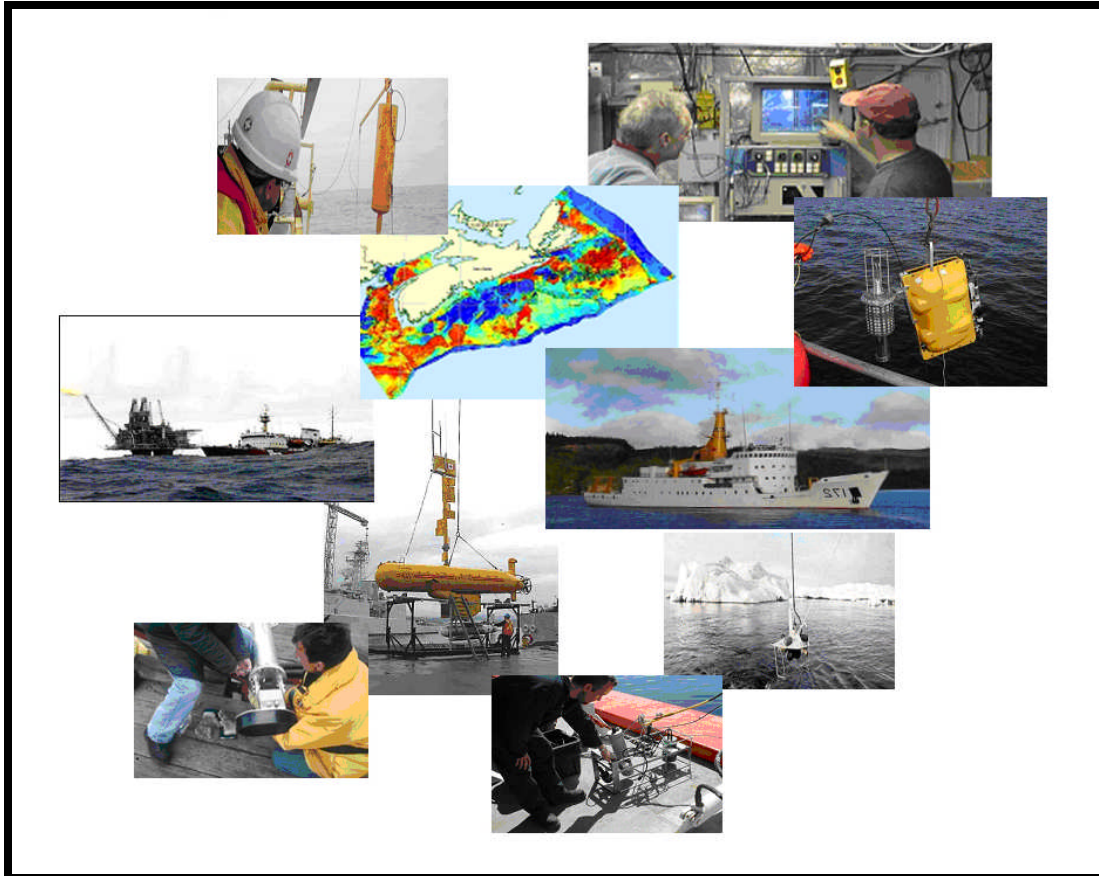


THE OCEAN TECHNOLOGY SECTOR IN ATLANTIC CANADA

Volume 2: Potential Public Sector Demand



Submitted to the
Atlantic Canada Opportunities Agency

Prepared by the
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Note: **The Ocean Technology Sector in Atlantic Canada – Volume 1: Profile and Impact**, the companion to this volume, details the economic importance of the industry in the region and its principal markets.

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THE OCEAN TECHNOLOGY SECTOR IN ATLANTIC CANADA

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EXECUTIVE SUMMARY

This study provides the ocean technology industry in Atlantic Canada, in particular the Small and Medium-sized Enterprises (SMEs)¹, with strategic information on **potential public sector demand for ocean technologies in federal departments of Canada**. It also offers guidance to companies in building business opportunities based on the anticipated ocean technology requirements of federal departments. It identifies the relevant federal departments, key contacts and sources of information, and potential business and collaborative opportunities.

There are numerous sources of information which can guide the private sector with regard to procurement by federal departments. These include: journals, websites, workshops and conferences, industry days, associations, and personnel, etc. Of major importance are:

- The annual **Procurement Outlook Conferences** involve all relevant government departments and are coordinated by PWGSC. The presentations of the 2005 Conference held in Gatineau on 26-27 April are available on CD from PWGSC (Bill Jamer – see page 13) and include presentations by PWGSC, CCG, DND, RCMP and Industry Canada.
- **MERX** is the most complete source of public tenders, private tenders and private-sector construction available in Canada. Businesses of any size can have easy and affordable access to billions of dollars in contracting opportunities with the federal government, participating provincial and municipal governments and the private sector. MERX is a subsidiary of Mediagrif Interactive Technologies Inc. - <http://www.merx.com>.

¹ See Appendix D on page 71 for a list of acronyms.

- **Jane's Defence Weekly** is published by the Jane's Information Group, a world-leading provider of intelligence and analysis on national and international defence, security and risk developments - <http://www.janes.com>.

- **One-day workshops** organized by Defence Research and Development Canada (DRDC) Atlantic twice yearly on the east coast to brief the private sector re DRDC operations and interests. The meetings are open to all interested companies. **Informal liaison** also takes place via two groups which meet on a regular basis in Atlantic Canada. **Group #1** is coordinated by AMIRIX Systems Inc. and **Group #2** is coordinated by Brooke Ocean Technologies. These informal meetings are held monthly or bi-monthly. Companies wishing to participate should contact the DRDC Business Development Office at atl.bdo@drdc-rddc.gc.ca.

- **Industry Days** are organized by Industry Canada to ensure that small industries have access to prime contractors (usually shipyards), in the case of the Mid-Shore Patrol Vessel (MSPV) and Offshore Science Fisheries Vessels (OSFV) Projects. For the offshore and mid-shore projects, Industry Days are planned for the Pacific Coast, Atlantic Coast and Québec. Companies can promote themselves by providing product information to the CCG, beyond that made available at Industry Days.

- The **Government Electronic Directory Services (GEDS)** - <http://direct.srv.gc.ca> - is a directory of federal public servants for all regions across Canada. GEDS includes names, titles, telephone and fax numbers, departmental names, office locations and position titles within the governmental structure. It also includes the email address for some employees. *Note:* It is the policy of some departments not to list all their employees.

The matrix on page 7 provides a summary of the major federal departments and agencies procuring ocean technologies, including the primary technology focus, major projects and budgets, the senior contact and outreach activities.

With respect to recommendations:

- Because of the myriad of information sources and events, the process of identifying procurement plans, both short and long-term, for ocean technology products and services is complex and time-consuming. For Atlantic Canadian companies, this process could be made significantly more efficient and cost-effective if **a sector association, with the support of ACOA, undertook to organize regular information sessions specifically focused on the ocean technology sector and the procurement opportunities** provided by the federal government departments involved in this sector.
- **Fundamental to major procurements is the central role of PWGSC.** The Director of the Marine Systems Directorate will meet with individual SMEs at their location in Atlantic Canada to ensure that procurement plans and processes are fully understood and that private sector products and capabilities are similarly understood by PWGSC.
- Departmental contacts interviewed by the authors all expressed their willingness to communicate with private sector personnel and brief them on their respective departmental partnership opportunities and procurement plans, however dependent these plans might be on the current 'political climate'. **Face-to-face contact between private sector personnel and the departmental contacts** is strongly recommended.
- Ocean technology companies, particularly those lacking R&D capacity, should **explore the opportunities provided by Defence Research and Development Canada (DRDC) Atlantic** to work with companies in research, field operations, consulting services, technology partnerships and licensing.

- The **Atlantic Science Forum Steering Committee within the Atlantic Federal Council** should be tasked with fostering inter-departmental collaboration with regard to ocean technology requirements and procurement.
- The expertise and facilities that reside at BIO should be further enhanced by the **establishment of a Marine Equipment and Technology Centre**. This Centre should be supported and funded by the relevant departments and agencies of government. It should have a clear mandate to promote interdepartmental, private sector and academic partnerships/collaboration and to facilitate the commercialization of Ocean Technology products and services by the private sector.
- To maximize the collection of coastal and marine data and to optimize valuable ship time, the **installation of shipboard monitoring equipment should be encouraged on vessels not normally associated with this task**, e.g., ferries, fishing craft and cargo vessels. This would also result in increased demand for the appropriate ocean technologies.
- The **industrial liaison and innovation offices** in Atlantic Canadian universities offer opportunities for the private sector to partner with both academia and the public sector in the furtherance of ocean technology development and sales.
- The **Government can further assist the private sector** with regard to procurement by:
 - Realizing greater transparency across the country in terms of procurement and partnership opportunities and departmental business plans.
 - Implementing long range procurement plans
 - Integrating the development of ocean technologies with procurement assurance
 - Maintaining some departmental in-house expertise to provide quality control.

- Ocean technology companies should become **active members in sector associations, clusters, partnerships and networks** which offer relevant information, business and partnering opportunities. These include:
 - Aerospace and Defence Industries Association of Nova Scotia (ADIANS) - <http://www.adians.ca>
 - Canadian Centre for Marine Communications (CCMC) - <http://www.ccmc.nf.ca>
 - Marine Technology Society (MTS) - <http://www.mtsociety.org>
 - Newfoundland and Labrador Association of Technology Industries (NATI) - <http://www.nati.net>
 - Newfoundland Ocean Industries Association (NOIA) - <http://www.noianet.com>
 - Nova Scotia Ocean Technology Council. For information concerning this organization, contact Jim King - jking@cfncon.com.
 - Ocean Science and Technology Partnership (OSTP). For information concerning this new organization, contact Paul Lacroix - paul.lacroix@shaw.ca
 - Oceans Advance - <http://www.oceansadvance.net>
 - Offshore/Onshore Technologies Association of Nova Scotia (OTANS) - <http://www.otans.com>.

SUMMARY MATRIX: MAJOR DEPARTMENTS/AGENCIES PROCURING OCEAN TECHNOLOGIES

Dept / Agency	Primary Technology Focus	Major Projects and Budget	Senior Contact	Major Outreach Activities
PWGSC	Procurement for all federal departments		Bill Jamer - page 13	Procurement Outlook Conference and MERX
DND	Security	12 Single Class Surface Combatants: \$18 B over 18 years 3 Joint Support Ships: \$2.1 B	Cmdre Richard Greenwood – page 19	Procurement Outlook Conference, Jane's Defence Weekly
DRDC Atlantic	Research and development re security	\$15 M per year for procurement/partnerships Access to: Applied Research Program - \$10 M and Technology Demonstration Funding ~\$20 M	Dr. Ross Graham – page 23	One-day Workshops and Informal Liaison Groups
CCG	Maritime safety and scientific support	National: \$400M - 1 st phase of recapitalization for 2 science trawlers and 8 multi-taskable mid-shore patrol vessels Atlantic Region: \$20 M per year for capital items	David Faulkner – page 28	Procurement Outlook Conference and Industry Days
DFO Science	Science in support of resource management	5 year capital plan identifies prioritized list of ocean technology requirements	Dr. Michael Sinclair, Maritimes – page 38 Julian Goodyear, NL – page 39 Dr. Michael Chadwick, Gulf – page 41	Innovation Office at BIO
CHS Atlantic	Hydrography	\$69 M over 10 years for mapping in support of Canada's extended claim re UNCLOS	Richard MacDougall – page 43	Innovation Office at BIO
GSC	Geoscientific information and research	O&M budget: \$3 M Capital budget: \$500-750 K O&M budget for Geoscience for Ocean Management (GOM): \$2 M Ocean Seafloor Mapping: \$4 M over 18 months	Dr. Jacob Verhoef – page 47 Dr. Dick Pickrill, GOM – page 52	Earth Science Sector Industry Liaison Office at BIO and public workshops
IC	Foster knowledge-based economy		Geoff Lewis – page 54	Industry Days

CHAPTER 1

INTRODUCTION

A proposal was submitted for funding under the Atlantic Canada Opportunities Agency (ACOA) Atlantic Policy Research Initiative in October 2004 by Canmac Economics and the ACZISC to carry out a **Study on the Economic Impact of the Ocean Technology Industry in Atlantic Canada and Potential Public Sector Demand for Ocean Technologies in Canada**. The proposal was approved in December 2004. The Terms of Reference are included in Appendix A. Within ACOA, the ocean technology file resides primarily within the St. John's, NL Office (contacts: Paul Mills, Vice-President, Newfoundland and Labrador and Don Hogan, Senior Regional Advocacy Officer, tel 709-772-2954, email don.hogan@acoa-apeca.gc.ca) and in Ottawa within the Advocacy and Industrial Benefits Branch (contact: Craig Rowsell, Director General, tel 613-954-0437, email crowsell@acoa-apeca.gc.ca). Furthermore, an ACOA ocean technology working group includes representation from each of the Agency's main offices.

The Atlantic Canada Opportunities Agency (ACOA) is a federal government agency headquartered in Moncton, New Brunswick. ACOA's goal is to improve the economy of Atlantic Canada through the successful development of business and job opportunities. ACOA offers a broad range of programs and services to ensure that a wide variety of business development tools and resources are available to Atlantic entrepreneurs throughout all stages of the business lifecycle. See <http://www.acoa-apeca.gc.ca>.

The Study on the Ocean Technology Industry has two components: one section (Volume 1), carried out by Canmac Economics, deals with the economic importance of the industry in the region and its principal markets; the second section (Volume 2) covered by this report was carried out by the ACZISC Association and focuses on business opportunities with the federal government and procurements by individual departments and agencies.

According to Volume 1 of this study, the Atlantic Canadian ocean technology sector, generally defined as any firm engaged in the delivery or creation of technology for marine applications (goods and/or services), consists of 137 identified firms. The range of products offered by this sector can generally be summarized as acoustic systems and equipment, defence systems and equipment, imaging systems and equipment, instrumentation and information systems, marine communications, navigation, platforms and vehicles as well as a wide variety of services.

The importance of the ocean technology sector to Atlantic Canada is clearly documented in Volume 1. The annual sales are estimated to be \$329.2 million. The sector directly creates an estimated 2,268 person years of employment resulting in over \$84.5 million of household income on an annual basis. This direct sector activity contributes \$152.8 million to the regions' gross domestic product (output). The sector's estimated indirect and induced (spinoff) economic activity is responsible for close to 5,298 person years of employment, \$201.8 million of household (labour) income and \$280.9 million of GDP on an annual basis.

According to Volume 1, the sales of ocean technology to the business sector represent close to 70% of all sales to end users, followed by sales to government at 21.2%. However, governments ultimately consume a higher percentage of ocean technology output because a significant portion of sales to businesses are component sales to other ocean technology firms. These components form part of a finished product (intermediate demand) which will ultimately be consumed by government (final demand). The importance of public sector markets for the ocean technology industry in Atlantic Canada is made more significant by their potential as 'springboards' into other markets, both national and international.

The government departments and agencies considered in Volume 2 of this study are those that have a major impact on the ocean technology sector in Atlantic Canada via procurement, advocacy and networking.

Public Works and Government Services Canada (PWGSC) is reviewed first because of its procurement mandate for the Federal Government as a whole. The other departments and agencies are considered in terms of the portion of their budgets devoted to the procurement of ocean technologies and/or their capacity to partner with the private sector and others: National Defence (DND); Defence Research and Development Canada (DRDC); Canadian Coast Guard (CCG); Fisheries and Oceans Canada (DFO) - Science; Canadian Hydrographic Service (CHS); and the Geological Survey of Canada (GSC). Industry Canada (IC) is included because of its mandate to foster the growth of industry.

In the foreseeable future the Government's Security agenda will inevitably dominate procurements in the ocean technology sector. Shipbuilding, from the perspective of hull construction, is not the focus of this study. However, because of the security agenda and the planned construction of numerous vessels, it will be a **major catalyst for the ocean technology sector**. Shipbuilding will lead to a significant demand for ocean technologies and services, including **oceanographic and electronic equipment, application tools, environmental and control instrumentation and tools, 'sophisticated' paints, composite materials and ceramics**, etc.

Other important drivers include:

- the **Oceans Act** (1996) - <http://laws.justice.gc.ca/en/O-2.4/>
- the **Marine and Ocean Industry Technology Roadmap** (2003) – http://route.nrc-cnrc.gc.ca/ocean/trm/home_e.cfm
- the **Oceans Strategy** (2002) - http://www.cos-soc.gc.ca/doc/publications_e.asp
- most recently the **Oceans Action Plan** (October 2004) – http://www.dfo-mpo.gc.ca/canwaters-eauxcan/oap-pao/index_e.asp.

1.1 CANADA'S OCEANS ACTION PLAN

In the October, 2004 Speech from the Throne the Canadian government committed...
“to move forward on its Oceans Action Plan by maximizing the use and development of oceans technology, establishing a network of marine protected areas, implementing

integrated management plans, and enhancing the enforcement of rules governing oceans and fisheries, including rules governing straddling stocks.”

The Oceans Action Plan articulates a government-wide approach which rests on four inter-connected pillars:

- International Leadership, Sovereignty and Security;
- Integrated Oceans Management for Sustainable Development;
- Health of the Oceans; and
- **Ocean Science and Technology:** There is a significant opportunity to turn the government’s need for technology solutions that arise from the other three pillars of the Oceans Action Plan into business and commercial opportunities for the ocean technology sector.

The Oceans Action Plan takes a phased approach to address key priorities. Phase I includes a series of initiatives that will be completed by March 2007, that build on progress made to date, and set the foundation for achieving the long-term objectives of the Oceans Act and Canada’s Oceans Strategy. Planning for Phase II of the Oceans Action Plan is underway.

1.2 THE FUTURE OF AQUATIC SCIENCE IN CANADA

A discussion paper entitled **The Future of Aquatic Science in Canada (2003)** - http://www.dfo-mpo.gc.ca/science/aquatic_2020/bluepaper_e.htm, authored by Dr. Jake Rice, Canadian Science Advisory Secretariat, Science Sector, Fisheries and Oceans Canada, identifies the scientific drivers for the development of ocean industries:

Developing New Ocean Industries

“The development of ocean-related industries has at least three major stimuli. One is the marketable advances that arise from research to increase the capabilities, durability, speed, miniaturization, life-span and density of remote-

sensing and semi-remote-sensing instruments. The second is the new commercial opportunities that arise from availability of much more extensive and more integrated databases on the geology, seabed, water column, biota, ocean chemistry, ocean physics and meteorology. The third is the favourable business environment that will arise from well-integrated and inclusive decision-making, with social sciences helping to ensure community and coastal identities and values are clear and considered reasonably in planning.

Speculating on the exact nature of these new industries would be fool-hardy, because many of the most influential commercial developments 20 years into the future will be important just because at most a handful of people see their potential at present. However, bio-technologies, particularly marine pharmaceuticals and bio-remediation methodologies, and instrumentation for durable operation under harsh environments look especially promising at present. Whatever the nature of the industries, there are several clear implications for science. One is that the private sector will have a much greater role in research and development, from development of instrumentation and research on fish health and culture to inventories of ocean biodiversity, seabed features and other resources. A second is that tolerances will be very small for failure to keep data streams available on a real-time or near-real-time basis, with high standards for QA/QC, and for value-added syntheses, because such failures could have major impacts on corporate performance. This will be particularly true in ocean-climate services areas. A third is that whereas government may be a minor partner in the actual research and development, it will be the key focus for planning, auditing and effects monitoring. Working with the inclusive and integrated decision-groups, government will be the neutral host for meetings where the sustainability of the ecosystem and community impacts of these industries are evaluated and multiple uses are reconciled, through zoning and other means.”

CHAPTER 2

PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

<http://www.tpsgc-pwgsc.gc.ca>

2.1 KEY CONTACT

Bill Jamer, Senior Director, Marine Systems Directorate

Public Works and Government Services Canada

Portage III, 6C1, 11 Laurier Street

Gatineau, QC K1A 0S5

Tel 819-956-0684 - Fax 819-956-0040

Email william.jamer@pwgsc.gc.ca

2.2 INTRODUCTION

Public Works and Government Services Canada supports the daily operations of nearly 140 federal departments and agencies. Its services include:

- purchasing goods and services on behalf of the government; and
- offering information technology, telecommunications, and many other important services to the government.

The **Marine Systems Directorate of PWGSC's Aerospace, Marine and Electronics Systems Sector** is responsible for acquiring military, law enforcement and civilian ships, and managing ship refit, conversion and drydocking contracts. It is also responsible for acquiring almost all structural, mechanical and electrical equipment used on ships, including spare parts, along with related services such as design engineering, investigation, equipment repair and overhaul, and in-service ships maintenance.

Former DFO Minister Tobin set up the Shipbuilding, Industry and Marine Advisory Committee (SIMAC) to advise the Government. Industry Canada is currently preparing a Memorandum to Cabinet to update the 2001 document entitled “**New Policy Framework for the Canadian Shipbuilding and Industrial Marine Industry**” - http://strategis.ic.gc.ca/epic/internet/insim-cnmi.nsf/en/h_uv00034e.html.

2.3 THE WAY FORWARD

The **Way Forward** is a recent strategy led by PWGSC to find innovative ways to deliver services smarter, faster and at reduced cost, and to **improve how the Government of Canada does business**. The Way Forward focuses on increasing efficiencies in three key areas: procurement, information technology and property management. See <http://www.pwgsc.gc.ca/b2k5/text/index-e.html>.

The **Way Forward recommendations** focus on:

- taking a corporate approach to procurement
- better managing the goods and services that government purchases through a commodity management approach
- improving relationships with suppliers
- ensuring that the procurement officers are trained and well supported
- ensuring that Canada gets the best prices for the goods and services it purchases. The management of procurement will be based on government-wide, commodity management planning.

For marine procurement, the changes will not necessarily be apparent in the short term.

A **Report Card on the Way Forward** published on 21 September 2005 states:

Acquisitions

- Budget 2005 confirmed that the PWGSC goal is to find \$2.5 billion in efficiencies over the next five years by using better planning, leveraging the government’s purchasing power and using electronic tools to make purchasing easier and quicker.

Mandatory Standing Offers

- As an initial step to capture savings, standing offers for 10 commodity areas were made mandatory on 1 April 2005.

Changes to Legislation

- Bill C-43 came into effect on 29 June 2005, giving the Minister of PWGSC responsibility for procurement of goods and services for the federal government, to enter into contracts on behalf of the government and to guarantee volume purchases.

Office of Small and Medium Enterprises

- **The Office of Small and Medium Enterprises (OSME)** was launched on 19 September 2005- <http://www.pwgsc.gc.ca/acquisitions/text/sme/osme-e.html>. OSME has already begun identifying issues of importance to small and medium enterprises (SMEs) and developing its mandate and action plan to respond to those issues. To contact OSME, phone 1-800-811-1148 (toll free).
- **Regional workshops** will be held to identify and discuss ways to address SME issues related to changes the government introduced in Budget 2005 regarding how it purchases goods and services.

Understanding Departmental Spending

- PWGSC is working with departments and agencies to gain a fuller understanding of their purchasing needs and methods.

Commodity Councils

- PWGSC has established five commodity councils and eleven commodity teams to determine the right balance in purchasing decisions among factors such as efficiency, effectiveness and the effects on small and regionally based businesses.

Government of Canada Marketplace

- PWGSC is developing a prototype of the Government of Canada Marketplace (GoCM) which is designed to simplify the purchase of goods and services and reduce costs.

2.4 BUSINESS AND COLLABORATIVE OPPORTUNITIES

Shipbuilding is a **major catalyst of the ocean technology sector** and includes, in addition to hulls, **oceanographic and electronic equipment, application tools, environmental and control instrumentation and tools, ‘sophisticated’ paints, composite materials and ceramics, etc.**

From a PWGSC perspective, the major shipbuilding initiatives which will impact the procurement of ocean technologies are as follows:

National Defence – see page 19:

- ~ 12 single class surface combatants to replace the four 280 destroyers and the 12 city class frigates: ~ \$18 billion
- Joint Support Ship (JSS) project: 3 vessels; approximately \$2.1 billion to build and \$2 billion to support over the vessels’ lifetime
- The Frigate Equipment Life Extension (FELEX): \$2.5 billion of which approximately \$1.5 billion for the shipyards and \$1 billion for the suppliers
- Refit monies for DND vessels: \$230-\$240 million per year
- Victoria class submarine in-service support contract: \$1.5 billion over 15 years.
- Auxiliary Oiler Replacement (AOR) and Iroquois class destroyer support contract \$130 million over 7 years; likely to extend contract for another 10 years at an additional cost of \$250 million

Canadian Coast Guard – see page 28:

- CCG refurbishment and replacement program: \$3.6 billion over 25 years
- CCG rust-out monies to extend life of vessels: \$55 million per year
- Refit monies for CCG vessels: \$35 million per year

Marine Atlantic:

- Marine Atlantic: 3-4 new ferries - \$800 million over 6 years.

2.5 SOURCES OF INFORMATION

Of particular relevance to SMEs, Bill Jamer travels to Atlantic Canada on a regular basis to communicate directly with companies to review the procurement process and to review their products/services.

Major sources of information for industry include:

- the annual **Procurement Outlook Conference** involving all relevant government departments and coordinated by PWGSC (Bill Jamer)
- **MERX** - <http://www.merx.com>
- The **Government Electronic Directory Services (GEDS)** - <http://direct.srv.gc.ca> - is a directory of federal public servants for all regions across Canada. GEDS includes names, titles, telephone and fax numbers, departmental names, office locations and position titles within the governmental structure. It also includes the email address for some employees. *Note:* It is the policy of some departments not to list all their employees.

For large contracts, PWGSC organizes **Industry Days**. Examples are the ones planned for Halifax and St. John's to publicize the Phase one - \$175 million procurement of the CCG mid-shore patrol vessels. The target for these vessels is a minimum of 80% Canadian content.

Companies must publicize their products and plans and make sure that PWGSC is aware of them. In addition they should make the potential prime contractors in Atlantic Canada aware of their capabilities and products. The major shipbuilding companies in Atlantic Canada, often prime contractors, are:

Frank Smith

Director of Business Development

Marystown Shipyard

Kiewit Offshore Services

Marystown, NL A0E 2M0

Tel 709-279-1200 - Fax 709-279-1262

Jim Theriault, General Manager

Newdock - **St. John's Dockyard Ltd**

475 Water Street,

St. John's, NL A1E 6B5

Tel 709-758-6800 - Fax 709-758-6824

Email jim.theriault@newdock.nf.ca

Web <http://www.newdock.nf.ca>

Steve Durrell, Ship Repair Manager

Halifax Shipyard and

Georgetown Shipyard

Irving Shipbuilding Inc.

3099 Barrington Street

Halifax, NS B3K 5M7

Tel 902-423-9271 - Fax 902-422-3745

Email steve.durrell@halifaxshipyard.com

Web <http://www.irvingshipbuilding.com>

Denise Verreault, President and CEO

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Arthur Theriault, President

A.F. Theriault & Son Ltd

Boatbuilding and Repair

Meteghan River, NS B0W 2L0

Tel 902-645 2327 - Fax 902-645 2174

Web <http://www.aftheriault.com>

Rick Beaupré, President and CEO

Verreault Navigation inc.

146 Principale, Les Méchins, QC G0J 1T0

Tel 418-729-3733 - Fax 418-729-3285

Email

richard.beaupre@groupeverreault.com

Web <http://www.groupeverreault.com>

CHAPTER 3

NATIONAL DEFENCE

<http://www.dnd.ca>

3.1 KEY CONTACT

Commodore Richard Greenwood, Director General

Maritime Equipment Program Management

National Defence Headquarters

Louis St. Laurent Building

Gatineau, QC K1A 0K2

Tel 819-994-8718 - Fax 819-997-2194

Email greenwood.rw@forces.gc.ca

3.2 INTRODUCTION

The fundamental goal of the Department of National Defence (DND) and the Canadian Forces (CF) is to protect Canada and Canadian interests and values, while contributing to international peace and security. DND exists to carry out the work assigned to the Minister of National Defence, so the Department's relationship with the CF is that of a support system.

The budget of the Canadian Forces and National Defence is approximately \$14 billion (in 2005-2006). DND is the third largest employer in Canada and the largest single public sector employer with more than 110,000 personnel in Canada and around the world.

Canada's Maritime Forces currently consist of about 13,000 personnel. They operate from bases in Halifax and Esquimalt, headquarters in Ottawa and Québec City, and 24 Naval Reserve Divisions across Canada. Their fleet consists of twelve Halifax-class

patrol frigates, three Iroquois-class destroyers, two Protecteur-class replenishment ships, and twelve Kingston-class maritime coastal defence vessels. Four diesel-electric Victoria-class submarines are currently being introduced.

The CF Materiel ² (Mat) Group is responsible for ensuring effective materiel acquisition and logistics support to the CF and DND. This involves a major role in the planning and implementation of the Long-Term Capital Equipment Plan, the National Procurement Plan to sustain in-service equipment, and logistics planning and support operations in general. For further details on the Materiel Group, see http://www.forces.gc.ca/admmat/site/index_e.asp.

3.3 BUSINESS AND COLLABORATIVE OPPORTUNITIES

The major procurement planned by DND in the foreseeable future (15 to 18 years) is the ~ **12 Single Class Surface Combatants** (large frigates and destroyers). Expenditures would be ~ \$1 billion per year for a total of \$18 billion. This has yet to be approved.

Three Joint Support Ships (JSS) are scheduled for service in 2012-2013 to replace the Auxiliary Oiler Replenishment (AOR) vessels HMCS Protecteur, HMCS Preserver and the decommissioned HMCS Provider. The three-vessel \$2.1 billion JSS project has been approved. See http://www.forces.gc.ca/admmat/dgmepm/pmojss/index_e.asp.

A Letter of Intent was distributed to industry as part of phase one of the JSS procurement process. Four consortia were subsequently formed. The responses were evaluated based on a number of criteria such as financial commitment, experience and expertise, concept design and a strategy to build the ships in Canada, in accordance with the current shipbuilding policy.

² *The equipment, apparatus, and supplies of a military force or other organization.*

As part of phase two, DND will identify its operational and technological requirements and an RFP will be let to industry in the new year for the Project Definition Phase. Two qualified consortia will be selected from among the qualifying proposals. These consortia will be awarded a contract to produce and deliver to the Crown an implementation proposal consisting of a preliminary ship design, a project implementation plan and an in-service support plan. The winning proposal will be chosen on the basis of technical merit and best value. The Canadian content requirements and Industrial Regional Benefits (IRBs) (see page 56) will also be taken into consideration and defined by a number of federal department and agencies. The final phase, Project Implementation, will see the winning bidder awarded two separate but inter-related contracts. The first contract (\$2.1 billion) will be for the completed design and construction of the Joint Support Ships. The second contract (~\$2 billion) will be for the in-service support for the life of the vessels.

DND is also planning for the addition of an **amphibious ship**

(http://www.navy.forces.gc.ca/mspa_news/news_e.asp?x=1&id=164) to support the Standing Contingency Task Force (SCTF) described in the Defence Policy Statement (http://www.forces.gc.ca/site/reports/dps/main/toc_e.asp). The new vessel would be designed to get ground forces ashore quickly. The project is in the early stages. The initial Concept of Operations is under development.

DND collaborates with allies, *e.g.*, UK, US and France, via working groups to achieve interoperability. From a DND perspective, **successful industry collaborators** have established niche markets, do business offshore as well as in Canada, and have a diversified product and customer base.

To maintain currency with latest research and threat assessments, Life Cycle Material Managers (LCMMs) monitor specific technologies, *e.g.*, diesels, radar, weaponry, communications and control equipment. These personnel work closely with Defence Research and Development Canada (DRDC).

3.4 SOURCES OF INFORMATION

Major sources of information for industry include:

- the annual **Procurement Outlook Conference** involving all relevant government departments and coordinated by PWGSC (see page 13)
- **MERX** - <http://www.merx.com>
- **Jane's Defence Weekly** - <http://www.janes.com>.

CHAPTER 4

DEFENCE RESEARCH AND DEVELOPMENT CANADA

<http://www.drdc-rddc.gc.ca>

4.1 KEY CONTACTS

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4.2 INTRODUCTION

Defence R&D Canada (DRDC) is a special operating agency of the Department of National Defence responding to the scientific and technological needs of the Canadian Forces. Its mission is to ensure that the CF remains scientifically and operationally relevant.

DRDC has an annual budget of \$300 million and employs 1500 people. DRDC is a unique 'model' among federal government departments in that only 50% of the total budget is spent on salaries unlike other departments where salaries consume approximately 95% of the operating budget. For additional information, see the DRDC publications at http://www.drdc-rddc.gc.ca/publications/publications_e.asp.

DRDC Atlantic (<http://www.atlantic.drdc-rddc.gc.ca>), located in Dartmouth, Nova Scotia, is one of six research centres operated by Defence R&D Canada. The mandate of DRDC Atlantic (formerly Defence Research Establishment Atlantic - DREA) as identified in its 2004-2006 Strategic Plan is to conduct R&D in the areas of Underwater Sensing and Countermeasures, Naval Command and Control, Maritime Information and Knowledge Management, Air Platforms, Naval Platforms, Signature Management, Emerging Materials, and Modelling and Simulation. These R&D activities support operations, acquisition, maintenance, and requirements planning by Canada's Navy and Air Force. R&D "thrusts" are identified in consultation with DND.

4.3 BUSINESS AND COLLABORATIVE OPPORTUNITIES

The 2005-2006 DRDC Atlantic budget is \$30 million. Staff salaries are only funded to 90%. **DRDC Atlantic currently expends ~ 50% (i.e. \$15 million) of its budget in the private sector.**

DRDC Atlantic's biggest internal client is the Canadian Navy. There is also active collaboration with other departments (e.g., NRCan and DFO) but few have money to

invest because most of their budgets are spent on salaries. DRDC Atlantic's biggest external client for business development is the US Navy.

DRDC Atlantic's R&D program includes collaboration, partnering, fee-for-service and technology transfers with universities, industry, other government departments, and international allies.

DRDC Atlantic **works with companies in research, field applications and operations, consulting services or technology partnerships and licensing.** It helps companies connect to new technologies and offers technical support to help them take their technology from research and development through to working systems and commercialization. This has resulted in the growth of many private sector companies, e.g., Martec and Seimac. To explore partnering opportunities, contact the business development office at atl.bdo@drdc-rddc.gc.ca.

DRDC Atlantic has access to the **DRDC Applied Research Program (ARP) - ~ \$10 million** - which is included in DRDC's annual budget. ARP is available annually and is used to contract with the private sector. ARP is designed to advance the defence science knowledge base, investigate novel and emerging technologies and explore the military application of those technologies - http://www.drdc-rddc.gc.ca/researchtech/arp_e.asp.

The Programs within the ARP are:

- Applied Research Projects
- Defence Industrial Research Program (DIR)
- DND/NSERC Research Partnership Program.

There is competitive bidding among the 6 DRDC Centres for the **annual \$5-10 million Technology Investment Fund (TIF)**, of which ~ \$1 million is secured by DRDC Atlantic.

The DRDC budget includes **Technology Demonstration funding** – see http://www.drdc-rddc.gc.ca/business/tdp/tdp_e.asp. The funds (~ \$20 million) are accessed by the DRDC Centres via competitive bid and are used for specific projects on a DND priority list. The work is contracted out to the private sector. Technology Demonstration projects can also be proposed by other DND organizations, other government departments, defence agencies of allied nations, and Canadian industry.

The Canadian military generally buy products ‘off the shelf’ when possible. DRDC acts as ‘smart advisors’. Procurements must be NAFTA and GATT compliant. DRDC plays an important role in demonstrating technology and operational concepts which influence procurement programs. DRDC involves industry early in this process. Companies are pre-positioned so they can ultimately sell the technology to DND and worldwide, *i.e.* commercialization. The “incubation’ process with DRDC can be a positive experience.

Small and Medium-sized Enterprises (SMEs) can **benefit from a ‘share mentality’**, which is the rationale for clusters, *e.g.*, the Aerospace and Defence Industries of Nova Scotia (ADIANS) - <http://www.adians.ca>. ADIANS has implemented and leads the Marine Security Technology Cluster. Because SMEs generally lack the resources and expertise to undertake R&D, they can achieve major benefits by partnering with the DRDC.

4.4 SOURCES OF INFORMATION

DRDC holds a one-day workshop annually on the east coast to brief the private sector re DRDC operations and interests. The meetings are open to all interested companies.

Informal liaison also takes place via two groups which meet on a regular basis in Atlantic Canada. **Group #1** is coordinated by AMIRIX Systems Inc. and **Group #2** is coordinated by Brooke Ocean Technologies. These informal meetings are held monthly

or bi-monthly. Companies wishing to participate should contact the DRDC Business Development Office at atl.bdo@drdc-rddc.gc.ca.

There is a **Science and Technology Committee** within the NS Federal Council, chaired by Warren Nethercote, DRDC Atlantic.

CHAPTER 5

CANADIAN COAST GUARD

<http://www.ccg-gcc.gc.ca>

5.1 KEY CONTACTS

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5.2 INTRODUCTION

On 1 April 2005, the Canadian Coast Guard became a Special Operating Agency within Fisheries and Oceans Canada. The Coast Guard plays a number of roles in the Department's mandate, including:

- maritime safety (preparation, prevention and response);

- protection of the marine and freshwater environment;
- facilitating maritime commerce and sustainable development;
- support of marine scientific excellence; and
- support of Canada's maritime priorities.

5.3 BUSINESS AND COLLABORATIVE OPPORTUNITIES

Nationally, CCG spends approximately \$470 million per year in total on salary and operating costs in Canada, and around **\$100 million on capital items, including ships, land-based infrastructure, communication control consoles, etc.** In the Atlantic Region, the numbers would be approximately \$170 million and \$20 million respectively. The major capital items are acquired as national projects managed by national headquarters.

CCG currently has a fleet of 105 vessels, each with a 30-40 year planning cycle. CCG has proposed a major fleet recapitalization/replacement program that will occur in several phases over a period of 25-30 years. A Memorandum to Cabinet (MC) was submitted to Cabinet in November 2004 and approved in principle for the first five-year segment of the recapitalization/replacement program. In the 2005 budget, CCG was allocated **\$400 million of new money to complete the first phase of recapitalization and will invest it in the procurement of two science trawlers and eight multi-taskable mid-shore patrol vessels.** It is expected that the CCG will go back to Cabinet in approximately 2½ years for approval of the next five-year segment of its fleet recapitalization/replacement program.

The **two Offshore Fisheries Science Vessels (OFSV)** will replace the Canadian Coast Guard Ships *Templeman*, *Alfred Needler* and *W.E. Ricker*. The vessels exceed \$100 million each; therefore they may be classified as major crown projects (to be determined at the Effective Project Approval stage). Regardless, they are subject to the advice and guidance of an interdepartmental Senior Project Advisory Committee (SPAC) – chaired by the DG of Coast Guard Integrated Technical Services – and including

representatives from Industry Canada, ACOA, WEDC, the Privy Council Office, Treasury Board, Finance, and Indian and Northern Affairs. SPACs approve project procurement strategies that may include industrial benefits programs.

In addition to the fleet recapitalization plan, and the maritime security funding, CCG manages a Long-Term Capital Plan that includes the replacement of small and **medium size vessels**, including hovercraft; the life-extension of large vessels; and for replacement of shore-based equipment and infrastructure, including communication and navigation systems. As well, Coast Guard has been allocated significant major capital which is being invested in the refurbishment of existing vessels, systems, and infrastructure. All of these projects cost less than \$20 million and are within the limits of DFO ministerial approval. Projects valued at greater than \$20 million require Treasury Board approval. Typical of most Ministers, the Minister of Fisheries and Oceans approval authority for goods contracts is \$5,000. The Minister of PWGSC has the authority to approve goods contracts up to \$40 million, including ship refits, on behalf of Departments. Treasury Board approval is required for goods contracts valued at greater than \$40 million.

CCG capital projects receive approval in four stages:

- Treasury Board Approval of a long-term capital plan
- Preliminary Project Approval
- Effective Project Approval
- PWGSC applies to Treasury Board for project approval, if the project is above \$40 million.

CCG works closely with PWGSC in all of its acquisition projects. PWGSC is the contracting and inspection authority. The CCG is the technical authority. The CCG and PWGSC work collaboratively to determine the 'Technical Statement of Requirements'. CCG program managers specify the operational requirements and performance specs for vessels and equipment being purchased, not the specific brand or model. The shipbuilder is free to seek the 'best buy'.

Any contract over \$84,000 is open to international bidding according to NAFTA. However, the Canada Shipbuilding Policy states that any vessel costing over \$25,000 must be built in Canada where competition exists, unless the construction capabilities do not exist in Canada, e.g., hovercraft uniquely designed and built in the UK.

Under the Canadian Shipbuilding Policy and internal trade agreements, small projects are contracted out at the regional level through PWGSC. Over \$25,000, bidding must be competitive. These contracts are announced on the MERX system (<http://www.merx.com>). The transfer cost (e.g., Great Lakes vessel to Shelburne, NS for refit) is taken into consideration with regard to the award of small contracts. This cost is paid by the CCG.

The CCG is interested in maintaining sufficient shipbuilding capacity in Canada in order to maintain and repair vessels. This cannot be achieved via Canadian federal contracts alone. Competitive pricing and quality is an issue. Therefore firms must sell offshore as well as in Canada. Several small firms have established global niches.

Approximately 75% of the labour and material related to CCG vessels can be expected to be Canadian content, e.g., steel, labour, pumps, etc. CCG also supports the private sector via testing equipment on their vessels, e.g., Vessel Monitoring System (VMS) and helping to develop Canadian technology, e.g., SmartBay technology in Placentia Bay in collaboration with the Canadian Centre for Marine Communications (CCMC).

Because the Security Agenda ties the CCG with DND, all communication equipment must be 'secure'. As a result, command and control equipment has to be replaced to conform to DND requirements. Bulk purchases are via DND contracts.

Unsolicited Proposals (UPs) may be submitted; however, if they meet the operational requirements of CCG, they would still have to go to competitive bid via PWGSC.

Contractors can complain to the Canadian International Trade Tribunal (CITT) if they feel they have been unjustly treated with regards to contracts. The CITT can impose a wide range of rulings re procurement.

5.4 SOURCES OF INFORMATION

To ensure that small industries have access to prime contractors (usually shipyards – page 18), in the case of the MSPV and OSFV Projects, well-publicized **Industry Days** are organized by Industry Canada. For the offshore and mid-shore projects, Industry Days are planned for the Pacific Coast, Atlantic Coast and Québec. Companies can promote themselves by providing product information to the CCG, beyond that made available at Industry Days. Also PWGSC organizes **Annual Procurement Outlook conferences** with regard to major vessel acquisition and recapitalization.

CHAPTER 6

FISHERIES AND OCEANS CANADA - SCIENCE

<http://www.dfo-mpo.gc.ca/science>

6.1 INTRODUCTION

Fisheries and Oceans Canada (DFO) is the lead federal department responsible for developing and implementing policies and programs in support of Canada's economic, ecological and scientific interests in oceans and inland waters.

DFO Science is undertaking a renewal program which will be built around three National Science Themes:

- Science to understand and describe the state of aquatic ecosystems, including sensitive habitats
 - Investigating the health of aquatic ecosystems
 - Understanding and describing the role of important determinants of ecosystem structure and change
 - Investigating the health and long-term sustainability of aquatic resources

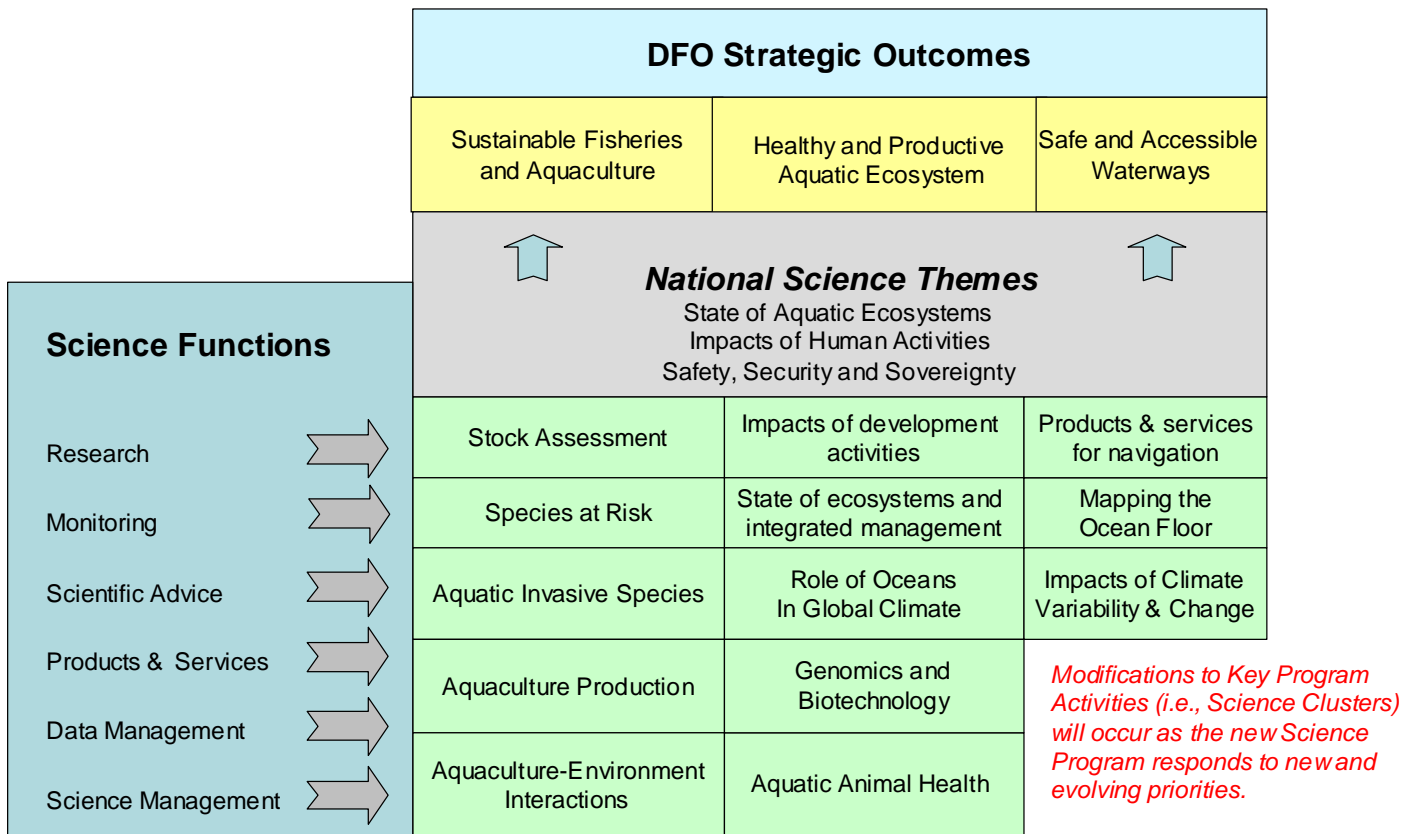
- Science to assess and mitigate the impacts of human activities on aquatic ecosystems
 - Assessing the impacts of human activities (e.g., resource extraction, transportation, industrialization, urbanization, fishing, aquaculture)
 - Assessing the impacts of climate variability and change

- Science to support maritime safety, security and sovereignty
 - Surveying, measuring, describing and charting physical features of Canada's oceans, seas, lakes and rivers

- Assessing oceanographic variables, forecasting ocean conditions and extreme events (e.g., storm surges, tsunami)

The scientific activities conducted under the National Science Themes directly support DFO’s three strategic outcomes, namely Sustainable Fisheries and Aquaculture; Healthy and Productive Aquatic Ecosystems; and Safe and Accessible Waterways – see Figure 1.

Figure 1: Support for DFO Strategic Outcomes



The delivery mechanisms for National Science Themes will include Geographic Centres of Expertise (GCE) and Virtual Centres of Expertise (VCE) as indicated in the table below. The GCEs and VCEs 'located' in Atlantic Canada are highlighted.

Geographic Centres of Expertise (GCEs)	Virtual Centres of Expertise (VCEs)
<ol style="list-style-type: none"> 1. Pesticides (Freshwater Institute, Winnipeg) - <i>operational</i> 2. Seabed Mapping - UNCLOS (Bedford Institute of Oceanography) - <i>operational</i> 3. Toxic Chemical Analysis (Institut Maurice-Lamontagne, Rimouski and Institute of Ocean Sciences, Sidney, BC) 4. Aquatic Animal Health (Gulf Fisheries Centre, Moncton and Pacific Biological Station, Nanaimo) 5. Sustainable Aquaculture (DFO St. Andrews and Centre for Aquaculture and Environmental Research, Vancouver) 6. Resource Survey Technology (Northwest Atlantic Fisheries Centre, St. John's) 7. Molecular Genetics (Pacific Biological Station, Nanaimo and Bedford Institute of Oceanography) 8. Instrument Development (Bedford Institute of Oceanography) 	<ol style="list-style-type: none"> 9. Marine Mammals - Centre of Excellence of Marine Mammalogy (Institut Maurice-Lamontagne, Rimouski) - <i>operational</i> 10. Arctic Ecosystem Science - National Centre for Arctic Aquatic Research Excellence (Freshwater Institute, Winnipeg) - <i>operational</i> 11. Environmental Impacts of Oil and Gas - Centre for Offshore Oil and Gas Environmental Research (Bedford Institute of Oceanography) - <i>operational</i> 12. Assessment Methodologies (Northwest Atlantic Fisheries Centre, St. John's and Pacific Biological Station, Nanaimo) 13. Oceanographic Modeling (Bedford Institute of Oceanography) 14. Aquatic Invasive Species (DFO Sault Ste. Marie) 15. Environmental Impacts of Hydro Development (Institut Maurice-Lamontagne, Rimouski)

The key program elements (science clusters) and delivery mechanisms for the National Science themes are indicated in the following diagram. The numbers in the GCE and VCE columns refer to the table on the previous page.

National Science Themes	
1. Understanding and Describing the State of Aquatic Ecosystems	
2. Assessing and Mitigating the Impacts of Human Activities on Aquatic Ecosystems	
3. Supporting Maritime Safety, Security and Sovereignty	

Key Program Elements <i>(Science Clusters)</i>	Funding Direction	Delivery Mechanism			
		Primary Delivery		Specialized Delivery	
		National	Zonal/Regional	GCE	VCE
Stock Assessment	↓		✓	6,8	9, 12
Species at Risk	–	✓			
Aquatic Invasive Species	↑	✓			14
Aquaculture Production	–		✓	5	
Aquatic Animal Health	↑	✓		4	
Aquaculture Environment Interactions	–		✓	5	
Genomics and Biotechnology	–	✓		7	
Impacts of Development Activities	↓		✓	1,3	11,15
State of Ecosystems and Integrated Mtg	↑		✓	6,8	10
Role of Oceans in Global Climate	↓	✓			13
Impacts of Climate Variability and Change	↓		✓		13
Products & Services for Navigation	↓		✓		
Mapping Ocean Floor, including UNCLOS	↑	✓		2	
Integrated Management Of Scientific Data	–	✓			
Integrated Delivery of Scientific Advice	–	✓			

In 2005-2006 DFO Science had a national budget of \$225 million. It is staffed by 1450 personnel (includes CHS and ship time). The DFO budget consists of an:

- A-based budget (core – salaries and Operations and Maintenance - O&M). Most of the O&M is contracted to the private sector, some of which would be spent on ocean technologies.
- B-based budget (targeted for sunset projects with deliverables - \$2.5 million for DFO Science nationally, e.g., Invasive Species)
- C-based budget (for partnering opportunities – not targeted, with deliverables).

The National Science Directors Committee chaired by the ADM DFO Science makes the final decisions re expenditures by DFO Science.

6.2 BUSINESS AND COLLABORATIVE OPPORTUNITIES

DFO Science requires ocean technology for the collection of data to support stock assessment, ecological surveys for management, physical oceanographic and bathymetric surveys. Most equipment used for data collection is under the control of CHS. To capitalize on limited funding, it is essential that DFO Science partner with OGDs, the private sector and academia.

In recent years there have been two injections of additional funds to DFO Science:

- \$1.7 million for salary increases in 2001.
- \$11 million in intergovernmental funds over three years of which \$1.9 million was provided in 2005-2006. The funds can be used for equipment purchase and employment of Full-time Equivalent (FTEs).

DFO has R&D contracts with other countries, *e.g.*, the US National Science Foundation. The US Government cannot pay Canadian federal departments directly but does so via contracts with US universities.

6.3 DFO SCIENCE, MARITIMES REGION

6.3.1 Key Contacts

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6.3.2 Business and Collaborative Opportunities

The overall budget in 2005-2006 for DFO Science, Maritimes Region is approximately \$31 million.

DFO Maritimes currently has 55 Joint Project Agreements (JPAs). Products developed through DFO JPA partnerships include:

- the new generation of the Icycler developed by Brooke Ocean Technology, in collaboration with other oceanographic institutions (Scripps, Southampton, etc) - <http://www.brooke-ocean.com/icycler.html>.
- the Free Fall Cone Penetrometer developed by Brooke Ocean Technology, which is sub-contracting many smaller companies, hence spawning a network of OT providers - <http://www.brooke-ocean.com/ffcpt-01.html>.

Funding agencies, including NSERC, ACOA and NRC, are supportive of ocean technology proposals which foster partnerships with DFO.

A detailed synopsis of the science projects, including partnerships, carried out in the Maritimes Region of DFO can be found in the “**Science Projects Inventory**” produced annually.

From the perspective of ocean technologies, the “**Five Year Capital Plan**” identifies a prioritized list of ocean technologies which the Science Branch anticipates purchasing in that period. The potential purchases are classified as: lab equipment; at-sea research equipment; facilities; and information technology. Among other items, the Capital Plan describes the products and estimated costs.

There are plans to **enhance the marine instrumentation section at BIO** which will become a collaborative initiative between DFO, NRCan/GSCA and the private sector. It is anticipated that this section will develop new instruments, maintain extant instruments and modify off-the-shelf instruments. It will also encourage the commercialization of developed products. An article entitled **History of Instrumentation at BIO** was published in the Bedford Institute of Oceanography 2002 in Review, available at http://www.mar.dfo-mpo.gc.ca/science/review/2002/english/BIO_2002_in_Review.pdf.

6.4 DFO SCIENCE, NEWFOUNDLAND AND LABRADOR REGION

6.4.1 Key Contact

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6.4.2 Business and Collaborative Opportunities

The overall budget in 2005-2006 for DFO Science, NL Region is \$28 million, which includes the purchase of ship time. Since 1991 the overall budget has varied between \$25-28 million. This does not include the budget for the Oceans and Habitat Management Branch.

\$500,000 was provided this year to DFO NL Science for the purchase of instrumentation 'kits' for research vessels, *i.e.* CCGS Teleost and CCG Wilfred Templeman. The various kits are common to research vessels/platforms and can be used by all of the DFO Regions.

Last year \$200,000 was provided to DFO NL Science for purchase of small craft via the 'Small Craft Acquisition Fund'. This is provided every 2nd year. A wish list is submitted by DFO Regions to this Fund.

NL received 78% of the \$11 million in intergovernmental funds provided to DFO Science, which can be used for equipment purchase and employment of FTEs.

The offshore fisheries science vessel Templeman will be retired in March 2006. The purchase of the replacement vessel is planned and will be under the aegis of the CCG (see page 28). It will be purchased via PWGSC procurement.

UPs may be considered but there is no identified budget for these proposals within DFO NL Science.

6.5 DFO OCEANS AND SCIENCE, GULF REGION

6.5.1 Key Contact

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6.5.2 Business and Collaborative Opportunities

The overall budget in 2005-2006 for DFO Oceans and Science, Gulf Region is approximately \$12 million.

Michael Chadwick is the Chair of the DFO National Monitoring Team, which is currently finalizing a report on aquatic monitoring in Canada. The report will be published by CSAS, the Canadian Science Advisory Secretariat (<http://www.dfo-mpo.gc.ca/CSAS/>), which coordinates the peer review of scientific issues for DFO.

The Atlantic Zone (Québec, Newfoundland and Labrador, Nova Scotia, New Brunswick and Prince Edward Island) receives approximately half of the \$60 million national DFO envelope for monies dedicated to monitoring (http://www.meds-sdmm.dfo-mpo.gc.ca/zmp/main_zmp_e.html). A large proportion of the funds are spent on vessel time.

Priority areas with regard to monitoring and associated technologies include:

- The development of autonomous devices to collect biological information and to build on the success of the ARGO float programme (http://www.meds-sdmm.dfo-mpo.gc.ca/meds/Prog_Int/Argo/ArgoHome_e.html).
- The development of equipment to enable community groups to monitor near-shore coastal and littoral waters in a uniform and consistent basis
- The installation of monitoring devices on Government of Canada vessels, as standard operating procedure.

With regard to the development of ocean technology, DFO Gulf must rely on the Bedford Institute of Oceanography where there is technical expertise and an interest in creating a 'Marine Equipment and Technology Centre'.

Through lack of investment, Canada has lost its lead in many areas of technology but remains a leader with regard to the storage and transmission of data. This expertise should be further developed and supported.

Additional information is available in "Oceans and Science Branch Annual Activities 2004-2005 – Gulf Region". Copies are available from the Regional Director.

CHAPTER 7

CANADIAN HYDROGRAPHIC SERVICE

<http://www.chs-shc.dfo-mpo.gc.ca>

7.1 KEY CONTACT

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7.2 INTRODUCTION

The Canadian Hydrographic Service (CHS) is in the Science Sector of the Department of Fisheries and Oceans (DFO). It operates from a Headquarters in Ottawa and five regional locations: Sidney (British Columbia), Burlington (Ontario), Mont-Joli (Québec), Dartmouth (Nova Scotia), and St. John's (Newfoundland and Labrador). Although the Service is decentralized, the CHS program is a national program with a national planning framework and national priority setting.

The CHS mandate is to provide clients with up-to-date, timely, and accurate hydrographic publications necessary for safe and efficient navigation for navigable waters of Canada in the most cost effective and efficient manner and to represent Canadian hydrographic interests nationally and internationally. CHS is responsible for the surveying, measuring, describing, and charting of the physical features of Canada's oceans, seas, rivers, and lakes. The data are then used to produce nautical material

including nautical charts (in both paper and digital formats), Sailing Directions, bathymetric maps, and Tides and Current Tables.

CHS aims for a five-year updating cycle for its hydrographic charts (900 digital, 500 vector, 500 raster); however, it can only achieve less than 25% within its current budget. CHS is conducting a level of service review to define the update cycle that can be sustained for products in high, medium and low risk areas. If the review is successful, it is hoped to put the 25% of charts considered to be high risk on a five-year cycle.

In 2002, CCMC, with the assistance of the CHS, undertook a study of Canada's capability and capacity in ocean mapping. Copies of the study report entitled “**Analysis of Canadian Ocean Mapping Capability and Capacity**” are available from CCMC (ccmc@ccmc.nf.ca).

7.3 BUSINESS AND COLLABORATIVE OPPORTUNITIES

The Government of Canada ratified the United Nations Convention on the Law of the Sea (UNCLOS) in November 2003. Canada has until 2013 to submit evidence for a claim to territory on the continental shelf outside the existing 200-nautical-mile Exclusive Economic Zone (EEZ).

\$69 million has been earmarked over 10 years for mapping in support of Canada's extended claim re UNCLOS. One third is for the Atlantic and two thirds for the Arctic. Of the \$23 million for the Atlantic, approximately one third of the funding is for bathymetry and two thirds for seismic. The plan is for the hydrographic surveys in the Atlantic to be done by contract because the Canadian Government does not have a deep-sea multibeam ship at this time. It is also intended that all seismic surveys in southern waters will be contracted out. The role for industry in the icebreaker seismic operations in Arctic waters is not yet determined.

CHS recommends that an internal government workshop be convened re UNCLOS mapping so that progress to date can be assessed and future requirements identified and available technologies be discussed. For example, DRDC has experience with Autonomous Underwater Vehicles (AUV) work under ice and others may have knowledge of or experience with other technologies and industries.

Sixty countries around the world could lay claim to an extended continental shelf beyond their EEZ. This provides an opportunity to the private sector having appropriate expertise. CHS is willing to provide expertise to support Canadian industry under Joint Project Agreements (e.g., Georges Bank mapping carried out via a Joint Project Agreement between Clearwater Fine Foods, the Geological Survey of Canada and CHS) or other funding methods.

In 2005-2006, \$7 million relief funding was allotted to DFO Science nation-wide, of which \$1 million was awarded to CHS for high-priority charting. This funding is for one year and cannot be used to hire staff. Some will be used for overtime to allow the survey ship Matthew to work more than 8 hours per day and on weekends while in Labrador, some to support revisory surveys from small shore-based launches (which have not been used for several years due to no O&M funds). The remainder will be used primarily for contract services to accelerate the updating and publishing of priority charting.

The Oceans Action Plan identified an additional \$2 million for NRCan this year to undertake seabed mapping in support of LOMAs, which will be done in collaboration with CHS.

Because of budget cuts and the internal DFO planning and budgetary process, CHS cannot undertake long-term planning that involves increased budgets or expansion of programs. Year-end money and 'slippage' on salary is used for O&M and minor capital (capital less than \$1 million).

CHS Atlantic has minimal money available for procurement in its annual O&M budget and therefore cannot 'grow' the ocean technology industry in Atlantic Canada by tendering for annual contract surveys.

CHS will buy equipment off the shelf when funds are available. Usually this occurs with year-end funding that other parts of the Department is lapsing – so it is difficult to plan life cycle maintenance.

To minimize cost, CHS will build systems, in collaboration with others, by integrating smart components purchased off the shelf and via development work done by industry or academia under contract. Technology transfer has resulted in several commercial systems, e.g., CARIS, Brooke Ocean Technologies Moving Vessel Profiler (MVP), etc.

To support development of oil, gas, and other offshore resources, CHS works with the Geological Survey of Canada on special surveys.

CHS will support the private sector in applications to CIDA and other funding agencies for international contracts. CHS can provide expertise but not funding. For example, Terra Surveys asked for and was provided with a hydrographer-in-charge for a New Zealand project for which CHS was compensated by Terra Surveys.

CHS will consider Unsolicited Proposals from the private sector but has no set funding for such proposals.

All CHS procurement is via PWGSC.

CHAPTER 8

GEOLOGICAL SURVEY OF CANADA

<http://gsc.nrcan.gc.ca>

8.1 KEY CONTACT

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8.2 INTRODUCTION

The Geological Survey of Canada (GSC) is a sub-unit of the Earth Sciences Sector (ESS) within Natural Resources Canada (NRCan). The other major components of NRCan are Energy; Forestry; and Mines and Minerals. For details of the divisions within each component, see http://www.nrcan-nrcan.gc.ca/inter/subsites_e.html.

Of NRCan's staff of ~5,000, the ESS comprises the largest component: 1400-1500 people. Only 120-150 people are directly associated with oceans, the majority of whom are with the GSC.

The GSC is Canada's premier agency for geoscientific information and research, with world-class expertise focusing on geoscience surveys, sustainable development of Canada's resources, environmental protection, and technology innovation. GSC's mandate is to provide Canada with a comprehensive geoscience knowledge base contributing to economic development, public safety and environmental protection by

acquiring, interpreting and disseminating geoscience information concerning Canada's landmass, including the offshore.

The strategic directions of the GSC are based upon the government priorities/issues (speeches from the Throne and federal budget speeches) and are articulated by senior administrators in Ottawa. The GSC priorities are articulated by the Divisional Directors and the DGs.

The Geological Survey of Canada is organized in two branches: the Atlantic and Western Canada Branch and the Central and Northern Canada Branch. GSC has two Director Generals: one in BC who is responsible for the Atlantic and Western Canada Branch and one in Ottawa who is responsible for the Central and Northern Canada Branch.

The Geological Survey of Canada - Atlantic (GSCA) focuses on marine research which includes climate change, coastal studies, basin analysis and mapping for UNCLOS (in collaboration with CHS/DFO). GSCA is comprised of specialists in marine and petroleum geology, geophysics, geochemistry and geotechnology providing a source of integrated knowledge and advice on marine geoscience, with a concentration on Canada's coastal and offshore landmass. It is:

- the principal marine geoscience facility in Canada
- co-located at the Bedford Institute of Oceanography, with the Department of Fisheries and Oceans
- a part of an Atlantic Provinces marine research and technology community.

The Director GSCA is responsible for ensuring that the organization has the staff with the appropriate skills to deliver the programs (if necessary through training and/or hiring) and GSCA assets, linking with stakeholders in the marine business sector and also for 'looking to the future' (*i.e.* identifying new issues and proposing new programs).

Programs are defined based on strategic directions. Recently the strategic directions for marine research have been influenced by all four Pillars of the Oceans Action Plan. Final approval for a program comes from the Executive Management Committee (DGs), which then assigns a budget. The DG for the Atlantic and Western Canada Branches identifies a Program Manager to develop the component projects of the program and to deliver the program on budget and within the allocated time frame.

The Program Managers, having been assigned a salary budget and an operational budget, identify the component Program projects (e.g., ~ 9 projects in the Geoscience for Ocean Management Program) with explicit workplans and deliverables. These are all peer reviewed. The Program Managers negotiate with the Director GSCA and other Division directors from across Canada, for access to people, services, ship-time, etc.

Six of the national Earth Science Sector (ESS) programs are within the GSC, each with an assigned Program Manager. Three of these six programs are managed by ESS personnel at the Bedford Institute of Oceanography (BIO):

- **Geoscience for Oceans Management (GOM)** (Dick Pickrill) - see page 52 and http://ess.nrcan.gc.ca/pri/sdev_e.php#om
- **Reducing Canada's Vulnerability to Climate Change** (Don Forbes) http://ess.nrcan.gc.ca/pri/env_e.php#cc
- **Consolidating Canada's Geoscience Knowledge** (Phil Moir) http://ess.nrcan.gc.ca/pri/sdev_e.php#gs.

8.3 BUSINESS AND COLLABORATIVE OPPORTUNITIES

The GSC annual budget is approximately \$60 million and the GSC Atlantic portion is ~ \$10 million, *i.e.* \$7 million for salaries and \$3 million for O&M. The GSC annual capital budget is about \$2 million of which GSC Atlantic receives between \$500-750,000 per

year (this depends on priorities and can fluctuate from year to year based on approval for large capital expenditures, which may be in other divisions).

The Director GSCA has no budget other than to keep the division running (fixed costs for lights, rental, staff training, etc.). The salary for the ~100 staff comes from the programs, whose Program Managers request staff from the Director GSCA to deliver their respective programs and then transfer the salary dollars. The approximate GOM annual budget is \$8 million, *i.e.* \$6 million for salaries and \$2 million for O&M.

Of the ~ \$2 million O&M yearly budget, \$500-750,000 per year is generated from collaborative research agreements with industry and other government departments (OGDs).

In the recently announced Oceans Action Plan, \$4 million of \$28 million was identified for the next eighteen months for ocean seafloor mapping activities. Most of this work will be conducted directly by NRCan and CHS.

Because of budget cuts, there is less money available for procurement, especially capital, and thus the private sector must rely primarily on international sales rather than on contracts from within the government.

All procurements are via Public Works and Government Services (PWGSC). The tendering process cannot be restricted to Atlantic Canada and must include the entire country (and in many cases the US, though the NAFTA provisions). Sole sourcing can occur if justifiable, *i.e.* if a company has unique products or capabilities.

Capital decision-making:

- Items up to \$100,000 – divisions get allocation and can decide on what to purchase
- \$100-250,000 – GSC management (all division directors and DGs) review and decide (based on national needs; and often total capital available is not sufficient for many large items and therefore priorities are set)

- Over \$250,000 – same process, but with the addition that an NRCan committee reviews the request to prevent duplications within the department.

Purchases:

- Divisions buy equipment and programs ‘buy’ services (including use of equipment) as needed to deliver programs.
- Technology developments: Managers lever outside sources, e.g., PERD, Climate Change, and private sector.
- Future procurements – mainly replacement of existing, aging equipment; new requirements for UNCLOS seafloor mapping: total budget \$70 million over 10 years. ~85% will be for data acquisition, e.g., seismic surveys and seismometers (Arctic) – the majority to be contracted out.

GSC buys most of its equipment ‘off the shelf’. If equipment is not available off the shelf, the GSC may contract with industry to develop, often in collaboration with the private sector. GSC retains some in-house technological expertise so it can configure smart components purchased off the shelf when it cannot afford to buy the pre-built systems. The GSCA can also loan equipment to the private sector if the equipment is unique and cannot be obtained elsewhere.

Unsolicited proposals are reviewed and, depending on priorities and funding availability, could be accepted.

The private sector/industry is currently supported in a number of ways:

- Equipment purchase
- Partnerships to develop equipment. The GSCA can contribute in-kind support but limited funds.
- Partnerships for collaborative research, e.g., Clearwater Fine Foods
- Reinforcing the private sector’s international efforts via provision of GSC profile and expertise.

The ocean technology community in Atlantic Canada is small collectively and individually. Canada is an insufficient marketplace for their technology, hence the importance of the export market.

The NRCAN ESS Guidelines for Working with Industry are available at http://ess.nrcan.gc.ca/intl/industry_e.php.

8.3.1 Geoscience for Oceans Management

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This program contributes to the geoscience knowledge that is required to inform decision-making in Canada's offshore lands so that land-use, including offshore structures and resource-development decisions, balance social, economic and environmental considerations. Underpinning this program is a systematic approach to seafloor mapping to deliver geoscience knowledge for integrated ocean management. The legislative and strategic framework for this program is found in the Canada Oceans Act and Canada's Oceans Strategy.

The program focuses on priority areas with multiple seafloor-use issues, or where large-scale projects require extensive multi-disciplinary knowledge. Projects address four themes: integrated management of large ocean areas; assessment of hazard potential and environmental impact of infrastructure; understanding geological controls on ocean-floor habitat distribution; and assessment of human impact on marine environmental quality in the coastal waters of Eastern Canada.

Committed Outputs

- All seafloor geoscience data accessible digitally, with 25 percent of the data incorporated in revised digital map products
- National seafloor mapping strategy developed with federal partners

Committed Outcomes

- Outputs used to minimize environmental impact of seafloor infrastructure and for the resolution of conflicts regarding seafloor use
- Ocean-management decisions will balance competing demands of renewable and non-renewable resources with conservation.

CHAPTER 9

INDUSTRY CANADA

<http://www.ic.gc.ca>

9.1 KEY CONTACTS

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9.2 INTRODUCTION

Industry Canada's mission is to foster a growing competitive, knowledge-based Canadian economy.

Within IC, the Aerospace, Defence and Marine Branch is responsible for developing and implementing policies, programs and services aimed at encouraging international competitiveness and sustainable growth in the aerospace, defence, space and marine sectors of the Canadian economy.

The Energy and Environment Industries Branch, also relevant to ocean technology, works in partnership with industry, federal and provincial organizations to increase the competitiveness of manufacturing and service activities within Canadian energy and environment sectors to promote the growth of a dynamic and innovative economy.

IC uses a sector approach and has an ocean technology federal/provincial team in all four Atlantic Provinces.

9.3 BUSINESS AND COLLABORATIVE OPPORTUNITIES

Industry Canada (IC) does not procure ocean technology. It promotes the Canadian marine sector within Canada. It has some O&M funding for studies and travel to conferences and to meet with companies. Conferences are important to demonstrate Canadian technologies, *e.g.*, Oceans 2005 MTS/IEEE, Washington, DC. IC organizes events, etc. International Trade Canada can subsidize participation by the private sector. IC is very successful in putting government/industry teams together to solve policy problems (*e.g.*, Oceans Action Plan), identify market solutions (*e.g.*, Technopole maritime du Québec) and develop relevant literature. It is important for industry to keep IC and its regional officers and Canada's Trade Commissioners aware of company profiles, new developments and R&D plans.

The **Industrial and Regional Benefits (IRB)** policy provides the framework for using federal procurement as a lever to promote industrial and regional development objectives. Industry Canada has produced an SME Information Kit as a source of information and resources, aimed at helping SMEs better understand and participate in the IRB policy. See <http://strategis.ic.gc.ca/epic/internet/inad-ad.nsf/en/ad03657e.html>.

IC has established a **Structured Financing Facility (SFF)** program for the Canadian shipbuilding and industrial marine industry (<http://strategis.ic.gc.ca/epic/internet/insim-cnmi.nsf/en/uv00003e.html>). The SFF has three elements:

- Financing support which can provide financing assistance within prescribed limits, up to 15% of the purchase price of a new Canadian built vessel. The support is in the form of a non-repayable contribution.
- Credit (loan / lease) insurance which can insure a portion of a loan or lease to acquire Canadian built vessels. The cost to the Government for this insurance cannot exceed 10% of the purchase price of the vessel.
- Insurance support which can provide a non-repayable contribution towards private loan/lease insurance within prescribed limits up to 10% of the purchase price of a new Canadian built vessel.

Technology Products Canada (TPC) - <http://tpc.ic.gc.ca> - is a special operating agency of Industry Canada with a mandate to provide funding support for strategic research and development, and demonstration projects that will produce economic, social and environmental benefits to Canadians. TPC was allocated ~\$20 million to be spent on marine projects. Brian McShane (mcshane.brian@ic.gc.ca) is the NL TPC rep; Bob Kennedy the NB rep (kennedy.bob@ic.gc.ca); and Gailene Murphy the PEI rep (gamurphy@gov.pe.ca). A replacement for Al Roper, the former NS rep, will be identified from the Halifax IC office. IC has no money to purchase, therefore it partners with other departments, often via TPC.

On 20 September 2005, the Minister of Industry announced that the Government would be introducing a new program to support innovation and technology adoption in

Canada, replacing the TPC program. The new **Transformative Technologies Program** (TTP) will be open to all industry sectors and to all technologies, with greater access for small and medium-sized companies. The existing TPC R&D program will be phased out. See <http://tpc-ptc.ic.gc.ca/epic/internet/intpc-ptc.nsf/en/hb00476e.html>.

\$2 million of the \$28 million available for Phase One of the Oceans Action Plan have been identified for ocean technology commercialization via IC's **Early Action Projects**. The funds have been allocated for the Placentia Bay Demo (Smart Bay) Project (see <http://www.smartbay.ca>). A national OAP implementation committee and regional OAP implementation committees are overseeing Phase One and setting priorities for Phase Two.

The development of the **Ocean Science and Technology Partnership (OSTP)**, formerly known as the Ocean Technology Network, initiated at the 2004 Ocean Innovation Conference in Victoria, BC will facilitate the development of the ocean technology sector in Canada. For information on the OSTP, contact Paul Lacroix - paul.lacroix@shaw.ca. The OSTP is currently preparing a Canadian Ocean Technology Directory; for information, contact Adam Dutton (adutton@ccmc.nf.ca), Canadian Centre for Marine Communications.

IC sees a need to work with international partners, e.g., with Denmark re the Arctic, with the US re its Ocean Exploration Program and with the international ocean drilling program – Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES). A drill ship was built in Halifax but Canada reduced its share and is now almost out of the consortium but there is still some private sector involvement (ENCANA).

The **National Marine Industrial Council (NMIC)** was recently established to promote the benefits of the Canadian marine industry as an economic generator and to provide a venue for discussing marine policy issues with leaders from the marine industry and Deputy Ministers of departments that have direct influence - <http://www.tc.gc.ca/pol/en/marine/nmic/menu.htm>. The NMIC has prepared a document

entitled “**Canadian Marine Industry: Overview**”

(<http://www.tc.gc.ca/pol/en/Marine/nmic/background/overview1.htm>). Another document entitled “**Charting the Marine Field**” is being prepared for the Council. Marc Fortin, Transport Canada (TC) is the point man. This document will identify the programs available to Canada’s marine sector.

The **Canada/Atlantic Provinces Cooperation Agreement on International Business Development (IBDA)** strives to increase exports from Atlantic Canada by funding projects designed to help small and medium-sized companies explore, enter and succeed in international markets. See <http://www.acoa.ca/e/ibda/index.shtml>. This Agreement focuses on export development in several sectors in Atlantic Canada, including ocean industries.

9.4 SOURCES OF INFORMATION

IC has produced an “**Ocean Technology Statistics and Industry Profile**” (John Appleby, Saleh Rahman and Matthew Lam).

A study prepared for Industry Canada in 2005 entitled “**A Fresh Look at Canadian Commercialisation and Success**” identifies a framework of factors that affect “successful commercialisation”. The marine and ocean technology industry sector was one of four sectors considered (IC contact: Josy Parrotta-Marck, email parrotta-marck.josy@ic.gc.ca).

The trade databases are important information tools for IC and industry, e.g.:

- **Strategis Guide to Canadian Company Capability (CCC)** – an IC product - http://strategis.ic.gc.ca/sc_coinf/ccc/engdoc/homepage.html
- **Ocean Technologies Company Directories by Product and Services** <http://strategis.ic.gc.ca/epic/internet/inicot-icto.nsf/en/to00016e.html>

- **Industry Trade Canada (ITC)** - <http://www.infoexport.gc.ca/ie-en/MarketReportsAndServices.jsp>
- **SourceCan** - <http://www.sourcecan.com> - Canada's e-marketplace and business opportunities network

The **Marine Technology Society** may be a good source of information for the private sector - <http://www.mtsociety.org>.

CHAPTER 10

RECOMMENDATIONS

The authors offer the following recommendations to assist the private sector in identifying and benefiting from business opportunities resulting from activities within the Federal Government:

- Because of the myriad of information sources and events, the process of identifying procurement plans, both short and long-term, for ocean technology products and services is complex and time-consuming. For Atlantic Canadian companies, this process could be made significantly more efficient and cost-effective if **a sector association, with the support of ACOA, undertook to organize regular information sessions specifically focused on the ocean technology sector and the procurement opportunities** provided by the federal government departments involved in this sector.
- **Fundamental to major procurements is the central role of PWGSC.** The Director of the Marine Systems Directorate will meet with individual SMEs at their location in Atlantic Canada to ensure that procurement plans and processes are fully understood and that private sector products and capabilities are similarly understood by PWGSC.
- Departmental contacts interviewed by the authors all expressed their willingness to communicate with private sector personnel and brief them on their respective departmental partnership opportunities and procurement plans, however dependent these plans might be on the current 'political climate'. **Face-to-face contact between private sector personnel and the departmental contacts** is strongly recommended.

- Ocean technology companies, particularly those lacking R&D capacity, should **explore the opportunities provided by DRDC Atlantic** to work with companies in research, field operations, consulting services, technology partnerships and licensing.
- The **Atlantic Science Forum Steering Committee within the Atlantic Federal Council** should be tasked with fostering inter-departmental collaboration with regard to ocean technology requirements and procurement.
- The expertise and facilities that reside at BIO should be further enhanced by the **establishment of a Marine Equipment and Technology Centre**. This Centre should be supported and funded by the relevant departments and agencies of government. It should have a clear mandate to promote interdepartmental, private sector and academic partnerships/collaboration and to facilitate the commercialization of Ocean Technology products and services by the private sector.
- To maximize the collection of coastal and marine data and to optimize valuable ship time, the **installation of shipboard monitoring equipment should be encouraged on vessels not normally associated with this task**, e.g., ferries, fishing craft and cargo vessels. This would also result in increased demand for the appropriate ocean technologies.
- The **industrial liaison and innovation offices** in Atlantic Canadian universities offer opportunities for the private sector to partner with both academia and the public sector in the furtherance of ocean technology development and sales.
- The **Government can further assist the private sector** with regard to procurement by:
 - Realizing greater transparency across the country in terms of procurement and partnership opportunities and departmental business plans.
 - Implementing long range procurement plans

- Integrating the development of ocean technologies with procurement assurance
 - Maintaining some departmental in-house expertise to provide quality control.
- Ocean technology companies should become **active members in sector associations, clusters, partnerships and networks** which offer relevant information, business and partnering opportunities. These include:
- Aerospace and Defence Industries Association of Nova Scotia (ADIANS) - <http://www.adians.ca>
 - Canadian Centre for Marine Communications (CCMC) - <http://www.ccmc.nf.ca>
 - Marine Technology Society (MTS) - <http://www.mtsociety.org>
 - Newfoundland and Labrador Association of Technology Industries (NATI) - <http://www.nati.net>
 - Newfoundland Ocean Industries Association (NOIA) - <http://www.noianet.com>
 - Nova Scotia Ocean Technology Council. For information concerning this organization, contact Jim King - jking@cfncon.com.
 - Ocean Science and Technology Partnership (OSTP). For information concerning this new organization, contact Paul Lacroix – paul.lacroix@shaw.ca
 - Oceans Advance - <http://www.oceansadvance.net>
 - Offshore/Onshore Technologies Association of Nova Scotia (OTANS) - <http://www.otans.com>.

OTHER SOURCES OF FUNDING AND INFORMATION

A number of federal funding sources are available to the private sector, often in partnership with federal departments and agencies. These include:

- The **Atlantic Innovation Fund (AIF)** - <http://www.acoa.ca/e/financial/aif/over.shtml> - focuses on R&D projects in the area of natural and applied sciences, as well as in social sciences and humanities, where these are explicitly linked to the development of technology-based products, processes or services, or their commercialization. Eligible applicants include universities, research institutions and private sector businesses. Partnerships which include the private sector are encouraged.
- Funds are allocated by Industry Canada to all science-based federal departments for **Federal Partners in Technology Transfer (FPTT)** - <http://www.fptt-pftt.gc.ca>. Letters of Intent are required. Business opportunities / partnering mechanisms include: intellectual property licensing; R&D collaboration; contract research; and spin-offs.
- **Joint Project Agreements (JPAs)** are arrangements whereby the parties involved agree to participate jointly in the actual carrying out of a project. This would involve the sharing of resources, the purchase of goods or services, the hiring of personnel, etc. JPAs are voluntary, negotiated, legally binding arrangements. Contracts issued under JPAs are administered by PWGSC.
- The **Program of Energy Research and Development (PERD)**, administered by the Office of Energy Research and Development (OERD) at Natural Resources Canada - <http://www2.nrcan.gc.ca/es/oerd> – provides a vehicle for interdepartmental transfer

of funds in relation to joint R&D projects. OERD coordinates PERD through 12 participating federal departments and agencies. It provides PERD funds directly to partner departments and agencies, which can then team up with, for example:

- federal laboratories
 - the private sector (industry, research institutes, companies, consortia and alliances, individuals)
 - associations
 - other funding agencies such as the Natural Sciences and Engineering Research Council (NSERC), the Industrial Research Assistance Program (IRAP), and Technology Early Action Measures (TEAM)
 - universities
 - provincial and municipal governments and research organizations
 - international organizations.
- The Government of Canada will provide \$150 million in new funding over six years for the **International Polar Year** in 2007 (<http://www.ipy-api.ca>). Funds will be allocated to academic, government and community researchers through a competitive, peer review process. Some of the funds will be directed to developing a sustainable monitoring program for the Arctic.

Additional sources of information which can guide the private sector with regard to procurement by federal departments include the following.

- The **Ocean Innovation Conference** series was initiated in 2003 by the Canadian Centre for Marine Communications. The goal of the Conference series is to provide an opportunity for industry, government and academic representatives to develop new business and collaborative activities, to network and to help promote the merits of Canadian ocean technologies - <http://www.oceaninnovation.ca>. The 2006 Ocean Innovation Conference will be held in St. John's. NL.

- The **trade databases** are important information tools for industry, e.g.:
 - **Strategis Guide to Canadian Company Capability (CCC)** – http://strategis.ic.gc.ca/sc_coinf/ccc/engdoc/homepage.html
 - **Ocean Technologies Company Directories by Product and Services** - <http://strategis.ic.gc.ca/epic/internet/inicot-icto.nsf/en/to00016e.html>
 - **International Trade Canada (ITC)** - <http://www.infoexport.gc.ca/ie-en/MarketReportsAndServices.jsp>
 - **SourceCan** - <http://www.sourcecan.com> - Canada's e-marketplace and business opportunities network

STUDY TERMS OF REFERENCE

For a Study on the Economic Impact of the Ocean Technology Industry in Atlantic Canada and Potential Public Sector Demand for Ocean Technologies in Canada

Purpose: The purpose of this study is two-fold:

- (1) to provide the ocean technology industry in Atlantic Canada with strategic information on potential public sector demand for ocean technologies in federal departments of Canada.
- (2) Provide an accurate assessment of the economic importance and principal markets of the ocean technology industry in Atlantic Canada.

Objectives: The study has three main objectives which are presented below in the order that they would be addressed in the report:

- To raise awareness on the economic importance of the industry in Atlantic Canada;
- To assist the federal government in promoting the development of markets for ocean technology firms in the region; and
- To help companies in Atlantic Canada's ocean technology industry build business opportunities from future ocean technology requirements of Canadian federal departments.

Methodology: The methodology will include a comprehensive literature review, a brief survey of companies in the region, and a series of interviews with key decision makers within federal departments involved in developing and/or procuring ocean technologies. The interviews will gather information on the business plans of those federal departments, research and development activities, and key contacts with whom Atlantic Companies can develop strategic business relationships.

Deliverables: The report will have two main components: one section dealing with the economic importance of the industry in the region and its principal markets; the second section will focus on business opportunities resulting from activities within the Federal Government.

The section on the economic importance and principal markets will develop and present information in the following areas:

- Direct economic impact of the ocean technology sector in Atlantic Canada, including direct sales, direct employment, direct income and direct exports;
- Indirect and induced economic impact of the ocean technology sector in Atlantic Canada including federal and provincial taxes;
- Principal markets for companies involved in ocean technologies including but not limited to:
 - Government departments both in Canada and outside the country;
 - Regulated or heavy industrial markets;
 - Consumer or recreational market; and the
 - University sector.

The "Federal Business Opportunities" section of the report will have the following sections and steps:

- consultation with industry to develop the types of questions to be asked of the federal key contacts;
- identification and listing of relevant federal departments and the rationale for that selection;
- identification and listing of relevant key contacts within those departments, their title, full contact information, and the rationale for selecting them;
- identification, listing, and a short description of key partners in developing and procuring ocean related technology for these federal government contacts and their departments;

- summary of business plans for those identified departments, highlighting areas of strategic importance to Atlantic Canadian companies; and
- description of potential business opportunities for Atlantic Canadian ocean technology companies.

Management Structure: The study will be undertaken by the Secretariat of the Atlantic Coastal Zone Information Steering Committee (ACZISC) in collaboration with Canmac Economics. A separate steering committee for the study will be composed of representatives of ACZISC, ACOA, Industry Canada and the ocean technology industry in Atlantic Canada.

Timeline: The project was initiated in December 2004 and will end in December 2005. The dates of the timeline for each section of the report will be identified by the management committee and will follow the stages outlined above. At each stage, the management team will evaluate and approve that section before progression to the next stage.

LIST OF INTERVIEWEES

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John Butler, Regional Director, CCG NL Region, Northwest Atlantic Fisheries Centre, St. John's

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Julian Goodyear, Regional Director, Science, DFO NL Region, Northwest Atlantic Fisheries Centre, St. John's

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Bedford Institute of Oceanography, Dartmouth

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GEOLOGICAL SURVEY OF CANADA

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LIST OF ACRONYMS

ACOA	Atlantic Canada Opportunities Agency	DG	Director General
ACZISC	Atlantic Coastal Zone Information Steering Committee	DIR	Defence Industrial Research Program
ADIANS	Aerospace and Defence Industries of Nova Scotia	DND	Department of National Defence
ADM	Assistant Deputy Minister	DRDC	Defence R&D Canada
AIF	Atlantic Innovation Fund	EEZ	Exclusive Economic Zone
AOR	Auxiliary Oiler Replenishment	ESS	Earth Sciences Sector
ARP	Applied Research Program	FELEX	Frigate Equipment Life Extension
AUV	Autonomous Underwater Vehicles	FPTT	Federal Partners in Technology Transfer
BAA	Broad Agency Announcements	FTE	Full Time Equivalent
BIO	Bedford Institute of Oceanography	GATT	General Agreement on Tariffs and Trade
C&P	Conservation and Protection	GCE	Geographic Centre of Expertise
CCC	Canadian Company Capability	GoCM	Government of Canada Marketplace
CCG	Canadian Coast Guard	GoM	Geoscience for Ocean Management
CCMC	Canadian Centre for Marine Communications	GSC	Geological Survey of Canada
CF	Canadian Forces	GSCA	Geological Survey of Canada - Atlantic
CHS	Canadian Hydrographic Service	IBD	International Business Development
CIDA	Canadian International Development Agency	IC	Industry Canada
CITT	Canadian International Trade Tribunal	IEEE	Institute of Electrical and Electronics Engineers
COOGER	Centre for Offshore Oil and Gas Environmental Research	IRAP	Industrial Research Assistance Program
CSAS	Canadian Science Advisory Secretariat	IRB	Industrial Regional Benefit
DFO	Fisheries and Oceans Canada	ITC	Industry Trade Canada

JOIDES	Joint Oceanographic Institutions for Deep Earth Sampling	OTANS	Offshore/Onshore Technologies Association of Nova Scotia
JSS	Joint Support Ship	PERD	Program of Energy Research and Development
LCMM	Life Cycle Material Manager	PWGSC	Public Works and Government Services Canada
LOI	Letter of Intent	RCMP	Royal Mounted Canadian Police
LOMA	Large Ocean Management Area	RFP	Request for Proposals
MC	Memorandum to Cabinet	S&T	Science and Technology
MSPV	Mid-Shore Patrol Vessel	SFF	Structured Financing Facility
MTS	Marine Technology Society	SIMAC	Shipbuilding, Industry and Marine Advisory Committee
MVP	Moving Vessel Profiler	SME	Small and Medium-sized Enterprises
NAFTA	North American Free Trade Agreement	SPAC	Senior Project Advisory Committee
NATO	North Atlantic Treaty Organization	SCTF	Standing Contingency Task Force
NMIC	National Marine Industrial Council	TC	Transportation Canada
NOIA	Newfoundland Ocean Industries Association	TEAM	Technology Early Action Measures
NRCan	Natural Resources Canada	TIF	Technology Investment Fund
NSERC	Natural Sciences and Engineering Research Council	TPC	Technology Products Canada
NRC	National Research Council	TTP	Transformative Technologies Program
O&M	Operations and Maintenance	UK	United Kingdom
OAP	Oceans Action Plan	UN	United Nations
OERD	Office of Energy Research and Development	UNCLOS	United Nations Convention on the Law of the Sea
OGD	Other Government Department	UP	Unsolicited Proposals
OSFV	Offshore Science Fisheries Vessels	US	United States
OSME	Office of Small and Medium Enterprises	VCE	Virtual Centre of Expertise
OSTP	Oceans Science and Technology Partnership	VMS	Vessel Monitoring System
OT	Ocean Technology	WEDC	Western Economic Diversification Canada