

## CURRICULUM VITAE

Name: Osvaldo E. Sala  
Address: Arizona State University  
School of Life Sciences and School of Sustainability, Tempe, AZ 85287, USA  
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### ACADEMIC TRAINING

BSc Agriculture, University of Buenos Aires, Argentina  
MSc, Ecology, Colorado State University, USA  
PhD, Ecology, Colorado State University, USA

### AWARDS AND HONORS

2018 **Regents' Professor, Arizona State University**  
2018 **Honorary Member**, Asociación Argentina de Ecología  
2013 **Ecological Society of America**, Fellow  
2009 **American Association for the Advancement of Science**, Fellow  
2004 **Andrew D. White Professor-at-Large, Cornell University**  
2003 **American Academy of Arts and Sciences**, USA, Elected Member  
2003 **National Academy of Physical and Natural Sciences**, Buenos Aires, Elected Member  
2002 **National Academy of Sciences**, Córdoba, Argentina, Elected Member  
1993 **Guggenheim Fellow**  
2003 **Bernardo Houssay** award for scientific accomplishments, Argentina  
1987 **Bernardo Houssay** award for scientific accomplishments, Argentina

### ACADEMIC EXPERIENCE

2017- Director, Global Drylands Center, **Arizona State University**  
2010- Julie A. Wrigley Professor of Life Sciences and Sustainability, **Arizona State University**  
2005-10 Sloan Lindemann Distinguished Professor of Biology, **Brown University**  
2005-08 Director, Environmental Change Initiative, **Brown University**  
2005-08 Director, Center for Environmental Studies, **Brown University**  
1991-04 Professor, Department of Ecology, School of Agronomy, **University of Buenos Aires**  
1982-04 Research Scientist, **National Research Council**, Argentina  
1999 Visiting Scholar, **Imperial College** at Silwood Park  
1993-94 Visiting Scholar, Department of Biological Sciences, **Stanford University**, USA  
1987-88 Chairman, Department of Ecology, School of Agronomy, **University of Buenos Aires**, Argentina  
1987-90 Associate Professor, Department of Ecology, School of Agronomy, **University of Buenos Aires**, Argentina  
1985-87 Research Scientist, Natural Resource Ecology Laboratory, **Colorado State University**, USA

1982-83 Assistant Professor, Department of Ecology, School of Agronomy, **University of Buenos Aires**, Argentina

1980-82 Assistant Professor, Range Science Department, **Colorado State University**, USA

## **PROFESSIONAL SERVICE**

### **Current**

\* President-elect, **Ecological Society of America**, 2018-present

### **Previous**

\* Chair, External Advisory Board, School of Global Environmental Sustainability, **Colorado State University**, 2012-2018

\* Co-Director, **SARAS** (South American Institute for Resilience and Sustainability Studies), 2010-16

\* LTER (Long Term Ecological Research) National Advisory Board, **National Science Foundation**, 2010-13

\* **Jury of Ramon Margalef Prize, Barcelona, Spain**, 2008-2011

\* Scientific Advisory Board, **SCOPE Biofuels Project**, 2007-10

\* **Rhode Island, Ocean Special Area Management Plan**, Science Advisory Task Force, 2008

\* Advisor, **National Science Foundation**, Environmental Research and Education, 2007-09

\* Member, Global Agenda Council, **World Economic Forum**, 2008-09

\* President, **SCOPE**, Scientific Committee on Problems of the Environment, 2005-09

\* External Evaluation **CREAF**, Universidad Autónoma de Barcelona, Spain, 2008.

\* Member, Science Council, **The Nature Conservancy**, 2005-07

\* Secretary General, **SCOPE**, Scientific Committee on Problems of the Environment, 2001-05

\* Editorial Board of **Climate Research**, Inter Research, 1992-05

\* Editor of **Global Change Biology**, Blackwell Scientific, 2003-05

\* Editorial Board of **Ecosystems**, Springer Verlag, 1997-2004

\* Editorial Board of **Oecologia**, Springer Verlag, 1994-2004

\* Member at large Governing Board of the **Ecological Society of America**, 2002-04

\* Chair of “**Red Latinoamericana de Botánica**,” 2001-2004

\* Scientific Committee for the **International Geosphere-Biosphere Programme (IGBP)**, 1994-1996

\* Scientific Steering committee of **Global Change and Terrestrial Ecosystems (GCTE)**, a core project of the International Geosphere Biosphere Programme, 1991-1999

\* Leader, Global Change and Terrestrial Ecosystems (**GCTE**). **Focus 4, Global Change and Ecological Complexity**, 1994-1999

\* Steering committee of **America's Interhemisphere Geo-Biosphere Organization (AMIGO)**, 1991-1995

\* Scientific Advisory Committee of the **Biodiversity and Ecosystem Functioning: Soils and Sediment**, a program of the Scientific Committee on Problems of the Environment (**SCOPE**), 1995-1999

\* Scientific Advisory Committee of **Diversitas**, An International Programme of Biodiversity Science, IUBS, SCOPE, UNESCO, ICSU, IGBP-GCTE, and IUMS, 1995- 2001

\* Scientific Steering Committee of **SCOPE**, Scientific Committee on Problems of the Environment, 1998-2001

\* Scientific Steering Committee of “**Red Latinoamericana de Botánica**” 1999-2001

\* Biology Panel, National Research Council of Argentina, 1989-1992

- \* Vice-President **Ecological Society of Argentina**, 1991-1993
- \* President **Ecological Society of Argentina**, 1997-1999 and 1999-2001
- \* Editorial Board of **Vegetatio**, Kluwer academic publishers, 1990-1996
- \* Editorial Board of **Global Change Biology**, Blackwell Scientific, 1994-2003

## RESEARCH GRANT EXPERIENCE

- 2018-22 Biogeochemical mismatches: decoupling of carbon, nitrogen and phosphorus cycles during drought **Australian Research Council** \$289,642 (co-PI)
- 2018-23 Long-term ecosystem responses to directional changes in precipitation amount and variability in an arid grassland **National Science Foundation** \$519,999 (PI)
- 2018-18 Looking for a Pulse in Dryland Ecosystems: Evaluating the Pulse Dynamics Paradigm Forty Years after its Creation **The New Phytologist Trust** \$10,000 (co-PI)
- 2017-21 Forecasting dryland ecosystem vulnerability to change: a cross-system assessment of vegetation and process responses to disturbance and climate variability on DoD lands **SERDP-DOD** \$730,851 (co-PI)
- 2016-19 Exotic grass and woody-plant encroachment in Southwestern rangelands: Mechanisms of invasion and opportunities of containment **USDA-NIFA-AFRI** (PI) \$500,000
- 2015-18 Water Availability Controls on Above-Belowground Productivity Partitioning: Herbivory versus Plant Response **National Science Foundation**, (PI) \$718,935
- 2014-19 Drought-Net: A global network to assess terrestrial ecosystem sensitivity to drought **National Science Foundation**, (co-PI) \$499,992
- 2012-13 Abrupt grass-woodland transitions: Determinants and consequences for ecosystem services **National Science Foundation**, \$49,798
- 2012-18 LTER: Long-Term Research at the Jornada Basin (LTER VI) **National Science Foundation**, (co-PI) \$5,880,000
- 2012-14 Woody-plant encroachment: Degradation or a shift in the portfolio of ecosystem services? **Keck Foundation**, \$75,000
- 2009-13 Precipitation Controls of Carbon and Nitrogen Cycles in Arid-Semiarid Ecosystems **US National Science Foundation**, \$799,439
- 2009-10 Vegetation structure constraints on ANPP in arid ecosystems: assessing the meristem limitation hypothesis **US National Science Foundation**, \$14,804
- 2004-07 Global change and the carbon cycle in arid and semiarid ecosystems: Experiments in the Patagonian steppe. **University of Buenos Aires**
- 2004-07 Spatial and temporal controls of carbon cycling in arid and semiarid ecosystems **PICT, Agencia Nacional de Promoción Científica y Tecnológica**
- 2002-04 Ecophysiological consequences of infrequent massive flowering of monocarpic bamboo grasses (*Chusquea* spp) in temperate and tropical South America **US National Science Foundation**
- 2001-02 Biodiversity effect on ecosystem functioning: Diversity of species, functional groups, patches, and resources. **University of Buenos Aires**
- 2000-03 Global change effects on primary production in arid ecosystems: The Patagonian steppe as a model ecosystem. **PICT, Agencia Nacional de Promoción Científica y Tecnológica**

- 1999-06 The role of biodiversity and climate in the functioning of ecosystems: A comparative study of grasslands, savannas, and forests. **InterAmerican Institute for Global Change Research**
- 1998-01 Ecosystem responses to stratospheric ozone reduction in southernmost South America. **US National Science Foundation**
- 1998-00 Biodiversity effects on the functioning of ecosystems: Experiments and models at two scales in the Patagonian steppe. **UBA**
- 1998-00 The effect of global change on the functioning of the Patagonian steppe ecosystem. **Agencia Nacional de Promoción Científica y Tecnológica**
- 1998-01 Management technology to increase production and decrease erosion in grasslands and steppes. **Agencia Nacional de Promoción Científica y Tecnológica**
- 1997-01 Production and decomposition controls in the Patagonian steppe. **CONICET**
- 1997 Global Change Effects on Biodiversity and Ecosystem Functioning: Manipulation of a Keystone Process. **InterAmerican Institute for Global Change Research**
- 1996 Workshop “Biodiversity Scenarios” at UC Santa Barbara, California, USA. June 1996. **InterAmerican Institute for Global Change Research** and **National Center for Ecological Analysis and Synthesis UC Santa Barbara**
- 1995 Workshop “Global Change and Ecological Complexity” Cedar Creek, Minnesota, USA, September 1995. **Electric Power Research Institute** and **International Geosphere Biosphere Programme**
- 1995 Workshop “Global Change Impacts on Latin American Terrestrial Ecosystems and Feedbacks to the Globe” Buenos Aires March 1995. **Inter-American Institute for Global Change Research**
- 1995-98 Ecosystem Responses to Stratospheric Ozone Reduction in Southernmost South America, **US National Science Foundation**
- 1994-97 Seasonal dynamics of primary production, **UBA**
- 1994-97 The role of small rainfall events on nitrogen mineralization, **UBA**
- 1994-97 Constraints on Production and Decomposition in Temperate Semiarid Grasslands, **US National Science Foundation**
- 1992-95 Sustainability of natural and cultivated systems Inter American Development Bank-**CONICET**
- 1991-93 Environmental and management effects on plant available water in the Patagonian steppe, **UBA**
- 1991-93 Nutrient partitioning between shrubs and grasses in the Patagonian steppe, **UBA**
- 1991-93 Cyclical dynamics of vegetation patches in the Patagonian steppe, **UBA**
- 1991 Argentina-Chile scientific collaborative award. **Fundación Antorchas**
- 1991 Competition and facilitation between grasses and shrubs **Fundación Antorchas**
- 1989-93 Resource partitioning among grasses and shrubs in semi-arid regions, **CONICET**
- 1989-93 Cyclical succession in the Patagonian steppe. **CONICET**
- 1988-89 Water dynamics in the Patagonian steppe: A simulation modeling approach **UBA**
- 1988-89 Water partitioning among grasses and shrubs in the Patagonian arid steppe, **UBA**
- 1987-88 Grass-shrub interactions in two semi-arid regions, **US National Science Foundation**
- 1985-88 The effect of defoliation on the community dynamics of a grassland of the Flooding Pampas. **CONICET**
- 1985-88 Resource partitioning among life forms of the arid steppes. **CONICET**
- 1983-84 Resource partitioning among life forms in Southern Patagonia. **UBA**
- 1983-84 Convergence in the partitioning of resources among functional types in two semiarid regions, **US National Science Foundation-CONICET**

## **GRADUATE STUDENTS AND POST DOCTORAL FELLOWS**

### **Graduate Students:**

Sam Jordan (exp 2023)  
Courtney Currier (exp 2023)  
Svenja Wagner (exp 2019)  
Luis Weber (exp 2021)  
Amy Wiedefeld, 2018  
Aaron Boydston (exp 2018)  
Owen McKenna, 2016  
Laureano Gherardi, 2014  
Lara Reichmann, 2011  
Pedro Flombaum, 2007  
Marselle Alexander, 2007  
Victoria Marchesini, 2006  
M. Laura Yahdjian, 2004  
Verónica Pancotto, 2004  
Pablo Roset, 2000  
Esteban Jobbágy, 1998  
Adriana Beltrán, 1997  
José M. Paruelo, 1991  
Martín R. Aguiar, 1991  
Rodolfo A. Golluscio, 1990

### **Postdoctoral fellows:**

Laureano Gherardi, 2015-  
José Anadón, 2012-  
Lara Reichmann, 2011-12  
Erika Sudderth, 2009  
M. Laura Yahdjian, 2005  
Elisabeth Huber-Sannwald, 1996-97  
Patricia Folgarait, 1995-97  
Silvia Cid, 1995-96  
Miguel A. Brizuela, 1991-94

## **TEACHING EXPERIENCE**

Classes currently being taught at Arizona State University:

Ecosystem Ecology (BIO 422/598 SOS 598)

Human Impact on Ecosystem Functioning (SOS494/598; BIO494/598)

Graduate Seminar in Sustainability Science (SOS/ BIO 591)

Life Sciences Career Paths (BIO 189)

Sustainability Science: Interactions between Human and Environmental Systems (SOS 591)

Classes taught in the past:

Human Impact on Ecosystem Functioning (BIOL1490), Brown University

Biodiversity (BIOL2430), Brown University

Topics in Conservation Science (BIOL1940), Brown University

Ecology, UBA

Ecosystem Ecology, UBA Plant Physiology, UBA

Range Ecophysiology (RS 351), Colorado State University

Functional Diversity in Ecosystems, University of Concepción, Chile

Global Change and Biodiversity, UNAM, Mexico

## PUBLICATIONS (H-index = 87)

217. Apodaca, M. J., J. D. McInerney, O. E. Sala, L. Katinas, and J. V. Crisci. 2019. A Concept Map of Evolutionary Biology to Promote Meaningful Learning in Biology. **The American Biology Teacher** 81(2): 79-87. [PDF](#)
216. Gherardi, L. A., and O. E. Sala. 2019. Effect of interannual precipitation variability on dryland productivity: A global synthesis. **Global Change Biology** 25(1): 269-276. [PDF](#)
215. Corman, J. R., S. L. Collins, E. M. Cook, X. Dong, L. A. Gherardi, N. B. Grimm, R. L. Hale, T. Lin, J. Ramos, and L. G. Reichmann. 2018. Foundations and Frontiers of Ecosystem Science: Legacy of a Classic Paper (Odum 1969). **Ecosystems**: 1-13. [PDF](#)
214. McKenna, O. P., and O. E. Sala. 2018. Playa-wetlands effects on dryland biogeochemistry: space and time interactions. **Journal of Geophysical Research - Biogeosciences** 123. [https:// doi.org/10.1029/2017JG004176](https://doi.org/10.1029/2017JG004176). [PDF](#)
213. Okin, G. S., O. E. Sala, E. R. Vivoni, J. Zhang, and A. Bhattachan. 2018. The interactive role of wind and water in drylands functioning: what does the future hold? **Bioscience** 68 (9): 670-677. [PDF](#)
212. Peters, D. P. C., D. N. Burruss, L. Rodriguez, D. S. McVey<sup>4</sup>, E. H. Elias, A. M. Pelzel-McCluskey, D. J.D., T. S. Schrade, J. Yao, P. S., J. Lombard, S. R. Archer, B. T. Bestelmeyer, D. M. Browning, C. W. Brungard, J. L. Hatfield, N. P. Hanan, J. E. Herrick, G. S. Okin, O. E. Sala, H. Savoy, and E. R. Vivoni. 2018. An integrated view of complex landscapes: a big data-model integration approach to trans-disciplinary science. **Bioscience** 68(9): 653-669. [PDF](#)
211. Munson, S. M., S. C. Reed, J. Peñuelas, N. G. McDowell, and O. E. Sala. 2018. Ecosystem thresholds, tipping points, and critical transitions. **New Phytologist** 218(4): 1315-1317. [PDF](#)
210. Petrie, M., D. Peters, J. Yao, J. Blair, N. Burruss, S. Collins, J. Derner, L. Gherardi, J. Hendrickson, and O. Sala. 2018. Regional grassland productivity responses to precipitation during multi-year above-and below-average rainfall periods: consequences for responses under climate change. **Global Change Biology** 24(5): 1935-1951. [PDF](#)
209. McKenna, O.P., and O.E. Sala. 2018. Groundwater recharge in desert playas: current rates and future effects of climate change. **Environmental Research Letters**. 13(1): 014025. [PDF](#)
208. Wilcox, K. R., A. T. Tredennick, S. E. Koerner, E. Grman, L. M. Hallett, M. L. Avolio, K. J. La Pierre, G. R. Houseman, F. Isbell, and D. S. Johnson. 2017. Asynchrony among local communities stabilises ecosystem function of metacommunities. **Ecology Letters**. 20(12): 1534-1545. [PDF](#)
207. Franco, A., M. A. Knox, W. Andriuzzi, C. Tomasel, O. E. Sala, and D. H. Wall. 2017. Nematode exclusion and recolonization in experimental soil microcosms. **Soil Biology and Biochemistry** 108: 78-83. [PDF](#)
206. Knapp, A. K., M. L. Avolio, C. Beier, C. J. Carroll, S. L. Collins, J. S. Dukes, L. H. Fraser, R. J. Griffin-Nolan, D. L. Hoover, and A. Jentsch. 2017. Pushing precipitation to

- the extremes in distributed experiments: recommendations for simulating wet and dry years. **Global Change Biology**. 23(5): 1774-1782. [PDF](#)
205. Sala, O. E., L. Yahdjian, K. M. Havstad, and M. R. Aguiar. 2017. Rangeland Ecosystem Services: Nature's Supply and Humans' Demand. Pages 467-489. *in* D. D. Briske, editor. **Rangeland Systems: Process, Management and Challenges**. Springer Verlag, New York. [PDF](#)
204. Sala, O. E., L. Vivanco, and P. Flombaum. 2017. Grassland Communities and Ecosystems. *in* **Reference Module in Life Sciences**, Elsevier, New York. <http://dx.doi.org/10.1016/B978-0-12-809633-8.02201-9>. [PDF](#)
203. Flombaum, P., L. Yahdjian, and O. E. Sala. 2017. Global-change drivers of ecosystem functioning modulated by natural variability and saturating responses. **Global Change Biology** 23(2): 503-511. [PDF](#)
202. Sala, O. E. 2016. How Scientists Can Help End the Land-Use Conflict. **Bioscience** 66: (11): 915. [PDF](#)
201. McKenna, O. and O. E. Sala. 2016. Biophysical controls over concentration and depth distribution of soil organic carbon and nitrogen in desert playas. **Journal of Geophysical Research. Biogeosciences** 121(12): 3019-3029. [PDF](#)
200. Estiarte, M., S. Vicca, J. Peñuelas, M. Bahn, C. Beier, B. Emmett, P. Fay, P. Hanson, R. Hasibeder, J. Kigel, G. Kröel-Dulay, K. Larsen, E. Lellei-Kovács, J. Limousin, R. Ogaya, J. Ourcival, S. Reinsch, O. E. Sala, I. Schmidt, M. Sternberg, K. Tielbörger, A. Tietema, and I. Janssens. 2016. Few multi-year precipitation-reduction experiments find a shift in the productivity-precipitation relationship. **Global Change Biology** 22(7): 2570-2581. [PDF](#)
199. Gherardi, L. and O. E. Sala. 2015. Enhanced interannual precipitation variability increases plant functional diversity that in turn ameliorates negative impact on productivity. **Ecology Letters** 18(12): 1293-1300. [PDF](#)
198. Gherardi, L. and O. E. Sala. 2015. Enhanced precipitation variability decreases grass- and increases shrub-productivity. **Proceedings of National Academy of Sciences** 112(41): 12735-12740. [PDF](#)
197. Knapp, A. K., D. L. Hoover, K. Wilcox, M. Avolio, S. Koerner, K. La Pierre, M. Loik, Y. Luo, O. E. Sala, and M. D. Smith. 2015. Characterizing differences in precipitation regimes of extreme wet and dry years: Implications for climate change experiments. **Global Change Biology** 21(7): 2624-2633. [PDF](#)
196. Sala, O. E., L. Gherardi, and D. P. C. Peters. 2015. Enhanced Precipitation Variability Effects on Water Losses and Ecosystem Functioning: Differential Response of Arid and Mesic Regions. **Climatic Change** 131(2): 213-227. [PDF](#)
195. Scheffer, M., J. Bascompte, T. Bjordam, S. Carpenter, L. B. Clarke, C. Folke, P. Marquet, N.M. Mazzeo, M., O. E. Sala, and F. Westley. 2015. Dual Thinking for Scientists. **Ecology and Society** 20(2): 3. doi.org/10.5751/ES-07434-200203. [PDF](#)

194. Vandegehuchte, M. L., Z. A. Sylvain, L. G. Reichmann, C. Milano de Tomasel, U. N. Nielsen, D. H. Wall, and O. E. Sala. 2015. Responses of a desert nematode community to changes in water availability. **Ecosphere** 6(3): 1-15. [PDF](#)
193. Yahdjian, L., O. E. Sala, and K. M. Havstad. 2015. Rangeland ecosystem services: shifting focus from supply to reconciling supply and demand. **Frontiers in Ecology and the Environment** 13(1): 44-51. [PDF](#)
192. Monger, C., O. E. Sala, M. C. Duniway, H. Goldfus, I. A. Meir, R. M. Poch, H. L. Throop, and E. R. Vivoni. 2015. Legacy effects in linked ecological-soil-geomorphic systems of drylands. **Frontiers in Ecology and the Environment** 13(1): 13-19. [PDF](#)
191. Peters, D. P., K. M. Havstad, S. R. Archer, and O. E. Sala. 2015. Beyond desertification: new paradigms for dryland landscapes. **Frontiers in Ecology and the Environment** 13(1): 4-12. [PDF](#)
190. Sala, O. E. and F. T. Maestre. 2014. Grass-woodland transitions: Determinants and consequences for ecosystem functioning and provisioning of services. **Journal of Ecology** 102(6): 1357-1362. [PDF](#)
189. Anadón, J. D., O. E. Sala, and F. T. Maestre. 2014. Climate change will increase savannas at the expense of forests and treeless vegetation in tropical and subtropical Americas. **Journal of Ecology** 102(6): 1363-1373. [PDF](#)
188. Jobbágy, E. and O. E. Sala. 2014. The imprint of crop-choice on global nutrient needs. **Environmental Research Letters** 9(8): 084014. [PDF](#)
187. Anadón, J. D., O. E. Sala, B. L. Turner, and E. M. Bennett. 2014. The effect of woody-plant encroachment on livestock production in North and South America. **Proceedings of National Academy of Sciences** 111(35): 12948-12953. [PDF](#)
186. Reichmann, L. G. and O. E. Sala. 2014. Differential sensitivities of grassland structural components to changes in precipitation mediate productivity response in a desert ecosystem. **Functional Ecology** 28(5): 1292-1298. [PDF](#)
185. Sylvain, Z. A., D. H. Wall, K. L. Cherwin, D. P. C. Peter, L. G. Reichmann, and O. E. Sala. 2014. Soil animal responses to moisture availability are largely scale, not ecosystem dependent: Insight from a cross-site study. **Global Change Biology** 20(8): 2631-2643. [PDF](#)
184. Flombaum, P., O. E. Sala, and E. B. Rastetter. 2014. Interactions among resource partitioning, sampling effect, and facilitation on the biodiversity effect: a modeling approach. **Oecologia** 174(2): 559-566. [PDF](#)
183. Yahdjian, L., L. Gherardi, and O. E. Sala. 2014. Grasses have larger response than shrubs to increased nitrogen availability: A fertilization experiment in the Patagonian steppe. **Journal of Arid Environments** 102: 17-20. [PDF](#)
182. Herrick, J. E., O. E. Sala, and J. W. Karl. 2013. Land degradation and climate change: a sin of omission? **Frontiers in Ecology and the Environment** 11(6): 283-283. [PDF](#)
181. Gherardi, L. A., O. E. Sala, and L. Yahdjian. 2013. Preference for different inorganic-nitrogen forms among plant-functional types and species of the Patagonian steppe. **Oecologia** 173(3): 1075-1081. [PDF](#)

180. Gherardi, L. and O. E. Sala. 2013. Automated rainfall manipulation system: A reliable and inexpensive tool for ecologists. **Ecosphere** 4(2): 1-10. [PDF](#)
179. Sala, O. E., L. Vivanco, and P. Flombaum. Grassland Ecosystems. 2013. Vol 4 Pages 1-7 in S. A. Levin, editor. **Encyclopedia of Biodiversity (Second Edition)**. Academic Press. [PDF](#)
178. Peters, D. P. C., S. A. Archer, B. T. Bestelmeyer, M. L. Brooks, J. R. Brown, A. C. Comrie, H. R. Gimblett, J. H. Goldstein, K. M. Havstad, L. López-Hoffman, H. C. Monger, G. S. Okin, A. Rango, O. E. Sala, C. E. Tweedie, and E. R. Vivoni. 2013. Desertification of Rangelands. Pages 239-258 *in* T. R. Seastedt and K. N. Suding, editors. **Ecosystem Functions and Services**. Elsevier. [PDF](#)
177. Reichmann, L. G., O. E. Sala, and D. P. C. Peters. 2013. Water controls on nitrogen transformations and stocks in an arid ecosystem. **Ecosphere** 4(1): 11. <http://dx.doi.org/10.1890/ES12-00263.1>. [PDF](#)
176. Reichmann, L. G., O. E. Sala, and D. P. C. Peters. 2013. Precipitation legacies in desert-grassland primary production occur through previous-year tiller density. **Ecology** 94(2): 435-443. [PDF](#)
175. Sala, O. E., L. Gherardi, L. Reichmann, E. Jobbágy, and D. Peters. 2012. Legacies of precipitation fluctuations on primary production: Theory and data synthesis. **Philosophical Transactions of the Royal Society B** 367(1606): 3135-3144. [PDF](#)
174. Schwartz, M. W., J. J. Hellmann, J. M. McLachlan, S. D.F., J. O. Borevitz, J. Brennan, A. E. Camacho, G. Ceballos, J. R. Clark, H. Doremus, R. Early, J. R. Etterson, D. Fielder, J. L. Gill, P. Gonzalez, N. Green, L. Hannah, D. W. Jamieson, J. D., B. A. Minter, J. Odenbaugh, S. Polasky, D. M. Richardson, T. L. Root, H. D. Safford, O. E. Sala, S. H. Schneider, A. R. Thompson, J. W. Williams, M. Vellend, P. Vitt, and S. Zellmer. 2012. Managed Relocation: integrating the scientific, regulatory and ethical challenges **Bioscience** 62(8): 732-743. [PDF](#)
173. Yao, J., O. E. Sala, and D. Peters. 2013. Cross-site studies "by design": Experiments and observations that provide new insights. *in* D. P. C. Peters, C. Laney, A. Lugo, S. Collins, C. Driscoll, P. Groffman, J. Grove, A. Knapp, T. Kratz, M. Ohman, R. Waide, and J. Yao, editors. **Long-Term Trends in Ecological Systems: A Basis for Understanding Responses to Global Change**. USDA Agricultural Research Service, Washington, DC, USA. [PDF](#)
172. Sala, O. E., R. A. Golluscio, W. K. Lauenroth, and P. A. Roset. 2012. Contrasting Nutrient-Capture Strategies in Shrubs and Grasses of a Patagonian Arid Ecosystem. **Journal of Arid Environments** 82: 130-135. [PDF](#)
171. Peters, D. P. C., J. Yao, O. E. Sala, and J. Anderson. 2012. Directional Climate Change and Potential Reversal of Desertification in Arid and Semiarid Ecosystems. **Global Change Biology** 18(1): 151-163. [PDF](#)
170. Flombaum, P. and O. E. Sala. 2012. Effects of plant species traits on ecosystem processes: Experiments in the Patagonian steppe. **Ecology** 93(2): 227-234. [PDF](#)

169. Throop, H., L. Reichmann, O. E. Sala, and S. Archer. 2012. Response of dominant grass and shrub species to water manipulation: An ecophysiological basis for shrub invasion in a Chihuahuan Desert Grassland. **Oecologia** 169(2): 373-383. [PDF](#)
168. Montti, L., P. I. Campanello, M. G. Gatti, C. Blundo, A. T. Austin, O. E. Sala, and G. Goldstein. 2011. Understory bamboo flowering provides a very narrow light window of opportunity for canopy-tree recruitment in a neotropical forest of Misiones, Argentina. **Forest Ecology and Management**. 262(8): 1360-1369. [PDF](#)
167. Yahdjian, L., L. Gherardi, and O. E. Sala. 2011. Nitrogen limitation in arid-subhumid ecosystems: A meta-analysis of fertilization studies. **Journal Arid Environments** 75(8): 675-680. [PDF](#)
166. Yahdjian, L. and O. E. Sala. 2011. El Futuro de los Pastizales Sudamericanos. **Interciencia** 36(2): 153-159. [PDF](#)
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