

Duncan N. L. Menge

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National Center for Ecological Analysis & Synthesis
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EDUCATION AND TRAINING

National Center for Ecological Analysis & Synthesis, Santa Barbara, California

Postdoctoral research, 2008-present

Project: Synthesizing ecosystem development data in a theoretical framework to understand transitions from nitrogen limitation to co-limitation to phosphorus limitation

Princeton University, Princeton, New Jersey

Ph.D., Ecology & Evolutionary Biology, 2008

M.A., Ecology & Evolutionary Biology, 2005

Ph.D. Thesis: The ecology and evolution of nitrogen fixation and nutrient limitation at multiple time scales

Committee: Simon A. Levin (co-adviser), Lars O. Hedin (co-adviser), Stephen W. Pacala

University of Utah, Salt Lake City, Utah

Supplemental education: Stable Isotope Ecology, 2004

Stanford University, Stanford, California

B.S., Earth Systems, 2003

Honors in Environmental Science, Technology, & Policy

Honors Thesis: Phosphorus! Or: Anthropogenic global environmental changes and phosphorus limitation: interactions and implications

Adviser: Christopher B. Field

AWARDS AND FELLOWSHIPS

- Postdoctoral Fellowship, National Center for Ecological Analysis & Synthesis, 2008-present
- Elizabeth Sulzman Award for outstanding publication by a graduate student, Ecological Society of America, Biogeosciences Section, 2008
- Postdoctoral Fellowship, Santa Fe Institute (*declined*), 2008
- Graduate Research Fellowship, National Science Foundation, 2004-2008
- Sir Robert May Fellowship, Sir Robert May Foundation, Princeton University, 2004
- Firestone Medal for excellence in research, Stanford University, 2003
- Departmental Award for excellence in research, Earth Systems, Stanford University, 2003
- Honors in Environmental Science, Technology, & Policy, Goldman Honors Program, Stanford University, 2003

RESEARCH EXPERIENCE

National Center for Ecological Analysis & Synthesis

Postdoctoral research, Santa Barbara, CA

Summer 2008-present

Princeton University

Graduate research, Princeton, NJ; Franz Josef, New Zealand

Fall 2003-Spring 2008

Field assistant, Biogeochemistry experiments, Maui, HI

Summer 2003

Stanford University

Undergraduate research, Stanford, CA

Winter 2001/2002-Spring 2003

Field technician, Jasper Ridge Global Change Experiment, Stanford, CA

Summer-Fall 2002

Oregon State University

Data analyst, Marine ecology experiments, Corvallis, OR

Summer 2001

Field assistant, Marine ecology experiments, Oregon coast

Summer 2000

PUBLICATIONS

In print/press

- Ballantyne, F, **DNL Menge**, & JS Weitz. 2010. A discrepancy between Michaelis-Menten based nutrient uptake model predictions and nitrogen to phosphorus stoichiometry in the surface ocean. *Limnology and Oceanography* in press.
- Hedin, LO, ENJ Brookshire, **DNL Menge**, & AR Barron. 2009. The nitrogen paradox in tropical forest ecosystems. *Annual Review of Ecology, Evolution, and Systematics* 40: 613-635. doi:10.1146/annurev.ecolsys.37.091305.110246.
- **Menge, DNL** & LO Hedin. 2009. Nitrogen fixation in different biogeochemical niches along a 120,000-year chronosequence in New Zealand. *Ecology* 90(8): 2190-2201. doi:10.1890/08-0877.1.
- **Menge, DNL**, SA Levin, & LO Hedin. 2009. Facultative versus obligate nitrogen fixation strategies and their ecosystem consequences. *American Naturalist* 174(4): 465-477. doi:10.1086/605377.
- **Menge, DNL**, SW Pacala, & LO Hedin. 2009. Emergence and maintenance of nutrient limitation over multiple time scales in terrestrial ecosystems. *American Naturalist* 173(2): 164-175. doi:10.1086.595749.
- **Menge, DNL** & JS Weitz. 2009. Dangerous nutrients: Evolution of phytoplankton resource uptake subject to virus attack. *Journal of Theoretical Biology*. 257(1): 104-115. doi:10.1016/j.jtbi.2008.10.032.
- Ballantyne, F IV, **DNL Menge**, A Ostling, & P Hosseini. 2008. Nutrient recycling affects autotroph and ecosystem stoichiometry. *American Naturalist* 171(4): 511-523. doi:10.1086/528967.
- **Menge, DNL**, SA Levin, & LO Hedin. 2008. Evolutionary tradeoffs can select against nitrogen fixation and thereby maintain nitrogen limitation. *Proceedings of the National Academy of Sciences USA* 105(5): 1573-1578. doi:10.1073/pnas.0711411105.
- **Received Elizabeth Sulzman Award, 2008**
- **Menge, DNL** & CB Field. 2007. Simulated global changes alter phosphorus demand in annual grassland. *Global Change Biology* 13(12): 2582-2591. doi:10.1111/j.1365-2486.2007.01456.x.
- **Recommended on Faculty of 1000 by Ingrid Burke**
- Koh, LP & **DNL Menge**. 2006. Rapid assessment of Lepidoptera predation rates in Neotropical forest fragments. *Biotropica* 38(1): 132-134. doi:10.1111/j.1744-7429.2006.00114.x.
- Menge, BA, J Lubchenco, MES Bracken, F Chan, MM Foley, TL Freidenburg, SD Gaines, G Hudson, C Krenz, H Leslie, **DNL Menge**, R Russell, & MS Webster. 2003. Coastal oceanography sets the pace of rocky intertidal community dynamics. *Proceedings of the National Academy of Sciences USA* 100(21): 12229-12234. doi:10.1073/pnas.1534875100.
- Loveland, W, M Andersson, KE Zyromski, N Ham, B Altschul, J Vlcakova, **D Menge**, LO Liljenzin, R Yanez, & K Aleklett. 1999. Heavy residue production in the interaction of 29 MeV/nucleon Pb-208 with Au-197. *Physical Review C-Nuclear Physics* 59(3): 1472-1479.

GRANTS

- Research grant, \$295,000, The Andrew W. Mellon Foundation, 2008-2011
Dynamics of South African vegetation
PI: Simon Levin (co-written with **DNL Menge**, S Archibald, I Rodriguez-Iturbe, & C Staver)
- Doctoral Dissertation Improvement Grant, \$11,990, National Science Foundation, 2006-2008
Linking theory and mechanistic experiments in explaining how nitrogen fixation strategies influence ecosystem nitrogen fertility
Co-PI with Lars Hedin & Simon Levin
- Major Grant, \$3,000, Undergraduate Research Office, Stanford University, 2002-2003
Phosphorus limitation in a California grassland ecosystem under global change conditions

**SELECTED
SCHOLARLY
PRESENTATIONS**

- **Menge, DNL.** August 3, 2009. Facultative versus obligate nitrogen fixation strategies and their ecosystem consequences. 94th annual meeting of the Ecological Society of America. Albuquerque, New Mexico.
- **Menge, DNL.** April 1, 2009. Resolving the paradox of nitrogen limitation in temperate forests. UC Irvine. Irvine, California. (**Invited**)
- **Menge, DNL, JL DeNoyer, & JW Lichstein.** December 4, 2008. Historical constraints do not explain the rarity of nitrogen-fixing trees in late-successional temperate forests. Annual meeting of the Ecological Society of Australia. Sydney, Australia.
- **Menge, DNL.** November 18, 2008. Nitrogen isotopic variation along a 120,000-year soil chronosequence in Franz Josef, New Zealand. Princeton University. Princeton, New Jersey. (**Invited**)
- **Menge, DNL.** February 11, 2008. Nitrogen controls on carbon storage in old-growth forests: insights from simple theory. Santa Fe Institute. Santa Fe, New Mexico. (**Invited**)
- **Menge, DNL, SA Levin, & LO Hedin.** August 10, 2007. Adaptive nitrogen fixation strategies with realistic tradeoffs allow persistent N limitation and N richness. 92nd annual meeting of the Ecological Society of America. San Jose, CA. (**Invited**)
- **Menge, DNL.** December 16, 2005. Nitrogen fixation in different biogeochemical niches along the Franz Josef soil chronosequence. Manaaki Whenua - Landcare Research. Lincoln, New Zealand. (**Invited**)

**TEACHING
EXPERIENCE**

Princeton University, Ecology & Evolutionary Biology, Princeton, New Jersey

- Guest lecturer, *Ecosystem & Global Change*, 11/2006 & 11/2008
- Guest lecturer, *Theoretical Ecology*, 4/2008
- Teaching assistant, *Ecosystems & Global Change*, Fall 2006
- Teaching assistant, *Theoretical Ecology*, Spring 2006
- Teaching assistant, *Biology of Organisms*, Fall 2003

**PROFESSIONAL
ACTIVITIES AND
SERVICE**

- Reviewer, Grant Applications: *National Science Foundation*, Ecosystem Studies Program
- Reviewer, Journals: *Proceedings of the National Academy of Sciences*, *Ecology*, *American Naturalist*, *Ecological Applications*, *Ecosystems*, *Biogeochemistry*, *Theoretical Ecology*, *Plant and Soil*, *Journal of Applied Ecology*, *Oecologia*
- Co-chair and Judge, ESA Biogeosciences section Awards committee, 2009
- English language reviewer for the Ecological Society of America, 2006-present
- Kids do Ecology, NCEAS/Monroe Elementary School, 2009-present
- Hiring committee, NCEAS Business officer search, 2009
- Guest lecturer and curriculum development assistant, Millennium High School, 2003-2008
- Graduate student representative to faculty, Princeton Univ., Ecol. & Evol. Bio., 2005-2007
- Docent, Jasper Ridge Biological Preserve, Stanford, California, 2002-2003

**PROFESSIONAL
MEMBERSHIPS**

- American Association for the Advancement of Science
- Ecological Society of America
- Sigma Xi

**OTHER
ACTIVITIES**

Cello (chamber groups and symphonies), guitar, mountain biking, rock climbing, backpacking, volleyball, ultimate frisbee, basketball, soccer

REFERENCES

1. Simon A. Levin, Princeton University (Ph.D. co-adviser)
203 Eno Hall, Dept. of Ecology & Evolutionary Biology, Princeton, NJ 08544-1003
Email: slevin@princeton.edu, Phone: (609) 258-6880
2. Lars O. Hedin, Princeton University (Ph.D. co-adviser)
222 Guyot Hall, Dept. of Ecology & Evolutionary Biology, Princeton, NJ 08544
Email: lhedin@princeton.edu, Phone: (609) 258-7325
3. Stephen W. Pacala, Princeton University (Ph.D. committee member)
102 Eno Hall, Dept. of Ecology & Evolutionary Biology, Princeton, NJ 08544
Email: pacala@princeton.edu, Phone: (609) 258-6885