

CURRICULUM VITAE (~ last 5 years and all publications)

WILLEM J. D. VAN LEEUWEN

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CHRONOLOGY OF EDUCATION

- 1995 Ph.D., University of Arizona, Tucson, Arizona. Major: Soil and Water & Remote Sensing (Dept. of Soil, Water and Environmental Science).
Dissertation Title: *Biophysical Interpretation of Spectral Indices for Semi-Arid Soil and Vegetation Types in Niger*
Advisor: Dr. Alfredo R. Huete
- 1988 M.S., Wageningen University, University for Life Sciences, Wageningen, The Netherlands.
Major Field: *Soils and Remote Sensing*. Department of Soil Science (1988)
Thesis: *Isolation of Soil, Vegetation, and Atmosphere Signals over Maricopa Agricultural Center*
Advisors: Drs. Toon Janse and Hein ten Berge
- 1986 B.S., Wageningen University, University for Life Sciences, Wageningen, The Netherlands.
Major Field: *Soils*. Department of Soil Science (1986)

CHRONOLOGY OF EMPLOYMENT

- 2017 – Professor, School of Natural Resources and the Environment & School of Geography and Development, University of Arizona, Tucson. Joint appointments: Arid Lands Resource Sciences, Remote Sensing & Spatial Analysis (Chair).
- 2011 – Director, Arizona Remote Sensing Center, University of Arizona, Tucson.
- 2011 – 17 Associate Professor, School of Natural Resources and the Environment & School of Geography and Development, University of Arizona, Tucson.
2013. *Visiting Professor*, Universidad de Sonora, División de Ciencias Biológicas y de La Salud, Departamento de Investigaciones Científicas y Tecnológicas, Hermosillo MX. Feb-May, 2013.
2012. *Visiting Professor*, Universidad Católica de Chile (UC), Centro Cambio Global UC. Departamento de Ecosistemas y Medio Ambiente, Santiago, Chile, August-December, 2012.
- 2010 – 11 *Associate Director*, Arizona Remote Sensing Center, University of Arizona, Tucson, AZ

- 2009 – 11 *Assistant Professor, School of Natural Resources and the Environment - Office of Arid Lands Studies, University of Arizona, Tucson, AZ.*
- 2005 – 11 *Assistant Professor, School of Geography and Development, University of Arizona, Tucson, AZ. (shared appointment)*
- 2005 – 09 *Assistant Professor, Office of Arid Lands Studies, University of Arizona, Tucson, AZ.*
- 2002 – 05 *Research Scientist, University of Arizona, Office of Arid Lands Studies, Tucson, AZ.*
- 2000 – 02 *Research Scientist, Météo France, Centre Nationale de la Recherche Scientifique (NSF equivalent), Toulouse, France.*
- 1999 – 00 *Research Scientist, Météo France, Centre Nationale de Recherches Météorologiques, Toulouse, France.*
- 1995 – 99 *Assistant Research Scientist, Department of Soil, Water and Environmental Science, University of Arizona, Tucson, AZ.*
- 1990 – 95 *Graduate Research Associate, Department of Soil and Water and Environmental Science, University of Arizona, Tucson, AZ.*

HONORS AND AWARDS

Individual:

- 2012 Visiting Professor Award, Pontificia Universidad Católica de Chile, Facultad de Agronomía e Ingeniería Forestal, Santiago, Chile.
- 2008 Invited Researcher (Phenology) by Drs. Susana Bautista & Francisco Rodríguez. Awarded by the University of Alicante, Spain, Dec 18-23, 2008.
- 1994 Gamma Sigma Delta Honor Society

Students' Honors and Awards While Under My Supervision:

- Jahan Kariyeva - 3rd place for best Remote Sensing paper award at AAG conference 2009. NASA Goddard summer internship (2009).
- Roy Petrakis - Graduate Student Travel Awards 2014/2015.
- Jeff Gillan – University of Arizona Fellow; ARCS Fellowship awarded for 2016/17, \$9,000 stipend plus tuition.
- Pratima KC - Natural Resources Tuition Scholarship; CALS Graduate College Fellowship; Lionel D. Drake Scholarship; Fannin, Joe K Scholarship; Pistor-Stanley Scholarship in Agriculture; Clifford W. Carstens, Jr. Endowment; Ervin H. Zube Scholarship (20015-2016).
- Jayanti Pokhrel - Honorable Mention Award for Poster Presentation in Earth Week (Title: Effect of Land Use and Land Cover Change in Buffer Zones of Chitwan National Park); Clifford W. Carsten's, Jr. Endowment Award by Agriculture and Life Sciences for the academic year 2016-2017.

SERVICE/OUTREACH (LIMITED TO PERIOD IN CURRENT RANK)

(last 5 years. Period [.] indicates completed, hyphen [-] ongoing)

Local/state Outreach

- 2011 – 12 Program committee for the Southwest US Region, American Society of Photogrammetry and Remote Sensing, Fourth Annual Phenology Research and Observations of Southwest Ecosystems Symposium (PROSE), Tucson, Arizona, October 1, 2011/2012.

National/international service/outreach

2014. *Co-Chair Oral and Poster Sessions: B53. Multi-Sensor Long-Term Data Records of Land Surface Parameters for Global Change Research, San Francisco, Dec 15-19, 2014. American Geophysical Union (AGU).*

2013. *Co-Chair Oral and Poster Sessions: B33M. Multi-sensor Long-Term Land Surface Data Records, San Francisco, Dec 11-12, 2013. American Geophysical Union (AGU).*
- 2012 – 13 *Chair and member of the organizing committee for the NASA MEASURES International Vegetation Index and Phenology Workshop - 30 Years of VI and Phenology Observations. Tucson, Arizona. Jan 23-24, 2013.*
- 2012 – *Associate Editor of Ecological Applications.*

University Committees

2016. *GIDP Faculty Director search committee.*
- 2015 – 16 *Review/Search committee “Imaging” cluster hire (5 faculty), University of Arizona.*
- 2014 – *Chair Graduate Interdisciplinary Graduate Programs Advisory Council (GIDPAC), University of Arizona.*
- 2009 – *Chair Remote Sensing and Spatial Analysis Graduate Interdisciplinary Program (RSSA GIDP), University of Arizona.*
- 2006 – *Faculty member, Arid Lands Resource Sciences Graduate Interdisciplinary Program (ALRS GIDP), University of Arizona.*
- 2007 – *Faculty member of Graduate Certificate in Geographic Information Science at the University of Arizona.*

Departmental Committees

- 2017 – *Chair Faculty status/P&T Committee (School of Natural Resources and the Environment).*
- 2016 – *Technology Committee (School of Geography and Development).*
- 2015 – *Executive Committee – Strategic Planning Committee (School of Natural Resources and the Environment).*
- 2014 – 16 *Faculty status/P&T Committee (School of Natural Resources and the Environment).*
- 2014 – *IT committee, School of Natural Resources and the Environment.*
- 2009 – *Faculty member Curriculum Development Committee (School of Natural Resources and the Environment).*
- 2006 – *Annual Performance Review Committee (Office of Arid Lands Studies/ SNRE).*
- 2014 – 15 *Move Committee (Biosc. East to ENR2; School of Natural Resources and the Environment).*
- 2006 – 16 *Faculty Member, Graduate Committee (School of Geography and Development).*
- 2013 – 15 *Tucson Festival of Books - School of Natural Resources and the Environment organizing Committee.*
2012. *Member, Governance committee (School of Natural Resources and the Environment).*
- 2008 – 14 *Member, Technology Committee (School of Geography and Development).*

College and University Committees

- 2017 *CALS Post Tenure Review Committee, Chair.*
- 2016 - *CALS Post Tenure Review Committee co-chair.*
- 2015 – 16 *CALS Post Tenure Review Committee Member.*
- 2013 *Chair Review committee of Agricultural Experiment Station - CRIS proposal (UA/CALS).*
- 2009 – *Institute of the Environment (University of Arizona; faculty member).*

Other committees (internal/external)

- 2015 – *Board of Directors, Toleo LCC; UAV’s William Aymard.*
- 2010 – 15 *Board of Directors, International Center for Remote Sensing of Environment, Tucson, Arizona, USA.*

Journal Reviewer (2005-present)

- 2008 – Ecological Applications (Subject editor since 2012)
- 2005 – Remote Sensing of Environment (16)
- 2012 – Remote Sensing (4)
- 2013 Catena
- 2005 – 11 I.E.E.E. Transactions on Geoscience & Remote Sensing (2)
- 2005 – 13 International Journal of Remote Sensing (3)
- 2005 – 11 Journal of Arid Environment (5)
- 2010 – 11 Agricultural and Forest Meteorology (4)
- 2010 Environmental Research Letters (2)
- 2010 Global and Planetary Change (1)
- 2010 Journal of Vegetation Science (1)
- 2010 Landscape Ecology (1)
- 2009 Global Change Biology (1)
- 2005 – 08 Ecological Modeling (2)
- 2008 Australian Journal of Agricultural Research (1)
- 2008 Biotropica (1)
- 2008 Geophysical Research Letters (1)
- 2008 International Journal of Wildland Fire (1)
- 2008 Journal of Geophysical Research (1)
- 2008 Land Degradation & Development (1)
- 2007 Journal of Applied Meteorology and Climatology (1)
- 2005 Photogrammetric Engineering & Remote Sensing (1)

Proposal reviewer

- 2015 NSF review panel Coupled Human and Natural Systems.
- 2013 NSF Geography proposal review.
- 2012 Panelist on NASA proposal review panel “NASA Water Resources” January 10-13, Washington DC. (3 primary reviews; 2 secondary reviews, 11 total).

Societies

- 1992 – American Geophysical Union (AGU).
- 2005 – Association of American Geographers (AAG).
- 2012 – Ecological Society of America (ESA).
- 2005 – 13 American Society of Photogrammetry and Remote Sensing (ASPRS).

PUBLICATIONS/CREATIVE ACTIVITY (PUBLISHED OR ACCEPTED)

*Note: * = substantially based on work done as a graduate student.*

Note: bold = My name and the names of students mentored who are co-authors are identified in **bold** to facilitate identification during the review process

Note: # = chapters presenting original research not reported elsewhere.

Chapters in scholarly books and monographs

- #Romo Leon, J.R., **Willem J.D. van Leeuwen**, A.E. Castellanos Villegas, 2013. Percepción Remota Para el Análisis de la Distribución y Cambios de Uso de Suelo en Zonas Áridas y Semiáridas. **In** E. Sánchez Flores and R.E. Díaz Caravantes (Eds.), Dinámicas locales del cambio global. Aplicaciones de percepción remota y análisis espacial en la evaluación del uso del territorio. Ttranslation: Remote Sensing Analysis of the Land Use Distribution and Change in Arid and

Semi-arid land. In: Local dynamics of global change. Remote sensing applications and spatial analysis of land use evaluation. Ciudad Juárez, Mexico: Universidad Autónoma de Ciudad Juárez Press.

#Pamela Lynn Nagler, B.B. Maruthi Sridhar, Aaryn Dyami Olsson, **Willem J.D. van Leeuwen**, and Edward P. Glenn, 2012. Hyperspectral Remote Sensing Tools for Quantifying Plant Litter and Invasive Species in Arid Ecosystems In: Hyperspectral remote sensing of vegetation Edts. Prasad Srinivasa Thenkabail; J G Lyon; Alfredo Huete; Boca Raton, FL, CRC Press.

Huete, A., Didan, K., **Willem J.D. van Leeuwen**, Miura, T., Glenn, E., 2010. PART V: MODIS Vegetation Indices. In: *Land Remote Sensing and Global Environmental Change: NASA's Earth Observing System and the Science of ASTER and MODIS*. B. Ramachandran, C. Justice and M. Abrams (Editors). Springer-Verlag, New York. 750 pp.

#**van Leeuwen, Willem J.D.**, 2009. Chapter 3: Visible, Near-IR & Shortwave IR Spectral Characteristics of Terrestrial Surfaces. In: *Handbook of Remote Sensing*. Editors: T. Warner, D. Nellis and G. Foody. SAGE. 33-50.

Refereed journal articles (published or accepted in final form) –

1. **Petrakis, R., van Leeuwen, Willem J.D.**, Villarreal, M.L., Tashjian, P., Dello Russo, R., & Scott, C., 2017. Historical Analysis of Riparian Vegetation Change in Response to Shifting Management Objectives on the Middle Rio Grande. *Land*, 6, 29
2. **El-Vilaly, M.A.S.**, Didan, K., Marsh, S.E., **van Leeuwen, Willem J.D.**, Crimmins, M.A., & Munoz, A.B. 2017. Vegetation productivity responses to drought on tribal lands in the four corners region of the Southwest USA. *Frontiers of Earth Science*, pp 1-15. 10.1007/s11707-017-0646-z
3. **Glade, F.E.**, Miranda, M.D., Meza, F.J., & **van Leeuwen, Willem J.D.** (2016). Productivity and phenological responses of natural vegetation to present and future inter-annual climate variability across semi-arid river basins in Chile. *Environmental Monitoring and Assessment*, 188, 676
4. **Wu, J.**, Cecilia Chavana-Bryant, Neill Prohaska, Shawn P. Serbin, Kaiyu Guan, Loren P. Albert, Xi Yang, **Willem J.D. van Leeuwen**, Anthony John Garnello, Giordane Martins, Yadvinder Malhi, France Gerard, Raimundo Cosme Oliviera, and Scott R. Saleska, 2016. Convergence in relations among leaf traits, spectra and age across diverse canopy environments and two contrasting tropical forests, *New Phytologist* doi:10.1111/nph.14051.
5. **Xu, C.**, Zeng, W., Huang, J., Wu, J. and **Willem J.D. van Leeuwen**, 2016. Prediction of Soil Moisture Content and Soil Salt Concentration from Hyperspectral Laboratory and Field Data. *Remote Sensing* 8: 42.
6. **Czyzowska-Wisniewski, E. H.**, **Willem J. D. van Leeuwen**, K. K. Hirschboeck, S. E. Marsh, and W. T. Wisniewski. 2015. Fractional snow cover estimation in complex alpine-forested environments using an artificial neural network. *Remote Sensing of Environment*, 156:403-417. doi:10.1016/j.rse.2014.09.026.
7. Flesch, A. D., Hutto, R. L., **van Leeuwen, Willem J. D.**, Hartfield, K. and Jacobs, S. 2015. Spatial, Temporal, and Density-Dependent Components of Habitat Quality for a Desert Owl. *PloS one* 10: e0119986.
8. **Romo-Leon, J.R.**, **Willem J.D. van Leeuwen**, and A. Castellanos-Villegas, Land Use and Environmental Variability Impacts on the Phenology of Arid Agro-Ecosystems. *Environmental Management*, 2015: p. 1-15.
9. **Shepard, C.**, M. G. Schaap, M. A. Crimmins, **Willem J. D. van Leeuwen**, and C. Rasmussen. 2015. Subsurface soil textural control of aboveground productivity in the US Desert Southwest. *Geoderma Regional* 4:44-54. doi:10.1016/j.geodrs.2014.12.003.

10. Carrière, Y., B. Degain, K. A. Hartfield, K. D. Nolte, S. E. Marsh, C. Ellers-Kirk, **Willem J.D. van Leeuwen**, L. Liesner, P. Dutilleul, and J. C. Palumbo, 2014. Assessing Transmission of Crop Diseases by Insect Vectors in a Landscape Context. *Journal of Economic Entomology*, *Forum*, 107:1-10. <http://dx.doi.org/10.1603/EC13362>.
11. **Romo Leon, J. R., Willem J.D. van Leeuwen**, A. Catellanos-Villegas, 2014. Using Remote Sensing Tools to Assess Land Use Transitions in Unsustainable Arid Agroecosystems. *Journal of Arid Environments*, 106:27-35. doi:10.1016/j.jaridenv.2014.03.002.
12. **Sanchez-Mejia, Z. M.**, S. A. Papuga, J. B. Swetish, **Willem J. D. van Leeuwen**, D. Szutu, and K. Hartfield. 2014. Quantifying the influence of deep soil moisture on ecosystem albedo: The role of vegetation. *Water Resources Research* 50:4038-4053.
13. **van Leeuwen, Willem J.D.**, Kyle Hartfield, Marcelo Miranda, Francisco J. Meza, 2013. Trends and ENSO/AAO driven variability in NDVI derived productivity and phenology alongside the Andes Mountains. In: Monitoring Global Vegetation with AVHRR NDVI3g Data (1981-2011), *Remote Sens.*, 5, 1177-1203.
14. Casady, G.M., **Willem J.D. van Leeuwen**, Reed, B.C., 2013. Estimating Winter Annual Biomass in the Sonoran and Mojave Deserts with Satellite- and Ground-Based Observations. *Remote Sensing*, 5, 909-926.
15. **Landau, K.I., Willem J.D. van Leeuwen**, 2012. Fine scale spatial urban land cover factors associated with adult mosquito abundance and risk in Tucson, Arizona. *Journal of Vector Ecology*, 37(2):407-418.
16. **Kariyeva, J., Willem J. D. van Leeuwen**, C. A. Woodhouse, 2012. Impacts of climate gradients on the vegetation phenology of major land use types in Central Asia (1981-2008) *Frontiers of Earth Science*, 6(2):206-225.
17. **Kariyeva, J., Willem J.D. van Leeuwen**, 2012. Phenological dynamics of irrigated and natural drylands in Central Asia before and after the USSR collapse. *Agriculture, Ecosystems & Environment*, 162, 77-89.
18. **Romo Leon, J. R., Willem J.D. van Leeuwen, G. M. Casady**, 2012. Using MODIS-NDVI for the Modeling of Post-Wildfire Vegetation Response as a Function of Environmental Conditions and Pre-Fire Restoration Treatments. *Remote Sensing*. 4(3): 598-621.
19. **Villarreal, M.L., Willem J.D. van Leeuwen, Jose Raul Romo-Leon**. 2012. Mapping and monitoring riparian vegetation distribution, structure and composition with regression tree models and post-classification change metrics, *International Journal of Remote Sensing*, 33:13, 4266-4290.
20. Hartfield, K.A., **Landau, Katheryn I., Willem J.D. van Leeuwen**, 2011. Fusion of High Resolution Aerial Multispectral and LiDAR Data: Land Cover in the Context of Urban Mosquito Habitat. *Remote Sensing*, 3(11): 2364-2383.
21. Olsson, A., **Willem J.D. van Leeuwen**, and Stuart E. Marsh. 2011. Feasibility of Invasive Grass Detection in a Desertscrub Community Using Hyperspectral Field Measurements and Landsat TM Imagery. *Remote Sensing*, 3(10):2283-2304.
22. **Davison, J.E., Breshears, D.D., van Leeuwen, W.J.D., & Casady, G.M.**, 2011. Remotely sensed vegetation phenology and productivity along a climatic gradient: on the value of incorporating the dimension of woody plant cover. *Global Ecology and Biogeography*, 20, 101–113.
23. **van Leeuwen, Willem J.D.**, Chuck Hutchinson, Sam Drake, Brad Doorn, Verne Kaupp, Tim Haithcoat, Vladislav Likholetov, Ed Sheffner, and Dave Tralli, 2011. Benchmarking enhancements to a decision support system for global crop production, *Expert Systems with Applications* 38(7): 8054-806.
24. **Kariyeva, Jahan, and Willem J.D. van Leeuwen**, 2011. Environmental Drivers of NDVI-based Vegetation Dynamics in Central Asia, Special Issue Remote Sensing in Climate Monitoring and Analysis - *Remote Sensing*, 3(2), 203-246.

25. **Casady, G.M., Willem J.D. van Leeuwen**, S.E. Marsh. 2010. Evaluating post wildfire vegetation dynamics as a response to multiple environmental determinants. *Environmental Modeling and Assessment*. 15(5): 295-307.
26. Gu, Yingxin, Jesslyn F. Brown, Tomoaki Miura, **Willem J.D. van Leeuwen**, and Bradley C. Reed. 2010. Phenological classification of the United States: A geographic framework for extending multi-sensor time-series data, *Remote Sens.*, 2, 526-544.
27. **van Leeuwen, Willem J.D., Davison J.E., Casady, G.M.**, and Marsh S.E., 2010. Phenological Characterization of Desert Sky Island Vegetation Communities with Remotely Sensed and Climate Time Series Data. *Remote Sens.*, 2, 388-415.
28. **van Leeuwen, Willem J.D., G. M. Casady, D. G. Neary, S. Bautista, J. A. Alloza, Y. Carmel, L. Wittenberg, D. Malkinson, B. J. Orr**, 2010. Monitoring post-wildfire vegetation response with remotely sensed time-series data in Spain, USA and Israel. *International Journal of Wildland Fire*, 19: 75-93.
29. **Huang, C., Geiger, E., Willem J.D. van Leeuwen**, and Marsh, S., 2009. Discrimination of invaded and native species sites in a semi-desert grassland using MODIS multi-temporal data. *International Journal of Remote Sensing*, Vol. 30, No. 4, pp 897–917.
30. Michael A. White, Kirsten M. de Beurs, Kamel Didan, David W. Inouye, Andrew D. Richardson, Olaf P. Jensen, John Magnuson, John O’Keefe, Gong Zhang, Ramakrishna R. Nemani, **Willem J.D. van Leeuwen**, Jesslyn F. Brown, Allard de Wit, Michael Schaeppman, Xioamao Lin, Michael Dettinger, Amey Bailey, John Kimball, Mark D. Schwartz, Dennis D. Baldocchi, John T. Lee, William K. Lauenroth, 2009. Intercomparison, interpretation, and assessment of spring phenology in North America estimated from remote sensing for 1982 to 2006. *Global Change Biology*, Volume 15, Number 10, October 2009, pp. 2335-2359(25).
31. **van Leeuwen, Willem J.D.**, 2008. Monitoring the Effects of Forest Restoration Treatments on Post-Fire Vegetation Recovery with MODIS Multitemporal Data. *Sensors*, 8, 2017-2042.
32. **van Leeuwen, Willem J.D.**, B. Orr, S. Marsh, S. Herrmann, 2006. Multi-Sensor NDVI Data Continuity: Uncertainties and Implications for Vegetation Monitoring Applications. *Remote Sensing of Environment*, 100(1):67–81.
33. **van Leeuwen, Willem J.D.**, Barron J. Orr, 2006. Spectral Vegetation Indices and Uncertainty: Insights from a User’s Perspective. *IEEE Transactions on Geoscience and Remote Sensing*. 44(7):1931–1933.
34. Fang, H, S. Liang, M. P. McClaran, **Willem J.D. van Leeuwen**, S. Drake, S. E. Marsh, A. Thomson, R. C. Izaurralde, J. Norman, 2005. Biophysical characterization and management effects on semiarid rangeland observed from Landsat ETM+ data. *IEEE Transactions on Geoscience and Remote Sensing*, 43(1):125–134.
35. **van Leeuwen, Willem J.D.** and J-L. Roujean, 2002. Land Surface Albedo from the Synergistic use of Polar (EPS) and Geo-Stationary (MSG) Observing Systems: An Assessment of Physical Uncertainties. *Remote Sensing of Environment*, 81(2–3):273–289.
36. **van Leeuwen, Willem J.D.**, A. R. Huete and T. W. Laing, 1999. MODIS Vegetation Index Compositing Approach: A Prototype with AVHRR data. *Remote Sensing of Environment*, 69:264–280.
37. Miura, T., Huete, A.R., **Willem J.D. van Leeuwen**, Didan, K., 1998. Vegetation detection through smoke-filled AVIRIS images: An assessment using MODIS band passes. *Journal of Geophysical Research*, 103, 32001– 32011.
38. Justice, C., Hall, D., Salomonson, V., Privette, J., Riggs, G., Strahler, A., Lucht, W., Myneni, R., Knjazihhin, Y., Running, S., Nemani, R., Vermote, E., Townshend, J., Defries, R., Roy, D., Wan, Z., Huete, A., **Willem J.D. van Leeuwen**, Wolfe, R., Giglio, L., Muller, J-P., Lewis, P., and Barnsley, M, 1998. The Moderate Resolution Imaging Spectroradiometer (MODIS): Land remote sensing for global change research. *IEEE Transactions on Geoscience and Remote Sensing*. 36(4):1228–1249.

39. Huete, A.R., H.Q. Liu, K. Batchily, and **Willem J.D. van Leeuwen**, 1997. A Comparison of Vegetation Indices over a Global Set of TM Images. *Remote Sensing of Environment*, 59:440–451.
40. ***van Leeuwen, Willem J.D.**, A.R. Huete, C.L. Walthall, S.D. Prince, A. Begué and J.L. Roujean, 1997. Deconvolution of remotely sensed spectral mixtures for retrieval of LAI, fAPAR and soil brightness. *Journal of Hydrology*. 188–189:697–724.
41. ***van Leeuwen, Willem J.D.** and A.R. Huete, 1996. Effects of standing litter on the biophysical interpretation of plant canopies with spectral indices. *Remote Sensing of Environment*, 55:123–138.
42. Franklin, J., J. Duncan, A.R. Huete, ***Willem J.D. van Leeuwen**, X. Li, and A. Begué, 1994. Radiative transfer in shrub savanna sites in Niger – preliminary results from HAPEX-II-Sahel: 1. Modeling surface reflectance using a geometrical approach. *Agricultural and Forest Meteorology*, 69:223–245.
43. ***van Leeuwen, Willem J.D.**, A.R. Huete, J. Duncan, and J. Franklin, 1994. Radiative transfer in shrub savanna sites in Niger – preliminary results from HAPEX-II-Sahel: 3. Optical dynamics and vegetation index sensitivity to biomass and plant cover. *Agricultural and Forest Meteorology*, 69:267–28
44. Huete, A.R., G. Hua, J. Qi, A. Chehbouni, and ***Willem J.D. van Leeuwen**, 1992. Normalization of Multispectral Red and NIR Reflectances with the SAVI. *Remote Sensing of Environment*, 41:143–154.
45. Kustas, W.P., D.C. Goodrich, M.S. Moran, S.A. Amer, L.B. Bach, J.H. Blanford, A. Chehbouni, H. Claassen, W.E. Clements, P.C. Doraiswamy, P. Dubois, T.R. Clarke, C.S.T. Daughtry, D.I. Gellman, T.A. Grant, L.E. Hipps, A.R. Huete, K.S. Humes, T.J. Jackson, T.O. Keefer, W.D. Nichols, R. Parry, E.M. Perry, R.T. Pinker, P.J. Pinter, Jr., J. Qi, A.C. Riggs, T.J. Schmugge, A.M. Shutko, D.I. Stannard, E. Swiatek, ***Willem J.D. van Leeuwen**, J. van Zyl, A. Vidal, J. Washburne, and M.A. Wertz, 1991. An Interdisciplinary Field Study of the Energy and water Fluxes in the Atmosphere-Biosphere System over Semiarid Rangelands: Description and some Preliminary Results. *Bulletin of the American Meteorological Society*, 72(11):1683-1706.

Scientific report (peer-reviewed by scientific panel)

Huete, A.R., Justice, C. and **Willem J.D. van Leeuwen**, 1999. MODIS Vegetation Index (MOD13) - Algorithm Theoretical Basis Document. Version 3. April 30, 131 p.
http://modis.gsfc.nasa.gov/data/atbd/atbd_mod13.pdf. Accessed June 2016.

Chapters in peer-reviewed proceedings (original research)

Orr, B.J., **G.M. Casady, D.G. Tuttle, Willem J.D. van Leeuwen, L.E. Baker, C.L. McDonald**, and S.E. Marsh. 2005. Phenology and trend indicators derived from spatially dynamic bi-weekly satellite imagery to support ecosystem monitoring. In: Gottfried, G.J., Gebow, B.S., Eskew, L.G., and Edminster, C.B. (compilers). *Connecting Mountain Islands and Desert Seas: Biodiversity and Management of the Madrean Archipelago II*. May 11–15, 2004; Tucson, AZ. Proceedings RMRS-P-36. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, pp. 206–211.

Electronic publications (web development)

Van Leeuwen, Willem J.D., Mike Crimmins, Kyle Hartfield, Stuart Marsh, Jeremy Weiss, Pratima KC, Yuta Torrey, Matt Rahr, 2014- present. *DroughtView - Keeping an Eye on Drought: Satellite Based Drought Monitoring and Assessment*. Tucson, AZ: Arizona Remote Sensing Center, University of Arizona. Online: <http://DroughtView.arizona.edu>. Accessed June 2016.

Marsh, S., B. Orr, **Willem J.D. van Leeuwen**, A. Thwaites, A-M. White, W. Grunberg, K. Jain, C. Baker, J. Dale, L. Baker, Y. Yang, C-L. Kao, N. Lerman, J. Saints, A. Olsson, M-S. Kang, G. Casady, G. Oldham, C. Wallace, C. McDonald, M. Hertzfeld, D. Tuttle, E. Benally, K. Mauz, S. Herrmann, C. Hutchinson, B. Hutchinson, G. Ruyle, L. Howery, and P. Krausman. 2000 – 2006. *RangeView: Geospatial Tools for Natural Resource Management*. Tucson, AZ: Arizona Remote Sensing Center, University of Arizona. Online: <http://rangeview.arizona.edu>. 321 indexed web pages. Accessed May 2010.

Electronic publications (online articles/report, not peer-reviewed)

Kamel Didan, Armando Barreto Munoz, Tomoaki Miura, Javzandulm, Tsend-Ayush, Xiaoyang Zhang, Mark Friedl, Josh Gray, **Willem J.D. van Leeuwen**, Jeffrey Czapla-Myers, Stacie Doman Bennett, Calli Jenkerson, Tom Maiersperger, David Meyer, 2015. Multi-Sensor Vegetation Index and Phenology Earth Science Data Records Algorithm Theoretical Basis Document And User Guide - Version 4.0

https://vip.arizona.edu/documents/VIP_ESDRs_ATBD_UsersGuide_03_22_2016_V4.pdf

Accessed 6-16-2016.

van Leeuwen, Willem J.D., Kyle Hartfield, Marcelo Miranda, Francisco J. Meza, 2013. Línea de investigación en monitoreo ambiental. Pp 29-32. In: Fortalecimiento de capacidades para enfrentar los desafíos del cambio global en Chile. Edt F. Meza.

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Villarreal, M. L., **van Leeuwen, Willem J.D.**, Romo, J.R., and Hubbard, J. A. 2011. Assessing landscape dynamics using multitemporal remotely sensed imagery in the Sonoran Desert Network. Natural Resource Technical Report NPS/SODN/NRTR—2011/513. National Park Service, Fort Collins, Colorado.

https://irma.nps.gov/App/Reference/DownloadDigitalFile?code=442962&file=SODNLandscapeDynamicsImagery_NRTR2011513_2176700.pdf. Accessed June, 2016.

Losleben, Mark and **Willem J.D. van Leeuwen**, 2007. Our changing biological and climate calendar, or, what is phenology and why should we care? *Arid Lands Newsletter* No. 59, August, 2007.

<https://ag.arizona.edu/OALS/ALN/aln59/losleben.html> Accessed June 2016.

Morisette, Jeffrey, Jaime E. Nickeson, Sebastien Garrigues, Frédéric Baret, Alfredo Huete, Kamel Didan, Tomoaki Miura, **Willem J.D. van Leeuwen**, Mark Friedl, Report from the CEOS Land Product Validation – Topical Workshop on the Validation of Global Vegetation Indices and their Time Series. *The Earth Observer*, 18(6), November – December, 2006.

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Huete, Alfredo R., Karl F. Huemmrich, Tomoaki Miura, Xiangming Xiao, Kamel Didan, **Willem J.D. van Leeuwen**, Forrest Hall, Compton J. Tucker, Vegetation Index greenness global data set. White Paper for NASA ESDR/CDR, April, 2006.

http://cce.nasa.gov/mtg2008_ab_presentations/VI_Huete_whitepaper.pdf Accessed June 2016.

Work in Progress

- **Glade, Francisco**, Marcelo D. Miranda, Francisco J Meza, **Willem J.D. van Leeuwen**, 2016. Productivity and phenological responses of natural vegetation to present and future inter-annual climate variability across semi-arid basins in Chile. *Environmental Monitoring and Assessment* (in review).

- **Leroux C, Miranda M, van Leeuwen, Willem J.D, Reyes S, Hartfield K.**, 2016 Climatic variability and urbanization as drivers of change in vegetation phenology and productivity in a Mediterranean environment: evidence from Santiago, Chile. *Landscape and urban planning*, Submitted.

MEDIA

- 2015 Research videos – BS-GIST and MS-GIST programs e.g. <https://youtu.be/2TeVg0zS94Q>
- 2010 *Introducing the National Phenology Network*, interviews and B-roll; <http://www.usanpn.org/intro-video>
- 2009 School of Natural Resources and the Environment project highlights website
- 2006 Participant in UA Promotional Video (2006): Remote Sensing and Spatial Analysis. Graduate Interdisciplinary Ph.D. program.

CONFERENCES/ SCHOLARLY PRESENTATIONS (LAST 5 YEARS)

Invited Presentations

- 2016 **van Leeuwen, Willem J.D.**, “REMOTE SENSING OF BIODIVERSITY.” 17-10-2016. Geospatial Workshop, Centro del Cambio Global y la Sustentabilidad en el Sureste, Villahermosa, Mexico.
- 2015 **van Leeuwen, Willem J.D.**, “REMOTE SENSING LAND SURFACE PHENOLOGY AND LAND COVER CHANGE.” 24-9-2015. Geospatial Workshop, Centro del Cambio Global y la Sustentabilidad en el Sureste, Villahermosa, Mexico.
- 2013 **van Leeuwen, Willem J.D.** “Trends and ENSO/AAO driven variability in productivity and phenology in South America: comparing NDVI-VIP and NDVI3g results” Vegetation Index and Phenology Workshop - 30 Years of VI and Phenology Observations. Tucson, Arizona. Jan 24, 2013.
- 2012 **van Leeuwen, Willem J.D.** “A Hierarchical Landscape Inventory, Monitoring, Assessment and Modeling Framework: Impact of Scales on Land Use and Land Cover”, NEON Spatial and Temporal Scaling in Continental-Scale Ecology Workshop. 11-12 June 2012, Boulder, CO USA.
- 2012 **van Leeuwen, Willem J.D.** "Water resource management Workshop. La Serena, Chile October 25-28, 2012.
- 2011 **van Leeuwen, Willem J.D.** "Phenology and climate". Catolica University, Santiago, Chile October 27, 2011.
- 2011 **van Leeuwen, Willem J.D.** "Innovation in remote sensing: multi-scale applications". Keynote: Remote Sensing Workshop. Santiago, Chile October 25-28, 2011.

Seminars (Invited)

- 2013 **van Leeuwen, Willem J.D.**, Bioclimatic Variability and Change in the Americas- Multi-Scale Case Studies, Universidad de Sonora, Departamento de Investigaciones Científicas y Tecnológicas y su programa de posgrado, May 3, 2013.
- 2011 **van Leeuwen, Willem J.D.**, Remotely Sensed Phenology. Tree Ring Laboratory University of Arizona, October 20, 2011.
- 2009 **van Leeuwen, Willem J.D.**, Climate and phenology. A video-conferencing seminar as part of a Climate change course using Access Grid at the University of Arizona, UNM and NAU. University of Arizona, February 24, 2009.

Conference presentations

Willem J.D. van Leeuwen, Kyle Hartfield, Remotely Sensed Identification, Monitoring and Assessment of Natural Response and Disturbance Processes at Yearly and Decadal Scales. AGU Conference, Dec 9-13, 2013 San Francisco, CA, USA.

Czyzowska, E., **van Leeuwen, Willem J.D.**, Hirschboeck, K., Marsh, S., Wisniewski, W., 2013, Snow cover estimation using IKONOS and Landsat, Western Snow Conference, April 15-18, Jackson Hole, Wyoming, USA.

Conference poster presentations

2016 Kyle Hartfield and **Willem J.D. van Leeuwen**, 2016. Quantifying Woody Cover: Multi Spatio-Temporal Remote Sensing Classification and Regression Methods. ESRI conference June 27 - July 1, 2016. San Diego.

Kyle Hartfield, **Willem J.D. van Leeuwen**, Michael Crimmins, Stuart Marsh, Yuta Torrey, Matt Rahr, Jeremy Weiss, and Pratima K C, DroughtView: Satellite-based Drought Monitoring and Assessment – An update. ESRI conference June 27 - July 1, 2016. San Diego.

2015 Kyle Hartfield, **Willem J.D. van Leeuwen**, Michael Crimmins, Stuart Marsh, Yuta Torrey, Matt Rahr, Jeremy Weiss, and Pratima K C, DroughtView: Satellite-based Drought Monitoring and Assessment American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19, 2015.

Roy Petrakis, Paul Tashjian, Gina Dello Russo, Bruce Thomson, and **Willem J.D. van Leeuwen**. “Multi-Source Remote Sensing to Observe Impacts of Fluctuating Management and Climate on Riparian Vegetation of the Rio Grande: 1935 to 2014” American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19, 2015.

Karen Wang, Victoria Scaven, **Willem van Leeuwen**, David Moore, 2015. “What are the phenological responses of poplar trees to the end of the growing season?” University of Arizona, Dec 10, 2015.

2014 Kyle A. Hartfield, **Willem J. D. Van Leeuwen**, Michael Crimmins, Stuart E. Marsh, Yuta Torrey, Matt Rahr, and Barron J. Orr. “DroughtView: Satellite Based Drought Monitoring and Assessment.” American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19, 2014.

Roy Petrakis, Kyle A. Hartfield, Pedro Barrera, **Willem J. D. Van Leeuwen**, Shirley A. Papuga, and Christopher A. Scott. “Multi-Temporal Remote Sensing Data for Modeling of Dryland Evapotranspiration and Land Cover Change.” American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19, 2014.

Willem J. D. Van Leeuwen and Kyle A. Hartfield. “Remote Sensing of Breaks and Trends in Vegetation Time Series Data Due to Fire and Drought.” American Geophysical Union Fall Meeting, San Francisco, CA, December 15-19, 2014.

Willem J.D. van Leeuwen, Kyle Hartfield, Roy Petrakis, and Chris Scott. Applications of Multi Scale Remotely Sensed Public Data for Land and Water Use Change Assessments. III International Climate Change Adaptation Conference - Adaptation Futures 2014, 12-16 May 2014 in Fortaleza/Ceara, Brazil.

2013 Kyle Hartfield, **Willem J.D. van Leeuwen**, Barron Orr, David Moore, Stuart Marsh, 2013. Remote Sensing and GIS - Natural Resource Applications at Multiple Spatial and Temporal Scales. GIS Career Day, University of Arizona, March 6, Tucson, AZ, USA.

2012 M.A. El Vilaly, K. Didan, **Willem J.D. van Leeuwen**, Stuart E. Marsh, M A. Crimmins 2012. A Remote Sensing Approach to Drought Monitoring for Range management at the Hopi Tribe and Navajo Nation. AGU Conference, Dec. San Francisco.

Elzbieta H. Czyzowska, **Willem J. D. van Leeuwen**, Stuart E. Marsh, Katherine K. Hirschboeck, Wit T. Wisniewski, Improved Remotely Sensed Snow Cover Estimation Using an Artificial Neural Network AGU Conference, Dec. San Francisco.

AWARDED GRANTS AND CONTRACTS

Federal/Agency

- 2016 – 21 Lower Gila River Vegetation Mapping Using Novel LiDAR and Multispectral Data Fusion and Classification Techniques to Inform Riparian Habitat Restoration; **W. van Leeuwen (PI)**, K Hartfield and T. Swetnam Co-PI's. \$249,999.00 My effort 80% research; Award Period: 8/2016 – 7/2021 Sponsor: Bureau of Land Management (BLM).
- 2016 – 18 Inspiring the Next Generation Naval Scientists and Engineers in NROTC Battalions Through UG Navy-Relevant Geospatial Experiences; S.P. Chavarria (PI); **W. van Leeuwen (Senior Personnel)**; \$747,843.00. My effort: 8% teaching. Award Period: 10/2016 – 9/2019. Sponsor: Office of Naval Research.
- 2015 – 18 Snow Water with Artificial Neural Network (SWANN); \$845,000; **W. van Leeuwen (PI)**. K. Hirschboeck Co-PI. My effort: 75% research.; Award Period: 12/2015 – 11/2018; Sponsor: Salt River Project.
- 2014 – 17 Collaborative Research: Slowing the Expansion of Woodlands and Increasing the Resilience of Grasslands in the Southern Great Plains; \$1,370,000 Brad Wilcox (PI @ TAMU); \$237,500 subcontract to **W. van Leeuwen (PI @UA)**; My effort: 80% research; S. Archer Co-PI @ UA) 1/09/14-8/31/17. Sponsor = NSF
- 2013 Land Cover for the Tijuana River Watershed; \$24,998.00, PI S. Marsh, **Co-PI W. van Leeuwen**. My effort 50% research. Sponsor = Environmental Protection Agency.
2012. Lidar and multispectral data for irrigation assessments \$15,000, **PI = W. van Leeuwen** My effort 40% research.; Co-PIs S. Marsh, S. Yool. Sponsor = Bureau of Reclamation.
2012. Pronghorn and owl habitat characterization ~\$25,000, **PI = W. van Leeuwen**. My effort 100% research. Sponsor = Fish and Wildlife Service.
- 2010 – 12 Assessing and supporting drought monitoring needs on the Hopi and Navajo Nations PI = M. Crimmins; **Co-PIs W. van Leeuwen**, S. Marsh, D. Ferguson. \$253,121 9/01/10-8/31/12, My effort: 20% research. Sponsor = NOAA.
- 2009 – 12 Assessing emerging hazards and adaptive capacities in southwestern metropolises: The case of mosquito disease vectors. PI = P. Robbins; **Co-PIs JP Jones, Andrew Comrie, W. van Leeuwen**. \$299,891 9/1/09- 6/1/12, My effort 20% research. Sponsor = NSF.
- 2008 – 13 Vegetation Phenology and Enhanced Vegetation Index Products from Multiple Long Term Satellite Data Records. PI = K. Didan; **Co-PIs W. van Leeuwen** and J. Czapla-Meyers; M. Friedl (Univ. Boston, T. Miura (Univ. of Hawaii), Calli Jenkerson (USGS), \$3,099,782 8/2008 – 7/2013. My effort: 12% research. Sponsor = NASA.

UA or Private Foundations

- 2016 Coupled above- and belowground instrumentation arrays to support the development of Local Elevational Network Sites (LENSES) \$67,220. 2016. PI = Greg Barron-Gafford, **Co-I's D. Moore, R. Gallery, W. van Leeuwen**. My effort: 25% research. Sponsor = Water, Environmental, and Energy Solutions (WEES) at Univ. of Arizona.

- 2014 Drought Assessment and Ecological Forecasting for the Southwest Through Improved Data Integration and Analysis. \$45,000. 2014-2015. **PI = W. van Leeuwen**. My effort: 40% research. Sponsor: Water, Environmental, and Energy Solutions (WEES) at Univ. of Arizona.
- 2013 Ground Penetrating Radar: A New Perspective on the Carbon Cycle? \$10,000. 2013-2014. **PI = Steve Archer, Collaborators: W. van Leeuwen, S. Marsh and C. Rasmussen**. My effort: 25% research. Sponsor = Faculty Exploratory Research Grant Proposal, UA Institute of the Environment.
2011. Remotely Sensed Vegetation mapping of woody Cover in Cienega Creek Basin. \$25,000. 2011-2012. **W. van Leeuwen (PI)**, My effort: 100% research. Sponsor = The Nature Conservancy.

International

- 2012 – 17 Innovative Science and Influential Policy Dialogues for Water Security in the Arid Americas. **PI F. Meza (Chile, Universidad Catolica) Co-PI C. Scott (UA); Elma Montaña (Co-PI – Argentina), Alfredo Ribeiro Neto (Co-PI – Brazil), Nicolás Pineda (Co-PI), Co-investigator: W. van Leeuwen**, \$800,000. 2012-2017. My effort: 10% research. Sponsor: Inter American Institute for Global Change Research.
- 2013 – 14 Estequiometria ecológica y percepción remota para el análisis de la distribución espacial e invasibilidad de zacate Buffel (*Cenchrus ciliaris*), en zonas prioritarias del Noroeste de México, Alejandro E. Castellanos V. (**PI**, Universidad de Sonora), José R. Romo L. (**co-PI**), **W. van Leeuwen (Collaborator)**. MX\$410,500. My effort: 25% research. Sponsor: CONABIO, MX.
- 2008 – 11 Post-Fire Vegetation Recovery: Impacts of Restoration and Environment. **PI = W. van Leeuwen**, Co-PIs B. Orr, G. Casady, D. Neary, C. Allen, S. Bautista, L Wittenberg, D. Malkinson, \$100,000 2008 – 2011. My effort: 50% research. Sponsor = International Arid Lands Consortium.

