

JUNE
2017

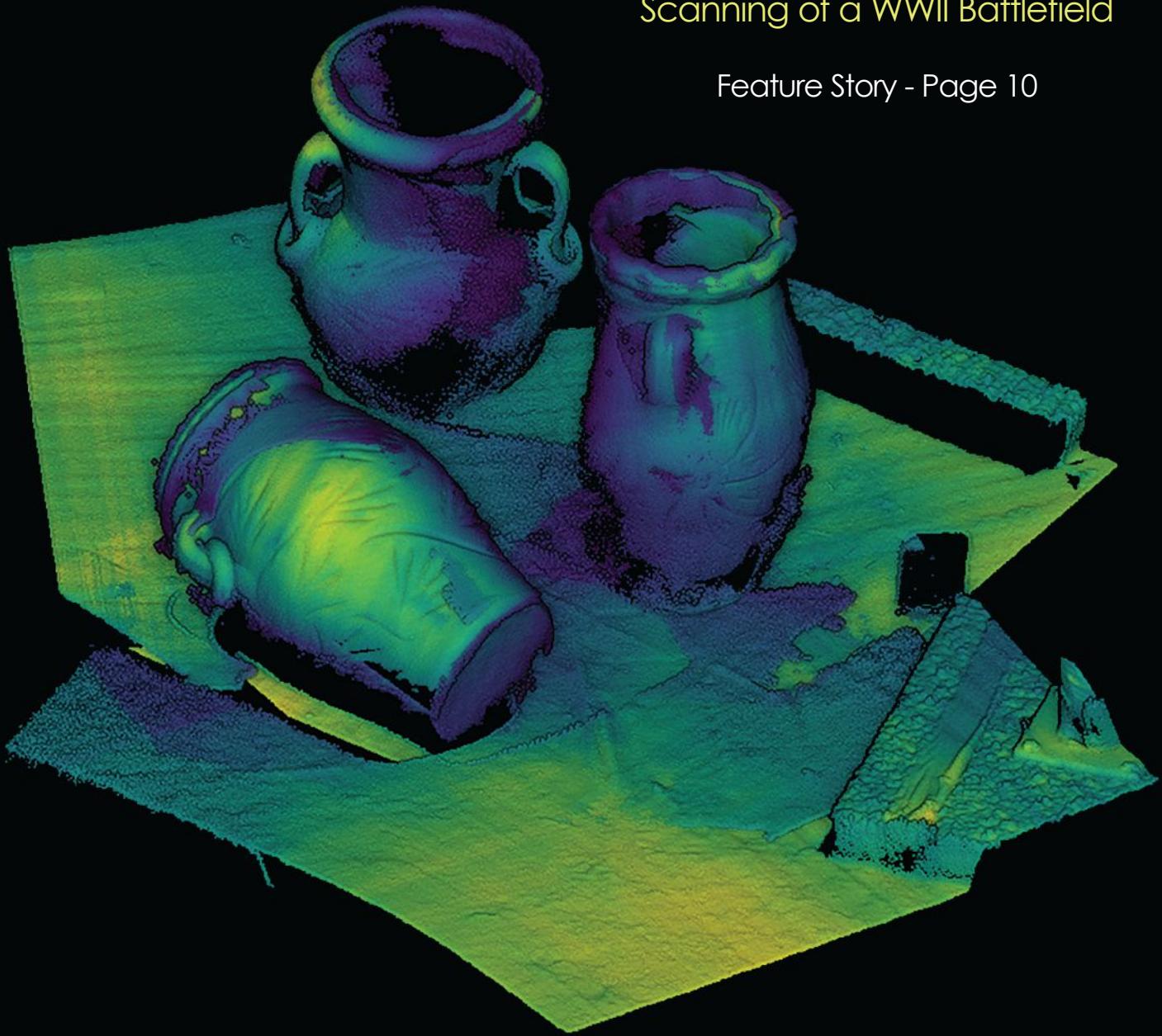
ON&T

Ocean News & Technology
www.oceannews.com

REMEMBERING THE BATTLE
OF THE ATLANTIC:

Dynamic Underwater Laser
Scanning of a WWII Battlefield

Feature Story - Page 10





No Compromise

RELIABILITY

VideoRay ROVs are the overwhelming choice of underwater professionals throughout the world for observation-class ROVs. From the interior of nuclear power plants, to the open ocean, more than 3,700 VideoRays are trusted by users just like you in demanding and hazardous missions. Reliability is often the most important factor when selecting a ROV system. Don't compromise with less expensive alternatives – understand what you are paying, and your costs when it doesn't work.

www.videoray.com



212 East High Street, Pottstown Pennsylvania USA | PHONE: +1 (610) 458-3000 | EMAIL: sales@videoray.com

© Copyright 2016, VideoRay LLC The Global Leader In MicroROV Technology

VideoRay® is a registered trademark of VideoRay LLC

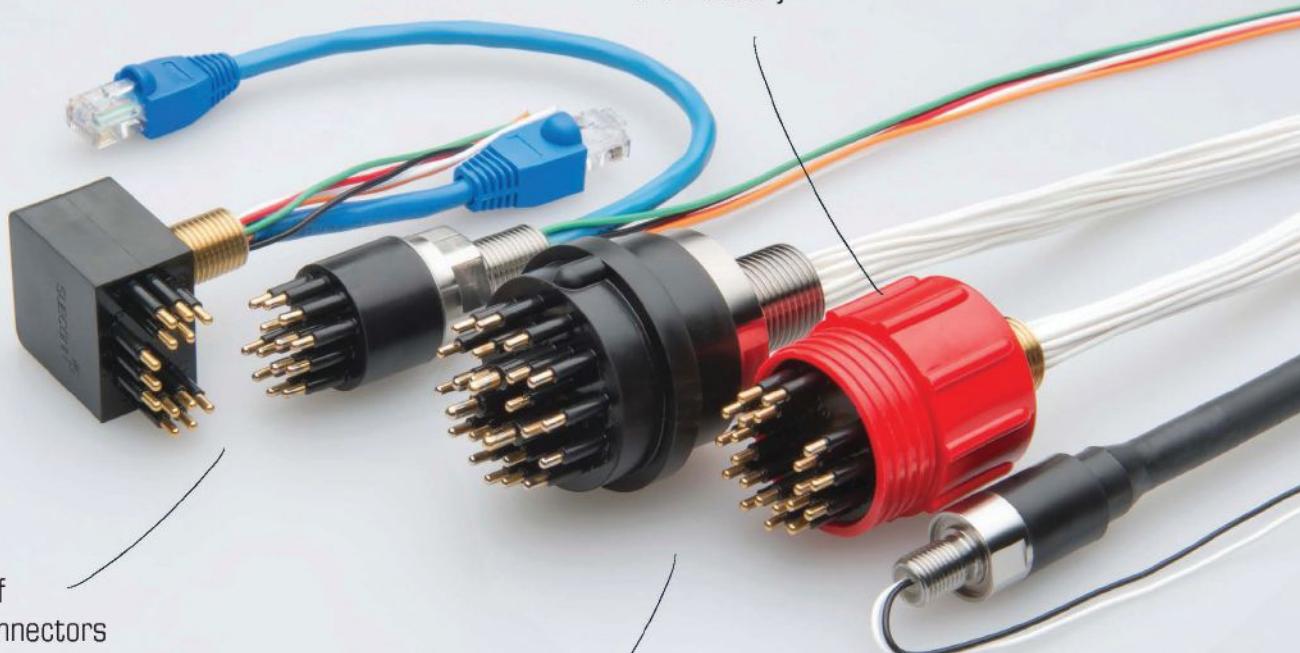


Wet-mate connectors

Recognised throughout
the industry

Full range of
Ethernet connectors

39 year track record



Available worldwide

Denmark | Norway | Sweden | Finland | United Kingdom
Netherlands | Germany | Poland | France | Spain | Portugal
Italy | UAE | South Africa | Israel | USA | Canada | Mexico | Brazil
Colombia | Peru | Uruguay | Chile | Singapore | China | India | Pakistan
Russia | Belarus | South Korea | Japan | Taiwan | Australia



A large, friendly-looking dolphin swims gracefully over a vibrant coral reef. The water is a clear, translucent blue.

Sea the difference.

Managing the environmental impact of marine activities around the world.

EIA, EIS, ESHIA, EMP

Permitting Services

EBS & Drill Surveys

Oil Spill Response (MESSR, STEP)

Beach Restoration & Nourishment

Habitat Mitigation, Damage & Risk Assessments

Coral, Seagrass, Oyster & Mangrove Services

Habitat Surveys & Mapping

Physical Sampling (Sediment, Water, Biological)

Hydrographic & Geophysical Surveys

Metocean & Current Studies

Acoustic Monitoring & Modeling

Sound Mitigation (PSO, MMO, PAM)

Environmental Data Geospatial Services (EDGS)

Research & Information Services

For more information,
visit our website at www.csaocean.com



8502 SW KANSAS AVE. STUART, FL / (772) 219-3000
INFO@CSAOCEAN.COM / WWW.CSAOCEAN.COM

I FIND
WRECKS.
I SOLVE
MYSTERIES.
I AM
REMUS



HYDROID
A KONGSBERG COMPANY

Intelligent Marine Robots You Can Rely On

OUR REMUS VEHICLES

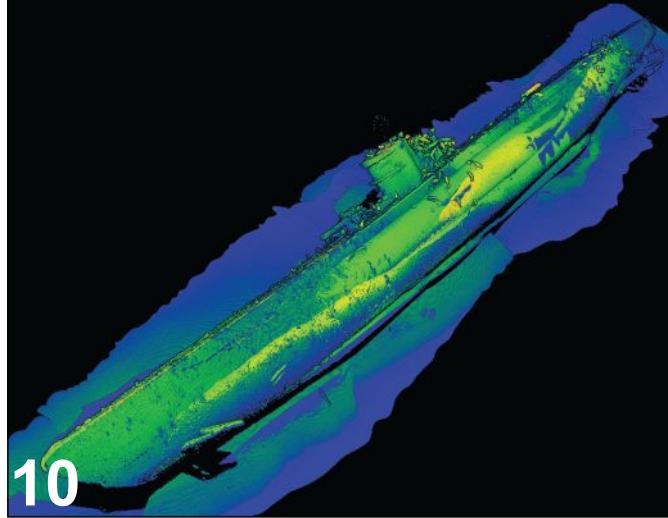
work for you to complete your mission –autonomously–whether solving underwater mysteries, performing site investigations or studying the ocean floor.

To learn more, visit HYDROID.COM/IAMREMUS



CONTENTS

FEATURE STORY



10

Remembering The Battle of the Atlantic:
Dynamic Underwater Laser Scanning of
a WWII Battlefield



14

'Sister Sanctuary' Agreement Protects
Whales

EDITORIAL FOCUS



20

In-Situ Microscope Provides Continuous
Time-Series of Plankton and Particulates



24

Innovating for the Upturn: Expro's Range
of New Technology Solutions

DEPARTMENTS

- 14 Ocean Science & Technology
- 24 Offshore Energy
- 40 Subsea Intervention & Survey
- 46 Communication & Subsea Cables
- 50 Defense

IN EVERY ISSUE

- 8 Editorial
- 52 Offshore Stats and Data
- 56 Events
- 60 Milestones
- 62 Ocean Industry Directory

EDITORIAL FOCUS



30

Touching History with Underwater Robotics

FROM THE FIELD



38

Imagenex Launches New Multibeam Imaging Sonar



40

Kongsberg to Market Two New Underwater Glider Systems



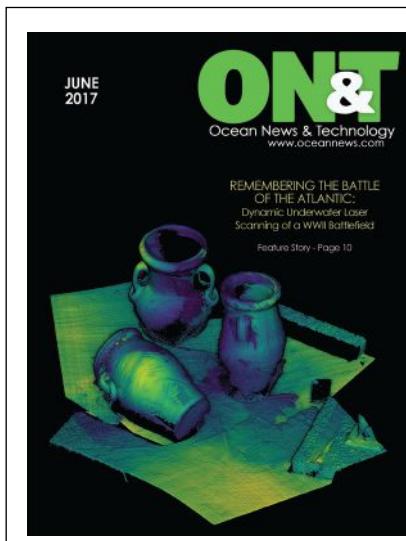
46

Emera Set to Install North America's Longest Subsea Power Cables



50

USCG Sentinel-class Cutters Rely on Fortress Anchors



JUNE
2017

ON&T
Ocean News & Technology
www.oceannews.com

REMEMBERING THE BATTLE
OF THE ATLANTIC:
Dynamic Underwater Laser
Scanning of a WWII battlefield

Feature Story - Page 10

About the Cover

Contactless 3D model of historic ceramics at the University of Trieste reveal fine details without disturbing the site.

Photo Credit: 2G Robotics Inc.

EDITORIAL



ON&T

Editor

Rhonda Moniz

News Editor

John Manock

UK Correspondent

Kira Coley

Art Director/Production Coordinator

Suzanne Short

Copy Editor

Robyn Bryant

Newsletter Editor

Inger Peterson

Web News Coordinator

Whitney Schwerin

Circulation

Jessica Lewis

jlewis@tscpublishing.com

ADVERTISING SALES**North American Ad Sales:**

Lisa Chilik

Tel: 574-261-4215

lchilik@tscpublishing.com

International Ad Sales:

Mimi Shipman

Mob: +44 (0) 777 6017 564

mshipman@tscpublishing.com

ADVISORY BOARD

Philippe Pierre Cousteau
Washington, D.C.

Dr. Phil Hart
Halifax, Canada

Drew Michel
Pierre Part, Louisiana

TO SUBSCRIBE:

www.oceannews.com/subscribe

PUBLISHED BY:

Technology Systems Corp.
Patrick C. Lagrange, CEO

Greg Leatherman, Managing
Editor of TSC Publications

Ocean News & Technology ISSN# 1082-6106 is published 12 times a year by Technology Systems Corporation, 7897 SW Jack James Dr., Suite A, Stuart, FL 34997, telephone 772-221-7720. Copyright ©2017 Technology Systems Corp. All rights to editorial content are reserved. No article, photograph, or illustration may be reproduced in whole or part without the written permission of the publisher. Unless otherwise stated in writing by the contributor, all images submitted to TSC may be used in other promotional materials belonging to TSC without permission. Subscriptions are free to qualified individuals or companies. For all others, call TSC for subscription information.

Printed in the USA.



Gary H. Isaksen
ExxonMobil Exploration Company
Manager, Global Ocean Science & Policy
Manager, Arctic Science & Policy

Advancing the Science of Sound and Marine Life

Our oceans host a variety of sounds. Some are generated from natural sources, such as breaking waves, plate tectonics, ice calving, whales, fish (e.g., croaker), and crustaceans (e.g., snapping and mantis shrimp). Other sounds are generated from human activities, such as vessel traffic, seismic surveys, pile driving, wind turbines, sea-bottom trawling, echo-sounders, and sonar.

Seismic surveys are used by governments (e.g., USGS and NOAA), academia, the wind industry, and the E&P industry. Sound waves in the oceans are integral to a range of mapping applications and the search for oil and gas. The E&P industry uses seismic technology to help determine where to drill. To do this, a seismic imaging tool sends sound waves from an exploration vessel to geologic formations below the ocean floor and the returning waves are used to create 3D images of sedimentary formations that may hold oil and gas.

In May 2006, several of the world's leading oil and gas companies and industry associations embarked on a multimillion, multi-year joint industry program (JIP) to advance the scientific understanding of the effects of sound generated by offshore operations on marine mammals, fish, and reptiles.

Looking back over 11 years, the accomplishments of the many academic researchers funded by this JIP have not only advanced the science, but also built a reputation of scientific integrity for this program of academic-industry-government cooperation. The Sound and Marine Life JIP is the largest non-government funder of research on this topic. To date, the JIP member companies have provided \$60 million in research funds to understand a broad range of marine sound issues and enabled marine mammal observations at sea in many areas where few data previously existed. Our policies stipulate that the research results be shared in public reports and submitted to peer-reviewed scientific journals to ensure maximum transparency and value to the wider research, stakeholder, and regulatory communities. Our partnerships have resulted in more than 30 reports and over 70 peer reviewed manuscripts published by independent scientists. Such results help inform regulators, policy makers, the regulated industries, and the scientific community.

Sound and Marine Life JIP research is divided into five complementary categories that allow the JIP to fully understand the issue and potential effects associated with underwater sound from E&P activities:

- Sound source characterisation and propagation
- Physical and physiological effects and hearing
- Behavioural reactions and biological significant effects
- Mitigation and monitoring
- Research tools

Don't miss our article in the ON&T July digital issue. Rhonda J. Moniz, Editor of ON&T, will highlight several scientific advancements made possible by the JIP, such as the large, multi-year humpback whale study by Curtin University, the University of Brisbane, and the University of Sydney; hearing among different species of Arctic seals by the University of California at Santa Cruz; and research into dolphin hearing by the U.S. Navy Marine Mammal Program in San Diego.

Information about the research, final project reports, and a list of peer-reviewed publications are available at www.soundandmarinelife.org.

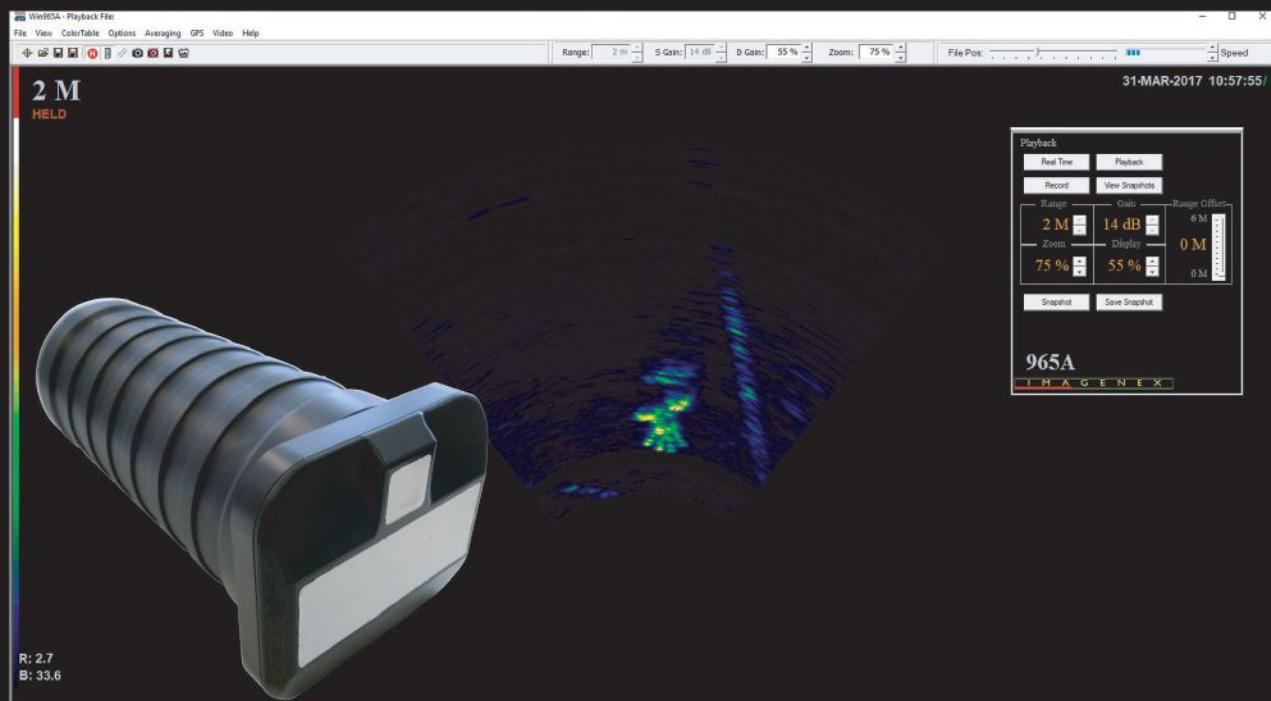
New Design. New Technology.

New 965A.

R E D E F I N I N G I M A G E C L A R I T Y

The Imagenex 965A

Multibeam Imaging Sonar



For more information on the 965A and other leading edge sonar products visit

www.imagenex.com

IMAGENEX TECHNOLOGY CORP. 209-1875 Broadway Street, Port Coquitlam, BC, V3C 4Z1 Canada
TEL: (604) 944-8248 FAX: (604) 944-8249 e-mail: info@imagenex.com

I M A G E Z E N E X

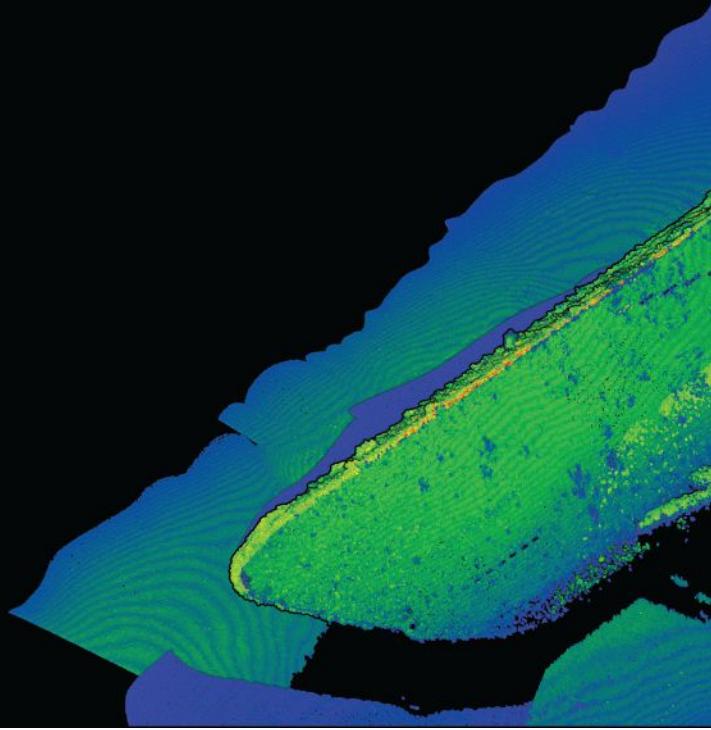
REMEMBERING THE BATTLE OF THE ATLANTIC:

Dynamic Underwater
Laser Scanning of a WWII
Battlefield

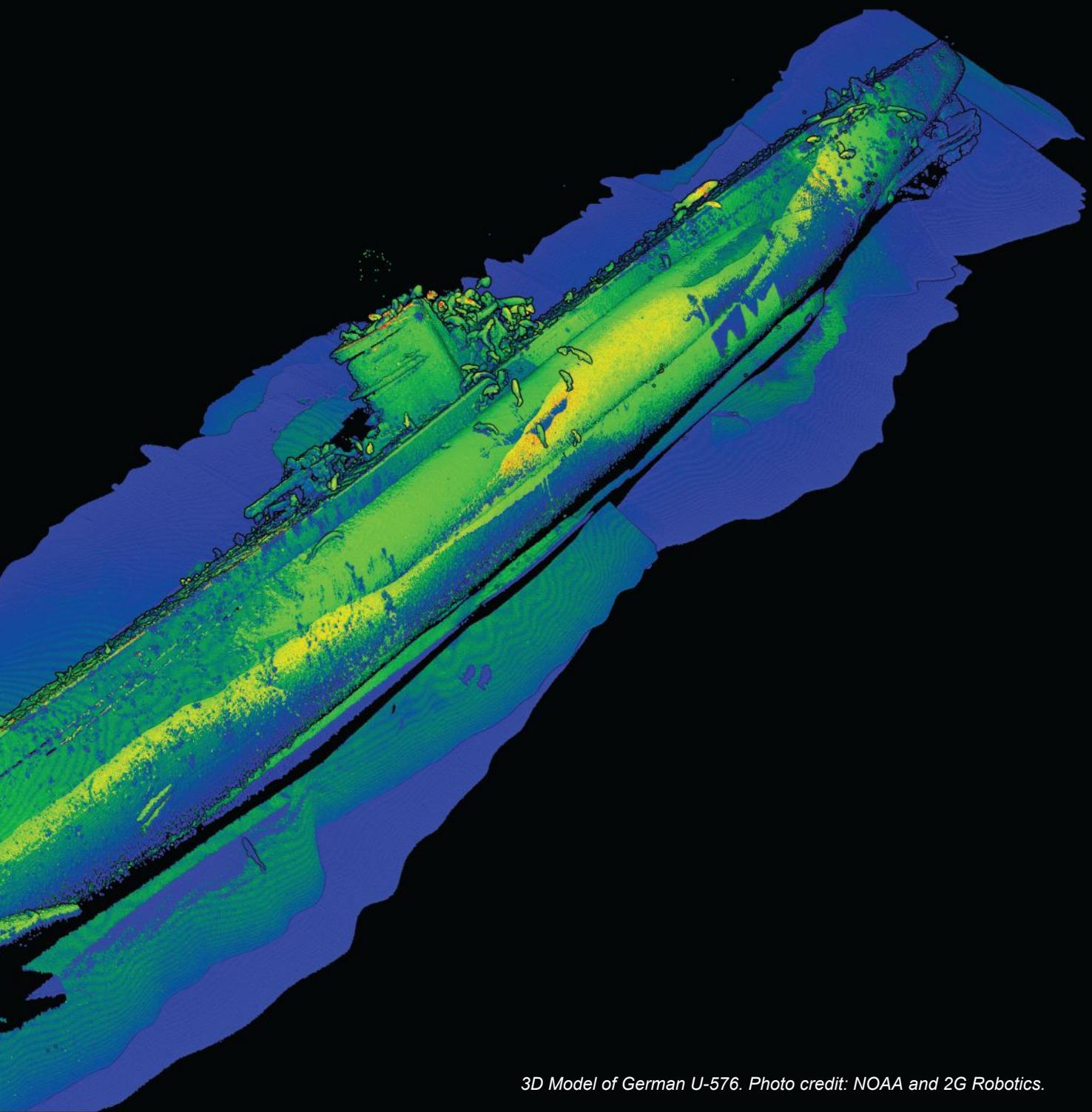
June 2017

10

Ocean News & Technology



By: Kelci Martinsen, 2G Robotics Inc.



3D Model of German U-576. Photo credit: NOAA and 2G Robotics.

FEATURE STORY

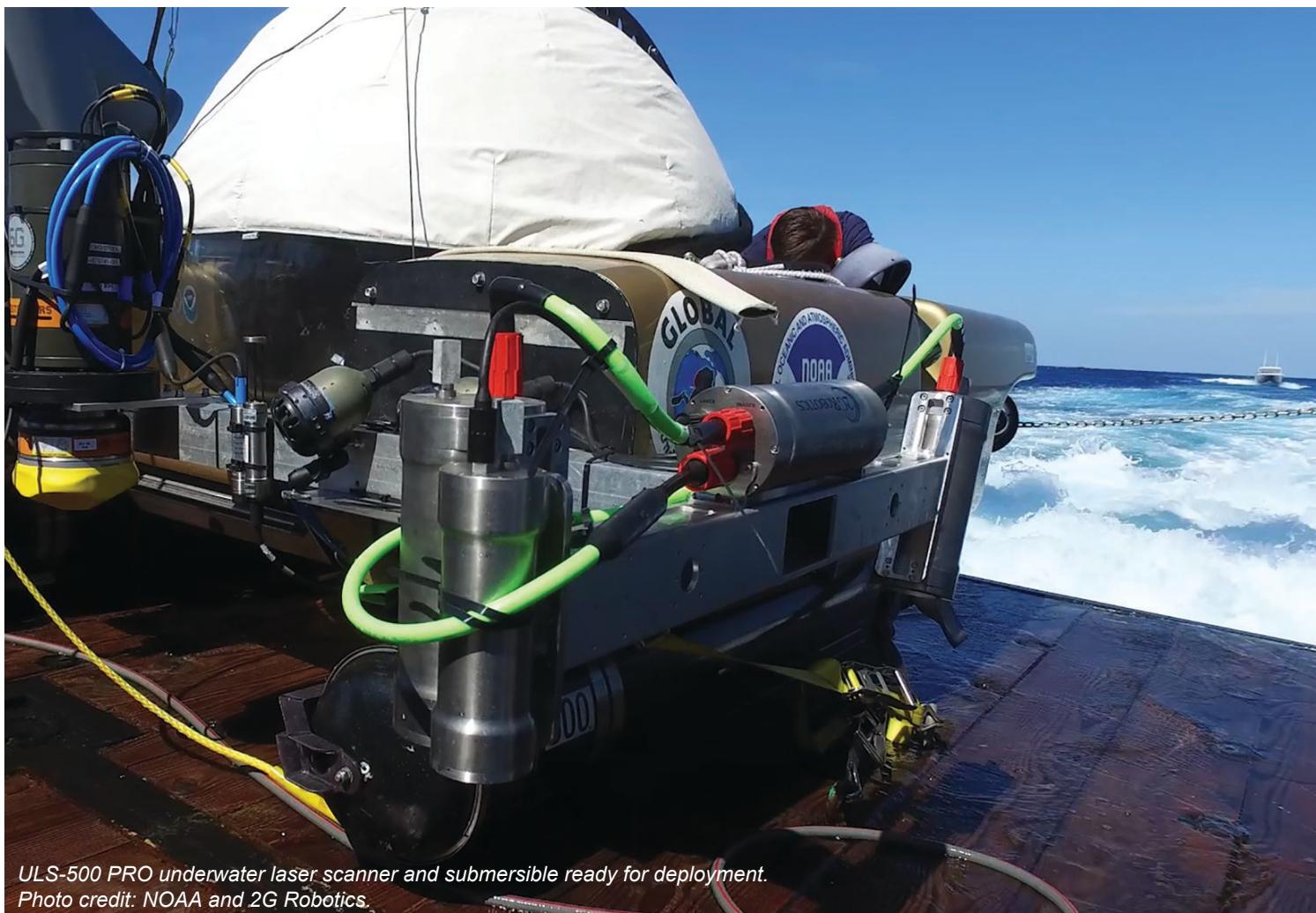
When thinking about the naval battles of the Second World War, the eastern coast of North America is not often the first battlefield to come to mind. However, crucial struggles over supplies were regularly taking place in the Atlantic. Sustained resources were critical to ensure an allied victory, without them, the allied forces in Europe would become increasingly ineffective, succumbing to a war of attrition.

One such conflict took place on 14 July 1942 approximately 35 miles offshore from Cape Hatteras, North Carolina. The German submarine, *U-576*, was returning home after sustaining damage to the main ballast tank from enemy depth charges. However, *U-576* encountered convoy KS-520 consisting of 19 merchant vessels and five military escorts travelling from Norfolk, Virginia to Key West, Florida for an extremely vital resource—fuel.

The German submarine fired four torpedoes into the convoy, damaging a steam merchant and a tanker and sinking the freighter *Bluefields*. As the U-boat surfaced, *Unicoi* opened fire on the submarine, landing a successful blow. Meanwhile, *Bluefields* crew members quickly evacuated the steadily sinking ship. Minutes later, depth

charges were released from two U.S. Navy aircraft, sending *U-576* to its final resting place on the ocean bed. The entire submarine crew, consisting of 45 men, was lost and four allied crew members were badly injured.

Decades later, *U-576* and *Bluefields* lay forgotten off the coast of North Carolina in approximately 800 feet of water—that is until the battlefield was rediscovered by NOAA. Due to the depth, NOAA was only able to document the sites via a Triton 1000/2 two-person submersible and so turned to a trusted collaborator, 2G Robotics, for an effective way to understand the newly identified battlefield. The submersible was equipped with Sonardyne's SPRINT INS and 2G Robotics' most advanced underwater laser scanner, the ULS-500 PRO, to dynamically capture true-scale 3D models of the sites. Even in adverse weather, NOAA's team was able to complete multiple passes over the 65- and 80-meter baselines. The team diligently photographed *U-576* and *Bluefields* as they passed over, capturing the magnitude of the battle's carnage. The gaping void in *Bluefields'* port side further emphasized the violence of the conflict. Meanwhile, raw laser point cloud data and navigational data were recorded and processed through EIVA nav-



ULS-500 PRO underwater laser scanner and submersible ready for deployment.
Photo credit: NOAA and 2G Robotics.



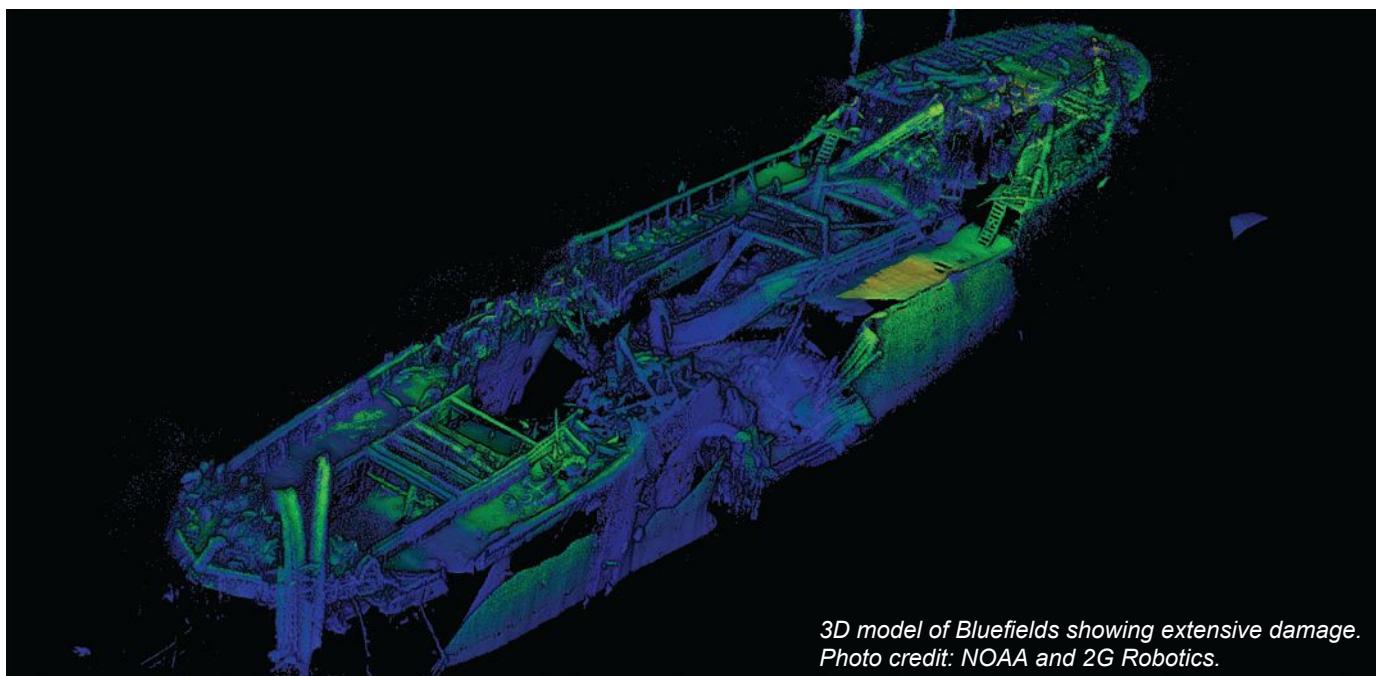
Manned submersible inspecting U-576. Photo credit: NOAA.

igational software, providing real-time display of data without the use of stitching. As the data for *U-576* water-falled in, it was plain to see the submarine had sustained little exterior damage and the hatches were still sealed tightly, giving additional insight into the last moments of the ill-fated crew members.

The data and 3D models captured by 2G's ULS-500 PRO provided NOAA with a complete millimetric record of the artifacts and site integrity, allowing for precise measurements and improved analysis. NOAA will now be able to monitor site changes over time, particularly those transformations caused by human impact.

The project represents a significant step forward, not only for cultural resource management and in understanding the implications of WWII naval conflicts but also for public outreach. Maritime history is now more accessible, enabling anyone to experience 3D models of *U-576* and *Bluefields* using a virtual reality system, further establishing underwater laser scanners as the new standard for underwater archaeological surveying.

For more information on the project visit www.2GRobotics.com or <http://oceanexplorer.noaa.gov/explorations/16battlefield/welcome.html>.



3D model of *Bluefields* showing extensive damage. Photo credit: NOAA and 2G Robotics.

'Sister Sanctuary' Agreement Protects Whales

A new "sister sanctuary" agreement signed this spring between NOAA and the government of The Netherlands adds to a network of marine protected areas stretching from New England to the Caribbean Sea, and now provides refuge for North Atlantic humpback whales at both ends of their 3,000-mi annual migration.

The agreement between NOAA's Stellwagen Bank National Marine Sanctuary, off the coast of Massachusetts, and the Yarari Marine Mammal and Shark Sanctuary of the Caribbean Netherlands in the Dutch Lesser Antilles, provides for joint whale research, monitoring, education, and conservation.

From April through December, humpback whales feed in Stellwagen Bank and migrate to lower latitudes in the Caribbean Sea during the winter to mate and calve. Yarari sanctuary is a breeding and calving

ground for the humpback whale population of around 1,000 whales, which are shared by both nations.

"This agreement has the potential to improve our scientific knowledge and enhance our management capabilities of these two special places," said John Armor, director of NOAA's Office of National Marine Sanctuaries.

The nearly 9,000-sq. mi Yarari sanctuary joins sanctuaries off Dominican Republic, French Antilles, and Bermuda in the sister sanctuary network originated by NOAA in 2007. The network now encompasses 257,000 sq. mi in the western North Atlantic, including the 842 sq. mi of waters protected by NOAA's Stellwagen Bank National Marine Sanctuary.

"The sister sanctuary network, with the Yarari sanctuary as its newest member, uniquely links both eastern



and western Atlantic humpback whale populations in the Caribbean, along with conservation efforts in Europe, the Caribbean, and the United States," said Paul Hoetjes, policy coordinator for Caribbean Netherlands Ministry of Economic Affairs.

The sister sanctuary concept is part of a plan for marine mammal protected areas worldwide and is partially supported by the United Nations Environment Programme.

"Cooperation is central to our goals of and to the implementation of the regional Marine Mammal Action Plan for the Caribbean," said Monica Borobia-Hill, UNEP program officer. "We welcome this agreement. It will open new opportunities for collaboration in activities of mutual interest on humpback whales and other marine mammals, as appropriate, as well as their respective habitats."

For more information, visit <http://stellwagen.noaa.gov/sister>.



Sonardyne
SOUND IN DEPTH
SUBSEA TECHNOLOGY

Total Autonomy



All-in-one acoustic tracking, navigation and communications for small AUVs

Small AUVs need small instruments and they don't get much smaller than our new AvTrak 6 Nano OEM. We've managed to combine USBL tracking, support for LBL and bi-directional communications in one easy-to-fit, easy-to-integrate design. A li-ion battery gives you 10 days standby life to help recover your vehicle if lost and it's compatible with all the Sonardyne 6G systems fitted to ships and unmanned systems in use across the oceans. Enhance the mission capabilities of your marine robotic platforms. Search **AvTrak 6 Nano OEM**

**POSITIONING
NAVIGATION
COMMUNICATION
MONITORING
IMAGING**

Floating Cities Will Soon be a Reality

Lack of space has provoked a floating cities initiative from Asian developers, and the technological experience with floating constructions in Norway comes in handy.

"Norway has a leading edge in floating constructions, but also in underground technology. It's been a long time since we started storing oil and gas below the ground," says Øyvind Hellan, research manager in SINTEF Ocean.

The cooperation with Singapore goes back to 2004, when SINTEF and NTNU were contacted about underground storage of oil and gas. Gradually, the cooperation has developed to include floating constructions, where the idea is to exploit the sea surface for a number of purposes, from manufacturing industry to housing. Singapore and Norway are both similar and different. The similarity is that both countries have around the same number of inhabitants. The difference is that Norway's land area is 1,500 times larger.

"I think this was a rather exotic trip for our guests. When we drove over the mountains, there were hardly any people or houses to be seen," Hellan said with a smile.

A company from Silicon Valley also took part in the seminar in Trondheim. They already have specific building plans, but not in Singapore.

"French Polynesia wants to build floating cities. They fear that its islands could be hit by rising sea levels," says Egor Rujikov, ambassador for Seasteding Institute.

French Polynesia consists of five groups of islands, comprising 121 islands in all, of which 76 are inhabited. The government is working to develop regulations that allow residential settlements floating at sea. Rujikov has received indications that building can start within a short period of time.

"We expect to set the first modules afloat during 2018. They will be 50 x 50 m in size. The idea is to make these floating communities as self-supporting as possible, when it comes to water, energy, and food," Rujikov says.

The researchers see few technical limitations relating to the building of floating cities. In Singapore, they have already built an underground oil storage, which is a direct result of the research cooperation.

"This is a good example of success in international cooperation. Now, we hope that more Asian countries can make use of this knowledge," concludes Øyvind Hellan in SINTEF.

For more information, visit www.sintef.no/en.



Field Proven Designs



Our customers rely on our superior engineering, development and testing protocols for connectivity solutions for extreme depth marine applications. The BIRNS Millennium™ connector series meets the needs of the most demanding subsea environments with 6km open face pressure rating, termination and testing by J-STD-001 Class 3 certified technicians, and molding at our NAVSEA PRO-020 certified molding facility. Whether a design requires titanium or stainless, solid cable or oil filled, high voltage, fiber or coax, this robust series provides the ultimate in flexibility and reliability at depth.

Six Decades of Excellence in the Subsea Industry



*High Performance . . .
Under Pressure®*

www.birns.com



BIRNS is NAVSEA PRO-020 Certified;
Our Quality Management System is
ISO 9001:2008 Certified by DNV GL



Robots May Bring Reef Relief

A study by University of Delaware professor Art Trembanis and colleagues reveals new details about deep-sea reefs—known as mesophotic reefs—near the island of Bonaire in the Dutch Caribbean. While coral reefs worldwide are in decline, the waters surrounding Bonaire comprise a marine park known as a “scuba diver’s paradise” because it contains some of the most well-preserved coral reefs in the Caribbean basin.

<http://ont.news/2q8dGiB>

Bureau Veritas Introduces New Technology Solution

Bureau Veritas announces the launch of the Veristar AIM 3D asset integrity management system, based on technology partner Dassault Systems’ 3DEXPERIENCE platform. The new solution combines a digital twin of any marine or offshore assets with smart data in a collaborative environment. Veristar AIM 3D will be used in the design, development, and implementation of the operational lifecycle to reflect and predict the condition of any asset or fleet of assets.

<http://ont.news/2rxtQ4I>



SHARK
SHARK MARINE
TECHNOLOGIES INC.

BARRACUDA

The Barracuda is a new breed of ROV, designed to work in high current.
Small, Streamlined, Extremely Powerful and loaded
with Advanced Capabilities.

- Lightweight, easy to deploy.
- High Thrust.
- Integrated Total Navigation System (TNS)
Including GPS, DNS,(LBL also available).
- Intelligent Flight with Shark Marine’s
“DiveLog Software” Provides:
 - 3D Route Following.
 - Station Keeping.
 - Auto Depth / Altitude.
- Able to run off of a wide range of power supplies.

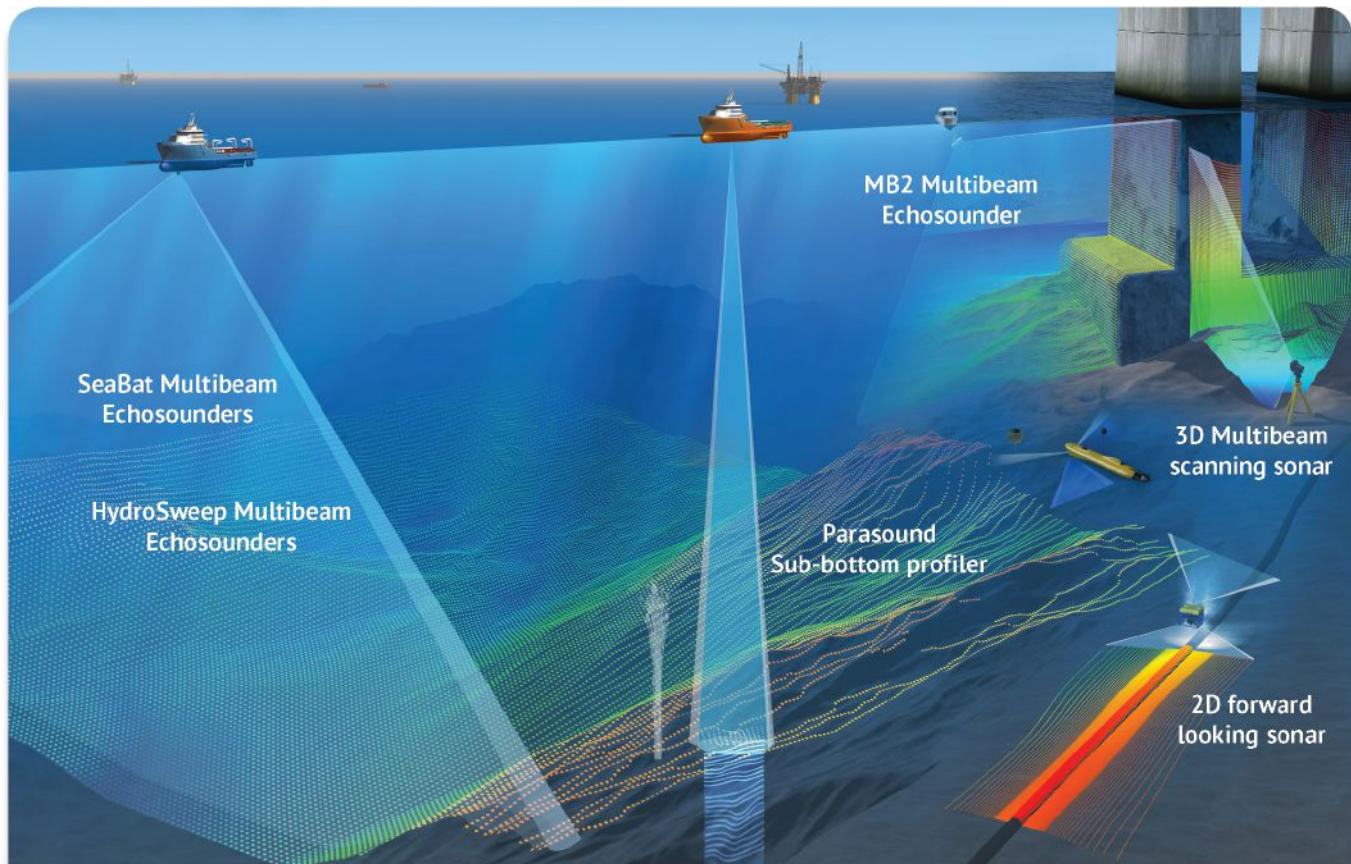


Shark Marine Technologies Inc. www.sharkmarine.com sales@sharkmarine.com Ph: (905) 687 6672



Teledyne Marine

All the sonars you need, in one place



Hydrography
*Seafloor mapping
Sub bottom profiling
Marine research*

Defense & security
*Terrain mapping
MCM and Obstacle Avoidance
Diver detection*

Civil engineering & dredge
*Dredge guidance
Construction support
Bridge, Dam and Harbor inspection*

Offshore
*Pipeline surveying
Leakage detection
Obstacle avoidance*

Take advantage of the collective expertise of how our combined underwater acoustic imaging technologies deliver far-reaching support for your business. We operate out of six worldwide locations and are closer to you than ever before supported by a global network of service partners. Contact our skilled team for an in-depth look at our pioneering products and customized solutions.

To know more, contact us at:

www.teledynemarine.com



TELEDYNE MARINE
Everywhereyoulook™
RESON • BlueView • Odom Hydrographic

In-Situ Microscope Provides Continuous Time-Series of Plankton and Particulates



June 2017

20

Ocean News & Technology

Plankton images generated by CPICS (Continuous Particle Imaging System).

1mm

The Continuous Plankton Imaging and Classification System (CPICS) is providing automated measurements of plankton biodiversity on long-term observing systems

Marine and freshwater ecosystems are changing on surprisingly rapid time scales as a function of a diverse suite of forcing functions, both natural and anthropogenic. Plankton are at the base of virtually all aquatic food chains supporting ecosystem function and are particularly relevant to commercially important fisheries.

Plankton and their resulting breakdown products called marine snow directly support the biogeochemistry of aquatic communities by providing more than half of the oxygen we breathe and the removal of more than half of the carbon produced by burning fossil fuels to the deep sea. Understanding the balance between plankton, their community structure, and the production of marine snow is essential to understanding ecosystem function and the survival of our species. To this end, establishing a continuous plankton and marine snow time series at key locations throughout marine and freshwater systems consisting of sampling scales from rapid (seconds) to long-term (decades) would provide a sentinel for ecosystem

change. The key is to measure plankton abundance and establish indices of biodiversity at sufficiently fast time scales that allow disentanglement of physical (transport) and biological (growth) properties of an ecosystem.

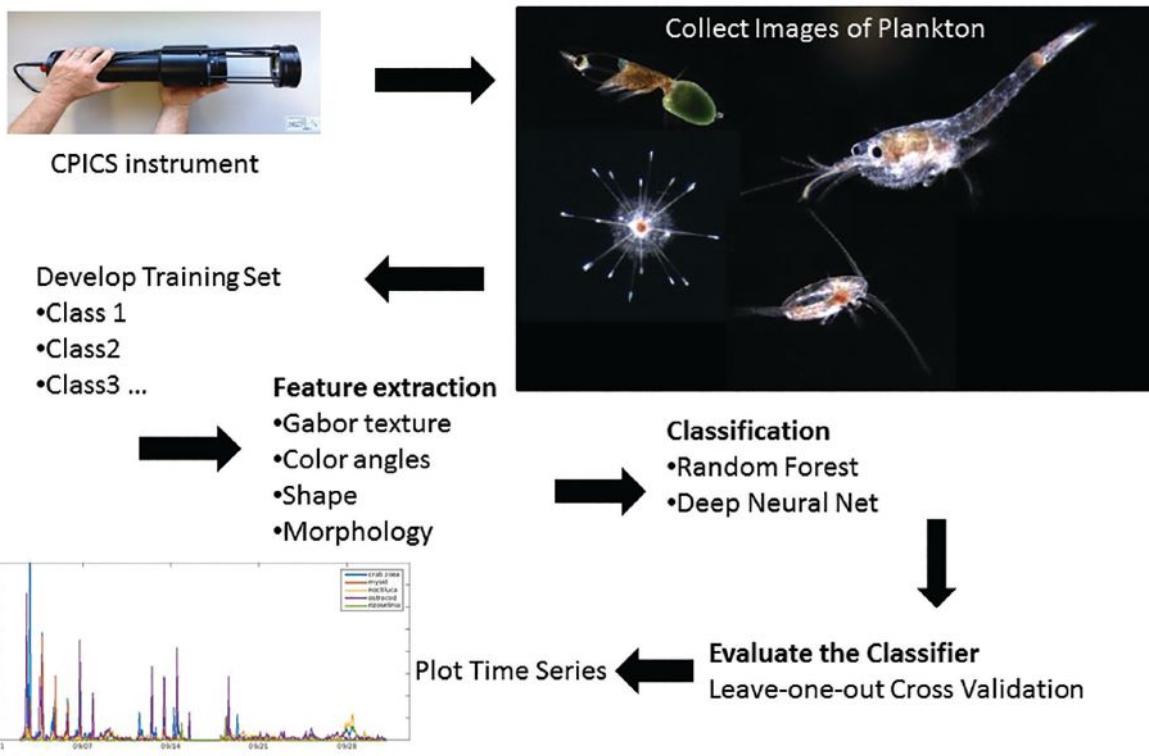
Traditionally, plankton and particle studies are carried out using nets towed through the water that screen out material between 50 microns and several millimeters, followed by laborious hours in the laboratory under a microscope sorting and identifying plankton by hand. This manual sampling approach precludes the kind of rapid sampling necessary to build indices of biodiversity that will allow us to better understand ecosystem dynamics. Conversely, the CPICS instrument puts the microscope in the water and, along with high-resolution optics and embedded processing, provides a continuous stream of data consisting of plankton and particle classifications, size, shape, volume, and other data types necessary for calculating the contribution of plankton to carbon flux to the deep ocean and lakes.



The CPICS instrument.

EDITORIAL FOCUS

Automated Classification of Plankton



June 2017

22

Figure 1. Workflow for embedded, automated classification of plankton on CPICS instrument.

Ocean News & Technology

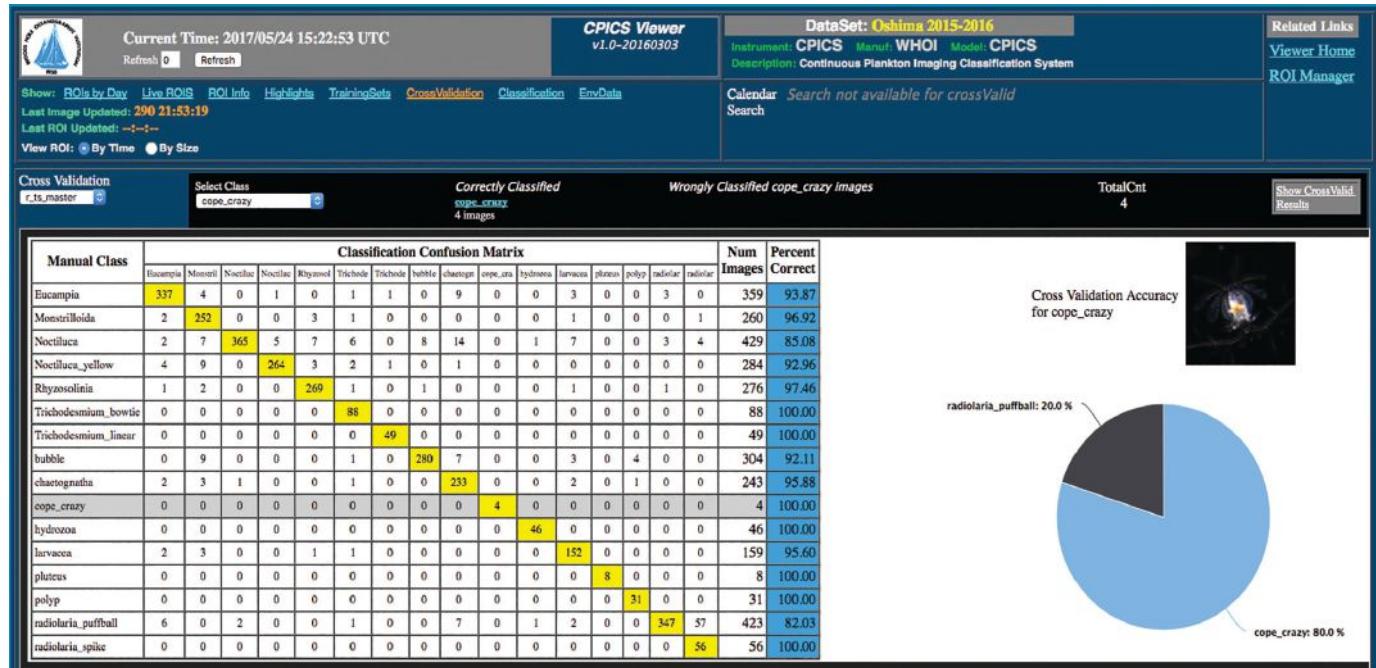


Figure 2. Example screen shot of website showing cross-validation confusion matrix with classification accuracies ranging from 92% to 100% and percentage composition of each class in a given sample of 16 classes.

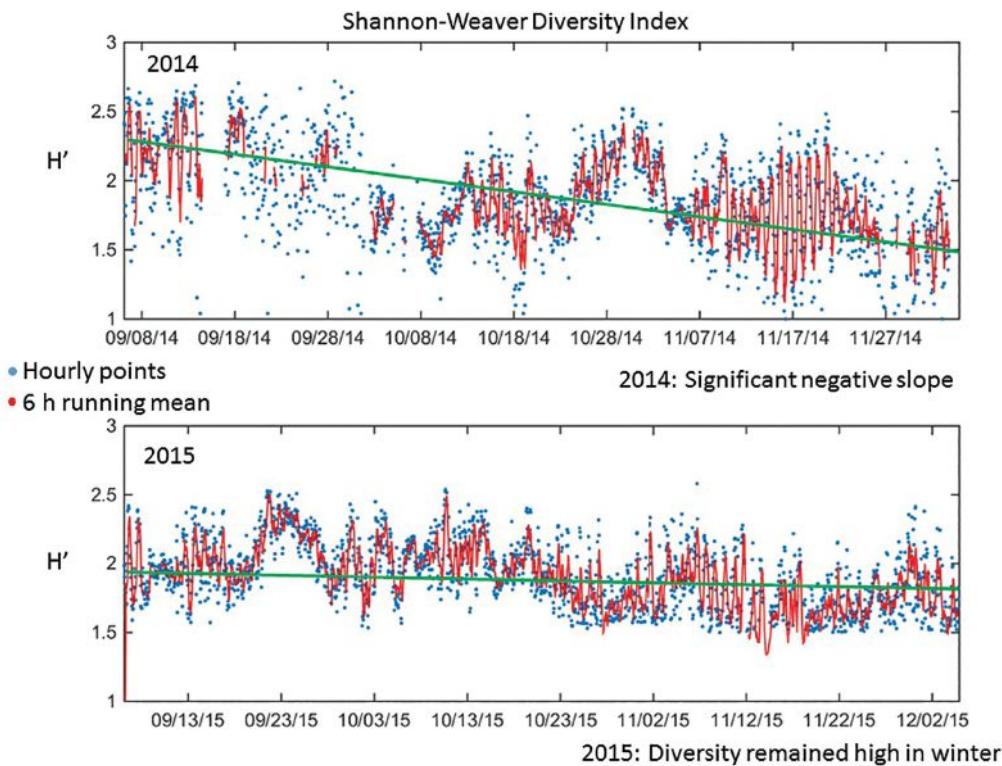


Figure 3. Time series of Shannon-Weaver Biodiversity Index (H') for 21 plankton classes classified automatically for the autumn months in 2014 and 2015 at a long-term observatory site in the Kuroshio Current south of Tokyo, Japan. Blue dots are hourly calculations of H' , red lines are 6-hour running means, and green lines are linear regressions. Notes: 1) very high variability in H' hour to hour; and 2) the negative slope in 2014 and not in 2015, suggesting that biodiversity did not decrease in 2015 as it normally should due to lack of decreasing fall temperature.

Continuous automated plankton classification has been accomplished recently on fixed observing systems allowing long-term, high-frequency biological measurements that are anti-aliased for physical processes. The OceanCubes program (oceancubes.whoi.edu) was established specifically to provide measurements of biological, chemical, and physical properties of the coastal ocean to capture the response of the plankton community to ecosystem change and to expose and quantify the drivers causing such change. This observing capability will be reported in the September issue of ON&T.

The CPICS plankton camera (Figure 1) has been installed on OceanCubes observatories off Okinawa, on Oshima island off Tokyo, on the Pacific and Caribbean coasts of Panama, and in Lake George, New York. In addition, it is proposed for several new sites where plankton communities are impacted by physical and geochemical features such as upwelling, intense horizontal mixing, and terrestrial run off.

CPICS is manufactured by CoastalOceanVision, Inc. in North Falmouth, Massachusetts (www.coastaloceanvision.com) and produces high-resolution dark-field images in vivid color six times per second and can process hundreds of

particles per image. The short exposure (100 μ s) from a custom LED ring eliminates motion blur, while the open flow design is non-invasive and non-restrictive, providing images of very fragile plankton in their natural orientation. Several magnifications are available from 0.5 to 20 x, forming a Field of View (FOV) of ~5 centimeters to ~100 microns, respectively. Images shown in this article were taken at a magnification of 1x and FOV of 12x11 millimeter. Image processing algorithms running on an Nvidia Jetson TX1 embedded processor extract and store images locally for later processing. The next step is to extract feature sets for texture, color pattern, morphology, shape, and volume to train a Random Forest machine learning classifier resulting in classifications that are cross-validated using confusion matrices (Figure 2). High classification accuracies (80% to 100%) are possible depending on the number of training categories and target complexity. A web-based utility running on the CPICS instrument will allow access to raw images, training sets, classifiers, and classification results over the Internet. CPICS may be stand-alone such as on a CTD, towed vehicle, AUV, or connected by Ethernet or serial to ship or shore. An ecologically meaningful plankton index of biodiversity and its variance is developed using a combination of species and taxon groups, which provides a novel approach for understanding ecosystem change (Figure 3).

Innovating for the Upturn: Expro's Range of New Technology Solutions

Leading international oilfield services company Expro has demonstrated its continued commitment to innovation, as it showcased a range of new capabilities and technology at OTC Houston 2017.

With Brent oil prices forecast to average \$55/bbl in 2017, according to the EIA, operators remain focused on optimizing production from existing assets.

In the last year since launching four new areas of capability, including production optimization and pre-well abandonment services, the company has seen a 15% increase in opportunities. This response and

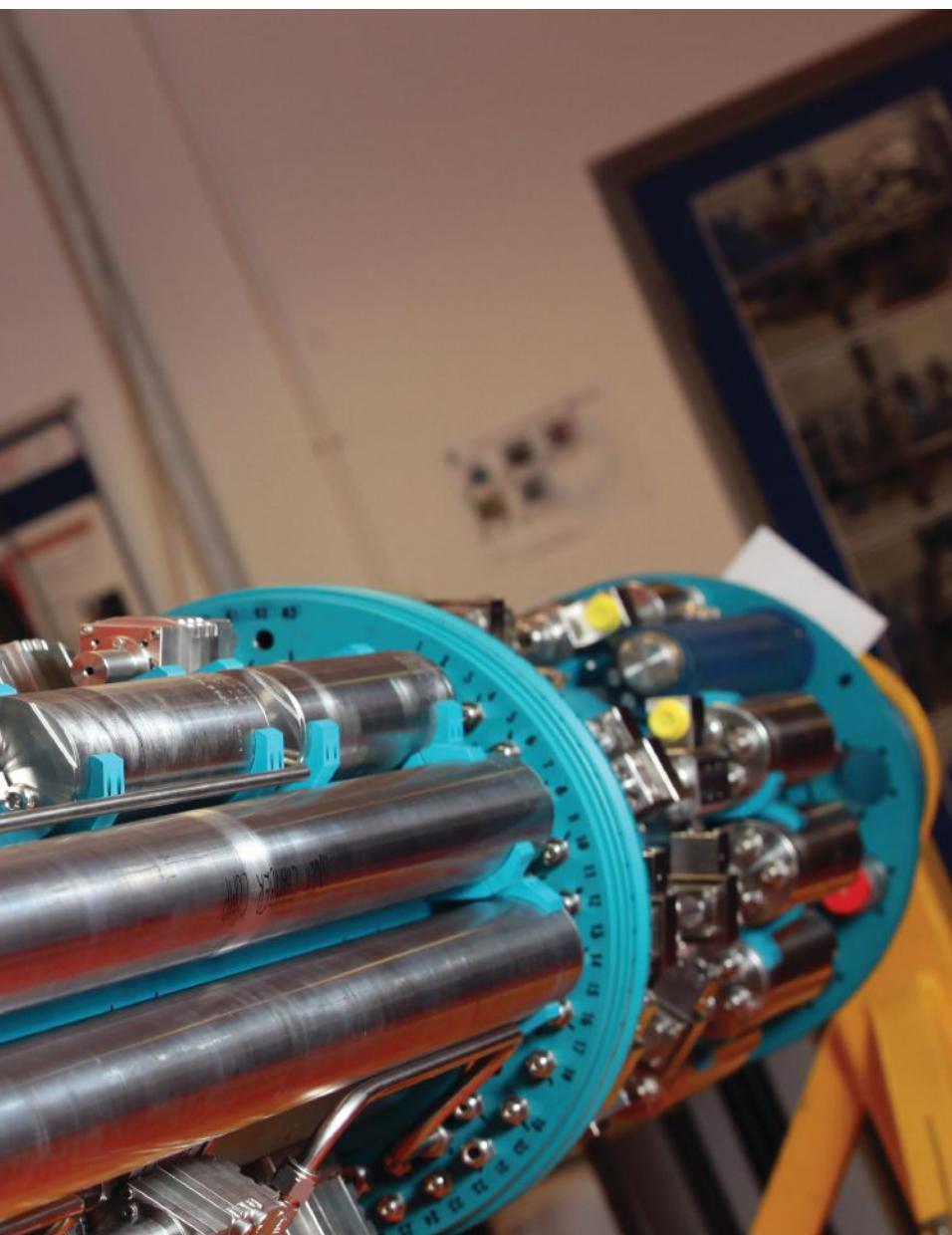
approach to the low oil price has reflected a change in focus areas for mature, higher cost basins like the U.S. Gulf of Mexico (GoM).

Commenting on this trend, Expro's technical marketing director, Nigel Webster, said, "While we have seen a softening in demand for our exploration and appraisal related products and services, our intervention and production business remains robust. This includes a record order backlog for our well intervention business, which has seen demand increase across a range of mechanical, slickline and cased hole support services. Our production surveillance and multi-phase metering related



business has also experienced an uptake in demand, reflecting the ongoing focus to maximize incremental reserves from existing assets. For companies prepared to invest time in understanding their market and customer needs, the business is there. We've proven this by maintaining a stable customer base throughout the downturn, leaving us ideally positioned for a return to increased activity in the coming year."

The landscape is continuing to change. For the first time in two years, exploration and production spend is forecast to increase, with North America poised to grow by as much as 60%, according to Barclay's 2017 Global E&P Spending Outlook report. Lower break-even prices on deepwater projects, combined with a 1.3 million bbl/day growth in global demand for energy, means that operators are reviewing key project sanctions this year.



In response to the market fundamentals rebalancing, Expro has invested for a return to increased activity and is showcasing a range of new technologies at OTC Houston.

The most significant investment is Expro's Next Generation Landing String (NGLS), which comprises a program of work to deliver a complete landing string package in line with the industry's latest API 17G standards.

This includes a range of new functionality across its 7 3/8 valves, including high debris tolerant ball mechanism and hydraulic latch mechanism; dual seal protection to both environment and control systems; and new retainer valve cut and seal technology. The system is validated through extensive connector testing and analysis, allowing the development of structural and fatigue capacities to meet the most rigorous industry standards. This is complemented by a comprehensive data and fatigue life cycle management system, with Expro's landing string certified SIL 2 compliant.

Colin Mackenzie, Expro's vice president of subsea, commented, "Subsea test trees have become the established safety system for well commissioning and intervention, with new standards developed to ensure well integrity is maintained at all times. As market leaders in subsea completions, Expro is committed to maintaining our position at the forefront of landing string technology as we continue to deliver the safest and most cost-effective solution for our customers."

The company has also invested in a range of other key technology solutions, including a new electronic choke for managed pressure drilling, well control, and other choke applications. It can be retrofitted onto existing chokes with no specialist tools, delivering a fast response choke speed of less than 10 seconds, compared to traditional hydraulic chokes.

Expro is also featuring its non-reactive samplers that, when used with its mercury speciation services, deliver absolute measurement on mercury independent of any contamination from the sample device or analysis techniques.

For more information, visit <http://exprogroup.com>.

Damen's First Renewables Service Vessel Launched

Damen has launched the Renewables Service Vessel (RSV) 3315, a new type developed in close cooperation with Scottish company Delta Marine.

The first in the new series was officially christened Voe Vanguard at Damen Shipyards Hardinxveld by Miss Akira Mary Lumsden, the granddaughter of Bob Spanswick, managing director of Delta Marine Ltd. Just a week later, Voe Vanguard was off to her first offshore wind farm, the Walney Extension project.

Delta Marine took delivery of its first Damen vessel 12 years ago and the Shetland-based company now has four Damen Multicat vessels in its fleet as well as one it manages.

David McNaugthan, Delta Marine general manager, says the decision to invest in a vessel specifically tailored for renewables was taken around four years ago. "We knew at Damen we get a good project and good quality backup."

The Damen RSV 3315 is based on the highly successful Multicat design. The vessel can undertake all duties normally expected of a Multicat but has the addition of a spacious, unobstructed deck, DP2 and dedicated 4-point mooring. The 33-m vessel has a 42-tonne bollard pull. "We were particularly interested in having a DP2 capability. This vessel is suitable for offshore wind but also for tidal projects, where she can stay in position using her DP in some pretty strong currents."



Delta Marine and Damen adapted the traditional Multicat design by moving the wheelhouse forward and leaving the aft deck open. Additionally, it was important to make sure the vessel was under the 500-tonne mark to keep the costs down.

"The vessel is diesel electric and has four azimuths with a large stern thruster. She is also very flexible, with a shallow draught of only 2.6 m. The two aft azimuths can swing up into the hull, and we can easily switch from DP1 to DP2 mode," McNaugthan points out.



In addition, Voe Vanguard has two powerful cranes, one of which has a capacity of 15 tonnes with an outreach of 20 m. "With these, we can carry and lift an awful lot for a wide variety of tasks." She also has comfortable accommodation for up to 18 crew.

McNaugthan outlines the potential of the Damen RSV 3315: "The DP2 system is very important for our clients, every single job is crying out for DP2. We are confident this new type will establish itself in the market."

Voe Vanguard went off to work straight away for the Walney wind farm extension and then she will be exhibited at the Seawork in Southampton. After that, it is straight back up the coast for another project. "We already have work into August and beyond!"

Jos van Woerkum, managing director of Damen Shipyards Hardinxveld, comments: "We have been working on this vessel together since 2013. Delta Marine gave us a sketch and outlined their requirements, and I think Damen has built exactly what they wanted. I always say we can do a lot if we do it together. I think the Renewables Service Vessel 3315 has the potential to be the next success for Damen once she proves herself in the market."

For more information, visit www.damen.com.



Connecting What's Needed with What's Next™

STRENGTHEN YOUR CONNECTIONS



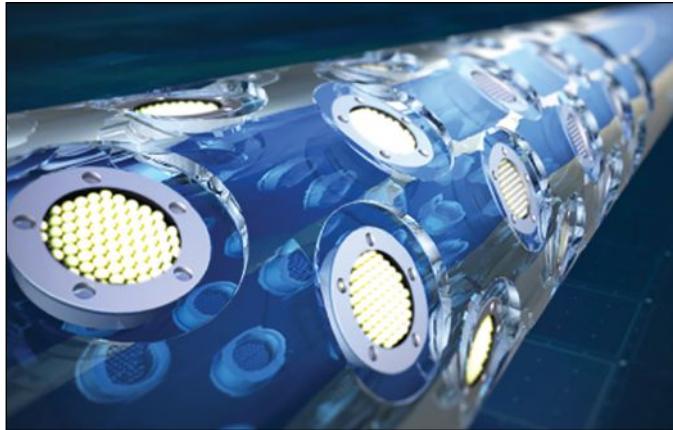
Copyright © 2017 Oceaneering International, Inc. All rights reserved.

To safely and cost-effectively solve your deepwater challenges in these dynamic market conditions, choose from our portfolio of advanced technologies and innovative subsea tieback solutions. As your trusted field-development partner, our unmatched experience and advanced engineering enable us to adapt and evolve to safely meet the current and future demands of the oil and gas industry.

By working together, we will safely and reliably re-shape the future of the oil and gas industry.

■ Connect with what's next at Oceaneering.com/WhatsNext

OFFSHORE ENERGY



DEEPFRAC™ Deepwater Multistage Fracturing Service from Baker Hughes

Baker Hughes Incorporated announces the introduction of its DEEPFRAC™ deepwater multistage fracturing service, which can save operators hundreds of millions of dollars in offshore developments through unprecedented efficiency gains across the completion phase. Using multiposition sleeves and patented flowback control technology, the service accelerates or eliminates certain steps of conventional multizone completion operations and enables rapid stimulation of 20+ stages. This translates into significantly greater reservoir contact, with an average OPEX savings of USD 30 to 40 million per well.

<http://ont.news/2rhNQsx>

Atlantis, Hyundai Sign Ocean Power Agreement

Atlantis Resources Ltd. has signed a Strategic Partnership Agreement with South Korean offshore construction giant Hyundai Engineering & Construction Co., Ltd regarding collaborating on the development of ocean power renewable projects globally. The particular focus for the collaboration is on the development of the domestic tidal stream market in South Korea and internationally as well as tidal range and floating offshore wind projects.

<http://ont.news/2qWNnc7>



June 2017

28

Ocean News & Technology

**NEW
INDUSTRIES**
www.newindustries.com

6032 Railroad Avenue
Morgan City, LA 70380
985-385-6789

JUMPERS • PLETs • PLEMs • Suction Piles



MONTH IN REVIEW

BP Announces Start of Production from West Nile Delta Development

BP announces that it has started gas production from the first two fields, Taurus and Libra, of the West Nile Delta development in Egypt.

<http://ont.news/2qhffXd>

Saipem Awarded New EPCI Contract by ExxonMobil

Saipem has been awarded a new EPCI contract for the SURF package of the proposed Liza project operated by Esso Exploration and Production Guyana Limited.

<http://ont.news/2rRFEfJ>

Maryland PSC Awards ORECS to Two Offshore Wind Developers

The Maryland Public Service Commission awarded offshore wind renewable energy credits (ORECs) to two projects to be built off the coast of Maryland.

<http://ont.news/2qQljsH>

Pioneering Burbo Bank Extension Offshore Wind Farm Opens

Burbo Bank Extension, a new offshore wind farm capable of meeting the electricity demand of well over 230,000 homes, officially opened on 17 May 2017.

<http://ont.news/2qhnld3>

M² Subsea and Frontera Offshore Join Forces in Gulf of Mexico

M² Subsea has joined forces with Frontera Offshore to deliver remedial pipeline work for Permaducto in the Ku-Maloob-Zaap (KMZ) oilfield.

<http://ont.news/2qhhb1V>

MacArtney to Deliver Winches for the Offshore Wind Market

Cable handling equipment from MacArtney ensures safe transport of cables from the seabed onto the substation decks of Hornsea Project One offshore wind farm.

<http://ont.news/2ql4WR9>

JW FISHERS

A perfect tool to locate missing objects
the Pulse 8X underwater metal detector.

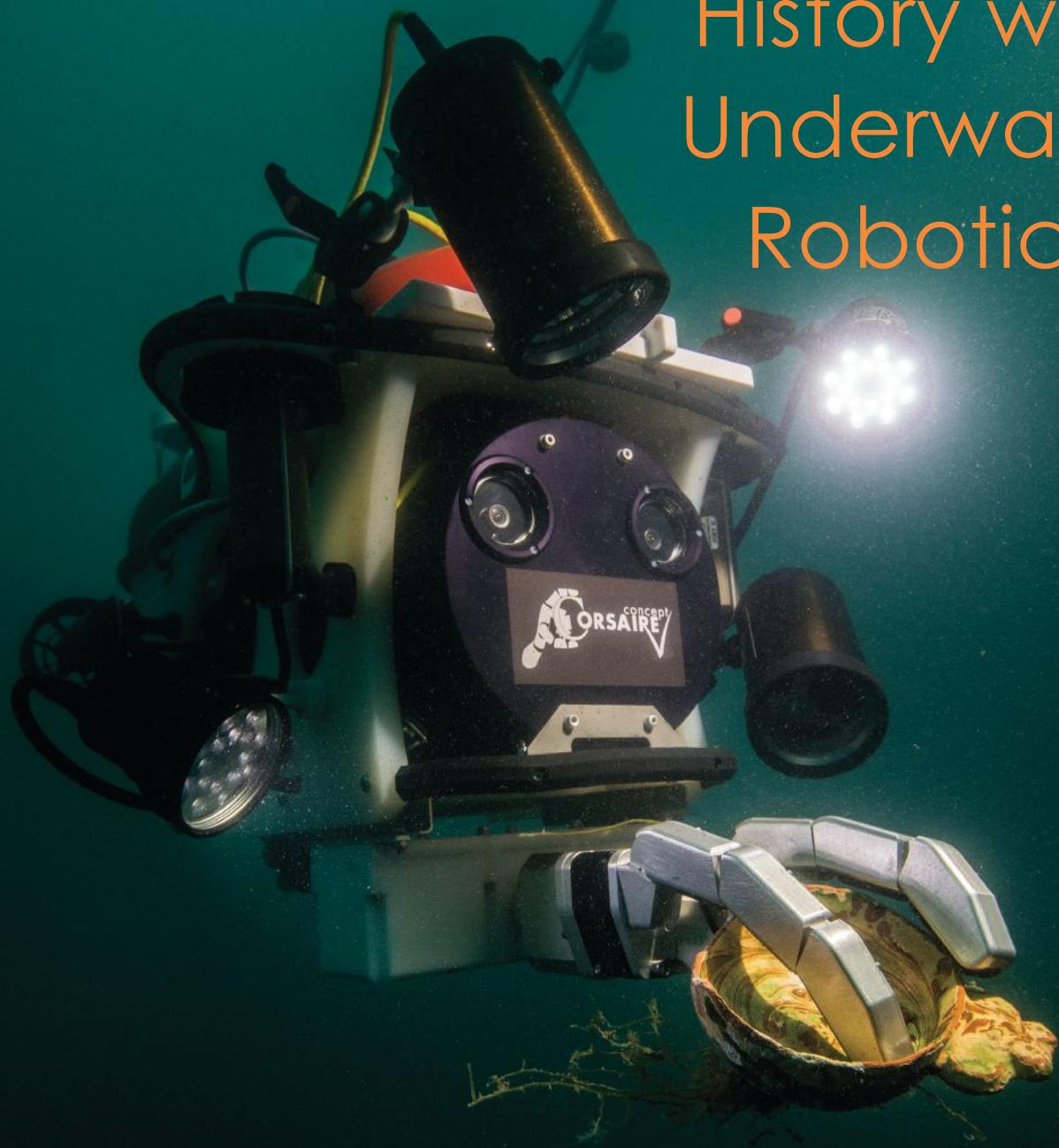
JW Fishers Mfg., Inc.
1953 County Street
East Taunton MA 02718 USA
(800)822-4744 or (508)822-7330
Email: info@jwfishers.com
www.jwfishers.com

Rated #1 by U.S. Homeland Security

- Easy operation
- Detects ALL metals
- Interchangeable coils
- Visual and audio readout
- Commercial grade
- Land & underwater detecting
- In use by FBI, US Navy and law enforcement agencies worldwide

ON&T

Touching History with Underwater Robotics

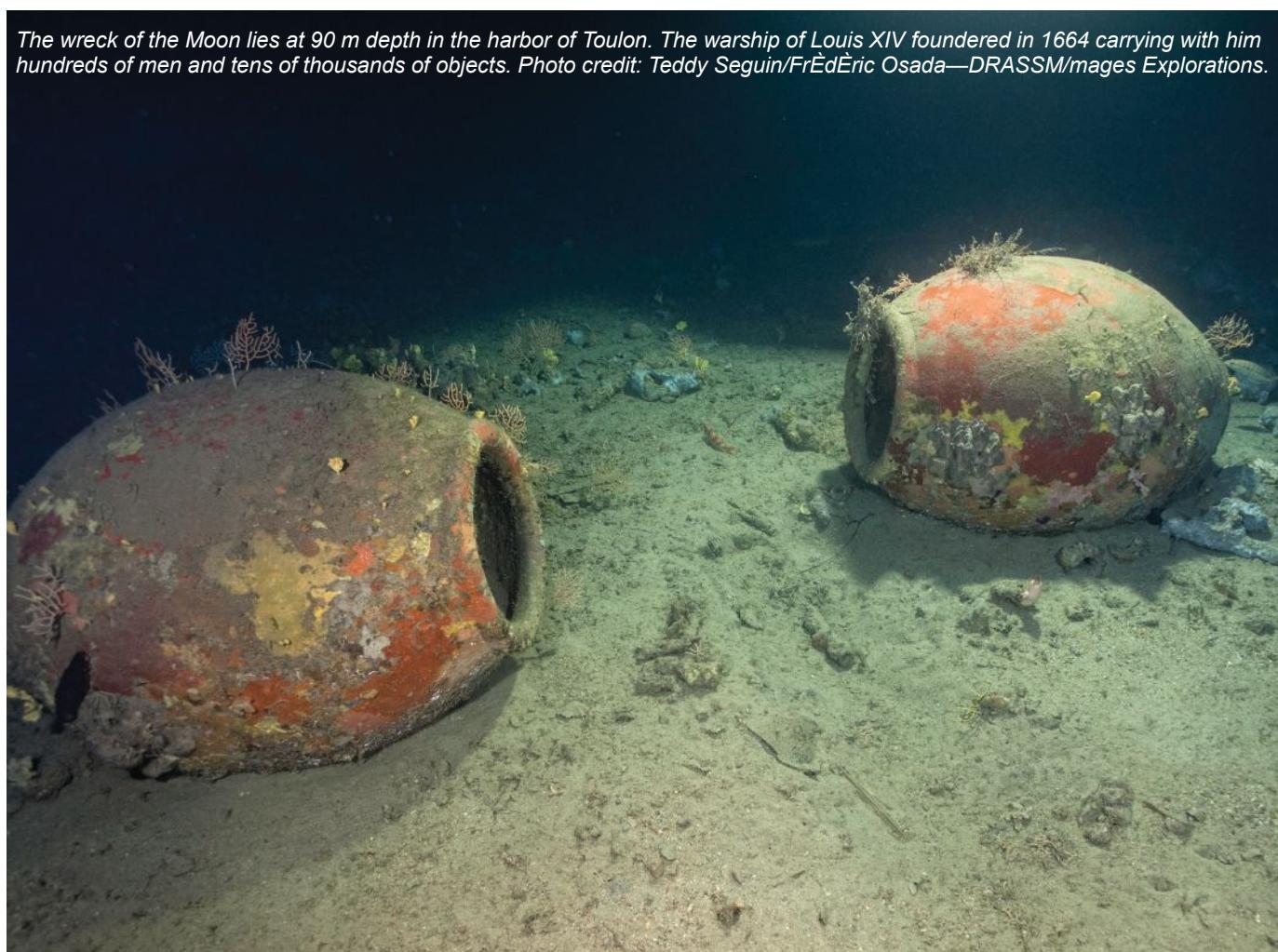


One of the biggest challenges of robotic archeology—being able to manipulate fragile objects without breaking them. The hand with three fingers called "adaptive grasp" adjusts to the shape of the object that it grips without breaking it. Photo credit: Teddy Seguin/FrEdEric Osada—DRASSM/mages Explorations.

The lure of pirates and buried treasure has long inspired generations of explorers to dive deep into the ocean's depths. Shielded from the world above, the remains of about three million shipwrecks lay hidden on the cold, dark seafloor around the world. The future of underwater archaeology is moving from the shallows into the deep ocean at over 90 m down where the harsh conditions have preserved thousands of

elusive wrecks. Now, the French Department for Underwater Archaeology (DRASSM) and the French Montpellier Laboratory of Computer Science, Robotics, and Microelectronics (LIRMM) have found a way to gain access to previously inaccessible historical sites by developing pioneering underwater robotics for deep-sea archaeology. Underwater archaeologists for the first time can "feel" ancient artefacts up to 2,000 m below through the touch of a robot.

The wreck of the Moon lies at 90 m depth in the harbor of Toulon. The warship of Louis XIV foundered in 1664 carrying with him hundreds of men and tens of thousands of objects. Photo credit: Teddy Seguin/FrÈdÈric Osada—DRASSM/Explorations.



EDITORIAL FOCUS

Since 2013, the Corsaire Concept Project aims to develop new tools for deep underwater archaeology at depths from 50 to 2,000 m. While the project is led by the DRASSM, the LIRMM coordinates the robotics division. Transforming the future of underwater archaeology into a robotic concept are several laboratories, including P'Prime; Stanford Robotics and Onera; and SME, Techno Concept, who have proposed new robotic tools under the supervision of expert archaeologists. Furthermore, the new robotic systems are tested in one of the most important sites in maritime history—the Moon.

Discovered by a submarine in 1993, the Lune (the Moon), lies 90 m under the surface. In November 1664, the warship of Louis XIV was wrecked off the French coast of Toulon, taking nearly one thousand people with her into the sea. Since 2012, the site has been a test laboratory for innovation in underwater archaeology and the advancement of robotics.

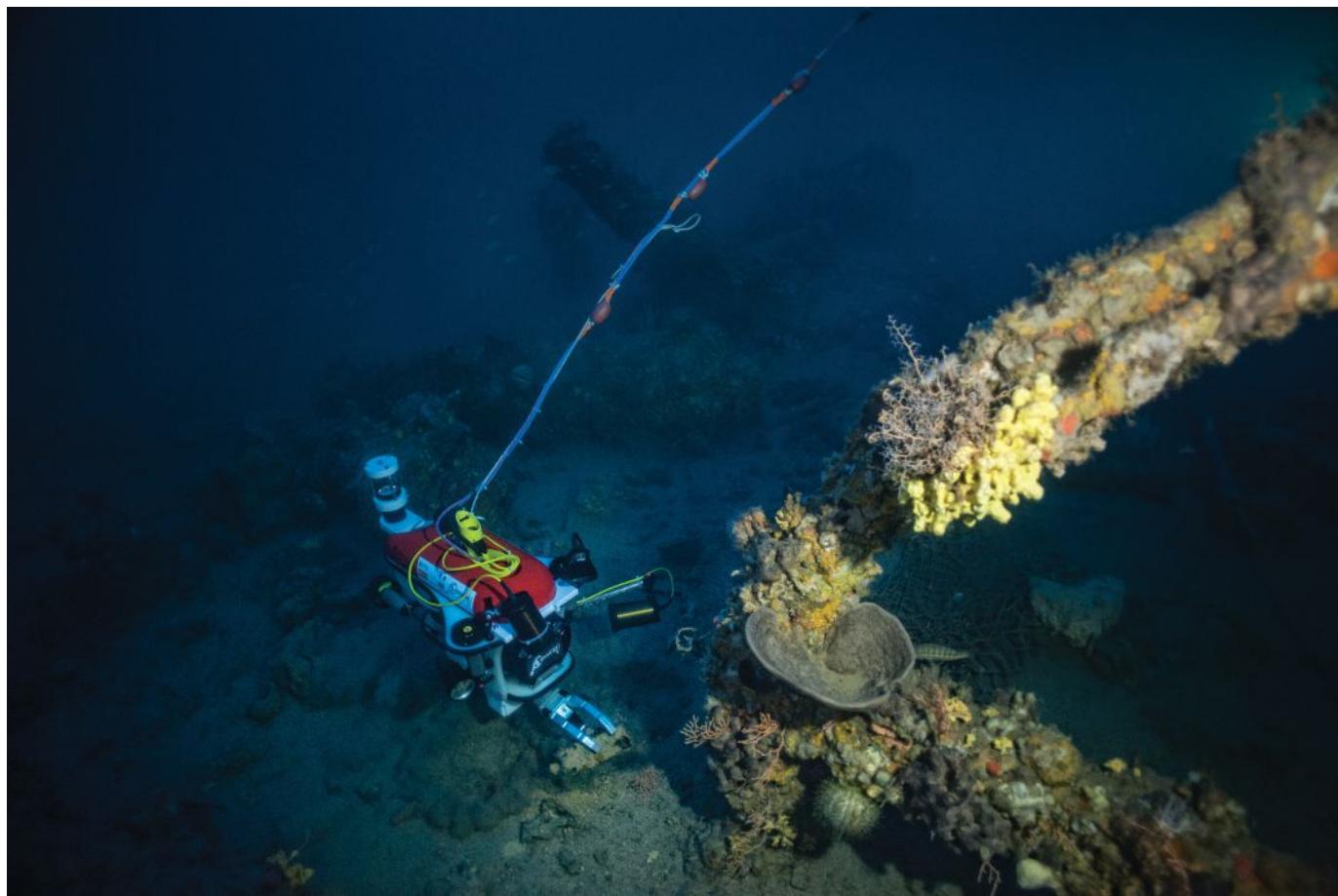
Dr. Vincent Creuze, the scientific coordinator of the Corsaire Concept project (LIRMM), explains: "Wrecks located at great depths, such as the Lune, tend to be far better preserved. Apart from the act of sinking, these ships are generally sheltered from human or environmental disturbance

such as ground swell, backwash, and tidal movements. But, because of the dark and high-pressured environment, it is also extremely difficult for humans to gain access."

"The difference between conventional underwater archaeology and deep-sea marine archaeology is, of course, depth. The latter requires investigative resources on an entirely different scale, which is still very largely experimental. Underwater 2D and 3D photogrammetry have become very common in the last five years and are now widely used for underwater archaeology, either with ROVs or AUVs. But, the navigation and control capacities of the robot near 3D structures still need to be improved."

For the last few years, several laboratories and companies have started to work on "path planning" and "path following" to make underwater photogrammetry more efficient.

Standard underwater manipulator arms are used to sample ancient artefacts from the deep. But, such operations are very long and require the robot to "land" on the seabed to provide a stable basis for the manipulator—not without risk of damaging buried objects under the vehicle. Moreover, the claws of underwater manipulator arms are not very well suited to fragile archaeological artefacts.



The Speedy submarine robot is connected to the ship by an umbilical that ensures its power supply and information exchanges with the researchers. Photo credit: Teddy Seguin/FrÈdÈric Osada—DRASSM/images Explorations.



The robotic hand is operated dry from the ship's scientific command post where the live images of the on-board cameras arrive. Photo credit: Teddy Seguin/FrÈdÈric Osada—DRASSM/mages Explorations.

Under the leadership of Vincent Creuze, the LIRMM has developed a prototype of an archaeological robot. As part of this research, the first Speedy robot tested an omnidirectional vision system and an anthropomorphic hand with three fingers that follow the shape of the objects seized. To mimic the gentle touch of human archaeologists, the robotic hand is equipped with a pressure sensor and “adaptive grasp” that allows it to adjust to the shape of the object it handles without breaking it.

“The main challenge is to design robots that can be directly piloted by an archaeologist and provide the pilot the sense of touch. We are developing underwater robotic hands to do just that. This work is in collaboration with the PPRIME Institute within the SEAHAND Project, founded by the French Research Agency (ANR). The first tested robotic hand itself was made by Techno Concept in collaboration with the LIRMM and the DRASSM. We also work on the monitoring of archaeological sites and on localization and navigation for 3D modeling with the ONERA French Research Institute,” said Creuze.

Most of the tests so far are conducted on the Lune shipwreck testing laboratory. Some other experiments have been carried out on deeper antic shipwrecks (500 m) and on a more modern battleship wrecked in 1917, located 1,025 m deep.

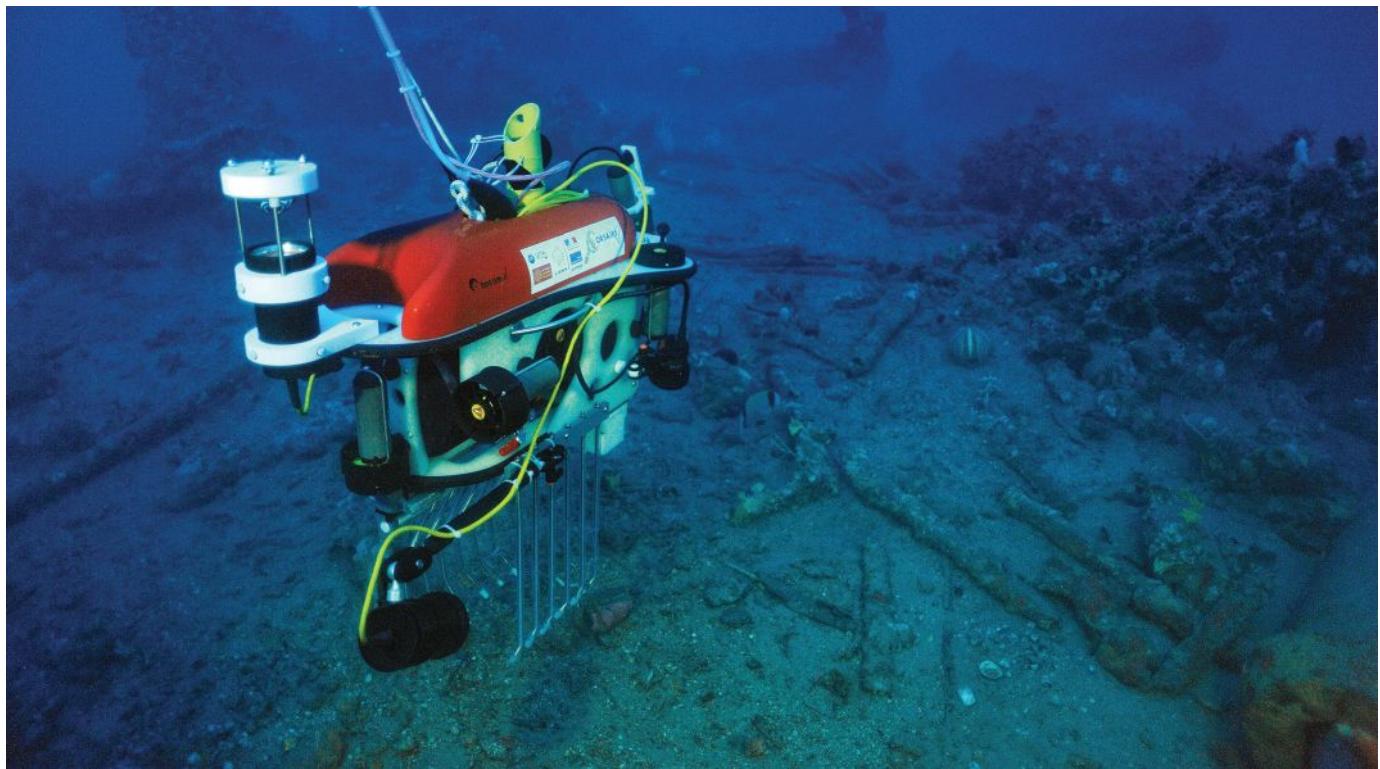
“With the hand and the Speedy ROV, we have collected numerous fragile artefacts from the Lune site without any damage. The DRASSM have also tested many types of robotics devices such as large claws, water jetting, crawlers, several types of lights, and several custom-made cameras. The robots need to be pressure resistant, which means that most moving mechanical parts are oil filled. And of course, they operate in the dark so need powerful lights.”

Each campaign gives the opportunity for Creuze and his team to experiment and improve new tools that are developed by the LIRMM and by the companies and institutions participating in the Corsaire Concept Project.

At the centre of the operation, there was the DRASSM's underwater research vessel, the André Malraux. Considered “the jewel in the crown” of marine archaeology, it is specially designed to dispatch machines to locations beyond the range of human divers.

Creuze explains, “The most well-preserved shipwrecks are located very deep, away from many environmental threats, away from looters, and under very stable environmental conditions. These shipwrecks cannot be excavated without robots. But now fishing activities threaten these deep wrecks, such as deep-sea trawling, and are no longer completely protected.”

EDITORIAL FOCUS

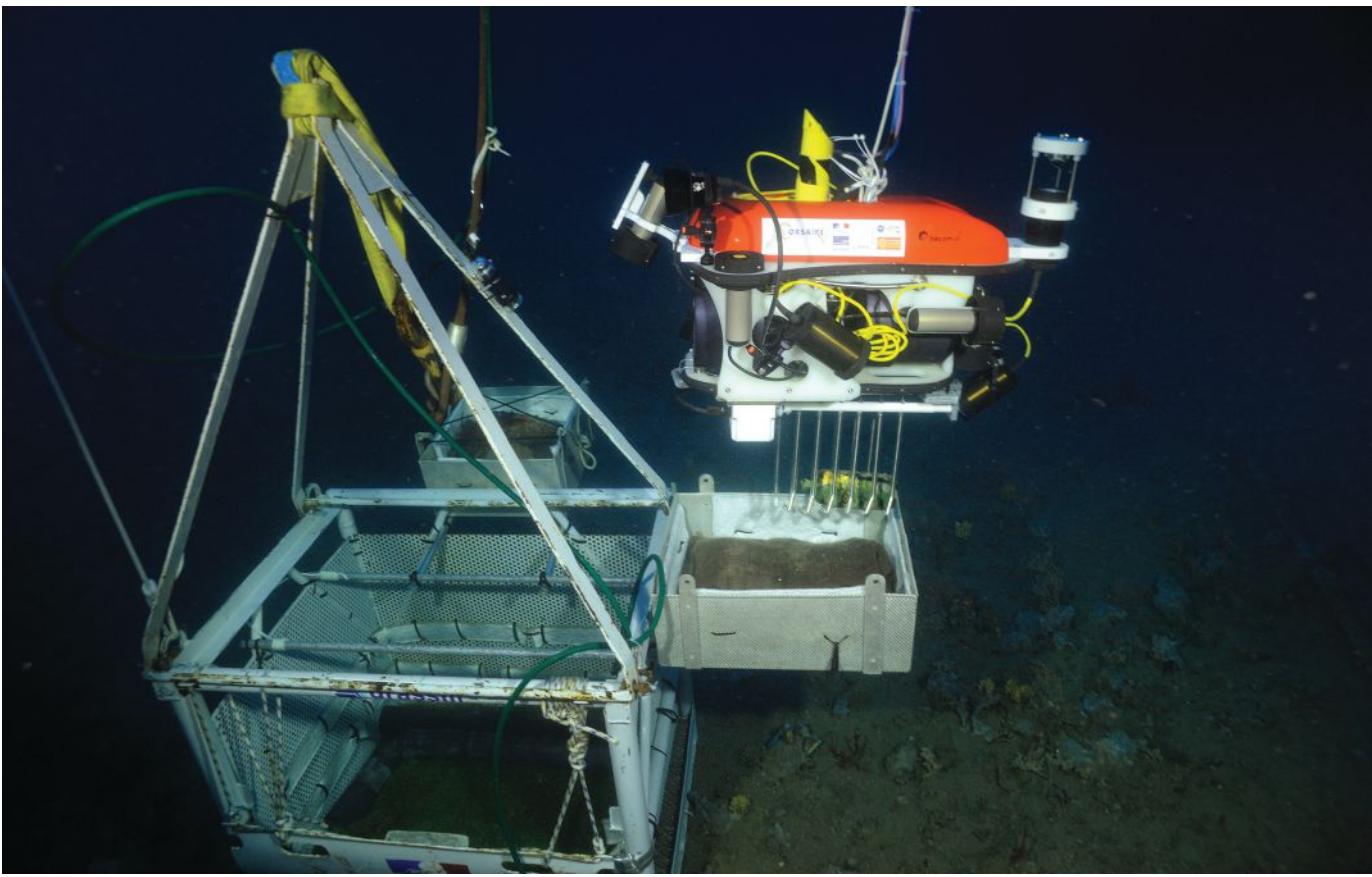


The robotized hand can be replaced by claws, kinds of rakes that crisscross to pick up objects difficult to grab. Photo credit: Teddy Seguin/FrÈdÈric Osada—DRASSM/images Explorations.

June 2017

34

Ocean News & Technology



The samples are then deposited in a box which will be brought up to the surface - Speedy the robot can thus return to work without delay. Photo credit: Teddy Seguin/FrÈdÈric Osada—DRASSM/images Explorations.

"But, thanks to pioneering work in underwater robotics, I'm very excited for the future. We have the great chance to collaborate with Stanford Robotics Laboratory. Professor Oussama Khatib's team has developed the amazing 'Ocean One' humanoid diver. This robot made its first dive in April 2016 in France and demonstrated incredibly promising abilities for underwater archaeology."

The Ocean One humanoid diver has embedded arms with force sensing and provides the sense of touch to the pilot through Force Dimension™ haptic interfaces—a 6D joystick with force feedback, similar to the technology used for robotic surgery. The human shape of Stanford's robot also makes piloting more intuitive.

The LIRMM will continue developing more accurate positioning and control algorithms, primarily based on artificial vision. Simultaneously, they will also focus on the delicate handling of artefacts and on excavation sites at deeper and deeper depths.

"Currently, we work frequently and easily at 500 m, with about 20 shipwrecks investigated at such depths. We occasionally work at 1,000 m—last year we did one of the largest (145-metre long) deep 3D modeling on the 100-year-old Danton shipwreck. And now we want to reach 2,000 m in the near future. It wasn't long ago that we would have never dreamt of reaching shipwrecks at these depths. But now, thanks to work in robotic engineering over the last decade, we have combined tech from healthcare, offshore, military, and the sciences to finally gain access to thousands of previously inaccessible sites. The future of underwater archaeology is truly exciting."

Deep shipwrecks are time capsules of human history preserved for centuries at the bottom of the ocean. Now, thanks to the Corsaire Concept Project, we are almost able to discover their story and share it with the world.

Acknowledgements

Dr. Vincent Creuze, the Scientific Coordinator of the Corsaire Concept project (LIRMM).

June 2017

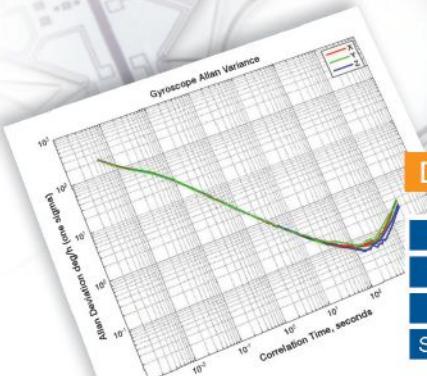
35

Ocean News & Technology

DMU30 Precision MEMS IMU ...FOG IMU performance, not price

- ❖ Proven MEMS Technology
- ❖ Non-ITAR

- ❖ Multi-MEMS Blending
- ❖ OEM & Custom Solutions
- ❖ 'Tactical Grade' Precision



DMU30

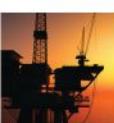
Bias Instability	0.1%/hr	15µg
Random Walk	0.02%/hr	0.05m/s/√hr
Scale Factor	250ppm	250ppm
Size - Mass - Power	270cm ³	- 300g - 3W



www.siliconsensing.com



sales@siliconsensing.com



SILICON SENSING.

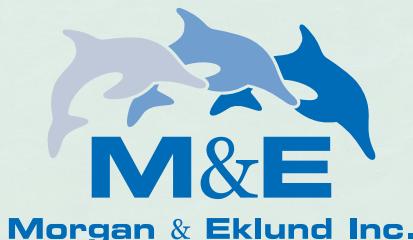
ON&T

COASTAL DATA

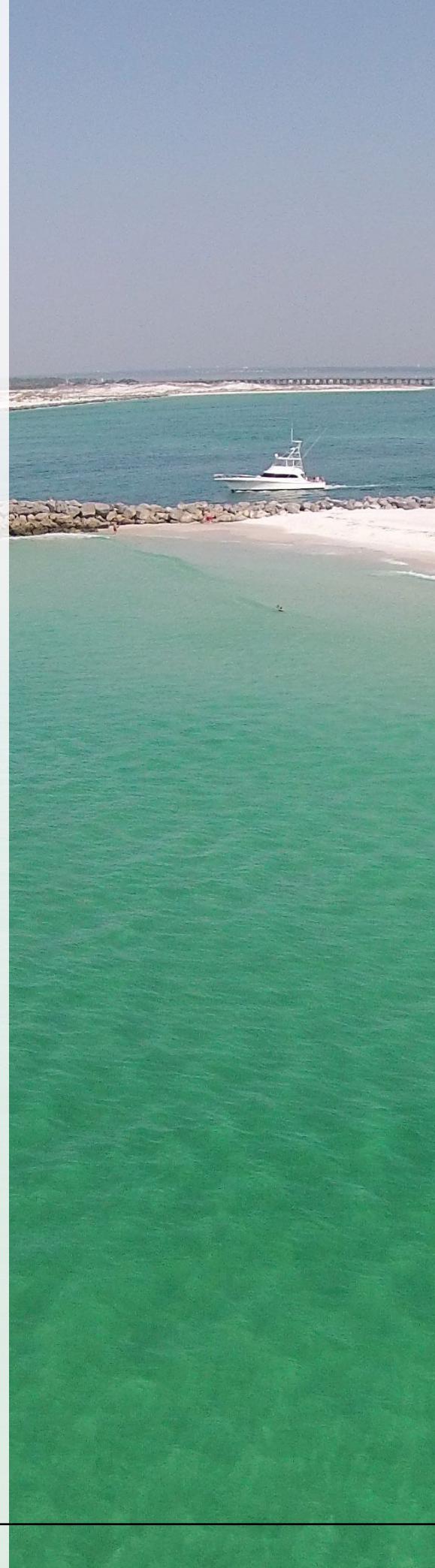
Morgan & Eklund, Inc. was contracted by Taylor Engineering, Inc. to perform topographic and bathymetric surveys along 58 Florida Department of Environmental Protection (FDEP) Range lines. The upland elevation data was collected using RTK/GPS, with the nearshore/wading data collected with a handheld laser for station and differential level and fiberglass rod for elevations. The offshore profile data were collected using real-time differential GPS for vessel positioning (together with Hypack Navigation Software), a TSS motion compensator, and digital fathometer. The onshore and offshore data were then "merged" to create a continuous line of elevation data and the completed profile line.

All of the profile elevation data were compiled into FDEP format, and survey and quality control reports were provided to FDEP upon completion.

To learn more, contact us today.



(772) 388-5364
www.morganeklund.com





Imagenex Launches New Multibeam Imaging Sonar

Imagenex was originally founded in 1988 and is located in Vancouver, BC, Canada. For nearly 30 years, the company has designed and manufactured a variety of sonar products including sidescan, mechanical scanning, multibeam, single beam echo sounders, and OEM (original equipment manufacturer) kits designed with low-power electronics.

The company's product line includes user friendly sonar for water deployment to full ocean depth. Their multibeam, sidescan and sector-scan imaging sonars have been used to locate shipwrecks, downed aircraft, pipelines, cables, anchors, and lost cargo. Suitable for a multitude of applications, Imagenex sonars have been used for inspections, underwater engineering and construction, offshore oil and gas exploration, underwater archaeology, and environmental surveys. For more information, visit <http://imagenex.com>.

Recently, ON&T sat down with sales manager Steve Curnew to catch up on the company's newest technology.



The Imagenex Model 965A 1.1 MHz is an advanced, high-speed, high-resolution, multi-beam imaging sonar system that has been designed to provide simple, reliable, and accurate representation of underwater images.

ON&T: Could you talk about the new product launch from Imagenex?

Curnew: Our newly designed hardware platform, Xi, has been in development for just over a year now, and we are pleased to finally roll out our first product sporting the new Xi platform: the 965A Multibeam Imaging Sonar.

ON&T: What are some of the differences with the new platform?

Curnew: It's faster. It allows faster sampling rates, and it is newer technology. Everyone talks about high frame rates or video-like frame rates, and that's what this new platform does for us. It allows us to have

higher frame rates. It gives us a smooth digital image, so that when you are panning across something, there is a smooth tracking to it. It also works very well for short-range imaging. We have found it works well in ranges less than 2 m. Within less than 1-m range, we can get nice images of even small items, things in the 6-mm diameter range and smaller. This works especially nicely if you are working in areas where your video camera just is not working, like in low visibility environments like turbid or black water.

ON&T: What are some of the benefits of the new 965A multibeam?

Curnew: The benefits of the new 965A are it's lighter—only 45 gm in water. It's more compact and can be easily integrated into the smallest of ROVs and other platforms, with faster processing capability for real-time high-resolution imaging performance and simple installation/operation on your laptop PC. The new Xi electronics hardware platform is one of the biggest technological advancements for us so far.

ON&T: Where does this fit in your current line of multibeam sonars?

Curnew: The 965A offers an excellent price/performance ratio, making it a very appealing solution for micro-, small-, and mid-size inspection class ROVs. We have already incorporated and tested an internal Ethernet extender to ensure two-wire copper umbilical compatibility for those vehicles already in the field. You may be looking to update your sonar technology without having to pay the high cost of upgrading to a fiber optic umbilical.

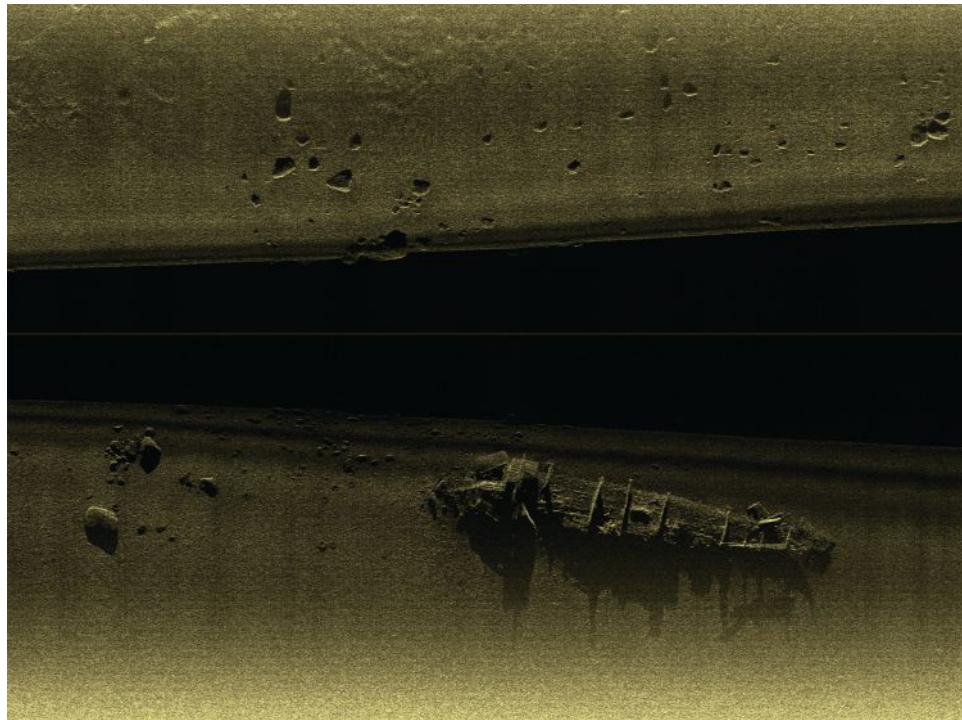
ON&T: Imagenex has also launched a new high-resolution sidescan. Can you tell us about that?

Curnew: Yes, another new product is our full-featured dual channel high-resolution sidescan sonar, the BlackFin, which is available in a towed solution or as an OEM kit for vehicle integration. The 1.1-MHz BlackFin creates very crisp and accurate images of the survey area. It is very cost effective, portable, and one-man deployable and connects easily to an Ethernet port on a Windows based PC.

ON&T: You also have another new product, which is the gyro stabilized sonar. Could you tell us about that?

Curnew: The gyro stabilized sonar still provides you the ability to scan 360 degrees, so it is a mechanical scanning sonar. There is a benefit there as opposed to just a forward-looking sonar, where you only have a field of view in front of the ROV. The two complement each other on some vehicles where you may want to have one of each sonar—one for navigating and finding longer-range targets while the other is used for more near-field inspection in front of the vehicle.

With the -GS sonar, we integrate a gyro and a compass and the two together help steer the transducer to where it should be scanning regardless of any kind of rotational movement of the sonar or the platform it is mounted to. With that, you get crystal clear imaging and smearless data when your platform is moving toward its target location. We can offer a suite of underwater imaging tools for a variety of vehicles and applications.



BlackFin sidescan image of the wreck of the ex-minesweeper VT100 in Bedwell Bay, Port Moody, BC.

Kongsberg to Market Two New Underwater Glider Systems

Kongsberg Underwater Technology, Inc. announces that it successfully completed negotiations with CoMotion®, the University of Washington's collaborative innovation hub, to obtain the sole rights to produce, market, and continue development of two new underwater glider systems.

Ocean gliders are a specialized type of autonomous underwater vehicle (AUV). Rather than using a propeller to move through the water, they use fixed wings and changes in buoyancy to achieve both vertical and forward motion. The vehicles move through the water in a saw-tooth trajectory and surface periodically to communicate data on water properties, such as temperature, salinity, and oxygen concentration, back to users via satellite telemetry. This form of propulsion is very energy efficient and allows mission periods of several months

and distances of thousands of kilometers, rather than just a few days and tens of kilometers, as is typical of propeller-driven AUVs.

Both new glider systems are based in part on the original, proven Seaglider™ design. The first vehicle, Deepglider, is designed for operation to a maximum of 6,000 m. This capability is unique in the world of underwater gliders and will allow the system to completely profile over 97% of the world's oceans.

The second vehicle, Oculus, is specifically designed for high-performance, shallow water operation. Oculus has an amazing amount of variable buoyancy – 3,500 cc—which will allow it to operate from freshwater to seawater without the need to alter its static ballast. It is also capa-



ble of achieving horizontal speeds up to 2 kts. These capabilities will enable operations in areas of extreme density variation and high currents.

"We are extremely pleased to be adding DeepGlider and Oculus to our underwater glider systems offering," said Tom Healy, president of Kongsberg Underwater Technology, Inc. "Each vehicle's unique capabilities fill some key gaps in the marketplace and will allow us to provide solutions to meet a wider range of customer needs."

"It was gratifying to work with the scientists in the UW School of Oceanography and the UW Applied Physics Lab to streamline the process for transferring and then selecting the best licensee for UW's autonomous underwater gliders," said Laura Dorsey, senior technology manager at CoMotion. "UW CoMotion worked through the intricacies of transferring the technology for these complex vehicles and is delighted that Kongsberg is making them commercially available."

Development of these glider systems was supported by federal grants from the National Science Foundation, National Oceanic and Atmospheric Administration, and the Department of Navy, Office of Naval Research.

For more information, visit www.km.kongsberg.com.



**Ultra-Compact
Dual Frequency
Echosounders**

- 200kHz & 450kHz
- Multi-node Network
- Versatile Interface Scheme
- Compact and Easy to Operate
- Accurate Backscatter Data along Water Columns

**High Resolution
& High Speed
Scanning Sonar Systems**

- Search & Rescue
- Scour Monitoring
- Navigation for ROV&AUV

www.echologger.com
info@echologger.com

Sulzer Offers Complete Supply Service for Subsea ROV Manufacturer

Manufacturing a hydraulic power unit (HPU) that is destined to operate on the ocean floor up to depths of 2,500 m requires considerable expertise and design excellence to deliver reliable and sustained performance. Having provided the build and test service for some time, Sulzer has now taken on the procurement phase of the process to release the client from this time intensive task.

The design and construction of remotely operated underwater vehicles (ROVs) is a specialist field and the components used to create the HPUs need to be carefully selected in order to produce a reliable, long-lasting unit. Furthermore, specialist equipment such as this built to order, so a timely delivery is essential to ensure that the build schedule is maintained. Sulzer is now providing a complete service that delivers a fully guaranteed HPU to the world's leading independent designer and manufacturer of work class ROVs.

Soil Machine Dynamics (SMD), based in Wallsend near Newcastle-upon-Tyne, is a leading designer and manufacturer of work class and specialist subsea ROVs that are used in oil and gas exploration as well as maritime exploration and mining. The company has designed and built over 400 subsea vehicles as well as delivering the control systems, umbilical systems, and launch and recovery systems (LARS).

The ROVs require hydraulic power to drive a number of on-board systems, depending on the configuration and prime purpose of the vehicle. SMD specializes in subsea equipment that can be fitted with a range of tools that rely on the hydraulic power generated by the HPU assembled and tested by Sulzer.

Initially, Sulzer was contracted to assemble and test new components, but this service was soon expanded as Paul Richardson, service centre manager at Sulzer's Middlesbrough facility, explains, "A few years ago we would have been sent a kit of parts that had been sourced by SMD and it was our responsibility to assemble the unit and carry out the performance and quality tests. Our working relationship has developed to such a point that we have now been handed the responsibility of the procurement phase as well. This new arrangement means that SMD simply place an order with Sulzer and we build the new unit according to SMD specifications. The new and fully guaranteed unit will be delivered on the agreed date, which fits neatly with the build program. In this way, SMD will use Sulzer as a one-stop shop, no longer needing to spend time and money chasing the numerous suppliers."

Sulzer's Middlesbrough Service Centre, which recently moved to new purpose-built premises on Middlehaven, has a dedicated work area for this operation, which ensures high-quality components are correctly assembled and tested. This is supported by a team that provides the necessary logistical and engineering support to ensure all the required performance criteria and quality standards are met.

Paul Richardson concludes: "Currently, we are equipped to manufacture all seven models of the standard hydraulic power units, which range in output from 11.5 kW to 185 kW. This new arrangement provides an assured delivery of components and allows SMD to concentrate on creating new solutions."

For more information, visit www.sulzer.com.



Riptide set out to change the undersea vehicle market by combining best in class hydrodynamics, ultra low power processing, and game changing new energy technology, while significantly reducing vehicle costs. To accomplish this, we introduced the small, yet highly-capable micro-UUV.

And now, the Family just got **BIGGER**

Introducing the Riptide Family of Low-Logistics, Man-Portable UUVs



Micro-UUV
4.875" Diameter
~25 lbs
300m rated



1 Man-Portable UUV
7.5" Diameter
~65 lbs
300m rated



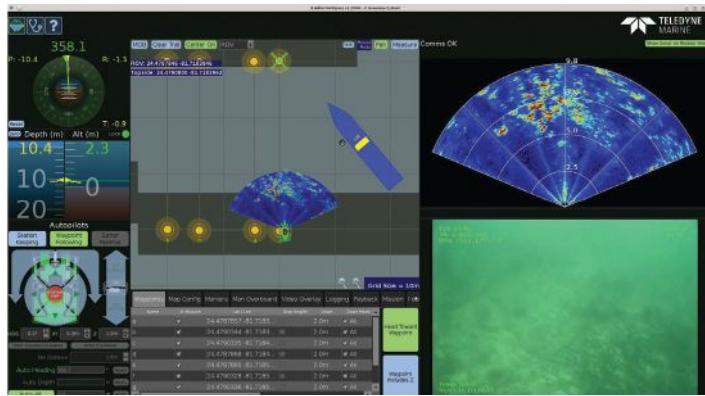
2 Man-Portable UUV
9.375" Diameter
~120 lbs
600m rated

Riptide
Autonomous Solutions

Email: info@RiptideAS.com • Website: www.RiptideAS.com

Phone: +1 617-820-4586 • Address: 36 Farmside Drive, Pembroke MA, 02359 USA

SUBSEA INTERVENTION & SURVEY



Teledyne Marine Launches a New Platform for ROV Visualization

Teledyne Marine introduces a partnership with Greensea Systems, Inc. that unites the intelligence of Greensea's proven OPENSEA™ platform with many of Teledyne's key technologies. Teledyne Marine Workspace ROV provides customers with a single-user interface that enables added functionality and intelligent operation to Teledyne's market-leading imaging, instrumentation, and navigation solutions for a range of ROVs from observation class to work class.

<http://ont.news/2qX8Zad>

Seatechs' New Generation of DipMate® Dredging Monitoring Systems

Seatechs announces the introduction of the fourth-generation DipMate® backhoe dredging monitoring and control systems. The upgrade encompasses two models: the Essential and Pro. The Essential is a cost-competitive visualization system that contains all essentials for efficient backhoe dredging. The Pro is an advanced version that can be delivered with a range of automation modules, enabling operators of all skill levels to dredge safely and maximize dredging productivity.

<http://ont.news/2rUKszW>



June 2017

44

Ocean News & Technology

MARINE ROBOTICS CONNECTING THE OCEANS THROUGH DATA



KONGSBERG



km.kongsberg.com/maro



**ADVANCED
NAVIGATION**
POSITIONING EVERYWHERE



SUBSONUS

USBL•MODEM•INS

- **Accurate Positioning**
- **Acoustic Heading Transfer**
- **Built-in Speed of Sound Sensor**
- **Automatic Setup**
- **Miniature Size**



Emera Set to Install North America's Longest Subsea Power Cables

The first of North America's two longest submarine electricity cables has arrived in Atlantic Canada on board the cable-laying vessel C.S. Skagerrak. Integral to Emera's Maritime Link Project, these cables each measure 170 km and weigh 5,500 tonnes—combined, the two cables weigh more than the Eiffel Tower. The first cable was manufactured in Halden, Norway, while the second cable, which is expected to arrive in mid-May, was manufactured in Futtsu, Japan.

The arrival of the Skagerrak, operated by the cable supplier Nexans, marks the start of the submarine cable installation process. Over the next few weeks, members of Nexans' highly specialized crew will prepare for the installation of the first electrical connection across the Cabot Strait between Nova Scotia and the island of Newfoundland.

Throughout the various stages of the manufacturing process and transport of each cable, members of Emera Newfoundland & Labrador's Marine Team have been monitoring and inspecting the progression to maintain quality assurance.

"The arrival of the submarine cables is the result of more than three years of dedication to safety and quality

by our team," says Rick Janega, president and CEO, Emera NL. "Throughout the manufacturing process, the successful testing phase, and the transportation of cables, the team's commitment continues to be the driving force of our success to date. This brings us another step closer to the completion of the Maritime Link Project later this year."

Nexans used two facilities for cable manufacturing, allowing both cables to be produced at the same time. The cable manufactured in Futtsu, Japan was spooled onto a giant barge in early April and then loaded onto a heavy lift vessel (HLV) for the long journey to the Cabot Strait to await installation.

The HLV carrying the second submarine cable from Japan will take approximately six weeks to travel to the port in Sydney, Nova Scotia. It will travel across the Pacific Ocean, through the Panama Canal, and then up the Eastern Seaboard. Expected to arrive in mid-May, it will be loaded onboard the Skagerrak once the first cable is installed. Installation of both submarine cables is expected to be completed by late summer.

For more information, visit www.emera.com.



Smit Lamnalco Selects KVH Maritime Solution for its Offshore Vessels

KVH Industries, Inc. announced that major European maritime operator Smit Lamnalco finalized an agreement earlier this year to install KVH's maritime solution on its offshore vessels. Following a successful field trial with KVH's mini-VSAT Broadband connectivity and TracPhone V3-IP satellite communications antenna system, the potential is for KVH to deliver and install its maritime solution on up to 100 Smit Lamnalco offshore vessels over the next few years—and 20 have already been delivered.

"We are extremely happy with the performance of KVH's systems and services based on our test and are proceeding to upgrade our vessels with this complete solution," says Patrick van Woudenberg, group IT manager for Smit Lamnalco. "KVH is a great partner for us, and their knowledgeable technical staff helped design a solution that we can replicate across our fleet to standardize the connectivity on our vessels and improve our operational efficiency."

The solution chosen by Smit Lamnalco includes KVH's mini-VSAT Broadband service with a usage-based monthly airtime package; TracPhone V3-IP Ku-band antenna system and Integrated CommBox Modem (ICM) below-decks unit; and CommBox network management and VPN solutions as well as VoIP service. All the hardware is protected by the KVH OneCare support program and warranty. The solution also comes with the myKVH portal, which provides vessel location, connectivity details, vessel tracking, and control of on-board data usage.

"We are proud to be Smit Lamnalco's choice for their impressive fleet, and the successful field test validates the high-quality of our products and services," says Mark Guthrie, KVH vice president of global channel management. "Our solution provides many benefits of broadband connectivity—for everything from communications to crew welfare, and Smit Lamnalco sees the advantages of this approach."

For more information, visit www.kvh.com.

June 2017

47

Ocean News & Technology

SEE WHAT'S IN THE WATER

IN-SITU PLANKTON CAMERAS
REAL-TIME PARTICLE CLASSIFICATION
END-TO-END OBSERVING SYSTEMS

COASTAL OCEAN VISION

WWW.COASTALOCEANVISION.COM

COMMUNICATION & SUBSEA CABLES



Novacavi Releases Custom Cables for Reliable Subsea Monitoring

Novacavi just released its P_22SSA ruggedized custom cable to support reliable and secure monitoring activity of marine environment. This electro-optical-mechanical custom cable enriches our extremely diverse production range of subsea armored cable for detection and instrumentation in defense and environmental monitoring applications. Key advantages of this armored, halogen-free, low-smoke cable are high working load performance, protection against electromagnetic interference, compactness, and versatility.

<http://ont.news/2qWYjZr>

Wagenborg Shipping Signs Multi-Year Contract with Castor Marine

Castor Marine has been awarded a multi-year contract with Wagenborg Shipping. The contract covers the delivery of 40+ new VSAT systems with satellite Internet based on Castor's global VSAT network, Inmarsat Fleetbroadband as back-up for the VSAT service, and IT support for the vessel LAN infrastructure. Castor Marine will provide an end-to-end solution, including installation and on-board support worldwide. This setup enables Wagenborg Shipping to enhance crew welfare and ship-to-shore connectivity using Castor's global Ku-band footprint.

<http://ont.news/2rUYMso>



June 2017

48

Ocean News & Technology

DEVELOPING
COST-
EFFECTIVE
FIBER OPTIC
NETWORK
SOLUTIONS



OSI specializes in full-lifecycle development and management of subsea telecom networks. Serving the oil and gas industry globally, our turnkey solutions offer increased operational efficiency, greater production, and the ability for your team to make decisions faster.

8502 SW KANSAS AVE., STUART, FL USA +1 (772) 219-3000 OCEANSPECIALISTS.COM

MONTH IN REVIEW

Infinera Validates Infinite Capacity Engine

Infinera announced a successful field test of ICE4 with Canalink across its subsea cable, demonstrating the capability to upgrade the cable capacity 13-fold.

<http://ont.news/2qcMCys>

Speedcast Secures Multiple Services Contracts with O&G Operators

Speedcast International Ltd has secured four new contracts for professional services with oil and gas operators in the North Sea and Asia-Pacific regions.

<http://ont.news/2rQVlhx>

SubCom Debuts Submarine Cable LMS

Seaborn SubCom has announced the availability of eLMS (enhanced line monitoring system), its customizable solution for tracking fault conditions and cable performance.

<http://ont.news/2rACF68>

NEC Begins Construction of Links to Palau, Yap and Chuuk

NEC Corporation has commenced construction of sub-sea links that will connect the islands of Palau, Yap, and Chuuk to the rest of the world.

<http://ont.news/2qclnDc>

Ocean Engineering



pCO₂ Analyzer

- Auto-calibration & cleaning

Li-Ion Batteries

- Highest capacity, reliability, safety
- Your power source for subsea, AUV, ROV



OTC 2017
Booth 3625-3
Hall B

Added Value

- MIL-STD, API17, ISO 13628 approved
- IPC class 3 production
- Customizing and personal support



SubCtech GmbH

info@subctech.com
www.gosubsea.com
www.subctech.com



Save your ROV Umbilical from seawater Rust & Corrosion

LUBE WITH SNOKOTE-CL™

In Stock
World-wide Delivery
Can be air freighted



Specially formulated for seawater environment
Environmentally Safe
Non-Toxic . Non-flammable . No VOCs
Long Lasting Protection

FOR EFFECTIVE APPLICATION USE ROVSCO LUBRICATION EQUIPMENT

FOR MORE INFORMATION ON SNOKOTE-CL, LUBRICATION EQUIPMENT & PROCEDURES
VISIT WWW.SNOKOTE.COM, FOR SALES: sales@rovoco.com, +1-281-858-6333

ROV SHACKLES 12 Ton TO 450 Ton WLL



QUICK RELEASE
ROV SHACKLES

MOST SIZES IN
READY STOCK

Worldwide Delivery



PATENTED 8230799B2, WORLDWIDE PATENTS PENDING

Rovco, Inc., Houston, Texas, USA
sales@rovco.com, Tel: +1-281-858-6333, www.rovco.com



USCG Sentinel-class Cutters Rely on Fortress Anchors

When wind and seas rise, it takes a lot of holding power to keep a 154 ft, 353-long ton vessel from dragging anchor. That's why the U.S. Coast Guard chose the 69-lb Fortress Marine Anchors FX-125 for its new Sentinel-class cutters. It boasts superior performance in a wide range of seabeds. The FX-125 is precision-machined from rust-proof, marine-grade aluminum-magnesium alloy. Because there are no welds—all of the anchor parts are interlocking—there are no joints to weaken and fail while under heavy loads. Because of its light weight, the Fortress® anchor is easily brought up on deck for fast deployment.

<http://ont.news/2qcKg2C>

Huntington Ingalls Redelivers Aircraft Carrier USS Abraham Lincoln

Huntington Ingalls Industries announced that the company has redelivered the nuclear-powered aircraft carrier USS Abraham Lincoln (CVN 72) to the U.S. Navy. The redelivery took place following successful sea trials that tested the ship's systems following its refueling and complex overhaul at the company's Newport News Shipbuilding division. "The successful completion of sea trials and redelivery of the ship to the Navy is the culmination of over 48 months of teamwork between Newport News shipbuilders, the CVN 72 crew, our government partners and all of our suppliers," said Chris Miner.

<http://ont.news/2qjz8kv>



Lights! Camera! Action!

Do you have a new product, technology or facility to show off to your potential clients?

If you have it on video, let us help you promote it!

Do you need help creating, editing or producing a video? We can help with that, too.

Contact us at (772) 221-7720 for more information.

ONT
Ocean News & Technology

www.oceannews.com

MONTH IN REVIEW

AECOM Wins Contract for Services for the Navy Fleet Readiness Center

AECOM has been awarded a maintenance services contract to support the U.S. Navy's Naval Air Warfare Center Aircraft Division.

<http://ont.news/2qXe3cL>

Austal USA Celebrates Christening of USNS City of Bismarck (EPF 9)

Austal celebrated the christening of Expeditionary Fast Transport ship USNS City of Bismarck (EPF 9) with a ceremony at its state-of-the-art shipyard on 13 May 2017.

<http://ont.news/2rRew0j>

Damen Supports Call for Dutch Naval Sector Investment

Damen Shipyards Group supports a report that calls for increased investment into the Dutch naval fleet via "Launching Customer" projects.

<http://ont.news/2qd2lrZ>

U.S. Navy Unmanned Maritime Systems Certification Begins

Fifteen students began classes recently at the University of Southern Mississippi, where they will earn a certification in Unmanned Maritime Systems.

<http://ont.news/2qXfB8G>

Royal Navy Astute-Class Submarine Launched

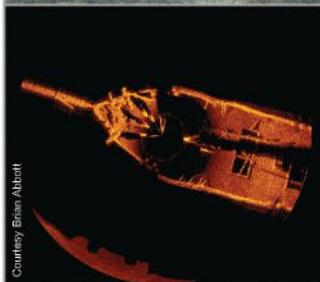
Audacious, the fourth of seven Astute-class attack submarines being built for the Royal Navy, was launched recently at Barrow-in-Furness.

<http://ont.news/2qQiyYd>

Kongsberg Supplies Digital IP CCTV System for RCN Fleet Supply Vessel

Kongsberg Maritime camera systems group has delivered a large network IP CCTV system for the new RCN Auxiliary Naval Replenishment Ship.

<http://ont.news/2qXgePJ>



Courtesy Brian Abbott



ROV Solutions for Underwater Imaging

For missions in turbid waters or in cases of poor visibility, **imaging sonars solutions** can relay efficiently the video cameras.

ECA Group modular ROVs can embark all together:

- The top-of-the-art **video cameras with zoom**
- **High quality 3D imaging sonars** such as ARIS3000, BlueView BV5000...
- **High resolution scanning sonars** such as MS1000, mounted horizontally or vertically

Find your
ROV solution



HYTEC™

eca-hytec@ecagroup.com | www.ecagroup.com

OPEC Parley Puts Exclamation Point on Oil Prices

For much of the past month, crude oil traders and speculators have been debating the conclusion of the May 25th OPEC semi-annual confab regarding the current production cut agreement scheduled to end on June 30th. Last November, the organization's 14 members reached an agreement to cut their combined output by 1.2 million barrels a day. More importantly, OPEC secured 10 non-OPEC oil exporting countries' support to reduce their collective output by 600,000 barrels a day. Key to that support was getting Russia, one of the world's three largest oil producers, to agree to cut its output by 400,000 barrels a day. Combined, the OPEC/non-OPEC countries would reduce oil production by 1.8 million barrels a day, or roughly 2% of world supply. Immediately, expectations concluded that global oil inventories would plummet and world oil prices would be on the rise soon.

The hoopla greeting the production cut announcement was tempered by seasoned oil traders reminding us of OPEC's poor compliance record with prior production limitations, especially when it came to the effort being to support or restore higher oil prices. Virtually every time OPEC has cut, the burden of restricting supply fell to Saudi Arabia, the world's largest oil exporter and one of the world's three largest producers, along with Russia and now the United States. Everyone wondered whether Saudi Arabia would be willing to shoulder the production cut burden this time after having experienced a significant loss of its foreign reserves when oil prices plummeted following their decision to walk away from the oil price supporting role in November 2014.

Saudi Arabia was not a reluctant supporter of the November 2016 production cut agreement—rather, it actively participated in helping forge the plan. As 2017 dawned, the global oil community began monitoring oil export volumes, waiting to assess whether OPEC was actively supporting the agreement or merely paying lip service to its terms. Traders and speculators, on the other hand, embraced the prospect of rapidly escalating oil prices as global oil inventories were projected to fall and they bid oil prices up into the mid-\$50s a barrel range. The initial export data suggested OPEC was aggressively complying with the production cut mandates, but world inventories continued growing. What had been missed by forecasters and traders was that for the month of December, OPEC was able to ramp up output and boost shipments before the terms of the production cut agreement went into effect on January 1, 2017.

With shipments up, people forgot that it took one to two months' time for tankers to deliver their cargos. Without an immediate increase in oil consumption, it was not surprising that inventories initially grew. At the same time, improved U.S. shale oil economics and the rise in global oil prices combined to boost shale output, delaying the impact on inventories from the OPEC/non-OPEC production cut.

As time progressed and global oil inventories failed to decline, doubts about OPEC's compliance began creeping into the marketplace, putting downward pressure on oil prices. At the same time, several global oil forecasters

Disappointing 2017 Oil Price Performance



By: G. Allen Brooks
Author of "Musings From the Oil Patch"
www.energymusings.com



boosted their U.S. oil production estimates while also reducing oil consumption projections, pushing the oil market rebalancing date into the second half of 2017. Some forecasters even pushed that date into 2018, further delaying prospects for higher oil prices.

Each time oil prices sagged, OPEC, led by Saudi Arabia, cranked up its PR machine claiming it would do "whatever was needed" to lift oil prices toward its \$60 a barrel target. In mid-May, when fears that oil prices might fall to \$40 a barrel or lower, Saudi Arabia and Russia's oil ministers held a press conference to announce their agreement to work for a nine-month, rather than for a six-month, extension of the production cut agreement when OPEC met in May. Rumors began circulating that in addition to a longer production cut extension, OPEC and non-OPEC producers might seek a deeper cut by inviting more countries to join the agreement. Those comments injected a mood of euphoria into the oil market, sending oil prices back above \$50 a barrel, which was where they were when the oil ministers arrived in Vienna for the OPEC meeting.

In contrast to the 2014 and 2016 OPEC meetings when the expected outcomes were surprisingly rejected, there was an expectation of the meeting's outcome. How real was that expectation? Yes, Equatorial Guinea was welcomed as an OPEC member with a production target of 300,000 barrels a day. It is unknown whether the country will be participating in the production cut. The real story was the agreement of all parties to a nine-month produc-

tion cut extension and that OPEC would meet again in November.

When the outcome of the OPEC meeting was leaked to the media, oil prices began to slip. When the formal decision arrived, it was clear the oil market was disappointed. Traders were hoping for either a longer extension or a deeper cut, but the absence of either or both caused them to follow through on the mantra to "buy the rumor and sell the news." WTI futures fell \$2.46, or nearly 5%, to \$48.90 a barrel, the lowest price since May 16th. Brent futures, the global oil marker, fell by similar amounts.

For oil traders, the WTI futures price finished the day below both its 50- and 200-day moving averages of \$49.59 and \$49.55 a barrel, respectively. Prices bounced above those averages the next day as people concluded more drastic OPEC/non-OPEC actions were not required for the market to reach OPEC's \$60 target by year end. This price action is good news for those oil traders and speculators who increased their bullish bets on higher oil prices the prior week.

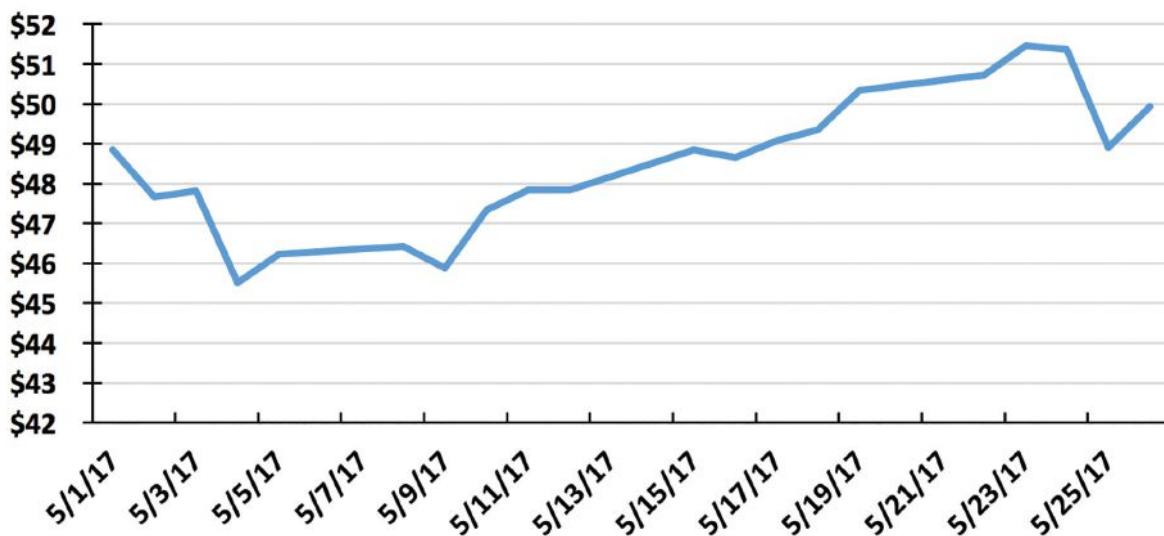
It is likely that as oil prices rise, many traders will look to cash out and collect their profits. Just what will be the news that causes them to cash out? Will it be weaker than expected demand, a decline in OPEC/non-OPEC production compliance, or surging U.S. oil output? Any one of those issues could derail OPEC's plan. Longer term, OPEC will have to deal with unwinding this agreement without sending oil prices lower. Is that a 2018 issue?

June 2017

53

Ocean News & Technology

Hopes For OPEC Meeting Lifted Oil Prices In May



OFFSHORE STATS & DATA

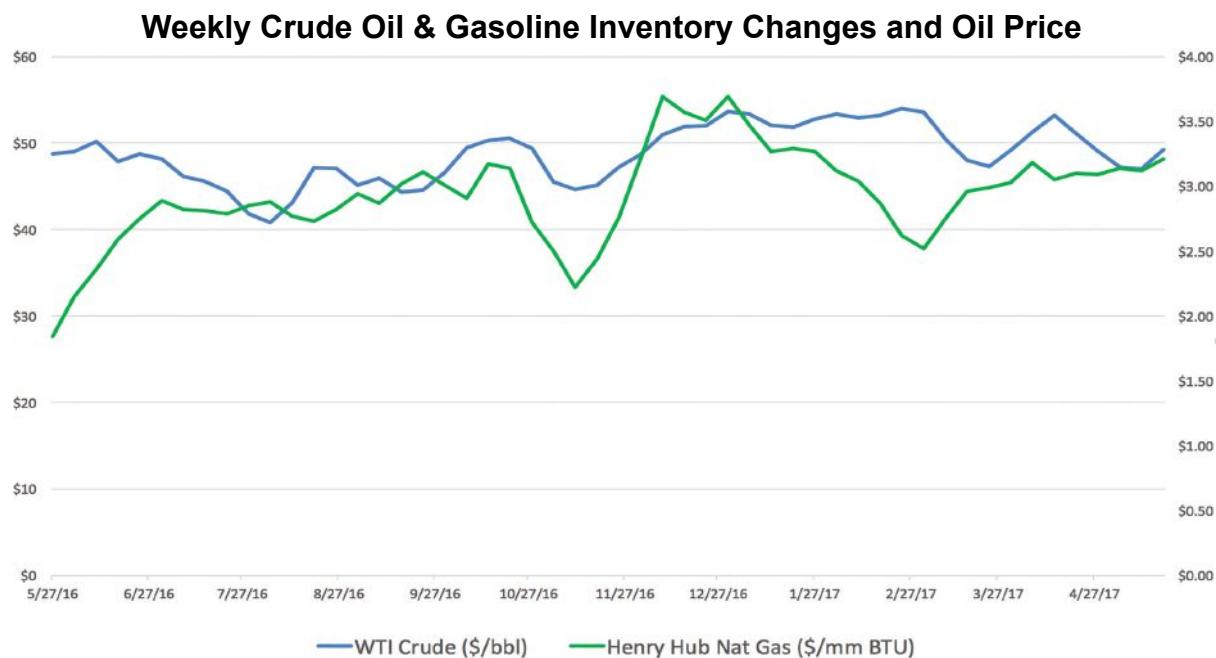
Crude & Natural Gas Spot Prices

Prices in USD as of May 19, 2017

Over the last several months, WTI crude prices have continued to fluctuate around the \$48 mark, ending essentially unchanged from a year ago. As of the week ending May 26, 2017, EIA reported crude oil inventories (excluding the Strategic Petroleum Reserve) of about 509.9 million barrels. This puts inventories in the upper end of the average range seen during this part of the year.

Crude oil refinery inputs average over 17.5 million barrels per day during the past week, which is 229,000 barrels per day more than the prior week. Refineries operated at 95% of capacity according to EIA.

Henry Hub natural gas prices stand somewhat higher than last year. As of May 19, 2017, EIA reported a spot price of \$3.21, compared to \$1.84 a year earlier. For the week ending May 24, 2017, average supply was 76.6 bcf/day, compared to 77.6 bcf/day a year ago. Demand for the same period increased from 68.6 bcf/day to 69.2 bcf/day. As of May 19, 2017, working gas in storage increased by 75 bcf from one year ago.



\$49.05

\$49.61 previous week



TRENDING DOWN



Cushing, OK
WTI Spot Price

\$3.16

\$3.26 previous week



Henry Hub
Spot Price

Oil & Gas Industry Trends

Key Equity Indexes

Cumulative Percentage Change as of May 29, 2017

The S&P 500 and DJIA have generally held their gains over the last 52 weeks despite plenty of financial and economic news to digest. For that period, the S&P 500 was up 18.33% and the Dow 30 was up 15.3%. Consumer spending was strong through April, and recent reports suggest that consumer confidence is up and the housing markets are showing strength through the spring.

The OSX is down 14.9% for the last year as the oilfield services businesses that make up the index struggle with the impact of the industry's continued cost cutting efforts, particularly in relation to companies focusing on offshore production. Industry analysts continue to express concerns about offshore drillers and service companies as efficiency gains in onshore E&P activities make those assets very competitive in the current pricing environment. OSX's constituents that depend more heavily on offshore opportunities, particularly the riskier deepwater projects, have become less attractive in the face of onshore gas and oil that is easier and cheaper to access.

Selected Equity Indexes - Cumulative Percentage Change Last 52 Weeks



June 2017

55

Ocean News & Technology

21,029.47

+50.81 from previous week



TRENDING UP

DJIA

2412.91

+2.91 from previous week



TRENDING UP

S&P 500

139.02

-3.09 from previous week



TRENDING DOWN

OSX

ON&

2017 EVENTS

Teledyne CARIS User Workshop
Ottawa, Canada
June 19-22
www.caris.com/conferences/caris2017

Oceans' 17
Anchorage, AK
September 17-21
www.oceans17mtsieeanchorage.org

Pacific Marine Expo
November 16-18
Seattle, WA
www.pacificmarineexpo.com

Teledyne Marine Technology Workshop
San Diego, CA
October 15-18
www.teledynemarinecom/events/teledyne-marine-technology-workshop-2017

Telecom Exchange
New York City, NY
June 20-21
<http://thetelecomexchange.com/nyc>

AWEA Offshore Wind
New York City, NY
October 24-25
www.awea.org/events/event.aspx?eventid=50111

LAGCOE
Lafayette, LA
October 24-26
www.lagcoe.com/events/event-one

WorkBoat
New Orleans, LA
November 29 – December 1
www.workboatshow.com

Offshore Wind Executive Summit
Houston, TX
August 9-10
www.offshorewindsummit.com/index.html

OilComm
Houston, TX
October 3-5
www.oilcomm.com

MTS Dynamic Positioning
Houston, TX
October 9-11
<http://dynamic-positioning.com>

SPE ATCE
San Antonio, TX
October 9-11
www.spe.org/events/en/2017/conference/17atce/home-1.html

Clean Gulf
Houston, TX
December 5-7
www.cleangulf.org

Seawork International

Southampton, UK

June 13-15

www.seawork.com**Oceans Aberdeen**

Aberdeen, UK

June 19-22

www.oceans17mtsieeeaberdeen.org**SPE Offshore Europe**

Aberdeen, UK

September 5-8

www.offshore-europe.co.uk**UTC**

Bergen, Norway

June 20-22

www.utc.no/conference**Offshore Energy**

Amsterdam

October 9-11

<http://offshore-energy.biz>**WindEurope**

Amsterdam

November 28-30

<https://windeurope.org/confex2017>**MAST**

Tokyo, Japan

June 12-14

<https://mastconfex.com>**World Congress of Ocean**

Shenzhen, China

November 3-5

www.bitcongress.com/WCo2017/default.asp**Philippines Marine**

Manila, Philippines

July 12-14

<http://philmarine.com>**Maritime & Border Security**

Manila, Philippines

October 3-4

www.maritimeandbordersecurityphp.com**Submarine Networks World**

Singapore

September 25-27

www.terrapinn.com/conference/submarine-networks-world/index.stm**Asia Pacific Deep Sea Mining**

Singapore

November 9-10

www.asia.deepsea-mining-summit.com

2017 EDITORIAL CALENDAR

ON&T

CALENDAR

JANUARY

Editorial: Underwater Navigation; Manned Submersibles Research & Development Services
Product & Services Focus: Multibeam & Side Scan Sonar; Research & Development Services

FEBRUARY

Editorial: Oceanology & Meteorology; Decom & Abandonment
Product & Services Focus: Buoys & Monitoring Instrumentation; Environmental Monitoring/Testing Services

MARCH

Editorial: Subsea Fiber Optic Networks; Maritime Security
Product & Services Focus: Connectors; Cables & Umbilicals; Diver Detection Systems

APRIL

Editorial: Offshore Technology; Ocean Mapping & Survey
Product & Services Focus: Subsea Tools & Manipulators; Batteries; Training/Safety

MAY

Editorial: Autonomous Unmanned Vehicles; Defense & Naval Systems
Product & Services Focus: Tracking & Positioning Systems; Seismic Monitoring; Equipment Leasing/Rental Services

JUNE

Editorial: UW Imaging & Processing; Marine Salvage/UW Archaeology
Product & Services Focus: Magnetometers; Water Dredges & Airlifts; Diving Services

58

JULY – Digital Distribution Only

Editorial: Ocean Engineering; Marine Construction
Product & Services Focus: Navigation, Mapping & Signal Processing; Data Processing Services

AUGUST

Editorial: Workclass ROVs; Deepwater; Pipeline/Repair/Maintenance
Product & Services Focus: Cameras, Lights & Imaging Sonars; Oil Spill Clean-Up Services

SEPTEMBER

Editorial: Ocean Observing Systems; Subsea Telecom; Offshore Wind Installation & Maintenance
Product & Services Focus: Water Sampling Equipment; Cable Installation Services

OCTOBER

Editorial: Offshore Communications; Subsea Inspection, Monitoring, Repair & Maintenance
Product & Services Focus: Acoustic Modems, Releases & Transponders; Marine Communications; Survey & Exploration Services

NOVEMBER – Digital Distribution Only

Editorial: Offshore Support, Supply & Emergency Vessels; Deep Sea Mining
Product & Services Focus: Ship Protection Systems; Cranes, Winches & Control Systems; Vessel Charter/Leasing Services

DECEMBER

Editorial: Light Workclass ROVs; Commercial Diving; Year in Review
Product & Services Focus: Diving Equipment & Services; Buoyancy Materials; Construction & Repair Services

SHOW DISTRIBUTION

JANUARY

UDT Asia – January 17-18*
Marine Data Infrastructure GCC – January 30-31*
Euromaritime January 31– February 2
GoM Oil Spill & Ecosystems – February 1-9
Oil North America – February 14-16

FEBRUARY

Underwater Intervention – February 21-23
US Hydro – March 20-23*

MARCH

Canadian Underwater Conf & Expo – March 26-28 Ballast Water Management – March 29-30
MCE Deepwater Development – April 3-5
Ocean Business – April 4-6
Telecom Exchange – June 20-21*

APRIL

Int'l Offshore Wind Forum – April 19-21*
OTC – May 1-4
AUVSI XPONENTIAL – May 8-11
IOSC – May 15-18
Deepwater Decomm Workshop – May 23-24*

MAY

UDT – May 30 – June 1
Offshore Wind Energy Europe – June 6-8
Seawork Int'l – June 13-15

JUNE

Teledyne CARIS User Workshop – June 19-22*
TBD

AUGUST

SPE Offshore Europe – September 5-8♦
TBD

SEPTEMBER

Oceans 17 – September 17-21
AWEA Offshore Wind – October 24-25♦
WindEurope November 28-30

OCTOBER

Oilcomm – October 3-5
MTS Dynamic Positioning – October 9-11♦
Offshore Energy – October 9-11
Teledyne Marine Technology Workshop – October 15-18
Offshore Well Intervention GoM – November 1-3*♦
Clean Gulf – December 5-7

NOVEMBER – Digital Distribution Only

World's Congress of Ocean – November 3-5*
International Workboat – November 29 – December 1*♦
TBD

* Digital Distribution Only
♦ Pending



ADVERTISING

NORTH AMERICA

Lisa Chilik

574-261-4215

lchilik@tscpublishing.com

EDITORIAL

MANAGING EDITOR

Greg Leatherman

772-617-6795

gleatherman@tscpublishing.com

INTERNATIONAL

Mimi Shipman

+44 (0) 777 601 7564

mshipman@tscpublishing.com

EDITOR

Rhonda Moniz

Phone: 506-951-4896

rmoniz@tscpublishing.com

A photograph of a boat deck. In the foreground, there's a large blue metal frame structure, possibly part of a crane or winch system. A thick, grey coiled rope is visible in the lower-left foreground. The middle ground shows the open ocean with some white-capped waves. In the upper right, the back of a person wearing a white hard hat and a blue and orange safety vest is visible, looking out at the sea.

INTRODUCING

SEACATALOG

THE OCEAN INDUSTRY'S ONLINE SOURCE
FOR MARINE SCIENTIFIC EQUIPMENT

SeaCatalog is a centralized marketplace where you can buy, rent and receive quotes on all the equipment you need to complete your project on time and within budget.

www.SeaCatalog.com



MILESTONES



AXYS Appoints New Director of Field Services Based in Europe

AXYS has appointed Guillaume Gautier to the position of Director of Field Services based in Nantes, France. This appointment represents the first time that AXYS has made such a senior operations appointment outside of their main office in Canada. "Guillaume's appointment reflects the growing importance of our global fieldwork in the renewables sector," says Terry Tarle, president and CEO. "We now have 11 of our FLiDAR WindSentinels contracted around the world and we see growing demand in Europe in the coming years. At the same time, we have seen consistent growth in the utilization of our wave and metocean buoys in sectors such as offshore construction, where we are now deployed on around a quarter of all of the offshore wind farms currently being built in Europe."

<http://ont.news/2rZH72B>

Klein Hires Richard Dentzman as New Regional Sales Manager

Dentzman will contribute to Klein's market share expansion and new product introduction. Dentzman will be instrumental in strengthening cooperation with our reference customers in the U.S. Navy, National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey (USGS) and the U.S. Army Corp of Engineers (USACE) as well as other defense customers around the world. Dentzman is a U.S. Submarine Veteran who brings a wealth of industry experience with some of the most prominent high technology sonar manufacturers. He has more than 20 years of surveying experience and his background includes work in numerous offshore research diving, acoustic subsea mapping, and maritime security programs.

<http://ont.news/2rEgcq>



June 2017

60

Ocean News & Technology



EXHIBITION & CONFERENCE
(9), 10 & 11 OCTOBER 2017
AMSTERDAM | THE NETHERLANDS

**Book your
stand now**

Offshore Energy attracts a global audience of more than 12,000 offshore energy industry professionals. The three-day event, features an exhibition where over 650 companies will showcase their products and services. The accompanying conference addresses current and future issues in the offshore industry, covering developments in oil & gas, offshore wind and marine energy. See you in Amsterdam!



WWW.OFFSHORE-ENERGY.BIZ

Supported by



Platinum Sponsor

ela[container]



Performance Inflatables Company Acquires SUBSALVE

SUBSALVE USA and Performance Inflatables Company jointly announces the acquisition of SUBSALVE USA by Performance Inflatables Company. The business will continue to operate, with its current staff, at its current location as a subsidiary of Performance Inflatables Company. Details of the transaction remain private. "The additional support, resources, and knowledge of Performance Inflatables Company, will provide a force multiplier to SUBSALVE USA to continue and further accelerate its leading position and enhance its new products growth across the world," said Richard Fryburg the founder of Subsalve USA in 1977 who has assumed the role of Chief Growth Officer, adding, "My entire management staff and I are truly excited about this new joint prospect and the vision that Performance Inflatables Company has for the industry."

<http://ont.news/2r0xth1>

RJE International, Inc. Attains ISO 9001:2015 Certification

RJE International, Inc. has attained ISO 9001:2015 Certification for quality management systems. Organizations use the standard to demonstrate the ability to consistently provide products and services that meet customer and regulatory requirements. A statement from the company said, "We are proud of this major accomplishment and thank all of our team members for their dedication to making this happen. This Certification will insure even better quality and consistency in serving our customers. Customer satisfaction is our Top Priority!"

<http://ont.news/2rZO16L>



Oceans '17
ANCHORAGE, ALASKA
SEPTEMBER 18-21



Now accepting abstracts
Registration opens May 6
Exhibitor space available

www.oceans17mtsieeeanchorage.org

Introducing the New 2017 Ocean Industry Directory

Scheduled for release in January 2017, the updated Ocean Industry Directory provides a dedicated solution for finding product and service providers. Avoid searching multiple, incomplete directories that fail to consolidate ocean industry companies in one place. The comprehensive, easy-to-use Ocean Industry Directory takes the mystery out of corporate listings by distinguishing between manufacturers, sellers, rental agents, and service providers.

Get Listed!

The Ocean Industry Directory is featured in every issue of Ocean News & Technology's print and digital magazines, providing exposure across multiple media channels that is important in a competitive marketplace. In addition, the Ocean Industry Directory is a key component of www.oceannews.com and updated on a monthly basis.

Key Features

If you're interested in becoming a part of the Ocean Industry Directory, consider the benefits of adding your own corporate listing. Key features include:



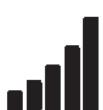
Company Listing

Offers companies the opportunity to list their company name, address, phone number, and website. All listings submitted through the website will be screened by a moderator to ensure that they align with the mission of the Ocean Industry Directory.



Search by Product or Service

Each listing will be categorized according to the product and or service offered by the company. The directory lists over 200 different oceanographic categories. Users will be able to search the categories listed within the directory to easily find information regarding companies associated with the products and services they are researching.



Sales Contacts

Upgraded listings include additional marketing content as well as sales contacts and emails. Let potential customers know who to reach and how to reach them.

Multiple Participation Levels

The directory offers three tiers of corporate participation. Ranging from free to upgraded, our listings are tailored to fit your company's marketing budget. These directory participation levels include:

	Free Plan Digital Only Listing	Silver Plan \$500 Digital Only Listing	Gold Plan \$950 Digital & Print Listing
Company name, address, phone number, and website	●	●	●
Link to chosen categories for products and services	●	●	●
Corporate Logo		●	●
100-word company introduction		●	●
Sales contact name and email		●	●
One corporate document upload		●	●
Print listing for one category			●

TSC Representatives

North American Ad Sales:

Lisa Chilik
Tel: 574-261-4215
Fax: 772-221-7715
lchilik@tscpublishing.com

International Ad Sales:

Mimi Shipman
Mob: +44 (0) 777 6017 564
Ph: +44 (0) 1460 242 060
mshipman@tscpublishing.com



ACOUSTIC SYSTEMS

APPLIED ACOUSTIC ENGINEERING LTD

Marine House, Garton Hall Road
Great Yarmouth, NR31 0NB, UK
Tel: +44 (0) 1493 440355
Fax: +44 (0) 1493 440720
E-mail: gavinwilloughby@appliedacoustics.com
Website: www.appliedacoustics.com
Contact: Gavin Willoughby



Manufacturer of fully integrated USBL acoustic tracking systems, both portable and vessel based, high quality multi-system compatible beacons for acoustic positioning and release, and seismic sub-bottom profiling systems for coastal, offshore or geohazard surveys. All products are supported by a network of overseas representatives providing a first class service on a global scale.

OCEAN SONICS LTD.

11 Lornevale Road
Great Village, NS, B0M 1L0
Tel: +1 902 655 3000
E-mail: info@oceansonics.com
Website: www.oceansonics.com



Ocean Sonics designs and manufactures the icListen, a compact self-contained easy to deploy digital hydrophone. As the world leader in gathering ocean sound, Ocean Sonics combines very high signal performance with innovative ease of use, to give customers the best digital hydrophone technology available. It's a compact, all-in-one instrument capable of processing data while collecting in real-time

Creating Acoustic Arrays is now simple. Connect two or more icListen hydrophones together and they self-synchronize, operating as one. Ocean Sonics offers a wide range of geometries, including vertical, horizontal, autonomous, very small geometrical arrays, or spread out over many kilometres.

RTSYS

25 rue Michel Marion
56850 Caudan, France
Tel: +33 297 898 580
E-mail: info@rtsys.eu
Website: www.rtsys.eu



- Acoustic Monitoring: EASDA14, Embedded Multichannel Passive Acoustic Recorders
- WiFi remote Buoy: BASDA14, Multi-sensor & Rechargeable Acoustic Buoy accessible in Real-time
- Sediment Characterization: INSEA, Acoustic Velocimeter for Sediment Characterization

We provide advanced embedded acoustic products in the environmental research, surveying and monitoring areas. With Synchronized Multichannel Acquisition and accepting a broad range of Acoustic Transducers and Hydrophones from 3Hz to more than 1MHz, our solutions allow the user a new range of applications.

HIGH TECH, INC

21120 Johnson Road
Long Beach, MS 39560, United States
Tel: 228 868 6632
Email: high_techinc@bellsouth.net
Website: www.hightechincusa.com
Contact: Glenn Pollock



Experts in rugged marine sensor systems utilized in geophysical surveys, anti-submarine warfare, marine mammal monitoring and downhole applications. Products include data acquisition systems, hydrophones, array cables, pressure vessels and peripherals related to marine systems.

ADCP/DVL

NORTEK AS

Vangkroken 2
1351 Rud, Norway
Tel: +47 67 17 45 00
E-mail: inquiry@nortek.no
Website: www.nortek.no



Nortek excels in the development and manufacture of acoustic Doppler instrumentation. Doppler Velocity Logs (DVL) are used for subsea navigation. Acoustic Doppler Current Profilers (ADCP) are used to understand physical processes in the ocean, rivers, lakes and laboratories. We pride ourselves on being innovative in product development and production processes. Nortek provides solutions to engineers and scientists by offering real-time data collection and support from our responsive technical team.

ROWE TECHNOLOGIES, INC.

12655 Danielson Ct., Suite 306
Poway, CA 92064
Tel: 858 842 3020
E-mail: sales@rowetechinc.com
Website: www.rowetechinc.com
Contact: Chris Arends, Global Sales Director



Rowe Technologies Inc. (RoweTech) specializes in the design and manufacture of underwater acoustic Doppler products and imaging systems for the oceanographic, hydrographic and hydrologic markets. Founded in 2009, Rowe Technologies is a technology-based private company with the main office located in Poway CA, USA. Rowe's ADCP/DVL competitive advantage is single-unit configuration which allows simultaneous current profiling and bottom tracking.

BUOYS

METOCEAN TELEMATICS

21 Thornhill Drive Dartmouth,
Nova Scotia B3B 1R9 Canada
Tel: +1 902 468 2505
Fax: +1 902 468 4442
E-mail: emily@metocean.com
Website: www.metocean.com
Contact: Emily MacPherson



MetOcean Telematics designs and manufactures drifting buoys, environmental platforms, and the world renowned NOVATECH locator beacon product line. In addition to providing complete end-to-end telematics services, and one of the few manufacturers in the world to achieve ISO 9001 certification. MetOcean Telematics' drifting buoy family consists of environmental and weather monitoring, oil spill response, and search and rescue drifters: NOVA profiling float, Iridium SVP (ISVP), ISPHERE, Argosphere, SLDB, and ISLDB.

BUOYANCY PRODUCTS

DEEPWATER BUOYANCY, INC.

394 Hill Street
Biddeford, ME 04005
Tel: +1 207 502 1400
Fax: +1 207 221 5718
E-mail: sales@deepwb.com
Website: www.DeepWaterBuoyancy.com
Contact: Dan Côté, Sales Manager



DeepWater Buoyancy creates subsea buoyancy products for leading companies in the oceanographic, seismic, survey, military and offshore oil & gas markets. Thousands of customers have relied on our products for over thirty-five years, from the ocean surface to depths exceeding six thousand meters.

NAUTILUS MARINE SERVICE GMBH

Alter Postweg 24
Buxtehude, 21614, Germany
+49 (0) 41618 66250
info@nautilus-gmbh.com
www.vitrovenx.com
Contact name: Steffen Pausch



Nautilus Marine Service provides the finest VITROVEX® glass housings that are capable of operating in the most extreme regions of the Earth. VITROVEX® glass enclosures offer the dual advantage of buoyancy and pressure proof housings - a perfect combination for small and autonomous underwater instrumentation packages. Simple, reliable and affordable.

SUBSALVE USA

P.O. Box 2030
North Kingstown, RI 02852
Phone: 401-884-8801
Fax: 401-884-8868
E-mail: richard@subsalve.com
Website: www.subsalve.com
Contact: Richard Fryburg



Since 1977 Subsalve USA has been America's #1 manufacturer of standard and custom flotation devices and we are the innovators in buoyancy and engineered inflatables. Our products include: Professional, Commercial, Standard, Shallow Water, Enclosed Flotation Bags, Cable & Pipeline Floats, Water Load Test Bags, Rapid Recovery & Mark V/ORCA EOD Systems.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today! +1-772-221-6796

OCEAN INDUSTRY DIRECTORY

CABLES

A-2-SEA SOLUTIONS LTD

Unit 15 Romsey Industrial Estate,
Romsey, Hampshire SO51 0HR,
United Kingdom
Tel: +44 (0)1794 830 909
E-mail: ross@a2sea.co.uk
Website: www.a2sea.co.uk
Contact: Ross Taylor



In the past 20 years, A-2-Sea Solutions Ltd has had significant involvement in major submarine cable installations, on behalf of manufacturers, purchasers and installers of sub-sea cable systems – operating worldwide.

From initial beginnings in submarine cable joint design and system maintenance, A-2-Sea are now providing customers with turnkey solutions for short haul cable system installations. Other key business areas include: product design and development, coastal and offshore survey, provision of beach and subsea cable joints, cable system maintenance with a 365/24/7 emergency hotline rapid response service.

In 2016, A-2-Sea Solutions was ranked 13th on the UK Sunday Times SME Export Track 100 league table and 21st on the Fast Track 100.

CORTLAND COMPANY

10333 Richmond Ave
Suite #1000
Houston TX 77042-4128
Tel: +1 (832) 833-8000
Fax: +1 (832) 833-8002
E-mail: cortland@cortlandcompany.com
Website: www.cortlandcompany.com
Contact: Marco Cano



Cortland has more than 30 years of manufacturing experience supplying custom-designed electro-optical-mechanical cables. We provide solutions that meet the challenges posed by harsh environments, hydrostatic pressures, and high mechanical stresses.

We manufacture custom EOM cables assemblies for various subsea applications which include CTDs, hydrophones, magnetometer, tow cables, ocean bottom, ROV cables, and other custom application. Our global presence and industry-leading design engineers, manufacturing facilities, and management teams, work together to implement integrated solutions with unsurpassed reliability that support the needs of customers worldwide. Visit us online at cortlandcompany.com

FALMAT CABLE

1873 Diamond Street
San Marcos, CA 92078
Toll Free: 800 848 4257
Tel: +1 760 471 5400
Fax: +1 760 471 4970
E-mail: sales@falmat.com
Website: www.falmat.com
Contact: Shawn Amirehsani



For over 50 years, Falmat Cable has been a key supplier and a solution provider to many global OEMs and end users supporting a wide range of marine applications. We design and manufacture high performance cables for use in harsh and demanding environments. Our rugged Xtreme cables are known and preferred worldwide for superior reliability and durability in commercial and military projects. We offer XtremeMarine cables with precision coaxial components for use with SD/HD video requirements, wet rated submersible pump cables, miniature fiber optic cables, a comprehensive range of highly engineered ROV Tethers plus our well recognized Xtreme Ethernet cables. Falmat is a Certified ISO9001/AS9100 organization. Visit our web site: www.falmat.com.

SOUTH BAY CABLE CORP

54125 Maranatha Drive
P.O. Box 67
Idyllwild, CA 92549
Phone: (951) 659-2183
Fax: (951) 659-3958
E-mail: Sales@southbaycable.com
Website: www.southbaycable.com
Contact: Gary Brown, Sales Manager



Since 1957, South Bay Cable Corp has designed and manufactured specialized electrical, electro-mechanical and electro-optical-mechanical cables for use in demanding marine environments. Cables are designed to meet customer requirements and include tether and umbilical cables for ROVs, tow cables, video inspection, faired cables and a host of other customer specific applications.

CONNECTORS

BIRNS, INC.

1720 Fiske Place
Oxnard CA 93033-1863 USA
Int'l: +1 805 487 5393
Fax: +1 805 487 0427
USA: +1 888 BIRNS 88 (+1 888 247 6788)
E-mail: service@birns.com
Website: www.birns.com
Contact: Eric Birns



BIRNS, Inc. has been serving the subsea industry since 1954, and is an ISO 9001:2008 certified global leader in the design and manufacturing of high performance connectors, custom cable assemblies and lighting systems. With a NAVSEA PRO-020 certified molding facility, the company leads the industry with sophisticated connector lines, including exceptional electrical, electromechanical, coaxial, electro-coax, optical, electro-optical and electro-opto-mechanical hybrid options. BIRNS provides the industry's highest volume of cost-effective hydrostatic and helium pressure testing, and has a wide range of ABS Product Design Assessment (PDA) certified fiber optic and electrical penetrators. BIRNS also delivers brilliant LED and tungsten-halogen marine, chamber, security and commercial diving lights trusted in the world's most extreme environments.

BIRNS AQUAMATE LLC

122 Waltham St.
Pawtucket, RI 02860 USA
Tel: +1 (401) 723 4242
Fax: +1 (401) 753 6342
E-mail: sales@birnsaquamate.com
Website: www.birnsaquamate.com
Contact: Eli Bar-Hai



Birns Aquamate design and manufacture underwater electrical connectors, cable assemblies, and cable terminations. The company produces a wide range of standard industry connectors such as the 5500 Series, SC, MC, LP, FAWL/FAWM, Rubber Molded, etc. BIRNS Aquamate is the only underwater connector producer that guarantees compatibility with other manufacturers. Birns also specializes in fast turn-around for custom design of special connectors for solutions. Stocking dealers in the UK, South Africa and Holland as well as dealers in Canada, Germany, Belgium, Norway, China, and Brazil.

SEACON

1700 Gillespie Way
El Cajon, CA 92020 USA
Tel: +1 619 562 7071
Fax: +1 619 562 9706
E-mail: seacon@seaconworldwide.com
Website: www.seaconworldwide.com



The SEACON Group are world leaders in underwater connector technology and provide an extensive and diverse range of electrical, optical and hybrid connector assemblies, submersible switches and cable system solutions for many applications within the Oceanographic, Defense, Oil and Gas and Environmental markets. With locations in California and Texas, USA, Mexico, Brazil, the United Kingdom and Norway and a worldwide network of agencies and representatives, SEACON is able to supply very quick solutions to any requirements across the globe.

TELEDYNE MARINE INTERCONNECT SOLUTIONS

1026 N. Williamson Blvd.
Daytona Beach, FL 32114
Tel: 386-236-0880
E-mail: TeledyneMIS@teledyne.com
Website: www.teledynemarine.com



Teledyne Marine Interconnect Solutions integrates the resources of ODI, DGO, Impulse, and Cable Solutions into a single organization that supplies innovative, high-performance solutions for harsh environment interconnect. Solutions for these harsh environments include wet-mate, splash-mate and dry-mate connectors, pressure boundary penetrators, cable assemblies, cable terminations, and custom-engineered encapsulation and molding. TMIS contains a broad portfolio of field-proven, time-tested electrical, optical, and hybrid interconnect capabilities optimized for applications where performance and reliability are imperative. Products are available as stand-alone items, or as complex solutions that integrate technologies into advanced, value-added systems.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today! +1-772-221-6796

DESIGN AND ENGINEERING

HYDRO LEDUC NA, INC.
 19416 Park Row, Ste. 170
 Houston, TX 77084
 Tel: 281-679-9654
 E-mail: bogden@hydroleduc.com
 Website: www.hydroleduc.com



Hydro Leduc is a specialist in the design and manufacture of hydraulic piston pumps, hydraulic motors, hydro pneumatic accumulators, and customized hydraulic components satisfying customer needs with reliable products from a reliable source. As the leader in micro hydraulics, it is feasible to obtain several tons of force from a minimal power source within a restricted space envelope. The techniques of micro hydraulics allow simple solutions to problems that are often beyond the limits of traditional mechanical options. Hydro Leduc's expertise is at your service in varied applications such as oil service tools, oceanographic instrumentation, aeronautics, and any extreme working condition of temperature, pressure, medium, and environment.

EQUIPMENT RENTAL

OKEANUS SCIENCE & TECHNOLOGY, LLC
 2261 Denley Road
 Houma, LA 70363
 Tel: 985-346-4666
 Fax: 985-346-8444
 E-mail: Bleblanc@oceanus.com
 Website: www.oceanus.com
 Contact: Benton LeBlanc



Okeanus is the premier rental provider for oceanographic and marine scientific research equipment utilized in nearshore and offshore projects around the world. Focused on providing industry-leading customer service, Okeanus offers advanced, high-quality technology coupled with knowledgeable and experienced staff that can deliver dedicated support regardless of a project's location.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today!
+1-772-221-6796

FIBER OPTIC PRODUCT/SERVICES

OCEAN SPECIALISTS, INC.
 8502 SW Kansas Ave
 Stuart, FL 34997
 Tel: +1 772 219 3033
 Fax: +1 772 219 3010
 Email: jbyous@oceanspecialists.com
 Website: www.oceanspecialists.com
 Contact: Jim Byous



Ocean Specialists, Inc. (OSI) is a submarine fiber optic network development company with global project capabilities. OSI works with clients during all project phases of subsea network development, from planning and design to procurement and implementation. Our customers, primarily representing Oil and Gas, Telecommunications and Ocean Observing, recognize the value of fiber optic networks to their field and services solutions, and look to OSI to deliver the skills and experience that developing these networks require.

GYRO COMPASSES

KONGSBERG SEATEX AS
 Pirsenteret
 N-7462 Trondheim, Norway
 Tel: +47 73 54 55 00
 Fax: +47 73 51 50 20
 E-mail: km.seatex@kongsberg.com
 Website: www.km.kongsberg.com/seatex
 Contact: Finn Otto Sanne at finn.otto.sanne@kongsberg.com



KONGSBERG

Kongsberg Seatex is a leading international marine electronics manufacturer specializing in the development and production of precision positioning and motion sensing systems. Our commitment is to provide quality products and solutions for safe navigation and operations at sea in the commercial offshore, maritime, hydrographics and defence industries.

INSURANCE

JOHN W. FISK COMPANY
 4833 Conti Street, Suite 200
 New Orleans, LA 70119
 Toll Free: +1 888 486 5411
 E-mail: insure@jwfisk.com
 Website: www.jwfisk.com



Fisk Marine Insurance provides all types of insurance to any limit required for commercial diving, marine contractors, offshore oilfield and platforms, plug and abandonment (P&A) contractors, land based energy, ocean marine cargo and oceanographic research worldwide. Our coverages include Workers Compensation (USL&H & Jones Act), General Liability, Professional Liability, Hull P&I, Equipment, Bonds and International Packages for clients working outside of the USA. Contact us for more information: 1-888-486-5411 or insure@jwfisk.com. Visit our website: www.jwfisk.com



OCEAN INDUSTRY DIRECTORY

LIQUID STORAGE

AERO TEC LABORATORIES, INC. (ATL)

45 Spear Road Industrial Park,
Ramsey, NJ 07446 USA
Tel: +1 201 825 1400
Fax: +1 201 825 1962
E-mail: atl@atlinc.com
Website: www.atlinc.com
Contact: David Dack



ATL specializes in the design/manufacture of custom bladder-type fluid containment systems, including tanks, inflatables, pillows and bellows for surface and subsea. ATL's flexible fluid containers boast unparalleled chemical tolerance, abrasion resistance, and remarkable durability - used with methanol, diesel fuel, gases, ethyleneglycol, hydraulic fluids and chemical cleaning cocktails. Expedited deliveries are also available.

MARINE ENVIRONMENTAL CONSULTING SERVICES

CSA OCEAN SCIENCES INC.
8502 SW Kansas Avenue
Stuart, FL 34997
Tel: +1 772 219 3000
Fax: +1 772 219 3010
E-mail: gstevens@conshelf.com
Website: www.csaocean.com
Contact: Gordon Stevens



CSA Ocean Sciences Inc. (CSA) is a marine environmental consulting firm specializing in multidisciplinary projects concerning potential environmental impacts of activities throughout the world. With extensive experience in environmental sciences and technical field operations, CSA is staffed and equipped to offer a complete range of services for projects in offshore, nearshore, estuarine, wetland, and freshwater environments.

MOTION SENSING EQUIPMENT

KONGSBERG SEATEX AS

Pirseteret
N-7462 Trondheim, Norway
Tel: +47 73 54 55 00
Fax: +47 73 51 50 20
E-mail: km.seatex@kongsberg.com
Website: www.km.kongsberg.com/seatex
Contact: Finn Otto Sanne at finn.otto.sanne@kongsberg.com



KONGSBERG

Kongsberg Seatex is a leading international marine electronics manufacturer specializing in the development and production of precision positioning and motion sensing systems. Our commitment is to provide quality products and solutions for safe navigation and operations at sea in the commercial offshore, maritime, hydrographics and defence industries.



NAVIGATION & POSITIONING SYSTEMS

ADVANCED NAVIGATION

Level 8, 37 Pitt Street, Sydney 2000
New South Wales, Australia
Tel: +61 2 9099 3800
E-mail: sales@advancednavigation.com.au
Website: www.advancednavigation.com.au



**ADVANCED
NAVIGATION**

Advanced Navigation is a privately owned Australian company that specialises in the development and manufacturing of navigation technologies and robotics. The company has a focus on generating products of the highest quality standard, both in terms of hardware and software. Advanced Navigation has specialised expertise across a broad range of fields including sensors, GNSS, inertial navigation, RF technologies, acoustics, robotics, AI and algorithms. Advanced Navigation is an ISO 9001 certified company and maintains a strict quality control system across the two research facilities and three manufacturing facilities that they operate in Australia. Advanced Navigation is a carbon neutral company, offsetting all emissions due to energy use through the planting of trees.

EVOLOGICS GMBH

Ackerstrasse 76
13355 Berlin, Germany
Tel: +49 (0) 30 4679 862-0
Fax: +49 (0) 30 4679 862-01
E-mail: sales@evologics.de
Website: www.evologics.de

**Evo
Logics®**

EvoLogics provides the world's most advanced spread-spectrum underwater communication systems (S2C) with multi-channel data management, networking capability, built-in tracking and positioning functions with USBL. Data loggers, acoustic wake-up module and releasers optionally included. Deployments in offshore platforms (FPSO, ABS), environmental monitoring, defense systems, ROV and AUV operations and more. Applications include simple positioning and sensor information to transmission of underwater photos.

KONGSBERG SEATEX AS

Pirseteret
N-7462 Trondheim, Norway
Tel: +47 73 54 55 00
Fax: +47 73 51 50 20
E-mail: km.seatex@kongsberg.com
Website: www.km.kongsberg.com/seatex
Contact: Finn Otto Sanne at finn.otto.sanne@kongsberg.com



KONGSBERG

Kongsberg Seatex is a leading international marine electronics manufacturer specializing in the development and production of precision positioning and motion sensing systems. Our commitment is to provide quality products and solutions for safe navigation and operations at sea in the commercial offshore, maritime, hydrographics and defence industries.

NETWORK AND DATA COMS

KONGSBERG SEATEX AS

Pirseteret
N-7462 Trondheim, Norway
Tel: +47 73 54 55 00
Fax: +47 73 51 50 20
E-mail: km.seatex@kongsberg.com
Website: www.km.kongsberg.com/seatex
Contact: Finn Otto Sanne at finn.otto.sanne@kongsberg.com



KONGSBERG

Kongsberg Seatex is a leading international marine electronics manufacturer specializing in the development and production of precision positioning and motion sensing systems. Our commitment is to provide quality products and solutions for safe navigation and operations at sea in the commercial offshore, maritime, hydrographics and defence industries.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today! +1-772-221-6796

OCEANOGRAPHIC INSTRUMENTS/SERVICES

ASL ENVIRONMENTAL SCIENCES, INC
Victoria, BC, Canada
Tel: +1-250-656-0177
E-mail: asl@aslenv.com
Website: www.aslenv.com



- **Metocean Equipment Leasing:** Acoustic Doppler Current Profiler ADCPs (including StreamPro & RiverRay), Ice Profilers, AZFP, acoustic releases, wave/tide gauges, pingers, satellite beacons, CTD+DO+Tu profilers, DO & turbidity loggers, weather station, cages, flotation, bottom frames.

- **Oceanographic Products:** Ice Profiler IPS5 & shallow water SWIP, Wave Profiler, Acoustic Zooplankton Fish Profiler (AZFP), Acoustic Scintillation Flow Meter (ASFM), Imagenex scanning sonar logger (IRIS), instrument cages, bottom frames. Custom acoustic products and system integration.

- **Consulting:** Field work, data collection, analyses, numerical modelling, acoustics, remote sensing, oceanographic mooring design and system integration.

- **Manufacturer's Representative:** Teledyne RD Instruments, Teledyne Oceanscience, Teledyne Bentos, WERA Northern Radar.

NKE INSTRUMENTATION

rue Gutenberg
56700 Hennebont, France
Tel: +33 2 97 36 41 31
Fax: +33 2 97 36 10 12
E-mail: info.instrumentation@nke.fr
Website: www.nke-instrumentation.com



- Fresh and marine waters multiparameter probes: CTD, dissolved oxygen, turbidity, chlorophyll, Phycocyanin, Phycoerythrin, CDOM, detection of hydrocarbons, pH, Redox
- Dedicated monitoring data loggers and equipment for: sediment transport, underwater systems behavior, marine corrosion, pCO₂ sensor (stand alone or on drifting buoy), density, absolute salinity.
- Intelligent network: environmental parameters (meteorologic and oceanographic), Ecosystems Approach to Fisheries (EAF - Voluntary fishing vessels), Webdata application. Contact: Valérie Le Pen - vlepen@nke.fr or Goulven Prud'homme - gprudhomme@nke.fr
- Provor and Arvor profiling subsurface floats (ARGO project): CTD, dissolved oxygen, BGC, deep: Argos and Iridium transmission.
- Drifting surface buoys with temperature and GPS receiver for Surface velocity project. Contact: Nathalie Le Bris - nlebris@nke.fr or Jérôme Sagot - jsagot@nke.fr

RBR
95 Hines Road
Ottawa, ON K2K 2M5
Tel: +1 613 599 8900
Fax: +1 613 599 8929
E-mail: info@rbr-global.com
Website: www.rbr-global.com



RBR creates instruments to measure the blue planet. From the ocean abyss to the polar ice caps, our sensors track water parameters – temperature, depth, salinity, dissolved gases, pH, and many others. With design and manufacturing centrally located in Ottawa, Canada, our team works in a fast-paced, dynamic atmosphere to serve customers all over the globe.



ROMOR OCEAN SOLUTIONS

41 Martha Avenue
Mount Uniacke, NS Canada
B0N 1Z0
Tel. +1 (902) 466-7000
Fax. +1 (902) 466-4880
E-mail: [Sales@romor.ca](mailto:sales@romor.ca)
Website: www.romor.ca
Contact: Darrin Verge, President & CEO



ROMOR Ocean Solutions provides instrumentation solutions for the geo-physical, oceanographic, defense, security, oil & gas, and renewable energy industries. By partnering with world renowned manufacturers, ROMOR is able to offer technical knowledge, value added services, logistics expertise, and the most reliable instrumentation on the market.

SEA-BIRD SCIENTIFIC

13431 NE 20th St.
Bellevue, WA 98005
Tel: +1 425 643 9866
Fax: +1 425 643 9954
E-mail: info@sea-birdscientific.com
Website: www.sea-birdscientific.com
Contact: Calvin Lwin, Sales



SEA·BIRD
SCIENTIFIC

Sea-Bird Scientific combines the capabilities of Sea-Bird Electronics, WET Labs, and Satlantic to provide best-of-class sensors and systems for oceanographic research and environmental water quality monitoring of physical and biogeochemical properties. Sea-Bird Scientific is the leader in accurate, stable ocean instruments for measuring conductivity (salinity), temperature, pressure, oxygen, pH, chlorophyll, CDOM, turbidity, beam attenuation, irradiance, radiance, PAR, nitrate, and phosphate. Our CTD profilers, water samplers, moored CT recorders, wave/tide recorders, DO sensors, and optical sensors are used by research institutes, ocean observing programs, government agencies, and navies globally.

STAR:ODDI

Skeidarars 12, 210
Gardabæur, Iceland
Tel: +354 533 6060
Fax: +354 533 6069
E-mail: baldur@star-oddi.com
Website: www.star-oddi.com
Contact: Baldur Sigurgeirsson



A manufacturer of miniature data loggers with sensors as temperature, depth/pressure, salinity, tilt/acceleration, compass direction/magnetometer, light levels, acoustic receiving/transmitting. The loggers are used for various researches, including oceanography, fishing gear studies, equipment behavioral monitoring and fish tagging. Data is presented in the application software with a time-stamp for each measurement.

ROV SUPPLIES/TOOLS

ROVSCO, INC.
5263 Barker Cypress Road, Suite 600
Houston, TX 77084 USA
Tel: +1 281 858 6333
Fax: +1 281 858 6363
E-mail: sales@rovoco.com
Website: www.rovoco.com
Contact: Jessica McKenney



ROVSCO is an ROV supply company, focused toward supporting worldwide the needs of work-class ROV operators for any small component or any large equipment. We have extensive experience in this and have been doing it for 31 years. Contact us for (all original brand) consumables, ROV electrical connectors, cable assemblies, hydraulic filters, parts & components. We will respond with a quick response, excellent service and great low prices.

We also manufacture tooling items which include ROV quick release shackles (11 ton to 250 ton), hydraulic compensators (1/2 liter to 2.5 gallon), video cameras & led lights, and 'SNOKOTE' for umbilical anti-corrosive protection.

SMART TELEMETRY

OCEANWISE LTD
Dovedale House, 16 Butts Road
Alton, Hants, GU341NB, UK
Tel : +44 (0)1420 768262
Fax : +44 (0) 872 115 0560
Email : info@oceanwise.eu
Website: www.oceanwise.eu
Contact : john.pepper@oceanwise.eu



Monitoring and measuring environmental data is not enough! You need to manage it so you get the right data in the right place at the right time. Our Port-Log.net Environmental Data Sharing and Publishing service gets the most out of your investment in data monitoring.

- Easy and inexpensive viewing and sharing of real-time data
- Secure and straightforward archiving and storage of all types of marine data
- Data accuracy, integrity and reliability

Enjoy the confidence of working with marine data experts!

OCEAN INDUSTRY DIRECTORY

SONAR SYSTEMS

EDGETECH

4 Little Brook Rd.
West Wareham, MA 02576
Tel: +1-508-291-0057
E-mail: info@edgetech.com
Website: www.edgetech.com
Contact: Amy LaRose



EdgeTech designs, manufactures and sells industry-leading side scan sonars, sub-bottom profilers, bathymetry systems and combined sonar systems. Additionally, the company produces world class underwater actuated and transponding solutions including deep sea acoustic releases, shallow water and long life acoustic releases, transponders, reliable USBL acoustic tracking and positioning systems, and custom-engineered acoustic products.

MARINE SONIC TECHNOLOGY

120 Newsome Dr. Suite H, PO Box 1309
Yorktown VA 23692-1309
Toll Free: +1 800 447 4804
E-mail: Regan.Lipinski@na-atlasc.com
Website: www.marinesonic.com



MARINE SONIC TECHNOLOGY
A brand of ATLAS NORTH AMERICA

Marine Sonic Technology builds high quality, high resolution side scan sonar systems.

Located in Yorktown, Virginia, Marine Sonic has been in business for more than 25 years.

Our towed systems are rugged, easy to deploy and simple to operate. We also offer highly efficient AUV/ROV embedded systems, which occupy minimal space and low power consumption.

SOUND VELOCITY PROBES/CTDS

SAIV A/S

Nygardsviken 1, 5164
Laksevag, Norway
Tel: +47 56 11 30 66,
Fax: +47 56 11 30 69
E-mail: info@scivias.no
Website: www.saivas.no
Contact: Gunnar Sagstad

- STD/CTD, Sound Velocity probes/recorder with optional multi-parameter facilities; Turbidity, Fluorescence, Oxygen etc. The new CTD/STD model SD208 with wireless communication and high accuracy: 0.002 mS/cm, 0.002 °C
- Precision pressure /depth (0.01% accuracy) and temperature sensors/recorders. Applications: hydrographic profilings, installation on ROVs and towed systems, etc. Robust and compact designs are combined with accuracy and "plug and play" compatibility. Output format for sonar equipment, e.g. EM1002, EM3000, SSP, HiPAP and Reson 8125.

SUBSEA FABRICATION

NEW INDUSTRIES

6032 Railroad Avenue
Morgan City, LA 70380
Tel: +1 985 385 6789
E-mail: bill.new@newindustries.com
Website: www.newindustries.com
Contact: Bill New



New Industries provides quality fabrication services to the offshore oil & gas and marine industries focusing on large diameter pressure vessels, suction piles, DNV buildings and deepwater subsea production equipment such as jumpers, PLETs, PLEMs and manifolds.

KEEP YOUR ONT DIRECTORY LISTINGS ON TARGET

- Can be updated at any time throughout the year
- Keeps your market aware of your current contact and product information

Call Today! +1-772-221-6796

SUBSEA TECHNOLOGY

KONGSBERG MARITIME AS – SUBSEA DIVISION (DIVISION OF KONGSBERG GROUP)

Strandpromenaden 50
NO-3183 Horten
Norway
Tel: +47 33 03 41 00
Website: www.km.kongsberg.com



KONGSBERG

Kongsberg Maritime is a marine technology company providing innovative solutions for all marine industry sectors including merchant, offshore, subsea, naval and fisheries. The company delivers systems that cover diverse maritime applications. Within subsea, Kongsberg Maritime's sonars, Sub-bottom profilers, multibeam and single beam echo sounders, cameras, positioning and underwater communication & monitoring systems, instruments, software and Marine Robotics are used in survey and inspection operations worldwide. Working closely with customers to develop technology that pushes the limits in subsea applications, Kongsberg Maritime is also dedicated to developing innovative environmental monitoring solutions such as the K-Lander system in addition to cutting-edge Marine Robotic platforms such as the futuristic Eelume vehicle.

SUBSEA TOOLING

SUBSEA AMERICAS

3447 Hwy 182
P.O. Box 185
Berwick, LA 70342
Tel: +1 985 714 1767 or 985 518-0055
E-mail: charles@subseaamerica.com
Website: www.subseaamericas.com
Contact: Charles Mayea



Subsea Americas (SSA) is a leading provider of rental ROV tooling equipment on a worldwide basis. SSA is a 24 hr. / 7 days a week service provider of a comprehensive range of standard subsea tooling equipment. From torque tools and flying lead orientation tools to 15k isolated hydraulic intensifiers and wire rope cable cutters - SSA can fully support the client's needs with quality service, and reliable equipment at a most competitive cost.

UNDERWATER VEHICLES/AUVS

HYDROID, INC.

a subsidiary of Kongsberg Maritime
1 Henry Drive
Pocasset, MA 02559
Tel: +1 508 563 6565
Fax: +1 508 563 3445
E-mail: glester@hydroid.com
Website: www.hydroid.com
Contact: Graham Lester



Located in the U.S. and a subsidiary of Kongsberg Maritime, Hydroid is the world's most trusted manufacturer of advanced Autonomous Underwater Vehicles (AUVs). Our Marine Robotics systems provide innovative and reliable full-picture solutions for the marine research, defense, hydrographic and offshore/energy markets. Our products represent the most advanced, diversified and field-proven family of AUVs and AUV support systems in the world.

Developed by a veteran team of engineers, the innovations of Hydroid and Kongsberg Maritime provide a safe and reliable answer to the challenges that have hampered ocean exploration and security. For more information on REMUS technology, please visit www.hydroid.com.

OCEANSERVER TECHNOLOGY, INC.

151 Martine Street
Fall River, MA 02723 USA
Tel: +1 508 678 0550
Fax: +1 508 678 0552
E-mail: sales@ocean-server.com
Website: www.iver-auv.com
Contact: Jim Kirk



OceanServer Technology, Inc. is a leading provider of man-portable Autonomous Underwater Vehicles (AUVs) with over 250 AUVs deployed worldwide. The Iver AUV is an affordable, commercial vehicle used for general survey and sub-surface security work, and serves as a research platform for autonomy, behavioral and sensor development studies at universities and navy research facilities.

UNDERWATER VEHICLES/ROVS

OCEANEERING INTERNATIONAL, INC.

11911 FM 529
Houston, TX 77041
Tel: 713.329.4500
E-mail: info@oceaneering.com
Website: www.oceaneering.com
Contact: Bill Mallin



At Oceaneering, we do things differently, creatively, and smarter. As your trusted subsea partner, our unmatched experience and innovative technologies and solutions allow us to adapt and evolve regardless of market conditions. Only by working together will we safely and reliably re-shape the future of the oil and gas industry.

We are connecting what's needed with what's next as the world's largest ROV operator and the leading ROV provider to the oil and gas industry worldwide. We push the limits of ROV intervention and meet new, demanding tooling intervention.

OUTLAND TECHNOLOGY

38190 Commercial Ct.
Slidell, LA 70458 USA
Tel: 985-847-1104
Fax: 985-847-1106
E-mail: jeff@outlandtech.com
Website: www.outlandtech.com
Contact: Jeff Mayfield



Offering the most rugged equipment and unsurpassed customer service, Outland Technology has been the world's leading manufacturer of underwater video, lighting and ROV equipment for over 30 years. We recognize that no two jobs are the same and specialize in products that are customizable for your specific applications.

QSTAR ROV TRAINING & SUBSEA SERVICES

C/ Sucre 26, 35008 - C/Medas 4-6, 08023
Canary Islands & Barcelona, Spain
Tel: + 34 616 604 778 / + 34 928 91 48 13
Fax: +34 928 91 48 13
E-mail: info@qstar.es
Websites: www.qstar.es & www.rovs.eu



QSTAR was established to offer services for industries that require effective solutions for Subsea projects through the use of our ROV fleet and high Qualified personnel. Our World leading ROV Training Division offers High Quality Training for ROV PILOT TECHNICIANS as a World-Wide ROV Training Establishment Member of the IMCA.

TELEDYNE SEABOTIX

9970 Carroll Canyon Road
Suite B
San Diego, CA 92131 USA
Tel: +1 619 450 4000
Fax: +1 619 450 4001
E-mail: SeaBotixInfo@Teledyne.com
Website: www.SeaBotix.com
Contact: Alasdair Murrie



Teledyne SeaBotix is a world leading manufacturer of capable underwater MiniROVs that perform a multitude of tasks including maritime security, search and recovery, hull and pipeline inspection, hazardous environment intervention, aquaculture, sensor deployment and oceanographic research. The Little Benthic Vehicle systems have become the benchmark in compact ROVs around the world and ROV equipment for over 30 years. We recognize that no two jobs are the same and specialize in products that are customizable for your specific applications.

VIDEORAY

212 East High Street
Pottstown, PA 19464
Tel: +1 610 458 3000
Fax: +1 610 458 3010
E-mail: sales@videoray.com
Website: www.videoray.com
Contact: Chris Gibson



With more than 3,700 ROV's in service around the world, VideoRay is the global leader in Observation ROV technology. VideoRay's underwater robot systems are extremely versatile, portable, affordable, and reliable solution for underwater operations including surveys, offshore inspections, search & recovery, homeland & port security, science & research, aquaculture, and many other underwater applications. The latest Mission Specialist systems provide solutions for particularly difficult underwater challenges. VideoRay is available on the General Services Administration (GSA) Schedule.

WINCHES, HANDLING & CONTROL SYSTEMS

ALL OCEANS ENGINEERING LTD.

Tyrebagger Works, Clinterty, Kinellar
Aberdeen AB21 0TT, UK
Tel: +44 (0) 1224 791001
Fax: +44 (0) 1224 791002
E-mail: admin@alloceans.co.uk
Website: www.alloceans.co.uk
Contact: Brian Abel

MECHANICAL HANDLING UNDERWATER

Launch and Recovery Systems - 6,000m plus Underwater Winches - ROV and Diver operated Tether Management Systems - 6,000m plus Torque Tools - Electric and Hydraulic systems - ROV and Diver operated General Products - Compensators, latches, swivels, metrology sets, cable reels, pressure housings, junction boxes Workshop Services - Fabrication, assembly and testing Engineering - prototyping, product development, solutions engineering AC-ROV - The mini ROV that broke the mold.

MARKEY MACHINERY COMPANY

7266 8th Ave. South
Seattle, WA 98108 USA
Tel: +1 800 637 3430
Fax: +1 206 623 9839
E-mail: info@markeymachinery.com
Website: www.markeymachinery.com



Preferred by the US fleet, Markey's advanced oceanographic winch systems provide ultimate dependability, reliability and precise performance when and where you want it. Operating within critical windows of opportunity you can count on our custom winches, capstans, windlasses and auxiliary machinery for the successful execution and completion of your research.



ADVERTISERS INDEX

Advanced Navigation	45	www.advancednavigation.com.au
BIRNS, Inc.	17	www.birns.com
CoastalOcean Vision, Inc.	47	www.coastaloceanvision.com
CSA Ocean Sciences Inc.	4	www.csaocean.com
ECA Robotics	51	www.eca-robotics.com
EofE Ultrasonic Co., Ltd	41	www.echologger.com
EvoLogics GmbH	71	www.evologics.de
Hydroid, Inc.	5	www.hydroid.com
Imagenex Technology Corp.	9	www.imagenex.com
JW Fishers Manufacturing, Inc.	29	www.jwfishers.com
Kongsberg Subsea	44	www.km.kongsberg.com
MacArtney A/S	3	http://macartney.com
Morgan & Eklund, Inc. - Centerfold	36-37	http://morganeklund.com
New Industries	28	www.newindustries.com
Ocean News & Technology.....	50, 58	www.oceannews.com
Ocean Specialists, Inc.	48	www.oceanspecialists.com
Oceans'17	61	www.oceans17mtsieeeeanchorage.org
Oceaneering International.....	27	www.oceaneering.com
Offshore Energy	60	http://offshore-energy.biz
Riptide Autonomous Solutions LLC	43	www.riptideas.com
ROVSCO	49	www.rovscocom
Rowe Technologies, Inc.	72	www.rowetechinc.com
SeaCatalog.....	59	www.seacatalog.com
Silicon Sensing Systems Limited.....	35	www.siliconsensing.com
Shark Marine Technologies, Inc.	18	www.sharkmarine.com
Sonardyne International Limited.....	15	www.sonardyne.co.uk
SubCtech GmbH	49	www.subCtech.com
Teledyne Marine	19	www.teledynemarine.com
VideoRay	2	www.videoray.com



UNDERWATER COMMUNICATION AND POSITIONING SOLUTIONS

Evo Logics®

S2C TECHNOLOGY: COMMUNICATION AND TRACKING COMBINED

- time, space and cost-saving solutions
- low power consumption for autonomous operations
- advanced data delivery algorithms, addressing and networking, remotely configurable settings
- extendable platform with multiple configuration options: power-saving Wake Up module, acoustic releaser, additional sensors, custom solutions, OEM versions available

USBL POSITIONING SYSTEMS

simultaneous positioning and communication - no need to switch between positioning mode and modem mode

- flexible SiNAPS positioning software
- reliable data transmissions
- range: up to 8000 m
- accuracy: up to 0.04 degrees

UNDERWATER ACOUSTIC MODEMS

reliable data transmissions even in adverse conditions, customizable R-series modems, light and compact M-series "mini" modems, **new S2CM-HS high-speed modem**, special editions for developers, S2C communication and positioning emulator - remote access or standalone device

- range: up to 8000 m
- depth: up to 6000 m
- data rate: up to 62.5 kbps

LBL POSITIONING SYSTEMS

highly accurate, precise and stable performance, simultaneous positioning and data transmissions

- flexible SiNAPS positioning software
- reliable data transmissions
- range: up to 8000 m
- accuracy: better than 0.01 m

Meet us at
OCEANS'17
MTS/IEEE ABERDEEN

19-22 June 2017
Aberdeen, UK
Stand 31

Meet us at
OCEANS'17
MTS/IEEE ANCHORAGE

18-21 September 2017
Anchorage, AK, US
Stand 316



Choose your frequency
Choose your depth rating
Choose the industry innovator

Rowe Technologies state-of-the-art SeaWATCH Acoustic Doppler Current Profiler (ADCP) is applicable to an array of oceanographic current measuring deployments. Operating at 300, 600, and 1200 kHz, and available in 300 to 6000-meter depth rated capsules, record all-inclusive current flow data from up to 200 cells worry-free on an industry leading 32 GB internal memory card. Rapidly download via standard Ethernet port into customizable data formats in MATLAB, CSV, and PDO.

Find out more at rowetechinc.com

