

# SUSAN SCHWINNING

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## EDUCATION

Degree	Year	University	Major	Thesis/Dissertation
Ph.D.	1994	University of Arizona, Tucson	Ecology and Evolutionary Biology	Effects of competitive symmetry on populations of annual plants.
M.S.	1986	University of California, Davis	Plant Physiology	Non-thesis option
Diplom	1984	University of Göttingen, Germany	Biology	Isolation of phaseic acid and test of its effects on stomata

## PROFESSIONAL AND ACADEMIC APPOINTMENTS

Position	Place of Employment	Dates
Associate Professor	Texas State University	Sep 2011 – present
Assistant Professor	Texas State University	Jan 2005 – Aug 2011
Academic Associate	University of Arizona	Jan 2001 - present
Postdoctoral Fellow	Columbia University's Biosphere 2 Center	Jan 2002 - Dec 2003
Postdoctoral Fellow	University of Utah	Apr 1997- Dec 2001
Science Officer	BBSRC Institute of Grassland and Environmental Research, Okehampton, UK	Jun 1994 - Mar 1997

## RESEARCH INTERESTS

The availability of liquid water in terrestrial ecosystems is the primary factor limiting the growth of land plants. How to integrate intermittent and from year-to-year highly variable processes of plant growth, reproduction and death into one coherent theory of community dynamics and ecosystem function has been a major challenge to ecologists. I am interested in the processes that govern primary production, competition and coexistence in plant communities, and the effects climate change has on these processes. Trained as a physiological plant ecologist my research comprises field studies, mathematical modeling and greenhouse experiments, with current projects in karst Ecohydrology, drought-related tree mortality, woody encroachment and invasive plant species.

## TEACHING INTERESTS

- Ecohydrology/Plant Water Relations
- Introduction to Ecological Modeling
- General Ecology

## PROFESSIONAL SERVICES

### Member of Editorial Boards:

*Journal of Ecology*. Impact Factor: 6.3 (5-year), Rank 12 of 144 in subject category Ecology, Rank 13 of 200 in subject category Plant Sciences. Published bimonthly by the British Ecological Society, Blackwell Publishing, Handling Editor since 2005.

*Oecologia*. Impact Factor: 3.6 (5-year), Rank 40 of 144 in subject category Ecology, published monthly by Springer Berlin Heidelberg, Handling Editor since 2010.

*Plant and Soil*. Impact Factor: 3.5 (5-year), Rank 42 of 200 in plant sciences, published by Springer Netherlands, Consulting Editor since 2004, Handling Editor since 2014.

### Member of National Committees:

Hydrology Section's Ecohydrology Technical Committee of the American Geophysical Union (AGU) 2010 – 2013.

### Intramural:

Campus Director of the Texas Invasive Species Institute (TISI), Fall 2011-present

## HONORS

**John L. Harper Prize** for a paper published in *Journal of Ecology*, British Ecological Society (Schwinning & Parsons 1996a), 1996.

## REFEREED PUBLICATIONS

[Researchgate](#) profile: RG score: 32.0 | [Google Scholar](#) profile: h-index = 17 | [ResearcherID](#) profile: h-index = 24

### Journal Articles

1. Reichmann, L.G., Schwinning, S., Polley, H.W., Fay, P.A. 2015. Traits of an invasive grass conferring an early growth advantage over native grasses. *Journal of Plant Ecology* DOI:10.1093/jpe/rtw014 pdf
2. Havill, S., Schwinning, S., Lyons, K.G. 2015. Fire effects on invasive and native warm-season grass species in a North American grassland at a time of extreme drought. *Applied Vegetation Science* 18: 637-649.
3. Tokumoto, I., Heilman, J.L., Schwinning, S., McInnes, K.J., Litvak, M.E., Morgan, C.L.S., Kamps, R.H. 2014. Small-scale variability in water storage in rocky soils and effects on tree transpiration. *Plant and Soil* 385: 193-204.

4. Jones, L.C., Schwinning, S., Esque, T. 2014. Seedling ecology and restoration of blackbrush (*Coleogyne ramosissima*) in the Mojave Desert, U.S.A. *Restoration Ecology* 22: 692-700.
5. Woods, S.R., Archer, S.R., Schwinning, S. 2014. Seedling responses to water pulse in shrubs with contrasting histories of grassland encroachment. *PLoS ONE* 9: e87278.
6. Schwartz, Benjamin F., Schwinning, Susanne, Gerard, Brett, Kukowski, Kelly R., Stinson, Chastity L., Dammeyer, Heather C. 2013. Using hydrogeochemical and ecohydrologic responses to understand epikarst processes in semi-arid systems, Edwards Plateau, Texas, USA. *Acta Carsologica* 42: 315–325.
7. Schwinning, S., Kelly, C.K. 2013. Plant competition in water-limited environments and implications for ecosystem function and adaptability to climate change. *Functional Ecology* 27: 886–897.
8. Schwinning, S. 2013. Do we need new rhizosphere models for rock-dominated landscapes? *Plant and Soil* 362: 25-31.
9. Kukowski, K., Schwinning, S., Schwartz, B. 2013. Hydraulic responses to extreme drought conditions in three co-dominant tree species in shallow soil over bedrock, *Oecologia* 171:819-830.
10. Heilman, J., Litvak, M., McInnes, K., Kjølgaard, J., Kamps, R. Schwinning, S. 2012. Water-storage capacity controls energy partitioning and water use in karst ecosystems on the Edwards Plateau, Texas. *Ecohydrology* 7: 27–138.
11. Street, G.M., Weckerly, F.W., Schwinning, S. 2012. Modeling forage mediated aggregation in a gregarious ruminant. *Oikos* 122: 929–937
12. Ruckman, E., Robinson, T., Lyons, K.G., Schwinning, S. 2012. Comparative seed heat tolerances among native and a non-indigenous, invasive species: implications for selective management of grassland using fire. *Ecological Restoration* 30: 136 – 142.
13. Ruckman, E., Schwinning, S., Lyons, K. 2011. Rainfall - burn time interactions in the recovery of an invasive grass after prescribed burn. *Restoration Ecology* 20: 756 - 763.
14. Woods, S.R., Archer, S.R., Schwinning, S. 2011. Early taproot development of a xeric shrub (*Larrea tridentata*) is optimized within a narrow range of soil moisture. *Plant Ecology* 212:507–517.
15. Schwinning, S. 2010. Ecohydrology Bearings – Invited Commentary: The ecohydrology of roots in rocks. *Ecohydrology* 3: 238-245.
16. Schwinning, S., Sandquist, D.R., Miller, D.M., Bedford, D.R., Phillips, S., Belnap, J. 2010. The influence of stream channels on shrub distributions in the Mojave Desert, CA, USA: patterns, mechanisms and effects of stream redistribution. *Ecohydrology* DOI: 10.1002/eco.116.
17. Eggemeyer K.D., Schwinning, S. 2009. Biogeography of woody encroachment: why is mesquite excluded from shallow soils? *Ecohydrology* 2:81-87.
18. Heilman, J.L., McInnes, K.J., Kjølgaard, J.F., Owens, M.K., Schwinning, S. 2009. Energy balance and water use in a subtropical karst woodland on the Edwards Plateau, Texas. *Journal of Hydrology* 373: 426-435.
19. Schwinning, S. 2008. The water relations of two evergreen tree species in a karst savanna. *Oecologia* 158: 373-383.
20. Schwinning, S., Belnap, J., Bowling, D.R., Ehleringer, J.R. 2008. Sensitivity of the Colorado Plateau to change: climate, ecosystems and society. *Ecology and Society* 13: Art. 28.
21. Schwinning, S., Starr, B.I., Wojcik, N.J., Miller, M.E., Ehleringer, J.E., Sanford R.L. Jr. 2006. Effects of nitrogen deposition on an arid grassland in the Colorado Plateau cold desert, *Rangeland Ecology and Management* 58: 565-574.

22. Schwinning, S., Starr, B. I. Ehleringer, J. R. 2005a. Summer and winter drought in a cold desert ecosystem (Colorado Plateau) I: Effects on soil water and plant water uptake, *Journal of Arid Environments* 60: 547-566.
23. Schwinning, S., Starr, B. I. Ehleringer, J. R. 2005b. Summer and winter drought in a cold desert ecosystem (Colorado Plateau) II: Effects on plant carbon assimilation and growth, *Journal of Arid Environments* 61: 61-78.
24. Seyfried, M. S., Schwinning, S., Walvoord, M.A., Pockman, W.T., Newman, B.D., Jackson, R.B., Phillips, E.M. 2005. Ecohydrological Control of Deep-Drainage in Arid and Semiarid Basins. *Ecology* 86: 277-287.
25. Schwinning, S., Sala, O.E., Loik, M.E., Ehleringer J.R. 2004. Thresholds, memory and seasonality: understanding pulse dynamics in arid/semiarid ecosystems. *Oecologia* 141: 191-193.
26. Schwinning, S., Sala, O.E. 2004. Responses to resource pulses in arid and semi-arid ecosystems. *Oecologia* 141: 211-220.
27. Huxman, T.E, Snyder, K., Tissue, D., Leffler, J., Ogle, K., Pockman, W.T., Sandquist, D.R., Potts, D.L., Schwinning, S. 2004. Precipitation pulses and carbon fluxes in semiarid and arid ecosystems, *Oecologia* 141: 254-268.
28. Chesson, P.L., Gebauer, R.L.E, Schwinning, S., Huntly, N., Wiegand, K., Ernest, M.S.K., Sher, A., Novoplansky, A., Weltzin, J.F. 2004. Resource pulses, species interactions, and diversity maintenance in arid and semi-arid environments. *Oecologia* 141: 236-253.
29. Huxman, T.E., Smith, M.D., Fay, P.A., Knapp, A.K., Shaw, M.R., Loik, M.E., Smith, S.D., Tissue, D.T., Zak, J.C., Weltzin, J.F., Pockman, W.T., Sala, O.E., Haddad, B.M., Harte, J., Koch, G.W., Schwinning, S., Small, E.E., Williams, D.G. 2004. Convergence across biomes to a common rain-use efficiency. *Nature* 429: 651 - 654.
30. Weltzin, J.F., Loik, M.E., Schwinning, S., Williams, D.G., Fay, P.A., Haddad, M., Harte, J., Huxman, T.E., Knapp, A.K., Lin, G., Pockman, W.T., Shaw, R., Small, E.E., Smith, M.D., Smith, S.D., Tissue, D.T., Zak, J.C. 2003. Assessing the response of terrestrial ecosystems to potential changes in precipitation, *Bioscience* 53: 941-952.
31. Schwinning, S., Starr, B. I., Ehleringer, J.R. 2003. Dominant cold desert plants of the Colorado Plateau do not partition rain by rainfall size, *Oecologia* 136: 252-260.
32. Schwinning, S., Davis, K., Richardson, L., Ehleringer, J.R. 2002. Deuterium enriched irrigation suggests three forms of pulse use in perennial species of the Colorado Plateau, *Oecologia* 130:345-355.
33. Gebauer, R. L.E., Schwinning, S., Ehleringer, J.R. 2002. Interspecific competition and resource pulse utilization in a cold desert community, *Ecology* 83: 2602 - 2616.
34. Schwinning, S., Ehleringer J. R. 2001. Water-use trade-offs and optimal adaptations to pulse-driven arid ecosystems, *Journal of Ecology* 89: 464-480.
35. Parsons, A.J., Schwinning. S., Carrère, P. 2001. Plant growth functions and possible spatial and temporal scaling errors in models of herbivory, *Grass and Forage Science* 56, 21-34.
36. Schwinning, S., Parsons, A.J. 1999. The stability of grazing systems revisited: spatial models and the role of heterogeneity, *Functional Ecology* 13: 737-747.
37. Schwinning, S., Weiner, J. 1998. Mechanisms determining the degree of size-asymmetry in competition among plants, *Oecologia* 113, 447-455.
38. Schwinning, S. 1996. Decomposition analysis of competitive symmetry and size structure dynamics. *Annals of Botany* 77: 47-57.

39. Schwinning, S., Parsons, A.J. 1996a. Analysis of the coexistence mechanisms for grasses and legumes in grazing systems. *Journal of Ecology* 84, 799-813.
40. Schwinning, S., Parsons, A.J. 1996b. A spatially explicit population model of stoloniferous N-fixing legumes in mixed pasture with grass. *Journal of Ecology* 84, 815-826.
41. Schwinning, S., Fox, G.A. 1994. Population dynamic consequences of competitive symmetry in annual plants. *Oikos* 72: 422-432.
42. Schwinning, S., Rosenzweig, M.L. 1990. Periodic oscillations in an ideal-free predator-prey distribution. *Oikos* 59: 85-91.

### **Chapters in Books**

1. Schwinning, S., G.A. Fox, Kelly, C.K. 2014. Temporal niches, ecosystem function, and climate change. In: *Temporal dynamics and ecological process*. C.K. Kelly, C.K., Bowler, M.G., Fox, G.A. (eds). Cambridge University Press, Cambridge, UK.
2. Kelly, C.K., Bowler, M.G., Fox, G.A., Solis-Magallanes, A., Ramos-Tapia, J.M., Lopera Blair, P., Schwinning, S., Williams, J.N., Joy, J. 2014. What temporal processes in trees tell us about competition, community structure and speciation. In: *Temporal dynamics and ecological process*. C.K. Kelly, C.K., Bowler, M.G., Fox, G.A. (eds). Cambridge University Press, Cambridge, UK
3. Fox, G. A., Kendall, B. E., Schwinning, S. 2012. Environmental heterogeneity impacts on plants at different scales. In: *Sourcebook in Theoretical Ecology*. Hastings, A., Gross, L. (eds). University of California Press, Berkeley, pp. 258-263.
4. Litvak, M.E., Schwinning, S., Heilman, J.L. 2010. Woody plant rooting depth and ecosystem function of savannas: a case study from the Edwards Plateau karst, Texas, USA. In: *Ecosystem Function in Global Savannas: Measurement and Modeling at Landscape to Global Scales*. Hill M.J., Hanan N.P. (eds). CRC/Taylor and Francis. pp. 117-134.
5. Schwinning, S., Hooten, M.M. 2009. Mojave desert root systems. In: *The Mojave Desert: Ecosystem Processes and Sustainability*. Webb, R.H., Fenstermaker, L.F., Heaton, J.S., Hughson, D.L., McDonald, E.V., Miller, D.M. (eds), University of Nevada Press, Reno, pp. 278-311.
6. Ehleringer, J.R., Schwinning, S. and Gebauer, R.L.E. 1999. Water use in arid land ecosystems. In: *Advances in Plant Physiological Ecology*, Press M. C., Scholes, J.D. and Barker, M.G. (eds), Blackwell Science, Oxford, pp. 347-365.
7. Parsons, A.J., Carrère, P. and Schwinning S. 1999. Dynamics of heterogeneity in a grazed sward. In: *Proceedings of the International Symposium on Grassland Ecophysiology and Grazing Ecology*, deMoraes, A., Nabinger, C. de Faccio, P.C., Alves, S.J. & Campos Lustosa, S.B. (eds), Curitiba, Parana, Brazil: pp. 187-214.
8. Schwinning, S. and Parsons, A.J. 1996. Interactions between grasses and legumes: understanding variability in species composition. In: *Legumes in Sustainable Farming Systems. Proceedings of the Sustainable Farming Systems/British Grassland Society Joint Conference*, pp.153-163 (not refereed).
9. Chapman, D.F., Parsons, A.J. and Schwinning, S. 1996. Management of clover in grazed pastures: expectations, limitations and opportunities. In: *White Clover: New Zealand's Competitive Edge*. Symposium of the New Zealand Grassland Association, Lincoln, N.Z, pp. 55-64 (not refereed).