

CURRICULUM VITAE

Name: Michael B. Coughenour

Academic Training:

Degree	Year	Institution	Major
B.S.	1973	University of Illinois	Biology
M.S.	1974	University of Illinois	Biology
Ph.D.	1978	Colorado State University	Systems Ecology/Zoology

Professional Experience:

Date	Position	Institution
1974-1978	Graduate Research Assistant	Colorado State University Natural Resource Ecology Laboratory
1978-1983	Postdoctoral Research Associate	Syracuse University Department of Biology
1983-1985	Postdoctoral Research Associate	Colorado State University Natural Resource Ecology Laboratory
1985-1986	Research Associate	Colorado State University Natural Resource Ecology Laboratory
1986-1991	Research Scientist	Colorado State University Natural Resource Ecology Laboratory
1990-2010	Associate Professor	Colorado State University Rangeland Ecosystem Science Department
1991-	Senior Research Scientist	Colorado State University Natural Resource Ecology Laboratory
1996-	Advising Faculty Member	Colorado State University Graduate Degree Program In Ecology
2008-	Member	Colorado State University School of Global Environmental Sustainability
2011-	Associate Professor	Colorado State University Department of Ecosystem Science and Sustainability
2013-	Senior Research Scientist	Colorado State University UVB Monitoring and Research Program

Professional Societies:

Ecological Society of America
Society for Range Management

Publications:

Mwakiwa, E., M. Coughenour, J. Hearne, H. de Knegt, H., F. de Boer, E. Kohi, J. Stigter, R. Grant, H.J. Prins, H. 2014. Elephant and biodiversity: manipulating waterpoints to meet management objectives. Submitted to *Oryx*.

Hilbers, J.P., F. Van Langevelde,, H.H.T. Prins, R. Grant, M. Peel, M.B., Coughenour, M.B., H.J. de Knegt, R. Slotow, I. Smit, G. Kiker, W.F. de Boer. 2014. Modeling elephant-mediated cascading effects of water point closure. *Ecological Applications* (in press).

Verchot, L., N.L. Ward, J. Belknap, D. Bossio, J. Gibson, O. Hanotte, M. Coughenour, A.N. Muchiru, B. Steven, D. Wall, R. Reid. From bacteria to elephants: effects of land-use legacies on biodiversity and ecosystem processes in the Serengeti-Mara ecosystem. Book chapter. *Serengeti IV*. A.R.E. Sinclair et al. eds. In Press. University of Chicago Press, Chicago.

Metzger, K., A.R.E. Sinclair, S. MacFarlane, M. Coughenour, J. Ding. The scale at which things change. Book chapter. *Serengeti IV*. A.R.E. Sinclair et al. eds. In Press. University of Chicago Press, Chicago.

Beale, Colin M., Sue van Rensberg, William J. Bond, Mike Coughenour, Richard Fynn, Angela Gaylard, Rina Grant, Brian Harris, Trevor Jones, Simon Mduma, Norman Owen-Smith, Tony Sinclair. 2013. Ten lessons for the conservation of African savannah ecosystems. *Biological Conservation* 167: 224-232.

Committee to Review the Bureau of Land Management Wild Horse and Burro Management Program: Board on Agriculture and Natural Resources (BANR); Division on Earth and Life Studies (DELS); National Research Council. 2013. *Using Science to Improve the BLM Wild Horse and Burro Program: A Way Forward*. The National Academy Press, Washington, D.C.

Baker, B.W., H.R. Peinetti, M.B. Coughenour, T. Johnson. 2012. Beaver and elk competition for willow in a simulated riparian environment. *Ecosphere* 3(11):1-15.

FAO. 2012. *Conducting national feed assessments* by Michael B. Coughenour & Harinder P.S. Makkar. FAO Animal Production and Health Manual No. 15. Rome, Italy.

White, P.J., G.E. Plumb, M.B. Coughenour, R.L. Wallen. 2011. Carrying capacity and movements of Yellowstone bison. *Yellowstone Science* 19(1):8-14.

Beltrán-Przekurat, Adriana, Roger A. Pielke Sr., Joseph L. Eastman and Michael B. Coughenour. 2011. Modeling the effects of land-use/land-cover changes on the near-surface atmosphere in southern South America. *International Journal of Climatology*. doi: 10.1002/joc.2346.

- De Knegt, H.J., F. van Langevelde, A. Skidmore, A. Delsing, R. Slotow, S. Henley, M. Coughenour, G. Bucini, R. Grant, W.F. de Boer, H.H.T. Prins and other Tembo members. 2011. The scale of habitat selection by African elephants. *Journal of Animal Ecology* 80:270-281,
- De Knegt, H.J., F. van Langevelde, M. Coughenour, A. Skidmore, W. de Boer, I. Ieikonig, N. Knox, E. Kohi, M. Peel, R. Slowtow, C. van der Waal, S. van Wieren, H. Prins. 2010. Spatial autocorrelation and the scaling of species-environment associations. *Ecology* 91:2455-2465.
- Plumb, G.E., P.J. White, M.B. Coughenour, R.L. Wallen. 2009. Carrying capacity and migration of Yellowstone bison: implications for conservation. *Biological Conservation* 142:2377-2387.
- Peinetti, H.R., B.W. Baker, M.B. Coughenour. 2009. Simulation modeling to understand how selective foraging by beaver can drive the structure and function of a willow community. *Ecological Modeling* 220:998-1012.
- Behnke, R., G. Davidson, A. Jabbar and M. Coughenour. 2008. Human and natural factors that influence livestock distributions and rangeland desertification in Turkmenistan. Chap.7 in R. Behnke (ed.), *The socioeconomic causes and consequences of desertification in Central Asia*. NATO Science Series. Springer. The Netherlands.
- Coughenour, M.B., R. Behnke, J. Lomas, K. Price. 2008. Forage distributions, rangeland condition, and the importance of pastoral movement in Central Asia: A remote sensing study. Chap. 4 in R. Behnke (ed.), *The Socioeconomic causes and consequences of desertification in Central Asia*. NATO Science Series. Springer. The Netherlands.
- Norton-Griffiths, M., M. Said, S. Serneels, D. Kaelo, M. Coughenour, R. Lamprey, R.Reid. 2008. Land use economics in the Mara area of the Serengeti Ecosystem. Chapter 12 . In. *Serengeti III: Human Impacts on Ecosystem Dynamics*. A.R.E. Sinclair, C. Packer, S. Mduma, and J.M. Fryxell (eds.)
- Matsui, T., A. Beltrán-Przekurat, D. Niyogi, R.A. Pielke Sr., and M. Coughenour, 2008: Aerosol light scattering effect on terrestrial plant productivity and energy fluxes over the eastern U.S. J. Geophys. Res. Yoram J. Kaufman Symposium Issue, 113, D14S14, doi:10.1029/2007JD009658.
- Coughenour, M.B. 2008. Causes and consequences of herbivore movement in landscape ecosystems. Chap. 3 in: K. Galvin, R. Reid, R. Behnke, and N.T. Hobbs (eds.). *Fragmentation of semi-arid and Arid Landscapes: Consequences for Human and Natural Systems*. Springer. The Netherlands.
- Matsui, T., A. Beltran-Prsekurat, R.A. Pielke Sr., D. Niyogi, and M.B. Coughenour. 2007. Continental-scale multi-objective calibration and assessment of Colorado State University Unified Land Model. Part 1: Surface Albedo. *Jour. Geophys. Res.* 112, G02028, doi:10.1029/2006JG000229.
- Holdo, R.M., R. D. Holt, M.B. Coughenour, M.E. Ritchie. 2007. Soil nitrogen and aboveground productivity as a function of grazing, migration, and fire in an African savanna. *Jour. Ecology* 95:115-128.

- Boone, R.B., K.A. Galvin, P.K. Thornton, D.M. Swift, and M.B. Coughenour. 2006. Cultivation and conservation in Ngorongoro Conservation Area, Tanzania. *Human Ecology* 34:809-828.
- Christensen, L., S. Burnsilver, M. Coughenour. 2006. Integrated Assessment of the Dynamics, Stability, and Resilience of the Inner Mongolian Grazing Ecosystems. *Nomadic Peoples* 9:131-145.
- Weisberg, P., M. Coughenour, and H. Bugmann. 2006. Modelling of large herbivore - vegetation interactions in a landscape context. Chapter 12 in: Kjell Danell, R. Bergstrom, P. Duncan, and J. Pastor (eds.), *Large Herbivore Ecology and Ecosystem Dynamics*. Cambridge University Press.
- Coughenour, M.B. 2006. Ecosystem research and modeling in protected areas with large mammals - Yellowstone as a case study. Pp. 165-175 In: D. R. McCullough, K. Kaji and M. Yamanaka (eds.), *Wildlife in Shiretoko and Yellowstone National Parks: Lessons in Wildlife Conservation from Two World Heritage Sites*. Shiretoko Nature Foundation, Hokkaido, Japan.
- Baker, B. R. Peinetti and M. Coughenour. 2005. Resilience of willow stems after release from intense elk browsing. *Rangeland Ecology and Manage.* 58:575-581.
- Sankaran, M., N. Hanan, R. Scholes, J. Ratnam, D. Augustine, B. Cade, J. Gignoux, S. Higgins, X. LeRoux, F. Ludwig, J. Ardo, f. Banyikwa, A. Bronn, G. Bucini, K. Caylor. M. Coughenour, A. Diouf, W. Ekaya, C. Feral, E. February, P. Frost, P. Hiernaux, H. Hrabar, K. Metzger, H. Prins, S. Ringrose, W. Sea, J. Tews, J. Worden, N. Zambatis. 2005. Determinants of woody cover in African savannas. *Nature* 438:846-849.
- Metzger, K., M. Coughenour, R. Reich, R.B. Boone. 2005. Effects of season of grazing on vegetation diversity, composition, and structure in a semi-arid ecosystem. *J. Arid Environments* 61:147-160.
- Chen, D.X. and M. Coughenour. 2004. Scaling up photosynthesis, transpiration and primary productivity from leaves and canopies to regions using multiscaled models and remotely sensed data. *Global Biogeochemical Cycles* 18(4) 1-15.
- Begzsuren, S., J. Ellis, D. Ojima M. Coughenour and T. Chuluun. 2004. Livestock responses to drought and severe winter weather in Gobi Three Beauty National Park, Mongolia *J. Arid Environ.* 59:789-796.
- Coughenour, M. 2004. The Ellis paradigm - humans, herbivores and rangeland systems. *African Journal of Range and Forage Science* 21:123-132..
- Wallace, L, Coughenour, M., Turner, M., Romme, W. 2004. Fire Patterns and Ungulate Survival in Northern Yellowstone Park: The Results of Two Separate Models. Chapter 14 in L. L.Wallace (ed.), *After the Fires: The Ecology of Change in Yellowstone National Park*. Yale University Press, New Haven.
- Singer, F.J., K.K. Symonds, M.B. Coughenour, J.E. Norland. 2004. Elk Biology and Ecology Before and After the Yellowstone Fires of 1988. Chap. 6 in L. L. Wallace (ed.), *After the Fires: The Ecology of Change in Yellowstone National Park*. Yale University Press, New Haven.

- Boone, R.B., K. Galvin, M. Coughenour, J. Hudson, P. Weisberg, C. Vogel and J. Ellis. 2004. Ecosystem modeling adds value to South African climate forecasts. *Climatic Change* 64:317-340.
- Christensen, L. M. Coughenour, J. Ellis, Z. Chen. 2004. Vulnerability of typical steppe grassland systems to grazing and climate change. *Climatic Change* 63:351-368.
- Weisberg, P., M. Coughenour. 2003. Model-based assessment of aspen responses to elk herbivory in Rocky Mountain National Park, U.S.A. *Environmental Management* 32: 152-169.
- House, J., S. Archer, D. D. Breshears, R. J. Scholes, and NCEAS Tree-Grass Interaction Participants. 2003. Conundrums in mixed woody-herbaceous plant systems. *J. Biogeography* 30: 1763-1877.
- Pielke, R., T. Chase, J. Eastman, L. Lu, G. Liston, M. Coughenour, D. Ojima, W. Parton, T. Kittel. Land-Atmosphere Interactions. 2002. In: *Global Change and Protected Areas, Edition: Advances in Global Change Research, Chapter: Volume 9, Section 1.* Editor G. Visconti. Kluwer Academic Publishers, The Netherlands., pp.119-126 . DOI:10.1007/0-306-48051-4_13 .
- Christensen, L. M. Coughenour, J. Ellis, Z. Chen. 2003. Sustainability of the typical steppe: model assessment of grazing on ecosystem state. *Journal of Range Management* 56: 319-327.
- Coughenour, M. 2002. Ecosystem Modeling in Support of the Conservation of Wild Equids - The Example of the Pryor Mountain Wild Horse Range. In: Moehlman, Patricia D. (ed.). *Equids: Zebras, Asses and Horses. Status Survey and Conservation Action Plan.* IUCN/SSC Equid Specialist Group. IUCN, Gland, Switzerland and Cambridge, UK. vii + 174 pp.
- Peinetti, R., M. Kahlkan, M. Coughenour. 2002. Long-term changes in willow spatial distribution on the elk winter range in Rocky Mountain National Park. *Landscape Ecology* 17:341-354.
- Weisberg, P., N. T. Hobbs, J. Ellis, M. Coughenour. 2002. An ecosystem approach to population management of ungulates. *Environ. Mgmt.* 65:181-197.
- Boone, R.B., M.B. Coughenour, K.A. Galvin, and J.E. Ellis. 2002 Addressing management questions for Ngorongoro Conservation Area, Tanzania, Using the Savanna Modeling System. *Afric. J. Ecol.* 40:138-158.
- Peinetti, R. R. Menezes, M. Coughenour. 2001. Changes induced by elk browsing on willow (*Salix monticola*) woody biomass, production and distribution,; its relationship with plant water, carbon, and nitrogen dynamics. *Oecologia* 127:334-342.
- Eastman, J.L., M.B. Coughenour, R.A. Pielke Sr. 2001. Does grazing affect regional climate?. *J. Hydromet.* 2: 243-253.
- Eastman, J.L., M.B. Coughenour, R.A. Pielke Sr. 2001. The regional effects of CO₂ and landscape change using a coupled plant and meteorological model. *Global Change Biol.* 7:797-815.

- Liedloff, A.C., M.B. Coughenour, J.A. Ludwig, and R. Dyer. 2001. Modelling the trade-off between fire and grazing in a tropical savanna landscape, northern Australia. *Environment International* 27: 173-180.
- Ludwig, J. A., M. B. Coughenour, A.C. Liedloff, and R. Dyer. 2001. Modelling the resilience of Australian savanna systems to grazing impacts. *Environment International* 27:167-172.
- Coughenour, M.B., R.Reid, and P. Thornton. 2000. The Savanna model - providing solutions for wildlife preservation and human development in East Africa and the Western United States, Press Release: Integrated Modeling and Assessment of Livestock-Wildlife Interactions in East Africa (IMAS) Project, Background Research Paper. Future Harvest, Washington D.C. Published on the WWW at <http://www.futureharvest.org/news/savannarelease.shtml>
- Coughenour, M.B. 2000. Ungulates and Grassland Interactions: Integrating across scales with models. Sir George Stapledon Memorial Lecture. Keynote paper. British Grassland Society 6th Research Conference, 9/11/2000, Aberdeen, Scotland. Available from the British Grassland Society, University of Reading, England, <http://www.britishgrassland.com>.
- Pielke, R.A., T.N. Chase, J. Eastman, L. Lu, G.E. Liston, M.B. Coughenour, D. Ojima, W.J. Parton, T.G.F. Kittel. 1999. Land-atmosphere interactions. American Meteorology Preprint Volume 8th Conference on Climate Variations. Also, Proceedings Global Change and Protected Areas Meeting, Italy.
- Pielke R.A., Sr., Liston G.E., Eastman J.L., Lu L., Coughenour M.B. 1999. Seasonal weather prediction as an initial value problem. *Journal of Geophysical Research* 104: 19463-19479.
- Singer, F.J., D.M. Swift, M.B. Coughenour, J. Varley. 1998. Thunder on the Yellowstone revisited: An assessment of natural regulation management of native ungulates, 1968-93. *Wildlife Soc. Bull.* 26:375-390.
- Coughenour, M.B. and D.X. Chen. 1997. An assessment of grassland ecosystem responses to atmospheric change using linked ecophysiological and soil process models. *Ecological Applications* 7: 802-827.
- Stohlgren, T.J., M.B. Coughenour, G.W. Chong, D. Binkley, M.A. Kahlkan, L.D. Schell, D.J. Buckley, and J.K. Berry. 1997. Landscape analysis of plant diversity. *Landscape Ecology* 12:155-170.
- Singer, F.J., A. Harting, K.K. Symonds and M.B. Coughenour. 1997. Elk calf mortality in Yellowstone National Park: the evidence for density dependence, compensation and environmental effects. *J. Wildl. Manag.* 61:12-25.
- Ojima, D.S. Parton, W.J., M.B. Coughenour, J.M.O. Scurlock, T.G. Gilmanov, R.J. Scholes, D.S. Schimel, T.B. Kirchner, J.C. Menaut, T. Seasteadt, E. Garcia-Moya, A. Kamnalrut, J.I. Kinyamario and D.O. Hall. 1996. Impact of climate change and atmospheric carbon dioxide on grasslands of the world. pp. 271-311 in A.I. Breymer, D.M. Hall, J. M. Melillo and G.I. Agren (eds.), *Global Change: Effects on Coniferous Forests and Grasslands*. SCOPE. John Wiley and Sons Ltd.

- Parton, W.J., M.B. Coughenour, J.M.O. Scurlock, D.S. Ojima, T.G. Gilmanov, R.J. Scholes, D.S. Schimel, T.B. Kirchner, J.C. Menaut, T. Seastedt, E. Garcia-Moya, A. Kammalrut, J.I. Kinyamario and D.O. Hall. 1996. Global grassland ecosystem modeling: development and test of ecosystem models for grassland systems. Chap. 11. in A.I. Breymeyer, D.M. Hall, J. M. Melillo and G.I. Agren (eds.), *Global Change: Effects on Coniferous Forests and Grasslands*. SCOPE. John Wiley and Sons Ltd.
- Bailey, D.W., J.E. Gross, E.A. Laca, L.R. Rittenhouse, M.B. Coughenour, D.M. Swift, and P.L. Sims. 1996. Mechanisms that result in large herbivore grazing distribution patterns. *J. Range Manage.* 49:386-400.
- Coughenour, M.B. and F.J. Singer. 1996. Yellowstone elk population responses to fire - a comparison of landscape carrying capacity and spatial-dynamic ecosystem modeling approaches. pp. 169-180 in J. Greenlee (ed.), *The Ecological Implications of Fire in Greater Yellowstone*. International Association of Wildland Fire. Fairfield, WA.
- Coughenour, M.B. and F.J. Singer. 1996. Elk population processes in Yellowstone National Park under the policy of natural regulation. *Ecological Applications* 6:573-593.
- Chen, D.X. and M.B. Coughenour. 1996. A mechanistic photosynthesis model of submerged aquatic plants. *Ecol. Model.* 89:133-146.
- Swift, D.M., M.B. Coughenour, and M. Atsedu. 1996. Arid and semi-arid ecosystems. Chapter 10 in T. McLanahan and T.P. Young (eds.), *East African Ecosystems and their Conservation*. Oxford University Press.
- Coughenour, M.B. 1995. The Use of GIS/RS Data in Landscape-Scale Simulation Models: the SAVANNA Model as an Example. in *Natural Vegetation as a Resource: A Regional Remote Sensing Workshop and Shortcourse for East and Southern Africa*. J. Scurlock (ed.). Overseas Development Institute.
- Coughenour, M.B. and W.J. Parton. 1995. Integrated models of ecosystem function: a grassland case study. Chap. 6 in B.H. Walker and W.L. Steffen (eds.). *Global Change and Terrestrial Ecosystems*, Cambridge University Press.
- Coughenour, M.B. and F.J. Singer. 1994. Evidence for nutritional limitation of elk on Yellowstone's northern winter range. in *Report to Congress on Grazing of the Yellowstone Northern Winter Range*. National Park Service, National Biological Service.
- Coughenour, M.B. 1994. Potential for modeling ecological responses to livestock disease prevention in African livestock. pp 229-244 in B.D. Perry and J.D. Hansen (eds.) *Modeling vector-borne and other parasitic diseases*, Proceeding of a workshop organized by ILRAD and FAO, November 1992. International Laboratory for Research on Animal Diseases. Nairobi. November.
- Coughenour, M.B., F.J. Singer and J.J. Reardon. 1994. The Parker Transects Revisited: Long-term herbaceous vegetation trends on Yellowstone's Northern Winter Range. Pp. 73-96 in: *Plants and Their Environments*. in: *Plants and Their Environments: Proceedings of the First Biennial*

- Scientific Conference on the Greater Yellowstone Ecosystem, Mammoth Hot Springs 1991. D. Despain (ed.). U.S. National Park Service, NPS/NRYELL.NRTR-93/XX. USDI/NPS. Denver.
- Coughenour, M.B. 1994. Elk carrying capacity on Yellowstone's northern elk winter range - Preliminary modeling to integrate climate, landscape, and elk nutritional requirements. pp. 97-112 in: *Plants and Their Environments: Proceedings of the First Biennial Scientific Conference on the Greater Yellowstone Ecosystem, Mammoth Hot Springs, 1991*. D. Despain (ed.). Technical Report NPS/NRYELL.NRTR-93/XX. USDI/NPS. Denver.
- Chen, D.X., M.B. Coughenour, D.B. Eberts and J.S. Thullen. 1994. Interactive effects of CO₂ enrichment and temperature on the growth of diocious *Hydrilla verticillata*. *Environ. Exper. Bot.* 34:345-353.
- Chen, D.X., M.B. Coughenour. 1994. GEMTM - A general model for energy and mass transfer at land surfaces and its application at the FIFE sites. *J. Agric. Forest. Meterol.* 68:145-171.
- Chen, D.X., M.B. Coughenour, C. Owensby and A. Knapp. 1993. Mathematical simulation of C₄ grass photosynthesis in ambient and elevated CO₂. *Ecol. Model.* 73:63-80..
- Coughenour, M. B., and J. E. Ellis. 1993. Landscape and climatic control of woody vegetation in a dry tropical ecosystem: Turkana District, Kenya. *J. Biogeogr.* 20:383-398.
- Ellis, J. E., M. B. Coughenour and D. M. Swift. 1993. Climate variability, ecosystem stability, and the implications for range and livestock development. pp. 31-41 in R.H. Behnke Jr., I. Scoones and C. Kaven (eds.), *Range Ecology at Disequilibrium: New Models of Natural Variability and Pastoral Adaptation in African Savannas*. Overseas Development Institute, London.
- Coughenour, M. B. 1992. Spatial modeling and landscape characterization of an African pastoral ecosystem: a prototype model and its potential use for monitoring drought. pp. 787-810 in: D.H. McKenzie , D.E. Hyatt and V.J. McDonald (eds.). *Ecological Indicators, Vol. I*. Elsevier Applied Science, London and New York.
- Ellis, J. E., M. B. Coughenour, D. M. Swift. 1991. Climate variability, ecosystem stability, and the implications for range and livestock development. In *New Concepts in International Rangeland Development: Theories and Applications*, R. P. Cincotta, C. W. Gay, G. K. Perrier (eds.) Utah State University, pp. 1-12.
- Coughenour, M. B. 1991. Spatial components of plant-herbivore interactions in pastoral, ranching, and native ungulate ecosystems. *J. Range Manage.* 44:530-542.
- Coughenour, M. B. 1991. A GIS/RS based modeling approach for a pastoral ecosystem in Kenya. in: *Proceedings Resource Technology 90 -- Second International Symposium on Advanced Technology in Natural Resource Management*, American Society Photogrammetry and Remote Sensing. Falls Church, Bethesda, MD.
- Coughenour, M. B., and F. J. Singer. 1991. The concept of overgrazing and it's application to Yellowstone's northern range. Pages 209-230 in: R. Keiter and M. Boyce (eds.), *The Greater*

Yellowstone Ecosystem: Redefining America's Wilderness Heritage. Yale Univ. Press, New Haven, CT.

Coughenour, M. B. 1991. Dwarf shrub and graminoid responses to clipping, nitrogen, and water: simplified simulations of biomass and nitrogen dynamics. *Ecological Modeling* 54:81-110.

Coughenour, M. B. 1991. Grazing responses of upland steppe in Yellowstone's Northern winter range. *J. Appl. Ecol.* 28:71-82.

Coughenour, M. B., J. K. Detling, I. E. Bamberg, and M. M. Mugambi. 1990. Production and nitrogen responses of the African dwarf shrub *Indigofera spinosa* to defoliation and water limitation. *Oecologia* 83:546-552.

Coughenour, M. B., D. L. Coppock, J. E. Ellis, and M. Rowland. 1990. Herbaceous forage variability in an arid pastoral region of Kenya: Importance of topographic and rainfall gradients. *J. Arid Environ.* 19:147-159.

Weltzin, J. S. and M. B. Coughenour. 1990. Savanna tree influence on understory vegetation and soil nutrients in northwestern Kenya. *J. Veg. Sci.* 1:325-334.

Coughenour, M. B., J. E. Ellis, and R. G. Popp. 1990. Morphometric relationships and developmental patterns of *Acacia tortilis* and *Acacia reficiens* in Southern Turkana, Kenya. *Bull. Torr. Bot. Cl.* 117(1):8-17.

Coughenour, M. B., D. L. Coppock, M. Rowland and J. E. Ellis. 1990. Dwarf shrub ecology in Kenya's arid zone: *Indigofera spinosa* as a key forage resource. *J. Arid Environ.* 18:301-312.

Kittel, T.G.F. and M. B. Coughenour. 1988. Prediction of regional and local ecological change from global climate model results: A hierarchical modeling approach. in: R.A. Pielke, T.G. Kittel (eds.). *Monitoring Climate for the effects of increasing greenhouse gas concentrations*. Coop. Inst. for Res. in the Atmos., Colorado State University, Ft. Collins.

Senft, R. L., M. B. Coughenour, D. W. Bailey, L. R. Rittenhouse, O. E. Sala, and D. M. Swift. 1987. Large herbivore foraging and ecological hierarchies. *Bioscience* 37:789-799.

McNaughton, S. J., R. W. Ruess, and M. B. Coughenour. 1986. Ecological consequences of Nuclear War: Grassland ecosystem simulations. *Nature* 321:483-487.

Coughenour, M. B., and J. K. Detling. 1986. *Acacia tortilis* seed germination responses to variation in water potential and nutrients. *African Journal of Ecology* 24:203-205.

Coughenour, M. B., S. J. McNaughton, and L. L. Wallace. 1986. Responses of an African graminoid (*Themeda triandra* Forsk.) to frequent defoliation, nitrogen, and water - a limit of adaptation to herbivory. *Oecologia* 68:105-110.

Wallace, L. L., S. J. McNaughton, and M. B. Coughenour. 1985. Effects of clipping and four levels of nitrogen on the gas exchange, growth and production of two East African graminoids. *Amer. J. Bot.* 72:222-230.

- Coughenour, M. B., J. E. Ellis, D. M. Swift, D. L. Coppock, K. Galvin, J. T. McCabe, and T. C. Hart. 1985. Energy extraction and use in a nomadic pastoral ecosystem. *Science* 230:619-624.
- Coughenour, M. B., S. J. McNaughton, and L. L. Wallace. 1985. Shoot growth and morphometric analyses of Serengeti graminoids. *Afric. J. Ecol.* 23:179-194.
- Coughenour, M. B., S. J. McNaughton, and L. L. Wallace. 1985. Adaptations of an African tallgrass (*Hyparrhenia filipendula* Stapf.) to defoliation and limitations of nutrients and water. *Oecologia* 68:50-56.
- Coughenour, M. B. 1985. Graminoid responses to grazing by large herbivores: Adaptations, exaptations and interacting processes. *Annals Missouri Bot. Garden* 72:852-863.
- Coughenour, M. B. 1984. A mechanistic simulation analysis of water use, leaf angles, and grazing in East African graminoids. *Ecological Modeling* 26:203-220.
- Wallace, L. L., S. J. McNaughton, and M. B. Coughenour. 1984. Compensatory photosynthetic responses of three African grassland species to different fertilization, watering, and simulated grazing regimes. *Bot. Gaz.* 145:151-156.
- Coughenour, M. B., S. J. McNaughton, and L. L. Wallace. 1984. Simulation study of Serengeti perennial graminoid responses to defoliation. *Ecological Modeling* 26:177-201.
- Coughenour, M. B., S. J. McNaughton, and L. L. Wallace. 1984. Modeling primary production of perennial graminoids: Uniting physiological processes and morphometric traits. *Ecological Modeling* 23:101-134.
- Ruess, R. W., S. J. McNaughton, and M. B. Coughenour. 1983. The effects of clipping, nitrogen source and nitrogen concentration on the growth responses and nitrogen uptake of an East African sedge. *Oecologia* 59:253-261.
- McNaughton, S. J., L. L. Wallace, and M. B. Coughenour. 1983. Plant adaptation in an ecosystem context: effects of defoliation, nitrogen, and water on growth of an African C4 sedge. *Ecology* 64:307-318.
- Coughenour, M. B. 1983. Simulation analysis of African graminoid responses to defoliation and potential implications for managed grazing systems. Pages 435-442 in W. K. Lauenroth, G. V. Skogerboe, and M. Flug (eds.), *Analysis of Ecological Systems: State of the Art in Ecological Modeling*. Elsevier Publishing Co., Amsterdam.
- Wallace, L. L., S. J. McNaughton, and M. B. Coughenour. 1982. The effects of clipping and fertilization on nitrogen nutrition and allocation by mycorrhizal and nonmycorrhizal *Panicum coloratum* L., a C4 grass. *Oecologia* 54:68-71.
- McNaughton, S. J., M. B. Coughenour, and L. L. Wallace. 1982. Interactive processes in grassland ecosystems. Pages 167-194 in J.R. Estes and R. J. Tylr (eds.), *Grasses and Grasslands: Systematics and Ecology*. Oklahoma State University Press.

McNaughton, S. J., and M. B. Coughenour. 1981. The cybernetic nature of ecosystems. *Amer. Nat.* 117:985-989.

Coughenour, M. B. 1981. Sulfur dioxide deposition and its effect on a grassland sulfur-cycle. *Ecological Modeling* 13:1-16.

Coughenour, M. B., W. J. Parton, W. K. Lauenroth, J. L. Dodd, and R. G. Woodmansee. 1980. Simulation of a grassland sulfur-cycle. *Ecological Modeling* 9:179-213.

Coughenour, M. B., J. L. Dodd, D. C. Coleman, and W. K. Lauenroth. 1979. Partitioning of carbon and SO₂-sulfur in a native grassland. *Oecologia* 42:229-240.

Dissertation:

Coughenour, M. B. 1978. Grassland sulfur cycle and ecosystem responses to low-level SO₂. Ph.D. Dissertation. Colorado State University.

Major Reports Available from Agencies or Author:

(Many of the following reports can be downloaded from the following web site.

www.nrel.colostate.edu/projects/savanna/bibliography.html)

Coughenour, M.B. 2008. Modeling the Yukon-Kuskokwim Delta Geese Grazing Ecosystem. Report to NSF and Univ. Nevada, Reno. (www.nrel.colostate.edu/projects/Yukon)

Coughenour, M.B. 2008. Development of a Spatial Database for Modeling of the Yukon-Kuskokwim Delta Ecosystem. Report to NSF and Univ. Nevada, Reno. (www.nrel.colostate.edu/projects/Yukon)

Coughenour, M.B. 2005. Bison and Elk in Yellowstone National Park - Linking Ecosystem, Animal Nutrition, and Population Processes. Part 3 - Final Report to U.S. Geological Survey, Biological Resources Division, Bozeman, MT. 29 pp. 39 Figures. 18 Tables.

Coughenour, M.B. 2005. Interactions Between Grazing Herbivores and Herbaceous Vegetation on a Heterogeneous Landscape - Yellowstone National Park Part 2 - Final Report to U.S. Geological Survey, Biological Resources Division, Bozeman, MT. 24 pp., 31 Figures, 13 Tables.

Coughenour, M.B. 2005. Plant Biomass and Primary Production on Bison and Elk Ranges in Yellowstone National Park - Data Synthesis and Ecosystem Modeling. Part 1 - Final Report to U.S. Geological Survey, Biological Resources Division, Bozeman, MT. 40 pp, 43 Figures, 27 Tables.

Coughenour, M.B. 2002. Elk in the Rocky Mountain National Park Ecosystem - A Model-Based Assessment. Final Report to USGS Biological Resources Division, Ft. Collins, Colorado and U.S. National Park Service, Rocky Mtn. Nat. Park. 125 pp. 116 Figs. (Externally reviewed).

- Boone, R. and M. Coughenour (eds.). 2001. A System for Integrated Management and Assessment of East African Pastoral Lands. Final Report to Global Livestock Collaborative Research Support Program, U.S. Agency for International Development, Univ. California, Davis. 168 pp.
- Coughenour, M.B. 2000. Ecosystem modeling of the PMWHR: Executive Summary. Pp. 125-131 in: Managers' Summary - Ecological Studies of the Pryor Mountain Wild Horse Range, 1992-1997. F.J. Singer and K.A. Schoenecker (eds.). U.S. Geological Survey, Midcontinent Ecological Science Center, Fort Collins, Colorado. 131 pp.
- Coughenour, M.B. 1999. Ecosystem modeling of the Pryor Mountain Wild Horse Range. Final Report to U.S. Geological Survey, Biological Resources Division, Fort Collins, Colorado, National Park Service, and Bureau of Land Management. 55 pp. + 100 Figs. (Externally reviewed).
- Singer, F.J., T. Johnson, L.C. Ziegenfuss, M. Coughenour, D. Bowden, M. Moses. 1998. Population estimation, plant interactions, forage biomass, and consumption and carrying capacity estimation of elk in the Estes Valley. Final Report to U.S. National Park Service, Rocky Mtn. Nat. Park..
- Chen, D.X., M.B. Coughenour, D.B. Eberts and J.S. Thullen. 1994. Assessment of Responses of *Hydrilla verticillata* to Atmospheric Change with Modeling Predictions for Four Western U.S. Reservoirs. Final Report. To U.S. Bureau of Reclamation, Denver, Colorado.
- Coughenour, M.B., T.G.F. Kittel, R.A. Pielke, and J. Eastman. 1993. Grassland/atmosphere response to changing climate: coupling regional and local scales, Final Report to U.S. Dept. of Energy. DOE/ER 60932-3.
- Coughenour, M.B. 1993. The SAVANNA Landscape Model - Documentation and Users Guide. Natural Resource Ecology Laboratory, Colorado State University, Ft. Collins CO.

Published Proceedings Papers:

- Liedloff, A.C., J.A. Ludwig, M. Coughenour. 2005. Modelling tropical landscapes for ecological management: what can we learn from preliminary SAVANNA.AU simulations? In: A. Zenger, R.M. Argent (eds.), MODSIM 05: International Congress on Modelling and Simulation: Advances and applications for management and decision making. Melbourne, Dec. 12-15. Pp. 354-360.
- Coughenour, M., R. Boone, P. Thornton, R. Howe. 2001. Integrated modeling and assessment of changing pastoral ecosystems - experience in East Africa, and potential for application in Mongolia. Proceedings of the Conference on Pastoralism in Mongolia, Ulan Baatar, Mongolia.

- Cibils, A., M. Coughenour. 2000. Impact of grazing management on productivity of cold temperate grasslands: examples from the grass steppes of southern Patagonia. Proceedings of the International Grassland Congress, Brazil.
- Ludwig, J. A., M. B. Coughenour, A.C. Liedloff, and R.Dyer. 1999. Modelling the resilience of Australian savanna systems to grazing impacts. Pp. 771-776 in L. Oxley, F. Scrimgeour and A. Jakeman (eds.), MODSIM 99, International Congress on Modeling and Simulation Proceedings. Vol. 3. Modeling Society of Australia and New Zealand Inc.
- Liedloff, A.C., M.B. Coughenour, J.A. Ludwig, and R. Dyer. 1999. Modelling the trade-off between fire and grazing in a tropical savanna landscape, northern Australia. Pp. 673-678 L. Oxley, F. Scrimgeour and A. Jakeman (eds.), MODSIM 99, International Congress on Modelling and Simulation Proceedings. Vol. 3. Modeling Society of Australia and New Zealand Inc.
- Coughenour, M. (editor). 1999. Integrated Modeling of Regional Wildlife Ecosystems in East Africa. Proceeding of a Workshop, Nairobi, 7/99. U.S. Agency for International Development.
- Christensen, L, M. Coughenour, J. Ellis, L. Li, K. Price. 1999. An integrated assessment of land use and vegetation on the grasslands of Inner Mongolia. Proceedings of the International Rangeland Congress, Townsville, Australia.
- Christensen, L., M. Coughenour, J. Ellis, L. Li, Y. Han & R. Lee. 1998. Land use change and its effects on long-term ecosystem productivity on the Mongolian Steppe. Proceedings of the LUTEA Conference, Beijing, China.
- Ellis, J. and M. Coughenour. 1996. The Savanna Integrated Modeling System. Proceedings of an International Workshop on Sustainable Use of Rangelands and Desertification Control. Jeddah, Saudi Arabia. November, 1996.
- Sims, P.L., M.B. Coughenour, D.W. Baily and J.A. Bradford. 1995. Evaluation of two gas exchange mathematical simulation models for C4 grasses. Pp. 185-190 In: Proceedings, 5th International Rangeland Conference, Volume 2. Society for Range Management, Denver.
- Buckley, D.J., F. Schreiner, M. Coughenour, and C. Blyth. 1995. The Ecosystem Management Model: Integrating ecosystem simulation modeling and Arc/Info in Parks Canada. In: GIS and Environmental Modeling: Progress and Research Issues: Proceedings of the Second International Conference on Integrating GIS and Ecological Modeling, Breckenridge Colorado.

Submitted:

- Mwakiwa, E., Coughenour, M., Hearne, J., de Knegt, H., de Boer, F., Kohi, E., Stigter, J., Grant, C., Prins, H. 2012. Elephant and biodiversity: manipulating waterpoints to meet management objectives. Submitted to Oryx.

In Prep:

- Morisette, J., L. Frid, M. Coughenour, J. Chew, D. Manier, T. Holcombe, H. He, B. Bradley, C. Brown. Integrating ecological models: an invasive species example. *Frontiers in Ecology*.

