

Ann L. Maclean
Professor

School of Forest Resources and Environmental Science
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Education

Ph.D. Environmental Remote Sensing/Forestry, University of Wisconsin, Madison, Wisconsin, 1987.
M.S. Environmental Remote Sensing, University of Wisconsin, Madison, Wisconsin, 1984.
M.S. Forestry, University of Wisconsin, Madison, Wisconsin, 1984.
B.S. Forestry, Michigan Technological University, Houghton, Michigan, 1976.

Employment

Full Professor (2009 – present), Remote Sensing/Geographic Information Systems, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, Michigan, 49931

Associate Professor (1993 - 2009), Remote Sensing/Geographic Information Systems, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, Michigan, 49931.

Assistant Professor (1986 - 1993), Remote Sensing/Geographic Information Systems, School of Forest Resources and Environmental Science, Michigan Technological University, Houghton, Michigan, 49931.

NASA Trainee (1983 to 1986), Goddard Space Flight Center, Greenbelt, Maryland.

Peer-Reviewed Publications

Mason, L.A., **A.L. Maclean** and R.E. Froese. 2009. GIS Modeling Of Riparian Zones Utilizing Digital Elevation Models And Flood Height Data. *Environmental Modeling and Assessment*. (in revision).

S. Saunders, M. Mislivets, K. Brosofske, D. Cleland, and **A. Maclean**. 2009. Predicting burns in subregional ecological and climatic units of the northern Great Lakes Region. *International Journal of Wildland Fire*. (in review).

Shonnard, D.R., J.R. Jensen, J.D. Naber, Q. Zhang, **A.L. Maclean**, K.E. Halvorsen, T.L. Jenkins, C. Polonowski, and J.W. Sutherland. 2008. Wood-to-Wheels: A Multidisciplinary Research Initiative in Sustainable Transportation Utilizing Fuels and Co-Products from Forest Resources. In: *Proceedings from Convergence 2008, SAE International*, October 20-22, 2008, Detroit, MI USA 2008-21-0026.

Cleland, David T., Thomas R. Crow, Sari C. Saunders, Donald I Dickmann, **Ann L. Maclean** James K. Jordan, Richard L. Watson, Alyssa Sloan, Kimberly Brosofske. 2004. "Characterizing Historical and Modern Fires Regimes in Michigan: A Landscape Ecosystem Approach." *Forest Ecology*. 19(3):311-325.

VanLuven, D.M., J.E. Huntoon, and **A.L. Maclean**. 1999. Determination of the Influence of Wind on the Keweenaw Current in the Lake Superior Basin as Identified by Advanced Very High Resolution Radiometer (AVHRR) Imagery. *Journal of Great Lakes Research*. 25 (3):631-647.

Owens, K.E., A.J. Londo, D.D. Reed., **A.L. Maclean** and G.D. Mroz. 1999. A landscape level comparison of pre-European settlement and current soil carbon storage of a forested landscape in upper Michigan. *Forest Ecology and Management*. Vol. 113, pp. 179-189.

Budd, J.W., W.C. Kerfoot and **A.L. Maclean**. 1998. Documenting complex surface temperature patterns from Advanced Very High Resolution Radiometer (AVHRR) imagery of Saginaw Bay, Lake Huron. *Journal of Great Lakes Research* 24(2): 582-594.

Weiner, J., S. Fredro-Boniecki, D. Reed, **A.L. Maclean**, and M. Strong. 1997. Niepolomice forest - a GIS analysis of ecosystem response to industrial pollution. *Environmental Poll.* 98:381-388.

Hindelang, M. and **A.L. Maclean**. 1997. Bone density determination of moose skeletal remains from Isle Royale National Park using digital image enhance and quantitative computed tomography (QCT). *International Journal of Osteoarchaeology*. Vol. OL343, 1-9.

Weiner, J., S. Frederico-Boniecki, D. Reed, **A. Maclean** and M. Strong. 1996. Effects of Industrial pollution and natural conditions upon forest stand in the Niepolomice Forest (GIS Applications). In: *Proceedings of the International Symposium on Air Pollution and Climate Change Effects on Forest Ecosystems* (A. Bytnerowics, A. Beymeyer, and R. Noble, eds.). USDA Forest Service, Pacific Southwest Forest Experiment Station. Pp 127-138.

Weiner, J., **A. Maclean**, D. Reed and M. Strong. 1996. The use of a geographic information system to investigate atmospheric influences on forest growth in the Niepolomice Forest near Krakow, Poland. In: *Air Pollution and Multiple Stresses* (R. Cox, K. Percy, K. Jensen, and C. Simpson, Eds.). Canadian Forest Service-Atlantic Centre, Natural Resources, Canada. pp. 267-274.

Weiner, J., S. Fredro-Boniecki, D. Reed, A.L. Maclean and M. Strong. 1995. The Niepolomice Forest: Ecosystem response to industrial pollution- an analysis using GIS. In: *GIS for Protected Areas* (W. Fieldasz and W. Widacki, eds.). Institute of Geography, Jagiellonian University, Krakow. pp. 95-107. [in Polish].

Maclean, A.L. and D. T. Cleland. 2003. The use of geostatistics to determine the spatial extent of historical fires as an aid in understanding fire regimes for northern lower Michigan in Fire, Fuel Treatments and Ecological Restoration: Conference Proceedings. Rocky Mountain Research Stations, Proceedings RMRS-P-29. pp 289-300.

Hindelang, Mary, Rolf O. Peterson and **Ann L. Maclean**. 2002. Compensatory Bone Remodelling in Moose: A Study of Age, Sex, and Cross-sectional Cortical Bone Dimensions in Moose at Isle Royale National Park. *International Journal of Osteoarchaeology*. 12:343-348.

Zhao G. and **A.L. Maclean**. 2000. A comparison of canonical discriminate analysis and principal component analysis for spectral transformation". *Photogrammetric Engineering and Remote Sensing*. 66:841-847.

Maclean, A.L., T.P. D'Avello and S.G. Shetron. 1993. The use of variability diagrams in a GIS to improve the interpretation of digital soil maps. *Photogrammetric Engineering and Remote Sensing*. 54:61-70. 59(2):223-228.

Maclean, A.L., D.D. Reed, G.D. Mroz, G.W. Lyon and T. Edison. 1992. Utilizing geographic information systems to estimate forest resource use: a case study in northern Michigan. *J. Forestry* 90(12):22-26.

Civco, D.L., R.W.Kiefer and **A.L. Maclean**. 1992. Perspectives on earth resources mapping education in the United States. *Photogrammetric Engineering and Remote Sensing*. 53:1087-1092

D'Avello, T.P., S.G. Shetron and A.L. Maclean. 1990. Interpretive variability of four soil map units for forest management. *J. of Soil and Water Conservation*. 45:497-499.

Hopkings, P.F., **A.L. Maclean** and T.M. Lillesand. 1988. Assessment of Thematic Mapper imagery for forestry applications under Lakes States conditions. *Photogrammetric Engineering and Remote Sensing*. 54:61-70.

Book Chapters

Buchheim, M.P., **A.L. Maclean** and T.M. Lillesand. 1984. Forest cover type mapping and spruce budworm defoliation detection using simulated SPOT imagery. SPOT Simulation Applications Handbook, pp.259-266.

Maclean, Ann L. 2008. Role of GIS in Visualization and Modeling" in Visualization, Modeling, and Graphics. Sheryl Sorby, Ed. DeVoe Publishers. (2008)

Video Produced

Maclean, A and T. DeBruyn. 1999. Education Video of Black Bears for Primary Grade Schools

Publications Edited

Maclean, A.L. and G.A. Maclean. Guest Editors. 1994. *Photogrammetric Engineering and Remote Sensing*- 9th Annual GIS Issue.

Maclean, A.L., Editor. 1994. *Remote Sensing and Geographic Information Systems: An Integration of Technologies for Resource Management*. 244 pp. American Society for Photogrammetry and Remote Sensing.

Maclean, A.L. and K. Winterberger. Guest Editors. 1992. *Journal of Forestry*, Special issues on Geographic Information Systems- November and December.

Peer-Reviewed Report

Makuni, A., **A.L. Maclean** and M.M. Moore. 1991. Report on United States Forest Service Region 6 Old Growth Mapping Project. U.S. Forest Service, Region 6, Portland, OR. 12 pp. Executive Summary of the report was presented to the U.S. Congress in January, 1992 by the Forest Service.

Non Peer-Reviewed Report

Maclean, A.L. 2008. Annual Report to NSF. Renewable Energy from Forest Resources: An Investigation into the Viability of Large-Scale Production of Sustainable Transportation Fuels From Lignocellulosic Biomass. 17 pp.

Maclean, A.L. 2007. Annual Report to NSF. Renewable Energy from Forest Resources: An Investigation into the Viability of Large-Scale Production of Sustainable Transportation Fuels From Lignocellulosic Biomass. 14 pp.

Maclean, A.L. 2006. Annual Report to NSF. Renewable Energy from Forest Resources: An Investigation into the Viability of Large-Scale Production of Sustainable Transportation Fuels From Lignocellulosic Biomass. 12 pp.

Maclean, A.L. 2005. Results of a Year Long Planning Grant to Lay the Groundwork for Renewable Energy from Forest Resources: Investigating the Complex Interrelated Issues Associated with Generating Automotive Fuels From Lignocellulosic Biomass. 12 pp.

Auer, N.A. and **A.L. Maclean**. 2001. An Assessment of Habitat Critical to Restoration of Lake Sturgeon in the Lake Superior Basin. Submitted to the Lake Superior Basin Trust. 21 pp.

Megown, R. and **A.L. Maclean**. 1997. A GIS Model for Indexing Gray Wolf Depredation in the Northern Great Lakes States. Submitted to the Wisconsin DNR. 60 pp.

Maclean, A.L. 1996. Ecosystem Management Plan for Private Lands in Chippewa County, Michigan using GIS. 18 pp.

Maclean, G.A. and **A.L. Maclean.** 1994. Inventory of Deer Habitat in Michigan's Upper Peninsula Utilizing Landsat Thematic Mapper Data. Submitted to the Michigan Dept. of Natural Resources. 29 pp.

Green, K, R. Congalton, **A.L. Maclean,** D. Dippon and J. Smith. 1992. The status of GIS in ASPRS. *Photogrammetric Engineering and Remote Sensing*, 53:1084-1085.

Mroz, G.D., DD. Reed, G.W. Lyon and **A.L. Maclean.** 1991. Revegetating private cutover lands on the Huron Pines Resource Conservation and Development District. Submitted to the Center of Wildland Conservation. 61 pp.

Instruction Manual

Maclean, A.L., S. Abood, L. Spaete. 2008. Utilizing GIS Technology to Understand Where and How Much Woody Biomass is Available for Biofuel Production. For: Future Fuels From Forests: An Investigation into the Sustainability of Biofuels Production. Summer Teacher Institute, School of Forest Resources and Environmental Science, MTU. July 7-11, 2008. 16 pp.

Non-Referred Publications

Bruning, J.N., J.S. Gierke and **A.L. Maclean.** 2009. A Digital Processing and Data Compilation Approach for Using Remotely Sensed Imagery to Identify Geological Lineaments in Hard-Rock Terrains: An Application for Groundwater Exploration in Nicaragua. *Proc. 2009 Annual Meeting of the American Society for Photogrammetry and Remote Sensing*, Baltimore, MD. Proceedings published on CD.

Mason, L.A. and **A.L. Maclean.** 2007. An Intelligent Approach to Modeling Riparian Zones In A GIS Utilizing Digital Elevation Models And Flood Height Data". *Proc. 2007 Annual Meeting of the American Society for Photogrammetry and Remote Sensing*, Tampa, FL. Proceedings published on CD.

DeBruyn, T. L. and **A.L. Maclean.** 2001. Using geographic information systems technology to assess differences in habitat use by black bears: telemetry point locations vs. telemetry error ellipses. *Proc. 13th Ursus Conference*. Jackson Hole, WY. Pp. 12-16.

Maclean, A.L., A.C. Koivunen and A.M. LaHaie. 1992. A first order principles thermal infrared model of deciduous trees species. *Proc. ASPRS/ACSM/RT92 Annual Meeting*, Washington, D.C. Vol.4, pp. 1-10.

Maclean, A.L. 1992. Remote sensing education in the United States. *Proc. ASPRS/ACSM/RT92 Annual Meeting*, Washington, D.C. Vol.1, pp. 321-324.

Maclean, A.L., T.P. D'Avello and S.G. Shetron. 1992. The use of variability diagrams in a GIS to improve the interpretation of digital soil maps. *Proc. ASPRS/ACSM/RT92 Annual Meeting*, Washington, D.C. Vol.3, pp. 66-70.

Wijayratne, I.D. and A.L. Maclean. 1992. Enhancement of positional accuracy of data obtained from scanned aerial photographs. *Proc. ASPRS/ACSM/RT92 Annual Meeting*, Washington, D.C. Vol.3, pp. 77-85.

Jipping, L.M. and **A.L. Maclean**. 1992. The use of image interrogation techniques to improve the accuracy of surface temperature mapping of freshwater lakes using AVHRR imagery. *Proc. First Thematic Conference on Remote Sensing for Marine and Coastal Environments*, New Orleans, LA. pp. 339-352.

Maclean, A.L. and R.L. Giese. 1989. An in-depth assessment of Thematic Mapper imagery for forest type mapping of northern hardwood and conifer forest in the Lake States area. *Image Processing '89*. Sponsored by ASPRS, Sparks, NV. pp. 124-130.

Maclean, A.L., R.L. Giese and F.L. Scarpace. 1985. A methodology using digitized color infrared photographs for detecting, mapping, and evaluating spruce budworm defoliation. *Proc. Tenth Biennial Workshop on Color Aerial Photography in the Plant Sciences*, Ann Arbor, MI. pp. 1-8.

Lillesand, T.M., P.F. Hopkins, M.P. Buchheim and **A.L. Maclean**. 1985. The potential impact of Thematic Mapper, SPOT and microprocessor technology on forest type mapping under Lakes States conditions. *Proc. Pecora X Symp.*, Fort Collins, CO. pp. 43-57.

Maclean, A.L. and R.L. Giese. 1984. A methodology using low-altitude thermal imagery interfaced digitally with color infrared photographs for detecting, mapping, and evaluating budworm defoliation. *Proc. ASP/ACSM 50th Annual Meeting*, Washington, D.C. pp. 580-588.

Oral Presentations (presenter bolded)

Shonnard, D.R., J.R. Jensen, J.D. Naber, Q. Zhang, A.L. Maclean, K.E. Halvorsen, T.L. Jenkins, C. Polonowski, and J.W. Sutherland. 2008. Wood-to-Wheels: A Multidisciplinary Research Initiative in Sustainable Transportation Utilizing Fuels and Co-Products from Forest Resources. Presented at: Convergence 2008, SAE International, October 20-22, 2008, Detroit, MI USA. (i)

Brosofske, K.D., D.T. Cleland, A. L. Maclean, P.C. Goebel, and S.C. Saunders. 2008. Composition and diameter differences between line and corner trees in the General Land Office (GLO) survey data for northern Michigan, USA. US-IALE Annual Meeting, Madison, WI. Abstracts published.

Shonnard, D.R., J. F. Schumaker-Chadde, A. L. Maclean. 2007. Education and Outreach Activities: Renewable Energy from Forest Resources, AIChE 2007 Annual Meeting, 07 November 2007, Salt Lake City, UT.

Maclean, A. L. and David T. Cleland. 2003. The Use of Geostatistics to Determine the Spatial Extent of Historical Fires as an Aid in Understanding Fire Regimes for Northern Lower Michigan. Presented at: Conference on Fire, Fuel Treatments and Ecological Restoration: Proper Place, Appropriate Time. Fort Collins, CO.

Johnson, D., A.L. Maclean, and P. Crocker. 2002. Estimate of Snow Water equivalent Values for Managing Outflows from Lake Superior, Presented at University Council on Water Resources – Integrated Trans-boundary Water Management, Traverse City, Michigan.

Maclean, A.L. 1996. The Use of Satellite Imagery and GIS in Natural Resource Management. MTU Summer Youth Program, Women in Engineering. Presented twice.

Maclean, A.L. 1992. Participant, Panel on Remote Sensing Education In the United States. APSRS/ACSM/RT92 Annual Meeting, Washington, D.C.

Maclean, A.L. 1991. Advanced Digital Image Interrogation Techniques for Vegetation Mapping. Presented to the NATO RSG Working Group Meeting. Keweenaw Research Center, Michigan Technological University, Houghton, MI.

Maclean, A.L. 1989. Use of AVHRR Imagery for Mapping Water Surface Temperatures on the Great Lakes. 1989 Fall Convention of the American Society of Photogrammetry and Remote Sensing. Cleveland, Ohio.

Maclean, A.L. 1988. Geographic Information Systems and Their Usefulness to the Surveying Profession. Presented to the MTU student Chapter of the American Congress on Surveying and Mapping and the Upper Peninsula Chapter of Professional Surveyor's Fall Meeting, Houghton, MI.

Maclean, A. L. 1987. Use of Landsat Thematic Imagery in Computerized Hazard Rating Systems for Jack Pine Budworm. Department of Forestry, University of Wisconsin, Madison, WI.

Maclean, A.L. 1987. Potential Use of GIS on the Ottawa National Forest. Presented at District Rangers Quarterly Meeting, Ironwood, MI.

Externally Funded Research (last 10 years)

USDA Forest Service Pacific Southwest Region Ecological Unit Mapping. Funded by USDA Forest Service. **Ann L. Maclean,** Kimberly D. Brosofske. Total Funding: \$56,827. Project Dates: 2007-10.

GIS Approach to Mapping Total Ecological Mapping Units in the Pacific Southwest

Ann L. Maclean. Funded by USDA McIntire Stennis. Total Funding: \$21,000.

Project Dates: 2007-2010

Renewable Energy from Forest Resources: An Investigation into the Viability of Large-Scale Production of Sustainable Transportation Fuels From Lignocellulosic Biomass.

Ann L. Maclean, John Sutherland, Chris Webster, Barry Solomon, Kathy Halverson, David Flaspholer, David Shonard. Funded by NSF. Total Project Funding: \$1,898,610. Project Dates: 2005-10.

Renewable Energy from Forest Resources: A Planning Grant to Lay the Groundwork for Investigating the Complex Interrelated Issues Associated with Generating Automotive Fuels From Lignocellulosic Biomass. National Science Foundation.

Ann L. Maclean, John Sutherland, Chris Webster, Barry Solomon, Kathy Halverson, David Flaspholer, David Shonard. Total Project Funding: \$114,498. Project Dates: 2004-05.

Quantifying Historical and Modern Vegetation and Disturbance Regimes for National Forests in Seven Midwestern States. USDA Forest Service. Research Joint Venture Agreement. Kimberly D. Brosofske, **Ann L. Maclean,** Sari Saunders. Total Project Funding: \$925,665. Project Dates: 2004-07.

Mapping Location and Extent of Modern Forest Fires within Ecological Province 212.

Funded by USDA Forest Service, North Central Experiment Station. **Ann L. Maclean.**

Research Joint Venture Agreement. Total Project Funding: \$263,737. Project Dates: 11/1/2001-10/30/2004

Identification of Historical Features, Natural and Manmade, on Digital Orthophotoquads for the Ottawa National Forest: A Pilot Study. **Ann L. Maclean.** Funded by USDA Ottawa National Forest. Total Project Funding: \$25,460. Project Dates: 10/15/2001- 10/1/2002.

Acquisition of Computational Facilities for the Michigan Tech Computational Science and Engineering Program. S. Seidel, X. Huang, C. Friedrich, D. Michalek, J. Jaszczak, **A. Maclean,** A. Mayer, and J. Lee. Funded by NSF. Total Funding: \$417,245. Project Dates: 11/1/98-10/30/01.

Inventory of Habitat Critical to Restoration of Lake Sturgeon in the Lake Superior Basin N. A. Auer and **A.L. Maclean.** Funded by Lake Superior Basin Trust. Total Funding: \$80,000. Project Dates: 8/15/98 - 8/14/00.

Development of GIS Data Layers for Improved Flash Flood Forecasting. Dennis Johnson and **Ann L. Maclean.** Funded by NWS- NOAA. Total Funding: \$63,613. Project Dates: 2/1/99 to 1/31/00.

Use of GPS and Airborne Digital Imagery for Mapping and Monitoring Usage of Micro-Habitats by Black Bears in Michigan's Central Upper Peninsula. **Ann L. Maclean** and Terry DeBruyn.

Funded by Michigan Dept. of Natural Resources. Total Project Funding: \$92,676. Project Dates: 1/1/96 - 5/31/99.

Education Video of Black Bears for Primary Grade School Children. **Ann L. Maclean** and Terry DeBruyn. Funded by Frey Foundation. Total Funding: \$5,000 Project Dates: 11/11/97-6/30/99

Climatic Effects as Determinants of Interannual Variation in the Forage Base Supporting Great Lakes Salmonid Fisheries. Stephen Bowen, **Ann L. Maclean**, Thomas Drummer. Funded by Michigan Sea Grant Program. Total Funding: \$67,082. Project Dates: 8/1/96-2/29/99.

Compilation and Analysis of Snowpack Data for the Lake Superior Basin. Dennis Johnson and **Ann Maclean**. Funded by: U.S. Army Corps of Engineers. Total Funding: \$49,000.00 Project Dates: 8/97- 9/99.

Research Proposals Submitted This Past Year

Sustainable Futures IGERT Renewal: Development of Science, Technologies and Strategic Decision Making Methods for Sustainability. S J.W. Sutherland, D.F. Karnosky, D.J. Michalek, B.D. Solomon, D.R. Shonnard, **A.L. Maclean**. Submitted to NSF (rejected).

EERI-RESIN: Development of Resilient and Sustainable Cellulosic Biofuels Production Infrastructures in the Upper Midwest. D.R. Shonnard, J. Camelio, Y.R. Li, A.L. Maclean, K. Haovorsen. Submitted to NSF (rejected).

Multi-Scale Spatial Analysis Laboratory Supporting Interdisciplinary Education for Natural Resources Management and Infrastructure Design.. David Watkins, Ann Maclean, Amlan Mukherjee, Kurt Paterson, John Gierke. Submitted to HP Innovations in Education (rejected)

Graduate Student Committees

PhD Committees

Jill Witt (SFRES)- major guidance with GIS portion of research

Sarah Brodeur-Campbell (SFRES)- major guidance with GIS portion of research, left program

Clara Anton-Fernandez (SFRES)- minor guidance, graduated December 2008

Foad Yousef (Biology)- major guidance with remote sensing and GIS portion of research

Kelly Durst (GMES)- co-advisor with Bill Rose in Geology, Kelly opted for MS and graduated in August 2008

Elisabet Head (GMES)- major guidance with digital image processing and GIS portions of research

Miriam Rios (GMES)- major guidance with digital image processing and GIS portions of research

Fredline Illorme (Civil and Environmental Eng)- minor guidance at present time

Andrea Munoz-Henerdaz (Civil and Environmental Eng.)- major guidance with GIS portion of research

Rabi Gyawali (EPD2/home dept.-Civil and Environmental Eng.)- major guidance with GIS portion of research

Abdul Koroma (Mechanical Eng.)- major guidance with remote sensing and GIS portion of research

MS Committees

Kristin Dennison (SFRES)- minor guidance

Chris Miller (SFRES)- major guidance with GIS portion of research, graduated August 2008

Crystal Payment (Civil and Environmental Eng.)- minor guidance with GIS portion of research

Ashwini Kashelikar (Civil and Environmental Eng.)- major guidance with GIS portion of research, graduated April 2009

Andrea Munoz-Henerdaz(Civil and Environmental Eng.)- major guidance with GIS portion of research, graduated August 2008

Linda Kersten (Civil and Environmental Eng.)- major guidance with GIS portion of research, graduate August 2008

Fredline Illorme (Civil and Environmental Eng.)- major guidance with GIS portion of research, graduated May 2008

Anna Colvin (GMES)- major guidance with digital image processing and GIS portions of research, graduated Dec. 2008

Jill Barbour (GMES)- major guidance with digital image processing portion of research, graduated May 2008

Professional Memberships

American Society for Photogrammetry and Remote Sensing

Past Associate Editor for *Photogrammetric Engineering and Remote Sensing* (1997-1999)

Past Director of the Geographic Information Systems Division (1995-97)

Past Chair of the Education Committee (1993-1995)

Past Chair- Space Imaging Digital Imagery Award

Current Manuscript Reviewer