

# Presentation to Hebron Public Review November 2011

## Ocean Engineering Research Center Faculty of Engineering and Applied Science

### Ocean Engineering Education and Research Activities

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# Presentation Premise

Hebron is a world-class Engineering project in our harsh offshore environment.

St. John's has become one of the world's capitals of Ocean Engineering, largely due to the offshore energy developments, and supported by many companies and institutions with an oceans focus.

Memorial University has a strong oceans focus, as does its Faculty of Engineering and Applied Science.

# Presentation Overview

- 1) Memorial has strong undergraduate and graduate programs in Ocean Engineering. Students are seeking opportunities for work-terms, internships and permanent employment.
- 2) Memorial has many faculty engaged in Ocean Engineering research. Collaborations with the Hebron companies will have a very beneficial impact on the scope and quality of the research.
- 3) We need to grow. We would like the Hebron project and partner companies to support our growth.

## 6 undergraduate engineering programs :

Civil Engineering

Computer Engineering

Electrical Engineering

**Ocean and Naval Architectural Engineering**

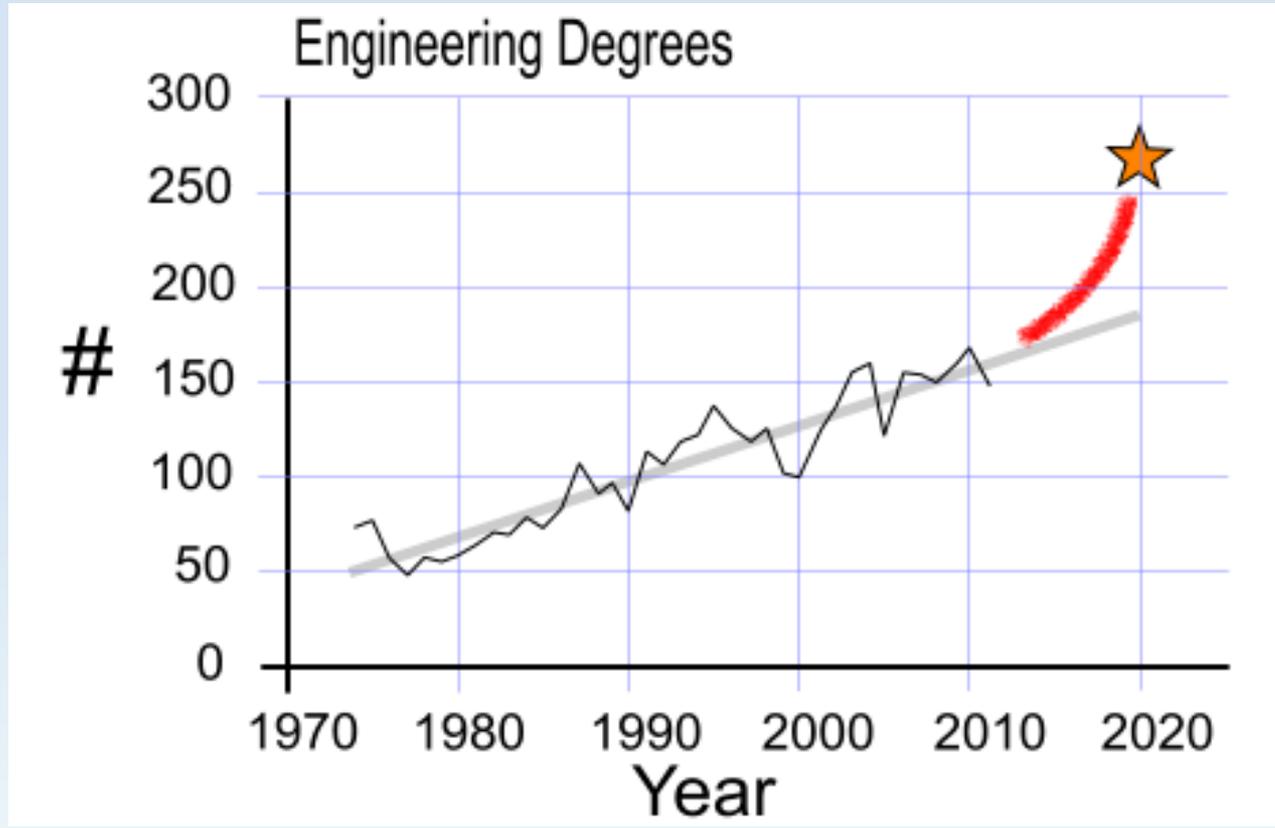
Mechanical Engineering

Process Engineering

All programs have significant ocean activities, though ONAE is totally focused on oceans ...

# Undergraduate...

Steadily growing a quality program...



# Ocean and Naval Program

- highly regarded (CEAB accredited, international links)
- only ONAE program in Canada (though common internationally)
- ONLY co-op ONAE program anywhere
- currently UG classes are 25-30 students
- special strengths include arctic, small craft, safety, submersibles
- 6 regular faculty
- ~ 70 students in funded research positions (WT, Grad.. PD)
- ONAE faculty research funds approx \$5M/yr, with~\$25M total project value (typical project is 3-5 years)

## ◆ Ocean Engineering researchers (examples)

- Claude Daley & Bruce Colbourne
  - arctic ships and platforms
- Shawn Kenny\*\* (Wood Group Chair)
  - arctic pipelines
- Ralf Bachmayer (CRC Chair)
  - underwater intelligent systems
- Heather Peng & Wei Qiu
  - marine & offshore hydrodynamics
- Faisal Khan\* & Brian Veitch
  - offshore process safety & maritime safety
- Lesley James\* & Thormod Johansen\*
  - reservoir engineering & enhanced oil recovery

These faculty are in ONAE except

\* Process Engineering

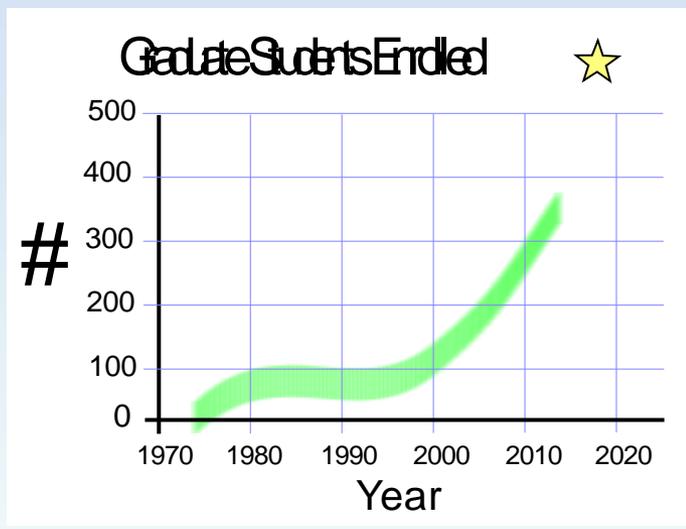
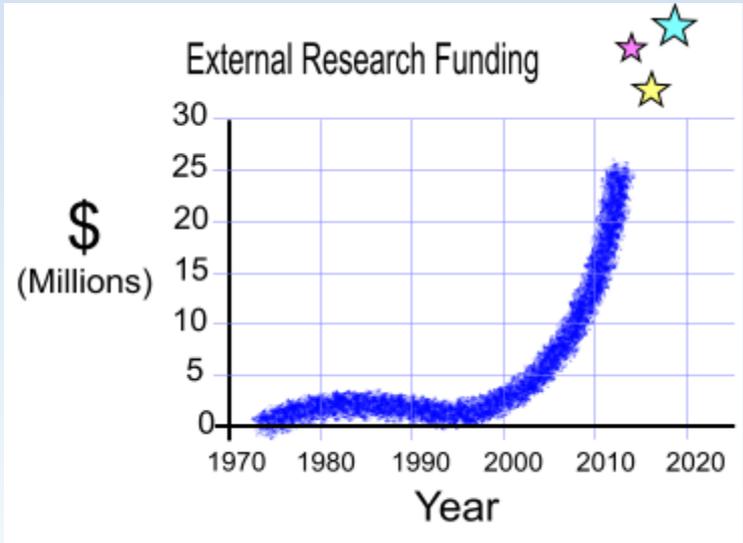
\*\* Civil & Process engineering

Ralf Bachmayer



# Growth in Research and Graduate Studies...

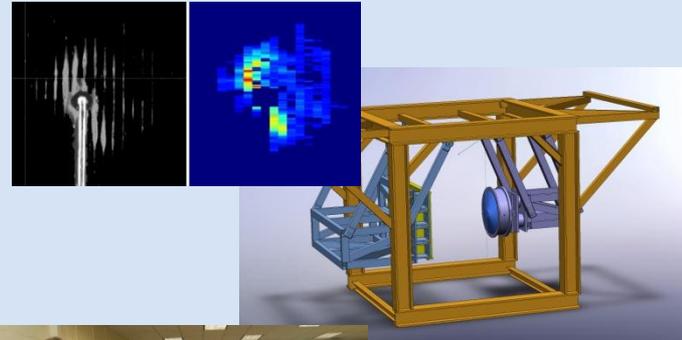
- Faculty-wide research funding 2011-2012 over \$20 million.
- Growth is strongest in Canada



# Major Research Activities ...

## ◆ Selected examples

- Sustainable technology for polar ships & structures
  - Focus on the platforms
  - Large experiments and num.modeling
  - Practical design tools
  
- Autonomous ocean systems lab
  - Ocean gliders
  - Under ice missions in support of operational oceanography
  
- Virtual environments for knowledge mobilization
  - Maritime simulation technology prototyping
  - Human factors
  
- Exploration drilling technology
  - Prototyping vibration assisted rotary drilling
  - Experimental drilling facility



# Summary, Comments and Recommendations...(1)

- there is strong Ocean Engineering group at Memorial
  - We welcome the Hebron project
  - We look forward to opportunities for collaborative research
  - We encourage input on our educational programs and directions
  - Our students are seeking a variety of employment opportunities : work terms, internships and permanent employment

# Summary, Comments and Recommendations... (2)

**workterms** are mandatory for all Engineering students at Memorial:

- Placement rates are high...but
- We have ~520 engineering students (all disciplines) looking for a WT in Jan 2012.
- Younger students have a challenge to find 1<sup>st</sup> work term (are not allowed to go to US)
- All our students need experience (A, B and C students) – we want to serve the entire class, and not just the top few.
- Our international undergraduate students face a 4-level challenge: language, culture, connections and legal status
- We ask that Hebron be aware of these concerns and help provide challenging and successful work term opportunities.

# Summary, Comments and Recommendations... (3)

research opportunities are greatly helped when industrial partners get involved:

- Funding can be leveraged (4:1 on private sector is common)
- The research focus gain 'realism'
- Graduate students gain contacts and internship opportunities
- Programs such as NSERC-CREATE and MITACS require graduate students to have a 4-month internship with an industrial partner.
- Research results are fed back to industry practice (and v.v.)

# Summary, Comments and Recommendations... (4)

The faculty of Engineering needs to **Grow**:

- Specific support for research, chairs and scholarships is very useful. But...
- we need to be more ambitious.
- we believe that a much larger Faculty would serve the interests of the province and the industry
- More students, faculty, staff, office space and lab space
- A focus on Oceans and Energy is important, but so is wide support of the many branches of Engineering.

We would like the Hebron project and partner companies to support our growth and help us reach our educational goals.

Thank you for your attention .....