2010-2011 CSEG Distinguished Lecturer Tour Diary – Part III

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On the last day of February I took the 7 am flight out of cold (-33° C), windy and snowy Calgary to Regina to begin my last and final week-long DL trip to Regina, Edmonton, St. John's, Halifax and Saskatoon. My goal was to wrap up the distinguished lectures before I deliver the final one at the CSEG luncheon on March 14th, 2011.

University of Regina

It was a short flight and the DL coordinator at the Department of Geology, University of Regina, Assistant Professor Dr. Maria Velez was at the airport to receive me. Maria immediately came across as a very warm and hospitable person, which made me feel comfortable and open to talk frankly. During our ride to the university, I was told that Regina, the capital city of Saskatchewan, is a small town with about 180,000 people and so it is not difficult to commute in the city. I was immediately struck by the flatness of the area, something that Maria confirmed while noting that there is a man-made hill there somewhere close by. On reaching the department, Maria took me around and later as we had coffee and chatted at her office, I gathered that Geophysics forms a part of the Geology curriculum at the Department of Geology, which offers graduate work leading to M.Sc. and Ph.D. degrees. With 7 faculty members, the department currently has around 120 undergraduates, 7 graduates and 3 Ph.D. students. Geophysics courses here have a strong emphasis on applied aspects and I was encouraged later on as I interacted with a Ph.D. student, Seyi, working under Professor Stephen Bend and involved with interpreting 3D seismic data on a workstation with Petrel interactive interpretation software and using seismic attributes. The geophysics lab seemed well-equipped with the latest hardware comprising workstations and desktops.

There were about 25 students and a few faculty (6) members at my talk. The talk went off well, and afterwards a few audience members came up to me and said they enjoyed the talk, and there were a few questions as well. One interesting question that came up was if seismic attributes had been applied for characterizing minerals; I knew seismic attributes had been applied for potash exploration but actually saw them applied for uranium exploration when I visited Saskatoon later on this trip. After the talk I was taken out for lunch by Stephen and Seyi. We chatted about various things and Seyi asked me about attribute applications for the 3D seismic data that he is working on. It was a pleasant and enjoyable lunch meeting. Later, as it was getting closer to my next flight time, Maria very kindly offered to drop me at the airport, which I appreciated very much.

University of Alberta, Edmonton

When I reached Edmonton that evening with snow all around, it was colder there (-40°C) than Calgary. After I settled at the Campus Tower Suites Hotel where I had been advised to stay, I decided to go out and have dinner. Of course not anticipating this cold, and also forgetting from my earlier experience at Ottawa to come equipped for the cold, I had not brought my gloves and cap with me. I braved the cold and walked a few blocks in one direction first and then in the other, only to realize that the wind chill had started getting the better of me with its numbing effect on my face and hands. The worst surprise was that the restaurant I was looking for was closed. I headed back after this and had dinner at a restaurant close to the hotel, though I have to admit that the cold almost froze me that night. The next morning I met the DL coordinator, Professor Mauricio Sacchi, who heads the Physics Department at the University of Alberta, at 9 am in the main lobby of the hotel, and together we went to the Physics Department, which was just a 5-minute walk.

The Geophysics program at the University of Alberta forms part of the Department of Physics and offers undergraduate and graduate degrees in Physics, Astronomy and

Lecture in progress at Department of Geology, University of Regina on February 28th, 2011.

Lecture in progress at Department of Physics, University of Alberta on March 1st, 2011.

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Geophysics. With a Geophysics faculty of 10 the department has 45 undergraduates and 32 graduate students. Research activities in Geophysics are also carried out at the institute of Geophysical Research, which is collaborative effort of the University of Alberta Earth and Atmospheric Sciences, Physics and Mathematics Departments.

Mauricio had arranged some meetings for me in the morning before my talk at noon. These were really interesting as I was able to talk to Mostafa Nagizadeh Post-doc at SAIG, Gautier Njiekak, Post-doc at Professor Doug Schmitt's Experimental Rock Physics Lab, Dr. Pratap Sahay, visiting Professor from Ensenada (Mexico), Nadia Kreimer who is doing Ph.D. under Mauricio in 5D tensor completion for data regularization and David Bonar who is doing his Master's in high resolution attributes and busy competing his thesis under Mauricio. My talk was arranged in a spacious lecture room. Mauricio introduced me to the audience, who were an enthusiastic group over 30 in number. This talk went down well with the students as Mauricio confirmed later. Pizza and pop had been arranged after the talk and so after having a quick bite, I headed to the airport to catch my next flight to St. John's via Toronto.

After the talk, students and faculty members enjoying pizza and pop at U of A.

Memorial University, St. John's

I reached St. John's at 5 am on Wednesday, March 2nd, after boarding a delayed flight in Edmonton. St. John's is a small city, though the capital of Newfoundland and Labrador province, with a population of less than 200,000 people. My talk that day at Memorial University was scheduled for 4 pm to enable some local industry folks to attend. So, I was able to catch up a bit on lost sleep that morning and was picked up from the hotel by Dr. Charles Hurich, Associate Professor and the DL coordinator for Memorial University just before 3 pm. A short ride to the Earth Sciences Department brought us in good time for my talk. Chuck took me around the department and apprised me about the activities going on there. This university is the largest in Atlantic Canada, and also has one of the largest Earth Sciences departments. Geophysics forms part of this department with 5 faculty members specializing in this discipline. The department has over 100 undergraduate and 80 graduate students. The Earth Sciences department as such is engaged in applied and basic research in different areas comprising offshore Newfoundland, marine and petroleum geology and exploration geophysics. The research and teaching base of the department is considerably broader than the resource sector, with a full compliment of geochemists, petrologists, sedimentary geologists, environmental geochemists, economic geologists as well as the geophysics group.

There were about 35 students and a few industry and faculty members in attendance for my talk, and some of them really seemed eager about the CSEG and geophysics. I could sense that some of them were enjoying their dose of attributes more than others, but by and large the talk was received well by them as confirmed by Chuck later. As I finished my talk, Chuck was kind enough to drop me at the airport in time for my next flight to Halifax.

Bedford Institute of Oceanography, Halifax

I arrived at Halifax late that evening and after a longish ride from the airport to the hotel, settled to have a quiet dinner and rest. The next day I reported at the front desk of the Bedford Institute of Oceanography (BIO), GSC Atlantic at 10:30 am, where I met the DL coordinator, Jennifer Bates. She took me to the George Needler boardroom, where my talk was scheduled for 11 am.

View of the harbour at St. John's from my hotel (March 2nd, 2011).

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(George Needler was the first director of the World Ocean Circulation Experiment in the UK and joined BIO in the first year of its existence, following which he made contributions in understanding issues at their fundamental scientific level).

BIO houses over 600 researchers, engineers, technicians, natural resource and environmental managers and support staff from different disciplines and belonging to one of the four federal departments, namely Fisheries and Oceans Canada, Natural Resources Canada, Environment Canada and Department of National Defense. Natural Resources Canada represented by GSC (Atlantic) is Canada's principal marine geoscience facility and is focused on marine and petroleum geology, geophysics, geochemistry and geotechnique. GSC (Atlantic) like its other offices at different locations across Canada, carries out innovative science that leads to new ideas and transfer of technology.

As it got close to the talk, the audience started arriving and one of them was Dr. Dave Mosher, Senior Research Scientist at this office. Dave and I have known each other since I first came to Canada in 1997 and spent some time at the GSC Sidney office in Victoria. Dave introduced me to the audience, 40 in number, the highest turnout at the three GSC offices that I visited on the DL trips. As I ventured through my talk, it appeared from the nodding of heads and my intermittent checking if I had made my point, that to most people the topic was interesting. There were some interesting questions following the talk. One of them was about what attributes would be useful for 2D data and another was about the use of attributes for complex geology situations.

After the talk, Dave took me out for lunch where we chatted about various things, trying to catch up over the last 13 years or so. Dave had moved to GSC Atlantic office in 2000, and is now engaged in active work that he is happy about. He has 5 students pursuing their M.Sc. and Ph.D. degrees under his guidance all affiliated with Dalhousie University. Dave saw me off at the commissionaire, where I picked up a taxi and headed for the airport.

University of Saskatchewan, Saskatoon

My next stop was Saskatoon which I reached at 1 am on a delayed flight on Friday morning. Igor Morozov, Professor at the Department of Geological Sciences, University of Saskatchewan, and the DL coordinator for this venue had my stay sponsored for 2 nights at Park Town Hotel, close to the University. Saskatoon is a small city with a population of 240,000 people, which is a little less than one-fourth of Calgary's. The Department of Geological Sciences at the University of Saskatchewan is housed at the centre of the campus and includes a Natural Sciences Museum, with three full-scale dinosaur replicas and a number of rock and mineral samples. The department offers a well-rounded geophysics program that includes field school, a dedicated

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computer laboratory with current software for projects, industry participation and hands-on experience with modern equipment, leading to B.Sc., M.Sc. and Ph.D. degrees. The department has two cluster systems one with 5 and the other with 50 nodes and has a passive stereoscopic Geo-wall visualization system. Two seismic stations located outside of Saskatoon record real-time regional seismic data that is analyzed at the department.

I got up at about 8 am, feeling fresh and ready for another day of lecturing and interaction. After a quick breakfast, I reached the Department of Geological Sciences at about 10 am and met Professor Jim Merriam, Head of the Department. After the exchange of pleasantries, Jim took me to Professor Zoli Hajnal's office. Zoli is an iconic name in Canadian Geophysics circles and I knew him from when I had interviewed him for the CSEG RECORDER years ago. Zoli has a big office which is overloaded with his impressive collection of books, periodicals and research literature that he has treasured over the years. Zoli was his warm, kind and polite self, appreciative of my accomplishments. Later he introduced me to his team members, Bhaskar Pandit, Professional Research Associate and Erno Takacs, Research Associate, who work with him on a project that entails the use of seismic data for uranium exploration. They shared the results with me of their project that entails the use of seismic data and attributes on a small 3D seismic data volume. The data has a shallow zone of interest for uranium mineralization and its exploration. It was a very interesting interaction for me to witness attribute application for mineral (uranium) exploration. One of Zoli's recent Ph D. graduates, Istvan Gyorfi and Zoli just published a book, "Seismic Methods in Uranium Exploration", concerning application of seismic methods in the Athabasca Basin. Thereafter Zoli took me out for lunch to the University faculty Club, accompanied with Bhaskar, Erno and Sam Butler, Associate Professor, the youngest member of the geophysics faculty. We chatted on various topics and it is always a pleasure to hear Zoli sprinkle intermittent humour in his conversation. After lunch, I met Professor Igor Morozov, who by now was free from his teaching assignment. Igor apprised me of the work that he is carrying out, which includes a book entitled *'Seismological Attenuation without Q'*, a processing software system that he has developed, and studies of nuclear explosions amongst others. He then introduced me to two of his students Le Gao and Amin Baharvand Ahmadi, who are engaged in studying reservoir characterization based on Weyburn time lapse and 3D VSP data. Both Le and Amin enthusiastically explained the work that they were doing and it was fun chatting with them.

Talk in progress (Photos courtesy: Chris Furey at Memorial University).

Audience assembling in just before the talk at Memorial University, St. John's, March 2nd, 2011.

My talk was arranged in a spacious lecture room and was attended by close to 50 people, including some faculty and local industry members. Coffee and cookies were there for people to enjoy during the talk as much as I enjoyed delivering the talk. Some interesting questions followed, mainly focused on what could be done to condition the seismic data before generating attributes, and the background that lead to the development of curvature attributes.

Igor had invited me out for dinner and so after finishing with the talk, Zoli very kindly gave me a ride to and back from the restaurant. Jim Merriam also joined us and it was great fun dining with them, talking about various things from geophysics, political scenarios around the world and sharing some personal experiences.

Overview of the CSEG DL Tour

The highlight of my DL tour this time, just like the earlier trips I made, was the warmth with which I was received at each location I visited and the hospitality extended to me. People at each

With Zoli and Bhaskar in their lab at U of S. (Photo courtesy: Zoltan Hajnal.)

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Lecture in progress at Department of Geological Sciences, University of Saskatchewan on March 4th, 2011.

Post-dinner enjoying coffee with Igor, Zoli and Jim at Saskatoon on March 4th, 2011.

location told me that they are thankful to the CSEG for sponsoring the DL trips so that they benefit from the technical communication, which in my case was the industry perspective on the use of seismic attributes. I got back to Calgary on Saturday morning with a satisfactory conclusion to my 2010-2011 Distinguished Lecture travel. At the time of this writing, the last lecture is scheduled at Calgary on March 14th, 2011 at the CSEG luncheon, which I am looking forward to.

On a personal note, I wish to thank the CSEG for bestowing this honour on me. I have tried my best to live up to the expectations that each location's audience may have had of the CSEG DL. I have personally gained a lot in terms of learning about the work that is being done at the different Canadian Universities as well as the GSC offices that I visited. To anyone offered this Distinguished Lecturer honour by the CSEG, I would highly recommend taking it on! R