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coastal zone, we need to be smarter about how we address these challenges. As we continue to live, work, and play in the Louisiana wetlands, we are saddling future generations with even greater environmental challenges. As our ancestors burdened us with saving the Mexico coastal zone, but this growth inevitably places greater demands on the natural environment. Although we recognize the need for conservation and restoration, we are still sacrificing our natural habitats for this growth and endangering the ecological services that these habitats provide.

Habitat restoration costs money — lots of money. Today, those of us involved in restoration in the U.S. coastal zone of the Gulf of Mexico are almost giddy with anticipation of the settlement of the fines related to the Macondo blowout and spill in 2010. Without the tragic and catastrophic outcomes of the Macondo event, these monies would have never been seen in the Gulf of Mexico region. Academic institutions, conservation non-government organizations (NGOs), government resources management agencies, politicians, personal injury lawyers, and more are lined up to reap the reward: potentially billions of dollars for restoration, research, and economic development.

There are 11 Gulf States, five U.S. states and six Mexico states — and all have a long list of restoration needs considered critical to a sustained quality of life. The restoration needs are common knowledge and the causes are known, but the will to reverse this trend of habitat degradation and destruction is less than the will to capture economic reward. The Gulf of Mexico coastal zone is arguably the fastest growing population center in North America, but this growth inevitably places greater demands on the natural environment. Although we recognize the need for conservation and restoration, we are still sacrificing our natural habitats for this growth and endangering the ecological services that these habitats provide.

The Macondo penalty monies will run out in 10 years. What will we do then? No doubt we will still be actively degrading the coastal habitats. There will still be a need for ongoing habitat restoration. We will still need money to address the needs of all 11 Gulf States. This leaves some serious questions to be addressed. Can we stop making the decisions that create the need for more restoration? Can we establish effective funding strategies that are not dependent on catastrophic events? Can we establish funding strategies that transcend election cycles, quarterly and annual financial reports, and politics? Can we get all industries, tourism, fisheries, agriculture, etc. meaningfully engaged, not just the major oil/gas companies? Can we save the Gulf of Mexico without giving equal attention to the needs of all 11 Gulf States?

In truth, today we can take comfort in the knowledge that we have a reasonable expectation to live our lives in the comfort we now enjoy in the Gulf of Mexico coastal zone. But, just as our ancestors burdened us with saving the Louisiana wetlands, we are saddling future generations with even greater environmental challenges. As we continue to live, work, and play in the coastal zone, we need to be smarter about how we address these challenges.
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**FUNDING OPPORTUNITIES**

**Competitive Marine and Hydrokinetic (MHK) Demonstrations at the Navy’s Wave Energy Test Site (WETS)**

*Response Date: TBA - expected QTR 2 / 2014*

The U.S. Department of Energy (DOE) has announced a Notice of Intent to issue a funding opportunity titled “Competitive Marine and Hydrokinetic (MHK) Demonstrations at the Navy’s Wave Energy Test Site (WETS).”

The goal of this funding opportunity is to collect important performance and cost data while supporting the Department of Defense’s renewable energy goals. DOE anticipates deployment of two full-scale Wave Energy Conversion (WEC) systems for a period of 1 year at Navy’s WETS.

This funding opportunity will be conducted in two phases and is designed for WEC technology developers that are in the late stages of technology development, prepared to build and test technology at close to full-scale in the ocean environment.

Phase I: Funding will be used for the optimization, designs, and planning for deployment and testing of a full-scale WEC system followed by a stage-gate review (Go/No-Go).

Phase II: Funding will be used to obtain final permitting approvals, fabrication, deployment, and retrieval and decommissioning of the system after 12 months of testing and data collection.

EERE plans to issue the FOA in the second quarter of calendar year 2014 via the EERE Exchange website (https://eere-exchange.energy.gov/).

**BOEM Announces $5M Contract Opportunity for Sand Resource Data Acquisition for Hurricane Sandy Projects on the Atlantic**

*Response Date: 21 May 2014*

The Bureau of Ocean Energy Management (BOEM) has announced a $5 million procurement opportunity to collect data offshore from Maine to Miami, Florida to identify sand resources for potential use in future coastal restoration projects. The contract will be handled under a Broad Agency Announcement (BAA) and is posted on FedBizOpVs.Gov under solicitation number M14PS00034. Proposals are due on or before 21 May 2014.

The objective of the BAA is to acquire geophysical and geological data to support identification, characterization, and delineation of Outer Continental Shelf (OCS) sand resources for use by coastal states in future coastal restoration, beach nourishment, and/or wetland restoration efforts.

The selected contractor will coordinate with Atlantic coastal states to determine areas for offshore investigation that contain potential sand resources and perform geophysical surveys and geological sampling. This work will help identify areas of potential sand and gravel resources that are compatible with and in proximity to coastal areas where those resources are likely to be needed. BOEM will distribute the data widely among coastal stakeholders.

This data acquisition effort is funded using part of the $13.6 million allocated to BOEM through the Disaster Relief Appropriations Act of 2013.

*Cocoa Beach, Florida, after Hurricane Sandy. Photo Credit: Paula Berntson, Brevard County, Natural Resources Management Department.*
**Greater Atlantic Region to Receive Nearly $5.6M for Fishing Industry Research**

*Response Date: Ongoing*

Research projects in New England and the Mid-Atlantic are expected to receive nearly $5.6 million in federal funding, according to 26 March 2014 announcement by NOAA Fisheries. Under the Saltonstall-Kennedy Grant Program, which is administered by NOAA Fisheries, funding will be made available to provide financial assistance for research and development projects that benefit the U.S. fishing industry. Of these funds, $2.3 million would support projects to benefit the groundfish industry. Funding will be made available to projects following review by NOAA’s Office of Acquisition and Grants, which is expected to be completed shortly.

Of the proposals received nationally for this competition, more than half were submitted by fishermen and scientists from New England and the Mid-Atlantic. Ultimately 40 projects were selected from across the country and 21 of those were from the Northeast. New England and the Mid-Atlantic projects are expected to receive over half of the available Fiscal Year 2013 Saltonstall-Kennedy Grant Program funds.

Available funds will support projects in aquaculture, conservation engineering, ecosystem studies, fisheries socioeconomics, and identifying ways to help fishermen better achieve their annual quotas of fish so they can be more profitable.

Recommended projects include: reducing fisheries bycatch in the lobster, monkfish and striped bass fisheries; ecosystem investigations involving Bluefin tuna, blue crabs, cod, lobster, mackerel, and striped bass; understanding the socio-economic issues impacting groundfish fishermen; and projects that increase utilization of fishery resources (e.g., redfish and dogfish).

For more information, visit www.nero.noaa.gov.

Atlantic bluefin tuna have been studied under the Saltonstall-Kennedy Grant Program. Photo credit: NOAA.

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**Vessel Charter for Arctic Whale Ecology Study (ARCWEST)**

*Response Date: Pre-solicitation*

The National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), National Marine Mammal Laboratory (NMML) located in Seattle, Washington has a requirement for one (1) commercial vessel with experienced crew to retrieve and deploy passive acoustic and oceanographic moorings, conduct oceanographic sampling, and assist with satellite tagging operations in the Bering, Chukchi and Beaufort Seas for the Arctic Whale Ecology Study (ARCWEST).

The vessel must be able to retrieve and deploy passive acoustic and biophysical moorings weighing up to two (2) tons, launch and retrieve a 23-foot rigid-hulled inflatable boat, and conduct oceanographic sampling.

The research conducted during this charter will involve passive acoustic/biological/biophysical surveys of whales, their prey, and their environment. The specific objectives of the research are to determine distribution, migratory patterns, and acoustic ecology of cetaceans in the Chukchi Sea, and to conduct oceanographic sampling to determine transport and advection of krill and nutrients from the northern Bering Sea to the Barrow Arch area. Solicitation will be posted 17 April 2014.

For more information, see pre-solicitation number AB-133F-14-RQ-0250 at www.fbo.gov.
by the NUMB3RS

MARINE SOUND

4.5 to 5 knots: Typical speed at which seismic survey operation vessels travel.

10 to 15 seconds: Time between seismic pulses during survey operations.

62 dB: Lower limit of human hearing under water (compared to 0 dB in air).

80 to 120 dBs: Sound intensity range of ambient sea sound.

190 dBs: Sound intensity of blue whale vocalizations.

200 Hz: Seismic activity carried out by the exploration and production industry is predominantly carried out in the frequency range below this number.

230 – 250 dBs: Sound intensity of typical seismic acoustic source.

25,000 to 125,000 Hz: Frequency range at which beaked whales hear best.

50,000 to 60,000 Hz: Frequency range at which pinnipeds, such as seals, hear best.

120,000 Hz: Frequency at which the loudest echolocation clicks made by dolphins occur.
When the sun rose this morning over the Mediterranean Sea, the Atlantic Ocean, the Pacific Ocean, the Arabian Sea, the Indian Ocean, the Gulf of Mexico, the South China Sea, the Bering Sea, and the Black Sea, we were there.

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Loggerhead sea turtles begin their adventure at a very early age. After hatching, they waddle off the beach into the surf and begin a journey that takes them clear across the ocean. Many loggerheads from the U.S. Atlantic coast turn up a few years later in the Canary Islands off West Africa. But how they get there and what they encounter along the way has long been a mystery. Biologists had referred to this period of time as the sea turtles’ “lost years.” But thanks to a new study, those years are no longer lost to science.

The Keratin Connection
To track adult sea turtles, scientists glue the transmitter to the animal’s shell. But baby sea turtles start so small and grow so quickly that their fast-expanding shells quickly shed whatever scientists attach to them. The solution to that problem came from an unlikely source. Marisol Marrero is a nail salon technician at Not Just Nails in Boynton Beach, Florida. One of the authors of the study, Jeanette Wyneken of Florida Atlantic University, is an occasional customer.

During a visit to the nail salon, Wyneken explained the difficulty in attaching satellite tags to the baby sea turtles. Sea turtle shells are made out of a protein called keratin, the same stuff that fingernails are made of.

“Have you considered using an acrylic base coat?” asked Marrero, referring to her technique for attaching artificial nails. The rest is history.

Kate Mansfield, a biologist at the University of Central Florida who was doing her postdoctoral research at NOAA’s Southeast Fisheries Science Center at the time, led the team that tracked the turtles’ migrations by attaching satellite tags to 17 young loggerhead sea turtles. The small, solar-powered tags allowed scientists to map the animals’ migrations. The tags also beamed back data on the environmental conditions the turtles encountered along the way.

A Few Surprises
Scientists had long assumed that Atlantic loggerheads hitch a ride on the North Atlantic Gyre, a circular system of currents that flows clockwise from North America to Europe and Africa and then flows back near the equator. That would explain how the young turtles made their way to the Canary Islands. But the satellite tags revealed that many turtles hop off the gyre to swim in the Sargasso Sea, which occupies a calm area inside the gyre. The sea is named for sargassum, a seaweed that collects there and, like a forest in the middle of the ocean, offers shelter and habitat to a diversity of marine creatures.

Temperature sensors on the satellite tags indicated that when in the Sargasso Sea, the turtles experienced warmer water temperatures than would be expected based on data from remote sensing satellites and data buoys. This may be due to the brown sargassum absorbing more of the sun’s energy than the open water around it. The scientists speculate that young sea turtles might detour into the sargassum habitat to warm up. Since the animals are cold-blooded, warmer water would accelerate their growth and help them to outgrow predators more quickly.

“Understanding what these animals are doing during their early life history is critical to better managing the species,” said Mansfield. This is particularly important for Atlantic loggerhead sea turtles in U.S. waters, listed as threatened under the Endangered Species Act.

Study results were published in the Proceedings of the Royal Society B (Biological Sciences) on 5 March 2014.

For more information visit www.fisheries.noaa.gov.
IPCC: Climate Change to Affect All

The Intergovernmental Panel on Climate Change (IPCC) issued a report on 31 March 2014 that says the effects of climate change are already occurring on all continents and across the oceans. The world, in many cases, is ill-prepared for risks from a changing climate. The report also concludes that there are opportunities to respond to such risks, though the risks will be difficult to manage with high levels of warming.

The report, titled Climate Change 2014: Impacts, Adaptation, and Vulnerability, from Working Group II of the IPCC details the impacts of climate change to date, the future risks from a changing climate, and the opportunities for effective action to reduce risks.

The report concludes that responding to climate change involves making choices about risks in a changing world. The nature of the risks of climate change is increasingly clear, though climate change will also continue to produce surprises.

The report identifies vulnerable people, industries, and ecosystems around the world. It finds that risk from a changing climate comes from vulnerability (lack of preparedness) and exposure (people or assets in harm’s way) overlapping with hazards (triggering climate events or trends). Each of these three components can be a target for smart actions to decrease risk.

Adaptation to reduce the risks from a changing climate is now starting to occur, but with a stronger focus on reacting to past events than on preparing for a changing future, according to Chris Field, co-chair of Working Group II. “Climate-change adaptation is not an exotic agenda that has never been tried. Governments, firms, and communities around the world are building experience with adaptation,” Field said.

Future risks from a changing climate depend strongly on the amount of future climate change. Increasing magnitudes of warming increase the likelihood of severe and pervasive impacts that may be irreversible.

Observed impacts of climate change have already affected agriculture, human health, ecosystems on land and in the oceans, water supplies, and some people’s livelihoods. The striking feature of observed impacts is that they are occurring from the tropics to the poles, from small islands to large continents, and from the wealthiest countries to the poorest.


Ocean Iron Cycling Gives Insight into Climate Change

Scientists at the University of Liverpool have found unique aspects of iron cycling in the Southern Ocean that will better inform scientists about the effects of climate change. An international team of researchers analyzed the available data taken from all previous studies of the Southern Ocean along with satellite images taken of the area in order to quantify the amount of iron supplied to the surface waters of the Southern Ocean, which is composed of the southernmost waters of the world’s oceans that encircle Antarctica.

Researchers have long known the region is crucial in the uptake of atmospheric CO₂ and that biological processes in the Southern Ocean influence the global ocean system via northward flowing currents. The scientists found that deep winter mixing, a seasonal process that carries colder and deeper, nutrient-rich water to the surface, plays the most important role in transporting iron to the surface. The iron is then able to stimulate phytoplankton growth, which supports the ocean’s carbon cycle and the aquatic food chain. They were also able to determine that following the winter iron surge, a recycling process is necessary to support biological activity during the spring and summer seasons.

Oceanographer Dr. Alessandro Tagliabue from the University’s School of Environmental Sciences said: “We combined all available iron data, matched them with physical data from autonomous profiling floats, and used the latest satellite estimates of biological iron demand to explore how iron is supplied to the phytoplankton in the Southern Ocean.”

“This is important because iron limits biological productivity and air-to-sea CO₂ exchange in this region. We found unique aspects to the iron cycle and how it is supplied by physical processes, making it distinct to other nutrients. This means that the Southern Ocean’s nutrient supply would be affected by changes to the climate system (such as winds and freshwater input) differently to other areas of the ocean.”

For more information, visit news.liv.ac.uk.
The National Science Foundation’s (NSF’s) ice-capable research vessel R/V Sikuliaq conducted preliminary acceptance trials on the Great Lakes at the end of February, and NSF planners hope to have her in the Washington, D.C. area for a summer visit while completing the remainder of her testing along the east coast.

The NSF-owned research vessel is a 261-ft ship that the University of Alaska Fairbanks School of Fisheries and Ocean Sciences will operate as part of the U.S. academic research fleet. R/V Sikuliaq is uniquely equipped to operate in ice-choked waters and will be able to do so in extreme ecosystems, especially in the Arctic region, serving the science and engineering research communities for decades to come.

By late September, R/V Sikuliaq is expected to begin funded science, but the historically cold winter on the Great Lakes gave an ideal opportunity to assess her performance in ice ahead of more formal trials.

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**FY 2015 Budget Justifications for BOEM/BSEE Highlighted**

Provided by HBW Resources (hbwresources.com) are notes from the FY 2015 budget justifications of Bureau of Ocean Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE).

**BOEM plans of note:**
- Atlantic OCS resource evaluation “a high priority” for the agency and administration.
- Increase use of Programmatic Environmental Impact Statements (PEIS) and “comprehensive planning.”
- Enhance traditional PEIS through a new format that depicts “impacts and issues” mainly through maps.
- Finalize the BOEM-NOAA PEIS for Gulf of Mexico seismic activity in FY 2014.
- Conduct an updated evaluation of undiscovered, technically recoverable oil and gas resources in 2016

**BSEE plans of note:**
- Determine whether regulatory action is needed to ensure agency access to industry real-time monitoring (RTM) facilities.
- Propose blowout preventer rule before 1 October 2014.
- Requests $905,000 increase to support two technical expert reviews of emerging technologies and the evaluation, testing, and use of Best Available and Safest Technologies (BAST).
- Implement National Academy of Sciences recommendations on BAST for offshore oil and gas.
- Work with Ocean Energy Safety Institute (OESI) to in defining how to test and evaluate BAST.
- Develop ePermits and eInspections.
- Pilot evidence-based risk analysis methodology for production facility inspections.

For the source document, visit www.doi.gov/budget.
According to Dr. Benjamin S. Halpern, lead scientist at the Ocean Health Index, marine protected areas (MPAs) have proven their value, but more needs to been done to maximize their impact. MPAs are areas of oceans or lakes that are protected for conservation. In the USA, there are over 1,600 MPAs, and around the world there are over 10,000 spanning a range of habitats — yet only 2.3% of the world’s oceans are protected.

While many of these areas represent critical habitats for endangered species, Dr. Halpern notes that they are typically only partially protected and allow a range of human uses. He adds that MPA designation accomplishes little if the area is too small to protect most species or the resources to enforce protection are lacking.

Citing a study led by Graham Edgar of the University of Tasmania, he lists five features necessary for success and stresses that any less than four means the MPA will not be effective.

The five features are full protection, effective enforcement, age greater than 10 years, area greater than 100 sq km, and isolation by deep water or sand.

Elizabeth Selig, director of marine science, Conservation International agrees. “However, there are also many other resource management tools, including more traditional fisheries management . . . and policies like those aimed at reducing the greenhouse gas emissions that cause global warming that are also important.”

For more information, visit www.oceanhealthindex.org.
The International Court of Justice (ICJ), the principal judicial organ of the United Nations, has rendered judgment in the case concerning Japan's whaling in the Antarctic. The case was brought by Australia, with New Zealand intervening.

The court found that Japan broke the International Convention for the Regulation of Whaling and decided that Japan shall revoke any extant authorization, permit or license granted in relation to JARPA II, and refrain from granting any further permits.

The court rejected arguments that the purpose of permits were “for purposes of scientific research,” citing, among other things: the scale of the program’s use of lethal sampling; the time frame associated with a program; and the program’s (lack of) scientific output.

Examining Japan’s decisions regarding the use of lethal methods, the Court finds no evidence of any studies of the feasibility or practicability of non-lethal methods, either in setting the JARPA II sample sizes or in later years in which the program maintained the same sample size targets. The Court also finds no evidence that Japan examined whether it would be feasible to combine a smaller lethal take and an increase in non-lethal sampling as a means to achieve JARPA II’s research objectives.

The Court notes that a comparison between the Research Plans in JARPA II its predecessor program, reveals a considerable overlap between the two programs’ subjects, objectives, and methods. These resemblances cast doubt on Japan’s argument that the JARPA II objectives relating to ecosystem monitoring and multi-species competition are distinguishing features that call for a significant increase in the minke whale sample size and the lethal sampling of two additional species. The Court notes that Japan launched JARPA II without waiting for the final review of JARPA by the Scientific Committee.

The Court notes that the evidence relating to JARPA II provides scant analysis and justification for the underlying decisions that generate the overall sample size, raising further concerns about whether the design of JARPA II is reasonable in relation to achieving its stated research objectives.

The Court also observes a significant gap between the JARPA II target sample sizes and the actual take. In the view of the Court, the gap between the target sample sizes for fin and humpback whales in the JARPA II Research Plan and the actual take of these two species undermines Japan’s argument that the objectives relating to ecosystem research and multi-species competition justify a larger target sample size for minke whales, as compared to that in JARPA.

The Court notes that there are three additional aspects of JARPA II which cast further doubt on its characterization as a program for purposes of scientific research: the open-ended time frame of the program, its limited scientific output to date, and the lack of co-operation between JARPA II and other domestic and international research programs in the Antarctic Ocean.

The Court concludes that the special permits granted by Japan for the killing, taking and treating of whales in connection with JARPA II are not “for purposes of scientific research.”

The Court concludes that Japan has violated: (i) the moratorium on commercial whaling in each of the years during which it has set catch limits above zero for minke whales, fin whales and humpback whales under JARPA II; (ii) the factory ship moratorium in each of the seasons during which fin whales were taken, killed and treated under JARPA II; and (iii) the prohibition of commercial whaling in the Southern Ocean Sanctuary in each of the seasons during which fin whales have been taken under JARPA II.

The Court therefore orders that Japan revoke any extant authorization, permit or license to kill, take or treat whales in relation to JARPA II, and refrain from granting any further permits under the Convention, in pursuance of that program.

For more information, visit www.icj-cij.org.
In two newly released bulletins, China's Oceanic Administration reports that 2013 marine disasters caused direct economic losses of over 16 billion yuan ($2.6 billion USD) and up to 121 deaths. The bulletins from the government agency also report that China's coastal sea levels are rising faster than the global average.

Storm surges accounted for 94% of the total direct economic losses due to marine disasters as well as most of the deaths. The provinces most affected were Guangdong, Fujian, and Zhejiang. Compared with the past 10 years, damages were well above average and ranked as the second worst year in terms of direct economic loss and death in the last 5 years.

The bulletins state that sea level rise could lead to further increases in coastal lowland flooding, storm surges, coastal erosion, saltwater intrusion and increased soil salinization, and the destruction of coastal ecosystems. The bulletin emphasizes the need to strengthen coastal protection strategies, including adapting strategies to deal with rising sea levels.

For the full report, visit www.so.gov.cn.

Super Typhoon Usagi bears down on China, 21 September 2013. Photo credit: NASA Earth Observatory.
A major decision in federal court could put an end to pollution that’s been fouling Lake Okeechobee for more than three decades. The case, first filed in 2002 by Earthjustice, challenged the practice of “backpumping.”

For years, South Florida sugar and vegetable growers have used the public’s waters, pumped out of giant Lake Okeechobee, to irrigate their fields. They wash the water over their industrial-sized crops, where it is contaminated with fertilizers and other pollutants. Taxpayers in the South Florida Water Management District (SFWMD) pay to pump the contaminated water back into Lake Okeechobee, where it pollutes public drinking water supplies. Lake Okeechobee provides drinking water for West Palm Beach, Fort Myers, and the entire Lower East Coast metropolitan area.

Earthjustice contended that the SFWMD was violating the Clean Water Act by allowing the agricultural companies to send fertilizer-laden water into public water supplies instead of cleaning it up first. U.S. District Judge Kenneth M. Karas in the Southern District of New York ruled that the water transfer practice does, indeed, violate the Clean Water Act.

The case ended up in New York because clean-water groups and several states also challenged the practice of allowing dirty water transfers into public water supplies without Clean Water Act protections. All the cases — including Earthjustice’s Florida case on behalf of Friends of the Everglades, Florida Wildlife Federation, and the Sierra Club — were bundled together.

"This victory has been a long time coming," said Florida Wildlife Federation president Manley Fuller. "Stopping pollution at the source is the key to cleaning up South Florida’s water pollution problems — the toxic green slime in the rivers, the dead wildlife washing up in the shores, the contaminated drinking water — and this decision will make that happen at long last.”

"Big sugar corporations have been illegally dumping dirty water into Lake Okeechobee for years. They won't be able to do that anymore, thanks to this very important decision by the federal courts," said Sierra Club's Florida staff director, Frank Jackalone.

Transfers of contaminated water have triggered numerous toxic algae outbreaks around the United States. The algal growths can make people sick and sometimes kill livestock or pets that drink the water.

The drinking water supplies for millions of Americans across the country have been affected, including notable cases in Florida, Colorado, New Hampshire, and California. The dirty water is a health risk for pregnant women, and taxpayers are on the hook for hundreds of millions of dollars in additional treatment costs while polluters put more profits in their pockets.

"Instead of tightening protections and cleaning up the pollution, the EPA chose to legalize it," said Albert Slap, attorney for Friends of the Everglades. “Now the courts have settled it — the South Florida Water Management District has to comply with the Clean Water Act.”

In related news, proposed Florida state bills HB 703 and SB 372 face strong opposition and appear unlikely to pass this session. Both would relax environmental regulations in the state and are opposed by environmental groups, such as the Sierra Club.
BP has entered into an administrative agreement with the U.S. Environmental Protection Agency (EPA) on behalf of the federal government, resolving all contractual matters related to the suspension, debarment, and statutory disqualification of BP following the Deepwater Horizon accident and oil spill. As a result of this agreement, BP is once again eligible to enter into new contracts with the U.S. government, including new deepwater leases in the Gulf of Mexico.

The administrative agreement applies to all of the suspended and debarred BP entities and certain affiliated companies. Under the terms and conditions of the administrative agreement, which will apply for 5 years, BP has agreed to a set of safety and operations, ethics and compliance, and corporate governance requirements, including those contained in the remedial order stemming from BP’s 2012 Plea Agreement with the U.S. Department of Justice and Final Judgment Order with the U.S. Securities and Exchange Commission. As part of the administrative agreement, BP will dismiss the lawsuit it filed against the EPA in federal court in Texas for improper statutory disqualification and suspension.
NOISY COASTAL WORKSITES AND THE MONITORING OF MARINE MAMMALS

By: Marc Gauthier, Patrick Charbonneau, Mario Heppell, and Richard Brunet, WSP Canada Inc.

Sound measurements in the St-Lawrence Estuary.
Since the beginning of the 19th Century, the motorization of ships and their increasing size and speed have contributed to a constantly growing maritime traffic and the intensification of related sounds. During the last decades, new submarine sound sources have multiplied, such as civil and military sonars and seismic surveys. Over the years, the marine environment has gone from a relatively natural background sound to a hostile acoustic environment for some species. Marine mammals are good examples because they are highly dependent on sounds to communicate and for echolocation. They are getting more disturbed by man-made noise. Those observations led many countries to issue standards and regulations concerning the protection of the marine fauna exposed to noise. This is notably the case in Canadian waters, where WSP conducted various projects related to submarine sound and the monitoring of marine mammals in the vicinity of noisy worksites. The aimed activities are mainly construction work or port infrastructure expansion, primarily for the transportation of ore extracted from mines in Quebec and Labrador.

Loud sound impacts can be classified according to three categories, based on sound intensity, and distance between the sources and animals. Clustered in space, three impact zones can be concentrically contained around the point of emission: the lethal zone, the physiological impact zone, and the behavioral influence zone. Beyond this limit, there is no more impact because the minimum exposure limit at which an effect is observed on behavior is reached.
Physiological effects provoked by an exposition to loud submarine sounds include various organic and tissue damages, which could, in some cases, be lethal. A hearing loss, temporary or permanent, can also occur following exposure to a high level of sound. To prevent hearing loss in marine mammals, the National Marine Fisheries Service (NMFS) had agreed in 2000 that cetaceans and pinnipeds should not be exposed to submarine sound pulses above 180 and 190 dB re 1 µPargs, respectively, as these levels of exposition are not likely to cause permanent hearing loss. Some maritime construction work, such as pile driving and sheeting, can generate sound pressures high enough to cause hearing loss in marine mammals. At a lower level or at greater distance, noises generated by such work can lead marine mammals to change their behavior. These changes include the avoidance and relocation of migratory corridors, modification of diving and breathing cycles, and changes related to vocalizations and social behavior. As for whales, such effects can be observed with an intensity of approximately 120 dB re 1 µPa. The masking effect, the covering of useful sounds by noises of similar frequency, can also interfere with the communication and echolocation system on which many marine mammals depend in order to direct themselves, find food, and communicate with other specimens. Moreover, studies reported that many marine mammals must adapt their vocalizations according to the background sound, in particular when noises are continuous and extended.

In Canada, regulations in force to protect marine mammals during noisy maritime work include, among others, seasonal restrictions such that during sensitive periods of marine mammal vital cycle (reproduction, calving, etc.) all noisy work is forbidden. Besides those periods, a visual monitoring of marine mammals is generally required inside an exclusion area where all noisy work has to be interrupted for a minimum of 30 minutes as soon as marine mammals are observed. To determine the extent of this monitoring and exclusion area, a physiological effect threshold of 180 dB re 1 µPargs for cetaceans and of 190 dB re 1 µPargs for pinnipeds is used in general. That means that work likely to generate sound pressures above these thresholds must be interrupted as soon as marine mammals are observed within the monitoring radius established around the work-site. Depending on the intensity and source of the sound and on attenuation parameters of the environment where work is realized, this monitoring radius can vary from approximately 50 m to more than 1 km. Remember that sound moves approximately 15 times faster in water than in the air and that it propagates much further. The attenuation of sound according to the distance depends on many factors, such as reflectivity of the bottom and surface, refraction due to water density variations (salinity, thermocline, etc.), and diffraction by particles in suspension like plankton and air bubbles.

Whether in the St. Lawrence River system or in Northern Quebec (Deception Bay, Nunavik), performed measures during our monitoring work confirmed that submarine background sound is particularly tainted by the sea state and by anthropic activities, notably those related to navigation and port activities. For example, sound pressures measured in the St. Lawrence Gulf under high water conditions in November and December 2010 reached values as high as 165 dB re 1 µPargs. In addition, sound levels reaching 143 to 155 dB re 1 µPargs were recorded from ships. The more favorable meteorological conditions that prevailed at the same location in June 2011 allowed us to determine that the background sound within a pressure bracket of 70 to 119 dB re 1 µPargs during calm water periods reached up to 158 dB re 1 µPargs during turbulent water periods. Sound level pressure generated by port activities, measured at a distance of approximately 1 km, has been established between 68 and 140 dB re 1 µPargs.

In comparison, background sound measured in July 2012 in Deception Bay (Nunavik) varied from 102,15 dB re 1 µPargs during calm weather and when no activity in undertaken in the port up to 126,81 dB re 1 µPargs during
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esa.org/am/

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American Fisheries Society Annual Meeting
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afs2014.org

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Offshore Northern Seas
Stavanger, Norway
onso.no/2014/

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the unloading of an oil tanker anchored at about 100 m from measuring instruments.

Measures obtained in April 2012 in the vicinity of the St. Lawrence Estuary worksite (pile driving) recorded sound pressures varying from 126 dB re 1 µParsms at a distance of 1,200 m up to more than 159 dB re 1 µParsms at a distance of 112 m. Based on recorded measures offshore the worksite, attenuation curves determined in the studied area allowed us to estimate the maximum sound pressure at 210,53 dB re 1 µParsms at 1 m from the source, which is generated by pile driving and sheeting work.

Even though measures confirm that coastal work can provoke sound damages to marine mammals, the current monitoring approach, which relies essentially on visual observation of marine mammals, can be the source of annoyances and major schedule delays in the construction of marine infrastructures. These delays are notably caused by the fact that work is not authorized during periods when marine mammal observation is limited by obscurity, fog, or sea state (high wave conditions). Thus, work interruptions are frequent. Visual monitoring of marine mammals also imposes an interruption of construction work as soon as specimens are observed in the monitored area. However, even under the most optimal conditions, visual monitoring does not represent a guarantee of the absence of marine mammals in the exclusion zone, since only the ones close to the surface can be detected. A specimen can, thus, considerably penetrate into the monitoring zone before being noticed.

For those reasons, WSP offers the possibility to measure sound generated by work on a continuous basis, while ensuring the monitoring of marine mammals with a sonar and hydrophones in complement to visual monitoring. This approach can help substantially reduce the length of construction work, since sonar and hydrophones can detect marine mammals at all times, making it possible to continue work during the night and in foggy conditions. The use of sonar and hydrophones also facilitated the detection and location of submerged marine mammals, thus eliminating the main limitation to visual monitoring. Marine mammals can also be detected underwater, both day and night, during good weather as much as in foggy conditions, with calm or turbulent waters. In addition, with the monitoring of marine mammal motions being more precise, work can start again as soon as observed specimens are out of the
monitoring zone rather than after a given length of time following the last observation (i.e., 30 minutes). Such an adjustment to the monitoring approach contributes considerably to reducing the length of work in marine environment because they can be performed night and day and they are not subjected to interruptions related to visual conditions.

In complement to electronic monitoring of marine mammals, continuous measurement of sound pressures generated by submarine work also brings certain advantages. This way, when sound pressures are under the safety thresholds established to protect marine mammals, work is not always interrupted as animals come closer. It is possible to modulate the radius of the exclusion zone in compliance with measured sound pressures, distance from marine mammals, and the site’s sound attenuation parameters. This way, when sound pressures generated by work decrease, marine mammals can be accepted at a shorter distance from worksite and the safety zone can be expanded as sound intensity increases. Furthermore, the possibility to modulate the operation of field equipment and limit the emission of potentially disturbing sounds as needed can reduce the necessity to interrupt work or to use complementary attenuation measures such as bubble screens. This combination of work surveillance approaches procures more flexibility in the realization of work while objectively enhancing the safety of marine mammals exposed to submarine sounds. Finally, the possibility to considerably reduce the length of work proportionally decreases the period of exposition of marine mammals to underwater noises.

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MARINE ACOUSTIC ENVIRONMENT REQUIRES BROAD EXPERTISE

By: Michele B Halvorsen, Ph.D.
CSA Ocean Sciences Inc.
In any coastal or offshore operation, managing risk to sensitive species as well as to operational success will likely involve the assessment of noise in the marine environment. The quality of data, assessment, and mitigation will directly affect decision making when it comes to regulation, operations, species protection, and resource access. The marine acoustic environment is complex and requires a broad scope of expertise to adequately evaluate and minimize risk. In response to this need for expertise, a new alliance has been established between three leaders in the marine acoustics and biota community. The Ocean Sound Solutions (OSS) strategic teaming alliance has brought together CSA Ocean Sciences Inc. (CSA), Marine Acoustics, Inc. (MAI), and Southall Environmental Associates, Inc. (SEA, Inc.) under one all-inclusive umbrella to help address ocean noise issues by leveraging the expert capabilities of each company. The strength of the team is the comprehensive acoustic and marine expertise of each entity that would otherwise be absent with any single member. Yet, each is still able to work and act autonomously.

CSA leads the OSS alliance through its established Ocean Sound & Marine Mammals business line. CSA brings experience and a long-standing reputation as a superior, marine environmental consulting firm that specializes in multidisciplinary projects concerning potential environmental impacts around the globe. CSA’s programmatic approach provides objective information that maintains an appreciation for the environmental, legal, and political sensitivities integral to most projects. Studies have been conducted internationally for more than 500 clients, including engineering firms; port authorities; dredging, oil and gas, utility, and telecommunication industries; and local, state, federal, and international government agencies. CSA’s corporate reputation subsists of reliable technical performance, unbiased analyses, and scientific integrity. The development and use of new technologies enhances CSA’s ability to produce unique, cost-effective, and scientifically valid solutions to the challenges faced in ocean noise issues.

MAI is a specialty engineering firm that provides state-of-the-art scientific, engineering, management, and technical services in support of environmental and undersea research and development programs. MAI’s areas of expertise include underwater and terrestrial acoustic research, bio-acoustics, marine biology, environmental compliance, and underwater and in-air acoustic modeling. MAI serves as the primary test and at-sea evaluation agent for a number of the U.S. Navy’s key development programs for surface, submarine, and air ASW systems. MAI has also played a major role in the Navy’s research program with regard to whale behavioral research and acoustic environmental issues. Since 1996, MAI has been at the forefront of environmental noise issues in the ocean, helping design and implement experimental plans to investigate these issues as well as formulate new national standards in this rapidly emerging field. Considered a foremost authority in the field, MAI has developed computer models, such as AIM®, to assess the impact of sound from a variety of sources on marine wildlife populations. Based on its expertise and experience in supporting many federal agencies (including the Bureau of Ocean Energy Management [BOEM], the National Marine Fisheries Service [NMFS], and the U.S. Navy), its first-hand knowledge of the existing modeling and take estimates prepared for both public and private sectors, and a long history of a successful working relationship with CSA, MAI has been the key alliance member that allows OSS to be complete in the services and consultancy offered by OSS.

SEA, Inc. is an international company that delivers science to support conservation management and environmentally responsible business decisions. Marine mammals are often the dominating force driving ocean sound regulations and management. As such, there is arguably no entity better qualified for evaluating marine mammals and sound than Brandon Southhall of SEA, Inc. The work of SEA, Inc. is directly relevant to many global issues affecting the oceans. In addition to designing and conducting scientific work upon which important decisions can be based, SEA, Inc. provides this information directly to decision-makers, educators, and the general public in compelling and meaningful ways.
Subsea Connectors In The Marine Renewable Energy Sector

By: David Pye, Renewable Energy Business Development Manager, SEA CON®

Presently, the Marine Renewable Energy (MRE) sector (both Wave and Tidal) is moving toward the deployment of the first arrays or “farms” of generators, having proven the basic design concepts with prototypes. Many of the problems of deployment will have been encountered during these initial installation processes, but the solutions will probably not be cost-effective for use on arrays. For instance, in a lot of cases the export cable at the test site will have been “hard-wired” to the generator using a field-installable splice or a low-cost connector.
This method is quite acceptable for deployments that are only intended to last for around 12 months and no retrievals are planned for routine maintenance. However, with longer-term deployments and multi-generator installations, retrieval of the cable and splice to the surface for disconnection is, in most cases, not an option for a number of reasons:

- Vessel time is very expensive and a specialist vessel may be required for this operation;
- The export cable would be disturbed with every retrieval and would have to be protected when returned to the seabed;
- Extra cable length would be required to facilitate its removal to the surface. This is normally estimated as being 2 X water depth (i.e., 100 m length in a depth of 50 m). This extra cable length is also a significant additional cost;
- With the extended time required for this operation comes the additional problem of weather windows, which, when taken in addition to the already restrictive slack-water periods, can greatly extend time on site.

In short, the costs of installation and maintenance are presently far too high to begin bringing the MRE industry towards a cost of energy that will match that of other sectors. If MRE is to be financially viable, a cost-effective solution to installation and maintenance by the introduction of new and innovative methods and products is essential.

Some Misconceptions Regarding Available Connector Products

In the very early days of this industry, it was often thought that there were already proven connector products available from the Oil & Gas industry. This was correct in that there were a number of companies producing products that had long and successful track-records of deployment in Oil & Gas and also in Military and Oceanographic applications. The truth of the matter is, however, very different. Most recent Oil & Gas applications are in deepwater, typically 500 to 3,000 m. In these environments, the only real problem is the presence of high ambient pressures, and these can be controlled by pressure compensation. The environment at these depths is somewhat lacking in oxygen and no really significant currents exist to refresh the supply, so the impact of marine growth and corrosion is not too severe. Also, the temperature is very stable at around 4°C, which also serves to reduce these problems.

The methods of physical connection and hook-up available in the Oil & Gas sector include both ROV intervention and the use of automatic connection via “stab-plates.” For the MRE sector, it is virtually impossible to use ROVs other than for observation due to the severe currents and short slack-water periods that exist in the areas of deployment. This means that if we are to discount retrieval of the cable to the surface for disconnection, we are left with only one option — the incorporation of an automatic connection system. Furthermore, the existing connector products were unsuited to the environment in shallow, warmer waters by virtue of their construction, materials in particular, and expensive cost. Thus, we have a situation where the ideal product for use in the MRE sector has to have superior long-term performance as well as being far cheaper — quite a tall order!

The Ideal Product

The features that the ideal product should exhibit include the following:

- Simplicity of design;
- Simplicity of operation;
- Long life without maintenance or deterioration of structure or reduction in electrical/optical properties;
- Protection of exposed components, particularly when un-mated;
- Field-installable at remote sites;
- Economically priced, bearing in mind the above requirements; and
- Good availability and after-sales support.

Experiences with prototype generators have proven that the ideal product does not yet exist. Existing products will meet a number of the above requirements, but by no means all. It is, therefore, the task of the subsea connector industry to come up with innovative designs that will come as near as possible to meeting these without compromising one of the most important, price!
Present Methods of Connection
As indicated above, there are two main methods of connection — on the surface or underwater. These require two very different types of connector, dry- or wet-mateable, both of which have their own particular advantages and disadvantages.

A dry mate connector is by far the less complex of the two types and, thus, the cheapest by a factor of at least three when compared to a wet-mate. It would seem, then, sensible to use this product where possible. However, as described above, the need to raise the connector to the surface for mating or de-mating has many disadvantages in the time required and cable disturbance. Overall, the reduced cost is far outweighed by these disadvantages, and an evaluation of these will normally indicate that this is not the cheapest option overall. The main advantage of the use of dry-mates is that they are mated in a benign environment and seals can be tested before deployment. Wet-mates are, therefore, far more expensive to purchase, but will return significant cost-savings down-line. Wet-mates require connection to be undertaken subsea, and the procedures for this have to be devised. Systems using stab plates are the most viable, and a number of designs have been trialled already by the industry. The stab-plate is provided with features that allow certain misalignments to be accommodated during the mating phase.

The existing connector designs provide protection to the contacts when mated, and some even provide this automatically when un-mated. However, they are still lacking in some respects in terms of meeting the requirements of the extreme conditions.

Normal Connector Requirements for MRE
There are normally up to three separate connections to be made when hooking-up a generator: Medium Voltage/High Power (6.6kV and up to 150 amps), Low Voltage (24V, 5 to 10 amps), and Fiber Optic (anything from 2 to 12 optics). At present, there are connector options available for all of these requirements from other market sectors. The simultaneous mating of multiple connectors is provided by the incorporation of these into a stab-plate assembly, but any reduction in the number of connectors will vary significantly, reducing the complexity of the design and overall cost of the assembly. It is, therefore, worth considering the production of hybrid connectors that will contain more than one element in the one housing.

Design Features of the SEA CON® Hybrid
Any new design should incorporate as many proven features as possible while ensuring that the resulting product is innovative. To this end, it is the intention to utilize electrical contacts from a long established range of connectors as well as an optical element that operates on proven principles but is reduced in size. To meet as many of the requirements in terms of electrical and optical capacity, the operating voltage is set at 6.6kV(u), current at 250 amps (4 pins), and with 4 optical circuits. This will allow the product to be used on generators of up to 1 MW with ease or 2.5 MW maximum.

Great emphasis is placed on making the resulting connector as suitable as possible for long-term operation in shallow water (up to 100 m), and the design will utilize the most appropriate materials for the application. Not only will this product reduce the size and complexity of any connection system, it will also come at a significantly reduced cost.

Test Standards and Design Requirements
Many test standards exist both in the general electrical sector (IEC standards) and for subsea connectors for Oil & Gas applications (STATOIL specifications, for instance). While these are useful in establishing some test parameters, they do not cover the sector-specific requirements of MRE. It would be very useful to set up a joint industry project to set out the basic requirements for testing, even to the extent of producing an industry-accepted specification.

The connector design could also be considered for a degree of standardization, not in terms of how it actually works as this would limit innovation, but by specifying certain parameters such as depth rating, service life, maintenance periods, power capacity (typical voltages and currents), mating forces, misalignment tolerances, and more. The establishment of these factors as well as test requirements would go a long way to helping the connector industry produce products that are fit for purpose at the best possible cost.

Conclusions
A decision has to be made by any developer as to the merits of increased capital expenditure weighed against reduced operating costs — this is common to most emerging industries. However, increased capital cost would not be wisely spent on un-proven products. The device developers and the connector industry should be seriously considering working closely together to ensure that any product offered is “fit for purpose.”
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LAND CONSERVATION EFFORTS PROTECT SEA TURTLES

By: Lauren Lipuma, Conservation Outreach Coordinator, Osa Conservation.
Sea turtles sprang into existence from a unique evolutionary line going back over 100 million years. They even outlived the extinction event that wiped out the dinosaurs 65 million years ago — but they may not outlive us. Their populations have been rapidly declining over the last few decades, and today experts estimate that fewer than one sea turtle in a thousand survives to adulthood. While sea turtles spend over 90% of their lives at sea, that small percentage of their time spent ashore provides a unique opportunity for humanity to ensure their survival. On Costa Rica’s Osa Peninsula, local conservationists have found a way to protect sea turtle populations from imminent extinction — on land rather than at sea — and shown us a valuable model for marine conservation worldwide.
In the remote southwest corner of Costa Rica lies the Osa Peninsula, a small pocket of lush tropical rainforest jutting out into the Pacific Ocean. “It’s a special part of Costa Rica and a special part of Central America,” explains Dr. Adrian Forsyth, a renowned tropical biologist and veteran conservationist. “It’s one of the few places where you can enjoy the richness of the tropics in a very concentrated area and where you have beautiful primary forest that runs right down to the surf.”

Contained within an area of just over 700 sq. mi, the Osa is a true natural jewel — harboring roughly 2.5% of all the species found on the planet in less than a thousandth of a percent of its total surface area. Its biodiversity is so astounding that National Geographic once referred to it as “the most biologically intense place on earth.”

Lack of road access and land unsuitable for farming kept the Osa largely untouched for most of its history and shielded from the eyes of developers hungry for its pristine beaches. As much of the peninsula is protected within Corcovado National Park, its coastline remains largely intact and life goes on in most of the peninsula as it has for thousands of years. Yet despite these protections, threats have still begun to emerge. To manage these threats, Dr. Forsyth founded Osa Conservation (OC) in 2003 with a long-time colleague, Costa Rican Manuel Ramírez.

Forsyth and Ramírez instantly recognized that humanity did not have the luxury of losing 2.5% of the world’s biodiversity — and sought to do something about it. “We were landowners here,” explains Ramírez, who now serves as the organization’s executive director. “We were worried that at that time there was a lot of mismanagement of natural resources [on the Osa]. Hunting and poaching were on the rise, and there were many ill-conceived development projects coming to the Osa. We thought that if we put our land together, that land would become an island in a sea of development.”

Now, over 10 years later, Osa Conservation has grown from those two founders and their small properties to an organization that manages and protects over 6,000 acres of land on and around the peninsula, including 18 km of critical nesting beach for vulnerable sea turtles.

Full-grown sea turtles fall prey to few natural predators — in the water, their hard, armor-like shells render them immune to attack from virtually everything, sharks being a notable exception. However, during that short time spent on land — when mothers lay eggs and the new hatchlings scuttle down to the sea — they are nearly defenseless. A nesting female uses her giant fins to slowly propel herself onto the beach at high tide to lay her eggs under cover of darkness. After digging a hole, dropping the eggs in, and covering them with sand, the mothers return to the sea, entrusting the survival of the clutch to nature. Roughly 2 months later, the tiny hatchlings are ready to emerge. They crack their way out of the shell using an egg tooth, or caruncle, and they climb up to the surface of the sand through a combined effort, acclimatizing to their new environment. Here, they wait until nightfall when there is less chance of being eaten by a passing animal to slowly propel themselves to the ocean, using the downward slope of the beach and the moonlight reflected by the waves as a guide. This is possibly the most dangerous time of a sea turtle’s life, but it is an important obstacle for them to overcome if they are to survive in the wild. A multitude of predators are drawn to the turtles during this time — crabs, birds, raccoons, and others snatch up the tiny hatchlings — the perfect nutritious meal. The hatchlings haphazardly scurry down the beach, dodging as many predators as they can, until the waves wash them out to sea. Thus, begins what’s referred to as the “lost years” — the years of childhood that the turtles spend in deepwater, their whereabouts and activities unknown. After about a decade, they return to coastal waters as adolescents and forage for food among coral reefs and seagrass beds. Only the females will set
fin on land again, when they return to the beaches to nest, often the same beach from which they hatched.

While sea turtles have evolved over millions of years to escape these natural challenges, one thing they can’t escape from is us. Six of the seven sea turtle species are threatened or endangered due to human activities on land and at sea. Massive coastal development has destroyed or polluted many nesting beaches, and the artificial lights of buildings and resorts confuse baby turtles during their journey to the ocean, stranding them on many a beachgoer’s doorstep. Nests are poached for the valuable eggs, which are a considered a delicacy in many tropical countries, and nesting mothers are killed for their meat. In the open ocean, grown turtles make up a large percentage of by-catch from commercial fisheries. The large creatures become hooked or entangled in longline fishing nets or caught in shrimp trawls, leading to injury and often death. Leatherbacks often mistake plastic bags for jellyfish — their only source of sustenance — and ingest them, to their demise. And young turtles swallow bits of plastic debris as they head to the depths of the ocean, unaware of the danger it poses to their gastrointestinal systems.

“This is something sea turtles have not learned to adapt to and possibly never will,” says Lindsay Metz, marine biologist and long-term volunteer with Osa Conservation’s sea turtle conservation program. “Humans are the main reason for their population declines, but possibly the only hope for their existence in the future as well.”

Sea turtles play an important role in marine ecosystems, controlling the health of coral reefs and seagrass beds, both directly and indirectly. “Just like any healthy ecosystem, if any of the layers collapse, the whole ecosystem
Green sea turtles are herbivorous, so in the primary layer they eat a lot of algae, creating space for other organisms to live. If Greens went extinct, a serious algae bloom would occur and wipe out many other animals, even some top predators. Olive Ridley’s prey on crustaceans (which eat algae), so they’re more a secondary layer in an ecosystem, but if they went extinct, again, everything would follow and collapse,” explains Metz.

For humans, it’s difficult to ensure the health of a marine ecosystem — we have far more control over the land than over the sea — but conserving sea turtles during their short time on land provides a unique opportunity to influence the health of large and complex marine systems, lengthening the reach of traditional land conservation models.

Osa Conservation began its sea turtle conservation program nearly a decade ago, working to guarantee the health and ecological success of the Osa’s sea turtles by integrating protection with research and educational outreach. The program monitors the nesting, predation rates, and hatchling success of the turtles who visit Osa’s beaches — mostly Olive Ridley and Pacific Greens, with occasional visits from Hawksbills and Leatherbacks.

Dedicated staff and volunteers conduct nightly beach patrols, looking for nesting mothers (the tracks made by their large fins) and vulnerable nests. Nesting mothers are tagged and tracked over time to see if they return to the same beach multiple times and over multiple years. “If everything goes as nature has planned, then the mother turtle should return to the same beach where she hatched,” explains Metz. Turtles can sense magnetic cues to their location after about 10 days of development in the egg. “Mothers know they survived hatching on that beach years ago, so their instincts will guide them back to that same beach to hope for the same fate for their babies,” Metz explains.

Nesting mothers often choose to lay eggs near the mouth of the nearby Piro River; as the river changes course, it can wipe out vulnerable nests, so staff relocate the nests to a hatchery where they remain undisturbed.
until the turtles hatch. “We move the eggs, we take some sand from the original nest, we simulate a nest as close to the mother’s as possible (measuring depth and width), and we monitor the temperature until the nest hatches. Then we only release the babies very early morning or at night, when they are less visible to predators,” explains Metz. Staff, volunteers, and visitors bring the hatchlings to a spot of open beach, set them down on the sand, and stand guard until the last turtle has made its way to the ocean. Last year alone, OC’s team relocated 52 nests, releasing over 5,000 hatchlings into the ocean.

Osa Conservation’s sea turtle program owes much of its success to a young Osa resident named Manuel Sánchez, who grew up just feet from OC’s Piro Biological Research Station. Enchanted by sea turtles since he was a young boy, Sánchez began working in turtle conservation at the age of 13.

Sánchez first began doing turtle patrols with WIDECAST, a network of biologists, educators, and community leaders dedicated to managing depleted sea turtle populations worldwide. “I began working with them because, at the time, it was the only organization that offered me what I wanted to do — to see sea turtles every day,” he explains. Later, Sánchez joined the team at Osa Conservation, who had begun their program right next to his father’s farm. Although he worked with other animals in the Osa, his boyhood passion for sea turtles remained. “Although it is very hard work — waking up very early to patrol the beaches — I love watching mother turtles leave the sea to lay eggs and then return.”
Now, Sánchez coordinates the entire sea turtle program — from collecting data, patrolling beaches, and maintaining the hatchery to organizing the volunteers and tourists that come to release hatchlings. “Looking into their faces...I can’t describe it. After seeing my first turtle, I knew I loved them, and my dream is to be able to help them survive for as long as I can.”

Lindsay Metz also describes the feeling of incredulity she gets when releasing hatchlings into the sea. “It’s my favorite part of the job,” she says. “The thing I look forward to most is walking to the hatchery and hoping that those cute little baby turtles hatched. My favorite experience of all time was when we had over 400 baby turtles hatch on the same day — so we went out at night to release them. That night, the bioluminescence was so amazingly bright and when the first baby turtle made it to the tide, a bunch of bioluminescent bacteria was stuck on its nose.”

Osa’s small population, minimal pollution, and limited offshore fishing has kept its turtle populations better off than in other regions of the world, even in other parts of Costa Rica. In the northern province of Guanacaste on the Nicoya Peninsula, massive development projects, including all-inclusive resorts, golf courses, and marinas, have ravaged the coastline. Much of the wildlife has been depleted, and sea turtles have virtually no beach left in which to nest. Osa’s turtle populations, in contrast, remain viable, though they have also suffered in recent years and conservation is a major priority on the peninsula.

Manuel Sánchez recalls, “Many years ago when I was just a boy, almost every day I went out to walk to the beach with my father or my mother, and I could see many turtle tracks. Over the years, there has been a great change in the nesting activities of turtles here; there are fewer females who come these days, and those that do face many problems. Many get caught in fishing nets, and sometimes their fins are amputated to cut them free. There are poachers and people with pets who dig up their nests. This program makes efforts to monitor the beaches every day and every night. The presence of our teams has made an impact here — poachers do not visit these beaches as often anymore.”

Educational and community outreach is a huge part of OC’s conservation plan. “There’s no one organization in the world that can save an entire population of turtles or an entire ecosystem,” says Lindsay Metz. “The only way to do it is [to] join together with the members of the community and get everyone on board.” To that end, Osa Conservation hosts an annual Sea Turtle Festival with games and prizes, staff members travel to
local ecolodges to give presentations about sea turtle conservation, and hotel guests can even come visit the nesting beaches to do night patrols and release baby turtles. The organization relies heavily on the help of volunteers from around the world who can tell others of their experience and serve as conservation ambassadors worldwide.

Thanks to Osa Conservation’s efforts, monitoring data show that populations of Olive Ridley and Pacific Green turtles are remaining healthy in this tiny corner of the world. Nesting mothers are returning to the beaches here year after year — a good indicator of population health — and the hatchery has given thousands of turtles a better shot at surviving than they would have had otherwise. Over the past three nesting seasons, Osa Conservation’s program has counted over 45,000 hatchlings, and poaching is on the decline. Successes here can also serve as a model for larger, more populated regions with more endangered turtle populations.

While land-based conservation efforts for sea turtles have had a positive impact on the health of marine life, efforts must be extended to the sea if these ecosystems are to survive in the long term. Just like human bodies, the world is composed of 70% water, so to focus conservation efforts on only land is to lose two-thirds of the battle.

“Costa Ricans are land-oriented,” explains Álvaro Ugalde, co-founder of Costa Rica’s national parks system. “The incredible resources of the ocean that we have — we haven’t even started. The 21st century should be the century for marine areas. The crisis of the oceans of the planet is becoming such a staggering dilemma, that I hope every country will do better.”
Seafood – From Boat to Plate: A Cornerstone Industry of the Gulf of Mexico

By: Quenton Dokken, Ph.D., President, Gulf of Mexico Foundation, Inc.
The sights, sounds, and aromas of the 2014 Seafood Expo North America were amazing! Seafood products from all around the world were on display with samples of unique seafood dishes at the many booths. The Boston Convention Center was the site of this seafood extravaganza, where the overwhelming impression was one of commerce — deals were being made; new processing technology bought and sold; and dollars, euros, yen, pesos, etc. were moved around the world. The Seafood Expo showcased a global industry based on living natural resources. As I explored the exhibits, two words appeared in the signage repeatedly: “quality” and “sustainability.” The quality of seafood is largely an outcome of harvest and processing technology and strategies. Sustainability is based on habitat and resource management. Entwined in both quality and sustainability is the profit motive. Jobs, business robustness, and stock prices are all tied to profit.
I was first exposed to seafood commerce in 1980, when I convinced my wife and my banker to let me buy a small bay shrimp boat. Two years later, they both decided it was time for the boat to go. Apparently, being a graduate student in marine science did not translate into being a good shrimper, but I did have a boat load of fun! My second exposure to seafood commerce was at the Tokyo fish market in 1989, where seemingly, anything from the ocean — from jellyfish to whale meat and everything in between, whatever your culinary preference — was sold. Fishing boats from around the world offloaded fresh catch every day. Local and international buyers kept the product moving out of the market place to the consumer, and the consumer demand was (and still is) insatiable.

Sustainability and Quality
The advancement of harvest and processing technologies is rapid. Engineers, scientists, and fishers are pushing the envelope, and added value technology is increasing the diversity of seafood offered to the consumer. Packaging and transportation advancements make it possible to ship “fresh” seafood around the world. Quality has never been better.

Sustainability is another matter. The sustainability of living resources depends on reproductive success and subsequent growth to reproductive maturity. The source population must be great enough at each spawning season to produce excess offspring to be harvested. For this to happen, the environmental quality must be adequate to support both reproduction and growth. And perhaps most difficult, harvest pressure must be controlled in order to ensure that the reproductive potential is not diminished.

As a regional enterprise, the seafood industries of the Gulf of Mexico rank among the world’s most productive. From oysters to shrimp to snapper, grouper, and menhaden, the fisheries of the Gulf of Mexico not only serve the Gulf States, but also support a robust export industry and Gulf catches factor into global productivity.
The seafood industry depends on the commercial fishery, which starts with the fishers who harvest the product and transport it to the dock where a buyer purchases the catch and moves it onto processing and distribution. Wholesalers move the product along to the retail markets — the restaurants and seafood retailers. The dollar value of the fish increases each time it changes hands, until it reaches the final consumer: you and me. Along the way, countless businesses and jobs are supported. The seafood industry is a cornerstone of the tourism industry and the quality of life that we enjoy in the coastal zone.

The National Marine Fisheries Service (a NOAA agency) and corresponding state wildlife management agencies regulate the harvest of targeted species, both commercial and recreational. The Gulf of Mexico Fisheries Management Council works with both regulators and the regulated to set harvest limits. Seemingly forever, regulators have struggled to equitably allocate catch allowances to the commercial and recreational fisheries — a challenge that is as much political as it is economic.

As we speak, recreational fishing interests are lobbying for a greater share of the Gulf’s red snapper allocation, which would have to be taken from the commercial fishers’ allocation. Not surprising, the commercial fishers are organizing to prevent this from happening, citing the market demand for their product and the claim that recreational fishers are already overfishing their annual allowance.

Conflicts over living marine resources are inevitable and will likely grow as more people move into and visit the coastal zone to live, work, and play. Just as with the seafood industry, the economic reach of recreational fishing goes beyond the boat dock. It is a fact that the Gulf of Mexico can provide only so much; the potential harvest of living resources is finite and far below the market demand. How do we balance catch shares to produce the greatest benefit to all? This is a people management, not resource management, challenge.

The next time you cast your hook hoping to catch a big red snapper to take home or take the family to your favorite seafood restaurant for a delicious meal (such as red snapper Pontchartrain), give a little thought to all the effort that has gone into ensuring that you will find red snapper on your table tonight and for generations to come. That effort, my friend, is what it takes to achieve sustainability.
Many economically important offshore activities are required to monitor their acoustic impacts on the marine environment and the animals therein. However, issues facing industry and regulators alike include a lack of the following:

- Baseline information about marine mammal populations;
- Understanding how sound moves through the water in specific regions near animal habitats;
- Measurement criteria for how sound impacts animals; and
- Cost-effective tools to measure and mitigate for potential impacts of sound on animals.

During 2013, a seismic operation was taking place and CSA Ocean Sciences Inc. (CSA) combined technological developments to pair the needs and interests of the seismic industry to the good environmental status of the oceans. A stand-alone acoustic recording device was deployed offshore the country of Suriname for 1 year. Sound data recorded during this year-long deployment has provided valuable insight on natural noise levels and the presence of marine mammals in the region. These recordings took place prior to significant offshore development in the region. These data can be used in the future to help determine if there are changes in marine animal presence during industry operations. A low-cost, data-rich approach was required to meet the needs of the client and meet the challenges presented in this region.
The autonomous acoustic recording device was installed on Acoustic Doppler Current Profiler (ADCP) moorings that are deployed offshore Suriname to gather metocean data. These moorings are required to collect data to ensure safe development of oil and gas production fields. The mooring was deployed in 1,870 m of water with the acoustic recorder fixed 520 m below the sea surface. Using the existing mooring allowed for cost savings of all deployment, servicing, and retrieval costs in the field. Upon data retrieval, several analyses were conducted to establish background noise levels, ship traffic density, and identification of marine mammal species. This deployment had the added benefit of recording sound pressure levels and spectral data during a geophysical seismic exploration survey in the surrounding lease blocks.

The data set was processed using energy detectors to identify individual acoustic events. Different kinds of acoustic signals (tonal and impulsive) were detected throughout the deployment. The detections were then analyzed using source-specific classification algorithms to identify the source and determine the loudness of each source over time. Sperm whale clicks were present in 78% of the data set. Dolphin whistles occurred in 58% of the data set and vessel traffic in 15%. Baleen whale vocalizations were present in approximately 20% of the data set.
CASE STUDY

Massachusetts Ocean Plan Improves Review and Permitting for Hybrid Submarine Cable Project

By: Stephanie Moura and Patrick Siebenlist, SeaPlan

Introduction
Even under the best conditions, marine infrastructure projects face confused regulatory seas. For proponents and regulators alike, multiple authorizations required from multiple levels of government, the absence of incentives to coordinate information-gathering and decision-making processes, and the lack of contextual baseline information and policy guidance frequently conspire to create an inconsistent and inefficient environmental review and permitting regime.

At the national, regional, and state levels, marine spatial planning is increasingly seen as a management tool that has the potential to address these kinds of inefficiencies. Practitioners and advocates of ocean planning commonly assert that it can provide benefits, including improved regulatory efficiency, greater certainty for marine industry, increased transparency and input into government decision-making by affected stakeholders, enhanced data availability, and outcomes that minimize environmental impacts and conflicts among users of ocean space and resources. To examine these claims, we turn to a recent example from Massachusetts.

Martha’s Vineyard Hybrid Submarine Cable Project
A 2008 Massachusetts state legislative mandate required development of an ocean plan that, among other things, protects sensitive, public trust marine life and habitats and fosters sustainable ocean uses, including infrastructure necessary to maintain the economy and quality of life. Accordingly, the Massachusetts Office of Coastal Zone Management (CZM), on behalf of the Executive Office of Energy and Environmental Affairs, led an intensive data integration and stakeholder consultation process, after which the state issued a marine spatial plan for its state waters in late 2009 — the Massachusetts Ocean Management Plan (Plan). The first project to go forward under the Plan is the installation of a hybrid submarine fiber optic and electric power cable between Cape Cod and the island of Martha’s Vineyard, a collaboration between Comcast and NSTAR Electric Company; the project is currently under construction. This project offers the first opportunity to review the impact of the state ocean plan on the permitting process and compare anticipated benefits and regulatory efficiencies experienced by project proponents and regulatory agency staff.

The Plan is implemented through existing authorities, including the state-equivalent NEPA program — the Massachusetts Environmental Policy Act (MEPA) — and other relevant state regulatory programs. The Plan guides project planning and permitting not by spatial designation but by siting and performance standards that direct development away from mapped areas of high value natural resources and concentrations of existing water-dependent uses. A straightforward compatibility analysis of natural resources and human uses confirms the intuitive: different kinds of development impacts resources and other uses differently. Accordingly, the Plan’s performance standards are tailored to reflect the sensitivity of a given resource to specific uses. For cable projects whose impact profile involves ocean bottom disturbance, applicable performance standards require that installation avoid damage or cause no alteration to the following sensitive marine habitats: 1) areas of hard/complex seafloor; 2) eelgrass; and 3) inter-tidal flats. See Figure 1, which presents resource map layers.

The cable project was initiated when Comcast, represented by Power Engineers, LLC and Epsilon Associates, Inc. (Epsilon), presented a proposal to run a marine fiber
optic cable from the Massachusetts mainland to the island of Martha's Vineyard. Using the Plan for baseline data and siting guidance, pre-application meetings with CZM and other state agencies identified a preferred alternative route and a scope for confirmatory field work. Comcast contracted with CR Environmental and Epsilon to conduct reconnaissance-level marine surveys, and resulting data were included in the project's first MEPA environmental review filing, which included a request that only a single environmental impact report, rather than the typical draft and final reports, be required. That request was granted, and detailed marine surveys were performed to refine the route; results were included in the EIR. Throughout route refinement and environmental review, the project team worked closely with agency representatives at CZM to ensure compliance with the Plan. This work was recognized in 2013 when the Environmental Business Council of New England awarded the proponents, their consultants, and CZM the Nicholas Humber Environmental-Energy Award for Outstanding Collaboration.

Prior to preparation of that EIR, NSTAR, which was separately investigating a project to replace a failed electric cable and improve electric transmission capacity to Martha's Vineyard, became a co-proponent when Epsilon initiated a joint Comcast-NSTAR discussion about the possibility of co-locating the utilities in a single hybrid cable. Co-location of utilities is encouraged in the Plan. The resulting hybrid cable has a diameter of 5.5 in. and runs 4.6 mi across Vineyard Sound. Approximately 80% of the cable will be buried 4 to 6 ft below the seafloor, and horizontal directional drilling (HDD) will enable near shore placement beneath sensitive resources. Construction on the project began in November 2013 and is expected to be fully installed and in service by May of 2014. See Figure 2, which shows zoom of project location; Special, Sensitive, or Unique resources; and alternative routes.

**Observations**

To understand whether and what benefits the project proponents and regulatory agencies experienced, SeaPlan conducted interviews with the proponents' environmental consultant, Epsilon, who supported the technical design and permitting process throughout the project and staff from five agencies involved in project review, consultation, or permitting: CZM, Division of Marine Fisheries and Department of Environmental Protection (MassDEP), the Martha's Vineyard Commission, and the U.S. Army Corps of Engineers.

Typical of this kind of proposal, the Comcast/NSTAR project required a number of environmental reviews and approvals, including State MEPA review and certificate (in this case the submission of an Environmental Notification Form (ENF) and a single Environmental Impact Report (EIR)), MassDEP Chapter 91 Waterways License, MassDEP Clean Water Act Section 401 Water Quality Certificate and US Army Corps of Engineers Section 404/10 permit, Wetlands Protection Act Order of Conditions from the towns of Falmouth and Tisbury, review by the Massachusetts Board of Underwater Archaeological Resources, review by the Martha's Vineyard Commission and Cape Cod Commission, and, finally, review for consistency with the enforceable policies of the State's Coastal Zone Management Plan.

The interview results demonstrate that the Plan benefitted both commercial and regulatory interests by providing previously unavailable baseline data and management guidance that supported 1) process predictability; 2) regulatory efficiencies; and 3) an improved environmental outcome.

**Predictability:** Generally, any industry sector proposing marine infrastructure development and operation has the dual objectives of meeting regulatory requirements while
also keeping the project on schedule and within budget. For their part, agency review and permitting authorities aim to effectively execute their respective regulatory responsibilities within inherent institutional resource limits. For both parties, reducing uncertainty in project development and review is desirable.

In this case, both the proponents and the agencies reported improved predictability, as compared with pre-Plan circumstances, stemming largely from the availability of baseline data and maps that represented a coordinated agency determination about the location and relative significance of jurisdictional resources. In short, through the process of developing the Plan, authorities had already agreed on their interpretation of the data and how it would be used in the context of their individual regulatory programs. Thus, the Plan benefited all parties by providing a roadmap that constructively focused pre-application and final review on a limited set of practicable alternatives. Epsilon, the project’s environmental consultants, summarized the new permitting process with the Ocean Management Plan “as being very helpful because it defined the environmental constraints up front so we were able to take them into account early in the project design which made the design and permitting more efficient.”

In addition, Plan guidance that linear infrastructure be "bundled" within common corridors to the maximum extent feasible provided clear direction to Comcast and NSTAR, thereby facilitating co-location. Bundling the two cables yielded considerable benefits for both companies: the larger cable diameter resulted in an operational benefit to Comcast, while the project consultant estimated that NSTAR saved 18 months in avoided review and permitting time.

Regulatory efficiencies: The Plan's data and management guidance also supported significant regulatory efficiencies. Agency and proponent interviewees indicated that they benefited from the availability of and access to relevant spatial information through the Plan's interactive data portal, Massachusetts Ocean Resource Information System (MORIS). Agencies were able to request the proponents gather and provide confirmatory data from within a better defined, project-specific survey corridor rather than the typical requirement for field studies over a larger geographic area required to characterize site conditions, potential impacts, and possible alternatives. Following this process of impact avoidance also resulted in a lower mitigation fee assessed to the proponent.

MORIS also gave the proponents an improved tool for accessing existing information and understanding data gaps, enabling them to more efficiently and cost effectively design their data collection plan. Management guidance and siting performance standards clarified up front in the Plan reduced the time spent between reviewing agencies and the project proponent identifying primary and alternative cable routes. Because resource and use characterization and compatibility analyses were conducted during Plan development and those data were made accessible through MORIS, the State MEPA unit was able to scope the project for a single, rather than two-part, environmental impact review. As a result, fewer consultations were required between the project proponent and regulatory authorities during MEPA review and the permitting process, although close consultations between the proponents and CZM were helpful throughout the process.

Also noteworthy in this case was a post-permitting efficiency during the construction phase. The proponent encountered an unforeseen need for additional technology to support the HDD conduit installation and was able to quickly and effectively agree on the preferred method through consultation with the previously established agency review team. This resulted in use of the technology with fewer environmental impacts.

Overall, participants reported that the Plan advanced their respective regulatory and development interests, but comments also illustrated that new practice under the Plan required more effort by certain agencies. For example, one agency would not have typically participated in coor-

Figure 2.
ordinated interagency discussion, a process now required under the Plan. It was noted that while this required a greater investment of agency time, it provided an overall benefit to the outcome by resolving issues internally rather than leaving the project proponent to reconcile inconsistent or conflicting agency directives. A regional agency felt that more time than usual was required in pre-application meetings with the project proponents but that the formal review and approval process was streamlined as a result. The lead federal agency reported no change in practice or efficiency, which is not surprising because the Plan does not guide federal action. State agencies who typically participate in coordinated project review estimated that their review time was reduced by half.

Environmental outcomes: While construction is not yet completed, the project promises better environmental outcomes than under the previous management system. Agencies and the proponents expect direct improved outcomes to result from a cabling route and installation technologies that avoid previously identified sensitive marine resources and a final design that combines two submarine cable projects in a single construction plan and footprint. Indirectly, the project's efficient approval process for the replacement power cable decreased the duration of the use for interim alternative power sources from fossil fuel burning generators on Martha's Vineyard.

Conclusion
In summary, the experiences reported by agency staff and the project proponents' consultant involved in the Martha's Vineyard Hybrid Submarine Cable Project demonstrate that the Massachusetts Ocean Management Plan provided many of the benefits attributed to marine spatial planning. Because this was the agencies' first practical experience using the Plan, regulatory efficiencies were distributed unevenly, but participants believe that as more data are incorporated in the Plan and as agencies gain experience with the new management framework, the benefits to agencies and project proponents will increase. The findings of this case study may be useful to government agencies and project proponents elsewhere seeking to assess the rhetoric associated with marine spatial planning or who are simply interested in options for improving ocean management decision making.

About SeaPlan
Established in 2006, SeaPlan serves governments, non-government organizations, and private sector clients committed to the objective use of best available science, the informed participation of affected stakeholders, and creation of pragmatic solutions that reflect consideration of the natural and human systems in which they occur.
RTsys provides underwater solutions for noise impact studies and underwater noise monitoring that respond to the European and global underwater noise monitoring standards.

Concerns over the impact of anthropogenic noise on marine mammals and aquatic life have raised significantly since the development of marine renewable and offshore constructions. As an example, pile-driving generates one of the most intense anthropogenic underwater noise which may affect negatively the marine species.

RTsys has developed a range of versatile hydrophone systems that respond to the current needs of the market in terms of noise impact studies and underwater noise monitoring. Not only do our systems fit the present demand from industries, contractors and researchers, but they also respond to the European Marine Strategy Framework Directive 2008/56/CE. For example RTsys solutions over-respond to the German standards that concern energy and underwater noise.

RTsys’ systems are used for both mammals and fish monitoring as well as noise impact such as ships, piling, offshore constructions, seismic airguns, etc.

Our EASDA-1000 autonomous hydrophone recorders are currently deployed for the construction of offshore wind farms in Europe before and during pile-driving. EASDA-1000 recorders are deployed over periods of two or three months as they can last over several months in continuous recording without being recovered.

First, our RTsys recorders are deployed before the construction phase in order to realize a report of the background noise (i.e. ambient noise, wildlife activity, etc). EASDA-1000 recorders can be used with high frequency hydrophones that recorded noises up to 150kHz so that noise of the present wildlife in the area be monitored and identified. Raw data monitored is stored in 24bits .wav files on SDcard or USB HDD with up to 2TB storage capacity. In combination, systems can store specific information such as 63Hz and 125Hz values of one-third octave bands; temperature and pressure, salinity, etc.

After pre-study phase, EASDA-1000 are used during the construction phase to record the piling noise activity. With our systems it is possible to add or switch hydrophones and parameters on the channels regarding the mission required. During that phase the EASDA-1000 recorders are deployed with low sensitivity hydrophones in order to monitor the piling noise. Users can then calibrate the acquisition channel according to the mission type.

RTsys also proposes real-time surveillance solutions such as the BASDA14, a robust and compact WiFi buoy, that can send noise measurements reports in real-time at a distance up to 1.5km thanks to a WiFi antenna. The WiFi antenna provides access to a Web embedded Interface via any computer device so that users can visualize and monitor the noise data and information in real-time. BASDA14 allows flexible display, so that the operator can change different parameters during monitoring such as the detection threshold level; for example 160dB; then when the 160dB threshold is exceeded the system puts itself in alert and displays the signal. Long-range capabilities can be implemented such as radio link, satellite, etc.

Since the settlement of various regulations and standards such as the European Marine Framework Strategy Directive, the accuracy of the measurements is very important for the operators. Thanks to the full calibration of our systems (+/- 0.1 dB calibration), operators can be sure that the data recovered is fully exploitable.

One of the advantages of our systems is that they are versatile. With only one of our recorders, users can have multiple uses by just changing the hydrophone set-up and configuration parameters.
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Wildlife Acoustics, the worldwide provider of bioacoustics recording and analytical technology, is supplying Gardline Environmental Ltd (GEL) with its Song Meter SM2M marine bioacoustics recording units for monitoring work in the East Irish Sea.

DONG Energy’s West of Duddon Sands offshore wind farm is located in the East Irish Sea approximately 14 km off the Cumbria coast, UK. As a condition of the Marine License (consent to develop), the developer was required to “undertake measurements of the noise generated by the installation of the foundation pieces.” GEL was awarded the construction noise monitoring project with a methodology requiring the use of autonomous recording units like Wildlife Acoustics’ Song Meters.

Fixed point measurements were obtained using seabed-moored Wildlife Acoustics Song Meter SM2M recorders. The Song Meters provided monitoring of any noise level changes for the complete duration of the piling activity, recording data before, during, and after each piling event and covering soft start (where the hammer energy is increased over time) and background noise levels during periods of inactivity.

The recorders used two channels: a hydrophone with reduced sensitivity for high sound pressure levels applications such as piling activities and a standard hydrophone suitable for background noise measurements. The units were deployed prior to the commencement of each piling event and recovered shortly afterwards with a maximum deployment duration of 13 hrs and average 7 hrs per measurement, utilizing a continuous recording duty cycle.

This project was the first to utilize the dual-sensitivity hydrophones on the Song Meter SM2M globally. The units have been used on other UK offshore wind farm sites and will be shipped to New Zealand this spring for seismic survey noise measurement work.

For more information, visit www.wildlifeacoustics.com.

James Fisher Marine Services Purchases Supcat (SMV 24)

James Fisher Marine Services (JFMS) has purchased the first Supacat Multi-purpose Vessel 24 (SMV 24).

With an overall length of 25.7 m, the SMV 24 is powered by two MAN V12 diesel engines providing a maximum speed of 30 knts and fully loaded range of 675 nmi. The vessel is capable of carrying three standard ISO 20ft containers with 30T load, providing extensive and versatile deck space for equipment such as ROVs, specialist diving equipment, accommodation modules, ship to turbine (STT) oil change service and offshore facility maintenance equipment.

With optional SOLAS A60 accommodation modules for 12 passengers and permanent accommodation for crew, the DNV1A1 Wind Farm Service Code R1 classed SMV 24 offers a solution for servicing sites that are 150 nmi offshore for continuous trips of up to one week’s duration.

For more, visit www.supacat.com.
MacArtney has introduced a new, versatile data acquisition system. Based on a rugged, yet extremely flexible remotely operated towed vehicle, the FLEXUS is a versatile and user-friendly system suitable for a multitude of oceanographic, monitoring, and survey applications.

Like the MacArtney TRIAXUS and FOCUS-2 ROTV systems, the FLEXUS is based on a towed vehicle featuring a broad range of innovative features and benefits. The FLEXUS vehicle is suitable for effective and detailed mapping of physical and chemical parameters in the water column. The vehicle can be controlled vertically with an operational envelope of 0 to 200 m and is able to operate at a tow speed of up to 10 kts and with a vertical speed of up to 1 m/s.

The FLEXUS is able to carry out a broad variety of scientific monitoring tasks and can be reconfigured for new applications. CTD packages, transmissometers, flourmeters, and sensors for PAR, turbidity, and dissolved oxygen are among the oceanographic equipment mountable on board the FLEXUS vehicle. The system may also be equipped with traditional survey sensors, including side-scan sonars.

The NEXUS MK E electric multiplexer is the backbone of the FLEXUS system, allowing it to be used with existing marine winch and cable solutions. It is fully deployable from small-sized vessels. Featuring multiple channels and connectivity options on the subsea multiplexer unit, the NEXUS MK E allows FLEXUS operators to combine systems and sensors to perform an extensive range of operations.

The NEXUS MK E can be dismounted for use with other oceanographic platforms, including CTDs, landers, corers, drop camera systems, and custom bottom tow sledges. Cross-application flexibility makes the NEXUS-enabled FLEXUS a competitive choice as an all-round, cost-effective monitoring and data acquisition tool.

For more information, visit macartney.com.

Ocean Sonics Launches New Smart Hydrophone Products

Ocean Sonics Ltd. launched two new icListen Smart Hydrophone products at Oceanology International: the icListen AF (audio frequency) and the icListen HF-X2 used for pile driving.

The new icListen AF extends the low frequency, ultra low noise performance of the respected icListen LF from 1 Hz to 12 kHz. It comes with all the features of the icListen HF, including spectral processing, event detection, PPS synchronization, and the powerful Webservers available on the Ethernet interface. AF applications include marine mammal observation, earthquake/tsunami monitoring, and shipping noise measurement.

The new icListen HF-X2 records high intensity sounds and is ideally suited to monitor pile driving, construction noise and explosions. The X2 offers all the same features of the standard icListen HF but with its reduced analog input gain, it records peak sound levels greater than 210 dB re.uPa without clipping or saturating. Users can employ the Event Detection feature to ensure that loud events are recorded or to send an event message when a preset sound level is exceeded.

For more information on these and other innovative Smart Hydrophone products, visit oceansonics.com.
Over the last couple of months a number of vessels have had their rudders coated with Ecoshield. These include a tanker, a ferry, two container vessels and several car carriers. The applications will protect the rudders against cavitation and corrosion damage for the remainder of the vessels’ service lives.

All of them experienced the same problem: severe cavitation damage on the rudders of their vessels coated with conventional coatings. The returning customers had seen firsthand that Ecoshield solved the problem on their other rudders and wanted the same protection for the rest of their fleet. The new ones saw the excellent result obtained by other owners.

Ecoshield’s overcoating time can be as short as three hours: for smaller surfaces such as rudders or bow thrusters the two coats required can usually be applied in one single day.

For more information, visit ecospeed.be.
Unique System FZE Launches Cygnus DIVE MK2 in Middle East

Unique System FZE, a Unique Maritime Group company, has introduced the new DIVE MK2 underwater gauge from Cygnus Instruments in the Middle East.

The new DIVE MK2 underwater gauge comes has a super bright AMOLED display, updated topside and reporting software, and the introduction of twin crystal probes to assist in taking measurements on highly attenuated materials such as cast iron, measuring link thickness of anchor chains, and on particularly heavily corroded steel. The large, bright color AMOLED display is easily viewable by both the diver and his camera, even in the poorest visibility. The operation of the gauge is simple with only two buttons for easy navigation of the menus.

A completely new feature is the added flexibility of single echo mode where twin crystal probes can be used. This feature is useful on uncoated surfaces that have extreme front face and back wall corrosion, making measurements in multiple echo mode difficult to achieve. Having the capability of using DIVE in single echo mode means twin crystal probes can be used. In some measuring situations, this can offer advantages where there are no protective coatings as this technique will not ignore coatings. Heavy corrosion as sometimes found on sea defenses and harbor pilings can be challenging in order to obtain measurements in multiple echo modes. It is also useful for attenuative materials such as cast iron found in water and sewage outfall pipes and round bar such as anchor chain links.

Key Features
- Wrist mountable, giving the diver a free hand.
- Large, bright color AMOLED display, highly viewable by diver and camera, even in poor visibility.
- It is multiple echo, which means there is no need to remove protective coatings up to 20 mm thickness. It also has a single echo option.
- Scan display.
- Auto-Log Data Log option, no log button to press — stores up to 5,000 measurements with A scans.
- Helmet View remote display for mounting on the diver’s helmet for use in extremely low visibility of water.

For more information, visit www.uniquegroup.com.

New CTruk OWSV Design Tailored to Work Further Offshore

While debate continues about the most efficient way to serve offshore wind installations further out to sea, CTruk has been quietly forging ahead with a new OWSV designed to safely deal with rougher seas, longer transits and tougher assignments while not neglecting the comfort of passengers and crew.

Based on a proven workboat design concept, the CTruk EVOC22 is a 22m composite twin-hull with 7.5m beam and 1.25m draft. This innovative workboat will have a 20 ton flexible payload capability and the ability to carry 24,000 litres of fuel, an invaluable function in servicing round 3 zones. CTruk’s patented moveable wheelhouse and flexible deck pod system will allow the vessel to fulfil multiple roles; potentially transferring 12 technicians in ultimate comfort one day and removing its passenger pod to make use of 72m² of deck space for equipment transfer the next, carrying cranes, transfer systems and amphibious rescue vehicles such as the CTruk Avenger.

Designed and built to Bureau Veritas (BV) classification rules, the vessel will join offshore wind solutions provider CWind’s charter fleet, where the increased capacity of this larger OWSV is eagerly awaited.

For more information, visit www.ctruck.com.
MacArtney and Teledyne ODI Join Forces for MEUST Underwater Infrastructure Challenge

In partnership with Teledyne ODI, MacArtney France will provide the underwater mateable connectors needed to realize the Mediterranean Eurocentre for Underwater Sciences and Technologies (MEUST) neutrino observatory project.

About MEUST
The MEUST project is a second-generation, deep-sea neutrino observatory infrastructure project integrated in the European network of neutrino telescope KM3NeT and deep-sea observatory EMSO. This new infrastructure is the km3 scale successor of the revolutionary ANTARES underwater neutrino telescope for which MacArtney supplied all the cables and connectors. The MEUST infrastructure will be installed in the Mediterranean Sea approximately 45 km off Toulon, France at 2,500 m water depth.

Detecting the Undetectable
The neutrino is the most elusive of the elementary particles and, as they travel almost unimpeded through all matter, observable collisions with atoms are rare. However, because trillions of neutrinos pass through the earth every second, there are sufficient impact flashes to be detected by an array of sensors. These flashes can only be detected if all light sources are filtered out; therefore, the absolute darkness at 2,500 m depth is the best place to observe them.

The present phase of the project is bound for installation in 2014 and includes the main cable and one node onto which the first lines will be connected soon after. The seafloor connectivity infrastructure needs to provide power and transmit data between instrumented mooring lines and shore.

This is achieved by means of a telecommunication cable connected to an offshore node onto which user ports allow the connection of lines using interconnection cables equipped with wet mateable connectors. MacArtney France will supply Teledyne ODI wet mateable connectors to equip the node and the interlink cables between detection units and between detection units and nodes.

For more information, visit www.odi.com and macartney.com.

Silexa Releases Ultima DTS
Silexa has released the high performance distributed temperature sensor ULTIMA™. The ULTIMA has a sampling resolution of 12.5cm and a spatial resolution of just 25cm – 30cm. Even with this breakthrough spatial resolution (all other commercial DTSs have a spatial resolution in excess of 1m) the ULTIMA matches the very best alternative units for temperature resolution, achieving better than 0.01°C. Further, the ULTIMA is optimised for high temperature measurements and has been successfully tested on fibres at temperatures above 700°C, achieving a 29cm spatial resolution over a step transition from 25°C to 700°C.

There are many proprietary technical advances in the ULTIMA which enable it to leapfrog the performance of existing DTS systems.

For more information, visit www.silixa.com.

A Mobile Solution for Ballast Water Treatment
74,400 vessels will be affected by the International Maritime Organization’s (IMO) Ballast Water Management Convention (BWMC); and so far no more than 5% of vessels — or around 4,000 — have been fitted with ballast water treatment systems (BWTS).

The BWTBoat concept, developed by IR Class, provides flexible facility fitted with a type-approved modular set of BWTS customized for local waters. Ships would connect to the BWTBoat for receiving treated water or for discharging ballast using standard discharge connections. Research by IR Class on behalf of the Indian Maritime Authority indicated that the BWTBoat approach could be implemented in regional and coastal trading zones all over the world.

For more information, please visit www.irclass.org
Wärtsilä to Retrofit Ballast Water Systems

Two Ro-Ro ferries owned by UK-based Condor Ferries are to be retrofitted with Wärtsilä’s new Aquarius Ready ballast water management system (BWMS) solution.

The contract was signed in February 2014 and the final equipment delivery will take place within 12 months from the ratification of the IMO Ballast Water Convention. Preparation work has already been undertaken on board the ferries. This includes making the required connections to the main ballast line, installing the bypass and isolating valves, preparing the space needed, and carrying out the foundation work. These tasks were carried out when the vessels were dry-docked. The actual equipment installation and commissioning will take place at a time convenient to the owners following ratification of the IMO Convention.

The Wärtsilä Aquarius Ready solution is a phased process that enables cost savings and installation flexibility for ship owners preparing their vessels for ballast water treatment regulatory compliance. Having Wärtsilä as a single point of contact between the yard and the different authorities is another significant benefit for the owners.

The Aquarius Ready concept has been developed by Wärtsilä to prepare vessels for the fitting of BWMS, while minimizing vessel downtime, thereby enabling more efficient operations. Wärtsilä’s Aquarius Ready enables the equipment to be installed at a time and location convenient to the customer.

The Ready concept avoids capacity bottlenecks in the delivery and installation of equipment while providing the needed flexibility to accommodate the vessel's operational priorities.

For more information, visit www.wartsila.com.

The Perfect Tool for Routine Drill Line Maintenance

Allspeeds Ltd launched a new heavy-duty steel wire rope cutting tool suitable for harsh offshore environments. Working from a 690 bar hydraulic supply, the WebtoolTM RCO54 has a cutting capacity of 51-mm (2-in.) diameter steel wire rope with a tensile strength of up to 1,960 N/mm². It can also cut 38-mm (1.5-in.) diameter steel wire rope with a tensile strength of up to 2,160 N/mm². Some of the main design features of the RCO54 include of an open-sided mouth intended to allow ease of location for the material to be cut and a blade-on-blade cutting action.

Two benefits of this blade-on-blade action are lower forces required to cut and reduced deformation of item being cut. Less deformation means that the material remains closer to its original profile than if cut with a blade-on-anvil tool, leading some to utilize the RCO54 on offshore drill line rigs.

In the past, cutting the ends of steel wire rope drill lines for maintenance in the field has been a laborious process. The RCO54 performs reliable cuts and exerts marginal deformation to the drill line itself, resulting in re-useable cut ends that easily fit back into a spelter socket or dog clamp.

Allspeeds Ltd has a proven track record of delivering cutting and lifting equipment for challenging offshore projects around the world.

For more information, visit www.allspeeds.com.uk
Scott Cassell, undersea explorer, CEO, and founder of the Undersea Voyager Project, spends most of his workday underwater. He stopped logging his underwater time when he reached 13,000 hours in 2007. Cassell has dedicated his life to saving the ocean, working with scientists and researchers in an often-lonely battle to protect the sea.

“If the seas fail, all of humankind goes extinct,” he warns. “Thousands of scientists around the world are screaming warning signs, and few care enough to listen to them.”

There’s urgency to his mission, which is being addressed through the Undersea Voyager Project. Cassell spends much of his time in the Great White, a submersible that he recently rebuilt and outfitted with Trelleborg’s syntactic foam. This foam, the industry leader in strength-to-weight ratio, is designed to withstand depths of up to 11,000 ft under tremendous pressure. Since it weighs less than other foam, it can also carry a bigger payload, a real advantage in cramped quarters. What’s more, Trelleborg’s foam typically lasts more than 20 years in sea environments. Cassell welcomed the support Trelleborg gave him regarding the Great White, which has a depth limit of 500 fsw (feet of salt water). “I received engineering and kind guidance from Trelleborg,” he says. “I was educated on what the best foam was for our application and how much we would need.”
Cassell explains that a real benefit with Trelleborg’s syntactic foam is its machinability, shock resistance, and strength-to-weight ratio. “We are a small operation, using a small submersible doing a huge job, often on TV,” he says. “Reliability and durability are paramount.”

The energetic explorer and his Great White are rarely stationary. This year alone, his project will be going to Asia, the U.S. (the coast of California and Lake Tahoe), Britain’s Channel Islands, and the Mexican Yucatan to perform studies. Cassell has a long list of memorable sea moments, including riding on the back of a 3,500 lb great white shark off Guadeloupe Island; seeing hundreds of man-sized Humboldt squid; being pushed out of the water by the nose of a gray whale; and being surrounded by dolphins, sardines, bronze whaler sharks, and 20 gannets while a Bryde’s whale lunge-fed just a few feet away from him.

“Holding a baby octopus no larger than a pea in the palm of my hand as she walked around looking for food between my fingers was pretty memorable too,” he adds. “Sometimes the greatest gifts are the smallest.”
Bluefin AUV Used in Search for Missing Flight MH370

Among tools being employed by the teams searching for missing Flight MH370 is the Bluefin Robotics autonomous underwater vehicle (AUV), named Bluefin-21, which is capable of searching and mapping the sea floor at a depth of 4,500 m below sea level. As of 9 April 2014, best estimates for the location of the downed airplane placed it within a 300-nmi stretch where the ocean depth is up to 4,500 m — at the far range of the Bluefin-21 AUV capability.

While the Bluefin-21 AUV maps the ocean floor via sonar, the U.S. Navy has deployed a towed pinger locator device capable of detecting and locating emergency pings from aircraft black boxes, such as the one on board Flight MH370. In addition, the Royal Navy employed a similar device from on board the HMS Echo.

For more, visit www.bluefinrobotics.com.

6 Alpha Associates and Royal HaskoningDHV to Write Offshore Unexploded Ordnance Best Practice

Royal HaskoningDHV and 6 Alpha Associates have signed a contract with CIRIA, the Construction Industry Research and Information Association, to be the research contractor for a project that will develop good practice guidance on the assessment and management of unexploded ordnance (UXO) risk in the marine environment.

As offshore wind and cabling projects begin to proliferate in UK and European waters, a legacy of unexploded WWII sea mines, munitions dumps, and former military testing sites poses a significant threat, both to the successful and timely delivery of these developments and to the safety of the workers servicing them.

In light of costly UXO-related delays on a number of high-profile offshore wind projects across Europe, there is a clear and growing need for project developers not only to come to terms with the nature of this threat but also to deal with it in a timely and efficient manner. In the absence of centralized formal guidance, the industry remains at risk of serious incident.

The CIRIA project, Assessment and Management of UXO Risk in the Marine Environment, profiting from 6 Alpha’s 10 years of experience managing high-risk marine construction projects, will lay down much-needed best practice guidelines for organizations working on all stages of offshore projects — from planning to operations and ultimately decommissioning.

The project, which is not exclusively focused on the offshore wind sector and will be applicable to all marine energy and construction projects, will outline each type of UXO and its corresponding threat, provide a framework for the assessment and management of the risks posed by potential or actual detonation, identify the responsibilities and duties of different organizations under existing legislative and regulatory regimes, and pinpoint where and when professional advice from an UXO specialist should be sought.

The project report will outline a comprehensive risk mitigation strategy and acknowledge that a balance must be struck between the costs of risk mitigation and its benefits, while asserting that the assessment and management of risk will be require throughout a project’s lifecycle.

For more information, visit www.6alpha.com.
Flower Garden Banks National Marine Sanctuary Research Coordinator to be Inducted in Women Divers Hall of Fame

Emma Hickerson, research coordinator at NOAA’s Flower Garden Banks National Marine Sanctuary, was recently inducted into the Women Divers Hall of Fame during a ceremony in New Jersey. The Hall honors women divers who have made outstanding contributions to the exploration, understanding, safety, and enjoyment of our underwater world.

A graduate of Texas A&M University, Hickerson has been sanctuary research coordinator since 1997. She has coordinated or participated in more than 150 research missions, using scuba, remotely operated vehicles (ROVs), and submersibles. She has also logged more than 1,200 scuba dives, lived and worked underwater as a saturation diver at the Aquarius research laboratory in Florida Keys National Marine Sanctuary, and piloted a handful of submersible dives.

“A day doesn’t go by without thinking how very fortunate I am to be able to study, observe, protect, photograph, film, and share the marine environment,” Hickerson said.

Hickerson is one of six new members in the Women Divers Hall of Fame Class of 2014.

For more, visit http://www.wdhof.org/aboutus.shtml.
Incoming IMarEST President Seeks to Inspire

“The protection of the world and its oceans is even more important than ever as we face the challenges of global warming and other strains on the environment,” says the new president of the Institute of Marine Engineering, Science and Technology (IMarEST), Richard Vie.

Addressing more than 400 leading marine professionals from around the world at the IMarEST’s Annual Dinner at London’s Guildhall on 28 March 2014, Mr. Vie, who is a vice president of Carnival Corporation, also called on members to inspire the next generation of marine engineers.

In his first official speech as the Institute’s new president, Mr. Vie praised the next generation of marine professionals, calling on more females to enter the industry. “One of my main aims during my presidential year is to inspire as many of our young people as possible — including girls — to look at the opportunities available to them in the world of engineering and marine engineering, science, and technology in particular.”

As an example of young engineering talent, he cited this July’s IMarEST-run European International Submarine Race, which sees 12 university teams from around the world compete to create the fastest human-powered submarine.

The dinner, sponsored by Lloyd’s Register of Shipping, also saw Sir Ranulph Fiennes Bt OBE, dubbed “Britain’s greatest living explorer,” present a highly entertaining after-dinner speech.

Sir Ranulph, whose maritime achievements include leading the first hovercraft expedition up the Nile, described several of his record-breaking achievements, including the Transglobe Expedition from 1979 to 1982 — a 35,000-mi circumnavigation of the world along its polar axis. When choosing teammates, Sir Ranulph spoke of the importance of personal motivation saying: “You can teach skills, but you can’t teach character.”

The IMarEST president, Richard Vie, whose marine industry career spans more than 40 years, also presented Dr. John McGrath, the dean of the Royal Naval Engineering College in Plymouth, with the institute’s prestigious President’s Commendation Award. The dinner also raised over £1500 for the charitable wing of IMarEST, The Guild of Benevolence, which supports maritime professionals and their families.

For more information, visit www.imarest.org.

Optimus Seventh Generation Expands Asian Relations

Optimus Seventh Generation Ltd, an Aberdeen, UK-headquartered behavioral safety consultancy, has entered into a Teaming Agreement with Kuala Lumpur-based SynergenOG that enables Optimus Seventh Generation to provide training for safety professionals in Malaysia, Indonesia and the wider Asia market.

For more information, visit www.optimus-she.com.

New Department of Ocean Energy at Kyushu University

Kyushu University has established a new Department of Ocean Energy Resources with support from classification society ClassNK. Research will cover new ocean energy sources such as the exploitation of methane-hydrates, including the design, installation, and operation of production platforms as well as research into technologies renewable energy sources such as floating offshore wind power generation.

For more information, visit http://www.classnk.or.jp.
**SEARCH Wins EBJ Business Achievement Award**

Florida-based business provider of archaeology and cultural resource services, SEARCH, was chosen to receive two national awards from the Environmental Business Journal. SEARCH was selected for a Business Achievement: Small Firms ($10 million to $20 million) award, as well as an Environmental Restoration Project Merit Award for the Chassahowitzka Springs Underwater Archaeology project. The Awards were presented at the Environmental Industry Summit XII in San Diego on 12 March 2014.

For more information, visit searchinc.com.

**Dade Moeller Wins EBJ Remediation Award**

Washington state’s Dade Moeller has been recognized for its provision of rapid-response sample quality management to NOAA for the remediation of the Deepwater Horizon oil spill.

Dade Moeller operates a turnkey sample intake and logistical center in Louisiana, supporting response efforts across the full 1,600 mi of Gulf coastline. In support of the natural resources damage assessment (NRDA) and the resulting remediation, more than 99% of the 150,000 collected samples arrived at the correct laboratory with an intact chain of custody, within holding time, and under correct preservation requirements. Dade Moeller provides sample and data intake support to teams throughout the Gulf region; procurement, storage, and rapid delivery of supplies to sampling teams; on-site accessioning of samples to ensure complete and documented samples; packing and shipping of samples to ensure accurate delivery; and training for sampling teams.

For more information, visit www.moellerinc.com.

**CIRIA Requests Feedback**

The Construction Industry Research and Information Association (CIRIA) is working with the Royal National Lifeboat Institution (RNLI) to address issues of coastal safety and construction. A wide variety of structures and materials are used in coastal infrastructure in the UK. It is suspected that a significant number of incidents could be avoided by modifying methods and materials.

CIRIA is undertaking a scoping study to assess the need and options for providing or compiling guidance in this area. The survey is aimed at coastal owners and businesses as well as those professionals involved in commissioning, designing, planning, and operating structures and other engineered schemes on the coast.

To participate, visit www.surveymonkey.com/s/CIRIA_RNLI_coastal_safety.

For further information, e-mail owen.peat@ciria.org.

**ABB Turbocharging Middle East at Drydocks World**

ABB’s first-ever Middle Eastern Turbocharging Service Point is now in operation inside Drydocks World’s Dubai-based facility. Drydocks World is an international leading service provider to the maritime, oil and gas, and energy sectors.

ABB’s turbocharger applications in the marine industry help reduce fuel consumption and emissions while increasing efficiency, reliability, service, and support. In service, ABB’s turbocharging solutions enable customers to save significantly on service costs and spare parts and to extend the lifetime of their applications.

The new Turbocharging Service Point enhance the business of both companies, ensure enhanced turbocharger services to customers in the yard, and offer one-stop ABB turbocharger solutions at Drydocks World and Maritime World. ABB’s large global service network will also support Drydocks World.

For more information, visit www.abb.com.
JMS to Perform Offshore Wind Turbine Feasibility Study

JMS and partner Oceanwind LLC were competitively awarded a contract to conduct a feasibility study for an international energy company headquartered in Norway. The energy company is assessing the development of floating offshore wind farms in the U.S. In the short term, a pilot park with 4-5 units is being planned in the Gulf of Maine, with the objective of building large, commercial-size, floating wind farms in the long term. The wind farms are planned to incorporate the energy company's proprietary design of floating wind turbines. The design represents further development of their prototype installed off the coast of Norway in 2009. JMS and Oceanwind are investigating the engineering feasibility of assembly and installation concepts of the design's floating substructures and wind turbine generators in the Gulf of Maine offshore environment.

The installation of the proposed design in the Gulf of Maine offers unique challenges for floating offshore wind turbines. The shallow water in the Gulf of Maine requires an innovative approach to transiting the offshore wind turbine towers to their mooring site. JMS and Oceanwind proposed a purpose-built barge configuration to transport the towers horizontally and to install the towers via a lifting mechanism onboard the barge. A number of factors influence the barge size: barge stability in various conditions of loading and operation, sea states, induced bending moments on the structure, and support of the wind turbine structure when horizontal.

A rough estimate of weather limitations was conducted for major operational tasks in the sequence of the system deployment. Using the meteorological data for the location of the wind farm site in the Gulf of Maine, the motions on the installation barge and turbine structure were evaluated. The motions induced by various sea states experienced at that location dictated the design of the structure and strength of the barge, as well as the limitations on completing the work at sea. The current estimation of barge size is larger than typical barges available for commercial chartering. A list of assist tugs and other vessels required for support during transiting and deployment and a cost estimate were developed for the study.
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**2014 EDITORIAL CALENDAR**

**JANUARY/FEBRUARY**
Editorial: Modeling, Simulation & Visualization Decommissioning & Abandonment
Product/Service Focus: Acoustic Modems, Releases & Transponders, Marine Comms; Environmental Consulting
Distribution: Subsea EXPO
Underwater Intervention
Decommissioning & Abandonment Summit
Oceanology International

**MARCH**
Editorial: HSSE, Risk Management & Mitigation
Product/Service Focus: Water Monitoring Equipment; Software
Distribution: SPE International Conference on HSE

**APRIL**
Editorial: Offshore Energy: Oil & Gas, Ocean Renewables, Metocean
Product/Service Focus: Mooring & Anchoring Products
Distribution: GMREC
International Oil Spill Conference
OTC - Offshore Technology Conference

**MAY**
Editorial: Environmental Monitoring, Marine Sound
Product/Service Focus: Gliders & AUVs; Cables & Connectors
Distribution: CHOW - Capitol Hill Ocean Week
Energy Ocean
OMAE - Ocean/Offshore/Arctic Engineering

**JUNE**
Editorial: Ocean/Environmental Law & Policy Ports/Harbors/Infrastructure
Product/Service Focus: Buoys; Environmental Monitoring Products; ISO Certification Services
Distribution: Seawork International
Commercial Marine Expo
CEER - Ecological & Ecosystem Restoration

**JULY/AUGUST**
Editorial: ECO’s Annual Interview Issue
Product/Service Focus: Data Acquisition, Analysis
Distribution: ESA Annual Meeting
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**SEPTEMBER**
Editorial: Coastal Engineering, Fisheries & Aquaculture
Product/Service Focus: Modeling & Simulation Software & Systems
Distribution: Ocean Innovation
Oceans’14 MTS/IEEE
AWEA Offshore Windpower

**OCTOBER**
Editorial: Restoration & Remediation, Estuary Management
Product/Service Focus: Artificial Reefs; Imaging Sonars Environmental Risk/Impact Assessment
Distribution: SPE ATCE
Restore Americas Estuaries
International Conference on Ocean Energy
North Sea Decommissioning

**NOVEMBER/DECEMBER**
Editorial: International Shipping Regulations, Ballast Water, Ports/Dredging, Emission Regulations
Product/Service Focus: Camera, Lights; Waste Management Services
Distribution: Clean Gulf
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www.sea-birdscientific.com