

PINEMAP Year 2 Interim Report 2
November 2012
Aim 6—Extension

Outcomes/Impacts

Describe how Aim-level activities; results, findings, techniques, or products contribute to project-level outcomes and impacts.

1. Total Number of individuals reached through Aim-6 activities by type of activity:
 - Instructor-led training events
 - a. face-to-face: 1117
 - b. technology assisted (e.g. webinars): 390 people attended an external webinars and 117 people attended 5 internal webinars
 - Self pace events
 - a. DSS:
 - b. eXtension
 - c. PDCs
 - Committees/Partnerships
2. Change in knowledge
 - PINEMAP project awareness: AIM 6 personnel have presented to numerous groups about the PINEMAP project. These groups include climatologist organizations, the Southern Group of State Foresters, State Extension Leaders, Forest Landowners, Forester groups and others. Aim 6 extension staff has filmed a forest landowner with desirable forest management practices that will be used to develop a PINEMAP promotional/educational video.
 - Forest/Climate Interactions: AIM 6 members continue to reach out and engage the climatologist community, including planning curriculum and workshops with state climatologists, as well as including them in forest landowner workshops. AIM 6 members have engaged and will continue to engage climatologists as we continue to develop more PINEMAP workshops, webinars and educational materials.
 - PINEMAP strategies: Results from Martha Monroe's Six Americas Survey of Extension Agents informs many of our strategies and approaches to PINEMAP extension.
 - Climate science: AIM 6 continues to utilize Ryan Boyles and Heather Dinon for their knowledge of climate science, they contribute and review any climate science related materials. Staff also consulted other state climatologists for their knowledge as well.
3. Adoption of PINEMAP strategies:
 - Acres impacted
 - Improved management
 - New planting
 - Concomitant results
 - increase in ability to sequester carbon
 - reduction of risk(resiliency)

Outputs

List **Products** developed/completed August 2012-current (including published, in press, or in review peer-reviewed publications; other written materials such as white papers, research summaries, fact sheets, or popular press articles; audio or video products; etc.).

Peer-reviewed Publications

Research Summaries

- PINEMAP Press and the PINEMAP Gazette. Two newsletters that summarize the latest developments from PINEMAP aim groups. One newsletter (PINEMAP Press) is a more technical version, while the second newsletter (PINEMAP Gazette) adapts the first newsletter's articles for less of a research focus and more of a focus on knowledge application.

Internal Webinar Series

Aim 6 organized and hosted internal webinars for integration of all PINEMAP members. Aim 6 members; other PINEMAP members and additional external lecturers gave Webinar presentations.

- July 13, 2012, Topic: *TerraC/PINEMAP Data Resources*, Speakers: Sabine Grunwald and Brandon Hoover (21 attendees)
- July 27, 2012, Topic: *Assessing Impact of Bioenergy Production on the Age Structure of Surrounding Forest Plantations*, Speaker: Puneet Dwivedi (20 attendees).
- August 17, 2012, Topic: *The Six Americas of Climate Change: Perceptions of Southeast Extension Professionals*, Speakers: Martha Monroe and Damian Adams (33 attendees).
- September 21, 2012, Topic: *Internship Successes and Education Research: PINEMAP's Integrating Education Projects*, Speakers: John Seiler, John Kidd, Martha Monroe and Stephanie Hall (19 attendees).
- October 19, 2012, Topic: *Does Wood-based Electricity Generation Reduce GHG emissions? An Exploration Considering Forestland Holdings, Harvest Age, and Power Plant Capacities*, Speaker: Puneet Dwivedi (24 attendees).

Fact Sheets

A. Finalized

B. In Progress

- *What can TACCIMO / CACCIMO tell us?* Mark Megalos
- *Obstacles to Delivering Climate Variability Programming to Traditional Audiences*, Mark Megalos, Heather Dinon
- *Frequently Asked Questions about Climate Projections*, Heather Dinon and Ryan Boyles
- *Water Cycle in Forested Lands with Emphasis on Silvopasture Systems*, Shareika Williams and Gwendolyn Boyd
- *Glossary of Climate Terms*, Mark Megalos and Heather Dinon
- *Assessing Forest Vulnerability*, Mark Megalos and Heather Dinon
- *Climate Oscillations: Impacts to Forestry*, Heather Dinon and Ryan Boyles

- *Introduction to Weather and Climate*, Heather Dinon and Ryan Boyles
- *Misconceptions about Global Warming and Climate Change*, Heather Dinon and Ryan Boyles
- *Climate Change and Forestry*, Leslie Bobby and Heather Dinon
- *Interpreting Uncertainty of Climate Model Projections*, Heather Dinon and Ryan Boyles
- *Herbicide Use Considerations*, Eric Taylor
- *Minimizing Forest Insect/ Disease Risk: A Practical Landowner Guide*, Mark Megalos
- *Fire Risk and a Changing Climate*, Rachel Burnett

C. In Review:

- *Climate change in the Southeastern United States: Opportunities for Adaptation and Mitigation*, Anslei foster and Joshua Idassi
- *Invasive Plants and Your Forest*, Hilary Cole, Christina Temple and Mark Megalos
- *Forest Land: Health and Resiliency*, Hilary Cole, Christina Temple and Mark Megalos
- *Southern U.S. Drought*, Ryan Boyles and Heather Dinon
- *What's Under the Umbrella that is Climate?*, Heather Dinon and Ryan Boyles
- *To Plant or Not To Plant: New Timber Stand Drought Risk Assessment*, Eric Taylor and Matthew Bonham and others
- *Southern Region Emerging Forest Threats: Management Options for Healthy Forests*, Lisa Jennings, Leslie Bobby, Mark Megalos, William Hubbard and Emrys Treasure.

Summarize **Events/Activities** (July 2012-current) as follows:

- Provide a bulleted list of presentations (oral and poster) given at meetings or conferences. The format for citing presentations is as follows:
 Presenter(s)/Author(s). Date. Name/title of meeting/conference, location.

July

- Dinon, H., L. Bobby, M. Bonham, G. Boyd, R. Boyles, B. Hubbard, J. Idassi, T. Martin, M. Megalos, M. Monroe, and E. Taylor. July 9-12, 2012. *PINEMAP: Progress and future plans*. 37th Annual Meeting of the American Association of State Climatologists, Destin, FL. (Poster)

August

- Bobby, L.A. and Markewitz, D. Aug. 23, 2012. *PINEMAP: Pine Integrated Network: Education, Mitigation and Adaptation Project*. Warnell School of Forestry, University of Georgia, Athens, Ga. Forestry Seminar, (40 attendees)
- Burnett, R. and Megalos, M. *PINEMAP: Pine Integrated Network: Education, Mitigation and Adaptation Project*. Poster presentation at NC Prescribed Fire Council Annual Meeting (115 attendees)
- Monroe, M. and Plate, R. August 21, 2012. *Climate change perceptions among Southeast Extension professionals*. Southeast Extension Administrators Annual Meeting. Orlando, FL. (25 attendees).
- Monroe, M. and Plate, R. August 22, 2012. *Climate change perceptions among Southeast Extension professionals*. Southeast Extension Administrators Annual Meeting. Orlando, FL. (20 attendees).

September

- Megalos, M.A, Vuola, A.J. Monroe, M. C., Wojcik, D., Plate, R., and Adams, D. C. *Bridging the climate communication divide between agents and small forest landowners in North Carolina* (Poster presentation) IUFRO 3.08, Amherst, MA (89 attendees)

October

- Boyles, R. October 4, 2012. Weather Hazards and Forests in NC. NC Forestry Association Meeting, Asheville, NC. (500)
- Megalos, M. A. October 5, 2012. *Tree Solutions to Today Vexing Environmental Problems: Remediation, Sequestration and Ecosystem Services*. NC Urban Forestry Council, Greensboro. (23 Attendees)
- Boyles, R. and McKeand, S. October 10, 2012. *Climate Hazards and Forests in NC. Forestry Forum Teleconference*, Raleigh, NC [online webinar]. (15)
- Boby, L.A. October 4, 2012. *Presentation on PINEMAP*. Southern Group of State Foresters SUM Task Force Meeting. Williamsburg, VA. (30 attendees)
- Monroe, M. C., Wojcik, D., Plate, R., and Adams, D. C. October 9, 2012. *Understanding educators' perceptions of climate change*, NAAEE Research Symposium formal presentation, Oakland CA. (30 attendees)
- McMillan, P. October 11, 2012. (Natural Resource Opportunities for Landowners Series). *Introduction to Natural Resource Conservation*. Webinar (75 attendees).
- Reed, D., Yarrow, G. October 18, 2012. (Natural Resource Opportunities for Landowners Series). *Wildlife Conservation on Your Land*. Webinar (75 attendees).
 - Boyd, G.D. October 17-20, 2012. *Climate Change and the Forest Environment*. Mississippi Forestry Association Annual Meeting. Tupelo, MS. (12 attendees)
- Cushing, T. and Stringer, J. October 25, 2012. (Natural Resource Opportunities for Landowners Series). *Forest Management on Your Land*. Webinar (75 attendees).

November

- Monroe, M.C. November 1, 2012. *What will help us communicate complex, value-laden information?: Climate Change*. County Extension Director's Training, University of Florida, Gainesville FL. (45 county extension directors attended)
- Hall, K. and Haggerty, M. November 1, 2012. (Natural Resource Opportunities for Landowners Series) *Natural Resource Appreciative Values on Your Land*. Webinar (75 attendees).
- Adams, D.C. and Monroe, M. C. November 5, 2012. *Climate change perceptions among Southeast Extension professionals*. AgSystems Seminar. Department of Agriculture and Biological Engineering, University of Florida, Gainesville FL. (25 agriculture and biological engineering students attended).
- Jones, D. November 8, 2012. (Natural Resource Opportunities for Landowners Series) *Natural Resource Enterprise Considerations for Your Land*. Webinar (75 attendees).
- Megalos, M. November 9, 2012. *PINEMAP and your forest*. Duke Forestry Symposium. Durham, NC. (175 attendees)
- Dinon, H. November 15, 2012. *What is PINEMAP and how could it help you?* Webinar given to South Atlantic LCC Third Thursday Web Forum (20 attendees).

→ Provide a short narrative describing experiments or surveys conducted and/or analyzed.

Forest Landowners Explore Climate Change

The University of Florida Extension faculty organized an extension workshop in Leon County, Florida for forest landowners called, "Climate and Forests, What's Changing?" The goals included 1) answering questions about climate change, 2) enhancing the ability of the participants to adapt to changes in climate, and 3) providing tools and strategies for coping with these changes. The program was organized by Stan Rosenthal, Wendy-lin Bartels, Martha Monroe, and Shelby Krantz.

At the program, Florida state climatologist Dr. David Zierden presented El Niño and La Niña cycles and how they affect weather. After taking questions, a panel of three faculty (Drs. Tim Martin, Jason Smith, and Pat Minogue) gave short presentations on disturbance, pests, and pine management strategies and then fielded questions. These topics were based on findings from focus groups with similar landowners in north Florida. The focus groups asked landowners what they were interested learning about climate and this program responded to their concerns. Workshop data collection took the form of a written survey before and after the program.

Most of the 14 participants were large landowners, with more than 100 acres. While a few of the participants answered that they do not believe the climate is changing, the majority participants answered that, "I believe it is changing and I am very concerned." This is a good indication of the type of participants that this program attracted, those that are concerned and want to learn more about climate change. There was no correlation between the size of the landowner's parcel and their amount of concern, nor between concern and interest in further workshops. Although there was no significant difference between the pre and post questions, more landowners desired more information to manage their forests in light of climate change *after* the program than before. This could be because the program presented new information and led them to realize how much more they could learn. Over half of the participants believe that the climate change is caused more or less equally by natural changes in the environment and human activities.

Evaluation feedback was generally positive. The participants found each part of the program to be fairly or very useful. By the end of the program, the participants still had many questions, which suggests the program established a comfortable atmosphere for considering the sometimes contentious issue of climate change and that there is a need for additional programming. There was a positive response on the survey to continuing climate-related workshops, with researchers providing information to landowners.

Milestones and Work Plan Progress

Provide a short narrative describing progress and accomplishments on the year 2 milestones and work plan tasks listed below. Please also describe any changes to the Aim 6 milestones and/or work plan.

Year 2 Milestones

→ Implement and strengthen forestry Extension/climatologist partnership (ONGOING).

Aim 6 has identified three strategies within this milestone and progress has occurred on many aspects.

1. Local training: State climatologists have been approached singly and as a group, to become members of the PINEMAP delivery teams to help plan and execute local workshops and distance education training programs. Additionally, Aim 6 members have established individual relationships with their respective state climatologists and engaged with them on workshops as well as to review materials.
2. Climate expertise to support research: Aim 6 members have surveyed many climatologists to learn more about their backgrounds and specialties and to use them as resources for PINEMAP research and products.
3. Integrating climate and forestry research with extension expertise: AIM 6 members (including climatologists) are developing the Decision Support System (DSS) to utilize climate and forestry data, including PINEMAP research for dissemination. This DSS will utilize climate and forestry research and use an extension approach to reach stakeholders and design a user-friendly interface.

There has been active collaboration on several workshops, presentations, and/or webinars in Texas between John Nielsen-Gammon, Eric Taylor, and Matt Bonham as well as in North Carolina between Mark Megalos, Ryan Boyles, and Heather Dinon. In addition, Georgia partnerships have been initiated between Pam Knox, David Stooksbury, Mark Riese, Leslie Boby, and Bill Hubbard as well as Florida partnerships between David Zierden and Martha Monroe. Heather Dinon and Adrienne Wootten from the State Climate Office of NC are partnering with the Association of Natural Resource Extension Professionals (ANREP) Climate Science Initiative (CSI) group. Bill Hubbard, Mark Megalos, Leslie Boby and Eric Taylor are all members of CSI as well. We are hoping to connect CSI, a national effort, with state climatologists in the Southeast US.

→ Audience/Needs Assessments for Extension programs (September 2012).

These are critical for better understanding stakeholders themselves as well as determining their needs and thus, the direction of PINEMAP extension programs and products.

- Extension staff: During year 1, Aim 6 staff conducted an audience assessment survey of all extension staff throughout 8 states in the southeastern U.S. This survey was designed to assess attitudes, beliefs, practices and interest in global warming and climate change programs and programming. Results of that survey, as well as summaries were written up in 2011's annual report. Results have been presented at more than five conferences, meetings and webinars.

- Forestry Professional: Aim 6 members are currently conducting a survey for professional foresters (includes consulting foresters, extension foresters and others). This survey utilizes a large database of forester contacts (5,000+) to reach as many people as possible. This needs assessment will examine forester and natural resource professionals needs for continuing education programs on increasing forest productivity (particularly pine plantation productivity) and resilience to extreme weather, climate variability and climate change. Specifically, participants will be questioned on their personal experiences and understanding of current and future effects of climate change on forestry management. We will also question attitudes and knowledge about climate change, climate variability, etc., with a focus towards developing the best approach for meeting perceived and actual needs. We will also query professionals on climate resiliency and forest “weather-proofing” areas they are interested in learning more about.
- The AIM 6 team has also completed and deployed the Texas FRESH (Forest Resources, Ecosystem Services and Health) Survey, both in hard copy and web versions. The intent of the survey is to get a better feel for the benefits that Texans associate with forests, and eventually use this data to support incentive programs to improve the management of Texas forests and woodlands. Data will be collected and analyzed in the second half of 2012. Analyzed data from this survey will also be used to direct and support PINEMAP education programs.

→ Extension programs evaluated (ONGOING).

It is important to develop evaluation instruments that will be use across the region to provide consistency with questions asked, etc.

- Retrospective Post – Family Forest Landowners: This retrospective-post evaluation allows the host to select/modify the types of question asked depending upon the topics of the training event. However, still maintain rigidity and consistency across the region. The form is scan tron to ease analyses.
- Retrospective Post – Natural Resource Manager: currently under development but will be retrospective-post, scan tron form with the ability to select questions from a pool of allowable questions designed to measure the impact of PINEMAP outreach programs.
- Follow-Up Surveys – Family Forest Landowners: under development.
- Follow-Up Surveys – Natural Resource Manager: under development

→ Extension programs delivered (ONGOING)

We have ongoing extension programs as listed in the events/activities section. We are also planning four regional workshops on forest resiliency, which will incorporate PINEMAP information and will be supportive of PINEMAP goals. We will include feedback from completed audience assessments and evaluations as we continue to develop these workshops and more extension programs.

PINEMAP AIM 6 members collaborated with Clemson University and University of Georgia’s Forestry Extension Faculty to deliver a webinar based program for forest

landowners this fall, titled, "Natural Resource Opportunities for Landowners." This five series course was conducted Thursday evenings from 7-8:30pm via Adobe Connect Software and ran from mid-October to early November. Topics included: 1. Introduction to Natural Resource Conservation, 2. Natural Resource Enterprise Considerations, 3. Wildlife Conservation (Introduction to Master Wildlifer), 4. Forest Management on Your Land (Introduction to Master Tree Farmer), and 5. Natural Resources Appreciative Values and Uses. Within the general course content, instructors also discussed impacts to natural resources from a changing and variable climate. Approximately 75 people attended each session, for a total count of 375 people reached, however, there were also 'viewing sites', where multiple attendees watched the webinars and we do not have final numbers from them yet. This is the link for the October 11th and 18th webinars: <http://connect.clemson.edu/p891o17tl9y/> and <http://connect.clemson.edu/p2maev1fj5j/>.

→ State extension & climatologist teams organized (December 2012).

A conference call with the state extension team was held in February 2012. Initial conference calls with climatologists across the region were held in December 2011. Another round of joint calls between the two groups is being planned for December 2012.

→ Decision Support System

Ryan Boyles and Heather Dinon have developed a subcommittee composed of at least one PINEMAP member from each Aim to provide guidance for the Decision Support System (DSS). This subcommittee has provided a list of existing tools and inputs/outputs from each aim for the DSS. A presentation and group activity at the annual meeting identified different ideas for the design of the DSS. Some of these ideas are shown in the figures below. Meetings with the DSS subcommittee will continue on a bi-monthly basis.

A layout and design of the PINEMAP DSS is being developed and reviewed by Aim 6 members. Also, conference calls are also being scheduled with the following goals:

- 1) To determine a theme for the PINEMAP DSS webpages (e.g. one similar to that of the www.pinemap.org website) and details of where it will be hosted, etc. To accomplish this task, Aim 6 is partnering with Darryl Outlaw, the PINEMAP website administrator.
- 2) To help build the back-end structure of the PINEMAP DSS. The data from Terra-C is very important to consider as part of this discussion so we are working with Sabine Grunwald and Brandon Hoover to accomplish this aspect of the DSS.

Aim 6 is also brainstorming ideas for determining a creative name for the PINEMAP DSS. One idea is to solicit ideas for a name from extension agents via the PINEMAP extension newsletter.

Year 2 Work Plan Tasks

→ Audience assessment—develop several “baseline” survey instruments that establish the existing knowledge levels, needs, beliefs, interests, attitudes, learning preferences, etc. regarding climate variability and forest interactions for various groups.

The audience assessment has been developed and will be implemented at the end of November 2012. Additionally, we have assembled a large database of forestry professionals across the southeastern United States for distributing the survey.

→ Strengthen relationships with education, research, and stakeholders: State/regional advisory planning meetings.

Aim 6 members will continue outreach activities including attending Forestry Cooperative Meetings, and other forestry related workshops and conferences. We will continue to coordinate the PINEMAP internal webinar series and will have each Aim group take turns presenting monthly, as well as including presentations on new developments and other research topics. Aim 6 members have joined other Aim’s listservs and will attend their in-person and virtual meetings as much as possible.

Leslie Boby has been working with Jessica Ireland to develop the PINEMAP Press and the PINEMAP Gazette. These two newsletters summarize the latest developments from PINEMAP aim groups. One newsletter is a more technical version, while the second newsletter adapts the first newsletter’s articles for less of a research focus and more of a focus on knowledge application. Both newsletters will be widely distributed. PINEMAP Press has been emailed to all of PINEMAP, to faculty and Deans at participating universities, NIFA and others. The PINEMAP Gazette will be distributed through the website (there is a button for viewers to sign up for updates), through extension forester lists and to the forester database list. This newsletter will also be printed for giving out at workshops and/or training sessions. For this newsletter, each AIM group was required to submit one article, therefore, it is inclusive of the latest developments from each group.

Bill Hubbard, Eric Taylor and Leslie Boby are developing regional workshops for the late spring 2013 and into 2014. The workshop agenda and delivery of the content will be built collaboratively with PINEMAP researchers. AIM 1, 2, 3 and 4 members will be consulted for ideas for the newest developments in PINEMAP research and will also be asked to deliver presentations at these workshops.

Bill Hubbard and Leslie Boby met with Earl and Wanda Barrs (Tree Farmers of the year 2009) to film at their 1500 acre tree farm. The Barrs were recognized for their implementation of desirable forest management techniques. At this visit, the Barrs were interviewed about changes that they have witnessed on their land within the past 30 years, as well as the management techniques that they have tried to increase their forest resiliency. Footage from this visit will be turned into a PINEMAP video that can be used to advertise the PINEMAP project, as well as introduce PINEMAP concepts for foresters, landowners and extension staff.

→ Creation of regional advisory panels.

Invitations to a webinar based meeting about PINEMAP's regional advisory panel were sent to more than 20 state level extension foresters and 1890's University's extension foresters in the early part of this year. About 10 foresters attended this initial meeting and expressed interest in evaluating PINEMAP extension products and plans.

→ External outputs (fact sheets, web-based climate education modules, complete analysis and submit articles on SE Extension perceptions of climate change, eXtension, etc.).

Numerous factsheets are currently in draft form or in review with expected publication at the end of 2012 or the beginning of 2013. Factsheet review guidelines have been established and will be used to vet all PINEMAP publications. Additionally, official formats and templates for PINEMAP factsheets have been selected. All publications will be submitted to the Climate, Forest and Woodlands Community of Practice on eXtension. Web-based climate education materials are being adapted for forestry, with a goal of creating a 'certificate' program through another agency (such as Society of American Foresters) in Climate Smart Forest Management. The theme has been built and topics are being reviewed for relevance to our stakeholders. Contextual examples are being developed for the topics that are most important to our target audience(s). Some of these materials will be implemented into eXtension.

→ Administrative activities

We will continue with PINEMAP reports, monthly web conferencing meetings and biannual in-person meetings. We will assist in the maintenance of the project website, provide content for PINEMAP Facebook page and attend monthly executive committee meetings. We are also assisting in development and writing of two different versions of a PINEMAP newsletter. Our continuing goal is to strengthen relationships with other Aim groups.

Broad Impacts & External Collaborations

Provide a short narrative describing broad impacts (i.e., far-reaching and possibly unanticipated outcomes resulting from Aim work, including contacts/collaborations with entities outside of PINEMAP).

The work of Aim 6 in extension necessitates cultivating contacts and collaborations with outside entities in order to be successful. To this end, some of our outreach efforts are targeted towards state level forestry extension personnel who can link us with stakeholders (i.e. forest landowners, industrial forestry members, county level extension agents). Aim 6 is already using the traditional forestry extension networks to reach our stakeholders, but beyond this, we have developed new contacts and collaborations through working with state climatologists and interacting with ANREP members, as well as potential regional advisory board members.

Aim 6 members have partnered with other forestry extension professionals to implement, "Natural Resources Resource Opportunities For Landowners," a web-based 5 class series which will focus on the basics of natural resources and private land and serve as an introductory course to 'Master Tree Farmers,' a more intensive course on forestry techniques for the private landowner. Through these courses, PINEMAP members will promote sustainable forestry practices as well as creating awareness about risks to forested land from climate change.

Aim 6 members collaborated with US Forest Service's "Template for Assessing Climate Change Impacts and Management Options" (TACCIMO) Project Staff on a workshop at the ANREP meeting and have shared ideas for further exchange of ideas as our project develops. Additionally, we have co-written a factsheet: "Southern Region Emerging Forest threats : Management Options for Healthy Forests." This factsheet is in the external review process and will be digitally and physically distributed throughout the Southeast.

Aim 6 is also partnering with Darryl Outlaw of SREF on the PINEMAP website and the DSS.

Presentations and discussions by Martha Monroe, of the results of the Six America's survey with SE Extension Professionals has generated interest among state leadership in Florida and Pennsylvania to carefully consider how to organize in-service training and deliver programs on climate change, and is being used in the Association of Natural Resource Professionals (ANREP)'s Climate Science Initiative.

Training

Please list undergraduate and graduate students, postdocs, and technical personnel trained under this project and include a description of their research focus and/or role in the project.

- Leslie Boby, Extension Associate, Southern Regional Extension Forestry. Leslie is assisting with formation of regional Extension teams, and a PINEMAP Extension Advisory Board; participating in and presenting at research cooperative meetings; and facilitating internal and external PINEMAP research dissemination. Planned work includes developing and evaluating written and web-based (i.e., eXtension, webinars, etc.) educational materials and disseminating resources and materials to forestry stakeholders.
- Rachel Burnett, Graduate Research Assistant, North Carolina State University. Rachel is assisting with reviewing factsheets and other PINEMAP-related publications.
- Matthew Bonham, Extension Assistant, Texas AgriLife Extension. Matt is assisting with formation of state Extension teams; implementing, coordinating, and hosting the PINEMAP internal webinar series; initiating the Texas Forest/Woodland Advisory Panel; contributing to regional fact sheets and extension modules in the areas of forest management and climate interactions; reviewing current eXtension materials to identify knowledge gaps; and creating several feedback instruments to gauge the effectiveness of outreach activities and identify areas for improvement.
- Hilary Cole, Graduate Research Assistant, North Carolina State University. Hilary is serving as a copy editor for factsheets and other PINEMAP-related publications. She is also providing guidance with contextual examples for the climate education materials in collaboration with the State Climate Office of NC. Hilary is assisting the SREF office with a region-wide Forest managers survey on Climate education needs that she will analyze as part of her Master's thesis
- Heather Dinon, Applied Climatologist, State Climate Office of North Carolina. Heather is facilitating interaction between PINEMAP team members and state climatologists across the region through activities such as presentations in the internal webinar series and research cooperative meetings and weather/climate conferences. Other involvement includes

development of the DSS, creation of fact sheets, and guidance on the best climate datasets for PINEMAP.

- Anslei Foster, Graduate student, North Carolina A&T University. Anslei is working on factsheets and publications for PINEMAP.
- Shelby Krantz, Undergraduate IFAS Research Intern, University of Florida. Shelby conducted focus groups, helped design the forest landowner Extension workshop, developed a pre/post survey and analyzed data to better understand perceptions on climate, willingness to change management strategies, and opportunities to make a meaningful difference.
- Charlie O’Connell, Undergraduate Research Assistant, North Carolina State University/State Climate Office of NC. Charlie is reviewing the climate education materials for forestry as well as developing a tool for forestry professionals across the southern US which displays historical temperature, precipitation, and drought indices.
- Richard Plate, Postdoctoral Associate, University of Florida. Dr. Plate is assisting with data analysis for the Extension climate perceptions survey.
- Christina Temple, M.S. candidate, North Carolina State University. Christina has drafted two fact sheets on adaptation related to forest pests and invasive species. Drafts were finalized by Hilary Cole and are undergoing developing a comprehensive list of climate education materials across the southern US.
- Aaron Vuola, M.S. candidate, North Carolina State University. Aaron successfully defended his thesis on 3/30, graduated in May 2012. Aaron’s thesis chapters will be edited by Hilary Cole and Rachel Burnett as research notes and ultimately as refereed publications.. Aaron’s thesis research was featured in poster during an IUFRO Small-Scale Forestry Conference in Amherst, MA fall, 2012.
- Deborah Wojcik, Postdoctoral Associate, University of Florida. Dr. Wojcik is assisting with survey development and data analysis for the Extension climate perceptions survey. Dr. Wojcik helped develop the Six Americas survey for SE Extension Professionals and is writing one article.

Collaborations and “integrated” knowledge developed

Provide a short narrative describing new ideas, research questions, or insights that have arisen through work and discussions with colleagues, stakeholders, and others. In addition, explain the extent to which you intend to incorporate this into PINEMAP milestones and/or your Aim work plan.

Aim 6 is an extension group and we are not generating direct primary research equivalent to Aims 1-4, however, our work on the DSS requires ideas, research and insights from all other aims in order to create the best system. Martha Monroe’s work with the “Six Americas” survey has yielded useful insights for those of us working with extension professionals in the Southeast. This information is also important for Aims 1-4 to understand, as it impacts how we deliver information and what information people are most concerned about. Our Professional Foresters Survey should also yield some interesting insights that may be especially important for Aim 4. Conversations within Aim 6 have sparked a research question about identifying the best drought index for southern conifers and using it as an indicator of risk. Potential funding resources for this are being explored.

Needs from/linkages to other Aim groups

→ Provide a bulleted list outlining research results, data, products, or assistance that your Aim group needs from another Aim group.

- Research results and guidance is needed from Aims 1 to 4 for the DSS development. Aim 5 will also be contributing to the DSS and several other Aim 6 activities, such as workshops and survey work.
- Guidance and input for Regional Forest Workshops is needed from Aims 1-4 for both agenda development as well as personnel to deliver presentations at the workshops. The topics for these workshops will be developed collaboratively with consultation from Aims 1-4.

→ Provide a bulleted list outlining research results, data, or products that your Aim group has compiled that have value or relevance to another Aim group (and note which Aim group).

- Ryan and Heather provided guidance on pros/cons of downscaled climate projection products available for the Southeast to Alfredo Farjat, Ross Whetten, and Fikret Isik. This data is useful to their study, which attempts to test a statistical model that Alfredo and Fikret have developed to predict the performance of pine plantations in the future.
- *Provided historical climate data to Jose Alvarez (Aims 1 and 2) to help him estimate potential productivity of loblolly pine in the Southeast US*
- *Heather Dinon and Megan Hall are reviewing material for Project Learning Tree activities as related to climate and forests.*
- *Providing feedback to Aims 1-4 on stakeholder needs and how this may influence research choices.*

- List any additional potential linkages to other Aim groups.

Aim 6 members will continue to cultivate relationships with other Aim groups to stay current on the newest developments in research and the potential for extension products developed from that research. It is critical for Aim 6 members to be knowledgeable about other Aims' research in order to successfully build the DSS.

Leveraged funding/additional resources

Describe how PINEMAP funds were leveraged as well as any additional resources obtained. Please list amounts and sources.

- *Martha Monroe, Anonymous donation to cover food for focus groups, travel to extension offices (\$1500)*
- *ANREP student scholarship, for Shelby Krantz (\$1000)*
- *UF IFAS Student Research Internship for Shelby Krantz (\$3360)*
- *Megan Hall, a graduate research assistant at the State Climate Office of NC, is coordinating the effort to adapt the climate education materials to other sectors, including forestry, in collaboration with our PINEMAP team. She is also reviewing materials for PLT in collaboration with Aim 5*
- *Graduate student Hilary Cole is combining her PINEMAP funding with US Fish and Wildlife Service intern support for a synergistic collaboration with the South Atlantic Landscape Conservation Collaborative.*

- *Leslie Boby, Heather Dinon, Mark Megalos and Bill Hubbard have been partnering with ANREP Climate Science Initiative (CSI).*
- *Eric Taylor and Mark Megalos are assisting the eXtension COP on forest and woodlands to incorporate SE and Pinemap materials for their nationwide effort and*