

Petroleum Research Challenges in Frontier Exploration

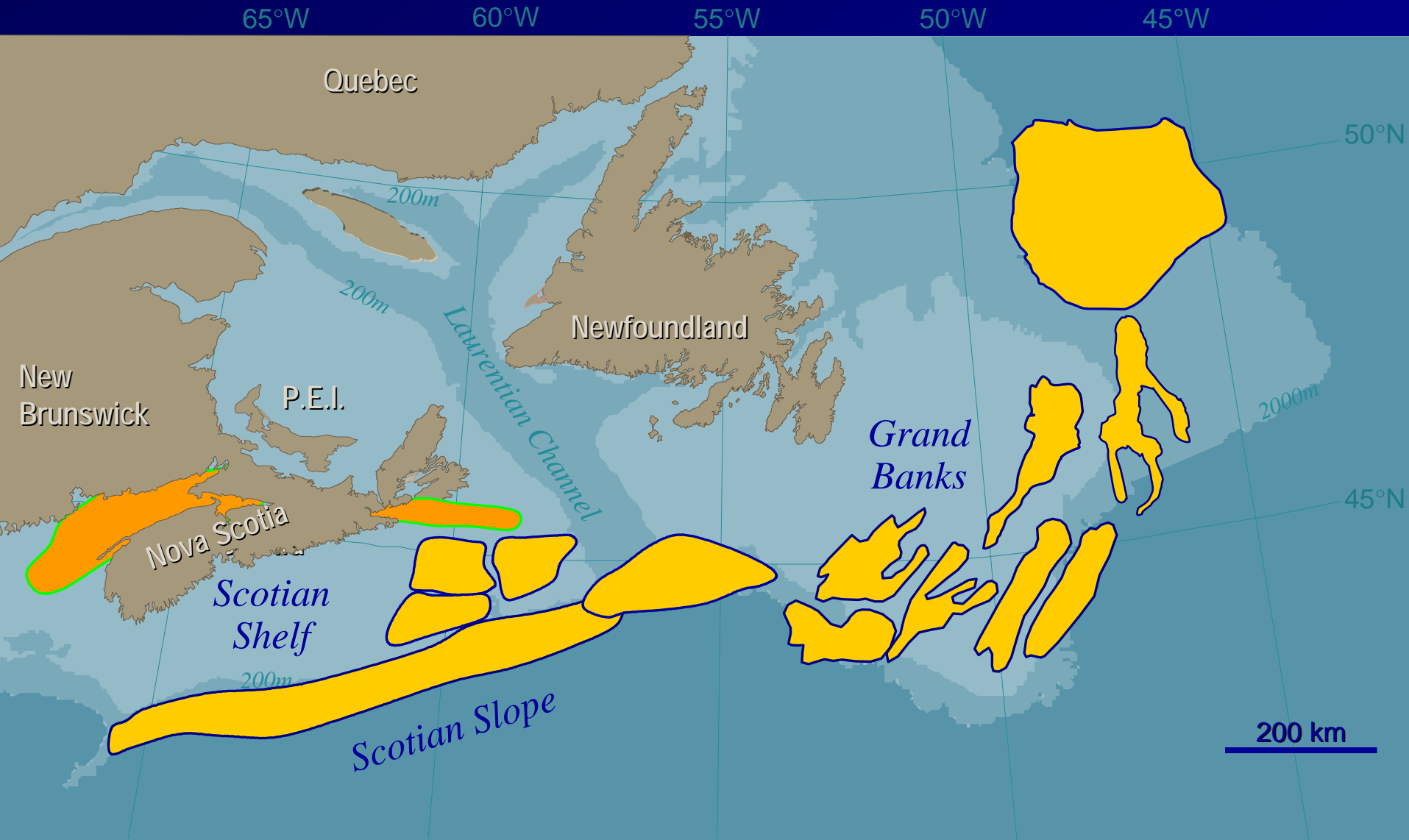
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Presentation Content

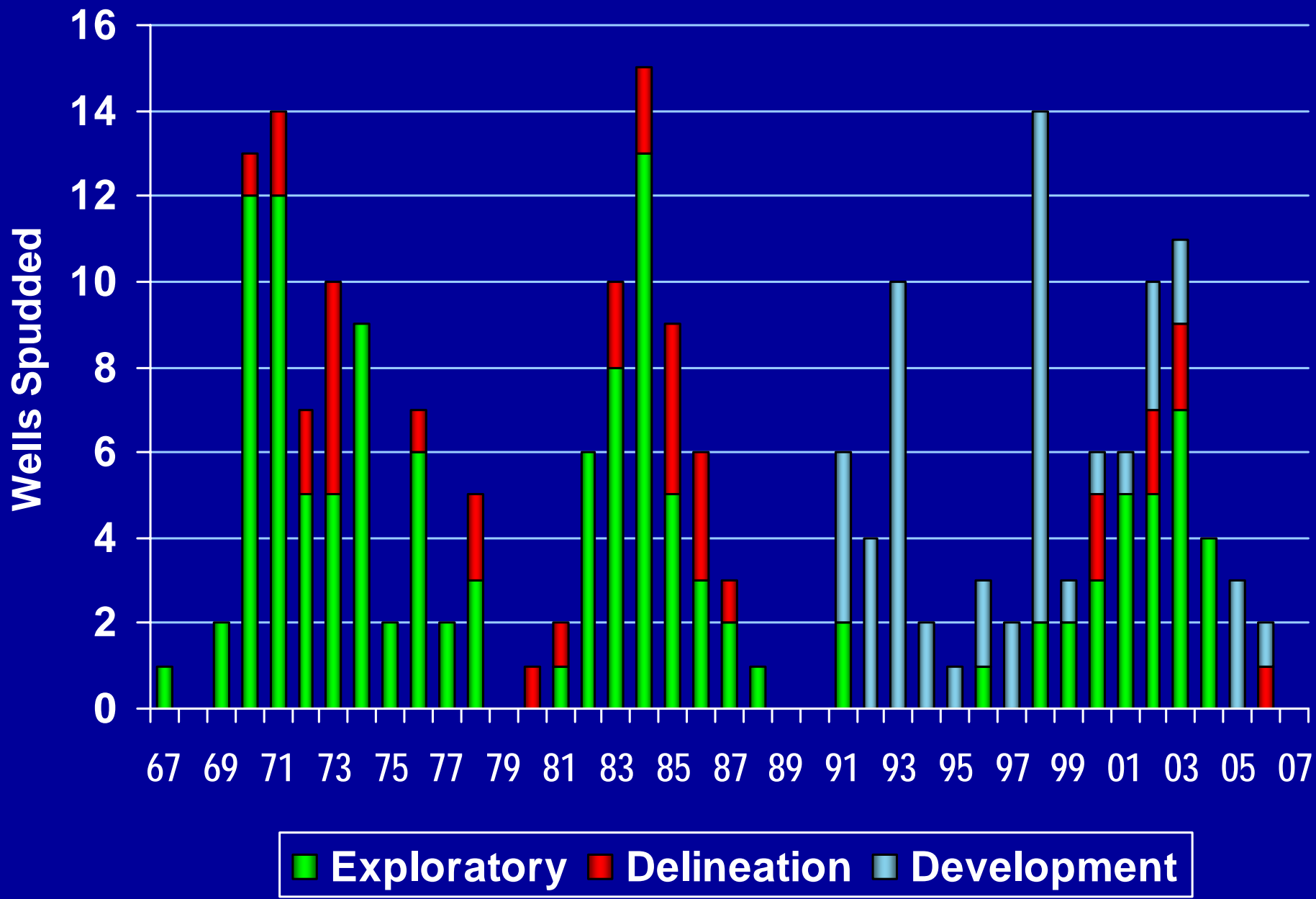
- **Petroleum Exploration in Atlantic Canada**
- **Petroleum Research in Atlantic Canada**
- **Petroleum Research in other Countries**
- **Energy Industry Research Needs**
- **Example of a Frontier Basin Challenges**
- **Summary**

Atlantic Canada

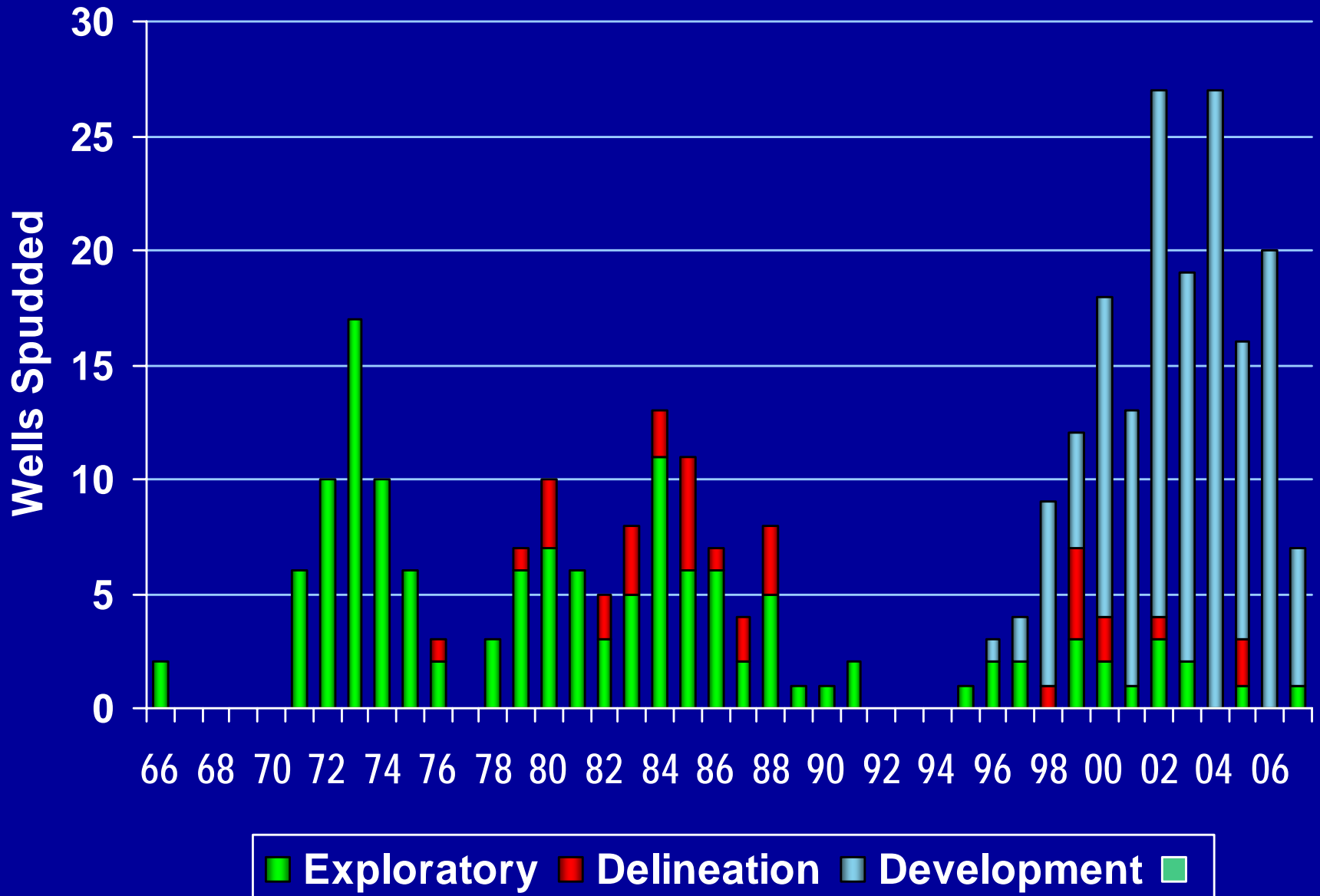
Mesozoic Basins



Wells Drilled Nova Scotia: 1967 - 2007



Wells Drilled Newfoundland: 1966 - 2007



Current State of Geoscience Research in Atlantic Canada

- Currently, all of the Atlantic Universities, except PEI, have Petroleum Related Research
- Money is limited and funding is through NSERC, PRAC, PPSC, Industry Funds
- << then 10% of the Earth Science faculty is focused on Petroleum Related Issues
- Very few Researchers have strong ties to the Energy Industry

Some Examples of Petroleum Research in Atlantic Canada

- Dr. Grant Wach, *Dalhousie*
 - Working on Sedimentology, Stratigraphy and Mineralogy issues in Nova Scotia offshore Basins
- Dr. Georgia Pe-Piper, *St. Mary's*
 - Working on Provenance Studies in the Jurassic and Cretaceous of Laurentian and Scotian Basins
- Dr. Michael Enachescu, *Memorial*
 - Working on Basin Studies in Newfoundland and Labrador Basins
- Dr. Chris Beaumont, *Dalhousie*
 - Salt Tectonics Deepwater Nova Scotia
- Dr. Rick Hiscott, *Memorial*
 - Sedimentology, Stratigraphy of Newfoundland Basins

Petroleum Geoscience Research in Other Countries – The USA

- In the United States, there are a number of geoscience schools focused on Petroleum Research
 - Colorado School of Mines
 - University of Texas
 - Oklahoma University
- These schools receive industry funding, soft money, through Academic\Industry Consortia and Federal and State to support Petroleum Research
- Benefits to focused approach: HQP, Directed Funding, Centres of Excellence
- Marine research is strong e.g. Woodshole, Scripps, Rosenstiel (Florida) private + government money

Petroleum Geoscience Research in Other N. Atlantic Countries – UK, Norway, Ireland

- **Norway**: strong government support and funding for universities and research institutes in petroleum geoscience; relatively free exchanges of experts; large access to modern digital data; encourages publications
- **UK**: specialized petroleum geoscience programs e.g. Aberdeen, Liverpool, Imperial College, Cardiff etc., Industry provide topics and direct financial support for research; Fast dissemination of info through Geological Society publications
- **Ireland**: small country, similar with Atlantic Canada provinces; not large entities; encourages petroleum research through a hybrid *government, academia and local and international consultants* who target specific topics, mix government and industry money (PIP)

Energy Industry Research

- Supermajors all have Research Facilities and their work is generally not shared with the Public
- Most of the Research is Applied; focused on specific G&G or Reservoir issues
- Very little Fundamental Research or desire to spend G&A on this type of Research
- To gain the Fundamental knowledge the Industry relays on Geological Surveys, Consortia and Private Non-Profits like EGI (Energy and Geoscience Institute, U of Utah)
- For marine fundamental and applied research IODP

What do we need in Atlantic Canada?

- More of the following:
 - Faculty members with academic credentials and direct experience in oil and gas business
 - More endowed chairs on specific rather than general topics
 - Courses in petroleum geology, petroleum geochemistry, geophysics, seismic interpretation, economics of exploration, strategy of exploration
 - Recruiting of graduate students from Atlantic Canada and offering thesis with “little known or poorly understood” topics
 - Teaching petroleum geology and seismic interpretation at graduate levels should be a must

What do we need in Atlantic Canada?

- More of the following:
 - More industry grants
 - Industry sponsoring graduate thesis
 - Encouraging young and no so young employees to pursue *targeted* research on Atlantic offshore or general topics
 - Advertising the possibility of petroleum research in Atlantic Universities
 - Industry-academia contacts and exchanges
 - Building expertise through collaboration
 - Acceptance of petroleum related courses taken at other Atlantic Universities, offered by AAPG, SEG, industry training (e.g. IHR)

What do we need in Atlantic Canada?

■ *Focused Research*

- Deepwater Depositional Systems
- Sandstone and Carbonate reservoir Quantification
- Source rock distribution, type and quality
- Structural & Tectonic Framework of Frontier Basins
- Deepwater Depositional Structures
- Biostratigraphic studies
- Age-dating of sediments, Provenance studies
- Stratigraphy and mobile salt tectonics.

Funding Model

- NSERC, PRAC, PPSC (ACOA, CFI)
- Energy Industry Funding of Research through Provincial Funds Derived from Industry Promissory Notes and R&D Funds Related to Producing Assets
- Academic Access to Modern 2D & 3D Seismic Data and Software

Results Communication

- To Ensure success we will need proper and Rapid Communications of results via:
 - Oral and Poster presentations at conferences
 - Peer reviewed journals and
 - Non-peer reviewed journals read by industry professionals
 - Working in teams academic, students, government and industry geoscientists
 - Presentation to interested companies

Summary

- Fundamental and applied research is critical to future Petroleum Exploration efforts
- Atlantic Canada Universities can be Leaders
- Focused Research to intrigue Exploration Companies topics selected in Collaboration with the Industry
- Adequate Communication; more then less
- Industry data Donation and Research Sponsorship will follow results and build Reputations of the Academic Institutions