Center for Advanced Forestry Systems (CAFS): Evaluator's Report for 2010

(http://www.nsf.gov/eng/iip/iucrc/directory/tger.jsp & 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 Annual Surveys of Faculty & IAB Reps
Attachment B: Success Stories
Attachment C: CAFS Developmental Milestones

Submitted by Craig S. Scott
NSF Center Evaluator

December 20, 2010

In 2009 the Center for Advanced Forestry Systems completed its 2nd year of operation as an IUCRC with North Carolina State University as the lead institution. The center is a very successful interdisciplinary research center that addresses a variety of forestry issues through multifaceted approaches. It is a stable, fast growing collaborative research enterprise that is to evolving to become a national resource because of strong center leadership based on a foundation of previous non-IUCRC industry/university collaborations at a number of the university sites.

CAFS is a multi-university center that is working to solve problems through multi-faceted approaches to questions on multiple scales, encompassing molecular, cellular, individual-tree, stand, and ecosystems research. The collaborative consortium involves scientists with expertise in biological sciences (biotechnology, genomics, ecology, physiology, and soils) and management and processing (silviculture, bioinformatics, modeling, remote sensing, and spatial analysis).

Center research themes combine traditional genetics, biotechnology and silviculture into integrated systems with quantitative models to support decision-making and value enhancement.

CENTER TRANSITIONS

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

MEMBERSHIP

The Center for Advanced Forestry Systems is an increasingly important national research entity. CAFS industrial membership includes leading forestry industry firms from throughout the Nation. A substantial number of the firms have international operations. In 2009, the center's industrial base, primarily paper, pulp and lumber interests, continues to experience a particularly severe economic downturn. This exacerbates an already difficult economic situation within the industry.

The center continues to expand. In 2010, The University of Idaho became the center's 9th research site.

COMPLIANCE WIH IUCRC MODEL

The Center remains faithful to the IUCRC Model.

Because of the nature of the technical field of tree genetic engineering, 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. For these reasons, when this center was established the IUCRC Program granted it a meeting frequency waiver that enables it to convene just one meeting annually and remain in good standing.

The annual meetings are used to review and discuss research, budgets and intellectual property and to plan for overall development of the center's research affiliations and programs.

The IUCRC Program's Online LIFE System is used to assess new proposals, as well as interest in maintaining ongoing projects and in the possibility of revising them. Project-specific feedback from these forms is discussed following each session (an innovation that was started in this center in 2010). Subsequent IAB discussions then focus on official project voting, discussions of general research thrusts and their budgetary implications.

CENTER ADMINISTRATION

The center director, deputy director and each site director are to be commended for operating an extremely smooth functioning center that has s to be almost issue free. CAFS center management includes:

Center Director, Barry Goldfarb, NCSU, 919.515.4471, bgg@gw.fis.ncsu.edu
Deputy Director, Lee Allen, 919.612.1456, lee_allen@ncsu.edu
Program Coordinator, Lisa Schabenberger, 919.513.7368, lisa_schabenberger@ncsu.edu
Outreach Coordinator, Liz Jackson, 765.583.3501, jackson@purdue.edu

CAFS University Sites:

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 (2/2010), 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, David Briggs, Site Director, 206.543.1581, dbriggs@u.washington.edu
Virginia Polytechnic Institute & State University, Thomas Fox, Site Director, 540.231.8862, trfox@vt.edu

Howard Duzan of Weyerhaeuser continues to serve as CAFS's IAB Chair.
Center evaluator, Craig Scott, University of Washington: 425.466.6535, scottcs@u.washington.edu.

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

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 industry members 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.

Issues facing the Center that have financial ramifications:

- A mechanism should be developed to help faculty and students receive support for travel to industrial sites and to the annual center meeting.
- An answer is needed for the question: How can the expanded center take best advantage of each site's strengths in order to better leverage industry dollars and technologies.
- Develop short- and long-term strategies for seeking large grants for applied research in tree genomic sciences.

Center strengths include:

- As a true national center with coast-to-coast geographic spread, CAFS is to be commended for its success at getting such high attendance at its annual center meetings.
- An industrially relevant research focus that has considerable potential for benefit to sponsors.
- A solid and relatively stable base of industry with common interests, needs and expectations.
- An expanding and dedicated set of site directors who are committed to the concept of cooperative research and who are responsive to the needs of the center.
- A talented, dedicated and innovative core of research and administrative faculty and graduate students
- Sound center operation made possible by professional collaborative efforts by the center director and by site directors and their support staff.

Bottom line: The center is recognized as a quality organization that is meeting the needs of a vital and growing forestry industry. Industry interest in the center's research is widespread and strong.

Attachment A

NSF/IUCRC OUCOME SURVEYS

In the fall of 2010, online outcome surveys were administered to IAB representatives and center research faculty as part of the NSF/IUCRC Program's Center Evaluation Program.

CAFS IAB Survey 2010
[Response Rate: 100%: 9 of 9]

IAB REP VIEWS OF CENTER RESEARCH PROGRAM

Means Displayed as follows - [*Center mean* (*Bold & Italicized*****/***Most Recent National Mean* (smaller & underlined)]

CF/QRP: ***4.2***/4.3 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: ***3.9***/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***/3.8 Focus of research?
(1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)

RST: ***3.6***/3.8 Relevance of research to my organization's needs?
(1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)

IAB rep suggestions for how could the center improve its research program? What features of the research program would your organization definitely want to see continued?

Continue focus on improved technology transfer (Maine CFRU as example) - - short technical bulletins on research results

Need a broader vision for the center. Still too many projects just tied to individual schools. Would like to have more cross-school research on fundamental areas like wood quality, nutrient use. Started to see a few of these but need more.

1) Categorize projects so that a portfolio approach can be used in the allocation process; 2) Continue the breadth of research that is critical in getting keeping the university/PI diversity high.

a) Focus on deliverables - some short term, some long term; b) Make sure funds are for active research versus travel (for instance travel expense to the annual CAFS meeting); c) Greater transparency in selection of projects; d) Make funding more competitive (don't guarantee funding to a site center unless it has received significant votes from the broad membership - if it doesn't, allocate the funds to a site center that has generated significant interest via voting by the advisory board - each site center should offer a range of quality, well-developed proposals so members can make effective choices, and; e) Reduce or eliminate the redundancy in project proposals to, in effect, force collaboration between universities.

There are too many projects. Create functional area working groups to prioritize projects and submit limited number for potential funding.

Location-specific research will always be preferable over national issues but it would be nice to have at least one issue that crosses regions. It has to be something we are all interested in and not driven by politics.

Work with industry to focus research on relevance to the organization rather than needs/strengths of the researcher.

The program is really good as it is. Continued encouragement for the Universities to work together.

IAB VIEWS OF THE BENEFITS OF CENTER MEMBERSHIP

Means Displayed as follows - [*Center mean* (*Bold & Italicized*****/***Most Recent National Mean* (smaller & underlined)]

ER&D ***2.7***/3.1 Enhanced R&D via tech awareness?
(1=No Impact; 2=Slight Impact; 3=Moderate Impact; 4=High Impact; 5=Very High Impact)

ECom ***2.1***/2.1 Enhanced commercialization via new products, processes, services, sales?
(1=No Impact; 2=Slight Impact; 3=Moderate Impact; 4=High Impact; 5=Very High Impact)

EPNet ***3.3***/3.4 Enhanced professional networking?
(1=No Impact; 2=Slight Impact; 3=Moderate Impact; 4=High Impact; 5=Very High Impact)

If your organization has benefited technically from its participation in the center, describe how. Where possible, try to quantify benefit (eg. dollars saved, months saved, waste/scrap reduced, etc.). NOTE: This information is helpful for member recruitment and continuing government sponsorship:

The center provides an opportunity to encourage fundamental research in areas we do not have expertise or funding to do alone. These technologies are needed to developed advanced forest systems and applied processes.

Growth and yield equation systems developed for clonal genotypes under development at Va Tech and UGA which are enhancing the first generation clonal models we have developed already. These will help our company with better wood flow estimates, cash flow analysis and customer buying decisions.

To-date, little to no benefit beyond networking.

Better information leads to better and timely decisions. This translates into better products and ultimately greater profits.

The main benefit to my organization is new technical information that I can use internally. For forest productivity, the use of fertilizers, and the ability to model the responses accurately is really important for planning.

IAB REP VIEWS OF CENTER ADMINISTRATION & OPERATIONS

Mean Displayed as follows - [*Center mean* (*Bold & Italicized***/*Most Recent National Mean* (smaller & underlined)]

CAOps ***3.4***/3.9 Center administrative operations?
(1=Not Satisfied; 2=Slightly Satisfied; 3=Somewhat Satisfied; 4=Quite Satisfied; 5=Very Satisfied)

LMR ***4.4***/4.1 Likelihood of membership renewal?
(1= Definitely Not; 2=Probably Not; 3=Uncertain; 4=Probably Yes; 5=Definitely Yes)

1 of 9 respondents "Uncertain" as to whether they will renew.
3 of 9 respondents indicated "Probably" they would renew.
5 of 9 respondents indicated "Yes" they definitely plan to renew.

Suggestions of what the center could do to make renewal more likely:

Build and retain a strong portfolio of research focused on pine genetics and silviculture.
Keep up the good work!

CAFS PI: 2010
[Response Rate: 89% 8 of 9]

FACULTY SATISFACTION WITH CENTER

Means Displayed as follows - [*Center mean* (*Bold & Italicized*****/***Most Recent National Mean* (smaller & underlined)]

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 ***4.5***/4.3 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)

CI ***4.0***/4.1 Your intention? Next year I'll 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 ***4.5***/4.2 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)

Suggestions for how the center can improve its research program?

The center needs better integration among the sites within the center. There is still too much individual activity with little thought to a truly integrated approach among the sites.

Supplemental Research Experience for Teachers is a valuable program, however the requirement that the teacher be selected prior to consideration for funding makes it difficult to recruit and delays project initiation. I suggest eliminating that requirement so that recruiting and funds administration can occur in parallel.

The center needs better coordination among institutions on related research projects. Hiring of a new assoc Director this year will hopefully help this aspect of the program.

The center may be able to better connect its center-directors throughout the year in order to increase the interaction via common projects.

I am satisfied with the process of identifying and prioritizing research within the center.

The center needs more cross-institution collaborative projects.

Suggestions from faculty on how the center can improve its administration and operations:

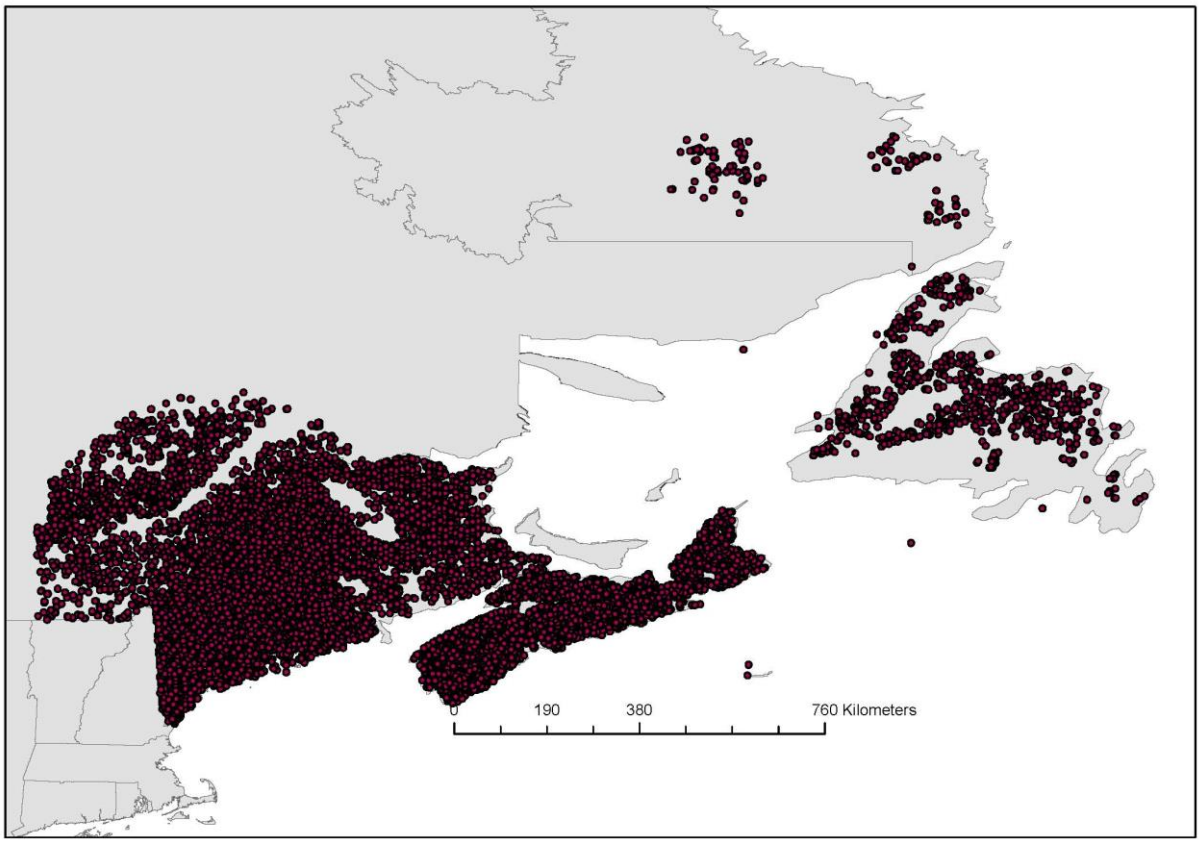
Improve planning & development of research program (x4)
Improve center communications (x3)
Improve fundraising (x2)
Improve project selection (x2)
Improve management of projects (x3)
Other: How do we leverage the limited funding of projects of CAFS centers into larger scale grants?

Attachment B

CAFS Success Story No. 1 (2010)

Prepared by: Aaron Weiskittel **Date**: 18 November 2010	**Contact phone**: (207)581-2857 **Contact email**: aaron.weiskittel@maine.edu
Award Numbers: (list all involved in this highlight) 0855370	**Funding directorate/division**: IIP **Funding program**: I/UCRC
Highlight title: Long-term forest inventory data compiled across the northeastern United States and Canadian Maritime Provinces	
Highlight text (limit 300 words): Forests in the northeastern US are unique from other regions in the world in that they are composed of very few planted stands, are largely regenerated by natural seed, and are composed of a variety of tree species. Due to the complexities of these forest types, there remains a void of accurate forest projection models in the region. Historically, it has been a challenge for scientists and land managers to forecast forest growth and predict future forest composition and structure due to the sparseness of long-term forest data. A recent effort has succeeded in compiling, cleaning, and archiving over 50 years of forest inventory information across the northeastern US and Canadian Maritime Provinces. These data represent over 4 million tree observations from 65 different tree species. Key variables have been archived such as individual tree growth and tree species abundance. Data represent the multitude of forest cover types and represent a large portion of the forested region in the northeastern US, much of which is owned by forest industry. The compiled database serves as the primary tool in developing computer models that forecast forest growth. These models will further our knowledge regarding the influence of forest management on tree growth, enable us to more accurately quantify forest carbon sequestration, and will aid our understandings of the implication of climate change on northeastern forests.	
In terms of *intellectual merit*, why was this outcome notable and/or important? The naturally-regenerated, mixed-species stands that comprise northeastern US forests are inherently complex and are thus difficult to quantify in terms of their composition and value. The ability to compile and archive over half a century of forest inventory information provides a unique platform not common in other regions. The compiled data serve to provide the basis for forest modeling efforts that seek to accurately predict future forest growth and forest composition.	
In terms of *broader impacts*, why was this outcome notable and/or important? Long-term data gathered from individual trees provide an exceptional data source for those seeking to understand forest conditions as they relate to plant communities, wildlife habitat conditions, wildfire risk, and other fields of study. Observed long-term growth data from forests will no doubt aid in understanding the influence of climate patterns on tree species distributions and assessing northeastern US forests in terms of their carbon sequestration potential.	
If applicable, tell us how this research is or may be transformational.	
If applicable, tell us how this research represents broadening participation.	

If applicable, tell us how the research may have societal benefits, e.g. the economy.
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. Please submit the NSF Form 1515 with your image.
Image file name: 25 characters or less: Can NSF use the image? Yes
Image credit line: Aaron Weiskittel
Image caption: Over 4 million observations from long-term forest inventory information have been recently compiled, cleaned, and archived across the northeastern United States and Canadian Maritime provinces.



Attachment C

CAFS Developmental Milestones
Subsequent to NSF Involvement

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 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 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.

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 received I/UCRC funding as CAFS's fifth university site in FY 09. The University of Maine's proposal is being reviewed @ NSF. The University of Washington received an award letter just before the meeting and will participate fully next year. 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.

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.

Next meeting: Seattle, Spring 2011.