

Welcome!



PINEMAP

- Meeting Objectives
- Outcome Themes
- Year in Review
- Agenda Highlights

PINEMAP Annual Meeting
Athens, GA, April 24-26, 2013



United States
Department of
Agriculture

National Institute
of Food and
Agriculture

Meeting Objectives


1. Share and reflect on emerging research results and methods.
2. Revisit broad project outcomes, recognize how each participant's work contributes, and identify gaps.
3. Continue to identify and create integrative mechanisms for achieving long-term project outcomes.

PINEMAP Project Team

Principal Investigators

Sabine Grunwald
 Aim 1, Aim 2
 Professor, GIS & Land Resources
 Soil & Water Science Department
 University of Florida

Research Interests: Soil-landscape modeling; pedometrics; digital soil mapping; envirometrics; Geographic Information Systems (GIS); soil and remote sensing applications.
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Staff & Postdocs

Jessica Ireland
 PINEMAP Project Coordinator
 School of Forest Resources & Conservation
 University of Florida

Role: Coordinates project-wide activities; maintains the project web site and intranet site; organizes and coordinates project meetings; manages and oversees interim and annual reporting; and coordinates project communications.




Graduate Students

Melissa Kreye
 Aim 4
 Ph.D. Student


...tion

...st-based changes in water quality; meta-analysis of
 ...fied an econometric model that predicts willingness
 ...sing benefit transfer method, applied the model to




...al Resources

...loblolly pine using 12C/13C ratios in wood




...nagement

...Agilent SureSelect target gene enrichment system
 ...design using the Agilent eArray tool and the most
 ...consisting of 42077 sequences representing
 ...ne.




...sources

...arbon storage and use with changing environmental




...nagement

...ress and soil nutrient deficiencies on tree growth and
 ...at physiological responses to silvicultural practices,
 ...petition control.



...ronmental Conservation


...n in widely distributed tree species; transcriptional
 ...phenotype association studies; conservation genetics;
 ...of tree populations to climate change; landscape



...lewski

...Ecosystem Science & Management
 ...iversity


...focus: Building a location database for the progeny tests and the parents
 ...those progeny tests that can be linked to climatic data. This database will
 ...one of the URF analysis to optimize seedling deployment.



...dinator



...Forest Resources & Environmental Conservation

...ting baseline measurements on Tier II sites and overseeing data collection
 ...r III site.



...alist

...tal Sciences

Team Members
 April 2013

57 PIs

23 Research and Technical Staff

7 Postdocs

38 Grad Students

Annual Report – A sampling of PINEMAP's first rate science



PINEMAP
Pine Integrated Network: Education, Mitigation, and Adaptation Project

Year 2 Annual Report | March 2012-February 2013
Mapping the future of southern pine management in a changing world

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The implication is that sizeable gains in future loblolly pine productivity can be made through the application of better silvicultural methods, targeted seedling deployment supported by continued breeding and progeny testing, and the integration of the two efforts—exactly the goal of the PINEMAP project.

In complex ways, one of the most important is minimum winter temperatures. Proven and movement guidelines that recommended planting seed sources that evolved where winters were warmer to more continental environments seem to be validated. These trees have less conservative growth habits and will grow faster and be more productive than the local material. Moved too far north, however, growth and survival may be challenged. The old rule of thumb, which calls for limiting movement of southern pine to areas experiencing no more than a 4°F decrease in winter minimum temperatures, seems to be confirmed (Figure 12.1). Where this zone will be in the future depends on future warming trends and is likely to be even further north than it is today.

Another weather factor with distinct geographic trends is precipitation. This is evident in both annual averages and in year-to-year fluctuations and is likely to be especially important in the western edge of the loblolly pine range where low rainfall is generally considered to be largely responsible for the species limits. While summer precipitation certainly plays a major role in determining pine productivity, it is less clear how much effect it has on determining seed source adaptability. Some of the reasons may be related to study design and the difficulties inherent in using progeny tests to study climate change. One challenge is that such tree improvement cooperative is working with a subset of the loblolly pine population, and some of the common garden trials have a range-wide sampling of seed sources. Perhaps a more significant problem is that all of the current test sites used for modeling were planted within the range of conditions generally recognized as suitable for supporting productive stands. Furthermore, early growth and productivity as measured in these tests does not necessarily reflect long term adaptability.

These modeling efforts provide robust support for current and future seed deployment guidelines at the provenance level. For example, a preliminary production model for height growth of loblolly pine based on historical progeny test data and climatic variables can be used to develop deployment decisions to mitigate climate change for plantation forestry (Figure 12.2). These modeling efforts also point out the limitations of the simplified approach for plantation forestry. By using only climatic variables as input, the impacts of site specific conditions such as soil quality and individual genetic factors that contribute substantially to forest productivity are ignored. Likewise, using only the climate of the seed source to represent a common evolutionary background fails to factor in gains that can be made from taking advantage of the considerable tree-to-tree genetic variation. The implication is that sizeable gains in future loblolly pine productivity can be made through the application of better silvicultural methods, targeted seedling deployment supported by continued breeding and progeny testing, and the integration of the two efforts—exactly the goal of the PINEMAP project.

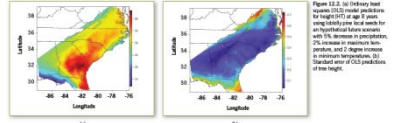


Figure 12.1. (a) Ordinal test sites (18°N to 36°N, 86°W to 76°W) used to evaluate loblolly pine response to a 4°F decrease in winter minimum temperatures. (b) Projected range of loblolly pine under a 4°F decrease in winter minimum temperatures. (c) Standard error of OLS prediction for height.



"I realized how much I learned about SO many things. I learned many new skills and techniques... over the course of the summer. I did everything from tree-ring, to stream-monitoring, to root-scanning, and of course Li-COR use [a Li-COR infrared gas analyzer measures carbon dioxide flux rates]."

Students became appreciably more capable of performing their duties over the summer. Being able to interact and have discussions with a graduate mentor also prompted undergraduates to consider their career paths in thoughtful ways. This response to the depth of a single project and the breadth of research within lab groups and departments gave undergraduates an appreciation for rigorous research that they may not have experienced through a traditional undergraduate education.

For example, W&I Estemiller worked with M.S. candidate Brent Holm at Virginia Tech and reflected on his experience: "I realize how much I learned about SO many things. I learned many new skills and techniques... over the course of the summer. I did everything from tree-ring, to stream-monitoring, to root-scanning, and of course Li-COR use [a Li-COR infrared gas analyzer measures carbon dioxide flux rates]. I learned how graduate school works and what it's like to be a grad student, which was especially valuable knowledge since I knew that I'd hopefully be in Brent's position in just a couple of years." Paul Dinkler, an undergraduate fellow paired with M.S. candidate Stephanie Hall at the University of Florida, worked on the development and pilot testing of activities for a Provenance Tree seedling trade-in for climate change and southern forests (Figure 20.2).

Graduate students remarked that they experienced growth as a mentor, particularly since this was the first time some of them interacted with undergraduates in this type of relationship. When asked about their experience, some of them reflected on the intricacies of directing undergraduates in specific research projects as well as in general work activities and communication. Wen Lin, a first-year Ph.D. student at North Carolina State University at the time, shared her reflections on the overall experience and noted that she had to revise her approach to directing her upcoming engineering assistant. Subsequent to the following:

"The most important lesson I learned from this internship is how to communicate effectively with undergraduates. As first communicated with the intern, I did with professors or graduate students... As time went by, I learned to articulate a task, giving clear and specific description of the background and goals, and being clear that requiring timely responses was the best way to get updates and provide help.

Part of this communication gap was due to varying degrees of education that I was able to see in the broader transition from a young adult to adult. Another mentor, Stephanie, was grateful for having someone to "share the workload" and for the experience of being a graduate student working with an undergraduate intern as an assistant at the degree level.

Based on reviews of the pilot year, additional emphasis is being placed on the identified strengths of the program. We are also making revisions to improve targeted areas of the program. Specifically, participants in the 2013 program can expect more opportunities for a shared cohort experience and integration into PINEMAP research. We look forward to reporting on the program's second year as we expand to include 12 fellows and 12 mentees in 2013.

Outcome Themes



Increased carbon (C) sequestration from silvicultural and genetic enhancement of productivity and efficiency of fertilizer use, and resilience to climate variability and disturbance.

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Public policy that supports sustainable management of planted pine under future climate scenarios.

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Public policy that supports sustainable management of planted pine under future climate scenarios.



A more robust and resilient forest-based economy in the Southeast U.S.

PINEMAP Graduate Course version 2.0

- Introduction to CC mitigation and adaptation issues; building capacity for integration
- Spring 2013 course revised based on feedback from 2012
- 19 students from 8 universities enrolled
- 41 graduate students enrolled over both years' offerings!



PINEMAP Undergraduate Fellowship Program

- Excellent opportunities for “two-way-benefits” between UG and Grad students
- Fellows participate in Fall online course and secondary school outreach
- 5 UG Fellows, 16 schools visited, 1,060 students reached
- 12 slots available for 2013



PINEMAP Datasets

PINEMAP Climate Data

PINEMAP's core mission is to provide information to forest landowners that enables them to continue managing southern forests for productivity and resilience in a changing world. To accomplish this mission, PINEMAP researchers need access to high quality historical climate data, and to state-of-the-art predictions about future climate. The PINEMAP data management group, in collaboration with PINEMAP modelers and climate scientists, has assembled a number of spatially-explicit datasets to meet this need.

PRISM (Parameter-elevation Regressions on Independent Slopes Model)

These data sets were created using the PRISM climate mapping system, developed by Dr. Christopher Dal PRISM Climate Group director. PRISM is a unique knowledge-based system that uses point measurements of precipitation, temperature, and other climatic factors to produce continuous, digital grid estimates of monthly, yearly, and event-based climatic parameters. Continuously updated, this unique analytical incorporates point data, a digital elevation model, and expert knowledge of complex climatic extreme world-wide as the highest-quality spatial climate data sets currently available. PRISM is the US' climatological data. <http://prism.oregonstate.edu>

Variables representing 1970-2010 included in the PRISM dataset are: Precipitation (average monthly), Minimum Temperature (average monthly), Maximum Temperature (average monthly), Dew Vapor Pressure (average monthly).

Idaho Geospatial

This gridded data set was developed by Dr. John Abatzoglou from the University combines spatial attributes of gridded climate data from PRISM with temporal and daily gauge-based precipitation. The gridded was based on observations including RAWS, AgriMet, AgWeatherNet and USHCN-2. The data set is intr climate data to drive ecological or hydrological models as well as other applied climate data in a netCDF format. Then these netCDF were reformatted and imported i http://inside.uidaho.edu/webapps/search/epsor_browse.aspx

Variables representing 1979-2011 included in the Idaho Geospatial dataset are: monthly), Precipitation (total monthly accumulations), Maximum Relative Humidity, Minimum Relative Humidity (average monthly), Specific Humidity (average monthly), Minimum Temperature at Surface (average monthly), Wind Direction (average monthly), Wind Speed (average monthly), Maximum Temperature (average monthly).

WWW.PINEMAP.ORG

Mapping the future of southern pine management in a changing world

Available Tier I Historical Data

Historical inventory data have been collected from PINEMAP cooperatives and made available through TerraC. These data have been reformatted so that each dataset uses the same column names for matching variables. Both individual tree DBH and Height measurements are available, as well as derived individual tree stem volume, and stand level volume and site index. Please contact the PINEMAP data manager if you have any questions or concerns.

Study Name	Cooperative	Description	Total Sites	Date Est	Age Range	# Measurements
CPCC06	PMRC	The Coastal Plain Intensive Culture / Density study was established in 1936/36 to examine the effects of intensive silviculture and current operational practices on the growth and yield of loblolly pine across a wide range of densities. The study was installed across a range of GRIF soil types so soil type interactions could be tested. Seventeen installations were established in the Coastal Plain of Georgia and Florida.	17	1936	2-12	6
SAGCD06	PMRC	The SAGS Culture / Density study was established in 1936/36 to examine the effects of intensive silviculture and current operational practices on the growth and yield of loblolly pine across a wide range of densities on the Piedmont and Upper Coastal Plain of South Carolina, Georgia, Alabama, Florida, and Mississippi.	21	1936	2-12	6
WGCD01	PMRC	Installations examining planting density, cultural treatment intensity, and thinning were established at 18 locations in Arkansas, Louisiana, Texas, and Mississippi during the 2000/2001, 2001/2002, and 2002/2003 dormant seasons.	18	2001	1-8	8
SAGSP05	PMRC	This study, established during 1986 at a planting density of 545 trees/acre in the Upper Coastal Plain and Piedmont of the southern U.S., examined the impact of the following six site preparation treatments on loblolly pine plantation growth and yield: 1) Burn only (B); 2) Chop and burn (C&B); 3) Stump, pile and disk (S,P,D); 4) Chop, herbicide and burn (C,H&B); 5) Herbicide and burn (H&B); and 6) Herbicide and burn followed by complete weed control during the life of study (H,B&W).	25	1986	6-21	6
HGLOB87	PMRC	A designed experimental study was established at multiple locations in the Coastal Plain region of Georgia and northern Florida, and the Piedmont region of South Carolina, Georgia and Alabama with the objective of evaluating the impacts of first generation genetic improvement, and of combining genetic improvement and complete vegetation control on yields of loblolly pine.	31	1987	3-21	7
Regional Study 1	FPC	Mid rotation fertilization study	48	1984	9-29	9
Regional Study 2	FPC	Study examined the effect of varying site preparation intensity.	13	1979	0-23	15
Regional Study 3	FPC	Study examined the effect of soil tillage.	16	1994	1-8	7
Regional Study 4	FPC	Study investigating mid-rotation fertilization with thinning.	8	1978	7-31	7
Regional Study 5	FPC	Investigation of fertilization effects in young stands.	19	1981	11-32	6
Regional Study 6	FPC	Study investigating mid-rotation fertilization with thinning.	13	1989	0-18	9
Regional Study 7	FPC	Study investigating mid-rotation fertilization with thinning.	26	1996	9-32	7
Regional Study 8	FPC	Study investigating mid-rotation fertilization with thinning.	22	1989	9-37	10
PGSS	NCCU CTIP	The Plantation Selection Seed Source Study (PGSS) was initiated by the Cooperative to determine the patterns of geographic variation in first-generation plantation selections	71	1994	3-8	4
QSSS	WGFTIP	Mixed Provenance Geographic Seed Source Study (QSSS) was established by the Cooperative to determine the patterns of geographic variation in first-generation plantation selections	4	2001	5-20	4
PPINES	FBRC	Family block plot experiment with spacing and silvicultural intensity treatments	1	1984	1-10	8
IMPAC	FBRC	Loblolly and slash pine study installed by the 'Intensive Management Practices Assessment Center' with factorial combinations of weed control (none or complete) and fertilization (none or intensive).	186	1984	1-23	16
Thinning Study	PMRC	Region-wide loblolly pine thinning study established 1980-1982 and now completed. Plots established across the natural growing region for loblolly pine.	170	1987	8-45	37
IMP Study	PMRC	Region-wide intensively managed plantation study.	170	1989	2-22	21

PINEMAP Data Management Contact
 Brandon Hoover
 University of Florida
 Phone: (352)294-3120
 Email: hoover@ufl.edu

Data Access Request Forms for Tier I data are available on the PINEMAP intranet site. All Tier I data can be downloaded from <http://TerraC.flas.ufl.edu>

Agenda Highlights - Today



2013 Annual Meeting

April 24-26, 2013 | UGA Hotel and Conference Center at the Georgia Center, Athens, GA

Meeting Objectives:

1. Share and reflect on emerging research results and methods.
2. Revisit broad project outcomes, recognize how each participant's work contributes, and identify gaps.
3. Continue to identify and create integrative mechanisms for achieving long-term project outcomes.

WEDNESDAY, APRIL 24, 2013

7-8 a.m.	Registration (outside of Dogwood Hall) Continental breakfast (Pecan Tree Galleria)
8-8:30 a.m.	Welcome (Dogwood Hall*) Tim Martin
8:30-8:45 a.m.	NIFA update Eric Norland, National Program Leader, Forest Resources Management USDA National Institute of Food and Agriculture
8:45-10:15 a.m.	Science presentations session #1 – Aim 1: Preliminary results from Tier III studies, Rod Will – Aim 3: Strengths and weaknesses of universal response function approaches for support of deployment decisions, Tom Byram – Aim 2: Regional carbon sequestration and climate change: It's all about water, Steve McNulty – Aim 4: Incorporating LCA elements into regional modeling, Bob Abt and Puneet Dwivedi
10:15-10:30 a.m.	Break (Pecan Tree Galleria)
10:30-11:15 a.m.	Science presentations session #2 – Aim 5: Student learning with two different ways of teaching about climate and carbon, Stephanie Hall and Martha Monroe – Aim 6: Climate change perceptions of southern foresters: Preliminary survey results, William Hubbard, Leslie Boby, and Hilary Cole
11:15 a.m.-12 p.m.	Translating science for different stakeholders Wendy-Lin Bartels
12-1 p.m.	Buffet lunch (Room K/L)
1-1:45 p.m.	Preparing future professionals: Graduate education panel
1:45-2:45 p.m.	DSS: Connecting your research to decisions Ryan Boyles and Heather Dinon Aldridge
2:45-3 p.m.	Break (Pecan Tree Galleria)
3-5 p.m.	Aim breakout sessions Aim 1: Dogwood Hall Aim 2: Room E Aim 3: Room A Aim 4: Room B Aim 5: Room C Aim 6: Room D
5-6 p.m.	Graduate student social (Dawg House Bar & Grill)
6:15 p.m.	Carpool departs UGA Hotel and Conference Center
6:30-8:30 p.m.	Dinner at Flinchum's Phoenix

*All sessions are in Dogwood Hall unless otherwise noted.

Pine Integrated Network: Education, Mitigation, and Adaptation Project
<http://www.pinemap.org>

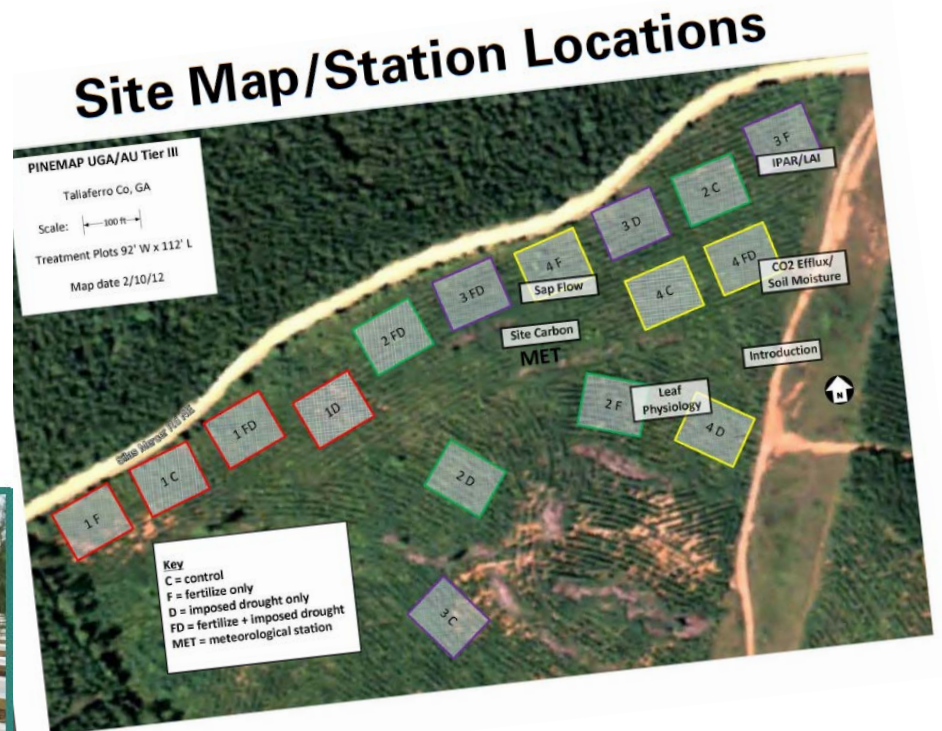
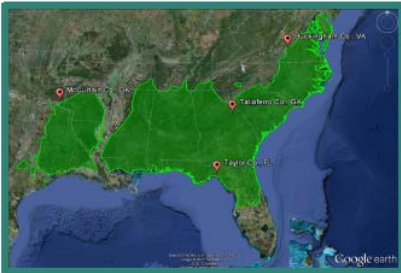
Mapping the future of southern pine management in a changing world

- Science presentations
- Translating science for stakeholders
- Graduate education panel
- DSS session
- Aim breakouts
- Group dinner at Whitehall Forest

Field Tour Thursday



Field Tour Guide PINEMAP 2013 Annual Meeting



April 25, 2013
Tier III Site
Taliaferro County, GA

Agenda Highlights - Thursday

THURSDAY, APRIL 25, 2013

6:30-7:15 a.m.	Continental breakfast (Pecan Tree Galleria)
7:15-7:30 a.m.	Meet in conference center lobby; load buses for field tour
7:30 a.m.	Buses depart conference center for field tour
7:30 am.-12:30 p.m.	Field tour Tier III site, Taliaferro County, GA (boxed lunch provided)
12:30-1 p.m.	Break <i>*snacks available continuously from 1-5 p.m. in Pecan Tree Galleria</i>
1-2 p.m.	Introduction to integration platforms Wendy-Lin Bartels
2-4 p.m.	Integration breakout sessions PINEMAP scenario development: Dogwood Hall Leader: Bob Teskey Seed deployment tool: Room J Leader: Tom Byram Communicating science to diverse stakeholders : Room F/G Leader: Nick Fuhrman, Associate Professor, Department of Agricultural Leadership, Education, & Communication, University of Georgia
4-5 p.m.	Poster session (Pecan Tree Galleria)
6 p.m.	Dinner on your own: meet in conference center lobby; walk to dinner

- Field tour
- Integration breakout sessions
 - Scenario development
 - Seed deployment tool development
 - Science communication workshop
- Poster session
- Dinner on your own

Agenda Highlights - Friday

FRIDAY, APRIL 26, 2013	
7-8 a.m.	Continental breakfast (Pecan Tree Galleria)
7:15 a.m.	Aim Leaders and Management Team gather for breakfast meeting in Dogwood Hall
8-9 a.m.	Building PINEMAP's integration culture Tim Martin
9-9:30 a.m.	Break/complete meeting evaluation (Pecan Tree Galleria)
9:30-11:30 a.m.	Aim breakout sessions Aim 1: Dogwood Hall Aim 2: Room L Aim 3: Room J Aim 4: Room A Aim 5: Room Y Aim 6: Room Z
11:30 a.m.-12:30 p.m.	Closing session, lunch (Magnolia Ballroom) Tim Martin

*All sessions are in Dogwood Hall unless otherwise noted.

- Reflection on field tour and integration discussion
- Aim breakouts
- Closing session and lunch