

CURRICULUM VITAE- SARAH E. HOBBIE

Department of Ecology, Evolution and Behavior
University of Minnesota
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Education

PhD in Integrative Biology, University of California at Berkeley, 1995
BA in Biology, *magna cum laude*, Carleton College, 1986

Positions Held

Director of Graduate Admissions, Ecology, Evolution and Behavior Graduate Program,
2005-2008
Associate Professor, University of Minnesota, 2004-present
Assistant Professor, University of Minnesota, 1998-2004
Post-Doctoral Research Fellow, Stanford University, 1995-1998
Graduate Student Instructor, University of California, Berkeley, 1990-1991
Research Assistant, Limnological Research Center, University of Minnesota, 1986-1989

Honors and Fellowships

Aldo Leopold Leadership Program Fellow, 2008
McKnight Land-Grant Professorship, 2000-2001
National Science Foundation Postdoctoral Research Fellowship, 1995-1997
NASA Global Change Graduate Fellowship, 1992-1995
National Science Foundation Doctoral Dissertation Improvement Grant, 1992-1994
Murray F. Buell Award for Excellence in Ecology, 1992
Outstanding Graduate Student Instructor, 1990-1991
National Science Foundation Graduate Fellowship, 1989-1992
Phi Beta Kappa, 1986
National Merit Scholar, 1982-1986

Grants and Contracts

9/01/08-8/31/11: co-PI, NSF Dynamics of Coupled Human and Natural Systems.
Collaborative Research: Coupling human choice and biogeochemical cycling in urban
ecosystems. \$998,121. With L Baker and K Nelson.

10/08-10/10: co-PI, DOE-NICCR. Interactive effects of carbon dioxide, water, and nitrogen
on grassland ecosystem processes. With PB Reich, T Lee. \$245,000.

10/01/06-9/30/12: co-PI, NSF LTER Program. Biodiversity, environmental change and
ecosystem function at the prairie-forest border. With D Tilman, PB Reich, S Polasky.
\$4,920,000.

3/1/06-2/29/10: co-PI, NSF Ecosystem Studies, Photodegradation of plant litter in grassland ecosystems: A mechanism for uncoupling C and N biogeochemistry; with J King, D Milchunas, W Parton and RL Sinsabaugh; \$315,000

5/01/04-4/30/10: PI, NSF Faculty Development. CAREER: Understanding nitrogen limitation of decomposition; \$500,000.

08/01/07-07/31/11: co-PI, DOE. Warming-induced biome change at the temperate-boreal ecotone: An experimental test of key regeneration processes. With PB Reich, R Montgomery, J Oleksyn and R Rich. \$1,806,655.

7/1/07-6/30/12: co-PI, NSF LTREB. LTREB: Long-term interactions among biodiversity, CO₂, and N in a perennial grassland ecosystem. With PB Reich, T Lee. \$450,000.

9/01/07-8/31/10: co-PI, NSF Biocomplexity: Dynamics of Coupled Natural and Human Systems: Integration of Human Choice into Models of Biogeochemical Cycling in Urban Ecosystems; with L Baker, J King, J McFadden, K Nelson. \$550,000.

Publications, Scientific Literature: Refereed Journal Articles

2009/In press

Clark, C. M., **S. E. Hobbie**, R. Venterea, and D. Tilman. 2009. Long-lasting effects on N cycling 12 years after treatments cease despite minimal N retention. *Global Change Biology* 15:1755-1766

Fornara, D. A., D. Tilman and **S. E. Hobbie**. 2009. Linkages between plant functional composition, fine root processes and potential soil N mineralization rates. *Journal of Ecology* 97:48-56

Keeler, B. L., **S. E. Hobbie**, and L. Kellogg. 2009. Effects of long-term nitrogen additions on soil and litter microbial enzyme activity in eight forested and grassland sites – implications for litter and SOM decomposition. *Ecosystems* 12:1-15

Schlatter, D., A. Fubuh, K. Xiao, D. Hernandez, **S. E. Hobbie** and L. Kinkel. In press. Resource amendments influence density and competitive phenotypes of *Streptomyces* in soil. *Microbial Ecology*

2008

Cornwell, W. K., J. H. C. Cornelissen, K. Amatangelo, E. Dorrepaal, V. T. Eviner, O. Godoy, **S. E. Hobbie**, B. Hoorens, H. Kurokawa, N. Perez-Harquindeguy, H. M. Quested, L. S. Santiago, D. A. Wardle, I J. Wright, R. Aerts, S. D. Allison, P. van Bodegom, V. Brovkin, A. Chatain, T. Callaghan, S. Diaz, E. Garnier, D. Gurvich, E. Kazakou, J. Klein, J. Read, P. Reich, V. Soudzilovskaia, M. Vaieretti, M. Westoby. 2008. Plant traits are the predominant control on litter decomposition rates within biomes worldwide. *Ecology Letters* 11:1065-1071

Hernández, D. L. and **S. E. Hobbie**. 2008. Effects of fire frequency on oak litter decomposition and N dynamics. *Oecologia* 158:535-543

Hobbie, S. E. 2008. Nitrogen effects on litter decomposition: a five-year experiment in eight temperate grassland and forest sites. *Ecology* 89:2633-2644

- Kay, A. D., J. Mankowski, and **S. E. Hobbie**. 2008. Long-term burning interacts with herbivory to slow decomposition. *Ecology* 89:1188-1194
- Sinsabaugh, R., C. Lauber, M. Weintraub, B. Ahmed, S. Allison, C. Crenshaw, A. Contosta, D. Cusack, S. Frey, M. Gallo, T. Gartner, **S. Hobbie**, K. Holland, B. Keeler, J. Powers, M. Stursova, C. Takacs-Vesbach, M. Waldrop, M. Wallenstein, D. Zak, L. Zeglin. 2008. Stoichiometry of soil enzyme activity at global scale. *Ecology Letters* 11:1-13

2007

- Baker, L. A., P. M. Hartzheim, **S. E. Hobbie**, J. Y. King, K. C. Nelson. 2007. Effect of consumption choices on fluxes of carbon, nitrogen and phosphorus through households. *Urban Ecosystems* 10:97-117
- Cornelissen, J. H. C., P. M. van Bodegom, R. Aerts, T. V. Callaghan, R. S. P. van Logtestijn, J. Alatalo, F. S. Chapin, R. Gerdol, J. Gudmundsson, D. Gwynn-Jones, A. E. Hartley, D. S. Hik, A. Hofgaard, I. S. Jónsdóttir, S. Karlsson, J. A. Klein, J. Laundre, B. Magnusson, A. Michelsen, U. Molau, V. G. Onipchenko, H. M. Quested, S. M. Sandvik, I. K. Schmidt, G. Shaver, B. Solheim, N. A. Soudzilovskaia, A. Stenström, A. Tolvanen, Ø. Totland, N. Wada, J. M. Welker, X. Zhao et al. 2007. Global negative vegetation feedback to climate warming responses of leaf litter decomposition rates in cold biomes. *Ecology Letters*. 10:619-627
- Dickie, I. A., S. A. Schnitzer, P. B. Reich, and S. E. Hobbie. 2007. Is oak establishment in old-fields and savanna openings context dependent? *Journal of Ecology* 95:309-320
- Dijkstra, F. A., J. B. West, **S. E. Hobbie**, J. B. Trost and P. B. Reich. 2007. Dissolved inorganic and organic N leaching from a grassland field experiment: interactive effects of plant species richness, atmospheric [CO₂] and N fertilization. *Ecology* 88:490-500
- Dauer, J. M., J. Chorover, O. A. Chadwick, J. Oleksyn, M. Tjoelker, **S. E. Hobbie**, P. B. Reich, D. M. Eissenstat. 2007. Controls over leaf and litter calcium concentrations among temperate trees. *Biogeochemistry* 86:175-187
- Hobbie, S. E.**, M. Ogdahl, J. Chorover, O. A. Chadwick, J. Oleksyn, R. Zytowskiak, and P. B. Reich. 2007. Tree species effects on soil organic matter dynamics: the role of soil cation composition. *Ecosystems* 10:999-1018
- Novotny, A., J. D. Schade, **S. E. Hobbie**, A. D. Kay, M. Kyle, P. B. Reich, and J. J. Elser. 2007. Stoichiometric response to nitrogen-fixing and non-fixing dicots to manipulations of CO₂, nitrogen, and diversity. *Oecologia* 151:687-696

2006

- Dijkstra, F. A., **S. E. Hobbie**, and P. B. Reich. 2006. Soil processes affected by sixteen grassland species grown under different environmental conditions. *Soil Science Society of America Journal* 70:770-777
- Dijkstra, F. A., K. Wrage, **S. E. Hobbie**, and P. B. Reich. 2006. Tree patches show greater N losses but maintain higher soil N availability than grassland patches in a frequently burned oak savanna. *Ecosystems* 9:441-452
- Hobbie, S. E.**, P. B. Reich, J. Oleksyn, M. Ogdahl, R. Zytowskiak, C. Hale, and P. Karolewski. 2006. Tree species effects on decomposition and forest floor dynamics in a common garden. *Ecology* 87:2288-2297
- McLauchlan, K., **S. E. Hobbie**, and W. M. Post, III. 2006. Conversion from agriculture to grassland builds soil organic matter on decadal time scales. *Ecological Applications* 16:143-153

- Reich, P. B., **S. E. Hobbie**, T. Lee, D. S. Ellsworth, J. B. West, D. Tilman, J. M. H. Knops, S. Naeem, J. Trost. 2006. Nitrogen limitation constrains sustainability of ecosystem response to CO₂. *Nature* 440:923-925
- West, J. B., F. A. Dijkstra, **S. E. Hobbie**, and P. B. Reich. 2006. Effects of plant species diversity, atmospheric [CO₂], and N addition on gross rates of inorganic N release from soil organic matter. *Global Change Biology* 12:1-9

2005

- Dickie, I. A., S. A. Schnitzer, P. B. Reich and **S. E. Hobbie**. 2005. Spatially disjunct effects of co-occurring competition and facilitation. *Ecology Letters* 8:1191-1200
- Dijkstra, F. A., **S. E. Hobbie**, P. B. Reich, and J. M. H. Knops. 2005. Divergent effects of elevated CO₂, N fertilization, and plant diversity on soil C and N dynamics in a grassland field experiment. *Plant and Soil* 272:41-52
- Hobbie, S. E.** 2005. Contrasting effects of substrate and fertilizer nitrogen on the early stages of decomposition. *Ecosystems* 8:644-656.
- Hobbie, S. E.**, L. Gough, and G. R. Shaver. 2005. Species compositional differences on different-aged landscapes drive contrasting responses of tundra to nutrient addition. *Journal of Ecology* 93:770-782
- Kennedy, T. A., J. C. Finlay, and **S. E. Hobbie**. 2005. Eradication of invasive saltcedar (*Tamarix ramosissima*) along a desert springbrook increases native fish density. *Ecological Applications* 15:2072-2083
- Reich, P. B., J. Oleksyn, J. Modrzynski, P. Mrozinski, **S. E. Hobbie**, D. M. Eissenstat, J. Chorover, O. A. Chadwick, C. M. Hale, and M. G. Tjoelker. 2005. Linking litter calcium, earthworms and soil properties: a common garden test with 14 tree species. *Ecology Letters* 8:811-818
- Schade, J. D. and **S. E. Hobbie**. 2005. Spatial and temporal variation in islands of fertility in the Sonoran Desert. *Biogeochemistry* 73:541-553
- Weiss, MS, **S. E. Hobbie**, and G. M. Gettel. 2005. Contrasting responses of nitrogen-fixation in Arctic lichens to experimental and ambient nitrogen and phosphorus availability. *Arctic, Antarctic and Alpine Research* 37:396-401
- West, J. B., J. HilleRisLambers, T. D. Lee, **S. E. Hobbie**, and P. B. Reich. 2005. Legume species identity and soil nitrogen supply determine symbiotic nitrogen-fixation responses to elevated [CO₂]. *New Phytologist* 167:523-530.

2004

- Dijkstra, F. E., **S. E. Hobbie**, J. M. H. Knops, and P. B. Reich. 2004. Nitrogen deposition and plant species interact to influence soil carbon stabilization. *Ecology Letters* 7:1192-1198.
- Hobbie, S. E.** and L. Gough. 2004. Litter decomposition in moist acidic and non-acidic tundra with different glacial histories. *Oecologia* 140:113-124
- Kay A. D., S. E. Scott, J. D. Schade, and **S. E. Hobbie**. 2004. Stoichiometric relations in an ant-treehopper mutualism. *Ecology Letters* 7:1024-1028
- Kennedy, T. A. and **S. E. Hobbie**. 2004. Saltcedar (*Tamarix ramosissima*) invasion alters organic matter dynamics in a desert stream. *Freshwater Biology* 48:1-12
- McLauchlan, K. K., and **S. E. Hobbie**. 2004. Comparison of labile soil organic matter fractionation techniques. *Soil Science Society of America Journal* 68:1616-1625.

2003

- Elser, J. J., K. Acharya, M. Kyle, J. Cotner, W. Makino, T. Markow, **S. E. Hobbie**, W. Fagan, J. Schade, J. Hood, and R. W. Sterner. 2003. Growth rate-stoichiometry couplings in diverse biota. *Ecology Letters* 6:936-943
- Gough, L., and **S. E. Hobbie**. 2003. Responses of moist non-acidic arctic tundra to altered environment: Productivity, biomass and species richness. *Oikos* 103:204-216
- Schade, J. D., M. Kyle, **S. E. Hobbie**, W. F. Fagan, and J. J. Elser. 2003. Stoichiometric tracking of soil nutrients by a desert insect herbivore. *Ecology Letters* 6:96-101
- van Wijk, M. T., K. E. Clemmensen, G. R. Shaver, M. Williams, T. V. Callaghan, F. S. Chapin, III, J. H. C. Cornelissen, L. Gough, **S. E. Hobbie**, S. Jonasson, J. A. Lee, A. Michelsen, M. C. Press, S. J. Richardson, and H. Rueth. 2003. Long-term ecosystem level experiments at Toolik Lake, Alaska, and at Abisko, Northern Sweden: generalizations and differences in ecosystem and plant type responses to global change. *Global Change Biology* 10:105-123
- van Wijk, M. T., M. Williams, L. Gough, **S. E. Hobbie**, and G. R. Shaver. 2003. Luxury consumption: a possible competitive strategy in aboveground-belowground carbon allocation for slow-growing arctic vegetation? *Journal of Ecology* 91:664-676
- Woods, H. A., W. Makino, J. B. Cotner, **S. E. Hobbie**, J. F. Harrison, K. Acharya, and J. J. Elser. 2003. Temperature and the chemical composition of poikilothermic organisms. *Functional Ecology* 17:237-245

2002

- Hobbie, S. E.** and L. Gough. 2002. Foliar and soil nutrients in tundra on glacial landscapes of contrasting ages in northern Alaska. *Oecologia* 131:453-452
- Hobbie, S. E.**, T. A. Miley, and M.S. Weiss. 2002. Carbon and nitrogen cycling in soils from different glacial surfaces in northern Alaska. *Ecosystems* 5:761-774.
- Hobbie, S. E.**, K. J. Nadelhoffer, and P. Höglberg. 2002. A synthesis: the role of nutrients as constraints on carbon balances in boreal and arctic regions. *Plant and Soil* 242:163-170

2001

- Cornelissen, J. H. C., T.V. Callaghan, J.M. Alatalo, A. Michelsen, E. Graglia, A.E. Hartley, D.S. Hik, **S.E. Hobbie**, M.C. Press, C.H. Robinson, G.H.R. Henry, G.R. Shaver, G.K. Phoenix, D. Gwynn Jones, S. Jonasson, F.S. Chapin III, U. Molau, C. Neill, J.A. Lee, J.M. Melillo, B. Sveinbjörnsson and R. Aerts. 2001. Global change and arctic ecosystems: is lichen decline a function of increases in vascular plant biomass? *Journal of Ecology* 89:984-994

2000

- Chapin, F. S., III. A. D. McGuire, J. Randerson, R. Pielke Sr., D. Baldocchi, **S. E. Hobbie**, N. Roulet, W. Eugster, E. Kasischke, E. B. Rastetter, A. Zimov and S. W. Running. 2000. Arctic and boreal ecosystems of western North America as components of the climate system. *Global Change Biology* 6 (S1): 211-223
- Chapin, F. S., III, E. S. Zavaleta, V. T. Eviner, R. L. Naylor, P. M. Vitousek, H. L. Reynolds, D. U. Hooper, S. Lavorel, O. E. Sala, **S. E. Hobbie**, M. C. Mack, and S. Díaz. 2000. Functional and societal consequences of changing biotic diversity. *Nature* 405:234-242

- Elser, J.J., R.W. Sterner, E. Gorokhova, W.F. Fagan, T.A. Markow, J.B. Cotner, J.F. Harrison, **S.E. Hobbie**, G.M. Odell, and L.J. Weider. 2000. Biological stoichiometry from genes to ecosystems. *Ecology Letters* 3: 540-550
- Hobbie, S. E.** 2000. Interactions between litter lignin and soil nitrogen availability during leaf litter decomposition in a Hawaiian montane forest. *Ecosystems* 3:484-494
- Hobbie, S. E.**, J. P. Schimel, S. E. Trumbore, and J. R. Randerson. 2000. A mechanistic understanding of carbon storage and turnover in high-latitude soils. *Global Change Biology* 6 (Suppl.1):196-210
- Hobbie, S. E.** and P. M. Vitousek. 2000. Nutrient limitation of decomposition in Hawaiian forests. *Ecology* 81:1867-1877
- Neff, J. C., **S. E. Hobbie**, and P. M. Vitousek. 2000. Nutrient and mineralogical control on dissolved organic C, N and P fluxes and stoichiometry in Hawaiian soils. *Biogeochemistry* 51:283-302
- Vitousek, P. M. and **S. E. Hobbie**. 2000. Heterotrophic nitrogen fixation in decomposing litter: patterns and regulation. *Ecology* 81:2366-2376

1999

- Hobbie, S. E.**, A. Shevtsova, and F. S. Chapin, III. 1999. Plant responses to species removal and experimental warming in Alaskan tussock tundra. *Oikos* 84:417-434
- Ostertag, R. and **S. E. Hobbie**. 1999. Early stages of root and leaf decomposition in Hawaiian forests: effects of nutrient availability. *Oecologia* 121:564-573

1998

- Hobbie, S. E.** and F. S. Chapin, III. 1998. An experimental test of limits to tree establishment in arctic tundra. *Journal of Ecology* 86:449-461
- Hobbie, S. E.** and F. S. Chapin, III. 1998. The response of tundra plant biomass, aboveground production, nitrogen, and CO₂ flux to experimental warming. *Ecology* 79:1526-1544
- Verville, J. H., **S. E. Hobbie**, F. S. Chapin, III, and D. U. Hooper. 1998. Response of tundra CH₄ and CO₂ flux to manipulation of temperature and vegetation. *Biogeochemistry* 41:215-235

1996

- Ahlberg, K., E. Almgren, H. E. Wright, Jr., E. Ito, and **S. E. Hobbie**. 1996. Oxygen-isotope record of Late-Glacial climatic change in western Ireland. *Boreas* 25:257-267
- Chapin, F. S., III, MS Bret-Harte, **S. E. Hobbie**, and H. L. Zhong. 1996. Plant functional types as predictors of transient responses of arctic vegetation to global change. *Journal of Vegetation Science* 7:347-358
- Chapin, F. S., III, S. A. Zimov, G. R. Shaver, and **S. E. Hobbie**. 1996. CO₂ fluctuation at high latitudes. *Nature* 383: 585-586
- Hobbie, S. E.** 1996. Temperature and plant species control over carbon and nitrogen cycling through litter and soil in Alaskan tundra. *Ecological Monographs* 66:503-522
- Hobbie, S. E.** and F. S. Chapin, III. 1996. Winter regulation of tundra litter carbon and nitrogen dynamics. *Biogeochemistry* 35:327-338

1992

Almquist Jacobson, H., J. E. Almendinger, and **S. E. Hobbie**. 1992. Influence of terrestrial vegetation on sediment-forming processes in kettle lakes of West-Central Minnesota. *Quaternary Research* 38:103-116

Hobbie, S. E. 1992. Effects of plant species on nutrient cycling. *Trends in Ecology and Evolution* 7:336-339