Engineering TIMES

October 2003
Vol. 9

Kevin Sibley returns as Department Head

Kevin Sibley

Dr. Robert Gordon has been appointed to a Canada Research Chair (CRC) Tier II position at the NSAC in Agricultural Resources Management. The Canada Research Chairs program is a federal government initiative to strengthen the research and innovation capacity of universities across Canada. The Chair is a five-year term, renewable once and is targeted at researchers who are acknowledged by their peers as having the potential to be leaders in their field. It is valued at $100,000 per year in salary and research support. Dr. Gordon continues to be a member of the Engineering Department and will now be able to focus exclusively on his research activities in the areas of water quality, engineered wetlands, nutrient management and greenhouse gas emissions. We all wish Dr. Gordon well in his new role, and on behalf of the department staff I wish to thank him for his leadership as Department Head for the past two years.

I have been re-appointed as Department Head for a five-year term, and I am excited about the changes we are making in the department. We continue to implement our strategic vision that we developed while I was Head in 1999/2000; to focus our activities in the Bio-Environmental areas of Environmental Quality Systems, Water Systems Quality and Quantity Management, Biological and Biophysical Systems, Renewable Energy Systems, Aquaculture Systems, Biomass Conversion and Waste Processing Systems, and Mechanized Food and Fiber Systems. We have made significant changes to our teaching programs. The B.Sc.(Agricultural Mechanization) program has been re-focused to provide students study opportunities in the management of technology used in the intertwined biological and environmental fields. The new program is named Bio-Environmental Systems Management (BESM). In addition this year, we have added three more discipline choices to our Engineering Degree Diploma program. We now offer discipline choices in Mechanical, Industrial, Environmental, Civil, Chemical, Electrical, Metallurgical, Mining, and BioSystems.

We have been working hard on recruiting initiatives, and these are starting to pay dividends for us. Our Engineering Degree Diploma students numbers have increased both this and last year, and we now have a total of 48 students in this program. We are just starting to promote the new BESM program, so only time will tell where we grow

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Department of Engineering Open House

The Department of Engineering will be having an Open House on Wednesday evening, November 5th from 6 to 9 pm.

Tour the facilities, mingle with the staff and students and see what Engineering is all about.

- Hands-on learning
- Competitive Tutition
- World Class facilities
- Entrance Scholarships
- Engineering Scholarships
- Personal Interaction with Professors

Focus on Research

Modeling and Design of Low Head Oxygenators for Aquaculture Recirculation Systems

Aquaculture is a growing industry all over the world. Research is continuously developing enhanced feeds, new species and advanced equipment to aid in the farming of aquatic species. In Canada the aquaculture industry generates approximately a half a billion dollars annually and employed over 5000 people. There are a variety of cultured species produced, ranging from fresh and saltwater fish, shellfish and plants. Many aquaculture sites have used advances in technology to increase their original production capacity.

Dissolved oxygen can be the single most important environmental factor in aquaculture. Not being able to maintain dissolved oxygen levels in rearing water during times of increased oxygen demand restricts feeding rates, fish loading, and rearing. To achieve improved rates of

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Staff Focus: Graham Pearson

Graham Pearson

Going back to the beginning, I was born in England and spent the first nine years of my life there before becoming part of the wave of emigrants which left Britain for Australia, South Africa, or Canada after World War 2. Naturally wanting to be part of the Great White North, and not really into the beaches thing, my parents came to Canada. The rest of my school years were spent in southern Ontario where I graduated from high school and then went to Queen's University intent on taking a degree in chemistry. Well, first year chemistry cured me of that (too much dishwashing) and, wanting to do laboratory work, I headed for the Physics Department and not Mathematics which was the other choice.

Four years in an Honours Physics degree turned out to be much more fun than I had initially anticipated and, despite three job offers, I decided to hang around and get a Master's degree in nuclear structure. There was lots of neat equipment to design and use and things went pretty well. However when this was done I thought that it had to be time to enter the real world (or as close to that as I ever came) and get a JOB! This was 1968, a very interesting time, and one where employers were tripping over each other in an effort to snag the new scientists for their particular pursuits. This is why I moved east as the Bedford Institute of Oceanography offered me a good job where I might go out on a boat now and then, and I could actually afford a new car on what they were willing to pay me!

Since then I have done some oceanographic research, taught at community college, St Mary's University and NSAC, married a wonderful girl and had three great kids, and generally had a really good time. During the past few years my professional interests have headed more in the direction of effective university teaching. This lead to a sabbatical leave, studying how to introduce Learning Community concepts into the Engineering Diploma program and possibly others. Last academic year was spent investigating all kinds of ways in which this could be accomplished and, no doubt, most students this year have already noticed some changes as a result. Stay tuned!

When I am not around NSAC and have time to indulge my own pleasures, I can quite often be found in the grease and the muck under my 1972 Volvo 1800 which I am trying to rebuild. The "on-the-road" date has now been pushed back to next summer, and there is an MG awaiting the same treatment if I ever get the Volvo finished. I have also built a wooden canoe, enjoy biking and skiing, listen to quite a lot of classical music, and am trying to put a model railroad together. Life is full and fun, and I can say that the students at NSAC really help to make it that way. The students are great and a wonderful incentive that makes me want to get to work each day.

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oxygen transfer to water, existing methods of oxygenation must be improved and new methods that will deliver oxygen to water under a wide range of aquaculture conditions must be developed. Oxygenation systems are becoming more common in aquaculture and will be considered an essential part of rearing systems in the future. Pure oxygen contact systems for nitrogen stripping and oxygen addition have revealed positive operational and economical characteristics.

Pure oxygen has been economically used since the 1970's to create supersaturation concentrations of dissolved oxygen in aquaculture. Using pure oxygen can increase the carrying capacity of a fish culture system, when dissolved oxygen is the most limiting factor. Increased dissolved oxygen can lead to higher quality fish as well as increased production for aquaculture sites. *Scott Lomond*

Selected Recent Publications

Rifai, N. M., Miller, J. Gadus, J., Otepka, P., Kosik, L.:(2003) Comparison of infrared, flame and steam units for their use in plant protection. RES. AGR. ENG., 49 (2): 65-73

Asiedu, S., T. Astatkie and E. Yiridoe (2003), The effect of seed-tuber physiological age and cultivar on early potato production, Journal of Agronomy and Crop Science. 189: 176-184.

Duston, J., T. Astatkie and P.F. MacIsaac (2003) Long-to-short photoperiod in winter halves the incidence of sexual maturity among Arctic charr, Aquaculture. 221: 567-580.

Kyei-Boahen, S., R. Lada, T. Astatkie, R. Gordon and C. Caldwell (2003), Response of carrots to varying irradiances, Photosynthetica. 41: 301-305.

Pruski, K., T. Astatkie, P. Duplessis, T. Lewis J. Nowak and P. C. Struik (2003), Use of Jasmonate for conditioning of potato plantlets and microtubers in greenhouse production of minitubers, American Journal of Potato Research. 80: 183-193.

Pruski, K., T. Astatkie, P. Duplessis, L. Stewart, J. Nowak and P. C. Struik (2003), Manipulation of microtubers for direct field utilization in seed production, American Journal of Potato Research. 80: 173-181.

Fredeen, A. H., T. Astatkie, R. W. Jannasch and R. C. Martin (2002), The productivity of grazing holstein cows in Atlantic Canada, Journal of Dairy Science. 85: 1331-1338.

Graduate Students Update

Afton Madore's topic of research is Manure Stockpiling: Nutrient Loss and Environmental Imapacts.

Debra McLellan's topic of research is predictive air emissions monitoring from a GE LM6000 natural gas fired turbine.

Kathy Bremner's research focuses on poultry manure management in Kings Co.

Abdirashid Elmi's research focuses on impacts of agricultural waste management systems on soil and on environmental quality.

Student Focus: Scott Lomond

Scott Lomond

Scott Lomond was born in Stephenville, Newfoundland, where he graduated from St. Stephen's High School. In high school Scott was very active with sports, band, peer counseling and air cadets. At the age of sixteen he received his glider pilot's license, and the following year his private license.

After graduating he earned a Diploma in Computer Aided Drafting from Westviking College in Stephenville. While attending college he played hockey for the local Junior Hockey Club. He then attended St. Mary's University and earned a Diploma in Engineering, moving on to DalTech and completed a Degree in Biological Engineering. At DalTech he was also a member of the varsity basketball team.

In the fall semester of his final year, Scott attended the NSAC as part of the Aquaculture emphasis for his degree. "I was amazed with the facilities and the atmosphere at the Nova Scotia Agricultural College, for a smaller School," he said when thinking back on his first exposure to the NSAC. After completing his degree he worked as a flight instructor at the regional glider school, flying out of Debert, NS, returning to Newfoundland at the end of the summer.

Over the next 8 months Scott worked as a carpenter's assistant building houses, saying, "I was looking for just the right engineering position and enjoyed working with my hands." The next spring he took an engineering job with a small aquaculture company focusing on ways to reduce the phosphorous levels in their effluent. Shortly after accepting that position, Dr. John Blanchard contacted him regarding a graduate project that he had received funding for. "Doing a Master's was something that I was always interested in!" So Scott started his master's at the NSAC in the fall of 2001, and is currently in the final stages of the project, which is titled Modeling and Design of Low Head Oxygenators for Aquaculture Recirculation Systems.

At NSAC Scott finished out his athletic eligibility as a member of the varsity basketball and soccer teams.

Engineering Students receive Dalhousie Entrance Scholarships

Engineering students Ryan Gaunce (center) and Nathan Bokma (right) are congratulated by Kevin Sibley. Ryan received the Minas Basin Pulp and Power Company scholarship valued at $2,000 and an APENS scholarship at $2,000. Nathan received the McCausland scholarship and an APENS award valued at $1,000 each.

Kevin SIbley, Ryan Gaunce and Nathan Bokma

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to with this initiative. Currently we have 17 students completing the Agricultural Mechanization program. We are also now heavily involved in the training of Highly Qualified Personnel (HQP), the new NSERC term used to describe graduate students. The number of graduate students our department faculty are supervising or co-supervising has grown to 20 M.Sc. and 4 Ph.D's.

Our Faculty continue to be involved in the development of international linkages. Of particular note is our key role in the development of a new Certificate in Atlantic Canadian Agriculture program. This unique program enables students from Central Europe to study at the NSAC for one academic year and provides them up to 8 months work experience on Atlantic Canadian Farms. We had 6 students in this program from Slovakia last year. Each year, we also lead a group of farmers from Atlantic Canada to tour Central European agriculture.

We have also identified an up-and-coming opportunity to make significant contributions in the emerging BioEconomy as society shifts from producing fossil-fuel based products to carbohydrate based bio-products. Over the next few years we intend to begin engaging in activities in this area that will compliment our expanding Bio-Environmental activities.

I hope you enjoy reading this issue of Engineering Times and that it continues to be informative about what is happening

Dr. Rifai receives Slovak Presidential Medal

Dr. Nabil Rifai, and six visiting Slovakia students were among the sixty-five people who gathered on Sunday, April 6, 2003 at Heritage Hall, Pier 21, Halifax, NS, to celebrate those Slovaks who arrived in Canada through Pier 21 and to welcome his Excellency Rudolf Schuster, president of the Slovak Republic. President Schuster officially unveiled the Slovak Commemorative Plaque, a reminder of the many Slovak immigrants who came through this port and established for themselves and their children a new home in Canada.

In recognition of his continuing efforts to promote cooperation between Canada and the Slovak Republic, Prof. Rifai was awarded the Slovak Presidential Medal and was presented the Presidential Certificate from his Excellency Rudolf Schuster.

Congratulations

Congratulations to Ashley Harding, 1st year Engineering who has won the Provincial Championship for the Orienteering Association of Nova Scotia, at the recent Bluenose Classic held in Oxford . This is the second year in a row for Ashley.

Alumni Focus: Jamie Carty

Jamie Carty is a 2002 Graduate of our B.Sc. (Agricultural Mechanization) program. He hails from a farm in Grafton in the Annapolis Valley, Nova Scotia. Currently he is working in New Brunswick with CropSmart Canada Inc. as an agronomist and precision farming specialist. In that role he assists agricultural producers in New Brunswick, Prince Edward Island, and the State of Maine with the installation of precision farming hardware on their field equipment and software on their computers. He conducts GPS-based soil sampling using mobile equipment and produces field maps for the producers. During the growing season, hyper-spectral image analysis techniques are used to monitor crop growth. And during harvest, the yield monitors installed on the producer's harvesters are used to gather data on crop yields.

Data, data, and more data. What to do with it all? Not to worry, Jamie has access to the latest GIS and data management software such as SiteMate, FarmWorks, and SSToolbox. With these tools he is able to prepare maps and databases of the information collected, and help the producers make sense out of it all. This is where his practical experience comes in. The new- fangled technological information is combined with conventional production management knowledge, creating an ability to make precise agronomic recommendations to increase yields and reduce overall input costs. On average Jamie has found yield increases in the order of 20% by the producers he has been working with. That's impressive!

Through strategic alliances and partnerships Jamie offers the complete suite of precision agriculture equipment sales or leasing, computer training with operating system support, specialized agriculture training, feasibility analysis, business planning and record keeping, and custom printing with photography development. This is in line with CropSmart's mission to maintain a leading position in the application of precision agriculture technology to proven agronomic practices. And it is Jamie's personal commitment to work with each producer to ensure that each piece of precision agriculture technology works in their best interests.

Farmers commended for International support.

On Sunday August 17, 2003 seven visiting Slovak students, their host families and selected farmers from Atlantic Canada were invited to a reception organized by Dr. Nabil Rifai. Dr. Garth Coffin presented a plaque to Mr. Jimmy Wells, Vice-President of J. W. Mason & Sons, Windsor, NS, in appreciation for his work with our visiting Slovak and Czech students.

Congratulations

Kevin Sibly received the C.A. Douglas Award which is awarded on an annual basis to an outstanding extension worker providing public service in the Province of Nova Scotia. The award has a value of $1,000 and is presented at the Nova Scotia Institute of Agrologists Honours and Awards Banquet in the spring of each year. This fund is used for a self-improvement program to further the development of the individual and/or agricultural extension in Nova Scotia. This allows an individual to pursue further studies related to their agricultural extension work.

Congratulations to Dr. Tess Astatkie on his promotion to Full Professor.

Congratulations to Prof. Ali Madani on receiving the Faculty Research Excellence Award.

Annual fall BBQ

On October 25th the Department of Engineering hosted its annual BBQ. The EUS handled the entertainment. Earlier that afternoon there was a forum presented by alumni to the Engineering students. Glenn Ross represented Horner and Associates as well as APENS, Debra McLellan, NS Power and Chrystal Archibald, Kohler International.

Back Row left, Kevin Sibley and Glenn Ross,
Front left, Crystal Archibald and Debra McLellan

The Engineering Undergraduate Society

The engineering undergraduate society (EUS) is in place to provide awareness of the engineering profession. The group is in its initial stages of organization, and is focused on providing a permanent system of organization for the following year's EUS. The executive consists of Jeremy Smith, Jennie Pryor, Kurtis Langille, Nick Stewart, and Gregor Archibald. The group is particularly looking forward to input from first year engineering students, who will potentially comprise next year's EUS. Also, the group advises all students to regularly check the bulletin board in the student lounge at Banting Building for any upcoming events. We encourage first year students to visit the Engineering Open House on Wednesday, November 5th at 6-9pm. This will prove to be an excellent opportunity for the engineering student body to offer insight to potential engineering students. We welcome any input from students with respect to the EUS, please notify one of the people mentioned above.

ENGINEERING TIMES is produced by the NSAC Dept. of Engineering staff, co-ordinated by Wayne Bhola, (NSAC class of '74) and is published three times a year.

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