

Syllabus

Spring 2012 PINEMAP Distance Graduate Course: Climate and Forests

Course Coordinators:

Martha Monroe, Professor and Extension Specialist, School of Forest Resources and Conservation, University of Florida (mcmonroe@ufl.edu); Jessica Ireland, PINEMAP Project Coordinator, School of Forest Resources and Conservation, University of Florida (jjtireland@ufl.edu)

Course Goals:

- Prepare graduate students to address climate change mitigation and adaptation issues in southern pine forests.
- Facilitate greater levels of integration by encouraging students to engage in the processes designed to enhance communication, cooperation, and collaboration among disciplines and across research, education, and Extension functions.
- Build transdisciplinary research, education, and outreach capacity.

Course Objectives:

- Increase understanding of climate, climate change, carbon cycle, carbon sequestration, and environmental controls on pine productivity.
- Increase understanding of the policy and economic realities driving regional pine forest management.
- Increase understanding of education and communication principles as applied to effective outreach strategies, the process of program development and evaluation, and the strategies used by Cooperative Extension to support changes in behavior.
- Gain an appreciation for the breadth and complexity of the PINEMAP project.
- Work with others outside of own aim to engage in education and extension aspects of the project.
- Be able to articulate the benefits and barriers to interdisciplinary research.

Format:

- Students will register for 2 credits of independent study or special topics with their advisor at their home institution. Advisor will assign a grade (pass/fail or letter grade).
- Students will participate in webinars and web thread discussions, listen to presentations, read papers, interact in both the live and asynchronous discussions, work in small groups, and complete two assignments.
- Live course sessions will be broadcast via Elluminate on Tuesdays, 12-2 p.m. EST. To join the Elluminate sessions, click on this link:
<https://sas.illuminate.com/m.jnlp?sid=2010029&password=M.FCFC4F779D4D0037A078760AA2B6DF>
- Live class sessions will begin January 17 and conclude May 1.

Assignments:

Aim Group Assignment 1:

Students in each Aim will work with one or two faculty members to better understand the literature and research questions in their Aim. This exploration should enable any student to comfortably explain what we already know, why the research is proposed, and what questions the research is designed to answer. Groups are encouraged to go beyond the proposed research to discuss additional questions that may be of interest. Students will explain their Aim research to the other students via a video, website, readings, PowerPoint, or other format of choice that will be loaded to the website by March 2 to be viewed asynchronously during the weeks of March 5-19. Groups should develop discussion questions for their Aim and encourage students to ask additional questions to help them prepare their opportunity to clarify their presentation on March 27. An Assignment 1 worksheet will be available to help students review all the presentations and reflect on their own.

Assignment 1 coordinators: Aim 1: Mike Kane; Aim 2: Randy Wynne; Aim 3: Gary Peter and Jason Holliday; Aim 4: Bob Abt and Damian Adams; Aims 5 and 6: Martha Monroe

Interdisciplinary Group Outreach Assignment 2:

Students will be assigned to four groups, each with an Extension faculty leader. Together they will identify a target audience of interest (such as private family landowners, youth, teachers, an undergraduate student club, or forest industry coop members), understand their needs for information and skills, revise or develop a program or product, and implement and evaluate it during the month of April. The vision is to explore the Extension program development process, albeit on a small scale. Groups may develop and test a fact sheet or develop and give a presentation to a group of students, for example. All team members should be involved in evaluating the program/product in some way, so it should be something that can be implemented by everyone in the group in their local area. Please post your product (PowerPoint presentation, fact sheet, etc.) on the course web site by April 17 for feedback from the faculty team.

Assignment 2 coordinators: Bill Hubbard, Gwendolyn Boyd, Joshua Idassi, Mark Megalos

Course Schedule

Live Elluminate webinars will be held Tuesdays, 12-2 p.m. EST on the following days: Jan 17, Jan 24, Jan 31, Feb 7, Feb 14, March 27, April 3, April 17, April 24, and May 1. To join the live webinars, click on this link:

<https://sas.illuminate.com/m.inlp?sid=2010029&password=M.FCFC4F779D4D0037A078760AA2B6DF>

Prior to January 17:

Review PINEMAP web site (www.pinemap.org); register on course web site

Jan 17: Welcome to PINEMAP; course overview and introductions

Coordinators: Martha Monroe and Jessica Ireland

Elluminate webinar, 12-2 p.m. EST: Tim Martin, Professor of Tree Physiology, School of Forest Resources and Conservation, University of Florida

To prepare for this week:

Send one PowerPoint slide that describes/illustrates you to Jessica Ireland (jjtireland@ufl.edu) by January 12, 2012 and be prepared to introduce yourself on the webinar.

Jan 24: The impact of climate change on forest ecosystems

Coordinators: Tom Fox, Randy Wynne, and Dan Markewitz

- **Elluminate webinar, 12-2 p.m. EST:** Soil Properties and Processes that Control Soil Carbon Accumulation Tom Fox, Professor of Forest Soils and Silviculture, Virginia Tech; Forest and Carbon Storage, Dan Markewitz, Professor, Soil Site Productivity, University of Georgia; Managing Forests in the Face of an Uncertain Climate, Randy Wynne, Professor of Forestry, Remote Sensing, Virginia Tech.

To prepare for this week, read:

- 1) Millar, C.I., N.L. Stephenson, and S.L. Stephens. 2007. Climate change and forests of the future: Managing in the face of uncertainty. *Ecological Applications* 17(8):2145-2151.
- 2) McKinley, D.C., M.G. Ryan, R.A. Birdsey, C.P. Giardina, M.E. Harmon, L.S. Heath, R.A. Houghton, R.B. Jackson, J.F. Morrison, B.C. Murray, D.E. Pataki, and K.E. Skog. 2011. A synthesis of current knowledge on forests and carbon storage in the United States. *Ecological Applications* 21(6):1902-1924.
- 3) Schmidt, M.W.I., M.S. Torn, S. Abiven, T. Dittmar, G. Guggenberger, I.A. Janssens, M. Kleber, I. Kogel-Knabner, J. Lehmann, D.A.C. Manning, P. Nannipieri, D.P. Rasse, S. Weiner, and S.E. Trumbore. 2011. Persistence of soil organic matter as an ecosystem property. *Nature* 478:49-56.

Jan 31: Climate model projections in the Southern U.S.

Coordinators: Ryan Boyles and Heather Dinon

Illuminate webinar, 12-2 p.m. EST: Climate projections: Where do they come from and what can we use them for? [Katharine Hayhoe, Research Associate Professor of Atmospheric Sciences, Texas Tech University](#)

To prepare for this week, read:

- 1) Intergovernmental Panel on Climate Change (IPCC). 2011. *Fact Sheet: IPCC Special Report on Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation*: http://www.ipcc.ch/news_and_events/docs/srex/SREX_fact_sheet.pdf
- 2) IPCC. 2007. *Summary for Policymakers: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the IPCC*. <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf>
- 3) Risbey, J.S. and T.J. O’Kane. 2011. Sources of knowledge and ignorance in climate research. *Climatic Change* 108(4):755-773. (“Abstract,” “Introduction,” and “Conclusions” required; entire article optional)
- 4) Jonassen, R. and R. Pielke Jr. 2011. Improving conveyance of uncertainties in the findings of the IPCC. *Climatic Change* 108(4):745-753. (read “Abstract” and Introduction” and review LMI-CLICKE web site: <http://clicke.lmi.org/index.php/Home>)
- 5) National Wildlife Federation. 2011. *Scanning the Conservation Horizon: A Guide to Climate Change Vulnerability Assessment*. http://training.fws.gov/CSP/Resources/climate_change/vulnerability_handouts_nov_2011/TOC_bookmarked.pdf (read pages 51-62, stopping at “Types of Response Models” and pages 68-71)

For more information/optional readings:

- 1) IPCC. 2011. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation: A Special Report of Working Group I and Working Group II of the IPCC*. http://ipcc-wg2.gov/SREX/images/uploads/SREX-SPM_Approved-HiRes_opt.pdf
- 2) *Climatic Change*, Volume 108, Number 4. October 2011. *Special Issue: Guidance for Characterizing and Communicating Uncertainty and Confidence in the Intergovernmental Panel on Climate Change*. <http://www.springerlink.com/content/k2r46wj51481/>
- 3) Yohe, G. and M. Oppenheimer. 2011. Evaluation, characterization, and communication of uncertainty by the intergovernmental panel on climate change—an introductory essay. *Climatic Change* 108(4):629-639. (“Introduction” section required; entire article optional)
- 4) Morgan, M.G. and C. Mellon. 2011. Certainty, uncertainty, and climate change. *Climatic Change* 108(4):707-721. (read pages 707-708)

Feb 7: Southern Forest Futures: Comparing driving forces

Coordinator: Robert Abt

Illuminate webinar, 12-2 p.m. EST: [David N. Wear, Southern Research Station, USDA Forest Service](#)

To prepare for this week, read:

- 1) Wear, D.N. and J.G. Greis. 2011. *The Southern Forest Futures Project: Summary Report*. USDA Forest Service Southern Research Station. http://www.srs.fs.usda.gov/futures/reports/draft/summary_report.pdf

Feb 14: The biology, economics, and scale effects of carbon scoring woody biomass for energy

Coordinator: Robert Abt

Illuminate webinar, 12-2 p.m. EST: Robert Abt, Professor of Forestry, Department of Forestry and Environmental Resources, North Carolina State University

To prepare for this week, read:

- 1) EPA Science Advisory Board. 2011. *Accounting Framework for Biogenic CO₂ Emissions from Stationary Sources*. Washington, DC: U.S. EPA Office of Atmospheric Programs, Climate Change Division. [http://yosemite.epa.gov/sab/sabproduct.nsf/0/2F9B572C712AC52E8525783100704886/\\$File/Biogenic_CO2_Accounting_Framework_Report_LATEST.pdf](http://yosemite.epa.gov/sab/sabproduct.nsf/0/2F9B572C712AC52E8525783100704886/$File/Biogenic_CO2_Accounting_Framework_Report_LATEST.pdf)
- 2) Manomet Center for Conservation Sciences. 2009. *Biomass Sustainability and Carbon Policy Study, Chapter 5: Forest Carbon Modeling: Stand-Level Carbon Dynamics and Implications of Harvesting for*

Carbon Accumulation. Brunswick, ME: Manomet Center for Conservation Sciences.

http://www.manomet.org/sites/manomet.org/files/Manomet_Biomass_Report_Chapter5.pdf

- 3) Abt, R.C., C.S. Galik, and J.D. Henderson. 2010. *The Near-Term Market and Greenhouse Gas Implications of Forest Biomass Utilization in the Southeastern United States*. Durham, NC: Climate Change Policy Partnership, Duke University. http://www.nicholas.duke.edu/ccpp/ccpp_pdfs/biomass.08.2010.pdf

Weeks of Feb 20 and 27: Assignment 1: Work with Aim teams and Aim coordinator to understand the theory, framework, and current issues in your Aim. Use your Aim Elluminate site as desired to work together on the assignment. Post assignment on the course website by March 2.

Aim Coordinators:

Aim 1: Mike Kane

Aim 2: Randy Wynne

Aim 3: Gary Peter and Jason Holliday

Aim 4: Bob Abt and Damian Adams

Aims 5 and 6: Martha Monroe

Weeks of March 5 – 19: Two weeks of asynchronous work during the three week period of spring break. Review each of the posted aim programs from Assignment 1, respond to questions, and ask questions.

March 27: Discuss Assignment 1: Aim groups respond to questions and comments, clarify their program, and engage in additional discussion of Aim-based research.

Coordinators: Martha Monroe and Jessica Ireland

Live discussion via Elluminate webinar, 12-2 p.m. EST

April 3: Effective climate change Extension programming

Coordinator: Bill Hubbard

Elluminate webinar, 12-2 p.m. EST: Bill Hubbard, Southern Regional Extension Forester

To prepare for this week, read:

- 1) Butler, B.J., M. Tyrrell, G. Feinberg, S. VanManen, L. Wiseman, and S. Wallinger. 2007. Understanding and reaching family forest owners: Lessons from social marketing research. *Journal of Forestry* 105(7):348-357.
- 2) Kittredge, D.B. 2004. Extension/outreach implications for America's family forest owners. *Journal of Forestry* 102(7):15-18.
- 3) Snyder, L.B. and S.H. Broderick. 1992. Communicating with woodland owners: Lessons from Connecticut. *Journal of Forestry* 90(3):33-37.
- 4) Israel, G.D., A. Harder, and C. Winton Brodeur. 2011. *What is an Extension program?* (WC108). Gainesville: University of Florida Institute of Food and Agricultural Sciences. <http://edis.ifas.ufl.edu/wc108>
- 5) Monroe, M.C. & G. Hochmuth. 2007. *Scholarship in Extension program development: The role of the state specialist* (FOR 123). Gainesville, FL: University of Florida Institute of Food and Agricultural Sciences. <http://edis.ifas.ufl.edu/fr179>
- 6) Israel, G.D. *Using logic models for program development* (AEC360). 2001. Gainesville, FL: University of Florida Institute of Food and Agricultural Sciences. <http://edis.ifas.ufl.edu/wc041>
- 7) Diem, K.G. 2002. *A step-by-step guide to developing effective questionnaires and survey procedures for program evaluation & research* (FS995). New Brunswick, NJ: Rutgers Cooperative Research & Extension, NJAES. <http://njaes.rutgers.edu/pubs/publication.asp?pid=FS995>

Additional resources:

- 1) University of Wisconsin-Extension. 2001. *Cooperative Extension Program Planning in Wisconsin*. <http://www.uwex.edu/ces/pdande/planning/pdf/ProgramPlanning.pdf>
- 2) University of Wisconsin-Extension. 2003. *Welcome to Enhancing Program Performance with Logic Models*. <http://www.uwex.edu/ces/pdande/evaluation/pdf/lmcourseall.pdf>

April 10: Challenges to communicating about climate

Coordinator: Martha Monroe

To prepare for this week, review narrated PowerPoint asynchronously, post comments/questions on weekly discussion board, and read:

- 1) Center for Research on Environmental Decisions (CRED). 2009. *The Psychology of Climate Change Communication: A guide for scientists, journalists, educators, political aides, and the interested public*. New York. 1-48. <http://cred.columbia.edu/guide/>
- 2) Somerville, R. C. J. and S. J. Hassol. 2011. Communicating the science of climate change. *Physics Today* 64(10):48-53.
- 3) Moser, S.C. and L. Dilling. 2007. Introduction, in Moser, S. C. and Dilling, L. (eds.) *Creating a climate for change: Communicating climate change and facilitating social change*. Cambridge UK: Cambridge University Press, 1-27.

April 17: PINEMAP Decision Support System (DSS)

Coordinator: Ryan Boyles

Illuminate webinar, 12-2 p.m. EST: Ryan Boyles, Director and State Climatologist and Heather Dinon, Applied Climatologist, State Climate Office of North Carolina

To prepare for this week, read:

- 1) Breuer, N.E., C.W. Fraisse, and P.E. Hildebrand. 2009. Molding the pipeline into a loop: The participatory process of developing Agroclimate, a decision support system for climate risk reduction in agriculture. *Journal of Service Climatology* 3, 1:1-12. <http://www.journalofserviceclimatology.org/articles/2009/Breuer-2009-JSC.pdf>
- 2) Greer, J.E., S. Falk, K.J. Greer, M.J. Bentham. 1994. Explaining and justifying recommendations in an agriculture decision support system. *Computers and Electronics in Agriculture* 11, 2-3:195-214.
- 3) Review AgroClimate web site: <http://agroclimate.org/about/>
- 4) Open-AgroClimate brochure: <http://open.agroclimate.org/wp/wp-content/uploads/2010/08/OAC-Brochure.pdf> and poster: <http://open.agroclimate.org/wp/wp-content/uploads/2010/11/Open-AgroClimate-Moving-Forward-Poster-v2.pdf>

April 24: Transdisciplinary research, adapting to a changing world

Coordinator: Gary Peter

Illuminate webinar, 12-2 p.m. EST: Gary Peter, Professor, Forest Genomics and Cell Biology, School of Forest Resources and Conservation, University of Florida

To prepare for this week, read:

- 1) Eigenbrode, S. D., M. O'Rourke, J.D. Wulfhorst, D.M. Althoff, C.S. Goldberg, K. Merrill, W. Morse, M. Nielsen-Pincus, J. Stephens, L. Winowiecki, and N.A. Bosque-Perez. 2007. Employing philosophical dialogue in collaborative science. *BioScience* 57:55-64.
- 2) National Research Council. 2009. *A New Biology for the 21st Century*. Washington, DC: The National Academies Press. http://www.nap.edu/catalog.php?record_id=12764 (read pgs. 1-38)

May 1: Groups report on their extension programs (what they did, with whom, and what they learned); course evaluation, discussion, and feedback.

Coordinators: Martha Monroe and Jessica Ireland

Live discussion via Illuminate webinar, 12-2 p.m. EST