

Derek B. Van Berkel

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Research

My research examines the human dimensions of land-cover/land-use change and ecosystem services at diverse scales. It aims to use spatial analysis and geovisualizations of social and environmental data and spatial thinking to develop solutions for today's most pressing environmental challenges. Within this growing body of interdisciplinary work, I leverage social theory, big data, machine learning, spatial-temporal computer modeling (e.g. agent-based and cellular automata) and spatial statistics.

Professional Appointments

School for Environment and Sustainability, University of Michigan, Assistant Professor, September 2019 - Present.

Utah State University, Department of Environment and Society, Adjunct Faculty Member, August 2018 - Present.

US Environmental Protection Agency, Oak Ridge Institute for Science and Education, Postdoctoral Researcher, June 2017 – Present.

North Carolina State University, Center for Geospatial Analytics, Postdoctoral Researcher, August 2014 – May 2017.

The Ohio State University, Department of Geography, Postdoctoral Researcher, July 2012 – July 2014.

Education

Ph.D. Spatial Analysis and Decision Support, VU University Amsterdam, 2012.

Dissertation: "Mapping, modeling and discussing rural development options".

Committee: P.H. Verberg, T. Veldkamp, M. Pinto Correia, A. Bregt and F. Berkhout.

M.S. Human Geography and Urban Planning, Utrecht University, 2007.

B.A. Human Geography, University of Calgary, 2004.

Publications

Peer-Reviewed Journal Articles

1. Jennifer Koch, Monica A Dorning, **Van Berkel, Derek B**, Scott M Beck, Georgina M Sanchez, Ashwin Shashidharan, Lindsey S Smart, Qiang Zhang, Jordan W Smith, and Ross K Meentemeyer.

- Modeling landowner interactions and development patterns at the urban fringe. *Landscape and Urban Planning*, 182:101–113, 2019
2. Caleb Gallemore, Darla Munroe, and **Derek Van Berkel**. Rural-to-urban migration and the geography of absentee non-industrial private forest ownership: A case from southeast ohio. *Applied Geography*, 96:141–152, 2018
 3. Johannes Hermes, **Derek Van Berkel**, Benjamin Burkhard, Tobias Plieninger, Nora Fagerholm, Christina von Haaren, and Christian Albert. Assessment and valuation of recreational ecosystem services of landscapes, 2018
 4. **Derek B Van Berkel**, Payam Tabrizian, Monica A Dorning, Lindsey Smart, Doug Newcomb, Megan Mehaffey, Anne Neale, and Ross K Meentemeyer. Quantifying the visual-sensory landscape qualities that contribute to cultural ecosystem services using social media and lidar. *Ecosystem Services*, 2018
 5. **Derek B Van Berkel**, Bronwyn Rayfield, Sebastián Martinuzzi, Martin J Lechowicz, Eric White, Kathleen P Bell, Chris R Colocousis, Kent F Kovacs, Anita T Morzillo, Darla K Munroe, et al. Recognizing the “sparsely settled forest”: Multi-decade socioecological change dynamics and community exemplars. *Landscape and Urban Planning*, 170:177–186, 2018
 6. Monica A Dorning, **Derek B Van Berkel**, and Darius J Semmens. Integrating spatially explicit representations of landscape perceptions into land change research. *Current Landscape Ecology Reports*, pages 1–16, 2017
 7. Darla K Munroe, Caleb Gallemore, and **Derek Van Berkel**. Hot tub cabin rentals and forest tourism in hocking county, ohio. *Revue économique*, 68(3):491–510, 2017
 8. Brian R Pickard, **Derek Van Berkel**, Anna Petrasova, and Ross K Meentemeyer. Forecasts of urbanization scenarios reveal trade-offs between landscape change and ecosystem services. *Landscape Ecology*, 32(3):617–634, 2017
 9. Boris T van Zanten, **Derek B Van Berkel**, Ross K Meentemeyer, Jordan W Smith, Koen F Tieskens, and Peter H Verburg. Continental-scale quantification of landscape values using social media data. *Proceedings of the National Academy of Sciences*, page 201614158, 2016
 10. Anita T Morzillo, Chris R Colocousis, Darla K Munroe, Kathleen P Bell, Sebastián Martinuzzi, **Derek B Van Berkel**, Martin J Lechowicz, Bronwyn Rayfield, and Brian McGill. “communities in the middle”: Interactions between drivers of change and place-based characteristics in rural forest-based communities. *Journal of Rural Studies*, 42:79–90, 2015
 11. **Derek B Van Berkel** and Peter H Verburg. Spatial quantification and valuation of cultural ecosystem services in an agricultural landscape. *Ecological indicators*, 37:163–174, 2014
 12. **Derek B Van Berkel**, Darla K Munroe, and Caleb Gallemore. Spatial analysis of land suitability, hot-tub cabins and forest tourism in appalachian ohio. *Applied Geography*, 54:139–148, 2014
 13. Darla K Munroe, **Derek B Van Berkel**, Peter H Verburg, and Jeffrey L Olson. Alternative trajectories of land abandonment: causes, consequences and research challenges. *Current Opinion in Environmental Sustainability*, 5(5):471–476, 2013
 14. **Derek B Van Berkel** and Peter H Verburg. Combining exploratory scenarios and participatory backcasting: using an agent-based model in participatory policy design for a multi-functional landscape. *Landscape ecology*, 27(5):641–658, 2012

15. **Derek B Van Berkel**, Sónia Carvalho-Ribeiro, Peter H Verburg, and Andrew Lovett. Identifying assets and constraints for rural development with qualitative scenarios: a case study of castro laboreiro, portugal. *Landscape and Urban Planning*, 102(2):127–141, 2011
16. **Derek B Van Berkel** and Peter H Verburg. Sensitising rural policy: Assessing spatial variation in rural development options for europe. *Land Use Policy*, 28(3):447–459, 2011
17. Andrew Lovett, Sonia Carvalho Ribeiro, **Derek Van Berkel**, Peter Verburg, and Ana Firmino. Representing and communicating rural futures through 3d landscape visualizations—experiences from the rufus project. *Peer reviewed proceedings of digital landscape architecture*, pages 261–268, 2010
18. Peter H Verburg, **Derek B Van Berkel**, Anne M van Doorn, Michiel van Eupen, and Harm van den Heiligenberg. Trajectories of land use change in europe: a model-based exploration of rural futures. *Landscape ecology*, 25(2):217–232, 2010

Conference Papers and Book Chapters

19. Ashwin Shashidharan, **Derek B Van Berkel**, Ranga Raju Vatsavai, and Ross K Meentemeyer. Futures-amr: Towards an adaptive mesh refinement framework for geosimulations. In *GIScience 2018 International Conference on Geographic Information Science*, pages –. Springer, 2018
20. Stacy Supak, Gene Brothers, Ladan Ghahramani, and **Derek Van Berkel**. Geospatial analytics for park & protected land visitor reservation data. In *Analytics in Smart Tourism Design*, pages 81–109. Springer, 2017
21. Qiang Zhang, Ranga Raju Vatsavai, Ashwin Shashidharan, and **Derek Van Berkel**. Agent based urban growth modeling framework on apache spark. In *Proceedings of the 5th ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data*, pages 50–59. ACM, 2016
22. Ashwin Shashidharan, **Derek B Van Berkel**, , Ranga Raju Vatsavai, and Ross K Meentemeyer. pfutures: A parallel framework for cellular automaton based urban growth models. In *International Conference on Geographic Information Science*, pages 163–177. Springer, 2016
23. A Petrasova, V Petras, **Derek Van Berkel**, BA Harmon, H Mitasova, and RK Meentemeyer. Open source approach to urban growth simulation. *Int Arch Photogramm Remote Sens Spat Inf Sci*, 41:B7, 2016

Papers Under Review or Revision

24. Darla Munroe, Jeff Olson, **Derek Van Berkel**, Yuxi Zhao & Calleb Gallemore. Multifunctional forest transitions in exurban landscapes reflect heterogeneous land-use and ownership motivations of new arrivals and long-term residents. Major Revisions: *Land Use Policy*.
25. **Derek Van Berkel**, Ashwin Shashidharan, Rua Mordecai, Raju Vatsavai, Anne Petrasova, Vaclav Petras, Helena Mitasova, John Vogler, & Ross Meentemeyer. Simulation of urbanization scenarios across the southern Atlantic States, U.S. *Futures*
26. Payam Tabrizian, **Derek Van Berkel**, Helena Mitasova, & Ross Meentemeyer. Modeling restorative potential of urban environments by coupling viewscape analysis of lidar data with experiments in immersive virtual environments. *Landscape and Urban Planning*

Work in Progress

27. Jason Matney, **Derek Van Berkel, D.**, Stacey Supak, Brian Reich & Koen Tieskens. National Park Service Visitation Estimation using Social Media and Site Specific Attributes. Target: *Proceedings of the National Academy of Sciences of the United States of America*
28. **Derek Van Berkel**, Koen Tieskens, Brois van Zanten, Payam Tabrizian, Jordan Smith, Megan Mehaffey, Anne Neale, & Peter Verburg. Social Media: A "Big Data" Lens for Mapping and Quantifying Human-Nature Interactions. Target *Nature Sustainability*
29. **Derek Van Berkel**, Peng Gao, John Kupfer, Adam Terando. Long-term Impacts of Urbanization in the Southeastern U.S.
30. Pen Gao, John Kupfer, **Derek Van Berkel**, Adam Terando. Impacts of Projected Landscape Transformation on Conservation Corridors in the Southeastern U.S.
31. **Derek Van Berkel**, Amy Lesen, Brian Stone, & Angela Chalk. Improving community science through photovisualization surveys.
32. Jeff Olson, **Derek Van Berkel**, Megan Mehaffey, & Darla Munroe. A typology of amenity landscapes: characterizing the new rural geography of the United States.
33. **Derek Van Berkel**, Jeremy Baynes, Sean Woznicki, Megan Mehaffey, & Anne Neale. What is the value of America's Nature: a travel cost social media method.
34. **Derek Van Berkel**, Caleb Gallemore, Whalen Dillon, & Ross Meentemeyer. Spatial scraping: leveraging geolocated 'big data' from the World Wide Web.
35. Jordan Smith, Georgina Sanchez, Lindsey Smart, **Derek Van Berkel**, & Ross Meentemeyer. Methodological and analytical frontiers for linking human dimensions theory and methods to land system agent-based models.

Other Publications

36. **Derek Van Berkel**, & Peter Verburg. (2011). De toekomst van het landschap in de Achterhoek: Sturende factoren en wensen voor de toekomst. *Institute for Environmental Studies, VU University*.
37. Lael Gilbert, L., Jordan Smith, **Derek Van Berkel**, & Boris van Zanten. (2016). Tapping into social media data to identify the public's most valued landscapes. (IORT-PR-2016-07). *Logan, UT: Institute of Outdoor Recreation and Tourism, Utah State University*.
38. Lael Gilbert, Jordan Smith, Brois van Zanten, & **Derek Van Berkel** (2016). Mapping landscape values using social media. (IORT-PR-2016-06). *Logan, UT: Institute of Outdoor Recreation and Tourism, Utah State University*.

Grants, Fellowships, & Awards

Professional Development Award for Postdoctoral Researchers (\$500), Graduate School and the Office of Postdoctoral Affairs, North Carolina State University, 2016.

Institute for Environmental Studies Graduate Fellowship, VU University, 2009–2011.

Land Dynamics Group Graduate Fellowship, Wageningen University, 2007–2009.

Field research grant (€ 1100), Utrecht University, 2006.

Undergraduate Deans list (\$500), University of Calgary, 2004.

Grant Activity

Lindquist, M.(PI), Weber, S. (PI), Van Berkel, D. (PI). MICHR Translational Research Diamond Program: *Scaling the perceptual and physiological benefits of urban greenspace*, 2019. Funded: \$15,000. *Proposal accepted June 2019*

Lesen, A.(PI), Chalk, A. (PI), Stone, B. (Co-PI), Van Berkel, D (Co-PI). Tulane University Community Engaged Research grant program: *Community-Science for Measuring and Monitoring the Effects of Greening on the Urban Heat Island Effect, Water Uptake, and Social Challenges*, 2018. Funded: \$3825. *Proposal accepted December 2018*

Smith, J (PI), Byrne, B (Co-PI), Van Berkel, D (Co-PI), Dorning, M (Co-PI), Milnor, A (Co-PI), Utah State University Public Lands Initiative Grants: *Identifying Recreation Use Adjacent to Zion National Park through Social Media Data*, 2018. Requested: \$55,358. *Proposal declined August 2018*

Smith, J (PI), Dorning, M (Co-PI), Van Berkel, Derek (Co-PI), Beck, S (Co-PI), City of Boulder Open Space & Mountain Parks Funded Research Program: *Identifying the Benefits of Cultural Resources and Iconic Views Through Social Media.*, 2018-2019. Funded: \$14,885. *Proposal accepted July 2018*

Darling, J (PI), Davis, A., Van Berkel, D., Neale, A., Mehaffey, M. Environmental Protection Agency Pathfinder Innovation Projects: *Big Data and Social Media: A New Lens for Quantifying Human-Nature Interactions*, 2017. \$10,000 requested for phase II funding. *Proposal declined Sept. 2017*

Cutts, B (PI), Van Berkel B., Stevenson K. & Rivers III, L. National Institutes of Environmental Health Science (NIEHS): *Environmental health justice: Engaging Raleigh youth in a multi-modal analysis of urban greening initiatives*, 2016. \$25,000 requested as seed grant for larger submission. *Proposal declined funding Feb. 2017*

Meentemeyer, R.(PI), Van Berkel, D. (Co-PI), Mordecai, R., Albright, E., Olander, & L., Jowers, K. EPA-G2016-STAR-A1: Investigating differential impacts of parks, greenways and neighborhood canopy on human health and well-being across multiple scales, 2016. *Proposal declined funding Jan. 2017* \$599,710 requested for two years. Passed first round of evaluation with a favorable rating based on its scientific and technical merit. *Proposal declined funding Dec. 2016*

Noss, R. (PI), Jacques, P. (PI), Meentemeyer, R. (PI), Reece, J., Laitner, J., Giri, C., Donely, A., Costanza, J., Terando, A. & Van Berkel, D. National Science Foundation (NSF) - Dynamics of Coupled Natural and Human Systems (CNH), Proposal # 1617201. 2015. \$1,578,224 requested for four years. *Proposal declined funding May 2016.*

Munroe, D. (PI), Van Berkel, D.(Co-PIs). National Science Foundation (NSF) - Geography and Spatial Sciences Program (GSS), Proposal # 0826775. 2013. \$200,437.97 requested for two years. *Proposal declined funding May 2013.*

Invited Presentations and Colloquia

2017: Ecology, Evolution, and Behavior departmental seminar, Wake Forest University, North Carolina. Invited presentation "*Leveraging Social media for understanding interactions with the environment*", April 12.

2016: Academy of Disaster Reduction and Emergency Management, Beijing Normal University, China. Invited presentation "*Leveraging social media for disaster monitoring and ecosystem services assessment*", October 27.

2016: Leibniz Universität Hannover, Germany, Invited presenter "*Workshop on Assessment and Economic Valuation of recreational Ecosystem Services of Landscapes in EU Member States*", September 12-13.

2016: South Atlantic Landscape Conservation Cooperative Webinar series. "*The FUTURES model: An open-source tool for understanding where cities will grow in the future and how this will impact conservation efforts*", June 16.

2016: Department of Geography and Environmental Sustainability, Oklahoma University. "*Leveraging Agent Based Models for environmental and resource management*", April 13.

2016: Nicholas Institute for Environmental Policy Solutions, Duke University. "*Understanding Urbanization Threats to Conservations using the FUTURES model*", March 24.

2014: North Carolina State University, "*Methods for integrating people in Maps: Web scraping, Agent-based models and social-spatial collaborative decision making*".

2013: The Ohio State University, "*Assessing the spatial variation in the use, management and plans for the forests in Appalachian Ohio*".

Conference Presentations

National Outdoor Recreation Conference: Storytelling in Outdoor Recreation People, Places, Landscapes, Cultures, Rapid City, South Dakota May 6-9, 2019: "*Leveraging social media to map America's recreational areas.*"

ACES (A Community on Ecosystem Service) 2018, Washington, D.C., Dec 3 - 6, 2018: "*EnviroAtlas's national assessment of cultural ecosystem services: Leveraging social media to understand America's most valued landscapes.*"

US-IALE 2018 Annual Meeting, Chicago, Illinois, April 8 - 12, 2018: "*EnviroAtlas's national assessment of cultural ecosystem services: Leveraging social media to understand America's most valued landscapes.*"

Ecosystem Services Partnership (ESP) world conference, Shenzhen, China, Dec. 11 - 13, 2017: "*Mapping Cultural Ecosystem services for the continental US using Social Media.*"

US-IALE 2017 Annual Meeting, Baltimore, Maryland, April 9 - 13, 2017: "*Leveraging social media to analyse and map landscape values and perceptions.*"

NC GIS Conference "30 Rocks GIS", Raleigh, North Carolina, February 22-24, 2017: "*The FUTURES model: A open-source tool for understanding where cities will grow and how it will impact economic development and conservation*".

3rd Open Science Meeting – Global land project, Beijing, China October 24–27, 2016: "*The future of Ecosystem Service provisioning at the urban fringe: What have we learned from simulating urban growth strategies using the FUTURES model?*"

US-IALE 2016 Annual Meeting, Asheville, North Carolina, April 3 - 7, 2016: "*Scaling future urban change: Simulation of urbanization scenarios across the southern Atlantic States, U.S.*"

9th IALE World Congress, Portland, Oregon, July 5–10, 2015: "*Mapping and quantifying cultural ecosystem services at continental and global scales using spatial scraping of web content*".

2nd Open Science Meeting – Global land project, Berlin, Germany, March 19–21, 2014: *"Using Agent Based Models and backcasting exercises for understanding social and environmental tradeoffs"*.

AAG Annual Meeting, Los Angeles, April 9–13, 2013: *"A comparison of methods to define agent typologies in land-change research"*.

4th Ecosystem Service Partnership Conference. Wageningen, Netherlands, October 4–7, 2011: *"Spatial quantification and valuation of cultural ecosystem services in a Dutch case study area"*.

1st Open Science Meeting – Global land project, Arizona, USA. October 17–19, 2010: *"The use of scenarios and photo realistic images for understanding landscape change possibilities"*.

2nd Eurogeo meeting, Bratislava, Slovakia, August 13–16, 2009: *"Assessing rural development options using spatially explicit methods"*.

1st International conference on geographies of children, youth & families, Reading, UK, September 9–13, 2008: *"Rural Cambodian Youth: Changing lives, changing perspectives"*.

Organized Conference Sessions & Workshops

US-IALE 2018 Annual Meeting, Chicago, Illinois, 8-12, 2017. *"Taking a look under the hood of EPA's EnviroAtlas: Ecosystem services, data and tools"*.

US-IALE 2017 Annual Meeting, Baltimore, Maryland, April 9-13, 2017. *"Integrated Modeling for the Analysis of Socio-Ecological Systems"*.

3rd Open Science Meeting – Global land project, Beijing, China October 24–27, 2016: *"Coupling Dynamic Land-Change Models with Ecosystem Service Evaluation"*.

US-IALE 2016 Annual Meeting, Asheville, North Carolina, April 3 - 7, 2016. Workshop: *"Spatio-temporal Modeling with Open Source GIS"*.

US-IALE 2016 Annual Meeting, Asheville, North Carolina, April 3 - 7, 2016. *"Modeling with Stakeholders"*.

Professional Activities

Editorial & Review Boards

Guest Editor: Special Issue on Assessment and Valuation of Recreational Ecosystem Services of Landscapes. Volume 31, Part C, June 2018, Pages 289-295. [Link to special issue.](#)

Reviewer: 4th Open Science Meeting of the Global Land Programme April 24-26, 2019 | Bern, Switzerland

Reviewer

Ambio, Nature Sustainability, Global Environmental Change, Applied Geography, Ecosystem Services, Environmental Modelling and Software, Landscape Research, Landscape and Urban Planning, Agriculture, Ecosystems and Environment, Frontiers in Ecology and the Environment, Land, Land Use Policy, Ecosystems, Integrative Journal of Environmental Sciences, International Journal of Biodiversity, Ecosystem Services & Management, International Journal of Biodiversity, Ecosystem Services & Management, Ecological Indicators, Czech National Science Centre.

Departmental service

Website developer: Land dynamics lab (2014 - 2017), Website manager: Appalachian Ohio research group (2013–2014), Organizing Committee: graduate field course: *Quantifying and Mapping Ecosystem services* - VU University Amsterdam (2011), Graduate Student Recruiting Committee - VU University (2011), Organizing Committee (Treasurer) graduate course: *Getting to the bottom of Mount: Kenya Analysis of land dynamics and sustainability* - Wageningen University (2009).

Membership

International Association for Landscape Ecology, American Association of Geographers, Global Land Project.

Experience on Funded Grants and Projects

American Geophysical Union's Thriving Earth Exchange project. "New Orleans's 7th Ward Healthy Community Services initiative: Community engagement for understanding the benefits of neighborhood greenspace" (2018-2019).

South Atlantic Landscape Conservation Cooperative (SALCC) "SMART-SLEUTH: Augmenting the SLEUTH Urban Growth Model with New Smart-Growth Scenario-Building Capabilities" (2014-2015).

National Science Foundation (BCS-1010314) "Explaining Socioecological Resilience Following Collapse: Forest Recovery in Appalachian Ohio" (2012-2014).

National Socio-Environmental Synthesis Center (SESYNC): "Rural forest communities at a tipping point? Trends and actionable research opportunities" (2013-2015).

Knowledge for Climate (Dutch research program): "Green climate change adaptation measures" (2011-2012).

7th framework project in the EU (Social Science and Humanities, Contract no. 217381): "Rural future networks" (2008-2011).

Graduate Student Mentoring

Ph.D. Students (graduation): Yuxi Zhao (2016), Brian Pickard (2017), Ashwin Shashidharan (2018), Georgina Sanchez (expected 2018), Lindsey Smart (expected 2018)

Advising

Undergraduate and Graduate students: S. Ngyuen (2011), J. Van Dobben (2012), Hongchao Zhang (present).

Teaching

North Carolina State University

GIS 610 – Landscape Dynamics Seminar (Ph.D.): Spring 2014, 2015, 2016, 2017; Fall 2015, 2016. *Role:* Co-instructor, co-design of course syllabus and content, main student contact.

The Ohio State University

Geography 3751 – The Socioecological Geography of Appalachian Ohio (Undergraduate Field Course): May Semester 2013, 2014. *Role:* Primary instructor, co-design of course syllabus and content, main student contact.

International Studies 3350 – Introduction to Western Europe (Undergraduate): Spring 2006. *Role:* Guest lecturer, class exercise facilitator.

Geography 5402- Land Use Geography (Undergraduate): Fall 2005. *Role:* Guest lecturer, class exercise facilitator.

VU University Amsterdam

Quantification and Mapping Ecosystem service seminar (Ph.D): Fall 2005. *Role:* Teaching assistant, co-design of course syllabus and content.

Multifunctional Land Use (Undergraduate): Fall 2005. *Role:* Teaching assistant, guest lecturer.

Community Engagement

2016: Introduction to GIS - "Hi-tech teens" from Wade Edwards Learning Lab (WELL), <http://www.wade.org/>

2006 - : Director Sustainable Village Pursat, Cambodia, <http://www.svillage-pursat.org/>

Miscellaneous

Programming Languages: Netlogo, R, L^AT_EX, Python.

Programs: ArcGIS, Adobe Photoshop, Adobe Illustrator.

Press

Social media photos priceless for natural resources research: Instagram, Flickr, Panoramio reveal most valued features of European landscapes *In Science Daily*, 01 Nov 2016. <https://www.sciencedaily.com/releases/2016/11/161101104400.htm>

Protect your favorite hiking trail with the power of an Instagram post *In Digital Trends*, By Dyllan Furness: November 14, 2016 2:20. <http://www.digitaltrends.com/social-media/social-media-landscape/>

Social media photos priceless for natural resources Research *In Environmental Research Web*: Nov 11, 2016. <http://environmentalresearchweb.org/cws/article/yournews/66948>

How Your Vacation Photo Posts Help Scientists *In Travel + Leisure*, By Talia Avakian: November 4, 2016. <http://www.travelandleisure.com/photography/social-media-photos-can-help-science>

Social Media: Fotos helfen beim Naturschutz – Algorithmus filtert beliebteste europäische Landschaften heraus *In PressText*: Thu, 03.11.2016 <http://www.presstext.com/news/20161103004>

References

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Last updated: September 5, 2019