

# **Curriculum vitae for Joseph M. Craine**

## **Institutional Address:**

Division of Biology  
Kansas State University  
Manhattan, KS 66506  
(785) 532-3062  
(785) 532-5563 (fax)  
email: jcraine@ksu.edu  
www.k-state.edu/~craine

## **Graduate advisor**

F. S. Chapin, III  
Institute of Arctic Biology  
University of Alaska-Fairbanks  
Fairbanks, Alaska 99775  
(907) 474-7922  
(907) 474 6967 (fax)  
email: terry.chapin@uaf.edu

## **Education**

Ph.D., University of California, Berkeley, 2000  
B.S., Ohio State University, 1995

## **Positions held**

2001-2002, Post-doctoral fellow, Landcare Research, New Zealand  
2003-2004, Post-doctoral fellow, National Science Foundation, International Research Fellowship, University of Minnesota/University of Cape Town  
2005-2007, Post-doctoral fellow, University of Minnesota, Ecology, Evolution, and Behavior  
2007-present, Research Assistant Professor, Kansas State University, Division of Biology  
2008, Consultant, World Wildlife Fund

## **Teaching Experience**

Principles of Biology 2007-2008: Kansas State University  
Ecosystem Ecology 2002-2004: University of Minnesota--Itasca Biological Station, Instructor.  
Field Ecology 2001: University of Minnesota--Itasca Biological Station, Instructor.  
Plant Ecophysiology 1997: University of California, Berkeley, Teaching Assistant.  
Introductory Biology 1995: University of California, Berkeley, Teaching Assistant.

## **Awards**

Outstanding Teaching Assistant, UC Berkeley, 1997  
Botanical Society of America, Young Botanist of the Year, 1995  
Research Experience for Undergraduates, Oregon State University

## **Service**

Organizer, Symposium for ESA 2008, "Research and Monitoring Networks in Ecology"  
Advised two graduate students at the University of Cape Town: Corli Coetsee (PhD), Vhalinavo Khavaghali (M.S.)  
Advised Undergraduate for Research Experience for Undergraduates Program at Cedar Creek Natural History Area, Summer 1997, 1998, 1999. Resulted in 2 publications (4, 5 below)  
Developed Schoolyard LTER project for Breck High School, MN, 2000  
Reviewer 2001-2007: *Acta Oecologica*, *American Naturalist*, *Annals of Botany*, *Australian Journal of Botany*, *Austrian Science Fund*, *Biogeochemistry*, *Biology Letters*, *BioScience*, *Ecological Modelling*, *Ecology*, *Ecology Letters*, *Ecography*, *Ecosystems*, *Functional Ecology*, *Geology*, *Global Biogeochemical Cycles*, *Global Change Biology*, *Global Ecology and Biogeography*, *Journal of Ecology*, *National Science Foundation*, *New Phytologist*, *Oecologia*, *Oikos*, *Plant and Soil*, *Plant Biology*, *Plant Ecology*,

### **Invited Talks (since 2000)**

2008: **1)** The Land Institute

2007: **1)** Penn State University, **2)** University of Georgia, **3)** University of Arkansas

2006: **1)** University of Illinois (Chicago), **2)** Kellogg Biological Station, **3)** Michigan State University **4)** University of Oregon

2005: **1)** Oak Ridge National Laboratory, **2)** Syracuse University, **3)** University of Toronto

2003: **1)** University of Cape Town

2002: **1)** Kansas State University, **2)** Landcare Research (Lincoln, New Zealand)

2001: **1)** CSIRO (Darwin)

2000: **1)** Iowa State University, **2)** Carleton College, **3)** University of Wisconsin (Madison)

### **Grants and Fellowships Received**

Kansas State University, BRIEF seed grant, “Relationships among plant functional traits for nitrogen and water in a tallgrass prairie” \$3,400.

National Science Foundation, 7/08-6/11; Craine, McLauchlan, and Fierer. “Testing the consequences of the carbon-quality temperature hypothesis for soil organic matter decomposition” \$437,157.

National Science Foundation, 7/03-12/04; International Research Fellowship Program. “Effects of soils and precipitation on plant and ecosystem traits in South African Savanna”, \$76,453

Andrew Mellon Foundation, 1/03-12/05; “Controls of resource supplies over belowground processes”. \$275,000

Landcare Research Post-Doctoral Research Grant, 1/01-12/02; “Leaf and root traits across precipitation and fertility gradients”. \$NZ120,000

Dissertation Improvement Grant, National Science Foundation, 5/98 –5/00; “The effect of nitrogen loading on root dynamics and nitrogen cycling across taxa of Cedar Creek, MN old field successional community.” \$10,000

NASA Earth Systems Science Fellowship, NASA, 9/98-9/01; “Aboveground and belowground plant species functional traits and their relation to ecosystem functioning” \$66,000

Graduate Fellowship, National Science Foundation, 1995-1998, \$42,000

Sigma Xi, Berkeley Chapter, 1996, \$300

Arts and Sciences Undergraduate Research Scholarship, 1994, Ohio State University, \$3,000

### **Books**

1. Craine, J. M. (2009) *Resource Strategies of Wild Plants*. Princeton University Press. In Press.

### **Peer-reviewed publications**

1. Craine, J. M., and M. C. Mack. 1998. Nutrients in senesced leaves: Comment (and reply). *Ecology* 79:1818-1820.
2. Craine, J. M., D. A. Wedin, and F. S. Chapin. 1998. Predominance of ecophysiological controls on soil CO<sub>2</sub> flux in a Minnesota grassland. *Plant and Soil* 207:77-86.

3. Craine, J. M., D. M. Berin, P. B. Reich, D. G. Tilman, and J. M. H. Knops. 1999. Measurement of leaf longevity of 14 species of grasses and forbs using a novel approach. *New Phytologist* 142:475-481.
4. Craine, J. M., J. Froehle, D. G. Tilman, D. A. Wedin, and F. S. Chapin, III. 2001. The relationships among root and leaf traits of 76 grassland species and relative abundance along fertility and disturbance gradients. *Oikos* 93:274-285.
5. Craine, J. M., and P. B. Reich. 2001. Elevated CO<sub>2</sub> and nitrogen supply alter leaf longevity of grassland species. *New Phytologist* 150:397-493.
6. Craine, J. M., D. A. Wedin, and P. B. Reich. 2001. Grassland species effects on soil CO<sub>2</sub> flux track the effects of elevated CO<sub>2</sub> and nitrogen. *New Phytologist* 150:425-434.
7. Craine, J. M., D. A. Wedin, and P. B. Reich. 2001. The response of soil CO<sub>2</sub> flux to changes in atmospheric CO<sub>2</sub>, nitrogen supply, and plant diversity. *Global Change Biology* 7:947-953.
8. Reich, P. B., J. M. H. Knops, D. Tilman, J. Craine, D. Ellsworth, M. Tjoelker, T. Lee, D. Wedin, S. Naeem, D. Bahauddin, G. Hendrey, S. Jose, K. Wrage, J. Goth, and W. Bengston. 2001. Plant diversity enhances ecosystem responses to elevated CO<sub>2</sub> and nitrogen deposition. *Nature* 410:809-812.
9. Reich, P. B., D. Tilman, J. Craine, D. Ellsworth, M. Tjoelker, J. Knops, D. Wedin, S. Naeem, D. Bahauddin, J. Goth, W. Bengston, and T. Lee. 2001. Do species and functional groups differ in acquisition and use of C, N and water under varying atmospheric CO<sub>2</sub> and N deposition regimes? A field test with 16 grassland species. *New Phytologist* 150:435-448.
10. Craine, J. M., Tilman, D. G., Wedin, D. A., Reich, P. B., Tjoelker, M. J. and Knops, J. M. H. 2002. Functional traits, productivity and effects on nitrogen cycling of 33 grassland species. - *Functional Ecology* 16: 563-574.
11. Craine, J. M., D. A. Wedin, and D. Tilman. 2002. Determinants of growing season soil CO<sub>2</sub> flux in a Minnesota grassland. *Biogeochemistry* 59:303-313.
12. Craine, J. M. 2003. The role of nitrogen in grasslands: from ecophysiology to ecosystem and competition to herbivory. *in* N. Allsopp, A. R. Palmer, S. J. Milton, K. P. Kirkman, G. I. H. Kerley, C. R. Hurt, and C. J. Brown, editors. *Proceedings of the VIIth International Rangelands Congress*, Durban, South Africa.
13. Craine, JM, Wedin, DA, F S Chapin, III and Reich, PB. 2003. Relationship between the structure of root systems and resource use for 11 North American grassland plants. *Plant Ecology* 165: 85-100.
14. Craine, J. M., and W. G. Lee. 2003. Leaf traits predict root traits across New Zealand grasslands. *Oecologia* 134: 471-478.
15. Craine, J. M., D. A. Wedin, F. S. Chapin, III, and P. B. Reich. 2003. Development of grassland root systems and their effects on ecosystem properties. *Plant and Soil* 250:39-47.
16. Craine, J. M., P. B. Reich, G. D. Tilman, D. Ellsworth, J. Fargione, J. Knops, and S. Naeem. 2003. The role of plant species in biomass production and response to elevated CO<sub>2</sub> and N. *Ecology Letters* 6: 623-630.
17. Reich, P., I. Wright, J. Cavender-Bares, J. Craine, J. Oleksyn, M. Westoby, and M. Walters. 2003. The evolution of plant functional variation: traits, spectra, and strategies. *International Journal of Plant Sciences* 164:S143-S164.
18. Craine, J., W. Bond, W. Lee, P. Reich, and S. Ollinger. 2003. The resource economics of chemical and structural defenses across nitrogen supply gradients. *Oecologia* 442:547-556.

19. Bond W.J., Lee W.G. & Craine J.M. (2004) Gondwana's evolutionary legacy: plants defended against large avian browsers. *Oikos*, 104, 500-508.
20. Craine, J. M., and K. K. McLauchlan. 2004. The influence of biotic drivers on North American paleorecords: alternatives to climate. *The Holocene* 14:787-791.
21. Reich, P. B., D. Tilman, S. Naeem, D. S. Ellsworth, J. Knops, J. Craine, D. Wedin, and J. Trost. 2004. Species and functional group diversity independently influence biomass accumulation and its response to CO<sub>2</sub> and N. *Proceedings of the National Academy of Sciences of the United States of America* 101:10101-10106.
22. Craine, J. M. 2005. Reconciling plant strategy theories of Grime and Tilman. *Journal of Ecology* 93:1041-1052.
23. Craine, J. M., J. Fargione, and S. Sugita. 2005. Supply pre-emption, not concentration reduction, is the mechanism of competition for nutrients. *New Phytologist* 166:933-940.
24. Craine, J. M., W. G. Lee, W. J. Bond, R. J. Williams, and L. C. Johnson. 2005. Environmental constraints on a global relationship among leaf and root traits. *Ecology* 86:12-19.
25. Craine, J. M., and P. B. Reich. 2005. Leaf-level light compensation points are lower in shade-tolerant woody seedlings: evidence from a synthesis of 115 species. *New Phytologist* 166:710-713.
26. Fierer, N., J. Craine, K. McLauchlan, and J. Schimel. 2005. Litter quality and the temperature sensitivity of decomposition. *Ecology* 85:320-326.
27. Tjoelker, M. G., J. M. Craine, D. Wedin, P. B. Reich, and D. Tilman. 2005. Linking leaf and root trait syndromes among 39 grassland and savannah species. *New Phytologist* 167:493-508.
28. Craine, J. M., W. G. Lee, and S. Walker. 2006. The context of plant invasions in New Zealand: evolutionary history and novel niches. in R. B. Allen and W. G. Lee, editors. *Biological Invasions in New Zealand*. Springer Verlag, Heidelberg.
29. Elmore, A., S. Manning, J. Mustard, and J. Craine. 2006. Decline in alkali meadow vegetation cover in California: the effects of groundwater extraction and drought. *Journal of Applied Ecology* 43:770-779.
30. Craine, J. M. 2006. Competition for nutrients and optimal root allocation. *Plant and Soil* 285:171-185.
31. Craine, J. M., J. Battersby, A. Elmore, and A. Jones. 2007. Building EDENs: the rise of Environmentally Distributed Ecological Networks. *Bioscience* 57:45-54.
32. Craine, J. M. 2007. Plant strategy theories: replies to Grime and Tilman. *Journal of Ecology* 95:235-270.
33. McLauchlan, K. K., J. M. Craine, W. W. Oswald, and G. E. Likens. 2007. Changes in nitrogen cycling during the past century in a northern hardwood forest. *Proceedings of the National Academy of Sciences of the United States of America* 104:7466-7470.
34. Craine, J. M., C. Morrow, and N. Fierer. 2007. Microbial nitrogen limitation increases decomposition. *Ecology* 88:2105-2113.
35. Craine, J. M., C. Morrow, and W. D. Stock. 2008. Nutrient concentration ratios and co-limitation in South African grasslands. *New Phytologist* 179:829-836.
36. Craine, J. M., A. Joern, E. G. Towne, and R. G. Hamilton. in press. Consequences of climate variability for the performance of bison in tallgrass prairie. *Global Change Biology*.
37. Craine, J. M., A. J. Elmore, M. P. M. Aidar, R. G. Amundson, M. Bustamante, C. Coetsee, T. E. Dawson, H. J. Hawkins, E. A. Hobbie, K. Koba, M. C. Mack, M. Makarov, K. K. McLauchlan, A. Michelsen, G. B. Nardoto, L. H. Pardo, J. Peñuelas, P.

- B. Reich, E. A. G. Schuur, W. D. Stock, R. Tateno, R. A. Virginia, J. M. Welker, and I. J. Wright. in review. Nitrogen isotopes in leaves index global patterns of nitrogen availability. *New Phytologist*.
38. Craine, J., F. Ballantyne, M. Peel, N. Zambatis, C. Morrow, and W. Stock. in press. Grazing and landscape controls on nitrogen availability across 330 south African savanna sites. *Austral Ecology*.
39. Craine, J. M., A. J. Elmore, K. C. Olson, and D. Tolleson. in review. Climate change and nutritional stress in grazers. *Proceedings of the National Academy of Sciences*.
40. Fierer, N., D. Nemergut, R. Knight, and J. Craine. in review. Changes through time: integrating microorganisms into the study of succession. *Trends in Ecology & Evolution*.

### **Other publications**

1. Craine, J. M., and D. Tremmel. 1996. Improvements to the minirhizotron system. *ESA bulletin* Dec 1995:234-235.
2. Craine, J. M. 2006. Paradigms undefined. *Bioscience* **56**:2-4.

Updated December 10, 2008

### References

F. S. Chapin, III  
(information above)

David Wedin  
School of Natural Resource Sciences  
University of Nebraska  
411 Hardin Hall  
Lincoln, NE 68583-0974  
402-472-9608  
402-472-2946 (fax)  
email: [dwedini@unl.edu](mailto:dwedini@unl.edu)

William G. Lee  
Landcare Research  
Private Bag 1930  
Dunedin, New Zealand  
+64 3 470 7200  
+64 3 470 7201 (fax)  
email: [LeeW@LandcareResearch.co.nz](mailto:LeeW@LandcareResearch.co.nz)

David Biesboer  
Department of Plant Biology  
University of Minnesota  
250 Biological Science Center  
1445 Gortner Ave.  
St. Paul, MN 55108  
612-625-1799

612-625-1738 (fax)  
email: [biesboer@umn.edu](mailto:biesboer@umn.edu)