Arctic Field Ecology

2005 Program Description and Application

a course offered by

The Itasca Field Biology Program, University of Minnesota

supported by

The USDA Forest Service
The International Institute of Tropical Forestry
The National Science Foundation

Program Director
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Research Expeditions to the Arctic

Integrating research, education, and Inuit knowledge of ecology in the North American Arctic

Thank you for requesting this information. The application is located on pages 4 and 5 inside. We encourage you to apply early. Feel free to copy this and pass it on to a friend. We look forward to hearing from you!

Program Description

Overall Objective

This program, begun in 1987, provides the training a research scientist needs to ask relevant questions and conduct independent research. Students explore topics in arctic natural history, practice field sampling skills, develop research hypotheses, assist in ongoing studies, and learn from course instructors, collaborating scientists, and local Inuit.

Two Main Features

Education: Students learn to develop and test hypotheses and employ data-collection techniques in the unique setting of the Arctic. Students will:

- Learn the regional flora and fauna
- Discuss current research topics in arctic ecology
- Gain an understanding of land-use and ecological issues facing the Arctic
- Gain an Inuit perspective on land-use and ecology in the Arctic
- Generate a set of original research hypotheses
- Outline a research proposal
- Gain confidence and knowledge to design and conduct original research

Research: We conduct our course in conjunction with a major research program involving an interdisciplinary group of ecologists, soil scientists, hydrologists and modelers. The research focuses on aspects of biocomplexity in the Arctic environment. We integrate the expertise of the scientists with a curriculum designed to introduce students to the research, we visit research sites across a wide range of environments, we actively involve students in data collection and analyses, and we encourage continued interaction of students and scientists.

Topics we cover

Arctic Ecology, Natural History, Current Issues in Arctic Research

The Arctic landscape: Climate, geochemistry, and topography – hierarchical controls on landscape patterns.

The Arctic ecosystem: The role of temperature, light, nutrients, disturbance, and organisms in above and belowground ecosystems.

Vegetation ecology: Landscape patterns and ecological controls on community composition.

Cryoturbation: The influence of glaciers, permafrost, snow cover, and freeze/thaw cycles on landforms, soils, vegetation, and ecosystem processes.

Soil ecology: Soil development and classification, ecosystem processes and soil organisms.

Traditional Ecological Knowledge: Understanding "Nuna" (the land) from Inuit perspectives.

Vertebrate ecology: Behavioral and physiological adaptations to the arctic environment.

Human history and current affairs: Inuit land use, archaeological sites, mining, oil, recreation.

Global change research: Climate and land-use, detecting environmental change.

Arctic transitions: Extrapolating in space and time – from field measures to modeling.

Biocomplexity: Understanding complex biological systems in the Arctic.

Caribou research: Interactions of migration, climate, vegetation, and hunting.

Note: These very adventurous journeys do not require any special experience. We use the best equipment available, and have personal safety at the top of our agenda. Each receives a detailed set of information to help prepare for the program. Upper participant division undergraduate and graduate credit will be offered through the Itasca Field Biology Program and the Department of Ecology, Evolution, and Behavior, University of Minnesota.

The Arctic Field Ecology Program

The Arctic Field Ecology Program offers ecology field courses in North America. We introduce undergraduate and graduate students to quantitative field science and regional natural history. The format gives students a chance to gain practical field skills as well as the tools to develop research proposals. Our summer courses take place along the rivers and lakes of Nunavut and Alaska. We camp and travel along these waterways as we learn. Each course involves study of arctic natural history as well as ongoing research of landscape ecology and Arctic ecosystems.

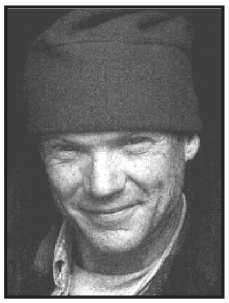
Our mission is to provide a unique educational experience that immerses each student in the Arctic landscape and the research practices associated with field ecology. Our goal is that each student comes away with a practical understanding of the capabilities and limits of field research, a confidence to apply themselves to graduate study or field work in the natural sciences, and an enhanced appreciation of the land.

The Environment

The Arctic has a variety of exciting aspects that make it a great place to study ecology and have a field class. The biome spans several countries, making the region ideal for international cooperative studies. The Arctic has a great deal of environmental and biological variability along a north-south climatic gradient. This gradient, and our current concerns about climate change, are important reasons for studying climatic controls on ecological properties and processes in the Arctic. The region stores vast amounts of fresh water; it is home to variety of unique mammals and birds; Arctic indigenous people depend on many of the resources from the land; and finally, the Arctic is strongly connected with other biomes by feedback effects on climate and hydrologic cycles.

The terrain is lush in the brief summer. Rolling hills and plains are covered with flowers, mosses, lichens, and shrubs. The summer climate is similar to late spring in the continental United States. Temperatures can reach 26° C (80° F) during the long summer days. It can get chilly, too. The average summer temperature is around 10° C (50° F).

The Staff



Dr. William Gould, the program director, is an ecologist who has been exploring the Arctic since 1977. His research includes the study of biodiversity patterns, description and mapping of vegetation, and analysis of vegetation change.

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Dr. Grizelle González is a soil biologist studying the effects of soil organisms on decomposition in tropic, temperate, and arctic ecosystems. She is a scientist at the International Institute of Tropical Forestry.

Andrew Borner is a graduate student at the University of Alaska - Fairbanks studying the effects of snow on plant phenology and ecosystem processes. He has worked in Arctic Alaska, Baffin Island, and the Central Canadian Arctic.

Additional Information (Please Read Carefully)

Comfort/Discomfort. The Arctic is a rugged, sometimes unpredictable place. Sudden storms, fierce winds, cold temperatures, and downpours can push people to tolerance limits. During travel through the area, you may at times be wet, cold, hungry, tired, bug-bitten, sunburned and sore. These conditions are reduced dramatically by proper preparation. Guidelines will be provided.

First Aid. The staff is certified in Wilderness Advanced First Aid (Red Cross) to handle injuries. In the event of a medical emergency, we carry a radio capable of contacting rescue groups for evacuation. There is no doctor on the trip. People with health conditions or in need of frequent medical attention should not consider this program.

Modes of Travel. Participants will be responsible for reaching Inuvik, Northwest Territories, Canada. We will travel by air charter to Banks Island, Prince Patrick Island, and Ellef Ringnes Island. We will travel by commercial air from Inuvik to Yellowknife, NWT and again by air charter to Bathurst Inlet.

Group Dynamics. A cooperative spirit is essential on these trips. People generally go through an adjustment time in a new and difficult environment. We will work with you to alleviate any problems or fears.

Keep a copy of this page for your records

Application For Admission

All trips are 4 weeks in the field

Part I. *Trip Preference and Cost*. There will be one section of Arctic Field Ecology for the summer of 2005.

Price includes 5 credits tuition, food, and gear (not including clothing, sleeping bag, and miscellaneous personal gear). We will meet in Inuvik, Northwest Territories, Canada to begin our class. Inuvik is accessible by road and commercial air.

☐ Arctic Field Ecology section 1. July 26 to August 18, 2005. $3000

Arctic Field Ecology will be investigating variation along a climatic gradient in the Canadian Arctic, from a High Arctic a research camp on Ellef Ringnes to a Low Arctic youth-elder-science camp on the shores of Bathurst Inlet.

We will integrate our course work with a major field study looking at the interaction of vegetation, climate and soils along a climatic gradient (http://www.geobotany.uaf.edu/cryoturbation). We will camp along the way, interact with scientists at the research sites, and meet with native people to learn about their knowledge of the region.

Part II. *Information About Yourself*. On separate paper, briefly describe:

1. Field courses or field work you have completed or in which you have participated.
2. Off-campus programs you have completed that may have relevance for wilderness travel and research.
3. Any special skills you bring to the group (this may include medical training, data gathering skills, camping skills, navigation skills, etc.).
4. Do you have any special needs (physical limitations, dietary needs, medical needs)?
5. A Brief Essay: Discuss how you would take advantage of this special opportunity. You should demonstrate how you would benefit academically and socially, and what motivates you to take on this challenge. Enthusiasm, compassion, character, and flexibility should be addressed.
6. Other materials needed: Please send a copy of your transcripts (unofficial o.k.). It is optional but highly recommended that you include a letter of recommendation from an academic source.

Part III. *Deposit:* Send a check payable to the University of Minnesota for $500. If you are not accepted it will be returned to you. If you are accepted, you will receive a letter and your deposit will be credited to the program cost. If you cancel up to two months before the program begins, all but $50 dollars will be returned to you. If you cancel after this time, you forfeit 50% of the program cost. Cancellations within one month of the program forfeit the full cost. If we find someone to replace you (we may have a waiting list), you will be refunded all but $50. After receiving your deposit, the University of Minnesota will bill for the remainder of the costs.

Part IV. *Data Sheet and Medical History*. Complete page 5 and leave no blanks! Put “none” or “n/a” if you must. Medical information should be provided with your application but the doctor’s signature and insurance information can be provided anytime prior to departure.

Part IV. Data Sheet and Medical History

Please print clearly, leave no blanks, put “None” or “N.A.” if no answer exists

First Name: Last Name:
Current Address:
City: State / Province: ZIP / Postal Code:
Country:

Current Home Phone with Area Code:
Alternate Phone Number:
Email address:

Your Birthdate (Month / Day / Year):

Your University and year (e.g., University of ..., junior, 4th year):
Social Security Number or Student Number:

Permanent Address:
City: State / Province: ZIP / Postal Code:
Country:

Emergency Contact Person:
Emergency Phone Number with Area Code:

Medical History

Height (in feet, inches):
Weight (in pounds):
Major Previous Illnesses:

Date of Last Tetanus or DPT shot:
Personal Medications Currently in Use:

History of Major Medical Problems in Family:

Major System Problems (e.g., Circulatory, Nervous, Digestive, Lymph):

Allergies:

Insurance Carrier and Policy Number:

Your Doctor's Name and Phone Number:

Doctor's Approval: As a physician for the person described above, I certify that the medical information on this page is true, to the best of my knowledge.

Signed: Date:

William Gould
International Institute of Tropical Forestry
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Checklist of Materials to Send

Part I. Copy pages 4 and 5 of this booklet for your records. Send one completed copy.
Part II. Send your responses on separate paper. Include unofficial transcripts and an optional letter of recommendation (or have them mailed directly).
Part III. Be sure you write your student number (social security number) on your check.
Part IV. Include the completed data sheet (page 5).

Send your application to:

William Gould
International Institute of Tropical Forestry
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After your application is received, it is reviewed and you will be contacted by phone or email. If you are accepted, we will send you additional information to help you prepare for the program.