

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

Nathan D. Sheldon, associate professor of Earth and environmental sciences, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of Earth and environmental sciences, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D. 2003 University of Oregon
B.A. 1999 Carleton College

Professional Record:

2013 – present Associate Professor, Department of Earth and Environmental Sciences, University of Michigan
2013 – present Associate Director, Program in the Environment, University of Michigan
2008 – 2013 Assistant Professor, Department of Earth and Environmental Sciences, University of Michigan
2007 – 2008 Reader, Department of Earth Sciences, Royal Holloway University of London
2004 – 2007 Lecturer, Department of Earth Sciences, Royal Holloway University of London
2003 – 2004 Post-doctoral Research Associate, University of Oregon

Summary of Evaluation:

Teaching – Professor Sheldon is an effective and popular instructor, who has contributed significantly to the educational missions of the Department of Earth and Environmental Sciences (EES) and the Program in the Environment (PitE). He receives excellent student evaluations of his courses. As the associate director of PitE, he revised and managed its undergraduate curriculum. He actively incorporates innovative teaching pedagogies into his classes. His diverse teaching record includes field instruction at the Camp Davis field station. Since his last promotion, Professor Sheldon has supervised the research of sixteen undergraduate students and nine graduate students, and he has served on a prodigious number of graduate qualifying examination and dissertation committees.

Research – Professor Sheldon is a paleoclimatologist, who investigates the causes of and responses to climate change through earth history using field methods, geochemical analyses, and modeling. He is considered the world expert on the use of fossil soils for this purpose. He has furthered our understanding of modern soil processes and pioneered methods of interpreting fossil soils that are widely used to document environmental change in the geologic past. His work has also led to the development of paleoclimate reconstructions across important evolutionary and climate transitions in Earth's history. Professor Sheldon has an active and impactful research program and has published over 70 peer-reviewed articles. He maintains an active research group of four graduate students, and he has an excellent record of student authorship and post-graduation placement. Additional evidence of his scientific impact is his receipt of the James Lee Wilson Medal from the Society for Sedimentary Geology (2015).

Recent and Significant Publications:

- “Multi-century stasis in C3 and C4 grass distributions across the contiguous United States since the industrial revolution,” with D. M. Griffith, et al., *Journal of Biogeography*, in press, doi: 10.1111/jbi.13061 [4.00, 0, 0].
- “Coupling of marine and continental oxygen isotope records during the Eocene-Oligocene transition,” with S. T. Grimes, et al., *GSA Bulletin*, 128, 2016, pp. 502–510, doi: 10.1130/B31315.1 [4.33, 1, 1].
- “Terrestrial cooling in northern Europe during the Eocene-Oligocene transition,” with M. Hren, et al., *Proceedings of the National Academy of Sciences*, 110, 2013, pp. 7562–7567 [9.42, 38, 41].
- “A new paleothermometer for forest paleosols and its implications for Cenozoic climate,” with T. M. Gallagher, *Geology* 41, 2013, pp. 647–650, doi:10.1130/B34074 [4.59, 24, 29].

Service – Professor Sheldon has provided substantial service EES and to PitE. Most significant is his four years of service as the associate chair of PitE. He also contributed to EES and PitE through his participation on numerous faculty search and promotion committees, and to EES through his coordination of a weekly lecture series. His professional service includes serving on the editorial boards for *Geobiology* and *Palaeogeography, Palaeoclimatology, Palaeoecology*, and as the associate editor of *Sedimentology*. He also organized theme sessions for Goldschmidt, regularly convened sessions at national scientific meetings, and participated as a National Science Foundation and National Aeronautics and Space Administration panelist.

External Reviews:

Reviewer (A)

“He is the current expert [in his cohort] in the field of interpreting ancient soils and has written some of the most recent, yet classic papers about interpretation of ancient soils. ... Dr. Sheldon lists 73 publications published or in press, with four more papers in review. He is first author on 22 of these, and his students are first authors on 31 of the papers. This is a very, very strong record of publications and productively for someone at this stage of his career.”

Reviewer (B):

“...Prof. Sheldon’s research is of the highest quality and he demonstrates a deep level of understanding of these systems and time intervals. ...[he] has made, and continues to make, fundamental advances to our understanding of the climate information provided by fossil soils.”

Reviewer (C):

“I consider Dr. Sheldon to be ONE OF THE BEST sedimentary geochemists studying fossil soils (paleosols) today, with an established national and international reputation. ... His recognition for awards from various professional societies...also attests to his professional reputation, as well as his selection to serve on journal editorships, external grant agency review panels, etc.”

Reviewer (D):

“I know Nathan only through his papers on the topic [paleosol geochemistry]...which are widely cited as among the very few moderately reliable constraints on Precambrian atmospheric CO2.”

Reviewer (E):

“I have respect and admiration for Dr. Sheldon’s work. He is widely regarded as an expert on stable isotope applications to terrestrial substrates; he is particularly well-known for his work on the paleosols of the Cenozoic.”

Reviewer (F):

“...[he] has established himself, I believe, as the recognized world expert on the quantitative evaluation of paleosols as environmental paleo-proxies, a reputation that was significantly enhanced by his 2009 Earth Science Reviews paper of 2009, which I see is his most highly cited. He’s contributed significantly to our understanding of Proterozoic, Paleozoic, and Cenozoic climate and biotic change, largely but not exclusively through his analysis and interpretation of paleosols.”

Reviewer (G):

“He is THE expert on ancient soils and continental archives of changing climate spanning geologic time. ... I see world-class expertise and productivity in topics spanning geobiology, Earth history, biogeochemical cycles (carbon in particular), paleoclimate, paleobiology, evolution of the early biosphere, and atmospheric evolution, among others—from the Precambrian to the Cenozoic. Few other scientists are able to contribute with the same quality over such a wide range of time scales and topics. This wide reach is an absolute strength and opens doors to impact and international reputation.”

Reviewer (H):

“...in my view Dr. Sheldon ranks as one of the top authorities in the world in the field of paleoenvironmental reconstruction in terrestrial systems, using diverse tools including paleosols. ... I can think of only a few other people at or above his level...”

Summary of Recommendation:

Professor Sheldon is recognized as the world leader in terrestrial paleoenvironmental reconstruction. He is a talented instructor and dedicated advisor, and has contributed to advancing the PitE undergraduate curriculum. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Nathan D. Simon be promoted to the rank of professor of Earth and environmental sciences, with 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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