

Marine Environmental Research – A Key Area of Strength in Atlantic Canada

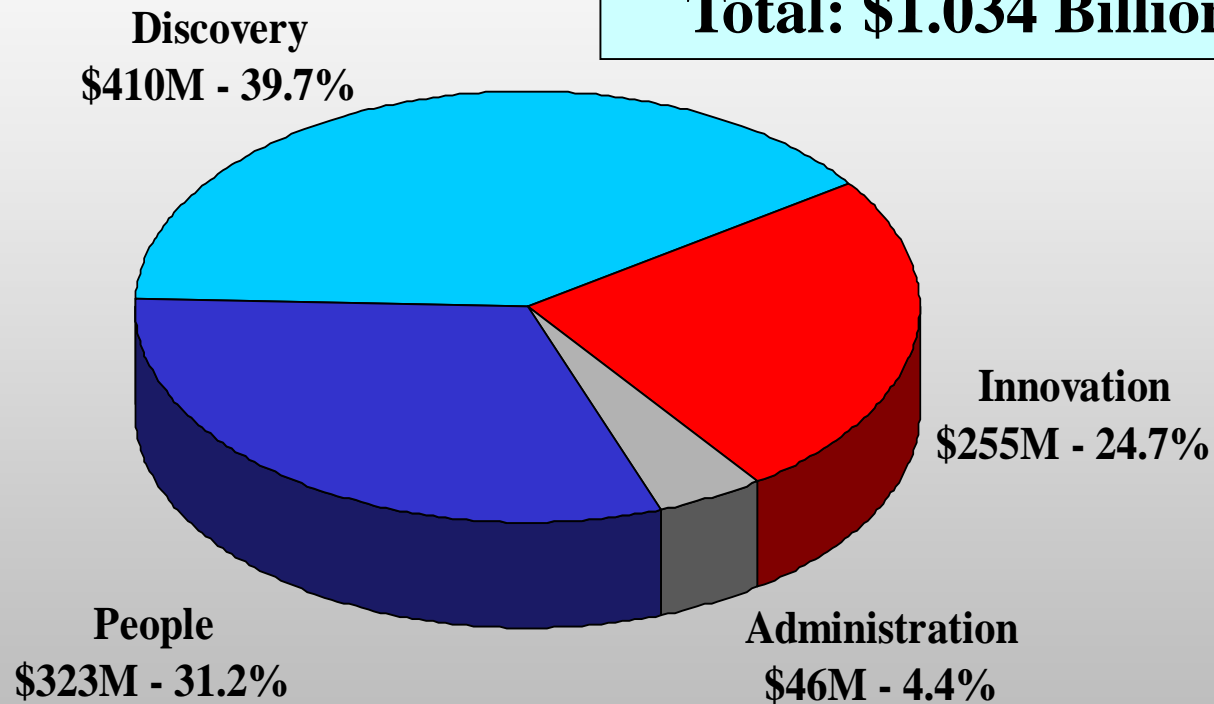
- More than 10 Canada Research Chairs and NSERC Industrial Research Chairs dedicated to marine environmental sciences
 - Dalhousie University is short listed for a Canada Excellence Research Chair in Ocean Science and Technology
- Dedicated research centres at universities (e.g. MUN Ocean Sciences Centre & Marine Institute; Dalhousie Centre for Environmental and Marine Geology)
- Leadership in national and international research networks (CHONe); Ocean Tracking Network
- Significant regional university strengths across all four Atlantic provinces.

NSERC's Five Goals

1. **Fuel the advancement of knowledge in science and engineering and ensure that Canadian scientists and engineers can be leaders and key players in a global knowledge community.**
2. **Connect and apply the strength of the academic research system to addressing the opportunities and challenges of prosperity for Canada.**
3. **Inspire new generations of students to pursue careers in science and engineering, and provide them with the means to develop their full potential.**
4. **Demonstrate NSERC's accountability and how the results of its investments in Canadian research and training benefit Canadians.**
5. **Increase the visibility of Canadian research.**

NSERC Budget 2008-09 (millions of dollars)

Total: \$1.034 Billion



Discovery – Our Knowledge Advantage

Goal: Fuel Canadian leadership in research

40% of the NSERC budget

- **Discovery Grants – provides the foundation of NSE research and training in Canada**
- **Discovery Accelerators – strengthens excellence in priority areas**
- **Research Tools and Support – equipment that enables excellence in research**

People for Canada's Economy

**Goal: Develop and inspire the next generation
31% of the NSERC budget**

- Undergraduates – **provide research experience (in university and industry)**
- Graduate scholarships – **support our top students to advance their education and training (in universities and industry)**
- Postdoctoral – **assist highly qualified people starting a research career in university, industry (IRDF) or government (Visiting Fellowships)**
- *+ most NSERC research grants to faculty also support training (students and post-doctoral fellows)*

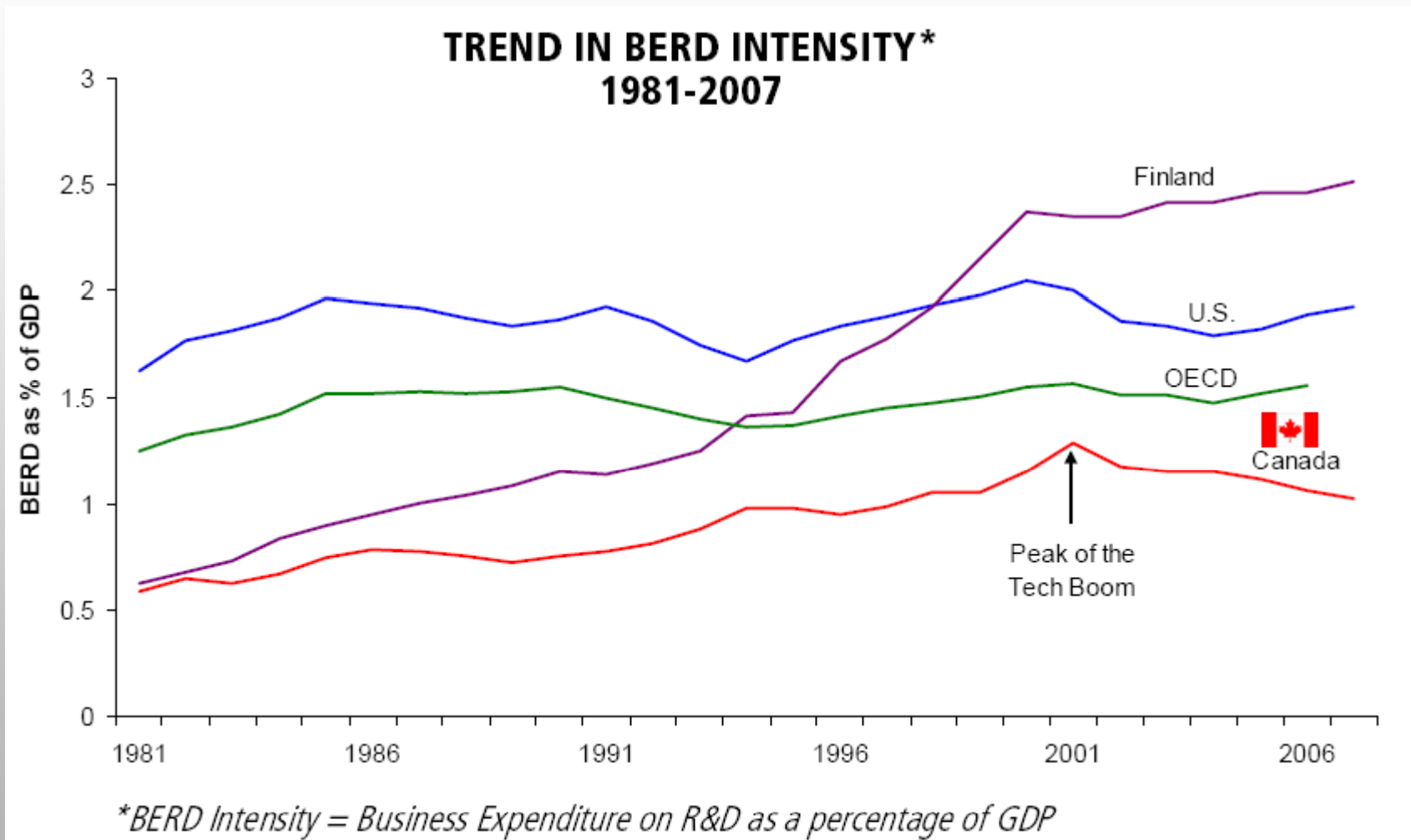
NSERC's Innovation & Partnership Framework: 3 Program Directions

- **Strategic Partnerships**
Top-down National Priority Areas:
From workshops to national initiatives
- **Industry Driven**
Market-driven: From short term projects to long term relationships (Chairs)
- **Tech Transfer/ Commercialization:**
Move academic innovations into industry/government. From building partnerships at the local/regional level to increasing the market readiness of research results

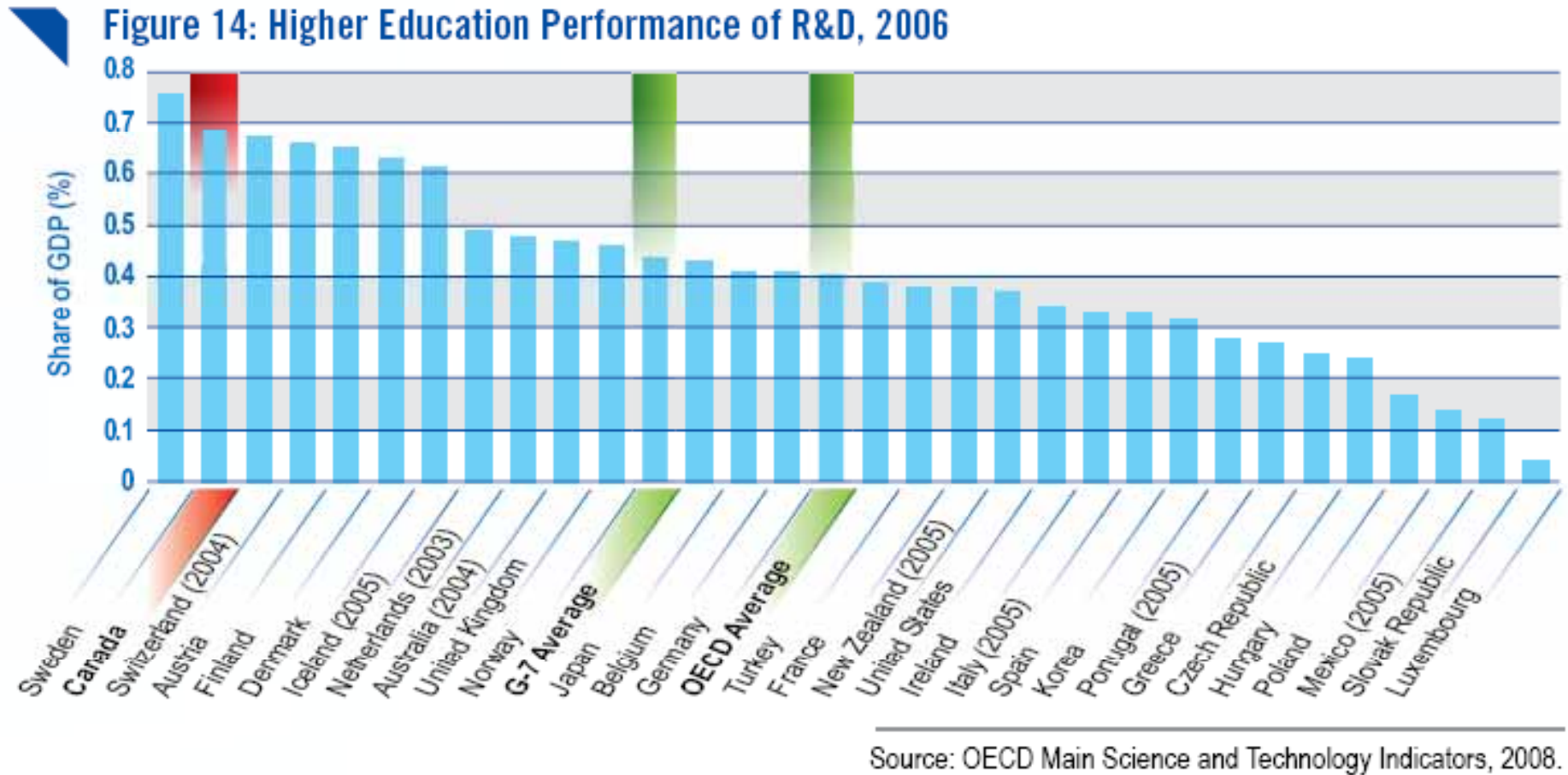


**\$204 M in Partnerships +
\$14.4 M in Industry Scholarships
& Fellowships**

Canadian Business Spending on R&D Trails Most Developed Countries



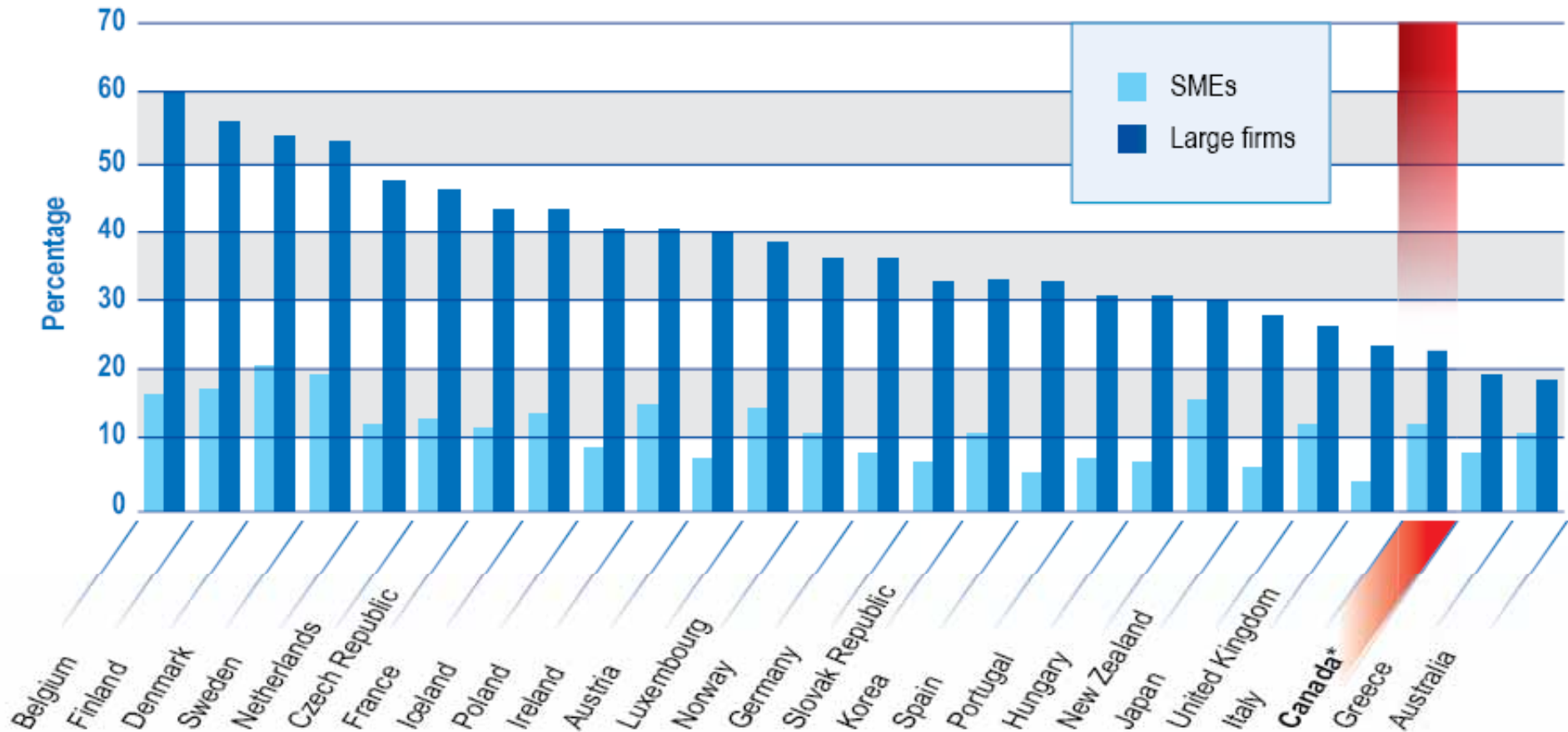
University R&D is Canada's Advantage



State of the Nation 2008, Canada's Science, Technology and Innovation System,
Science, Technology and Innovation Council, 2009

Few Canadian Firms Collaborate

Figure 11: Firms Collaborating in Innovative Activities with Public and/or Private Partners by Size, 2001–04



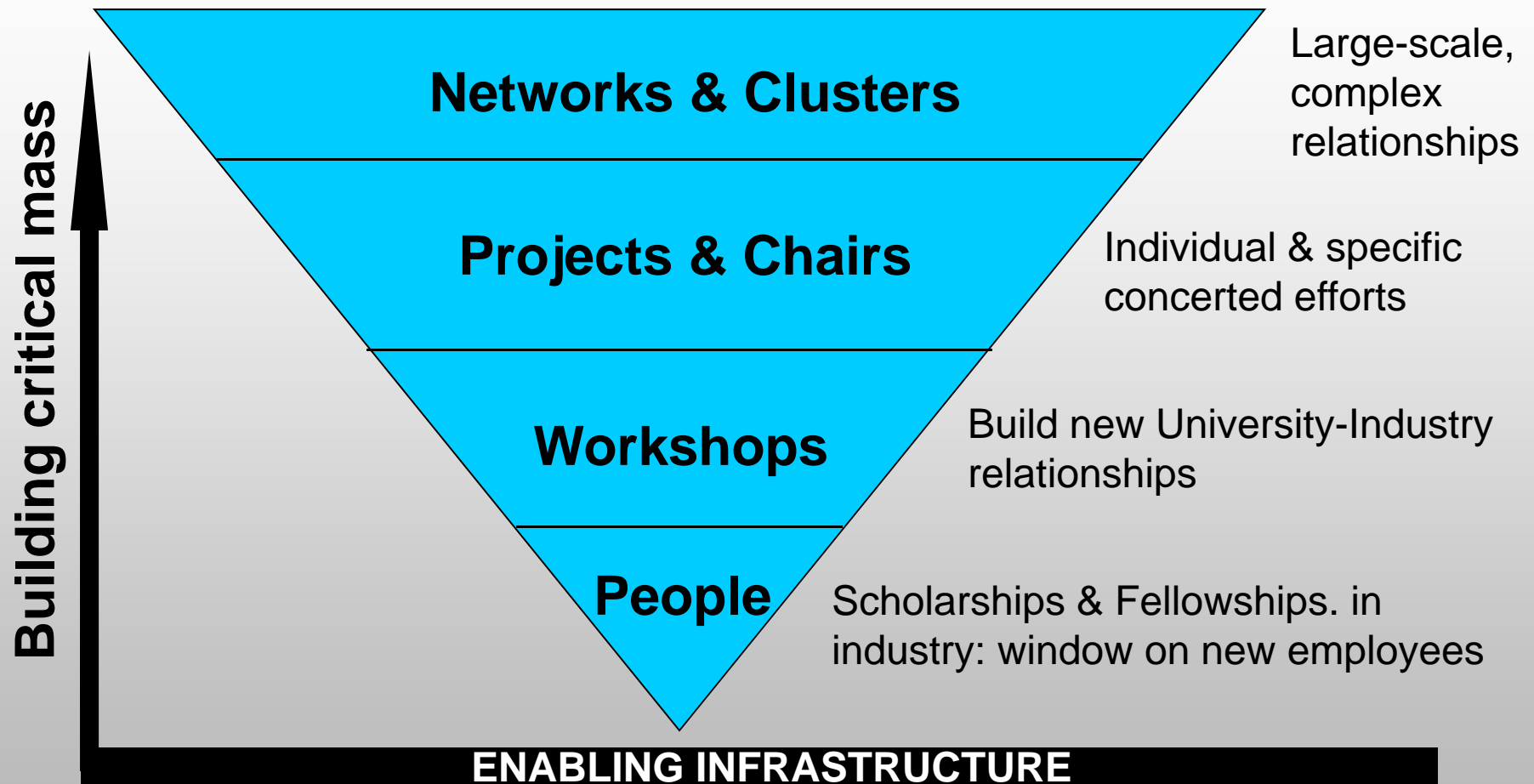
* Manufacturing sector only.

Source: OECD STI Scoreboard, 2007.

Why Should Industry Partner with Universities & Colleges via NSERC?

- **Stretch research dollars (including tax treatment)**
- **Lower costs of risk**
- **Problem-solving: link to world-class expertise and facilities**
- **Creativity: access to new ideas**
- **Students working in your company (window on future employees)**
- **Long-term productive relationships**

NSERC Innovation - Flexibility



NSERC Collaborative R&D Projects Integrated Multi-Trophic Aquaculture

A Regional Success Story of Collaboration Involving NSERC-Funded University Researchers, Federal Scientists and Industry



Dr. Thierry Chopin (University of New Brunswick), Dr. Shawn Robinson (Fisheries and Oceans Canada), Mr. Glenn Cooke (Cooke Aquaculture Inc.) and Mr. Jean-Paul Deveau (Acadian Seaplants Limited).

Recipients of the 2008 NSERC Synergy Award for Innovation for their collaboration on novel aquaculture techniques that enhance the industry's productivity and environmental sustainability.

NSERC Strategic Research Networks Program

Healthy Oceans Network (CHONe) - Scientific Criteria for Conservation and Sustainable Usage of Marine Biodiversity in Canada's Oceans

Network Scientific Leader: Dr. Paul Snelgrove, Memorial
University

Federal Partners: Dept. of Fisheries and Oceans, Natural
Resources Can, Canadian Museum of Nature, Huntsman
Marine Science Centre

**CHONe incorporates research from 15 different
institutions studying three main themes:**

- marine biodiversity,
- ecosystem function, and
- population connectivity.



Dr Paul Snelgrove

Atlantic Success in NSERC Strategic Research Grants for Fisheries & Aquaculture

12 strategic research projects awarded to Atlantic universities:

- 6 projects worth a total \$2.25 million at Memorial University of Newfoundland;
- 2 projects totalling \$702,070 at the University of New Brunswick (SJ)
- \$466,000 project at Dalhousie University in Halifax, NS – Thomas Gill (Aquaculture waste utilization: bio-actives from farmed salmon and cod);
- \$389,948 project at Nova Scotia Agricultural College in Truro – James Duston (Integrating red macroalgae into land-based marine finfish aquaculture)
- \$410,036 project at Saint Mary's University in Halifax, NS – David Cone (Gyrodactylosis: an emergent disease of cod aquaculture)
- \$368,261 project at the University of PEI in Charlottetown, PEI - Richard Cawthorn (Integrated studies of the effects of bitter crab disease on Atlantic Canadian snow crabs)

NSERC Strategy for Partnerships and Innovation (2010-2015): Thrusts & Actions

Build relationships:

- Companies and researchers need help finding each other, and getting partnerships started.

NSERC Program Changes for Impact:

- (Easy) changes to make programs & policies more relevant

Strengthen Innovation Capabilities:

- New approaches that draw on University and College capabilities

Strengthen Skills in Industry:

- Make it more attractive for innovating companies to hire people with advanced degrees

How to Reach Us

Richard Isnor

richard.isnor@nserc-crsng.gc.ca

Tel: 506-854-8756

Catherine Vardy

catherine.vardy@nserc-crsng.gc.ca

Tel: 506-854-9423

Jason Frenette

jason.frenette@nserc-crsng.gc.ca

Tel: 506-854-7767

Cécile LaPlante

cecile.laplante@nserc-crsng.gc.ca

Tel: 506-854-8154



Examples of Atlantic University Strengths in Marine Environmental Science

- Dr. Kajta Fennel, CRC in Marine Prediction at Dalhousie University - studies the responses of phytoplankton to climate change; uses ocean circulation models to observe phytoplankton diffusion and distribution.
- Dr. Heike Lotze, CRC in Marine Renewable Resources at Dalhousie, reconstruction of past ecological changes to better predict responses of marine ecosystems to human influence.
- Dr. Jeffery Hutchings, CRC in Marine Conservation and Biodiversity at Dalhousie University – studies external influences on population recovery in anadromous fish.
- Dr. Douglas Campbell, CRC in Environmental Processes at Mt. Allison University (and founder of the spin-off company Environmental Proteomics); identifying proteins involved in photosynthetic processes to study resource reallocation and acclimation in phytoplankton.
- Dr. Andrew Irwin at Mount Allison University, integrates phytoplankton data with a General Circulation model developed at MIT to model flow and circulation in the atmosphere and improving understanding of phytoplankton's role in the global carbon cycle.

Examples of Atlantic University Strengths in Marine Environmental Science

- Dr. Keith Thompson, CRC in Marine Prediction and Environmental Statistics at Dalhousie University - Participating in research to determine the feasibility of global/Atlantic ocean forecasts; modelling prediction of ocean circulation.
- Dr. John Cullen - NSERC/Satlantic Industrial Research Chair in Environmental Observational Technology, Dalhousie University. Ocean forecasting and automated Marine Environmental Prediction Systems.
- Dr. Ricardo Scrosati, CRC in Aquatic Ecology at the St. FX Environmental Sciences Research Centre (ESRC), is working on biodiversity in the environmental stress gradients of intertidal zones.
- Dr. Gary Saunders, CRC in Molecular Systematics and Biodiversity at UNB, works on diversity and distribution of algae in the Bay of Fundy; human impact on health of the bay's ecosystems.
- Dr. Helmuth Thomas, CRC in Marine Biogeochemistry at MUN explores the mechanisms of carbon flux in the oceans and prediction of coastal carbon cycles.
- Dr. Susan Ziegler, CRC in Environmental Science at MUN, looks at cycling of nutrients and dissolved organic material along with its response to environmental change and UV radiation.