to complete the requirements for the degree. The duration of the total program must not exceed six consecutive calendar years.

The Program consists of \*30 units of course weight with a minimum weight of \*24 at the graduate level (500 number or higher).

The student's program will be developed around the concept of integrated resource management and sustainable development. Course work must include REN R 601 and 602, and at least \*3 in each of the following 4 areas - forest resource management, forest biology, statistics/experimental design, and forest policy/sociology/human resources. Upon completion of the course work, students will be required to take and successfully complete, a 3 hour oral examination on relevant issues.

This examination will be based on course work and designed to evaluate the student's knowledge and understanding of the broad area of integrated resource management.

# GRADUATE PROGRAMS IN RENEWABLE RESOURCES

Enhanced Forest Management

Biodiversity Conservation

Environmentally Sustainable Agriculture

Land Reclamation, Remediation and Restoration

# GRADUATE PROGRAMS IN RENEWABLE RESOURCES

## Overview

Graduate studies in the Department of Renewable Resources encompass a broad spectrum of scientific and management applications in natural and managed landscapes which fall within 4 major research themes: 1) Enhanced Forest Management 2) Environmentally Sustainable Agriculture 3) Land Reclamation, Remediation, and Restoration and 4) Biodiversity Conservation.

Each year we recruit approximately 20 new students into our graduate programs in Renewable Resources.

## Admission Requirements

- GPA of 3.0 out of 4.0 in the last two years (60 units) of coursework.
- Applicants are encouraged to correspond with academic staff who may be suitable as a potential graduate research supervisor. See list on other side.
- Application fees and instructions for submitting applications from the web are available at [www.gradstudies.ualberta.ca/](http://www.gradstudies.ualberta.ca/)

## Financial Assistance

- Most students are funded by research grants held by academic staff serving as graduate supervisors.
- Historically, the Department has been able to offset the tuition differential assessed to international students.
- Exceptional MSc and PhD applicants are nominated by the Department for FGSR recruitment scholarships
- Graduate students may apply for Departmental specialized awards in August and FGSR-sponsored General Awards in January of each year.

## Program Requirements

### Degree of MSc

- Minimum requirements are two graduate research seminar courses, plus \*12 in coursework acceptable for graduate credit, of which \*6 must be at the 500 level or above.
- Candidates for the degree of MSc must prepare an acceptable thesis presenting their research results.
- The minimum period of residence is two, 4-month terms; normally, at least 2 academic years are required to complete the MSc.

### Degree of PhD

- All students must take two graduate research seminar courses. Otherwise there is no fixed course requirement for students with a Master's degree.
- Students in the PhD program must complete an oral pre-candidacy assessment within 6 months of registration and pass an oral candidacy exam within 2 years of registration.
- Candidates for the PhD must prepare an acceptable thesis presenting their research results.
- The minimum residence requirement is 3 academic years for a student with a Bachelor's degree or 2 academic years for those with a Master's degree. Typically, a minimum of 3 years is normally required to complete the PhD.

## Course based Programs

The Department offers a number of non-thesis (course-based) programs including: MAg, MF, Joint MBA/MAg, Joint MBA/MF. Please see the departmental website for more details: [www.ales.ualberta.ca/rr](http://www.ales.ualberta.ca/rr)

# Enhanced Forest Management

*A recognized area of excellence, enhanced forest management includes research on silvicultural practices, genetic improvements, stand dynamics, tree physiology and pest, landscape and biodiversity management. The aim is to provide a scientific basis for improvements to forest management practices which aim to ensure economic and ecological sustainability now and in the future.*

## Landscape Forestry and Integrated Resource Management

Research interests: forest activity scheduling, forest economics, integrated resource management, forest level optimization and simulation modeling; policy analysis.

ARMSTRONG, Glen W  
glen.w.armstrong@ualberta.ca  
(780) 492-8221  
807 General Services Building



## Natural Resource Politics & Governance, Environmental Risk, State Theory and Rural Sociology

Research interests: social sustainability in resource-based communities, vulnerability and resilience in the face of change, aboriginal land & resource rights.

DAVIDSON, Debra J  
debra.davidson@ualberta.ca  
(780) 492-4598  
543 General Services Building



## Forest Soils and Nutrient Dynamics

Research interests: Forest soil processes, soil microbial ecology, global change and soil acidification, carbon sequestration, forest fertilization, tree nutrition, forest ecophysiology, and silviculture-soil management interactions.

CHANG, Scott  
scott.chang@ualberta.ca  
Phone (780) 492-6375  
Office: 424 Earth Sciences Building



## Forest Entomology Lab in Chemical Ecology

To understand roles of tree induced chemical defenses mediating interactions between insects and fungal pathogens and between herbivores and their natural enemies

ERBILGIN, Nadir  
nadir.erbilgin@ualberta.ca  
(780) 492-8693  
230A Earth Sciences Building



## Silviculture and Stand Dynamics

Research interests: Silviculture, Quantitative Silviculture, Mixedwood (aspen-spruce) Silviculture, Vegetation Management, Intra- and inter-specific competition, Silvicultural Systems.

COMEAU, Philip G  
phil.comeau@ualberta.ca  
(780) 492-1879  
426 Earth Sciences Building



## Wildland Fire

Research interests: fire resilient fire landscapes including landscape fire modeling, fire and weather/climate interactions including the potential impact of climatic change, lightning-ignited forest fires and in stand weather and the influences on fuel moisture.

FLANNIGAN, Mike  
mike.flannigan@ualberta.ca  
(780) 248-2033  
713A General Services Building



## Plant Physiology

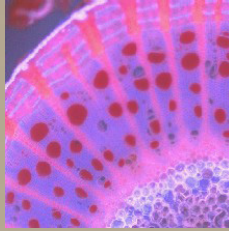
Research interests: Plant physiological ecology, especially subjects related to water transport and xylem structure in woody plants.

HACKE, Uwe

uwe.hacke@ualberta.ca

(780) 492-8511

251 Earth Sciences Building



## Hardwood Genetics

Research interests: Effects of climate change on ecosystems; conservation and ecological genetics; breeding and deployment; tropical ecology

HAMANN, Andreas

andreas.hamann@ualberta.ca

(780) 492-6429

739 General Services Building



## Forest Regeneration & Seeding Ecology

Research interests: Impact of nursery culture and morphological characteristics on seedling quality and outplanting success. Mixed species, competition and vegetation management.

LANDHAUSSER, Simon

simon.landhausser@ualberta.ca

(780) 492-6381

426 Earth Sciences Building



## Silviculture & Forest Ecology

Research interests: Dynamics of boreal and mixedwood forests; tree recruitment, competitive relations and ecophysiology of trees, shrubs and herbs; light transmission through mixed canopies.

LIEFFERS, Victor J

victor.lieffers@ualberta.ca

(780) 492-2852

440 Earth Sciences Building



## Forest Ecology and Plant Biodiversity

Research interests: Natural regeneration of forests after natural disturbance or harvesting; understanding natural stand dynamics as a basis for mixedwood management; impacts of forest management on understory plant communities.

MACDONALD, S Ellen

ellen.macdonald@ualberta.ca

(780) 492-3070

743 General Services Building



## Soil-Plant Relations

Research interests: Soil fertility, soil ecology, rhizosphere dynamics, carbon sequestration (biochar), disturbance ecology, land reclamation, silviculture, agroforestry

MACKENZIE, M. Derek

m.derek.mackenzie@ualberta.ca

(780) 492-6388

340C Earth Sciences Building



## Forest Ecology and Wildlife Management

Research interests: Understanding the effects of forest disturbance (managed or natural) on wildlife populations and biodiversity; wildlife habitat supply modelling

NIELSEN, Scott

scott.nielsen@ualberta.ca

(780) 492-1656

741 General Services Building



## Wildland Fire Science and Management

Research interests: Effects of disturbances and processes in forest ecosystems over various spatial and temporal scales, evaluation and quantification of the effects of disturbance on ecological processes in forest ecosystems, sustainable ecosystem management and urban landscapes.

RYU, Soung

soung-ryoul.ryu@ualberta.ca

(780) 492-2356

869 General Services Building





## Forest Ecology and Wildlife Management

Research interests: Understanding the effects of forest disturbance (managed or natural) on wildlife populations and biodiversity; wildlife habitat supply modelling

SCHMIEGELOW, Fiona  
fiona.schmiegelow@ualberta.ca  
(780) 492-0552  
705A General Services Building



## Forest Hydrology and Watershed Management

Research interests: Forest evapotranspiration dynamics; eco-hydrology of forest stand dynamics, hydraulic architecture of trees, and forest disturbance effects on streamflow & water quality.

SILINS, Uldis  
uldis.silins@ualberta.ca  
(780) 492-9083  
809 General Services Building



## Forest Entomology, Ecology, Conservation, and Evolutionary Biology

Ecosystem-based forest management; effects disturbances on forest invertebrate populations; forest insect pest management;; biology & systematics of beetles, bugs and spiders.

SPENCE, John  
john.spence@ualberta.ca  
(780) 492-1426  
751E General Services Building



## Forest Genetics

Research interests: Tree improvement and breeding; quantitative and population genetics; forest conservation and biotechnology; evolutionary, ecological, quantitative, population, and conservation genetics.

YEH, Francis C  
francis.yeh@ualberta.ca  
(780) 492-3902  
701 General Services Building



## Tree Physiology

Research interests: Effects of pollution, drought and environmental stress on tree function; stress resistance, physiological, biochemical & structural adaptations of trees to stress; structure and function of cell membranes.

ZWIAZEK, Janusz J  
janusz.zwiazek@ualberta.ca  
(780) 492-2358  
438 Earth Sciences Building



*Our research helps ensure that forest management is economically, ecologically, and socially sustainable. Experimental, observational, and modeling studies are used to assess the long-term effects of various forest management strategies and practices on timber, wildlife, biodiversity.*

*The quality, quantity and impact of our research, the honors and awards received by our staff, and the strong history of funding from both government and industry attest to the Department's strength in Forestry.*



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E-mail Chair\_rr@ualberta.ca  
<http://www.ales.ualberta.ca/rr/>

# Biodiversity Conservation

*This is a rapidly growing area of well-supported research activity, also in great demand by potential graduate students. Our research within this theme is aimed at understanding how biological diversity, at various spatial and temporal scales and organizational levels, is affected by land use practices and human actions.*

## Bryophyte Distribution and Ecology, and Endangered Plants

Research interests: Patterns of bryophyte diversity on landscapes, historic plant geography, rare plant conservation, bryophyte taxonomy.  
BELLAND, Rene  
rbelland@ualberta.ca  
(780) 987-3054 or (780) 492-0801  
703 General Services Building  
Devonian Botanic Garden



## Biodiversity and Landscape Modeling

Research interests: Community ecology, species diversity, biological conservation, landscape ecology, ecological methodologies and modeling, and spatial statistics.  
HE, Fangliang  
fhe@ualberta.ca  
(780) 492-7575  
713C General Services Building



## Wetland Ecology and Management

Research interests: Waterfowl habitat creation, disturbance and reclamation using adaptive management; wildlife habitat manipulation and using natural processes; sustainable use of boreal wildlife.  
FOOTE, A Lee  
lee.foote@ualberta.ca  
(780) 492-4020  
855E General Services Building



## Forest Ecology, Tree and Ecosystem Function

Research interests: Trembling aspen ecology, effects of disturbance on species establishment and movement. Importance of carbon reserve strategies and carbon allocation in trees for growth and survival.  
LANDHAUSSER, Simon  
simon.landhausser@ualberta.ca  
(780) 492-6381  
426 Earth Sciences Building



## Hardwood Genetics

Research interests: Effects of climate change on ecosystems; conservation and ecological genetics; breeding and deployment; tropical ecology  
HAMANN, Andreas  
andreas.hamann@ualberta.ca  
(780) 492-6429  
739 General Services Building



## Forest Ecology and Plant Biodiversity

Research interests: Factors influencing biodiversity of understory plant communities (vascular and non-vascular); redevelopment of understory plant communities after natural disturbance or forest harvesting.  
MACDONALD, S Ellen  
ellen.macdonald@ualberta.ca  
(780) 492-3070  
743 General Services Building



## Ecology, Land Reclamation, and Restoration Ecology

Research interests: Land reclamation, revegetation and remediation of disturbed ecosystems; restoration ecology; vegetative reclamation and conservation; plant ecology; ecology and succession in disturbed ecosystems.

NAETH, M Anne  
anne.naeth@ualberta.ca  
(780) 492-9539  
855C General Services Building



## Conservation Biology

Research Interests: Species distribution and habitat supply modeling; endangered species monitoring and management; conservation planning and reserve design; grizzly bear ecology and management; landscape ecology.

NIELSEN, Scott  
scott.nielsen@ualberta.ca  
(780) 492-1656  
741 General Services Building



## Conservation Biology

Research interests: Community and landscape ecology, and applied conservation biology. Broad-scale effects of land-use policies and practices on wildlife and ecosystem integrity in northern systems.

SCHMIEGELOW, Fiona  
fiona.schmiegelow@ualberta.ca  
(780) 492-0552  
705A General Services Building



## Forest Entomology, Ecology, Conservation and Evolutionary Biology

Ecosystem-based forest management; effects disturbances on forest invertebrate populations; forest insect pest management; biology & systematics of beetles, bugs and spiders.

SPENCE, John  
john.spence@ualberta.ca  
(780) 492-1426  
751E General Services Building



## Forest Genetics

Research interests: Tree improvement and breeding; quantitative and population genetics; forest conservation and biotechnology; evolutionary, ecological, quantitative, population, and conservation genetics.

YEH, Francis C  
francis.yeh@ualberta.ca  
(780) 492-3902  
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*Research is conducted in the context of resource-based economies, and strives to develop innovative solutions to biodiversity concerns.*



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E-mail [Chair\\_rr@ualberta.ca](mailto:Chair_rr@ualberta.ca)  
<http://www.ales.ualberta.ca/rr/>

# Environmentally Sustainable Agriculture

*Good soil and water quality is an essential part of healthy agricultural and forest ecosystems. Soil and water quality may be lost if the soil is mismanaged during food and fibre production.*

## Hydrology, Applied Soil Physics, and Reclamation

Research interests: soil water, hydrology, snowmelt, runoff and erosion, soil compaction, land reclamation, and water quality.

CHANASYK, David S

david.chanasyk@afhe.ualberta.ca

(780) 492-6538

847 General Services Building



## Physiology of Forage Crops

Research interests:

Physiological adaptation of introduced and native forage species to optimize forage production and stand persistence under a range of management systems; evaluating grass legume mixtures.

KING, Jane

Jane.King@ualberta.ca

(780) 492-4750

416E Agriculture Forestry Building



## Fate and Transport of Mass and Energy in Agroecosystems

Research interests: Impacts of agricultural management practices on soil quality, soil water balance, soil transport properties, environmental fate of agricultural chemicals. Evaluation of agricultural best management practices (BMPs). Environmental services associated with agricultural management practices (e.g., carbon sequestration in soils, maintenance of healthy wetlands and riparian areas).

DYCK, Miles

miles.dyck@ualberta.ca

(780) 492-2886

773 General Services Building



## Ecology, Land Reclamation, and Restoration Ecology

Research interests: Land reclamation, revegetation and remediation of disturbed ecosystems; restoration ecology; vegetative reclamation and conservation; plant ecology; ecology and succession in disturbed ecosystems.

NAETH, M Anne

anne.naeth@ualberta.ca

(780) 492-9539

855C General Services Building



## Ecosystem Modeling

Research interests: simulation modeling of physical, chemical and biological processes in soil-plant-atmosphere systems as a means of studying resource management and conservation in agricultural ecosystems under current or future climates.

GRANT, Robert F

robert.grant@ualberta.ca

(780) 492-6609

340B Earth Sciences Building



## Soil Biogeochemistry

Research interests: Organic matter and microbial processes; soil-vegetation relationships; dynamic pedology.

QUIDEAU, Sylvie A

sylvie.quideau@ualberta.ca

(780) 492-5397

340B Earth Sciences Building



## Agriculture and the Environment

Research interests: Biogeochemistry of the soil environment; soil-water-plant interactions; cycling of trace elements; human impacts; soil health and water quality; archives of environmental change; analytical chemistry; humus, peat and the global carbon cycle.



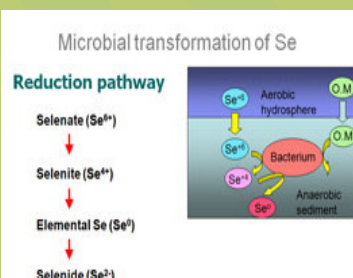
SHOTYK, William  
shotyk@ualberta.ca  
(780) 492-7155  
839 General Services Building

## Soil Chemistry and Environmental Microbiology

Research interests: Microbial transformations of heavy metals; their speciation in soil, sediment and water; and characterization of microbial populations involved in biotransformation processes.

SIDDIQUE, Tariq  
tariq.siddique@ualberta.ca  
(780) 492-2899

338A Earth Sciences Building



## Why should we be concerned with soil conservation?

*Good soil and water quality is an essential part of healthy agricultural and forest ecosystems. Soil and water quality may be lost if the soil is mismanaged during food and fibre production.*

## How does our work help us to deal with climate change?

*Our research is part of a national program to estimate how much greenhouse gas is emitted from agricultural and forest ecosystems, and how these emissions could be reduced. Our research will also be used to examine how ecosystem management might be altered to benefit from climate change in agricultural and forest production.*



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# Land Reclamation, Remediation & Restoration

*A recognized area of excellence at the University of Alberta, land reclamation embodies many disciplines, including soil science, plant science, hydrology, botany, ecology and microbiology.*

## Hydrology, Applied Soil Physics, and Reclamation

Research interests: soil water, hydrology, snow-melt, runoff and erosion, soil compaction, land reclamation, and water quality.

CHANASYK, David S  
david.chanasyk@afhe.ualberta.ca  
(780) 492-6538  
847 General Services Building



## Forest Land Reclamation and Restoration of Ecosystem Functions

Research interests: Importance of a forest canopy to understory and soil development on severely disturbed areas. Species selection, seedling quality, and growth performance.

LANDHAUSSER, Simon  
simon.landhausser@ualberta.ca  
(780) 492-6381  
426 Earth Sciences Building



## Forest Soils and Nutrient Dynamics

Research interests: Forest soil processes, soil microbial ecology, global change and soil acidification, carbon sequestration, forest fertilization, tree nutrition, forest ecophysiology, and silviculture-soil management interactions.

CHANG, Scott  
scott.chang@ualberta.ca  
(780) 492-6375  
424 Earth Sciences Building



## Soil-Plant Relations

Research interests: Soil fertility, soil ecology, rhizosphere dynamics, carbon sequestration (biochar), disturbance ecology, land reclamation, silviculture, agroforestry

MACKENZIE, M. Derek  
m.derek.mackenzie@ualberta.ca  
(780) 492-6388  
340C Earth Sciences Building



## Fate and Transport of Environmental Contaminants in Soils

Research interests: Remediation of saline/sodic soils; contaminant transport through soils; ecological risk assessment.

DYCK, Miles  
miles.dyck@ualberta.ca  
(780) 492-2886  
773 General Services Building



## Ecology, Land Reclamation, and Restoration Ecology

Research interests: Land reclamation, revegetation and remediation of disturbed ecosystems; restoration ecology; vegetative reclamation and conservation; plant ecology; ecology and succession in disturbed ecosystems.

NAETH, M Anne  
anne.naeth@ualberta.ca  
(780) 492-9539  
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## Soil biogeochemistry

Research interests: Organic matter and microbial processes; soil-vegetation relationships; dynamic pedology.

QUIDEAU, Sylvie A

sylvie.quideau@ualberta.ca

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## Agriculture and the Environment

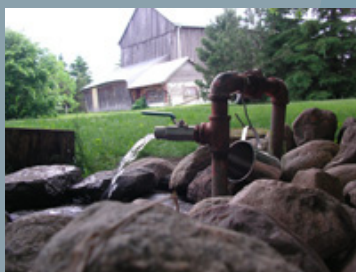
Research interests: Biogeochemistry of the soil environment; soil-water-plant interactions; cycling of trace elements; human impacts; soil health and water quality; archives of environmental change; analytical chemistry; humus, peat and the global carbon cycle.

SHOTYK, William

shotyk@ualberta.ca

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## Soil Chemistry and Environmental Microbiology

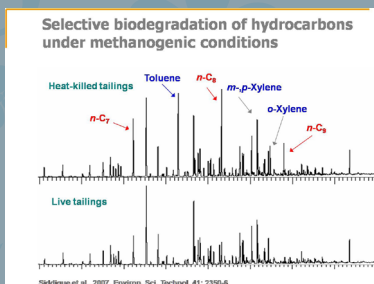
Research interests: Biodegradation of petroleum hydrocarbons under anaerobic conditions; metabolic pathways of hydrocarbon degradation; and molecular fingerprinting of hydrocarbon-degrading microbial communities.

SIDDIQUE, Tariq

tariq.siddique@ualberta.ca

(780) 492-2899

338A Earth Sciences Building



*Our research is aimed at understanding the impact of human land use activities, how disturbances alter a given ecosystem, and how that ecosystem can be reclaimed to productive capacity.*



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