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2012 Annual Meeting Evaluation Report

July 13, 2012

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Executive Summary

The PINEMAP year 2 annual meeting evaluation survey provided some very useful data and feedback from project participants regarding project administration, communication, and integration. This report summarizes the survey results.

Annual Meeting

In terms of the general evaluation of the meeting, participants most valued interaction and opportunities for network building, learning, and sharing and exchange as well as the Aim breakout sessions. Participants felt that the meeting was lacking in progress update/research results presentations, cross-Aim meetings, and unstructured/informal time (see pages 2-4).

Project Administration

In terms of project administration, the majority of PINEMAP team members are satisfied with communication from project management and find the intranet site and bi-weekly newsletter to be useful resources (see pages 5-7).

Communication and Integration

Qualitative responses indicate that consistency, coordination, and decision-making among leadership may be missing and that more meetings and interactions both within and among Aims would be beneficial; respondents also highlighted the importance of personal commitment and responsibility to making the most of the resources available to them. Some of the main challenges identified related to integrated science were diversity (i.e., different disciplinary backgrounds, training priorities, objectives, expectations), time, communication, distance, and the process of team work (i.e., different working styles, varying needs, etc.) (see pages 8-10).

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Introduction

The year 2 PINEMAP annual meeting was held May 15-16, 2012 in Atlanta, Georgia. The specific objectives of the meeting were to:

- foster Aim interaction (both internal and cross-Aim);
- set the stage for cross-Aim interaction in year 2;
- provide opportunity for Aim groups to accomplish needed tasks;
- engage participants in thinking about integration and collaboration as the project moves forward;
- introduce team members to internal resources and data management tools;
- inform team members about the PINEMAP DSS and Aim-specific roles in the DSS; and
- facilitate a process to help PINEMAP collaborators understand how their part fits into the whole.

Eighty-two participants attended the meeting, including PINEMAP PIs, staff, postdocs, and graduate students, as well as team members of partner projects and External Advisory Board members.

This report summarizes results from the 2012 PINEMAP annual meeting evaluation survey.

Objectives

The objectives of the PINEMAP 2012 annual meeting evaluation were to: 1) evaluate annual meeting logistics and the degree to which the meeting met its specific objectives; 2) evaluate the effectiveness of project administration/management and communications between project management and team members and among team members as a whole; and 3) learn about team members perceptions of integrated team science, including plans and motivations for integration as well as challenges for/barriers to integration within PINEMAP.

Methods

Data was collected via a survey distributed at the 2012 annual meeting. The survey instrument included four sections (participant background information, general meeting evaluation, project administration, and integrated team science). The survey contained 20 questions (6 background questions, 6 closed-ended questions, and 8 open-ended questions) (see Appendix A). A total of 65 surveys were completed and turned in by meeting participants. Data for closed-ended questions is summarized with bar graphs; a narrative summary of results depicted in the graphs is also provided. For the open-ended questions, qualitative responses are categorized by theme with the total number of responses and responses per theme noted. Direct quotes from respondents are provided for a number of the open-ended questions.

General Evaluation of Meeting

In general, we received positive feedback about the meeting structure, use of time, participant engagement, and next steps. Participants were most satisfied with the effort made to involve everyone at the meeting (Figure 1). In terms of achieving our specific meeting objectives, responses indicate that we could perhaps have done better at setting the stage for cross Aim interaction in year 2 as well as fostering interaction among Aims and specifically among research and extension (Figure 2).

Qualitative results show that participants most valued interaction opportunities for network building, learning, sharing and exchange as well as the Aim breakout sessions. Interestingly, several individuals commented on the benefits of other CAP participation (Table 1). Specific responses offered regarding the most valuable component of the meeting include the following:

- "A clear discussion of integration so early in the project"
- "Discussion times when people could contribute ideas from the floor"
- "Interaction with people from other Aims, putting faces with names, building more and better relationships"
- "Meet different researchers and scientists from different Aim groups; exchange ideas and communicate with each other"

To review all responses, see raw qualitative data in Appendix B.

In response to what was missing from the meeting, participants indicated that they would have liked more progress reports and scientific or technical presentations. Furthermore, opportunities for cross-Aim integration and planning meetings were somewhat lacking. A few respondents also felt that use of time during Aim breakout sessions could have been better managed. In future meetings, planners might consider providing space for more unstructured/informal time (Table 2). Specific responses offered regarding what was missing from the meeting include the following:

- "More scientific details, talks, explanations, discussions"
- "Reports from Aims—it takes time and can be dull, but it's still useful for folks to learn about the activity in Aims"
- "Unstructured time for interaction—presentations are fine for one-way information flow but don't really lead to collaboration, which requires two-way exchange"
- "Clearly identified, basic steps that all will work towards to truly integrate efforts all the way through measuring impact"
- "Integration among Aims. Each Aim needs something from the other Aims, but we didn't know exactly what that was…"

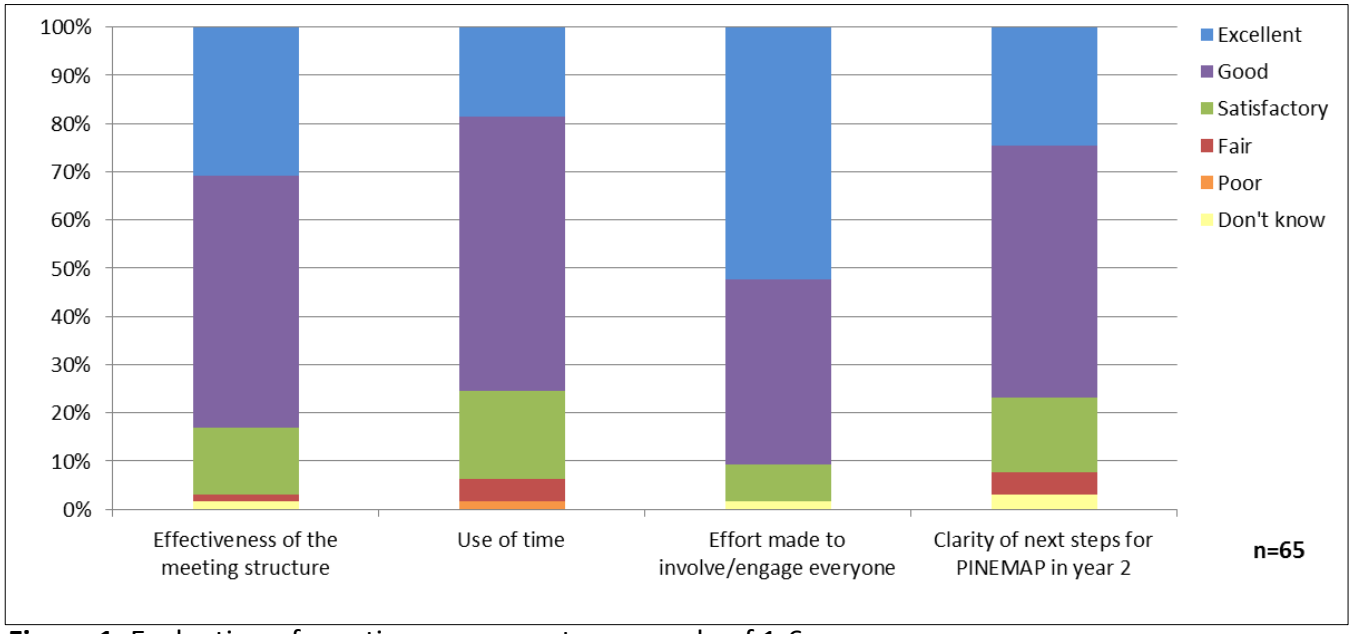

Figure 1. Evaluation of meeting components on a scale of 1-6.

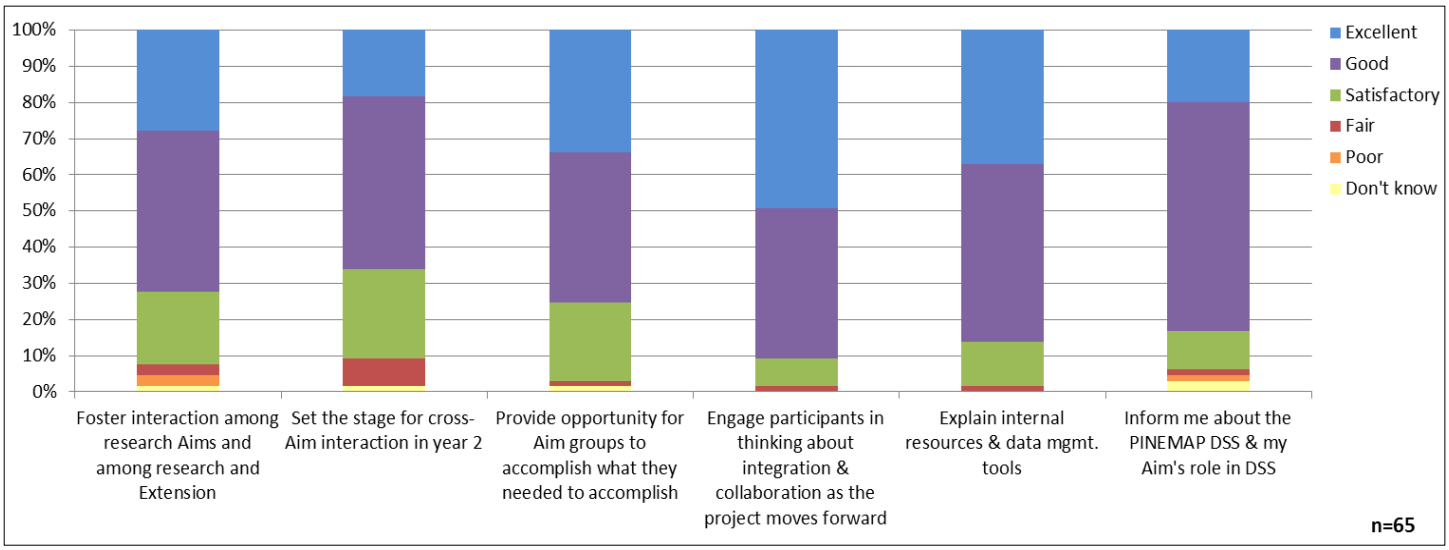

Figure 2. Degree to which meeting met its specific objectives on a scale of 1-6.

Table 1. Themes that emerged from qualitative responses regarding the most valuable component of the meeting (total number of responses = 69).

Theme	Number of responses
Interaction and network building for learning, sharing, and exchange	26
Aim breakout sessions	19
Integration, transdisciplinarity	4
Planning	4
CAPs	4
Posters	4
DSS	3
Data management	2
Informal side meetings	1
Plenary discussion with comments	1
Keynote speaker	1

Table 2. Themes that emerged from qualitative responses regarding what was missing from the meeting (total number of responses = 52).

Theme	Number of responses
Cross-Aim meetings (Aim integration, planning)	10
Research results, technical presentations (the science)	8
Progress updates	8
Need for unstructured/informal time (social event)	6
More Aim breakout time (and better management of Aim breakout time)	5
Graduate student engagement (presentations and structured time for interaction)	4
Use of time (agenda too crammed, keeping on time)	3
Action/outcome orientation (push to deliverables)	3
Small discussion groups and activities	2
Time spent on problem solving (usually referred to within Aim)	2
Better venue (room too small)	2
Lack of interest in poster session	1

Project Administration

An evaluation of PINEMAP communication materials shows that not all participants read the interim and annual reports (Figure 3), perhaps because these individuals do not consider the reports useful to them personally (Figure 4). In addition, results show that approximately 85% of respondents read the *PINEMAP Forecast* and 81% access the PINEMAP Intranet site and find these resources useful to them personally. Suggestions to improve these materials included:

- Reduce level of detail provided in reports.
- Share success stories and progress updates through *PINEMAP Forecast*, newsletter, and/or Intranet (i.e., publication of the week, top 5 items you need to know from each Aim, Aim highlight/snippet).
- Use Intranet for sharing data collection protocols, Aim calendar, Aim-specific information, and uploading results.

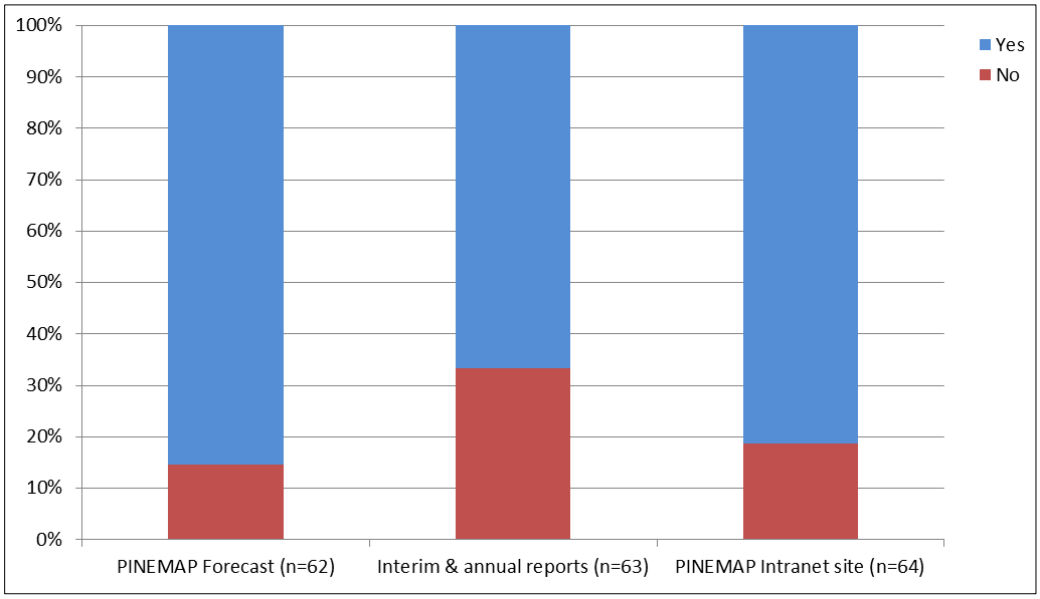

Figure 3. Respondents indicate if they read/access the *PINEMAP Forecast*, interim and annual reports, and PINEMAP Intranet site.

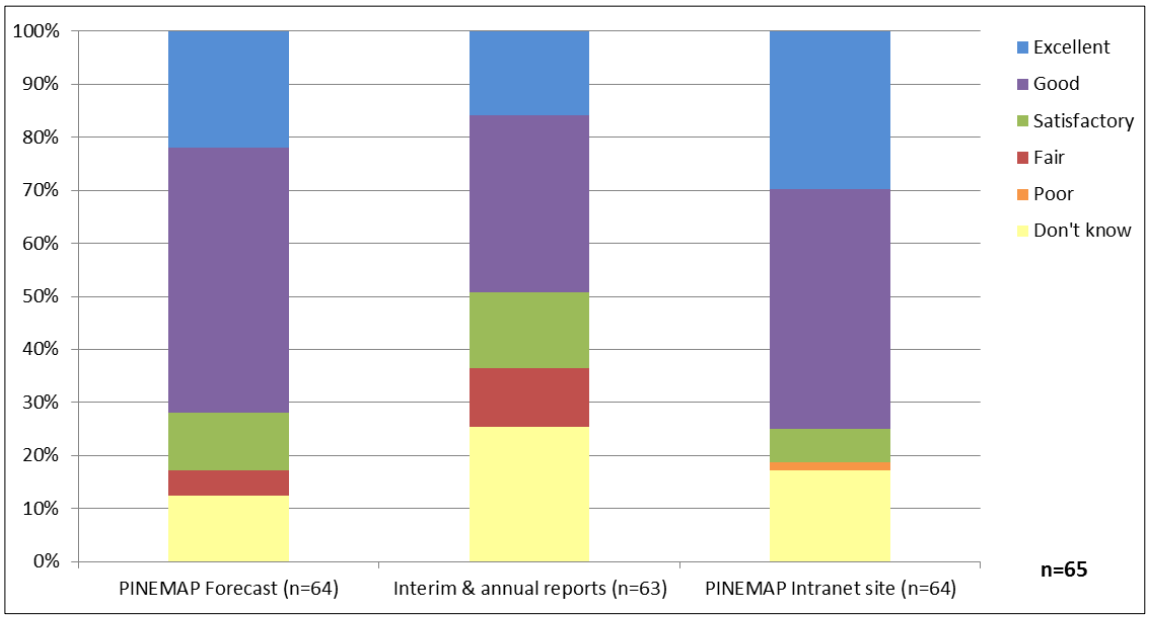

Figure 4. Respondents evaluate the usefulness of the PINEMAP Forecast, interim and annual reports, and intranet site.

The majority of respondents (89%) agree that there is good communication from project management. In addition, although most participants are satisfied with communication among members of Aim groups, almost 20% of individuals responded neutrally or somewhat negative regarding within Aim communication (Figure 5). Participants also provided specific, qualitative feedback and suggestions on what is working and what is missing related to project management communications (see Table 3).

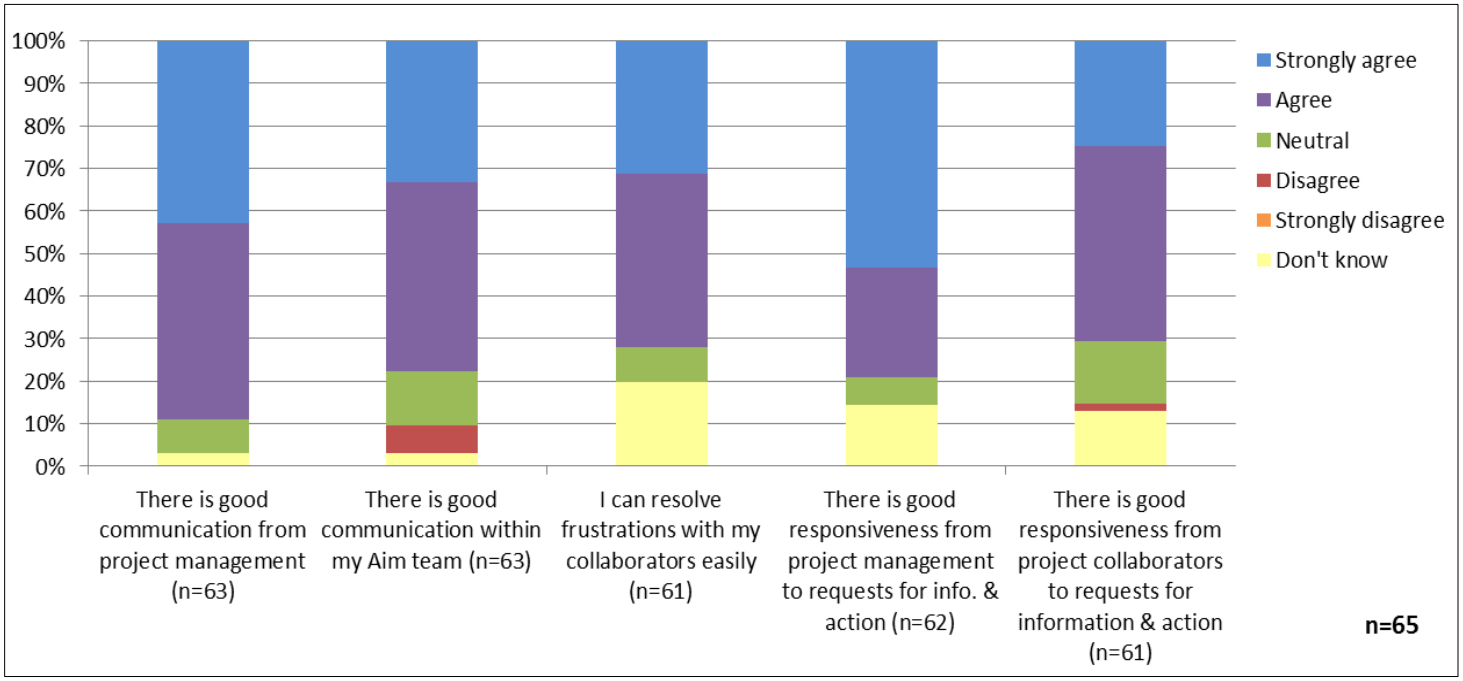

Figure 5. Respondents evaluate communication from project management, within Aim groups, and with project collaborators.

Table 3. Feedback/suggestions regarding project management communications.

What is working	What is missing
In general, responses indicate that most people are satisfied with communication from the project management team → quick replies → informative → clear and organized → about right given needs → efficient	**Leadership** • Need to establish a decision-making process → suggestion of top-down process with room for feedback from team members, → emphasize inclusion and appropriate updating on process and results → sharing of Aim meeting reports with all PINEMAP team members • Consistency—need clear direction in terms of goals/objectives • Need for better coordination → More within Aim progress updates/status tracking/communication → cross-Aim linkages → Extension Aim feels out of the loop • Leadership styles evolve over time **Mechanisms for communication** • Meetings → Stated preference for face-to-face meetings → Request for more periodic Aim meetings and interactions • Online resources → Web-based sessions (Elluminate) are possibly preferred over conference calls, → Online space good for exchanging ideas • Delivery of materials: Consider formats besides email, such as printing and mailing newsletter and fact sheets • Emphasize efficiency, prioritize information (we're all busy) • Recognize need for personal responsibility and commitment to using available tools

Integrated Team Science

Perceptions on Integration

When asked to describe the meaning of team science within the context of PINEMAP, themes that emerged included a unique larger opportunity, teamwork, and outcomes (Table 4). When asked about science integration within PINEMAP Aims, 74% of respondents agreed that it is working well. However, only 51% agreed that cross-Aim integration is working well. Furthermore, although 44% of respondents believe that PINEMAP is improving their *research productivity*, 13% of respondents do not agree. At the same time, 51% of respondents agree that PINEMAP has improved the *quality of their research* and 81% feel that time spent on PINEMAP is well worth the effort in terms of returns they receive. Results also suggest that the PINEMAP team is doing a fairly good job of accommodating the different working styles of team members and capitalizing on strengths of different researchers (Figure 6).

Table 4. Synthesis of responses related to the meaning of integrated team science within the context of PINEMAP.

WHY Unique, larger opportunity	HOW Teamwork	WHAT Outcomes
• Contribute to something bigger • Achieve ambitious common cause • Pieces fit together • Different scales • Better than we could individually, something I would not have done myself • Put own research aside to work on big issues • Beyond what was produced and envisioned earlier on in the project	• Coordination • Cooperation • Collaboration • Communication • Investigation • Helping • Sharing • Talking/Discussing	• Develop complete and extraordinary products, strategies, and teaching • Integrate research and education • Provide, get, and share data • Develop standardized, agreed upon approaches • Enrich understanding of the biology of the system • Get info. to the end user

Challenges for Science Integration

As might be expected, participants perceive the major challenges to integration within PINEMAP to be limited time, problems with communication, and distance among participants. Interestingly, however, the largest number of responses relates to the challenge of managing diversity within the context of disciplinary backgrounds, priorities, and expectations, the ability to relate to one another's work, preconceived notions of other Aims, etc. (Table 5).

Many participants also mentioned that teamwork presented difficulties, especially to those unfamiliar with working in an integrated manner. Synchronizing the timing of completion of deliverables and outputs across Aims appears to be another important problem PINEMAP is likely to face. These responses are also complemented by results from the integration activity implemented during the meeting (see page 10 and Appendix C).

Table 5. The major challenges for integration within PINEMAP. Total number of responses = 54

Theme	Number of responses
Diversity → different disciplinary backgrounds, training, priorities, objectives, expectations → difficulty finding common terminology, ground, understanding other research areas, getting on the same page, hard to relate to each other's findings, → preconceived notions of other Aims, inability to view other Aims research, lack of interest in others, everyone thinks his/her Aim is most important, concentration on one Aim	22
Time (needed for interaction)	18
Communication	11
Process of team work → Working styles and procedures, cooperation and personalities, → new and unfamiliar, lack expertise in integration → varying needs and incentives	11
Synchronization (speed of deliverable development, products, data, keeping up with outcomes)	11
Distance	10
Motivation (willingness, dedication, commitment)	4
Vision (clarity of plan, scientific vision)	3
Size of team	3
Focus	2
Competition (and protectionism)	2
Data synthesis	2
Consideration of end user	2
Leadership for decision making	2
Authorship	1

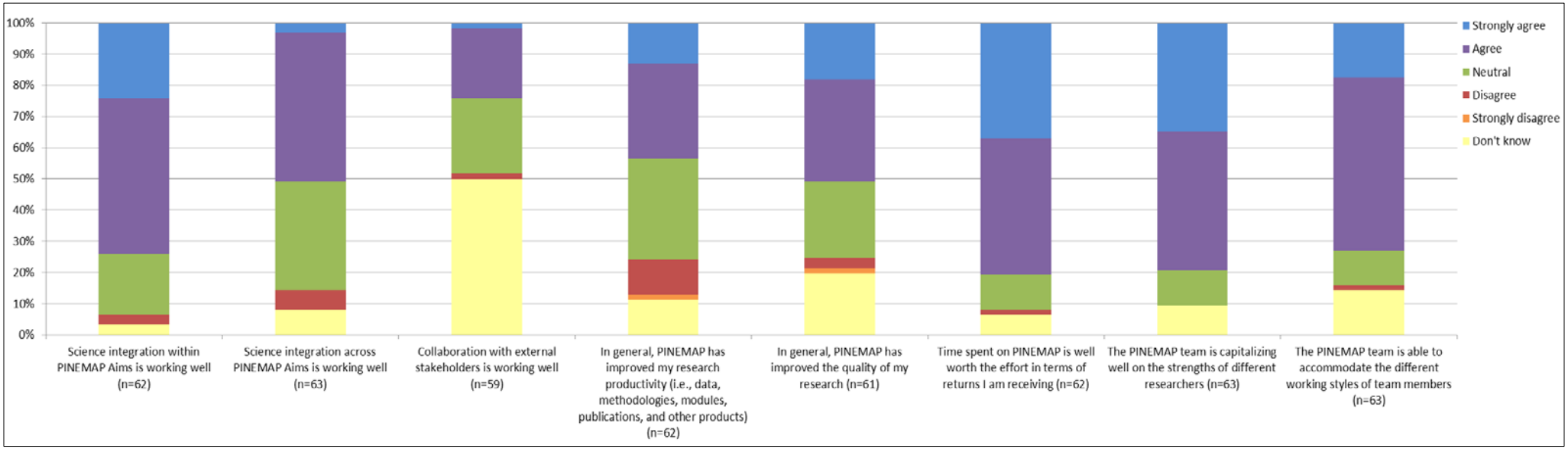

Figure 6. Respondents indicate the extent to which they agree with statements regarding integrated team science within PINEMAP.

Integration Activity Highlights

An integration activity was conducted at the annual meeting in which participants broke into groups to discuss perceptions and ideas related to integrated team science. Specifically, groups discussed: 1) successful integration examples/activities/mechanisms, factors that facilitate success, and new ideas/suggestions; 2) the main barriers to integration and potential solutions/suggestions/new ideas to overcoming challenges; and 3) expectations for integration, indicators of success and ideas for evaluating integration, and new ideas/suggestions.

As a result of this group activity, participants offered several ideas to create success in integration within the PINEMAP project including the following:

- → Short, focused on site workshops around particular objectives
- → More face-to-face problem-specific (focused) working groups
- → Regular meetings and interactions among Aim members
- → More cross-Aim meetings to illustrate how different Aims relate to each other
- → Create sub-groups across Aims that are excited about answering long standing questions (i.e., genetics and growth and yield, productivity)
- → Water cooler idea—regularly scheduled meetings in which all PINEMAP team members are invited to participate to discuss issues, ask questions, etc.
- → Request feedback from Aim members on current needs and impacts
- → Strategizing to target competitive funding on a Southwide extent
- → Standardizing, prioritizing datasets/variables needed for modeling
- → Make sure to clearly define areas of responsibility
- → Closer interaction with Extension to better understand the client base

In addition, participants offered potential solutions/suggestions that may help overcome challenges/barriers to integration including:

Meetings/interaction

- → Regional meetings or site visits
- → Mandated inter-Aim/interdisciplinary meetings, workshops aimed at integration, targeting integration of specific activities (half-day video conference)
- → Scheduled conference calls for brainstorming sessions
- → More time at annual meetings devoted to specific integration tasks

Tools/resources for communication/information sharing

- → Online data sharing and discussion board
- → Newsletter with specific requests, needs, etc.
- → Document with overview of disciplines and specific opportunities for integration
- → Identify mechanism to determine if integration is occurring, identify examples of integrated outputs as a guide
- → Mandatory factsheet/research summary for each paper submitted
- → Sharing success stories (both internal and from other integrative projects); disseminate information about outcomes
- → Include scientists in outreach to bridge the gap

Incentives

- → Opportunities for co-authorship in peer-reviewed publications
- → Recognize young scientists for their successes
- → Innovation awards for teams

Expanding Impact

- → Leverage funding, seek outside funding to enhance interdisciplinary opportunities
- → Expand collaborations with other projects to bring more attention to PINEMAP
- → Publicize successes

See Appendix C for a complete summary of responses from the integration activity.

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Appendix A
PINEMAP Annual Meeting Evaluation
May 2012

Write your **ID NUMBER** here

BACKGROUND

1. **Please indicate your role/position on the PINEMAP team** *(Circle the one that applies)*
   PI or co-PI
   Professional and technical staff
   Graduate Student
   Advisory Board
   Extension educator
   Other

2. **On which PINEMAP Aim(s) are you working?** *(Choose all that apply)*

   ❒ Aim 1.
   ❒ Aim 2.
   ❒ Aim 3.
   ❒ Aim 4.
   ❒ Aim 5.

3. **Please list your academic discipline(s) below** e.g., biology, silviculture, environmental ed, modeling, economics, agronomy, sociology, statistics, chemistry etc.

Primary discipline_____

Secondary discipline (if any)_____

Third discipline (if any)_____

4. **How did you first become involved in PINEMAP?** (e.g. Worked with Y on project y, or Invited by X, who I have known since 1978…etc)

5. **What is your gender?**

   Female ..... 1 Male 2

6. **When were you born? _____**

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GENERAL EVALUATION OF MEETING 2

7. Please evaluate the following aspects of the meeting on a scale of 1-5.	Poor	Fair	Satisfactory	Good	Excellent	Don't know
a. Effectiveness of the meeting structure	1	2	3	4	5	6
b. Use of time	1	2	3	4	5	6
c. Effort made to involve/engage everyone	1	2	3	4	5	6
d. Clarity of next steps for PINEMAP in year 2	1	2	3	4	5	6

8. Please evaluate the degree to which the meeting met its specific objectives. How well did the meeting serve to:	Poor	Fair	Satisfactory	Good	Excellent	Don't know
a. Foster interaction among research Aims and among research and Extension	1	2	3	4	5	6
b. Set the stage for cross-Aim interaction in year 2	1	2	3	4	5	6
c. Provide opportunity for Aim groups to accomplish what they needed to accomplish	1	2	3	4	5	6
d. Engage participants in thinking about integration and collaboration as the project moves forward	1	2	3	4	5	6
e. Explain internal resources and data management tools	1	2	3	4	5	6
f. Inform me about the PINEMAP DSS and my Aim's role in the DSS	1	2	3	4	5	6

9. What was the <u>most valuable component</u> of the meeting?

10. What was <u>missing</u> from this meeting?

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PROJECT ADMINISTRATION

11. Indicate if you read / access the following (circle one)

a. bi-weekly reader (the *PINEMAP Forecast*)? Yes No
b. interim and annual reports Yes No
c. the PINEMAP Intranet site? Yes No

12. **Please evaluate the usefulness of the following (to YOU personally)**	Poor	Fair	Satisfactory	Good	Excellent	Don't know
a. bi-weekly reader (the *PINEMAP Forecast*)	1	2	3	4	5	6
b. interim and annual reports	1	2	3	4	5	6
c. the PINEMAP Intranet site?	1	2	3	4	5	6

13. Please provide suggestions to improve any of the above.

14. **Indicate the extent to which you agree with the following statements** ***(Choose one number on each line.)***	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Don't know
a. There is good communication from project management	1	2	3	4	5	6
b. There is good communication within my Aim team	1	2	3	4	5	6
c. I can resolve frustrations with my collaborators easily	1	2	3	4	5	6
d. There is good responsiveness <u>from project management</u> to requests for information and action	1	2	3	4	5	6
e. There is good responsiveness <u>from project collaborators</u> to requests for information and action	1	2	3	4	5	6

15. Please provide feedback/suggestions regarding project management communications. What is working? What is missing?

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INTEGRATED TEAM SCIENCE

16. What does integrated team science mean to you within the context of this project?

17. Following the discussions you have had during this meeting, what are the 3 main ways in which you plan to integrate your science with others in PINEMAP? (Be as specific as possible)

18. What are the 3 main factors that motivate you to integrate your science with other PINEMAP researchers or external stakeholders?

19. Based on your experience (in PINEMAP and in other collaborative research projects), what do you envision the 3 main challenges for integration will be within PINEMAP?

20. Indicate the extent to which you agree with the following statements about PINEMAP ***(Choose one number on each line.)***	**Strongly disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly agree**	**Don't know**
a. Science integration within PINEMAP Aims is working well	1	2	3	4	5	6
b. Science integration across PINEMAP Aims is working well	1	2	3	4	5	6
c. Collaboration with external stakeholders is working well	1	2	3	4	5	6
d. In general, PINEMAP has improved my research productivity (i.e., data, methodologies, modules, publications, and other products).	1	2	3	4	5	6
e. In general, PINEMAP has improved the quality of my research.	1	2	3	4	5	6
f. Time spent on PINEMAP is well worth the effort in terms of returns I am receiving.	1	2	3	4	5	6
g. The PINEMAP team is capitalizing well on the strengths of different researchers.	1	2	3	4	5	6
h. The PINEMAP team is able to accommodate the different working styles of team members.	1	2	3	4	5	6

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Appendix B

PINEMAP 2012 Annual Meeting Evaluation Survey
Raw data: Qualitative responses to open-ended questions

General Evaluation of Meeting

Q9. What was the most valuable component of the meeting?

- Aim group meeting time; DSS, website (Intranet), and TerraC explanations; learning other Aim roles
- Interaction with colleagues, knowing new people. After that, we will try to work in a more effective way.
- The most valuable component of the meeting was breaking down into the individual Aim groups
- Aim breakout sessions
- Aim group sessions
- Appreciating the NIFA CAPs projects; finalizing protocols--Aim Breakout
- Adjust plan for the coming year; know information on education and extension progress of PINEMAP
- Hearing about work in Aim 2-6; Aim breakouts
- Meeting everyone at poster session
- Aim breakout sessions
- On day 2, I found the Aim breakout very useful
- Emphasis on the importance of trans-disciplinarity
- Verify the engagement; clarification; commitment of the participants "Pine-Mappers"; The opportunity to face-to-face discussion (from strategic to operational)
- Networking
- The Aim breakout groups and the interactions with other Co-PIs and students during the breaks and impromptu meetings
- The planning meeting for Aim 1
- Aim breakout time
- Meeting people face-to-face to make plans more concrete and explore new opportunities for work on future efforts
- The Aim group meetings
- Discussion of DSS, breakout session
- 1. side meetings; 2. other CAP information
- Interaction between Aim groups
- Meeting with others involved in PINEMAP
- For me, it was the Aim-level meeting (Aim 2). This may be because I am relatively new and still learning about my Aim
- Able to integrate data management with Aim groups
- A clear discussion of the integration so early in the project; getting the Aims a chance to interact
- Communicate with each other
- Seeing the other CAPs!
- Engage, interact, and next year goals and current programs.
- Opportunity to interact with the larger group

- Meeting other people, from other Aims and backgrounds
- Interactions with people outside of my discipline; spending time with Aim 3 members on revising milestones
- Time devoted to discussion within Aim groups
- Personal interaction
- I realized how out of touch I am with details
- Focus on integration and cross aim needs
- The Aim breakout sessions, and getting to interact with those work on the same projects
- The discussion times when people could contribute ideas from the floor
- Meet different researchers and scientists from different aim groups; exchange ideas and communicate with each other
- Aim breakout meetings
- Feeling part of the overall group
- Interaction with members of my group
- Aim group interaction was very valuable. Overall information about the project was also helpful
- I think the most valuable component is the interaction with people from other aims, putting faces with names, building more and better relationships, and developing a better understanding of what is going on in the other aims.
- Enjoyed posters/session; to "see" what other Aims and researchers were doing
- Poster session--finding what others have/will do
- To meet and network with members of PINEMAP. This opportunity served as a forum to know the participants/activities of all Aims
- Interacting with other Aims
- Interaction with other Aims; breakout sessions
- Face-to-face meeting with all Aims
- For my work, the DSS engagement activity
- Interacting with other Aims and networking
- Talking with individual researchers at breaks and reception
- DSS--interactive; Group dynamics--social; Graduate student posters
- Not sure
- To see what is happening in other CAPs
- Learning what the Aims and Tiers are.
- Keynote speaker

Q10. What was missing from this meeting?

- Technical presentations, e.g., modeling examples, spatial datasets
- An emphasis on actual research rather than admin. goals
- Presentation by graduate students
- At this stage very little; in the future, it would be good to dedicate some time to a select number of technical presentations on graduate student and project results; more time for informal networking
- Science presentations
- More from grad students, selection of students give 10 minute talk; more Aim breakout time
- More activities and small discussion groups

- More scientific details, talks, explanations, discussions
- Presentation of science results
- Solving outstanding Aim-specific problems
- More formal and standardized (?) for the Aim's PI (very different approaches); A group picture for historical use; A better group dynamics (we had the time but it was not that effective)
- Aim updates to entire group; science specifics
- An update of the current progress/achievements of the different Aims
- More time to discuss science!
- Specific cross-Aim (2 way) meeting time after breakout session
- Synopsis of progress to date over past year from each Aim
- Setting the stage for better integration going forward
- No major component was missing
- A bit more time for Aim-level meetings (personally)
- DSS exercise/break-outs were not that effective; other breakout theme would have been more enjoyable
- Integration among Aims. Each Aim needs something from the other Aims, but we didn't know exactly what that was (until we met with them at lunch)
- Opportunity for the students to interact with each other (just a suggestion)
- N/A
- Specific time for an Aim-specific summary
- Discussion on obtained results; probably will happen in following years (initial phase, so understandable)
- We needed more time for Aim specific working groups
- A social event like going out to a bar or walking to downtown, something like that.
- Better venue (meeting room was too small)
- Expand inter-Aim component
- Nothing
- Time--too much crammed in to too few hours
- Room was a little small, but worked o.k.
- Push to deliverables
- A full update for where each Aim currently is at
- Unstructured time for interaction--presentations are fine for one-way information flow but don't really lead to collaboration, which requires two-way exchange
- Formal cross-Aim meeting times
- Nothing
- Inter group breakout session
- I wish we had inter group breakout sessions so that we can talk about each other’s needs
- Nothing really. Maybe a little more informal time to talk and get to know people would have been nice.
- Not enough time to meet with other support staff not associated with silvicultural research (not exclusive of them though)
- Aim plans reporting to others; Aim interaction?
- To discuss concerns about the functioning of the Aim activities. Most of the time was spent on planning for report and future activities. What happened during this year, names/numbers of interns, their … was not discussed.

- More small milestones--baby steps
- Nothing I can think of
- Interaction of cross Aims gathering. Having a representative in each Aim group working on project outcome
- Reports from Aims--it takes time and can be dull, but it's still useful for folks to learn about the activity in those Aims
- Might need to extend by 1/2 day and provide more time for discussions
- Can't think of anything; perhaps more rigor in keeping on time
- Clearly identified, basic steps that all will work towards to truly integrate efforts all the way through to measuring impact
- Interaction time = breaks; people's interest in poster session
- From a data management perspective, I probably needed to be in multiple Aim meetings.
- Nothing

Q13. Please provide suggestions to improve the PINEMAP Forecast, interim and annual reports, and/or the PINEMAP Intranet site.

- I usually scan the annual report info. related to Aim 1. I don't think the other Aim pieces are sub-standards, I just don't think the level of detail is relevant to me.
- Collaborators need to upload more results, ongoing work.
- Get more people on web site; teach people how to upload to website; no one is using web site; once it is used freq., it will be very valuable
- 1. The public part of the web site could provide more information; 2. The screen space should be used more effectively once in the Intranet by getting rid of the broad header and picture of the pine stand; 3. Aim workspace should have options to post multiple files at a time
- Pinemap Intranet-directory of Aim's protocols; good start (I'll try!)
- Communication at meeting about them will facilitate use
- Include an Aim calendar
- Put data collection, etc. protocols on Intranet site
- None
- All are quite good; the web site for PINEMAP is very good
- The PINEMAP Forecast should also include "Publication of the week" (sort-of): a paper or report that is very relevant to PINEMAP. This may not be a PINEMAP publication, and may be old. Nonetheless, it may be interesting to most people involved.
- N/A
- Seems fine at this point, I guess improvement will follow as data vol. increases
- I plan to spend more time on the Intranet site as publications are listed
- Place "Logout" link on top of page, maybe?
- More effort on my part to participate
- N/A
- Don't have any. Intend to use them now.
- Get newsletter and e-mails from PINEMAP site
- As long as I know where to go, it's great to know that it's there
- You could ask a person from each Aim to provide a highlight or snippet of info/result/progress for the biweekly reader. Just a couple of sentences to keep

everyone more informed of what is happening in Aims. So this would be one highlight from one Aim on each reader.
- To circulate by mail/or inform via e-mail about the items a-c. However, I did not get time to keep up with the updates
- I hope that for Facebook use of FB may act as a way to update PINEMAP Collaborators internally
- As with many projects--info. is more likely to be read and ingested if it is pushed to me. Am Less likely to search out such info. due to the many other commitments.
- Maybe provide "top 5 items you need to know from my Aim group"
- Please keep up the good work; add success stories
- None
- Suggest adding one poster summary to next Forecast until all done; Forecast--start highlighting GS projects, Aim milestones, updates on Tier III sites, integration successes; meet the PI feature (defacto have internal story or each PI to start the integration that was lost because this meeting was really needed)
- The reports just aren't relevant to me
- Improve quantity of Aim-specific info--this will come with time.

Q15. Please provide feedback/suggestions regarding project management communications. What is working? What is missing?

- I think it works well when managers propose decisions, then ask for comments. When everyone is involved in decision-making from the beginning, the process is inefficient.
- Different leader styles are looking for different results; professionals need to focus in the objectives of their project; new objectives means new progress; leaders need to work in one way
- At the moment everything seems to be working accordingly
- Strong communication from Jessica/Tim is outstanding; strong leadership
- Quick reply; very helpful
- Working great; e-mails are very informative and responsive
- We need more top-down instruction for protocols, and need to make sure everyone is included in listservs and mailings
- I find we have good communication. I did find the face to face in Athens for Aim 1 very effective relative to conference calls. Why did we give up on Elluminate?
- UF team is awesome! Aim leads are not as effective, but not everyone can be "the best"
- The inter-Aim's goals should be more clear; for the next annual meeting, each Aim could select 2 main that completely cover what the Aim is doing and will do; facilitating the next 3 year integration
- Sometimes a bit too much info. makes it hard to differentiate "optional" info from critical info.
- Communication seems fine to me at this point.
- Our Aim leaders have gotten better…
- Management communication is good so far
- Aim 1 is still a loose collection of individual projects. Need better within Aim Coordination.
- Project management communications are good.
- All ok! :)

- Good; Good communication among Aim team depends on Aim group leader
- I think it is working well. We should have this kind of meeting every year in the coming 5 years or so, so we can communicate with each other and make better progress on our projects.
- I know this is retro--but what about some hard copy materials like fact sheets, summary newsletters, etc.? We all get too much e-mail for it to be truly effective. PINEMAP App?!
- Looks good at this point.
- I appreciate the use of the web based sessions over conference calls
- I need to get more engaged.
- Have not been here long enough to know
- Online space is very valuable for exchanging ideas
- Seems to be working well.
- More periodic meetings
- More periodic interactions and meeting
- The little direct communication I've needed from PM has been excellent.
- There's definitely a gap, but I don't know how to fix it. "We're too busy" doesn't seem to be good enough.
- I think everything is going well! From my perspective, communication about PINEMAP related activities/opportunities/deadlines/etc. are clear and organized. But they are only useful if people use and read them.
- The members within the same Aim should have a meeting/teleconference/discussion via easy method to know the updates. This is lacking and results in frustration to the intern who is selected and later denied his internship. Some concrete explanation should be provided to the student/Co-PI.
- Doing a great job!
- Timely responses can be an issue, due to everyone's busy schedule
- Meeting with group members, but it would be nicer if the time was later. Nothing is missing.
- Some might appreciate a summary of the executive meetings and advisory board meetings
- Everything is working! :) Time is always precious among project collaborators so maximizing efficiency whenever possible (which you are doing)
- Highlight the upcoming Aim meetings; If there are specific topics, that need Aim 6 member to attend, this may be the best time.
- None at this time.
- Extension Aim still feels out of loop. Extension, engagement, and outreach can't be the last minute item. I loved the brief (one page) SWOT analysis that REACCH CAP conducted in their annual report--a simple realistic approach; should be included in our report (Exec Comm or Ext Comm could do it)
- Need more status tracking
- Plenty of communications--about right given needs.

Q16. What does integrated team science mean to you within the context of this project?

- Nobody can work in a bubble
- Clear goals on teamwork; delegation of responsibilities
- Working across multiple aims in order to achieve common goals

- People with differing disciplines working together to solve a common problem
- Common students to advise; teaching classes I would have never taught before
- Appreciating the interdisciplinary efforts involve and the coordination necessary to move the project forward
- Different groups from different backgrounds coming together to achieve a common goal/objective
- Aims helping each other, sharing info.
- Talking, discussing, collaborating about research needs, methods, results to come to conclusions
- I missed this discussion on day 1; it means sharing results and eventually trying to use results collectively to think at large scale
- Collaboration. Ambitious goals
- A team that have common goals and agree upon the methodology and approach to reach them
- Working across different scales of integration; within my Aim is one opportunity, but project wide is another, unique larger opportunity
- Integration of Aim objectives and activities toward meeting our shared project objectives
- Right now within Aim, but future Aim II
- All levels, within schools, within Aims, between Aims. Nobody works by themselves
- Attempt to answer broad questions by combining expertise-e.g., project title
- The outputs (planned and organized) of one project feeding into another
- Providing data (Aim 1) that is needed for higher-level analysis. Working with other Aims to help them understand the biology of the system
- Theory based investigation
- Cooperation
- Making sure that all of the relevant pieces fit together
- It means developing products (such as the DSS) between Aims
- Not familiar with this term
- Communication between teams throughout the project, not just at the end
- Different people from different universities can work with each other in order to achieving the same goal.
- Working together toward an important shared common objective
- Success to overall aim of project
- Working on problems that require inputs from multiple disciplines to arrive at solutions.
- That I can make my contribution to a big project and also learn about other areas.
- Getting data (climate) from members to use in my research
- Group of people from different disciplines working together to generate a complete product.
- 1. Working out a general standardized approach for high-throughput genotyping; 2. sharing data.
- We have large, difficult problems to study, questions to answer
- Working collaboratively with people from other institutions to achieve an overall main goal.
- Enrich the understanding of different areas
- Transdisciplinary science
- We all work towards a common cause

- Interdisciplinary knowledge
- Working with people from other disciplines, using their expertise to solve a common problem
- Working with people from different disciplines to motivate and help each other to create better research and outcomes than we could have individually
- An end goal requires collaboration across disciplines/sub disciplines where objectives within them may/may not depend heavily on those of others.
- Working with people outside my discipline to accomplish something I wouldn't have done by myself BUT I also think my work is enhanced when I remember to think about other perspectives, even without anyone else telling me what they think.
- Working with others to better understand their research so I can develop strategies to teach students; individual professional development--learning and working with other disciplines
- 1. I understand that research outcomes will be applied for instructing and educating the graduates/undergraduates/high school students; 2. Integration of research with education for Aim 5
- Different disciplines working together to achieve a common goal.
- Mixing all the CoPI together to reach the expected outcomes
- Exploration of how large groups progress and interact
- Communication, collaboration, and group leadership
- That everyone puts their own personal research interests aside to work on big issues
- Researchers and outreach folks working together with the aim of getting information to the end user
- When communication takes place and extraordinary products are produced above and beyond what was produced and envisioned early on in the project
- Don't know
- Working together on common goal.

Q17. Following the discussions you have had during the meeting, what are the 3 main ways in which you plan to integrate your science with others in PINEMAP? (Be as specific as possible)

- Be more informative about what I'm doing; look for ways to incorporate other Aims and Universities
- Communication; sharing paper/resources/ideas/work; doing publications
- 1. Ecophys. measurements will be used in modeling and every other aim; 2. integrating modeling into research
- Integrate with modeling Aim; work with others inside my own Aim; work with extension
- Education (new courses); common research proposals; site visit
- Foster greater collaborations toward publications and additional grants
- Collaborate with other grad students working on similar projects; continued discussions with other Tier II managers
- 1. Communication with others. I got good suggestions this way; 2. Attend the internal meeting, may not limited by annual meeting; 3. Contact other members if I need suggestions/discussion
- Offer Aim updates (short reports); possible video conf. calls; clarify what others need from us
- Develop and pilot learning modules

- 1. Data sharing; 2. Collaboration on specific methods for variables outside the primary; 3. Work with other Aim researchers with similar goals/objectives
- 1. Post more on PINEMAP web site; 2. Provide webinar; 3. Propose and carry out specific cross Tier III research activity
- Keep communication open; collaborate
- Participating in meetings, webinars; Graduate students works (committees share); research specific/paper specific meetings
- look harder for opportunities
- My integration with others is all through collaborations with Co-PIs and students in Aims 1, 2, 3, 4, 5, and 6
- Look at data/model integration; look at integration between models; work more with modelers of 3PG at UGA
- My student interested in leaf-level processes will interact with student(s) interested in large-scale variation in the rings, share ideas, perhaps data, methodologies
- Develop data for models; estimate parameters for models; assist with PLT
- Discuss with other Aims their needs and what is feasible to measure
- Field coordinated studies with other PIs
- Communicate with others; exchange information and results; plan continued collaboration
- Talk to Aim 1 people about what is important in modeling; pay more attention to Aim 3 and 4 objectives
- Yes; research collaboration
- Thinking about bringing a different set of ecosystem models that I work with to the project
- 1. Communicate with people from different aims; 2. Maybe teleconference more often; 3. E-mail
- 1. Use my results/data to get further interpretation in separate discipline; 2. Vice versa; 3. Combine everything to get a better picture
- Hope to see a genetics growth modifier incorporated within Aim 2 growth and yield models; use ecophys… outputs from Aim 1 to refine breeding objectives
- I will try to explain my findings and results in a "down to earth" way.
- I plan to explore and share statistical models with other Aim 3 members.
- Communication; meetings; being inclusive
- 1. Via comparative analysis of obtained data; 2. material discussion; sharing data; 3.collaborative decisions
- Get more active with Aim members
- Provide datasets to TerraC
- Better communication; clarity of objectives
- 1. Integrate phenotype info. with climate predictions; 2. Combine various genotyping data for future modeling; 3. Can't think of anything else
- 1. Make progress on my project; 2. Exchange the ideas and discussions within aim group researchers who have similar research; 3. Make some modification on my project results
- ?
- Sharing information; incorporating their information; idea exchange
- Personal communication with Aim group 3 and sharing of information, collaboration
- Collaborate; communication; sharing of information

- 1. Graduate course and continued discussions with other students; 2. Working with other aims on activity review; 3. Not sure but will keep thinking
- Involving graduate students in preparing educational presentations/lessons
- Expert reviews of PLT activities; Improved grad course; New activities for PLT that blend others' research interest
- 1. I have new contacts for reviewing draft activities (for PLT Modules); 2. I'd like to watch more of the Internal Webinars; 3. I'd like to connect with Aim 3 experts to develop genetics activity for PLT Module.
- To interact with Aim 6 and Aim 1 or 2 (in addition to Aim 5) in following ways: 1. Teach undergraduate course with focus in PINEMAP; 2. Integrate the results of Aim 1 and 2 in enhancing teaching
- Increase communication; find areas that are mutually beneficial
- Include my 1890 contacts in the discussion; weigh the value of the 1890 communities involvement with the PINEMAP agenda; pin-point landowner who can benefit from PINEMAP
- Webinars on climate; educational/curriculum; interaction with Aim 2
- 1. Try to attend other Aim meetings; 2. DSS subcommittee; 3. More communication in general with other Aims
- 1. Work with other research Aims to help them understand Extension and landowner needs; 2. co-author Extension publications, etc.; 3. Engage researchers in Extension work
- 1. Getting together face-to-face; 2. Sharing info. using webinar series; 3. Sharing/reviewing publications
- Continue to look for synergies; force my way into other Aim presentations and products; make Extension something other than an afterthought
- I'll do my job
- Share data, experimental platform, co-authorship

Q18. What are the 3 main factors that motivate you to integrate your science with other PINEMAP researchers or external stakeholders?

- It's required; it opens up opportunities; it helps popularize the project
- Professional interest--I want to use my skills; quality of science; scope and importance of project
- 1. the progression/distribution of knowledge; 2. feedback opp. From non-ecophysiologists
- Answering broader questions; Interest in work others are doing; Ability to interact with those people
- Idea sharing; Teaching curriculum; research projects
- Advancing science in a coordinated and meaningful way; improve research quality; understand research of colleagues and other aims
- 1. Project request; 2. Get insights from different discipline; 3. Adjust my research if I know the need of potential users of my research
- Its my job? Good pride booster
- Personal interest; responsibility
- More complete or broader research; publications

- 1. Novel science; 2. More robust results; 3. I like the other researchers and learn a lot from them
- 1=2=3 interest in the regional effects of forest ecosystems their C…
- The nice network put together, building Tier III; the possibility to be with other scientists and discuss and learn and share info, hypotheses; to engage new scientists (graduate students)
- Sense of responsibility; leadership team; evolving ethic that this is just the way business is done
- The project goals are too big to solve/achieve without the help of others
- Breadth of other's expertise; access to data from all sites; working toward common goals
- Better inferences (multiple scales, pieces of information); potentially contribute to better management; potential to generate exciting research projects and questions
- Overall objective of project; usefulness of my work
- Having larger impact
- 1. Potential to leverage infrastructure and results for further funding; 2. Potential to foster collaboration across universities
- Do better science
- Needed to accomplish project goals; Interesting challenge; Advances science in all areas involved
- Integrated science is cool
- Size of project; potential of project (synthesis and analysis)
- Data sharing/generating ideas
- Chance to work with great data
- 1. To know more people; 2. To finish my own project; 3. To help other people and share my work with people who are interested in.
- Better science, basically
- It's useful; it's important; some beyond the normal research course/overachieve
- Need to broaden science based solutions for complex problems
- I like to solve real problems through science. This is a great opportunity to work and learn.
- Increased and better publications; use of data from others to develop tools important for breeding and deployment; Network and learn from others
- Can learn from others' experience; can generate novel ideas; can gain better perspective and understanding of my research
- 1. Expand scope of my research; 2. Learn new methods and approaches
- We need adaptability info for genetic deployment decisions
- Quality of researchers and interest in research topics
- Desire to learn new things; outcomes--real world impacts
- 1. The more integration the more predictability for future modeling; 2. The more types of research that can come about from collaborating; 3. The satisfaction of larger goals being met
- ?
- Good research
- Common cause; interest in other perspectives; need to produce better product
- Team effort; share knowledge; acquire knowledge
- Team work, knowledge sharing, technical support

- 1. It makes for better research; 2. I need the information from other aims to make the activities; 3. Help further the goals of PINEMAP
- Training future researchers; Teaching next generation of society about science/social issues; Learning how to integrate
- Wanting to do a good and responsible job in our commitments; wanting to learn; wanting to earn respect of others
- 1. I need their help understanding the science/content for creating activities; 2. I want to make sure we move toward our collective goals.
- 1. Widen the activities by the Aims (1-5) PINEMAP … areas which contribute to overall productivity; 2. Find interacting link between research by Aims 1 and 2; Extension by Aim 6; 3. Publicize my work on natural resources/ecosystem studies GPS for use by Aims 6 and 5.
- Increase impact/usability for end user
- Being a part of the team; my location; my background
- There is a clear need for climate info.; there are opportunities now and in the future
- 1. Success of the project; 2. Progress with the DSS; 3. Benefit of stakeholders
- 1. Impact; 2. They need to understand the human dimensions; 3. They will assist with program delivery
- 1. Webinar series; 2. Workshops (joint teams); 3. Establishing demo. Plots
- Impact; Challenges; Relationship building; model behavior to grad students
- That's my job
- Leverage cooperative research, personal relationships, advance science

Q19. Based on your experience (in PINEMAP and in other collaborative research projects), what do you envision the 3 main challenges for integration will be within PINEMAP?

- Effective communication; No clear leaders in some situations; and the participants can't decide on a method/idea/etc.
- Communication; focus on the project goals; team work
- 1. Distance between researchers; 2. Inability to view alternate aim research; 3. Concentration of single aim
- Distance between investigators; competition between investigators; Commitment
- Coordination between Aims, especially 1 with 5 and 6 and 2 with 5 and 6
- Disciplinary training of most PIs; time; physical distance among collaborators
- 1. The big difference between different disciplines; 2. The time needed for such interaction may be limited, because such interaction may not be as necessary as it is.
- Distance; lack of time in peoples busy lives; lack of clear detailed plans and objectives
- Distance, info. overload
- Communications; finding common ground; coordinating and timing of events
- Time
- Poor coordination; potential protectionism, competition
- Leadership styles; get people excited to make them adjust their very busy agenda to accommodate PINEMAP stuff; distance
- Understanding what the other aims are doing
- Communication about activities in the different Aims; the speed at which deliverables are being developed in the different groups and by individual researchers; the newness of the large-scale integrative research model for most of us.

- A clear vision for how to do this
- 1. Coordination of deliverables; 2. Communication between Aim interdependencies (what does Aim x need from Aim y and when?); 3. Educational outreach
- Making them truly effective and sustained; time to do this and still get everything else done; effective communication (different expectations in different disciplines)
- I don't know
- Scientific vision and leadership
- Fostering meaningful communication among various areas; Finding time to carry out integration; Providing incentives for integration
- Doing integrated science is tough
- Continued strong communication
- Getting everyone on the same page in a timely fashion.
- The timing of delivering the different products among the groups that need them
- N/A
- The main thing is not to let the efforts to foster integration impede it through overkill
- Continuous dialogue is must; time/dedication; unsynchronization in obtaining results
- Different priorities and organizational objectives, i.e., need to do basic research vs.. support cooperator goals
- The main challenge will be to understand the work of the other research areas.
- Lack of responsive; timely delivery of data
- Broad scope of disciplines; scattered locations; large team
- I don't envision any serious problems with integration.
- Time to spend on project
- Timeliness of communication and progress
- 1. Physical barriers of communication; 2. Compiling data into a uniform format; 3. Everyone progressing on a similar timeline
- ?
- Diversity of group; geographical location; size of group
- Improve communication; different educational background; different objectives
- Lack of communication; different working style; different objectives
- 1. Knowing who to ask; 2. Distance; 3. Communication/finding common terminology
- Needs for integration may vary, e.g., silviculture may not see a need for education; Many PIs and procedures vary; My tasks feel like a discrete chunk of PINEMAP; difficult to see how to integrate INTO others
- Time to communicate; time to understand each other; time for 1 on 1 interaction
- Time and distance--I think having more small working meetings across the Aims would be good (like what Aim 1 and 2 did in Athens).
- 1. Hard to relate to others findings (either by e-mail or telephone); 2. The participants do not connect with each other regularly to keep up with the outcomes (e.g., Aim 5--we do not interact/discuss the details of what interns are expected to do; 3. There is no written document circulation before the intern announcement goes out to me. Working relationship has to be on friendly...to discuss environment
- Time; priorities; preconceived notions of other Aims
- Personalities; authorship; collaborative efforts
- Researchers generally don’t consider the end users; Extension is an afterthought
- 1. Lack of time; 2. Need easier ways to communicate--not sure how; 3. Lack of interest from other groups

- 1. Time; 2. Expertise in integration; 3. Focus!
- 1. Time and busy schedule ; 2. Willing to integrate
- Everyone thinks his/her Aim is the most important one.
- Communication; cooperation; reach to an already overworked group of dedicated professionals
- Communication; Collaboration; Data synthesis
- Time availability

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Appendix C

Responses to Integration Activity at Second Annual PINEMAP Meeting

Examples of successful integrated team science ***and …. reasons for success***	**New ideas to generate success**
This meeting: *focused* – *good topics* Aim 1 & 2 integrating: *meeting was really strong, task focused, not too long* Grad Course: *made next generation share ideas* Webinar Meetings: *opportunities for topics*	More mixed integration meetings (Aim3+4) etc. Have graduate students attend integration meetings Fieldtrip at Tier III sites to meet group regionally or sub regionally University focused meeting Google doc for sharing ideas Quarterly new development check-in Paper to factsheets
Climate scientists /forests managers/scientists learning from each other and building stronger robust outputs, ideas, direction Growth Yield/genetics/economics *Funds, interest, energy, early adopters of communication technology*	Carefully identify project-wide baby steps milestones
Crops with proprietary data sets (that at least at some level compete) sharing their data coming together for a common objective Collaborations outside of PINEMAP (Aim 2 w NASA, Ames, eg) *Physical proximity or means by which physical meetings maintained* *Leveraging resources to increase size of overall pie* *Known and trusted relationships or at least shared "use" of each other so both gain*	Short focused on site workshops around particular objective – (around a single manuscript for eg)
Hard to read!! *Foundations existing* *Three missions of land grant university*	
County extension surveys Development of fact sheets Graduate student course / internship recruitment *Collaboration among PINEMAP partners* *Frequent webinars/conference calls*	Selecting (?) demo sites with Aims 6 – 2 & 3 Involve 1890 students in the internship program

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Examples of successful integrated team science ***and …. reasons for success***	**New ideas to generate success**
Communications (webinars, monthly meetings) Flexibility Number of people showing up at annual meeting *Initial Structure* *Leadership at top* *Transparency* *Distributing resources* *Diversity of groups* *Importance of topic* *Personal Relationships*	Crawfish boil
Modeling framework and integration with other aims Education / online course Co-ops coming together contributing to PINEMAP *Shared goals and interests* *Leadership and collaborative atmosphere*	Clearly define areas of responsibility (partly done) Closer interaction with extension (understanding the client base) Coming to meetings prepared (having goals and agenda advanced in time) Involvement of comp (?) staffers
Athens meeting (Aim 1& 2 work together …) Interaction between different Aims – learn from each other *Researchers with different research interest identify data* *Effective and efficient ways* *Leadership and organization* *Short-term common objectives*	
Interaction between genetics and modeling data sets in common modeling framework *Good leadership* *Respect for each other* *Desire to do something different and learn something new*	More communications Sharing outcomes, projects, problems -- repeat
Internal webinar series to share ideas and research Conference calls between aim groups (and in person meetings) Graduate course DSS committee *They foster communication and attempt to find linkages among aim groups*	Have Aim members sit on other Aim calls (but time is always a concern) Have Aim 6 rep sit in on other aims Have more round robin updates on webinars Aim updates in Jessica's PINEMAP forecast
Working of Aim 2 providing data on field trials to modeling group which is Aim 2.	Regular meeting and interactions among Aim

Examples of successful integrated team science *and …. reasons for success*	New ideas to generate success
Aim 2 visiting field sites and discussing with Aim 1 to focus their data collection according to modeling needs Since most of the decisions are focused on economic impact, all the scientists willing to work with Aim 4 people to provide economic and policy inputs *Understanding each other needs to solve complex problems* *Better communication* *Flexibility and open mindedness*	members Dissemination of information of what others are doings and data available and expertise available for some problem. A central collection where we can access this information
Sharing Data Cross disciplinary discussion of goals, inputs, outputs (new networks) Webinars Graduate Course *Commitment on part of individual participants* *Common forecasts (?) or data suits* *Champions* *Frequent communication or useful communication platforms*	Need more face-to-face problem-specific (focused) working groups
Aim 1 Developing common set of protocols for tier 2 & 3 network Aim 1& 2 collaboration *Intersectoral structured approach to improve protocol definition (emails, calls, face-to-face meetings)*	Request feedback from Aim minders on current needs and impacts Some task or session to illustrate how different Aims relate to each other
Aim 1 & 2 & 3 – How they are working together – data collection *Enough time* *Talking, meeting, common protocols* *Time to fully ingest/digest/ruminate on what other Aims need* *Non-competitive*	Time machine Modelers tell data collectors specifically what variables they need – A “top 10 list” – to improve our model we need….
Establishment of written documented protocols for collecting data, establishment of tier III sites and gap flow, Life cycle analysis development for carbon accounting *Graduate student training in project – grad course* *Clear need, timeline for putting in place – face-to-face meeting* *Distance ed., E-graduate student involvement tools (Elluminate)* *Leaders took the challenge*	Need subgroups (across Aim) that are excited about answering long standing questions (genetics and), productivity Establish new science/stakeholder goal of mapping in productivity Create intensive meeting to advise industry..?
The regional approach to Tier III seems to be working drawing together researchers relatively close on a common site Best example of integration (economical science only) seems to be through	Perhaps a strategizing or focus group to target competitive funding on a south wide extent? This will be a difficult project to sustain beyond

Examples of successful integrated team science *and …. reasons for success*	New ideas to generate success
discussion and planning to leverage research support and funding for continued support	five years.
The management team of PINEMAP helping design activities for Aim 5 (by Aim 1 people) Taking grad distance class Doing extension product assignment 2 Structure of annual meeting *Motivation of individuals – they want this to work and are willing to try new things* *Pressure of need, urgency*	Voluntary participation for fabricated and necessary opportunities Critical assessment by extension advisory board (?)
Meetings with different Aims – maybe pressure deliverable Distance course Network of open communication Annual meeting structure (focus on integration) PLT Management team (geneticist, education, ecophysiology) meeting weekly *Pressure: to get something done* *NIFA requirements: budget reflects that* *Forced collaboration: voluntary participation* *Open communication* *Commitment* *Building trust*	Central database for modeling- having standard datasets for modelers Try to put pressure on Aims to get things done Water cooler idea
Modeling group identifying needs to biophysical scientists who in turn collect data to feed models in a meaningful way while simultaneously moving their agenda forward *Small group meetings with targeted participants across Aims with a specific focus*	

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Main Barriers	*Some Solutions*……. and a New idea
The outcome of different aims: How these will address the main goals of PINEMAP How to interconnect the contributions from Aims 1-6.	To facilitate close interactions the participants of Aims (closely connected) via small workshops/meetings The PI of PINEMAP disseminate information about the outcomes of Aims (1-6) or through newsletter The exchange between the participants via videoconferences so that exchange will take place
Different sites for different aims Distance – funding (travel?) Terminology – Jargon A "water cooler" A communication void Data sharing Ranked list of outcomes related to delegation of responsibilities/priorities Time constraints Fear of unknown Overwhelming problem scale Different leadership styles and expectations	*Incentives, small teams* *More funding for collaborations* *Include more scientists in outreach to bridge gap – regional meetings or site visits* *Online data sharing and discussion board* *Newsletter with specific requests, needs, etc.* *Mandated Inter-Aim meetings* *Frequent real-time updates* *An IT guru to facilitate and software* A booklet with overview of disciplines and specific opportunities for integration, contact info, specific project info, "personal adds" in effect Sessions/Workshops on campus Bottom-up review of everyone's efforts Redraw framework
Delegation of responsibility Style of leadership Differences in expectations	*Teamwork* *Communication* *Prioritization* *Simplification* Publications – forecast booklet
Many collaborators from diverse backgrounds and disciplines Lack of experience participating in extension/outreach Over commitment – Not enough time to give to PINEMAP Lack of common terminology or approaches Not enough resources or time to do anything beyond disciplinary focus	*More opportunities for communication within and between Aims* *Opportunities for co-authorship in peer reviewed publications* *Sharing success stories from other, perhaps smaller integrative projects* *Leveraging funding to enhance interdisciplinary opportunities*

Main Barriers	*Some Solutions*……. and a New idea
The nature of the problem: scale high Too complex problems Not clear objectives Lack of experience with integrated team science Not clear boundaries between expertise limits Not clear background Fear to work with unknown disciplines Overlapping work	*Leadership – Communication* *Real-time advance reports*
Difference in disciplinary perspectives, jargon etc. Time constraints Funding constraints	*Communication among specialists/team members* *Incentives for participating in inter/transdisciplinary research* Joint meetings or sessions at meetings between disciplinary areas Workshops aimed at integration
Physical distance between collaborators Constraints on the timeframe and budget – optimal experimental design may have been different (in terms of germplasm, sites – a special problem in forestry) Trappings of our disciplinary boundaries – lack of understanding between disciplines	*Brainstorming sessions and more integration meetings in subsequent years* *Scheduled conference calls / water cooler* Schedule more time at meeting to deal with specific integration tasks
Lack of the complete understanding of the specific and general components (aims) of the project Different leadership styles may not work for all co-PI, graduate students Priorities – previous commitments – adjustments (as soon as possible) to fully dedicate to the expected goal Constraints of location - boundaries	*Meetings like that first – more* *Review of the framework: Step one – money top down to bottom up --- commitment review – dynamic final one* *Webinars more framework* *A map of climate change – where am I?* Review of all the climate change is really incorporated? What are we missing? Big part of C-budget is missing?
Data sharing Communications	*Online data resources sharing platform* *Discussion board online to list questions and some group experts could answer questions and share ideas*
Time constraints Different priorities on different levels	*Provide opportunities for collaboration* *Financial incentives for collaborative products* *Provide platform/culture for learning and knowledge sharing* Assign extension member to each Aim

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Main Barriers	*Some Solutions*……. and a New idea
Lack of knowledge about another science Don't see the integrative connection and not convinced by it	*Dialog and introspection* *Going deep into the subject fundamental and overall goal wise and realize the integration* A workshop after initial product development to see if the and realizing if the integration was useful and in which way
Disciplinary foundational training of most and lack of understanding of other team member's expertise – human dimensions vs. modeling vs. plant biology Physical distances among scientists and institutions Division of resources to meet Aims and goals Hard to think in 6 dimensions	*Interdisciplinary meetings – discussions* *Team-based analyses and generation of research papers* *Clear vision / leadership for moving project forward* How to determine if integration is in fact occurring, How to identify low hanging fruit and a few examples of integrated outputs as guide. Congressional testimony to foster policy
Unrealistic expectations of what is possible within various disciplines / aims Timely communication Time constraints	*Discussion, field visits, assisting within among Aims, grad students face-to-face* Mandatory outreach effort/factsheet with each submitted paper Grad students work with various aims
The issue is complex and will take years to gather some of the needed research results. Everyone already fully committed and opportunities for more than only superficial integration are minimal Not sure everyone is on the same page as far as what they want to achieve within this project – refereed pubs vs behavior	*Use funds to release faculty time to this project* *Focus on outcomes and what each person's role is in achieving these outcomes* Create a think tank to guide discussions at the 30000foot level, include some of the more energized people on the team, not necessarily the Aim and Integration leaders
Complexity of the issue Lack of communication Different objectives or points of view for some problems based on different background among researchers	*Periodic meetings* *Set similar objectives or steps to follow by different groups – at least for common problems* *Position or white papers for a particular issue* Exchange of researchers among related Aim groups to understand what others are doing and how they are doing.
Six different Aims Budget – it is ? (turf issue) Six Americas among PINEMAP – extension, but especially land owners – audience interest	*Quality information addressing basic and applied science* Figure

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Main Barriers	*Some Solutions*……. and a New idea
Money Diverse opinions on methodologies Time commitment Competition Desire to keep results to self	*Seek outside funding* *Encourage strict data sharing protocols* *Doodles – see when others are available* *Grow by pulling in for outside others work that falls under PINEMAP umbrella* Meetings in person are key Use video technology Publicize successes Smaller groups Tunnel vision – have not seen other people's work
Forced collaboration Institutional issues Turf Issues Conceptual frameworks Collaborators Resource allocation issues Cultural backgrounds become too focused on our own	*Institutional Issues – Emphasize team achievement, failures* *Analyze communications issues – make sure everyone is on the same page* *Step back and look from a farther distance* Difficult ?
Everyone is busy with their own responsibility and other projects outside PINEMAP Clear understanding of another group's assumptions, expectations, requirements and objectives can be hard to achieve, but is essential to integrating activities of different groups in a meaningful way Academic culture – independence is a highly valued characteristic in academia, so integrative/collaborative work is counter to the selective pressure faculty are used to responding to	*Jim mentioned that SECC grew by encouraging participants to bring in other collaborations and projects – This could be a way to bring more of people's attention to PINEMAP by incorporating more of what they are doing into PINEMAP* *Face-to-face meetings or longer conference calls to allow discussion of details among a subset of Aim groups targeting integration of specific activities* Try a half day video conference using Google Plus or another tool that allows live synchronous video interaction.
Face-to-face time with potential "integrators" Lack of hypotheses that are transdisciplinary	*?* *? Transaction costs – honor agreement?*
See Geoffrey for 1st answer	*Sum more that parts can address larger issues than could be done alone* Time and space issues – i.e., barriers only arise at certain points
Administration differences between institutions Deciding what is important	*Decide beforehand on potential products and who is in charge of each one*

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Main Barriers	*Some Solutions*……. and a New idea
Consensus on appropriate methodologies Who gets the credit	More frequent interaction via emails (?)
Different background Different responsibilities Different locations Different ideas on how to accomplish goals	*Task delegation* *Conference telecommunication* *Email* *Face-to-face interaction* *Detailed task assignments* Video examples of desired outcomes Assign member from each Aim to work on team together
Transaction costs Too many meetings Funding Frameworks vs. single frameworks Multiple levels are needed depending on research questions Lack of data integration	*Recognize young scientists for their successes* *Create opportunities for publications – success stories for public view* *Encourage innovation awards for teams* *Help with new proposals – Strengthen members* *Hierarchical – break down into smaller groups each of which fits into larger framework* Publications

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Parts of project good for transdisciplinary work	Your expectations for integrated team science	Ideas for recognizing and monitoring progress and success of integrated team science	New idea
Extension education Modeling processes Distance ed.	Learning about other topics and subject content I am not familiar with Being part of a larger project, something bigger than can be completed individually or within one team	Being able to visually see connections among Aims, people, products Being able to articulate new info/outcomes that can't happen with just one part Having a framework/ model first that represents our integration and defining indicators from that	Cross Aim meetings? Jigsaw (person from each Aim)
Connecting different aspects to further overall project goals	Interdisciplinary - different institutions pooling their research and working together Transdisciplinary – the various Aims coming together and helping to solve the main goal	Have regular check-in meetings / … various aspects of the project (?) Yes, modeling, maps, fact reports Individual groups achieving smaller personal goals Evaluating integration – making ideas that carry across through integration	More structured individual and collaborative goals
Extension part to be used in education	Database availability – we can query data as much as we want and whenever we want	Reach the goals we set for Tons of papers published from this teamwork People from different places know each other and co-author on several papers	
DE(?) Extension – it creates and opportunity for both students and faculty to create something new through synthesis of ideas	Collaborative	Central point of projects spawned from PINEMAP (Intranet) Collaborating by sharing data (publications)	
Modeling Extension Education	Multiple Aims Interdisciplinary	Process: workshop discussions etc. Outcomes: publications, models etc. Communication is key, we are all learners	Graduate student training programs

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Parts of project good for transdisciplinary work	Your expectations for integrated team science	Ideas for recognizing and monitoring progress and success of integrated team science	New idea
The goals of PINEMAP	Being able to integrate We will benefit from other aims to give us breeding goals – how can/should we better modify pine populations resilience?	Do results feed directly from one Aim to another and back	
The outcomes desired which are to alter management practices to improve sustainability of loblolly pine plantations	Collaboration Innovation Interactions Hard Work Communication Accomplish mitigation and adapt to CC Goals of PINEMAP – 10% less N fertilization, 25% greater productivity and C sequestration	If that also leads to accomplishing the goals of PINEMAP – Assumes team science is needed to accomplish PINEMAP – not team science for the sake of team science	Data management /storage access Library science --archives, catalog and providing access to information is their skill and science
Data model integration Integration between ecologists, geneticists and economists Education and extension interaction with academics in ?	Direct interaction between modelers and experimental scientists will inform data collection and consistency Focus will shift for many participants from specifics to generalities	New ideas are the main criterion I would used Having too many preconceived notions on how things happened is not useful but keeping focused on goals will perhaps make everyone focus on finding ways to communicate Collaborative web tools seem like an awfully good idea – build into communication methods?	Integrating across 70 levels (???) aside of student postdoc Principle of what is measured for integration
Intermodel integration	Pragmatically appropriately integration	Presumably participants get better as the project adapts and discovers new questions – These get addressed more and efficiently. Funding that depends on transdisciplinary (?) Impactful research is accomplished Stakeholder engagement	Stakeholder participation

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Parts of project good for transdisciplinary work	Your expectations for integrated team science	Ideas for recognizing and monitoring progress and success of integrated team science	New idea
Economics, Forestry, Ecology, Statistics, Climate Science, Modeling, Values and Scales	Data collected over the range of study Keep momentum going Advancing in more than one field of science	Meetings, summary reports, yearly, bi-yearly reports, updates, committees for joint publication, output from Aims	Step outside comfort zone Extension education teams Transdisciplinary Tuesday Website or update map of what is being done, vs. what is done, vs. what needs done Online board access for all Aims
Modeling Economics Extension	Data share Common protocols Alternative analysis	Number of emails phone calls Tim gets to settle disputes	Have each grad student's work plan posted on web
Synthesis of data to develop guidelines using DSS	Integration of different knowledge produced by Aim scientists to come up easy to implement guidelines for reducing Ca footprint at the same time increase productivity of forest plantations while minimizing the risk brought by climate change	Development of guidelines based on multi factors/ disciplines Development of models to predict the impact of CC on productivity, risk of pine plantations	Discovery of alleles and genes to examine pine populations for adaptation may have no practical immediate application Maybe using genomic tools (genotyping) to develop more resilient and productive pine varieties
Integration of multiple fields of study will always lead to transdisciplinary work in a sense. Combining disciplines will typically lead to further questions and ideas	The only true expectation I have for integration between these disciplines is the transfer of knowledge across in order to meet the goals of PINEMAP	The best possible way to monitor progress/success is to continue having meetings on integrated partnership whether that be between 2, 3, or 4 Aims	
Carbon sequestration Outreach to the public	Models, information transfer	What teams form collaboration? How much the project outputs are integrative efforts	

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Parts of project good for transdisciplinary work	Your expectations for integrated team science	Ideas for recognizing and monitoring progress and success of integrated team science	New idea
Outreach infused throughout Aims and Co-PIs	Sharing results, sharing failures Being kept in the loop or ? to participate Webinar topics from each Aim Multiplier effect – many pure benefits from across the project ? with? I will learn new skills Science to make a well-rounded p? paper?	Planted acres by co-ops Enhanced genetic material Also by ? L.O? ? of sequestration before and after/during project	Sharing of baseline values in year of project – receiving it each year at annual meeting. Repeat data sharing at sustainable platform that will outlive the project
Modeling and deep collaboration	Sharing of data, knowledge, expertise. Cross collaboration across institutions, disciplines. Communicative, open, transparent Seeing the big picture and big questions – grand challenges to address in PINEMAP Openness and trust to facilitate transdisciplinary research education and extension	Joint publications Joint supervision on graduate student committees Surveys	Resolution commitment of each co-Pi to engage in one or more project activities outside their core disciplinary background
Modeling across scales, values, systems that are heavily integrated, complex	Advancing more than one field of science	Progress success monitoring Pubs New grants Discoveries that advance multiple fields Output that draws from multiple aims and answers important question	Transdisciplinary Tuesdays

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Parts of project good for transdisciplinary work	Your expectations for integrated team science	Ideas for recognizing and monitoring progress and success of integrated team science	New idea
We seem to share a common goal of producing research benefiting forest landowners in a future projected climate change	Definitely there will be some barriers – particularly in the beginning in integrating. Different perspectives may provide insight. Cross scale learning. Consistent standardized methodology. Knowledge base shared with others.	Deliverables met on time Coming to consensus Consistent communication Common tools, joint pubs Test now and later (knowledge-based) Private landowners implementing Periodically ask how goals are being achieved Implementation towards policy Citations, Congressional Records	PINEMAP food web – who is eating who? Continued collaboration
	New collaboration maybe Are we expecting too much Strong expectations within Aim or between related Aim (e.g. 1&2)	Ask specific Aim of the end of chain	
Silviculture and genetics + climate models = new transdicplinary platform for breeding climate change resistant trees	Developing common approaches A common seed deployment tool Sharing data – common database Further collaborative proposals and projects Exchanging students A permanently acting training center of excellence for both research and educational ..?	Tools and approaches of common use A common data base Joint publications Further collaborative project A training Center	
The core question objective is inherently transdisciplinary	Components of forest (end cycling, water, soils, leafs), Scale of observation interface (temporal and spatial)	Interface (economic, social, ecological) Products – papers, student training, new proposals Specific section in reports	

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Parts of project good for transdisciplinary work	Your expectations for integrated team science	Ideas for recognizing and monitoring progress and success of integrated team science	New idea
Problem driven science – the climate issue drives many aspects	Team members develop basic knowledge and understanding of other members subjects, science and methods All members contribute to different deliverables – tools, extension materials, publications	Generic questions / test that cross all disciplines --- baseline now and end of project (EOG as example) Fingerprint products and deliverables – track and trace ho each member touches and contributes to end-level products	Foodweb of PINEMAP Rewrite original proposal with what we have collectively learned and use as future proposal Design a new comprehensive model of how we work
Individual disciplines are working toward a goal	Data sharing Standardized data collection List of studies taking place at tier sites	Identify possible collaborators (working in same studies, similar research) and set up some sort of workspace to share ideas etc.	