

## Paul W. Barnes

### PROFESSOR AND J.H. MULLAHY ENDOWED CHAIR IN ENVIRONMENTAL BIOLOGY

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#### ADDRESS

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#### RESEARCH INTERESTS

Physiological plant ecology; Grassland & savanna ecology; Plant & ecosystem responses to global environmental change; Environmental UV photobiology; Mechanisms of plant-plant interactions; Plant carbon, water and light relations [ResearchGate: [https://www.researchgate.net/profile/Paul\\_Barnes4](https://www.researchgate.net/profile/Paul_Barnes4); Google Scholar: <https://scholar.google.com/citations?user=BPgUXBQAAAAJ&hl=en&oi=ao>]

#### EDUCATION

- 1985-88 *Postdoctoral Research Associate*, Dept. Wildland Resources, Utah State University, Logan, UT (M.M. Caldwell, advisor)  
1984 *Ph.D. Biological Sciences/Ecology*, University of Nebraska, Lincoln, NE (A.T. Harrison, R.B. Kaul, co-advisors)  
1980 *M.S. Biological Sciences/Ecology*, University of Nebraska, Lincoln, NE (A.T. Harrison, advisor)  
1978 *B.A. Biology*, Augustana University, Sioux Falls, SD (magna cum laude; L.L. Tieszen, advisor)  
1974-75 Northern State University, Aberdeen, SD (Biology major)

#### PROFESSIONAL EXPERIENCE

- 2012 *Visiting scientist*, Massey University, Palmerston North, New Zealand  
2006-11 *Chair, Environment Program*, Loyola University, New Orleans, LA  
2004- *Professor and J.H. Mullahy, S.J. Endowed Chair of Environmental Biology*, Dept. Biological Sciences and Environment Program, Loyola University New Orleans  
2001-04 *Professor*, Dept. Biology, Texas State University, San Marcos, TX  
1996-01 *Associate Professor*, Dept. Biology, Texas State University, San Marcos, TX  
1995-04 *Adjunct Faculty*, Dept. Rangeland Ecology & Management, Texas A&M University, College Station, TX  
1991-96 *Assistant Professor*, Dept. Biology, Texas State University, San Marcos, TX  
1990-91 *Courtesy Assistant Professor*, Dept. Botany and Plant Pathology, Oregon State University, Corvallis, OR  
1988-91 *Project Leader and Scientist*, Stratospheric Ozone Research Group, NSI Technology Services, Inc., USEPA Environmental Research Lab., Corvallis, OR  
1984-85 *Assistant Professor*, Biology Department, St. Olaf College, Northfield, MN  
1984 *Instructor*, School of Biological Sciences, University of Nebraska, Lincoln, NE  
1978-83 *Graduate Research & Teaching Assistant*, School of Biological Sciences, University of Nebraska, Lincoln, NE  
1978 *Plant Ecologist*, Archaeological Survey Crew, University of South Dakota (summer)

1977-78 *Undergraduate Laboratory Assistant*, Biology Department, Augustana University, Sioux Falls, SD

#### **PUBLICATION SUMMARY:**

- 69 Journal Articles, Book Chapters and other Peer-Reviewed Publications
- 20 Miscellaneous Publications, Reports and Book Reviews
- 94 Published Abstracts

**GRANT AND RESEARCH FUNDING SUMMARY:** (TOTAL GRANTS = 28; TOTAL FUNDING CA. \$1.5 MILLION)

- 4 NSF grants - PI and Co-PI (\$460,842)
- 5 USDA/NRI/Research grants - PI (\$455,845)
- 2 USEPA grants - Co-PI (\$320,000)
- 5 Other external competitive grants - PI (\$16,250)
- NASA/EOS Investigator (summer salary 1991-1998)
- 11 Internal university grants - PI and Co-PI (\$190,483)

#### **HONORS, AWARDS AND PROFESSIONAL RECOGNITION**

- Faculty Research Excellence Award, College of Arts & Sciences, Loyola University (2017)
- Editorial Board, *International Association for Plant UV-Research (UV4Plants)* (2016-present)
- Member, UNEP Environmental Effects and Assessment Panel (2015-present)
- External Evaluator, European Union COST Action FA0906 UV4Growth (2014)
- Fulbright Specialist Candidate (2012)
- Presidential Research Seminar, Texas State University (2002)
- College of Science Finalist, Presidential Award for Scholarship, TSU (2000)
- Favorite Professor, Alpha Chi National Honor Society (TSU Chapter; 1999)
- Who's Who Among America's Teachers (student nominated; 2000, 2004)
- Faculty of the Year Award Recipient, TSU Catholic Student Center (1996)
- Graduate Fellowship Research Awards, University of Nebraska (4; 1979-84)
- NSF Undergraduate Research Program Recipient (Augustana University; 1978)

#### **PROFESSIONAL SOCIETIES**

American Association for the Advancement of Science, American Geophysical Union, Ecological Society of America, International Association for Plant UV-research (UV4Plants), Sigma Xi-University of Nebraska Chapter

#### **INVITED LECTURES, SEMINARS & PANEL DISCUSSIONS**

- 2018 *Potential effects of stratospheric ozone, UV radiation and climate change on terrestrial habitats.* Invited speaker, Conference to the General Public, University of Malaga, Spain.
- 2017 *Assessing the effects of global environmental change on ecosystems: linking science with international policy.* Invited Speaker, Environmental Science Symposium, Johnson County Community College, Overland Park, Kansas.
- 2017 *The influence of ozone depletion and climate change interactions on terrestrial ecosystems.* Invited Speaker, Environmental Science Symposium, Johnson County Community College, Overland Park, Kansas.

- 2017 *Science and the Environment in the Age of Denial*. Invited presentation in the Loyola History Department Roundtable: Trump Presidency: The Age of Anxiety? Loyola University New Orleans.
- 2014 *Rediscovering leaf optical properties: New insights into plant acclimation to solar UV radiation*. Invited Seminar, Department of Biology, University of Eastern Finland, Joensuu.
- 2013 *Global Climate Change: Ecological and Human Dimensions*, Loyola Alumni College.
- 2012 *Plant and Ecosystem Responses to Solar UV Radiation*, Dept. Biological Sciences Seminar, Loyola University New Orleans.
- 2012 *How does solar UV influence litter decomposition? Studies in desert and marsh ecosystems*, Dept. Biology Seminar, Monash University, Melbourne, Australia.
- 2010 *Science and decision making in the context of the BP oil spill*, Loyola University, College of Law Panel Discussion “The Deepwater Horizon Oil Spill—A Billion Pound Dossier”.
- 2007 *Plant and ecosystem responses to changes in the solar UV climate*, USGS National Wetlands Research Laboratory Seminar, Lafayette, Louisiana.
- 2006 *Ecophysiology of plant-plant interactions in changing environments*, School of Renewable Natural Resources Seminar, Louisiana State University, Baton Rouge, LA.
- 2006 *Ecophysiology of plant-plant interactions in changing environments*, Department of Biological Sciences seminar, Southeastern Louisiana University, Hammond, LA.
- 2006 *Ecological effects of stratospheric ozone depletion and increased UV-B radiation*, Lecture to Xavier University Environmental Club, New Orleans, LA.
- 2003 *Facilitation, competition and woody patch dynamics in Texas savannas*, Dept. Biology Seminar, Southwestern University, Georgetown, TX.
- 2003 *Grassland Ecology*, Comal Chapter (Lindheimer), Lecture to Texas Master Naturalist Program, Sattler, TX.
- 2000 *Ecophysiology of woody plant interactions in Texas savannas*, Dept. Ecology and Evolutionary Biology Seminar, University of Texas, Austin, TX.
- 1999 *Facilitation, competition and woody patch dynamics in Texas savannas*, Biology Department Seminar, Baylor University, Waco, TX.
- 1999 *Photomorphogenic effects of ultraviolet-B radiation and consequences for plant competition*, Molecular and Environmental Plant Science Interdisciplinary Seminar Series, Texas A&M University, College Station, TX.
- 1999 *Introduction to Plant and Savanna Ecology*, National Wildflower Research Center, Austin, TX.
- 1998 *Plant Ecology and Nurse Plants in Texas Savannas*, Capital Area Master Naturalist Program, National Wildflower Research Center, Austin, TX.
- 1998 *Global Environmental Change: Some Ethical, Religious and Moral Considerations*. Faculty Lecture Series, H.L. Grant Catholic Student Center, TSU.
- 1995 *Mechanisms of plant-plant interactions in changing environments*, Texas A&M University, Department of Rangeland Ecology and Management Seminar, College Station, TX
- 1993 *Potential ecological consequences of stratospheric ozone depletion and increases in solar ultraviolet radiation for plants*, Department of Biology Seminar, Trinity University, San Antonio, TX.
- 1990 *UV-B Fluence and Dosimetry*, International Rice Research Institute, Los Baños, Philippines.
- 1984 *Local differentiation in bluestem populations*, Biology Department Seminar, Augustana College.
- 1984 *Divergence and adaptation in adjacent bluestem populations*, Biology Department Seminar, University of Nebraska-Omaha.

#### PROFESSIONAL SERVICE, GRANT PANELS & REVIEWS

- Managing Committee Member, International Association for Plant UV-Research (UV4Plants), elected 2018.

- Session Chair, 1st Network Conference of The International Association for Plant UV-Research (UV4Plants), Pécs, Hungary. 2016.
- Panel Member, UNEP Environmental Effects and Assessment Panel. 2015-Present.
- Contributing Co-Author, United Nations Environmental Programme Panel, “Environmental Effects of Ozone Depletion and its Interaction with Climate Change”. 2014.
- External Reviewer, Tendry Randriamanana’s PhD Dissertation, “Global change and sexual dimorphism in two Salicaceous species”, University of Eastern Finland, Joensuu. 2014.
- External Evaluator, European Science Foundation COST-Action UV4growth Program--UV-B Radiation: A Specific Regulator of Plant Growth and Food Quality in a Changing Climate. Bled, Slovenia, March-April 2014.
- Subject Matter Expert, The Water Institute of the Gulf, Grants and Contracts Office. 2013.
- Moderator, ESA Organized Oral Session (OOS 25), “Ecology in a Dusty World: Integrating Dust Flux, Human Dimensions, and Ecological Processes in Drylands”, Annual ESA Meeting, Portland, OR, August 2012.
- Organized and lead ESA field trip “Ecology, Hydrology and Management of Live oak-Juniper Savannas on the Edwards Plateau”, Annual ESA Meeting, Austin, TX, August 2011.
- USEPA Global Change STAR peer review panel, Washington, D.C. 2011.
- Collaborative Scientific Research Opportunities Relative to the Gulf Oil Spill. Participant. New Orleans, LA, Nov. 1-2, 2010.
- External tenure/promotion/faculty award reviewer for: Bradley University, Colorado State University, Texas State University, Oklahoma State University, University of Arizona, University College Cork, Ireland.
- Participant, Louisiana Board of Regents, Programmatic Review of the Endowed Chairs for Eminent Scholars Program. New Orleans, LA. 2009.
- USDA Workshop Participant: The molecular aspects of plant secondary metabolism in response to UV-B radiation. San Antonio, TX. 2006
- NSF Dissertation Improvement Grants Panelist, Arlington, VA. 2004, 2005
- Texas Water Resources Institute Workshop, San Antonio, TX. 2003
- NASA/EOS Workshop, Keystone, CO. 2001
- NSF Research Experiences for Undergraduates Panelist, Arlington, VA. 1998
- NASA/EOS Workshop Participant, Rocky Mountain Biol. Lab., CO. 1996
- NASA/EOS External Program Review (Participant), National Center for Atmospheric Research, Boulder, CO. 1992
- Indo-US Workshop, “Global Climatic Changes: Photosynthesis and Plant Productivity”, New Delhi, India. 1991
- USEPA-IRRI Global Climate Change Workshop, Los Baños, Philippines. 1989
- USEPA Peer Review Panel of IRRI-Univ. Maryland Global Climate Change proposal, Gainesville, FL. 1989
- USDA Workshop, “UV-B radiation effects on crop productivity”, Gainesville, FL. 1989
- USDA Competitive Grants Panelist, Environmental Stress Program, Washington, D.C. 1989
- National Research Council Workshop Panelist, “Determination of research needed to predict the impact of an increase in UV-B radiation on the biota”, Washington, D.C. 1988
- *Ad hoc* grant reviewer: NSF, USDA, EPA & others
- *Ad hoc* manuscript reviewer: Ecology, Oecologia, Global Change Biology, Plant Physiology, Photochemistry & Photobiology, New Phytologist, Plant, Cell & Environment, & others
- Textbook reviewer: Botany and Ecology texts (various publishers)

## UNIVERSITY SERVICE

- University fundraising (2014-present). Assist Loyola Institutional Advancement in procuring foundation funds for Biology and Environment Programs, including a new Greenhouse (\$250,000 awarded from Azby Foundation in 2014).
- *Chair, Environment Program*, Loyola University (2006-2011). Lead efforts to develop a new interdisciplinary program in the Environment, which includes 3 new undergraduate majors (Environmental Science-Biology; Environmental Studies-Humanities; Environmental Studies-Social Sciences).
- *Environment Program Faculty*, Loyola University (2004-present). Teach, supervise and advise students in the program.
- *Departmental Committees* - 8 Chaired Committees (Personnel Committee; Planning Committee; 3 Search Committees; Annual Post-tenure Faculty Review Committee; Greenhouse Committee); 9 Member Committees.
- *College/University Committees* - 8 Member (incl. Study Group on Campus Sustainability (Loyola), Graduate Education Working Group (Loyola), Interdisciplinary Studies Committee (Loyola), Presidential Scholarship Committee, College of Science Promotion/Tenure Review Committee; Freeman Ranch Advisory Committee)
- *Graduate Student Committees* - 15 TSU; 6 Univ. Texas-Austin and Texas A&M Univ. (MS and PhD students)

**STUDENT RESEARCH SUPERVISION:** Graduate Students – 10; Undergraduates – 30+; Summer Teachers – 3; Postdoctoral Researchers – 4 (2 @ TSU; 1 co-advised @ Texas A&M; 1 @ Loyola)

#### STUDENT THESES SUPERVISED

- LeBleu, C. 2018. Mycorrhizae and flavonoid interactions in okra (*Abelmoschus esculenta*). BS Honors Thesis, Loyola University New Orleans.
- Burst, S. 2011. Effect of solar UV-B on standing dead litter decomposition in southern marshes. BS Honors Thesis, Loyola University New Orleans.
- Allison, M. 2006. Changes in leaves UV protection shield due to increase in radiation. BS Honors Thesis, Loyola University New Orleans.
- Scott, K. D. 2004. Above and below-ground morphological responses of cucumber seedlings (*Cucumis sativus*) to ultraviolet-B radiation. MS Thesis, Texas State University, San Marcos, TX.
- Elliott, K.G. 2004. Wildfire-induced mortality of woody species in a central Texas savanna. MS Thesis, Texas State University, San Marcos, TX.
- Mittlehauser, J. 2002. Blackland prairie restoration in central Texas. MS Thesis, Texas State University, San Marcos, TX.
- Ramirez, P. 2002. Live oak (*Quercus virginiana* var. *fusiformis*) – Ashe juniper (*Juniperus ashei*) interactions in a central Texas savanna. MS Thesis, Texas State University, San Marcos, TX.
- Jessup, K. 2001. Vegetation dynamics of an oak-juniper savanna on the Edwards Plateau of Texas: An isotopic assessment. MS Thesis, Texas State University, San Marcos, TX.
- Phillips, P. 1999. Composition of the woody plant understory of plateau live oak (*Quercus virginiana* var. *fusiformis*) clusters in a central Texas savanna. MS Thesis, Texas State University, San Marcos, TX.
- Ruiseco, L. 1998. Woody plant effects on the soil seed bank in a central Texas savanna. MS Thesis, Texas State University, San Marcos, TX.
- Beck, J. 1998. Effects of ultraviolet-B radiation on grass morphology and competition. MS Thesis, Texas State University, San Marcos, TX.
- McMurtry, C.R. 1997. Gas exchange physiology and water relations of co-occurring woody plant species in a Texas subtropical savanna. MS Thesis, Texas State University, San Marcos, TX.
- Nelson, J.A. 1997. Leaf demography and growth of co-occurring woody plant species in a Texas subtropical savanna. MS Thesis, Texas State University, San Marcos, TX.

## COURSES TAUGHT

*University of Nebraska-Lincoln:* Biology 230 **Great Plains Ecology**

*St. Olaf College:* Biology 91 **Senior Seminar**; Biology 62 **Field Ecology**; Biology 61 **Ecological Principles**; Biology 50 **Plant Taxonomy**

*Texas State University:* Biology 5318 Topics: **Quantitative Field Ecology**; Biology 5318 Topics: **Global Change Biology**; Biology 5110E **Plant Ecology Journal Club**; Biology 4454/5454 **Plant Ecology**; Biology 4416 **General Ecology**; Biology 2410 **General Botany**; Biology 1410 **Introduction to Plant Biology**; Biology 1421 **Modern Biology II (non-majors)**; Honors 2380C **Global Ecology & Humanity**

*Loyola University New Orleans:* BIOL Y264 **Global Ecology** (advanced, non-majors common curriculum course); BIOL A208 **Ecology and Evolution** (majors core course); BIOL A338/339 **Plant Ecology** lecture and lab (advanced majors course); BIOL A394 **Plant Science** (lecture and lab); ENVA A105 **Foundations in Environmental Studies** (Guest Lectures), ENVA A106 **Foundations in Environmental Science** (Guest Lectures), BIOL A100 **Biology Freshman Seminar** (Guest Lectures), and **Institute for Environmental Communications** (Guest Lectures).

## JOURNAL ARTICLES, BOOK CHAPTERS AND OTHER PEER-REVIEWED PUBLICATIONS

1. **Barnes, P.W.**, C.E. Williamson, R.M. Lucas, S. Madronich, S.A. Robinson, N.D. Paul, and the UNEP Environmental Effects Assessment Panel. 2019. Ozone depletion, UV radiation, climate change and prospects for a sustainable future. *Nature Sustainability* doi:10.1038/s41893-019-0314-2
2. **Barnes, P.W.** 2019. Meet a member: Paul W. Barnes. *UV4Plants Bulletin (In Press)*.
3. Häder, D-P., and **P.W. Barnes**. 2019. Comparing the impacts of climate change on the responses and linkages between terrestrial and aquatic ecosystems. *Science of the Total Environment* 682:239-246. doi: 10.1016/j.scitotenv.2019.05.024
4. **Barnes, P.W.** 2019. Physiological ecology of water balance in terrestrial plants. In *Oxford Bibliographies in Ecology*. Ed. David Gibson. New York: Oxford University Press, forthcoming.
5. Robson, T.M., J.M. Abaigar, P.J. Aphalo, A.K. Banaś, **P.W. Barnes**, C.C. Brelsford, G.I. Jenkins, T.K. Kotilainen, J. Łabuz, L.O. Morales, S. Neugart, M. Pieristè, N. Rai, F. Vandenbussche, and M.A.K. Jansen. 2019. A perspective on ecologically relevant plant-UV research and its practical application. *Photochemical & Photobiological Sciences* doi: 10.1039/C8PP00526E
6. Neugart, S., M. Tobler and **P.W. Barnes**. 2019. Different irradiances of UV and PAR in the same ratios alter the flavonoid profiles of *Arabidopsis thaliana* wild-types and UV-signalling pathway mutants. *Photochemical & Photobiological Sciences* doi: 10.1039/c8pp00496j
7. Hewins, D.B., H. Lee, **P.W. Barnes**, N. G. McDowell, W.T. Pockman, T. Rahn, and H.L. Throop. 2019. Early exposure to UV radiation overshadowed by precipitation and litter quality as drivers of decomposition in the northern Chihuahuan Desert. *PloS ONE* 14(2): e0210470. doi: 10.1371/journal.pone.0210470
8. Bornman, J.F., **P.W. Barnes**, T. M. Robson, S.A. Robinson, M.A.K. Jansen, C.L. Ballaré, and S.D. Flint. 2019. Linkages between stratospheric ozone, UV radiation and climate change and their implications for terrestrial ecosystems. UNEP Environmental Effects Assessment Panel, 2018 Assessment, *Photochemical & Photobiological Sciences* doi: 10.1039/c8pp90061b
9. **Barnes P.W.**, Jansen M.A.K., Jenkins G.I., Vandenbussche F., Brelsford C.C., Banas A.K., Bilger W., Castagna A., Festi D., Gaberscik, A., Germ M., Golob A., Hauser, M.-T., Llorens Guasch L., Martinez-Abaigar J., Morales L.O., Neugart S., Pieristè M., Rai N., Ryan L., Santin M., Seddon A.,

- Stelzner J., Tavriduo E., Labuz J., Robson T.M. 2018. Importance and direction of current and future plant-UV research. *UV4Plants Bulletin* 2018(2):19-32. doi: 10.19232/uv4pb.2018.2.11
10. Predick, K.I., S. R. Archer, S.M. Aguilon, D.A. Keller, H. L. Throop and **P. W. Barnes**. 2018. UV-B radiation and shrub canopy effects on surface litter decomposition in a shrub-invaded dry grassland. *Journal of Arid Environments* 157:13-21. doi: 10.1016/j.jaridenv.2018.06.007.
  11. Bais, A.F., R.M. Lucas, J.F. Bornman, C. E. Williamson, B. Sulzberger, A.T. Austin, S.R. Wilson, A.L. Andrady, G. Bernhard, R.L. McKenzie, P.J. Aucamp, S. Madronich, R.E. Neale, S. Yazar, A.R. Young, F.R. de Gruijl, M. Norval, Y. Takizawa, **P. W. Barnes**, T.M. Robson, S.A. Robinson, C. L. Ballaré, S.D. Flint, P.J. Neale, S. Hy-lander, K.C. Rose, S-Å Wängberg, D.-P. Häder, R.C. Worrest, R.G. Zepp, N.D. Paul, R.M. Cory, K.R. Solomon, J. Longstreth, K.K. Pandey, H.H. Redhwi, A. Torikai and A.M. Heikkilä. 2018. Environmental effects of ozone depletion, UV radiation and interactions with climate change: UNEP Environmental Effects Assessment Panel, Update 2017, *Photochemical & Photobiological Sciences* doi: 10.1039/c7pp90043k
  12. **Barnes, P.W.**, R.J. Ryel and S.D. Flint. 2017. UV screening in native and non-native plant species in the tropical alpine: Implications for climate change-driven migration of species to higher elevations. *Frontiers in Plant Science* 8: doi: 10.3389/fpls.2017.01451.
  13. **Barnes, P.W.**, T.M. Robson, M.A. Tobler, I.N. Bottger and S.D. Flint. 2017. Plant responses to fluctuating UV environments. Pp. 72-89, *In*: B.R. Jordan (ed.), *UV-B radiation and plant life: Molecular biology to ecology*. CABI Press, Oxford, UK.
  14. Andrady, A.L., P.J. Aucamp, A. Austin, A.F. Bais, C.L. Ballaré, **P.W. Barnes**, G.H. Bernhard, L.O. Björn, J.F. Bornman, N. Congdon et al., United Nations Environment Programme. Environmental Effects Assessment Panel. 2017. Environmental effects of ozone depletion and its interactions with climate change: Progress report, 2016. *Photochemical & Photobiological Sciences* doi: 10.1039/C7PP90001E.
  15. **Barnes, P.W.** 2016. Understanding the ecological role of solar ultraviolet radiation in the life (and death) of terrestrial plants: an historical perspective. *UV4Plants Bulletin* 2016(2): 7-15. doi: 10.19232/uv4pb.2016.2.12
  16. **Barnes, P.W.**, S.D. Flint, M.A. Tobler, and R.J. Ryel. 2016. Diurnal adjustment in UV-sunscreen protection is widespread among higher plants. *Oecologia* 181:55-63. doi: 10.1007/s00442-016-3558-9
  17. Andrady, A.L., P.J. Aucamp, A. Austin, A.F. Bais, C.L. Ballaré, **P.W. Barnes**, G.H. Bernhard, L.O. Björn, J.F. Bornman, D.J. Erickson et al., United Nations Environment Programme. Environmental Effects Assessment Panel. 2016. Environmental effects of ozone depletion and its interactions with climate change: Progress report, 2015. *Photochemical & Photobiological Sciences* doi: 10.1039/c6pp90004f.
  18. **Barnes, P.W.**, M.A. Tobler, K.M. Keefover-Ring, S.D. Flint, A.E. Barkley R.J. Ryel, and R.L. Lindroth. 2016. Rapid modulation of UV-shielding in plants is influenced by solar UV radiation and linked to alterations in flavonoids. *Plant, Cell and Environment* 39: 222-230. doi: 10.1111/pce.12609
  19. **Barnes, P.W.** 2016. Contributions of Ron Ryel to plant UV research. *UV4Plants Bulletin* 2016 (1): 7-9. doi: 10.19232/uv4pb.2016.1.11 <http://uv4plants.org/2016/05/uv4plants-bulletin-20161/>
  20. Andrady, A.L., P.J. Aucamp, A. Austin, A.F. Bais, C.L. Ballaré, **P.W. Barnes**, G.H. Bernhard, J.F. Bornman, M.M. Caldwell and 34 additional authors. 2015. Environmental effects of ozone depletion and its interactions with climate change: 2014 assessment. Executive Summary. *Photochemical & Photobiological Sciences* 14(1): 14-18. doi: 10.1039/c4pp90042a.
  21. Bornman, J. F., **P. W. Barnes**, S. A. Robinson, C. L. Ballaré, S. D. Flint, and M. M. Caldwell. 2015. Solar ultraviolet radiation and ozone depletion-driven climate change: effects on terrestrial ecosystems. *Photochemistry & Photobiological Sciences* 14(1): 88-107. doi: 10.1039/c4pp90034k.
  22. **Barnes, P.W.**, S.D. Flint, R.J. Ryel, M.A. Tobler, A. Barkley, and J.J. Wargent. 2015. Rediscovering leaf optical properties: New insights into plant acclimation to solar UV radiation. *Plant Physiology and Biochemistry* 93:94-100. doi: 10.1016/j.plaphy.2014.11.015

23. **Barnes, P.W.**, H.L. Throop, S.R. Archer, D. D. Breshears, R.L. McCulley, and M.A. Tobler. 2015. Sunlight and soil-litter mixing: drivers of litter decomposition in drylands. *Progress in Botany* 76:273-302. doi: 10.1007/978-3-319-08807-5\_11.
24. Wargent, J.J., B.C.W. Nelson, T.K. McGhie, and **P.W. Barnes**. 2015. Acclimation to UV-B radiation and visible light in *Lactuca sativa* involves up regulation of photosynthetic performance and orchestration of metabolome-wide responses. *Plant, Cell and Environment* 38:929-940. doi: 10.1111/pce.12392
25. **Barnes, P.W.**, A.R. Kersting, S.D. Flint, W. Beyschlag, and R.J. Ryel. 2013. Adjustments in epidermal UV-transmittance in sun-shade transitions. *Physiologia Plantarum* 149: 200-213. doi: 10.1111/pp1.12025.
26. **Barnes, P.W.**, H.L. Throop, D.B. Hewins, M.L. Abbene, and S.R. Archer. 2012. Soil coverage reduces photodegradation and promotes the development of soil-microbial films on dryland leaf litter. *Ecosystems* 15:311-321. doi: 10.1007/s10021-011-9511-1.
27. Mittelhauser, J.R., **P.W. Barnes**, and T.G. Barnes. 2011. The effect of herbicide on the re-establishment of native grasses in the Blackland Prairie. *Natural Areas Association Journal* 31:500-507.
28. Ryel, R. J., S. D. Flint, and **P.W. Barnes**. 2010. Solar UV-B radiation and global dimming: effects on plant growth and UV-shielding. Pp. 370-394, In: W. Gao, D.L. Schmoldt, and J. R. Slusser (eds) *UV Radiation in Global Climate Change: Measurements, Modeling and Effects on Ecosystems*. Tsinghua University Press (Beijing) and Springer-Verlag (Berlin-Heidelberg).
29. Shinkle, J.R., M.C. Edwards, A. Koenig, A. Shaltz, and **P.W. Barnes**. 2009. Photomorphogenic regulation of increases in UV-absorbing pigments in cucumber (*Cucumis sativus*) and *Arabidopsis thaliana* seedlings induced by different UV-B and UV-C wavebands. *Physiologia Plantarum* 138:113-121.
30. **Barnes, P.W.** 2009. Our changing planet: A scientist's call for environmental stewardship. Pp. 22-37, In: *The Gift of Creation: Images from Scripture and Earth*. N. Wirzba (ed.), Acclaim Press, Morley, Missouri.
31. **Barnes, P.W.**, S. Flint, J. Slusser, W. Gao and R. Ryel. 2008. Diurnal changes in epidermal UV transmittance of plants in naturally high UV environments. *Physiologia Plantarum* 133: 363-372.
32. D'Souza, L., and **P.W. Barnes**. 2008. Woody plant effects on soil seed banks in a central Texas savanna. *The Southwestern Naturalist* 53:495-506.
33. **Barnes, P.W.**, S-Y Liang, K.E. Jessup, P.A. Ramirez, L.E. D'Souza, K.G. Elliott, and P.L. Phillips. 2007. Ecological impacts of Ashe juniper on subtropical savanna parklands and woodlands. Pp. 133-155, In: *Ecology and Management of Western North American Juniperus Communities: A Dynamic Vegetation Type*. O.W. van Auken (ed.), Ecological Studies 196, Springer.
34. **Barnes, P.W.**, J. R. Shinkle, S.D. Flint, and R.J. Ryel. 2005. UV-B radiation, photomorphogenesis and plant-plant interactions. Pp. 313-340, In: K. Esser, U. Lüttge, W. Beyschlag, and J. Murata (eds). *Progress in Botany* Vol. 66, Springer-Verlag, Berlin.
35. Shinkle, J.R., D.L. Derickson, and **P.W. Barnes**. 2005. Comparative photobiology of growth responses to different UV wavebands in dim-red-light and white-light-grown cucumber (*Cucumis sativum*) seedlings: physiological evidence for photoreactivation. *Photochemistry and Photobiology* 81:1069-1074.
36. Zou, C.B., **P.W. Barnes**, S.R. Archer, and C.R. McMurty. 2005. Soil moisture redistribution as a mechanism of facilitation in savanna tree-shrub clusters. *Oecologia* 145:32-40.
37. Shinkle, J.R., A.K. Atkins, E.E. Humphrey, C.W. Rodgers, S.L. Wheeler, and **P.W. Barnes**. 2004. Short and long wavelength UV-B radiation induce different growth and morphological responses in cucumbers (*Cucumis sativum*) and other dicotyledonous seedlings. *Physiologia Plantarum* 120:240-248.
38. Jessup, K.E., **P.W. Barnes**, and T.W. Boutton. 2003. Vegetation dynamics in a *Quercus-Juniperus* savanna: an isotopic assessment. *Journal of Vegetation Science* 14:841-852.

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#### MANUSCRIPTS IN PREPARATION

1. J.R. Logan, M. Pieristè, S. Evans, T.M. Robson, and **P.W. Barnes**. Experimental approaches to the study of photodegradation of plant litter. *Ecosystems* (In Prep).
2. **Barnes, P.W.**, M.A. Tobler, H.L. Throop, R.L. McCulley, and S.R. Archer. Interaction of soil deposition and UV radiation on dryland litter decomposition. *JGR-Biogeosciences* (In Prep).
3. Tobler, M.A., D.A. White, R.L. McCulley, and **P.W. Barnes**. Influence of solar UV radiation on decomposition of standing dead litter in a southern marsh ecosystem. *Plant Ecology* (In Prep).
4. **Barnes, P.W.**, S. R. Archer, C. R. McMurtry, S. F. Zitzer, and D.S. Schimel. Functional organization of a subtropical savanna/woodland ecosystem. *Ecology* (In Prep).

#### MISCELLANEOUS PUBLICATIONS, REPORTS & PUBLISHED BOOK REVIEWS

1. **Barnes, P.W.**, C.E. Williamson, R.M. Lucas, S. Madronich, S.A. Robinson, N.D. Paul (Lead Authors) J.F. Bornman, A.F. Bais, B. Sulzberger, S.R. Wilson, A.L. Andrady, P.J. Neale, A.T. Austin, G. Bernhard, R.L. McKenzie, K.R. Solomon, R.E. Neale, P.J. Young, M. Norval, L.E. Rhodes, S. Hylander, K.C. Rose, J. Longstreth, P.J. Aucamp, C.L. Ballaré, R.M. Cory, S.D. Flint, F.R. de Gruijl, D.-P. Häder, A.M. Heikkilä, M.A.K. Jansen, K.K. Pandey, T.M. Robson, C.A. Sinclair, S.-Å. Wängberg, R.C. Worrest, S. Yazar, A.R. Young, R.G. Zepp. 2019. Executive

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#### **PUBLISHED ABSTRACTS & PAPERS PRESENTED AT SCIENTIFIC MEETINGS**

1. Neugart, S., M. Tobler, and **P.W. Barnes**. 2018. The interlink of UV transmittance and flavonoids in okra driven by diurnal changes. *12<sup>th</sup> World Congress on Polyphenols Applications*, Bonn, Germany (oral presentation).
2. LeBleu, G.C. II, M.A. Tobler, and **P.W. Barnes**. 2018. Arbuscular mycorrhizal association in okra (*Abelmoschus esculentus*): Influences on growth, morphology and leaf epidermal flavonoid levels under contrasting solar UV conditions. *Ecological Society of America*, New Orleans, LA (poster).
3. **Barnes, P.W.**, C.S. Hood, and R.A. Thomas. 2018. Environmental sustainability at Loyola University New Orleans: linking the curriculum with action on and off-campus. *Ecological Society of America*, New Orleans, LA (Invited Oral Presentation).
4. **Barnes, P.W.**, H.L. Throop, and S.R. Archer. 2018. Understanding the role of photodegradation as a driver of litter decomposition now and in the future. *UV4Plants Conference*, Bled, Slovenia (Invited Oral Presentation).
5. Logan, J.R., K.M. Jacobson, P.J. Jacobson, **P.W. Barnes** and S.E. Evans. 2018. Photodegradation of the plant cuticle increases biological decomposition by facilitating uptake of non-rainfall moisture. *UV4Plants Conference*, Bled, Slovenia (poster presentation).
6. Neugart, S., M. Tobler, and **P.W. Barnes**. 2018. The interlink of UV transmittance and flavonoids in okra driven by diurnal changes. *UV4Plants Conference*, Bled, Slovenia (oral presentation).
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8. McCulley, R.L., J.A. Nelson, K.I. Predick, E.M. Levi, **P.W. Barnes**, H.L. Throop, and S.R. Archer. 2017. UV radiation stimulates but soil-litter mixing reduces fungal role in dryland litter decomposition. *Ecological Society of America*, Portland, OR (oral presentation).
9. **Barnes, P.W.**, H.L. Throop, and S.A. Archer. 2016. Sunlight and soil-litter mixing: Drivers of dryland litter decomposition now and in the future. Symposium: Litter decomposition in the Anthropocene: Do we understand the regulators of decomposition well enough to predict future consequences? *Ecological Society of America*, Ft. Lauderdale, FL. (Invited oral presentation).
10. Throop, H.L., **P.W. Barnes**, M-A de Graaff, and L. Wang. 2016. When and where are drylands not dry? Precipitation pulses and decomposition in changing drylands. *Ecological Society of America*, Ft. Lauderdale, FL. (Ignite presentation).
11. Tobler, M.A., D.A. White, M.L. Abbene, S. Burst, R. McCulley, and **P.W. Barnes**. 2016. What role does UV radiation play in influencing plant litter decomposition and biogeochemistry in coast marsh ecosystems? *UV4Plants Conference*, Pécs, Hungary (poster).
12. **Barnes, P.W.**, I.N. Bottger, and M.A. Tobler. 2016. Exploring the mechanisms and functional significance of diurnal changes in UV sunscreen protection in plants. *UV4Plants Conference*, Pécs, Hungary (oral presentation).

13. Tobler, M.A., D. A. White, M.L. Abbene, S.L. Burst, R.L. McCulley, and **P.W. Barnes**. 2016. What role does photodegradation play in influencing plant litter decomposition and biogeochemistry in coastal marsh ecosystems? *AGU Ocean Sciences Meeting*, New Orleans, LA (poster).
14. Bottger, I. N., M.A. Tobler, and **P.W. Barnes**. 2015. The influence of ambient solar UV on the growth and morphology of plants differing in diurnal UV sunscreen protection. *Ecological Society of America*, Baltimore, MD (poster).
15. **Barnes, P.W.**, M.A. Tobler, A.E. Barkley, S.D. Flint, R.J. Ryel, K.M. Keefover-Ring, R.L. Lindroth. 2014. Rapid changes in UV-shielding in plants: mechanisms, species patterns and physiological significance. European Union COST Action UV4growth Final Meeting, March 30-April 2, 2014. Bled, Slovenia. (Invited Oral Presentation)
16. Levi, E.M., S.R. Archer, H.L. Throop, K.I. Predick, **P.W. Barnes**, and M.A. Tobler. 2013. Soil deposition and UV radiation influence litter decomposition in a shrub-invaded dryland ecosystem. RISE Conference, Tucson, AZ (poster).
17. **Barnes, Paul W.**, Mark A Tobler, Stephan D. Flint, Ronald J. Ryel, Kenneth Keefover-Ring, and Richard L. Lindroth. 2013. Diurnal changes in leaf UV-absorbing compounds and epidermal UV-transmittance. *Ecological Society of America*, Minneapolis, MN, August 2013. Oral presentation.
18. McCulley, Rebecca L., Jim A. Nelson, Heather Throop, Steve Archer, **Paul W. Barnes**. 2012. UV-B and soil deposition interact to alter lipid profiles of decomposing plant litter. *Ecological Society of America*, Portland, OR, August 2012. Oral presentation in the Organized Oral Session (OOS): Ecology in a Dusty World: Integrating Dust Flux, Human Dimensions, and Ecological Processes in Drylands.
19. Levi, Eva M, Steven R Archer, Heather L Throop, Katharine I Predick, **Paul W Barnes**, Mark A Tobler. 2012. Soil deposition and UV radiation influence litter decomposition in a shrub-invaded dryland ecosystem. *Ecological Society of America*, Portland, OR, August 2012 (poster).
20. Throop, Heather L., Steve R. Archer, Rebecca L. McCulley, **Paul W. Barnes**. 2012. Integrating dust and ecological processes: Moving beyond spatial stasis. *Ecological Society of America*, Portland, OR, August 2012. Oral presentation in the OOS: Ecology in a Dusty World: Integrating Dust Flux, Human Dimensions, and Ecological Processes in Drylands.
21. Aguilon, Stephanie M., Katherine I. Predick, Eva M. Levi, Jim A. Nelson, Rebecca L. McCulley, Heather L. Throop, **Paul W. Barnes**, Steven R. Archer. 2012. Does UV Radiation Alter Short-Term Leaf Litter Decomposition in Contrasting Dryland Canopy Regimes? *Ecological Society of America*, Portland, OR, August 2012 (poster).
22. Nieto, Brenda, Hanna Lee, Daniel B. Hewins, **Paul W. Barnes**, Nathan G. McDowell, William T. Pockman, Thom Rahn and Heather L. Throop. 2012. The effects of UV radiation, litter chemistry, and drought on desert litter decomposition. *Ecological Society of America*, Portland, OR, August 2012 (poster).
23. Tobler, M.A., M.K. Grabner, H.L. Throop, S.R. Archer, and **P.W. Barnes**. 2011. Interaction of soil deposition and UV radiation on dryland litter decomposition. *Ecological Society of America*, Austin, TX, August 2011 (poster).
24. Throop, H.L., S.R. Archer, and **P.W. Barnes**. 2010. Wind and water transport of soil mediate dryland biogeochemical processes via effects on decomposition. *American Geophysical Union*, San Francisco, CA, December 2010 (oral presentation).
25. **Barnes, P.W.**, M.K. Grabner, S.D. Flint, and R.J. Ryel. 2010. Diurnal changes in epidermal UV transmittance: Variation among species and locations. *Ecological Society of America*, Pittsburgh, PA, August 2010 (poster).
26. Tobler, M.A., D.A. White, and **P.W. Barnes**. 2010. Solar UV inhibits and promotes decomposition of standing dead litter in a southern marsh ecosystem. *Ecological Society of America*, Pittsburgh, PA, August 2010 (poster).
27. Hackenburg, D.M., M.A. Tobler, and **P.W. Barnes**. 2010. A UV dosimeter for estimating the influence of soil deposition and other factors on solar UV exposure of decomposing leaf litter in dryland ecosystems. *Ecological Society of America*, Pittsburgh, PA, August 2010 (poster).

28. Throop, H.L., S.R. Archer, and **P.W. Barnes**. 2009. Addressing the dryland decomposition conundrum by integrating vegetation structure, soil transport, and ultraviolet (UV) photodegradation. *Ecological Society of America*, Albuquerque, NM, August 2009 (Invited oral symposium presentation).
29. Tobler, M.A., White, D.A., M.L. Abbene, and **P.W. Barnes**. 2009. Decomposition of standing dead litter is inhibited by solar UV-B in a southern marsh ecosystem. *Ecological Society of America*, Albuquerque, NM, August 2009 (poster).
30. **Barnes, P.W.**, S.D. Flint, and R.J. Ryel. 2009. Diurnal changes in UV-shielding in plants. *Society for Experimental Biology*, Glasgow, UK, June 2009 (Symposium oral presentation).
31. White, D.A., M. A. Tobler, M.L. Abbene, and **P.W. Barnes**. 2009. Decomposition of standing dead litter is inhibited by solar UV-B in a southern marsh ecosystem. *Society of Wetland Scientists*, Madison, WI, June 2009 (poster).
32. Abbene, M.L., **P.W. Barnes**, H. L. Throop, and S. R. Archer. 2008. Interactive effects of UV radiation and soil coverage on leaf litter decomposition in velvet mesquite (*Prosopis velutina*). *Ecological Society of America*, Milwaukee, WI, August 2008 (poster).
33. Throop, H.L., S.R. Archer, **P.W. Barnes**, M.L. Abbene, D. Hewins, and G. Okin. 2008. Addressing the dryland decomposition conundrum by integrating vegetation structure, soil transport, and UV photodegradation. *Regional Long Term Ecological Research Site Symposium*. Albuquerque, NM (poster).
34. **Barnes, P.W.**, V. Del Bianco, A.P. Dickhute, and R.J. Ryel. 2007. Dynamic adjustments in leaf epidermal UV transmittance of plants in sun-shade transitions. *Ecological Society of America*, San Jose, CA, August 2007 (poster).
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36. Ryel, R., S. Flint, and **P. Barnes**. 2006. Diurnal changes in epidermal UV transmittance of plants in naturally high UV environments. *Ecological Society of America*, Memphis, TN, August 2006 (poster).
37. **Barnes, P.W.** J. Shinkle, S. Flint, and R. Ryel. 2005. Plant morphological responses to UV-B: mechanisms and ecological consequences. *XVII International Botanical Congress*, Vienna, Austria, 12-16 July, 2005. Invited oral presentation in symposium, Plants and UV-B radiation—from photobiology to global change.
38. Shinkle, J., D. Derickson, and **P. Barnes**. 2004. Laboratory studies of differential responses to short and long wavelength UV-B indicate the presence of at least two signal perception processes. *American Society for Photobiology*, Seattle, WA, July 10-14, 2004. Invited oral presentation in symposium, UV Effects in Terrestrial Ecosystems.
39. **Barnes, P.W.**, S.-Y. Liang, L.E. D'Souza, K.E. Jessup, P.L. Phillips, and P.A. Ramirez. 2004. Impacts of junipers on subtropical savanna ecosystems: implications for restoration. *Southwestern Association of Naturalists*, San Antonio, TX, April 16-17, 2004. Invited oral presentation in symposium, "Juniperus woodlands – Biology and Ecology".
40. **Barnes, P.**, M. Huston, and D.E. Lemke. 2004. Texas versus Tennessee: comparing patterns of exotic plant invasions. *Southwestern Association of Naturalists*, San Antonio, TX (contributed oral presentation).
41. Elliott, K.G., and **P.W. Barnes**. 2004. Wildfire-induced mortality of the woody species in a central Texas savanna. *Southwestern Association of Naturalists*, San Antonio, TX (contributed oral presentation).
42. Shinkle, J.R., A. Shaltz, and **P.W. Barnes**. 2003. Distinctive features of UV-absorbing pigment accumulation in response to short-wavelength UV-B. *American Society of Plant Biologists*, Abstract #552. Honolulu, HI (contributed oral presentation).

43. Lemke, D.E., and **P.W. Barnes**. 2003. A half-century of southwestern botany: past accomplishments and future prospects. *Southwestern Naturalist Association*, Norman, OK (contributed oral presentation).
44. Jessup, K.E., T.W. Boutton, and **P.W. Barnes**. 2002. Vegetation Dynamics and Soil C and N Storage in an Oak-Juniper Savanna: An Isotopic Assessment. *Soil Science Society of America Meetings*. Indianapolis, IN (poster).
45. Archer, S.R., **P.W. Barnes**, C.B. Zou, C.R. McMurtry, and K.E. Jessup. 2002. Hydraulic lift: evidence of soil moisture redistribution by *Prosopis glandulosa* in a semi-arid savanna parkland in southern Texas. *Ecological Society of America*, Tucson, AZ (poster).
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48. McMurtry, C.R., S.R. Archer, **P.W. Barnes**, K.E. Jessup, and C.B. Zou. 2002. Structure and distribution of shrub patches in a savanna parkland upland is influenced by argillic horizon development. *Ecological Society of America*, Tucson, AZ (poster).
49. Mittlehauser, J.R., **P.W. Barnes**, and T.G. Barnes. 2002. Blackland prairie restoration in central Texas. *Ecological Society of America*, Tucson, AZ (poster).
50. Zou, C.B., S.R. Archer, **P.W. Barnes**, C.R. McMurtry, and K.E. Jessup. 2002. Soil moisture partitioning and overstory-understory interactions among co-occurring woody plants in a savanna parkland. *Ecological Society of America, Tucson, AZ (poster)*.
51. **Barnes, P.W.**, K.E. Jessup, P.A. Ramirez, and M. Scoggins. 2001. Ecophysiology of *Colocasia esculenta*, an exotic emergent plant species of the San Marcos River Ecosystem. *Texas Academy of Science*, San Marcos, TX. (Invited oral presentation in symposium, *Texas Aquatic Exotics: Ecology, Impacts, Management and Policy*).
52. Ramirez, P.A., and **P.W. Barnes**. 2001. Ecophysiology of tree-shrub interactions in a central Texas savanna. *Ecological Society of America*, Madison, WI (poster).
53. Wayne, E.R., O.W. Van Auken, and **P.W. Barnes**. 2001. Physiologic response of *Carex planostachys* (Cyperaceae) along a woodland to intercanopy patch gradient. *Ecological Society of America Abstracts*, Madison, WI (contributed oral presentation).
54. Shinkle, J.R., E. Humphrey, C.W. Rodgers, J. Garrison, and **P.W. Barnes**. 2001. A Role for DNA Damage (and Repair) in UV-B-Induced Photomorphogenesis. In *Proceedings of 19<sup>th</sup> Annual Symposium on Current Topics in Plant Biochemistry, Physiology and Molecular Biology*, Columbia Missouri (contributed oral presentation).
55. **Barnes, P.W.**, and S. Archer. 2000. Landscape variation in overstory-understory relationships in a subtropical savanna/woodland ecosystem. *Ecological Society of America Abstracts*, p. 246. Snowbird, UT (poster).
56. Jessup, K., **P.W. Barnes**, and T. Boutton. 2000. Vegetation dynamics of an oak-juniper savanna on the Edwards Plateau of Texas: An isotopic assessment. *Ecological Society of America Abstracts*, p. 294. Snowbird, UT (poster).
57. Shinkle, J.R., A-L. Koenig, and **P.W. Barnes**. 2000. Characteristics of two plant photomorphogenesis programs induced by short- versus long-wavelength UV-B. *Thirteenth International Congress on Photobiology*. San Francisco, CA (contributed oral presentation).
58. **Barnes, P.W.**, P.S. Searles and M.M. Caldwell. 1999. Non-invasive measurements of leaf epidermal transmittance of UV radiation using chlorophyll fluorescence. *Ecological Society of America Abstracts*, Spokane, WA (contributed oral presentation).
59. Shinkle, J.R., A. Atkins, A-L. Koenig, and **P.W. Barnes**. 1999. UV-B-induced phototropism is mediated by a distinct photoreceptor. *American Society of Plant Physiology* (contributed oral presentation).

60. Beck, J.R., and **P.W. Barnes**. 1997. Effects of ultraviolet-B radiation on grass morphology and competition. *Ecological Society of America*, Albuquerque, NM (poster).
61. McMurtry, C.R., **P.W. Barnes**, and S. Archer. 1997. Leaf longevity/photosynthesis relationships in a Texas subtropical savanna. *Ecological Society of America*, Albuquerque, NM (poster).
62. Nelson, J.A., **P.W. Barnes**, and S. Archer. 1997. Leaf demography and growth responses to moisture availability in co-occurring woody plants in a Texas subtropical savanna. *Ecological Society of America*, Albuquerque, NM (poster).
63. Ruiseco, L.E., and **P.W. Barnes**. 1997. Woody plant effects on soil seed banks in a central Texas savanna. *Ecological Society of America*, Albuquerque, NM (poster).
64. **Barnes, P.W.**, and S. Archer. 1996. Competition or facilitation: the nature of overstory-understory interactions in southern Texas savannas. *Southwestern Association of Naturalists*, McAllen, TX (contributed oral presentation).
65. Nelson, J., **P. W. Barnes**, and S. Archer. 1996. Morphological and leaf demographic responses to resource availability in a diverse group of south Texas woody plants. *Southwestern Association of Naturalists*, McAllen, TX (contributed oral presentation).
66. McMurtry, C., **P. Barnes**, and S. Archer. 1996. Resource availability and physiological activity of a diverse woody plant assemblage in south Texas savannas. *Southwestern Association of Naturalists*, McAllen, TX (contributed oral presentation).
67. Ruiseco, L., and **P. Barnes**. 1996. Grazing and habitat influence on a central Texas soil seed bank: implications for succession. *Southwestern Association of Naturalists*, McAllen, TX (contributed oral presentation).
68. Beck, J.R., and **P.W. Barnes**. 1996. Effects of ultraviolet-B radiation on grass competition. *Southwestern Association of Naturalists*, McAllen, TX (contributed oral presentation).
69. **Barnes, P.W.**, C.L. Ballaré, and M.M. Caldwell. 1995. Photomorphogenic effects of UV-B radiation on plant growth: consequences for light competition. *European Conference on Vegetation Stress*, München, Germany. (Invited symposium oral presentation).
70. **Barnes, P.W.**, C.R. McMurtry and S.R. Archer. 1995. Leaf gas exchange and water relations of co-occurring savanna shrubs in habitats with contrasting soils and overstory development. *Ecological Society of America*, Snowbird, UT (poster).
71. McMurtry, C.R., **P.W. Barnes**, and S.R. Archer. 1995. Physiological responses of woody plants to irrigation in a Texas subtropical savanna. *Ecological Society of America*, Snowbird, UT (poster).
72. Nelson, J.A., **P.W. Barnes**, and S.R. Archer. 1995. Influence of irrigation on leaf longevity, biomass production, and shoot growth in diverse woody plant growth-forms in a Texas Subtropical savanna. *Ecological Society of America*, Snowbird, UT (poster).
73. Archer, S., **P. Barnes**, D.S. Schimel, S. Tan, and S. Zitzer. 1995. Spatial variation in leaf area, biomass and nitrogen distribution in a subtropical savanna woodland and parkland. *Ecological Society of America*, Snowbird, UT (poster).
74. Searles, P.S., S.D. Flint, M.M. Caldwell, and **P.W. Barnes**. 1995. Variation within monospecific plant canopies under enhanced ultraviolet-B radiation. *Ecological Society of America*, Snowbird, UT (contributed oral presentation).
75. **Barnes, P.W.**, S. Flint, M.M. Caldwell. 1994. Early-season effects of solar UV-B enhancement on plant canopy structure, simulated photosynthesis and competition. *Ecological Society of America*, Knoxville, TN (contributed oral presentation).
76. **Barnes, P.W.**, and S. Archer. 1993. Competition or facilitation: response of understory shrubs to removal of the mesquite (*Prosopis glandulosa*) overstory in a Texas subtropical savanna. *Ecological Society of America*, Madison, WI (poster).
77. **Barnes, P.W.**, S. Archer, and V.B. Brown. 1992. A test for habitat facilitation by honey mesquite (*Prosopis glandulosa*) in a Texas subtropical savanna. *Ecological Society of America*, Honolulu, HI (poster).
78. **Barnes, P.W.** 1992. Potential consequences of ozone depletion for higher plants: An ecological perspective. *AAAS*. Chicago, IL. (Invited symposium oral presentation).

79. Ballaré, C.L., **P.W. Barnes**, and R.E. Kendrick. 1991. Photomorphogenic effects of UV-B radiation on hypocotyl elongation in wild-type and stable-phytochrome-deficient mutant seedlings of cucumber. USDA Beltsville Symposium XVI, Photomorphogenesis in plants: emerging strategies for crop improvement. University of Maryland, College Park. (Invited oral presentation).
80. **Barnes, P.W.**, S.R. Holman, and B.S. Vergara. 1991. Intraspecific variation in sensitivity to UV-B radiation in rice (*Oryza sativa*). Indo-US Workshop, "Global Climatic Changes: Photosynthesis and Plant Productivity", New Delhi, India. (poster)
81. **Barnes, P.W.**, B.S. Vergara, J.M. Bonman, and S.R. Holman. 1990. Impact of UV-B radiation on lowland, tropical rice ecosystems. *Ecological Society of America*. Toronto, Canada (poster).
82. Olszyk, D., D. Bachelet, **P. Barnes**, S. Holman, K. Ingram, B. Vergara, M. Bonman, P. DeVries, K. Heong, and H. Neue. 1990. The EPA/IRRI Rice Research Project: Projecting the Impacts of Global Climate Change on Asian Rice Production. *Amer. Society of Agronomy* (contributed oral presentation).
83. **Barnes, P.W.**, H. Gucinski, and D. Turner. 1989. Ecosystem responses to increases in solar ultraviolet-B radiation. *Air and Waste Management Association Symposium* 89-5.6. Anaheim, CA. (Invited symposium oral presentation).
84. **Barnes, P.W.**, S.D. Flint, and M.M. Caldwell. 1989. Morphological responses of crops and weeds to ultraviolet-B radiation. *Ecological Society of America*, Davis, CA (contributed oral presentation).
85. **Barnes, P.W.**, S.D. Flint, and M.M. Caldwell. 1988. Competition for light in multi-species canopies: influence of enhanced UV-B radiation on canopy structure and light interception in wheat/wild oat mixtures. *Ecological Society of America*, (poster).
86. Potvin, M.A., and **P.W. Barnes**. 1987. Depth of seed burial: effect on emergence and survival in prairie grasses. *Ecological Society of America*, Columbus, OH (poster).
87. **Barnes, P.W.**, P.W. Jordan, S.D. Flint, and M.M. Caldwell. 1987. Canopy structure, photosynthesis and competitive balance of wheat and wild oat under UV-B radiation enhancement. *Ecological Society of America*, Columbus, OH (contributed oral presentation).
88. Keeler, K.H., B. Kwankin, **P.W. Barnes**, and D.W. Galbraith. 1986. Detection of polyploid polymorphism in big bluestem (*Andropogon gerardii*). *American Journal of Botany* 73(5):686. (contributed oral presentation).
89. **Barnes, P.W.** 1984. A physiological basis for population divergence and habitat assortment in native bluestem grasses. *Ecological Society of America*, Fort Collins, CO. (Invited oral presentation in symposium, *Towards an Understanding of Physiological Processes in Grasslands*).
90. **Barnes, P.W.** 1983. Variation in leaf anatomy and its effect on gas exchange in two closely related C-4 grasses. *Ecological Society of America*, Bloomington, IN (contributed oral presentation).
91. Tieszen, L.L., D.J. Ode, **P.W. Barnes**, and P.M. Bultsma. 1983. Seasonal variation in C-3 and C-4 biomass at the Ordway Prairie and selectivity by bison and cattle. *Seventh North American Prairie Conference*, Springfield, MO, 1980. (contributed oral presentation).
92. **Barnes, P.W.**, and A.T. Harrison. 1981. Water use patterns and site preferences of C-3 and C-4 grasses in the Nebraska Sandhills. *Ecological Society of America*, Grand Forks, ND (contributed oral presentation).
93. **Barnes, P.W.**, and A.T. Harrison. 1979. Water relations and species distributions in a Nebraska Sandhills prairie. *Ecological Society of America*, Stillwater, OK. (contributed oral presentation).
94. **Barnes, P.W.**, and A.T. Harrison. 1979. Factors controlling species distributions and community organization in a typical Nebraska Sandhills prairie. *Nebraska Academy of Sciences*, Lincoln, NE. (contributed oral presentation).

#### GRANTS AND FUNDED RESEARCH PROJECTS

2017-2018. DFG Research Fellowship (German). UV-B radiation changes and diurnal rhythm affect shielding properties and antioxidant activity of complex flavonoid glycosides dependent on their chemical structure. S. Neugart (Applicant) and P.W. Barnes (Advisor and Sponsor).

2013-2014. Louisiana Board of Regents/NSF. Supervised Undergraduate Research Experience (SURE). Elucidating the mechanisms and physiological significance of rapid changes in epidermal UV-shielding in plants. P.W. Barnes (PI) and A. Barkley (UG). \$4,500.

2008-2013. NSF Ecosystems. Collaborative Research: RUI: Decomposition in drylands: Soil erosion and UV interactions. S.R. Archer (PI), D. Breshears (Co-PI), P.W. Barnes (Co-PI), H. Throop (Co-PI), R. McCulley (Co-PI). (\$1.2 million total; \$135,340 Loyola Budget, including REU Supplements).

2008-2009. USDA CSREES UV Monitoring Program via subcontract with Colorado State University. Epidermal transmittance for UV: assessing effects of light climate and drought. R. Ryel, PI; P. W. Barnes, Co-PI; S.D. Flint, Co-PI. ca. \$6,000 to PWB.

2008-2009. Loyola University Faculty Research Grant. Interactive effects of soil deposition and UV on litter decomposition. P.W. Barnes, PI. \$2,100.

2006-2007. Loyola University Faculty Research Grant. Plant responses to solar ultraviolet radiation in the Hawaiian alpine. P.W. Barnes, PI. \$2,490.

2006-2007. USDA UV Monitoring Program via subcontract with Colorado State University. Plant optical properties and UV absorbing pigments: Response to intensity and timing of irradiation. R. Ryel, PI; S.D. Flint, Co-PI; P.W. Barnes, Co-PI.

1999-2003. NSF Ecology. Collaborative Research: RUI: Facilitation, competition and woody plant dynamics in a savanna parkland. S. Archer, PI; P.W. Barnes, Co-PI; T. Boutton, Co-PI. \$253,536 (to TSU).

1998-1999. NSF Research Opportunity Award (ROA). Ecosystem responses to stratospheric ozone reduction in southernmost South America. Martyn Caldwell, PI; P.W. Barnes, Co-PI. \$19,000.

1998-1999. Freeman Ranch Advisory Committee, Texas State University. Historical changes in vegetation at the Freeman Ranch. \$8,100. P.W. Barnes, PI.

1998-1999. Freeman Ranch Advisory Committee, Texas State University. Freeman Ranch Management Workshop. \$5,000. P.W. Barnes, PI.

1998-1999. Institute for Environmental and Industrial Science, Texas State University. Analysis of spatial and temporal patterns in vegetation on the Edwards Plateau using remote sensing and GIS. P.W. Barnes, PI. \$8,000.

1998. Texas State University. Improving student access to computing facilities. J. Ott, PI; J. Koke, Co-PI; P. Barnes, Co-PI. \$133,000.

1997-1998. Freeman Ranch Advisory Committee, Texas State University. Vegetation of the Freeman Ranch. P.W. Barnes, PI. \$10,000.

1997. Freeman Ranch Advisory Committee, Texas State University. Weather station for the Freeman Ranch. B. Davis and P.W. Barnes (Co-PIs). \$4,873.

1996-1997. USDA NRI Strengthening Grant. A plant growth chamber to enhance research activities in plant biology. P.W. Barnes, PI. \$33,542.

1996-1999. USDA NRI Competitive Grants Program, Plant Responses to the Environment.

Photomorphogenic effects of UV-B radiation on plant morphology and pigmentation. P.W. Barnes, PI; J.R. Shinkle, Co-PI. \$197,164.

1995-1996. Faculty Research Enhancement Grant, Texas State University. Photomorphogenic effects of UV-B radiation on plants. P.W. Barnes, PI. \$5,000.

1994-1995. USDA NRI Strengthening Grant. A scanning UV/Visible spectrophotometer for use in plant ecophysiology and microbiology research. P.W. Barnes, PI; R.J. McLean, Co-PI. \$15,000.

1993-1994. Faculty Research Enhancement Grant, Texas State University. Physiological ecology of co-occurring shrubs in a Texas subtropical savanna. P.W. Barnes, PI. \$5,910.

1992-1995. USDA NRI Competitive Grants Program, Plant Responses to the Environment. Photomorphogenic effects of UV-B radiation on the growth and pigmentation of higher plants. P.W. Barnes, PI; C. Ballare, Co-PI. \$204,339.

1992-1993. NSF ILI. Development of laboratory exercises in plant physiological ecology: integration of modern instrumentation and computer simulation. P.W. Barnes, PI; D.C. Whitenburg, Co-PI. \$52,966.

1991-1997. NASA EOS Interdisciplinary Science Program. Factors controlling carbon balance in global arid and semiarid ecosystems. D. Schimel, PI; S. Archer, Co-PI; P. W. Barnes, collaborating investigator. Summer salary support.

1991-1992. Faculty Research Enhancement Grant, Texas State University. Plant competition and resource partitioning in South Texas shrublands. P.W. Barnes, PI. \$6,000.

1990-1993. US EPA. Response of lowland, tropical rice to ultraviolet-B radiation enhancement. B.S. Vergara and P.W. Barnes, Co-PIs. \$180,000.

1990-1993. US EPA. Effects of UV-B irradiation on rice blast disease. M. Bonman, PI; H. Leung, Co-PI; P.W. Barnes, Co-PI. \$140,000.

1983-1984. Lower Loup Natural Resource District, NE. Predicting the response of wet meadow hay yield to permanent ground water depletions. P.W. Barnes, PI. \$1,500.

1982-1984. The Center for Rural Affairs (Jessie Smith Noyes Foundation). Primary production and species composition of wet meadows and adjacent sand dunes in the Nebraska Sandhills: The ecological implications of decreasing water table levels. P.W. Barnes, PI. \$10,000.

1982-1983. The Nature Conservancy. Ecology of C<sub>3</sub> and C<sub>4</sub> plant communities at the Ordway Prairie, SD. P.W. Barnes, PI. \$250.