Xavier Prevost, chief mineral economist at the Minerals Bureau of the Department of Minerals and Energy, was instrumental in creating computerised databases for commodities such as coal.

Xavier Prevost
Mr Coal

Xavier, you hail from Bolivia in South America. How did you end up in South Africa?

Bolivia is situated in the middle of the Andes amongst many rich deposits of copper, gold and other metals. After school I studied towards a masters degree in engineering geology at the Universidad Major de San Andres in La Paz. After receiving my MSc in 1968, I worked in Bolivia for six years. Then I received a scholarship from UNESCO and went to Austria to obtain a diploma in prospecting and exploration from the University of Leoben. During my studies, I learned a lot about computerised methods of data processing. The use of computers was just starting; we were using mainframes, as personal computers were not yet available. This experience made a big difference in my later life, although I didn't realise this at the time. I completed the course in 1974 and came to South Africa in the same year. One reason for me coming here was the oil crisis which badly affected economies around the globe and caused many people to lose their jobs. In South Africa, I joined the Geological Survey (GS). I was sent to Western Transvaal (now North West Province) to investigate its diamond potential. The National Party government wanted to create a buffer zone in that area to protect South Africa from the incursion of liberation fighters. It was thought it would be an ideal area to undertake diamond prospecting. I was based in the centre of the Lichtenburg alluvial diamond field. We used mainly geochemical methods for prospecting.

But then you went from diamonds to coal?

Correct. Soon afterwards, I was recalled to head office. The Geological Survey (GS) woke up to the fact that coal was a very valuable commodity. They therefore wanted to have more research done on coal, and I was transferred to the fossil fuels division which had been created for that purpose. When I was transferred, the only thing I knew about coal was that it was black. I had to pick up information from books and other sources to learn about coal. I became involved with the Coal Club at the University of the Witwatersrand (Wits) where I attended lectures and seminars about coal. I learnt about coal qualities, parameters and mineability, but I didn't conduct any academic research work. I worked under Dr Frikkie de Jager. The best approach it was thought, was to conduct regional studies to collect borehole data on coal and create base maps of the data available from archives. The data was then transferred and plotted on maps by hand, since computers were not available. The different parameters of coal were plotted so one ended up with 20 different base maps of ash content, volatiles, calorific value and other parameters. Once this was done we merged the different parameters.

By sheer luck I was given the area where today the town of Secunda is situated. There I had about 1 200 boreholes available (7:36). I compiled the data and started contouring them when we discovered another 20 boreholes, so I had to start all over again. I thought to myself that I should be doing this by computer rather than by hand. The GS did not know anything about computers. But, luckily, I had a friend who was a geophysicist, and he referred me to the Department of Water Affairs which had a computer and software that could do exactly what I wanted to do. I used an IBM computer and software to do gridding and contouring using point information that was fed into the program. It was by far not what we have available today but it was substantially better and faster than doing it by hand.

As a result of my work we created the National Coal Data Base (NCDB). This database grew and grew and eventually became a sizeable tool for the GS. We first did it free of charge at the Department of Water Affairs. Eventually, in 1979, we signed a contract with the Computer Sciences Corporation, a computer company based in Braamfontein, Johannesburg, which was partly owned by Anglo American which had a mainframe computer called Univac. They undertook all the data processing for us. I had four coders and four input clerks to do the data capture and encoding in-house at the GS. The data was sent on-line to Braamfontein where the database resided, and I had a computer terminal in my office at the GS from where I could do the contouring and data processing on-line. Until 1989, I was the manager of the NCDB.

So from there you stayed in this field?

No. In 1989 Genmin offered me a job as IT manager for gold exploration. There was a possibility that I would also be involved in coal so I accepted the offer. It turned out that there was a big difference in approach between gold and coal exploration. For every 1 000 boreholes one drills for coal exploration, there was probably only one borehole in gold exploration, simply because these boreholes are so expensive and deep. So information is very scant. I never became an expert in gold exploration, but rather ran the database and provided the electronic facilities to facilitate information capture, interpretation and borehole logging.

And you went back into coal?

Around 1990 I became involved in base metal and coal exploration within Genmin. But, by about 1992, low commodity prices caused a crisis in exploration and the company started closing regional offices. At that time I was in charge of four regional offices in Springs, Klerksdorp, Welkom and the Pilgrims Rest area. Almost overnight I didn't have a regional office left to look after. I saw the database deteriorating. People were moved from regional offices to the head office. In the same year I left Genmin.

I worked as a consultant for a number of years, installing information services and providing system support for financial institutions and others. I was not very happy in this field, and in 1995 I joined the Minerals Bureau in Braamfontein, which was independent from the Department of Minerals and Energy, as a coal economist. The division was in a bit of disarray, since the position had been filled on a temporary basis by a number of people. There was also a lack of engagement with the mining industry. Luckily I still had many contacts in the industry. One of the people was the well-known Prof Rosemary Falcon. She studied at Wits and then went to Germany where she was awarded a doctorate in coal petrography. She became the official South African coal petrographer.

So your expertise in coal research is largely self-taught?

Yes – to a large degree. But one of the consequences of getting in touch with Prof Falcon was that I went back to Wits in 1997 to obtain an M. Eng. in coal science and technology, which I completed in 2002. This was my first formal qualification in coal research. I am currently busy studying at the University of Johannesburg towards a PhD, doing research on the remaining coal reserves in the central Karoo basin. Prof Falcon is my supervisor.

You are also involved in new technologies?

Over the past 12 years I have developed good relationships with local and international coal industries. The main benefit is that it enables me to liaise between all parties in the industry. I have made incursions into clean coal technology which endeavours to reduce emissions and I was also involved in low-smoke fuels. One of the objectives was to remove D-grade coal from townships and replace it with low-smoke fuel. We also help facilitate coal exports by BEE companies through the coal industry task team, and are busy implementing the Richards Bay Coal Terminal (RBCT) phase five, where we serve as the interface between RBCT and new entrants to the industry. We are also busy with an inventory of coal reserves in cooperation with the CSIR's natural resources and environment division, and we promote the local coal industry nationally and internationally. I worked intensely on assisting economic empowerment companies to start new coal mines and provide them with insight.

And what is next?

I am now preparing to work, privately, as a coal and carbon consultant (with a heavy emphasis in economic empowerment) outside the DME. After being in coal for more than 24 years, I have the advantage of knowing and being able to tap into consultants' expertise in areas such as reserves' assessment, quality control, logistics, marketing, etc. This is going to be a holistic approach to coal science. South Africa is experiencing a "coal bóom". The Council for Geoscience's National Coal Data Base is a great asset just in need of users.