



PROPOSAL TRANSMITTAL

Date: 3/6/2009

OSP No: 134561

Title: Examine Current and Future Costs and Revenues from Forest Products and OGM Extraction on Pennsylvania Game Commission Lands (PGC)

Submitted to: John Rowe
PA Legislative Budget and Finance Committee
jrowe@lbfc.legis.state.pa.us

Program:

Submitted by: Michael G. Jacobson
Bruce E. Lord
Marc E. McDill
Andrew N. Kleit
James T. Engelder

Budgetary Contact:

Kaye Fetzer
Coordinator, Research and Administrative Services
College of Agricultural Sciences
107 Agricultural Administration Building
University Park, PA 16802-2602
Tele: 814/865-5419
Fax: 814/865-0323
E-Mail: kxz2@psu.edu

Contractual Contact:

Cheryl George
Office of Sponsored Program
The Pennsylvania State University
110 Technology Center
University Park, PA 16802
Tele: 814/863-0674
Fax: 814/865-3377
E-Mail: cqm2@psu.edu

Comments:

Revised Proposal. Replaces proposal submitted on 3/2/09.

cc: OSP
File
B. A. McPheron
M. Messina
S. Lavan

M. G. Jacobson
B. E. Lord
M. E. McDill
A. N. Kleit
J. T. Engelder

The Pennsylvania State University employs individuals and accepts students and graduate research students from a multitude of national backgrounds. As an entity, the University is subject to, and works diligently to obey, federal regulations regarding the export of controlled technologies and data. Sponsor, as an independent entity, is individually responsible for ascertaining its compliance with federal export laws and procedures. If Sponsor anticipates disclosure or provision of controlled technology or data to University as part of the proposed sponsored project, Sponsor should inform University, in writing, of the existence of, and information concerning the scope and extent of, such anticipated disclosures or provisions.

Please reference OSP Number in all correspondence.

Proposal to Examine Current and Future Costs and Revenues from
Forest Products and OGM Extraction on
Pennsylvania Game Commission Lands (PGC)

Submitted by:
The Pennsylvania State University
College of Agricultural Sciences
School of Forest Resources

Submitted to:
John Rowe
PA Legislative Budget and Finance Committee
jrowe@lbfc.legis.state.pa.us

Submitted By:



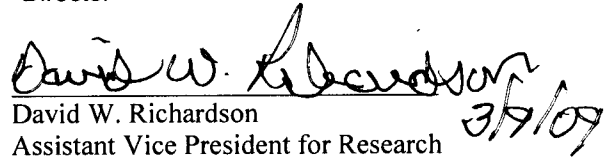
Michael Jacobson
Principal Investigator

300 Forest Resources Building
University Park, PA 16802
P: 814-865-3994
F: 814-865-6275

Approved by:



Michael Messina
Director



David W. Richardson
Assistant Vice President for Research 3/7/09

For negotiation of awards, contact:
Timothy M. Stodart, Lead Contract & Proposal Specialist
Office of Sponsored Programs
110 Technology Center Building
University Park, PA 16802-7000
Tele: 814/865-1027
Fax: 814/865-3377
E-mail: tms21@psu.edu

Proposal to Examine Current and Future Costs and Revenues from Forest Products and OGM
Extraction on Pennsylvania Game Commission Lands (PGC)

Submitted to The Pennsylvania Legislative Budget and Finance Committee
February 2009

Co –Investigators:

Dr. Michael Jacobson, Associate Professor, School of Forest Resources

Dr. Bruce Lord, Senior Research Assistant, School of Forest Resources

Dr. Marc McDill, Associate Professor, School of Forest Resources

Dr Andrew Kleit, Professor, Energy and Environmental Economics

Dr. Terry Engelder, Professor, Geosciences

Statement of Problem:

The Pennsylvania Game Commission (PGC) administers 1.4 million acres of State Game Lands. While the agency’s primary mission is “to protect, propagate, manage, and preserve the game or wildlife” (Game and Wildlife Code, 34 Pa.C.S.A. §322(a)), these lands contain valuable natural resources such as timber, coal, oil and gas. The sale and lease of these natural resources accounted for approximately 25% of PGC revenues in FY 2006-2007. In recent years, revenues from the sale of hunting licenses have been declining. Meanwhile the financial cost of managing the State Game Lands and protecting the Commonwealth’s wildlife continues to grow. The purpose of this study is to evaluate the PGC’s administration and use of these resources and assess whether the PGC could and should increase revenues from these resources in order to offset recent declines in revenues from hunting licenses.

Management Summary:

A team of researchers from three departments at The Pennsylvania State University with expertise in production, use and management of oil, gas and other minerals (OGM) and timber in Pennsylvania will address the following four objectives:

1. Assess, relative to the PGC’s OGM and timber resource management activities, the agency’s (a) administrative structure and staffing, (b) forest and resource management plans and information systems, (c) strategic plans, policies, guidelines and regulations, and (d) marketing strategies, procedures and activities. The team will compare the PGC’s policies and practices to those employed by the PA DCNR Bureau of Forestry, the USDA Forest Service (e.g., the Allegheny National Forest), and the relevant agencies in New York and West Virginia.
2. Determine whether the PGC is maximizing the revenue-generating potential, within the provisions of the Game and Wildlife Code and sound stewardship practices, of its timber and OGM resource holdings through an assessment of (a) actual transactions and (b) future plans for the sale or lease of these resources. This assessment will include consideration of any “in-kind services” and exchange values received by the PGC.
3. Evaluate the potential for future increases, within the parameters of sound wildlife conservation stewardship practices, in the sale, lease, and/or exchange values of timber and

OGM resources beyond the levels currently projected by the PGC. The team will evaluate the extent to which such increased sales, leases and/or exchange values could be used to offset PGC funding obligations now met through revenues from hunting license sales.

4. Synthesize findings and conclusions and provide recommendations on how to improve and sustain revenue generation in order to meet the budget requirements and obligations of the PGC.

Deliverables will include:

1. On or before the last business day of each month, beginning on April 30, 2009 we will provide LB&FC staff with a written "Monthly Project Activity Summary" that briefly lists and discusses work plan steps accomplished during the prior month (e.g., contacts made, meetings held, specific study activities completed).
2. On or before the close of business on August 31, 2009, we will provide LB&FC staff with a preliminary written draft outline of our report.
3. On or before the close of business on September 30, 2009, we will provide an oral report of our preliminary findings to LB&FC staff, along with any modifications or revisions to the draft outline.
4. On or before the close of business on October 31, 2009, we will deliver a confidential draft report to the LB&FC offices.
5. On or before the close of business on November 30, 2009, we will deliver a final report to the LB&FC offices.
6. The project investigators will be available to provide oral testimony and make presentations to the Legislative Budget and Finance Committee and up to two additional presentations to other legislative committees.

Work Plan:

The study will be conducted as follows:

1. Assemble data from the PGC, the PA DCNR Bureau of Forestry, USDA Forest Service, and the relevant agencies in New York and West Virginia on their (a) administrative structure and staffing, (b) forest and resource management plans and information systems, (c) strategic plans, policies, guidelines and regulations, and (d) marketing strategies, procedures and activities. For each agency, we will also assemble data on the extent of their land and resource holdings and recent revenues from the sale, lease and exchange of these resources. Where possible, data will be obtained over the telephone or electronically. However, we will also make at least one site visit to the administrative offices of each Commonwealth agency. For the PGC, we will also conduct site visits to regional offices. This work will be conducted between March and July, 2009.
2. Assess the adequacy of the PGC's staffing, data, planning and marketing procedures, for sales and other exchanges in timber, and OGM on PGC lands. This will include a review of the literature relevant to the management of wildlife agencies and OGM leasing on public lands. We will benchmark the PGC relative to the PA DCNR Bureau of Forestry, USDA Forest Service, and the relevant agencies in New York and West Virginia. We will also discuss the PGC's staffing, policies, and procedures with relevant PGC clientele, including

the Pennsylvania Forest Products Association, the Pennsylvania Coal Association, and the Independent Oil and Gas Association. In addition, we will conduct case reviews of a representative sample of individual sale and lease transactions in each revenue category. This step will be conducted between June and August, 2009.

3. Estimate potential future values of timber, and OGM resources on PGC lands. The team will identify the maximum potential revenues from unconstrained exploitation of these resources as an upper bound on what is possible. We will then address market conditions and sustainability and stewardship constraints that would likely make revenue maximization undesirable and estimate the extent to which these constraints would reduce potential revenues from the maximum potential identified initially. For timber management, we will develop and run models to examine potential yield and value scenarios. Finally, we will suggest approaches to optimize revenues given these constraints. In conjunction with these activities, the study team will also examine and evaluate the PGC's current five-year projected revenue yields from timber sales and OGM ground rentals and royalties in relation to the study team's estimate of potential future revenue yields. These projections will be assessed in light of the sustainability and stewardship constraints to which the PGC must adhere. This step will be conducted between June and August, 2009.

4. Write reports that provide an overview of the PGC's management of their timber and OGM resources. The reports will synthesize findings and conclusions and provide recommendations on how to improve and sustain revenue generation in order to meet the budget requirements and obligations of the PGC. Suggestions will include identification of data and procedures needed to develop sustainable management plans for the PGC's timber and OGM resources. Recommendations will address PGC policies, procedures and personnel needs. This step will be conducted between August and November, 2009.

The work will begin March 1, 2009 and be completed by November 30, 2009. After mid-May, the graduate student will work 40 hours/week and Co-PIs will provide time on this project as needed.

Prior experience:

Each of the 5 Co-PIs has unique contributions to make to the project. The following provides a synopsis of our expertise.

Dr. Michael Jacobson's extension, research, and teaching activities are in the area of economic incentives and alternative income opportunities from natural resources. As an extension specialist he focuses on socio-economic and policy issues with various stakeholder groups. As part of his extension program he has developed publications and workshops on forest finance, forest taxes, and more recently because of the Marcellus shale rush has co-authored a gas finance extension publication. He carries out research in forest economics and policy issues such as taxation, regulations, and financial incentives and teaches college-level courses on forest economics, international forestry, and agroforestry.

Dr. Marc McDill has over 20 years of experience using quantitative modeling to evaluate and project forest conditions under different management and policy scenarios. His research interests

include forest management planning, forest growth and yield modeling, biofuels feedstock supply assessment, climate change impacts and mitigation, and forest taxation. His major research work over the past 10 years has been to develop new forest management planning modeling methods for private landowners with large forest areas and for public forests, such as Pennsylvania's state forests. Dr. McDill's models were used by the Pennsylvania Bureau of Forestry to develop their current forest management plans.

Dr. Bruce Lord is a Senior Research Assistant with the School of Forest Resources at Penn State. He has over 25 years of experience studying forest resources economics. Dr. Lord's principal research interests center around the economic impact of forest lands upon rural economies. He has been involved in research projects looking at the impacts of Pennsylvania's solid hardwood industries, of public lands in north central Pennsylvania, and the impact of the wood products industry in the AHUG region and throughout the Commonwealth. A parallel research interest for Dr. Lord are the equally important impacts of forest based travel and tourism.

Andrew N. Kleit is Professor of Energy and Environmental Economics at Penn State and has a Ph.D. in economics from Yale University. He is an expert in behavior in energy markets. His role on this project would be to analyze how exploration firms would react to different Pennsylvania Game Commission policies, and which Game Commission policies would be most conducive to increasing state revenues.

Terry Engelder, a leading authority on the recent Marcellus gas shale play, holds degrees in geosciences from Penn State B.S. (?68), Yale M.S. (?72) and Texas A&M, Ph.D. (?73). He is currently a Professor of Geosciences at Penn State and has previously served on the staffs of the US Geological Survey, Texaco, and Columbia University. He has written 150 research papers, many focused on Appalachia, and a book, the research monograph "Stress Regimes in the Lithosphere". In the international arena, he has worked on exploration and production problems with companies including Saudi Aramco, Royal Dutch Shell, Total, Agip, and Petrobras. His role in this project will be to supply the geological expertise to understand where in the state potential drilling sites are located, and the costs of exploration at each of these sites.

Personnel:

See attached 2 page CVs at end of document

Cost and price analysis:

A budget of \$95,699 is requested for the project.

The specific budget items are:

1) Research Associate = \$23,328 for 6 months

We have a Research Associate in forestry already with a law degree ready to work on the project.

2) Salary for the five co-PIs @ \$7,776 each = \$38,880

3. Fringe benefits are computed using the rates of 28.6% applicable to Category I Salaries, 15.4% applicable to Category II Graduate Assistants, 8.3% applicable to Category III Salaries and Wages and 0.6% applicable to Category IV Student Wages for the current fiscal year - July 1, 2008 through June 30, 2009. If this proposal is funded, the rates quoted above shall, at the time of funding, be subject to adjustment for any period subsequent to June 30, 2009, if superseding Government approved rates have been established. The fringe benefit rates are negotiated and approved by the Office of Naval Research, Penn State's cognizant federal agency.

4) Travel = \$10,700;

Travel to Harrisburg and other agencies field offices

5) Materials and supplies = \$5,000

Includes computer and publication materials (printing, photocopying)

Conflict of Interest:

No conflict on interest

MICHAEL G. JACOBSON, The Pennsylvania State University, School of Forest Resources,
309 Forest Resources Building, University Park, PA 16802, Phone: (814) 865-3994, Fax: (814) 865-6275,
E-mail: mgj2@psu.edu

Dr. Jacobson's extension, research, and teaching activities are in the area of natural resources, incentives and alternative income opportunities, especially from forestland. As an extension specialist he focuses on socio-economic and policy issues with various stakeholder groups, including forest taxes and finances. He has over 20 years of international forestry experience with international organizations such as the World Bank, Peace Corps, and Tropical Forest Foundation. Dr. Jacobson has taught college-level courses on forest economics, international forestry, agroforestry, and natural resource development projects.

EDUCATION

Ph.D. in Forest Resources, 1997 *North Carolina State University, Raleigh, NC*

Master of Environmental Management, 1990 *Duke University, School of Forestry and Environmental Studies, Durham, NC*

Bachelor of Arts, 1984 *University of Connecticut, Storrs CT*

EXPERIENCE

Associate Professor, July, 2005 – Present; *The Pennsylvania State University,*

Extraordinary Professor Appointed August 2007 *Department of Forest and Wood Science, Faculty of AgriSciences, Stellenbosch University, South Africa*

Assistant Professor, July, 1999 – June, 2005 *The Pennsylvania State University,*

Assistant Professor, April 1997 – June, 1999 *University of Florida, Gainesville, FL*

Director of Information, 1992-1993 *Tropical Forest Foundation, Alexandria, Virginia*

Research Associate, 1990-1992 *World Bank, Agriculture Department, Washington, DC*

Agroforestry Technician/Extension Agent, 1986-1988 *United States Peace Corps, Lesotho, Africa*

ADDITIONAL INTERNATIONAL EXPERIENCE

September, 2008, *Borlaug Fellowship Makerere University, Uganda*

June 2008, *UNDP project Chittagong Hills, Bangladesh*

January-July 2007, *Sabbatical at Stellenbosch University, South Africa*

March 2007, *Ford Foundation, Mozambique*

December 2006. *World Bank/IFC, Indonesia*

October 2006 *Ukraine*

March 2006. *OIC International, Guinea*

October/November 2005. *USAID Rural Livelihoods Consortium, ICRAF, ITTA.*

September 2005. *Winrock International, Indonesia*

June/July 2003; May 2004. *GTZ BASED Program. Africa*

April 2002. *FAO. South Africa.*

July/August, 1998 *VOCA (Volunteers in Overseas Cooperation and Assistance) Ethiopia*

SELECTED AWARDS and ACTIVITIES

Member, Society of American Foresters Forest Science and Technology Board, 2002-2005

Editorial Board, Small-Scale Forest Economics, Management and Policy, 2002- present

Chair, Society of American Foresters Technical Working Group B1 (Non-industrial Private Forests), 1998-2002

Chair, Northeast Extension Foresters Committee, 2001-2002

Gene Namkoong Fellowship Award, North Carolina State University, 1996

RECENT PUBLICATIONS

- Burkhart, E. and M. Jacobson. 2008. Transitioning from wild collection to forest cultivation of indigenous medicinal forest plants in eastern North America is constrained by lack of profitability. In press *Agroforestry Systems*
- Jacobson, M, C. Ham and P. Ackerman. 2008. Investigation of the Forestry Management Educational Needs in South African Forestry Companies. In press *Southern Hemisphere Forestry Journal*
- Kilgore, M. J. Greene, M. Jacobson, T. Straka, and S. Daniels. 2007. The Influence of Financial Incentive Programs in Promoting Sustainable Forestry on the National Family Forests. *Journal of Forestry* 105(4):184-191.
- Straka T, M. Kilgore, M. Jacobson, J, Greene, and S. Daniels. 2007. Influence of Incentive Programs in Sustainable Wildlife Values. *Human Dimensions of Wildlife*. 12_197-199.
- Strong, N. and M. Jacobson. 2006. A Case for Consumer-Driven Extension Programming: Agroforestry Adoption Potential in Pennsylvania. *Agroforestry Systems* 68(1):43-52
- High, J., and M. Jacobson. 2005. "Internet-based Natural Resource Education." *Journal of Extension*. 43(3)
- Kilgore, M. J. Greene, M. Jacobson, T. Straka, and S. Daniels. 2007. The Influence of Financial Incentive Programs in Promoting Sustainable Forestry on the National Family Forests. *Journal of Forestry* 105(4):184-191.
- Strong, N. and M. Jacobson. 2006. A Case for Consumer-Driven Extension Programming: Agroforestry Adoption Potential in Pennsylvania. *Agroforestry Systems* 68(1):43-52
- Linehan P., and M. Jacobson. 2005. "Forecasting Hardwood Stumpage Price Trends in Pennsylvania." *Forest Products Journal* 55(12):47-52
- Strong, N., and M. Jacobson . 2005. "Utilizing Social Marketing Research Methods to Assess Agroforestry Adoption Potential in Diverse Landscapes: A Market Segmentation Case Study in Pennsylvania." *Small Scale Forest Economics, Management and Policy* 4(2):215-228
- Jacobson, M., and M. McDill. 2004. Forest tax incentives: A public official's perspective. *Journal of Multi-State Taxation and Incentives* 14(8):18-27.
- Linehan, P, M. Jacobson, and M. McDill. 2003. Hardwood Stumpage Price Trends and *Forestry*, 20(3):124-130.
- Jacobson, M. 2003. Wood vs. Water: Timber Plantations in Semiarid South Africa. *Journal of Forestry*, 101(5):31-35.
- Jacobson, M. and M. McDill. 2003. A Historical Review of Forest Property Taxes in Pennsylvania: Implications for Special Forestland Tax Programs. *Northern Journal of Applied Forestry*, 20(2):53-60.
- Jacobson, M. 2002. Factors affecting Private Forest landowner Interest in Ecosystem Management: Linking Spatial and Survey Data. *Environmental Management*, 30(4):577-583.
- Jacobson, M. 2002. Ecosystem Management in the Southeast United States: Interest of Forest Landowners in Joint Management Across Ownerships. *Small-Scale Forest Economics, Management and Policy*, 1(1):57-70.
- Finley, J. and M. Jacobson. 2001. Pennsylvania's Extension Program: A Community Based Cooperative Effort. *Journal of Forestry*, 99(3):9-11.
- Jones, S., G. Glover, J. Finley, M. Jacobson, and A. Reed. 2001. Empowering Private Forest Landowners. *Journal of Forestry*, 99(3):4-7.
- Jacobson, M., R. Abt, and D. Carter. 2000. Attitudes Toward Joint Forest Planning Among Private Landowners. *Journal of Sustainable Forestry*, 11(3): 95-112.

Marc E. McDill

Associate Professor of Forest Management
School of Forest Resources
310 Forest Resources Building
The Pennsylvania State University
University Park, PA 16802-4301

PHONE, (814) 865-1602, FAX: (814) 865-3725; E-MAIL: mmcduill@psu.edu

EDUCATION: Ph.D. in Forest Economics, Virginia Polytechnic Institute and State University, 1989. M.S. in Forest Economics, North Carolina State University, 1986. B.S. in Forest Management, University of Minnesota, 1984.

ACADEMIC POSITIONS: 2003 to present: Associate Professor of Forest Management and Program Chair for Forest Science, School of Forest Resources, Penn State University. 1997-2003: Assistant Professor of Forest Management, School of Forest Resources, Penn State University. 1994-1997: Assistant Professor of Forest Management, School of Forestry, Wildlife and Fisheries, Louisiana State University. 1993-1994: Assistant Professor of Forest Management, School of Forest Resources, Penn State University.

PROFESSIONAL INTERESTS: Forest management planning and economics, operations research, private forest management, property taxes, forest values and valuation, forest growth and yield modeling, oak regeneration, timber supply, geographic information systems, forest management under uncertainty, regional development.

EDITORSHIPS: Associate Editor for *Forest Science* in the area of Operations Research (2003-2006); Associate Editor for *Operations Research* in the area of Natural Resources and Environment (2003-2005).

RECENT PEER-REVIEWED PUBLICATIONS:

- Kaesler, Melanie, Peter Gould, Marc McDill, Kim Steiner, and James Finley. 2008. Classifying patterns of vegetation and regeneration in mixed-oak stands across the Allegheny Plateau and Ridge and Valley Ecoregions of Pennsylvania. *Northern Journal of Applied Forestry* 25(1):38-44.
- Steiner, Kim C., James C. Finley, Peter J. Gould, Songlin Fei, and Marc McDill. 2008. Oak regeneration guidelines for the Central Appalachians. *Northern Journal of Applied Forestry* 25(1):5-16.
- Tóth, Sándor F., and Marc E. McDill. 2008. Promoting large, compact mature forest patches in harvest scheduling models. *Environmental Modeling and Assessment* 13(1):1-15.
- Brubaker, Roy, James Finley, and Marc McDill. 2006. The effect of timber value information on Pennsylvania's private forest landowner: a case study. *Northern Journal of Applied Forestry* 23(4):234-240.
- Gould, Peter, Kim Steiner, Marc McDill, and James Finley. 2006. Modeling seed-origin oak regeneration in the central Appalachians. *Canadian Journal of Forest Research* 36(4):833-844.
- Tóth, Sándor F., Marc E. McDill, and Stephanie Rebain. 2006. Finding the efficient frontier of a bi-criteria, spatially-explicit, harvest scheduling problem. *Forest Science* 52(1):93-107.
- Tóth, Sándor, Tatsuhito Ueki and Marc McDill. 2006. Monitoring the forest resources and management of private landowners in Nagano, Japan. *Japanese Journal of Forest Planning* 12:59-64.
- Fei, Songlin, Peter Gould, Kim Steiner, James Finley, and Marc McDill. 2005. Forest regeneration composition and development in upland, mixed-oak forests. *Tree Physiology* 25: 1495-1500.
- Gould, Peter J., Kim C. Steiner, James C. Finley and Marc McDill. 2005. Developmental pathways following the harvest of oak-dominated stands. *Forest Science* 51(1):76-90.
- Jacobson, Michael, and Marc McDill. 2004. Forest tax incentives in Pennsylvania: A public official's perspective. *Journal of Multistate Taxation and Incentives* 14(8):18-27.
- Silva, Gabriela, and Marc McDill. 2004. Barriers to ecotourism supplier success. *Journal of Sustainable Tourism* 12(4):289-305.

- Jacobson, Michael, and Marc McDill. 2003. An historical review of forest property taxes in Pennsylvania: implications for special forestland tax programs. *Northern Journal of Applied Forestry* 49(4):608-618.
- Keefer, Matthew, James Finley, A.E. Luloff, and Marc McDill. 2003. Understanding loggers' perceptions. *Journal of Sustainable Forestry* 17(3):81-102.
- Linehan, Peter, Michael Jacobson, and Marc McDill. 2003. Hardwood stumpage price trends and regional market differences in Pennsylvania. *Northern Journal of Applied Forestry* 20(3):124-130.
- Rebain, Stephanie, and Marc McDill. 2003. A mixed-integer formulation of the minimum patch size problem. *Forest Science* 49(4):608-618.
- Rebain, Stephanie, and Marc McDill. 2003. Can mature patch constraints mitigate the fragmenting effect of harvest opening size restrictions? *International Transactions of Operations Research* 10(5):499-513.
- Cao, Quang, Shiansong Li, and Marc McDill. 2002. Developing a system of annual tree growth equations for the loblolly-shortleaf pine type in Louisiana. *Canadian Journal of Forest Research* 32(11): 2051-2059.
- Keefer, Matthew, James Finley, A.E. Luloff, and Marc McDill. 2002. Characterizing loggers' forest management decisions. *Journal of Forestry* 100(6):8-15.
- McDill, Marc, Stephanie Rebain, and Janis Braze. 2002. Harvest scheduling with area-based adjacency constraints. *Forest Science* 48(4):631-642.
- McDill, Marc, and Janis Braze. 2001. Using the branch and bound algorithm to solve forest planning problems with adjacency constraints. *Forest Science* 47(3):403-418.
- McDill, Marc, and Janis Braze. 2000. Comparing adjacency constraint formulations for randomly generated forest planning problems with four age-class distributions. *Forest Science* 46(3):423-436.

SELECTED RECENT GRANTS AND CONTRACTS:

- Determining Costs, Product Recovery Factors, and Environmental Impacts for Biomass Harvest Treatments in Northeastern US Forests.* Investigators: Marc McDill, Charles Ray, Eric Zenner, Michael Jacobson, Bruce Lord, Andrew Bartholomay. Sun Grant Initiative. July 2008-June 2010. \$99,825.
- Forest Management Planning for the Pennsylvania DCNR Bureau of Forestry – 2006 to 2009.* Investigator: Marc McDill. Pennsylvania Department of Conservation and Natural Resources, Harrisburg, PA. August 14, 2006 to June 30, 2009. \$480,627.
- NE/NC Softwood and Hardwood Forest Resources.* Investigators: James Finley, Marc McDill and Charles Ray. Consortium for Research on Renewable Industrial Materials (CORRIM), Seattle, WA. July 7, 2004 to June 15, 2006. \$36,044.
- Predicting and Evaluating Regeneration Success on State Forest Lands.* Investigators: Kim Steiner, James Finley, and Marc McDill. Pennsylvania Department of Conservation and Natural Resources, Harrisburg, PA. June 1, 2003 to June 30, 2008. \$830,760.
- Forest Management Planning for the Pennsylvania DCNR Bureau of Forestry – 2003 to 2006.* Investigator: Marc McDill. Pennsylvania Department of Conservation and Natural Resources, Harrisburg, PA. February 2, 2004 to June 30, 2006. \$463,320.
- Predicting and Evaluating Regeneration Success on State Forest Lands.* Investigators: Kim Steiner, James Finley, and Marc McDill. Pennsylvania Department of Conservation and Natural Resources, Harrisburg, PA. June 1, 2003 to June 30, 2008. \$830,760.
- Developing Silvicultural Guidelines for Oak Regeneration.* Investigators: Kim Steiner, Marc McDill, and James Finley. Pennsylvania Hardwood Development Council, Harrisburg, PA. September 1, 2002 to August 31, 2003. \$39,205.
- Assessing Impacts of Public Ownership of Land Upon Local Governments and Communities in Pennsylvania.* Investigators: Robert McKinstry, Marc McDill, and Michael Jacobson. Pennsylvania Department of Conservation and Natural Resources, Harrisburg, PA. August 1, 2002 to July 31, 2003. \$34,836.

RESUME

Bruce E. Lord, Senior Research Assistant
Forest Resource Management
School of Forest Resources
The Pennsylvania State University

Contact Information:

206 Ferguson Bldg.
University Park, PA 16802
814-865-7554
bel@psu.edu

FORMAL EDUCATION:

<u>Degree</u>	<u>Institution</u>	<u>Major field</u>	<u>Date of degree</u>
B.S.	The Pennsylvania State University	Forest Science	1978
M.S.	The Pennsylvania State University	Forest Resources	1987
M.S.	The Pennsylvania State University	Operations Research	1987
Ph.D.	The Pennsylvania State University	Forest Resources	2001

PROFESSIONAL EXPERIENCE:

<u>Institution</u>	<u>Title</u>	<u>Specialization</u>	<u>Dates</u>
Penn State	Grad. Research Asst.	The Cost and Production of Recreation	1978-81
Penn State	Research Assistant	Forest and Recreation Management	1981-1993
Penn State	Senior Res. Asst.	Resource Economics	1993-present
Juniata College	Instructor	Biostatistics	1997

TEACHING EXPERIENCE:

<u>Course</u>	<u>Title</u>	<u>School</u>	<u>Semesters</u>
FOR 440	Forest Economics	Penn State	1/2
BISCI 350	Biostatistics	Juniata College	1
ENNEC 484	Economics of Energy and the Environment	Penn State	1
FOR 366	Forest Measurements	Penn State	8
FOR 416	Forest Recreation	Penn State	6
FOR 497g	German Forestry	Penn State	4
FOR 496c	Economics of Outdoor Recreation	Penn State	1
AG 150s	Be a Master Student	Penn State	4

**SELECTED ARTICLES PUBLISHED IN REFEREED JOURNALS AND PROCEEDINGS
(Total of 8):**

Strauss, C. H. and B. E. Lord. 1991. Expenditure characteristics of Pennsylvania state park audiences. *Journal of Park and Recreation Administration*. Vol. 8, No. 4, 53-70.

Grado, S. C., C. H. Strauss and B. E. Lord. 1997. Antiquing as a tourism recreational activity in southwestern Pennsylvania. *Journal of Travel Research*. XXXV(3): 52-56.

Strauss, C.H. and B.E. Lord. 2001. Economic impact of a heritage tourism system. *Journal of Retailing and Consumer Services*. 8(4):199-204.

Lord, B.E. and W.F. Elmendorf. 2008. Are Recreation Organizations Representative of All Participants? *Journal of Park and Recreation Administration*. (In Press).

**SELECTED ARTICLES PUBLISHED IN NONREFEREED JOURNALS AND
PROCEEDINGS (Total of 21):**

Strauss, C. H. and B. E. Lord. 1991. Impacts of state parks on Pennsylvania's economy. *Trends*. Vol. 28, No. 1, pp 30-37.

Lord, B. E., C. H. Strauss, and S. C. Grado. 1996. The economic impact of state forest recreation in southwestern Pennsylvania. IN: *Proceedings of the 1995 Northeastern Recreation Research Symposium*. USDA Forest Service N. For. Exp. Sta. Gen. Tech. Rpt. NE-218, pp 137-140.

Strauss, C. H., B. E. Lord and S. C. Grado. 1997. Economic impact of travel and tourism in southwestern Pennsylvania. IN: *Proceedings of the 1996 Northeastern Recreation Research Symposium*. USDA Forest Service. Northeastern Forest Experiment Station. Gen.Tech.Rpt. NE-232.

Strauss, C. H., W. M. Tzilkowski and B. E. Lord. 2000. Eco-Tourism in Pennsylvania: Managing Elk and People. IN: *Proceedings of the Seventh International Conference on Retailing and Services Science*. European Institute of Retailing and Services Studies. Lisbon, Spain. pp. 98-102.

Lord, B. E., C. H. Strauss and M. J. Powell. 2002. Elk viewing in Pennsylvania: An evolving eco-tourism system. IN: *Proceedings of the 2001 Northeastern Recreation Research Symposium*. USDA Forest Service. Gen. Tech. Rpt. NE-289. pp249-252.

Lord, B. E., C. H. Strauss and M. J. Powell. 2005. Economic Impact of the Wood Industry in Northwest Pennsylvania. IN: *Proceedings of the 2005 Southern Forest Economics Workers Workshop*. March 18-20, 2005. Baton Rouge, LA.

Biographical Sketch

Andrew N. Kleit

a. Professional Preparation

Middlebury College, Middlebury, VT	B.A.	1982	Math., Political Sci.
Yale University, New Haven, CT	M.A.	1983	Economics
Yale University, New Haven, CT	M.Phil.	1987	Economics
Yale University, New Haven, CT	Ph.D.	1987	Economics

b. Appointments

1987-1991	Economist, Division of Economic Policy Analysis, Bureau of Economics, Federal Trade Commission, Washington, DC
1989-1991	Economic Adviser to the Director, Bureau of Competition, Federal Trade Commission, Washington, DC
1991-1992	Senior Economic Adviser to the Director for Investigation and Research, Consumer and Corporate Affairs Canada, Ottawa/Hull, Canada
1992-1994	Assistant Professor, Department of Economics, Ourso School of Business Administration, Louisiana State University, Baton Rouge, LA
1994-1998	Associate Professor, Department of Economics, Ourso School of Business Administration, Louisiana State University, Baton Rouge, LA
1998-2002	Associate Professor of Energy, Environmental, and Mineral Economics; Senior Research Associate, the Center for Health Care and Policy Research, The Pennsylvania State University, University Park, PA.
2002-Present	Professor of Energy and Environmental Economics, The Pennsylvania State University, University Park, PA.

c. Publications

(i) Closely related to the proposed project

Kleit, A.N. and J.D. Reitzes, The Effectiveness of FERC's Transmission Policy: Is Transmission Used Efficiently and When Is It Scarce?, *Journal of Regulatory Economics* 34:1 (2008) 1-26.

Kleit, A.N., Impacts of Long-Range Increases in the Corporate Average Fuel Economy (CAFE) Standard, *Economic Inquiry* 42:2 (April 2004) 279-294.

Kleit, A. N., & Terrell, M. D. (2001). Measuring potential efficiency gains from deregulation of electricity generation: A Bayesian approach. *Review of Economics and Statistics* 83(3) 523-530.

Kleit, A.N. (2001). Are Regional Oil Markets Growing Closer Together?: An Arbitrage Cost Approach. *Energy Journal*. 22, 1-15.

Dismukes, D. W., & Kleit, A. N. (1999). Cogeneration and electric power industry restructuring. *Resource and Energy Economics*, 21(2), 153-166.

(ii) Other significant publications

Bradford, W.D. and A.N. Kleit, The Effect of Direct to Consumer Television Advertising on the Timing of Treatment, forthcoming, *Economic Inquiry*

Butz, D. A., & Kleit, A. N. (2001). Are vertical restraints anti- or pro-competitive? Lessons from *Interstate Circuit*. *Journal of Law and Economics*, 44(1) 131-160

Bradford, W. D., Kleit, A. N., Re, R. R., & Krousel Wood, M. A. (2001). Stochastic cost frontier estimation of hospital production functions. *Review of Economics and Statistics* 83(2) 302-309.

Coate, M.B. and A.N. Kleit, The Art of the Deal: The Merger Settlement Process at the Federal Trade Commission, *Southern Economics Journal*, 70:4 (2004). 977–997.

Kleit, A.N., ASCAP vs. BMI (vs. CBS): Modeling Competition Between Performance Rights Organizations, *Economic Inquiry* 38:4 (2000) 579-590.

d. Synergistic Activities

Creator and Professor in charge of the undergraduate major in Energy Business and Finance, B.S. degree offered through the College of Earth and Mineral Sciences at Penn State. Begun in May 2004, the EBF major is an interdisciplinary course of study that draws on classes in economics, business, finance, and the earth sciences. The major currently has approximately 230 students, making it the second largest major in the College of Earth and Mineral Sciences.

Lead faculty member in the development of a M.S. and Ph.D. option in Energy Management and Policy in the Department of Energy and Mineral Engineering. The EMP option accepted its first students in August 2008.

e. Collaborators & Other Affiliations

Collaborators and Co-Editors (previous 48 months)

W.D. Bradford, University of Georgia Joseph Doucet, University of Alberta, James Falvey, Oceantomo Inc., L. Lynne Kiesling, Northwestern University, James Reitzes, The Brattle Group Stanley Reynolds, University of Arizona

Thesis Advisor and Postgraduate-Scholar Sponsor

Brendan Heinrich, Ph.D. Energy and Mineral Engineering (Current), Kyle Howe, M.S. Meteorology (Current)

Number of graduate students advised (career): 10

f. Recent grants

“Assessing and Mitigating Rising Electricity Prices in Rural Pennsylvania,” Center for Rural Pennsylvania, Principle Investigator (\$50,000).

“Effect of FDA Boxed Warnings and Public Information on Pharmaceutical Use,” Agency for Healthcare Quality Research and Quality (September 2007 to August 2011), Co-Principle Investigator (\$1,172,609).

“What is a 'Better' Prediction System? Combining Statistical and Economic Metrics of Prediction Quality,” National Science Foundation, Program in Decision Making, Risk, and Uncertainty, September 2007 to August 2010, Co-Principle Investigator (\$749,992).

“Decision Markets and Uncertainty in Weather Forecasting,” National Science Foundation, Program in Decision Making, Risk, and Uncertainty, January 2006 to December 2008, Co-Principle Investigator (\$475,692).

Terry Engelder

Professor of Geosciences Department of Geosciences, Pennsylvania State University , University Park , PA 16802

Professional Preparation

Penn State University Geology B.S. 1968
Yale University Geology M.S. 1972
Texas A&M University Geology Ph.D. 1973

Professional Appointments

1990- Present Professor of Geosciences, Pennsylvania State University
1999 Visiting Professor, Erherzog Johann Tech. U., Graz , Austria
1985-1990 Associate Professor of Geosciences, Pennsylvania State U.
1974-1985 Res.Assoc., Lamont-Doherty Geol. Obs. of Columbia University
1968 Geologist, Texaco, Inc.
1966-1967 GS-4 Hydrologist, U. S. Geological Survey

Honors and Awards

Phi Eta Sigma - Honor Society, 1965
Fellowship - Geological Society of America , 1989
Wilson Distinguished Teaching Award - The Pennsylvania State University , 1992
Geological Society of Washington - Second Place Paper, 1992
John and Cynthia Oualline Lecturer in Geological Sciences, University of Texas , 1993
Phi Kappa Phi – Honor Society, 2004

Fellowships

Fulbright Senior Fellowship, Macquarie University, Sydney , Australia , 1984
French-American Foundation Fellowship, France , 2001-2002

Guest Professorship :

Erherzog Johann Technical University , Graz , Austria , 1999

Visiting Scholar :

TotalFinaElf, CSTJF Pau, France, 2001-2002

Editorships

Co-Editor-in-Chief, Tectonophysics, 1993-1999

Research Monographs

Engelder, T., 1993, Stress Regimes in the Lithosphere: Princeton Press, Princeton, New Jersey, 451 p.

Editor or Co-editor of Major Volumes

The Oertel Volume: Engelder, T., ed, 1995, 30 Years of Tectonophysics, A Volume in Honour of Gerhard Oertel: Tectonophysics, v. 247, Nos 1-4.
The Logan Volume: Chester , F.M., Engelder, T. and Shimamoto, T., eds, 1998, Rock Deformation: The Logan Volume: Tectonophysics, v. 295, Nos 1-2.
The Hancock Volume: Cosgrove, J.W. and Engelder, T., eds, 2004, The Initiation, Propagation, and Arrest of Joints and Other Fractures: Geological Society, London , Special Publications, 231.

Selected Recent Publications on Fracture in the Earth (> 120 papers since 1973)

- Engelder, T., 2004, Tectonic implications drawn from differences in the surface morphology on two joint sets in the Appalachian Valley and Ridge, Virginia : *Geology*, v. 32, p. 413-416.
- Engelder, T., and Peacock, D., 2001, Joint development normal to regional compression during flexural-slow folding: The Lilstock buttress anticline, Somerset, England: *Journal of Structural Geology*, v. 23, p. 259-277.
- Engelder, T., and Fischer, M.P., 1996, Loading configurations and driving mechanisms for joints based on the Griffith energy-balance concept: *Tectonophysics*, v. 256 , p. 253-277.
- Engelder, T., Gross, M.R., and Pinkerton, P., 1997, Joint development in clastic rocks of the Elk Basin anticline, Montana-Wyoming: in Hoak, T., Klawitter, A., and Blomquist, P., eds., *An analysis of fracture spacing versus bed thickness in a basement-involved Laramide structure: Rocky Mountain Association of Geologists 1997 Guidebook*, Denver, Colorado, p. 1-18.
- McConaughy, D.T., and Engelder, T., 2001, Joint initiation in bedded clastic rocks: *Journal of Structural Geology*, v. 23, p. 203-221.
- McConaughy, D.T., Engelder, T., 2000. Joint interaction with embedded concretions: Joint loading configurations inferred from propagation paths. *Journal of Structural Geology*, v. 21, p. 1637-1652.
- Rogers, C.M., Myers, D.A., and Engelder, T., 2004, Kinematic implications of joint zones and isolated joints in the Navajo Sandstone at Zion National Park: Evidence for Cordilleran relaxation: *Tectonics*, v. 23, TC1007, doi:10.1029/2001TC001329.
- Ruf, J.C., Rust, K.A., and Engelder, T., 1998, Investigating the effect of mechanical discontinuities on joint spacing: *Tectonophysics*, v. 295, p. 245-257.
- Scanlin, M.A., and Engelder, T., 2003 , The basement versus the no-basement hypothesis for folding within the Appalachian Plateau Detachment Sheet: *American Journal of Science*, v. 303, p. 519-563
- Silliphant, L.J., Engelder, T., and Gross, M.R., 2002, The state of stress in the limb of the Split Mountain Anticline, Utah: constraints placed by transected joints: *Journal of Structural Geology*, v. 24, p. 155-172.
- Younes, A., and Engelder, T., 1999, Fringe cracks: Key structures for the interpretation of progressive Alleghanian deformation of the Appalachian Plateau: *Geological Society of America Bulletin*, v. 111, p. 219-239.

Recent Graduate Students Supervised (career in Science)

- Richard Plumb Ph.D. '82 Schlumberger, Houston, TX
- Stephen Marshak Ph.D. '83 Prof., University of Illinois, Urbana, IL
- Paul Scott M.S. '89 British Petroleum, Houston, TX; Second. Ed.
- Alfred Lacazette Ph.D. '91 Lacazette Consultanting, Houston, TX
- Amy Freeman M.S. '91 Ass. To Dean, Engineering, Penn State
- Irene Meglis Ph.D. '92 Research Assoc., U. of Alberta, Edmonton, Can.
- John Leftwich Ph.D. '93 Old Dominion U: Shell Offshore, New Orleans
- Michael Gross Ph.D. '93 Assoc. Prof., Florida International U., Miami
- Mark Fischer Ph.D. '94 Assoc. Prof., U. Northern Illinois, Dekalb, IL
- Staci Loewy M.S. '95 University of Texas
- Amgad Younes Ph.D. '96 Royal Dutch Shell, Holland
- David McConaughy M.S. '97 Shell Offshore; Consultant, Pittsburgh
- Laura Silliphant M.S. '98 Anadarko Oil, Houston Texas
- Michael Scanlin Ph.D. '00 Assoc. Prof. Elizabethtown College, E-town, PA
- Christie Rogers M.S. '02 Exxon-Mobil, Houston
- Laura Savalli M.S. '03 Chevron-Texaco, Houston
- Redescal Uzcatequi Ph.D '04 Simon Bolivar Univ., Venezuela

Estimated Budget Submitted by The Pennsylvania State University
to the PA Legislative Budget and Finance Committee
March 1, 2009 - November 30, 2009

A. Salaries and Wages		
Co-Prin. Inv., M. Jacobson		7,776
Co-Prin. Inv., B. Lord		7,776
Co-Prin. Inv., M. McDill		7,776
Co-Prin. Inv., Andrew Kleit		7,776
Co-Prin. Inv., T. Engelder		7,776
Res Assoc., Audrey Broucek		23,328
Total Category I		62,208
Total Salaries and Wages		62,208
B. Fringe Benefits		
Category I @ 28.6%		17,791
Total Fringe Benefits		17,791
C. Total Salaries, Wages, and Fringe Benefits		79,999
D. Equipment (\$5,000 and greater)		0
E. Materials & Supplies		
1. Supplies for publications printing & copying		5,000
Total Materials & Supplies		5,000
F. Travel		
1. Project travel		10,700
Total Travel		10,700
G. Other Direct Costs		0
H. Total Project Costs		95,699

Budget Notes:

KLF: 2/26/09

Estimated salary costs are based on current salary rates (fiscal year 2008-09) escalated approximately 4% beginning July 1 of each subsequent year. University policy has been to award salary increases on the basis of merit only.

Fringe Benefits: Rates are computed using the rates of 28.6% applicable to Category I salaries; 15.4% applicable to Category II graduate assistants; 8.3% applicable to Category III non-student wages and fixed-term II salaries; and 0.6% applicable to Category IV student wages for the current fiscal year of July 1, 2008 through June 30, 2009. If this proposal is funded, the rates quoted above shall, at the time of funding, be subject to adjustment for any period subsequent to June 30, 2009 if superseding Government approved rates have been established. The fringe benefit rates are negotiated and approved by the Office of Naval Research, Penn State's cognizant federal agency.

Travel: All travel will be in accordance with University travel regulations. Travel estimates are based on costs that were incurred on previous projects of a similar nature for federal and state agencies.

Tuition: Based on the predetermined rates (beginning Fall 2008) of \$6,290/semester and \$3,145/summer 2009 (estimated) and escalated approximately 7% beginning each academic year.