

4 October 2021

Letter for Dr. Nicholas Smith

Dear colleagues -

It is my absolute pleasure to write an enthusiastic letter giving my strongest possible support to Dr. Nick Smith's nomination as an ESA Early Career Fellow. He is an absolute rock star and it has been tremendously exciting to follow his work. I have been enthusiastically following Dr. Smith's career since he was a graduate student at Purdue. Although I have never collaborated with Dr. Smith, I have come to know he and his work well through interactions at working groups and meetings and through his students and post-docs. Dr. Smith is a rising star in ecology and his work will help us understand and solve the climate crisis.

Dr. Smith uses an innovative combination of experiments and models to understand how terrestrial ecosystems regulate climate and climate feedbacks. Dr. Smith's first paper (Smith and Dukes 2013) published in *Global Change Biology* set the stage for the exciting work he continues to do. He was pushing the envelope by arguing that models predicting climate feedbacks from the land surface to the atmosphere needed to incorporate the acclimation of plants to perturbations that had been observed in experiments. He experientially tested some of these ideas (Smith et al. 2016) and he used his modeling and experimental approach to inform his *Nature Climate Change* (2015) and his *Journal of Advances in Modeling* (Smith et al. 2017) papers where he showed that land models that omit foliar temperature acclimation are overestimating the temperature sensitivity of terrestrial carbon exchange. These papers have shaped the conversations in the global change community and I fully expect Dr. Smith to keep producing papers that push how we observe and model ecosystems. His work extends to all aspects of global change and physiology.

He has at least two other related arms to his research program one that explores the response of ecosystems to changing precipitation (e.g., Schuster et al. 2016, Smith et al. 2016, Ploughe et al. 2021) and another that tackles how to scale individual ecosystem and site-level data to make better predictions about global scale processes and how those processes will likely respond to global change (Smith & Dukes 2018, Liang et al. 2019, Kumarathunge et al. 2019, Liu et al. 2019). Both of these areas of work are important in their own right, but Dr. Smith's ability to **think synthetically and clearly across areas of physiology, modeling and ecosystem ecology make his work truly exciting and impactful** (e.g., Smith and Keenan 2020, Wang et al. 2020). Overall, Dr. Smith has already published more than 39 papers and he has been the first author on 15 of these; 8 of his publications have been cited more than 50 times and four over 100 times. I'm waiting to read his new *Nature* paper on a constraint on historic growth in photosynthesis due to rising CO₂ concentrations. Many of these papers are published in the best scientific (e.g., *Nature*, *Nature Communications*, *Global Change Biology*) and ecological (e.g., *Ecology Letters*, *New Phytologist*) journals, are highly cited, and will continue to have impact for many, many years. It's also clear that Dr. Smith's work has impact and is already changing the way global change ecologists design experiments and parameterize models. There is no doubt that Dr. Smith's research is having not only a significant impact, but it is changing the way we study global change. His recently funded **NSF early career grant** is an underscore to what is an exciting scientific program. I cannot wait to see what they find in that study.

Dr. Smith has a knack for mentoring and the graduate and undergraduate students in his lab are thriving. It's unusual in letters that I can touch on someone's role as a classroom teacher, but I have the unique position of having interacted with some of Dr. Smith's undergraduate classes. Dr. Smith is a stellar teacher. He can clearly communicate and describe complex physiological and global change concepts. He has a wonderful rapport with this class, his classes are well structured, clear and they help students develop skills (e.g., modeling and data analysis). In the lecture I attended, students broke up into groups to work on scenarios and discuss data. The conversations were lively, informed, and the groups wound up where Dr. Smith thought they would, so the larger group conversation after the exercise was informed. I was impressed with the level of engagement as well as how Dr. Smith was able to guide the classroom activity, which was complicated, to get students to think critically. It was inspiring. Given his excellent papers and ability to land large NSF grants, his ability to clearly describe complex physiological topics to students isn't surprising. He's an incredibly clear communicator.

I want to emphasize that the sorts of papers Dr. Smith writes and **the work he conducts is impactful in multiple dimensions**. His work is important for our mechanistic understanding of physiological processes and understanding the way plants work. His work is impactful because the experiments he runs contribute to our understanding of how ecosystems will respond to global changes. His work is impactful because he is designing and working on models that include much needed physiological inputs. However, his work is particularly important because he excels at working in all of these fields. His work is making our global change models better and thus it is improving global climate-change policy. Dr. Smith's is an outstanding scientist and has exceptional professional promise. He has the rare ability to understand, in depth, dirty boots ecology and modeling – and this combination of traits makes his science punch way above its individual parts. Given what he has already produced, I am excited to see his career unfold. I can't believe there would be a more deserving applicant for an ESA Early Career Fellow.

Sincerely,

A handwritten signature in black ink, appearing to read 'A. Classen', with a stylized, flowing script.

Aimée T. Classen

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