

RV Falkor Technical Cruise Support 2013 - 2015

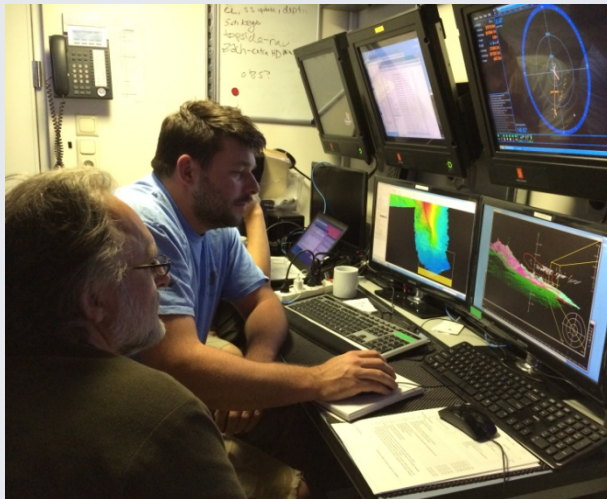
Leighton Rolley – Lead Marine Technician





Introduction

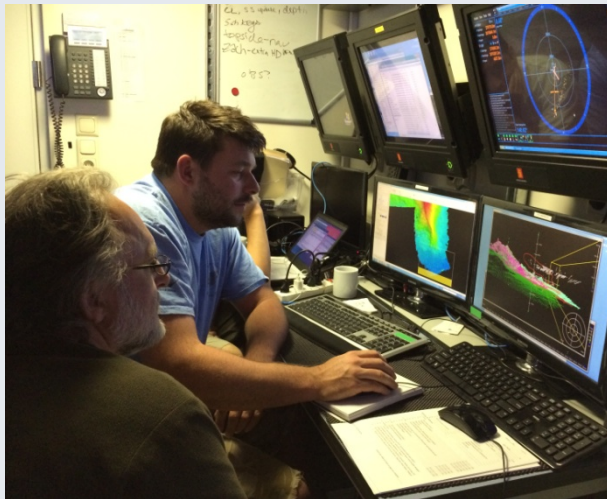
- Overview of Technology Driven Cruises 2014 – 2015
- Challenges - *There are no secrets to success. It is the result of preparation, hard work, and learning from failure.*
- Changes to science systems and technical support





Marine Technician Team

- 3 Marine Technicians - (Veit, James and Paul)
 - Access to temporary technicians based on mission requirements
- 2 Lead Marine Technicians (Leighton, Colleen) – 2015
- Science Services Manager (Shore side) – 2015
- 24hr science support – Typically 1 LMT, 2 x MT's
- *Maximizing platform system usage with the aim to meet and exceed PI's cruise objectives*





SOI
Cruises

2014
-
2015

Science Expeditions 2014/15

2014 Expeditions – 10 expeditions

FK12L010 – Andy Bowen – Hybrid tether tests

FK140218 – Adrienne Copeland – Student cruise 1

FK140307 – Chris Kelly – Multibeam Mapping

FK140418 – Student Cruise 2 – Multibeam Mapping, VMP/CTD

FK140502 – Chris Kelly – Multibeam Mapping

FK140613 – Student Cruise 3 – MOCNESS, CTD

FK140626 – **Brian Glazer** – **AUV/CTD**

FK141015 – Mike Coffin – Mapping EM302, EM710

FK141109 – **Jeff Drazen** – **SOI 11km Landers**

FK141215 – Doug Bartlett - Landers

2015 Expeditions – 6 Expeditions

FK150117 – Amy Waterhouse – Tasmin Sea CTD, ADCP

FK150301 – **Malcolm McCulloch** - **ROV**

FK150324 – **Oscar Pizaro** – **Multiple AUV's, ROV**

FK150410 – **Greg Ivey**

FK150523 – Satish Singh – Seismics, Multibeam, Knudsen, Maggie

FK150728 – Kelvin Richards – CTD/ADCP

2015 Science program impacted by loss of NEREUS AUV



Core Platform Systems

Acoustics

EM302

EM710

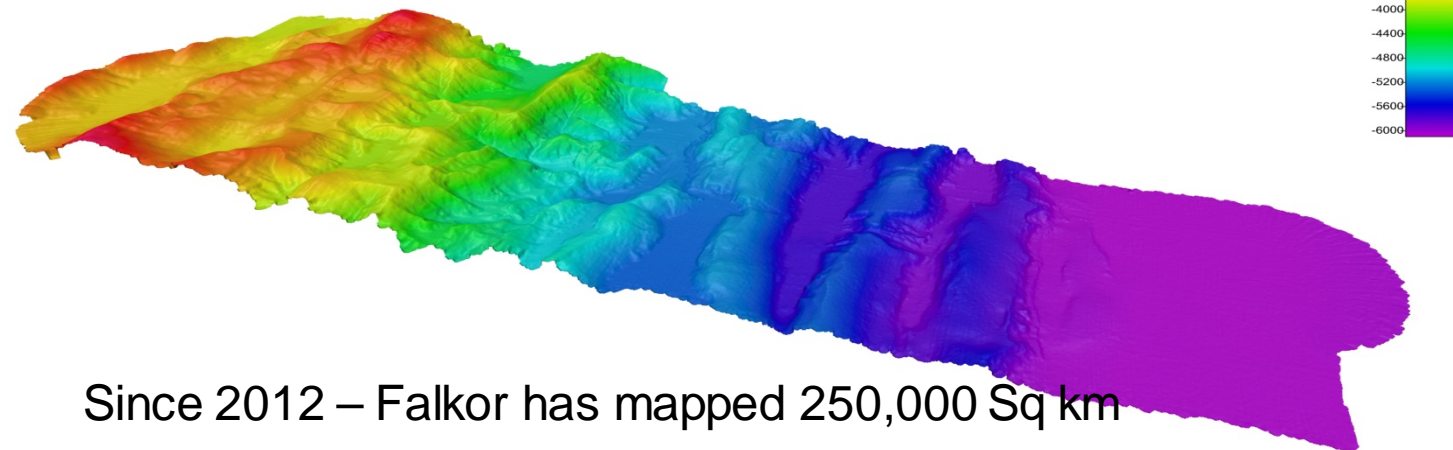
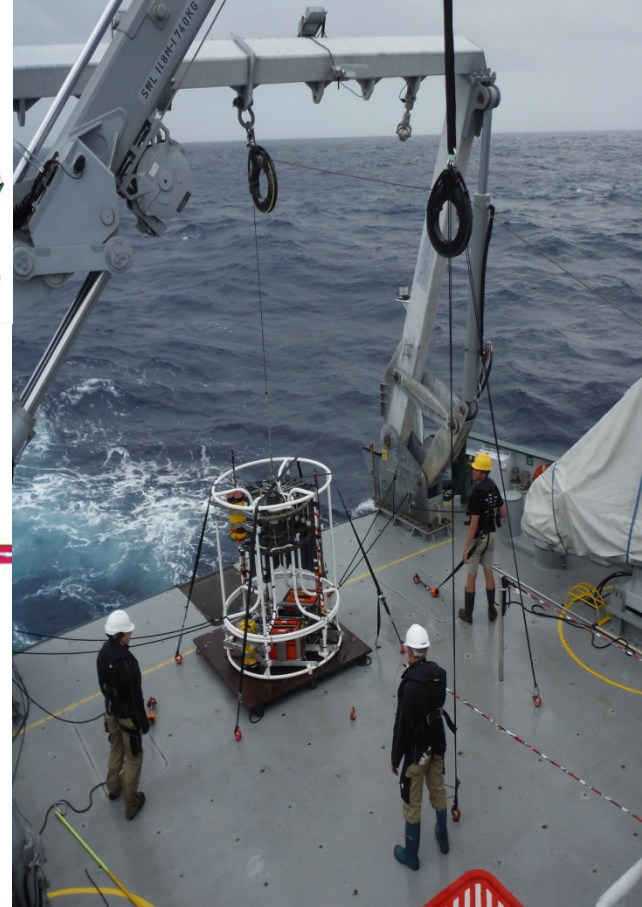
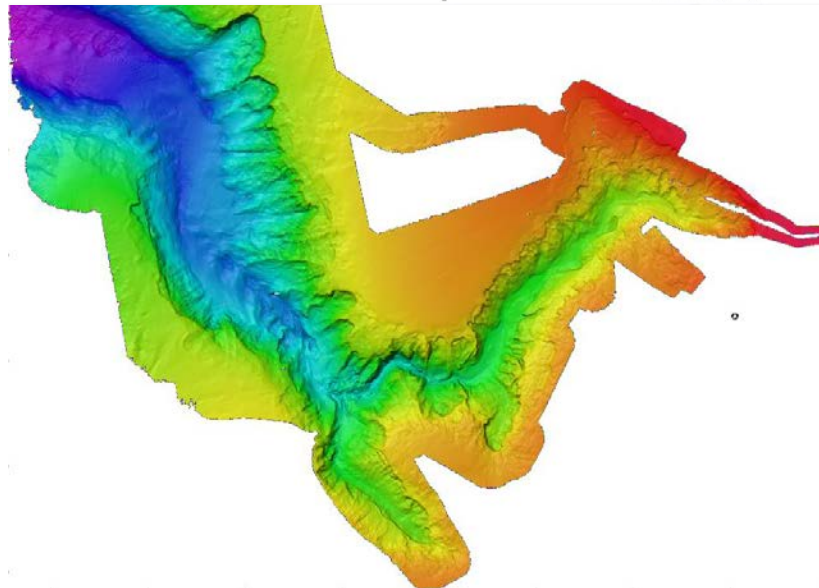
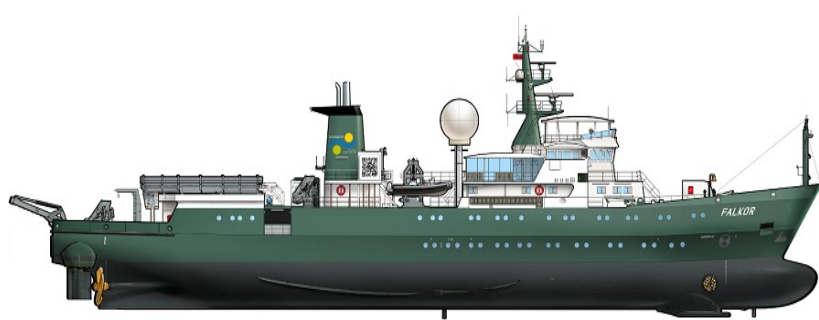
EK60

USBL

EA600

CTD

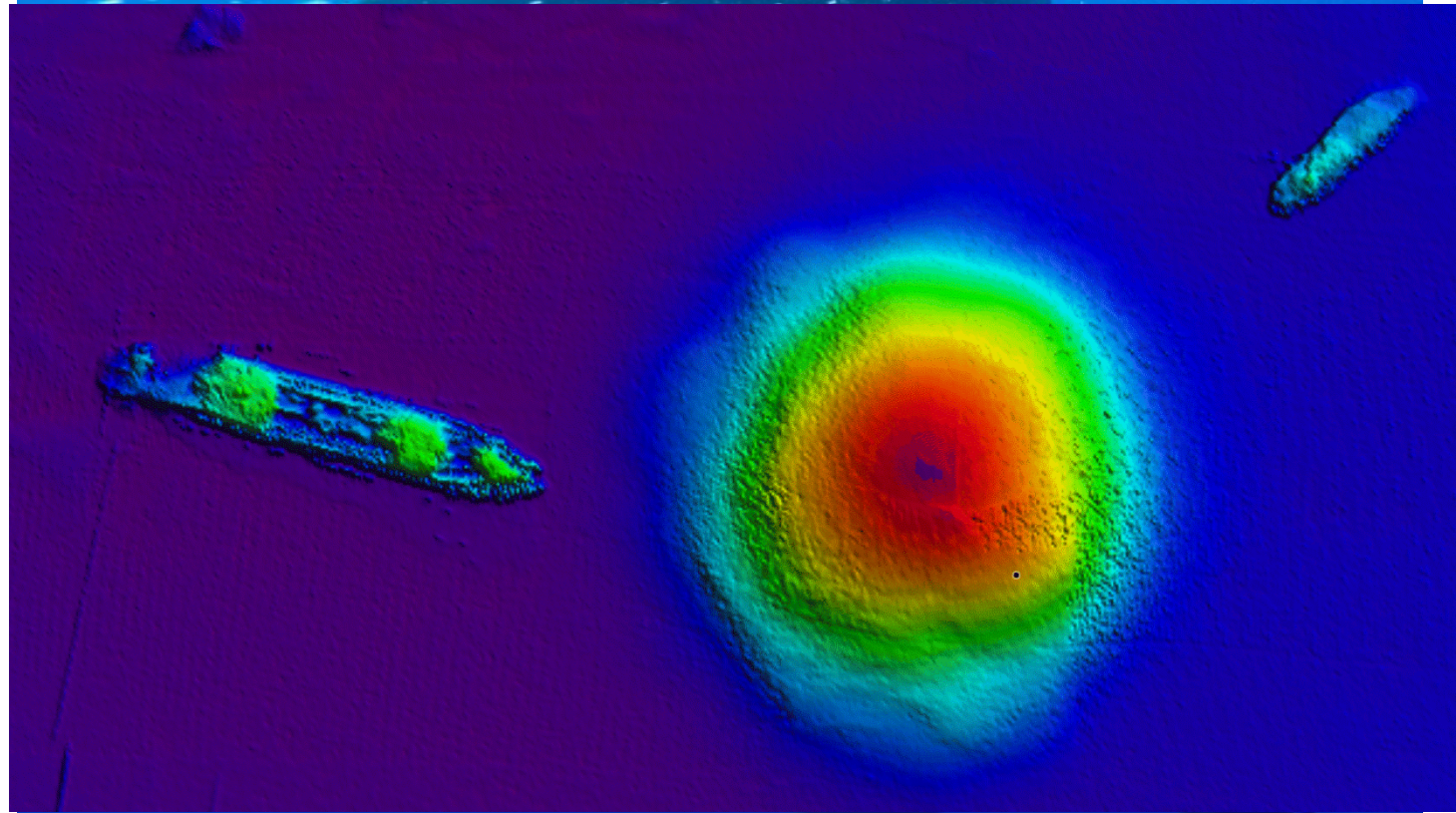
Maggie



Since 2012 – Falkor has mapped 250,000 Sq km



Best Multibeam Platform!



An underwater photograph of several dolphins swimming in clear blue water. The dolphins are dark grey or black, and their sleek bodies are visible as they move through the water. The background is a deep, vibrant blue, and there are some small white specks, possibly bubbles or particles, scattered throughout the water.

Multi Component Technology Driven Cruises

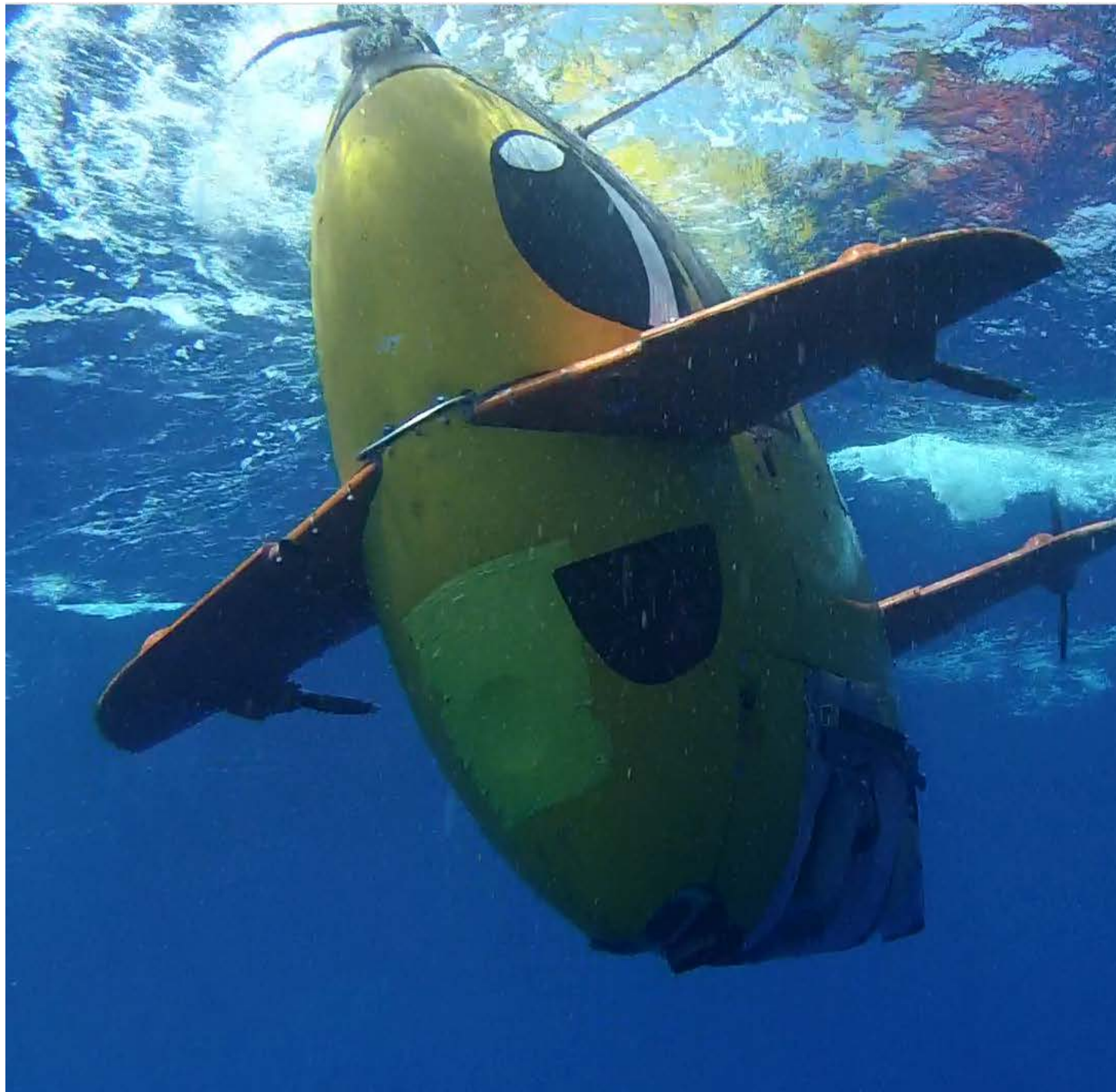
Platform and portable systems



2014

FK140626

Brian Glazer

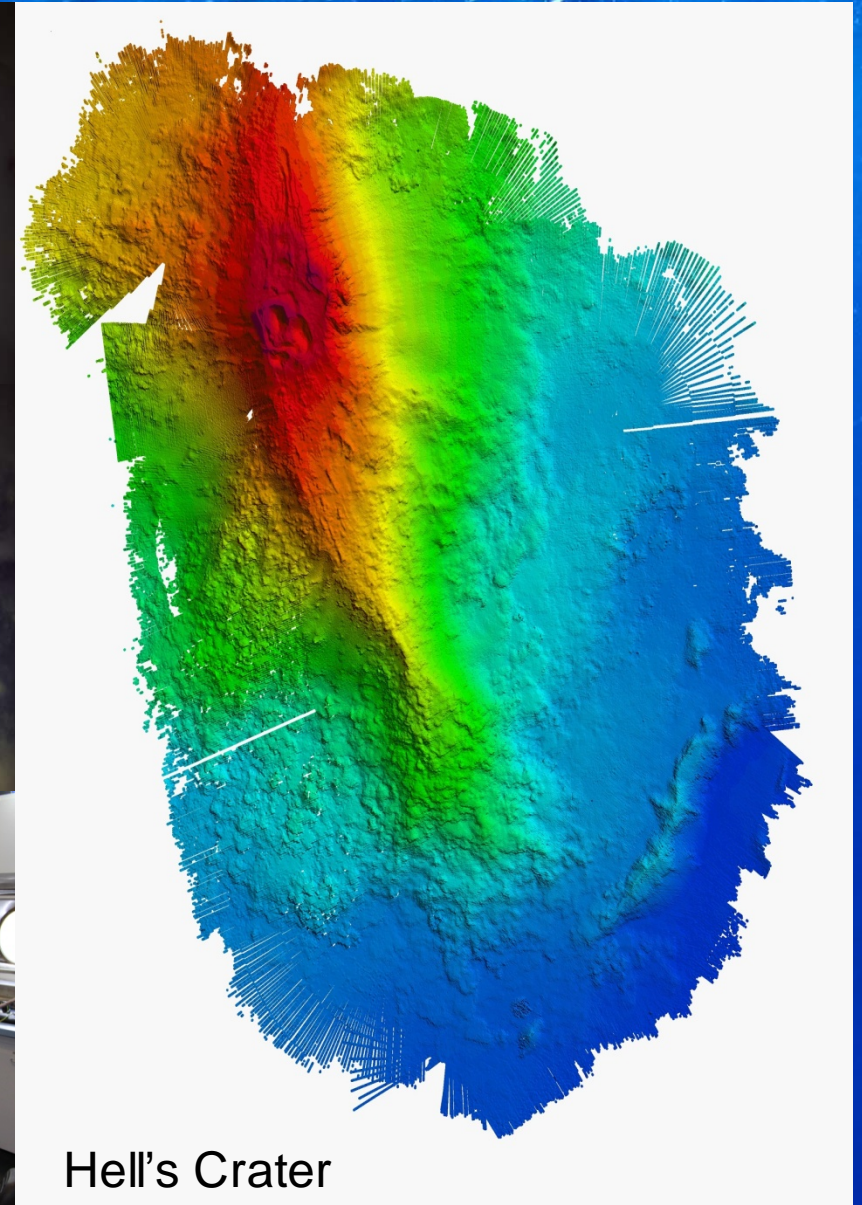
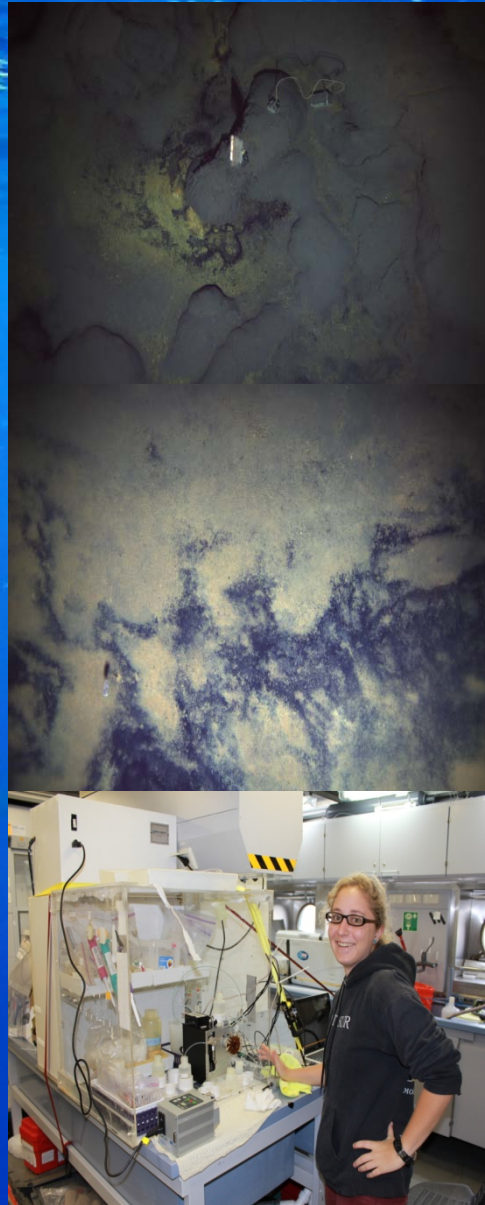




CTD

EM302

Sentry AUV





November
2014

FK141109

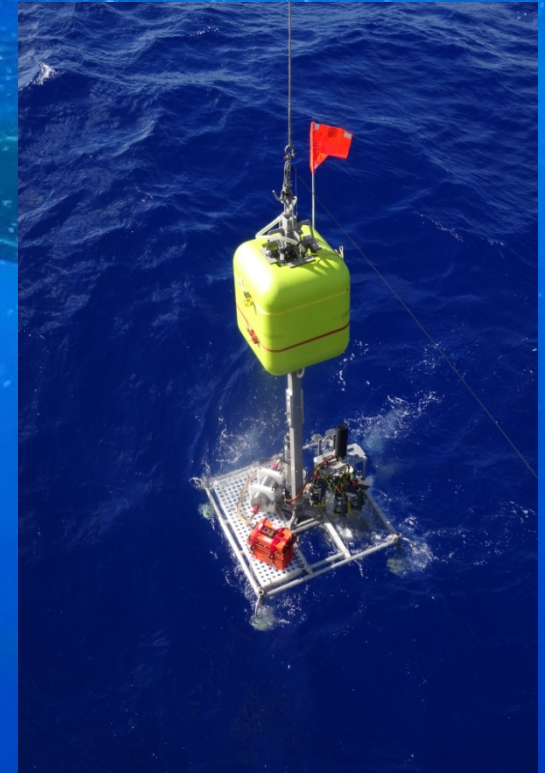
Jeff Drazen

- Initially NEREUS AUV Cruise
- SOI 11k Landers
 - Lander design verification
 - Corer/Camera – Deepest Fish
 - Box corers
- EM302 Multibeam – 10,000m
- Aberdeen Camera Trap
- Baited traps



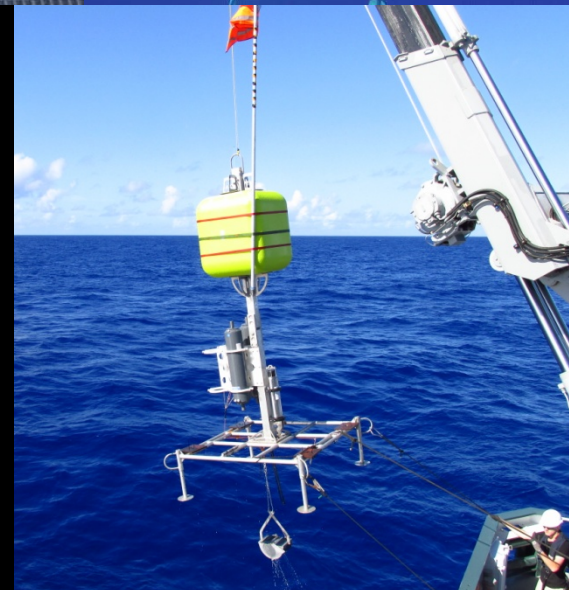
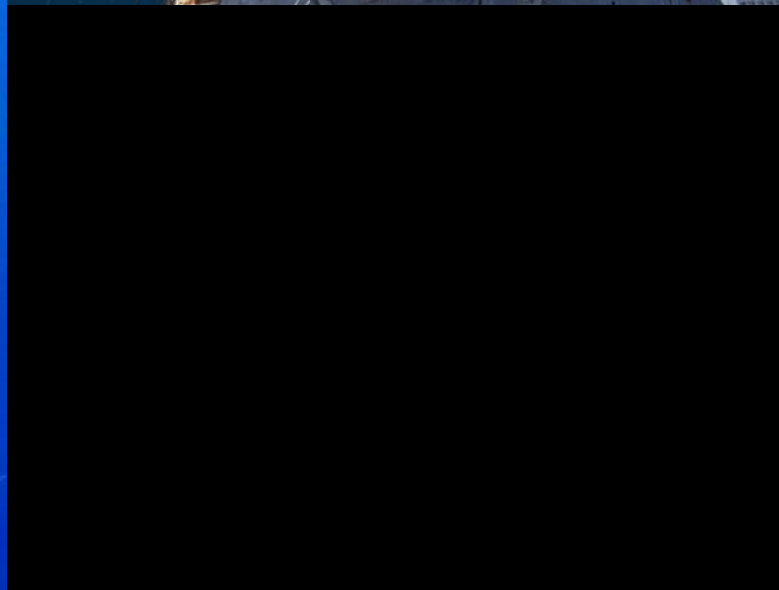
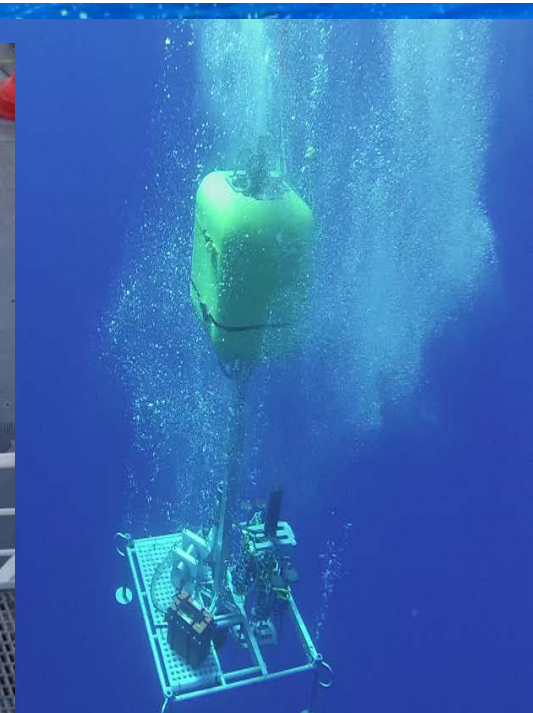
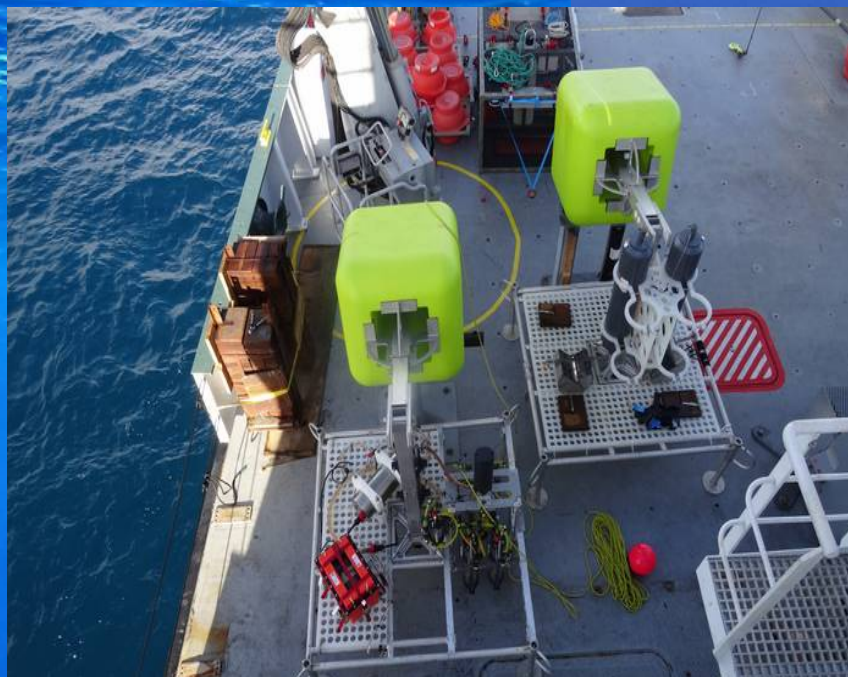
Challenges!

- Full ocean depth operations
- Lander design and testing
- Loss of SOI Lander & Coring System
- Aberdeen Lander camera damage



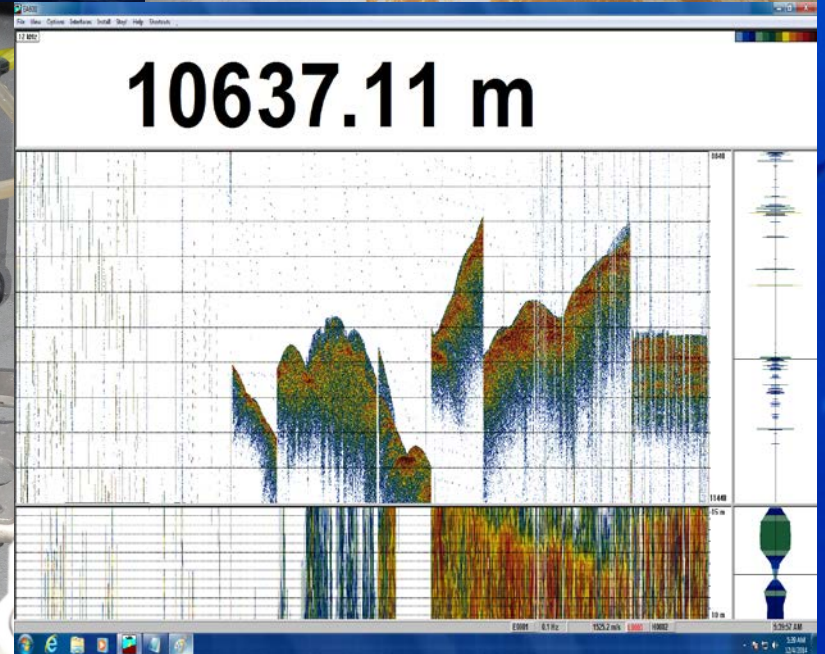
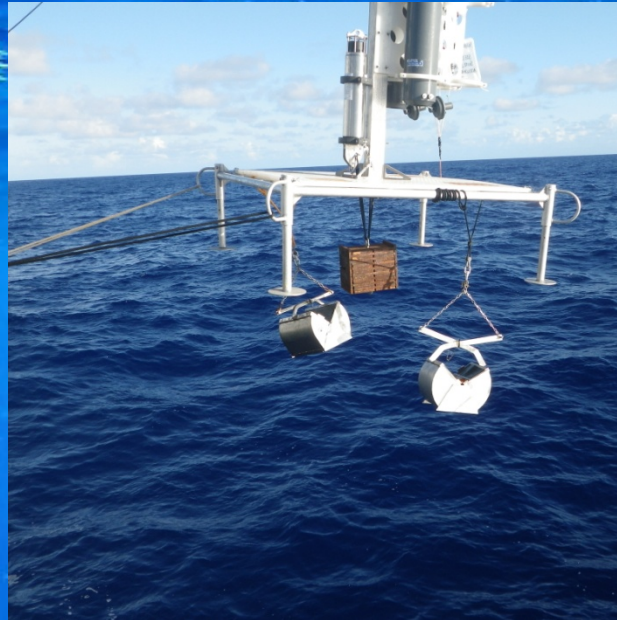


Full Ocean Depth Science





Full Ocean Depth Science





RF Failure





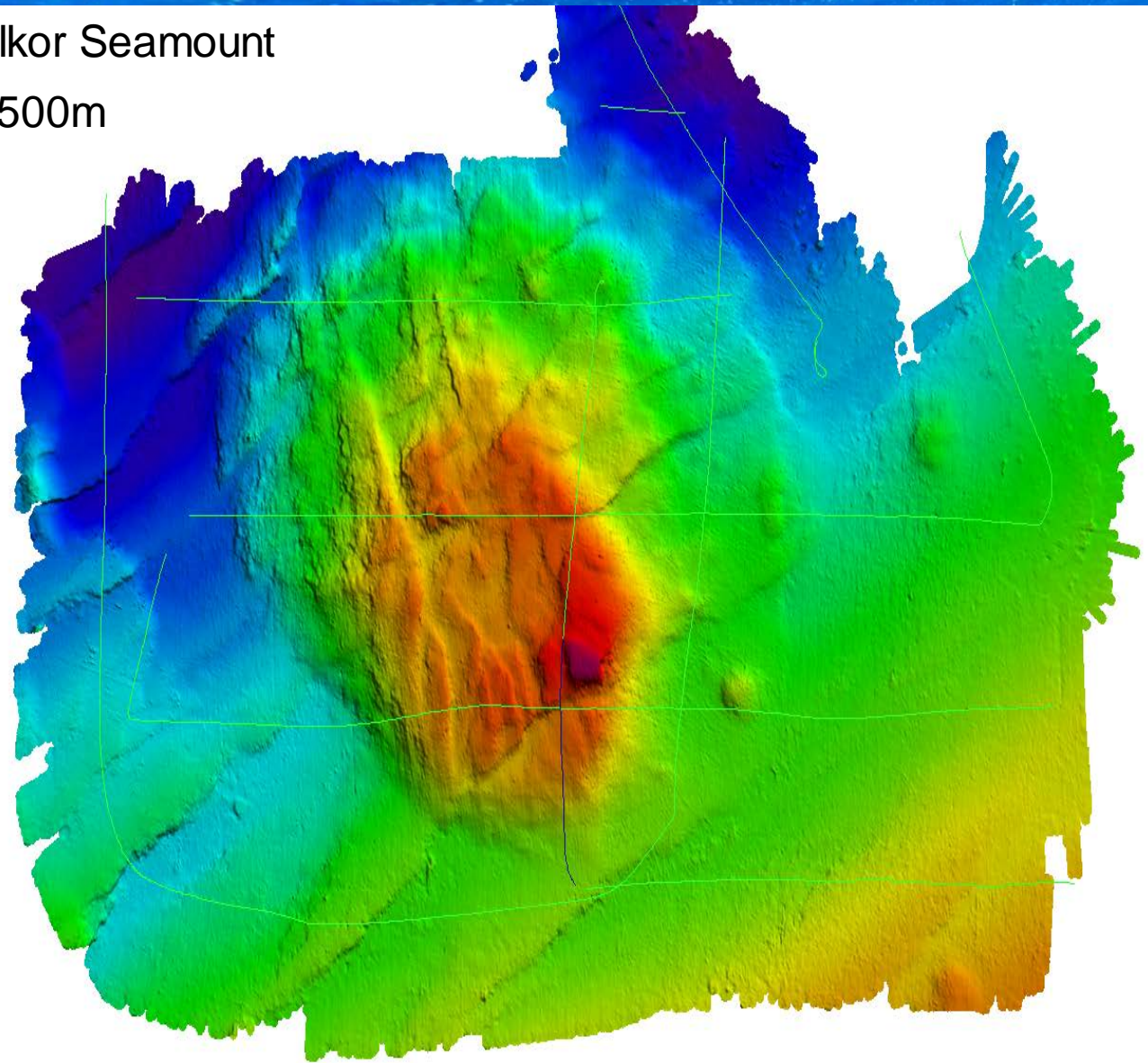
Can Do
Attitude





Falkor
Seamount
8500m

Falkor Seamount
8500m





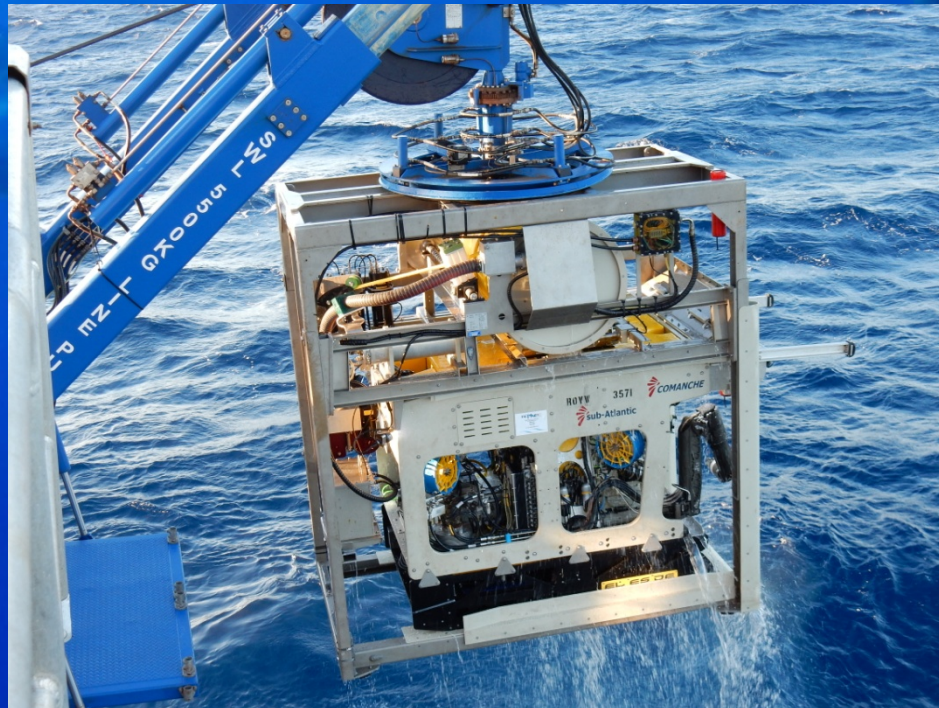
FK150301

Malcolm
McCulloch

Perth Canyon

FK150301 – Malcolm McCulloch

- Australia has no science ROV capable of exceeding a few hundred meters
- Comanche ROV – Commercial ROV Hire
 - Fitted with SOI supplied equipment Lasers, CTD, HD Cameras, Tooling sled
- Vessel-CTD operations
- Extensive Mapping of canyon EM710/EM302
- Comprehensive Outreach program and real-time streaming





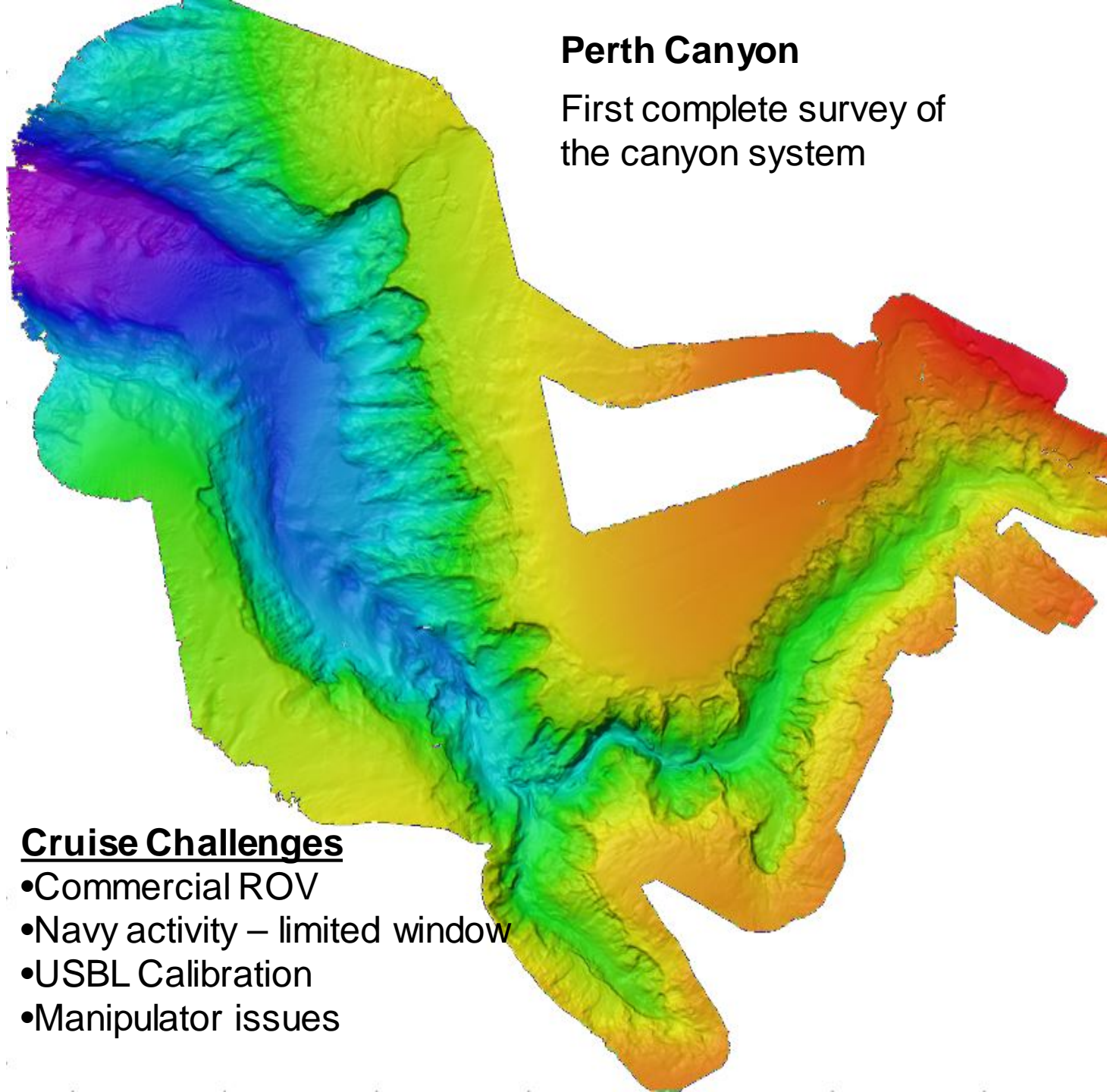
FK150301

Malcolm
McCulloch

Perth Canyon

Perth Canyon

First complete survey of
the canyon system

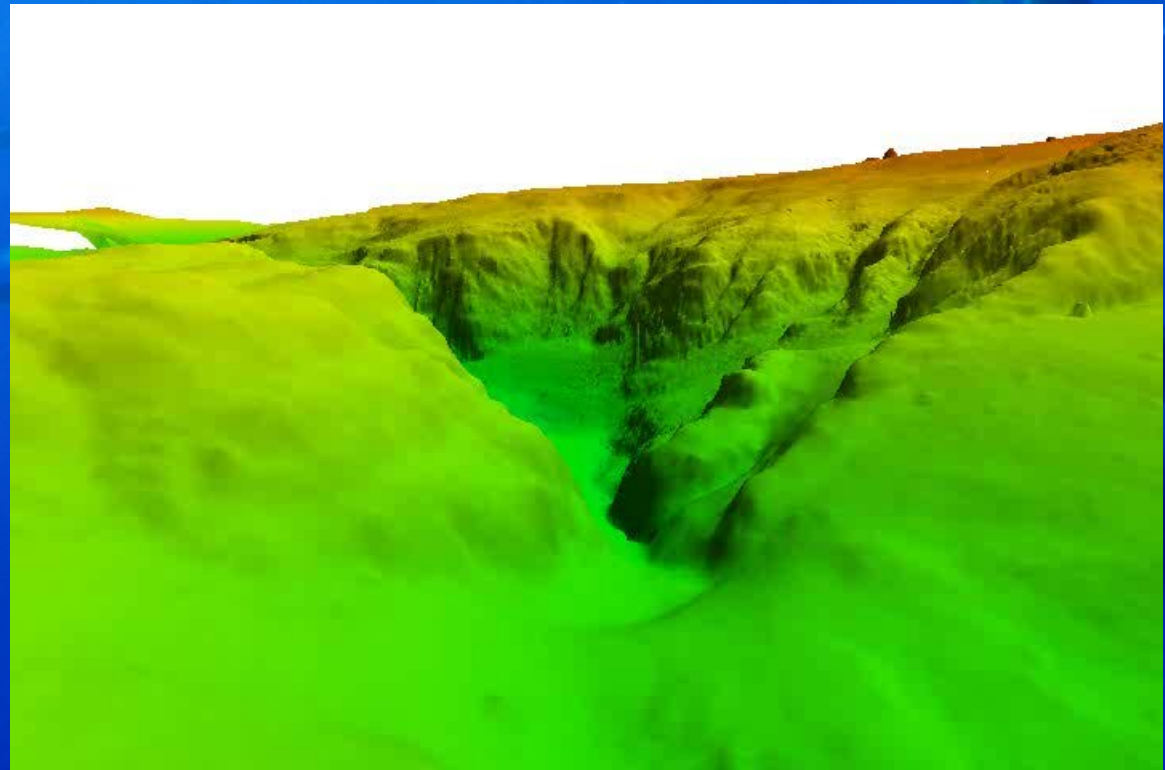
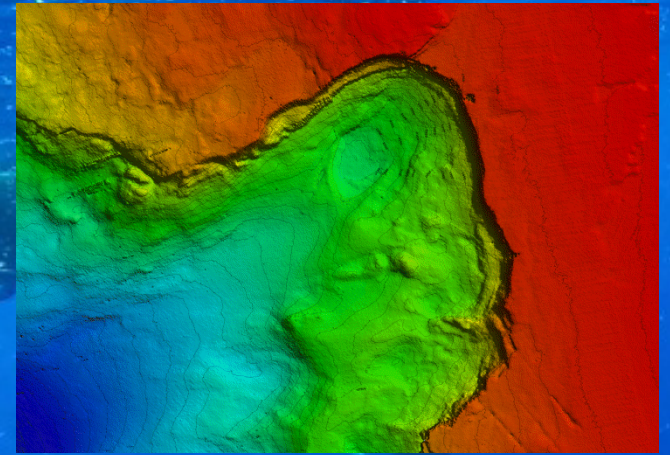
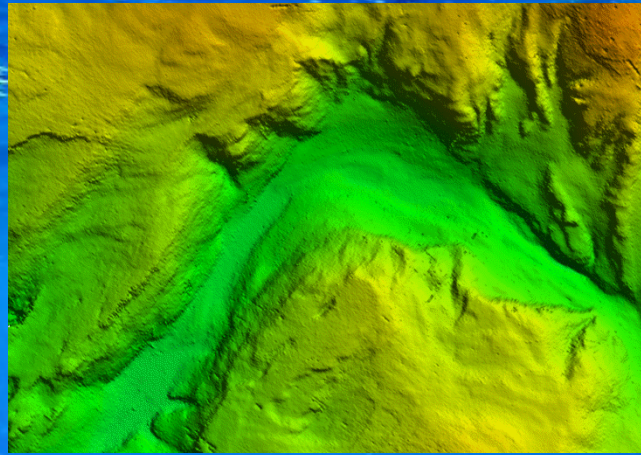


Cruise Challenges

- Commercial ROV
- Navy activity – limited window
- USBL Calibration
- Manipulator issues



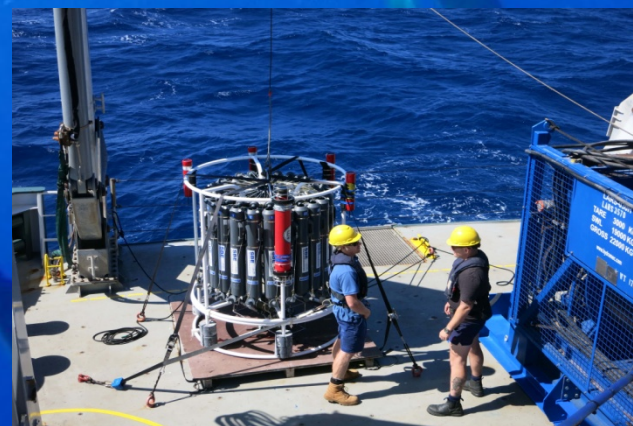
Multibeam Perth Canyon





Perth
Canyon

The
Challenges





FK150324

Oscar
Pizzaro

Scott Reef

FK150324 – Oscar Pizzaro

- SAAB Falcon ROV
- Multiple AUV Operation
 - 2 x Iver AUV
 - 1 x Wave Glider
 - SIRIUS AUV
 - Slocum Glider
 - Camera Float
- Workboat operations
- Pole mounted system
- EM710 Multibeam
- Nebula







SIRIUS
AUV

Challenges

Multiple teams and Multiple Systems



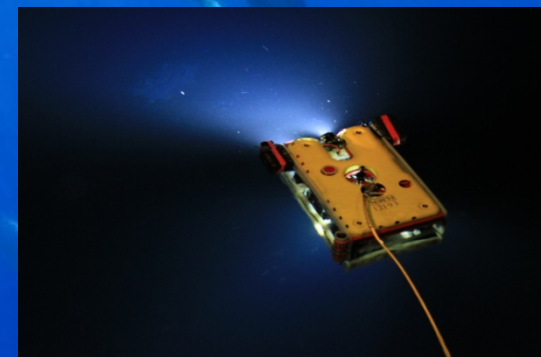
FK150410
Greg Ivey

FK150410 – Greg Ivey

- Represents SOI's first truly multi disciplinary cruise with multiple platforms and multiple systems

SAAB Falcon ROV – 50 deployments/80hrs footage

- 15TB of cruise Data
- Sample Basket
- EM710 Habitat Mapping
- EK60 Fisheries Sounder
- ADCP75 kHz
- ADCP150 kHz
- Workboat – Atreyu
- Workboat – Zodiac
- USBL
- CTD
- Turbo map (VMP)
- Moorings 800m/200m
- Snorkel operations/Shallow moorings
- Nebula





Challenges

Data Management

Intense 24hr Science

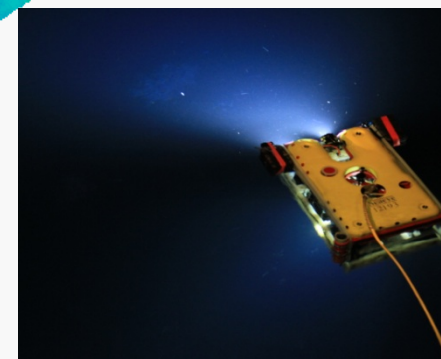
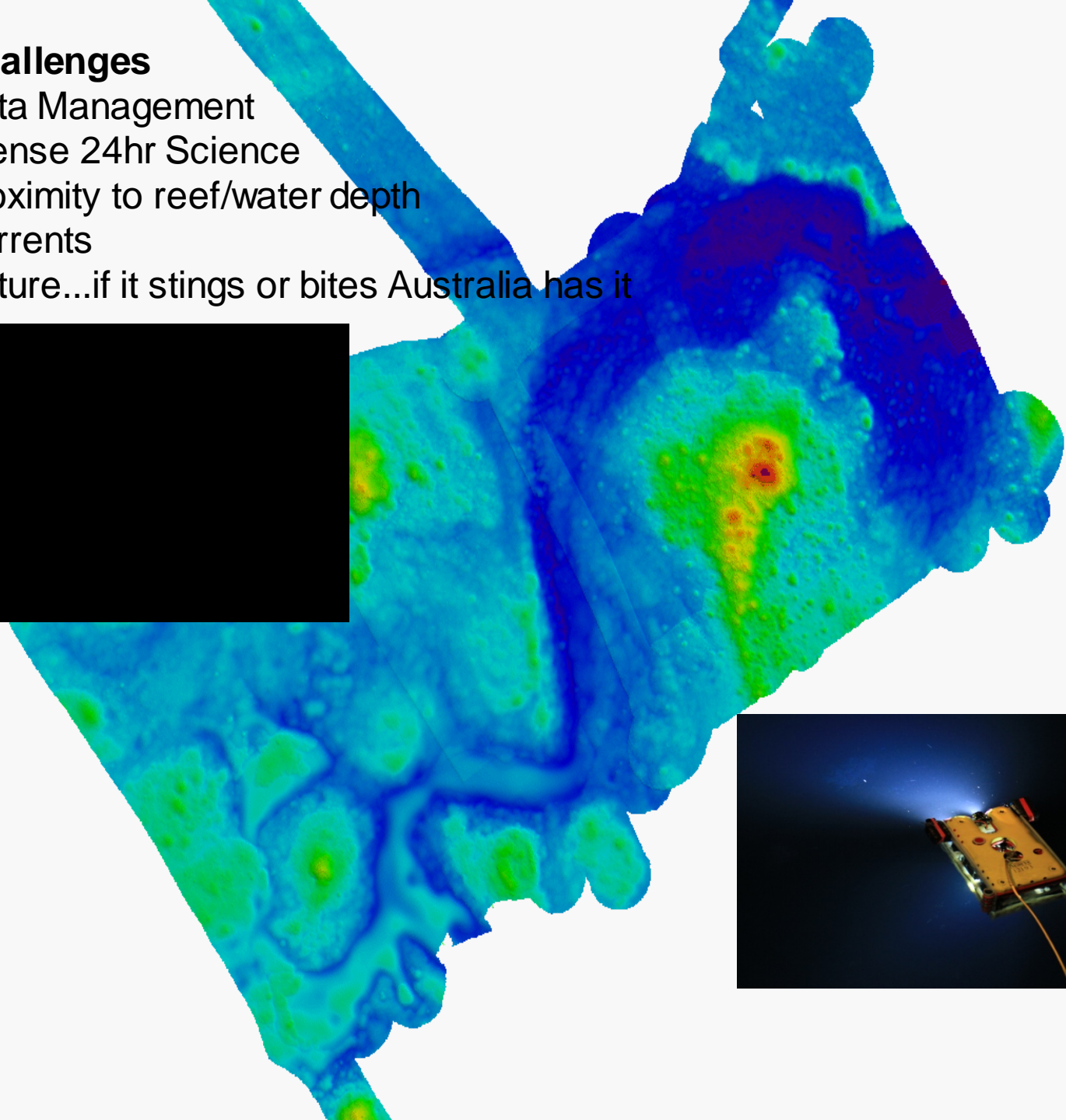
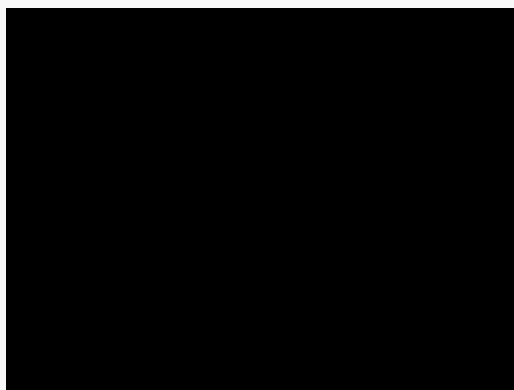
Proximity to reef/water depth

Currents

Nature...if it stings or bites Australia has it

FK150410

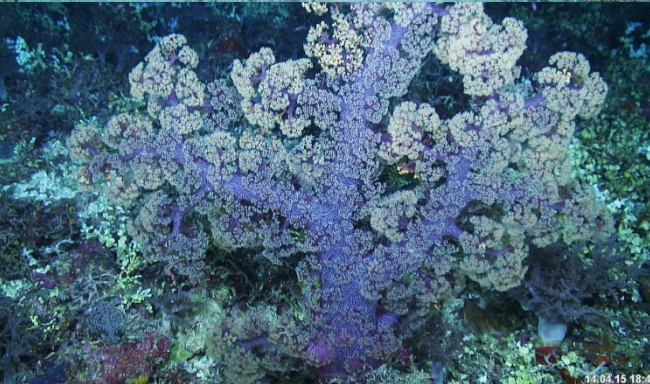
Greg Ivey





FK150410
Greg Ivey

FK150410 – Greg Ivey





*Of the nearly 50 instruments,
we appear to have almost
100% data return. On the ship,
we have used every
measurement system
available, as well as deployed
tools like the TurboMAP probe
and the ROV
Greg Ivey*



Evolving the platform to
deliver world class science for
current and emerging
technologies

Streamlining core science
systems



Heli Deck Removal

- 4 x 20ft containers
- Freshwater
- Seawater
- Network connectivity





Science Systems Upgrades 2013 - 2015

Starboard Deployment
Vessel motion monitor

.322 Wire replacement





Science Systems Upgrades 2013 - 2015

Acoustics & Nav

- Release Transducers
- WHOI Transducers
- Over-the-side pole
- POSMV Installation – IMU & GPS
- Mast modifications
 - New systems
 - Ease of access
- Gondola Cameras
- Hydrophone
- USBL Beacons





Science Systems Upgrades 2013 - 2015

- Main mast modifications
- Magnetometer
- Movement of laser alignment
- PAR Sensors
- Nebula
- Blimp Aerial Platform
- Met Mast fabrication
 - Dual Gill Met Pack
- Upgraded Matrix System - 64



© Jessica Chen



2014/15
Biggest
Challenge

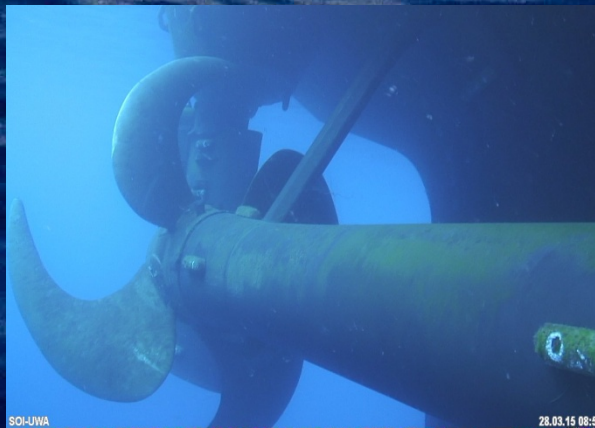
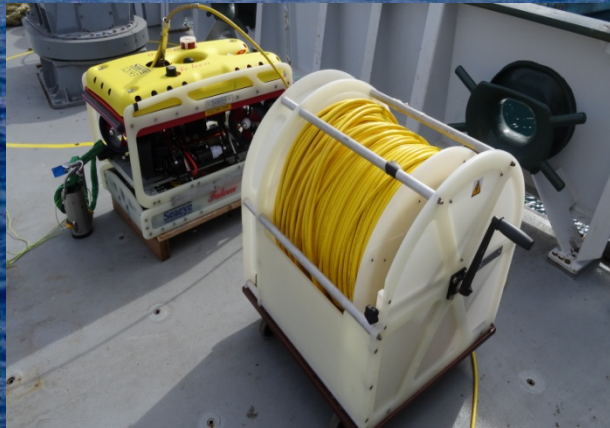




SAAB
Falcon
12193

SAAB Falcon

300m Rated Vehicle
HD Camera
Hydrolek Manip





Falcon Sampling

