Evaluators Report Cover Sheet
[Craig S. Scott]
[Period Covered by This Report: [01/2012 – 12/2012]
[December, 20, 2012]

Center Center for Advanced Forestry Systems (CAFS) Center Director: Barry Goldfarb

Site	Director	Award Period[1] (MM/YY-MM/YY)	Funding Phase (I, II, or III)
North Carolina State University	Barry Goldfarb and Jose Stape	08/12-07/17	II
Oregon State University	Glenn Howe	08/12-07/17	II
Purdue University	Charles Michler	08/12-07/17	II
Virginia Tech	Thomas Fox	08/12-07/17	II
University of Maine	Bob Wagner	02/09-01/14	I
University of Georgia	Michael Kane	02/09-01/14	I
University of Washington	Gregory Ettl	02/09-01/14	I
University of Florida	Erik Jokela	07/09-06/14	I
University of Idaho	Mark Coleman	02/10-01/15	I

[1] Please list the award period as it applies to each site; this information is available on the NSF website.
*Add additional lines here to list additional sites.

Significant Personnel Changes:

IAB Meetings	Meeting 1	Members Participating via Video/Phone Conference?	Meeting 2	Members Participating via Video/Phone Conference?
Date	July 2012	☐	CAFS has a 1 meeting exemption	☐
Location	Bangor, Maine (UM)			
Attendance: IAB/Total[2]	41			

[2] Please list total dues-paid members (not people) in attendance over total number of attendees.
*Please attach the Semi-Annual Meeting Best Practices Checklist as an Appendix to your Evaluator Report.

Membership Activity Table*

Member Name	Site	Membership Fee Level (Full, Assoc., etc.)	Status: New, Left, Continuing
FILL IN MEMBER's NAME	YOUR SITE (UNIVERSITY) NAME	FULL or ASSOC?	ENTER STATUS
Agrium Advanced Technologies	VT	Full	Continuing
AgXplore	VT	Assoc	New
American Forest Management	NCSU, PU, VT	Full	Continuing
ArborAmerica	PU	Full	Continuing
ArborGen	OSU, UF, VT	Full	Continuing
Baskahegan Corporation	UMaine	Assoc	Continuing
BBC	UMaine	Full	New
Beasley Timber Management, LLC	UGA	Assoc	Continuing
Black Bear Forest, Inc.	UMaine	Full	Terminated
Boise, Inc	NCSU	Assoc	Continuing
Buckeye Technologies	NCSU	Assoc	Continuing

Bureau of Land Management	OSU, UI	Full	Continuing
Canopy	UMaine	Assoc	New
Carolina Soil	NCSU	Assoc	Continuing
Cascade Timber Consulting, Inc.	OSU, UW	Assoc	Continuing
CBD Technologies, Ltd.	OSU	Assoc	Continuing
CellFor	UF, UGA, VT	Full	Terminated
Claritas	NCSU	Assoc	Continuing
Clayton Lake	UMaine	Assoc	Continuing
CMPC Forestry - Forestal Mininco/Forestal Bosques del Plata	VT	Assoc	Continuing
Cooke Foundation	PU	Assoc	Continuing
Copener	NCSU	Assoc	Continuing
Deforsa	NCSU	Assoc	Continuing
Deltic Timber Company	UGA	Assoc	Continuing
Dougherty & Dougherty Forestry	NCSU	Assoc	Continuing
Dow AgroSciences LLC	UGA	Assoc	Continuing
DuPont Agricultural Products	NCSU	Assoc	Continuing
F&W Forestry Services, Inc	UF, VT	Full	Continuing
Fazenda Campo Bom (FCB)	NCSU	Assoc	Continuing
Fibria	NCSU	Assoc	Continuing
Foley Timber and Land, Inc	UGA	Assoc	Continuing
Forest Capital Partners	OSU, UGA, UI, UW, VT	Full	Existing during 2012 Meeting, but was acquired afterward by Hancock
Forest Investment Associates	UGA, VT	Full	Continuing
Forest Resource Consultants Inc.	UGA	Assoc	Continuing
Forestaciones Operativas de México	VT	Assoc	Continuing
Forestal Rio Biabo	VT	Assoc	Continuing
Forestry & Land Resource Consultants, Inc.	VT	Assoc	Continuing
Gavilon Fertilizer, LLC (named changed from ConAgra International Fertilizer)	NCSU	Assoc	Continuing
Global Forest Partners	VT	Assoc	Continuing
GMO Threshold Timber Corp	UGA	Assoc	Continuing
Green Diamond Resource Company	OSU, UW	Full	Continuing
Green Edge (formerly Green Technologies, LLC)	VT	Assoc	Continuing
Hancock Forest Management	NCSU, UGA, UW, VT	Full	Continuing
Huber Resources Corporation	UMaine	Assoc	Terminated
Idaho Dept of Lands	UI	Full	Continuing
Indiana Hardwood Lumbermen's Association	PU	Full	Terminated
Inland Empire Paper Co	UI	Assoc	Continuing
International Forest Company	NCSU, UGA	Assoc	Continuing
International Paper	NCSU	Full	Continuing
International Plant Nutrition Institute	VT	Assoc	Continuing
J.D. Irving (Irving Woodlands)	UMaine	Full	Continuing
James W. Sewell Co.	VT	Assoc	Continuing
Jordan Lumber Company	NCSU	Assoc	Continuing
Katahdin Forest Management, LLC	UMaine	Assoc	Continuing

Koch (AGROTAIN)	NCSU	Assoc	Continuing
Larson and McGowin, Inc.	VT	Assoc	Continuing
Lone Rock Timber Management Co.	OSU	Assoc	New
Longview Fibre Co. Timber Department	OSU, UW	Full	Continuing
Lykes Brothers	NCSU	Assoc	Continuing
Maine Bureau of Parks and Lands	UMaine	Assoc	Terminated
Milliken Forestry Company, Inc.	VT	Assoc	Continuing
Molpus Timberlands Management, LLC	NCSU, UGA,VT	Full	Continuing
Montana Dept of Natural Resources and Conservation	UI	Assoc	Continuing
Mosaic Fertilizer	VT	Assoc	Continuing
MWV (formerly MeadWestvaco)	VT	Full	Continuing
National Hardwood Lumber Association	PU	Assoc	Continuing
Olympic Resource Management	OSU, UW	Full	Continuing
Oregon Department of Forestry	OSU, UW	Full	Continuing
Payne's Flying Service	VT	Assoc	Continuing
Plum Creek Timber Company	NCSU, OSU, UF, UGA, UMaine, UW, VT	Full	Continuing
Port Blakely Tree Farms	OSU, UW	Full	Continuing
Potlatch Forest Holdings	UGA, UI	Full	Continuing
Prentiss and Carlisle Company, Inc.	UMaine	Full	Continuing
Purdue Research Foundation	PU	Full	Continuing
Purdue Univ. Forestry & Natural Resources	PU	Full	Continuing
Quinault Dept. Natural Resources	UW	Assoc	Continuing
Rayonier, Inc.	NCSU, OSU, UF, UGA, UW, VT	Full	Continuing
Refofestadora de la Costa SA (formerly Refocosta S.A.)	VT	Assoc	Continuing
Renewable Resources LLC	VT	Assoc	Continuing
Resource Management Service, LLC	NCSU, UF, UGA, VT	Full	Continuing
RMK Timberland Fund	NCSU	Full	Continuing
Roseburg Forest Products	OSU, UW	Full	Continuing
SAPPI (Fine Papers & South Africa)	OSU, UMaine	Full	Continuing
Seven Islands Land Company	UMaine	Full	Continuing
Smurfit Carton de Colombia / Venezuela	NCSU	Full	Terminated
Snowshoe Timberlands, LLC	UMaine	Assoc	New
Starker Forests, Inc.	OSU	Assoc	New
Steelcase	PU	Assoc	Continuing
Stimson Lumber Company	OSU, UI, UW	Full	Continuing
Superior Pine Products Company	UGA, VT	Full	Continuing
Suzano	NCSU	Assoc	Continuing
SweTree Technologies AB	OSU	Assoc	Continuing
Sylvan Timberlands, LLC	UMaine	Assoc	New
Syngenta	NCSU	Assoc	Continuing
TerraSource Valuation	VT	Assoc	Continuing
The Campbell Group	OSU, UGA, UW, VT	Full	Continuing

The Forestland Group, LLC	UMaine	Assoc	Continuing
The Nature Conservancy	UMaine	Assoc	Continuing
The Westervelt Company	NCSU, VT	Full	Continuing
Thrash Aviation, Inc.	VT	Assoc	Continuing
Timberland Investment Resources	UGA, VT	Full	Continuing
Timbervest, LLC	UGA, UMaine	Full	Continuing
USDA Forest Service Research	UF, UI	Full	Continuing
USDA Forest Service State and Private	PU	Full	Continuing
Valor Florestal	NCSU	Assoc	Continuing
Van Eck Foundation	PU	Full	Continuing
Wagner Forest Management	UMaine	Full	Continuing
Washington State Dept. of Natural Resources	OSU, UI, UW	Full	Continuing
West Fork Timber Co., LLC	UW	Assoc	Continuing
Weyerhaeuser	NCSU, OSU, UF, UGA, OW, VT	Full	Continuing
	Key: NCSU - North Carolina State University OSU - Oregon State University PU - Purdue University UF - University of Florida UGA - University of Georgia UI - University of Idaho UMaine - University of Maine UW - University of Washington VT - Virginia Tech		

* Add additional lines here as necessary.

	Estimated Budget This Year (Sponsor $$s)	**Estimated Budget Last Year (Sponsor $$s)**
North Carolina State University	$344,667	$400,511
Oregon State University	$346,706	$311,970
Purdue University	$353,000	$300,000
Virginia Tech	$447,000	$418,844
University of Maine	$448,670	$434,292
University of Georgia	$348,666	$391,300
University of Washington	$413,556	$384,834
University of Florida	$152,600	$150,000
University of Idaho	$330,030	$331,633
Total Center Support (All Sources):	$3,184,895	$3,123,384

* Please change the label "Membership Support for Site XX" to reflect the appropriate university sites. Add additional lines here to list additional sites.

Research Breakthroughs: FILL IN:

Concerns & Cautions: None

Supplemental IUCRC Awards Won: FILL IN: NCSU received an REV and an REU for a total of $16,000

Center for Advanced Forestry Systems (CAFS): Evaluator's Report for 2012

December 8, 2012

http://cnr.ncsu.edu/fer/cafs/

North Carolina State University
Oregon State University
Purdue University
University of Florida
University of Georgia
University of Idaho
University of Maine
University of Washington
Virginia Polytechnic Institute and State University

Attachment A: NSF/IUCRC 2012 Annual Surveys of PIs & IAB Reps
Attachment B: CAFS Success Story
Attachment C: CAFS Developmental Milestones
Attachment D: CAFS Meeting Best Practices Checklist

Submitted by Craig S. Scott
Center Evaluator

The Center for Advanced Forestry Systems (CAFS) bridges leading forestry research programs with representatives of forest industry sponsors for the purpose of solving complex, industry-wide problems. In 2012, CAFS completed its 5th year of operation as an IUCRC with North Carolina State University as the lead institution. The NSF continues to consider CAFS to be a model cooperative research center that is vitally important to the US and to the international forestry industry. It is a productive collaborative enterprise that has become a national resource within academia and industry because of great leadership and organization, a geographically representative set of universities and a broad base of industry and governmental sponsors. It also has exceptionally strong, experienced and insightful center support staff. A genuine strength of the center is the interest in and willingness of the industry participants to focus on a wide variety of research with various species of plants and trees.

The Center for Advanced Forestry Systems excels as a remarkably successful multi-university center that is working to solve problems through multi-faceted approaches to basic problems in molecular, cellular, individual-tree, stand, and ecosystems research. The collaborative consortium involves scientists with expertise in biological sciences (biotechnology, genomics, ecology, ecophysiology, and soils). It encompasses a broad spectrum of research areas related to forestry management and processing including: growth and yield, stand and plantation management, wood quality, soils and nutrition, genetics and biotechnology, modeling, and remote sensing,

Center research themes combine traditional genetics, biotechnology and silviculture into integrated systems with quantitative models to support decision-making and value enhancement. Center research is conducted by a core of over 25 faculty, 4 post-docs, 16 doctoral, 17 masters, and several undergraduate students. In 2012, 7 PhD and 8 MS students completed their studies. Eighteen (18) students are continuing their graduate studies (9 PhD, 9 MS).

MISSION

CAFS's major goal remains to increase the economic value and utility of plantation forests; thereby enabling foresters to more efficiently produce greater volumes of high-quality wood materials. It bridges top university-based forestry research programs with leading industrial organizations to solve complex, industry-wide problems. The mission of CAFS is to optimize genetic and cultural systems to produce high-quality raw forest materials for new and existing products by conducting collaborative research that transcends traditional species and disciplinary boundaries.

CENTER ADMINISTRATION

The center director, deputy director and in particular its operations coordinator, Lisa Schabenberger (NCSU), its outreach coordinator, Liz Jackson (Purdue) and Lea Cooney (University of Maine) are to be commended for operating an extremely smooth functioning 2012 center meeting that was almost issue-free; on day 2 there was a small glitch with the online LIFE form system that was quickly fixed.

CAFS center management includes:

Center Director, Barry Goldfarb, NCSU, 919.515.4471, barry_goldfarb@ncsu.edu
Deputy Director, Lee Allen, 919.612.1456, lee_allen@ncsu.edu
Operations Coordinator, Lisa Schabenberger, 919.513.7368, lisa_schabenberger@ncsu.edu
Outreach Coordinator, Liz Jackson, 765.583.3501, jackson@purdue.edu
IAB Chair, Marshall Jacobson, Plum Creek Timber Co, 706.583.6716, marshall.jacobson@plumcreek.com
Immediate Past IAB Chair, Howard Duzan of Weyerhaeuser (retired 2011)
Center Evaluator, Craig Scott, University of Washington: 425.466.6535, scottcs@uw.edu.

CAFS Sites Directors:

NCSU Site Director, Jose Stape, (919) 513-4041, jlstape@ncsu.edu
Oregon State University, Glenn Howe, Site Director, 541.737.9001, glenn.howe@oregonstate.edu
Purdue University, Charles Michler, Site Director, 765.496.6106, michler@purdue.edu
University of Florida, Eric Jokela, Site Director, 352.846.0890, ejokela@ufl.edu
University of Georgia, Michael Kane, Site Director, 706.542.3009, mkane@warnell.uga.edu
University of Idaho, Mark Coleman, Site Director. 208.885.7604, mcoleman@uidaho.edu
University of Maine, Robert Wagner, Site Director, 207.581.2903, bob_wagner@umenfa.maine.edu
University of Washington, Gregg Ettl, Site Director, 206.543.9744, ettl@uw.edu
Virginia Polytechnic Institute & State University, Thomas Fox, Site Director, 540.231.8862, trfox@vt.edu

Between annual meetings, the CAFS Executive Committee (EC) serves as a sounding board for the Director, the Deputy Director and site directors on research and administration issues. The EC provides timely input (outside of regularly scheduled annual meetings) on issues, including final review of project selections, budget adjustments and related concerns, and location and organization of annual meetings.

CENTER TRANSITIONS

In 2010, the center grew to include 9 university sites. In 2003-2004, Oregon State University's Tree Genetic Engineering Research Center (TGERC) merged into Purdue University's Center for Tree Genetics (CTGr). In 2007, CTGr was subsumed into North Carolina State University's new IUCRC, the Center for Advanced Forestry Systems (CAFS).

In June of 2011, Scott Enebak of Auburn University submitted a letter of intent to become CAFS's 10th site. There was no action following the LOI. Dr. Enebank resubmitted the LOI in 2012 and intends to submit the full proposal by the upcoming March 2013 due date.

In early 2012, the original four sites of CAFS submitted a Phase II proposal to the NSF that sought support for a 2nd 5-year period of IUCRC funding. That proposal was approved and funded, effective August of 2012.

TECHNOLOGY TRANSFER

On the 2012 technology transfer study an IAB representative of Wagoner Forrest's (WF), a forestry management firm, reported significant impact for the company of a product referred to as the Acadian version of the Acadian Variant of Forest Vegetation Simulator-Northeast variant (FVS-NE) that was developed and maintained by the US Forest Service. The Northeast variant encompasses Maine to Maryland and westward through Ohio, whereas the Acadian variant encompasses data from throughout the Acadian forest (Quebec, New Hampshire, Maine, New Brunswick, Nova Scotia and New Foundland. This technology is used for modeling and to develop management plans for WF's client's forest management activities that involve their regionally developed proprietary volume tables. This product is enhancing the accuracy of their modeling efforts because it incorporates extensive data specific to the Acadian forest and it's various intensive management techniques. Dr. Weiskittel has developed new taper and volume equations; improved predictions regarding natural regeneration and ingrowth, and; effects of commercially thinned stands and the impact of spruce budworm. As a result it will be much more in-tune with the type of forests that WF manage. Because the technology is just being rolled out, it is not yet possible to estimate the commercialization impacts on the organization. Wagner Forrest's IAB representative anticipates a significant impact relatively soon but has not actually had the opportunity to use a final product.

Scott's June 2012 Technology Transfer Survey identified the following additional tech transfer instances: 1) Use of fertilization response data to make operational decisions (Hancock Forest Management); 2) Baseline long-term control plot data used for modeling: (Hancock Forest Management), and; Updated growth & yield NE models that improve Huber's understanding of volume production - early non-quantified commercial yield increases were reported (Huber Resources Corporation).

MEMBERSHIP

The Center for Advanced Forestry Systems is an increasingly important national research entity. CAFS industrial membership encompasses leading forestry industry organizations from throughout the nation. A substantial number of the firms have international operations.

CFAS has two levels of membership. Full members pay an annual fee of $25,000. Associate member fees range from $5,000 to $25,000. These fees have remained stable since the center was established.

In 2012, CAFS had a total of 99 total members made up of 47 full and 52 associate members. These sponsoring organizations are made up of an estimated 23 large (>500 employees) and 60 small companies, 9 governmental agencies, and 7 not-for-profit organizations (involving special arrangements) and foundations.

COMPLIANCE WITH IUCRC MODEL

The Center remains extremely faithful to the IUCRC Model. The one exception is that when the center was founded it was granted a meeting frequency waiver that enables it to convene just one meeting annually and remain in good standing. This is because of the nature and pace of the technical field of forestry research,

wherein research proceeds at a somewhat slower and more deliberate pace than research in the typical IUCRC. Also, the various co-op members of this center typically meet separately one or two times per year.

CENTER MEETING

The 2012, the University of Maine hosted the 5th annual meeting of the Center for Advanced Forestry Systems (CAFS) in Bangor, Maine. As is typical for this center, the 2012 annual meeting was well attended (see table below) organized and superbly run. The center director, deputy director, the University of Maine site director, Robert Wagner, and in particular Lisa Schabenberger (NCSU), Liz Jackson (Purdue) and Kea Cooney (Maine) are to be commended for operating such an effective center meeting that was almost issue-free.

Attendance Sheet for CAFS's 2012 Meeting
(Hosted by University of Maine in Bangor)

	NCSU	Oregon	Purdue	Florida	Georgia	Idaho	Maine	UWash	VPI	**TOTALS**
Faculty	2 (0)	1 (0)	2 (0)	2 (0)	2 (0)	2 (0)	6 (1)	3 (0)	3 (0)	23 (1)
Ind/gov membs**	30**	0	0	0	0	0	0	0	0	33
Ind/gov visitors**	0	0	0	0	0	0	0	0	0	0
Students	1 (0)	1 (0)	1 (1)	1 (1)	0	0	2 (0)	2 (1)	2 (1)	10 (0)
TOTALS	**33 (0)**	**2 (0)**	**3 (1)**	**3 (1)**	**2 (0)**	**2 (0)**	**8 (1)**	**5 (1)**	**5 (1)**	**63 (0)**

* __ = male & female combined; number in parentheses = females
** Because of the way that sponsors are shared with other sites, it is difficult to specify sponsors exclusively to one site.

An innovative meeting structure/agenda format, begun in 2011, was continued at the 2012 meeting. This meeting design reduces the number of presentations and provides increased time for participant interactions within sequenced, grouped poster sessions. This meeting included 3 final reports, 6 proposals for new projects, 15 posters that updated continuing projects, and an update of the CAFS Fundamental Research Project on the use of stable isotopes to tract nitrogen that is on a no cost extension.

CAFS' adaptation of the protocol for sequenced, grouped poster session participation is the best I have seen. Attendees are cycled in groups through each session's posters so that everyone gets to hear from and interact with each poster presenter; almost everyone participates and contributes to the discussions.

LIFE forms were completed on all presentations and posters. The IUCRC Program's Online LIFE System was used to assess new proposals and industry interest in maintaining ongoing projects and the possibility of revising them. Industry feedback from the LIFE forms was discussed following each presentation session. Feedback was discussed following each presentation/poster set. On day 2 there was a small glitch with the online LIFE form system – this was quickly addressed by the NCSU LIFE From System support team.

MEETING ISSUES

At this time there are no major issues in this center other than:

It would be helpful to have more research dollars to support the high cost of field-based forestry research.

While progress has been made on getting post-docs and graduate students to annual meetings, further improvement is being sought (see below) – though some in the survey complained about taking travel costs out of the research dollars.

While more cross-site multidisciplinary collaboration is happening, center administration continues to strategize on how to promote further improvements in this area.

CAFS is working to collaboratively identify the most suitable topic/area for another fundamental research project.

How to make further improvements in student attendance was discussed by the IAB.

Though Barry does an excellent job with the closed IAB meeting, it would be good to have the IAB Chair have more of a role in leading the meeting (with Barry co-assisting). This would make the meeting seem more like industry's advisory board.

MEETING STRENGTHS

Attendees are absolutely dedicated to gaining thorough understandings of the CAFS research, its possible implications for their operations, and to getting things right. This is a real asset for the center.

Some progress has been made on getting post-docs and graduate students to annual meetings. In 2011, with leadership from the executive director, 9 sponsors contributed a total of $4,500 attendance by graduate students and post-docs. These industry funds were used in 2012 to supplement CAFS funds in order to make it easier for these students to attend by covering lodging and registration fees. Some sites took advantage of these funds; others did not. That said, center administration is striving to realize further improvement in grad student/post-doc attendance.

CAFS' innovative meeting structure/agenda format, begun in 2011, was continued at the 2012 meeting. This approach reduces the number of presentations and provides increased time for participant interactions within sequenced, grouped poster sessions. NOTE: This centers fundamental research project helped spawn a 20 million USDA grant for the southeast region of the US that involves 50 co-investigators and 12 institutions.

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The debriefing of the above procedure during the closed IAB meeting indicated that a few found it difficult to view detail of posters during the presentations (having handouts was suggested as a possible remedy), others suggested briefer presentations (they are now as long as regular presentations, 15 minutes, but groups are smaller and tend to more interactive). Another IAB rep suggested PowerPoint presentations (possibly to go along with the posters?) that might make them PPTs rather than posters. Barry said that they would consider possible modifications to the protocol. For the most part, having posters instead of too many, large group presentations seemed to be very well received by attendees.

<u>Issues facing the Center that have financial ramifications</u>:

At this time there are no major issues in this center other than a general consensus that it would be helpful to have more research dollars to support the high cost of field-based forestry research. While more cross-site multidisciplinary collaboration is happening, center administration continues to strategize on how to promote further improvements in this area.

CENTER STRENGTHS

CFAS is a true national center with coast-to-coast geographical spread. Its leaders are to be commended for its success at getting good attendance at its annual center meetings.

Attendance at the 2012 meeting was good: 63 attendees. Each of the 9 sites was relatively well represented.

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CAFS' innovative meeting structure/agenda format, begun in 2011, was continued at the 2012 meeting. This approach reduces the number of presentations and provides increased time for participant interactions within sequenced, grouped poster sessions. The meeting also included 3 final reports, 6 proposals for new projects, 15 posters that updated continuing projects, and an update of the CAFS Fundamental Research Project on the use of stable isotopes to tract nitrogen that is on a no cost extension. NOTE: This project helped spawn a 20 million USDA grant for the southeast region of the US that involves 50 co-Is and 12 institutions.

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The center has an industrially relevant research focus has considerable potential for benefit to sponsors.

The center benefits from solid and stable base of industry with common interests, needs and expectations.

Sponsors clearly respect the researchers and the values of the work they are doing.

Sponsors have demonstrated a willingness to focus on a wider variety of methodologies and species than they typically study.

The center is benefitting dedicated set of site directors who are committed to the concept of cooperative research and who are responsive to the needs of the center.

CAFS has a dedicated and innovative core of research and administrative faculty and graduate students.

Sound center operation is made possible by professional collaborative efforts by the center director, the deputy director, and by site directors and their support staff.

NSF ANNUAL OUTCOME SURVEYS

IAB reps of CAFS' major sponsors and PIs were conducted again in 2012 according to the I/UCRC Program's Center Evaluation Protocol (see attachment A). Response rates for the IAB rep and researcher surveys were 52% (17 or 33) and 100% (22 of 22), respectively.

IAB SURVEY RESULTS

Ratings by IAB reps of the quality of the research program and the capabilities Center faculty hovered around the national mean. In 2012, three new items were added that focus on the research program. Responding IAB representatives indicated that: they were interested in about 60% of the projects; it would take them about 27 months for their organizations to plan, conduct and complete the center's typical research project internally, and; on average about three projects were important enough for the their organization to consider conducting them internally, within the next few years, if the center was not doing so.

Overall, IAB representatives reported few criticisms of the center's research program. When asked how the center can improve its research program, responses included such things as: reduce the amount of paperwork for the small dollar amounts that are available to individual scientists, try to get a bit more diversification of topics; allocate project funds more nationally; and limit the use of research dollars for travel expenses. On the very positive side, one respondent simply said that if it weren't for CAFS, we couldn't afford to do any of the research projects, regardless of how highly we might rate them.

There were also three new items in 2012 having to do with networking and human capital benefits. When asked whether the center enhanced their organization's ability to network and build scientific capability through collaboration, respondents on average reported a moderate impact. Respondents were slightly less positive about the impact on their organization's ability to identify and recruit well-qualified graduate students.

Positive results also came from two new questions having to do with the benefits of the center's research and development. 70% of respondents indicated “yes” the center accelerated their organization's internal R&D. Similarly, 41% indicated “yes” the center help them avoid new R&D costs. Sponsoring organizations indicated that approximately 8 new projects were triggered by Center research - with the dollar value of these new or redirected projects exceeding 1 million dollars annually.

Finally, IAB representatives reported that they were on average quite satisfied with Center administrative operations. Comments were quite positive with respect to the generally perceived outstanding caliber of CAFS researchers, the outstanding staff, the excellent collaboration between the university sites and administrative communications in general.

PI SURVEY RESULTS

Faculty are quite pleased with the quality of the center supported research program and with its relevance to their professional goals. Overall, faculty would like to see levels of funding increase and they would like to see more between meeting interactions. They generally view the program as providing worthwhile interactions. Faculty are particularly pleased with: the smooth center Operations; the director's and the operations coordinator's administrative skills and motivational capabilities; the responsiveness of the staff and administration, and; the center's overall organization and planning.

Bottom line: CAFS remains a very successful center. Industry interest in the collaborative research is widespread. Participation in the center by industry sponsors and co-ops and its receipt of Phase II funding demonstrate that industry and the NSF view it as a valuable national organization that is addressing vital needs of the forestry industry.

Attachment A

CAFS IAB Survey: Fall 2012

[Response Rate: 52%: 17 of 33]

I) CENTER RESEARCH PROGRAM *(Think about the 20 currently funded center projects):*

Means Displayed as follows - [*Center mean* (***Bold & Italicize***d) – *2011 National Mean* (smaller]

PPR	60%/NA in 2012*	Mean percent of projects relevant to organizations' future R&D needs.
NSM	27/NA in 2012*	Mean number of scientist-months (full-time) it would take organizations to plan, conduct, and complete the center's typical research project internally
NPHP	3.0/NA in 2012*	Mean number of current research projects considered high enough priority that organizations would conduct them internally or by contract (within the next few years) if the Center was not conducting this research.

* = New and therefore not available in 2012

Means Displayed as follows - [*Center mean* (***Bold & Italicize***d - *2011 National Mean* (smaller & underlined)]

CF/QRP:	4.2/4.1	Capabilities of faculty and quality of the research program (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)
BRT:	4.1/3.9	Breadth of the research topics covered (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)
FOR:	3.4/3.9	Focus of research (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)
RRON:	3.4/3.7	Relevance of research to my organization's needs (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)

How can the center improve its research program? What features of the research program would your organization definitely want to see continued?

Not every region of the country can economically justify carrying the costs of intensive forest management practices like fertilization or other chemical use throughout the rotation. While these practices are essential throughout much of the US and therefore merit research, I would like to see more diversification of topics.

Continued interaction of members and researchers. Occasionally a project that seems important to the researchers rather than the members can sneak in, but overall, the research seems well aligned with the membership

A lot of paperwork for what amounts for small dollar amounts to individual scientists

if it weren't for CAFS, we couldn't afford to do any of the research projects, regardless of how highly we might rate them.

I think the research program is very good - very focused on applied science in forestry. It is refreshing to attend meetings and review progress.

Limit the use of research dollars for travel expenses.

Allocate funds nationally and require a nationally competitive process to allocate funds.

II) BENEFITS OF BELONGING TO THIS CENTER

A. NETWORKING & HUMAN CAPITAL BENEFITS

	Mean	
OAN	2.8/NA*	Enhanced R&D organizations' ability to network and build scientific capability via cooperation with industry and university scientists outside your organization (1=No Impact; 2=Slight Impact; 3=Moderate Impact; 4=High Impact; 5=Very High Impact)
OAR	1.9/NA*	Enhanced organizations' ability to identify/recruit well-qualified graduate students to hire. (1=No Impact; 2=Slight Impact; 3=Moderate Impact; 4=High Impact; 5=Very High Impact)
SH	4/NA*	Number of center-trained students hired by center organizations
MSH	0.2/NA*	Mean number of center-trained students hired by center organizations

*NA = New in 2012; Not available in 2012

B) RESEARCH & DEVELOPMENT BENEFITS

ARHA	70%/NA*	Percent indicating "Yes" Center accelerated organization's internal R&D: Access to Center research findings and outputs helped accelerate the pace and/or completion of some R&D projects already underway at organizations
ARHDA	41%/NA*	Percent indicating "Yes" Center helped avoid new R&D costs: Access to Center research findings and outputs helped my organization to decide against initiating a new project organization otherwise would have conducted

*NA = New in 2012; Not available in 2012

If "Yes" to the above question (ARHDA), taking into account personnel, facility and related costs, sum of organization's estimates of how much these accelerated AND/OR avoided project(s) would have cost your organization:

Total Costs Avoided by Respondent Organizations $133,824*

* = New and therefore not available in 2012

If organization indicated "other" to the previous (ARHDA) question, they indicated:

Growth models.

My company has limited capacity for internal research projects done independently so many of these questions don't apply

Without CAFS, we cannot afford to undertake ANY research projects on our own.

We don't have our own research dept. We contribute to cooperative research through Universities, etc. Some questions aren't relevant to us & we're not hiring. NSF benefits organizations we cooperate in & furthers research of interest, which are important.

ARTD	30%/NA*	Percent indicating "Yes" Center stimulated new or re-directed R&D in organizations: Access to Center research findings and outputs has triggered the development of new R&D projects in organizations, or significantly redirected current R&D

* = New and therefore not available in 2012

If "Yes" to the above question (ARDT), organizations' estimates how many projects were triggered/stimulated:

Number Projects Stimulated: 8*

* = New and therefore not available in 2012

If "Yes" to the above question (ARDT), combined total dollar value of organization's new or redirected projects:

Value of New/Redirected Projects $1,025,000*

* = New and therefore not available in 2012

If organization indicated "other" to the previous (ARDT) question, they indicated:

Our part of a project to better understand Nitrogen fate in Loblolly

The one project that applies to our core business has not been completed as of yet. We have not realized any benefit as of this date.

N/A - need to ask the University cooperatives we are members of. It's value to them, which translates into value to us.

C. COMMERCIAL BENEFITS

ECE: 2.2/4.1 During the past year, to what extent has participation in the Center enhanced organizations' commercialization efforts via new technical knowledge, strengthened intellectual property rights, improved or new products, processes, services, improved sales, or new or retained jobs (1=No Impact; 2=Slight Impact; 3=Moderate Impact; 4= High Impact; 5=Very High Impact)

If organization benefited commercially from participating in the Center, they offered the following descriptions of how their organization benefited:

Silviculture processes improved. G&Y models improved and more accurately provide for accurate harvest planning.

We are anticipating a benefit from new growth and yield models but the research project is not yet completed.

It has helped us increase funding to accelerate our establishment of Stand Based Inventory.

Projects in Maine have enhanced our internal planning for growth and ultimately income projections

NSF advances University research we cooperate in, benefitting us in the long-term.

Research advance in the area of forest nutrition and limited influence on operational forest activities.

Research in one particular area by the Center that the company is commercializing has helped in gaining acceptance.

!!!) IAB VIEWS OF CENTER ADMINISTRATION & OPERATIONS

Mean

CAOps 3.8/4.0 Center administrative operations
[range 2 > 5] (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)

IMPCOpps? How can the center improve its administration and operations program? Please put CHECKS next to any issues that can be improved:

A. Planning the Research Program	27%
B. Project Selection	40%
C. Project Development and Management	7%
D. Dissemination of results via publications	33%
E. Technology Transfer	47%
F. Intellectual Property Management	0
G. Fund Raising and Recruitment of New Members	7%
H. IAB Meeting Planning	0
I. IAB Meeting Content	0
J. IAB Meeting Execution	7%
K. IAB Meeting Follow-up	7%
L. Communications	13%
M. Center Personnel	0%

Other (see below):

None

Suggestions for how any of the above areas can be improved:

A. More diversification of topics

Provide more time for members to interact/review center funded projects that originate with new nuds from the center

I only listed project selection above because it seems to me that the process is kind of a black hole, don't really know how and why projects are selected for further assessment by the members. However, not at all disappointed in the projects we get to review.

Perhaps providing regular updates - short informal updates provided by project leaders for instance.

Area(s) of excellence should the Center continue or repeat next year:

The caliber of researchers is outstanding

Outstanding staff with broad ranges of experience.

Collaboration between Universities is excellent
Administration communications is excellent (answer in #22 does not indicate poor communication)

All forestry related centers

IV) GENERAL EVALUATION

Mean

LMR 4.5/4.1 Likelihood of membership renewal
(1= Definitely Not; 2=Probably Not; 3=Uncertain; 4=Probably Yes; 5=Definitely Yes)

0 of 17 respondents is "Uncertain" as to whether they would renew
8 of 17 respondents indicated "Probably" they would renew
9 of 17 respondents indicated "Yes" they definitely would renew

What can the center do to make your renewal more likely?

Improve the economy...
Have more focus on technology transfer and ability for remote participation in communications and meetings.

CAFS Faculty & Research Scientist Survey: Fall 2012

[Response Rate: 100%: 22 of 22]

FACULTY SATISFACTION WITH CENTER

Means Displayed as follows - [*Center mean* (***Bold & Italicize*d - *2011 National Mean* (smaller & underlined)]

	Mean	
QCR	4.5^{4.3}	Quality of center supported research program (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)
RCR	4.4/4.4	Relevance of center's research program to my professional goals. (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)

How can the center improve its research program? What features of the center's research program do you definitely want to see continued into the future?

Including a meeting 4 months prior to the next annual meeting for PIs better interact following the CAFS previous meeting in preparation for collaborative projects proposals. Need leadership that emphasizes innovation. Need more integration among the various scientists.

The Center is making great progress with the individual research projects that are supported. However, it would make even more progress with more collaboration and linkages among the various programs. It might help to form working groups that bring together scientists and industry that are interested in a specific project or topic. These groups could meet periodically outside the annual meeting to deal with specific research projects.

Funding levels are low. I'd like to see higher base funding levels and more opportunities for supplemental funding for additional work identified in the center.

Explore opportunities for additional funding to support synthesis-based research on contemporary topics.

Overall the program is very useful and sound. As always, additional funding would be wonderful.

Amount of funding is low for the type of research I undertake, thus only small pilots are feasible

Increasing collaborative, inter-site research projects.

I enjoy the interaction that occurs at the annual gathering but I would be interested in having a plenary-type address by a leading scientist who might not be part of the center-funded program.

Set meeting dates at least one year in advance to help us avoid conflicts with our busy schedules

Funding is too low to do, and especially to complete, quality science projects

Improve integration

Working with this center has been one of the most useful things I have done in a decades-long career as a scientist. I see the work that we are doing applied to forested landscapes quickly, and the work is helping increase and sustain US forest products productivity as well as sequester C and avoid its production in the first place.

Need more inter-site collaboration.

CI	3.8/4.2	Which option best expresses your current intentions? Next year I will submit my best research ideas in a center funded proposal. (1 = Definitely Not; 2 = Probably Not; 3 = Uncertain; 4 = Probably Yes; 5 = Definitely Yes)
CAO	4.4/4.3	During the past year, how satisfied were you with center administrative operations (1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)

IMPCOpps? How can the center improve its administration and operations program? Please put CHECKS next to any issues that can be improved:

	% Checking Area
Communication	21%
Planning & development of res program	43%
Management of projects	7%
Project selection	21%
Proposals and publications	14%
Technology transfer	7%
Intellectual property	0
Fundraising	43%
Other:	21%

ITEM: Are there any features of the administration and operations with which you are particularly pleased?

Seems to be smoothly run, nothing really stands out in particular.

Good understanding of industrial cooperator and university researcher considerations and perspectives.

Barry's administrative skill to keep all PIs motivated and include.

Communication and meetings.

Responsiveness of the staff and administration. Excellent job.

Additional funding will help perform more comprehensive/quality projects

Things seem to be running smoothly.

Lisa responds to email questions very quickly & effectively

Organization and planning

Operations coordinator.

Attachment B

CAFS Research Highlight for 2012

Prepared by: Thomas Fox **Date**: December 9, 2012	**Contact phone**: 540-231-8862 **Contact email**:trfox@vt.edu
CENTER NAME Center for Advanced Forestry Systems (CAFS)	**Funding Program: I/UCRC**

Highlight title:
CAFS Research With Stable Nitrogen Isotopes Evaluates Nitrogen Dynamics in Forest Ecosystems

Highlight text (limit 300 words): Urea is the most widely used nitrogen fertilizer in forestry. However, significant losses of nitrogen through volatilization of ammonia can occur following urea fertilization. This decreases N available to the target trees following fertilization and increases the cost of fertilization because more fertilizer must be applied to forest ecosystems. There is also concern that nitrogen fertilization of forests can lead to increase leaching losses and potentially impact stream water quality. CAFS sponsored research at Virginia Tech, Purdue and the University of Washington is using enhanced efficiency nitrogen fertilizers labeled with stable nitrogen isotopes to examine volatilization losses, uptake efficiency and environmental fate nitrogen fertilizers in forest plantations. Urea and three enhanced efficiency nitrogen fertilizers were labeled with ^{15}N and were then applied to loblolly pine, walnut and Douglas-fir plantations. Early results indicate that volatilization losses of N were reduced from approximately 25% to less than 10% when enhanced efficiency N fertilizers were applied in loblolly pine plantations in the South compared to conventional urea. This work also found that there was no leaching of nitrogen below 30 cm in any of the treatments, which indicates that there was no nitrogen loss to streamwater following fertilization.

In terms of *intellectual merit*, why was this outcome notable and/or important?
The use of stable isotopes of nitrogen provides a precise method to examine the fate of applied fertilizer nitrogen in forest systems. Relatively small increases in the total nitrogen in the ecosystem that occur following nitrogen fertilization can be measured and the movement of the applied nitrogen in the soil and trees can be followed through time. This provides unambiguous results that can be used to tailor forest management regimes to maximize nitrogen uptake and minimize loss.

In terms of *broader impacts*, why was this outcome notable and/or important?
Decreased volatilization losses of N following fertilization will increase nitrogen use efficiency in forest ecosystems. This will enable landowners to apply precise amounts of nitrogen fertilizer to forest plantations which will improve the growth response, reduce costs and decrease the environmental impacts of fertilization

If applicable, tell us how the research may have societal benefits, e.g. the economy.
Improved nitrogen use efficiency following fertilization will improve financial returns to forest landowners who will be able to grow more wood at lower cost with less environmental impacts.

Images are important. Please include one as a separate file with your highlight submission. Files must be GIFs or JPEGs. Maximum width and height are 240 pixels.

Attachment C:

CAFS Developmental Milestones: Subsequent to NSF Involvement in the original Tree Genetics Engineering Center (TGE)

5/1998 TGE Center Technical Meeting, Portland, Oregon. Preparation for a planning grant: Alex Schwarzkopf and Craig Scott, the NSF Evaluator, presented a summary of the IUCRC Program.

11/1998 TGERC Annual meeting, University of Washington Urban Horticultural Center, Seattle, Washington. Introduction to NSF I/UCRC Centers & LIFE forms (Schwarzkopf, Scott); Operational requirements of NSF I/UCRC Centers (Schwarzkopf); Evaluator role in I/UCRC Center function (Scott); Discussion of changes in TGERC from "conversion" to NSF/I/UCRC (Strauss); Presentation of LIFE form results (Meilan).

5/1999 TGERC Proposal submitted to NSF

11/1999 TGERC Annual meeting (Technical & IAB Meeting), LaSells Stewart Center, Oregon State University, Corvallis Oregon:

Major issues at the IAB meeting were: 1) the amount and nature of public concern about genetically altered products and their potential impacts on the environment, and 2) a new 26% indirect cost rate on sponsors' fees to be applied by OSU to all OSU cooperative research centers that that would take effect when NSF support ceases.

1/1999 Letter to Wilson Hayes, OSU Vice Provost, from John Trobaugh TGERC IAB Chair (The Timber Company), on behalf of the IAB, protesting the possible imposition of overhead charges on TGERC sponsor dues.

1/2000 Steven Strauss announced a 50% reduction in the 26% indirect cost rate that was to have been imposed by OSU on sponsors' fees when NSF support ceases.

8/2000 Center Director and Center Evaluator meet to discuss Center-related issues

11/2000 TGERC Annual meeting (Technical & IAB Meeting), Seattle, Washington: Meeting was proceded by short course entitled "Gene School II" chaired by Meilan and Bradshaw. Included within the Meeting was a report entitled "Flowering Control in Euculypts" by Simon Southerton of Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO). Major issues at the IAB meeting were: 1) discussion of intellectual property, research conduct, confidentiality of results and publicity; 2) Review of membership projections, sponsor dues and implications for NSF support; 3) TGERC research directions, and; 4) summary/discussion of LIFE form numeric results and project-specific comments.

7/2001 Symposium on ecological and societal aspects of transgenic plantations (Skamania Lodge).

11/2001 TGERC Annual meeting (Technical & IAB Meeting), Corvallis, Oregon:Meeting proceeded by short course entitled "Gene School II" chaired by Meilan and Bradshaw. Included within the Meeting was a report entitled "Flowering Control in Euculypts" by Simon Southerton of Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO). Major issues addressed at the IAB meeting were: 1) funding problems amidst consolidations; 2) Review of membership projections,

sponsor dues and implications for NSF support; 3) TGERC research directions; 4) the possibilities for affiliate memberships; 5) new funding or operations models; 6) the distractions of public controversies and the need for and implications of public interactions, and; 7) summary/discussion of LIFE form numeric results and project-specific comments.

11/2002 TGERC Annual meeting (Technical & IAB Meeting), Corvallis, Oregon. Major issues addressed at the IAB meeting were: 1) funding problems and center continuation as an NSF/IUCRC, and 2) Review of membership projections, sponsor dues and implications for NSF support.

3/22003 Purdue Planning Grant submitted to NSF.

11/2003 TGERC Annual meeting (Technical & IAB Meeting), West Lafayette, Indiana:

8/1/2004 Official start date of Purdue University's Center for Tree Genetic Research (CTGr) NSF/I/UCRC.

10/2004 CTGr Annual meeting (Technical & IAB Meeting), Corvallis, Oregon. Eight projects were presented at the technical meetings. The center essentially held two center meetings under an almost transparent umbrella of the Center for Tree Genetics (CTG). IAB meeting included: possible collaborating relationships with Kasetsart University of Thailand; interest in mechanisms for funding seed proposals; center growth goals and the possible addition of Virginia Polytechnic Institute and State University and North Carolina State University; activating/tagging direction, and; nomination of a new CTGr IAB chair (new chair to be from Purdue).

10/2005 CTGr Annual meeting (Technical & IAB Meeting), West Lafayette, Indiana.

1/2006 CTGr Directors' Planning Meeting of current Center administrators (Michler, Meilan & Scott) and NCSU's Tom Fox and Virginia Polytechnic Institute and State University's Barry Goldfarb, (Arlington, Virginia).

9/2006 CTGr Annual meeting (Technical & IAB Meeting) and CAFS Planning Meeting, Atlanta, Georgia): Schools represented – North Carolina State University, Purdue University, Virginia Tech and Oregon State University.

4/2007 University of Vermont, Purdue and Oregon State University receive IUCRC funding (effective May 31, 2007).

2/2008 CAFS Technical and IAB Meeting (Portland, Oregon). Topics addressed included: Center structure and function; IAB executive committee approved (selection of IAB chair to follow); voting process (proportional to dues); How to foster strong participation @ center meetings.

2/2009 University of Georgia and University of Main received I/UCRC funding, becoming CAFS's 5th and 6th sites (effective November 2, 2009). The University of Washington received an award letter just before the meeting. Both Florida and Idaho made brief presentations and were preparing to submit a proposal.

2/2009 CAFS Technical and IAB Meeting (Charleston, South Carolina). 68 total members, including: 21 large, 35 small, 12 governmental agencies & not-for-profit, 28 full and 40 associates. 8 new proposals presented; 6 continuation presentations. The new CASF sites (Georgia and Maine) made presentations about their research capabilities. Florida and Idaho made capability presentations as potential new sites. IAB meeting included: Executive committee (structure, function, nominations and appointment by acclamation); project voting (satisfaction with last year's funding allocations,

ideas for obtaining greater voting participation); membership agreement – minor modification needed [to reflect new sites without naming them in the standard agreement - no re-signing should be needed]; open and closed discussion of potential new sites (Florida and Idaho). Both of the aforementioned schools received approval from the IAB to go forward with their proposals.

4/2009 University of Florida becomes 7th CAFS site (effective April 2, 2010).

11/2009 University of Washington becomes 8th CAFS site (effective November 30, 2009).

2/2010 University of Idaho becomes 9th CAFS site (effective February 1, 2010).

4/2010 CAFS Technical and IAB Meeting (Indianapolis, Indiana). 58 total members (not including Idaho's 4), including: 24 large, 49 small, 8 governmental agencies & not-for-profit, 46 full and 43 associates. Presentations included: 11 new proposals; 2 completed and 12 continuing projects. IAB meeting included: overall discussion of LIFE feedback (project-specific discussions occurred after each session); business meeting. Field trip hosted by Hardwood Tree Improvement and Regeneration Center (HTIRC) to Danzer/HTIRC research plots and the ecosystem experiment in Morgan-Monroe State Forrest.

6/2011 CAFS Technical and IAB Meeting (Seattle, WA). 99 total members made up of 44 full and 55 associates. There are an estimated 23 large, 60 small, 9 governmental agencies & 7 not-for-profit (involving special arrangements). The technical meeting included: 11 continuation proposals and 1 new one; 2 completed and 12 continuing projects. The meeting followed an innovative agenda format that reduced the number of presentations and increased time for two-way communications by having a series of 11 single highlighted presentations followed by a total of 13 focused, grouped poster sessions. LIFE forms were completed on presentations and posters and feedback was discussed. There was an invited talk by Eric Vance of the National Council for Air and Stream improvement. The closed IAB meeting included: election of replacement members for the executive committee (it has 9 members; 1 per site); discussion of the meeting format and of support from industry for student travel (this year sponsors donated $4,500); discussion of graduate student participation at annual meeting; discussion of CAFS functioning (controlling meeting costs, center processes and projects); Possible collaborations with other NSF's IUCRCs; Planning for Phase II of CAFS, and; date for 2012 meeting in Maine.

6/2012 CAFS Technical and IAB Meeting (Bangor, ME). Meeting included 3 final reports, 6 proposals for new projects, 15 posters that updated continuing projects, and an update of the CAFS Fundamental Research Project on the use of stable isotopes to tract nitrogen that is on a no cost extension. CAFS currently has 99 total members made up of 47 full and 52 associate members. There are an estimated 23 large (>500 employees), 60 small, 9 governmental agencies & 7 not-for-profit (involving special arrangements) and foundations. Center consists of a core of over 25 faculty, 4 post-docs, 16 doctoral, 17 masters, and several undergraduate students. In 2012, 7 PhD and 8 MS students completed their studies. Eighteen (18) students are continuing their graduate studies (9 PhD, 9 MS). IAB meeting agenda included: In-kind memberships; potential new NSF IUCRC Fundamental Research Proposal; possibilities for an International Supplemental Proposal;

8/2012 NCSU, OSU, Purdue and Virginia Tech receive Award Letter for Phase II

6/2013 CAFS Technical and IAB Meeting (Augusta, GA)

Next meeting: Last Week of June 2012, Augusta, Georgia

Attachment D:

CAFS Annual Meeting Best Practice Checklist

[Annual Meeting: June 26, 2012]

☐ The Center has 2 face-to-face meetings of IAB, Center scientists & students per year:
- ☐ One primarily dedicated to proposal presentations w/ LIFE feedback (+ closed IAB Mtg).
- ☐ One primarily dedicated to a technical review of progress w/ LIFE feedback (+ closed IAB Mtg).

Comments: Excellent attendance, participation and collaborative spirit

☒ At Point of Registration, "Non-Disclosure Form" is signed by each non-member industrial attendee.

☐ At Meeting: "Closed Meeting" sign posted; materials labeled "Center Proprietary"

☒ A "List of Attendees" (industry, university) is contained in each attendee's registration packet.

☒ A Center Update Report that includes:
- ☒ A review of the center's vision and research roadmap and/or priorities
- ☐ A membership status report (including MIPRs and/or gov agency commitment involvement)
- ☐ An annual financial statement x site (w/ member fees collected & amt available for projects)
- ☐ Some discussion of center-related technology advances & economic impact
- ☒ An up-to-date listing of publications list plus PI awards & research highlights (OK if online)

Comments:

☒ A common presentation template is used and adhered to by most presenters (w/deliverables, milestones, timetable, budget & time limits).

Comments:

☒ 1-page executive summaries are available to all attendees at each bi-annual IAB meeting.

Comments: Online before the meeting.

☒ LIFE forms are completed following each presentation.

Comments:

☒ LIFE feedback is discussed by industrial attendees in session(s) scheduled for that purpose.

Comments:

☒ There is a closed IAB session (members can make it open) that includes an opportunity for IAB representatives to raise and discuss issues about center policies, procedures and research direction.

Comments:

☒ A "state-of-the center" discussion by IAB members.

Comments:

☒ Clear procedures (voting/ranking) are used for project continuation/selection.

Comments:

☒ Meeting activities are included that support industry/ university networking; such poster sessions, evening hors d'oeuvres or dinner, and industry-driven mentoring sessions.

Comments:

☒ A discussion of and preferably a decision on the date and location of the next meeting.