

APRIL  
2017

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Ocean News & Technology

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## THE SKILL TO SURVIVE:

Survival Systems USA Provides the  
Ultimate High-Tech Training to  
Prepare for Real-World Dangers

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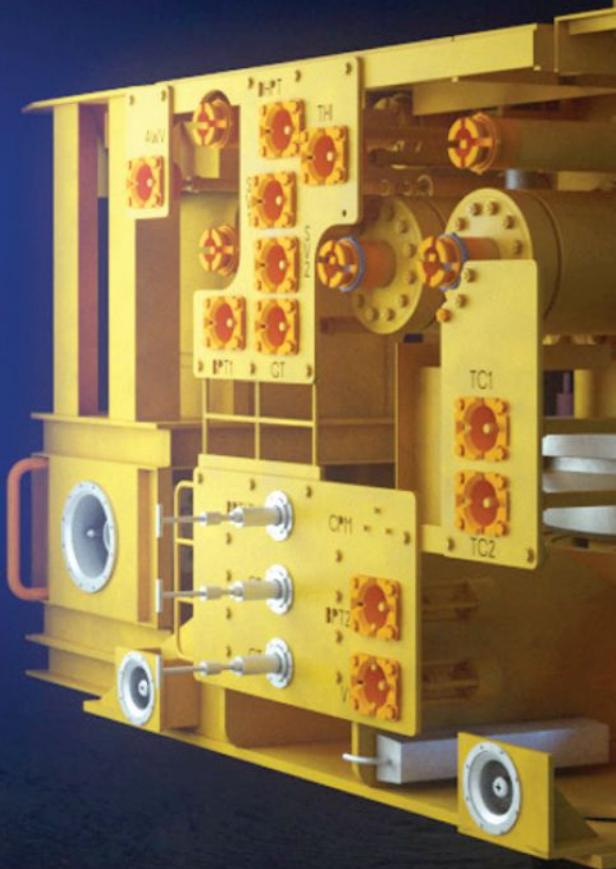
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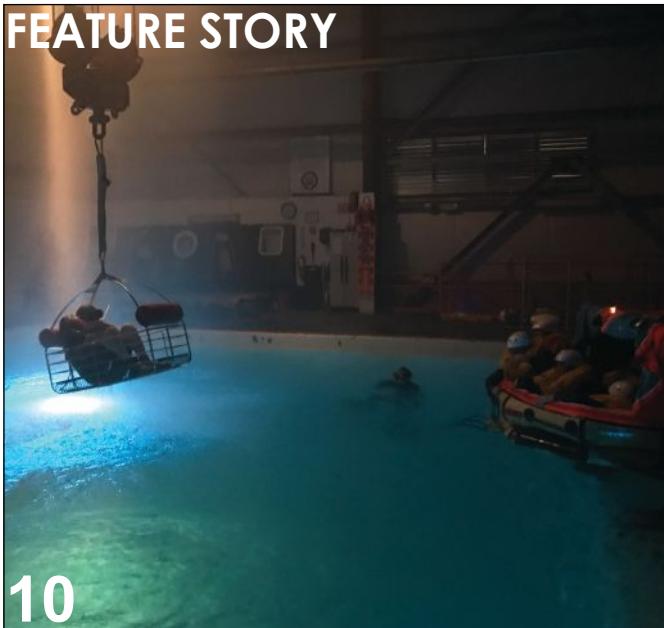
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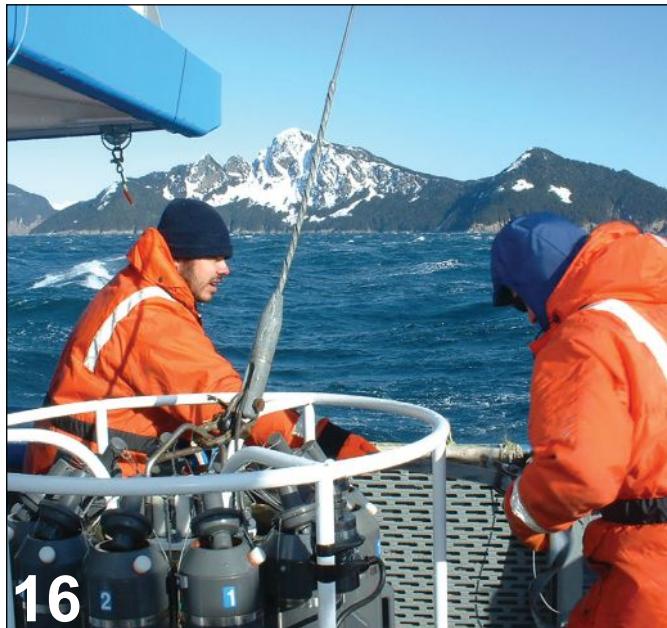
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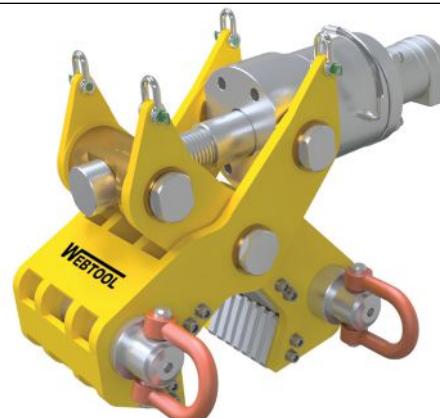
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The Safe Bristolia semisubmersible platform located in the North Sea.

Photo Credit: Dariusz Kuzminski

# EDITORIAL



# ON&T

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## From Garage Start-ups to Global Maritime Companies

Everyone knows that Apple Computers started in a garage, but what most people are not aware of is how many of our global maritime companies also started in garages or small “incubator” settings. For example, the 2016 winner of the Energy Department’s \$1.5 million dollar Wave Energy Prize was AquaHarmonics—literally two guys in a garage who tested their device in cooperation with their alma mater (Oregon State University).

The New England region is also rich in maritime history and maritime innovation. The triangle formed by Boston, Woods Hole, and Newport has seen some of the most forward-looking devices developed—from the innovative iron toggle harpoon invented in New Bedford by Lewis Temple (a self-emancipated slave) to the complex unmanned, maritime vehicles developed by both major players and small inventors.

Right now, we are experiencing an explosion in innovative maritime vehicles in this region. The inventive maritime spirit seems to be accelerating not only in New England but up and down the East Coast from the Canadian Maritimes to Florida and on the West Coast from start-ups to major players.

In order to keep the forward momentum going in maritime robotics, there is a great need to increase cooperation among players of all sizes. The tide is coming in on these high-tech vehicles, and all players benefit from cooperation, sharing, and team work. Commercial companies, academic institutions, and government agencies all need to work together to keep the bright light of discovery glowing.

Toby Stapleton, director of the Center for Innovation and Entrepreneurship (CIE) at the University of Massachusetts Dartmouth, has been promoting exactly this sort of maritime cooperation with a series of events—the Maritime Innovations Conferences—designed to bring together commercial, academic, and government agencies for the purpose of collaboration. The CIE location in the center of the triangle is the perfect meeting place for all of these institutions and private sector players. More institutions globally need to build on this idea in order to promote cooperation between large and small players; and accelerate business, invention, and future advances in maritime sensors.

No matter where one stands on issues of climate, oceans, fisheries, and aquaculture, the need to monitor our oceans and engage in dispassionate scientific research is not going away. If anything, we need to collect more empirical data to better understand the complexities of our ocean planet. Intelligent ocean robots developed through scientific cooperation between innovators—both new and established—will help us collect these data better, faster, and more efficiently than ever before.



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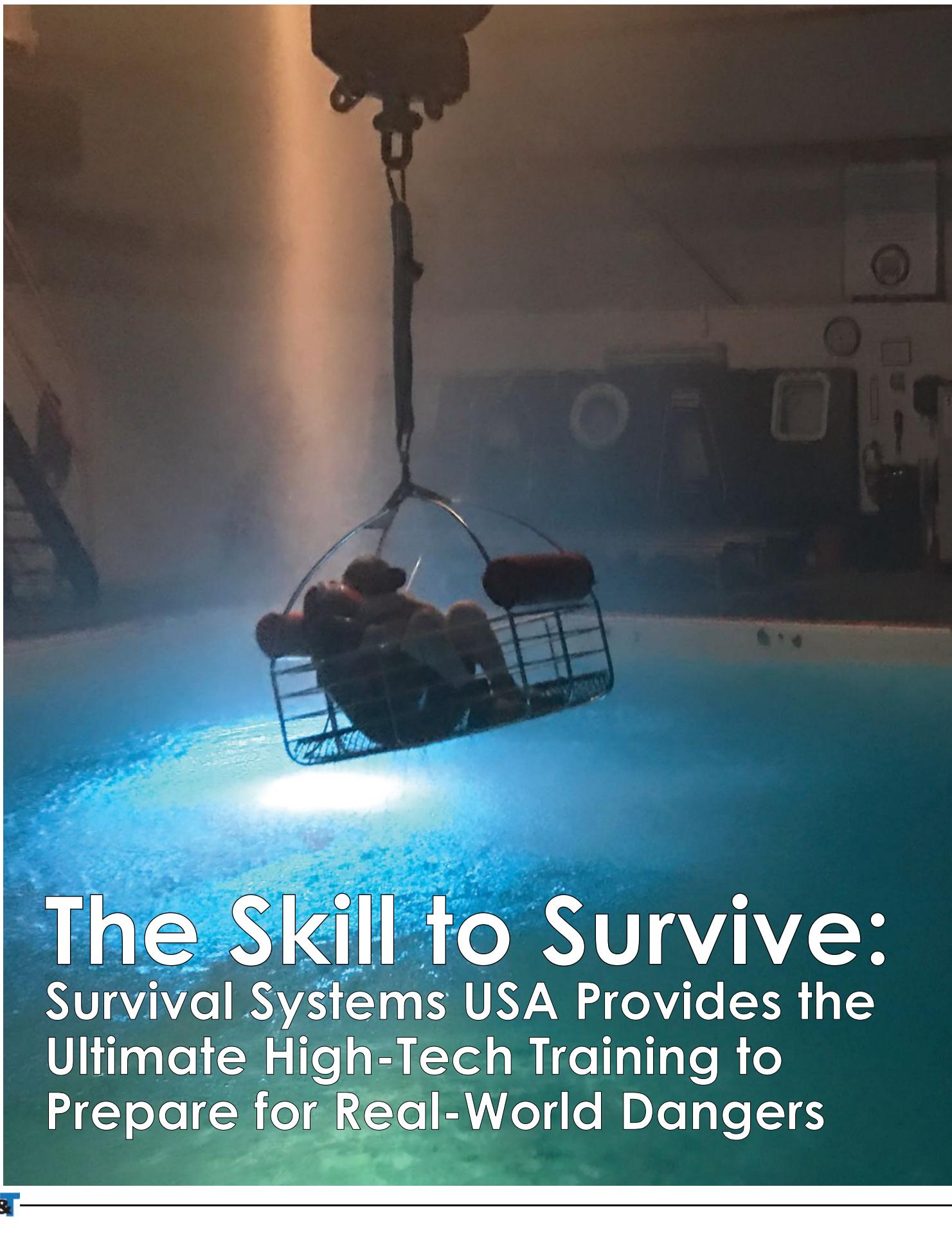


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# The Skill to Survive: Survival Systems USA Provides the Ultimate High-Tech Training to Prepare for Real-World Dangers

Survival Systems USA, Inc. is an employee-owned company in Groton, Connecticut dedicated to safety and survival education. The family of companies was established in the 1980s in Dartmouth, Nova Scotia after Canadian pilot and founder Albert Bohemier survived a plane crash. He credited his survival to the training he received while in the military.



*Students waiting inside liferaft while single student is lifted to safety by Search & Rescue. Photo credit: Survival Systems USA, Inc.*

# FEATURE STORY

One aspect of the company's mission is manifested in post-incident survival training—whether it's an aircraft ditching event, a vessel abandonment situation, or an accident involving a submerged motor vehicle, the programs are designed to teach the skills needed to perform surface abandonment, underwater egress, and survival in an inhospitable environment (both land and sea) with limited resources until rescue.

"Albert developed training for the oil and gas industry and Canadian military that was specific to underwater egress, surface survival, and related areas. Training was his passion. That's where the company got its start. And where the company mission of '*enhancing and preserving workers' lives through safety education, training technologies, and applied research and development*' truly began. His initial focus was two-fold: 1) training and the equipment that you need to use to accomplish that training and 2) shortly thereafter, what R&D was needed to develop the equipment that you would use in training and in real emergencies," said Maria C. Hanna, president

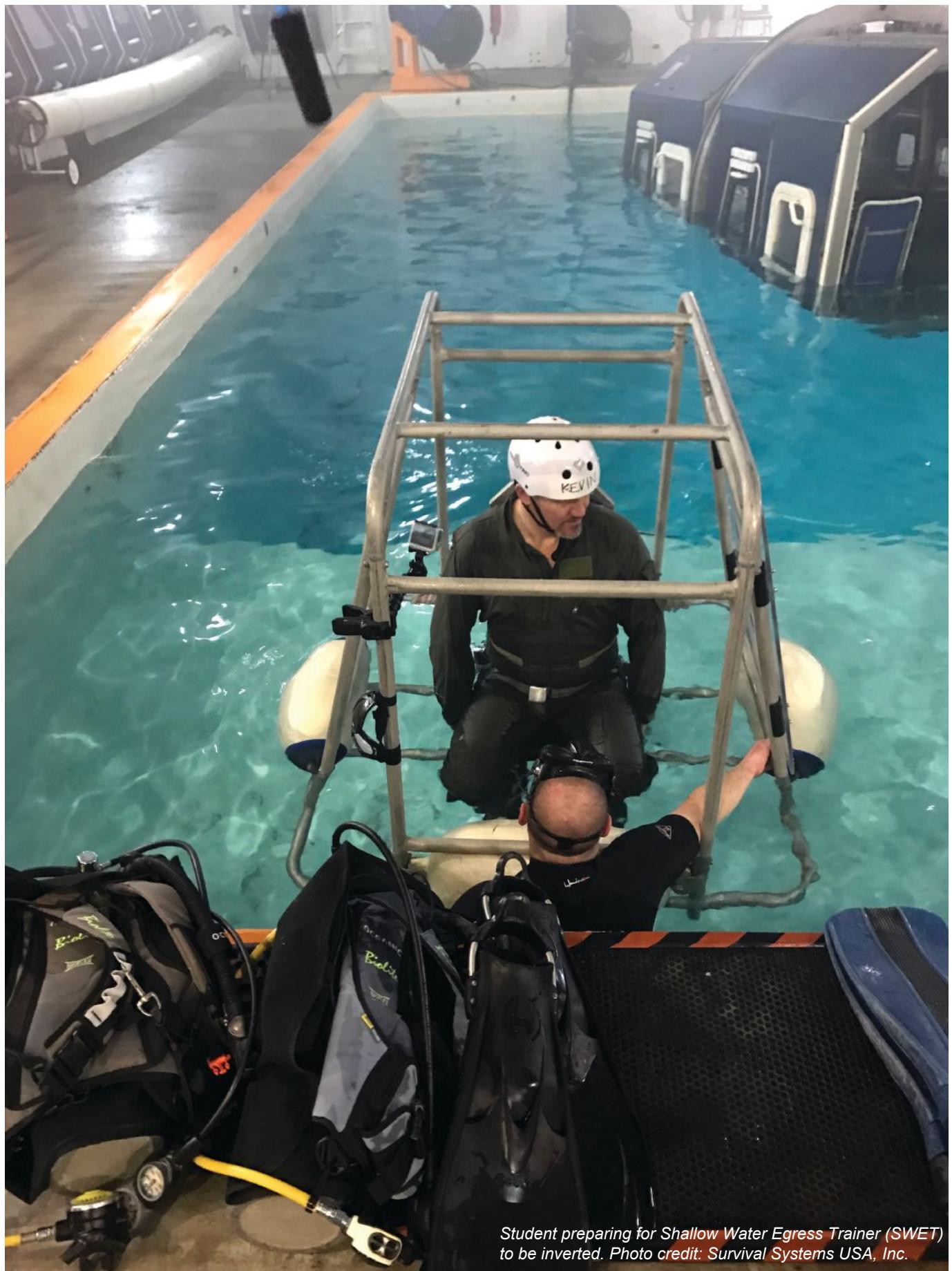
of Survival Systems USA, Inc. In 2008, Hanna purchased Survival Systems USA from Bohemier and soon after began the conversion to an employee-owned company.

Survival Systems USA provides high-tech incremental training combined with adult learning principles to meet the learning objectives of the courses. Experienced staff members work with each student to ensure success. Multiple civilian and military courses are conducted on a rolling basis, catering to the transportation industry—with a focus on aviation, maritime, and ground transport training.

The crown jewel of the facility is the Modular Egress Training Simulator (METS®), manufactured by Survival Systems Limited in Canada. The METS® can be configured to replicate multiple aviation, maritime, and ground transport platforms. Configurations for each course are determined by the student population, allowing for an unprecedented level of fidelity in training.



*Students inside the liferaft during surface water survival. Photo credit: Survival Systems USA, Inc.*



*Student preparing for Shallow Water Egress Trainer (SWET) to be inverted. Photo credit: Survival Systems USA, Inc.*

# FEATURE STORY

**“Course content may be driven by requirements, but all of our training programs have one goal in mind—to give our students the confidence and skills to survive when they are faced with an emergency out there on their own.”**

- Maria C. Hanna, president of Survival Systems USA, Inc.



*Students preparing for group formation and group movement as part of surface water survival. Photo credit: Survival Systems USA, Inc.*



Facilities at Survival Systems USA include Modular Egress Training Simulator and full environmental suite of equipment—allowing the “perfect storm” indoors for training. Photo credit: Survival Systems USA, Inc.

For aircraft that are unusual in their configuration, such as the AH-64 or the AH-1, the company also offers the Apache METS®, a unique simulator that replicates the tandem seating configuration for those aircraft.

Combined with the XGH™ handling system, the facility provides a safe training environment for clients. The XGH™ is a cross-gantry hoisting system that features dual lifting mechanisms, integrated METS™ remote air brake system, user settable variable ditching speeds, advanced ditching monitoring, and effects sequencing and control as well as a pneumatically operated redundant retraction system (RRS) to mitigate the risk of power failure during critical (submerged) periods of the underwater escape training.

Notably, the facility is home to a state-of-the art Survival Training Simulation Theater (STST™) that provides

real-world egress training by expanding the METS® and XGH™ systems to integrate environmental training aids such as wind, waves, rescue hoist systems, and other environmental variables.

To date, Survival Systems USA, Inc. has trained over 140,000 individuals with a completion rate in excess of 99%. The trainees come from diverse industries, experiences, and backgrounds, and the company has a broad array of product offerings, including the capability to customize not only their simulators but their course content to meet specific client requirements.

Within the last year, the company has expanded its offerings to include “survival experiences” for those who aren’t in the aviation, maritime, or ground transport communities, but who want to develop their own leadership skills or those of their team.”

## NSF Funds Two Long-Term Coastal Research Sites

National Science Foundation (NSF) grants will support two new Long-Term Ecological Research (LTER) sites. Scientists will conduct research along the Northeast U.S. continental shelf and in the northern Gulf of Alaska, regions known for productive fisheries and abundant marine resources.

The new LTER sites were each awarded \$5.6 million over five years, adding to 25 existing LTER sites in ecosystems including the open ocean, coral reefs, deserts, and grasslands. The complex food webs in these regions are affected by human activities, short-term environmental variability, and long-term ecosystem changes.

"The new LTER sites will bring new locations, technologies, and scientists to the challenge of understanding our coastal oceans," says Rick Murray, director of NSF's Division of Ocean Sciences. "The sites are in areas where there's much recreational and commercial fishing, and both sites are in the midst of significant environmental changes."

Murray adds that "research at the new sites will matter to everyone who eats U.S. seafood, is involved in

coastal industries, or depends on the coastal oceans in any way. That includes all of us, through the oceans' importance in weather and climate and a long list of other 'ecosystem services' the sea provides."

Researchers at the Woods Hole Oceanographic Institution (WHOI), along with scientists at the University of Massachusetts, Wellesley College, and the University of Rhode Island, will lead the Northeast U.S. Shelf LTER site.

Scientists at the University of Alaska Fairbanks, in collaboration with researchers at Western Washington University, Oregon State University, and the University of California, Santa Cruz, will manage the Northern Gulf of Alaska LTER site.

### Northern Gulf of Alaska LTER site

Two decades of research along Alaska's Seward Line—a series of ocean sampling stations extending from Resurrection Bay near Seward, Alaska to the continental slope 150 miles offshore—are the foundation of the new NSF Northern Gulf of Alaska LTER site.

"We've monitored Prince William Sound and the conti-



Scientists at the Northern Gulf of Alaska LTER site conduct research off the coast of Alaska. Photo credit: Sarah Thornton, UAF.

ntental shelf long enough to know where many of the important features are," says Russ Hopcroft, a scientist at the University of Alaska Fairbanks and the principal investigator of the new LTER site. "But until now, we haven't been able to study the processes and mechanisms in-depth behind what we've been observing."

The new LTER site will allow researchers to make observations across a larger geographic region. It will also give scientists an opportunity to undertake studies aboard the NSF research vessel Sikuliaq, operated by the University of Alaska Fairbanks.

Researchers at the Northern Gulf of Alaska LTER site will study the gulf's waters, which support the well-known fish, crabs, seabirds, and marine mammals of Alaska.

The scientists say that the addition of the Northern Gulf of Alaska site to the LTER network will lead to a better understanding of an ecosystem with many of the nation's largest fisheries.

### Northeast U.S. Shelf LTER site

Scientists have documented environmental changes in the Atlantic Ocean off the U.S. Northeast coast, but they've lacked an understanding of the links among the ocean environment, plankton food webs, and fish stocks. That has limited their ability to predict how this ecosystem will respond to environmental change, research at the new LTER site will fill that gap.



The NSF Northeast U.S. Shelf LTER site spans the continental shelf across an area connecting the WHOI-operated Martha's Vineyard Coastal Observatory with the Pioneer Array, part of NSF's Ocean Observatories Initiative. The Pioneer Array, a group of moorings and other instruments, is located off the coast of southern New England where coastal waters meet the open ocean.

These instruments collect continuous data and, along with samples retrieved by scientists aboard ships, will become integral parts of ecological models of the changing Atlantic ecosystem.

"This is an exciting opportunity to develop a much more detailed understanding of the ocean," says WHOI biologist Heidi Sosik, principal investigator of the project. "We want to know how different pathways in the food web may shift seasonally or with environmental change. Ultimately, we hope this knowledge can help promote science-based stewardship of marine ecosystems and be applied to the ocean beyond the waters of the Northeast."

For more information, visit [www.nsf.gov](http://www.nsf.gov).

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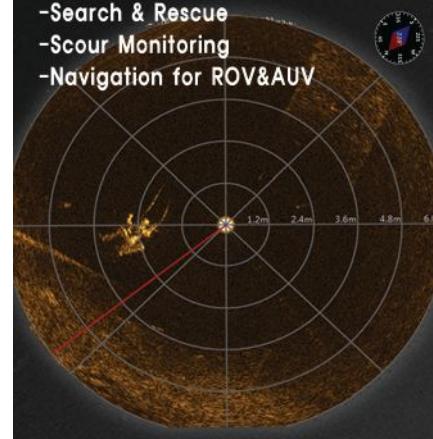


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## Argonne National Laboratory Invents Reusable Sponge That Soaks Up Oil

When the *Deepwater Horizon* drilling pipe blew out seven years ago, beginning the worst oil spill in U.S. history, those in charge of the recovery discovered a new wrinkle: the millions of gallons of oil bubbling from the sea floor weren't all collecting on the surface where it could be skimmed or burned. Some of it was forming a plume and drifting through the ocean under the surface.

Now, scientists at the U.S. Department of Energy's (DOE) Argonne National Laboratory have invented a new foam, called Oleo Sponge, that addresses this problem. The material not only easily adsorbs oil from water, but is also reusable and can pull dispersed oil from the entire water column—not just the surface.

"The Oleo Sponge offers a set of possibilities that, as far as we know, are unprecedented," said co-inventor Seth Darling, a scientist with Argonne's Center for Nanoscale

Materials and a fellow of the University of Chicago's Institute for Molecular Engineering. "We already have a library of molecules that can grab oil, but the problem is how to get them into a useful structure and bind them there permanently."

The scientists started out with common polyurethane foam, used in everything from furniture cushions to home insulation. This foam has lots of nooks and crannies, like an English muffin, which could provide ample surface area to grab oil; but they needed to give the foam a new surface chemistry in order to firmly attach the oil-loving molecules.

Previously, Darling and fellow Argonne chemist Jeff Elam had developed a technique called sequential infiltration synthesis, or SIS, which can be used to infuse hard metal oxide atoms within complicated nanostructures.



After some trial and error, they found a way to adapt the technique to grow an extremely thin layer of metal oxide “primer” near the foam’s interior surfaces. This serves as the perfect glue for attaching the oil-loving molecules, which are deposited in a second step; they hold onto the metal oxide layer with one end and reach out to grab oil molecules with the other.

The result is Oleo Sponge, a block of foam that easily adsorbs oil from the water. The material, which looks a bit like an outdoor seat cushion, can be wrung out to be reused—and the oil itself recovered.

At tests at a giant seawater tank in New Jersey called Ohmsett, the National Oil Spill Response Research & Renewable Energy Test Facility, the Oleo Sponge successfully collected diesel and crude oil from both below and on the water surface.

“The material is extremely sturdy. We’ve run dozens to hundreds of tests, wringing it out each time, and we have yet to see it break down at all,” Darling said.

Oleo Sponge could potentially also be used routinely to clean harbors and ports, where diesel and oil tend to accumulate from ship traffic, said John Harvey, a business development executive with Argonne’s Technology Development and Commercialization division.

Elam, Darling, and the rest of the team are continuing to develop the technology.

“The technique offers enormous flexibility and can be adapted to other types of cleanup besides oil in seawater. You could attach a different molecule to grab any specific substance you need,” Elam said.

The team is actively looking to commercialize the material, Harvey said: those interested in licensing the technology or collaborating with the laboratory on further development may contact partners@anl.gov.

Argonne scientists Anil Mane and Joseph Libera and postdoctoral researcher Edward Barry also contributed to the development of the Oleo Sponge. Preliminary results were published in a study in the Journal of Materials Chemistry A, titled “Advanced oil sorbents using sequential infiltration synthesis.”

The research was funded by the U.S. Coast Guard and the Bureau of Safety and Environmental Enforcement. The team used resources of the Center for Nanoscale Materials, a DOE Office of Science User Facility, in the development of the material.

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## CSA Awarded BOEM Contract for Analysis of Seismic Survey Mitigation Data

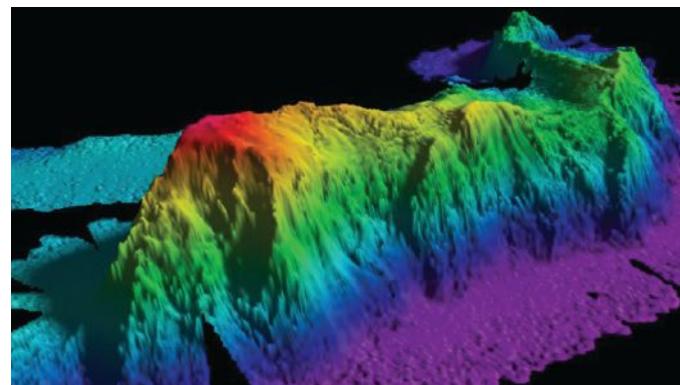
CSA Ocean Sciences Inc. (CSA) has been awarded a contract from the Bureau of Ocean Energy Management (BOEM) for the analysis of all visual and acoustic mitigation survey data collected during seismic operations in the Gulf of Mexico (GOM) from 2009 through 2015. These data will be combined with the first 6 years (2002-2008) of data analysis, also completed by CSA staff in 2012, and the resulting dataset will be the largest and most comprehensive analysis of U.S. seismic mitigation data and the largest dataset globally collected under standardized regulations.

<http://ont.news/2o4cr2d>

## Underwater Mountains Help Ocean Water Rise from Abyss

At high latitudes, such as near Antarctica and the Arctic Circle, the ocean's surface waters are cooled by frigid temperatures and become so dense that they sink a few thousand meters into the ocean's abyss. Ocean waters are thought to flow along a sort of conveyor belt that transports them between the surface and the deep in a never-ending loop. However, it remains unclear where the deep waters rise to the surface, as they ultimately must.

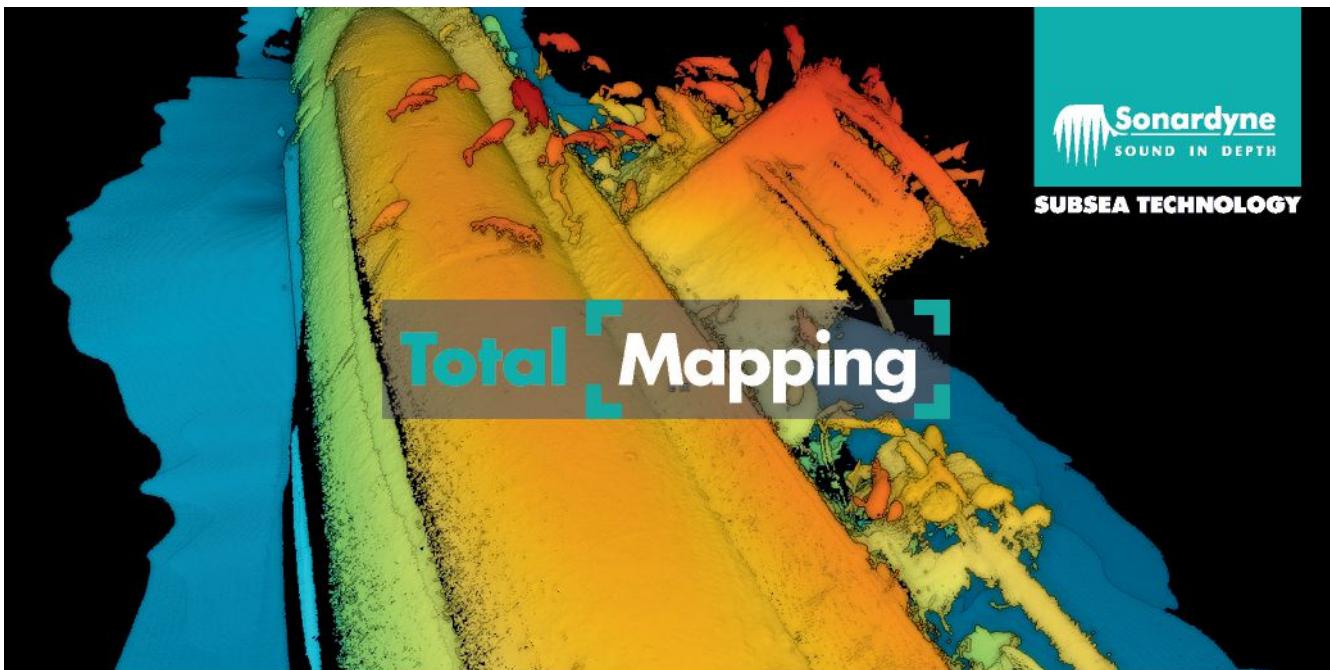
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SPRINT-Mapper. Great subsea imagery starts with great subsea navigation

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# MONTH IN REVIEW

## NASA's ICESat-2 to Provide More Depth to Sea Ice Forecasts

In March, the Arctic sea ice pack is supposed to reach its greatest extent but this year is far below average—off by an area the size of Texas and New Mexico combined.

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

## World Ocean Council Addresses Investment in the Ocean Economy

World Ocean Council CEO described for institutional investors the opportunities for investing in responsible ocean economic development.

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

## New Study Shows Red Tides Can Be Predicted

A recent study found that red tides are not purely random and offers opportunities to predict these harmful algal blooms.

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

## Study Opens New Questions on How the Atmosphere and Oceans Formed

A new study led by The Australian National University (ANU) has found seawater cycles throughout the Earth's interior down to 2,900 km.

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

## Automated Evaluation of Underwater Images as a Global Task

Underwater robots, autonomous underwater vehicles, permanently installed observatories, and more marine science devices are equipped with high-resolution cameras.

<http://ont.news/2oInvF0>

## Enormous Caribbean Waves Before 1492

Geologists have discovered evidence that unusual seas detached living corals from a Caribbean reef and scattered them far inland as boulders.

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

## Hydromea Receives Order for LUMA 250LP Modem

Hydromea has received a large order for its LUMA 250LP optical modem from Alfred Wegener Institute for Polar and Marine Research.

<http://ont.news/2of7rla>

## OceanWise to Deliver Water Level Monitoring System for Dominica

OceanWise has been awarded a contract by the Government of Dominica for the supply, installation and maintenance of a water level monitoring system.

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

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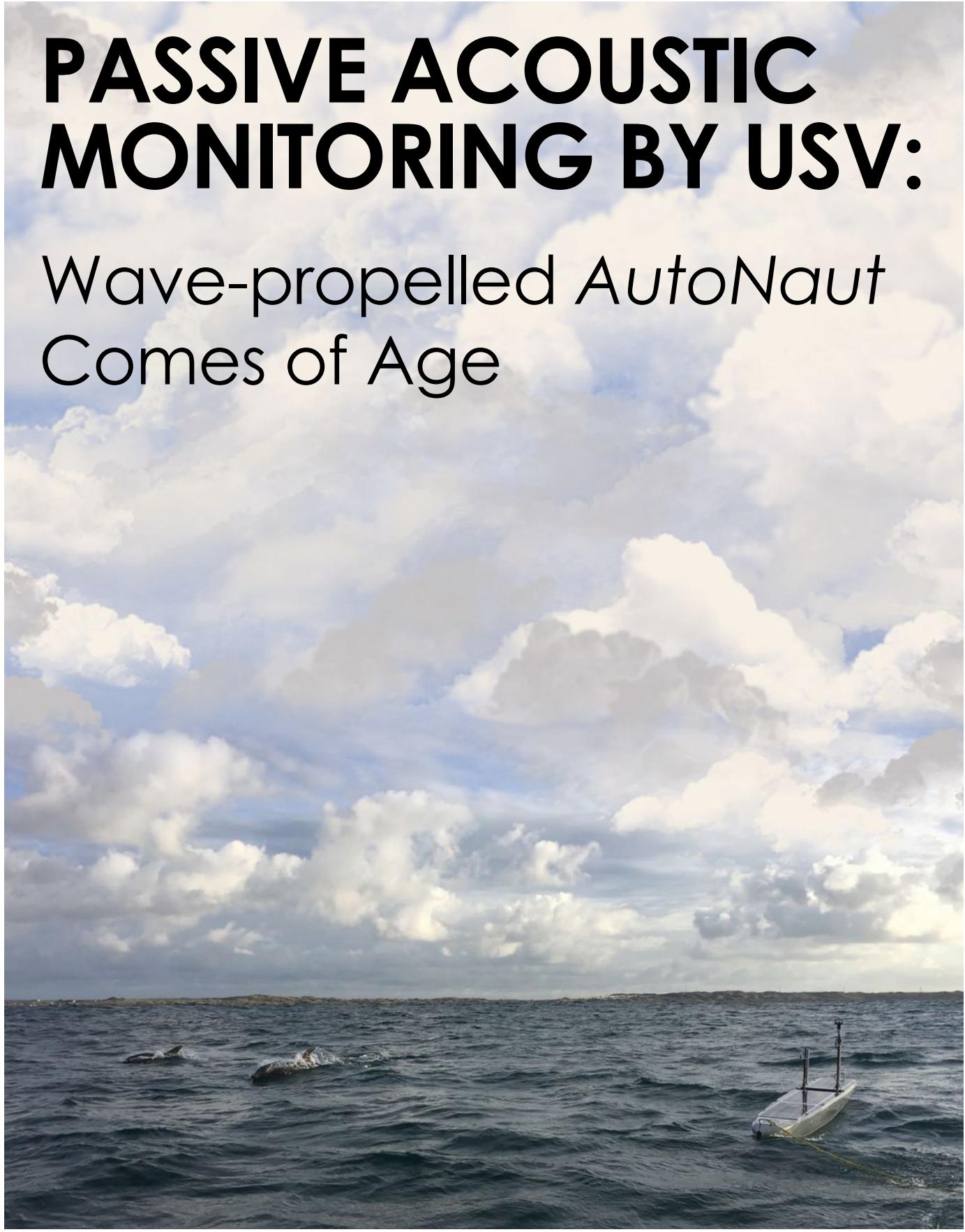
# PASSIVE ACOUSTIC MONITORING BY USV:

## Wave-propelled AutoNaut Comes of Age

April 2017

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Ocean News & Technology



*Welcoming party for AutoNaut Islay while towing in for slipway recovery after a successful mission monitoring water pollution. The mission also involved ground-truthing satellite Synthetic Aperture Radar (SAR) images off the south coast of England.*

Recent years have seen an explosion in the number of applications for unmanned surface vessels (USVs), including a game-changing solution for Passive Acoustic Monitoring (PAM) detection of whales or submarines, the *AutoNaut*.

Low noise, high mobility, and long mission duration are key requirements for acoustic surveys. These are areas where *AutoNaut* is particularly capable, enabling the measurement of underwater sound and monitoring of marine mammals, which are two tasks in high demand from both the commercial and academic sectors. For defence purposes, the same capabilities mean proficiency in listening for submarines.

### Advantages of USVs for PAM

The *AutoNaut*'s wave-propulsion system has an elegant design involving only four moving parts—for near-silent operation. This is a vital asset for persistent, unobtrusive monitoring. As with Liquid Robotics' Wave Glider, being powered wholly by renewable energy has the additional benefit of requiring no carbon fuel. Also, with a role to play in PAM, conventionally powered USVs such as the ASV C-Worker can offer quicker survey speeds for shorter duration missions.

Fieldwork for acoustic surveys at sea commonly involves hydrophone arrays towed from conventional vessels or moored data loggers. Vessel-towed PAM provides mobility, but all too frequently suffers from self-noise. With acoustic data loggers, these issues are reversed. Both methods require personnel heading out to sea for deployment and retrieval, and the associated cost and risks are often major limiting factors. By providing both mobility and high signal-to-noise ratio, the *AutoNaut* can overcome these challenges.

Higher mobility surveys are brought into play by the 5M model, which has a top speed of 4 knots, but it is the *AutoNaut*'s ability to hold position that allows for both spot measurement sampling as well as transects. Station-keeping within 50 m of a given way-point is readily attainable, even in harsh sea conditions. As a complement to conventional surveys, smaller USVs can be launched from a principal research vessel to provide additional data. Alternatively, USVs can operate independently to gain data that might not otherwise be acquired. In addition, *AutoNaut* has a unique ability in that it is simple to launch from a slipway by two personnel before transiting to the survey area, including shallower coastal regions as well as the oceanic depths.



*AutoNaut Islay taking part in the anti-submarine warfare (ASW) section of the Royal Navy's Unmanned Warrior exercise off Stornoway, October 2016. Sensors include a Seiche digital thin-line Passive Acoustic Array, which detected the submarine target, 360° camera, 360° Radar Electronic Support Measures (RESM) Teledyne radar threat warning system, YSI EXO2 Sonde measuring six water properties, and Gill Windsonic weather station. AIS autonomous collision avoidance is fitted together with a radar transponder and all-round white light.*

# EDITORIAL FOCUS

## Developing PAM for *AutoNaut*

The marriage between USV and hydrophone array is a crucial consideration for successful PAM missions. In collaboration with the acoustic array specialists, Seiche Ltd., two PAM systems have been specifically designed for *AutoNaut*. The first, a lightweight two-channel analogue array 25 m in length, is aimed at the commercial and academic sectors for sound measurement and marine mammal detection. The second, a fully digitized eight-sensor array with configurability and very high sensitivity, is designed for use in defence applications to counter the threat from enemy submarines.

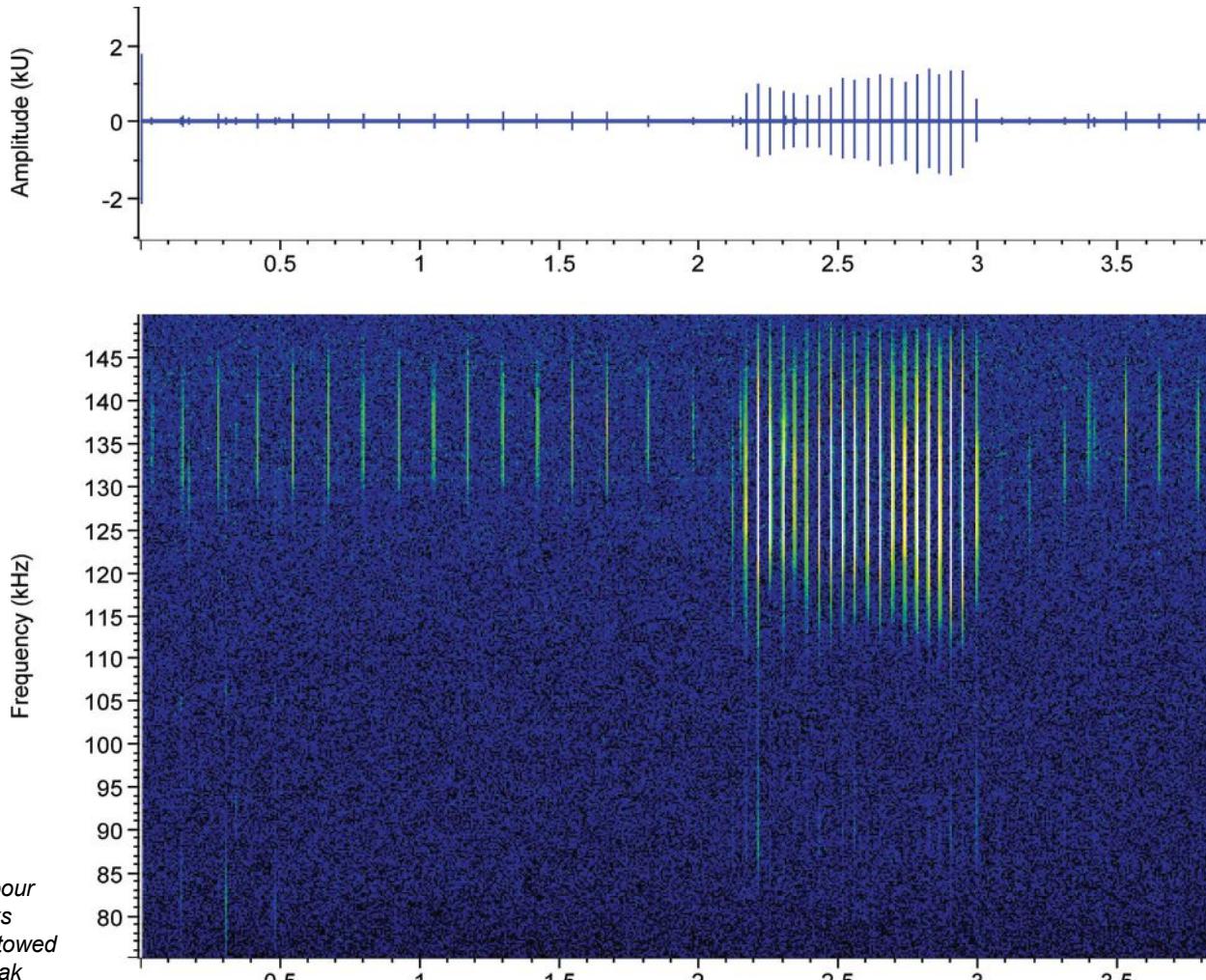
Throughout the development of PAM for *AutoNaut*, three key challenges have been constantly assessed and addressed: 1) Will the USV's performance be affected by the PAM array?; 2) Will there be an unacceptable entanglement risk?; and 3) Will high-quality acoustic data be acquired?

At slower speeds and when utilizing environmental conditions for propulsion, the concern is that inertial

drag of a towed array will hinder maritime capabilities of the USV. *AutoNaut*'s pace has been slightly slowed by about half a knot in several trials, but the inertial problem has not been a factor. The effect on manoeuvrability is also a potential problem but, to date, the *AutoNaut* has been able to perform its turning circle of 50-m radius without hindrance.

A serious consideration in the deployment of any array is the risk of entanglement. Significant safety concerns are apparent, and this is especially so from an unmanned platform where no personnel are present to monitor changing conditions. With *AutoNaut*, the PAM array cable is conventionally deployed direct from the stern. The arrangement contains the array to remain clear of the wave-propulsion foils before streaming astern up to 25 m. Installed as a depth of 0.8 m below the waterline, the foils are the only subsea part of the *AutoNaut* and, to date, no problems have occurred.

Finally, to discover just how quiet the *AutoNaut* is, audio recordings have been analysed and assessed. In early



*Spectrogram showing harbour porpoise echolocation clicks recorded on the AutoNaut-towed PAM array system, with peak energy at 135 kHz.*

tests, analysis of “self-noise” picked out noise from surface waves against the hull, harmonic sounds created by the USV’s steering mechanism, and electrical interference from the power supply. The analysis guided technical development to eradicate the latter and reduce the harmonics. While minor, the “surface slap” can be countered by a greater hydrophone depth, which also moves the hydrophone sensors away from sea-surface noise. The depth gauge has recorded a minimum of 10 m, though this will vary depending on speed and environmental conditions.

Identified ambient sounds have included those of nearby vessels and echo sounders with excellent recording clarity. Indeed, during *AutoNaut* trials off Scotland, the system recorded the echolocation click trains of a harbour porpoise. The clarity and high signal-to-noise ratio of the detection gave confidence that these cetaceans, which are generally considered to be shy and wary of boats, were not responding negatively to the vessel.

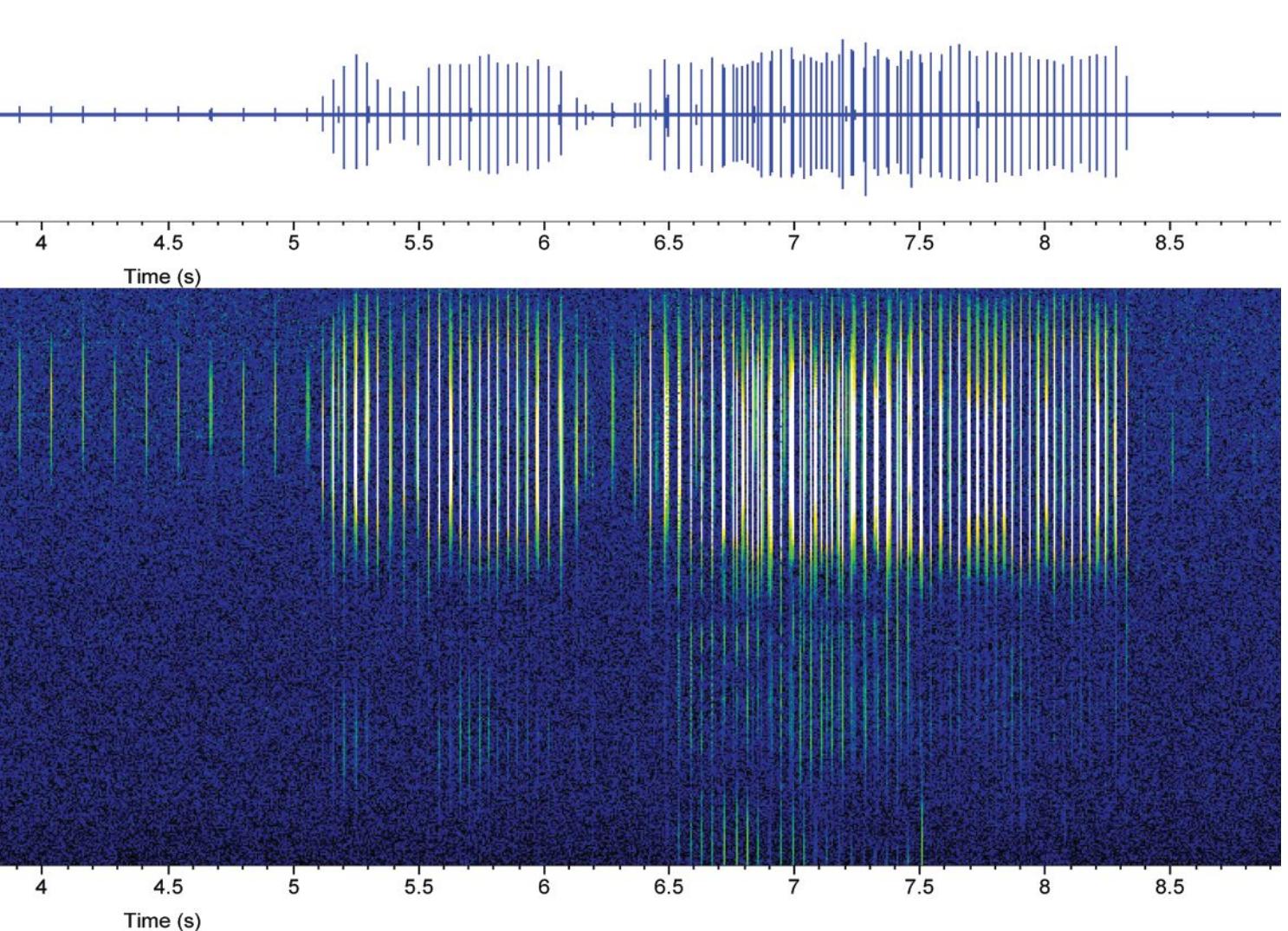
*AutoNaut* has completed a series of trials in collaboration with Seiche Ltd. and was successfully operated during Unmanned Warrior 2016. In this UK Royal Navy exercise

off the Hebrides in October 2016, *AutoNaut* deployed Seiche’s Digital Thin Line Array to successfully detect and track a submarine target. Information was transmitted to the operational commanders for dissemination into the wider operational picture. Much of these data were transmitted in real-time with further meteorological and oceanographic data recorded from a suite of state-of-the-art sensors on board.

#### The Future of Passive Acoustic Monitoring by USV

For *AutoNaut*, with the maturation of its PAM capability, several projects are upcoming. One mission will be to monitor for marine mammals for the National Oceanographic Centre (NOC) as part of MASSMO4 and another for an oil and gas major. More projects are in the pipeline.

USVs are now coming of age. Craft such as *AutoNaut* have a major role to play in meteorological and oceanographic science, surveillance missions, hydrographic charting, and as an at-sea communications gateway. Listening to our ocean environment, be it for measurement of sound levels, detection of whales and dolphins, or tracking submarines, is now a key capability for USVs.



## Regulatory Relief? NOIA Sees Trump Administration as Friend to Offshore Energy

Speaking at the 40th Annual Marine/Offshore Industry Outlook Conference on March 30 in Houston, Texas, Randall Luthi, president of the National Ocean Industries Association (NOIA), gave a positive preview of what he expects from the Trump Administration in the coming months as well as a preview of NOIA's 2017 Annual Meeting to be held April 5-7, in Washington, DC, and includes an appearance by Department of Interior Secretary Ryan Zinke.

Luthi was clear that he believes the entire U.S. Outer Continental Shelf should be opened to drilling: "Other countries get it. If they have the resources, they are going to look for oil and natural gas."

He believes that it is important that lawmakers and regulators make sure that when the market allows investment, companies are free to do so. It's not just about the Atlantic Coast and the Gulf of Mexico either. Luthi also said the Arctic should be opened.

Referring to the election of President Trump, Luthi said, "We were promised a new attitude, something very different from Washington, DC—and I can tell you, we've

gotten exactly that. On the energy front, it's been fantastic change."

While Luthi expects delays over Trump nominations, he cited new Interior Secretary Zinke as a friend to industry: "I'm very excited about what he's going to do because he does have big plans."

Among those big plans, Luthi says, is moving NOAA from the Department of Commerce to DOI. Luthi also said that Zinke wants to decentralize DOI, so that the Gulf region could soon be making more decisions about its own offshore resources.

"For [the] offshore industry, the two most important positions to be named will be the director of BSEE and the director of BOEM. Neither one has been named yet... but I can tell you that I haven't heard a name that would not be a marvelous person."

Luthi predicted that DOI would move to combine BOEM and BSEE. He said that confusion over who has jurisdiction could be reduced, but that the move would take time and cost political capital. Luthi expects



changes in BOEM's Five Year Plan soon and supports other regulatory changes by the Trump Administration, including a proposal to eliminate two regulations for every regulation introduced, saying the result would be a less-redundant comment process. He applauded repeal of DOI's Royalty Valuation Rule, which he says would have created regulatory uncertainty for off-shore industry, and Trump's roll-back of the Clean Power Plan, saying "Our energy future relies on the ability to actually develop energy resources."

Commenting on the recent stay on BOEM's Financial Assurance Requirements (to help pay for removing abandoned oil and gas platforms), Luthi said he expects the stay to remain in effect until industry and regulators sit down and figure out "how to decide how much money we need to put forward with bonding."

He added, "There are some facilities out there that need removed that do not have a financially viable owner, but the threat is pretty small. We want to make sure it never happens. And industry needs to be a leader. We need to show the federal government that we know how to prevent that from happening, rather than them telling us what to do."

On the Air Quality Rule, Luthi said that no studies show that offshore activities are impacting onshore air quality. He made a similar brief reference to seismic regulations, citing a lack of science. As he looked around at the industry members in attendance, Luthi concluded with, "Most people actually like the energy industry. They backed candidates that were energy-friendly. Most people think offshore development is a good thing. Most people think access means more jobs, meaning the more you develop energy, the more jobs there will be. And despite some of the louder protests you may hear, I want you to know, you've got the American people behind you."



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## Cairn Announces Results of Senegal Appraisal Well

Cairn announced the results of the SNE-5 appraisal well offshore Senegal where operations have been safely and successfully completed ahead of schedule and under budget following drilling, logging, drill stem testing, and the setting of pressure gauges.

Cairn's analysis and integration of the dataset collected is continuing with initial results in line with expectations:

- SNE-5 targeted a location in the Upper Reservoirs where two principal units are located within the oil leg
- Main reservoir units, pressure data, and fluid contacts match previous SNE wells as expected.
- Multiple samples of oil and gas were recovered during wireline logging and drill stem tests; analysis indicates oil of similar quality to previous wells.
- Two drill stem tests were conducted within the Upper Reservoir units over gross intervals of 18 and 8.5 m and were in line with expectations:
  - DST 1a flowed from an 18-m interval at a maximum rate of ~4,500 barrels of oil per day (bopd) on a 60/64" choke. Two main flows of 24 hours each were performed: the first at ~2,500 bopd on a 40/64" choke, followed by a second at ~3,000 bopd on 56/64" choke; and

- For DST 1b, an additional 8.5-m zone was added and the well flowed at a maximum rate of 4,200 bopd and for 24 hours at an average rate of ~3,900 bopd on 64/64" choke.

The SNE-5 well has been plugged and abandoned, and the Stena DrillIMAX drill ship is moving location to commence operations shortly on the Vega-Regulus (VR-1) well, ~5 km to the west of the SNE-1 discovery.

VR-1 has two objectives—an Aptian exploration target and an appraisal objective in the SNE field.

The well will target the Vega-Regulus exploration prospect in the Aptian Carbonates underlying the SNE field, which has potential gross mean consolidated prospective resource of more than 100 mmbbls.

In addition, the well will further appraise the SNE field, targeting potential incremental resources. The results will help narrow the range of SNE field volumes and also allow the JV time to fully integrate the results of SNE-5 prior to moving to appraisal well SNE-6 to complete the planned interference test.

For more information, visit [www.cairnenergy.com](http://www.cairnenergy.com).





# Kystdesign AS:

## 20 Years' Experience in the Deep

Subsea company Kystdesign AS has had the Norwegian continental shelf as its nearest neighbor for 20 years and has demonstrated the ability to deliver complete ROV solutions to the oil and energy industry at a time of rapid change in the market in terms of both water depths and technological demands.

### Solid Experience

Norway's Kystdesign, which translates as Coastal Design, is far from the biggest company supplying offshore ROV services to the oil and energy sector. Size has never been an objective. Kystdesign's goal is to offer customers the best possible solutions. During its 20 years in the industry, the company has grown slowly and remained focused on what it does best—complete solutions based on solid technical knowledge and operational experience.

"I was an ROV pilot myself for several years and stood on the aft deck far out at sea, trying to fix things that didn't work or were hard to maintain," says Erik Kold Bakkevig, managing director and owner of Kystdesign. "I have also worked as a technical manager for ROV operators. That experience gives us a unique foundation for making equipment that is tailored to operations. Our customers can't afford to lose time on equipment that doesn't work or is difficult to maintain. Good design means functionality and predictability."

### New Building with a Test Basin

Kystdesign recently moved into a new building, which was designed and built to meet the company's needs.

"We have all of our professional disciplines in-house when it comes to engineering of mechanical, control systems, hydraulics, and electronics. That gives us total control," says Bakkevig. "These disciplines working in tight cooperation leads to final products that are more complete and comprehensive."

The new production hall includes an impressive test basin, measuring 12 by 8 m and a full 10 m deep.

One end of the basin has an observation room that can look out from a depth of five meters. Pilots can sit there with a unique view of tests through a 2 x 3 meter window. A treatment plant ensures constantly clear water, so the basin is always full and ready for use without waiting for preparation.



*Kystdesign's new workshop facility with various ROVs by the new test pool.*

### Supporter and Constructor ROVs

Kystdesign's main products are its Supporter and Constructor Work Class ROVs. The Supporter Work Class is very compact, is 150 Hp, and has so far been the most popular of Kystdesign's ROVs. The Constructor Work Class is the most powerful, with 220 Hp. Kystdesign has already delivered a Supporter with a 6,000-m water depth rating. At the moment, another Supporter with a 6,000-m rating is ready for testing. All relevant components are pressure-tested in a tank prior to mounting on the ROV to ensure that depth ratings are maintained.

"Our ROVs are extremely robust and reliable," says Bakkevig. "That, in tandem with the ROV being very maintenance friendly, has won us a lot of praise from users. We have a strong focus on customer support and enable customers to talk directly with the development engineer rather than an outside sales representative. That direct contact, in combination with our extensive stock of spare parts, is greatly appreciated by our customers," says Bakkevig.

# OFFSHORE ENERGY



## Wärtsilä to Optimize Performance of Four Songa Offshore Drilling Rigs

Wärtsilä has signed a five-year technical management and services agreement with Songa Offshore for four Cat-D type semi-submersible drilling rigs operating in the North Sea. Through the partnership with Wärtsilä, Songa Offshore ensures optimal performance and maximum availability of the Wärtsilä engines and thrusters on board the drilling rigs, which operate in extremely harsh conditions. This is possible with real-time knowledge of the actual condition of the equipment, provided by Wärtsilä's digital offering.

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

## Chevron Starts Production Offshore Angola

Siem Offshore Contractors (SOC) Chevron Corporation announced that its subsidiary, Cabinda Gulf Oil Company (CABGOC) Limited, has commenced oil and gas production from the main production facility of the Mafumeira Sul project offshore Angola. "This milestone supports our priority of completing major projects and improving free cash flow," said Jay Johnson, executive vice president, Upstream, Chevron Corporation. "The Mafumeira Sul project generates new production and value for Angola, our partners, and the corporation."

<http://ont.news/2nQ3kkY>



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# MONTH IN REVIEW

## BOEM Receives Lease Requests for Offshore Wind

BOEM has received unsolicited lease requests from two companies seeking to develop offshore wind energy on the Outer Continental Shelf (OCS).

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

## InterOcean Offers Oil Spill Monitoring Service

The Slick Sleuth™ Rig Guard Oil Spill Monitoring as a Service gives owners and operators peace of mind with a state-of-the-art spill monitoring system.

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

## Odfjell Drilling Signs for Work in South Africa

Odfjell Drilling has signed a conditional letter of award for a one-well contract to be drilled by the Deepsea Stavanger offshore South Africa.

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

## GoM Lease Sale Yields \$275 Million in High Bids

U.S. Secretary of the Interior Ryan Zinke has announced that Lease Sale 247 for oil and gas parcels in the Gulf of Mexico garnered \$274,797,434 in high bids.

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

## Second Shah Deniz 2 Platform Jacket Sent Offshore

The Shah Deniz consortium has announced the sail away of the second jacket for the Shah Deniz Stage 2 platforms ahead of schedule.

<http://ont.news/2n4i4xo>

## Quoceant Secure Funding for Wave Power

Artemis Intelligent Power and Quoceant secured £2.5 million from Scottish agency Wave Energy Scotland to trial a wave power prototype.

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

## Delivering Floating Power to Turn the World On

A floating power plant built on a ship that can travel to anywhere in the world and provide power to onshore communities where needed.

<http://ont.news/2nOPc9v>

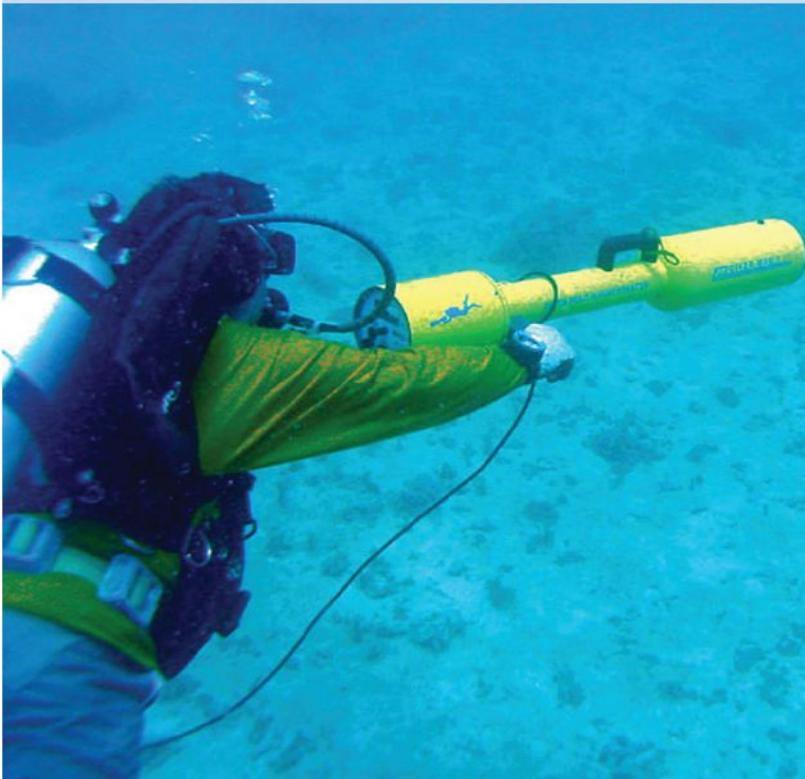
## BOURBON Announces a Sustainable Reorganization of its Financial Debt

BOURBON announces a sustainable reorganization of the major part of its financial debt under the "Stronger for longer" action plan.

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



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# SIMPLE & SOPHISTICATED

At Hutchinson Island in Stuart, Florida an Unmanned Aerial Vehicle (UAV) captures imagery to be used in the new **EDGSonline 2.0**.

A scalable, cloud-based mapping and data visualization platform, **EDGSonline 2.0** utilizes Full Motion Video (FMV) integrated with geospatial information (real-time latitude and longitude) that can be related to other data layers such as bathymetry, sampling locations, and field observations, resulting in a powerful tool for capturing data from within the video image and rendering that information in GIS for analysis.

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## JW Fishers Sonar Systems Help Search Teams, Scientists, and Salvors

A variety of sonar systems are now being used by law enforcement and public safety dive teams, universities, and salvage companies for recovery operations, subsea surveys, and marine research. Sonars produce almost photographic images of the underwater environment regardless of water clarity. Side-scan sonar can sweep several hundred feet of ocean, lake, or river bottom in one pass of the boat, allowing large areas to be searched or surveyed quickly.

Scanning sonar, which operates in water similar to the way radar operates in air, can image a 200 ft circle on the bottom in less than a minute. Subbottom profilers transmit a sound wave that penetrates soft bottom and reflects off the harder substrate below, showing what lies buried in the bottom. These sonar systems help save time and money, increase diver safety, and allow more extensive study of the marine environment.

China's Yangtze River, known locally as the Chang Jiang,

is the country's longest river and the third longest in the world. It originates in the mountains of the Qinghai Province and runs from west to east, terminating in Shanghai where it pours into the East China Sea.

It is an economically important route for ships carrying freight from inland regions to the coast. The waters of the Yangtze are notoriously difficult to navigate with unseen submerged obstructions, treacherous crosscurrents, and whirlpools. Many ships have been sunk and many others have lost precious cargo after being tossed about in the raging river. It is not unusual for large containers to be thrown overboard where they are quickly engulfed in the river's muddy bottom.

With new improvements in underwater imaging technology, a concerted effort is now being launched to locate the many containers littering the bottom of the Yangtze. One of the tools being employed in these salvage operations is JW Fishers SBP-1 subbottom profiler. This low-frequency



Search team prepares to deploy JW Fishers SBP-1 sub bottom profiler on Yangtze River.

sonar system can easily locate these cargo containers buried in the soft bottom.

Chong Zhao is an assistant professor at Dalian Ocean University's Key Laboratory of Marine Culture and Stock Enhancement. His research includes work on how changes in the ocean environment affect marine life in the East China Sea. This area is an important food source for the Chinese people. Two of the tools Zhao and his team use to gather data are JW Fishers SSS-100K/600K side-scan sonar and the SeaLion-2 ROV. The side-scan provides high-resolution images of the seafloor allowing scientists to clearly see the varying bottom conditions in different areas. The remote-controlled underwater camera system then allows researchers to view and document the variety of marine life that inhabit these unique benthic environments.

Williamson Marine Service has been conducting commercial diving and underwater engineering work in Hong Kong since its founding in 1968. The company utilizes an extensive list of high-tech equipment in its operations. Video systems are used for inspections of underwater structures and ships. Sonar systems help locate shipwrecks, survey archaeological sites, find lost anchors and propellers, examine pipelines and sewer outfalls, and much

more. Williamson recently acquired a JW Fishers SCAN-650 scanning sonar that can serve a variety of functions. Mounting it on an ROV aids in navigating the vehicle to underwater sites beyond the visual range of the on-board camera. The sonar can be deployed from a boat and letting its sonar beam sweep a wide arc around the boat showing the topside operator what lies on the bottom. It can even be affixed to a diver's helmet, providing topside personnel a clear picture in a low-visibility environment, letting them guide the diver directly to the job site.

When two recreational scuba divers went missing off Gonio, a coastal town on the Black Sea, Domenti Apakidze was working on a research project with the State Hydrographic Service in the Republic of Georgia. Domenti and his team offered to assist in the search using their JW Fishers SSS-100K/600K side-scan, a tool commonly used in hydrographic surveys. It creates a detailed map of the underwater terrain and any obstructions on the bottom that could pose a hazard to navigation. The side-scan is also routinely used by law enforcement agencies and public safety dive teams to find sunken vessels, submerged vehicles, and drowning victims.

For more information, visit [www.jwfishers.com](http://www.jwfishers.com).

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## 2G Robotics and Sonardyne Revolutionize Subsea Metrology Operations

In December 2016 at The Underwater Centre in Fort William, Scotland, DOF Subsea (DOF) conducted a demonstration of dynamic underwater laser scanning as a replacement for traditional metrology techniques using 2G Robotics' and Sonardyne's complete dynamic survey solution.

The demonstration showcased the complete dynamic survey solution, which integrates 2G Robotics' underwater laser scanner, the ULS-500 PRO, with Sonardyne's inertial navigation sensor, SPRINT, Syrinx DVL, and 6G acoustics. Seatronics, channel partner for 2G Robotics and provider of Sonardyne rental equipment, provided sensors and project/technician support.

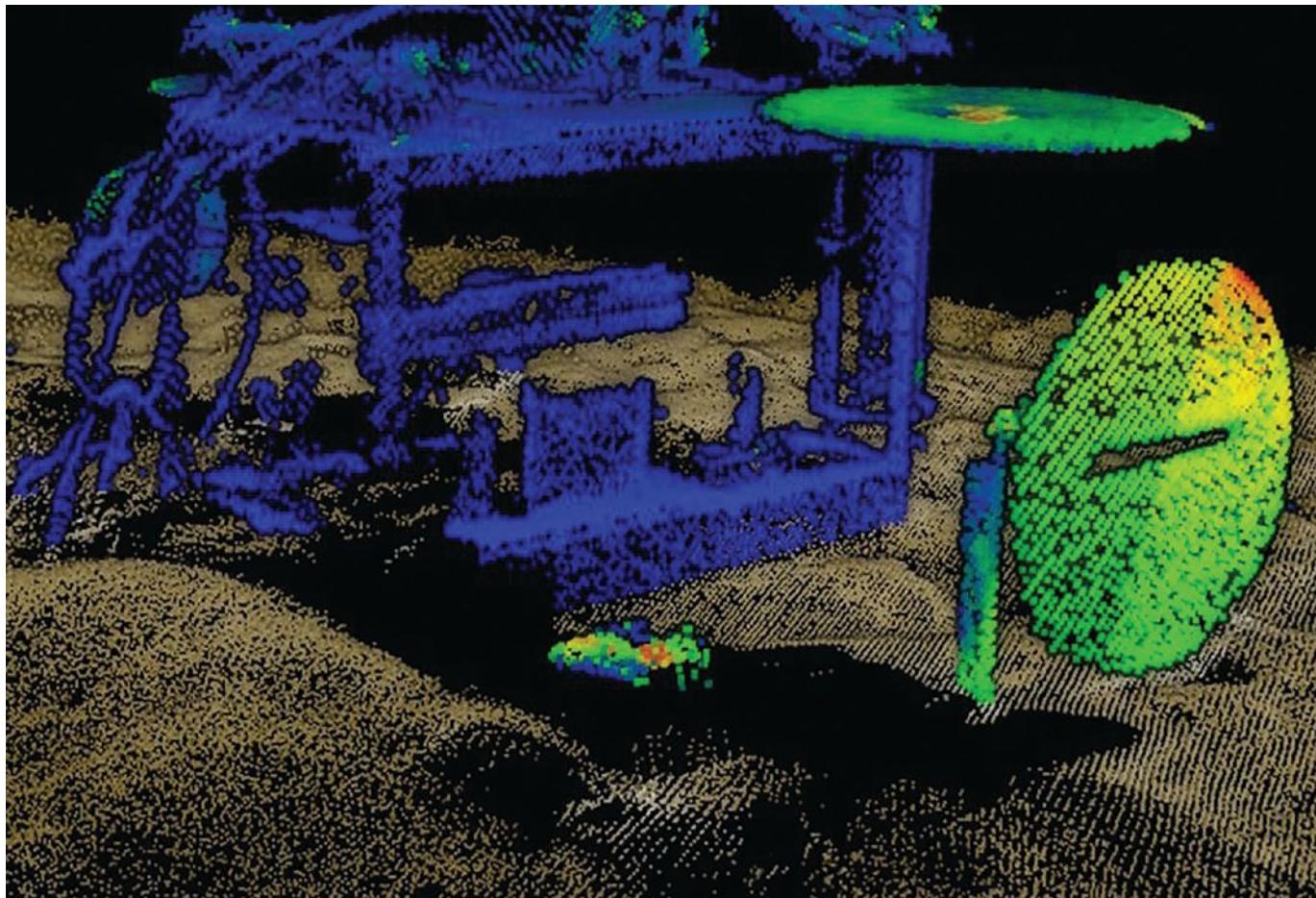
Historically, metrology campaigns using Long BaseLine (LBL) acoustics and photogrammetry have demanded significant vessel and ROV time. Additionally, LBL requires physical interaction with the subsea assets and photogrammetry is unable to provide real-time results. The goal of the demonstration was to quantify the reduction in operational time and increased accuracy of dynamic laser scanning for subsea metrology.

### Methodology

Two structures, each containing four flanges, were placed on the seafloor with an approximate baseline distance of 18 m. The control measurement for the analysis was established by an LBL acoustic technique with flange orientations provided by installed gyro frames.

A Triton XL ROV was fitted with the complete dynamic survey solution from 2G Robotics and Sonardyne. The ULS-500 PRO was mounted at 30° to capture the side-facing hubs, upward-facing hubs, and seabed in a single scan pass over the 18 m baseline. With each scan run taking only 4 minutes, the ROV performed multiple redundant runs from structure-to-structure at an altitude of approximately 3 m.

The data were transmitted to the surface in real-time, processed through EIVA navigational software, and then through DOF's Metro Prep software for automated metrology analysis. From these high-resolution point clouds, exact measurements were taken to facilitate the fabrication of spools and jumpers while concurrently providing as-built condition assessments. The



measurements of the vertical jumper metrology and the horizontal spool metrology were within accepted industry tolerances.



Overall, DOF Subea is extremely pleased with the quality of results and performance of 2G Robotics' ULS-500 PRO and Sonardyne's SPRINT systems, stating, "[Dynamic Laser Scanning] has revolutionized the capability to perform mobile metrology operations in a timescale previously unattainable."

## Results

**Reduced Survey Time** – Significant reduction in the time to gather the data when compared to other techniques.

**Real-time Data** – Delivery of final metrology measurements offshore within hours of data acquisition.

**Contactless** – No physical interaction with assets is required.

**Flexible Deployment** – Configurable mounting orientations on ROVs for specific survey applications.

**More than Metrology** – The 3D model used for metrology serves as an as-built model of the subsea installation and the surrounding area to provide a baseline for future intervention work.

For more information, visit [www.2grobotics.com](http://www.2grobotics.com) or [www.sonardyne.com](http://www.sonardyne.com).

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# SUBSEA INTERVENTION & SURVEY



## Surveying Wrecks Around Estonia Using Teledyne RESON SeaBat

As a part of ensuring safe navigation, the Estonian Maritime Administration identifies potential dangerous wrecks in Estonian waters. The mission of the Estonian Maritime Administration is to ensure safe navigation in Estonian waters. It is extremely important to identify all possible navigational hazards, including wrecks. Some of these wrecks, especially those lost during WWII, pose a potential environmental threat because of their cargo and fuel. High-resolution multibeam sonar systems help find and identify such wrecks.

<http://ont.news/2oDP2B1>

## Exocetus Selects Greensea for Navigation and Control

Another Greensea system is entering the market—this time with the versatile, long-duration, Exocetus Coastal Glider. Greensea is providing their commercially available navigation, control, and automation product based on their patent-pending OPENSEA™ operating platform—the first operating platform for the marine industry—for the command and control of the Exocetus vehicle and sensors. The Exocetus AUV carries more payload and is faster than competing gliders.

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



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# TE SubCom

## An Interview with Mark Enright, Vice President, Customer Solutions

TE SubCom, a TE Connectivity Ltd. Company, announced in January that it has begun manufacturing C+L optical transmission technology, a significant advancement for cable system operators seeking ultra-wide, low-latency transmission.

Ocean News & Technology recently spoke with Mark Enright, vice president, customer solutions at TE SubCom about this new development in undersea fiber optic technology.

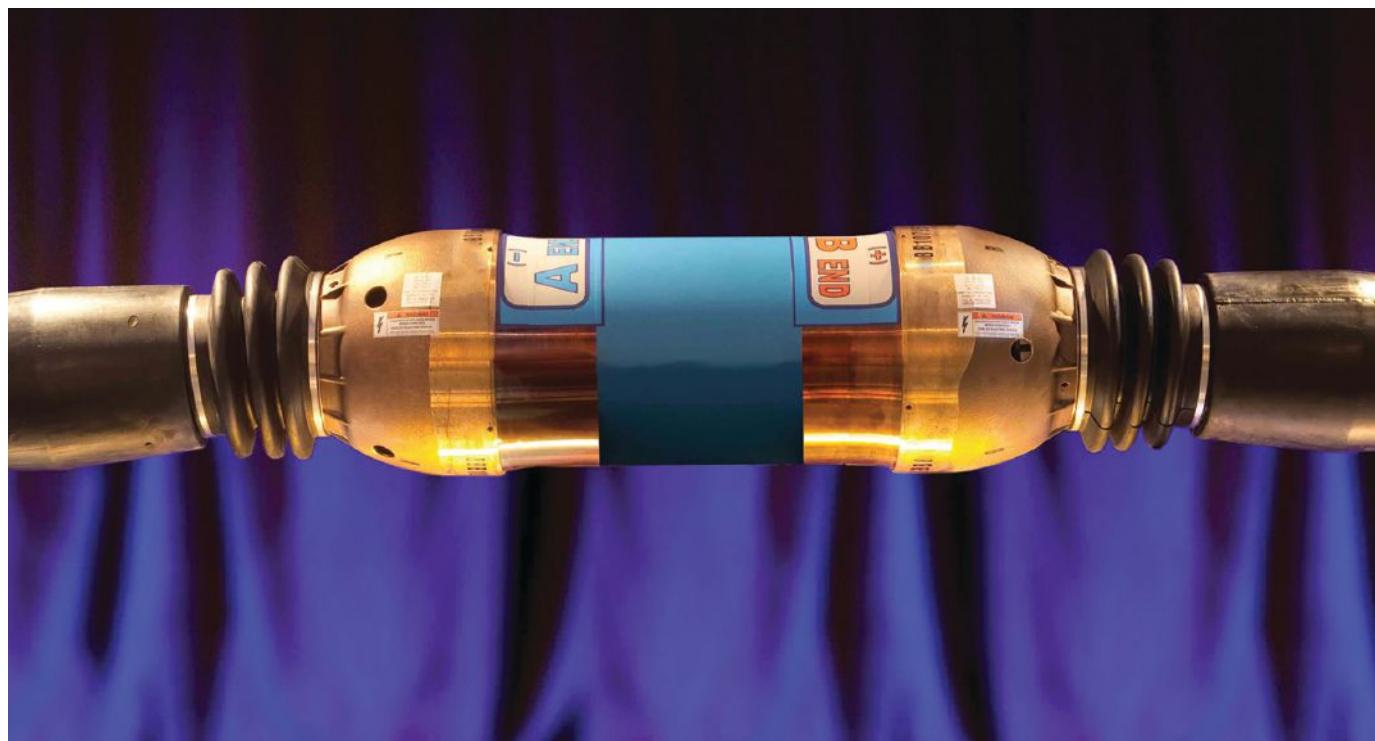
**ON&T:** *What is C&L technology and how is this repeater different from its predecessors?*

**Mr. Enright:** C+L technology refers to the signal amplification technology used in the undersea repeaters.

Standard repeaters support the “conventional” transmission band, or C-band, near the minimum attenuation wavelength of optical transmission fiber. The C-band is determined by the strongest amplification

band of Erbium-doped fiber, which is used to provide the optical amplification in the repeaters. The C-band is limited to about 4.5 THz of bandwidth for optical amplification.

However, Erbium-doped fiber can also provide amplification on the long wavelength side of the C-band, even though amplification here is typically much weaker. With increased Erbium concentration and longer Erbium-doped fiber length in the amplifier design, similar levels of amplification and performance can be achieved in the “long-wavelength” band or L-band as in the C-band. C+L technology is, therefore, an evolutionary step in repeater technology that expands on established Erbium-doped fiber technology.



TE Connectivity SubCom Repeater. Photo credit: TE SubCom.

**ON&T: The demand for Internet bandwidth is seemingly insatiable. How will the C&L repeater help meet this demand?**

**Mr. Enright:** Indeed, Internet bandwidth demand continues to increase exponentially, and more capacity is needed on the undersea path connecting continents. C+L technology effectively doubles the available transmission bandwidth of the repeater, an unprecedented factor of two in supported capacity per fiber pair when compared to the same number of fiber pairs in C-band technology.

Since only half the number of fiber pairs are needed compared to a C-band repeater-based cable with the same capacity, C+L technology is much more cost competitive and opens the path to cable capacities that were previously unachievable.

**ON&T: When will we begin seeing deployment?**

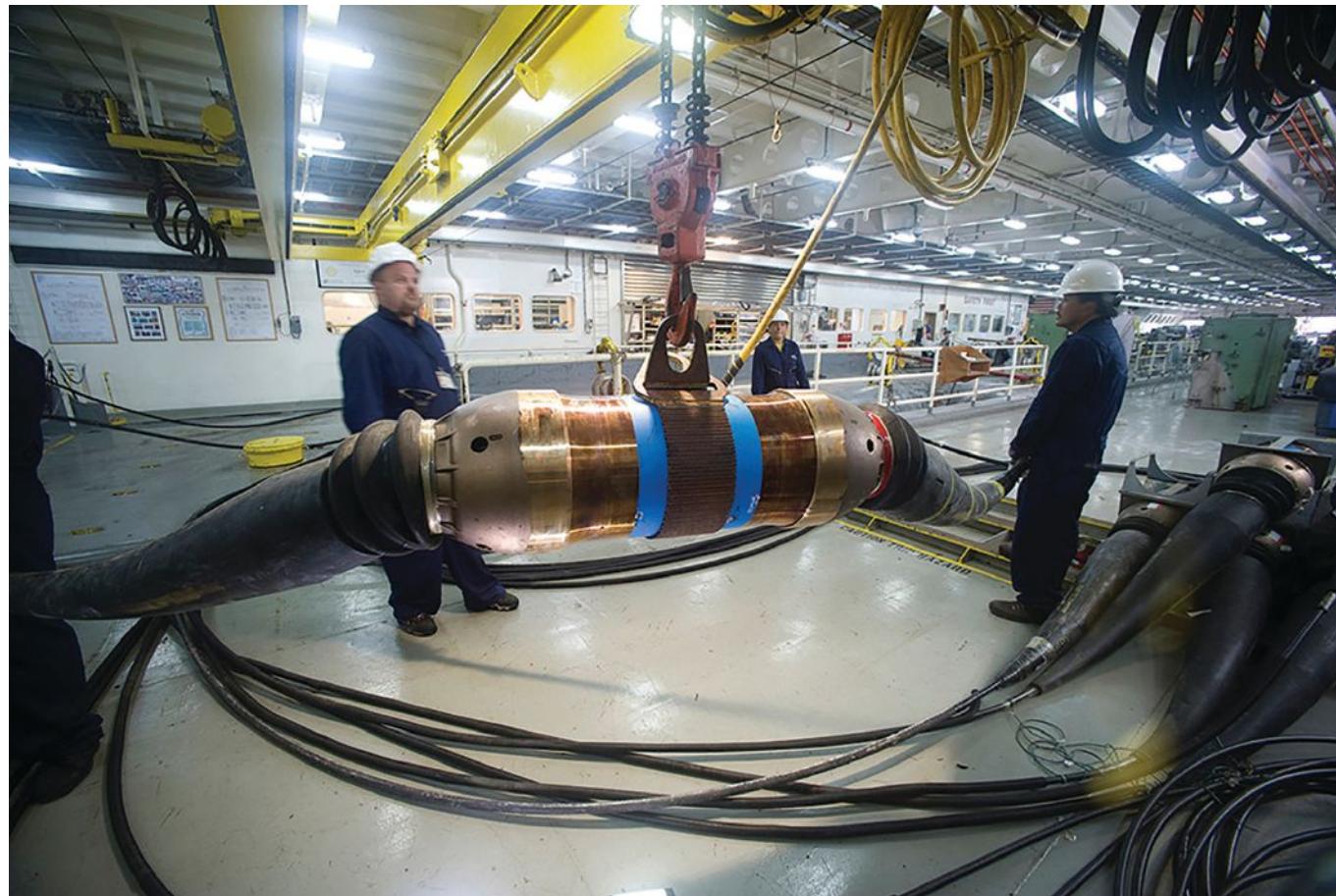
**Mr. Enright:** The C+L repeater has been in development at TE SubCom for the last two years and has just recently entered the production stage. Manufacturing for the wet plant of a contracted and funded large trans-oceanic system is underway and the ready-for-service date is scheduled for late 2018.

**ON&T: How does this repeater fit in with the equipment and services offered by TE SubCom?**

**Mr. Enright:** The new C+L repeater fits seamlessly into the equipment and services offered by TE SubCom. There is no physical difference on the outside of the repeater body compared to a standard C-band repeater, and the new C+L repeater fits all the existing handling and installation procedures. Optical Add/Drop Multiplexing (OADM) technology for the L-band is in development alongside the C+L repeater enabling complex undersea OADM network architectures and applications while leveraging the benefits of C+L technology.

**ON&T: What do you see for the future of the submarine cable market?**

**Mr. Enright:** The future of the submarine cable market is vibrant and bright! Bandwidth demand between data centers will continue to be driven upward by virtual reality, the Internet of things and machine-to-machine traffic. Increased requirements for cable route diversity will provide better network resilience against faults and attacks. In response, we will continue to innovate with new technology, better engineering, and creative solutions.



TE Connectivity SubCom Repeater being loaded onto a Reliance Class ship. Photo credit: TE SubCom.

## Webtool Announces Subsea Cable Recovery Gripping and Lifting Tool

Hydraulic systems specialist, Webtool, announces a gripping and lifting tool for recovering subsea cable during telecom cable lay projects. The Cable Retrieval Tool (CRT200), developed in consultation with international certification body and classification society DNV GL, allows the safe and controlled recovery of damaged cable up to 8 in. (203 mm) diameter.

Current methods of recovering cables for repair or replacement are laborious, time consuming, and expensive. They involve trenching the seabed around the cable to allow a double choke sling to be attached using an ROV. The hydraulically operated Webtool CRT200 gripper offers a quicker and safer method of retrieval and improved cable handling.

The CRT200 cable gripper provides a streamlined cable recovery whereby the gripper, guided by an ROV, is lowered onto the end of the cable without requiring preliminary clearing of the soil around the cable. The mechanically locked gripping action ensures the cable cannot escape during retrieval; moreover, an internal clutch mechanism prevents damage from overtightening. By gripping the end of the cable, it makes subsequent handling much easier, enabling the cable to be recovered to a reeler or spooler on the surface vessel.

Fabricated from corrosion-resistant materials, the cable gripper weighs approx. 500 kg and has a lifting capacity of 20 tonnes. The CRT200 can be used at any water depth and is available with hydraulic hotstab or torque bucket interface options.

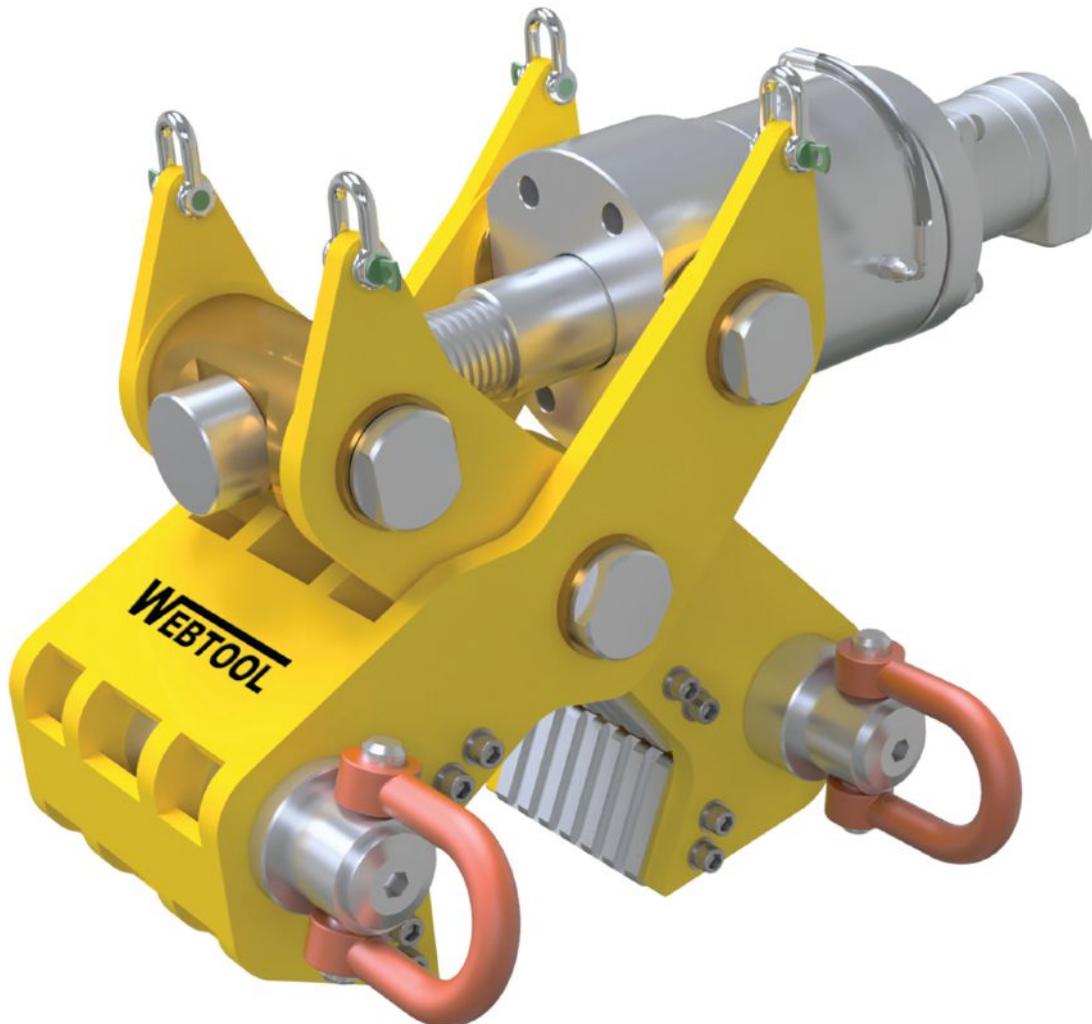
"Working in consultation with DNV GL, we've designed the CRT200 cable gripper to provide telecom cable lay contractors with a highly

effective way of recovering cable from any water depth. By gripping the end of the cable, it is easier to handle once on board the vessel," says Keith Elliot, engineering director, Allspeeds Ltd.

Webtool offers the complete cable recovery package, covering both cutting the cable and its recovery with the gripper. The ROV-operated Webtool cable cutting tools range from the light weight HCV100 for cables and umbilicals up to 4 in. (101 mm) to the HCV270 for cutting up to 10.6 in. (270 mm) in severe working conditions and allows diverless deployment.

The Webtool range of high-performance cutting tools is designed and manufactured exclusively by Allspeeds Ltd.

For more information, visit [www.allspeeds.co.uk](http://www.allspeeds.co.uk).



# Inmarsat Maritime Secures Fleet Xpress Commitment from Hapag-Lloyd

Inmarsat has signed a five-year contract with Hapag-Lloyd to migrate all ships directly managed by the shipping line to services enabled for Fleet Xpress.

Hapag-Lloyd, the sixth largest container shipping operator in the world by Twenty Foot Equivalent Unit (TEU) capacity, will transition all existing ships that it manages in-house from Inmarsat FleetBroadband services to Fleet Xpress. The agreement also covers five 10,500-TEU vessels as latest new builds.

Launched in 2016, Fleet Xpress sets a new standard in maritime communications. The service enhances vessel efficiency, crew welfare, and safety and facilitates “connected ship” applications by delivering the highest levels of reliable high-speed broadband connectivity available from a single supplier on a global scale.

Hapag-Lloyd has been an Inmarsat customer for more than a decade, and the transition commitment to Fleet Xpress coincides with the expiry of a service contract based on FleetBroadband with VSAT back-up via Ku-band. The new agreement reflects the ship owner's requirement for a fully managed migration to high-

speed broadband and support it can trust from a single service provider. The agreement also stipulates redundant service provision that would be scalable for any future fleet growth. The deal includes terminals from both Inmarsat-approved manufacturers Intellian and Cobham SATCOM.

“IT integration of our fleet has grown rapidly and will further develop. As a consequence, Hapag-Lloyd has to ensure that the ship-to-shore connectivity not only supports the increasing demand, but is also future proof,” said Jens Habler, Head of Hapag-Lloyd IT-Operations Management.

“Hapag-Lloyd is recognized as one of shipping’s most advanced owners when it comes to IT and ship-shore connectivity and for the close attention it pays in addition to keeping its crews connected,” said Gerbrand Schalkwijk, chief sales officer, Inmarsat Maritime. “We look forward to working with the owner’s team to realize the potential of the fully redundant Fleet Xpress service within the Hapag-Lloyd office, vessel, and service organization.”

For more information, visit [www.inmarsat.com](http://www.inmarsat.com).



# COMMUNICATION & SUBSEA CABLES



## Pacific Basin Completes KVH mini-VSAT System Deployment on 99 Vessels

KVH Industries, Inc. announces that Pacific Basin Shipping Limited has completed the deployment of KVH's mini-VSAT Broadband solution to support Pacific Basin's initiative to modernize ship-shore communications on their entire fleet of owned ships. Pacific Basin is one of the world's leading owners and operators of modern Handysize and Supramax dry bulk ships. "Satellite communications continue to become more cost-effective over time as requirements rapidly grow for bandwidth and speed," says Capt. Uttam K. Jaiswal, Pacific Basin's general manager—marine. "Aside from the obvious business requirements, we at Pacific Basin see value in enabling our seafarers to keep in contact with family and friends through the Internet."

<http://ont.news/2oirm8M>

## Flexenclosure to Deploy eCentre Cable Station in Palau

Internet infrastructure specialist Flexenclosure has taken a firm grip on the cable landing station market in the Pacific region with a second order in as many weeks. Flexenclosure recently announced that it will deliver a cable landing station to Belau Submarine Cable Corporation (BSCC) in Palau. Last month, Flexenclosure announced a separate deal for two cable landing stations in Samoa. BSCC have ordered Flexenclosure's eCentre CLS solution to terminate the island nation's connection to the SEA-US trans-Pacific cable.

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



April 2017

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Ocean News & Technology

A large offshore oil or gas platform is shown at night, illuminated by its own lights against a dark, cloudy sky. To the right of the platform, large white text reads "DEVELOPING COST-EFFECTIVE FIBER OPTIC NETWORK SOLUTIONS".



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# MONTH IN REVIEW

## Angola Cables Selects Ciena's GeoMesh and Blue Planet for MONET

Angola Cables has selected Ciena's® GeoMesh and Blue Planet solutions to support its new service launch on the MONET subsea cable.

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

## PT Telkom Enhances JASUKA Subsea Cable with Coriant Technology

PT Telkom has deployed Coriant's coherent optical transport and universal switching technology to upgrade the JASUKA submarine cable.

<http://ont.news/2oQTw7t>

## H.I.G. Capital Acquires Assets of Subsea Fiber Equipment Maker Xtera

H.I.G. Capital, a global private equity investment firm, has acquired substantially all the assets of Xtera Communications, Inc.

<http://ont.news/2nXu8xt>

## Transas, Satcom Global Partner to Bring Connectivity to THESIS

Transas has signed a partnership agreement with Satcom Global to add integrated connectivity to THESIS, its unified platform for digital operations.

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

## Global Eagle Launches Portal for Cruise Ships

Global Eagle Entertainment Inc. is unveiling its new Airtime Portal for cruise ships at Seatrade Cruise Global 2017.

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

## Inmarsat Signs Radio Holland Service Agreement to Meet Demand Surge

Inmarsat signed a service and installation agreement with Radio Holland to support strong customer demand for migration to Fleet Xpress services.

<http://ont.news/2otq5vD>

## MCT Submarine Cable Launch Promises Bright Future for Cambodia

Telcotech celebrated the momentous launching of the Malaysia-Cambodia-Thailand (MCT) submarine cable system and landing station in Cambodia.

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

## TNL Group, Marlink Form Joint Venture for Greek and Cypriot Markets

Joint Venture with TNL Group's satellite connectivity business forms platform for "Marlink CG," the new maritime satcom expert in Greece and Cyprus.

<http://ont.news/2o2iSSv>

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## U.S. Coast Guard, Navy Conduct Oceania Maritime Security Mission

The U.S. Coast Guard and Navy completed an 18-day joint mission in the Central and South Pacific under the Oceania Maritime Security Initiative to combat transnational crimes, enforce fisheries laws, and enhance regional security. Coast Guard Law Enforcement Detachment 103 from Pacific Tactical Law Enforcement Team embarked USS Michael Murphy (DDG 112) and conducted 16 fisheries enforcement boardings with the assistance of the ship's visit, board, search, and seizure team and law enforcement ship riders from Tuvalu and Nauru.

<http://ont.news/2nlgDn5>

## ONR, NRL Put Sea Hunter, Tern on Display at Sea-Air-Space

Advanced software that can transform existing medium-sized vessels into unmanned ships able to autonomously complete naval missions. A four-legged, bio-inspired robot that can perform reconnaissance or dispose of explosives safely. A drone that merges the flying capabilities of a helicopter and airplane. These are just a few of the technologies the Office of Naval Research (ONR) and the Naval Research Laboratory (NRL) will showcase at the 2017 Sea-Air-Space Exposition, to be held April 3-5 at the Gaylord Convention Center in National Harbor, Maryland.

<http://ont.news/2oHD0qa>



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# MONTH IN REVIEW

## General Dynamics Knifefish UUV Completes Mine-hunting Evaluation

General Dynamics Mission Systems completed a comprehensive evaluation of Knifefish, an autonomous surface mine countermeasure (SMCM) unmanned undersea vehicle.

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

## BAE Systems to Modernize USS Vicksburg Under \$43 Million Contract

The U.S. Navy has awarded BAE Systems a \$42.9 million contract for the modernization of the USS Vicksburg (CG 69), a Ticonderoga-class guided missile cruiser.

<http://ont.news/2oQU2SN>

## Navy Tests Deployment and Retrieval of Minesweeping UUV by Helicopter

The U.S. Navy conducted a demonstration by deploying a MK-18 Mod 2 unmanned underwater vehicle (UUV) from a MH-60S aircraft.

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

## Saab Signs Contract for Advanced Anti-Submarine Training System

Saab has received an order for delivery of the advanced anti-submarine warfare training system, AUV62-AT, with deliveries during 2017 and 2018.

<http://ont.news/2o2t3qq>

## UDT 2017: Optimising the Constraints by Maximising the Variables

Clarion Events announced the UDT 2017 Conference Agenda. The response to this year's call for papers has resulted in an agenda of the highest quality.

<http://ont.news/2nwr21J>

## CTF-150 Reports Second Seizure of Heroin in Last Two Weeks

USS Laboon (DDG 58) intercepted a small stateless dhow in the international waters of the Arabian Sea March 13, seizing 270 kg of heroin.

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



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# Shifting Focus of Oil and Gas Companies Seen in Rig Count Changes

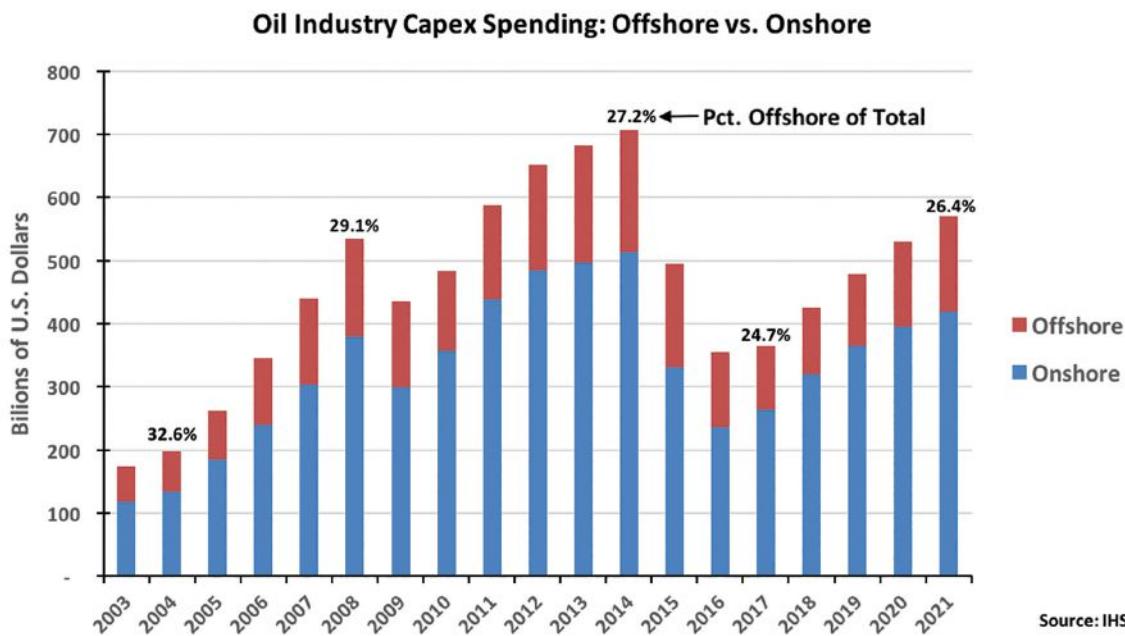
In the 10 months since the drilling rig count decline of 2014-2016 bottomed last May, the U.S. count has doubled according to weekly data reported by Baker Hughes. Starting approximately three months prior to the rig count bottom, crude oil prices stopped declining when they hit \$26 a barrel and, subsequently, have nearly doubled, helped by the OPEC/non-OPEC production cut agreement put in place at the start of 2017. The worries about the oil market that depressed crude oil prices for most of March appear to have been alleviated by OPEC official comments that its members are meeting their target output cuts and are discussing extending the agreement's reduced output targets for the balance of 2017. Although global oil inventories have yet to reflect the production cuts, OPEC officials have pointed to temporary factors such as the surge in output at the end of 2016 prior to the start of the agreement as a reason why oil inventories have failed to shrink. As oil demand begins climbing as the world heads into the summer and fall months when gasoline consumption increases, continued improvement in global economic activity also will further boost oil use.

So far, the improvement in the domestic oil market due to higher oil prices has been evident only in the onshore sector. Between May 2016 and late March 2017, the land rig count increased by 108%, as an additional 411 rigs have been activated. At the same time, the U.S. offshore rig count has fallen by 25%, or by six rigs of the

24 that were active last spring. The offshore rig decline is even greater if one starts counting at the beginning of 2016. Since then, the U.S. offshore rig fleet has seen nine rigs shutdown, or a third of its active fleet. There are numerous reasons why there is such a dichotomy in the trends for offshore and onshore drilling rigs.

In the U.S., the nation's offshore basin is about the oldest in the world, making it mature region, especially for properties in the shallow waters of the Shelf. As that area has been well explored and exploited, opportunities to find undiscovered resources are fewer, meaning the efforts are more difficult and costly. The shelf has also evolved into primarily a natural gas basin as most oil reserves have already been produced. This makes shelf activity more susceptible to low gas prices that have driven the domestic market for the past few years. Growth in natural gas demand, especially with the advent of LNG exports, may boost gas prices and make Gulf of Mexico shelf drilling more profitable. Until that trend kicks in, however, the offshore market will be heavily influenced by deepwater drilling for oil. This is very expensive work, meaning that the industry must lower its high well-breakeven costs in order to improve returns and reduce drilling risks as the industry confronts a "lower for longer" oil price environment.

According to industry sources, deepwater projects had break-even prices in the \$80 a barrel range, but



By: G. Allen Brooks  
Author of "Musings From the Oil Patch"  
[www.energymusings.com](http://www.energymusings.com)



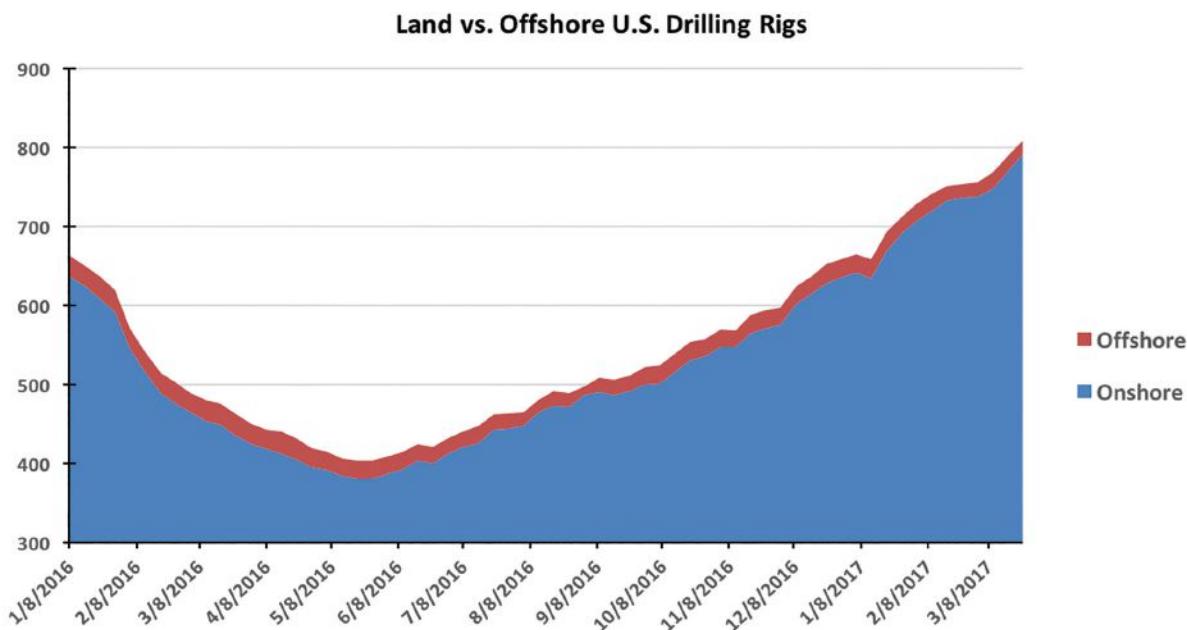
reports are that now they have fallen closer to \$65. The problem is that most long-term forecasts, including any based on the oil futures market, do not see oil prices exceeding this reduced breakeven price until the early 2020s, and that assumes that costs can be contained in the interim. For oil companies who have offshore projects that will not begin producing until then, executives have to make tough decisions about whether the benefits in continuing to develop the projects are worth the cost.

While industry surveys don't break down oil company capital spending plans between offshore and onshore in every region of the world, we can gain a perspective about the industry's entire offshore versus onshore spending plans. Because the offshore market is characterized by long-term projects, it also tends to have long-term contracts for offshore drilling and completion equipment. Therefore, when industry conditions change, such as occurred in 2015-2016, industry spending is cut immediately in areas where it can be stopped quickly. Offshore is usually one of the last to be cut, because it is very costly to exit long-term contracts. Additionally, if the industry wants to continue to work, it needs to renegotiate lower day rates for the offshore equipment it has under contract, in order to help improve project economics in the face of reduced commodity prices. Thus, what we see in the industry data is that as a percentage of total capital spending, the offshore segment's share grows initially during an

industry downturn before it then declines to a new sustainable level and then hopefully begins increasing.

Oil industry consulting firm IHS is estimating that the amount of capital spending devoted to offshore projects will decline to the lowest level it has been since 2005. And the share of total industry spending directed offshore will also shrink to the lowest it has been since 2002. According to their forecast, by 2021, the share of capital spending directed offshore will rise from 24.7% estimated for 2017 to 26.4%. While this represents a positive for industry attitudes toward the importance of the offshore oil and gas business, in 2021, the industry is only expected to spend \$150 billion offshore, or slightly less than it spent in 2008. The heady days of 2014 when the oil industry spent \$192 billion offshore are gone for quite some time, barring a dramatic rise in oil and gas prices that is not incorporated in anyone's forecasts at the present time.

How long will it take for offshore spending to return to 2014 levels? The answer partially involves estimating when and by how much offshore drillers and service companies will be able to increase prices. Higher service prices will boost financial returns and enable paying workers more. Without visibility about when these conditions will improve, the offshore recovery will prove agonizingly slow, with fallouts still to be determined. The industry will recover but it will probably look different than it does now.



# OFFSHORE STATS & DATA

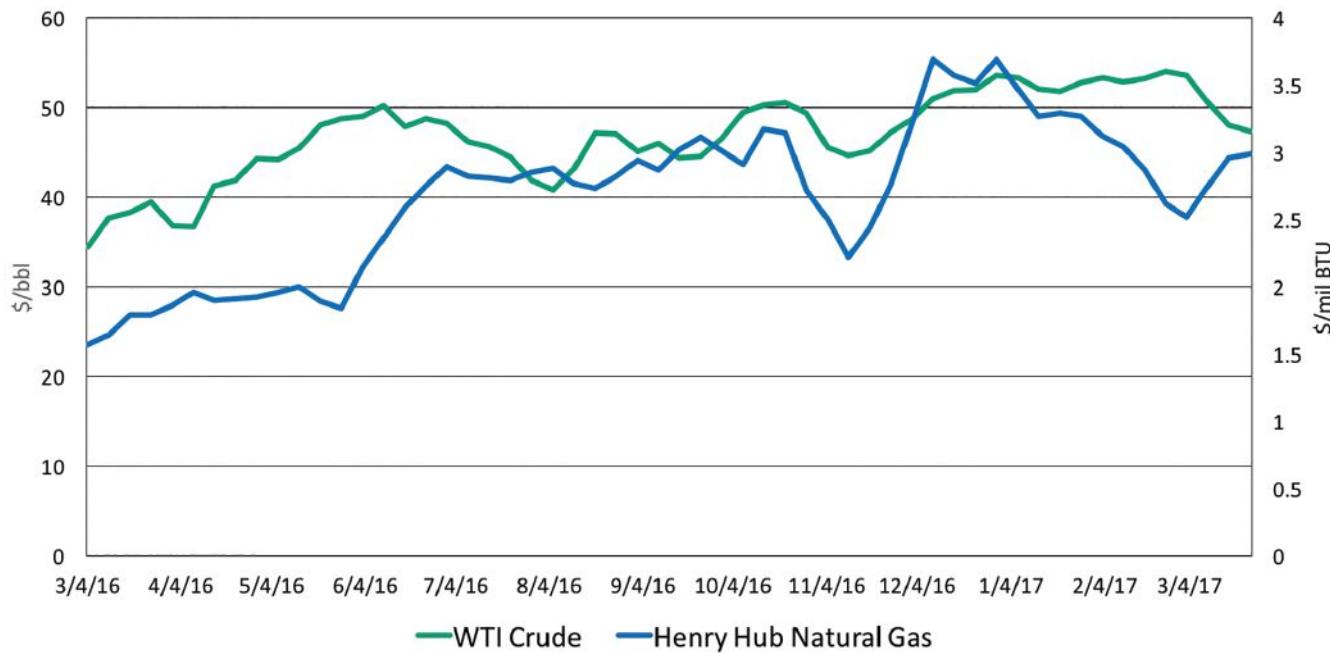
## Crude & Natural Gas Spot Prices

Prices in USD as of March 24, 2017

Crude oil prices have suffered throughout March as worries about the veracity of the OPEC and non-OPEC production cut agreement and its impact on global inventories and whether the agreement might be extended. Those worries translated into lower oil prices as oil traders believed they were too high. During the month's final week, OPEC's technical committee reported that its member compliance with the agreement was nearly total, easing those worries. The concerns were further eased when Middle East oil officials indicated that the agreement's extension was being discussed and was likely to happen. Oil prices rose as the negativity depressing the market was replaced with optimism about a path to higher prices in the second half of 2017.

A recent bout of winter weather and colder temperatures in the populous Northeast and Midwest regions, despite the official arrival of spring, helped lift natural gas prices. Continued restraints on gas supply growth due to the slowdown in new well drilling is helping draw down gas storage inventories. The supply shrinkage is further assisted by growing gas volumes being exported via pipelines to Canada and Mexico, along with stepped-up liquefied natural gas (LNG) shipments.

Ocean News & Technology



**\$47.28**

**\$48.03** previous week



TRENDING DOWN



**Cushing, OK**  
**WTI Spot Price**

**\$2.99**

**\$2.96** previous week



**Henry Hub**  
**Spot Price**

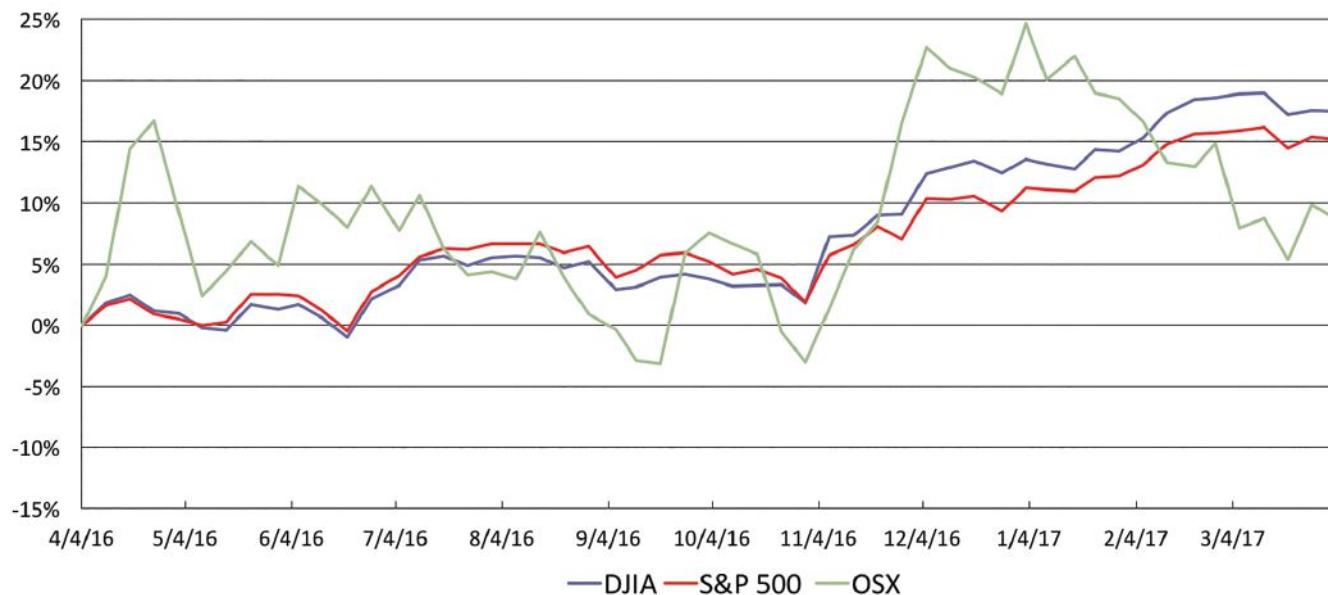
# Oil & Gas Industry Trends

## Key Equity Indexes

Cumulative Percentage Change as of April 4, 2017

Over the last 52 weeks, the equity indexes we watch here at ON&T have generally followed an upward trend. The DJIA is up 17.5% and the S&P 500 up 15.2% with the bulk of the gain coming after Election Day which many commentators have opined to be the result of market expectations of a more business-friendly environment under the Republican controlled legislative and executive branches leading to stronger earnings growth. This perspective persists despite the Fed's March 15, 2017 federal funds rate hike and stated objective of keeping inflation at around 2% in the context of generally improving economic indicators.

The OSX rose 8.7% over the last 52 weeks. For the period from April 2016 through the end of the year, the index was up 24.6%. However, since the beginning of the year, investors have shown concern about the challenges that face many oilfield services companies as the industry continues to focus on efficiencies and overall cost reductions. Cost reduction efforts clearly benefit producers, particularly the majors, but these initiatives will likely continue to put pressure on service providers.



**20,650.21**

-13.01 from previous week



TRENDING DOWN

**DJIA**

**2,358.84**

-3.88 from previous week



TRENDING DOWN

**S&P 500**

**167.84**

-1.82 from previous week



TRENDING DOWN

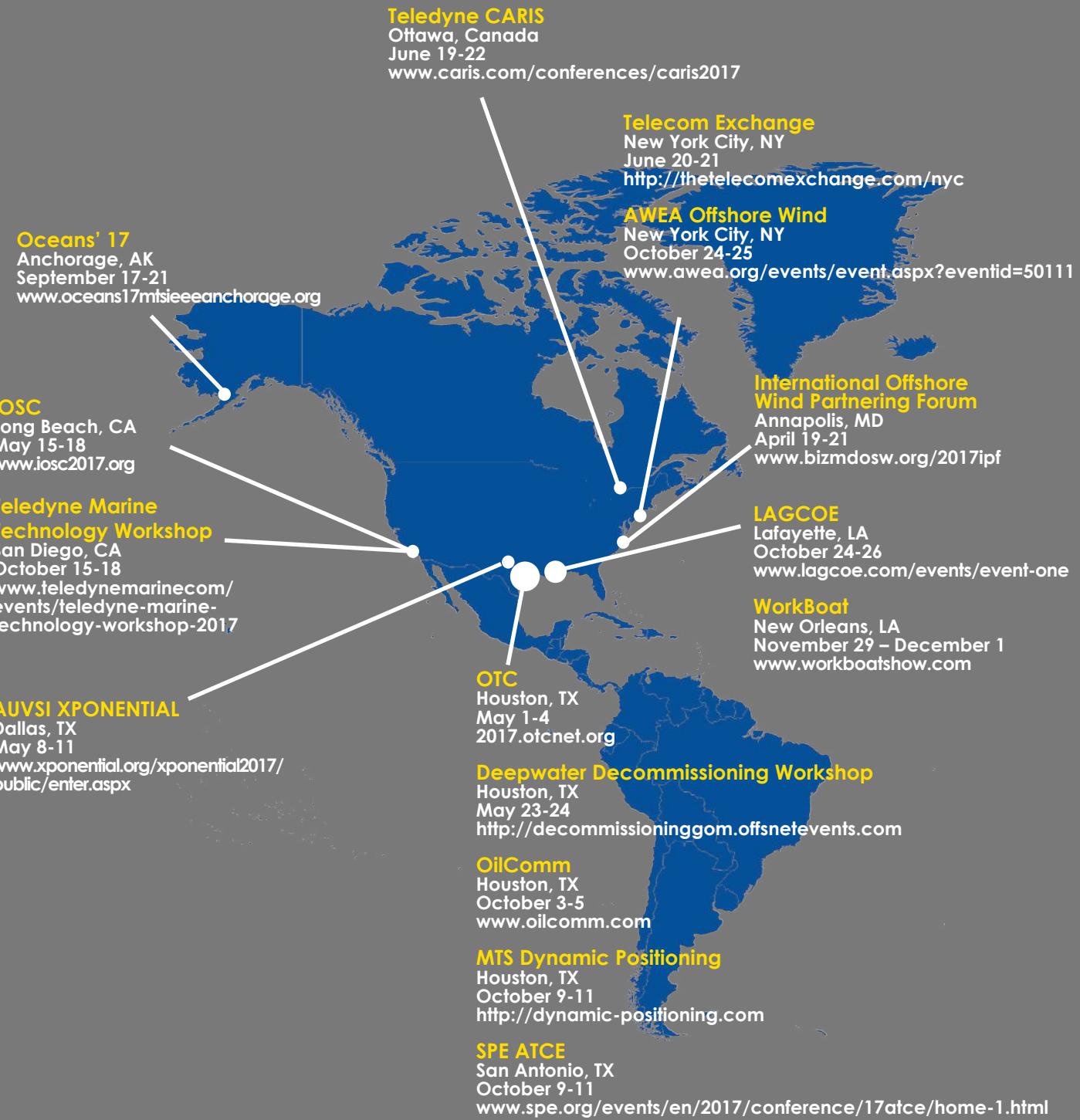
**OSX**

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# 2017 EVENTS



**Deep Sea Mining Summit**  
London, UK  
May 22-23  
[www.deepsea-mining-summit.com](http://www.deepsea-mining-summit.com)

**Offshore Wind Energy**  
London, UK  
June 6-8  
<http://offshorewind2017.com>

**Seawork International**  
Southampton, UK  
June 13-15  
[www.seawork.com](http://www.seawork.com)

**Oceans Aberdeen**  
Aberdeen, UK  
June 19-22  
[www.oceans17mtsieeaberdeen.org](http://www.oceans17mtsieeaberdeen.org)

**SPE Offshore Europe**  
Aberdeen, UK  
September 5-8  
[www.offshore-europe.co.uk](http://www.offshore-europe.co.uk)

**UTC**  
Bergen, Norway  
June 20-22  
[www.utc.no/conference](http://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>

**UASUV**  
Athens, Greece  
May 17-19  
[www.unmanned-v.com](http://www.unmanned-v.com)

**ADIPEC**  
Abu Dhabi, UAE  
November 13-16  
[www.adipec.com](http://www.adipec.com)

**UDT**  
Bremen, Germany  
May 30 - June 1  
[www.udt-global.com](http://www.udt-global.com)

**World Congress of Ocean**  
Shenzhen, China  
November 3-5  
[www.bitcongress.com/WCo2017/default.asp](http://www.bitcongress.com/WCo2017/default.asp)

**Philippines Marine**  
Manila, Philippines  
July 12-14  
<http://philmarine.com>

**Submarine Networks World**  
Singapore  
September 25-27  
[www.terrapinn.com/conference/submarine-networks-world/index.stm](http://www.terrapinn.com/conference/submarine-networks-world/index.stm)

**Asia Pacific Deep Sea Mining**  
Singapore  
November 9-10  
[www.asia.deepsea-mining-summit.com](http://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

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### 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

Ocean News & Technology

### 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 – June 19-22\*

**JULY – Digital Distribution Only**  
TBD

### AUGUST

SPE Offshore Europe – September 5-8♦

### SEPTEMBER

Oceans 17 – September 17-21  
Teledyne Marine Technology Workshop – October 15-18♦  
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  
Offshore Well Intervention GoM – TBD♦  
Clean Gulf – December 5-7

### NOVEMBER – Digital Distribution Only

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

### DECEMBER

TBD

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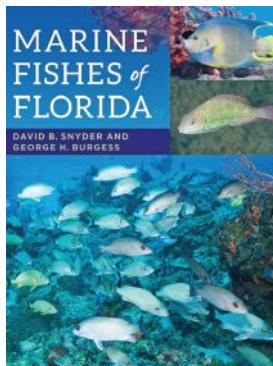
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# MILESTONES



## CSA Scientist Authors Illustrated Guide to Florida's Marine Fishes

CSA Ocean Sciences Inc. (CSA) senior scientist David Snyder and George Burgess, coordinator of museum operations and the director of the Florida Program for Shark Research at the University of Florida's Florida Museum of Natural History, have authored the most comprehensive book about Florida's marine fishes ever produced. Titled *Marine Fishes of Florida*, it includes hundreds of photographs and species you'll encounter—plus many that are rare—when diving, snorkeling, kayaking, or fishing. Coverage includes both the Atlantic and Gulf coastline, from habitats near the shore to deeper waters.

<http://ont.news/2o2t5hN>

## OceanWorks International Hires New Project Director

OceanWorks International announced the appointment of Mr. Richard Gage, P.Eng, in the role of director of the Project Management Office (PMO). Gage is responsible for overseeing and supporting the successful execution of all projects. Through the management of the PMO, the project director facilitates the required approval of project scopes, schedules, and budgets. His extensive experience is directly in line with OceanWorks' growing subsea technology business in oil & gas, Submarine Rescue, and ocean observing systems.

<http://ont.news/2oBK0Wp>



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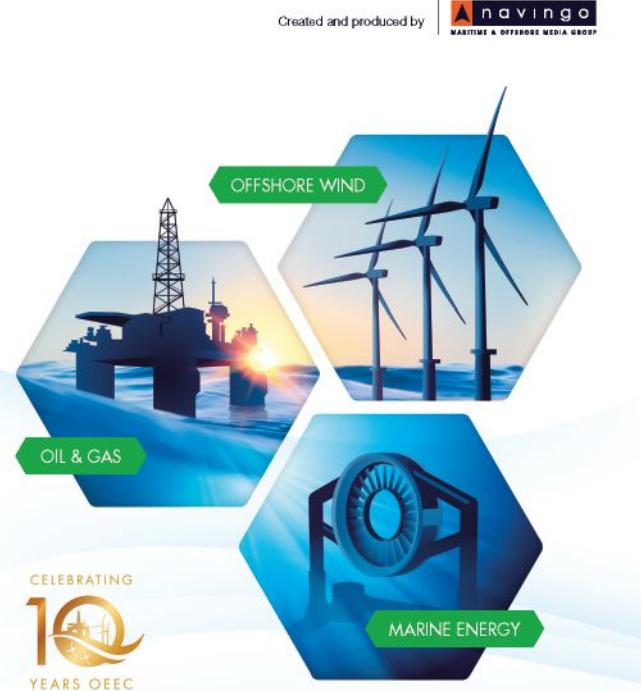
 **OFFSHORE ENERGY 17**  
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## Book your stand now

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!

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## Life Cell Marine Safety Secures Government Funding

A near-tragedy was the inspiration for the Life Cell, an innovative floating safety device. Now, the product and its inventor, Scott Smiles, have caught the attention of the Australian government. Smiles was awarded a \$370,000 AUD grant (roughly \$280,000 USD) to help Life Cell Marine Safety commercialize the product internationally. Kevin Hogan, member of the Australian Parliament for Page, a coastal area of New South Wales, is fully supportive of his government's Accelerating Commercialization Program.

<http://ont.news/2oR7x4Z>

## SeeByte Achieves ISO 9001:2015 Certification

SeeByte, a global leader in creating smart software technology for unmanned systems, has achieved International Organization for Standardization (ISO) 9001:2015 certification for the design of its Business Management System. This follows a successful assessment by Lloyd's Register Quality Assurance (LRQA). Lloyd's Register Quality Assurance (LRQA) is the world's leading provider of independent assessment services, including certification, validation, verification, and training across a broad spectrum of standards and schemes, with recognition from over 50 accreditation bodies.

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



A collage of images related to underwater operations, including divers, AUVs, ROVs, and engineering equipment. The word "DIVING" is written diagonally across the top left, "AUV" across the bottom left, "ADS" across the bottom center, "ROV" across the bottom right, and "ENGINEERING" across the bottom right. The central logo for Phoenix International features a stylized wave and the text "PHOENIX INTERNATIONAL" above "UNDERWATER SOLUTIONS WORLDWIDE" and the website "www.phnx-international.com" and phone number "(800) 648-8949". A DNV-GL ISO 9001 quality system certification logo is at the bottom. The footer lists locations: Bayou Vista, LA • Fort Lauderdale, FL • Houston, TX • Largo, MD • Norfolk, VA • Pearl City, HI • San Diego, CA.

## 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](http://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:



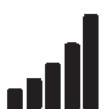
#### Company Listing

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			●

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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.

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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.

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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.

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Contact: Trevor Davis



Hydra Offshore Construction, Inc. fabricates, inspects, repairs, and installs single point back down buoys for field vessels and hazard avoidance buoys to mark site clearance locations or downed platforms. We can also design and install sophisticated mooring systems. Our crews are trained in anchor handling work, spooling services, and wire rope terminations.

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Website: www.metocean.com  
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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's 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, SLDMB, and iSLDMB.

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Contact: Dan Cote, 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.

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# OCEAN INDUSTRY DIRECTORY

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United Kingdom  
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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.

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Website: www.falmat.com  
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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.

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### SOUTH BAY CABLE CORP

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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.

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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.

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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 connector solutions. Stocking dealers in the UK, South Africa and Holland as well as dealers in Canada, Germany, Belgium, Norway, China, and Brazil.

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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.

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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.



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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.

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Website: www.km.kongsberg.com/seatex  
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KONGSBERG

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# OCEAN INDUSTRY DIRECTORY

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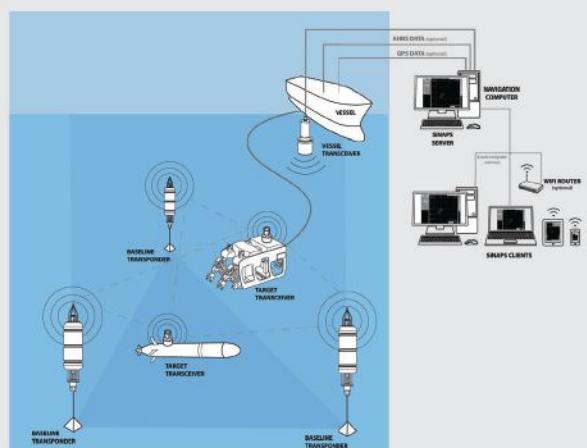
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Only one name can connect them all—**metOcean telematics**.

Our team understands the challenges you face when integrating and deploying your device. With our broad portfolio of Iridium® products and services, we offer innovative solutions for applications ranging from AUV's and Unmanned Surface Vehicles to buoys, profilers and everything in between.

We are leading the global effort to better understand, assess, monitor and connect our planet. That's why we are the leading global provider of Iridium® satellite communications products and services that keep you **connected without limits.™**

