



Large-scale Ice Keel Modelling

C-CORE is undertaking a major Ice Keel Testing program in collaboration with National Research Council’s Institute for Ocean Technology (IOT) as part of the PIRAM (Pipeline Ice Risk Assessment and Mitigation) joint industry project with additional support from ACOA’s Atlantic Innovation Fund. The significance of ice keel failure mechanisms, by either local or global keel section failure, is being investigated. Of particular importance are the strength characteristics of a ridge keel and subsequent failure as the keel interacts with the seabed. The goal is to conduct physical tests designed to improve understanding of the failure mechanisms associated with keel interaction with the seabed and the state of keel capacity during touchdown and initiation of gouge events. It will test how the shear strength of a ridge keel increases with level of confinement imposed by gouge geometry and resultant resisting forces that develop as the keel gouges the seabed.

The self reacting steel frame shown in IOT’s ice tank was designed by C-CORE specifically for these tests. The ridge keels are constructed from more than 100 tonnes of freshwater ice blocks placed into floating formwork and refrozen into an ice sheet to simulate the characteristics of a first year ice pressure ridge.

The depth of the ridge keels will be 1.5 m. The frame has an open side through which the ice keel is floated into the center of the apparatus and positioned for testing. Four vertical hydraulic cylinders are used to place a surcharge load (not shown) to the top of the ice keel. Tests will be carried out under varying levels of vertical

surcharge to study the effect on keel strength. Increases in surcharge simulate the effect of the ridge rising up out of the water as occurs during an upslope seabed gouging event.

In the photograph, personnel are installing the “seabed” on a platform which is moved by two hydraulic actuators. Instead of moving the keel into the seabed, the seabed moves into the keel. Both the horizontal and vertical forces generated during the tests are reacted through the keel and soil bed into the opposite ends of the frame. The dimensions of the frame are 8.6 m long x 5.0 m wide x 3.0 m high allowing keel drafts up to 2.0 m to be tested. The horizontal load capacity is 0.7 MN and the maximum loading rate will be 60mm/sec. The vertical surcharge capacity is 0.6 MN. The first series of tests will be completed this summer.



Test frame in ice tank prior to filling

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C-CORE Named Employer of Distinction for 2008

C-CORE was honored to be named the Employer of Distinction in the small employer category at the sixth annual Newfoundland and Labrador Employers Council (NLEC) awards luncheon on February 5, 2009.

The Employer of Distinction Award recognizes employers who go above and beyond the norm when it comes to all elements of the employment relationship. Organizations are judged on five criteria: Health and Safety, Compensation and Advancement, Presence in the Community, Stakeholder Awareness, and the overall implementation of Human Resource Best Practices.

C-CORE was recognized for the programs and benefits offered to its employees, creative recruitment and retention strategies, charity and volunteer work of staff, and the company's focus on work life balance.

Dr. Charles Randell, President and CEO of C-CORE said "C-CORE's business is applied research and development to solve those very tough problems that challenge a variety of industries. C-CORE's product – innovative solutions - is generated entirely by the intellect and imagination of our staff. Over the past year we have worked on every continent on Earth, and in many of the oceans. It's a global market and our clients will go anywhere in the world to get the top talent. They come here to this province, to C-CORE. We work very hard, drawing on our relationship with Memorial University and anywhere else we can to be the employer of choice in research and development. This award is a great message to us that we're on the right track."



Employer of Distinction Award



C-CORE President - Charles Randell

President's Message

Protect your capital. That familiar mantra seems particularly relevant during this period of economic instability. C-CORE's most important capital by a wide margin is the human variety. Our strength is a team passionate about generating knowledge and developing technology, then applying it with

world-class excellence to address some of the most challenging operational issues on Earth. To protect and grow this capital, two years ago we set a Strategic Goal to be the employer of choice in R&D. As you will read in this edition of C-CORE News, we were recently recognized as the Employer of Distinction for companies with fewer than 70 employees. We're on track, but stay tuned; we plan to win it again in the over 70 employee category.

In addition to staff, an important supplement to the C-CORE Team is graduate students, primarily from Memorial University. C-CORE's roots are at Memorial and we continue to enjoy a strong, mutually beneficial relationship. We are very pleased to have had the opportunity to partner with Memorial on a Chair in Geotechnical Engineering, and are delighted to welcome C-CORE alumnus, Dr. Bipul Hawlader back to fill that position.

In this edition you can get a sense of the breadth of work and expertise at C-CORE. Recent radar work ranges from radar simulation in Ottawa, to space-based radar monitoring of ice conditions in the Barents Sea. Ice work took us from remote sensing of Barents Sea ice (and ice engineering work to be reported in future editions of C-CORE News) to being very up close and personal with ice keels during an unprecedented test at the National Research Council's Institute for Ocean Technology.

C-CORE's capital is the people who serve this organization. Of course I'm referring to staff, but also to our Board of Directors. We have been extremely fortunate in attracting and maintaining a Board of immense calibre. That tradition continues as we welcome David Oake back as Chair of the Board and we welcome new Board Members Anne Downey, Jim Keating and Jan-Kristian Haukeland.

Thank you for taking the time to read this update.

Charles Randell Ph.D., P. Eng.

Radar Systems work with DRDC Ottawa

C-CORE is currently working with the Radar Systems Section of Defence Research and Development Canada (DRDC Ottawa) to conduct radar research for a number of platforms including those that are space-based, airborne and surface-based. The work directly supports DRDC's commitments to The Technical Cooperation Program (TTCP). The TTCP is an international organization in which Australia, Canada, New Zealand, the United Kingdom, and the United States are principal members. The goals of this organization are scientific and technical defense information exchange; program harmonization and alignment; and shared research activities (<http://www.dtic.mil/ttcp>).

One component of the work is performing tracker optimizations for real High Frequency Surface Wave Radar (HFSWR) data with a stand-alone Interactive Multiple Model Nearest Neighbor Joint Probabilistic Data Association (IMM-NNJPDA) tracker previously developed by the DRDC Ottawa lab and C-CORE Ottawa staff. Tracking optimization was accomplished by running a given scenario with different Kalman filter process noise settings and analyzing the tracker prediction accuracy. This type of optimization is key in defining acceptable levels of noise estimates to produce accurate tracks in cluttered and high target volume environments. The results were tested with a scenario with a very sharp vessel turn and demonstrated the advantage of IMM tracking, as it allows for both fast and slow dynamics and provides accurate tracking through complex motion, while controlling process noise levels. The results will be published later this year.

The work also includes investigation of adaptive radar resource management techniques for naval multifunction radars (MFRs), using a MATLAB-based modeling tool called Adapt_MFR. This simulation software models the different MFR functions, including

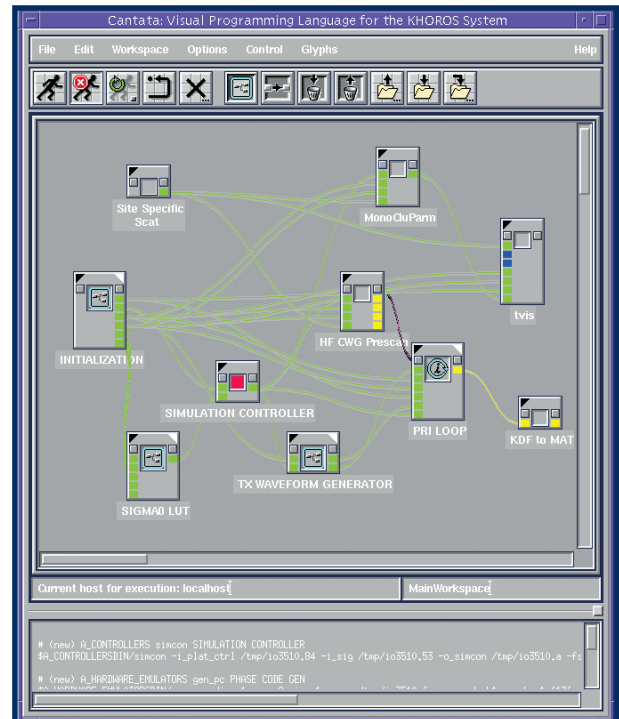


Figure 1: Typical RLSTAP lineup in the Khoros Cantata Editor

detection, tracking, task scheduling and prioritization, as well as different clutter and propagation conditions. The tracker implemented in Adapt_MFR is the IMM-NNJPDA software mentioned above. The task scheduler features time-balancing capabilities and newly integrated fuzzy-logic prioritization.

The goal of this work is to release an updated version of Adapt_MFR with the new tracking and fuzzy logic functionality to the TTCP partners so that they may, in turn, add their contributions. This work is ongoing and improvements continue to be implemented in anticipation of the next TTCP meeting.

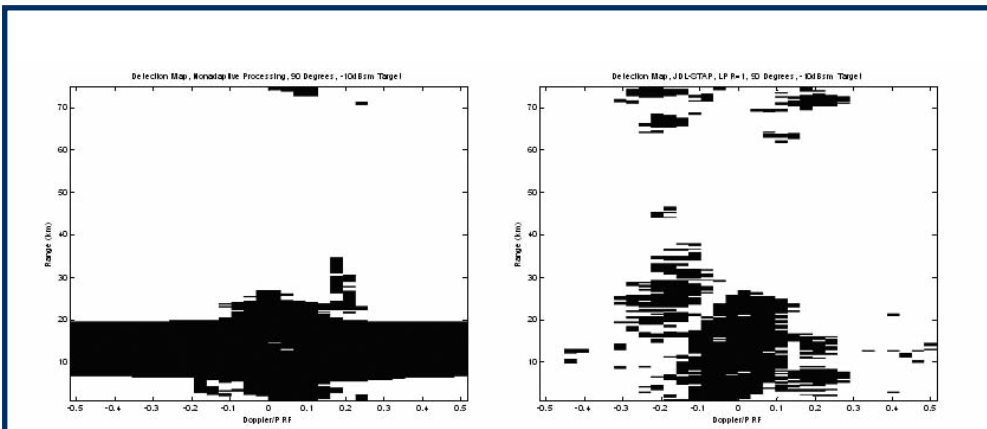


Figure 2: Range Doppler target detection maps resulting from 2-dimensional FFT processing (left) and Joint-Domain Logic-STAP (right)

In another component of the work, DRDC used the Research Laboratory Space-Time Adaptive Processing (RLSTAP) tool to conduct radar simulations such as ships at sea, satellite based radar, and radars on unmanned aerial vehicles (UAV). RLSTAP is a powerful simulation tool that includes flexible platform models and high-fidelity clutter models. Figure 1 shows a typical top-level RLSTAP lineup. The output of the simulation lineups are range-channel-pulse data cubes, which are processed using two-dimensional Angle-Doppler Fast Fourier Transforms (2DFFT) and Joint Domain Localized

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Space-Time Adaptive Processing (JDL-STAP) routines implemented using MATLAB. Analysis of the processed results is used to evaluate improvements in target detection when using STAP versus non-adaptive processing in various scenarios and environments. For example, black regions in Figure 2 represent areas where the target cannot be detected. The plot on the right shows improvements in target detection in Doppler space (horizontal axis) is improved using STAP processing.

To improve the simulation capability of RLSTAP a number of additions and improvements have been added including: electronic counter measure (ECM) support such as false targets, multiple pulse repeat, and smart or bandwidth-limited white noise; the Georgia Institute of Technology Sea clutter model; and limited Radar Cross Section (RCS) data import support. Two false targets, multiple pulse repeat, and smart noise have been added to a single target scenario shown in Figure 3 resulting in target obscuration (the actual target position is shown in red).

The goal of this work was to evaluate the effectiveness of bistatic radar detection methods in various scenarios and environments through simulation. The results of this work were reported to the TTCP partners. C-CORE Ottawa staff has had a long and fruitful relationship with DRDC Ottawa, providing high quality expertise in the areas of Radar and Radar applications.

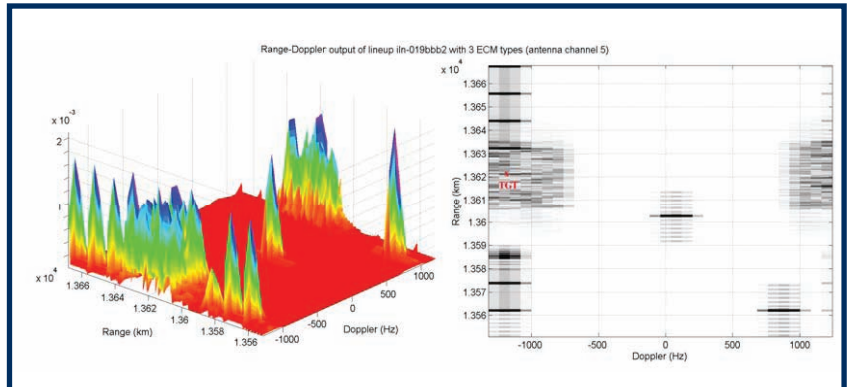


Figure 3: Multiple ECM techniques added to a single target RLSTAP scenario

C-CORE Chair in Geotechnical Engineering

C-CORE has made a five year commitment to Memorial University to support a Chair in Geotechnical Engineering within the Faculty of Engineering and Applied Science. Following an intensive search we are very pleased that the successful candidate for the Chair is Dr. Bipul Hawlader.

Dr. Hawlader received a B.Sc. in civil engineering from Bangladesh University of Engineering and Technology (BUET) in 1992, a Masters in geotechnical engineering from Asian Institute of Technology (AIT) in Thailand in 1995 and a Ph.D. in geotechnical engineering from Yokohama National University in Japan in 1998.

He worked as a Research Associate at Cambridge University and was a Post-doctoral Research Fellow at University of Western Ontario. From 2002 to 2006, Dr. Hawlader was at C-CORE as a Senior Research Engineer working on various issues of onshore and offshore oil and gas pipelines. For the past three years he gained valuable industry experience at AMEC Earth and Environmental in Calgary working as a Senior Geotechnical Engineer on oil sands development.

Dr. Hawlader's research interests cover a wide range of areas in geotechnical engineering, both in laboratory testing and numerical

analysis, including onshore and offshore pipelines, consolidation of soft clay and fine tailings, tunneling in soil and rock, constitutive modeling of geomaterials, geothermal modeling, ground improvement, and foundation design.

C-CORE extends a very warm welcome back to Dr. Hawlader and looks forward to many years of fruitful collaboration.



L-R: Ms. Susan Kennedy, Vice-President, Operations, Dr. Hawlader, and Dr. Charles Randell, President & CEO

Using Satellite Surveillance to Monitor the Red River Flood

Occurrences of too much or too little water (floods and droughts) have historically been Canada's most expensive natural disasters. During the 20th century, flooding caused at least 168 disasters in Canada resulting in several billion dollars in losses and the deaths of at least 195 people. Between 1975 and 1999, 63 floods resulted in federal assistance payments of almost \$720 million (1999 dollars). Between 1984 and 1998, insurance claims for flooding, which do not include residential losses, were in excess of \$750 million. Floods affect all of Canada. Well-known areas prone to flood disasters include the St. John valley, New Brunswick, southern Quebec and the Red River valley, Manitoba. The Exploits River in Central Newfoundland is also prone to winter flooding, as witnessed in 2003 when part of the town of Badger became submerged after an ice jam caused the river banks to overflow. According to Manitoba emergency authorities, the Red River flood of 2009 now appears to be the second highest water level on record. Provincial officials say near 777 square kilometers of the Red River valley is underwater.

C-CORE's Polar View program provides integrated monitoring and forecasting services. Products are generated primarily from monitoring and/or analysis of (river, lake, glacial and sea) ice, icebergs and snow. One such service is river ice monitoring in support of flood, monitoring and mitigation. This year, C-CORE included monitoring services to the Manitoba Water Stewardship, providing river ice and flood extent maps to support the efforts of federal and provincial agencies to managing flood damage.



Communities affected by the flood in Manitoba (credit: CBC, 2009)



C-CORE is an innovative engineering solutions provider based in St. John's, NL with offices in Ottawa, ON and Halifax, NS.

We publish *C-CORE News* twice a year for our partners, clients, and associates.

President & CEO
Dr. Charles Randell

Vice-President, Operations
Susan Kennedy

Directors
Des Power
Freeman Ralph
Paul Adlakhia
Arash Zakeri

Deputy Director
Chris Fowler
Jim Bruce

Business Manager
David Gullage

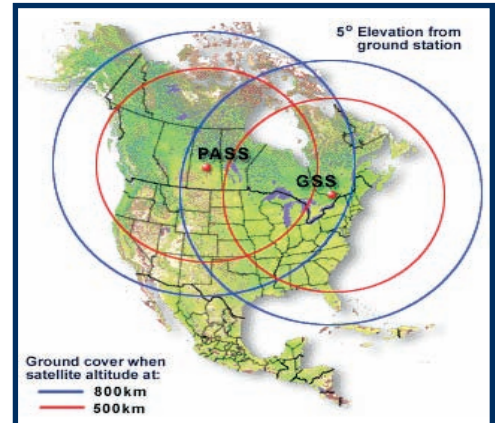
Principal Consultant - Ice Engineering
Dr. Ian Jordaan

Principal Consultant - Geotechnical Engineering
Dr. Ryan Phillips

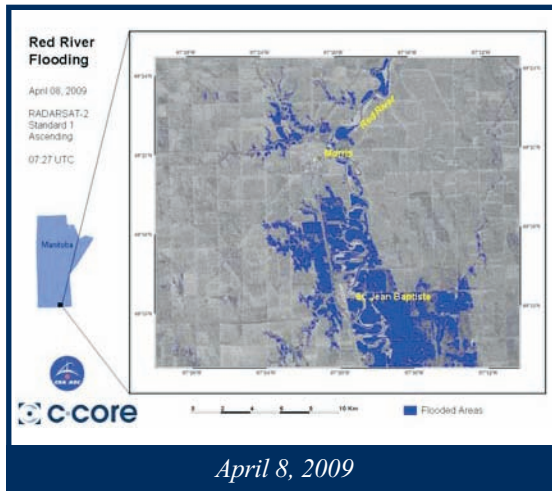
www.c-core.ca
709-737-8354
info@c-core.ca

Where is your EO data?

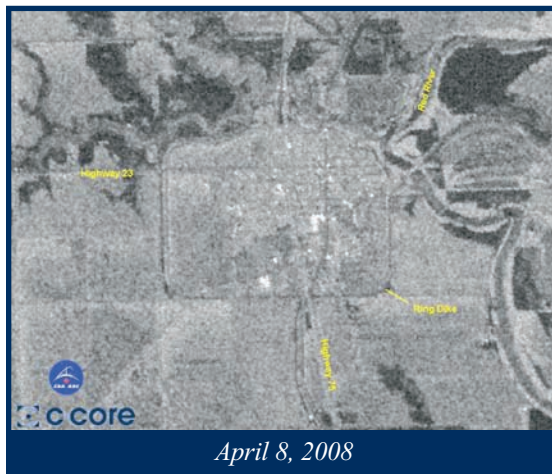
The phone rings on a hot autumn afternoon and it's the Prince-Albert Satellite Station (PASS) with an update on this evening's (Saturday of all days!) acquisition status. It seems as though data reception from a European Earth Observation (EO) satellite that night will have to be moved to the Gatineau Satellite Station (GSS). This has become routine for the new C-CORE employees at the Satellite Acquisition Services but, in this case, the re-scheduling involves a few more steps since this acquisition is for C-CORE's iceberg population survey (in collaboration with the Canadian Ice Service) and being processed using C-CORE's new Advanced Synthetic Aperture Radar (ASAR) satellite data processing system. The operator re-plans the acquisition, sends an updated schedule to the stations with new antenna pointing co-ordinates and times and uploads control files to C-CORE's ASAR processing system at Gatineau to ensure that the data will be processed in near-real time, all of this using a laptop and the wireless connection from a posh west-Ottawa coffee shop. All that is left to be done now is to sip espresso and wait for post-acquisition e-mails from the processing system to signal that the data has been received and processed into an image.



C-CORE now schedules for EO data reception across North-America through the SAS

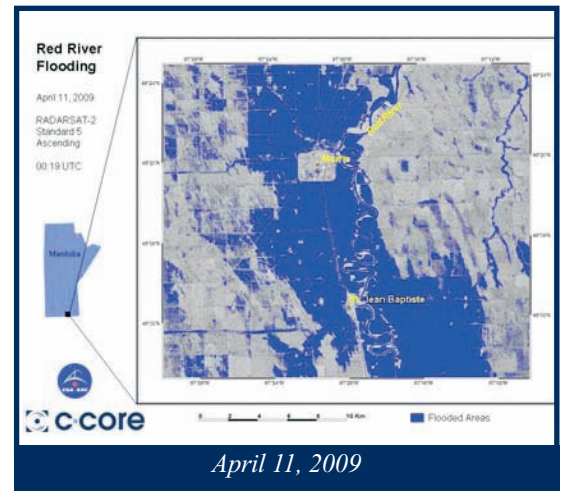


April 8, 2009



April 8, 2008

As of October 1st 2008, C-CORE has been applying its EO know-how and expertise to provide a single interface for the Government of Canada clients and satellite operating agencies around the globe. Working out of the Natural Resources Canada Headquarters building in Ottawa operational duties include acquisition planning, reception scheduling and responding to order desk client requests for EO data. This service has also been seamlessly integrated with C-CORE's current ASAR processing service for the Canadian Ice Service, thus reducing the overall cost of providing data to end-users.



April 11, 2009



April 8, 2008

These flood products were generated by C-CORE for Polar View, Manitoba Water Stewardship and the Canadian Space Agency Earth Observation Applications & Utilization Division. All imagery used in the production of these products are © 2008 MacDonald Dettwiler (MDA). Further details available from Guy Aubé at the Canadian Space Agency Tel: 450-926-6418.

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From legacy optical mission such as Landsat-5, to the state of the art RADARSAT-2 mission, C-CORE is involved in delivering a wide scope of quality products to both government and private sector. Through the hard work and dedication of the personnel at both the St. John's and Ottawa offices C-CORE's visibility as a leader in the provision and analysis of EO data and services continues to grow.

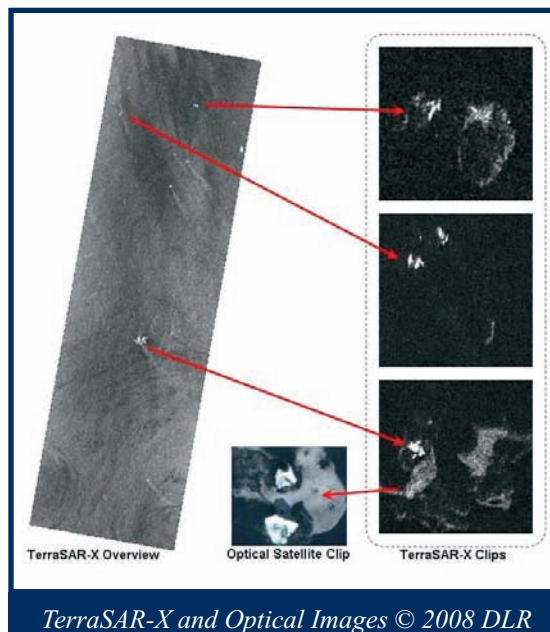
Satellites equipped with high resolution radar provide an effective approach to monitoring a broad range of naturally occurring phenomena over large areas. They "see" through clouds, fog, darkness and other obstacles that typically limit visibility, and with the number of these satellites continually increasing – five have been launched over the past 20 months – observations several times daily are possible.

Satellite radar images from Canada's RADARSAT-2 were acquired in early April 2009 over southern Manitoba. In these images, flooded areas are typically characterized by low levels of radar echo and appear in dark tones (colour coded blue in the image clips shown here). On the other hand river ice, particularly ice that has consolidated into an ice jam, shows up much more brightly in a satellite radar image. This difference facilitates accurate mapping of areas affected by ice and flooding. Images captured on April 8 and 11, 2009, show an increase in flooded area from 70 km² (7000 hectares) on April 8 to more than 300 km² (30,000 hectares) three days later. The image clips of the town of Morris clearly shows effect of protective barriers around the town. With the false colour removed, the darker portions of the image are flooded regions. Up to April 11 there was very little flooding within the town and several of the highways were above water.

Iceberg Monitoring with TerraSAR-X and RADARSAT-2

The year 2008 heralded a new era in security surveillance capabilities with the introduction of a new series of high resolution radar satellites. These satellites, with resolutions of as high as one metre, rival the imaging capabilities of the high resolution satellites used in the popular computer program Google Earth. Radar satellites are naturally applicable to security surveillance with their ability to provide images in either day or night, through cloud or fog, and through many types of camouflage cover.

C-CORE is a world leader in iceberg detection with satellites; thus, it is no surprise that the first application we investigated with these new high resolution satellites was for the iceberg detection service. Iceberg Detection with satellites has seen significant expansion over the past five years, in part through the international Polar View project. Polar View (www.polarview.org) provides ice and iceberg monitoring services from satellites, focused on operational users requiring timely information on an ongoing basis. Polar View's iceberg



detection service has been used by the Canadian Ice Service, the International Ice Patrol, international yacht races such as the Volvo Ocean Race, numerous oil and gas companies, and is the basis for the popular website www.icebergfinder.com.

To date, C-CORE has collected iceberg information on two high resolution satellites: TerraSAR-X, a German X-Band satellite, and RADARSAT-2, the C-Band satellite launched for the Canadian Space Agency. C-CORE has tested these satellites in West Greenland and Labrador. Results achieved to date have been astounding. Data collected with these new satellites have achieved detection and ship/iceberg classification rates of over 95%. Based on these results, systematic data collections with

TerraSAR-X and RADARSAT-2 began this Spring with the help of the Canadian Ice Service. In March, C-CORE collected data on over 250 icebergs off Labrador and the analysis of these data are expected to commence this Spring.

New Board Members

A key factor in C-CORE's success is the guidance and governance provided by an exceptional Board of Directors. We are very happy to welcome the following new Board Members. We also offer sincere thanks for the outstanding service of retiring Board Members James Bates and Vic Young, who most recently served as Chair and Vice-Chair respectively. David Oake is our Chair and has already been very active in that role. More information on C-CORE's Board can be found on our website, www.c-core.ca.



CHAIR

David J. Oake, B.Comm (Hons.) MBA
President, Invenio Consulting Inc.

Mr. Oake is a graduate (1978) of Memorial University of Newfoundland with a Bachelor of Commerce (Honours) degree majoring in Finance and Accounting and a graduate (1979) of Queen's University with a Master of Business Administration degree specializing in Finance and International Business.

From 2000 to 2008, Mr. Oake was Executive Vice-President (Corporate Development) of Stratos Global Corporation, the world's largest provider of remote satellite communications services. In this capacity he was responsible for development of corporate strategy, mergers and acquisitions and development of international partnerships and ventures. Prior to that, Mr. Oake was Vice-President (Corporate Development) of Aliant Inc. and Executive Vice-President of NewTel Enterprises Ltd.

Before moving to the private sector, Mr. Oake held a number of senior executive positions with the Government of Newfoundland and Labrador including Deputy Minister of the Treasury Board and Deputy Minister of Industry, Trade and Technology. During his tenure Mr. Oake was heavily involved in negotiations with the project proponents pertaining to royalty, project finance, taxation and industrial benefits issues leading to the development of the Hibernia and Terra Nova offshore oil projects.

Mr. Oake has served as a Director of Stratos Global Corporation, Moscow Teleport Ltd., Navarino Telecom, xwave and as Chairman and Director of Marystown Shipyard Ltd. and Bull Arm Site Corporation. He served previously on C-CORE's Board (1995 -2001) and was Chair from 1998 to 2001.



Anne W. Downey, P.Eng.
Manager – Commercial & Business Development
East Coast Canada
International & Offshore Business Unit, Petro-Canada

Anne is a graduate of Memorial University of Newfoundland and attained a Bachelor of Mechanical Engineering in 1977. Upon graduation, she joined Gulf Canada in the Western Canada oil industry working in various technical and management positions including reservoir and production engineering; field & gas plant engineering; joint venture operations; corporate planning and budgeting; and development planning. In 1997, Anne joined Petro-Canada as Asset Team Leader & Development and Operations Team Leader for Central Alberta & North Eastern British Columbia oil and gas properties. Anne later held management positions for Environment, Health, Safety, Security and Stakeholder Relations in Western Canada, Exploration and International as well as East Coast Offshore Operations. Anne's background in the non-conventional side of the oil and gas business included assignments as Project Manager for Petro-Canada's In Situ Oil Sands properties and Manager of In Situ Operations and Technical Services at the MacKay River SAGD Plant. Anne is currently responsible for leading and coordinating commercial & contract negotiations and business development efforts for Petro-Canada's interests in East Coast Canada.

Anne is a member of AGEFGA, Petroleum Society & Society of Petroleum Engineers. She has recently joined Memorial University of Newfoundland's Engineering and Applied Science Advisory Council (EASAC). Anne is married to Bernard and they have 3 sons.



Jim Keating, P. Eng, MBA
Vice President
Nalcor Energy - Oil and Gas

Jim Keating was appointed Vice President of Nalcor Energy - Oil and Gas in January 2009. He joined Newfoundland and Labrador Hydro, a subsidiary of Nalcor Energy, in December 2005 as Vice President, Business Development.

Mr. Keating is a graduate and Dean's Award recipient of Memorial University and attained a Bachelor of Engineering (Civil) in 1993 and a Master of Business Administration in 2002. In 1993, he began working in project management and planning for global engineering, procurement and construction firms working in the offshore. In 1998 he joined Norsk Hydro ASA as a Project Engineer with Hydro's Technology and Projects division evaluating concepts for new offshore developments in the North Sea and elsewhere. In 2001, Mr. Keating became an Area Asset Manager with the International Oil and Gas Division of Norsk Hydro and in 2004, became Norsk Hydro Canada Oil & Gas Vice-President of Field Development and Operations. He was responsible for all aspects of that company's Canadian development and operations portfolio including representation on the executive management committees of the Hibernia, Terra Nova and Hebron Projects.

Mr. Keating holds several board memberships including the Board of Regents of Memorial University, the Energy Council of Canada and the Bull Arm Site Corporation. He currently resides in St. Philips with his wife Kimberly and their three daughters Karoline, Ava and Madeline.



Jan-Kristian Haukeland, M.Sc.
Workstream Leader Stanze Project
Acergy Group

Mr. Haukeland is currently assigned to a corporate improvement project as a work stream leader based in Acergy's head office in London.

Mr. Haukeland graduated from the technical university in Trondheim, Norway in 1990 and he holds a master degree in mechanical design and technical management.

Mr. Haukeland has worked for more than 18 years in the offshore construction industry. He started his professional career joining Stolt Nielsen Seaway early 1991. He has worked on several projects for this company worldwide as a Project Engineer, Project Technical Manager and Assistant Project Manager. In 1997 Mr. Haukeland joined Statoil's Shipping and Maritime division where he was responsible for offshore crude loading and FPSO design (this division is today known as Teekay). From 2002 to 2003 Mr. Haukeland worked as the Engineering Manager of Stolt Offshore AS in Norway. From 2003 to the end of 2008, Mr. Haukeland was the Technical Director of Acergy Group's Northern Europe and Canada Operations.

Mr. Haukeland serves on the Board of Director's of Marintek AS, with its main office in Norway and branch offices in Rio and Houston. He has recently been appointed to the program board for Arctic OTC in 2010.

New Employees

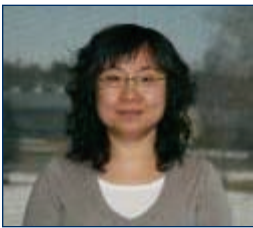
Pierre Jean Alasset, Ph.D.

Pierre-Jean Alasset has 8 years experience in geohazard using remote sensing (optical and radar images, aerial photos) and geophysical techniques (seismic surveys, GPR, GPS, paleoseismology). Since 2006, he has been working essentially on D-InSAR and PSI techniques to monitor and characterize natural hazard sites (earthquake, landslide, permafrost) in North America. He has been involved also on Digital Elevation Map generation from InSAR. His current work at C-CORE Ottawa is in synthetic aperture radar interferometry and coherent change detection as an Earth Observation Specialist. Pierre-Jean enjoys cooking, playing with his kid and photography.



Bing Yue, B.Eng., M.A.Sc.

Bing Yue joined C-CORE Ottawa team in March 2009. She received a Bachelor of Electrical Engineering from the Hebei Institute of Technology in China and a Master of Applied Science from the System Design Engineering Department of University of Waterloo. From 2002 to 2005, Bing worked as a Research Associate at the Canada Center for Remote Sensing in research projects specialized in target detection using SAR polarimetry and interferometry. From 2006, Bing worked as a geomatics analyst with the crop and land cover mapping projects at Agriculture and Agri-Food Canada, where she gained experience in remote sensing image processing and GIS applications. When she is not working Bing has fun playing with her pre-school daughter, cooking, and reading.



Brian Gamberg, B.Eng.

Brian has recently rejoined C-CORE after a 14 year absence. His technical background is in Signal processing, radar and acoustics. During his absence from C-CORE, Brian worked in the manufacturing sector, supplying underwater communications and navigation systems for marine interests. In his spare time, he enjoys skiing, skating, ballroom dancing and gardening.



James Youden, Ph.D., P.Eng.

James rejoined C-CORE in January 2009. He has a background in both electrical engineering and physics, and has more than 10 years experience working with synthetic aperture radar. He has also worked on projects in molecular physics, neutron spectroscopy including neutron Brillouin scattering, stochastic processes, molecular dynamics and Monte Carlo simulations, infrared spectroscopy, and iceberg towing and fracturing systems. His current work at C-CORE is in synthetic aperture radar for monitoring glaciers and sea ice.



Marco Perlot

After graduating from the The Hague Polytechnic School in 1997 and working at the city of Leidschendam, The Netherlands while waiting for the paper work to get through, I moved to Canada in May 2000 and started working at the Satellite Acquisition Services at Natural Resources Canada in Ottawa as a system administrator and am currently working as a Satellite Acquisition Specialist for C-CORE. In my spare time I like to play football (ie. soccer!), skate, rollerblade and enjoy watching my adoptive sport of hockey, as season ticket holder of the Ottawa 67's junior hockey team and going to the occasional Ottawa Senators game. Waiting patiently until professional football (ie. soccer!) comes to town.



(continued from page 1)



Jonathon Bruce

Jonathon Bruce has recently joined the C-CORE team after spending 2 years working on a master's degree in ice engineering. Jonathon has been studying under the supervision of Ian Jordaan which enabled him to work with C-CORE on a number of projects throughout his graduate studies. Prior to this, Jonathon completed a bachelor degree in mechanical engineering at Memorial University which included six work term positions. During this time Jonathon gained experience in fields relating to pipeline stress analysis, iron ore mining and processing, along with various manufacturing and safety related positions. In his spare time, Jonathon enjoys hiking, cycling, and playing his guitar.

New Director, Geotechnical Engineering Arash Zakeri, Ph.D., P.Eng.



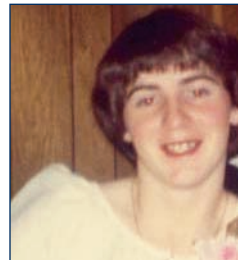
Arash Zakeri joined C-CORE as the new Director for the Geotechnical Group in October 2008. He has obtained his Bachelor of Engineering degree from Carleton University in Ottawa, and his Master of Engineering degree from the University of Toronto. In November 2008, Arash successfully defended his Ph.D. thesis at the University of Oslo, Norway. His Ph.D. project was on

Submarine Debris Flow Impact on Pipelines, which he carried out in affiliation with the International Centre for Geohazards (ICG), hosted by the Norwegian Geotechnical Institute (NGI). Arash has more than 10 years experience in the mining and offshore oil and gas industries. He has national and international experience on numerous large-scale civil engineering, mine waste management and offshore projects in Canada, USA, Australia, New Caledonia, Norway, Peru, Venezuela, Bolivia, Greenland (Denmark) and Vietnam. The primary focus of Arash's team at C-CORE is to work with the oil and gas, mining and government authorities in addressing their offshore and on-shore geotechnical challenges and to provide innovative and effective solutions.

30 Years!

C-CORE's Financial Manager recently celebrated 30 years at C-CORE and while many of you may not have met her most have you have certainly been in contact with her during her tenure at C-CORE. Sheila Bartlett joined C-CORE in 1978 for a one year contract and has been a key employee ever since. She began her career as an Information Assistant in C-CORE's Library (OEIC) and then moved into the accounting department where she has held many positions from Accounting Clerk to her current role of Financial Manager. C-CORE has the reputation of being a great organization to build a long-term career while maintaining a happy work life balance and Sheila is a prime example on both fronts. Sheila has built a 30 career at C-CORE while raising a family and no matter how stressful things get she is always there to meet you with a smile.

Congratulations Sheila!



Sheila in 1978 when she started at C-CORE



Sheila in April 2009

Building hope and a home in Guatemala - Reprinted with permission from MUN Communicator

If you think home is where the heart is, you'd understand why it was so important for the team at C-CORE to build a home for a family in Guatemala. Charles Randell, President and CEO of the C-CORE – and his wife, Deborah travelled in 2007 to Guatemala on a sponsorship program with the Arms of Jesus Children's Mission. They helped provide food, shelter, education, medical services and much needed love and attention to the poorest people in Parramos and Pampay. They were so touched by that experience they wanted to do more. His co-workers were asking about his trip and when Dr. Randell showed pictures and described the conditions, the team at C-CORE knew immediately what needed to be done.

A home in Guatemala costs roughly \$1,400 so the capable employees at C-CORE, led by Sheila Bartlett and Freeman Ralph, co-ordinated breakfasts and lunches to raise funds over the fall and winter. In total, \$2,841 was raised which was more than enough to build a house and provide a bed and furnishings for a family. The additional money provided desperately needed children's and pre-natal vitamins.

That help was well deserved. Of the 14 million people who live in Guatemala, more than one million are refugees who live in desperate conditions.

"It is life altering," remarked a humble Dr. Randell. "You'll never look at life quite the same once you've been part of something this meaningful."



The original home in Guatemala



The new 'C-CORE' home

Just as Dr. Randell had been inspired, the group at C-CORE was inspired by him. The money raised was delivered in 2008 by Dr. Randell and his wife who then helped build the home in the name of C-CORE for a grateful family. What's amazing about the circle of kindness is it continues and gets larger. When bags are packed with supplies for the missionary, homemade quilts and newborn cradle caps made at local senior's homes and by other supporters are brought. At least five churches from the province have joined mission teams, often going on to lead missions in future years. The need is greater than supply, but people are excited to feel a connection and make a difference. This is about life and hope.

If anyone wishes to be involved or learn more about the many ways in which you can make a difference, you can get in touch with Dr. Randell or visit www.armsofjesus.org/frameset.htm. More than 90 per cent of funds actually go to the people in Guatemala with a focus on sustainable food, health, education and hope.

"The goal is to give a hand up, not a hand out," said Dr. Randell. "Like Habitat for Humanity, the family is involved in the build and is so grateful. Honestly, I get far more back than I give. The children capture your heart and you want to keep doing more to help. There is hope in Guatemala. It will take time and money but there is hope. I am so proud of the employees of C-CORE who came together to build a house and a future for this family."

Note, this year C-CORE staff will be raising money for the Children's Wish Foundation of Canada

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