Research Update

Jennifer Matthews
Fundy Ocean Research Center for Energy
fundyforce.ca
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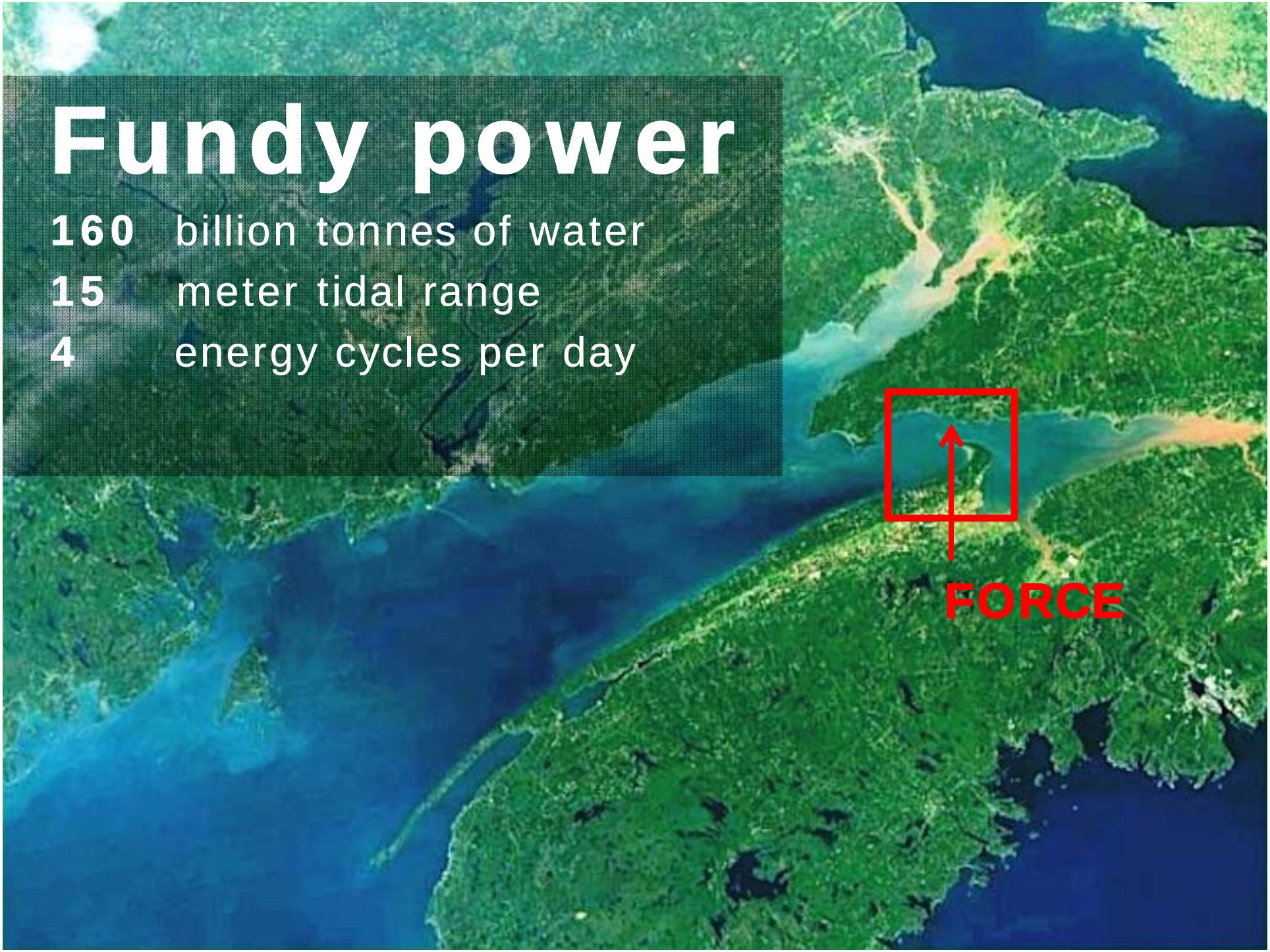
Overview

- FORCE overview
- Highlights
- Research update
- EEM Program
- Emerging research priorities
- Questions

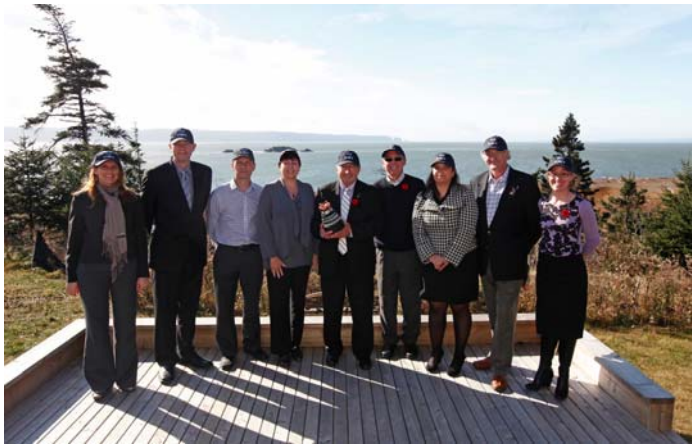

Fundy power
160 billion tonnes of water
15 meter tidal range
4 energy cycles per day
FORCE

Key functions

1. ***Catalyst***: lower barriers to innovation by providing developers and researchers an approved, grid connected test site; promote collaboration.
2. ***Watchdog***: conduct environmental monitoring in the Minas Passage, with emphasis on fish and marine life effects.
3. ***Research***: collaborating, supporting and directing research including resource assessment, subsea mapping, current profiling, near and far field effects, and technical problems.

INCREASED EMPHASIS ON RESEARCH

Staff

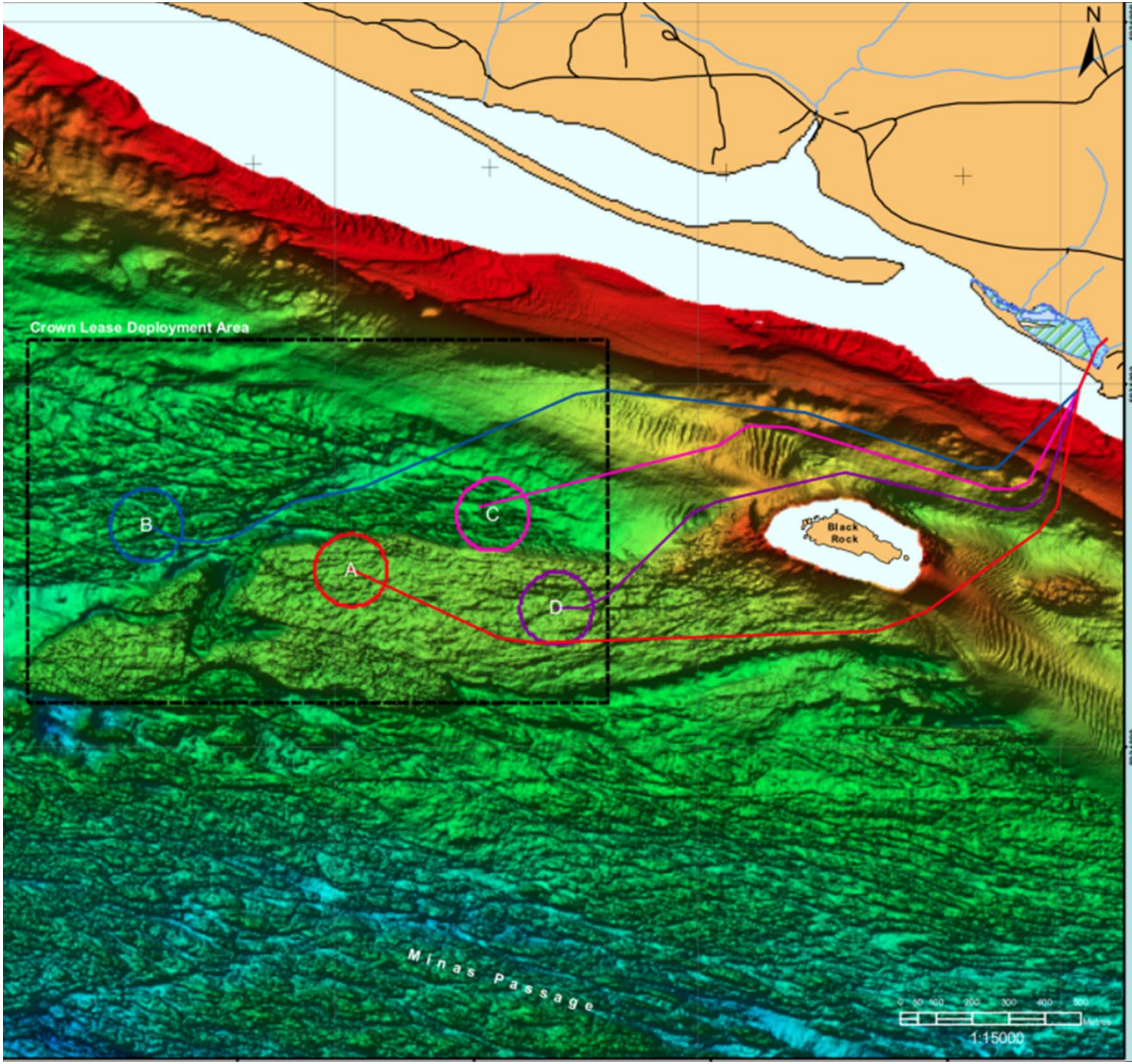


(report to Board of Directors)

- **Executive Director** – Doug Keefe
- **Capital Projects** – Frank LeBlanc
- **Operations + Research** – Jennifer Matthews
- **Environmental Programs** – Joe Kozak
- **Communications** – Matt Lumley
- **Marine Operations** – Tony Wright
- **Visitor Centre** – Mary McPhee
- Student assistants
- Various consultants

Highlights

- Site identified
- Environmental Assessment complete
- Advisory committees established
- Commercial-scale device deployed + recovered
- Environmental monitoring ongoing, first report complete
- Observation facility complete
- Submarine cable fabricated, onshore electrical near complete



LEGEND

- Route to site A
- Route to site B
- Route to site C
- Route to site D
- Crown Lease

Turbine Generator Berths: A, B, C, D

-80 m -60 m -40 m -20 m -1 m
Depth

GEODETIC INFORMATION

Datum:	WGS84
Spheriod:	WGS84
Semi Major Axis:	6378137.000
Inv. Flattening:	298.257224

PROJECTION PARAMETERS

Projection:	Universal Transverse Mercator (UTM), Zone 20 North
Latitude of Origin:	0° 0' 0"
False Easting:	500,000 m
False Northing:	0 m
Central Meridian:	63° West
Grid Units:	meters
Scale Factor at Central Meridian:	0.9996

ENGINEERED CABLE ROUTES OVER CHS MULTIBEAM

FORCE
FUNDY OCEAN RESEARCH CENTRE FOR ENERGY

Prepared for:

INTERNATIONAL TELECOM
297 Hymus Blvd.
Pointe Claire, Quebec
Canada
H9R-1G6

Prepared by:

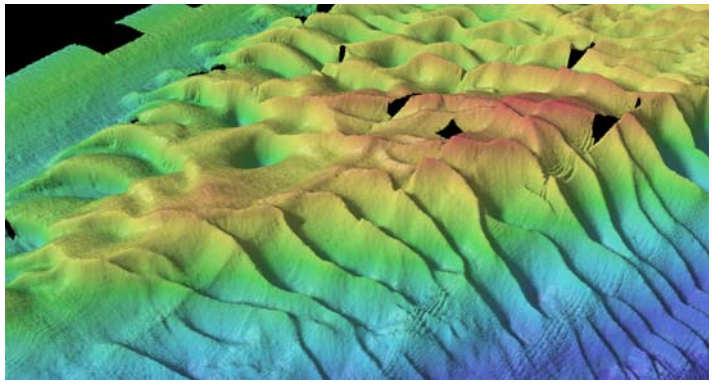
SEAFORTH GEOSURVEYS
Paddlers Cove
300 Prince Albert Road, Suite 200
Dartmouth, Nova Scotia
Canada B2Y 4J2
Phone: (902)468-3579
Fax: (902)468-6885
http://www.seaforthengineering.com/

Rev/No.	Revision	Signed	Date
A	DRAFT FOR REVIEW		11-Feb-10
B	UPDATED ROUTES A		17-Mar-10
C	UPDATED ROUTES		31-Aug-10
GS/AA	CHECKED / CB		
	APPROVED		

Map #: SEG-612-FORCE-007-C

Monitoring Oversight

- **Environmental Monitoring Advisory Committee (EMAC)** formed as independent advisor on environmental effects monitoring (EEM)
- Ongoing EEM by FORCE and developers
- EMAC identified key priorities as fish and mammal strikes and behaviour
- Reports available online: fundyforce.ca/monitoring



FORCE EEM for 2011

EEM Program for 2011 – Report to be available in June/July 2012

- Seabird and Marine Mammals – from shore/vessel observations
- Passive Acoustic Monitoring (PAM) for marine mammals study
- Fish movement – acoustic tagging/tracking study
- Lobster Movement – acoustic tagging/tracking study
- Benthics characterization study –based on existing data

FORCE EEM for 2012

EEM Studies underway or planned for 2012:

- Seabird and Marine Mammals – from shore/vessel observations
- Passive Acoustic Monitoring (PAM) - marine mammals study
- Fish movement – acoustic tagging/tracking study
- Lobster Movement – acoustic tagging/tracking study
- Marine Noise – hydrophone measurements of background noise at Reference site completed. Demo area planned for late spring/early summer
- Fish migration – analysis of existing weir catch data to be completed this year, with field studies in 2013

Research

Research plan finalized, including additional:

- SOPs,
- Multi-beam,
- Side-scan sonar,
- ADCP,
- Acoustic monitoring,
- Fish monitoring, and
- Met ocean station development

Available Data

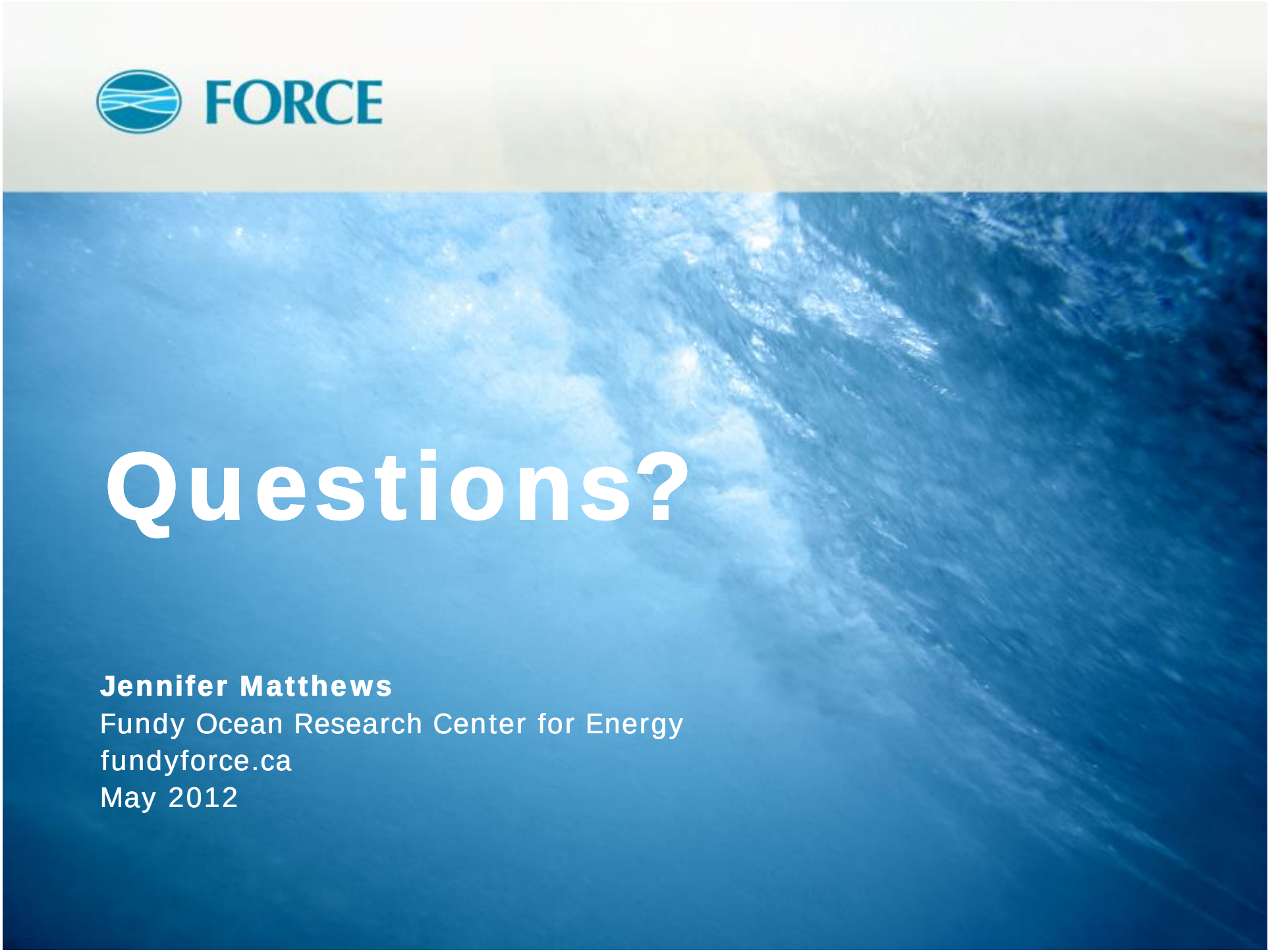
- **FORCE is making data available via TLA to advance research**
- Multi-beam
- Sidescan sonar
- ADCP
- Photography

Emerging Priorities

- Additional requirements to characterize the site;
- Mooring design for equipment is key;
- Global need to work on end termination technology, connectors, repair and power converters;
- Economical deployment, maintenance and retrieval of devices;
- Monitoring equipment that will withstand high flow environments.

*** Collaborative approach is required!**


FUNDY TIDAL
RESEARCH



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