



DATE: August 1, 2023

TO: Clayton T. Christian, Commissioner of Higher Education  
Members of the Montana Board of Regents

FROM: Seth Bodnar, President

RE: Nomination of Dr. Cory Cleveland for Regents Professorship

I write seeking your support for the appointment of Dr. Cory Cleveland as a Regents Professor at the University of Montana. As described below and in the attached nomination packet, Dr. Cleveland's commitment to his students and their educational experiences, combined with his dedication to service and numerous research accomplishments, make him an excellent candidate for this prestigious honor.

A professor in the Department of Ecosystem and Conservation Sciences within the University of Montana's Franke College of Forestry and Conservation (FCFC), Dr. Cleveland research focuses on understanding the biotic and abiotic controls on ecosystems processes. Described in the attached packet as "one of the preeminent global scholars in the fields of ecosystem ecology, biogeochemistry and environmental conservation," Dr. Cleveland's work is widely published in leading national and international scientific journals. Designated by Clarivate's Institute for Scientific Information as a Highly Cited Researcher in 2018 – placing his work in the top one percent by citations for the field – Dr. Cleveland was also the first ecologist in Montana to be bestowed with the lifetime honor of being named a Fellow to the Ecological Society of America.

Another indicator of Dr. Cleveland's research prowess is the more than \$5 million in grant funding he has secured – largely through highly competitive National Sciences Foundation funding opportunities. One of the University of Montana's "most successful Federal grant-funded researchers," Dr. Cleveland is also praised for his work building interdisciplinary research teams at UM.

Beyond his significant research accomplishments, Dr. Cleveland is widely-regarded as a dedicated teacher and mentor. Praised in the attached nomination letters for the curriculum development and curricular changes he has spear-headed throughout his career, Dr. Cleveland is a student-centered faculty member who is considered a "core member of the DECS and FCFC undergraduate and graduate teaching and curriculum development faculty." A creative teacher, Dr. Cleveland is also a devoted mentor. Through his work mentoring 14 graduate students and serving on more than 40 graduate committees, Dr. Cleveland has consistently demonstrated his commitment to UM's graduate students.

Equally as impressive as his research and teaching accomplishments is Dr. Cleveland's service record at the University of Montana. With a long list of positions at the departmental, college and institutional level, Dr. Cleveland is also a leader in his field beyond the University of Montana. A

Office of the President

sought-after speaker on both national and international stages, he has also received numerous awards and accolades for his work and contributions.

Nominated by Professor of Habitat Ecology, Dr. Mark Hebblewhite, in a letter unanimously co-signed by nineteen additional faculty members, Dr. Cleveland's nomination was supported by the Dean of the Franke College of Forestry and Conservation, and Regents Professor Emeritus of Global Ecology, Dr. Steven Running. Unanimously recommended by the Regents Professor Selection Committee and approved by Provost Pardis Mahdavi, I enthusiastically support the appointment of Dr. Cory Cleveland as the next Regents Professor at the University of Montana.



**MEMORANDUM**

DATE: April 28, 2023

TO: Seth Bodnar, President

FROM: Pardis Mahdavi, Provost and Executive Vice President

SUBJECT: Regents Professor Nomination

I am pleased to inform you that the Regents Professor Selection Committee has reviewed nominations for Regents Professor and has unanimously recommended Dr. Cory Cleveland, Professor in the Department of Ecosystem and Conservation Sciences in the Franke College of Forestry and Conservation, to be the person UM nominates for Board of Regents consideration.

As you may know, Dr. Cleveland has mentored 14 of his own graduate students and has served on over 40 other graduate committees across departments within FCFC and across campus, serving as a model University citizen.

Dr. Cleveland's list of university service and contributions is astounding. He has worked tirelessly across campus, from reviews of the UM Financial Aid Office, University Research Administration oversight committees, many FCFC committees at the graduate and undergraduate level, served on FCFC College Council, served on half-a-dozen FCFC and broader faculty hire committees, chaired several policy review committees, served on the year-long Presidents Ecology Program Review (EPOR) committee, and many more. I attach Dr. Cleveland's nomination packet for your review and final consideration.

Thank you.

Pardis Mahdavi, Provost and Executive Vice President

Office of the Provost

March 16, 2023

Re: Letter of Nomination for Professor Cory Cleveland for a Regents Professorship

Dear Regents Professor Committee,

It is our distinct pleasure to unanimously nominate Dr. Cory Cleveland for consideration for promotion to Regents Professor, on behalf of the entire Department of Ecosystem and Conservation Sciences (DECS) in the Franke College of Forestry and Conservation (FCFC). Dr. Cleveland has demonstrated true excellence in teaching, research, and service over nearly two decades at the University of Montana. Dr. Cleveland's contributions in all three areas have elevated the University, and his discipline of ecosystem ecology, at national and global scales. In our nomination letter, we highlight some specific examples from his portfolio that set Dr. Cleveland distinct from his peers.

First, in teaching, Dr. Cleveland has been a core member of the DECS and FCFC undergraduate and graduate teaching and curriculum development faculty. Soon after he started, Cory completely revamped the traditionally taught 'soils' class (FOR 210 "Introductory Soils") into a modern environmental science course integrating biogeochemistry, bioclimatology and hydrological (NRSM 210, Soils, Water and Climate). Dr. Cleveland was instrumental in implementing innovations that combined team-teaching (at a time when this was not encouraged) and demanding field and laboratory experiences, helping make this course one of the most foundational undergraduate courses in the physical and natural sciences at the University of Montana. These early curricular changes have also helped propelled many of the more recent advances in the fast-growing Environmental Science and Sustainability (ESS) degree. Dr. Cleveland's contributions in teaching exemplify creativity, vision, teamwork, and a dedication to student-centered learning.

This dedication is mirrored in his upper-division courses in Environmental Soil Science (ENSC 415) and Terrestrial Ecosystem Ecology (BIOE 447). Dr. Cleveland developed both new courses that have served students across campus from Forestry, Biology, Restoration, and Environmental Studies. This again reflects his innovation and interdisciplinarity across departmental and college silos. Cory was also an instrumental colleague in helping develop and then redesign the Wildland Restoration later renamed the Ecosystem Science and Restoration programs. Cory's contributions over a decade ago towards simplifying undergraduate programs and redesigning the environmental sciences curriculum around student-centered learning now appears prescient and visionary. It is these exact changes being called for across campus in how we deliver undergraduate environmental sciences. He also applied this excellence to similar undergraduate curriculum committee work on just about every undergraduate curriculum in FCFC (e.g., Ecosystem Science and Restoration Curriculum, Resource Conservation Curriculum) and across campus (e.g., Climate Change Studies Minor in the Davidson Honors College). Cory's excellence stands out amongst faculty in his visionary and collaborative approach to enhancing our entire FCFC undergraduate curriculum, from pedagogy, committee work, to delivery in the classroom across departments and programs.

At the graduate level, Dr. Cleveland's track record of teaching and training has similarly been outstanding, as exemplified through the success and career impacts of his many graduate students and post-doctoral researchers. His commitment to graduate education is also mirrored by his outstanding track record of service at the graduate level to the Interdisciplinary Systems Ecology Curriculum

committee, and entire Systems Ecology Program. Dr. Cleveland has mentored 14 of his own graduate students and has served on over 40 other graduate committees across departments within FCFC and across campus, serving as a model University citizen. Over half of Dr. Cleveland's scientific papers are published by his trainees as first authors - a major signal of his commitment to graduate excellence. Furthermore, most of these papers are in scientific outlets of the highest quality and global impact. Finally, perhaps the strongest signal of his outstanding graduate and research training is that all his graduate students have gone onto careers in science or natural resources, with six in tenure-track positions in academia across the US.

Second, Dr. Cleveland's research accomplishments have established him as one of the preeminent global scholars in the fields of ecosystem ecology, biogeochemistry, and environmental conservation. Dr. Cleveland is one of only a handful of Clarivate I.S.I. highly cited scientists at the University of Montana. This notably places him in the same I.S.I. status of many other current notably Regents professors. This globally significant ranking places Dr. Cleveland in the realm of being in the top 1 of 1000 scientists. He and his students have published over 111 high-impact scientific papers in leading national and international scientific journals. Their quality is most notable: his work has been cited by other scientists in his field more than 27,000 times, and over 100 papers cited more than ten times. His most-cited scientific paper, "*Nitrogen cycles: past, present and future*" has been cited nearly 6,000 times! This astonishing level of impact makes Dr. Cleveland one of only a handful of UM scientists to have such a far-reaching global impact. Finally, as perhaps the greatest sign of his distinct status in his field, Dr. Cleveland's contributions were formally recognized by his peers in 2018 through his election as a Fellow to the Ecological Society of America, a lifetime honor bestowed upon members "*who have made outstanding contributions to [disciplines that help] advance or apply ecological knowledge*".

Dr. Cleveland's transformative and pioneering impact in his research has been consistently strong and career spanning. For example, some of his most recent NSF-funded work, led by his post-doctoral research associates and in press for publication in the prestigious journal *Nature Geosciences*, has the potential to have transformative impacts on how we consider and model global carbon budgets. This new work by Dr. Cleveland returns to fundamental aspects of biogeochemistry to point out significant shortcomings in assumptions about how increased plant growth might be able to absorb the excess CO<sub>2</sub> that human emissions are creating. This has profound impacts on everything from local carbon budgeting in forest management to the meetings of the International Council of Parties (COP) seeking to quantify, track, and mitigate carbon emissions. The implications of this high-quality work are massive. There could not be a more salient example of his global reach and ability to train the next generation of scientists at the same time. His local work on the science of wastewater reclamation here in the city of Missoula early in his tenure clearly demonstrates his ability to connect these global phenomena to local, city-scale management in a way that improves the conservation of local Montana resources.

Cory has had prolific success at obtaining extremely competitive National Sciences Foundation (NSF) grants. This is also a clear hallmark of Dr. Cleveland's outstanding performance as one of the University of Montana's most successful Federal grant-funded researchers. Over Dr. Cleveland's career, Cory has received > \$5,000,000 USD in mostly NSF funding from over a dozen different NSF granting opportunities from a variety of programs. With funding success rates < 10% for most NSF funding panels, this is a huge achievement. Yet what is also a hallmark of Dr. Cleveland is his ability to build teams across the University. He has been involved in several large, interdisciplinary NSF funding programs, for example, his NSF-funded Research Coordination Network, which has led to some of the most exciting and impactful research syntheses of his scientific career.

Thirdly, we cannot imagine DECS, FCFC or indeed, environmental sciences at UM without the contributions of Dr. Cleveland to service at all levels of the University. Cory's contribution to curriculum reform has already been mentioned, within virtually every program within FCFC and across campus. But his list of university service and contributions is astounding. He has worked tirelessly across campus, from reviews of the UM Financial Aid Office, University Research Administration oversight committees, many FCFC committees at the graduate and undergraduate level, served on FCFC College Council, served on half-a-dozen FCFC and broader faculty hire committees, chaired several policy review committees, served on the year-long Presidents Ecology Program Review (EPOR) committee, and many more. He also served as the Departmental Chair of DECS for a full three-year term, and recently stepped up again to fill a sabbatical replacement in that role. This recognition of service at the University level has been awarded many times; this is his second Regents nomination (the first cancelled because of COVID), he received the FCFC Wambach Service Award twice, and has received every University merit-based award for which he has been nominated.

Perhaps most significantly, Dr. Cleveland recently co-chaired the FCFC Strategic Planning committee. Anyone involved in strategic planning knows this is a beyond thankless task. But it was more than just the absence of a strategic plan in FCFC that prompted Cory to step up and take on this role. Like many of the bricks-and-mortar changes to FCFC's undergraduate curriculum that Cory helped lead over the past two decades, Cory could see the crucial need for such a strategic plan to help navigate the campus-wide - and indeed global - recognition that UM is poised to become a global leader in environmental sustainability. Indeed, this exemplifies Cory's ability to serve at the nexus of the nuts-and-bolts of committee work that might appear mundane, and the cutting edge of ideas and science of where UM's environmental sciences can go. His ability to work creatively and collaboratively are perhaps UM's strongest assets as a Regents Professor to promoting environmental sciences at UM and beyond.

Finally, Dr. Cleveland's service record beyond the University is peerless. He has served in editorial roles in some of the leading scientific journals in ecology and global change biology. He has served on NSF, foundation, and government review panels allocating tens of millions in research funding to support the nation's leading scientific research. He has received numerous scientific accolades, and has given dozens of invited research talks to local and international audiences. Perhaps no better recognition could be highlighted for his Regents nomination than his election as Montana's first Fellow of the Ecological Society of America (ESA) - the pre-eminent US professional ecological organization. This huge honor clearly identifies the traits of excellence in teaching, research, and service that we believe Dr. Cleveland's CV, track record of accomplishments, letters of support from some of the global leaders in ecology, and our nomination letter provide ample evidence thereof.

We believe that there could be no stronger Regents professor nomination worthy of your consideration.

Sincerely,

**Mark Hebblewhite,**

PROFESSOR of HABITAT ECOLOGY, WILDLIFE BIOLOGY PROGRAM,  
The Department of Ecosystem and Conservation Sciences

Unanimously signed:

Dr. Ashley Ballantyne, Associate Professor of Bioclimatology  
Dr. Chad Bishop, Director, Wildlife Biology Program  
Dr. Ben Colman, Associate Professor of Aquatic Ecosystem Ecology  
Dr. Victoria Dreitz, Professor & Director of the Avian Science Center  
Dr. Lisa Eby, Professor of Aquatic Ecology

Dr. Akasha Faist, Assistant Professor of Rangeland and Restoration Ecology  
Dr. Scott Ferrenberg, Associate Director of the MFCES  
Dr. Erim Gómez, Assistant Professor of Wildlife Biology  
Dr. Philip Higuera, Professor of Fire Ecology  
Dr. John S. Kimball, Professor of Systems Ecology; NTSG Director  
Dr. Anna Klene, Professor of Geography  
Dr. Angela Luis, Associate Professor of Population & Disease Ecology  
Dr. Paul M. Lukacs, Senior Associate Dean of Research and Graduate Studies  
Dr. Joshua Millspauh, Boone and Crockett Professor of Wildlife Conservation  
Dr. David Naugle, Professor of Large-Scale Wildlife Ecology  
Dr. Cara Nelson, Professor of Restoration Ecology  
Dr. Thomas Riecke, James K. Ringleman Chair in Waterfowl Conservation, Associate Professor  
Dr. Diana Six, Professor of Forest Entomology and Pathology  
Dr. Andrew Whiteley, Associate Professor of Fisheries & Conservation Genomics



**Numerical Terradynamic Simulation Group (NTSG)**  
College of Forestry and Conservation  
The University of Montana  
Missoula, Montana 59812

Phone: (406) 243-6311  
FAX: (406) 243-4510

13 March, 2023

REFERENCE for Prof Cory Cleveland,  
nomination for Regents Professor

Dear Review Committee,

This is a letter of reference for the nomination of Prof. Cory Cleveland for Regents Professor. Rather than rehashing his CV that you have already seen, I want to focus your attention on three factors of Dr. Cleveland's performance that I think illustrate his international academic credentials that qualify him for Regents Professor.

First, he has attracted over \$5 million of grant money to U of M. This of course is an exemplary level of grant funding, and most of it comes from the National Science Foundation Ecosystem Studies Program. You must recognize that the average grant selection rate for NSF Ecosystems is 10-15%, and has been for decades. This means that Cory has vastly beaten the odds competing against the best ecologists in the country for this NSF funding.

Second, I draw your attention to his selection as Fellow of the Ecological Society of America, the first ecologist in Montana to be honored at that time. The ESA is the largest professional organization for ecological sciences in the world. Again, he is competing successfully with the best Ecologists in the country.

Third, I find his designation as a Clarivate Analytics/ISI Highly Cited Researcher to be very significant, as for a number of years I was the only Highly Cited Researcher in the Montana University System. As quoted from the Clarivate website, "Highly Cited Researchers have demonstrated significant and broad influence reflected in their publication of multiple highly cited papers over the last decade. These highly cited papers rank in the top 1% by citations for a field or fields and publication year in the Web of Science™. Of the world's population of scientists and social scientists, Highly Cited Researchers™ are 1 in 1,000. "

In scientific research, it is easy to publish a lot of papers in lower tier journals that will publish almost anything, resulting in a personal CV with a long string of publications. However, if none of these papers are read, or more significantly cited in others works, then the papers are pretty inconsequential. The real measure of quality is when other researchers read and cite your papers, and this is a bibliographic metric that cannot be exaggerated or puffed up by a researcher. Another similar metric, from Google Scholar, now lists Cory Cleveland as having over 27,000 citations to his work ( as of March 2023).



Others will undoubtedly summarize his active teaching, his excellent graduate student mentorship, and his willingness to volunteer for campus administrative chores. I have chosen what I consider his most outstanding and uncommon qualities to emphasize. I certainly support his election as a Regents Professor.

Best Regards,

A handwritten signature in blue ink, appearing to read "Steven W. Running". The signature is fluid and cursive, with a large, sweeping flourish at the end.

Dr. Steven W. Running  
Regents Professor Emeritus of Global Ecology  
W.A. Franke College of Forestry & Conservation  
University of Montana  
Email: [swr@ntsg.umt.edu](mailto:swr@ntsg.umt.edu)  
<https://www.ntsg.umt.edu/about/people.php?ID=1139>

# Curriculum Vitae

(Revised February 2023)

## Cory C. Cleveland, Ph.D.

Department of Ecosystem & Conservation Sciences | W.A. Franke College of Forestry & Conservation |  
University of Montana | Missoula, MT 59812 | Tel: (406) 243-6018 |

Email: [Cory.Cleveland@Umontana.edu](mailto:Cory.Cleveland@Umontana.edu)

Web: <https://www.cfc.umt.edu/research/biogeochemistry/>

### Professional Preparation

<b>B.A.</b>	University of Colorado, Geography (Environmental Conservation)	1992
<b>M.S.</b>	Cornell University, Natural Resources (Forest Science)	1997
<b>Ph.D.</b>	University of Colorado, Environmental, Population, and Organismic Biology	2001

### Professional Experience

2023 – present	<b>Interim Chair</b> University of Montana, Department of Ecosystem & Conservation Sciences
2016 – present	<b>Professor</b> University of Montana, Department of Ecosystem & Conservation Sciences
2016 – 2019	<b>Chair</b> University of Montana, Department of Ecosystem & Conservation Sciences
2013 – present	<b>Affiliate Faculty</b> University of Montana, Montana Institute on Ecosystems (IoE)
2012 – 2015	<b>Associate Professor</b> University of Montana, Department of Ecosystem & Conservation Sciences
2007 – 2012	<b>Assistant Professor</b> University of Montana, Department of Ecosystem & Conservation Sciences
2011 – present	<b>Charter Faculty Member</b> , Systems Ecology Graduate Degree Program, University of Montana
2005 – 2007	<b>Research Affiliate of INSTAAR</b> University of Colorado, Institute of Arctic & Alpine Research
2005 – 2007	<b>Research Scientist of INSTAAR</b> University of Colorado, Institute of Arctic & Alpine Research
2001 – 2005	<b>Postdoctoral Research Associate</b> University of Colorado, Institute of Arctic & Alpine Research
1997 – 2001	<b>Graduate Research Assistant</b> University of Colorado, Department of Ecology & Evolutionary Biology
1996 – 1997	<b>Research Associate</b> Cornell University, Department of Natural Resources

# Curriculum Vitae

(Revised February 2023)

- 1995 – 1996                      **Graduate Teaching Assistant**  
Cornell University, Department of Natural Resources
- 1991 – 1994                      **Research Assistant**  
National Center for Atmospheric Research, Boulder, CO

## Professional Awards, Honors, and Distinctions

- UM Regents Professor Nomination (2019)  
UM Faculty Merit Awards (2009, 2011, 2013, 2014, 2019)  
UM Davidson Honors College Special Recognition (2019)  
College of Forestry and Conservation Wambach Faculty Service Award (2012, 2019)  
Fellow of the Ecological Society of America (2018 - present)  
Clarivate Analytics/ISI Highly Cited Researcher (2018)  
Faculty of 1000 Faculty of the Month (2019)  
Faculty of 1000 (2019 – 2021)  
College of Forestry & Conservation Faculty Research Award (2014)  
Andrew W. Mellon Foundation Early Career Fellowship (\$340,000)  
NSF Doctoral Dissertation Improvement Grant (DDIG) (\$8,800)  
Ecology and Evolutionary Biology Graduate Fellowship, University of Colorado (\$10,000)  
Ecology & Evolutionary Biology Departmental Research Grant, University of Colorado (\$2,500)  
Jenny Kate Collins Fellowship, University of Colorado (\$500)  
Sussman Environmental Fellowship, University of Colorado (\$3,000)  
NSF Biosphere-Atmosphere Interactions Fellowship, University of Colorado (\$60,000)  
Andrew W. Mellon Graduate Research Fellowship, Cornell University (\$5,000)  
Kieckhefer Adirondack Research Fellowship, Cornell University (\$2,500)

## Research Productivity and Experience

- Google Scholar Profile:** [https://scholar.google.com/citations?user=P6B\\_FaQAAAAJ&hl=en](https://scholar.google.com/citations?user=P6B_FaQAAAAJ&hl=en)
- Peer-reviewed, published articles:** 107; h-index: 67; i10 index: 103; Total citations: 27,043 (2/28/23)
- Research Gate Profile:** [https://www.researchgate.net/profile/Cory\\_Cleveland](https://www.researchgate.net/profile/Cory_Cleveland)

## Manuscripts submitted or in preparation

111. Heumann, R.E., Turner, M.G., Cleveland, C.C. Climate controls on cryptic N fixation in postfire lodgepole pine ecosystems in the Greater Yellowstone Ecosystem (in preparation)
110. Reis, C.R.G., Perakis, S.P., Cleveland, C.C. et al. New global estimates of terrestrial nitrogen fixation and its modification by agriculture (In preparation).
109. Turner, M.G., Kiel, N.G., Warren, J.A., Heumann, R.E., Cleveland, C.C. Reburning before recovery: Effects of short-interval fire on subalpine forest nitrogen stocks (in preparation).
108. Hauser, E., Wieder, W., Bonan, G., **Cleveland, C.** 2023. Flexible foliar stoichiometry reduces the magnitude of the land C sink. *Nature Geoscience* (submitted).

# Curriculum Vitae

(Revised February 2023)

## Peer-reviewed publications

### 2022

107. **Cleveland, C.C.**, K.A. Dynarski, S.A. Batterman, T.E. Crews, M. Gei, M.J. Gundale, D.N.L. Menge, M.B. Peoples, S.C. Reed, C.R.G. Reis, V.G. Salmon, F.M. Soper, B.N. Taylor, M.G. Turner, N. Wurzburger, S.S. Perakis. 2022. Cryptic nitrogen fixers: An important frontier in terrestrial N cycling research. *Ecosystems* <https://doi.org/10.1007/s10021-022-00804-2>.

106. Dynarski, K.A., Soper, F.M., Reed, S.C., Wieder, W.W., **Cleveland C.C.** 2022. Patterns and controls of foliar nutrient stoichiometry and flexibility across United States forests. *Ecology* doi:10.1002/ecy/3909.

105. Sheng, M., Rosche, C., Al-Gharaibeh, M., Bullington, L.S., Callaway, R.M., Clark, T., **Cleveland, C.C.**, Dunan, W., Flory, S.L., Khasa, D.P., McLeod, M., Okada, M., Pal, R.W., Shah, M.A., Lekberg, Y. 2022. Acquisition and evolution of enhanced mutualism promotes invasive plant performance. *ISME J* 16: 2467–2478 <https://doi.org/10.1038/s41396-022-01293-w>

### 2021

104. Osborne, B. B., F. M. Soper, M. K. Nasto, D. Bru, S. Hwang, M. B. Machmuller, L. Philippot, B. W. Sullivan, G. P. Asner, **C. C. Cleveland**, A. R. Townsend, S. Porder. 2021. Litter inputs drive patterns of soil nitrogen heterogeneity in a diverse tropical forest: Results from a litter manipulation experiment. *Soil Biology & Biochemistry* <https://doi.org/10.1016/j.soilbio.2021.108247>.

103. Luce McLeod, M., Bullington, L., **Cleveland, C.**, Rousk, J., and Lekberg, Y. 2021. Invasive plant-derived dissolved organic matter alters microbial communities and carbon cycling in soils. *Soil Biology and Biochemistry* <https://doi.org/10.1016/j.soilbio.2021.108191>.

### 2020

102. Soper, F.M., B.N. Taylor, J.B. Winbourne, M.Y. Yong, K.A. Dynarski, C.R.G. Reis, M. Peoples, **C.C. Cleveland**, S.C. Reed, D.N.L. Menge, S.S. Perakis. 2020. A roadmap for sampling and scaling nitrogen fixation in terrestrial ecosystems. *Methods in Ecology and Evolution* DOI: 10.1111/2041-210X.13586.

101. Shaw, A.N., and **Cleveland, C.C.** 2020. The effects of temperature on soil phosphorus availability: a cross-ecosystem study from the tropics to the Arctic. *Biogeochemistry* doi.org/10.1007/s10533-020-00710-6.

100. Osborne, B.B., M. K. Nasto, F.M. Soper, G.P. Asner, C.S. Balzotti, **C.C. Cleveland**, P.G. Taylor, A.R. Townsend, and S. Porder. 2020. Leaf litter inputs reinforce islands of nitrogen fertility in a lowland tropical forest. *Biogeochemistry* doi.org/10.1007/s10533-020-00643-0.

### 2019

99. Sullivan, B.W., R.L. Nifong, M.K. Nasto, S. Alvarez-Clare, C. Dencker, F.M. Soper, K.T. Shoemaker, F. Yoko Yashida, J. Zaragoza-Castells, E.A. Davidson, **C.C. Cleveland**. 2019. Biogeochemical recuperation in lowland tropical forest during succession. *Ecology* doi.org/10.1002/ecy.2641.

## Curriculum Vitae

(Revised February 2023)

98. Gao, S., T.H. DeLuca, **C.C. Cleveland**. 2019. Biochar additions alter phosphorus and nitrogen availability in agricultural ecosystems: A meta-analysis. *Science of the Total Environment* 654: 463-472.
97. Nasto, M.K. K. Winter, B.L. Turner, **C.C. Cleveland**. 2019. Nutrient acquisition strategies augment growth in tropical N<sub>2</sub> fixing trees in nutrient poor soil and under elevated CO<sub>2</sub>. *Ecology* doi.org/10.1002/ecy.2646.
96. Taylor, P.G., **C.C. Cleveland**, F.M. Soper, W.R. Wieder, S.Z. Dobrowski, C.E. Doughty, A.R. Townsend. 2019. Greater stem growth, woody allocation, and aboveground biomass in Paleotropical forests than in Neotropical forests. *Ecology* doi.org/10.1002/ecy.2589.
95. Soper, F.M., B.W. Sullivan, B.B. Osborne, A.N. Shaw, L. Philippot, **C. Cleveland**. 2019. Leaf-cutter ants engineer large N<sub>2</sub>O hot spots in tropical forests. *Proceedings of the Royal Society of London - B Biology* doi.org/10.1098/rspb.2018.2504.

### 2018

94. Soper, F., B. Sullivan, M. Nasto, B. Osborne, D. Bru, C. Balzotti, P. Taylor, G. Asner, A. Townsend, L. Philippot, S. Porder, and **C. Cleveland**. 2018. Remotely-sensed canopy nitrogen correlates with nitrous oxide emissions in a lowland tropical rainforest. *Ecology* <https://doi.org/10.1002/ecy.2434>.
93. Soper, F.M., M.K. Nasto, B.B. Osborne, **C.C. Cleveland**. 2018. Nitrogen fixation and foliar nitrogen do not predict phosphorus acquisition strategies in tropical trees. *Journal of Ecology* doi.org/10.1111/1365-2745.13044.
92. Darcy, J.L., S.K. Schmidt, J.E. Knelman, **C.C. Cleveland**, \*S.C. Castle, D.R. Nemergut. 2018. Phosphorus, not nitrogen, limits plants and microbial primary producers following glacial retreat. *Science Advances* DOI: 10.1126/sciadv.aag0942.

### 2017

91. Castle, S.C., B.W. Sullivan, J. Knelman, E. Hood, D.R. Nemergut, S.K. Schmidt, **C.C. Cleveland**. 2017. Nutrient limitation of soil microbial activity during the earliest stages of ecosystem development. *Oecologia* DOI 10.1007/s00442-017-3965-6.
90. Soper, F.M., P.G. Taylor, W.R. Wieder, S.R. Weintraub, **C.C. Cleveland**, S. Porder, A.R. Townsend. 2017. Low rates of gaseous nitrogen loss point to conservative nitrogen cycling in a lowland tropical forest watershed. *Ecosystems* DOI: 10.1007/s10021-017-0193-1.
89. Taylor, P.G., **C.C. Cleveland**, W.R. Wieder, B.W. Sullivan, C.E. Doughty, A.R. Townsend. 2017. Temperature and rainfall interact to control carbon cycling in tropical forests. *Ecology Letters* doi: 10.1111/ele.12765.
88. Nasto, M.K., B.B. Osborne, Y. Lekberg, G.P. Asner, C.S. Balzotti, S. Porder, P.G. Taylor, A.R. Townsend and **C.C. Cleveland**. 2017. Nutrient acquisition, soil phosphorus partitioning, and competition among trees in a lowland tropical forest. *New Phytologist* DOI:10.1111/nph.14494.
87. Osborne, B, M. Nasto, G. Asner, C. Balzotti, **C. Cleveland**, B. Sullivan, P. Taylor, A. Townsend, S. Porder. 2017. Climate, topography and organisms are hierarchical controls of soil N cycling in a Neotropical lowland forest. *Ecosystems* DOI: 10.1007/s10021-016-0095-7.

# Curriculum Vitae

(Revised February 2023)

## 2016

86. Balzotti, C., G.P. Asner, P.G. Taylor, **C.C. Cleveland**, R. Cole, R. Martin, M. Nasto, B.B. Osborne, S. Porder, A.R. Townsend. 2016. Environmental Controls on Canopy Foliar N Distribution in a Neotropical Lowland Forest. *Ecological Applications* DOI: 10.1002/eap.1408.
85. Castle, S.C., Y. Lekberg, D. Affleck, **C. Cleveland**. 2016. Abiotic and biotic controls on plant performance in early ecosystem succession. *Journal of Ecology*, doi: 10.1111/1365-2745.12615.
84. Castle, S.C., D.R. Nemergut, A.S. Grandy, J.W. Leff, E.B. Graham, E. Hood, S.K. Schmidt, K. Wickings, **C.C. Cleveland**. 2016. Plant colonization drives convergence of soil microbial communities. *Soil Biology and Biochemistry*, doi:10.1016/j.soilbio.2016.07.010.
83. Balzotti, C., G. Asner, P. Taylor, R. Cole, B. Osborne, **C. Cleveland**, S. Porder, A. Townsend. 2016. Topographic distributions of emergent trees in tropical forests of the Osa Peninsula, Costa Rica. *Ecography*, doi: 10.1111/ecog.02062.
82. McLeod, M., **C. Cleveland**, Y. Lekberg, J.L. Maron, L. Philippot, D. Bru, R.M. Callaway. 2016. Exotic invasive plants increase productivity, abundance of ammonia-oxidizing bacteria, and nitrogen availability in intermountain grasslands. *Journal of Ecology* doi: 10.1111/1365-2745.12584.
81. Murphy, D., C. Wyborn, L. Yung, D.R. Williams, **C. Cleveland**, L. Eby, S. Dobrowski, E. Towler. 2016. Engaging Communities and Climate Futures with Multi-Scale, Iterative Scenario Building (MISB) in the Western U.S. *Human Org* 75: 33-46.
80. Ganzlin, P., M. Gundale, R. Becknell and **C. Cleveland**. 2016. Forest restoration treatments have subtle long-term impacts on soil C and N cycling in Rocky Mountain conifer forests. *Ecological Applications* doi: 10.1002/15-1100.

## 2015

79. Smith, W.K., S.C. Reed, **C.C. Cleveland**, A.P. Ballantyne, W.R. Anderegg, W.R. Wieder, Y.Y. Liu, S.W. Running. 2015. Large divergence of satellite and Earth system model estimates of global terrestrial CO<sub>2</sub> fertilization. *Nature Climate Change* DOI: 10.1038/NCLIMATE2879.
78. Wieder, W.R., **C.C. Cleveland**, W. Kolby Smith, K. Todd-Brown. 2015. Reply to 'Land unlikely to become a large carbon source.' *Nature Geoscience* 8: 893-894.
77. Weintraub, S.R., P.G. Taylor, S. Porder, **C.C. Cleveland**, G.P. Asner, A.R. Townsend. 2015. Topographic controls on soil nitrogen availability in a lowland tropical forest. *Ecology* 96: 1561-1574.
76. Wieder, W.R., **C.C. Cleveland**, D.M. Lawrence, G.B. Bonan. 2015. Structural uncertainty related to biological nitrogen fixation increases terrestrial carbon cycle uncertainty. *Environmental Research Letters*, doi:10.1088/1748-9326/10/4/044016.
75. **Cleveland, C.C.**, P. Taylor, K.D. Chadwick, K. Dahlin, C.E. Doughty, Y. Malhi, W.K. Smith, B.W. Sullivan, W.R. Wieder, A.R. Townsend. 2015. A comparison of plot-based, satellite and Earth system model estimates of tropical NPP. *Global Biogeochemical Cycles* 29, doi:10.1002/2014GB005022.

## Curriculum Vitae

(Revised February 2023)

74. Wieder, W.R., **C.C. Cleveland**, W. Kolby Smith, K. Todd-Brown. 2015. Nutrient availability strongly constrains future terrestrial productivity and carbon storage. *Nature Geoscience* DOI: 10.1038/NCEO2413.

73. Taylor, P.G., W.R. Wieder, S. Weintraub, S. Cohen, **C.C. Cleveland**, A.R. Townsend. 2015. Organic forms dominate hydrologic nitrogen losses from a lowland tropical watershed. *Ecology* 96(5), 2015, pp. 1229–1241.

### 2014

72. Knelman, J.E., S.K. Schmidt, H.J. Lynch, J.L. Darcy, S.C. Castle, **C.C. Cleveland**, D.R. Nemergut. 2014. Nutrient addition dramatically accelerates microbial community succession. *PLoS ONE* 9(7): e102609. doi:10.1371/journal.pone.0102609).

71. Nasto, M.K., S. Alvarez-Clare, Y. Lekberg, B.W. Sullivan, A.R. Townsend, **C.C. Cleveland**. 2014. Interactions among nitrogen fixation and soil phosphorus acquisition strategies in lowland tropical rain forests. *Ecology Letters* doi: 10.1111/ele.12335.

70. Sullivan, B.W., W.K. Smith, A.R. Townsend, M.K. Nasto, S.C. Reed, R.L. Chazdon, **C.C. Cleveland**. 2014. A novel approach to quantify biological (N) fixation implies substantial human alteration of the tropical N cycle. *Proceedings of the National Academy of Science of the USA* doi/10.1073/pnas.1320646111.

69. Bowman, W.D., L. Halada, J. Hreško, **C.C. Cleveland**, J.S. Baron, J. Murgel. 2014. *How much is too much? Nitrogen critical loads and eutrophication and acidification in oligotrophic ecosystems*. In: M.A. Sutton, K.E. Mason, L.J. Sheppard, H. Sverdrup, R. Haeuber and W.K. Hicks (Eds). *Nitrogen Deposition, Critical Loads and Biodiversity*. Springer Dordrecht.

68. Sullivan, B.W., S.C. Castle, S.A. Alvarez Clare, S. Porder, S.C. Reed, L. Schreag, A.R. Townsend, **C.C. Cleveland**. 2014. Assessing nutrient limitation in complex forested ecosystems: alternatives to large-scale fertilization experiments. *Ecology* 95: 668-681.

67. Taylor, P., T. Bilinski, H. Fancher, **C. Cleveland**, D. Nemergut, S. Weintraub, W. Wieder, A. Townsend. 2014. Palm oil wastewater methane emissions and bioenergy potential. *Nature Climate Change* 4: 151-152.

66. Graham, E.B., W.R. Wieder, J.W. Leff, S.R. Weintraub, A.R. Townsend, **C.C. Cleveland**, L. Philippot, D.R. Nemergut. 2014. Do we need to understand microbial communities to predict ecosystem function? A comparison of statistical models of nitrogen cycling processes. *Soil Biology and Biochemistry* 68: 279-282.

### 2013

65. Smith, W.K., **C.C. Cleveland**, S.C. Reed, S.W. Running. 2013. Agricultural conversion without external water and nutrient inputs reduces biospheric vegetation productivity. *Geophys. Res. Lett.* 41, doi:10.1002/2013GL058857.

This article was also highlighted in *Nature Geoscience*

# Curriculum Vitae

(Revised February 2023)

64. **Cleveland, C.C.**, S.C. Reed, A.B. Keller, D.R. Nemergut, S.P. O'Neill, R. Ostertag, P.M. Vitousek. 2013. Litter quality versus microbial community controls over decomposition: A quantitative analysis. *Oecologia* 174: 283-294.
63. **Cleveland, C.C.**, B.Z. Houlton, W.K. Smith, A.R. Marklein, S.C. Reed, W. Parton, S. Del Grosso, S.W. Running. 2013. Patterns of new versus recycled primary production in the terrestrial biosphere. *Proceedings of the National Academy of Science of the USA* 110: 12733-12737.
62. Keville, M.P., S.C. Reed, **C.C. Cleveland**. 2013. Nitrogen cycling responses to mountain pine beetle disturbance in a high elevation whitebark pine ecosystem. *PLoS ONE* 8(6): e65004. doi:10.1371/journal.pone.0065004.
61. Vitousek, P.M. D.N.L. Menge, S.C. Reed, **C.C. Cleveland**. 2013. Biological nitrogen fixation: Rates, patterns and ecological controls in terrestrial ecosystems. *Philosophical Transactions of the Royal Society of London B* 368: 20130119.
60. Reed, S.C., A.R. Townsend, **C.C. Cleveland**. 2013. Assessing the relationships among phosphorus, molybdenum and free-living nitrogen fixation in a tropical rain forest: Results from observational and experimental analyses. *Biogeochemistry* DOI 10.1007/s10533-013-9835-3.
59. Ferrenberg, S., S. O'Neill, J. Knelman, B. Todd, S. Duggan, D. Bradley, T. Robinson, S.K. Schmidt, A.R. Townsend, M. Williams, **C.C. Cleveland**, B.A. Melbourne, L. Jiang, D.R. Nemergut. 2013. Changes in assembly processes in soil bacterial communities following a wildfire disturbance. *ISME Journal*. DOI: ISMEJ.2013.11.
- 2012**
58. Weintraub, S.R., W.R. Wieder, **C.C. Cleveland**, A.R. Townsend. 2012. Both absolute and relative soil resource availabilities drive exo-enzymatic shifts in a lowland tropical forest. *Biogeochemistry* DOI 10.1007/s10533-012-9812-2.
57. Keller, A.B., S.C. Reed, A.R. Townsend, **C.C. Cleveland**. Effects of canopy tree species on belowground biogeochemistry in a lowland wet tropical forest. *Soil Biology and Biochemistry* 58: 61-69.
56. Wieder, W.K., **C.C. Cleveland**, P.G. Taylor, D.R. Nemergut, E. Hinckley, L. Phillippot et al. Both increases and decreases in organic matter inputs reduce nitrate production and loss in lowland tropical forest. *Biogeochemistry* DOI 10.1007/s10533-012-9793-1.
55. Schmidt, S.K., D.R. Nemergut, B. Todd, R.C. Lynch, J.L. Darcy, **C.C. Cleveland**, A.L. King. 2012. A simple method for determining limiting nutrients for photosynthetic crusts. *Plant Ecology and Diversity* DOI:10.1080/17550874.2012.738714.
54. **Cleveland, C.C.**, B.W. Sullivan. 2012. Drought and tropical soil emissions. *Nature* 489: 211-212.
53. Reed, S.C., A.R. Townsend, E.A. Davidson, **C.C. Cleveland**. 2012. Patterns in foliar nutrient resorption and stoichiometry across multiple scales. *New Phytologist* 196: 173-180.
52. Wickings, K., A.S. Grandy, S.C. Reed, **C.C. Cleveland**. 2012. The origin of litter chemical complexity during decomposition. *Ecology Letters* doi: 10.1111/j.1461-0248.2012.01837.x.



## Curriculum Vitae

(Revised February 2023)

51. Smith, W.K., **C.C. Cleveland**, S.R. Reed, S.W. Running. .2012. Quantification of bioenergy potential for the conterminous United States constrained by satellite observations of productivity. *Environmental Science & Technology* dx.doi.org/10.1021/es203935d.

50. Leff, J.W., W.R. Wieder, P.G. Taylor, A.R. Townsend, D.R. Nemergut, A.S. Grandy, **C.C. Cleveland**. 2012. Experimental litterfall manipulation drives large and rapid changes in soil carbon cycling in a wet tropical forest. *Global Change Biology* doi: 10.1111/j.1365-2486.2012.02749.x (*Biology Faculty of 1000 Selection*)

### 2011

49. Leff, J.W., D.R. Nemergut, A.S. Grandy, S.P. O'Neill, K. Wickings, A.R. Townsend, **C.C. Cleveland**. 2011. The effects of soil bacterial community structure on decomposition in a tropical rain forest. *Ecosystems* DOI: 10.1007/s10021-011-9510-2.

48. Knelman, J.E., T.M. Legg, S.P. O'Neill, C.L. Washenberger, A. Gonzalez, **C.C. Cleveland**, D.R. Nemergut. 2011. Bacterial community structure and function change in association with colonizer plants during early primary succession in a glacier forefield. *Soil Biology & Biochemistry* 46: 172-180.

47. Reed, S.C., **C.C. Cleveland**, A.R. Townsend. 2011.. Functional ecology of free-living nitrogen fixation: A contemporary perspective. *Annual Review of Ecology, Evolution and Systematics* 42: 489-512.

46. **Cleveland**, C.C. A.R. Townsend, P. Taylor, S. Alvarez-Clare, M.M.C. Bustamante, G. Chuyong, S.Z. Dobrowski, P. Grierson, K.E. Harms, B.Z. Houlton, A. Marklein, W. Parton, S. Porder, S.C. Reed, C.A. Sierra, W.L. Silver, E.V.J. Tanner, W.R. Wieder. 2011. Relationships among net primary productivity, nutrients and climate in tropical rain forest: A pan-tropical analysis. *Ecology Letters* 14: 939-947.

45. Wieder, W.R., **C.C. Cleveland**, A.R. Townsend.2011. Throughfall exclusion and leaf litter manipulation drive higher rates of soil N<sub>2</sub>O emissions from a lowland wet tropical forest. *Global Change Biology* 17: 3195-3207.

44. Schmidt, S.K., **C.C. Cleveland**, D.R. Nemergut, S.C. Reed, A.J. King, P. Sowell. 2011. Estimating phosphorus availability for microbial growth in an emerging landscape. *Geoderma* 163: 135-140.

43. Reed, S.C., P.M. Vitousek, **C.C. Cleveland**. 2011. Are patterns of nutrient limitation belowground consistent with those aboveground?: Results from a 4-million-year chronosequence. *Biogeochemistry* 106: 323-336.

42. Wickings, K, A.S. Grandy, S.C. Reed, **C.C. Cleveland**. 2011. Management intensity effects on the biological and biochemical pathways of litter decomposition. *Biogeochemistry* 104: 365-379.

### 2010

41. Townsend, A.R., **C.C. Cleveland**, B.Z. Houlton, C.B. Alden, J.W.C. White. 2010. Multi-element regulation of the tropical forest carbon cycle. *Frontiers in Ecology and the Environment* 9: 9-17.

40. Reed, S.C., A.R. Townsend, P.G. Taylor, **C.C. Cleveland**. 2010. Phosphorus Cycling in Tropical Forests Growing on Highly Weathered Soils. pp. 339-369 In: E Buenemann, A Oberson and E Frossard (Eds). *Soil Biology 26: Phosphorus In Action – Biological Processes in Soil Phosphorus Cycling*: Springer, Berlin.

# Curriculum Vitae

(Revised February 2023)

39. Maron, J., M. Marler, J. Klironomos, **C. Cleveland**. 2010. Soil pathogens contribute to the positive plant diversity-productivity relationship. *Ecology Letters* 14: 36-41.
38. Nemergut, D.R., **C.C. Cleveland**, W.R. Wieder, C.L. Washenberger, A.R. Townsend. 2010. Plot-scale manipulations of organic matter inputs to soils correlate with shifts in microbial community composition in a lowland tropical rain forest. *Soil Biology & Biochemistry* 42: 2153-2160.
37. Reed, S.C., A.R. Townsend, **C.C. Cleveland**, D.R. Nemergut. 2010. Microbial community shifts influence patterns in tropical forest nitrogen fixation. *Oecologia* 164: 521-531.
36. Nemergut, D.R., E.K. Costello, M. Hamady, C. Lozupone, L. Jiang, S.K. Schmidt, N. Fierer, A.R. Townsend, **C.C. Cleveland**, L. Stanish, R. Knight. 2010. Global patterns in the biogeography of bacterial taxa. *Environmental Microbiology* 13: 135-144.
35. **Cleveland, C.C.**, W.R. Wieder, S.C. Reed, A.R. Townsend. 2010. Experimental drought in a tropical rain forest increases soil carbon dioxide losses to the atmosphere. *Ecology* 91: 2313-2323.
34. Johnson, P.J. T., A.R. Townsend, **C.C. Cleveland**, P. M. Gilbert, R. W. Howarth, V. J. McKenzie, E. Reimankova, M. H. Ward. 2010. Linking environmental nutrient enrichment and disease emergence in humans and wildlife. *Ecological Applications* 20: 16-29.
33. Wieder, W.R., **C.C. Cleveland**, A.R. Townsend. 2010. Controls over leaf litter decomposition in wet tropical forests. *Ecology* 90:3333-3341.
- 2009**
32. **Cleveland, C.C.**, B.Z. Houlton, C. Neill, S.C. Reed, A.R. Townsend, Y. Wang. 2009. Using indirect methods to constrain symbiotic nitrogen fixation rates: A case study from an Amazonian rain forest. *Biogeochemistry* 99: 1-13.
31. Fierer, N., M.S. Strickland, D. Liptzin, M.A. Bradford, **C.C. Cleveland**. 2009. Global patterns in belowground communities. *Ecology Letters* 12:1-12.
30. Sattin, S., **C.C. Cleveland**, E. Hood, S.C. Reed, A.J. King, S.K. Schmidt, M.S. Robeson, N. Ascarunz, D.R. Nemergut. 2009. Functional shifts in unvegetated, perhumid, recently-deglaciated soils do not correlate with shifts in soil bacterial community composition. *The Journal of Microbiology* 47: 673-681.
- 2008**
29. Bowman, W.D., **C.C. Cleveland**, L. Halada, J. Hreško, J.S. Baron. Negative impact of nitrogen deposition on soil buffering capacity. 2008. *Nature Geoscience* doi:10.1038/ngeo339.
28. Townsend, A.R., G.P. Asner, **C.C. Cleveland**. 2008. The biogeochemical heterogeneity of tropical forests. *Trends in Ecology & Evolution* 23: 424-431.
27. Wieder, W.R., **C.C. Cleveland**, A. R. Townsend. 2008. Tropical tree species composition affects the oxidation of organic matter from litter. *Biogeochemistry* 88: 127-138.
26. Reed, S.C., **C.C. Cleveland**, A.R. Townsend. 2008. Tree species control rates of free-living nitrogen fixation in a tropical rain forest. *Ecology* 89: 2924-2934.

## Curriculum Vitae

(Revised February 2023)

25. Schmidt, S.K., S.C. Reed, D.R. Nemergut, S. Grandy, **C.C. Cleveland**, M.N. Weintraub, A.W. Hill, E.K. Costello, A.F. Meyer, A.M. Martin, J. Neff. 2008. The earliest stages of microbial and ecosystem succession in high-elevation, recently deglaciated soils. *Proceedings of the Royal Society of London Series B*: doi:10.1098/rspb.2008.0808.

### 2007

24. **Cleveland, C.C.**, D. Liptzin. 2007. C:N:P stoichiometry in soil: Is there a "Redfield ratio" for the microbial biomass? *Biogeochemistry* 85: 235-252 / DOI 10.1007/s10533-007-9132-0.

23. Nemergut, D.R. S.P. Anderson, **C.C. Cleveland**, A.P. Martin, A.E. Miller, A. Seimon, S.K. Schmidt. 2007. Microbial community succession in unvegetated, recently-deglaciated soils. *Microbial Ecology* 53: 110-122.

22. Townsend, A.R., **C.C. Cleveland**, G.P. Asner, M.M.C. Bustamante. 2007. Controls over foliar N:P ratios in tropical rain forests. *Ecology* 88: 107-118.

21. Reed, S.C., **C.C. Cleveland**, A.R. Townsend. 2007. Controls over leaf litter and soil nitrogen fixation in two lowland tropical rain forests. *Biotropica* 39:585-592.

20. Schmidt, S.K., Costello, E.K., Nemergut, D.R., **Cleveland, C.C.**, Reed, S.C., Weintraub, M.N., Meyer, A. F., Martin, A.M. 2007. Microbial turnover and seasonal succession drive biogeochemical cycles in the alpine. *Ecology* 88: 1379-1385.

### 2006

19. **Cleveland, C.C.**, A.R. Townsend. 2006. Nitrogen and phosphorus additions cause substantial losses of soil carbon from a lowland tropical rain forest. *Proceedings of the National Academy of Sciences of the USA* 103: 10316-10321.

18. **Cleveland, C.C.**, D.R. Nemergut, S.K. Schmidt, A.R. Townsend. 2006. Increases in soil respiration following labile carbon additions linked to rapid shifts in soil microbial community composition. *Biogeochemistry* DOI 10.1007/s10533-006-9065-z.

17. **Cleveland, C.C.**, A.R. Townsend, S.C. Reed. 2006. Nutrient regulation of organic matter decomposition in a tropical rain forest. *Ecology* 87:492-503.

### 2004-2005

16. **Cleveland, C.C.**, D.M. McKnight, A.R. Townsend. 2005. Trophic interactions: Links between the carbon and hydrologic cycles in terrestrial ecosystems. Pp. 1557-1574 in: M. G. Anderson and J. J. McDonnell (Eds). *The Encyclopedia of Hydrological Sciences, Volume 3*: John Wiley & Sons, West Sussex, UK (Invited contributor).

15. Galloway, J.N., G. Asner, E.W. Boyer, D.G. Capone, **C.C. Cleveland**, F.J. Dentener, P. Greene, E. Holland, R.W. Howarth, D.M. Karl, A.F. Michaels, S.P. Seitzinger, A.R. Townsend, C. Vorosmarty. 2004. Global and regional nitrogen cycles: Past, present and future. *Biogeochemistry* 70: 153-226.

14. **Cleveland, C.C.**, A.R. Townsend, B. C. Constance, R. E. Ley, S. K. Schmidt. 2004. Soil microbial dynamics in Costa Rica: Seasonal and biogeochemical constraints. *Biotropica* 36: 184-195.

## Curriculum Vitae

(Revised February 2023)

13. Boyer, E.W., R.W. Howarth, J.N. Galloway, F.J. Dentener, P. Green, C. Vorosmarty, **C.C. Cleveland**, G.P. Asner. 2004. Nitrogen inputs to world regions. In A. R. Mosier, K. Syers and J. R. Freney (Eds.), *Agriculture and the nitrogen cycle: assessing the impact of fertilizer use on food production and the environment*. Washington, D.C., Island Press.
12. **Cleveland, C.C.**, J.C. Neff, A.R. Townsend, E. Hood. 2004. Composition, dynamics and fate of leached dissolved organic matter in terrestrial ecosystems: Results of a decomposition experiment. *Ecosystems* 7: 275-285.
11. Bowman, W.D., H. Steltzer, T.N. Rosenstiel, **C.C. Cleveland**, C.L. Meier. 2004. Litter effects of two co-occurring alpine species on plant growth, microbial activity and immobilization of nitrogen. *Oikos* 104: 336-344.

### 1997-2003

10. Townsend, A.R., R.W. Howarth, F.A. Bazzaz, M.S. Booth, **C.C. Cleveland**, S.K. Collinge, A.P. Dobson, P.R. Epstein, E.A. Holland, D.R. Keeney, M.A. Malin, C.A. Rogers, P. Wayne, A.H. Wolfe. 2003. Human health effects of a changing global nitrogen cycle. *Frontiers in Ecology and the Environment* 1: 240-246.
9. **Cleveland, C.C.**, A.R. Townsend, B.C. Constance, S.K. Schmidt. 2002. Soil microbial dynamics and biogeochemical cycling in lowland tropical rain forests and pastures of southwestern Costa Rica. *Ecological Applications* 13: 314-326.
8. **Cleveland, C.C.**, A.R. Townsend, S.K. Schmidt. 2002. Phosphorus limitation of microbial processes in moist tropical forests. *Ecosystems* 5: 680-691.
7. Townsend, A.R., G.P. Asner, **C.C. Cleveland**, M.E. Lefer, M.M.C. Bustamante. 2002. Unexpected changes in soil phosphorus dynamics following tropical deforestation to cattle pasture. *Journal of Geophysical Research* 107 (D20), 8067, doi: 10.1029/2001 JD000650, 2002.
6. Vitousek, P.M., K. Cassman, **C.C. Cleveland**, T. Crews, C.B. Field, N.B. Grimm, R.W. Howarth, R. Marino, L. Martinelli, E.B. Rastetter, J.I. Sprent. 2002. Towards an ecological understanding of biological nitrogen fixation. *Biogeochemistry* 57/58: 1-45.
5. Asner, G.P., A.R. Townsend, W. Riley, P.A. Matson, J.C. Neff, **C.C. Cleveland**. 2001. Physical and biogeochemical controls of terrestrial ecosystem responses to nitrogen deposition. *Biogeochemistry* 54: 1-39.
4. **Cleveland, C.C.**, A.R. Townsend, D.S. Schimel, H. Fisher, R.W. Howarth, L.O. Hedin, S.S. Perakis, E.F. Latty, J.C. Von Fischer, A. Elseroad, M.F. Wasson. 1999. Global patterns of terrestrial biological nitrogen (N<sub>2</sub>) fixation in natural ecosystems. *Global Biogeochemical Cycles* 13: 623-645.
3. Fahey, T.J., C.J. Williams, J.N. Rooney-Varga, **C.C. Cleveland**, K.M. Postek, S.D. Smith, D.R. Bouldin. 1999. Nitrogen deposition in and around an intensive agricultural district in Central New York. *Journal of Environmental Quality* 28: 1585-1600.
2. **Cleveland, C.C.**, J.B. Yavitt. 1998. Microbial consumption of atmospheric isoprene in a temperate forest soil. *Applied and Environmental Microbiology* 64: 172-177.

# Curriculum Vitae

(Revised February 2023)

1. **Cleveland, C.C.**, J.B. Yavitt. 1997. Consumption of atmospheric isoprene in soil. *Geophysical Research Letters* 24: 2379-2382.

## **Funded Research (External) (\$5,006,766 total to UM)**

Collaborative research: Nitrogen recovery in postfire lodgepole pine forests: cryptic sources, uncertain futures. NSF (\$466,397, 5 years, PI).

New paradigms for understanding ecosystem nutrient limitations. New Phytologist Trust (\$16,000, 1 year, Co-PI).

Novel multi-scale synthesis of nitrogen fixation rates and drivers across the terrestrial biosphere. USGS Powell Center for Analysis and Synthesis (\$153,734, 3 years, Co-PI).

RCN: INCyTE: Investigating Nutrient Cycles in Terrestrial Ecosystems: Integrating Observations, Experiments, and Models. NSF (\$499,355 total, \$499,355, 5 years, PI and INCyTE project lead).

Collaborative Research: Bioavailability of soil phosphorus in tropical forest soils: Is slowly cycling P accessible to plants and soil biota? NSF (\$399,759, 3 years, PI).

Patterns and controls of tree regeneration and composition following forest restoration treatments in low elevation ponderosa pine (*Pinus ponderosa*) forests of western Montana. USDA Forest Service, Macintire-Stennis Research Program (\$23,327, 3 years, PI).

UGP 2020: Exploring the effects of rock nitrogen on ecosystem processes. University of Montana (\$5000, 2 years, PI).

UGP 2018: Nitrogen (N) dynamics in a post-fire landscape: A search for the missing N source. University of Montana (\$5000, 2 years, PI).

Collaborative Research: Geomorphic Control of the Lowland Tropical Nitrogen Cycle. NSF (\$271,506 to UM, 4 years [2014-2018], PI)

Dissertation Research: Interactions among nitrogen and phosphorus through plant-microbial mutualisms in tropical rain forests. NSF (\$18,850, 3 years, PI; Megan Nasto PhD Co-PI).

The long-term effects of alternative fuel treatments on ecosystem properties and processes: The Lubrecht Forest Fire and Fire Surrogates Study revisited. USDA Forest Service, Macintire-Stennis Research Program (\$98,859, 3 years [2011-2014], PI)

A spatially explicit evaluation of the bioenergy potential of the Southwestern United States. USGS (\$42,625, 3 years [2013-2016]; Co-PI)

Revisiting nutrient limitation in tropical forest: Synthesis and emerging ideas. National Center for Ecological Analysis and Synthesis (\$87,000; 5 years [2008-2013], PI)

Collaborative Research: Controls over nitrogen loss from very wet tropical forests. NSF (\$170,802, 3 years [2012-2015], PI)

## **Curriculum Vitae**

(Revised February 2023)

MSB: Collaborative Research: Links between soil biogeochemistry and microbial community dynamics along recently deglaciated chronosequences. NSF (\$176,433, 4 years [2010-2014], PI)

Exploring nutrient limitation in tropical forests. Andrew W. Mellon Foundation (\$325,000, 5 years [2009-2014], PI)

Late-seral woody riparian plants and their environment along the upper Missouri River, Montana. US Bureau of Land Management (\$66,796, 2 years, Co-PI)

Climate change vulnerability and adaptive capacity in Montana: Using dynamic scenario-building and network analysis to investigate community decision-making under uncertainty. Montana EPScOR (\$50,000, 1 year, Co-PI)

Coupled climatic limitations on the regeneration niche: Implications for modeling climate change impacts across time and space. Montana EPScOR/IoE (\$15,866, 1 year, Co-PI)

Ecological and social dynamics of mountain pine beetle outbreaks in western Montana. USDA Forest Service, Macintire-Stennis Research Program (\$62,251, 2 years, Co-PI)

Causes and consequences of climate change-driven outbreaks of mountain pine beetle in western subalpine ecosystems. USFS (\$75,717, 2 years, Co-PI)

Graduate Training in Multi-Scale Analysis of Forest Disturbance Ecology. USDA (\$235,991, 3 years, Co-PI)

Prying Open the Black Box: Does microbial community composition regulate respiration in tropical rain forest soil? NSF (\$499,998, 3 years, PI)

Interactions between rainfall, nutrient cycles and decomposition in a lowland tropical rain forest. NSF (\$680,000, 3 years, Co-PI)

Phosphorus regulation of decomposition, microbial dynamics, and foliar chemistry in moist tropical forests. NSF (\$570,000, 3 years, Co-PI)

### **Invited Oral Presentations**

#### **2020**

Invited presentation: Nitrogen fixation data synthesis: Historical perspectives and future directions. USGS Powell Center, Ft. Collins, Colorado, January 26, 2020.

#### **2019**

Invited presentation: Nutrient Constraints on Future Productivity and Carbon Storage in Terrestrial Ecosystems, Hawkesbury Institute for the Environment, Sydney, Australia, August 29, 2019.

Invited presentation: A new view on terrestrial nutrient limitation, University of Western Australia, September 6, 2019.

Invited presentation: Nutrient constraints on the global carbon cycle, Montana State University, November 4, 2019.

# Curriculum Vitae

(Revised February 2023)

## 2018

Invited presentation: Nutrient Constraints on Future Productivity and Carbon Storage in Terrestrial Ecosystems, California Institute of Technology/Jet Propulsion Laboratory, Pasadena, CA, October 18, 2018.

Invited presentation: Overcoming Nutrient Limitation: Will Phosphorus Availability Constrain Global Plant Production Under Elevated CO<sub>2</sub>? American Geophysical Union, Washington, DC, December 2019.

## 2017

Invited Presentation: How do diverse ecosystems overcome low soil phosphorus: Mechanism, implication, and meditations. Annual Meeting of the Ecological Society of America, August, 2017, Portland, OR.

## 2016

Invited Presentation: Nutrient Limitation in Tropical Forests: Evidence and Implications. Smithsonian Tropical Research Institute, Balboa, Panama.

Invited Presentation: Bioavailability of phosphorus in tropical forest soils: Is slowly cycling P accessible to plants and soil biota? Phosphorus Cycling in Terrestrial Ecosystems: Advancing our fundamental understanding through a model-data connection, Townsend, TN

## 2013

Invited Presentation: The Paradox(es) of Nitrogen Fixation in Tropical Forests. University of Texas, November 6 – 8, 2013.

Invited Presentation: Bioavailability of phosphorus in tropical forest soils: Is slowly cycling P accessible to plants and soil biota? Phosphorus Cycling in Terrestrial Ecosystems: Taking a New Approach to Advancing our Fundamental Understanding Through a Model-Data Connection. Joint NSF/DOE Workshop, Townsend, TN, June 22-25, 2016.

Invited Presentation: Patterns of new versus recycled primary production in the terrestrial biosphere, Annual Meeting of the American Geophysical Union, San Francisco, CA.

## 2011

Invited Presentation: *Nutrient Limitation in Terrestrial Ecosystems: Observational Insights*. How Do We Improve Earth System Models? Integrating Earth System Models, Ecosystem Models, Experiments and Long-Term Data, INTERFACE Workshop, Captiva Island, FL, February 29 – March 3, 2011. <http://www.bio.purdue.edu/INTERFACE/index.php>.

Invited Presentation: *Climate and nutrient regulation of the tropical forest C cycle*. Organized Oral Session: From leaf to biosphere: the effects of a warming climate on tropical rain forests. Ecological Society of America 96<sup>th</sup> Annual Meeting, Austin, TX, August 7 – 12, 2011.

Invited Presentation: *Stoichiometric controls on terrestrial biological nitrogen fixation*. 27th New Phytologist Symposium: Stoichiometric flexibility in terrestrial ecosystems under global change, Oracle, AZ, September 25-28, 2011.

# Curriculum Vitae

(Revised February 2023)

## 2010

Invited Presentation: *Multi-element regulation of the tropical forests carbon cycle*. University of Minnesota, Minneapolis, MN, September 29, 2010.

## 2009

Invited Presentation: *Too Much of a Good Thing: N Deposition and Ecosystem Processes in Mountain Soils*. Department of Ecology, Montana State University, March 12, 2009

Invited Presentation: *The Future of the Global P Cycle: Nutrient Limitation, Soils, and Biofuel Production in the Tropics*. Aspen Global Change Institute, Aspen, CO, October 1, 2009.

Invited Presentation: *Hot and Getting Hotter: Global Environmental Change Accelerates Greenhouse Gas Emissions From Tropical Forests to the Atmosphere*. College of Forestry and Conservation Graduate Seminar, University of Montana, Missoula, MT, November 20, 2009.

## 2008

Invited Presentation: *Too Much of a Good Thing: N Deposition and Ecosystem Processes in Mountain Soils*. Department of Geosciences, University of Montana, November 9, 2008.

Invited Presentation: *Ecosystem Processes, Tropical Forests and Global Change*. University of Montana International Education Week. International Lecture Series: *Human and Ecological Dimensions of Global Change: From Problems to Solutions*, UC Theater, November 17, 2008.

## 2007

Element stoichiometry in terrestrial ecosystems: How do nutrient ratios inform our understanding of ecosystem function? Natural Resources Ecology Laboratory (NREL) Ecology Seminar, Colorado State University, April 6, 2007.

Element stoichiometry in terrestrial ecosystems: How do nutrient ratios inform our understanding of ecosystem function? Biogeochemistry Seminar Series, Cornell University, April 13, 2007

Invited Presentation: *Global organization of C:N:P ratios in plants and soils: Implications of terrestrial Redfield-type ratios*, DBS/OBE Noon Seminar. University of Montana, August 25, 2007.

Invited Presentation: Element stoichiometry in terrestrial ecosystems: How do nutrient ratios inform our understanding of ecosystem function? Natural Resources Ecology Laboratory (NREL) Ecology Seminar, Colorado State University, April 6, 2007

Invited Presentation: Element stoichiometry in terrestrial ecosystems: How do nutrient ratios inform our understanding of ecosystem function. Biogeochemistry Seminar Series, Cornell University, April 13, 2007

## Teaching Experience

Introduction to Biogeochemistry (EBIO 4160; U Colorado)

Introductory Soils (FOR 210/ENSC 245; U Montana)



## Curriculum Vitae

(Revised February 2023)

Soils, Water and Climate (NRSM 210N; U Montana)  
Environmental Soil Science (ENSC 415; U Montana)  
Terrestrial Ecosystem Ecology (BIOE 447; U Montana)  
Fundamentals of Ecosystem Science (BIOS 532; U Montana)  
Global Biogeochemical Cycles (FOR 495; U Montana)  
Global Cycles and Climate (NRSM 408; U Montana)  
Tropical Biology: An Ecological Approach (OTS Field Course, Costa Rica)  
Forest Ecology Seminar (FOR 595; U Montana)  
Advanced Topics in Biogeochemistry (FOR 595; U Montana)  
Fundamentals of Ecosystem Science (BIOS 532; U Montana)  
Emerging Topics in Ecosystem Science (NRSM 595; U Montana)

### Synergistic Activities

2020 Co-chair, Strategic Planning Committee, W.A. Franke College of Forestry and Conservation

2019 – 2021 Associate Editor, *Faculty Opinions*

2020 Reviewer and Panelist, Ford Foundation, Washington DC, March 2020

2020 – present *Skype a Scientist* participant

2020 – present Co-organizer, *Novel multi-scale synthesis of nitrogen fixation rates and drivers across the terrestrial biosphere*, Ft. Collins, CO, January 26 – 30, 2020.

2019 Co-Organizer: *Elucidating Coupled Biogeochemical Cycles in Terrestrial Ecosystems: Integrating Theory, Observations, Experiments, and Models*, AGU Annual Meeting, San Francisco, CA, December 2019

2019 Co-organizer, *New Paradigms for Understanding Nutrient Limitation*, New Phytologist Workshop, Perth, Australia, September 6 – 10, 2019

2019 Reviewer and Panelist, Ford Foundation, Irvine, CA, March 2019

2019 – 2020 *Faculty of 1000* faculty member

2018 – present Project Director, INCyTE Research Coordination Network (NSF)

2012 – 2016 Associate Editor, *Ecological Applications*

2012 Scientific Reviewer and Panelist, US Department of Energy Terrestrial Ecosystem Sciences Program, Washington DC, April 26, 2012

2012 Session Co-organizer. *New strategies for defining planetary boundaries*, Planet Under Pressure, London, England, March 24 – 29, 2012 (<http://www.planetunderpressure2012.net/index.asp>)

2011 Session Co-organizer (Invited): *Phosphorus limitations to plant growth and microbial processes, CLIMMANI/INTERFACE joint workshop: Nutrient constraints on the net carbon balance*, June 15-17, 2011, Keflavik, Iceland

# Curriculum Vitae

(Revised February 2023)

- 2011 Invited Participant, INTERFACE, *How Do We Improve Earth System Models? Integrating Earth System Models, Ecosystem Models, Experiments and Long-Term Data*, INTERFACE Workshop, Captiva Island, FL, February 29 – March 3, 2011.
- 2010 – 2016 Associate Editor, *Biogeochemistry* (Synthesis & Emerging Ideas)
- 2010 NSF Panelist, Division of Environmental Biology, Ecosystems Sciences
- 2010 Invited Participant, Department of Energy Office (DOE) of Biological and Environmental Research (BER) Climate Change Research Road Mapping Workshop, Arlington, VA
- 2010 Writing Team Member, Terrestrial Carbon Cycling, Department of Energy Office (DOE) of Biological and Environmental Research (BER) Climate Change Research Road Mapping Workshop, Arlington, VA
- 2009 Invited Instructor, Forest Nutrient Cycling, University of Montana, College of Forestry & Conservation Mini-College, November 2009
- 2009 Invited Resource Faculty, *Tropical Biology: An Ecological Approach*, Organization for Tropical Studies (OTS), Costa Rica, July 4-11, 2009
- 2009 Invited Participant, State of the Global Phosphorus Cycle, Aspen Global Change Institute, Aspen, CO September 30 – October 5, 2009
- 2009 – 2010 Associate Editor, *Biogeochemistry*
- 2009 NSF Panelist, Office of Polar Programs, Antarctic Organisms & Ecosystems
- 2008 – 2014 Workshop Organizer and Co-chair, *Revisiting nutrient limitation in tropical forests*, National Center for Ecological Analysis and Synthesis, Santa Barbara, CA
- 2007 Workshop Organizer, *Nitrogen fixation in natural and agricultural ecosystems*, Nitrogen 2007, Bahia du Sauipe, Brazil, October 2007
- 2003 Rapporteur (invited), *Science Plan for Integrated Studies of Coupled Biosphere-Atmosphere Carbon and Nitrogen Cycles, The impact of nitrogen deposition on soil microbial processes*, Boulder, CO, March 2003
- 2002 – 2003 Invited Contributor, International SCOPE Nitrogen Project, *Nitrogen and Human Health*
- 1998 – 2000 Invited Contributor, *International SCOPE Nitrogen Project, Nitrogen Transport and Transformations: A Regional and Global Analysis*, Working Group IV: *Unifying Models of Nitrogen Fixation*
- 1998 – present Reviewer for *Biogeochemistry, Biotropica, Canadian Journal of Forest Research, Ecological Applications, Ecological Monographs, Ecology, Ecology Letters, Environmental Research Letters, Ecosystems, Functional Ecology, Geoderma, Global Biogeochemical Cycles, Global Change Biology, Global Ecology and Biogeography, Journal of Ecology, Limnology and Oceanography, JGR-Biogeosciences, Environmental Science and Technology, Journal of Environmental Quality, Nature, Nature Communications, Nature Geoscience, New Phytologist, Oecologia, PLOS-Biology, PNAS, Science, Science Advances, Soil Use and Management, Soil Biology and Biochemistry.*

# Curriculum Vitae

(Revised February 2023)

## Professional Affiliations

American Geophysical Union

American Association for the Advancement of Science

Ecological Society of America (Lifetime member since 2007, fellow since 2018)

Soil Ecology Society

## Academic Advisors

M.S. Dr. Joseph Yavitt (Cornell University)

Ph.D. Dr. Alan Townsend (University of Colorado)

Postdoctoral Dr. Alan Townsend (University of Colorado)

## Postdoctoral Advisees

Dr. Sasha Reed (2008-2010)

Dr. Benjamin Sullivan (2012 – 2015)

Dr. Silvia Alvarez-Clare (2012 – 2015)

Dr. William Kolby Smith (2013 – 2015)

Dr. Alison Marklein (2015 – 2016)

Dr. Fiona Soper (2016 – 2018)

Dr. Katherine Dynarski (2020 – 2021)

Dr. Emma Hauser (2021 – present)

## Graduate Advisees

Heath Carey (U Montana, M.S. 2010)

Jonathan Leff (U Montana, M.S. 2011)

Megan Keville (U Montana, M.S. 2011)

Adrienne Keller (U Montana, M.S. 2011)

Kali Pennick (U Montana, M.S. 2012)

Sasha Reed (U Colorado, Ph.D. 2008)

Nataly Ascarrunz (U Colorado, Ph.D. 2010)

Will Wieder (U Colorado, Ph.D. 2011)

Philip Taylor (U Colorado, Ph.D. 2012)

Peter Ganzlin (U Montana, M.S. 2013 – 2015)

Sarah Castle (U Montana, Ph.D. 2010 – 2015)

Megan Nasto (U Montana, Ph.D., 2012 – 2017)

Alanna Shaw (U Montana, Ph.D. 2016 – present)

Robert Heumann (U Montana, Ph.D. 2021 – present)

## Undergraduate Advisees (Honors)

Lindsay Myers (2007 – 2009)

Erika Foster (2011 – 2012)

# Curriculum Vitae

(Revised February 2023)

## **Undergraduate Advisees (Research)**

Jonathan Orndoff (2007-2008)  
Toren Johnson (2007 – 2008)  
Patrick Funk (2009 – 2011)  
James Dyke Jr. (2010 – 2012)  
Erika Foster (2010 – 2012)  
Molly Garcia (2011 – 2012)  
Rachel Becknell (2013 – Summer REU Program Advisee)  
Alexandra Ginter (2012 – 2015)  
Natasha Boote (2012 – 2013)  
Emily Prag (2012 – 2015)  
Stacia Hill (2015 – 2016)  
Leone Claire (2016 – 2017)  
Haley Hodge (2016 – 2018)  
Corey Leach (2018 – 2019)  
Kian Speck (2021- 2022)  
Rowan Grassi (2022)

## **Laboratory Technicians (Supervised)**

Jonathan Leff (U Montana, 2008 – 2009)  
Tell Dietzler (2009 – 2010)  
Jason Aylward (2009 – 2011)



## UNIVERSITY OF ALASKA FAIRBANKS

INSTITUTE OF ARCTIC BIOLOGY

P.O. Box 757000

Fairbanks, Alaska 99775-7000 U.S.A.

907 474-7640

FAX 907 474-6967

Professor Alan Townsend, Dean  
W.A. Franke College of Forestry and Conservation  
Missoula, MT 59812

Dear Alan,

I'm proud to support Cory Cleveland's nomination as Regents Professor at the University of Montana. I have not worked directly with Cory but often talk with him at meetings and have tremendous admiration for his work. He has strongly influenced my thinking about the role of microbes in ecosystem processes. When I revised my textbook on Principles of Ecosystem Ecology a few years ago, I asked Cory to review the sections on microbial processes and nutrient cycling, and his comments were insightful and contributed substantially to the concepts and narrative. Therefore, I'm confident that he must be an effective teacher. Cory is a superstar in every dimension of his academic performance. I consider him to be among the top 1-3 scientists to enter the field of ecosystem ecology this century. He has been an author (generally the lead author) on most of the really important papers during the last decade on the role of microbes in ecosystem processes.

Cory's main contribution, in my view, is to provide a mechanistic understanding, based on the physiology, evolution and ecology of microbes, of the nature of phosphorus and nitrogen limitation in ecosystems—especially in the tropics. Since Cory began his research career, he has revolutionized this field by moving it from black-box correlational science to a hypothetico-deductive science based on understanding of the physiology and ecology of microbes as they interact with their physical, chemical, and biological environment. With many top scientists, I can point to one or two papers that epitomize their contribution to science, but with Cory this is impossible because so many of his papers have been major breakthroughs.

Cory has also made important contributions to ecosystem ecology through service at local to global scales, including involvement in Future Earth (international research planning), DOE climate planning, and his service at the University of Montana. He is an editor for Ecological Applications and Biogeochemistry. In my view, he is one of America's leading young scientists.

I hope these comments are useful to your nomination process,

F. Stuart Chapin, III



April 6, 2023

TO: 2023 Regents Professor Panel  
RE: Professor Cory Cleveland

Dear Panel Members:

It's a real pleasure for me to support the nomination from the Department of Ecosystem and Conservation Sciences (DECS) that Professor Cory Cleveland be named a Regents Professor. I offer this support in the strongest possible terms, and stress up front how telling and extraordinary it is that his entire department came together to submit a unanimous nomination. And while that fact is impressive, for those who know Cory, it's not surprising. Simply put, Professor Cleveland exemplifies the Regents Professor criteria in every dimension. He is a scholar of substantial international renown, he is a deeply devoted teacher and mentor, and he is an exemplary College and University citizen in so many ways. I will expand on all of these areas in the subsequent paragraphs, and have included two additional letters of support which further underscore his case. I also note that Dean DeLuca nominated Cory four years ago, and he received strong consideration for the honor at the time. He has only furthered his impressive credentials in the subsequent years, and I urge you to grant him the honor in this round.

I'll begin with his research accomplishments. Professor Cleveland has a record and reputation in the field of ecology that very few people in the world can match. That's not hyperbole; it's borne out by multiple metrics. He has published more than 100 research papers in high quality journals; these papers have been cited more than 27,000 times by other authors, and he has a currently listed H-index of 67. He was elected as a Fellow of the Ecological Society of America, was named one of ISI's highly cited researchers, and was named a member of the Faculty of 1000. All of these are honors reserved for only the very top people in their fields. As Regents Professor Emeritus Steve Running states in his letter of support, these metrics offer a true measure of impact, and cannot be "exaggerated or puffed up." A few years ago, National Academy of Sciences member Bill Schlesinger stated that one of Cory's papers was "a classic that will be regarded with the likes of Redfield and others that shaped the field of ecology for decades." I know Bill well, and he does not give praise lightly—to put Cory up there with Redfield is as strong as it gets. Another National Academy member—Terry Chapin, who is widely regarded as one of the best ecologists in history—wrote in support of this nomination, and as part of his letter stated: "***Cory is a superstar in every dimension of his academic performance. I consider him to be among the top 1-3 scientists to enter the field of ecosystem ecology this century.***" Again...it doesn't get any stronger than that. These statements make it clear that Cory is on a path for some of the highest honors in science, including consideration for membership in the National Academy.

Somehow, Cory has pulled off this rather astonishing level of research productivity and impact while consistently going well above and beyond in his teaching and service duties. He has an excellent record of student and postdoc mentorship, and he willingly takes on some of the most demanding courses in the college—and teaches them well. He also has a pattern of going beyond his assigned duties in support of others and the college. He's done so to take pressure off more junior colleagues, and he's done so to fill

teaching holes that emerge last minute. He did that yet again in my first year here, amidst the pandemic and while simultaneously leading FCFC's strategic planning process (more on that below). Just a few short weeks before the spring term, he volunteered to step into a large and demanding teaching slot—a move that represented one of many voluntary overloads in his teaching effort over the years, and yet another example in a long history of him just stepping up for FCFC and UM.

That history extends to his service record, which is also rather astonishing for someone with his research profile. This spring, he stepped back into the DECS Chair role to cover for Cara Nelson while she is on sabbatical. During my first few months at UM, five different people independently told me that Cory was “the best chair in the history of the college.” The DECS letter of nomination lays out multiple examples of his service work—and his approach to it—and states that “his list of university service and contributions is astounding” and that “his service record beyond the university is peerless.” When I joined UM in the fall of 2000, I solicited nominations from the faculty for who should lead a strategic planning group—a critical task that will shape the direction of the college for years to come. Cory received the most nominations by far, and it was telling that they came from every department. He then took on this leadership task under truly tough circumstances, in that the task was large and complex and yet the time to do it was short, and it all had to be done under remote circumstances given COVID. Despite all those challenges, he led a large and diverse group of faculty and staff to the production of an excellent and widely supported strategic document. As I came to learn since, this surprised...pretty much nobody. Cory has a well-earned reputation for efficient, focused and inclusive leadership.

All of these attributes clearly make him an excellent candidate for the Regents Professor honor. But I want to close with another quality that doesn't appear so easily on a CV: his deep and genuine caring for others and the university. Last year, Cara Nelson wrote to me that Cory “frequently reached out to me and other faculty during times of departmental, college, or campus-wide stress to check in and offer assistance.” She's dead on with this. I've known Cory for his entire professional career, and he is always—always—willing to help someone else, and always thinking about the welfare of others. I saw that repeatedly through the COVID challenges: Cory was consistently reaching out to others amidst the pandemic stress, and working on ways to maintain FCFC's strong and connected culture when we all had to be so separate from each other.

That devotion also extends to the university as a whole. With Cory's record, he could easily jump to another institution that could offer higher pay, lower teaching loads and substantial research support. I know others have come calling over the years. They've done so not just because of his research record, but because his superb all-around reputation extends well beyond this campus. People in the field know he is the kind of colleague everyone wants to land in a department. But he's remained at UM, with little fanfare or drama. Why? Because he loves this college and university, pure and simple.

UM now has a chance to reward both that devotion and his remarkable accomplishments with a Regents Professor designation. I urge you do to so in the strongest possible terms.

Thank you for your consideration, and please feel free to reach out if I can answer any questions.

Sincerely,



Alan Townsend  
Dean and Franke Professor