

Aquaculture in Eastern Canada

A Growing Opportunity



November 2005

“Large scale commercial aquaculture is little more than 30 years old. New technologies, new breeds and newly domesticated species of fish offer great hope for the future. They promise a blue revolution in this century to match the green revolution of the last.”

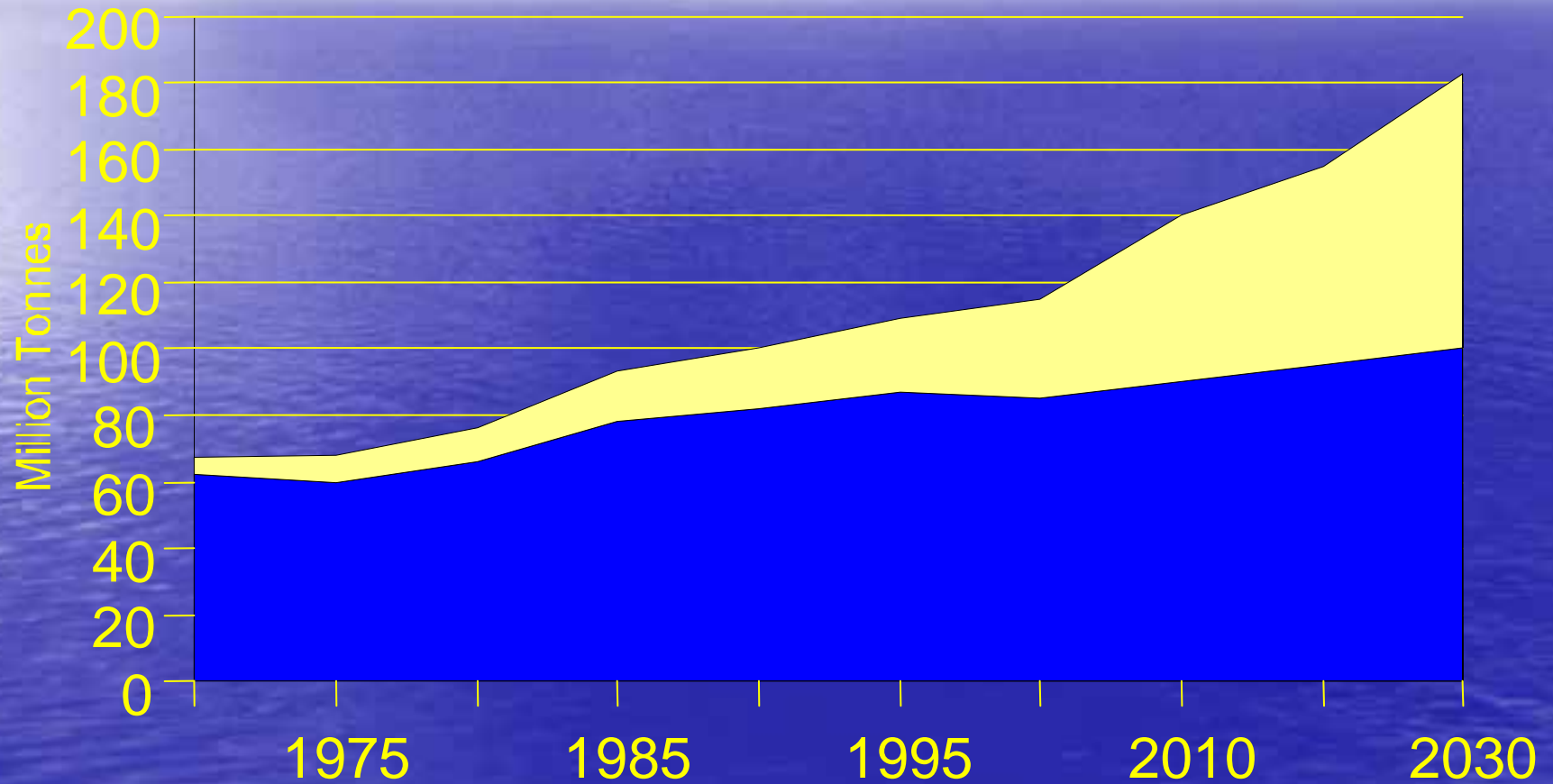


The Economist: 9 – 15 August 2003
Blue Revolution – the promise of fish farming.



World Seafood Production (FAO)

■ Aquaculture ■ Fisheries



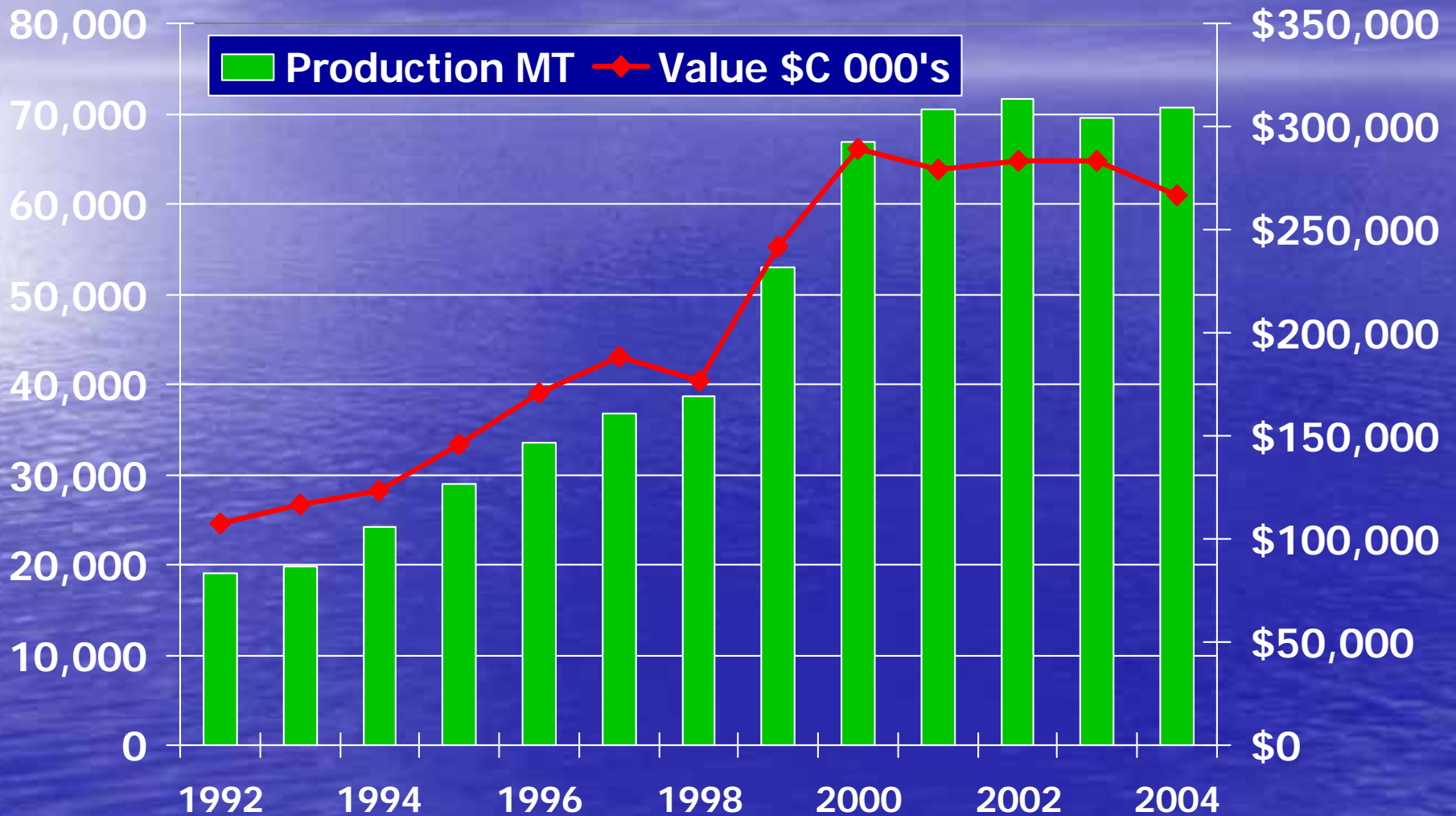
Economic Profile

Aquaculture In Eastern Canada



Total Production & Value

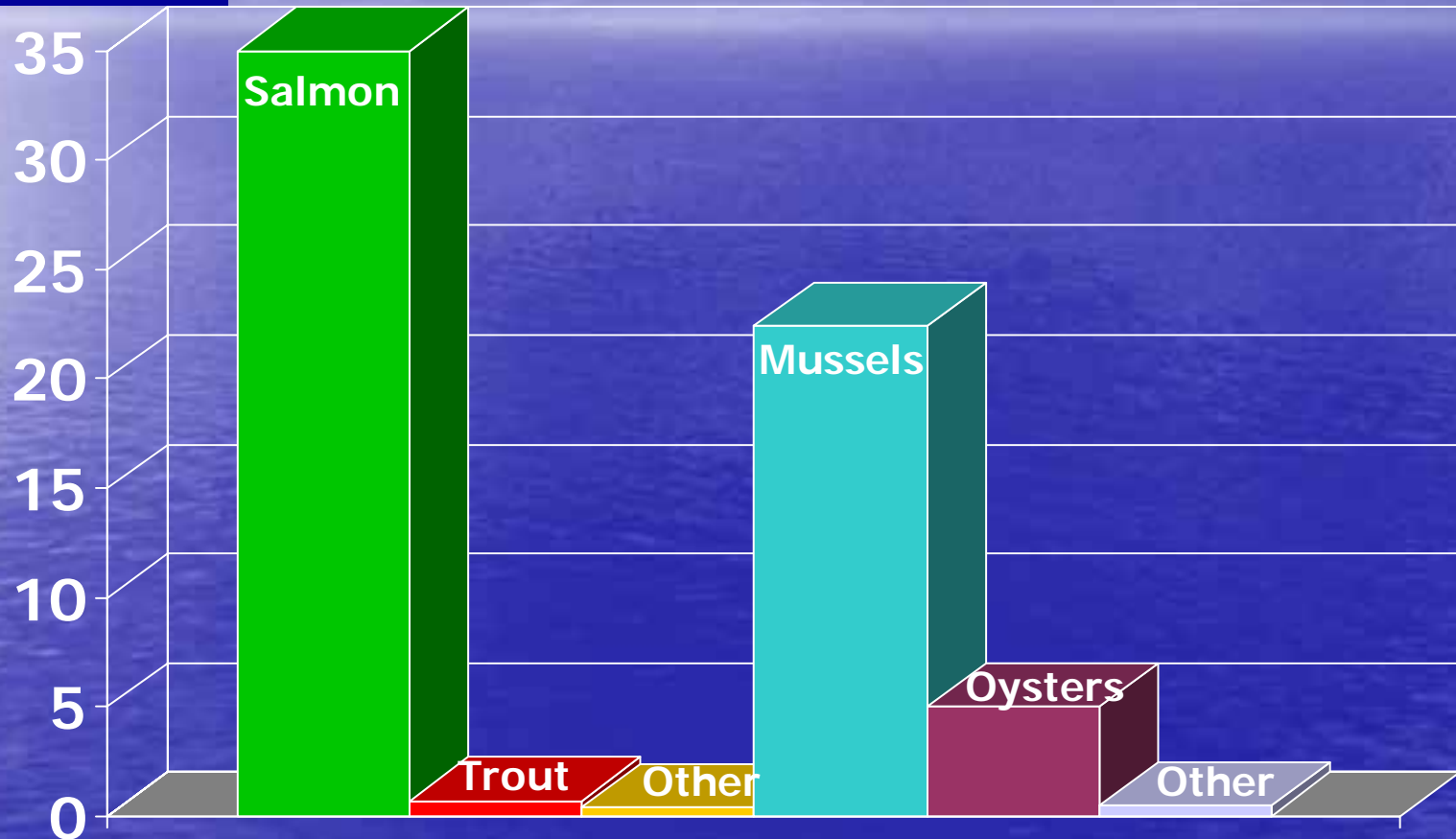
NB, NS, NL, PEI, PQ



Source: Stats Canada

Major Species Farmed By Volume 2004

MT (000's)



Source: Stats Canada

Key Industry Drivers

Rural Based

Providing an Economic Alternative for Rural & Coastal Communities.
Residents can stay, & educated young people can return, to their communities.

Science Based

Highly Efficient Producer of Protein using Science & Technology.
The Science of Today is not the Science of Tomorrow.

Market Based

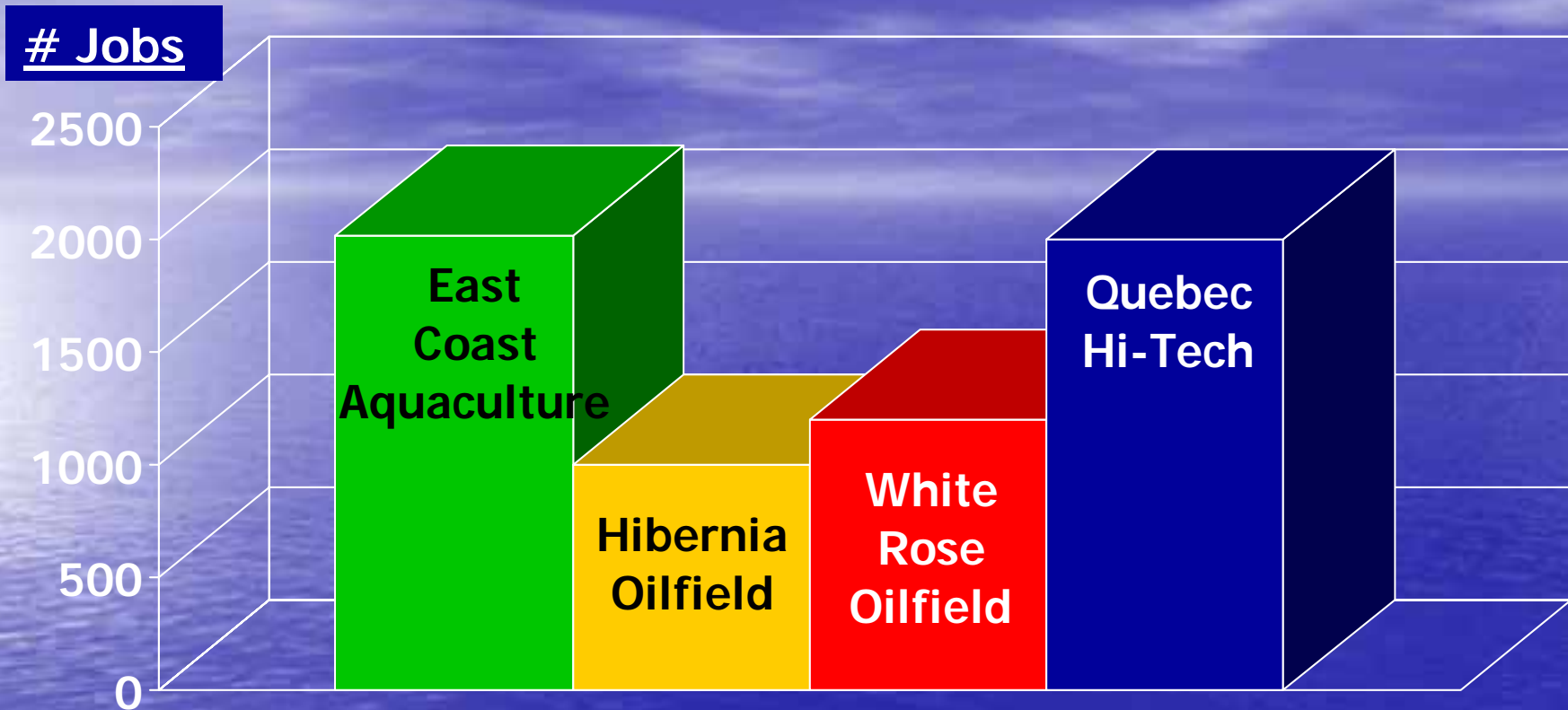
We are in the Food Industry - Growing Demand by Consumers.
Producing High Quality, Safe, Nutritious, Tasty products year round.

Rural Based Industry

Major Impact in Rural Eastern Canada



Rural Stability – Direct Employment 2003



- Aquaculture has brought much needed stability & employment to rural eastern Canada helping to minimize out-migration. It is an alternative for educated young people to pursue a career in their home communities.

Source: Atlantic Task Force Report & CAIA Employment Study

Faces of the Industry

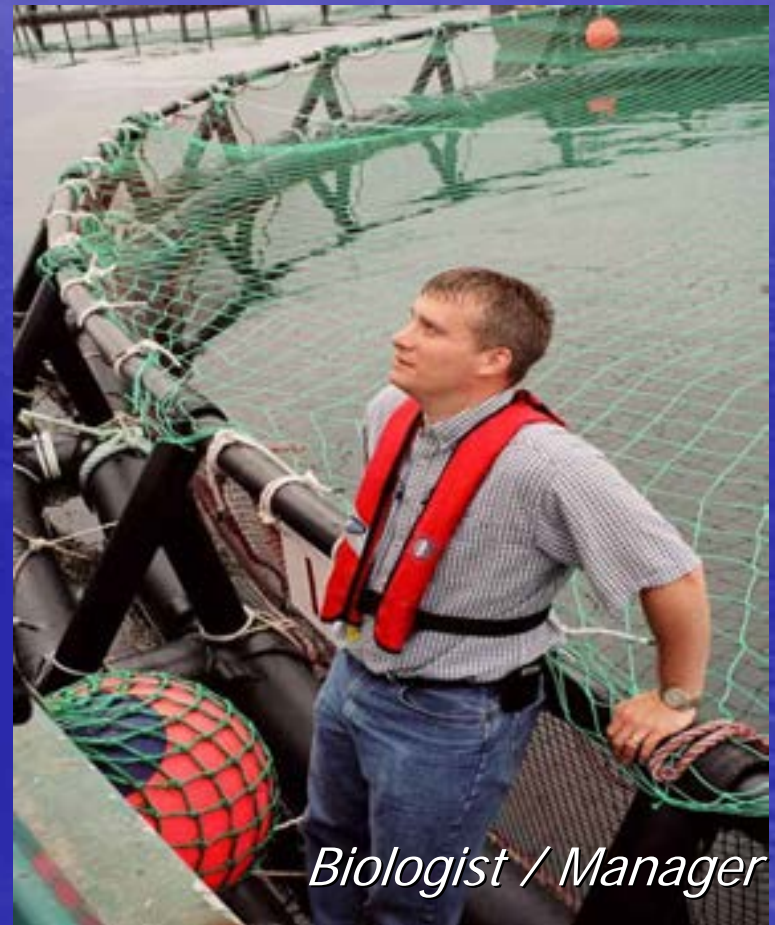
Researcher



From Truck Drivers to Veterinarians the East Coast Aquaculture Industry has a major impact across many sectors of the economy.



Veterinarian



Biologist / Manager

Faces of the Industry



| | Jobs | Payroll |
|-----------------|-------------|----------------------|
| Direct | 2018 | \$56 Million |
| Indirect | 2997 | \$46 Million |
| TOTAL | 5018 | \$102 Million |



75% of industry employees are under 40 years of age.

On Farm Employment



Support Industries

Aquaculture is supported by many other industries both near to and far from the coast.



Feed Mills NB, NS



Shellfish Socks, Shippagan, NB



Boat & Barge Making, All Provinces

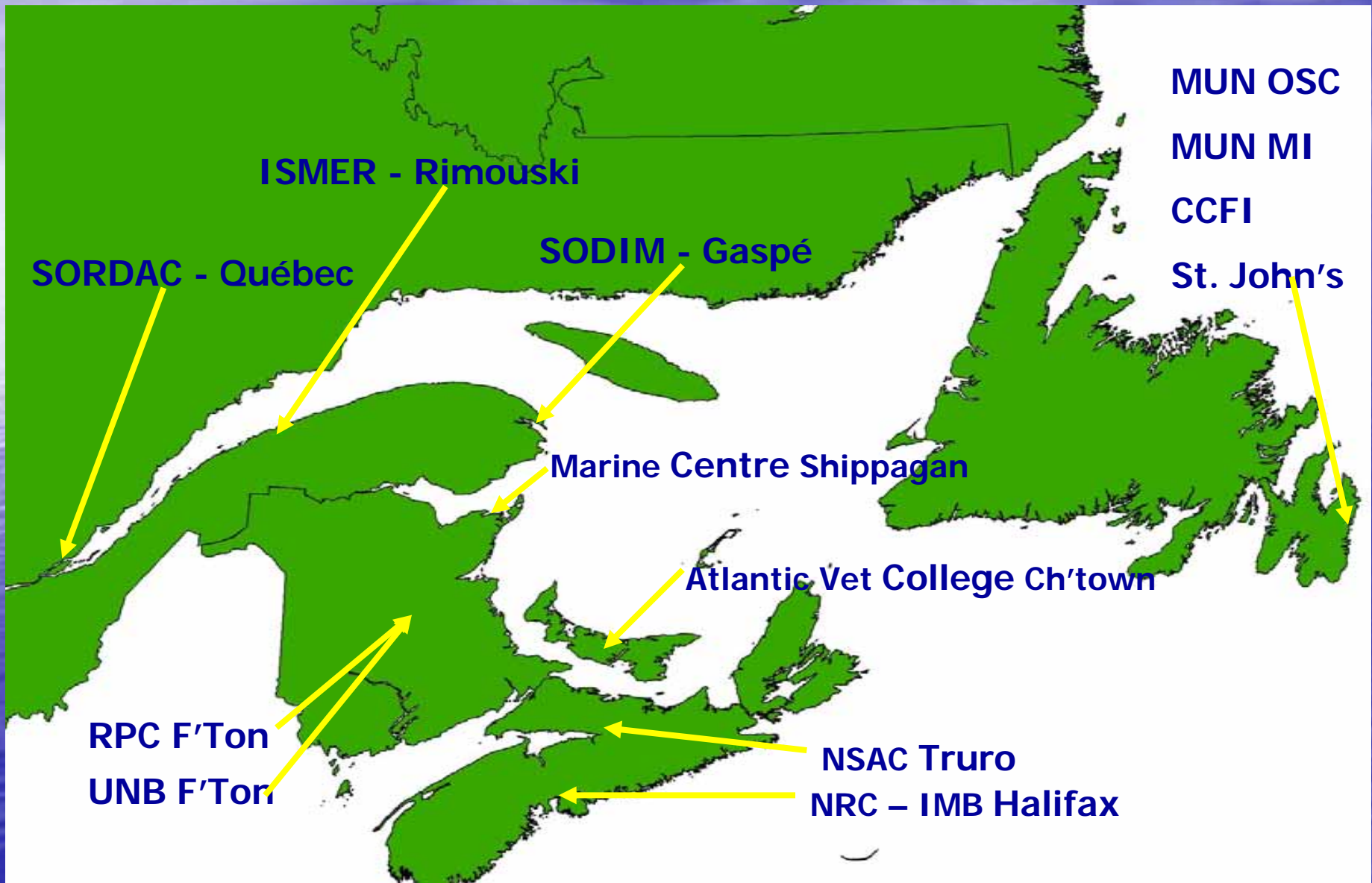


Cage & Net Making, All Provinces

Science Based Industry



Aquaculture Education & Research Institutions



Monitoring & Sustainability

The Industry and Government are working together to provide for Sustainable Aquaculture Development. Programs include:

- Environmental Impact Assessments pre licensing.
- Environmental Monitoring & Codes of Practice.
- Canadian Shellfish Sanitation Program.
- National Aquatic Animal Health Program.
- Processing Plant Quality Management Program (QMP).
- Safe Quality Food Institute Certification Program.



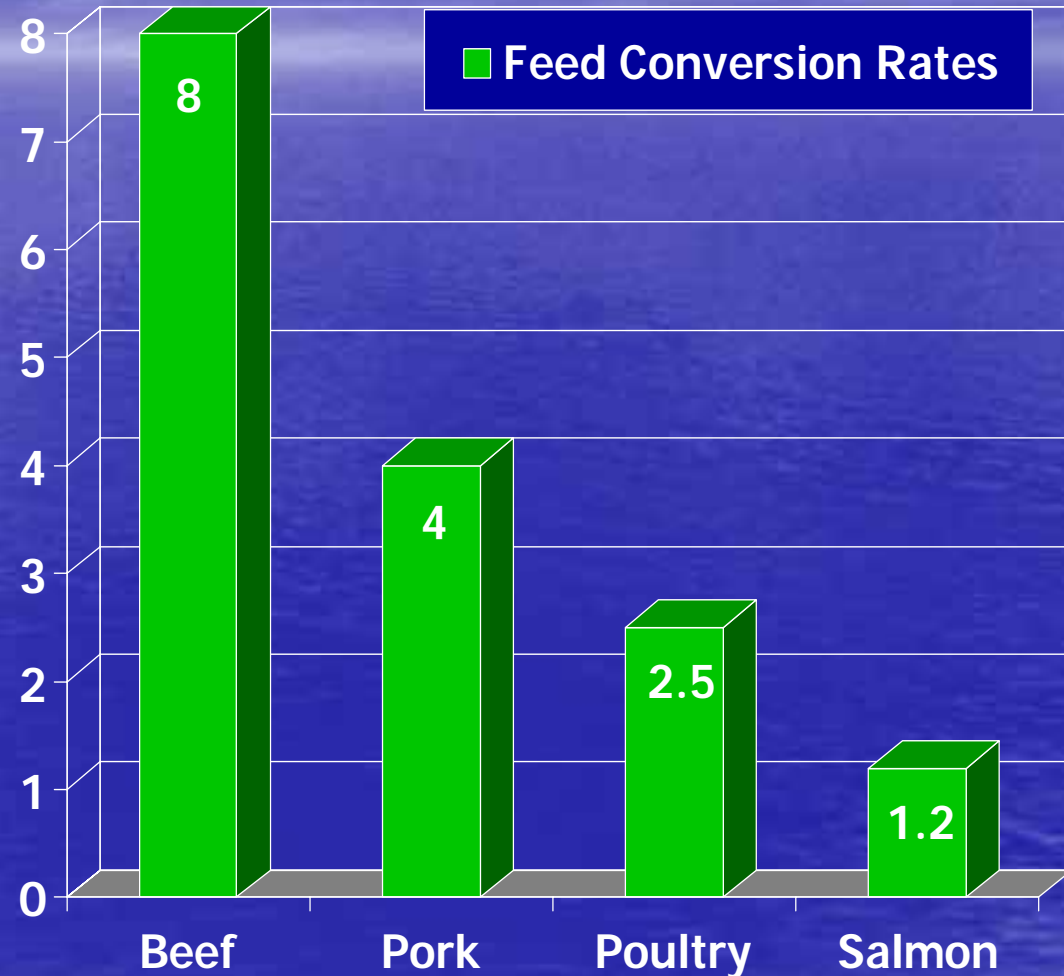
Fish Health Management

- All fish diseases originate in the wild.
- All fish are transferred ONLY after veterinary screening and vaccinated against diseases.
- There is no evidence of disease being transferred from farmed to wild salmon.
- Antibiotics are ONLY administered with a veterinarian's certificate. Farmed fish have the lowest antibiotic use of all farmed animals.

Aquaculture & the Environment

- Fish are the most efficient converter of feed to protein.
- Salmon farming is one of the most efficient food production industries.
- Salmon FCR's of 2.4 kg's in 1984 to 1.2 kg in 2004.
- Freshwater Consumption in Aquaculture is minimal to nil.

Kg of Feed Consumed Per Kg of Live Weight Produced



Source: Stats Canada Vista

Aquaculture Footprint Eastern Canada



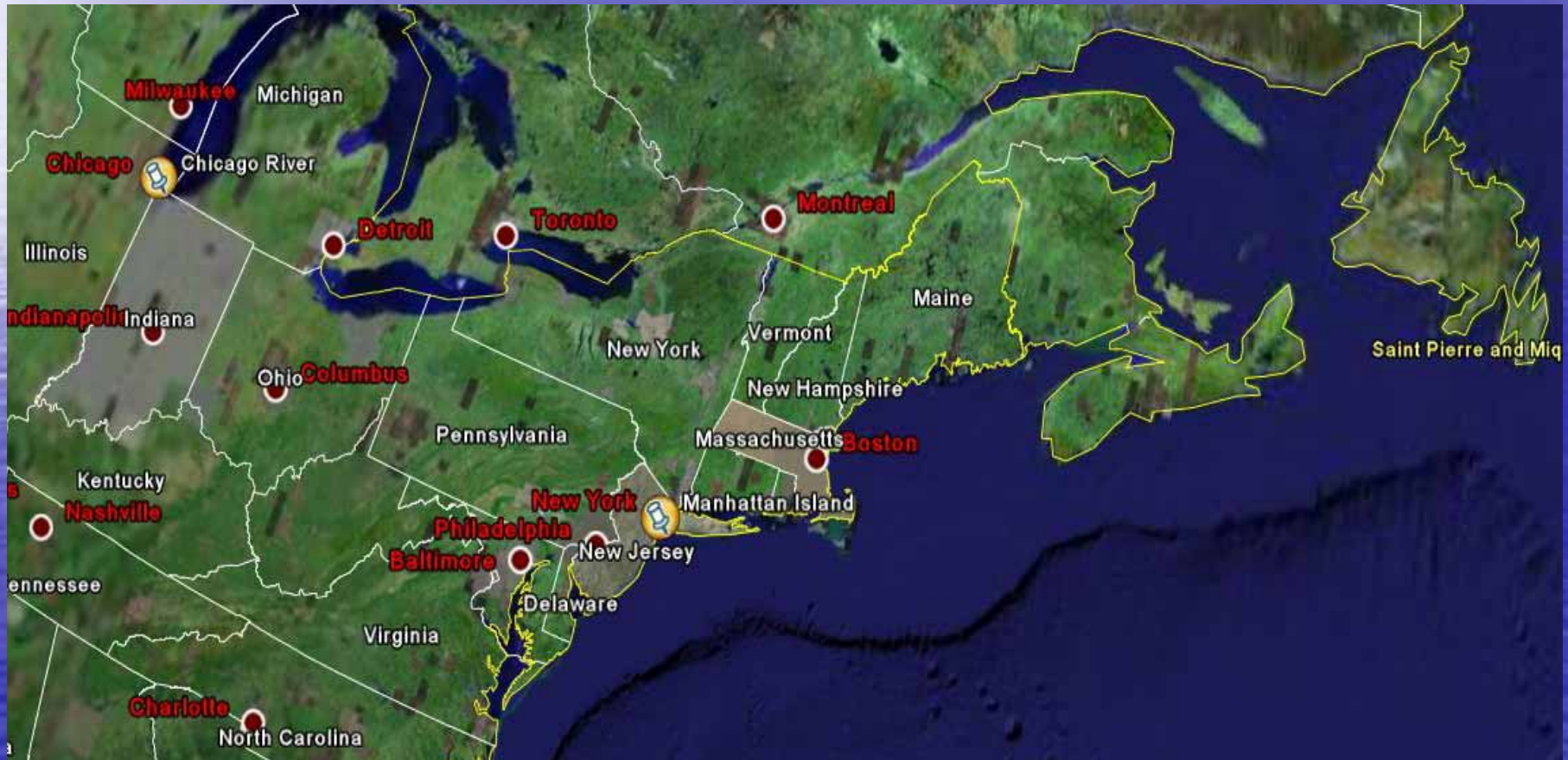
Market Based Industry

Producing Safe, Healthy Food in a Sustainable Environment



East Coast Proximity to Market

- The wealthiest consumer market in the world is on our doorstep.
- No other aquaculture producing area can service it faster or fresher.



Map Source: Google

Market Overview

- US aquaculture imports in the last 10 years have almost doubled from \$1.5 billion to \$2.7 billion.
- Eastern Canada's share of that market is \$US 216 Million.
- Aquaculture's success can be seen in the statistics for per capita growth of various foods in the North American market between 1990 – 2004:
 - Beef, Pork and Seafood overall = No growth.
 - Chicken = 97% growth, success story.
 - Salmon = 2,200% growth due to aquaculture providing fresh, high quality, year round supply.

N. American 2003 Seafood Consumption

| SPECIES | LBS PER PERSON |
|-----------------|----------------|
| Shrimp* | 4.00 |
| Tuna | 3.40 |
| Salmon* | 2.22 |
| Alaskan Pollock | 1.70 |
| Catfish* | 1.14 |
| Cod | 0.64 |
| Crab | 0.61 |
| Tilapia* | 0.54 |
| Clams* | 0.53 |

* Majority of the supply is from Aquaculture

Marketplace Growth Opportunities



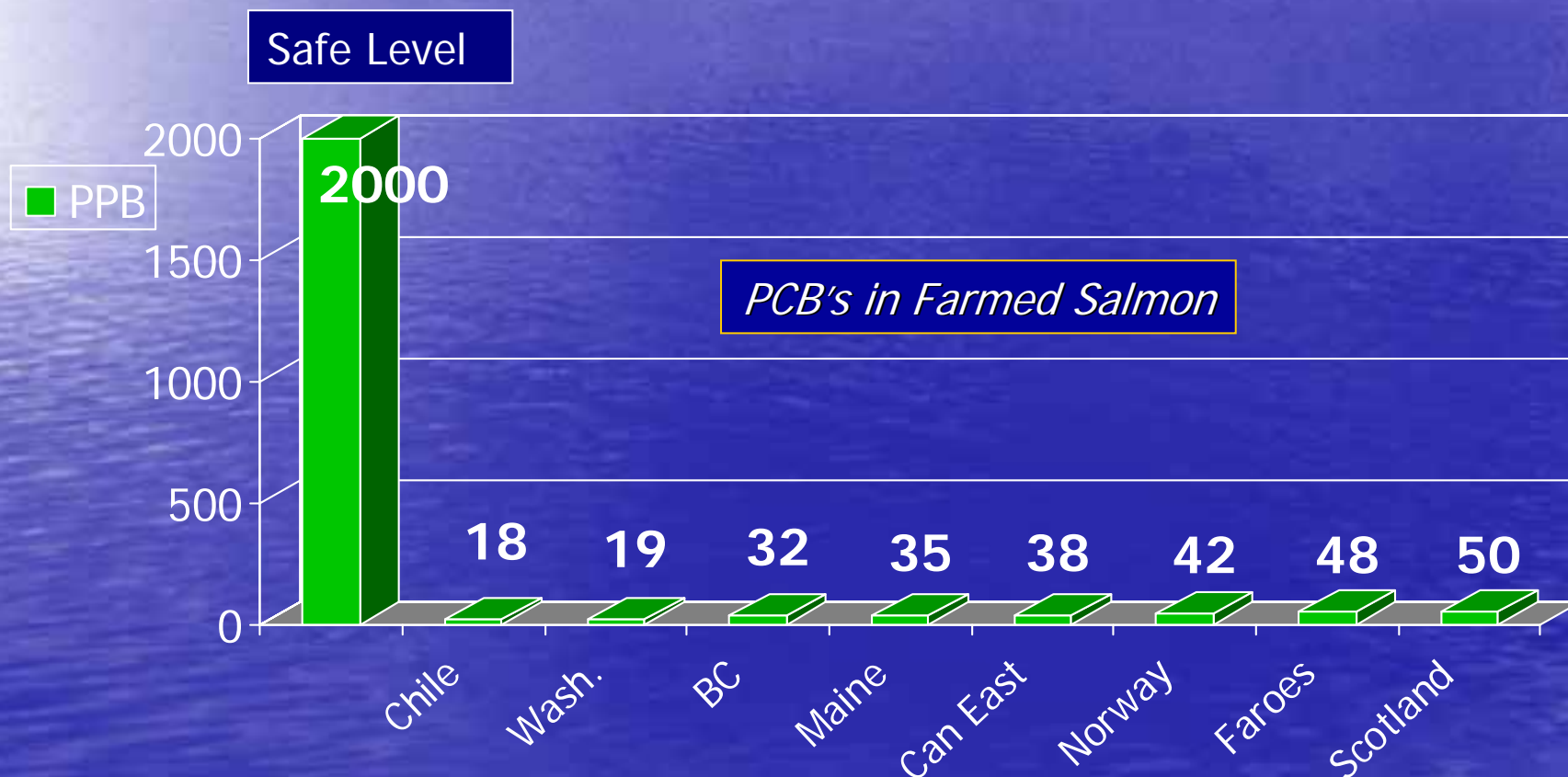
- Heart Healthy Foods.
- Brain Healthy Foods.
- Digestive Healthy Foods - Wellbeing & Sickness.
- Low Fats to Right Fats – Omega 3 Foods.

The opportunity is to educate consumers and the Retail & Foodservice markets about the health benefits of our products.

Source: Future Trends in Food: 2005 Business Insights Ltd Publication

Consumers & Food Safety Issues

A Harvard Research Group found that overblown fears of contaminants in fish could cause consumers to lower their consumption and lose the "substantial nutritional benefits" fish offers, (*American Journal of Preventive Medicine*).



Source: Health Canada & USFDA



The Future for Eastern Canada

An Exciting Socio-Economic Opportunity

Canadian Production Opportunities

| | PROD'N (000's MT) <u>2000</u> | PROD'N (000's MT) <u>2015</u> | VALUE (\$Millions) <u>2000</u> | VALUE (\$Millions) <u>2015</u> |
|--------------------------------------|--|--|---|---|
| Salmonids | 85 | 350 | \$ 511 | \$ 2,100 |
| Cod | - | 128 | - | \$ 545 |
| Other Finfish | 0.5 | 5 | \$ 5 | \$ 30 |
| Mussels | 17 | 52 | \$ 23 | \$ 69 |
| Oysters | 9 | 36 | \$ 14 | \$ 57 |
| Clams | 1 | 4 | \$ 4 | \$ 16 |
| Other Shellfish | 0.1 | 2 | - | \$ 4 |
| <u>TOTAL AQUA</u> | <u>113</u> | <u>577</u> | <u>\$ 557</u> | <u>\$ 2,821</u> |
| + Value Added | | | | \$ 500 |
| + <u>Supply & Service</u> | | | | <u>\$3231</u> |
| TOTAL | | | | \$6,642 |

Source: OCAD/ACOA



Provincial Overviews

Newfoundland & Labrador



The #1 Seafood Processing Plant is on the south coast producing fresh Farmed salmon year round. Aquaculture on the south coast employs 300 people & co-exists with the traditional fishery.



Newfoundland Aquaculture

The opportunity



- 500 years of living from the sea
- Abundant area for development
- Excellent water quality
- Existing infrastructure
- Community acceptance



Newfoundland Aquaculture Capability and expertise



- Skilled workforce
 - Aquaculture
 - Processing
 - Support sector
- R&D Capability
 - Marine Institute
 - Ocean Sciences Centre



Newfoundland Aquaculture Supportive Government



- Aquaculture is a priority for rural economic development.
- Sustainable development strategy
- Streamlined approval process
- Business friendly
 - Aquaculture Loan Guarantee



Prince Edward Island



PEI's \$70 million aquaculture industry co-exists with the traditional fishing, agriculture and tourism industries.



Prince Edward Island



A strong backbone with mussels...

- Year round employment
- Rural jobs
- \$50 million economic value
- Modern processing facilities
- Support institutions





Prince Edward Island

A sea of opportunities...

- An expanding oyster industry
- Potential for off-shore mussel production
- Value-added shellfish products



Prince Edward Island



Finfish – room for development...

- A huge resource of fresh and salt water
- “Disease free” certified facilities
- Expertise in fish health services, diagnostics and training
- Land-based production technology



Prince Edward Island



Constraints must be addressed...

- Aquaculturists take pride in their farmed products
- Investment is needed to address invasive species
- The future is bright if we invest in today



Nova Scotia



A world leader in New Species Development supported by strong research centres of excellence.



Nova Scotians' Opportunities in Aquaculture



- Atlantic halibut, haddock, and cod R&D
- Diversified approach - clam, abalone, marine plants
- New technologies - off-shore facilities, marine & land-based farms
- Jobs for graduates in rural and coastal communities
- Close links with other Atlantic provinces on research and business
- 7400 kilometers of "Coastal Opportunities"



Nova Scotia's Aquaculture Environment



- Provincial department staff monitor sites regularly
- Industry and Dept. promote sustainable use & environmental stewardship
- All marine finfish and shellfish suspended aquaculture sites are monitored
- NS aquaculture sites monitored meet or exceed Env. Can. standards
- World class vet. provide diagnostic and pathology lab services



Nova Scotia - Come to Prosper



- Nova Scotia is well recognized as one of the best R&D places in N A
- Significant strengths in biotechnology, nutrition, fish health and aquaculture
- NS is a brand unto itself with strong NA seafood identification
- Safety of investment and quality of life in Nova Scotia - 2nd to none
- Technical, business, R&D - Nova Scotia has the expertise



Québec : A Tradition of innovation



- More than 150 years of history
- Total sales of 12.4 M\$ (2004)
- Many direct and indirect jobs
- Strong potential, particularly in Quebec's maritime regions



Québec : Freshwater aquaculture



- Freshwater aquaculture responsible for 90% of all aquaculture sales
- More than 2/3 of the sales go to lake and river stocking
- Main species are brook trout (60%) and rainbow trout (28%)



Québec Marine Aquaculture



- Started in the mid-1980
- Commercial production of mussels and scallops and less of urchins and clams
- Sales of 1.2 M\$ (2004)
- Priority for regional development



Québec

Governmental action



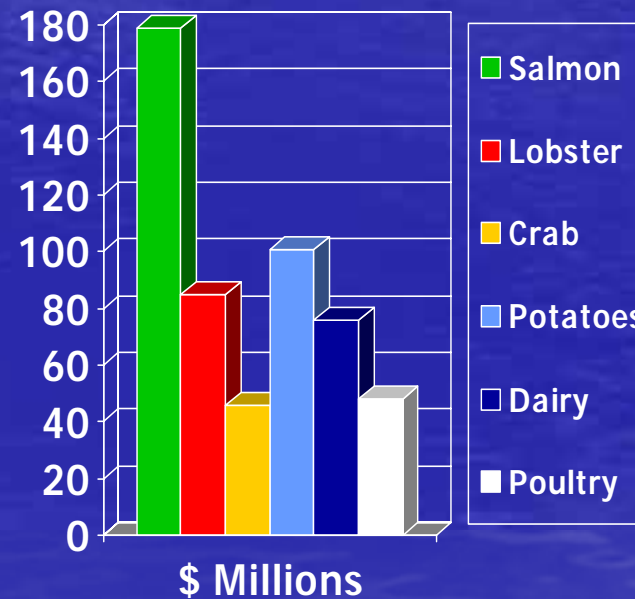
- commercial Aquaculture Act - 2004
- Freshwater Aquaculture Development Strategy in Quebec (STRADDAQ)
- Technical, scientific and financial support to enterprises
- Creation of a corporation for development of mariculture industry (SODIM) and a corporation for research and development in continental aquaculture (SORDAC)

New Brunswick

A Significant Industry



- Second largest aquaculture producer in Canada
- Industry production value of \$181 million in 2004
- Salmon Aquaculture is the largest crop in the Agri-Food Sector with a value of \$179 Million in 2004



New Brunswick Strong Support Sector



- Having grown over the last 25 years, the New Brunswick aquaculture industry is surrounded by a well developed support sector.
 - feed mills,
 - hatcheries,
 - cage & net manufacturing,
 - processing plants,
 - private veterinary practices
 - research institutions
- Vital to the continued development of aquaculture in Atlantic Canada.



New Brunswick

More than just salmon



- The shellfish industry on the province's east coast is also growing significantly
 - oyster industry forecasted worth \$17 million by 2010
 - popular cocktail oysters
 - mussel farming expected to double production
- Alternate species opportunities
 - Canada's only sturgeon facility
 - Halibut and cod at marine sites
 - Broodstock programs for
 - Cod (HMSC -cod genome project)
 - Arctic charr (CZRI)



New Brunswick Supportive Government



- Significant provincial investment in the industry.
 - Loan guarantee program,
 - Fish health unit,
 - Extension services,
 - Research & development support,
 - Strategic planning support for industry,



What Aquaculture Is

- Socially Sustainable.
 - A rural industry for rural Canada
- Economically Sustainable.
 - A financially sound investment in rural Canadian communities
- Environmentally Sustainable.
 - An environmentally responsible industry producing high quality seafood for the world marketplace.

What MP's Can Do

- Get to know your Industry.
- Understand the Issues – dispel the myths.
- Support the existing industry and foster new development.
- Support the Federal and Provincial Governments policy and program initiatives to move this industry forward for the benefit of all Canadians.

A National Strategy for Aquaculture

*"Today, Canadian Council of Fisheries & Aquaculture Ministers (CCFAM) agreed that an **Aquaculture Framework Agreement (AFA)** is the most important step that governments can take to move this critically important seafood sector forward. The AFA is a shared vision for Canadian aquaculture."*

(CCFAM Press Release 06 Oct '05).

Future Policy & Program Initiatives

- Aquaculture Framework Agreement (AFA)
 - Business friendly Governance.
 - Crop Insurance / Income Stabilization
 - Marketing Initiatives
 - Food Safety and Traceability
 - Research & Innovation
 - Development & Commercialization
- We will need your support!