Biographical Sketch

ALAN K. KNAPP
Professor, Department of Biology, Colorado State University

A. EARNED DEGREES

1974-1978 Idaho State University, B.Sc. (Biology)
1979-1981 University of Wyoming, M.Sc. (Botany)
1985-1988 University of Wyoming, Ph.D. (Botany)

B. TEACHING EXPERIENCE

Foundations of Ecology ECOL505
Research Seminar in Ecology ECOL693
Plant Ecology BZ450

C. EMPLOYMENT HISTORY

2017 - present University Distinguished Professor, Colorado State University
2019 – 2020 Director, Graduate Degree Program in Ecology, Colorado State University
2016 - 2017 Director, Graduate Degree Program in Ecology, Colorado State University
2004 - present Professor & Senior Ecologist, Dept. of Biology, Colorado State University
2002 - 2003 University Distinguished Professor, Kansas State University
1997 - 2002 Professor of Biology, Division of Biology, Kansas State University
1995, 1998 NASA Summer Faculty Fellow, Stennis Space Center, MS
1993-1997 Associate Professor of Biology, Div. of Biology, Kansas State University
1991 Visiting Professor, University of Nebraska--Cedar Point Biological Station
1988-1993 Assistant Professor of Biology, Div. of Biology, Kansas State University
1982-1985 Research Associate, Kansas State University – LTER Research Program
1985-1988 Graduate Teaching Assistant/Research Assistant/Instructor (UW)

D. PROFESSIONAL AND SYNERGISTIC ACTIVITIES

Editorial Boards:

Oecologia 1994 – 2011
Ecology/Ecological Monographs 1998 – 2001
Functional Ecology – Senior Editor – 2011-present

Natl. Committees:

NSF/LTER Publications Committee, Appointed 1998- 2006
NSF/LTER Publications Committee, Elected Chair 2007 - present
NSF/LTER Executive Committee, Elected 2001-2004
Ecol. Soc. America Publications Comm., Appointed 2002-2005
NEON Climate Change Sub-committee, Selected 2004
S. Dakota Center Biocomplexity, Advisory Comm., 2004-2006
U. Wyoming Ecology Initiative, Advisory Comm., 2004-2008

NSF/LTER Network Climate Change Planning Comm., Appointed 2004
Consortium of Regional Ecological Observatories, 2004-2006
NEON Global Change Experiment Design Committee, 2006-2008
US Climate Change Sci. Prog., Subcom. Global Change Research, 2008
Ecological Society of America, Awards Committee, 2012- present

E. HONORS AND AWARDS

1992 – Stamey Award for Outstanding Undergraduate Instruction, Kansas St. Univ.
2002 – University Distinguished Professor, Kansas State University
2004 – Senior Ecologist, Graduate Degree Program in Ecology, Colo. State University
2009 – Designated ISI Highly Cited Researcher in Ecology
2009 – Professor Laureate, College of Natural Sciences, Colorado State University
2009 – Scholarship Impact Award, Vice President for Research, Colo. State University
2009 – Elected AAAS Fellow, Biological Sciences Section
2011 – Appointed Senior Editor, Functional Ecology, British Ecological Society
2012 – Awarded Harvard Bullard Forest Fellowship
2016 – Elected Fellow, Ecological Society of America
2017 – University Distinguished Professor, Colorado State University
2017 – Elected Fellow, American Geophysical Union

F. GRANTS RECEIVED (active)

Blair, J.M. and others. 2014-2020. LTER: Long-Term Research on Grassland Dynamics - Assessing Mechanisms of Sensitivity and Resilience to Global Change. NSF Long-Term Ecological Research Program ($105,139 subaward).

Knapp, A.K., M.D. Smith and D. L. Hoover. 2018-2022. Foundational research for managing forage production in semi-arid grasslands: preparing for a future with increased climate variability. USDA NIFA, $498,500.

Knapp, A.K. 2018-2019. Improving and Parameterizing the DOE Energy Exascale Earth System Model. Oak Ridge National Lab, $124,956.

Knapp, A.K. 2019-2021. InSPIRE 2.0 Water Management Opportunities for Solar and Agriculture Co-location. National Renewable Energy Laboratory. $90,000

G. PUBLICATIONS (last 4 years, 2018-2021)

Zhang, H. ,X. Lü, A.K. Knapp, H. Hartmann, E. Bai, X. Wang, Z. Wang, X. Wang, Q. Yu and X. Han. 2018. Facilitation by leguminous shrubs increases along a precipitation gradient. Functional Ecology 32:203-213.

Griffin-Nolan, R.J., C.J. W. Carroll, E. M. Denton, M.K. Johnston, S.L. Collins, M.D. Smith, A.K. Knapp. 2018. Legacy effects of a regional drought on aboveground net primary production in six central US grasslands. Plant Ecology 219: 505-515.

Hoffman, A.M., M.L. Avolio, A.K. Knapp, M.D. Smith. 2018. Codominant grasses differ in gene expression under experimental climate extremes in native tallgrass prairie. PeerJ 6: e4394, DOI: 10.7717/peerj.4394.

Ochoa-Hueso, R, S. L. Collins, M. Delgado-Baquerizo, K. Hamonts, W.T. Pockman, R. L. Sinsabaugh, M.D. Smith, A.K. Knapp, S.A. Power. 2018. Drought consistently alters the composition of soil fungal and bacterial communities in grasslands from two continents. Global Change Biology 24: 2818–2827.

Griffin-Nolan, R.J., J.A. Bushey, C.J.W. Carroll, A. Challis, J. Chieppa, M.Garbowski, A. M. Hoffman, A.K. Post, I.J. Slette, D. Spitzer, D. Zambonini, T.W. Ocheltree, D.T. Tissue, A.K. Knapp. 2018. Trait selection and community weighting are key to understanding ecosystem responses to changing precipitation regimes. Functional Ecology 32:1746–1756.

Luo, W., C. Xu, W. Ma, X. Yue, X. Liang, X. Zuo, A.K. Knapp, M.D. Smith, J. Sardans, F.A. Dijkstra, J. Peñuelas, Z. Wang, Q. Yu and X. Han. 2018. Effects of extreme drought on plant nutrient uptake and resorption in rhizomatous vs bunch grass dominated grasslands. Oecologia 188: 633–643.

Wu, D. P. Ciais, N. Viovy, A.K. Knapp, K. Wilcox, M. Bahn, M.D. Smith, S. Vicca, S. Fatichi, J. Zscheischler, A. Ito, A. Arneth, A. Harper, A. Ukkola, A. Paschalis, B. Poulter, C. Peng, D. Ricciuto, D. Reinthaler, G. Chen, H. Tian, H. Genet, J. Mao, J. Ingrisch, J. E.S.M. Nabel, J. Pongratz, L. Boysen, M. Kautz, M. Schmitt, P. Meir, Q. Zhu, R. Hasibeder, S. Sippel, S.R.S. Dangal, S. Sitch, X. Shi, Y. Wang, Y. Luo, Y. Liu, S. Piao. 2018. Asymmetric responses of primary productivity to altered precipitation simulated by ecosystem models across three long-term grassland sites. Journal of Geophysical Research: Biogeosciences 15: 3421–3437.

O'Loughlin, L.S., D.B. Lindenmayer, M.D. Smith, M.R. Willig, A.K. Knapp, K. Cuddington, A. Hastings, C.N. Foster, C.F. Sato, M.J. Westgate, and P.S. Barton. 2018. Surrogates underpin ecological understanding and practice. BioScience 68: 640-642.

Zhongmin, H., Q. Guo, S. Li, S. Piao, A. K. Knapp, P, Ciais, X. Li, and G. Yu. 2018. Shifts in the dynamics of productivity signal ecosystem state transitions at the biome-scale. Ecology Letters 21: 1457–1466.

Knapp, A.K., C.J.W. Carroll, R.J. Griffin-Nolan, I.J. Slette, F.A. Chavez, L.E. Baur, A. J. Felton, J.E. Gray, A.M. Hoffman, N.P. Lemoine, W. Mao, A. Post, and M.D. Smith. 2018. A reality check for climate change experiments: do they reflect the real world? Ecology 99: 2145–2151.

Luo, W., X. Zuo, W. Ma, C. Xu, A. Li, Q. Yu*, A.K. Knapp, R. Tognetti, F.A. Dijkstra, M. Li, G. Han, Z. Wang, and X. Han. 2018. Differential responses of canopy nutrients to experimental drought along a natural aridity gradient. Ecology 99: 2230–2239.

Hopping, K.A., A.K. Knapp, T. Dorji and J. A. Klein. 2018. Warming and land use change concurrently erode ecosystem services in Tibet. Global Change Biology 24: 5534–5548.

Langley, A., S.K. Chapman, K. La Pierre, M. Avolio, W. Bowman, D. Johnson, F. Isbell, K. Wilcox, B. Foster, M. Hovenden, A.K. Knapp, S. Koerner, C. Lortie, J. Megonigal, P. Newton, P.B. Reich, M.D. Smith, B.K. Suttle, D. Tilman. 2018. Ambient changes exceed treatment effects on plant species abundance in long-term global change experiments. Global Change Biology 24: 5668–5679.

Lemoine N.P., R.J. Griffin-Nolan, A.D. Lock and A.K. Knapp. 2018. Drought timing, not previous drought exposure, determines sensitivity of two shortgrass species to water stress. Oecologia 188: 965–975.

Asbjornsen, H., J.L. Campbell, K.A. Jennings, M.A. Vadeboncoeur, C. McIntire, P.H. Templer, R.P. Phillips, T.L. Bauerle, M.C. Dietze, S.D. Frey, P.M. Groffman, R. Guerrieri, P.J. Hanson, E.P. Kelsey, A.K. Knapp, N.G. McDowell, P. Meir, K.A. Novick, S.V. Ollinger, W.T. Pockman, P.G. Schaberg, S.D. Wullschleger, M.D. Smith and L. Rustad. 2018. Guidelines and considerations for designing field experiments for simulating precipitation extremes in forest ecosystems. Methods in Ecology and Evolution 9: 2310-2325.

Koerner, S.E., M.D. Smith, D.E. Burkepile, N.P. Hanan, M.L. Avolio, S.L. Collins, A.K. Knapp, N.P. Lemoine, E.J. Forrestel, S. Eby, D.I. Thompson, G. Aguado-Santacruz, J.P. Anderson, M. Anderson, A. Angassa, S. Bagchi, E.S. Bakker, G. Bastin, L.E. Baur, K.H. Beard, E.A. Beever, P.J. Bohlen, E.H. Boughton, D. Canestro, A. Cesa, E. Chaneton, J. Cheng, C. M. D'Antonio, C. Deleglise, F. Dembélé, J. Dorrough, D. Eldridge, B. Fernandez-Going, S. Fernández-Lugo, L.H. Fraser, B. Freedman, G. Garcia-Salgado, J. R. Goheen, L. Guo, S. Husheer, M. Karembé,.J. M. H. Knops, T. Kraaij, A.Kulmatiski, M. Kytöviita, F. Lezama, G. Loucougaray, A. Loydi, D.G. Milchunas, S. Milton, J.W. Morgan, C. Moxham, K. C. Nehring, H. Olff, T.M. Palmer, S. Rebollo, C. Riginos, A. C. Risch, M. Rueda, M. Sankaran, T. Sasak, K. Schoenecker, N. L. Schultz, M. Schütz, A. Schwabe, F. Siebert, C. Smit, K. A. Stahlheber, C. Storm, D. J. Strong, J. Su, Y. V. Tiruvaimozhi, C. Tyler, J. Val, M. L. Vandegehuchte, K. E. Veblen, L. T. Vermeire, D. Ward, J. Wu, T.P. Young, Q. Yu, T.J. Zelikova. 2018. Resolving variation in herbivore effects on plant biodiversity – change in dominance as a global mechanism. Nature Ecology and Evolution 2: 1925-1932.

Carroll, C.J.W., P.H. Martin, A.K. Knapp and T.W. Ocheltree. 2018. Temperature induced shifts in leaf water relations and growth efficiency indicate climate change may limit aspen growth in the Colorado Rockies. Environmental and Experimental Botany 159: 132–137.

Pendall, E., D. Bachelet, R. T. Conant, B. El Masri, L. B. Flanagan, A. K. Knapp, J. Liu, S. Liu, and S. M. Schaeffer. 2018. Chapter 10: Grasslands. In Second State of the Carbon Cycle Report (SOCCR2): A Sustained Assessment Report [Cavallaro, N., G. Shrestha, R. Birdsey, M. A. Mayes, R. G. Najjar, S. C. Reed, P. Romero-Lankao, and Z. Zhu (eds.)]. U.S. Global Change Research Program, Washington, DC, USA, pp. 399-427

Yue, X., X. Zuo, Q. Yu, C. Xu, P. Lv, J. Zhang, A.K. Knapp, and M.D. Smith. 2019. Response of plant functional traits of Leymus chinensis to extreme drought in Inner Mongolia grasslands. Plant Ecology 220: 141-149.

Griffin-Nolan, R.J., T.W Ocheltree, K.E Mueller, D.M Blumenthal, J.A Kray and A.K Knapp. 2019. Extending the osmometer method for assessing drought tolerance to herbaceous species. Oecologia 189: 353-363.

Felton, A.J, A.K. Knapp and M.D. Smith. 2019. Carbon exchange responses of a mesic grassland to an extreme gradient of precipitation. Oecologia 189:565-576.

Collins, S.L. and A.K. Knapp. 2019. NEON should be run by ecologists for ecologists. BioScience 69:319.

Symstad, A.J., A.T. Smith, W.E. Newton and A.K. Knapp. 2019. Experimentally derived nitrogen critical loads for northern Great Plains vegetation. Ecological Applications 29(5):e01915. 10.1002/eap.1915.

Wang, J., Y. Gao, Y. Zhang, J. Yang, M.D. Smith, A.K. Knapp, D.M. Eissenstat and X. Han. 2019. Asymmetry in above- and belowground productivity responses to N addition in semi-arid temperate steppe. Global Change Biology 25: 2958–2969.

Griffin-Nolan, R.J., D.M. Blumenthal, S.L. Collins, T.E. Farkas, A.M. Hoffman, K.E. Mueller, T.W. Ocheltree, M.D. Smith, K.D. Whitney and A.K. Knapp. 2019. Shifts in plant functional composition following long-term drought in grasslands. Journal of Ecology 107: 2133–2148.

Song, J., S. Wan, S. Piao, A. Knapp, A. Classen, S. Vicca, P. Ciais, M. Hovenden, S. Leuzinger, C. Beier, P. Kardo, J. Xia, Q. Liu, J. Ru, Z. Zhou, Y. Luo, D. Guo, J. Langley, J. Zscheischler, J. Dukes, J. Tang, J. Chen, K. Hofmockel, L. Kueppers, L. Rustad, L. Liu, M. Smith, P. Templer, R. Thomas, R. Norby, R. Phillips, S. Niu, S. Fatichi, Y. Wang, P. Shao, H. Han, D. Wang, L. Lei, J. Wang, Z. Li, Q. Zhang, X. Li, F. Su, B. Liu, F. Yang, G. Ma, G. Li, Y. Liu, Y. Liu, Z. Yang, K. Xhang, Y. Miao, M. Hu, C. Yan, A. Zhang, M. Zhong, Y. Hui, Y. Li, and M. Zheng. A meta-analysis of 1119 manipulative experiments on terrestrial carbon cycling responses to global change. Nature Ecology and Evolution 3:1309–1320.

Slette, I.J., M. Awad, T. Even, A.K. Post, A. Punzalan, S. Williams, M.D. Smith and A.K. Knapp. 2019. How ecologists define drought, and why we should do better. Global Change Biology 25: 3193–3200.

Caplan, J.S., D. Giménez, D.R. Hirmas, N.A. Brunsell, J.M. Blair and A.K. Knapp. 2019. Decadal-scale shifts in soil hydraulic properties induced by altered precipitation. Science Advances 5: eaau6635.

Komatsu, K.J., M. Avolio, N. Lemoine, F. Isbell, E. Grman, G. Houseman, S. Koerner, D. Johnson, K. Wilcox, J. Alatalo, J. Anderson, R. Aerts, S. Baer, A. Baldwin, J. Bates, C. Beierkuhnlein, R. Belote, J. Blair, J. Bloor, P. Bohlen, E. Bork, E. Boughton, W. Bowman, A. Britton, J. Cahill Jr., E. Chaneton, N. Chiariello, J. Cheng, S. Collins, J. Cornelissen, G. Du, A. Eskelinen, J. Firn, B. Foster, L. Gough, K. Gross, L. Hallett, X. Han, H. Harmens, M. Hovenden, A. Jagerbrand, A. Jentsch, C. Kern, K. Klanderud, A. Knapp, J. Kreyling, W. Li, Y. Luo, R. McCulley, J. McLaren, J. Megonigal, J. Morgan, V. Onipchenko, S. Pennings, J. Prevéy, J. Price, P. Reich, C. Robinson, F. Russell, O. Sala, E. Seabloom, M. Smith, N. Soudzilovskaia, L. Souza, K. Suding, K. Suttle, T. Svejcar, D. Tilman, P. Tognetti, R. Turkington, S. White, Z. Xu, L. Yahdjian, Q. Yu, P. Zhang, Y. Zhang. 2019. Global change effects on plant communities are magnified by time and the number of global change factors imposed. Proceedings of the National Academy of Sciences 116: 17867-17873.

Luo W, X. Zuo, R.J. Griffin-Nolan, C. Xu, W. Ma, L. Song, X. Liang, K. Helsen, Y. Lin, J. Cai, A. K. Knapp, M.D. Smith, Q. Yu, Z. Wang and X. Han. 2019. Long term experimental drought alters community plant trait variation, not trait means, across three semiarid grasslands. Plant and Soil 442: 343-353.

Chen, M., W.J. Parton, M. D. Hartman, S.J. Del Grosso, W.K. Smith, A.K. Knapp, S. Lutz, J.D. Derner, C.J. Tucker, D.S. Ojima, J.D. Volesky, M.B. Stephenson, W.H. Schacht, W. Gao. 2019. Assessing precipitation, evapotranspiration, and NDVI as controls of U.S. Great Plains plant production. Ecosphere 10(10):e02889.

Post, A.K and A.K. Knapp. 2019. Plant growth and aboveground production respond differently to late season deluges in a semi-arid grassland. Oecologia, 191: 673-683.

Knapp, A.K. and S.L. Collins. 2019. Reimagining NEON operations: We can do better. BioScience 12: 956–959.

Felton, A.J., I.J. Slette, M.D. Smith and A.K. Knapp. 2020. Precipitation amount and event size interact to reduce ecosystem functioning during dry years in a mesic grassland. Global Change Biology 26: 658-668.

De Boeck, H. J., J. Bloor, R. Aerts, M. Bahn, C. Beier, B. Emmett, M. Estiarte, J. Grünzweig, A. Halbritter, P. Holub, A. Jentsch, K. Klem, J. Kreyling, G. Kroel-Dulay, A. Milcu, B. Sigurdsson, M. Smith, K. Larsen, M. Sternberg, V. Vandvik, T. Wohlgemuth, I. Nijs, and A. Knapp. 2020. Understanding ecosystems of the future will require more than realistic climate change experiments – a response to Korell et al. Global Change Biology 26: e6-e7. doi:10.1111/gcb.14854.

Slette, I. J., M.D. Smith, A.K. Knapp, S.M. Vicente-Serrano, J.J Camarero, and S. Beguería. 2020. Standardized metrics are key for assessing drought severity. Global Change Biology 26: e1-e3. doi:10.1111/gcb.14899.

Smith, M. D., S. Koerner, A.K. Knapp, M. Avolio, F. Chaves, E. Denton,J. Dietrich, D. Gibson, J. Gray, A. Hoffman, D.L. Hoover, K. La Pierre, A. Silletti, K.R. Wilcox, Q. Yu, J.M. Blair. 2020. Mass ratio effects underlie ecosystem responses to environmental change. Journal of Ecology 108:855–864.

Wilcox K.R, S. E. Koerner, D.L. Hoover, A.K. Borkenhagen, D.E. Burkepile, S.L. Collins, A. Hoffman, K.P. Kirkman, A.K. Knapp, T. Strydom, D.I. Thompson and M.D. Smith. 2020. Rapid recovery of ecosystem function following extreme drought in a South African savanna-grassland. Ecology 101:e02983.

Paschalis, A, S. Fatichi, J. Zscheischler, P. Ciais, M. Bahn, L. Boysen, J. Chang, M. De Kauwe, M. Estiarte, D. Goll, P. J. Hanson, A. B. Harper, E. Hou, J. Kigel, A. K. Knapp, K. S. Larsen, W. Li, S. Lierert, Y. Luo, P. Meir, J.E.M.S. Nabel, R. Ogaya, A. J. Parolari, C. Peng, J. Peñuelas, J. Pongratz, S. Rambal, I. K. Schmidt, H. Shi, M. Sternberg, H. Tian, E. Tschumi, A. Ukkola, S. Vicca, N. Viovy, Y. Wang, Z. Wang, K. Williams, D. Wu, and Q. Zhu. 2020. Rainfall-manipulation experiments as simulated by terrestrial biosphere models: where do we stand? Global Change Biology 26:3336–3355.

Knapp, A.K., A. Chen, R.J. Griffin-Nolan, L.E. Baur, C.J.W. Carroll, J.E. Gray, A.M. Hoffman, X. Li, A.K. Post, I.J. Slette, S.L. Collins, Y. Luo and M.D. Smith. 2020. Resolving the Dust Bowl paradox of grassland responses to extreme drought. Proceedings of the National Academy of Sciences 117: 22249-22255.

Post, A.K. and A.K. Knapp. 2020. The importance of extreme rainfall events and their timing in a semi-arid grassland. Journal of Ecology 108: 2431–2443.

Al-Yaari, A. J-P Wigneron, P. Ciais, M. Reichstein, A. Ballantyne, J. Ogée, A. Ducharne, J. J. Swenson, F. Frappart, L. Fan, L. Wingate, X. Li, K. Hufkens and A. K. Knapp. 2020. Asymmetric responses of ecosystem productivity to rainfall anomalies vary inversely with mean annual rainfall over the conterminous U.S. Global Change Biology 26: 6959–6973.

Avolio, M.L., K.R. Wilcox, K.J. La Pierre, N. Lemoine, W.D. Bowman, S.L. Collins, A.K. Knapp, S.E. Koerner, M.D. Smith, S.G. Baer, K.L. Gross, F. Isbell, J. McLaren, P.B. Reich, K.N. Suding, K. B. Suttle, D. Tilman, Z. Xu, Q. Yu. 2020. Temporal variability in production is not consistently affected by global change drivers across herbaceous-dominated ecosystems. Oecologia 194: 735–744.

Lagueux, D., A. Jumpponen, A. Porras-Alfaro, J. Herrera, Y. A. Chung, L.E. Baur, M.D. Smith, A.K. Knapp, S.L. Collins, and J.A. Rudgers. 2021. Experimental drought re-ordered assemblages of root-associated fungi across North American grasslands. Journal of Ecology 109: 776-792.

Post, A.K. and A.K. Knapp. 2021. How big is big enough? Surprising responses of a semi-arid grassland to increasing deluge size. Global Change Biology 27: 1157–1169.

Felton, A.J., A.K. Knapp and M.D. Smith. 2021. Precipitation-productivity relationships and the duration of precipitation anomalies: an underappreciated dimension of climate change. Global Change Biology 27: 1127–1140.

Chen, A., J. Mao, D. Ricciuto, J. Xiao, C. Frankenberg, X. Li, L. Gu, and A.K. Knapp. 2021. Moisture availability mediates the relationship between terrestrial gross primary production and solar-induced fluorescence: Insights from global scale variations. Global Change Biology 27: 1144–1156.