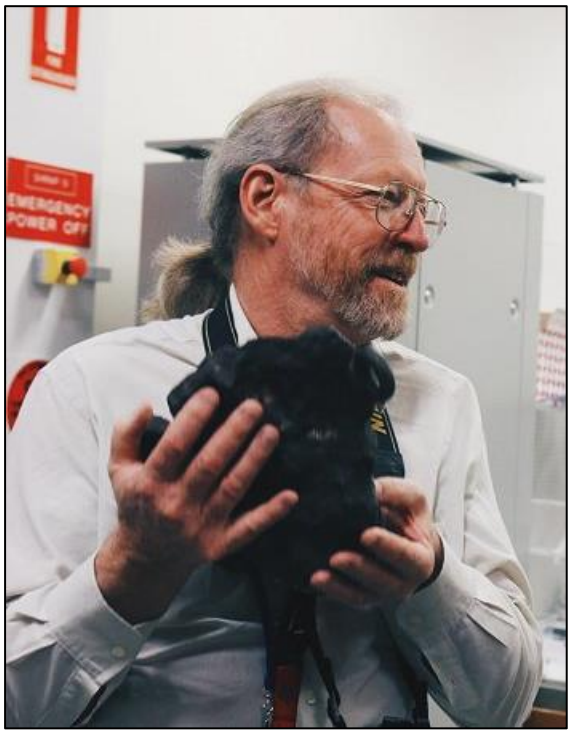
My Earth science educator story – Greg McNamara
What I did, why I did it and what happened



Greg McNamara holding the oldest rock on Earth (a meteorite) during an Olympiad Summer School tour of the SHRIMP dating laboratory at the Australian National University.

I didn't set out to become a geologist. When I finished High School I was very keen on biochemistry but my first experiences at university were not good and ultimately I dropped out and found work as a laboratory technician. In hindsight this was a good thing as it allowed me to earn some much-needed money, grow up a bit and think more about what I wanted out of life. This unplanned 'gap year or two' soon helped me realise I did want a university education, but I still wasn't sure what I was most interested in. Biological sciences were still my primary interest though, when I returned to tertiary studies.

University outreach

Having been put right off mathematics at university by my previous experience, I was short a subject when I enrolled at Monash University. I added geology to my biology, chemistry and physical geography studies and my world changed for ever! I soon found geology the most compelling subject and topped the year academically, rounding it off with volunteer work on a vertebrate fossil dig that turned into paid employment over the summer holidays. I was hooked, but biological sciences were still high on my list and in my second year I undertook geology as well as botany and zoology. I topped the year in both geology and zoology and became ever more interested in palaeontology along the way. Ultimately I had to choose a major and I chose geology, and after third year I undertook an honours project in sedimentology and stratigraphy. By this time (1982) I was married, my son was two years old and money was tight!

Unfortunately, the minerals industry crashed just as I was finishing honours, and scholarships for PhD programs in Australia did not pay enough to support a family. So instead of undertaking a full-time PhD on a scholarship, I accepted an offer to work full-time as a junior academic at James Cook University (JCU) while doing a PhD part-time.

I had always enjoyed teaching but never considered teaching as a career when going through university. However, as a junior geoscience academic my Head of Department found in me the ideal member of staff to engage in education and outreach with school groups and the public. Through his enthusiasm for public engagement, this progressively occupied more of my time and I found myself writing material for school groups, attending science shows on behalf of the university and managing outreach projects and activities.

Eventually I found myself lecturing the geoscience component of a science for education students' subject, mandatory for all trainee school teachers at JCU. I soon realised that teachers in Australia were ill

prepared to teach the geoscience within the curriculum and that I was one of the few academics in my circle of colleagues able to communicate the science in a constructive manner to teachers. However, in order to truly engage with teachers, it was clear I needed to also understand their environment and speak a common language, so I undertook a graduate teaching diploma without thinking I would do any serious school teaching. By this time I had two school age children and was paying a mortgage which meant my part-time PhD was not getting done. I converted the good work I had done into a research-based Master of Science (MSc – Research) thesis and moved on!

CSIRO science education centre

Shortly after completing my MSc and Graduate Diploma of Education (Grad. Dip.Ed.), university funding issues made me consider other options. In addition to my geoscience and education teaching duties I had also developed a major interest in museum operations[1].

Combining these two sides of my job was easy because museum collections and displays are a natural fit with education and outreach activities, especially in the geosciences. When the university partnered with Commonwealth Scientific and Industrial Research Organisation (CSIRO) to establish a science education centre in Townsville, I took a part-time secondment to help set it up, write the programs and present a whole range of sciences to school groups. These new challenges along with my previous experiences really helped to establish in my mind that my pathway was into the realm of public education and outreach, involving teachers and students.

Broken Hill GeoCentre

When the chance came to run a public museum and interactive science display space – the GeoCentre – in the legendary township of Broken Hill[2], I took it. This was a great experience and I was lucky enough to be appointed on grant money that also enabled a new edition of the iconic *Minerals of Broken Hill* book to be commissioned and an extension to the museum to be built. It was a rare privilege to be involved in the rewrite of such a book and also be part of the design and building of the extensions.

Geoscience Australia

I was all for staying much longer in Broken Hill but another opportunity too good to turn down came my way thanks to Gary Lewis who managed the education program at Geoscience Australia (known at the time as the Australian Geological Survey Organisation). He encouraged me to apply for a Canberra-based position specifically created to manage the development of a geoscience education centre for visiting school groups. I thoroughly enjoyed the effort of setting up the facility as well as writing and delivering the programs. The education group also wrote and delivered professional development materials and workshops for teachers which I also ultimately came to manage as well as deliver.

Snowy River Thinking and consulting

After only four years, ongoing funding problems saw me decide to leave and take a part-time teaching position in Victoria but an 11th hour reprieve saw the education centre remain intact and I am happy to report it is thriving and more popular than ever, 16 years after it first opened.

[1] By then I had transitioned to a curatorial role at the university and was responsible for the care and display of an extensive collection of museum quality minerals and fossils as well as the management of the departments teaching and research collections.

[2] Famous for its massive lead zinc mine, diverse mineral assemblages and artistic endeavours.

While I wrote and taught an environmental education program in Victoria aimed at rural water security and river rehabilitation issues that I called Snowy River Thinking (SRT), I also continued to work as an education and outreach consultant to the geoscience community. The classroom experiences I had through the SRT program further brought home to me the great need teachers have for good quality resources and ongoing professional development.

As a consultant to the Geological Society of Australia (GSA) and others I found myself at a key moment in Australian educational history as, for the first time, a truly national science curriculum was developed. I wrote much of the stakeholder feedback[3] for the GSA and other professional societies[4] and I believe we were influential in this endeavour. As a consultant I still write the GeoEdLink newsletter for the AGC and GEOZ for the GSA.

TESEP

It was during this time in 2007 that the Teacher Earth Science Education Programme (TESEP) was formed in response to the closure of geoscience professional development programs for teachers, once offered by Geoscience Australia and others. I became TESEP's executive officer and helped establish the organisation as well as write workshops and present them to teachers all over Australia. To date we have run hundreds of workshops and associated field trips and trained over 2000 teachers in aspects of Earth Science and the teaching of Earth Science in the classroom. The multiplier effect of this training across the student population runs into millions of improved student experiences.

Greg waxing lyrical about rocks to teachers on a TESEP field trip to coastal outcrops in southern Victoria (on a very cold day).

Earth Science Olympiads

Since moving to Victoria all the work I have engaged in has been part-time. When the SRT program finally wound up I took on a variety of extra roles including casual relief teaching in local schools, adult literacy and numeracy teaching and casual cave guiding for Parks Victoria in one of Australia's premier show caves, Buchan Caves. However in 2014 another part-time opportunity arose: Australian Science Innovations, who had for many years run national Olympiad programs for Biology, Chemistry and Physics, secured funding for an Earth and Environmental Science (EES) Olympiad program to coincide with the development of a national EES curriculum for senior high school. I am proud to say I have so far had several exceptionally enjoyable years writing and running the Australian Earth and Environmental Science Olympiad Summer School program and

[3] In respect of the Earth Science component in the K-10 curriculum documents and the senior Earth and Environmental Science curriculum.

[4] Allied under the umbrella of the Australian Geoscience Council (AGC).

accompanying students to two International Earth Science Olympiads which resulted in students returning with 1 gold, 3 silver and 3 bronze medals and 4 international team awards.

Greg enjoying the delights of Tokyo with Australian 2016 IESO students and Bronte Nicholls. Left to right: Winnie Yuan, Catriona Illingworth, Bronte Nicholls, Jeff Brown, Greg McNamara and Daniel Ho.

New ventures

I am happily engaged in the many part-time activities described above but continue to seek new ideas and ventures. Currently I am expanding my education and outreach consultancy to include a range of quirky gifts for the geoscience professional (or student) who has everything!

Lessons learned

Over my career I have learned several things which I think are transferrable to others:

1) Always work hard at what you do but understand it is much easier to work hard at things you enjoy. If you do this you will easily exceed expectations and keep your job.
2) Be prepared to take on opportunities as they arise, they will probably never come your way again. If you can't take on an opportunity, draw it to the attention of someone you know could do it. Such favours often return to you many fold in the future.
3) Be prepared to learn new things every day. You are not indispensable but you can remain relevant through lifelong learning. Even a basic new skill can open doors you never dreamed of.

Greg McNamara, aged ~61 years, East Gippsland, Victoria, Australia, October 2016, geoservices@geoed.com.au

References

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