

Sean Carey's citation for Professor Jeffrey McKenzie – 2015 CGU Young Scientist Award

It is my sincere pleasure to provide the citation for Professor Jeffrey McKenzie for the Canadian Geophysical Union's Young Scientist Award. Professor McKenzie, Jeff to his friends and colleagues, is an early career scientist who is rapidly establishing an international reputation for his research in several fields, but most notably, cryo-hydrogeology, where he is already a leading pioneer. Jeff received his PhD from Syracuse University in 2005 and, following a post-doctoral fellowship as a Byrd Fellow at The Ohio State University, has been a member of the faculty of the Department of Earth and Planetary Sciences since 2006. Interestingly, Jeff began his university studies in music. Regardless, Jeff has made important contributions to physical hydrology and hydrogeology, including alpine hydrology in the glaciated Peruvian Andes and the numerical modelling of cold region processes; which are scientifically vexing. Furthermore, Jeff has applied novel geochemical techniques to wetland hydrology, contaminated sites, and most recently to identifying pathways for shale gas extraction contaminants.

Jeff's research has led to 33 peer-reviewed publications, 80+ conference abstracts, and more than 15 invited seminars at institutions across the Americas and Europe. For a young scientist, Jeff's research has had an immediate impact across a number of fields, as reflected by his current citation metrics. Jeff's research is remarkable in that his top publications, in terms of citations, are each in very different fields – numerical modelling of groundwater flow in cold regions, groundwater contributions to proglacial Peruvian rivers, and new methods for using temperature as a tracer of groundwater interactions. The importance of this research beyond traditional academic circles is reflected in considerable media coverage, including being interviewed on CBC's Quirks and Quarks and a feature article in Science.

It is most appropriate that I read a few comments from some of the letters of support for Jeff's nomination.

Paul Glaser from the University of Minnesota states:

What emerges from these varied activities is an exceptionally versatile and energetic young scientist who appears to be on the threshold of a long and exciting career. Professor McKenzie has also already established himself as a key player in the groundwater modeling community given the international influence of the SUTRA code and the new functionality he added to assess the effects of global warming on periglacial landscapes. He is among those rare scientists who is equally familiar with developing new computer code and conducting field research in some of the most challenging environments in the world. One cannot but be impressed by the rigor, scope, and potential scientific impact of his research program.

Shemin Ge from the University of Colorado at Boulder says:

Dr. McKenzie's work that incorporates water freeze and thaw in permafrost into a well-established USGS flow and heat transport model is brilliant and well done. This work demonstrated several special traits that distinguish Dr. McKenzie from the rest. Two stood out for me are the following. First, Dr. McKenzie has a mastering understanding of the physical processes involved in studying permafrost hydrology. Second, Dr. McKenzie is meticulously detailed with unparalleled quantitative skills that are essential for tackling quantitative hydrologic problems. Dr. McKenzie is a bright shining star and a leader in quantitative permafrost hydrology.

Brian McGlynn from Duke University:

His research record is impressive both in its quality and in its combination of breadth and depth. This is a rare combination and I believe that it is commendable and should be recognized. His local, regional, and international research spans hydrogeology, hydrochemistry, wetland hydrology and chemistry, surface water hydrology, and permafrost and glacial dynamics. His methods include numerical and geochemical analyses that are firmly grounded in field experiments and difficult field observations and measurement campaigns. These time intensive and difficult measurements are critical to our science and I believe they should be recognized for the time, energy, and intellectual commitment they require. The contributions of this type of science are extensive and when coupled with quantitative modeling and analysis like Jeff performs they are even more powerful.

And finally, Dan Moore from UBC comments on some personal aspects of Jeff

I would like to offer some comments about Jeff as a person. Despite his ambitious and high-level research program, he is truly modest and definitely not a self-important prima donna. He is the type of colleague with whom I look forward to meeting at conferences to bounce ideas around over a beer at the end of a day's sessions. I always come away from these discussions enlightened and inspired by new ideas. Further, I would like to highlight Jeff's generosity. One of my PhD students was applying SUTRA to model subsurface water and heat transport in a headwater catchment. Jeff kindly offered to assist him and participated in weekly Skype meetings to help guide my student through the process of setting up and trouble-shooting the model.

In summary, based on his early career accomplishments, I believe that Professor Jeff McKenzie is an outstanding and deserving candidate for the CGU's Young Scientist Award. Congratulations Jeff.

Dr. Jeff McKenzie, Acceptance Speech for the 2015 CGU Young Scientist Award

Thank you very much to the Canadian Geophysical Union for the Young Scientist Award. And thank you to Sean Carey for the very kind citation and thank you to the support-letter writers. This award is a very generous recognition of research not just by myself, but by my graduate students and collaborators. My graduate students have done much of the heavy lifting of our research program and I am very thankful for all that they have done. Additionally, I am eternally thankful to my many collaborators – they are not only exceptional and inspiring scientists, but are also truly good friends. There are too many to thank them all, but it is worth mentioning a few - Laura Lautz at Syracuse University, Michel Baraer at ÉTS, Cliff Voss at the US Geological Survey, Bryan Mark at The Ohio State University, and my PhD advisor, Don Siegel at Syracuse University.

It seems that receiving this award marks a transition - the end of being able to call oneself a 'young scientist' and the beginning of being a senior scientist. As such, I pass along some advice to other, still young, scientists. Arthur C. Clarke, the famous science fiction writer, in 1962, proposed what are now referred to as 'Clarke's Three Laws of Science'. I have them printed out and they sit beside my computer in my office. Very often I have reflected on the first 'law', which I think is worth remembering and could be a mantra for young scientists. Paraphrased, it states that, "When a distinguished but elderly scientist states that something is possible, they are almost certainly right. When they state that something is impossible, they are very probably wrong." (And now, as a senior scientist, I am free to tell people that their brilliant ideas are impossible.)

And finally, thanks to my family, parents, and brothers. My wife Jane and daughters Juniper and Maggie have always been supportive and far too enduring of my schedule. Truly this award is shared with them.

Again, my heartfelt gratitude to the Canadian Geophysical Union. Thank you.