Auburn University
Standard Biographical Data

Name Timothy P. McDonald

Department Biosystems Engineering College Agriculture

Present Rank Professor Years Completed in Present Rank 2

Years in Faculty Service at AU 15 Years in Faculty Service Elsewhere 0

Type Of Current Appointment: _X_ Tenured ____Untenured ____Non-Tenure Track

Pay Basis: _X_ 9 mo. ____12 mo.

Graduate Faculty Status: ____Class I _X_ Class II Date Awarded: 4/2/2013

Education

Institution	Degree	Major	Date Awarded
Purdue University	PhD	Agricultural Engineering	1987
Clemson University	MS	Agricultural Engineering	1984
Clemson University	BS	Agricultural Engineering	1981

Professional Experience

Institution	Rank	Period Of Appointment
Auburn University	Professor	10/2015 — present
Auburn University	Associate Professor	08/2002 — 09/2015
USDA Forest Service	Research Engineer	1991 — 2002
USDA ARS	Agricultural Engineer	1987 — 1991
USDA ARS	General Engineer	1984 — 1987

I have reviewed (except letters) the contents submitted in the attached dossier:

Signature: _____ Date: _____

Timothy P. McDonald, Ph.D.
Associate Professor of Forest Engineering,
Department of Biosystems Engineering

Contents

AUBURN UNIVERSITY
Information for Promotion and Tenure

Timothy P. McDonald, Ph.D.
Associate Professor of Forest Engineering,
Department of Biosystems Engineering

General Information

1 Information on Biosystems Engineering

The Biosystems Engineering Department is part of the College of Agriculture with faculty reporting to the Dean of the College of Agriculture. The department offers undergraduate degree programs leading to the Bachelor of Science in Biosystems Engineering. The degree program meets engineering accreditation requirements and is administered through the College of Engineering. Students may choose to pursue options in Ecological Engineering and in Forest Engineering, a program jointly administered by the College of Engineering and the School of Forestry and Wildlife Sciences. In 1998 the Department stopped accepting students as M.S. and Ph.D. candidates and the graduate degree programs were removed from the ACHE inventory. In Fall 2010 the privilege of granting M.S. and Ph.D. degrees was restored by ACHE to the Biosystems Engineering Department.

2 Assigned Duties

2011—2012	Teaching:	65%	Research:	35%
2012—2013	Teaching:	65%	Research:	35%
2013—2014	Teaching:	65%	Research:	35%

3 Honors and Awards

- Alabama Section ASABE Distinguished Engineer Award, 2014.
- Outstanding Faculty Member, 2005, 2010 – Department of Biosystems Engineering. Annual award presented by biosystems and forest engineering students to the outstanding teacher in the department.

- Member, Alpha Epsilon, Agricultural Engineering honor society.
- USDA Forest Service Certificate of Merit, 1999, "For development of a research program on Spatial Data Applications for forest operations".
- USDA Forest Service Certificate of Merit, 1993, "Outstanding research contributions in forest operations research".
- USDA Agricultural Research Service Certificate of Merit, 1989, "Outstanding research contributions in the area of meat grading".

Scholarly Contributions by the Candidate

A Teaching

1 Courses taught for the past three years

Year	Semester	Course	Title	Lec	Lab	Enrolled
2011	Fall	BSEN 3210	Mechanical Power for Biosystems	2	3	11
		BSEN 2210	Engineering Methods for Biosystems	1	3	38
		BSEN 7710	Fundamentals of Instrumentation for Biological Systems	1	3	8
2012	Spring	BSEN 4250	Hydraulic Control Systems Design	2	3	3
		BSEN 3610	Instrumentation & Controls for Biosystems	2	3	16
	Fall	BSEN 3210	Mechanical Power for Biosystems	2	3	20
		BSEN 2210	Engineering Methods for Biosystems	1	3	42
		BSEN 7710	Fundamentals of Instrumentation for Biological Systems	2	3	3
2013	Spring	ENGR 3610	Instrumentation & Controls for Biosystems	2	3	24
	Fall	BSEN 3210	Mechanical Power for Biosystems	2	3	15
		ENGR 2210	Engineering Methods for Biosystems	1	3	39
		BSEN 7970	Practical Programming for Researchers	0	3	5
2014	Spring	BSEN 3610	Instrumentation & Controls for Biosystems	2	3	32
		BSEN 7710	Fundamentals of Instrumentation for Biological Systems	2	3	5

2 Graduate students whose work has been completed

Name	Degree	Year	Role	Current Position
Jaskaran Dhiman	MS	2014	Committee member	Graduate Student, McGill University
Ravinder Thaper	MS	2014	Committee member	US Army

Name	Degree	Year	Role	Current Position
Nan Wei	MS	2013	Committee member	Henkel Investment Co., Ltd.
Qun Wang	MS	2013	Major Advisor	Graduate Student, Statistics, Georgia State University
David Herriott	MS	2013	Committee member	Mechanical Engineer, Cooper Tire and Rubber Co..
Jonathan Hall	MS	2012	Committee member	Precision Ag Specialist, Jimmy Sanders, Cleveland, MS.
Simerjeet Virk	MS	2012	Committee member	Product Support Specialist, Hagie, Corp.
Ajay Sharda	PhD	2011	Committee member	Assistant Professor, Biological and Agricultural Engineering, Kansas State Universiity.
Taylor Wingo	MS	2011	Committee member	N.A.
Daniel Mullenix	MS	2011	Committee member	Precision Ag Specialist, Agri AFC
Karunakaran Haridass	MS	2010	Committee member	Project Engineer with Flowserve in Coimbatore, India
Darrell Krueger	MS	2009	Committee member	Mechanical Engineer, BNSF Railway
Jeff Hunt	MS	2007	Co-chair (with Dr. Hung, ELEC)	N.A.
Stephen Meadows	MS	2010	Committee member	Forester with Weyerhaeuser in North Carolina
Bruno Folegatti	PhD	2007	Committee member	Analyst with Regions/Morgan Keegan Bank
Brooks Butler	MS	2007	Committee member	Engineer with Georgia Pacific, Monroeville, AL
Clay Campbell	MS	2008	Committee member	Water Resources Specialist, AMEC Earth and Evnvironmental, Birmingham, AL
Corey Kichler	MS	2008	Committee member	Support Engineer, USDA ARS National Soil Dynamics Lab
Jonathan Melton	MS	2008	Co-chair (with Dr. Wes Zech, Civil Engineering)	Engineer II, Atwell, LLC
Owen Michels	MS	2010	Committee member	Department of Forestry, Commonwealth of Kentucky

Name	Degree	Year	Role	Current Position
Jaspreet Aulakh	MS	2008	Committee member	N.A.
Christian Brodbeck	MS	2007	Co-chair (with Dr. Dan Brown, Civil Engineering)	Engineer III, Auburn University, Biosystems Engineering
Jonathan Davis	MS	2005	Co-chair (with Dr. Dan Brown, Civil Engineering)	Engineer with URS Corporation

2.1 Outside reader

- Komkrit Pitiruek, Industrial and Systems Engineering. 2011. An operating and investment model for integrating wind electric power in manufacturing.
- Tyrel Harbuck, Horticulture. 2010. Assessment of precision technologies for accurate delivery of crop inputs.
- Jose Terra, Agronomy and Soils. 2004. Soil management and landscape variability impacts on field-scale cotton and corn productivity.

3 Graduate students on whose committee the candidate is presently serving

Name	Degree	Role	Thesis Title
Pengmin Pan	PhD	Major Advisor	Comparison of NIR and ECT in predicting moisture content of woody biomass
Rees Bridges	MS	Major Advisor	Route planning for autonomous skidder operations
Chennan Xue	MS	Major Advisor	Assessment of route planning algorithms for automated forest operations
Aurelie Poncet	PhD	Committee Member	Planter factors affecting stand establishment and growth
Daniel Pegoretti Leite de Souza	MS	Committee Member	Determining the impacts of felling method and season of year on coppice regeneration
Jonathan Kenney	MS	Committee Member	Factors that affect fuel consumption in logging systems
Ujjain Pradhan	MS	Committee Member	Physical treatments for reducing ash content in biomass

4 Courses and curricula developed

BSEN 2210. Engineering methods for biosystems engineers. New course. This course was added to the curriculum for all Biosystems Engineering students in Fall 2010. It is intended to develop students'

ability to solve non-trivial problems in engineering and mathematics using technical software, plus develop basic understanding of professional engineering practice. The course was new and required development of all lecture and lab material. Subject matter was intended to introduce modeling of biological and mechanical systems as a means of fostering an analytical approach to problem solving. Labs were focused on applying analytical software in analyzing model behavior. Other material was developed to introduce professional practice for engineers, especially written communication and working in a group environment, plus instrumentation and measurement and statistical concepts for dealing with biological systems.

Much of the new material developed was used to introduce students to specific software tools used in later courses, including `Excel, Matlab, LabView,` and `Autodesk Inventor`. Projects were designed for each package to ensure students' skill with the software was developed to a point where they could model a range of deterministic and stochastic biological systems. Students were also asked to verify predictions based on their models for various physical systems, for example, comparing predicted and actual flow of water from reservoirs with various shapes, which introduced statistical concepts into the course. Other projects used relatively simple problems in basic geometry or applied math to give students an opportunity to apply critical thinking in problem solving.

BSEN 3610. Instrumentation and controls for biosystems. New course. This course was added to the curriculum for Biosystems Engineering students in Spring 2011. It is intended to introduce analysis of basic electrical circuits plus provide students an introduction to measurement and data acquisition. The lab subjects ranged from basic electrical measurements using DVM and oscilloscope to construction of a load cell using strain gauges and modern instrumentation.

The labs reinforce material introduced in class with a hands-on approach. Simple current and voltage relationships can be abstract to students not familiar with how electrical systems work and the labs provide an opportunity to directly interact with circuits and gain a more intuitive understanding of their behavior. Labs developed for the course included lessons on passive components, particularly resistive networks, plus operational amplifiers that can be reconfigured to perform numerous functions important in signal processing. This class provides the only exposure in our curriculum for the students to these types of circuits and their utility in developing custom measurement systems. The techniques used in solving problems presented in the course also help students understand more general math problems, such as applications of linear algebra and differential equations, plus give the students an opportunity to use engineering software tools such as `Matlab`.

BSEN 7710. Fundamentals of instrumentation for biological systems. New course. Taught for the first time Fall 2011. Developed lecture and lab material for a graduate course in research instrumentation methods. Objective of the course was to introduce graduate students to data acquisition and instrumentation fundamentals necessary to complete their research projects. Focus was on microcontrollers and higher-level data acquisition with `Labview` software.

Besides the practicalities of data acquisition, the class introduced some system theoretic concepts related to discrete sampling of continuous signals. We also covered simple frequency domain analysis and filtering plus software tools to perform the calculations.

BSEN 7970. Special Topics: Practical programming for researchers. New course (Fall 2013). A course developed to introduce graduate students to programming in `C` and `Python`. The intention in developing the course was to provide students necessary background to gain better understanding of the practicalities covered in BSEN 7710. Emphasis is on proficiency in `C` for micro controller applications and in `Python` for data analysis. The approach is entirely practical, covering the fundamentals of software development through examples designed to emphasize the core concepts of each language: addressing and

pointers in `C`, and object oriented development in `Python`.

ENGR 1110. Introduction to Engineering Modified course (taught Fall 2005 to Spring 2008). The introductory class in engineering, each department teaches its own section(s), the objective being to give students some background in engineering practice. Topics include ethics, professionalism, and safety, plus an introduction to team design typically through an assigned project. I developed several new design projects that instructors in subsequent years have replicated.

5 Grants received related to teaching

Authors *(PI)*	Title	Funding Source	Duration	Amount
T. McDonald, O.O. Fasina, J.P. Fulton, S. Taylor	Lab-scale teaching tools to test biofuels	AU Provost - GFE Equipment Grants	1/08 - 8/08	$9,000

These funds were used to construct a small engine dynamometer. The dyno is used each year in multiple labs for the BSEN 3210 course to highlight engine characterization, power and work relationships for mechanical and hydraulic systems, and to evaluate the relative efficiency of engines running on various biofuels.

6 Publications pertaining to teaching

None.

7 Other contributions to teaching

7.1 Undergraduate Advisement

Each faculty member in Biosystems Engineering advises about 15 students each semester.

7.2 Student Activities

- **$\frac{1}{4}$-scale Tractor Competition Team Advisor** Our professional society, the American Society of Agricultural and Biological Engineers (ASABE) sponsors an annual competition in which teams of students design, build, and test a small-scale tractor. Their designs are evaluated by groups of professional engineers at a site hosted by a sponsor of the competition, typically a large OEM. The

students' entries are judged for their design quality, marketing potential, plus performance. I was the faculty advisor for the team from 2007 to 2010 and assisted them with fundraising, provided advice on design choices, and traveled with the team to their competitions.

The competition involves year-round work to compete successfully. Students must fundraise early in the fall, make design choices to complete preliminary designs before January, then finalize plans soon after the spring semester starts. They must develop CAD drawings for the entire tractor, build a prototype, and test it, all of which has to happen before a final design report is submitted early in April. Only then is the final design built and readied for competition, which happens in late May.

I worked with the team each year through the entire design process, plus assisted in construction and testing. I also helped them secure funding to develop their own test sled and track, a significant tool used in evaluating design choices and generating meaningful content for the design report. It was a large time commitment, mostly evenings and weekends, but was of great benefit to the students participating. They gained relevant design and work experience, had a chance to develop leadership skills, and met numerous engineers working in the equipment industry.

There were several years during which a core student cadre could not be formed and AU did not field a team. This years I have high hopes for a new bunch of students that seem to have the willingness to commit to the rigors of the competition and I fully expect we'll have a tractor at this year's event.

- **ASABE Student Branch Advisor** The role of the advisor is to guide the students in setting an agenda for the organization that enhances their professional goals, including planning of meetings, recruitment of speakers, help in coordinating fundraising, and traveling with them to regional events. I have served as advisor at various times over the last 12 years, and am the current (2014-2015) principal.

  Advising the group requires varied tasks be done, organizing meetings, contacting speakers, and assisting with Departmental outreach events such as E-Day. Perhaps the largest effort, however, has to do with fundraising, and most of that is done through a single event – the Lawnmower Clinic. Local citizens bring the students lawnmowers to be serviced for a nominal fee and the group uses the funds raised to finance their participation in the annual Rally of peer ASABE branches hosted at one of the 13 southern schools having Biosystems Engineering programs. The students gain a great deal from this process. They make lasting friendships working together in putting on the event, plus they get a chance to meet students from other Universities and gain an appreciation for how they fit into the wider world of engineering.

- **FE Exam Preparation** All BSEN faculty have joined together to assist students in studying to pass the first test of their general engineering knowledge, FE Exam. Passing the FE is the first step in their becoming a registered professional engineer, a significant accomplishment from a career standpoint. I have developed review materials covering general mathematics, dynamics, and basic circuit analysis. All have been compiled into study guides offering review problems, plus solutions.

- **Graduate Handbook** Compiled and edited the Department's Graduate Handbook, available here.

- **2+2 and 3+2 Programs with Shanghai Ocean University** Have been involved in discussions with faculty at SHOU concerning development of joint undergraduate programs.

B Research/Creative Work

1 Books

1. McDonald, Tim; Gallagher, Tom. 2010. Best management practices (BMPs) and water quality. Chapter 8 in: Gjerstad, Dean; McNabb, Ken, eds. Managing forests on private lands in Alabama and the Southeast. Alabama Forestry Commission.

2 Article-length publications

2.1 Refereed and peer-reviewed articles and research reports

1. Wang, Bangping; Pan, Pengmin; McDonald, Timothy P.; Wang, Yifen. In Press (Accepted 6 October, 2016). Development of a capacitance sensing system for monitoring moisture content of spray-dried gelatin powders. Journal of Food Engineering. DOI: http://dx.doi.org/10.1016/j.jfoodeng.2016.10.008
2. Oyedeji, O.; Fasina, O.; Adhikari, S.; McDonald, T.; Taylow, S. 2016. The effect of storage time on the grindability of loblolly pine (Pinus taeda *L.*). European Journal of Wood and Wood Products. 74(6):857-866. DOI: 10.1007/s00107-016-1070-x
3. Olatunde, G.; Fasina, O.; Adhikari, S.; McDonald, T.P.; Duke, S.R. 2016. Size measurement method for Loblolly Pine grinds and influence on predictability of fluidization. Canadian Biosystems Engineering. 58(1):1-10. DOI: http://dx.doi.org/10.7451/CBE.2016.58.4.1
4. Sharda, A.; Fulton, J.P.; McDonald, T.P. 2015. Impact of response characteristics of an agricultural sprayer control system on nozzle flow stabilization under simulated field scenarios. Computers and Electronics in Agriculture. 112:139-148.
5. Pan, P.; Fulton, J.P.; Via, B.; Hung, J.; McDonald, T.P. In Press. Predicting moisture content of chipped pine samples with a multi-electrode capacitance sensor. Biosystems Engineering. DOI: 10.1016/j.biosytemseng.2015.12.005.
6. Haridass, K.; Valenzuela, J.; Yucekaya, A.D.; McDonald, T. 2014. Scheduling a log transport system using simulated annealing. Information Sciences 264:302-316.
7. Mullenix, D.K.; Adhikari, S.; Runge, M.; McDonald, T.P.; Son, A.; Dougherty, M.; Fulton, J.P. 2014. Small-Scale Biodiesel Production: A Case Study of On-Farm Economics. Applied Engineering in Agriculture. 30(4): 585-592.
8. Wei, N.; Via, B. K.; Wang, Y.; McDonald, T.;Auad, M.L. 2014. Liquefaction and substitution of switchgrass (*Panicum virgatum*) based bio-oil into epoxy resins. Industrial Crops and Products. 57:116-123.
9. Virk, S. S.; Mullenix, D.K.; Sharda, A.; Hall, J.B.; Wood, C.W.; Fasina, O.O.; McDonald, T.P.; Pate, G.L.; Fulton, J.P. 2013. Distribution uniformity of a blended fertilizer applied using a variable-rate spinner-disc spreader. Applied Engineering in Agriculture. 29(5):627-636.
10. Virk, S. S.; Fulton, J.P.; Fasina, O.O.; McDonald, T.P. 2013. Influence of broiler litter bulk density on metering and distribution for a spinner-disc spreader. Applied Engineering in Agriculture. 29(4):473-482.

11. Virk, Simerjeet S.; Fulton, John P.; Fasina, Oladiran O.; McDonald, Timothy P. 2013. Capacitance and near-infrared techniques for the real-time moisture measurement of broiler litter. Biosystems Engineering. 116(4):357-367.
12. Jernigan, P.; Gallagher, T.; Aulakh, J.; Tufts, R.; McDonald, T. 2013. Implementing residue chippers on harvesting operations in the southeastern US for biomass recovery. International Journal of Forest Engineering. 24(2):129-136.
13. McDonald, T.P.; Haridass, K.; Valenzuela, J.; Gallagher, T.V.; Smidt, M.F. 2013. Savings in distance from optimization of coordinated trucking. International Journal of Forest Engineering. 24(1):31-41.
14. Sharda, Ajay.; Luck, Joe D.; Fulton, John P.; McDonald, Timothy P.; Shearer, Scott A. 2013. Field application uniformity and accuracy of two rate control systems with automatic section capabilities on agricultural sprayers. Precision Agriculture. 14(3):307-322.
15. Sharda, A.; Luck, J.D.; Fulton, J.P.; McDonald, T.P.; Shearer, S.A.; Mullenix, D.K. 2012. Comparison of 2-way versus metered 3-way boom shut-off valves for automatic section control on agricultural sprayers. Applied Engineering in Agriculture. 28(5):725-733.
16. Fulton, J. P.; Shearer, S. A.; Higgins, S. F. ; McDonald, T.P. 2012. A method to generate and use as-applied surfaces to evaluate variable-rate fertilizer applications. Precision Agriculture. 14(2):184-200.
17. Via, B.; McDonald, T.; Fulton, J. 2012. Nonlinear multivariate modeling of strand density from near-infrared spectra. Wood Science and Technology. 46(6):1073-1084.
18. Sharda, A.; Fulton, J.P.; McDonald, T.P.; Brodbeck, C.J. 2011. Real-time nozzle flow uniformity when using automatic section control on agricultural sprayers. Computers and Electronics in Agriculture. 79(2):169-179.
19. Kichler, C.M.; Fulton, J.P.; Raper, R.L.; McDonald, T.P.; Zech, W.C. 2011. Effects of Transmission Gear Selection on Tractor Performance and Fuel Costs during Deep Tillage Operations. Soil and Tillage Research. 113(2011): 105-111.
20. Sharda, A.; Fulton, J.P.; McDonald, T.P.; Zech, W.C.; Darr, M.J.; Brodbeck, C.J. 2010. Real-time pressure and flow dynamics due to boom section and individual nozzle control on agricultural sprayers. Trans. ASABE. 53(5):1363-1371.
21. Liu, S.; McDonald, T.; Wang, Y. 2010. Producing biodiesel from high free fatty acid waste cooking oil assisted by radio frequency heating. Fuel. 89(10):2735-2740.
22. Campbell, C.M.; Fulton, J.P.; Wood, C.W.; McDonald, T.P.; Zech, W.C. 2010. Utilizing nutrient over mass distribution patterns for assessment of poultry litter spreaders. Transactions of the ASABE. 53(3):659-666.
23. Campbell, C. M.; Fulton, J.P.; McDonald, T.P.; Wood, C.W.; Zech, W.C.; Srivastava, P. 2010. Spinner-disc technology to enhance the application of litter. Applied Engineering in Agriculture. 26(5):759-767.
24. McDonald, T.P.; Fulton, J.P.; Darr, M.J.; Gallagher, T.V. 2008. Evaluation of a system to spatially monitor hand planting of pine seedlings. Computers and Electronics in Agriculture. 64(2):173-182.
25. Liu, S.; Wang, Y.; McDonald, T.P.; Taylor, S.E. 2008. Efficient production of biodiesel using radio frequency heating. Energy & Fuels. 22(3):2116-2120.
26. Folegatti, B.S.; Smidt, M.F.; Loewenstein, E.F.; Carter, E.; McDonald, T.P. 2007. Analysis of mechanical thinning productivity and cost for use at the wildland urban interface. Forest Products Journal. 57(11):33-38.
27. Davis, J.N.; Baier, J.E.; Fulton, J.P.; Brown, D.A.; McDonald, T.P. 2007. Use of chemical soil additives to stabilize off-road vehicle trails. Applied Engineering in Agriculture. 23(5):597-602.

28. Valenzuela, J.F.; Balci, H.H.; McDonald, T. 2005. A transportation-scheduling system for managing silvicultural projects. International Journal of Forest Engineering. 16(1):65-75.
29. McDonald, T.P.; Fulton, J.P. 2005. Automated time study of skidders using global positioning system data. Computers and Electronics in Agriculture. 48(1):19-37.
30. Visser, R.J.M.; McDonagh, K.D.; Meller, R.D.; McDonald, T.P. 2004. Harvesting system simulation using a system dynamic model. Southern Journal of Applied Forestry. 28(2):91-99.
31. Jun, H.; Way, T.R.; Lofgren, B.; Landstrom, M.; Bailey, A.C.; Burt, E.C.; McDonald, T.P. 2004. Dynamic load and inflation pressure effects on contact pressures of a forestry forwarder tire. Journal of Terramechanics. 41:209-222.
32. McDonald, T.P.; Carter, E.A.; Taylor, S.E. 2002. Using the global positioning system to map disturbance patterns of forest harvesting machinery. Canadian Journal of Forest Research. 32(2):310-319.
33. Veal, M.W.; Taylor, S.E.; McDonald, T.P.; McLemore, D.L.; Dunn, M.R. 2001. Accuracy of tracking forest machines with GPS. Transactions of the ASAE. 44(6):1903-1911.
34. Carter, E.; McDonald, T.; Torbert, J. 2001. Assessment of soil strength variability in a harvested loblolly pine plantation in the piedmont region of Alabama, United States. New Zealand Journal of Forestry Science. 30(1/2):237-249.
35. Clark, M.M.; Meller, R.D.; McDonald, T.P.; Ting, C.C. 2000. A new harvest operation cost model to evaluate forest harvest layout alternatives. Annals of Operations Research. 95:115-129.
36. Clark, M.M.; Meller, R.D.; McDonald, T.P. 2000. A three-stage heuristic for harvest scheduling with access road network development. Forest Science. 46(2):204-218.
37. Vechinski, C.R.; Johnson, C.E.; Raper, R.L.; McDonald, T.P. 1999. Forestry tire tractive performance: new, worn, and with chains. Applied Engineering in Agriculture. 15(4):263-266.
38. Seixas, F.; McDonald, T. 1997. Soil compaction effects of forwarding and its relationship with 6- and 8-wheel machines. Forest Products Journal. 47(11/12):46-52.
39. McDonald, T.P.; Seixas, F. 1997. Effect of slash on forwarder soil compaction. Journal of Forest Engineering. 8(2):15-26.
40. Nienaber, J.A.; Hahn, G.L.; McDonald, T.P.; Korthals, R.L. 1996. Feeding patterns and swine performance in hot environments. Transactions of the ASAE. 39(1):195-202.
41. McDonald, T.P.; Stokes, B.J.; Aust, W.M. 1995. Soil physical property changes after skidder traffic with varying tire widths. Journal of Forest Engineering. 6(2):41-50.
42. McDonald, T.P.; Nienaber, J.A. 1994. Modeling feed intake in group-penned growing-finishing swine. Transactions of the ASAE. 37(3):921-927.
43. McDonald, T.P.; Stokes, B.J.; Wilhoit, J. 1993. Field evaluation of skidder tire tractive performance. Applied Engineering in Agriculture. 9(6):571-576.
44. McDonald, T.P.; Chen, Y.R. 1992. A geometric model of marbling in beef carcass ribeyes. Transactions of the ASAE. 35(3):1057-1062.
45. McDonald, T.P.; Nienaber, J.A.; Chen, Y.R. 1991. Modeling eating behavior of growing-finishing swine. Transactions of the ASAE. 34(2):591-596.
46. Nienaber, J.A.; McDonald, T.P.; Hahn, G.L.; Chen, Y.R. 1990. Eating dynamics of growing-finishing swine. Transactions of the ASAE. 33:2011-2018.
47. McDonald, T.P.; Chen, Y.R. 1990. Separating connected muscle tissue in images of beef carcass ribeyes. Transactions of the ASAE. 33(6):2059-2065.

48. McDonald, T.P.; Chen, Y.R. 1990. Application of morphological image processing in agriculture. Transactions of the ASAE. 33(4):1345-1352.
49. McDonald, T.P.; Jones, D.D.; Barrett, J.R.; Nienaber, J.A.; Hahn, G.L. 1988. Activity related heat increment in growing-finishing swine. Transactions of the ASAE. 31(4):1180-1186.
50. Delwiche, M.J.; McDonald, T.; Bowers, S.V. 1987. Determination of peach firmness by analysis of impact forces. Transactions of the ASAE. 30(1):249-254.

2.2 Non-refereed articles

1. McDonald. 2015. Timber and the future of technology. Guest editorial, The Landing. Accessed at: http://www.deere.com/en_US/docs/html/brochures/publication.html?id=122b9aed#2
2. Smidt, Mathew; Tufts, Robert; Gallagher, Tom; McDonald, Tim. 2005. Safety pays. Southern Logging Times. 34(1):18-20.
3. McDonald, Tim; Smidt, Mathew; Tufts, Robert; Gallagher, Tom. 2005. Trucking logistics. Southern Logging Times. 34(6):22-25.
4. Gallagher, Tom; Smidt, Mathew; Tufts, Robert; McDonald, Tim. 2005. Increasing truck payloads and performance. Forest Operations Review. 7(1):8-19.
5. Tufts, Robert; Gallagher, Tom; Smidt, Mathew; McDonald, Tim. 2004. Talking Trucking: Many factors affect performance, efficiency. Southern Logging Times. 33(12):18-20.
6. Obiozor, C.; Kelley, T.; McDonald, T.P.; Stokes, B.J. 1993. Develop computer-based instrumentation systems for measuring and recording timber harvesting machine functions - phase 1. Engineering Field Notes. 25:39-47.

2.3 Papers in published proceedings

1. McDonald, T.P.; Fulton, J.P.; Taylor, S.E.; Darr, M. 2006. Mobile data acquisition systems for documenting motor-manual silvicultural operations, in: W. Chung and H.-S. Han (Eds.), 29th Council on Forest Engineering Conference, Coeur d'Alene, Idaho. pp. 383-392.
2. McDonald, T.; Taylor, S.; Valenzuela, J. 2001. Potential for shared log transport services, in: J. Wang, et al. (Eds.), 24th annual meeting of the Council on Forest Engineering, Appalachian hardwoods - managing change, Corvallis, OR: Council on Forest Engineering, 2001 July 15-19: Snowshoe, WV. pp. 115-120. [CDROM].
3. McDonald, T.P.; Rummer, R.B.; Taylor, S.E.; Roberson, J.R. 1998. Using GPS to evaluate traffic patterns of forest harvesting equipment, First International Conference on Geospatial Information in Agriculture and Forestry, ERIM, 1998 June 1-3; Orlando, FL. pp. 465-471.
4. McDonald, T.P. 1998. A system for drawing synthetic images of forested landscapes, in: T. A. Waldrop (Ed.), Ninth Biennial Southern Silvicultural Conference, Asheville, NC, USDA Forest Service, Southern Research Station, 1997 February 25-27; Clemson, SC. pp. 623-626.
5. McDonald, T.; Stokes, B. 1998. A forest landscape visualization system, 7th International Conference on Computers in Agriculture, American Society of Agricultural Engineers, 1998 October 26-30; Orlando, FL. pp. 753-760.

6. McDonald, T.; Carter, E.; Taylor, S.; Torbert, J. 1998. Relationship between site disturbance and forest harvesting equipment traffic, 2nd Southern Forestry GIS Conference, University of Georgia Continuing Education, Darnell School of Forest Resources, 1998 October 28-29; Athens, GA. pp. 85-92.
7. Carter, E.A.; McDonald, T.P. 1998. Interaction among machine traffic, soil physical properties and Loblolly pine root proliferation in a piedmont soil, in: T. A. Waldrop (Ed.), Ninth Biennial Southern Silviculture Conference, USDA Forest Service, Southern Research Station, 1997 February 25-27; Clemson, SC. pp. 368-372.
8. McDonald, T.; Stokes, B. 1997. Visual quality assessment of alternative silvicultural practices in upland hardwood management, Council on Forest Engineering 20th Annual Meeting, Forest Operations for Sustainable Forests and Healthy Economies, Council on Forest Engineering, 1997 July 28-31; Rapid City, SD. pp. 165-169.
9. Clark, M.M.; Meller, R.D.; McDonald, T.P.; Ching, C.C. 1997. A new harvest operation cost model to evaluate forest harvest layout alternatives, Council on Forest Engineering 20th Annual Meeting, Forest Operations for Sustainable Forests and Healthy Economies, Council on Forest Engineering, 1997 July 28-31; Rapid City, SD. pp. 42-47.
10. Stokes, B.J.; McDonald, T.P.; Kelley, T. 1994. Transpirational drying and costs for transporting woody biomass - a preliminary review, IEA/BA Task IX, Activity 6 Conference, Aberdeen University, 1994 May 16-25: New Brunswick, Canada. pp. 76-91.
11. McDonald, T.P.; Stokes, B.J. 1994. Harvesting costs and utilization of hardwood plantations, in: B. J. Stokes and T. P. McDonald (Eds.), IEA/BA Task IX, Activity 1 International Conference, Short Rotation Intensive Culture Forestry, USDA Forest Service, 1994 March 1-3: Mobile, AL. pp. 5-13.
12. Nienaber, J.A.; Hahn, G.L.; Korthals, R.L.; McDonald, T.P. 1993. Eating behavior of swine as influenced by environmental temperature, International Livestock Environment Symposium IV. pp. 945-956.
13. McDonald, T.P.; Stokes, B.J.; Vechinski, C.; Aust, W.M. 1993. Rut formation potential of wide-tire-equipped skidders, 11th International Conference of the International Society for Terrain-Vehicle Systems, 1993 September 27-30: Lake Tahoe, NV. pp. 724-733.
14. Chen, Y.R.; McDonald, T.P. 1990. Application of AI to carcass beef grading automation, 1990 Food Processing Automation Conference, ASAE, 1990 May 6-8: Lexington, KY. pp. 244-255.

2.3.1 Papers in published proceedings - International

1. Taylor, S.E.; McDonald, T.P.; Fulton, J.P.; Shaw, J.N.; Corley, F.W.; Brodbeck, C.J. 2006. Precision forestry in the southeast US, in: P. A. Ackerman, et al. (Eds.), Precision Forestry in plantations, semi-natural and natural forests. Stellenbosch University, Stellenbosch, South Africa. pp. 397-414.
2. McDonald, T.P.; Fulton, J.P.; Darr, M.; Taylor, S.E.; Corley, F.W.; Brodbeck, C.J. 2006. GPS-based documentation of manual silvicultural operations, in: P. A. Ackerman, et al. (Eds.), Precision Forestry in plantations, semi-natural and natural forests, Forest Engineering, Department of Forest and Wood Science, Stellenbosch University, Stellenbosch University, Stellenbosch, South Africa. pp. 489-501.
3. McDonald, T.P.; Rummer, R.B.; Grift, T.E. 2003. Diameter sensors for tree-length harvesting systems, in: M. I. Wide and B. Baryd (Eds.), 2nd Forest Engineering Conference, Skogforsk, Uppsala Science Park, SE-751 83 UPPSALA, Sweden, Vaxjo, Sweden. pp. 45-54.

4. Seixas, F.; Stokes, B.; Rummer, B.; McDonald, T. 1996. Harvesting soil impacts for selected silvicultural prescriptions, IUFRO P3.07 Meeting: The Way Ahead With Harvesting and Transportation Technology, International Union of Forestry Research Organizations XX World Congress, 1995 August 6-12; Tampere, Finland. pp. 230-238.
5. Seixas, F.; Rummer, R.; McDonald, T.P. 1996. Forest Harvesting in the United States: a search for sustainable management in balance with the ecosystem, Seminario De Atualizacao, Sistemas de Colheita de Madeira e Transporte Florestal, Universidade Federal do Parana, 1996 May 19-24; Parana, Brasil. pp. 73-94.
6. McDonald, T.; Way, T.; Lofgren, B.; Seixas, F.; Landstrom, M. 1996. Load and inflation pressure effects on soil compaction of forwarder tires, Symposium on Forest Certification, Environmental Implications for Forestry Operations, Canadian Pulp and Paper Association, Canadian Woodlands Forum, and IUFRO, 1996 September 9-11; Quebec City, Canada. pp. 67-70.
7. McDonald, T.P.; Stokes, B.J.; McNeel, J.F. 1995. Effect of product form, compaction, vibration and comminution on energywood bulk density, Workshop on Preparation and Supply of High Quality Wood Fuels, IEA/BA Task IX, 1994 June 13-16; Garpenburg, Sweden. pp. 6-23.
8. Stokes, B.J.; Rummer, R.B.; McDonald, T.P.; Seixas, F. 1994. Biological and mechanical interactions - what do we know?, 1994 Interactive Workshop and Seminar, FORSITRISK, Soil, Treee, Machine Interactions, 1994 July 4-8: Feldafing, Germany. pp. 1-17.
9. McDonald, T.; Stokes, B. 1994. Status of short rotation forestry in the USA, Status of Short Rotation Forestry Mechanization Worldwide, ETSU; Oxford, IK, 1993 March 2-4: Uppsala, Sweden. pp. 21-44.
10. Chen, Y.R.; McDonald, T.P. 1990. Artificial intelligence application in carcass beef grading automation, IROS '90, Institute of Electrical and Electronic Engineers, 1990 July 3-6: Tsuziura, Japan. pp. 271-278.

3 Papers or lectures

3.1 Papers written for professional meetings

1. McDonald, T.; Klepac, J. 2015. Modelling the productivity of feller-bunchers in small diameter pine plantations. COFE Annual Meeting, Lexington, KY: 20-23 July. 6pp.
2. McDonald, T.P.; Pan, P. 2015. Tree diameter and the acoustic signature of feller-buncher saws. Forest Products Society Annual Meeting, June 2-5. Atlanta, GA. 4pp.
3. McDonald, Tim; Fulton, John; Gallagher, Tom; Smidt, Mathew. 2014. Correlation between tree size and disc saw speed during felling using a wheel-mounted feller-buncher. COFE Annual Meeting, Moline, IL: 23-25 June. 7pp.
4. Bridges, R.; McDonald, T. 2014. Effect of feller buncher load density on harvest efficiency of small stem diameter biomass. Paper No. 141909691, presented at 2014 ASABE and CSBE/SCGAB Annnual International Meeting. 13-16 July: Montreal, Quebec, Canada. 8 pp.
5. Virk, S.S.; Fulton, J.P.; McDonald, T.P.; Balkcom, K.S.; Poncet, A.; Brooke, A.B. 2014. Impact of Ground Speed and Varying Seeding Rates on Meter Performance. ASABE Paper No. 141897985. St. Joseph, Mich.: ASABE.
6. Virk, S.S.; Fulton, J.P.; McDonald, T.P.; Balkcom, K.S.; Poncet, A.; Brooke, A.B. 2014. Current Performance of Planter Technology to Support Variable-rate Seeding in the Southern US. ASABE Paper No. 141898019. St. Joseph, Mich.: ASABE.

7. Virk, S.S., A. Poncet, J.P. Fulton, K.S. Balkcom, B. Ortiz, T.P. McDonald, and G.L. Pate. 2014. Row-Crop Planter Requirements to Support Variable-rate Seeding of Maize. In Proceedings of the 12th International Conference on Precision Agriculture, Sacramento, CA, July 20-23.
8. McDonald, Tim; Corley, Frank; Hindman, Nick. 2013. Performance of a prototype eLoad Sheet for monitoring timber hauling operations. COFE Annual Meeting, Missoula, MT: 8-10 July. 4 pp.
9. McDonald, Timothy; Fulton, John; Pan, Pengmin. 2012. Mapping machine productivity and tree size of a feller-buncher harvesting biomass in pine plantations. COFE Annual Meeting, New Bern, NC: 10-12 September. 10 pp.
10. Pan, Pengmin; McDonald, Timothy; Taylor, Steve; Fulton, John. 2012. Real-time monitoring mass-flow of wood chips based on force sensor. COFE Annual Meeting, New Bern, NC: 10-12 September. 7 pp.
11. Sharda A.; Luck, J.D.; Fulton, J.P.; McDonald, T.P.; Shearer, S.A.; Mullenix, D.K. 2011. Effect of agricultural sprayer flow control hardware on nozzle response. ASABE Paper No. 1111791. ASABE Annual International Meeting, Louisville, Kentucky: August 7-10.
12. Virk S.; Hall, J.; Mullenix, D.K.; Sharda, A.; Wood, C.W.; Pate, G.; Fulton, J.P.; Fasina, O.; McDonald, T. 2011. Mass and nutrient distribution uniformity of a blended fertilizer using a spinner spreader equipped with VRT. ASABE Paper No. 1111149. ASABE Annual International Meeting, Louisville, Kentucky: August 7-10.
13. Hall, J.B; Fulton, J.P.; Fasina, O.O.; McDonald, T.P.; Pate, G. 2011. Using 3-D simulation to evaluate spinner spreader performance for variable-rate application of poultry litter. ASABE Paper No. 1111193. ASABE Annual International Meeting, Louisville, Kentucky: August 7-10.
14. Mullenix, D.K.; Adhikari, S.; Runge, M.; McDonald, T.P.; Son, A.; Fulton, J.P.; Dougherty, M. 2011. Small-scale biodiesel production: a case study of on-farm economics. ASABE Paper No. 1111041. ASABE Annual International Meeting, Louisville, Kentucky: August 7-10.
15. McDonald, T.P.; Haridass, K.; Valenzuela, J. 2010. Mileage savings from optimization of coordinated trucking. Proceedings of the 2010 Council of Forest Engineers Conference. 7-9 June. Auburn, AL. 11 pp.
16. McDonald, T.P.; Rummer, R.B. 2010. Temperature variations and spark generation from rock contact in hot saws. Proceedings of the 2010 Council of Forest Engineers Conference. 7-9 June. Auburn, AL. 12 pp.
17. Sharda, A.; Luck, J.D.; Fulton, J.P.; Shearer, S.A.; McDonald, T.P. 2010. Nozzle uniformity for agricultural sprayers operating under field operation when using automatic section control technology. ASABE Paper No. 1009386. ASABE Annual International Meeting, Pittsburgh, PA, June 20-23.
18. Fulton, J.P.; Darr, M.J.; McDonald, T.P.; Taylor, S.E.; Corley, F.W. 2005. Customized backpack sprayers for site-specific herbicide application in forestry operations. In: Proceedings of the ASAE Annual International Meetin; 17-20 July; Tampa, FL: ASAE Paper No 051043. (Abstract).
19. Ayala, R., P. Srivastava, C. Brodbeck, E. Carter, and T. McDonald. 2005. Water Quality Impacts from an ORV Trail Stream Crossing in the Talladega National Forest, Alabama, USA. Soil, Water, and Timber Management: Forest Engineering Solutions in Response to Forest Regulation. Proceedings of the Council on Forest Engineering, 28th Annual Meeting, July 11-14, 2005.
20. Ayala, R., P. Srivastava, C. Brodbeck, E. Carter, and T. McDonald. 2005. Modeling Sediment Transport from an Off-Road Vehicle Trail Stream Crossing Using WEPP Model. Annual International Meeting of American Society of Agricultural and Biological Engineers. Tampa, FL.

21. Valenzuela, J.; Balci, H.; McDonald, T. 2002. A simulation-based optimization model for planning forest operations, 25th Annual COFE Meeting, Forest Engineering Challenges: A Global Perspective, COFE, Portland, OR, Auburn, AL. pp. 5 p.
22. Taylor, S.E.; McDonald, T.P.; Veal, M.W.; Corley, F.W.; Grift, T.E. 2002. Precision Forestry: Operational tactics for today and tomorrow, 25th Annual Meeting of the Council of Forest Engineers, Portland, OR: Council of Forest Engineers, 2002 June 13-16; Auburn, AL. pp. 6.
23. McDonald, T.; Rummer, B. 2002. Variation in skidder productivity over time in timber harvest, 25th Annual COFE Meeting. Forest Engineering Challenges: A Global Perspective, Council of Forest Engineers, Portland, OR, Auburn, AL. pp. 5 p. [CDROM].
24. Taylor, S.E.; McDonald, T.P.; Veal, M.W.; Grift, T. 2001. Using GPS to evaluate productivity and performance of forest machine systems, 1st International Precision Forestry Symposium, 2001 June 17-20: Seattle, WA. pp. 18 p. [CDROM].
25. McDonald, T.P.; Taylor, S.E.; Rummer, R.B.; Valenzuela, J. 2001. Information needs for increasing log transport efficiency, 1st International Precision Forestry Symposium, 2001 June 17-20: Seattle, WA. pp. 12 p. [CDROM].
26. McDonald, T.; Twaddle, A. 2000. Industry trends in chip storage and handling, TAPPI 2000 pulping/process and product quality conference, TAPPI Press, Atlanta, GA, 2000 November 5-9: Boston, MA. pp. 7 p. [CDROM].
27. McDonald, T.; Rummer, B.; Taylor, S. 2000. Automating time study of feller-bunchers, Joint COFE 23rd Annual Meeting/ Canadian Woodlands Forum 81st Annual Meeting, Technologies for new millennium forestry, COFE, Portland, OR, 2000 September 11-13: Kelowna, BC, Canada. pp. 4 p [CDROM].
28. Carter, E.A.; McDonald, T.P.; Torbert, J.L. 2000. Harvest traffic monitoring and soil physical response in a pine plantation, in: P. C. Robert, et al. (Eds.), 5th International Conference on precision agriculture, Madison, WI: American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, 2000 July 16-19: Bloomington, MN. pp. 13.
29. Carter, E.; McDonald, T.; Torbert, J. 1999. Assessment of soil strength variability in a harvested loblolly pine plantation in the Piedmont region of Alabama, United States, IEA Task 18 Conventional Systems for Bioenergy Workshop, Rotorua, NZ: New Zealand Forest Research Institute, 1999 September 19-21: Charleston, SC. pp. 12.
30. McDonald, T.; Carter, E.; Taylor, S.; Torbert, J. 1998. Traffic patterns and site disturbance, 21st Annual Council on Forest Engineering Annual Meeting, Harvesting Logistics: From woods to markets, Council on Forest Engineering, 1998 July 20-23; Portland, OR. pp. 5 p.
31. McDonald, Tim; Seixas, Fernando. 1996. Soil compaction effects of forwarding and its relationship with drive train configuration. ASAE Paper No. 96-5007. St. Joseph, MI. American Society of Agricultural Engineers. 15 p.
32. Carter, Emily; McDonald, Tim; Samuelson, Lisa. 1996. Root damage from forwarder traffic - preliminary results. ASAE Paper No. 96-5001. St. Joseph, MI. American Society of Agricultural Engineers. 10 p.
33. McDonald, T.P.; Stokes, B.J.; Rummer, R.B.; Seixas, F. 1995. A skidder-mounted ripping tool for skid trail bulk density remediation. ASAE Paper No. 95-7205. St. Joseph, MI. American Society of Agricultural Engineers. 10 p.
34. Seixas, F.; McDonald, T.P.; Stokes, B.J.; Raper, R.L. 1995. Effect of slash on forwarder soil compaction, 18th Annual Meeting of the Council on Forest Engineering, Sustainability, Forest Health & Meeting the Nation's Needs for Wood Products, Council on Forest Engineering, 1995 June 5-8: Cashiers, NC. pp. 10.

35. McDonald, T.P.; Seixas, F.; Stokes, B.J. 1995. Soil compaction effects of forwarding with wide tires and tracks. ASAE Paper No. 95-7203. St. Joseph, MI. American Society of Agricultural Engineers. 12 p.
36. McDonald, T.P. 1994. Computer-aided visualization in the Pacific Northwest, Southcentral Technical Division Meeting of the APA, American Pulpwood Association, Jackson, MS. pp. 4.
37. Chen, Y.R.; McDonald, T.P.; Eigenberg, R.A. 1990. Fractal analysis of ribeye surface texture, Symposium on Chaos in Biology and Agriculture: Statistical Issues, Institute of Agriculture and Natural Resources, University of Nebraska, 1990 July 3-5; Lincoln, NE.
38. Vechinski, Cynthia R.; Johnson, Clarence E.; Raper, Randy L.; McDonald, Timothy P.1993. Forestry tire tractive performance: new, worn, and with chains. ASAE Paper No. 931519. St. Joseph, MI. American Society of Agricultural Engineers. 13 p.
39. Korthals, R.L.; Hahn, G.L.; Nienaber, J.A.; McDonald, T.P.; Eigenberg, R.A. 1992. Experiences with transponders for monitoring bioenergetic responses. ASAE Paper No. 923010. St. Joseph, MI. American Society of Agricultural Engineers. 13 p.
40. McDonald, T.P.; Stokes, B.J.; Wilhoit, J. 1992. Field evaluation of skidder tire tractive performance. ASAE Paper No. 927514. St. Joseph, MI. American Society of Agricultural Engineers. 19 p.
41. McDonald, T.P.; Nienaber, J.A. 1992. Modeling feed intake in group-penned growing-finishing swine. ASAE Paper No. 924023. St. Joseph, MI. American Society of Agricultural Engineers. 10 p.
42. Nienaber, J.A.; Hahn, G.L.; McDonald, T.P. 1991. Thermal environment effects on feeding patterns and swine performance. ASAE Paper No. 914026. St. Joseph, MI. American Society of Agricultural Engineers. 13 p.
43. Chen, Y.R.; McDonald, T.P.1990. Automated image segmentation in a restrictive domain: locating and isolating longissimus-dorsi muscle within a rib. ASAE Paper No. 907049. St. Joseph, MI. American Society of Agricultural Engineers. 9 p.
44. McDonald, T.P.; Chen, Y.R. 1989. Application of morphological image processing in agriculture. ASAE Paper No. MCR-89-130. St. Joseph, MI. American Society of Agricultural Engineers. 14 p.
45. McDonald, T.P.; Nienaber, J.A.; Chen, Y.R. 1989. Predicting feeding behavior of growing-finishing swine. ASAE Paper No. 894587. St. Joseph, MI. American Society of Agricultural Engineers. 14 p.
46. Nienaber, J.A.; McDonald, T.P.; Hahn, G.L.; Chen, Y.R. 1989. Group feeding behavior of swine. ASAE Paper No. 894519. St. Joseph, MI. American Society of Agricultural Engineers. 14 p.
47. McDonald, T.P.; Nienaber, J.A. 1988. Reducing noise in deconvolved signals. ASAE Paper No. 884501. St. Joseph, MI. American Society of Agricultural Engineers. 11 p.

3.1.1 Papers written for professional meetings - International

1. McDonald, Tim; Pan, Pengmin; Wang, Qun; Fulton, John; Fasina, Oladiran; Taylor, Steve. 2014. Real-time measurement of biomass properties using infrared reflectance and capacitive sensors. Precision Forestry Symposium, Stellenbosch, South Africa: 3-5 March. 12 pp.
2. McDonald, T.; Haridass, K.; Smidt, M.; Valenzuela, J. 2010. Reduction in unloaded log transport mileage using route optimization. Precision Forestry Symposium, Stellenbosch, South Africa, March 2010.

3. Taylor, S.E.; Fulton, J.P.; McDonald, T.P. 2005. Tactical Precision Forestry: site-specific silvicultural operations in the southeast USA. In: Proceedings of the XXII IUFRO World Congress; 8-13 August; Brisbane, Australia: (Abstract).
4. McDonald, T. 1999. Time study of forest harvesting equipment using GPS-derived positional data, 1st International Forest Engineering Group Conference, Forestry Engineering for Tomorrow, Silsoe, UK, Institution for Agricultural Engineers, 1999 June 28-30; Edinburgh, Scotland. pp. 8 p.

3.2 Presentations for professional meetings with published abstracts

3.3 Invited Lectures

McDonald, Timothy. 2013. Monitoring forestry equipment. Southeastern Society of American Foresters, Special Session on Technology in Forestry. Mobile, AL. 29 January.

McDonald, Timothy. Carter, Emily. 2005. Soil disturbance patterns – measurement and sampling techniques. Cut-to-Length Workshop: Southern Innovations and Applications. Southern Forest Engineering Center. 25 August.

3.3.1 Invited Lectures - International

McDonald, Timothy; Wang, Yifen. 2013. Acquiring data anywhere: Research outside the lab. Research Frontiers Lecture. College of Food Science and Technology, Shanghai Ocean University. 27-28 November.

McDonald, T. Wang, Y. 2013. Biomass energy research in the Southeast. Zhiejang University, Biosystems Engineering Department. 29 November.

4 Exhibitions

None.

5 Performances

None.

6 Patents and inventions

6.1 Patent disclosures filed but not pursued.

McDonald, T., Corley, F., Fulton, J., Taylor, S. 2005. Device to Monitor Hand Planting Activity of Pine Tree Seedlings in Real Time. Auburn University Patent Disclosure AU05-058. 8 September.

7 Other research/creative contributions

- Member of the Steering Committee for the International Precision Forestry Symposium, held every four years from 2002 to the present.
- Served as mentor to a USDA SEED fellow, Evan Betterton, Jun-Aug 2013. He completed a project using smart phones to track log truck movements and generate information on turn times. The goal was to develop simple, portable, and cheap systems for measuring the efficiency of a log transport system.
- Hosted a visiting scientist, Camila Mazão, from the University of São Paulo, Ecola Superior Agricultura a 'Luiz de Queiroz' during the period Mar-Jun 2012. She completed a project evaluating automated time study in skidders and has submitted a paper for publication to a Brazilian journal, entitled 'Comparao entre mtodos de estudo de tempo: uma aplicao operao de arraste florestal com uso de skidder'.

8 Grants and contracts

8.1 Contracts and grants received.

Authors *(PI)*	Title	Funding Source	Duration	Amount
McDonald, Taylor, Ortiz, Knappenberger, Pate	Replacement of GPDS equipment	Alabama Ag Experiment Station	2015	$73,494
McDonald, Fasina, Gallagher	*In-situ* moisture determinatio for woody biomass	8/15-9/16	USDA Forest Service	
Fulton, Pate, McDonald, Hall	Variable orifice nozzle evaluation	Alabama Commodity Groups	2012 - 2015	$11,000
Fulton, Wood, Pate, Fasina, McDonald	Evaluating the potential for blended fertilizer segregation during application with spinner spreaders	Alabama Commodity Groups	2012 - 2015	$24,500

Authors *(PI)*	Title	Funding Source	Duration	Amount
Taylor, Rials, Kelley, Henchee, et al.	Southeastern partnership for integrated biomass supply systems	USDA AFRI - Sustainable Bioenergy	1/12 - 12/16	$15MM
T. McDonald, T. Burch	Energy efficiency of a novel fast pyrolysis system	US DoD	1/12 - 9/12	$52,773
Fulton, Wood, Pate, Fasina, McDonald	Potential of blended fertilizer segregation during variable rate application	International Plant Nutrition Institute	2011 - 2013	$2,864
Fulton, Sharda, Winstead, McDonald, Hall	Variable orifice nozzle evaluation	Cotton, Inc.	2011	$4,500
Fulton, Wood, Pate, Fasina, McDonald	Impact of spreader design and setup on blended fertilizer application	International Plant Nutrition Institute	2011	$35,000
B. Ortiz, J. Fulton, P. Mask, J. Shaw, B. Guertal, T. McDonald	Precision Agriculture: Management Approaches Toward Environmental Stewardship for Alabama	USDA CSREES	8/10 - 8/12	$389,950
S. Taylor, F. Corley, R. Rummer, ...	High tonnage biomass production from a southern pine energy plantation	7/10 - 12/13	US DOE	$4.9MM
T. McDonald, Y. Wang	Factors affecting yield and quality of biodiesel: Monitoring biodiesel quality for the City of Enterprise	3/09 - 12/09	ADECA	$45,000
T. McDonald, Y. Wang	American Bio-fuels Cooperative Proposal	1/09 - 12/09	ADECA	$30,000
T. McDonald, T. Gallagher, M. Smidt	Potential ignition from the operation of hotsaws	USDA Forest Service	10/07 - 12/08	$15,000
Mask, Howe, Fulton, Shaw, McDonald, Adrian	Precision Agriculture Technologies to increase production efficiency in Alabama	USDA CSREES	8/8 - 8/10	$413,605
Fulton, Mask, Shaw, McDonald, Taylor	Precision Agriculture - Alabama	USDA CSREES	8/8 - 8/10	$415,769
Taylor, Fulton, McDonald, Hall	Bioenergy and bioproducts demonstration vehicle	Wheat and Feed Grain Committee	3/07 - 3/10	$5,000
Barlow, Smidt, Zhang, McDonald	Wood production systems and cost in the US South	NCASI	8/08 - 12/09	$20,000
Fasina, Fulton, McDonald	Agglomeration of biomass feedstocks for bioenergy applications	Southeast Regional SunGrant	10/07 - 9/09	$50,000

Authors *(PI)*	Title	Funding Source	Duration	Amount
Fulton, Mask, McDonald, Shaw, Dougherty, Srivastava, Taylor	Use of precision agriculture technologies for natural resource management	USDA CSREES	8/06 - 8/08	$555,507
McDonald, Zech, Gallagher	Revision of biomass harvest cost analyzer	USDA Forest Service	10/06 - 12/07	$30,000
Fulton, Burmester, McDonald, Norwood, Shaw	Calibration of Granular Variable-Rate Application Equipment: Volume versus Mass Measurement for Pattern Assessment.	Alabama Wheat and Feed Grain Committee	8/05 - 10/06	$4,200
Srivastava, McDonald	Reducing Sediment Yield from ORV Trails through Monitoring and Modeling	USDA Forest Service	9/05 - 8/07	$10,000
Fulton, Mask, McDonald, Shaw, Srivastava, Smidt, Dougherty, Taylor	Precision Agriculture and Precision Forestry - Alabama	USDA-CSREES Special Grant	8/05 - 7/07	$561,821
McDonald, Gallagher, Fulton	Establishing Norms for Maintenance Practices on Southern National Forest ORV Trails	USDA Forest Service	9/04 - 3/06	$19,775
Stringer, Barton, McDonald, Smidt	Timber harvesting analysis using GPS and GIS	UKY - USDA CSREES Special Grant Competitive Award	3/05 - 3/08	$133,909
McDonald, Mask, Fulton, Shaw, Taylor	Precision Agriculture and Precision Forestry	USDA CSREES Special Grant	7/04 - 6/06	$544,330
McDonald, Taylor	Poultry house distributed generation using recycled vegetable oils	Alabama Department of Economic and Community Affairs	11/03 - 5/06	$49,900
Gallagher, Smidt, Tufts, McDonald, Taylor, Rummer	How to improve transport efficiency and cost	Wood Supply Research Institute	9/03 - 9/04	$45,200
Mask, Shaw, McDonald, Taylor	Precision Agriculture and Precision Forestry	USDA CSREES Special Grant	7/03 - 6/05	$440,000
McDonald, Baier, Taylor	Monitoring Off-trail Sediment Production of the Kentuck ORV System	USDA Forest Service	5/03 - 6/04	$9,720

Authors *(PI)*	Title	Funding Source	Duration	Amount
Baier, McDonald, Taylor, Tufts	Erosion and Recreational Trails: Construction and Maintenance Practices to Minimize Watershed Impacts	Environmental Institute	5/03 - 8/05	$80,000
			Total:	$23,908,000

C Outreach

1 Commentary

I have no formal extension appointment, but do fully support the mission of Auburn as a land-grant University. My goal in promoting that mission is to work with colleagues here at Auburn, and in the wider forestry community, to support the sustainability and economic advancement of the forest products industry in the state and nation, and to provide expertise in specific subject areas to interested landowners or operations contractors.

2 Outreach Publications

2.1 Circulars

- Fulton, J.P.; Raper, R.; McDonald, T.P.; Tyson, T. 2006. ANR-1303: Fuel Conservation Strategies for the Farm. Circular. Alabama Cooperative Extension System, Auburn University. 5pp, 2500 copies.

2.2 Timely Information Sheets

- Fulton, J.P.; Raper, R.; McDonald, T.P.; Tyson, T. 2006. Fuel Conservation Strategies for the Farm, BSEN06-02, Timely Information Web publication, www.aces.edu/timelyinfo/BioSysEng/2006/April/BSEN-06-02.pdf, Alabama Cooperative Extension System, 5pp.

2.3 Popular Press Publications

- Gallagher, T., T. McDonald, M. Smidt, and R. Tufts. 2005. Increasing truck payloads and performance. FRA Technical Release 05 R 1. 3 p.

- Gallagher, T., T. McDonald, M. Smidt, and R. Tufts. 2005. Lets talk trucking: Weights and loading methods. FRA Technical Paper 05 P 2. 4 p.
- McDonald, T., M. Smidt, R. Tufts, and T. Gallagher. 2005. Improving log truck logistics. FRA Technical Release 05 R 9. 2 p.
- McDonald, T., M. Smidt, R. Tufts, and T. Gallagher. 2005. Lets talk trucking: Log truck logistics. FRA Technical Paper 05-P-4.
- McDonald, T., M. Smidt, R. Tufts, and T. Gallagher 2005. Trucking logistics. Southern Loggin Times June 2005.
- Smidt, M., R. Tufts, T. Gallagher, and T. McDonald. 2005. Safety pays. Southern Loggin Times January 2005.
- Smidt, M., R. Tufts, T. Gallagher and T. McDonald. 2005. Lets talk trucking: Safety and driver management. FRA Technical Paper 05-P-5.
- Smidt, M.F., T. Gallagher, and B. Jones. 2005. Trucking issues (American Logging Council Eagle) Timber Harvesting July/August 2005.
- Tufts, R., T. Gallagher, T. McDonald, and M. Smidt. 2005. Lets talk trucking: Truck performance and fuel consumption. FRA Technical Paper 05 P 3. 6 p.
- Tufts, R., T. Gallagher, T. McDonald, and M. Smidt. 2005. Lets talk trucking: Trucks and trailers in use in the South. FRA Technical Release 05 P 1. 8 p.
- Tufts, R., T. Gallagher, T. McDonald, and M. Smidt. 2005. Trucks and trailers in the South. FRA Technical Release 05 R 8. 3 p.
- Tufts, R., T. Gallagher, T. McDonald and M. Smidt. 2004. Talking trucking. Southern Loggin Times December 2004.

2.4 Presentations at Workshops, Training Events

- Smidt, M.; McDonald, T. 2005. Technology tools for logging. 30 minutes. Auburn, Demopolis, Boaz, and Thomasville, AL. 32 participants.
- Basic hydraulic system design. 2012. Continuing Logger Education Series. Remote Presentation. 11 December.
- McDonald, T. 2014. Technology for improving efficiency of forest operations. Southern Forest Engineering Center Research Update. CAT ForestPro Training Center. 14 August. 42 participants.
- McDonald, T.; Bridges, R. 2014. UAVs in forestry. War Eagle Chapter, Society of American Foresters. CAT ForestPro Training Center. 16 September. 28 participants.

D Service

1 University Service

- University Senate. 2005—2009.

1.1 College Service

- College of Agriculture Planning Committee member. 2003—2005.
- Dean Search Committee member. 2004.
- College of Agriculture Request for Equipment funding review committee. 2007—2008,2012.
- Ag Illustrated advisory committee. 2011-2013.
- Judge, College of Engineering Graduate Showcase. 2014.

1.2 Departmental Service

- Chair, Search Committee for Forest Engineering position. 2003—2004.
- Member, Search Committee for Food and BioProcess Engineering position. 2003—2004.
- Member, Search Committee for Bioenergy position. 2009.
- Chair, Computer Committee. 2009—present.
- Member, Graduate Student Admissions Committee. 2011—present.
- Faculty advisor to Quarter-scale Tractor Student Competition Team. 2004—present.
- Faculty advisor to Student Branch, ASABE. 2004, 2007,2011,2014.

2 Professional Service

- Member Engineer, American Society of Agricultural and Biological Engineers.
  - President, Alabama State Section. 2007—2008.
  - Treasurer, Alabama State Section. 2011-present.
- Member, Council of Forest Engineers.
- Member, Forest Products Society.
- Reviewer for Forest Science, Southern Journal of Applied Forestry, International Journal of Forest Engineering, Forest Products Journal, Transactions of the ASABE, Applied Engineering in Agriculture, Computers and Electronics in Agriculture, Croatian Journal of Forest Engineering
- Review panelist for USDA NIFA RFA, August 2014. Also reviewer for SBIR, Sun Grant, DOE.