

Master of Science in Sustainability Management

SUMA PS5770 Sustainable Management of Forests

Scheduled Meeting Times: TBD

Number of Credits (3)

Elective

Instructor: Ralph Schmidt, ralphschmidt@gmail.com, rs3729@columbia.edu
Office Hours: TBD
Response Policy: Preferred means of communication is via email and students can expect responses typically within 24 hours during the work week (ideally)

Facilitator/Teaching Assistant: TBD

Office Hours: TBD

Response Policy: TBD

Course Overview

One in three seems to be the indicative number. 30% of earth's land area is covered by forests (5000 years ago it was 50%); one third of current total CO₂ emissions are reabsorbed by forests; one third of humanity cooks with wood every day; agroforestry is the preferred system for these same 2 billion people. Hundreds of millions of indigenous peoples have their native land in forests. The biodiversity score is much higher: more than half of all of earth's species are found in forests (about 25% are in the oceans); forests are the major system for fresh water conservation; and the traded value of global forest products is about \$300 billion. Finally, to be in the forest (especially with your eyes open) makes life worth living.

Forests are therefore intimately connected with climate, water, biodiversity, food production, global poverty, indigenous people, and human spiritual well-being; not to mention the major global industries based on them. They are best understood when considered holistically, and that is the approach of this course. We will examine all the issues mentioned above and their connections with forests to develop a comprehensive understanding of them. We will study both forest ecology, economics and business. We will examine indigenous peoples' vision and view of forests and nature. We will delve deeply into the role of forests in climate change; forests both absorb and produce CO₂ emissions. We will consider temperate, tropical and boreal forests. On Saturday field trips we will learn to measure forest biomass, commercial volume and carbon content. We will learn to financially analyze forest business ventures. Students will produce reports at the end of the course on one of the connections outlined above or on a country of interest. Mid semester, students will develop analytical work products on measurement and financial analysis.

Without an understanding of forests, one's grasp of all the issues mentioned above is incomplete. Also forests provide a rather straight-forward context for understanding and analyzing many issues that are critical to all areas of sustainability. We will utilize the forest context to better understand, for example, management of water, biodiversity, poverty alleviation, environmental justice, forest industries and the global carbon cycle and climate. In other words, skills acquired here will be useful in other fields of study.

The instructor managed forest projects for UNDP in many countries for many years. He also lived and worked in Colombia, Puerto Rico, Italy, Australia, and Argentina for 16 years. We will weave these experiences into our study of principles. I (to switch the pronoun) am also available throughout the semester for any career discussions students may wish to pursue.

Diversity Statement

It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

Learning Objectives

Students will learn:

1. To understand the basic functioning of forest ecosystems, soil and water conservation, nutrient retention and recycling, the essential role of biodiversity in trophic interactions, growth and productivity, and the determinants of forest types;
2. To understand the interactions of forests with: water, biodiversity, wood production, agroforestry, carbon sequestration, and homelands for indigenous peoples;
3. To appreciate the role of biodiversity in sustaining humanity and the natural world;
4. To understand economic principles as they apply to forests;
5. To financially analyze the benefits and costs of private forest investments, and public forest policies;
6. To measure, analyze and report data on forest growth, biomass, commercial volume and carbon sequestration;
7. To understand the role of trees and forests in climate change mitigation and adaptation;
8. To be informed on global markets developing for forest carbon sequestration;
9. To understand the differing role of forests in developed (usually temperate) and developing (usually tropical) countries;
10. To think effectively about what constitutes sustainability for forests, and what are the consequences of achieving it, or not.

Course Schedule/Course Calendar

Week	Subject Matter	Reading Assignments (to be completed before the next week)	Other Assignments
1	Introductions; the eight major benefits of forests and issues that surround them; growth, dynamics and architecture of forests	Perry <i>et al.</i> pp. 1 - 40	Each student will make a five minute introduction on their academic background and major interests.
2	Types of forests across the globe and in the US; succession and disturbance; climate change and fires	Perry <i>et al.</i> pp. 41 – 68; 79 – 92.	Each week two students will together make a 5 minute report highlighting an especially interesting aspect of the reading assignment.
3	Forest Biodiversity	Perry <i>et al.</i> pp. 108 – 130; 140 - 155	

4	Deforestation; subsistence farmers and forest; agroforestry	Perry <i>et al.</i> pp. 170 – 215	
5	Forest economics; timber industry and markets in developed countries	Field pp. 1 – 50.	
6	Forest investment analysis; net present value, discounted cash flow, rate of return	Field pp. 51 – 96	
7	Optimal rotations for financial return, for biomass production, for carbon sequestration	Field pp. 97 – 140.	
8	The Science of forest carbon; micro and macro	Field pp. 141 – 159; 211 -229.	Final paper topics and outlines are due.
9	Measuring forest carbon	Ashton <i>et al.</i> pp. 1 -4; 31 -44; 51 – 72; 77– 89.	
10	Managing forests for carbon sequestration	Ashton <i>et al.</i> pp. 90- 101; 109-131; 139 – 152.	
11	Current forest carbon programs and policies	Ashton <i>et al.</i> pp. 165 – 176; 183 – 201; 205 -222.	
12	Forest dwelling indigenous people	Ashton <i>et al.</i> pp. 285-302; 305 – 318; 321 – 334.	Final papers are due.

Note. I cannot overemphasize the importance of completing and understanding the reading assignments as scheduled. It is critical to students' understanding and learning.

Readings:

David Perry, Ram Oren, and Stephen Hart; Forest Ecosystems; Second edition; 2008; Johns Hopkins Press.

Barry Field; Natural Resource Economics; Third Edition; 2016; Waveland Press

Mark Ashton, Mary Tyrrell, Deborah Spalding, Bradford Gentry; Managing Forest Carbon in a Changing Climate; 2012; Springer

Evaluation:

Student evaluation depends on the quality of the final report and class attendance and participation.

Grading

The final grade will be calculated as described below:

FINAL GRADING SCALE

Grade	Percentage
A+	98–100 %
A	93–97.9 %
A-	90–92.9 %
B+	87–89.9 %
B	83–86.9 %
B-	80–82.9 %
C+	77–79.9 %
C	73–76.9 %
C-	70–72.9 %
D	60–69.9 %
F	59.9% and below

Further Reading:

The books below are listed in chronological order. I find all of them excellent, and they help to bring the study of forests up to date. They are listed titles first which are mostly self-explanatory.

The Treeline – The Last Forest and the Future of Life on Earth. 2022. Ben Rawlence. St. Martin's Press. If you read one book on this list, this is the one. He visits six countries and reviews what's happening to the boreal forests and tundra and the indigenous people within them. Disturbing or terrifying, your choice. A poetic book, and full of scientific information.

Finding the Mother Tree - Discovering the Wisdom of the Forest. 2021. Suzanne Simard. Knopf. For those with mothers. Great research on mycorrhizae in the Pacific Northwest.

Entangled Life. 2021 Merlin Sheldrake. Random House. Serious research on mushrooms. Literally a mind-blower.

The Uncommon Knowledge of Elinor Ostrom. 2021. Erik Nordman. Island Press. Only woman to win the Nobel prize in economics. Debunks the tragedy of the commons.

Forests Adrift – Currents Shaping the Future of Northeastern Trees. 2020. Charles Canham. Yale University Press. A lifetime of research on northeastern (US)trees.

The Age of Wood. 2020. Roland Ennos. Scribner. Homo sps. use of wood for a half million years.

Natural Resource Economics: The Essentials. 2020. Tom Tietenberg and Lynne Lewis. Routledge. This covers the same territory as the Field book, but is a bit denser. Those with a strong economics background may prefer this one.

The Language of Plants: Science, Philosophy and Literature. 2019. Monica Gagliano, John Ryan, Patricia Viera. University of Minnesota Press. See the motto over Schermerhorn Hall.

The Financial Ecosystem. 2019. Satyajit Bose, Guo Dong and Anne Simpson. Palgrave Macmillan. Our brilliant colleague.

Climate Change and Biodiversity. 2019. Thomas Lovejoy and Lee Hannah. Yale University Press. The century's leading authority on biodiversity.

Breakpoint: Reckoning with America's Environmental Crises. 2018. Jeremy Jackson and Steve Chapple. Yale University Press.

Forest Bathing – Shinrin-Yoku. 2018. Li Qing. Penguin. Japanese forest immersion for healing mind and body.

The Structure and Dynamics of Human Ecosystems. 2017. William Burch, Gary Machlis and Jo Ellen Force. Yale University Press.

Why Forests? Why Now? 2016. Frances Seymour and Jonah Busch. Brookings Institution Press. Focuses on Tropical Forest Carbon Cycles.

Nature's Fortune – Investing in Nature. 2015. Jonathan Adams and Mark Tercek. Island Press. Mark Tercek was head of The Nature Conservancy; this focuses mostly on financial management of water projects.

Norwegian Wood- Stacking Wood the Scandinavian Way. 2015. Lars Mytting. Abrams. Those Vikings -still unique.

The Sixth Extinction. 2014. Elizabeth Kolbert. Holt and Company. "Trouble ahead, trouble behind." Jerry Garcia.

The River of Life: Sustainable Practices of Native Americans and Indigenous Peoples. 2014. Michael Marchand et. al. Michigan State University Press.

Working Together. 2010. Amy Poteete, Marco Janssen, Elinor Ostrom. Princeton U Press. Research on communities sustaining natural resources.

The Value of Life – Biological Diversity and Human Society. 1997. Stephen Kellert. Island Press

Course Policies

Participation and Attendance

I expect you to come to class on time and thoroughly prepared. I will keep track of attendance and look forward to an interesting, lively and confidential discussion. The class moves quickly, and if you miss an experience in class, you miss an important learning moment and the class misses your contribution. More than one absence will affect your grade.

Late work

Work that is not submitted on the due date noted in the course syllabus without advance notice and permission from the instructor will be graded down 1/3 of a grade for every day it is late (e.g., from a B+ to a B).]

Citation & Submission

All written assignments must use standard citation format (e.g., MLA, APA, Chicago), cite sources, and be submitted to the course website (not via email).

School and University Policies and Resources

Copyright Policy

Please note—Due to copyright restrictions, online access to this material is limited to instructors and students currently registered for this course. Please be advised that by clicking the link to the electronic materials in this course, you have read and accept the following:

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be "used for any purpose other than private study, scholarship, or research." If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of "fair use," that user may be liable for copyright infringement.

Academic Integrity

Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times.

SPS holds each member of its community responsible for understanding and abiding by the SPS Academic Integrity and Community Standards posted at <https://sps.columbia.edu/students/student-support/academic-integrity-community-standards>. You are required to read these standards within the first few days of class. Ignorance of the School's policy concerning academic dishonesty shall not be a defense in any disciplinary proceedings.

Diversity Statement

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Accessibility

Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website: <https://health.columbia.edu/content/disability-services>.

School Policies and Expectations:

Accessibility Statement – I want you to succeed in this course. Contact disability@columbia.edu or disability@columbia.edu for learning accommodations.

Names/Pronouns

You deserve to be addressed in a manner that reflects your identity. You are welcome to tell me your pronoun(s) and/or name (if different from University records) at any time, either in person or via email.

Discrimination

We embrace the diversity of gender, gender identity & expression, sex, sexual orientation, race, ethnicity, national origin, age, religion, disability status, family status, socioeconomic background, and other visible and non-visible identities. Columbia University does not tolerate unlawful discrimination, discriminatory harassment, sexual assault, domestic violence, dating violence, stalking, or sexual exploitation and all such conduct is forbidden by Columbia University Policy.

Duty to Report

You deserve a University community free from discrimination, harassment, and gender-based misconduct including sexual harassment, sexual assault, domestic and dating violence, stalking, and sexual exploitation. It is therefore University policy to require Columbia faculty and staff to report to EOAA any instance or allegation of prohibited conduct involving any undergraduate or any graduate student that is disclosed to, observed by, or otherwise known

to that employee. This requirement to report is in place to help ensure that students are provided appropriate resources and to allow the University to mitigate harm to our community.

Confidential Resources

There are confidential resources on campus who do not have a Duty to Report, including:

- * Sexual Violence Response & Rape Crisis/Anti-Violence Support Center (SVR)
- * Ombuds Office
- * Medical Services
- * University Counseling and Psychological Services
- * University Pastoral Counseling
- * Columbia Office of Disability Services

University employees working in a confidential capacity will not report information shared with them.

Inclusion

In the M.S. in Sustainability Management program, faculty and staff are committed to the creation and maintenance of “inclusive learning” spaces – classrooms and other places of learning where you will be treated with respect and dignity, and where all individuals are provided an equitable opportunity to participate, contribute, and succeed. All students are welcome regardless of race/ethnicity, gender identities, gender expressions, sexual orientation, socio-economic status, age, disabilities, religion, regional background, Veteran status, citizenship status, nationality and other diverse identities that we each bring to class.

Class Recordings

All or portions of the class may be recorded at the discretion of the Instructor to support your learning. At any point, the Instructor has the right to discontinue the recording if it is deemed obstructive to the learning process.

If the recording is posted, it is confidential and it is prohibited to share the recording outside of the class.

SPS Academic Resources

The Division of Student Affairs provides students with academic counseling and support services such as online tutoring and career coaching: <https://sps.columbia.edu/students/student-support/student-support-resources>.

Columbia University Information Technology

[Columbia University Information Technology](#) (CUIT) provides Columbia University students, faculty and staff with central computing and communications services. Students, faculty and staff may access [University-provided and discounted software downloads](#).

Columbia University Library

[Columbia's extensive library system](#) ranks in the top five academic libraries in the nation, with many of its services and resources available online.

The Writing Center

The Writing Center provides writing support to undergraduate and graduate students through one-on-one consultations and workshops. They provide support at every stage of your writing, from brainstorming to final drafts. If you would like writing support, please visit the following site to learn about services offered and steps for scheduling an appointment. This resource is open to Columbia graduate students at no additional charge. Visit <http://www.college.columbia.edu/core/uwp/writing-center>.

Career Design Lab

The Career Design Lab supports current students and alumni with individualized career coaching including career assessment, resume & cover letter writing, agile internship job search strategy, personal branding, interview skills, career transitions, salary negotiations, and much more. Wherever you are in your career journey, the Career Design Lab team is here to support you. Link to <https://careerdesignlab.sps.columbia.edu/>

*Netiquette**{Only applies to courses using online platforms}*

Online sessions in this course will be offered through Zoom, accessible through Canvas. A reliable Internet connection and functioning webcam and microphone are required. It is your responsibility to resolve any known technical issues prior to class. Your webcam should remain turned on for the duration of each class, and you should expect to be present the entire time. Avoid distractions and maintain professional etiquette.

Please note: Instructors may use Canvas or Zoom analytics in evaluating your online participation.

More guidance can be found at https://jolt.merlot.org/vol6no1/mintu-wimsatt_0310.htm

Netiquette is a way of defining professionalism for collaborations and communication that take place in online environments. Here are some Student Guidelines for this class:

- Avoid using offensive language or language that is not appropriate for a professional setting.
- Do not criticize or mock someone's abilities or skills.
- Communicate in a way that is clear, accurate and easy for others to understand.
- Balance collegiality with academic honesty.
- Keep an open-mind and be willing to express your opinion.
- Reflect on your statements and how they might impact others.
- Do not hesitate to ask for feedback.
- When in doubt, always check with your instructor for clarification.