

Curriculum Vitae
John A. Madsen, Associate Professor,
Department of Geological Sciences, College of Earth, Ocean and Environment,
University of Delaware, jmadsen@udel.edu, 302-831-1608

Education:

Ph.D., Oceanography, University of Rhode Island, Graduate School of Oceanography, 1988
B.S. with distinction, Geology, Iowa State University, 1981

Experience:

Associate Professor of Geology (with tenure), University of Delaware, 1994-Present
Governing Scientist and Education Coordinator, Center for Carbon-free Power Integration,
University of Delaware 2013-Present

Adjunct Scientist, Woods Hole Oceanographic Institution, 1999-2001

Summer Guest Investigator, Woods Hole Oceanographic Institution, 1996 –1998

Senior Lecturer (Temporary), Department of Geology, University of Papua New Guinea, 1992

Assistant Professor of Geology, University of Delaware, 1988–1994

Teaching Interests:

Have taught introductory-level courses in geology, earth science and environmental science; upper-level undergraduate courses in structural geology and plate tectonics and a senior seminar (intensive writing course) in petroleum geology and energy; graduate and upper-level undergraduate courses in environmental and applied geology, geophysics, geological aspects of offshore wind, and science education.

Courses Taught (Within Past 5 Years)

GEOL107 – General Geology – introductory-level physical geology course (enrollment ~300)

GEOL108 – Volcanoes and Earthquakes – introductory-level continuing education course
(enrollment ~25)

GEOL113 – Earth Science – introductory-level earth science course intended for elementary education majors (enrollment ~175)

GEOL305 – Structural Geology & Plate Tectonics – upper-level undergraduate course primarily for geology majors (enrollment ~15)

GEOL401 – Senior Seminar – upper-level undergraduate course for geology majors, intensive writing course, course topic: energy, petroleum geology, including unconventional oil & gas (fracking) (enrollment ~15)

GEOL421/621 – Environmental & Applied Geology – graduate and upper-level undergraduate course primarily intended for geology majors, course topics include climate change and global sea-level rise, water resources and contamination, mineral resources (enrollment ~20)

GEOL453/653 – Elementary Geophysics I - graduate and upper-level undergraduate course primarily intended for geology majors, course topics include gravity, geodesy (including GPS), magnetics, high-resolution acoustic methods (e.g., side-scan sonar, chirp sub-bottom profiling) (enrollment ~15)

GEOL663 – Geological Aspects of Offshore Wind - graduate and upper-level undergraduate course primarily intended for graduate students studying wind power and geology majors, course topics include geological evolution of continental margins, geotechnical properties of continental marine sediments, structural properties of offshore foundations (enrollment ~15)

ARSC390 – Honors Colloquium – intensive writing course for freshmen students in the honors program, course topics included geological and societal implications of blood diamonds, mineral resources of Afghanistan, and unconventional oil & gas (fracking) (enrollment ~20)

SCEN650 Scientific Inquiry for Current and Future Teachers – graduate and upper-level undergraduate course for pre- and in-service middle to high school science teachers, problem-based learning pedagogy with investigations focused on energy, climate change, and environmental topics (enrollment ~15)

UNIV101 First-Year Experience – seminar course for first semester freshmen, course topics include introduction to university-life and discussion focused around a common reading book (enrollment ~25)

K-12 Earth Science Curriculum Support

Co-Designer of 9th Grade Earth Systems Curriculum Unit for Delaware Department of Education's Science Coalition. Have offered training of unit to 9th Grade Teachers in the State of Delaware that have implemented the curriculum.

Consultant Instructor in Earth History for Delaware Middle School (6th Grade) Science Teachers for Delaware Department of Education's Science Coalition

Graduate Student Advisement

Currently academic advisor for 1 PhD graduate student (Bartholomew Wilson)

Currently academic advisor for 1 MS graduate student (Alia Ponte)

Within Past 5 Years have advised 2 PhD and 5 MS graduate students

Total number of graduate students advised and post-doctoral scholars sponsored: 18

Research Interests:

Areas of Focus: Coastal and Estuarine Geophysics; Geological and Geotechnical Aspects of Offshore Wind Projects; Earth Science Education in K-12 Schools

Funded Research (Within Past 5 Years)

Co-Principal Investigator with Bonnie Ram, Center for Carbon-free Power Integration, University of Delaware - Delaware EPSCoR: Meeting Delaware's 21st Century Water and Energy Challenges through Research, Education, and Innovation; Theme 4: Innovations in Renewable Energy; Funding Agency: National Science Foundation, 2/1/13-1/31/17.

Principal Investigator - Energy Upcycling: Transforming Oil Rigs to Geothermal Power Systems; Funding Agency: University of Delaware Energy Institute (UDEI) Innovative Energy Research Grants Program, 3/3/14-3/30/15.

Co-Principal Investigator with Matthew Oliver, School of Marine Science and Policy, University of Delaware, Dwayne Fox, Delaware State University, and researchers from four other states' agencies - Sturgeons in the Mid-Atlantic region: A multi-state collaboration for research and conservation; Funding Agency: National Marine Fisheries Service, 6/1/10-5/31/15.

Co-Principal Investigator with Willett Kempton and Jeremy Firestone, School of Marine Science and Policy, University of Delaware - A System Design Study for Wilmington Canyon Offshore Wind Farm; Funding Agency: US Department of Energy, 10/1/11-9/30/14.

Principal Investigator with Deborah Allen, Biological Sciences, Steve Fifield, Education Research and Development Center, Danielle Ford, School of Education, Harry Shipman, Physics & Astronomy, and Richard Donham, Math & Science Educational Resource Center, University of Delaware – Development of Pedagogical Content Knowledge and the Transition from University Student to Teacher; Funding Agency: National Science Foundation, 7/01/05 – 12/31/09 (completed no-cost extension 2013).

- Co-Principal Investigator with Dewayne Fox, Delaware State University - Delaware EPSCoR RII-2-CIBER Seed Grant Program: Impact of Delaware River Channel Deepening on Benthic Habitats Utilized by Atlantic and Shortnose Sturgeon, Funding Agency: Delaware State University EPSCoR program, 2/1/13-7/31/13.
- Co-Principal Investigator with Harry Shipman, Physics & Astronomy, State of Delaware Department of Education - Delaware Extends the Use of NASA Materials in High School Curricula; Funding Agency: NASA, 01/26/10 –07/31/11.
- Co-Principal Investigator with Jeremy Firestone, Willett Kempton, Matthew Oliver, Jim Corbett, School of Marine Science and Policy, and John Callahan, Delaware Geological Survey - Offshore Wind Power for Delaware in a Marine Spatial Planning Context; Funding Agency: Delaware Sea Grant, 2/01/2011 – 1/31/2012
- Co-Principal Investigator with George Watson, College of Arts & Sciences, Kathryn Scantlebury, Department of Chemistry & Biochemistry, Deborah Allen, Department of Biological Sciences, and Amy Quillen, New Castle County Vocational Technical School District – Track 1, GK-12: Improvement of Science Education in Vocational Technical High Schools through Collaborative Learning and Coteaching; Funding Agency: National Science Foundation, \$1,600,000, 06/01/06–05/31/09 (completed no-cost extension in 2010)
- Principal Investigator - Benthic and Sub-Benthic Mapping of Delaware’s Coastal Areas for Natural Resource Management: Continuation 2009, Funding Agency: Delaware Department of Natural Resources and Environmental Control, \$24,806 – 6/01/09-5/31/10

Publications (Within Past 5 Years)

- Firestone, J., Archer, CA., Gardner, MP, Madsen, JA, Prasad, AK, Veron, DE, 2015, The time has come for offshore wind power in the US, Proceedings of the National Academy of Sciences, 112(39): 11985-11988, doi: 10.1073/pnas.1515376112.
- Ford, D., Fifield, S., Madsen, J., and Qian, X., 2013, The Science Semester: Cross-disciplinary inquiry for prospective elementary teachers, Journal of Elementary Science Teacher Education, v. 24, no. 6, 1049-1072.
- Madsen, J., Bates, A., Callahan, J., and Firestone, J., 2011, Use of geospatial techniques in planning for offshore wind development, Thakur, J., Singh, S., Ramanathan, A., Krishna, M., Gossel, W. (eds.), Geospatial techniques: Managing environmental resources, Springer (Germany) and Capital Publication (India)
- Wilson, B., and Madsen, J., 2011, Investigation and review of the surface and sub-surface sediment distribution of Reach E for the Delaware River and Bay Main Channel Deepening Project, Technical Report, Delaware Department of Natural Resources and Environmental Control, Dover, DE

Abstracts of Presentations at National/International Meetings (Within Past 5 Years)

- Madsen, J., Ram, B., and Ponte, A., 2016, Offshore Wind: Unconventional Constraints on Project Siting in Order to Lower Risks and Overall Costs, American Wind Energy Association (AWEA) WINDPOWER 2016, May 24-26, New Orleans, LA.
- Madsen, J. and Ponte, A., 2016, Selecting Next Generation Wind Energy Areas: Incorporating Geological/Geotechnical Setting, American Wind Energy Association (AWEA) Offshore 2016, October 25-26, Providence, RI.
- Madsen, J., 2015, Role of geological models and geotechnical characteristics in reducing costs and uncertainties and assessing risks in the development of offshore wind projects, European Wind Energy Association (EWEA) Offshore 2015 Conference and Exhibition, March 10-12, 2015, Copenhagen, Denmark.

- Comer, A., Madsen, J., Fox, D., 2014, A non-invasive assessment of reproductively mature Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) habitat use, American Geophysical Union, Ocean Sciences Meeting, February 23-28, 2014, Honolulu, HI.
- Comer, A., Madsen, J., and Fox, D., 2014, Integration of acoustic methodologies to constrain Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) distribution and habitat preferences, Southern Division of American Fisheries Society Meeting, January 22-26, 2014, Charleston, SC.
- Comer, A., Fox, D., and Madsen, J., 2013, Hydroacoustic Assessment of Shortnose Sturgeon Spawning Aggregations in the Tidal Delaware River, Tidewater Chapter of the American Fisheries Society Annual Meeting, March 21-24, 2013, Solomons, MD.
- Comer, A., Higgs, A., Madsen, J., and Fox, D., 2013, A novel approach for identifying concentration areas of reproductively mature Atlantic sturgeon and assessing the impacts of targeted anchored gillnetting, American Fisheries Society 2013 Meeting, September 8-14, Little Rock, AR.
- Bates, A., Madsen, and Firestone, J., 2013, Accounting for Commercial Fishing Interests in Offshore Wind Planning, American Wind Energy Association (AWEA) Offshore WINDPOWER, October 22-23, Providence, RI.
- Bates, A., Madsen, J., and Firestone, J., 2013, Accounting for Commercial Fishing Interests in Offshore Wind Planning, European Wind Energy Association (EWEA) Offshore 2013, November 19-21, 2013, Frankfurt, Germany
- Madsen, J., 2012, Geologic Setting of the U.S. Eastern Continental Shelf: Implications for Selection and Design of Offshore Wind Turbine Foundations, Marine Foundations Seminar, Deep Foundations Institute, Norfolk, VA, December 6-7
- Comer, A., Fox, D., and Madsen, J., 2012, Hydroacoustic assessment of habitat utilization for sturgeon in the Delaware River, Mid-Atlantic Chapter of the American Fisheries Society 2012 Annual Meeting, Wilmington, DE, November 1-2
- Madsen, J., 2011, Relevance of the geologic setting of the Delaware Estuary to offshore wind sites, Delaware Estuary Science and Environmental Summit, Cape May, NJ, January 30-February 2
- Madsen, J., 2011, Integration of geophysical surveys with geotechnical investigations at offshore wind facilities, Symposium on the Application of Geophysics to Engineering and Environmental Problems (SAGEEP) 2011, Charleston, SC, April 10-14
- Wilson, B., and Madsen, J., 2011, Investigation and review of the surface and sub-surface sediment distribution of Reach E to evaluate the potential suitability of “beneficial reuse” of sediments removed for the Delaware Estuary Main Channel Deepening Project, Delaware Estuary Science and Environmental Summit, Cape May, NJ, January 30-February 2
- Wilson, B., Madsen, J., and Siok, D., 2011, Utilizing 3D GIS for Marine Spatial Planning in Delaware, 2011 Esri International User Conference, San Diego, CA, July 11-15
- Krantz, D., Madsen, J., and Childers, D., 2011, Importance of Geologic Setting in the Development of Offshore Wind Projects Along the East Coast of the United States, American Wind Energy Association (AWEA) Offshore Windpower 2011, Baltimore, MD, October 11-13
- Madsen, J., 2011, Relevance of the geologic setting of the Delaware Estuary to offshore wind sites, Delaware Estuary Science and Environmental Summit, Cape May, NJ, January 30-February 2
- Wilson, B., and Madsen, J., 2011, Investigation and review of the surface and sub-surface sediment distribution of Reach E to evaluate the potential suitability of “beneficial reuse” of sediments removed for the Delaware Estuary Main Channel Deepening Project, Delaware Estuary Science and Environmental Summit, Cape May, NJ, January 30-February 2

Service Activities (Within Past 5 Years):

University of Delaware:

President, University of Delaware Faculty Senate (2010-2011 academic year)

Co-Chair, University of Delaware Sustainability Task Force (2007-2012)

Member, University Faculty Senate Executive Council
Member, Environmental Sciences and Studies Advisory Committee
Member, University Academic and Student Affairs Council
Member, Search Committee for Dean of College of Education and Human Development
Member, Search Committee for Associate Provost for Institutional Effectiveness
Member, Department Promotion and Tenure Committee

Current or Recent Professional Activities or Assignments:

Reviewer of proposals submitted to National Science Foundation
Reviewer of proposals submitted to New York Sea Grant
Reviewer for manuscripts submitted to Ocean and Coastal Management journal

Memberships and Affiliations:

National Science Teachers Association (NSTA)
American Geophysical Union (AGU)