

## CURRICULUM VITAE

### **Niall P. HANAN**

Plant and Environmental Sciences (PES) & Jornada Basin LTER  
New Mexico State University  
Las Cruces, NM 88003

#### Web Profiles

<https://savannalab.nmsu.edu>  
<https://tinyurl.com/HananRgate>  
<https://tinyurl.com/HananScholar>

#### **a) Education**

BSc 1985. Liverpool Polytechnic-John Moore's University, Applied Biology, 1<sup>st</sup> Class Honors  
PhD 1990. Queen Mary College, University of London, Biology

#### **b) Academic Positions**

September 2019 – present: **Associate Department Head**, Plant and Environmental Sciences, New Mexico State University, Las Cruces, New Mexico  
January 2017 – present: **Co-PI**, Jornada Basin Long Term Ecological Research (LTER) Program  
January 2017 – present: **Professor**, Plant and Environmental Sciences, New Mexico State University, Las Cruces, New Mexico  
January 2011-December 2016: **Senior Scientist & Professor**, Geospatial Sciences Center of Excellence (GSCE), South Dakota State University, Brookings, South Dakota.  
January 2017 – present: **Adjunct Faculty**, Natural Resource Management, South Dakota State University, Brookings, South Dakota  
January 2011 – present: **Adjunct Faculty**, Department of Ecosystem Science and Sustainability, Colorado State University, Fort Collins, Colorado  
September 2007-July 2008: **Fulbright Research and Teaching Scholar**, Université de Bamako, Mali and Institut Polytechnique Rural de Katibougou, Koulikoro, Mali  
July 2007 – December 2010: **Senior Research Scientist/Research Professor**, Natural Resource Ecology Laboratory, CSU  
January 2002 – December 2009: **Faculty Member**, NSF-IGERT Program for Interdisciplinary Mathematics, Ecology, and Statistics (PRIMES), CSU  
September 2001 – December 2010: **Faculty Member**, Graduate Degree Program in Ecology, CSU  
June 2001 – December 2010: **Academic Joint Appointment**, Department of Forest, Rangeland and Watershed Stewardship, CSU  
February 2001 – June 2007: **Research Scholar III/Research Associate Professor**, Natural Resource Ecology Laboratory, CSU  
July 1998 – January 2001: **Research Scholar II/Research Assistant Professor**, Natural Resource Ecology Laboratory, CSU

#### **c) Other Positions**

January 1998 – June 1998: **Research Scientist**, Bren School of Environmental Science & Management, University of California, Santa Barbara & Carnegie Institution of Washington, Department of Plant Biology, Stanford.  
May 1995 – August 1997: **Research Scientist**, Winand Staring Centre (now Wageningen University Research), Wageningen, The Netherlands.

August 1993 – February 1995: **Assistant Research Scientist**, Geography Dept., Univ. of Maryland.  
 September 1990 – July 1993: **Research Associate**, Geography Department, Univ. of Maryland.  
 August 1988-March 1989: **Ecologist**, Ecological Monitoring Center/United Nations Development Program, Senegal.  
 July 1986-September 1986: **Assistant Scientist**, Tropical Development & Research Institute, Zimbabwe  
 July 1985-December 1985: **Assistant Scientist**, Pest & Vector Management Dept, Tropical Development & Research Institute, London U.K.

**d) Publications (last four years; papers led by \* graduate student, + post-doc;)**

- 85. Hanan, N. P.**, Limaye, A. S. and Irwin, D. E., 2020, Use of Earth observations for actionable decision making in the developing world, *Frontiers in Environmental Science*, **8**: 601340 (DOI: 10.3389/fenvs.2020.601340).
- 84. Hanan, N. P.** and Anchang, J., 2020, Satellites could soon map every tree on earth, *Nature* **587**, (5 November 2020), 42-43. (DOI: 10.1038/d41586-020-02830-3).
- 83.** +Kumar, S. S., Prihodko, L., Lind, B. M., Anchang, J. Y., Ji, W., Ross, C. W., Kahiu, N., Velpuri, N., and **Niall P. Hanan**, 2020, Remotely sensed thermal decay rate: an index for vegetation monitoring, *Scientific Reports*, **10**, 9812 (DOI: 10.1038/s41598-020-66193-5).
- 82.** \*Samasse, K., **Hanan, N. P.**, Anchang, J., and Diallo, Y., 2020. A high-resolution cropland map for the West African Sahel based on high-density training data, Google Earth Engine, and locally optimized machine learning. *Remote Sensing*, **12**, (9) 1436 (DOI: 10.3390/rs12091436).
- 81.** +Anchang, J. Y., Prihodko, L., Ji, W., Kumar, S. S., Ross, C. W., Yu, Q., Lind, B. M., Sarr, M. A., Diouf, A. A. and **Hanan, N. P.**, 2020, Towards operational mapping of woody canopy cover in tropical savannas using Google Earth Engine, *Frontiers in Environmental Science*, **8**, 4 (DOI: 10.3389/fenvs.2020.00004).
- 80.** \*Brennan, J., Johnson, P., and **Hanan, N. P.**, 2020, Comparing stability in random forest models to map northern Great Plains plant communities in pastures occupied by prairie dogs using Pleiades imagery, *Biogeosciences*, **17**, 1281-1292 (DOI: 10.5194/bg-17-1281-2020).
- 79.** +Kumar, S. S., **Hanan, N. P.**, Prihodko, L., Anchang, J. Y., Ross, C. W., Ji, W., Lind, B. M., 2019, Alternative vegetation states in tropical savannas: the search for consistent signals in diverse remote sensing data, *Remote Sensing*, **11**, (7) 815 (DOI: 10.3390/rs11070815).
- 78.** +Anchang, J. Y., Prihodko, L., Kaptué, A. T., Ross, C. W., Ji, W., Kumar, S. S., Lind, B. M., Sarr, M. A., Diouf, A. A. and **Hanan, N. P.**, 2019, Trends in woody and herbaceous vegetation in the savannas of West Africa, *Remote Sensing*, **11**, (5) 576 (DOI:10.3390/rs11050576).
- 77.** +Ji, W., **Hanan, N. P.**, Browning, D. M., Monger, H. C., Peters, D. P. C., Bestelmeyer, B. T., Archer, S. R., Ross, C. W., Lind, B. M., Anchang, J., Kumar, S. S., Prihodko, L., 2019, Constraints on shrub cover and shrub-shrub competition in a U.S. southwestern desert, *Ecosphere* **10**, 2, e02590 (DOI: 10.1002/ecs2.2590).
- 76.** \*Lind, B. M., **Hanan, N. P.**, Gigliotti, L. C., Allen, R. L. McHenry, A., and Gardiner, A., 2019, Termite diversity along a catena in southern Kruger Park, South Africa, *African J. Ecology*, **57**, 160-165 (DOI: 10.1111/aje.12569).
- 75.** \*Samasse, K., **Hanan, N. P.**, Tappan, G., Diallo, Y., 2018, Assessing cropland area in West Africa for agricultural yield analysis, *Remote Sensing*, **10**, 1785 (DOI: 10.3390/rs10111785).
- 74.** Koerner, S.E., M.D. Smith, D.E. Burkepile, **N.P. Hanan**, M.L. Avolio, S.L. Collins, A.K. Knapp, N.P. et al., 2018, Resolving variation in herbivore effects on plant biodiversity – change in dominance as a global mechanism, *Nature Ecology and Evolution*, **2**, 12, 1925-1932. (DOI: 10.1038/s41559-018-0696-y; *Nature* SharedIt Link: <https://rdcu.be/bajCn>).

73. Peters, D. Burruss, N., Rodriguez, L., McVey, D. S., Elias, E., Derner, J., Schrader, T. S., Yao, J., Pauszek, S., Lombard, J., Archer, S., Bestelmeyer, B., Browning, D., Brungard, C., Hatfield, J., **Hanan, N. P.**, Herrick, J., Okin, G., Sala, O., Savoy, H. Vivoni, E., 2018, An integrated view of complex landscapes: a big data-model integration approach to trans-disciplinary research, *BioScience*, **68**, 653-669 (DOI: 10.1093/biosci/biy069).
72. **Hanan, N. P.**, 2018, Agroforestry in the Sahel, *Nature Geoscience*, **11**, 296-297 (DOI: 10.1038/s41561-018-0112-x; *Nature SharedIt Link*: <https://rdcu.be/LGq4>).
71. \*Ross, C.W., L. Prihodko, J. Anchang, S. Kumar, W. Ji, and **N. P. Hanan**. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Runoff Modeling, *Scientific Data*, **5**, 180091 (DOI: 10.1038/sdata.2018.91; [www.nature.com/articles/sdata201891.pdf](http://www.nature.com/articles/sdata201891.pdf)).
70. \*Kahiu, M. N. and **Hanan, N. P.**, 2018, Fire in Sub-Saharan Africa: the fuel, cure and connectivity hypothesis, *Global Ecology and Biogeography*, **27**, (7) 946-957 (DOI: 10.1111/geb.12753).
69. \*Axelsson, C. R. and **Hanan, N. P.**, 2018, Rates of woody encroachment in African savannas reflect water constraints and fire disturbance, *Journal of Biogeography*, **45**, (6) 1209-1218 (DOI: 10.1111/jbi.13221).
68. \*Kahiu, M. N. and **Hanan, N. P.**, 2018, Estimation of woody and herbaceous leaf area index in Sub-Saharan Africa using MODIS data, *JGR-Biogeosciences*, **123** (1) 3-17 (DOI: 10.1002/2017JG004105).
67. Griffith, D. M., Lehmann, C. E. R., Strömberg, C. A. E., Parr, C. L., Pennington, R. T., Sankaran, M., Ratnam, J., Still, C. J., Powell, R. L., **Hanan, N. P.**, Nippert, J. B., Osborne, C. P., Good, S., Anderson, T. M., Holdo, R. M., Veldman, J. W., Durigan, G., Tomlinson, K. W., Hoffmann, W. A., Archibald, S. and Bond, W. J., 2017, Comment on “The extent of forest in dryland biomes”, *Science*, **358** (6365), eaao1309 (DOI: 10.1126/science.aao1309).
66. Gilmanov, T. G, Morgan, J. A., **Hanan, N. P.**, Wylie, B. K., Rajan, N., Smith, D. P., Howard, D. M., 2017, Productivity and CO<sub>2</sub> exchange of Great Plains ecoregions. I. Shortgrass steppe: Flux-tower estimates, *Rangeland Ecology & Management*, **70**, 700-717 (DOI: 10.1016/j.rama.2017.06.007).
65. \*Axelsson, C. R., and **Hanan, N. P.**, 2017, Patterns in woody vegetation structure across African savannas, *Biogeosciences*, **14**, 3239-3252 (DOI:10.5194/bg-14-3239-2017).
64. \*Dohn, J. Augustine, D. J., **Hanan, N. P.**, Ratnam, J. and Sankaran, M., 2017, Spatial vegetation patterns and neighborhood competition among woody plants in an East African savanna, *Ecology*, **98** (2), 478-488 (DOI: 10.1002/ecy.1659).

#### e) Published Data Sets (led by \* graduate student, + post-doc)

16. Hanan, N.P., L. Prihodko, C.W. Ross, G. Bucini, and A.T. Tredennick. 2020. Gridded Estimates of Woody Cover and Biomass across Sub-Saharan Africa, 2000-2004. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1777>.
15. \*Samasse, K., Hanan, N. P., Anchang, J., and Diallo, Y. (2020). High-Resolution Cropland Map for the West African Sahel. Google Earth Engine Visualization, <https://savannalabnmsu.users.earthengine.app/view/wa-cropmap-30m>.
14. +Anchang, J.Y., L. Prihodko, A.T. Kaptue, C.W. Ross, W. Ji, S.S. Kumar, B. Lind, M.A. Sarr, A.A. Diouf, and N.P. Hanan. 2020. Woody and Herbaceous Vegetation Change across the Savannas of West Africa, 1982-2013. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1738>. Google Earth Engine Visualization, <https://savannalabnmsu.users.earthengine.app/view/wavetrends>.
13. +Ji, W. and Hanan N.P., 2019, High resolution shrub cover raster maps of the Jornada Basin LTER, including JER and CDRRC (2011), Environmental Data Initiative, DOI: <https://doi.org/10.6073/pasta/2bbec949ad08c7feb1d5cec6570b65b8>.

12. \*Axelsson, C. and Hanan N.P., 2018, Supplementary materials from: Rates of woody encroachment in African savannas reflect water constraints and fire disturbance, *J. Biogeography*, DOI: 10.1111/jbi.13221.
11. +Ross, C.W., L. Prihodko, J. Anchang, S. Kumar, W. Ji, and N.P. Hanan. 2018. Global Hydrologic Soil Groups (HYSOGs250m) for Curve Number-Based Runoff Modeling. ORNL DAAC, Oak Ridge, Tennessee, USA. <https://doi.org/10.3334/ORNLDAAC/1566>.
10. \*Kahiu, M. N. and Hanan, N. P., 2017, Data from: Estimation of woody and herbaceous leaf area index in Sub-Saharan Africa using MODIS data, Dryad Digital Repository, <http://doi.org/10.5061/dryad.v5s0j>.
9. \*Axelsson, C. and Hanan N.P., 2017, Supplementary Information from: Patterns in woody vegetation structure across African savannas, *Biogeosciences*, DOI: 10.5194/bg-14-3239-2017.
8. +Kaptue, A.T., N.P. Hanan, L. Prihodko, and J.A. Ramirez. 2015. Spatio-temporal Characteristics of Rainfall in Africa, 0.25 degrees, from 1998-2012. Data set. Available on-line from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1263>.
7. +Kaptue, A. T., Hanan, N. P., and Prihodko, L., 2015, Location and permanency of water bodies in the African Sahel region from 2003-2011. Data set. Available on-line from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, USA. <http://dx.doi.org/10.3334/ORNLDAAC/1269>.
6. \*Tredennick AT, Hanan NP, Martinez K, Keita L, 2014, Data from: Effects of tree harvest on the stable-state dynamics of savanna and forest. Dryad Digital Repository. <http://dx.doi.org/10.5061/dryad.vg121>
5. Caroline E. R. Lehmann, C. E. R. Anderson, M. T., Sankaran, M., Higgins, S. I., Archibald, S., Hoffmann, W. A., Hanan, N. P., et al., 2014, Savanna Vegetation-Fire-Climate Relationships Differ Among Continents, *Science* **343**, 548-552 Supplementary Information available on-line <http://www.sciencemag.org/content/343/6170/548/suppl/DC1>], DOI: 10.1126/science.1247355.
4. +Sankaran M., N. P. Hanan, and R. J. Scholes. 2007. Characteristics of African Savanna Biomes for Determining Woody Cover. Data set. Available on-line [<http://www.daac.ornl.gov>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. doi:10.3334/ORNLDAAC/850
3. +Sankaran, M. Hanan, N. P. et al., 2005, Determinants of woody cover in African savannas, Data set. *Nature*, **438**, 846-849, Supplementary Information. Available on-line [<http://www.nature.com/nature/journal/v438/n7069/supinfo/nature04070.html>], DOI: 10.1038/nature04070
2. Privette J. L., M. Mukelabai, N. Hanan, and Z. Hao. 2005. SAFARI 2000 Surface Albedo and Radiation Fluxes at Mongu and Skukuza, 2000-2002. Data set. Available on-line [<http://daac.ornl.gov/>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. DOI: 10.3334/ORNLDAAC/786
1. Hanan N., R. Scholes, and M. Coughenour. 2004. SAFARI 2000 Meteorological Tower Measurements, Kruger National Park, 2000-2002. Data set. Available on-line [<http://daac.ornl.gov/>] from Oak Ridge National Laboratory Distributed Active Archive Center, Oak Ridge, Tennessee, U.S.A. DOI: 10.3334/ORNLDAAC/761

## **f) Research Support**

### **\*Active Projects**

**Patterns and drivers of tree height and biomass in water limited (tropical and temperate) ecosystems**, PI Q Yu, Co-Investigators, NP Hanan, W Ji, JY Anchang, L Prihodko, MG Ryan and R. St. Hilaire, 12/1/2020-11/30/2023, NASA GEDI Science Team (\$499,566)

**LTER: Long-term research at the Jornada Basin (LTER VII)**, PI D Peters, Co-Investigators NP Hanan and B Bestelmeyer, 11/1/2020-10/31/2024, National Science Foundation, LTER Program (\$4,508,000)

**Improving estimates of vegetation structure in global savannas and drylands with ICESat-2**, PI NP Hanan, Co-Investigators, L Prihodko, J Anchang, W Ji, CW Ross, Q Yu, 6/1/2020-5/31/2023, NASA ICESat-2 Science Team (\$617,500)

**Range monitoring for decision support, pastoral livelihoods and food security in arid and semi-arid East and Southern Africa**, PI NP Hanan, Co-Investigator J. Anchang, 11/1/19-10/31/22, NASA-SERVIR Applied Sciences Team (\$646,871)

**Enhancing Native American education and land management through research, collaboration and training on remote sensing of southwest rangelands**, PI D Dye (SIPI), Co-Investigators L. Prihodko (NMSU), NP Hanan (NMSU), 11/1/2019-10/31/2021, USDA-NIFA Tribal College Research Area of Expertise (TCRAE) (\$500,000)

## **f) Graduate students**

**\*Graduate Student Advisees / Graduate Committees** (Degree, Program, Year Graduated, Role) Christoffer Axelsson (PhD, GSE-SDSU, 2018, Chair), Jameson Brennan (PhD, NRM-SDSU, 2019, Member), Gabriela Bucini (PhD, GDPE-CSU, 2010, Chair), Kurt Chowanski (PhD, NRM-SDSU, 2016, Member), Kathy Corbin (MSc, Atmos-CSU, 2005, Member), Amadou Dieye (PhD, GSE-SDSU, 2013, Member), Justin Dohn (MSc, GDPE-CSU, 2015, Chair), Mikaela Hoellrich (PhD, PES-NMSU, Member), Njoki Kahiu (PhD, GSE-SDSU, 2018, Chair), David Kimiti (PhD, Range Science-NMSU, 2017, Member), Steven Lee (PhD, Biology-NMSU, Member), Zhengpeng Li (PhD, GSE-SDSU, 2016, Member), Brianna Lind (MSc, Biology-SDSU, 2015, Chair & PhD, PES-NMSU, Chair), William Sean Mason (MSc, EE-NMSU, 2017, Member), Seth Munson (PhD, GDPE-CSU, 2008, Member), Nick Parazoo (MSc, Atmos-CSU, 2006, Member), Andrew Philpott (MSc, Atmos-CSU, 2006, Member), Kaboro Samasse (PhD, GSE-SDSU, Chair), William Sea (PhD, GDPE-CSU, 2007, Chair), Andrew Schuh (PhD, Atmos-CSU, 2008, Member), Mandira Sigdel-Phuyal (MSc, Geography-SDSU, 2016, Chair), Sanath Sathyachandran (PhD, GSE-SDSU, 2014, Member), Andrew Tredennick (PhD, GDPE-CSU, 2014, Chair), Tony Swemmer (PhD, Biology-CSU, 2006, Member), Caroline Toth (MSc, PES-NMSU, Chair), Tyler Turk (PhD, ANRS-NMSU, Member), Emma White (PhD, GSE-SDSU, 2014, Member), Robert Wojcikiewicz (MSc, PES-NMSU, Chair).

## **g) Post-doctoral advisees**

### **\* Postdoctoral Advisees:**

Dr. Julius Anchang (2017-present), Dr. Bok-Haeng Baek (2004), Dr. Wenjie Ji (2017-present), Dr. Armel Kaptué (2011-2015), Dr. Sanath Sathyachandran Kumar (2017-2018); Dr. Mahesh Sankaran (2002-2006); Dr. Jayashree Ratnam (2002-2006), Dr. C. Wade Ross (2017-present), Dr. Christopher Williams (2004-2007), Dr. Qiuyan Yu (2018-present).