

Education

BS Biology: University of Michigan-Flint. May 1988.

Additional Graduate Level Studies: Forest Ecology (M.S. degree unfinished): University of Michigan School of Natural Resources and Environment 1990-1993.

Concentration: Landscape ecosystem classification, forest ecology, soils, botany.

Professional Experience

Visiting Scholar (2014-2015) and Research Fellow (2016-present): University of Massachusetts–Amherst, Department Geosciences, Amherst MA. Organized, developed, and funded pollen laboratory within existing sedimentary facilities at the Department of Geosciences. Equipped, tested, and initiated lab operation for pollen analysis and other supporting work (sediment digestion, charcoal analysis, macro-fossil recovery, etc.). Additionally, set up microscopy and pollen library areas in adjacent Hartshorn Quaternary Laboratory. Lab is supported by wide-ranging analytical capabilities of Woods Hole Oceanographic Institution and the University of Massachusetts Geosciences Department including, but not limited to, characterizing sediment core attributes with Geotek and XRF facilities, as well as a wide range of bio-geo-chemical proxy techniques. Pollen work here, as in the previous location at Brown University, supports high-resolution dating of hurricane records and integrated studies of hurricane, fire, drought, and vegetation dynamics. Recent research activities include: tropical plant coursework at the Kampong National Botanical Garden, Coconut Grove, Florida; vegetation, hurricane, and fire, paleo-reconstructions at Mullet Pond, Florida; Abaco and Long Islands, Bahamas; as well as, Shark Pond and Discovery Bay, Jamaica; and a vegetation and fire reconstruction to support inland barren restoration, Barre, Massachusetts. Recent student work includes supervising one undergraduate research assistant, one undergraduate senior honors student, and one graduate student to produce a high-resolution charcoal analyses for barrens in central Massachusetts, a 4.2 thousand year-long fire and hurricane record for Florida, and a comparison of macro-charcoal and polycyclic aromatic hydrocarbon fire reconstruction methods in Maine, respectively.

Research Associate: Woods Hole Oceanographic Institution, Coastal Systems Group, Falmouth, MA 2005-present. Position a parallel appointment with the current University of Massachusetts-Amherst position. Activities at Woods Hole include US and international fieldwork, fieldwork planning, lab work, grant writing and review, assisting in report and manuscript writing, and collaboration with numerous projects conducted in the Coastal Systems Group. Wide-ranging research in paleo-hurricane reconstruction expanded experience to new temperate, sub-tropical, and tropical regions. Examples include extensive coring and field study in Florida, coring trips to Mexico, Belize, Jamaica, seminar participation in Costa Rica (University of Costa Rica), and co-teaching a macro-charcoal workshop at the University of the West Indies ó Mona, Kingston. Worked in coring groups to utilize and refine coring techniques and platforms in the US and abroad, including the use of jumbo piston corer, Rossfelder, vibra-coring, and push-core applications. Conducted training and supervised one undergraduate senior thesis student and one research intern to produce a high-resolution charcoal analyses for research supported by the Department of Energy.

Professional Experience *continued*

Adjunct Lecturer: University of Massachusetts – Amherst, Department of Landscape Architecture and Regional Planning fall semester 2004, 2006, 2008, 2012-present. Taught as a returning lecturer an undergraduate and graduate course in landscape ecology for Landscape Architecture, Regional Planning, and Environmental Design programs entitled, Pattern and Process: Landscape Architecture 547. This course initially a three and currently four credit course with enrollment ranging from 58-65 students and has two lectures per week. Additionally, taught four lab sections of three hours each, with one-to-two teaching assistants per week. Mean teaching evaluations in 12 categories on scale of 1-5 were: 2004(3.5), 2006(4.5), 2008(4.7), 2012(4.6), 2013(4.5), 2014(4.5), 2015(4.7), and 2016(4.7).

Research Assistant: Brown University Department of Geological Sciences, Providence, RI 2003-2014. Conducted various paleo-ecological laboratory work ranging from pollen processing and analysis, loss-on-ignition, macro charcoal processing and enumeration, and sediment digestion. Work expanded experience in pollen processing and coring (in some settings) from northeastern US fresh water ponds to new depositional sites including estuarine basins, near shore bays and lagoons (US, Mexico, Belize), off shore marine floor, salt marshes, coastal salt ponds, sink holes, cenotes (Mexico and US), river deltas (Romania), and tropical lakes (Indonesia). Supervised, trained, and collaborated with faculty, graduate, undergraduate, and visiting researchers, oversaw daily operation of the pollen laboratory as well as acted as lab hazardous waste and lab safety coordinator. Other projects included, but not limited to, assisting in the set up and operating the Geotek core scanner and establishment of core storage and processing facility. Additionally, supervised three undergraduate student senior/honors thesis research projects and trained one Ph.D. candidate in salt marsh pollen identification. Conducted vegetation surveys, plant sampling, and manuscript review to support organic biogeochemical research on leaf wax proxy temperature and precipitation reconstruction techniques. Largest project developed and refined multiple techniques to integrate high-resolution pollen, hurricane, fire, and drought reconstructions for a multi-basin study of coastal vegetation change over the last 2000 years.

Research Assistant: Harvard Forest, Harvard University, Petersham, MA 1999-2003. Paleo-laboratory segment of responsibilities includes sediment coring and sediment processing, fossil pollen identification, loss-on-ignition analysis, imaging and enumeration of micro and macro charcoal, data collection, data organization and communication. Completed high-resolution pollen, charcoal, and loss-on-ignition records over the past 2000 years for five sites in Massachusetts and New York. Extended records for an additional nine sites in New England. Summer field research segment of responsibilities (1999-2000) included co-management of vegetation and soil sampling component of regional study addressing land use history and present-day vegetation on the New England coast. Project area extended from Cape Cod to Long Island and resulted in the establishment of over 700 combined soil and coastal vegetation sampling plots. Primary duties included project scheduling, cooperator contacts, supervision of summer research students, teaching vegetation identification and sampling, teaching soil profile characterization and sampling, and teaching field land use history interpretation. Additional responsibilities include interim seminar coordinator (fall 2001) and seminar co-coordinator (2002-3). Organized approximately 50 speakers (about 12 per semester) over a two-year period

Associate Ecologist: New York Natural Heritage Program, Department of Fish and Wildlife, New York Department of Environmental Conservation, Latham, NY 1997-1999. Conducted field surveys for ecological communities and rare plants using methods and techniques developed by the Heritage Program Network and the New York Natural Heritage Program. Mapped significant ecological communities using aerial photo interpretation and other appropriate methods and transcribed, updated, and edited natural community and rare plant element occurrence records. Administered inventory project and acted as liaison to project sponsors. Wrote periodic progress reports and summary reports as needed. Assisted in grant writing and for pending projects. Primary project was a two-year study to identify reference wetlands from 12 ecological communities on Long Island, NY. Principle objective was to select exemplary wetland occurrences representative of island-wide patterns of ecological diversity. Project was cooperatively funded through the United States Environmental Protection Agency, The Nature Conservancy-Long Island Chapter, and Suffolk County. Secondary projects included pilot surveys of coastal salt pond communities at the Mashomack Preserve, Shelter Island and surveys for exemplary occurrences of wetland and forest communities on the Tug Hill Plateau.

Additional Professional Experience

Biologist: Parker Mill/Forest Park Project, Farrand and Associates, Ann Arbor, MI 1994-95.
Research Assistant: University of Michigan School of Natural Resources and Environment, Ann Arbor, MI 1991-95.
Biologist: Pollack Design Associates, Ann Arbor, MI 1990-93.
Teaching Assistant: University of Michigan School of Natural Resources and Environment, Ann Arbor, MI 1991.
Contract Wetland Specialist: Michigan Department of Natural Resources, Division of Water Quality, Newberry, MI 1989-90.
Adjunct Lecturer and Teaching Assistant: University of Michigan-Flint, Flint, MI 1988-89.

Voluntary Field Trip and Research Experience

Summer intern vegetation instructor for coastal forest monitoring studies: The Nature Conservancy, Mashomack Preserve, Shelter Island, NY 2003-present.
Field Trip Leader: University of Massachusetts Department of Landscape Architecture and Regional Planning, Amherst, MA, spring/fall semesters, 1996-present.
Field Trip Leader: Harvard Forest, Petersham, MA 1999-2003.
Field Trip leader: Brookhaven National Laboratory, Upton, NY, Pine Barrens Research Forum, October 2001.
Field Trip Leader: Harvard University, Old-growth forest Mt. Wachusett, MA October 1996.
Botanist: Forestry Canada, Moose River, Ontario July 1992.

Community Service

Pelham Community Preservation Committee: Secretary 2012-2014, Chair 2014-present
Pelham Conservation Commission: Member 2007-present, Secretary 2008-2010, Chair 2010-

Honors

University of Michigan Xi Sigma Pi Chapter Forester. 1992-1993.
Xi Sigma Pi National Forestry Honor Society. Inducted 1991.

Publications

Miller, Daniel R., Raymond S. Bradley, Isla S. Castañeda, and Dana MacDonald. 2017. Local and regional wildfire activity in central Maine (USA) during the past 900 years. *Journal of Paleolimnology*. *In review*.

Donnelly, J. P., A. Hawkes, P. Lane, D. MacDonald, M. Toomey, P. van Hengstum, and J. Woodruff. Climate Forcing of Unprecedented Intense-Hurricane Activity in the Last 2000 Years. (23 February 2015) *Earth's Future: American Geophysical Union open access journal*.

Newby, P. E., Shuman, B. N., Donnelly, J. P., & MacDonald, D. (2011). Repeated century-scale droughts over the past 13,000 yr near the Hudson River watershed, USA. *Quaternary Research*, 75(3), 523-530.

Gao, L., Hou, J., Toney, J., MacDonald, D., & Huang, Y. (2011). Mathematical modeling of the aquatic macrophyte inputs of mid-chain n-alkyl lipids to lake sediments: Implications for interpreting compound specific hydrogen isotopic records. *Geochimica et Cosmochimica Acta*, 75(13), 3781-3791.

Oswald, W. W., Foster, D. R., Doughty, E. D., & MacDonald, D. (2010). A record of Holocene environmental and ecological changes from Wildwood Lake, Long Island, New York. *Journal of Quaternary Science*, 25(6), 967-974.

Newby, P. E., Donnelly, J. P., Shuman, B. N., & MacDonald, D. (2009). Evidence of centennial-scale drought from southeastern Massachusetts during the Pleistocene/Holocene transition. *Quaternary Science Reviews*, 28(17), 1675-1692.

Hou, J., D'Andrea, W. J., MacDonald, D., & Huang, Y. (2007). Evidence for water use efficiency as an important factor in determining the δ D values of tree leaf waxes. *Organic Geochemistry*, 38(8), 1251-1255.

Hou, J., D'Andrea, W. J., MacDonald, D., & Huang, Y. (2007). Hydrogen isotopic variability in leaf waxes among terrestrial and aquatic plants around Blood Pond, Massachusetts (USA). *Organic Geochemistry*, 38(6), 977-984.

Parshall, T., Foster, D. R., Faison, E., MacDonald, D., & Hansen, B. C. S. (2003). Long-term history of vegetation and fire in pitch pine-oak forests on Cape Cod, Massachusetts. *Ecology*, 84(3), 736-748.

Motzkin, G., Eberhardt, R., Hall, B., Foster, D. R., Harrod, J., & MacDonald, D. (2002). Vegetation variation across Cape Cod, Massachusetts: environmental and historical determinants. *Journal of Biogeography*, 29(10/11), 1439-1454.



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Dana D. MacDonald

MacDonald, D. and G. Edinger. 2000. *Identification of reference wetlands on Long Island, New York.* Final report prepared for United States Environmental Protection Agency Wetland Grant 66-561. New York Natural Heritage Program, 700 Troy-Schenectady Road, Latham, NY 12110-2400.