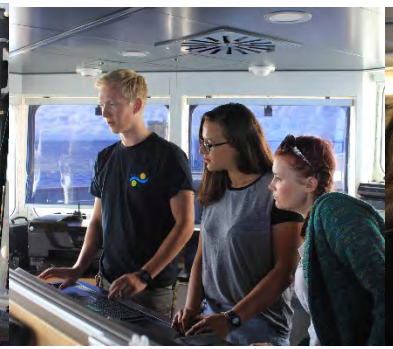
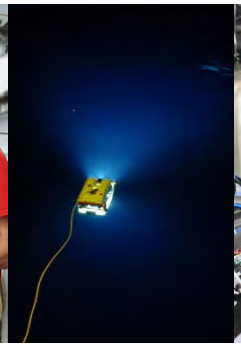
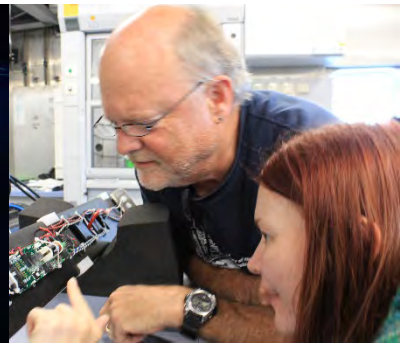
Sharing Ship Based Ocean Research Through Innovative Technology and Hands-On Experiences

Eric King, Director of Marine Operations +1 2064281950 eking@schmidtocean.org

R/V *Falkor*…a 3 Year Review

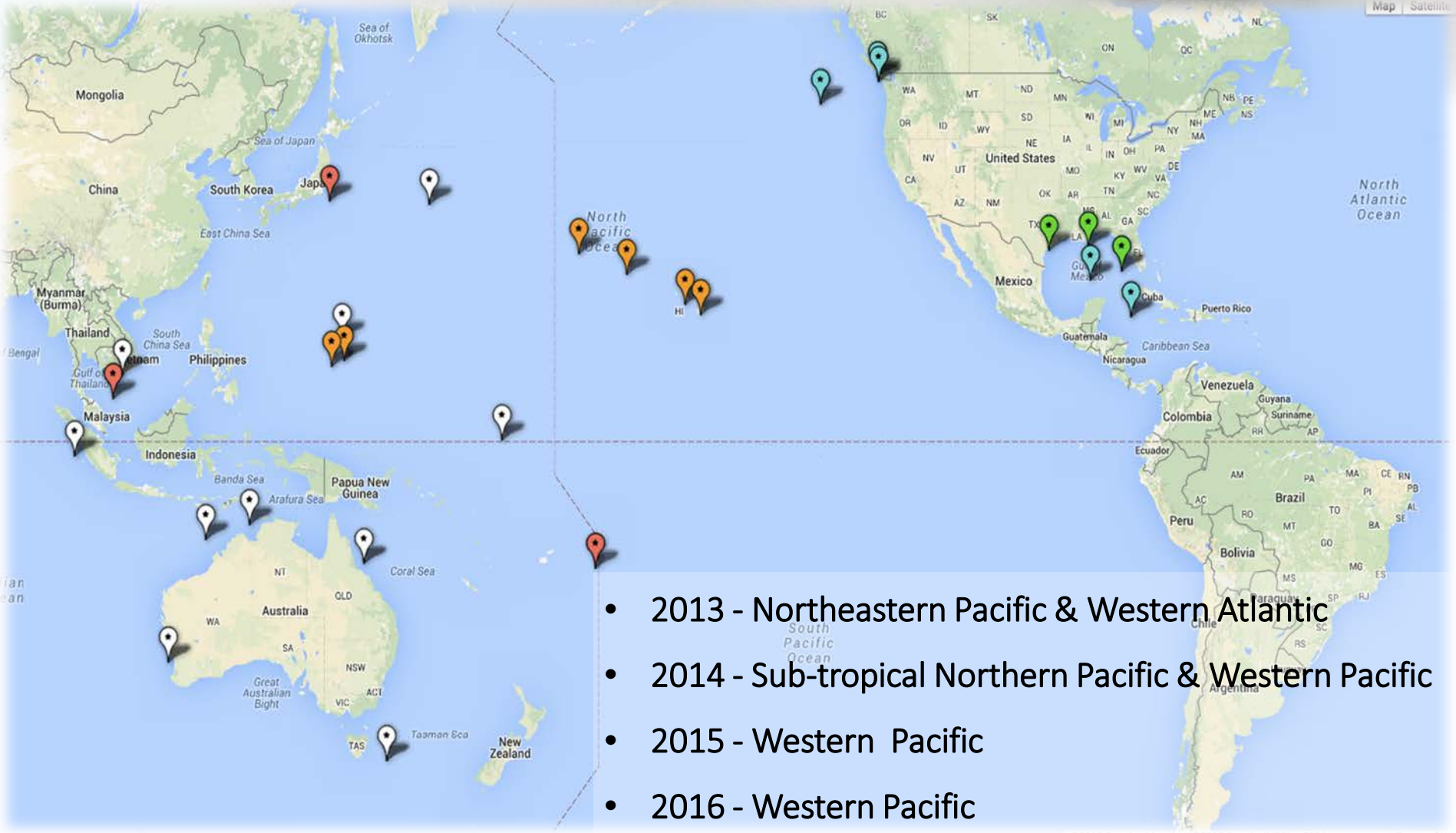
* 26 missions
* 480 science days
* 70,466 miles
* 19 countries
* 294 scientists
* 84 institutions
* 120 students

Focus on Innovation and Sharing

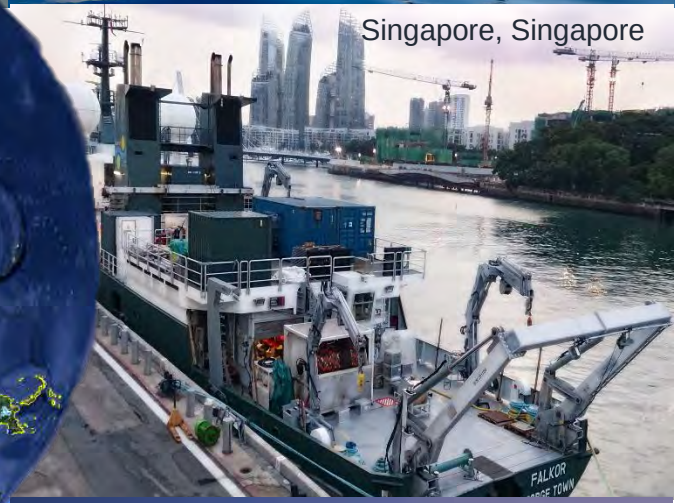
Our program is structured around the following 5 areas:

1. Commitment to excellence in oceanographic research operations
2. Infrastructure, platform, and technology development for marine sciences
3. Collaborative scientific research aboard *Falkor*
4. **Communications, Education and Outreach**
5. Open Sharing of Information, Data and Research Outcomes

Global Reach



- 2013 - Northeastern Pacific & Western Atlantic
- 2014 - Sub-tropical Northern Pacific & Western Pacific
- 2015 - Western Pacific
- 2016 - Western Pacific



Falkor in 2015

Where We've Been

2015

Sonar and Seismic Mapping in the Mentawai Quake Zone
May to June

Hydrothermal Hunt with Robotic Vehicles in the World's Deepest Trench
November to December

Understanding the World's Largest Volcano with Bathymetric Mapping
September to October

Improving Climate Models with Current Profilers in the Tropical Pacific
July to August

Understanding Oceanographic Conditions in the Kimberly's
April to May

SCHMIDT OCEAN INSTITUTE

Perth Canyon: First Deep Exploration
March

Coordinated Robotics on Australia's West Coast
March to April

Tracking the Tasman Sea's Hidden Tide
January to February

How do you reach audiences when you are in the middle of the Ocean?

Evaluation & Planning

Communications Audit & Strategic Planning helped us :

- provide rationale for existing programs, and how they further SOI's broader goals
- implement new program activities and materials to increase SOI newsworthiness
- identify and engage target audiences and expand to new groups
- obtain measurable results and gauge progress over time

Communications Audit

- What do we need to know?
- Identify sources: messages, mediums, feedback
- Collect & analyze data

Develop communication tools

- Design measurable goals
- Communicate science results
- Systematic evaluation and reporting

Cruise Outreach Planning

Preliminary meeting with Principal Investigators

Assignment of multimedia journalist, outreach planning & student recruitment

Pre-cruise community engagement & ship tours

Science communications training for science party

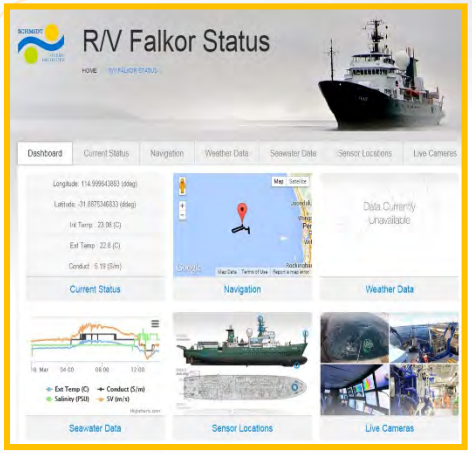
Ship-to-shore communication via blogs, social media, telepresence

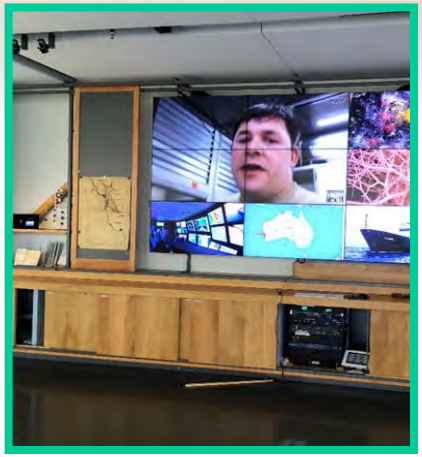
Post-cruise press & community engagement

Cruise Outreach Components

1. Pre-cruise outreach planning
2. Advance selection of target groups *(e.g. schools, community, aquariums)*
3. Media coverage/ press *(e.g. conferences, releases, etc.)*
4. Web presence *(e.g. blogs, web events, radio podcasts)*
5. Daily social media plans, draw to blogs, events, etc.
6. Communication & media training for science party

Cruise Outreach Components





Web Presence & Media

- SOI Website
- Status Page
- Blogs
- Social Media
- Press

Data Sharing

- Real-Time Data
- Annual Report
- Conferences / Workshop

Telepresence

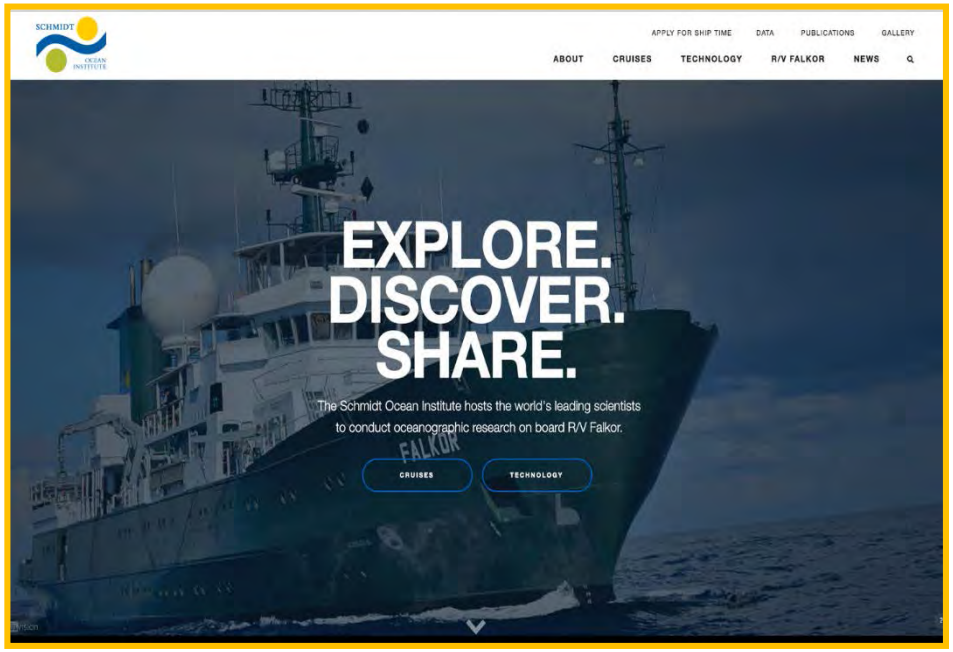
- Live-streaming footage
- Ship-to-shore connections
- Robot tracker

Students & Community

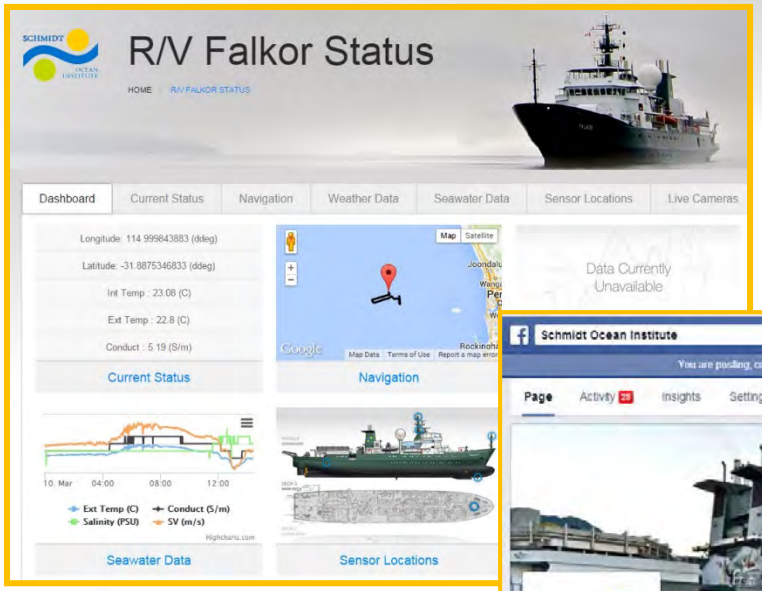
- Student Opportunities
- Ship Tours
- Citizen Science
- Community Presentations

Web Presence & Media:
Website Redesign & Status Page

- Website focus group & usability tests
- Language selection
- Multimedia gallery
- Cruise & publication search features
- Real-time data via *Falkor* status



Web Presence & Media:
Online Engagement



- Daily blogs during cruises: over 300 blogs viewed from over 200 countries
- Dedicated multimedia journalist
- Growing social media

Web Presence & Media:
Press

- Since 2014 we have conducted 8 live radio broadcasts from RV *Falkor* for the *All Things Marine Radio Show.*
- Over 250 articles from science cruises in 2014 and over 100 in 2015.
- Appeared in international and national television, radio, print, and web outlets.

Web Presence & Media: Press

MTR 100

Editor's Choice

Five Stand-Outs

MTR's roving correspondent Kira Coley was tasked to identify and deliver five innovative companies worthy of inclusion in the 10th Annual MTR100.

Deep Trekker Inc.

Deep Trekker Inc. was founded in 2010 with a mission to bring a fully capable yet portable and accessible remotely operated vehicle to market. Over the last 5 years, Deep Trekkers ROVs have quickly been adopted around the world as the go to underwater observation tool. Based on clean-sheet, innovative engineering, Deep Trekker offers a new breed of submersibles. Deep Trekker products are used across the world for applications including aquaculture, commercial diving, salvage, military, oil & gas, marine survey, research and recreation.

As the World's first fully Portable Vectored ROV, Deep Trekker's DTX2 patented pitching system is combined with powerful vectored thrusters for unprecedented flexibility and movement in the water. Forward, reverse, up, down, and lateral movements are available in 360 degree vertical and horizontal planes using only 4 thrusters. Vertical movements are accomplished using the main thrusters instead of relying on substandard vertical thrusters, providing unmatched speed & maneuverability. The DTX2 comes with many options for sophisticated add-ons such as single and multi-beam sonar, USBL positioning, Cutter Attachments, Cygnus Thickness Gauge, tether lengths up to 300 M. Intelligent features come as standard with the DTX2 ROV System, allowing users to work in higher currents and maintain stability.

Taking its cues from larger ROVs, the DTX2 brings all of the functionality required for difficult jobs, but without the usual complexity. Building on the proven DTG2 platform, Deep Trekker offers unparalleled ease of use and simplistic sophistication.

Schmidt Ocean Institute

Established in 2009, the Schmidt Ocean Institute strives to advance the frontiers of ocean research and exploration through novel technologies, intelligent observation and analysis. The last year has seen their involvement in many ground-breaking projects, pushing the boundaries of innovation and marine research. Schmidt Ocean Institute approaches oceanographic research from the technological, operational, and informational perspectives. The institute maintains and operates R/V Falkor as a technologically advanced scientific platform suitable to support multidisciplinary oceanographic research and technology development. Collaborators get free access to R/V Falkor with her on-board research facilities and expert technical support in exchange for a commitment to openly share and communicate the outcomes of their research.

In March 2015, the Schmidt Ocean Institute worked with the University of Sydney, MIT, as well as other institutions on the "Coordinated Robotics" project, which was also featured in June 2015 issue. The goal was to expand techniques for efficiently coordinating deployments of multiple exploratory underwater vehicles by advancing algorithms and their autonomous capabilities. The success of the project has brought engineers even closer to leaving groups of vehicles untended for long periods for a variety of underwater observation and data collection missions.

The "Perth Canyon: First Deep Exploration" was another project based in one of Australia's proposed national reserves. Despite being just 50 kilometers or so from Western Australia's capital of Perth, the canyon's deeper reaches remained poorly known and largely unexplored until 2015, when scientists from the University of Western Australia onboard Schmidt Ocean Institute's Research Vessel Falkor explored the region, along with a deep-diving remotely operated vehicle.

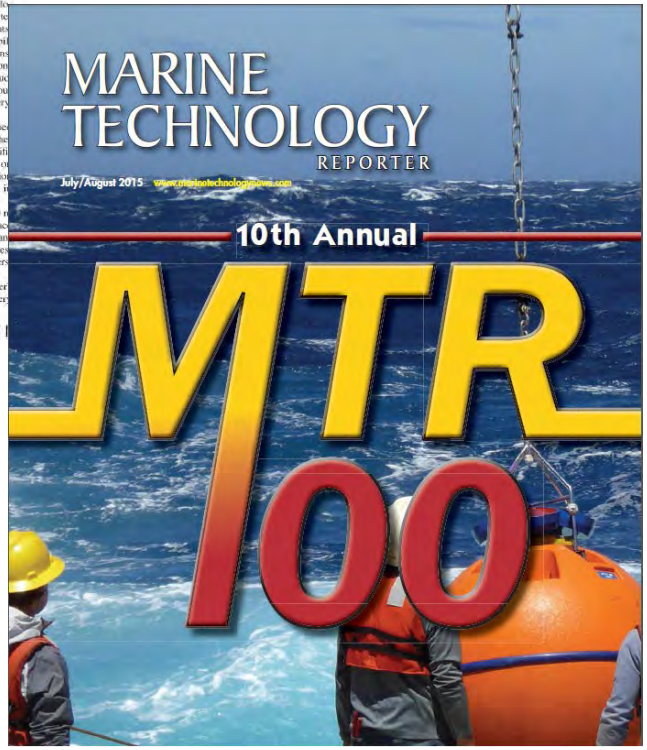
Xeos Technologies

With decades of manufacturing experience, Xeos Technologies have successfully designed market leading wireless telemetry products for use in the world's harshest environments. Products range from deep sea alarm beacons to surface oil spill tracking systems to land based perimeter surveillance systems. Xeos is an Iridium Value Added Reseller and provides contract engineering services in addition to its standard product line. All these qualities have brought them success in their four divisions: Communications, Oceanographic Asset Recovery, Remote Monitoring and Security.

The Apollo is an independently powered, self-contained mooring beacon with the power of an ultra-bright LED Flasher combined with satellite communications. Users receive notification of the Apollo's arrival at the surface from anywhere on earth via the Iridium Low Earth Orbit satellite communication system. This beacon provides unparalleled visibility, even in the worst conditions.

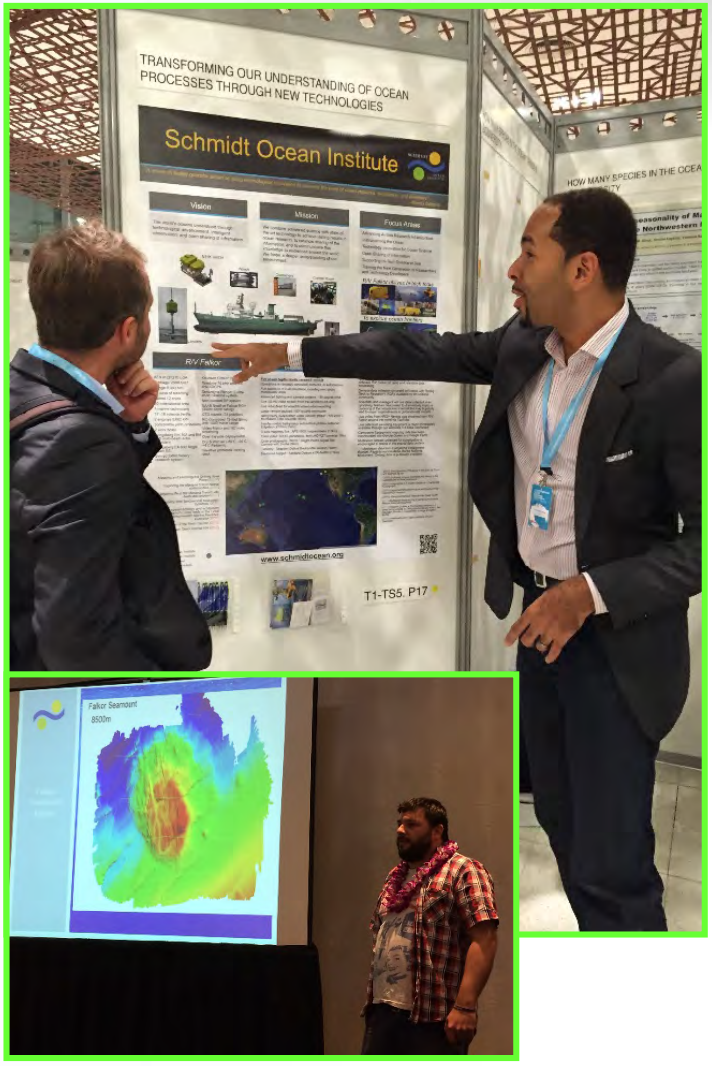
Apollo is fully submersible and has been rated to 11,000 m (36,089 ft) below sea level. In addition, the solid state surface sensor provides a measure of reliability unavailable in mechanical methods. The new APOLLO unit combines all the best features of Iridium communication beacons and LED Flashers along with up to 10 years deployment on alkaline batteries.

With older style VHF beacons, a handheld "direction finder" would need to be used to locate equipment, sometimes in very



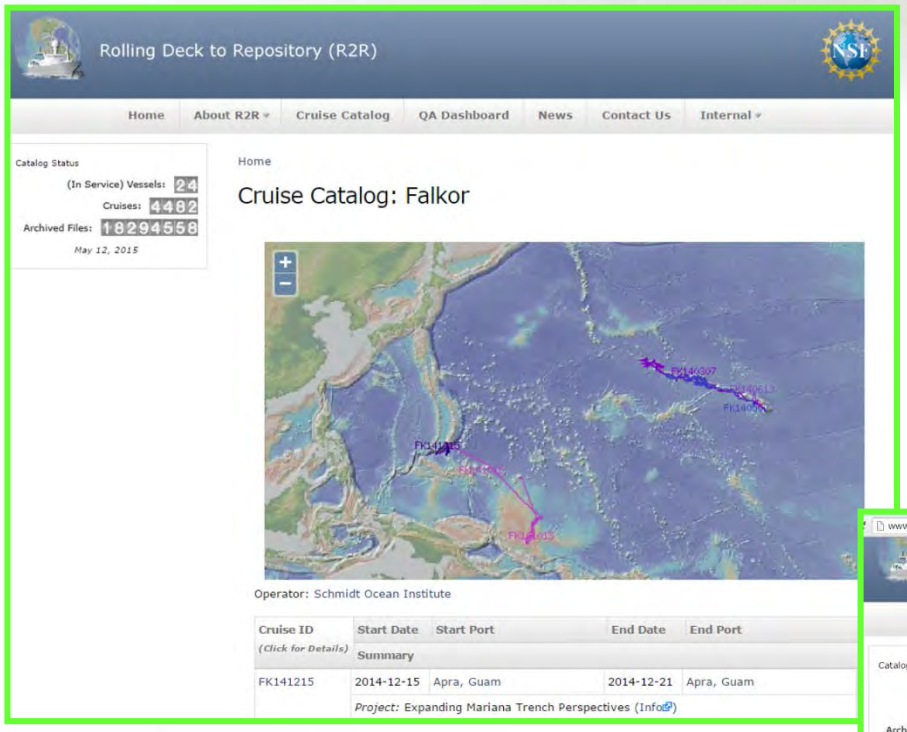
Schmidt Ocean Institute was selected as the Editor's Choice top Five Stand-Outs in the ***Marine Technology Reporter***'s annual **Top 100** innovators in the maritime industry.

Data Sharing:
Conferences / Workshops

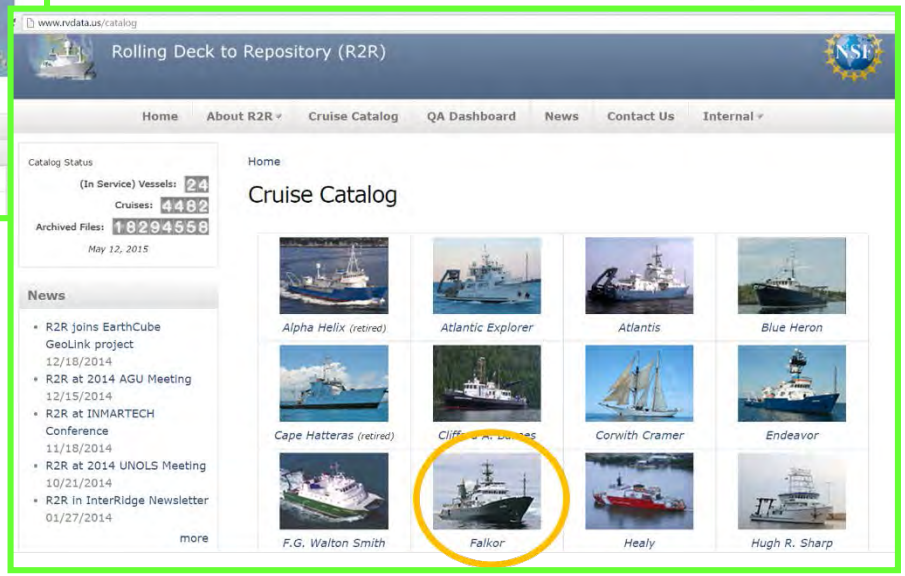


- Annual research planning workshop.
- Targeted conference presentations and booth displays both at the national and international level.
- 2,000 people already reached in 2015 through conference presentations

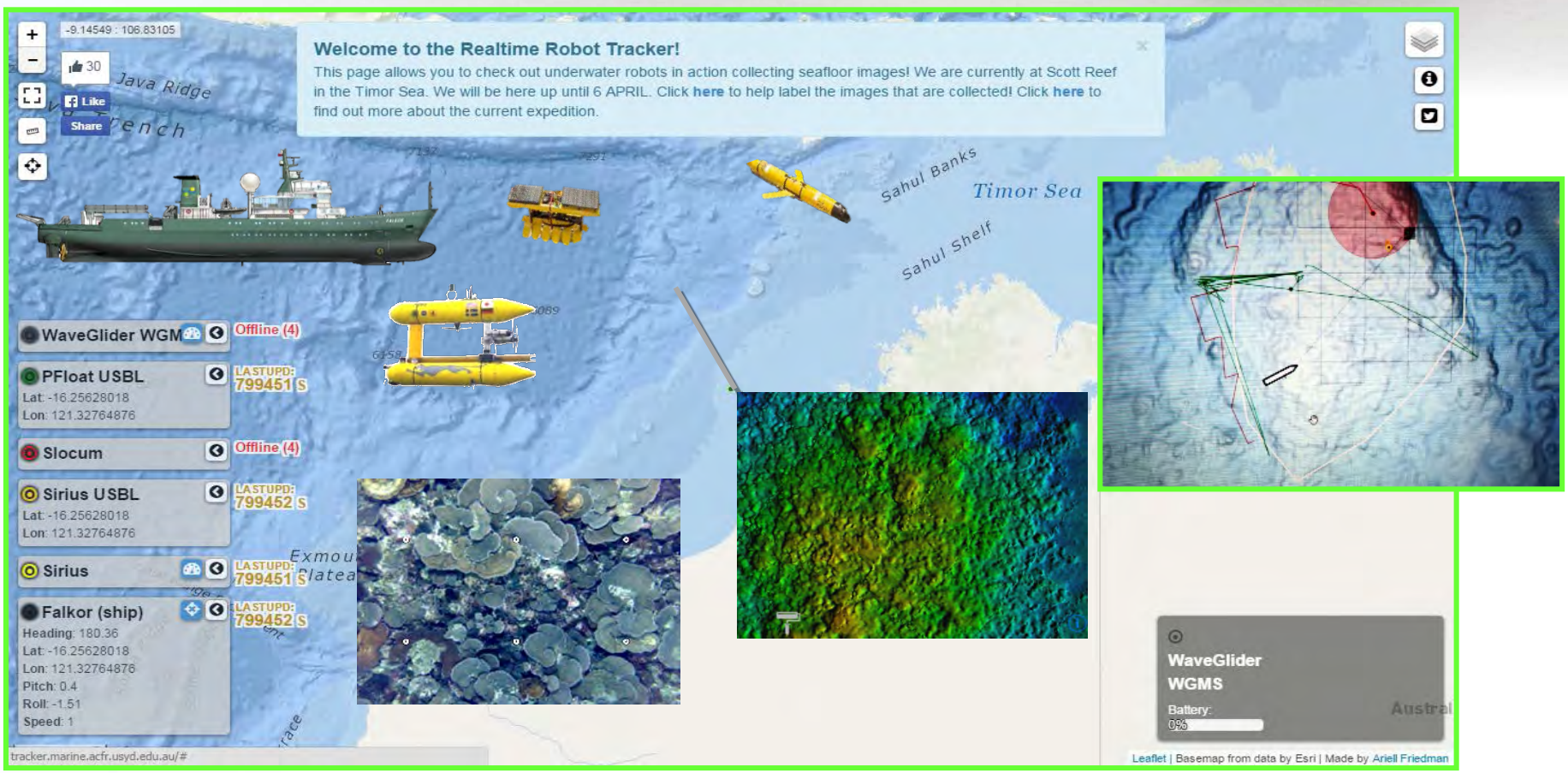
Data Sharing:
Real Time Data



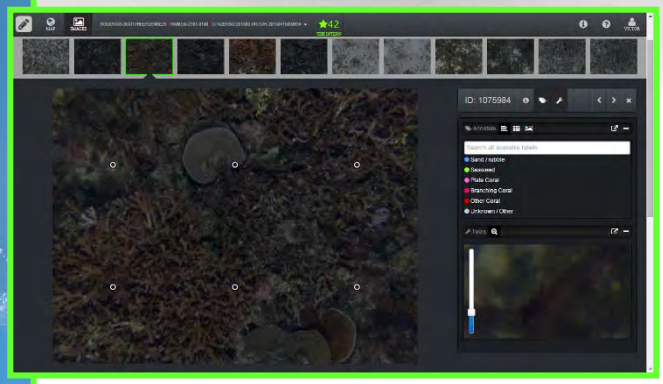
- 45 academic publications/ presentations in 2014.
- All shipboard data shared through Rolling Deck to Repository (R2R)
- Bathymetric dataset from multibeam mapping sent to National Geoscience Data Center (NGDC)

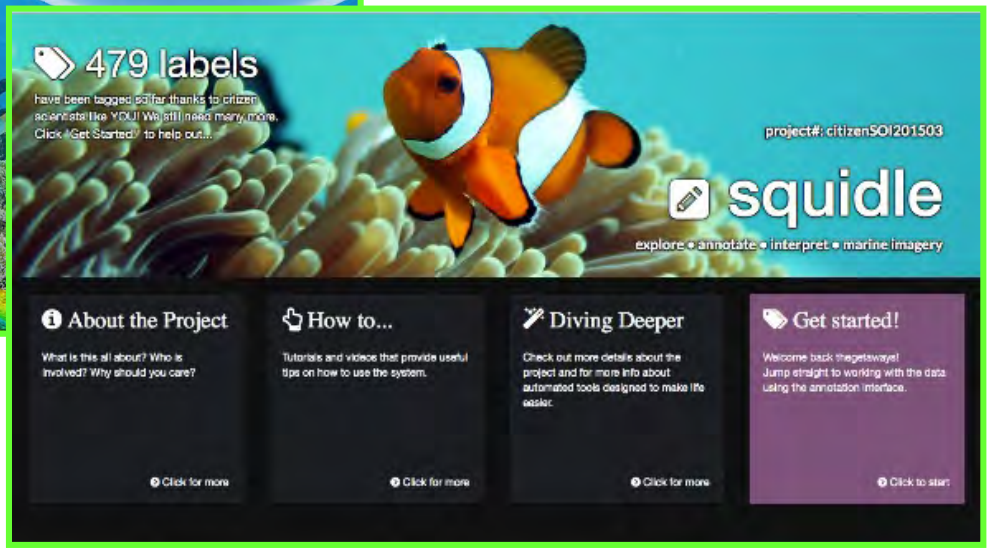


Data Sharing:
Robot Tracking



Data Sharing:
HPC & Citizen Science

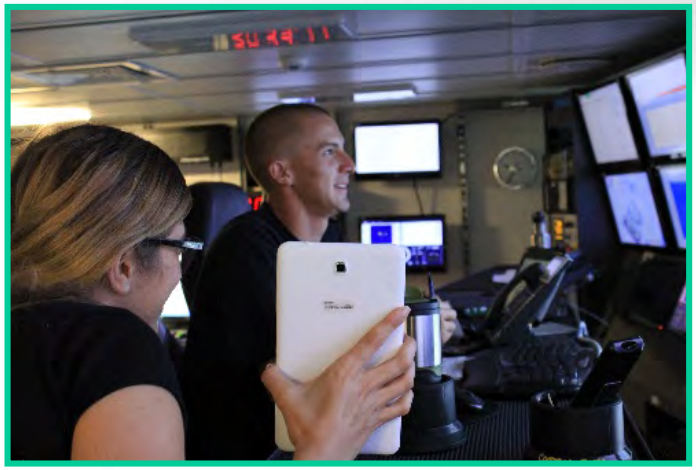





FALKOR
YouTube
Data Sharing
Live Video
Scott Reef ROV Dive 9.5 - Falkor
TIME: 02:03
Coral Type #1
Scott Reef ROV Dive 9.5 - Falkor
TIME: 08:41
Crab Species #3
Scott Reef ROV Dive 9.5 - Falkor
TIME: 11:48
Fish Type #7
00:00
02:00
04:00
06:00
08:00
10:00
12:00
02:03
05:37
08:41
11:48
5. Jun
Pressure (hPa)
Humidity (%)
Temperature (C)

Telepresence:
Live-streaming

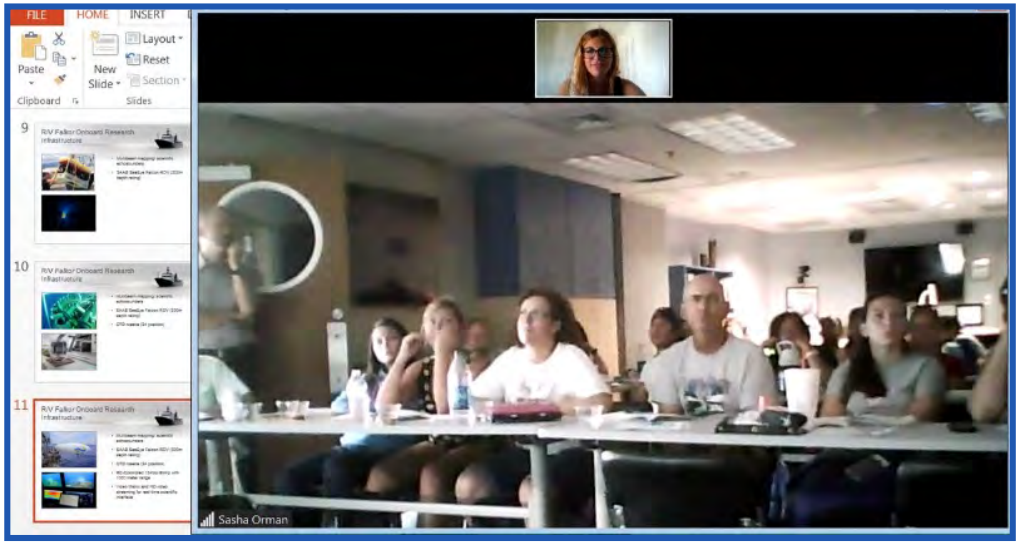
Telepresence:
Ship-to-Shore



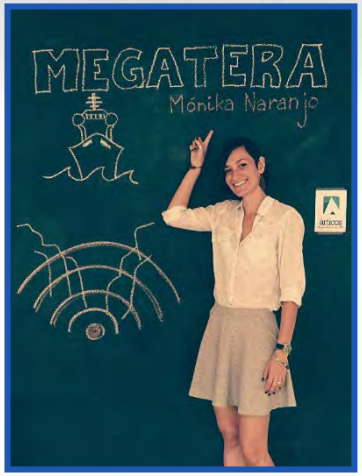
- 25 live ship-to-shore chats this year in 5 different countries.
- Live connections with middle and high school classrooms, museums, universities, and aquariums.

Students & Community:
Classroom Connections

- 1,969 students through ship-to-shore connections from *Falkor* so far this year.
- Inspiring the next generation of marine scientists at both the high school and college / university level.
- Connecting with teachers and students internationally with telepresence and in-person classroom visits.



Students & Community:
Community Presentations



Students & Community:
Ship Tours

- This year we hosted 826 people in eight different ports in six countries on *Falkor* ship tours.

Students & Community:
Student Opportunities Program

What's Next?

* Artist at Sea

* New website launch December 2015

* AV/IT upgrades including live presentation center on *Falkor*

* Expanding global engagement


Thank You