

# College of the North Atlantic Office of Applied Research

## Strategic Research Plan

### Introduction:

College of the North Atlantic (CNA) is one of the largest post-secondary educational and skills training centers in Canada. The College has seventeen campuses and twelve learning centers located throughout Newfoundland and Labrador, and one international campus in the Middle East State of Qatar. The college also serves over five hundred students in China through cooperative arrangements with Chinese universities. Operating on an annual budget of approximately \$90 million, College of the North Atlantic serves more than 10,000 full-time students and employs up to 1,300 staff at peak periods.

As an outstanding performer in quality teaching, research and innovation, the College enjoys a significant size of intellectual apparatus, state-of-the-art infrastructure, a substantial inventory of equipment and the most modern communication network. With all these resources, the College is well positioned to contribute to the economic prosperity of the community. The institution takes pride in measuring itself against the highest national and international standards in post-secondary instruction, applied research and innovation.

In 1999, The College of the North Atlantic was given a mandate from its Board of Governors to engage in applied research and innovation along with its on-going mission of post secondary instruction and training. The new mandate extended the College's role from a teaching-only institution to a teaching-and-research institution. After few years of planning and preparation, the Office of Applied Research (OAR) was established in 2004. The Office was assigned the role of strengthening the institution's capacity as a key player in the community and regional innovation. By leading the pan-provincial College Research and Innovation Network, the Office serves the industry and community needs through a number of coordinated activities including; generation of new knowledge, clustering and partnerships, research grants management, intellectual property and technology transfer. The Network is supported by the strategic inclusion of public and private partners, individuals and groups, technology industries, regional universities, colleges, research laboratories, etc. Partnerships with national entities such as NRC, IRAP, Industry Canada, HRDC, NSERC, ACOA etc., is an important element of the College's applied research and innovation planning.

The College plans to promote research and innovation culture within the system where researchers would be able to create new knowledge as well as innovative products and services. Industry and government Liaisons have been created to increase the number of strategic partnerships. These initiatives strengthen our ability to transfer technology to society. Researchers are provided support in the technology transfer process through strategic inclusion of option such as; market research, incubation of technologies, patenting, licensing, etc. The College is committed to integrating research and innovation and to moving research discoveries into the community. The Office of Applied Research plays a major role in facilitating transfer of research results and in evaluating the broader societal contributions of our research efforts. The research mission of the College encompasses a number of broad themes; (i) to foster the spirit of creativity among its faculty, students and staff, (ii) to engage in a meaningful applied research and innovation activity and (iii) to transfer the benefits of innovation to the community.

**Key Objectives of the College's Strategic Research Plan are:**

- Build on our existing and emerging strengths, to achieve excellence in selected applied research areas
- Seize new opportunities to enhance innovation potential of the Institution.
- Help achieve integration of research and teaching to improve instructional and training component
- Promote inter-disciplinary applied research as key to the success of innovation planning
- Protect our investment in areas of strategic importance
- Recruit and retain excellent faculty whose efforts are a key to our long-term strategic plans
- Capitalize on the diverse range of funding opportunities and partnerships, to realize integrated capital, infrastructure and faculty renewal objectives;
- Develop the capacity for effective knowledge transfer to maximize the benefit of research to society

**Research Strategy:**

College's outstanding strengths have demonstrably achieved recognition for excellence among its peers. With the majority of programs operating under highest quality standards as laid out in their accreditations with national certification agencies, the College enjoys a widespread and sustained distinction among the national counterparts. Nodes of research and development are present throughout the College in program areas generally represented in the Academic Schools.

The research strategy of the college focuses on fostering areas of existing and emerging strengths, and to undertake a range of investigative and scholarship activity in support of its educational goals. The elements of the College's research strategy are; its academic strengths, community needs, resources and priorities. The disciplines identified in the College's research strategy come from the major programs offered, coupled with areas for existing and potential industrial/community partnerships.

**Current, Emerging and Targeted Research Strengths**

Our research strengths are grouped into six priority areas as outlined below:

- (i) Leading innovation in engineering disciplines, particularly in; electrical, mechanical, manufacturing, petroleum and industrial technologies.
- (ii) Creating new products and services in the information technology, particularly in; digital animation, simulation, etc.
- (iii) Exploring innovative applications in communication technology
- (iv) Advancing optimal utilization and management of Natural Resources
- (v) Develop technologies to deal with current issues in environmental sciences
- (vi) Exploring interdisciplinary innovations in natural, biological and health sciences.

## **Engineering Technologies**

The College's potential for innovation in engineering disciplines are based upon the strong foundation of faculty and infrastructure related to broad range of engineering technology programming across the college system, particularly at Ridge Road and Prince Philip Campuses. An exciting field for applied research relates to the integration of network management, database management and instrumentation.

## **Manufacturing Centre**

College of the North Atlantic's Manufacturing Technology Centre (MTC) is a cooperative venture between the College, the Alliance of Manufacturers and Exporters, and Memorial University of Newfoundland. The MTC allows Newfoundland and Labrador's manufacturers and entrepreneurs access to the combined technological and research capabilities of the province's public post-secondary education centre. MTC also provides hands-on access to a suite of advanced technologies with the ability to quickly generate complex geometric models of product concepts – a critical factor in reducing product development time, minimizing associated costs, and shortening the lead-time to market. More than 50 industrial assistance projects have been undertaken through the centre. The establishment of an Office of Applied Research has the potential to greatly amplify the impact of the Centre through addressing human resource deployment issues i.e., faculty secondments on industrial projects.

## **Aircraft Maintenance**

The Avionics and Aircraft Maintenance Centre located at the College campus in Gander offers programming that directly addresses the deepening skills shortage in the aircraft industry. Faculty in the centre are working with industrial partners such as CAE Electronics and Bombardier in research related to both technical issues and training, and can directly benefit from the support of an Office of Applied Research.

## **Petroleum Technology**

The College's Petroleum Specialty Centre at the Seal Cove campus maintains state-of-the-art equipment and skills related to petroleum production, well control, fluid hydraulics and industrial instrumentation and generates approximately a million dollars annually in contract training revenues. A strong opportunity for applied research relates to network-based "remote" control of petroleum production-related instrumentation and this crosses over to other areas of strength in the college, e.g. engineering technologies. This strength is the basis of the PAWS (Petroleum Application of Wireless Systems) project funded by the Atlantic Innovation Fund in collaboration with the University of Cape Breton and the University of New Brunswick.

Electrical Technology: A strong electrical engineering technology program, offers significant potential to lead innovative solutions to alternate energy challenges including; ocean wave, wind energy, hydrogen, and fuel cells. The College fosters ambitious plans in moving quickly in these areas and to offer viable solutions to current environmental challenges.

## **Information Technology**

The College offers extensive programming and specialized training in the area of information technology, including industrial partnership and training with provincial and national telecommunication industries. Two areas of activity are particularly strong with respect to applied research activities and opportunities: Distributed Learning and Digital Animation.

Converged Network Services Lab is a modern instructional and research facility situated at the Ridge Road Campus in St. John's. The facility is equipped with state-of-the-art equipment and

plays a key role in building innovative products processes, designs and services. This is an important component of the Colleges research strategy.

### **Distributed Learning**

Based on the College's Distributed Learning Centre in Clarenville, the Distributed Learning Service (DLS) is a vital component of the College. DLS enrolment continues to grow at an impressive rate. Students from more than 250 Newfoundland and Labrador communities (and from every other Canadian province and the world) are becoming active participants in the distance learning with the College. Internet-mediated and Web-based instruction is used to provide access to a growing number of College programs and services. There are currently more than 200 credit and non-credit courses and programs available for study on-line. As part of this service, the College's pan-provincial Distributed Learning Centre works with the public and private sector to nurture technology-enabled learning and develop courseware for local and international markets and clients.

CNA's "@College Distributed Learning Centre" is a Certified WebCT Institute – one of only six in Canada - and its courses have been recognized with the WebCT Exemplary Course Award. Collaboration with external agencies such as the National Research Council and CANARIE is ongoing.

### **Digital Animation**

Digital animation is a rapidly growing field with applications in areas ranging from entertainment to modeling, education, health, engineering, environment, etc. At the Digital Animation Center at the Stephenville Campus, the College offers a modern instruction and research program, with strong linkages to industrial partners (such as Silicon Graphics and Alias). Several local businesses have been started by graduates of the Center. Graduates are employed nationally and internationally. A strong applied research opportunity related to simulation in the area of equipment operator training (e.g. forest harvesters) is currently under development and spans College expertise in the natural resource sector.

### **Natural Resources**

The College's capabilities in the general area of natural resources are based upon skills and infrastructure developed in support of programming outlined above, and an ongoing relationship with industry. A complete overview is beyond the scope of this document, but highlighted opportunities include: Geomatics, Geospatial, Forestry Harvesting Simulation Training , Petroleum Production, Agrifoods and Mining.

### **Geomatics and Forestry**

Geospatial Research Centre: An example of the College's teaching and research capacity is the Geospatial Research Facility located at Corner Brook campus. This initiative is an innovative undertaking intended to expand the present research and innovation capacity in the terrestrial resource sectors within Atlantic Canada. The geospatial research facility model enables multi-agency, multi-disciplinary collaboration to seek solutions to challenges facing the terrestrial resource sectors in the region. Research themes supported under this project include: biodiversity assessment and modeling, 3D visualization of terrestrial environments, landscape-level spatial forest modeling, spatial data management and communications, and sub-surface mapping, and modeling and visualization.

New applied research opportunities in forestry include the secondary processing of Labrador black spruce and further involvement in the Model Forest.

## **Mining**

The College maintains the Mining Centre in Labrador West, which reflects an ongoing industrial partnership with the Iron Ore Company of Canada, and an important component of potential collaboration with Voisey's Bay Nickel Company.

### **Interdisciplinary Research:**

The college recognizes the value and uniqueness of its intellectual apparatus. A highly qualified faculty with diversified skills and qualifications is a valuable resource that needs to play its full role in the College's innovation agenda. In addition to above disciplines, faculty's interests in interdisciplinary areas, on novel projects of significant commercialization potential will be encouraged and supported by the College. An excellent example of interdisciplinary research is \$4.8 million project "wave Powered Pumping of Seawater for On-Shore Use and Electrical Generation", at the Burin Campus. The project bridges several scientific disciplines such as; mechanical engineering, marine technology, biology, fisheries, electrical engineering, etc.

### **New initiatives:**

Some areas are beginning to emerge as unique research strengths and have been targeted as sectors for development and growth in the next few years, particularly due to the availability of faculty skills and the potential benefit to the provincial and national economies. The institution will play its role as an innovator to disseminate new and/or state-of-the-art technologies, focusing on economic prosperity of the community.

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