

**Contact us to learn more about  
NSCC Applied Research**

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# Results




Applied Knowledge.  
Innovative Research.  
Proven Results.

**nscc**

[nsc.ca/appliedresearch](http://nsc.ca/appliedresearch)

**nscc**

Nova Scotia Community College  
Canada



In everything we do, our central focus is to build Nova Scotia's economy and quality of life through education and innovation.

## Responsive & Innovative

Working in collaboration with industry partners, academia, communities, researchers and faculty experts, NSCC brings resources, knowledge and skills needed to develop practical solutions for real-world applications.

The Industry Liaison Office facilitates partnerships between industry and researchers for the development of new and improved technologies that have commercial applications. We value the opportunity to bring unique learning to our students and the ability to partner with organizations to apply our knowledge and skills to research that is challenging, innovative and delivers practical solutions.

Building on our world-renowned reputation in geomatics, NSCC has advanced applied research in the areas of:

- > Environmental Sciences
- > Resource Management
- > Renewable Energy
- > Mechanical, Electrical and Electronic Technology
- > Robotics
- > Aerospace
- > Health & Human Services
- > Information and Communications Technology
- > The Built Environment – building technologies and green construction

In everything we do, our central focus is to build Nova Scotia's economy and quality of life through education and innovation. This focus makes NSCC a valued applied research partner. Our goal is to advance applied research and business innovation in areas that respond, and have direct relevance, to defined industry needs. With campuses located across the province, 100+ academic programs, and a talented team of faculty with unique experience and skills sets, we can bring a broad range of facilities and capabilities to collaborative partners in all sectors.

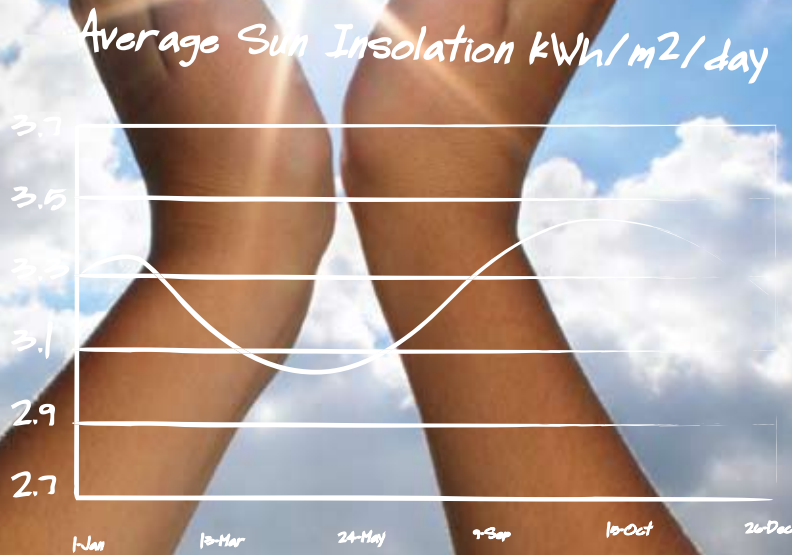
## Creating Applied Solutions

Some of our projects include:

- the prototype development of a MRI compatible incubator for premature babies
- the creation of a prosthetic ankle for an amputee diver
- flood-risk assessments for coastal communities due to storm surges and rising sea-levels associated with climate change
- examination of the influence of tree structure on apple productivity

## Mapping the Solar Future

Research scientists at NSCC and Green Power Labs Inc. have been using data collected from satellite weather map images to assess the available solar radiation, and ultimately the potential for solar energy in our region.



“Using solar assessment tools, people can see for themselves the many advantages of using solar energy.”

**Alexandre Pavlovski**  
President and CEO of Green Power Labs

NSCC's Applied Geomatics Research Group (AGRG) is working with Green Power Labs Inc., a Dartmouth-based solar energy assessment and consulting company, to provide detailed information to individual home owners, businesses, or power utilities who are interested in solar power. “Most people agree that solar energy is a good idea,” says Alexandre Pavlovski, President and CEO of Green Power Labs. “The challenge is how to turn that into thinking solar energy is a smart investment. Using solar assessment tools, this knowledge gap is addressed and people can see for themselves the advantages of solar energy.”

The collaboration between NSCC and Green Power Labs extracts very specific information from the satellite images. “In any area, there are obviously better locations for the extraction of solar energy than others,” says David Colville, an AGRG research scientist based at the Centre of Geographic Sciences in the Annapolis Valley. “This software allows us to build up a climatology of the area we’re interested in, based on a long term mapping of cloud cover in that region.”

The outcome is a high-resolution solar radiation map predicting how much solar energy a specific site could expect to obtain and use. One of these maps recently resulted in a client of Green Power Labs being awarded a large contract by the Ontario Power Authority to build a 10-megawatt solar power station.

# Engineering Medical Devices

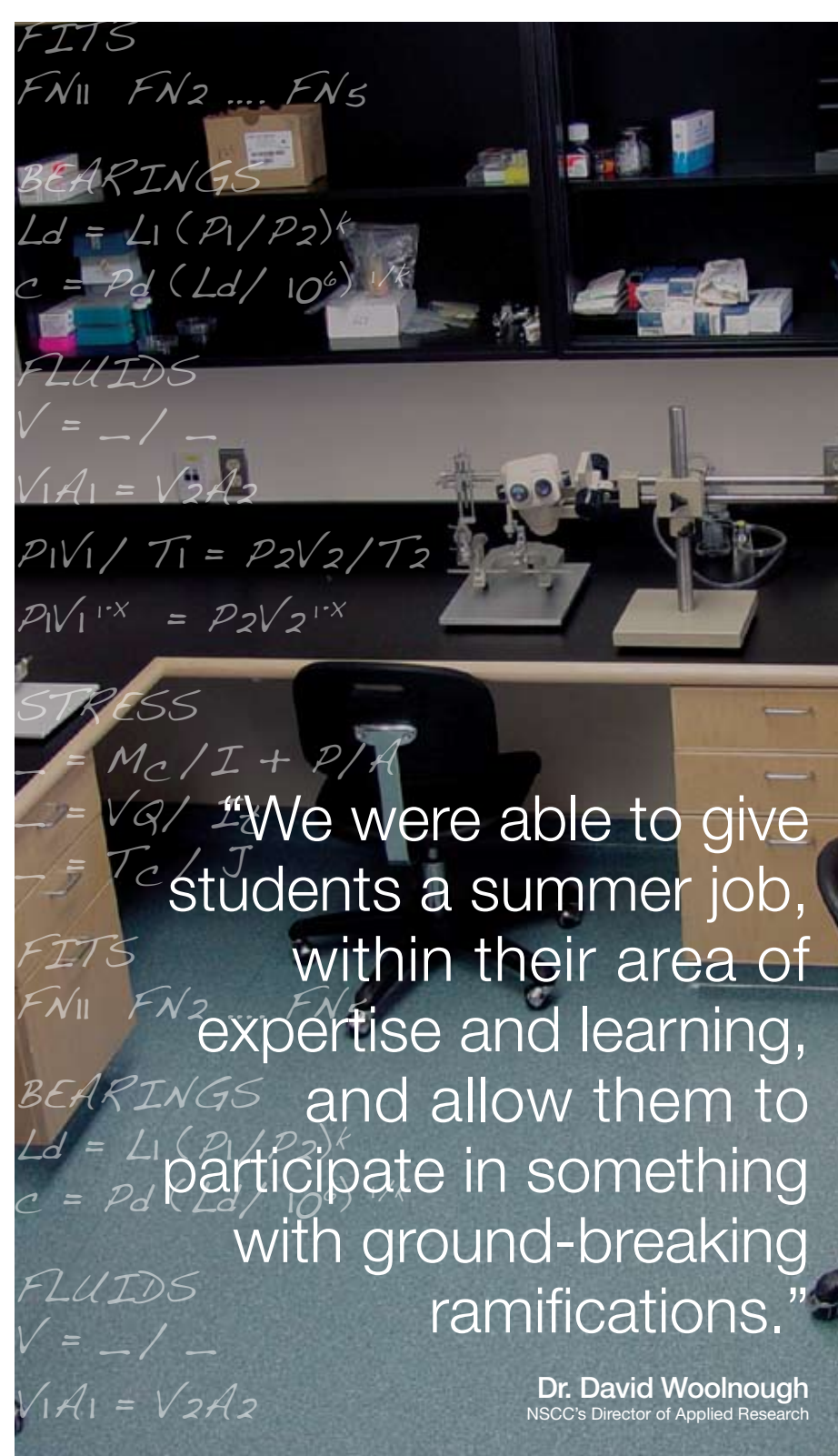
When the Brain Repair Centre (BRC) in Halifax needed to re-design their apparatus for injecting stem cells into the brain, they came to NSCC. The goal was to make the injector smaller, lighter, and easier to operate.

Two of the students hired – Peter Allan and Michael Doyle – were studying Mechanical Engineering Technology, and the third, David Grant, was in the Electrical Engineering Technology program. All three had just completed their first year at NSCC before spending their summer building a better prototype for testing.

The BRC, under the leadership of world-renowned researcher and physician Dr. Ivar Mendez, is pioneering innovative solutions for diseases and injuries of the brain and spinal cord. The specialized piece of equipment that NSCC students worked on, and NSCC faculty Dan Bolivar, David Taylor and Academic Chair Abid Ahmad completed, was delivered to the BRC in the summer of 2007.

As Ron Hill, the Technology Coordinator at the BRC, says – “the clinical trials for their initial prototype of the device have been very successful”. Hill, an NSCC graduate, was the direct liaison between the BRC and NSCC and was supportive of the partnership. “It allowed students to see what happens in the real world.”

For NSCC, it was a win-win. “We were able to give students a summer job, within their area of expertise and learning, and allow them to participate in something with ground-breaking ramifications,” says Dr. David Woolnough, NSCC’s Director of Applied Research. “It’s a classic case of linking college skills with industry needs and it works very well.”



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NSCC's Director of Applied Research

## Coastal Solutions

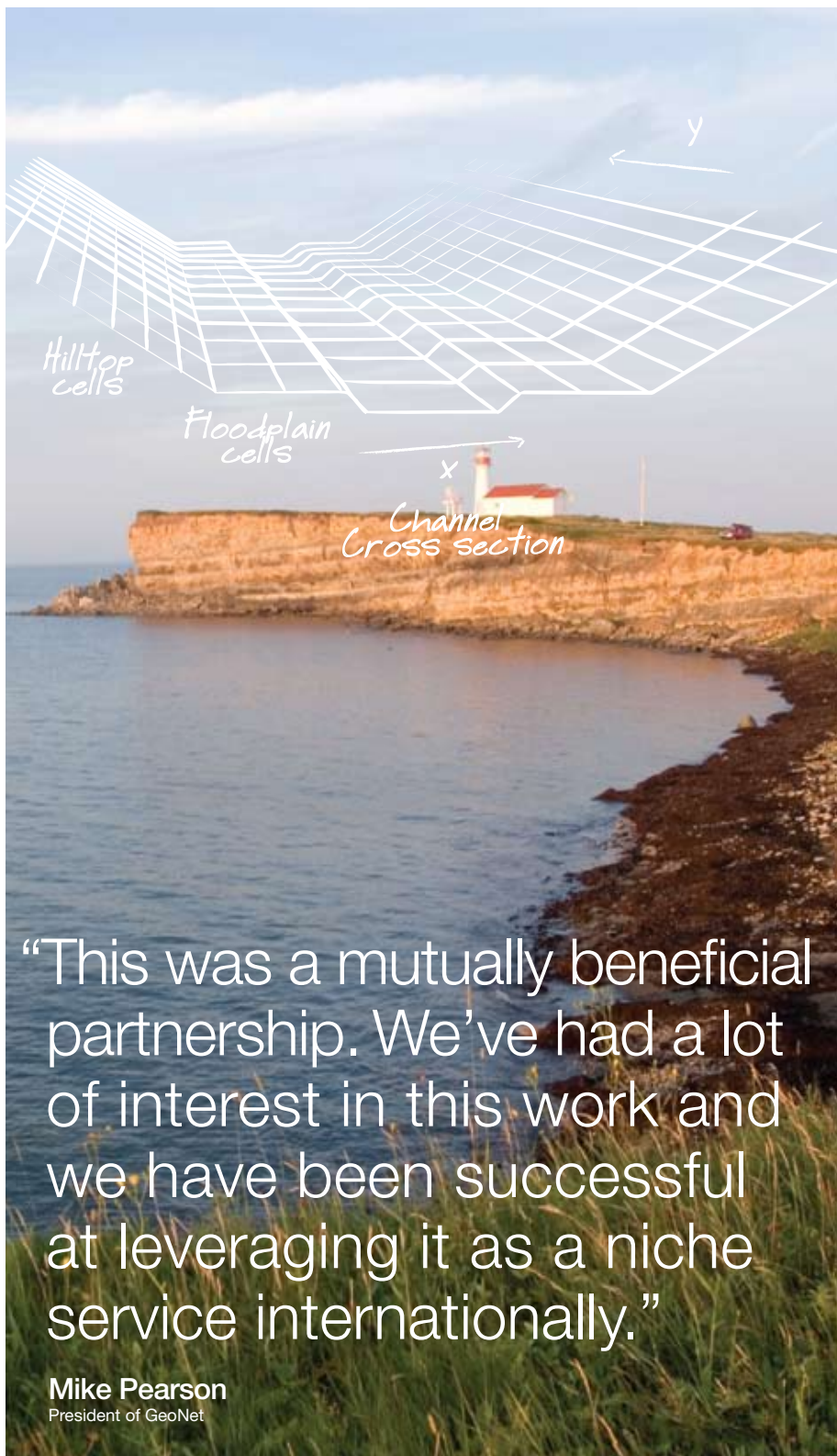
Despite the threat of coastal flooding, coastlines all over the world are becoming more developed and populated. As sea levels continue to rise with climate change, the threat of coastal flooding from storm surges is expected to become worse in the future.

To help communities mitigate the risks and assess the threats of rising coastal water, NSCC's Applied Geomatics Research Group (AGRG) along with private sector partners, GeoNet Technologies Inc and CARIS, secured funding through a grant from ACOA's Atlantic Innovation Fund to develop a Coastal Zone Decision Support System.

"The combination of Geomatics tools, such as high-resolution LiDAR elevation models for coastal flood inundation and a new software tool that estimates the associated risk, allows coastal communities to better plan for the future," says Tim Webster, AGRG Research Scientist.

AGRG used Light Detection and Ranging (LiDAR) to build digital elevation models (DEM) of the terrestrial coastal regions and produced flood inundation maps associated with high water levels from storm surges and long term sea-level rise. In addition, Roger Mosher, a Research Scientist with AGRG, developed a new software tool, the "Water Modeler", to determine the risk associated with higher coastal water levels from storm surge events and long term sea-level rise. This new software has been applied in two case studies in Nova Scotia and has been demonstrated in the Caribbean by GeoNet Technologies.

"This was a mutually beneficial partnership," says Mike Pearson, President of GeoNet. "We've had a lot of interest in this work and we have been successful at leveraging it as a niche service internationally," he adds.



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**Mike Pearson**  
President of GeoNet

## NSCC Facilities & Capabilities

Below is a sample of what we can offer our applied research partners

### Health & Human Services

#### FACILITIES

Dental Clinic  
Early Childhood Support Centres  
Medical Technology Laboratory  
Pharmacy Technology Lab  
Practical Nursing &  
Continuing Care Laboratories

#### CAPABILITIES

Early Childhood Years  
Aging Populations and  
Assistive Technologies  
Learning Methodologies  
Reflecting Cultural Diversity  
Life Course Transitions for  
Persons with Disabilities  
Addiction Counselling  
Mental Health Strategies

### Geomatics & Environmental Sciences

#### FACILITIES

Environmental  
Instrumentation Network  
LiDAR (Light Detection and Ranging)  
- Airborne and ground-based  
GPS surveying, Remote Sensing  
and GIS technologies  
Greenhouses

#### CAPABILITIES

Business Geographics  
Geographic Information Systems  
GPS Surveying and Data Collection  
Horticulture, Green Roof & Biowalls  
Land use planning  
Mapping  
Marine Geomatics  
Remote Sensing & Photogrammetry

### Information & Computer Technology

#### FACILITIES

Wide Area Network Simulation  
Enterprise Network Simulation  
High reliability and virtualized  
computer systems  
Multiple Operating Systems

#### CAPABILITIES

Computer programming  
Computer System Virtualization  
Data Acquisition Systems

Data Communications Systems  
Data, Network and Systems  
encryption and security  
Database Management & Design  
Internet enabled data presentation  
and retrieval  
Software Engineering  
Systems Management & Design

### Technology & Engineering

#### FACILITIES

Programmable Logic Controller  
(PLC) Lab  
Motors & Controls Shop  
Soldering & Fabrication Shop  
Advanced Electronics Lab  
Residential & Industrial Electrical Shop  
Computer Aided Design (CAD) Labs  
Advanced Manufacturing Shop  
(CNC turning and milling  
centres and CMM capability)  
Mechanical Engineering Lab  
Conventional Machine Shop

#### CAPABILITIES

Engineering (Civil, Electrical,  
Electronics, Mechanical)  
Computer Aided Design (CAD)  
Manufacturing & Machining  
(Computer Numerical Control  
(CNC), Conventional)  
Data Communications Systems  
Machine Design (including prototyping)  
Process Engineering  
Quality Assurance & Management

### Marine Technologies

#### FACILITIES

Nautical Institute  
(Transport Canada approved)  
School of Fisheries  
Full-Mission bridge simulation facilities  
Fully enclosed wave-training pool  
Dockside survival craft facility  
Propulsion Plant Simulation  
Maritime Communication Simulation

#### CAPABILITIES

Safety, Firefighting & Survival Training  
Crisis Management & Security  
Navigation  
Naval Architecture  
Chartwork and Pilotage



“The opportunity to work on this project was phenomenal. It has a strong connection to real life, and it’s inspiring to know what we’re doing could help save lives.”

**Rob Agombar**

Student Researcher, MRI Compatible Neonatal Incubator Project