

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Catherine E. Badgley, associate professor of ecology and evolutionary biology, with tenure, and associate professor in the Residential College, without tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of ecology and evolutionary biology, with tenure, and professor in the Residential College, without tenure, College of Literature, Science, and the Arts.

Academic Degrees:

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| Ph.D. | 1982 | Yale University |
| M.S. | 1974 | Yale University |
| B.A. | 1972 | Radcliffe College, Harvard University |

Professional Record:

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| 2013 – present | Associate Professor, Department of Ecology and Evolutionary Biology and Residential College, University of Michigan |
| 2007 – 2013 | Assistant Professor, Department of Ecology and Evolutionary Biology and the Residential College, University of Michigan |
| 2004 – present | Research Scientist, Museum of Paleontology and Department of Earth and Environmental Sciences, University of Michigan |
| 1992 – 2004 | Associate Research Scientist, Museum of Paleontology and Department of Geological Sciences, University of Michigan |
| 1987 – 2007 | Lecturer, Residential College, University of Michigan |
| 1985 – 1992 | Assistant Research Scientist, Museum of Paleontology, University of Michigan |
| 1982 – 1987 | Visiting Assistant Professor, Department of Geological Sciences, University of Michigan |
| 1982 – 1985 | Post-doctoral Fellow, Michigan Society of Fellows, University of Michigan |

Summary of Evaluation:

Teaching – Professor Badgley has contributed substantially to the teaching mission of the Department of Ecology and Evolutionary Biology (EEB) and the Residential College. Her recent contributions to both units add to her many years of offering highly creative courses in the Residential College. Professor Badgley is a very experienced and talented instructor who is able to engage effectively with students by using creative learning techniques. She allows students to own their educational experiences while still providing guidance along the way. She excels at teaching interdisciplinary courses and she contributes in important ways to the department's graduate offerings. Her commitment to mentoring students at all levels is outstanding.

Research – Professor Badgley is an accomplished ecologist who works on the evolutionary dynamics of terrestrial faunas, emphasizing exploration of the factors that control mammalian diversity and community structure. The primary focus of her research program has been the study of long-term faunal dynamics of land-based ecosystems over the last few tens of millions of years. Her work is central to new efforts to understand how processes within lineages and changes in relative abundance interrelate, and her publications on these issues are highly cited. Professor Badgley has organized international meetings for researchers devoted to these topics. Her contributions to taphonomy include seminal studies on how the best procedures for evaluating patterns of abundance vary according to depositional environment and style of preservation. These apply well beyond the

bounds of her studies and have been used to guide many other paleoecological investigations. Professor Badgley's work is especially innovative because of its use of Bayesian methods, based on likelihood models. She has also studied how temporal completeness varies within long stratigraphic sequences and in different depositional settings. Professor Badgley has documented some of the longest records of faunal change available anywhere in the world and through studies of modern fauna she has helped to clarify how well-preserved material reflects the living community. Her research also extends into the current biodiversity crisis, including societally relevant issues such as how agricultural practices impinge on the biodiversity of today's organisms.

Recent and Significant Publications:

- "Biodiversity and topographic complexity: Modern and geohistorical perspectives," with T. M. Smiley, et al., *Trends in Ecology and Evolution*, accepted 2016 (in final revision).
- "Small-mammal isotope ecology tracks climate and vegetation gradients across western North America," with T. M. Smiley, et al., *Oikos*, doi: 10.1111/oik.02722.
- "Great Basin mammal diversity in relation to landscape history," with T. M. Smiley and J. A. Finarelli, *Journal of Mammalogy*, 95(6), 2014, pp. 1090-1106.
- "Diversity dynamics of mammals in relation to tectonic and climatic history: Comparison of three Neogene records from North America," with J. A. Finarelli, *Paleobiology*, 39(03), 2013, pp. 373-399.

Service – Professor Badgley has provided exceptional service to the department, the university, and to her profession nationally and internationally, continuing the strong record of service she established early in her career here at Michigan. She has served as the associate chair for undergraduate studies in EEB, chair of the EEB Diversity Committee, faculty advisor for the Residential College, chair and member of several graduate student committees, and other service roles at the university. To the wider community, Professor Badgley is senior editor for the leading journal in her field and has provided extensive service to professional societies in and beyond her research area.

External Reviewers:

Reviewer (A)

"I respect Dr. Badgley's work immensely. Her focus on using fossil mammals as a way to understand the evolution and maintenance of biodiversity is innovative and timely, and she is considered the go-to person on questions of the evolution of mammal diversity in relation to climate and tectonic disruptions. Her papers are data-rich with thoughtfully reasoned conclusions and discussions."

Reviewer (B)

"She has pioneered the development of a conceptual framework and the use of various methods (e.g, isotopes, taphonomy, phylogeography) to investigate habitat, foraging ecology, diet and trophic level among mammalian faunas."

Reviewer (C)

"I enthusiastically support the promotion of Catherine Badgley to Professor in your department."

Reviewer (D)

"Certainly in terms of scholarly impact her analyses of how tectonic processes influenced the evolution of vertebrate diversity and disparity as well as their influence on vertebrate biogeography

have had a major impact on our field. They have been a significant counter-balance to the many studies of the phylogeny of mammals and other vertebrates that often overlook the influence of changes in the physical aspects of the environment.”

Reviewer (E)

“Her recent work on topography, tectonic setting, and response to climate change...incorporating both existing data and new fieldwork, is really fascinating and is yielding important new insights into the role of orogenesis and vertical environmental gradients in controlling species diversity and distribution (including under varying climatic change histories). The potential significance of this work for understanding potential responses of biotas to future climate change is obvious.”

Reviewer (F)

“Catherine has long been one of the world’s leading figures in paleobiology, starting with her pioneering work on mammalian evolution in the Miocene sequence of the Siwaliks. ... Her work is required reading for all students interested in diversity, environmental change, and the approaches we take to reconstruct the history of life from the fossil record. ...she has produced some of the finest analyses demonstrating that, for the terrestrial realm, topographic complexity is a first-order determinant of biodiversity.”

Reviewer (G)

“I have no hesitation in saying that she is widely recognized as an internationally leading researcher in her field, way above the level of an average full professor. Her extensive and continued engagement in outreach activities is testimony that she is having a societal as well as a scholarly impact.”

Reviewer (H)

“...following her tenure decision Dr. Badgley has continued and expanded upon her status as an internationally recognized contributor to our understanding of macroevolutionary patterns and the influence of climate. I recommend her for promotion to Full Professor most emphatically.”

Summary of Recommendation:

Professor Badgley is a leading scholar in paleoecology and is internationally recognized for her fundamental contributions in mammalian evolution. She is a superb teacher and mentor, and she provides valuable service to the university and to the wider community. The Executive Committee and the College of Literature, Science, and the Arts and I recommend that Associate Professor Catherine E. Badgley be promoted to the rank of professor of ecology and evolutionary biology, with tenure, and professor in the Residential College, without tenure, College of Literature, Science, and the Arts.



Andrew D. Martin, Dean
Professor of Political Science and Statistics
College of Literature, Science, and the Arts

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