

My Earth science educator story – Eileen van der Flier-Keller What I did, why I did it and what happened



Beginnings

I have always loved being outside. As a youngster in Ireland, I was lucky enough to be able spend countless hours poking round on the pebble beach near my home. My parents took my siblings and me on holidays where we explored the wilder places in Ireland and later nearby Wales and Scotland. My parents had a great love of nature and they nurtured my emerging passion which led to an undergraduate degree in geology at Trinity College, Dublin. After four amazing years of fieldtrips, field mapping projects and inspirational teachers, as well as field mapping for two summers with the Geological Survey of Ireland, I moved to Canada to pursue a PhD in Geology at the University of Western Ontario. During this time in Ontario, I taught my first Earth science course, at York University in Toronto, and really caught the education bug. After finishing our PhDs, Pete, my geographer husband, and I were fortunate to both find academic jobs at the University of Victoria (UVic) in British Columbia on the West coast of Canada.

Opportunities and choices: redefining what is important

University faculty positions are to me the best of all worlds; research, teaching, and community engagement. Finding myself the only geologist in a Geography department, I developed a Geology Minor program for our students, and then worked

with the wider community to establish a School of Earth and Ocean Sciences at UVic.

Although I enjoyed my geology research and teaching, changes in our lives opened new paths. Our children Connor and Allie, curious, and excited about exploring the world around them, inspired new outdoor adventures, Discovery Tables at their cooperative preschool, and engagement in their school classes. This helped me to realise that what I really loved doing was sharing the science of the Earth and oceans with youth and their teachers. Colleagues in the Faculty of Education helped identify Earth science topics that, in their experience, teachers and education students often sought help with, and I began developing fun, hands-on activities to meet this need. From rocks and their stories, fossils and Earth history, soil, landscapes, plate tectonics, earthquakes, volcanoes, water, non-renewable resources, hazards, to local geology, we then worked in teams with teachers and Earth scientists, to put on professional development EdGEO teacher workshops and fieldtrips for K-12 teachers.



An EdGEO workshop - teachers not only try out the activities, learn about Earth science, and get comfortable, but they meet other teachers in the same boat – networking. They also get teacher resource kits to take back to their classrooms.

Our goal was to support and empower teachers in science, with hands-on activities, classroom resources and a support network. Chairing EdGEO www.edgeo.org for six years gave me the opportunity to learn from many other educators across Canada and to help start up new local groups.



AAAS 2012.

Science education research and Pacific CRYSTAL:

With an opportunity to be a member and then co-director of a nationally-funded Pacific Centre for Research in Youth Science Teaching and Learning (CRYSTAL) from 2005 to 2011, science education research and education became the core of what I did. I enjoyed the new opportunities and collaborating with other scientists, engineers, community groups and science educators. As well, it meant funding was available that enabled me, together with a colleague David Blades in Education, to develop a new initiative, a lab section in my first year undergraduate earth science course especially for teachers in training. 'Education lab' students learned the same material as other students, but through activities and approaches transferable to their future K-12 classrooms. Impact assessment results were very positive both on comparative success in the course and on perceptions of the value of learning and teaching Earth science, and enjoyment of it. A longitudinal study showed that after five years, participants, now teachers, remembered specific details of many of the activities, still had the resources we

gave them, and were enthusiastic about teaching Earth science, even finding opportunities to 'wedge' it into other subjects.



05, 06, 07 Education Lab pilot, since then a regular part of the EOS 120 course; this has been so successful that many of the activities were incorporated into the regular labs.

Developing resources for Earth science engagement:

From the start, teachers had often expressed their wish for usable, local, fun, engaging and ready-made resources. To help address this need, I developed the South Vancouver Island Earth Science Fun Guide in 1998. In response to teacher comments that they felt unsure about rocks and overwhelmed by the pocketfuls of pebbles students brought to class when they taught that unit, I wrote a Field Guide to the Identification of Pebbles (2005) www.harbourpublishing.org.

Collaborations with CBC (the Canadian Broadcasting Corporation) involved co-writing teacher guides to CBC Nature of Things TV Series episodes including One Ocean (2010), Geologic Journey I (2007) and Geologic Journey II (2011). In 2011, the British Columbia (BC) Year of Science, I led the 'Science in our Lives' project involving a year of 'science activities of the month' and '5 minutes with a scientist' career profiles of UVic science faculty to help showcase careers in science. The responses to these resources have been encouraging and especially the Pebble Guide which has become both a BC and Canadian bestseller.



Victoria, teacher fieldtrip 2013.

Role models and support networks:

In Canada, we have a wonderful group of Earth science educators from all sectors, the Canadian Geoscience Education Network or CGEN www.earthsciencescanada.com/CGEN . They have kept my enthusiasm ignited through our annual meetings, sharing ideas, and taking on projects and challenges together. I am grateful to all these generous and passionate educators for inviting me to engage with them and learn, and who are a fun, creative and supportive community. In turn I have worked with many university students, through Coop and student research projects, mentoring them as they develop and deliver Earth science presentations in school classrooms across BC.

New challenges:

In July 2016, Pete and I moved to Simon Fraser University (SFU) in Vancouver. I feel immensely privileged to be doing my “dream job”. As Teaching Professor in the Earth Sciences Department and Special Advisor to the Dean of Science on Public Education and Outreach, I get to champion science education, community engagement and outreach in a university and Science Faculty which places great

importance on outreach, engaging the public and communicating the cutting edge and exciting science being done at the university. An example of a new initiative is “Seasonal Science”, a series of K-12 curriculum-linked activities for youth which connect to “Meet the Scientist” conversations, such as in Fall 2016, Trace Fossil Detective and Antimatter Explorer <http://www.sfu.ca/science/programs---events-for-the-general-public/seasonal-science/fall.html>.

What would I say to young people starting out:

Do what you are passionate about, even if it means doing things off the side of your desk. You never know where this might lead.

And find a community. Volunteer, join a group or meet with friends or colleagues to share, learn, encourage each other, collaborate..... Science education and outreach are rewarding, fun and you know you’re doing something that will really make a difference.



Excited about the geology of northern Patagonia.

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