



The SUBSEA newsletter

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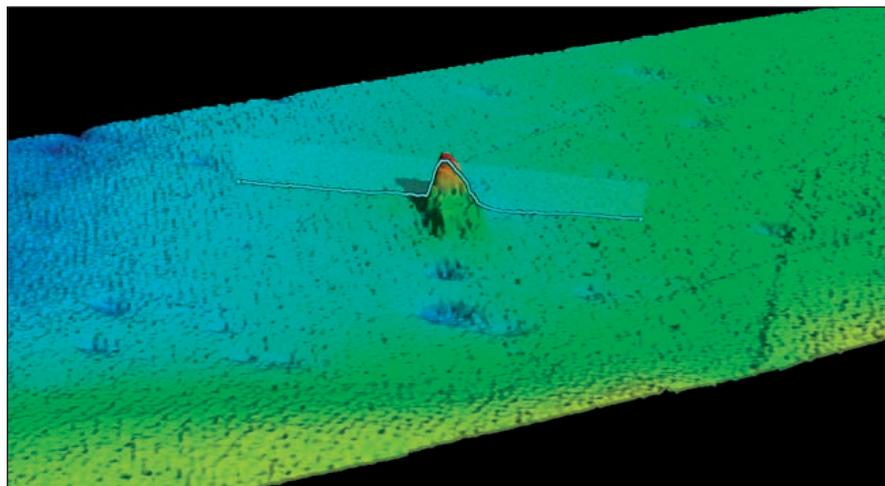
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EM 710 system used to find the wreck of the SS Terra Nova



In July an international team of researchers discovered the wreck of S.S. Terra Nova, a whaler, sealer and polar exploration ship that sank off the southern coast of Greenland in September, 1943, after being damaged by ice. The discovery occurred during performance verification testing of a newly installed Kongsberg EM 710 multibeam echo sounder. The testing included a shallow water survey off the southern coast of Greenland to assess the system's performance in complex topography.

Researchers selected the test survey site for multiple reasons: It allowed testing of the EM 710's mapping capabilities at seafloor depths between 10 and 1800 meters, which covered the major portion of the systems operational depth range. In addition the glacial and iceberg activ-

ity in the area have created distinct and prominent seafloor features that would be useful in testing the system's resolution. Because of the glaciers, the survey team expected to see mixtures of deposits from soft sediment to gravel and boulders. The different seabed compositions would also enable testing of the reception quality of the back scatter signals collected by the multibeam system. In addition to meeting all of these criteria, it was also known that the polar exploration vessel S.S. Terra Nova was reported lost in the general vicinity. With all the topographical considerations and with the secondary possibility of using a wreck as a calibration reference for the sonar equipment, the evaluation team had prioritized this location as the optimal spot for this round of tests.

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Approximate estimated position of the wreck was used as the central point for the test survey. An area roughly five nautical miles around this position was selected for the survey to encompass various features, shallows and slopes necessary to evaluate the sonar performance. The chosen area yielded excellent topographical data that enabled comprehensive verification of the EM 710 performance. The bathymetric data produced by the multibeam echo sounder during these sonar trials was of very high quality, substantially exceeding expectations. All members of the collaborative group of sonar experts who were present on-board to evaluate the system's operational capabilities were satisfied with the outcomes of the sonar trials.

As anticipated, numerous iceberg strikes and gouges were observed on the seabed along with striking features not listed on the existing nautical charts. The contrast between hard and soft

sediment signatures shown in the backscatter data also exceeded expectations. Gullies and gouges had collected soft sediment, while the surrounding flat seabed consisted largely of gravel and coarse material deposited by icebergs and glaciers with clearly contrasting backscatter.

On the first line of the calibration survey, on-board survey experts had noted a feature on the seabed which remained initially unidentified. Upon completion of the main calibration exercise, the team reviewed each of the many potential targets identified during the 12 hours of surveying, and the target from the initial line of the calibration the survey was noted as a strong candidate for further investigation. Further analysis found the feature's length (57m) to match the reported length of the Terra Nova.

Encouraged by the similarity, the acoustic survey team post-processed the col-

lected multi-beam data to verify the observed feature. A shorter survey from several angles reaffirmed the possibility that the team had found a wreck. Subsequently, the ship was able to lower an underwater camera package to take a visual survey of the potential wreck area. Captured images showed the remains of a wooden wreck laying on the seabed. The camera footage also identified the funnel of the vessel, next to the wreck. The forecandle of the vessel appeared to be "peeled" upwards to the port side and at an angle from the rest of the ship. The team compared the funnel image with historical photographs of the S.S. Terra Nova. All observations jointly identified this wreck as the sunken S.S. Terra Nova.

The discovery of the lost S.S. Terra Nova, one of the most famous polar exploration vessels, was an exciting achievement—in addition to serving to successfully verify the performance and operational condition of the new multibeam echo sounder.

Kongsberg Maritime Subsea User Conference (KSUC)

During 22 - 23 August 2012, the Kongsberg Maritime Subsea User Conference (KSUC) was held in Singapore. KSUC is normally held every two years and gives an opportunity for the large number of Kongsberg Maritime Subsea users in the Asian region to attend a 'local' seminar located closer to their respective home countries.

Two days is a long time for people to take off from their busy daily schedules, so it is important the seminar is as valuable as possible to attendee's. Over 120 guests attended the two day event to listen to 20 technical papers which were presented. Over half of the papers presented came directly from customers and users of Kongsberg Maritime Subsea systems. This made a unique seminar, as the majority of presentations at manufacturers seminar's are normally performed by the manufacturer themselves. The talks from the actual users of the systems proved very interesting and gave the attendee's some valuable



feedback and idea's on how Kongsberg Maritime Subsea equipment is being used in the real world.

Representatives from Kongsberg Maritime's Hydrographic, AUV, Hydroid, Geoacoustics, Seatex, UNAV, Camera and Mesotech divisions were in attendance. The event was held in an open

and relaxed atmosphere, and it was wonderful to see so many guests from around the Asian region attending the event, sharing information and enjoying each others company.

We would like to thank all those who attended KSUC 2012 and we look forward to seeing you at KSUC 2014!

Kongsberg Maritime Ltd invests £2 million in future with new building in Aberdeen

Kongsberg Maritime Ltd, has recently moved into new purpose-built premises in Westhill, Aberdeen. The relocation, which is due to successful growth in the company over the past two years, provides double the existing floor space over three levels, allowing for substantial future expansion.

David Shand, General Manager Off-shore at Kongsberg Maritime says of the move, “We have significantly increased our workforce in the last 12 months and this is expected to continue to rise in the coming year. As a result, we felt it imperative to find a site which could accommodate the future growth of the organisation. This new facility provides us with the required capacity to meet the needs of our forecasted growth during the next five to 10 years.”

Kongsberg Maritime has invested in the installation of innovative new features and facilities in the new building. One such feature is the Advanced Ship Simulator system which will be housed within the training centre early next year.

David explains, “The simulator will offer delegates and prospective customers a unique opportunity to experience the most advanced dynamic positioning simulator in the market, with access to



qualified trainers with real operational experience of KONGSBERG equipment.

“Another significant feature, the first of its kind in Aberdeen, is the bespoke test tank which has been installed on the ground floor. The 45m³ tank has been constructed with the surfaces and sides designed to minimise hydro-acoustic interference, resulting in increased accuracy during equipment assessment. Also installed beneath floor level is a 400 bar pressure test tank which will further enhance our onsite equipment testing capabilities.”

As part of a global KONGSBERG initiative to enhance the client customer support experience, Kongsberg Maritime Ltd will become one of the first KONGSBERG divisions to install a

Virtual Collaboration Centre within the customer support department. David continues, “The centre will give our customer support team the ability to instantly communicate with other global KONGSBERG support departments in a virtual environment – a set-up which will result in quicker decisions being made, shared problem-solving of live issues and improved knowledge distribution.”

David concludes, “The move to Westhill launches a new era for us at Kongsberg Maritime Ltd, and we are all incredibly excited to be involved in a project, achievable because of successful performances over the past two years. Our commitment in this new venture is a reflection of our continued desire to invest in our people, our customers and our future.”

Cost effective upgrade from HPR to HiPAP

Kongsberg Maritime stopped delivery of HPR 410/418 systems about 10 years ago. Testament to the quality of the systems is that many of them are still in operation today. However, except for the HPR Portable series, Kongsberg Maritime is no longer able to provide full spare parts or servicing support on these products.

The reason is that we are now not able to obtain specific electronic components

on the world market, whilst experienced and skilled engineers on this older technology are becoming less available.

There is an answer though. HPR systems can easily be upgraded to state of the art HiPAP 501/451/351 systems and by using existing hardware and cabling when possible, Kongsberg Maritime has optimised the installation to make upgrading as cost-effective as possible.

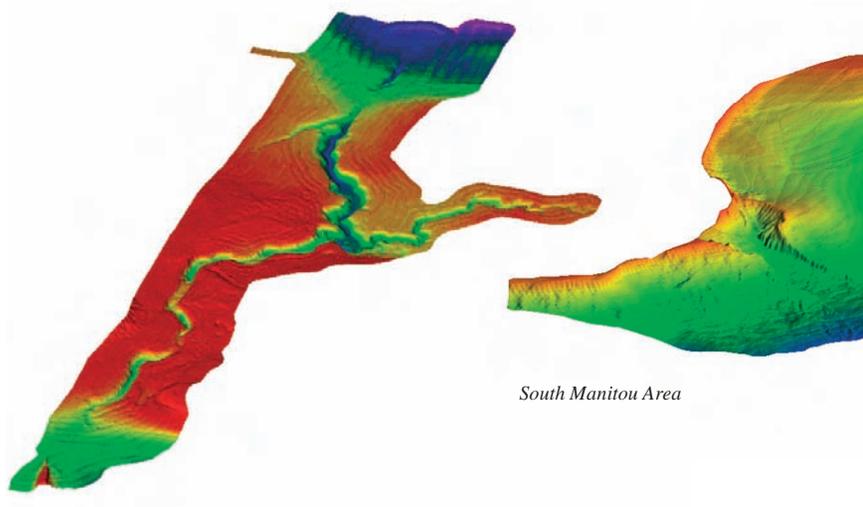


Find out more at <http://www.km.kongsberg.com/HiPAP>

GLWSI completes third year of Great Lakes Hydrograph



NMC EM 3002 deployment



Paleo River

South Manitou Area

By Hans Van Sumeren, Great Lakes Water Studies Institute

Since the early 2000s, Northern Lake Michigan habitats near Traverse City, MI and Sleeping Bear Dunes National Lakeshore (SLBE) have been greatly altered by the invasion of dreissenid mussels and round gobies, the growth and deposition of nuisance algae, and outbreaks of type E botulism affecting fish and birds. Like marine parks nationwide, SLBE lacks the physical and biological baseline data needed to understand and respond to these recent changes.

Recognizing this widespread information gap, the National Park Service (NPS) Ocean Park Stewardship Action Plan identified 'discover, map, and protect ocean and Great Lakes parks' as one of four critical themes. The stewardship strategy for Great Lakes national parks identified the development of benthic habitat maps, including lake bathymetry, near shore benthic habitat, lake bed classification, geomorphology, etc. as a specific goal.

The identification of these priorities resulted in the development of a Benthic Habitat Mapping Project between the Sleeping Bear Dunes National Lakeshore and the Great Lakes Water Stud-

ies Institute (GLWSI) at Northwestern Michigan College. Under this partnership, GLWSI has completed two years of precision, multibeam, hydrographic surveys in Northern Lake Michigan. The project provides, for the first time, state-of-the-art multibeam sonar investigations of NPS near-shore regions through the use of multiple Kongsberg Maritime platforms, including the EM3002 Multibeam Echo Sounder (MBES) and the Seapath 300 series vessel position, heading and attitude system.

Initially launched in 2009, prior to support by the Michigan Coastal Management Program (MCMP), the hydrographic survey of Grand Traverse Bay was a pilot project designed to demonstrate the utility of advanced mapping technology in a freshwater environment in the Great Lakes. To this end, Kongsberg Maritime AS through its US sister company, Kongsberg Underwater Technology, Inc. partnered with NMC to outfit the R/V Northwestern, NMC's research vessel, with an advanced sonar system.

Activities conducted after the awarding of grant monies include the surveys of the 2010, 2011 and 2012 field seasons. KM was particularly interested in launching this technology in the Great Lakes in partnership with an institute

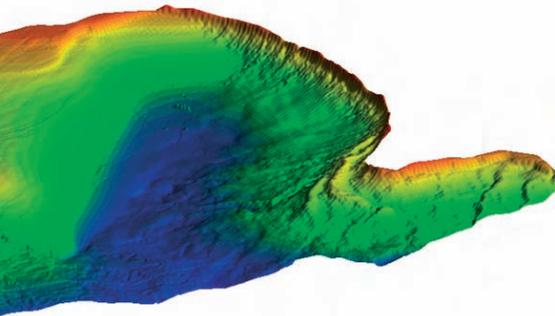
focused on water that is co-located with the only maritime training program on the Great Lakes, the Great Lakes Maritime Academy (GLMA).

While it has been known that Grand Traverse Bay represents a unique, fjord-like embayment where existing bathymetric and lakebed classification data are highly outdated or nonexistent, the survey's findings have been nothing short of remarkable. The project has yielded an enormous amount of information, and more importantly, key outcomes that are exceptional.

The project's first year provided exciting experiences in the survey of Grand Traverse Bay. Highlights included the location and positive identification of the wreck of the tugboat Lauren Castle discovered in 2009 during inaugural surveying. This valuable find served as a springboard for placing the project in a global spotlight after KONGSBERG released an article on the Lauren Castle in its quarterly newsletter.

In subsequent years of the project, detailed mapping of Grand Traverse Bay and SLBE has revealed the existence of ancient paleo river beds and geographic features created since the end of the last ice age that have helped scientists better understand the mechanisms believed to

ographic Survey Project



be contributing to the significant type-E botulism outbreaks in the area, as well as identify ancient lake levels approximately 8000 ybp.

The Benthic Habitat Mapping Project at SLBE and the Great Lakes Hydrographic Survey Project have been launch pads for increasing the knowledge base on the Great Lakes through new academic programs and pathways. In addition, it has provided advanced training and valuable career workforce experiences for participating students by providing one-of-a-kind insights into benthic habitat distribution, cultural artifact identification and potential changes in a highly-diverse ecosystem.

University of Maryland Purchases REMUS 600 system



The Horn Point Laboratory at the University of Maryland's Center for Environmental Science has purchased one REMUS 600 system to use as a shared research platform for advancing oceanographic studies of coastal and near coastal environments.

"We wholeheartedly support the Horn Point Laboratory's plan for using their new REMUS 600 AUV as a shared resource for marine oceanographic exploration," said Christopher von Alt, president/CEO in Kongsberg Maritime Hydroid. "Allowing researchers to 'rent' this state-of-the-art marine exploration tool—and especially for organizations conducting research with limited resources—is a powerful business model for advancing the study of coastal ocean environments." The Lab's REMUS 600 AUV will be outfitted with several state-of-the-art technologies to enable a wide variety of research tasks. "The reason we picked the REMUS 600 specifically is the modular capabilities the vehicle offers," said Nick Nidzieko, coastal

physical oceanographer and assistant professor at the University's Center for Environmental Science. To that end, the Lab's REMUS 600 will include forward and aft hovering modules, which allows the AUV to hold position in a single location above the sea floor, a second on-board payload computer which permits users to implement autonomy algorithms they develop and a nitrate sensor enabling real-time measurements of a critical element in oceanographic research. "It's amazing—you can put this AUV in all these unique places and generate an incredibly rich data set that will open up new ways of thinking about oceanographic research," Nidzieko said. The Horn Point Laboratory plans to make the REMUS 600 system available for charter to other researchers in the marine sciences industry. While under charter, Horn Point's AUV technician will serve as the AUV's "skipper", enabling groups with limited experience to safely utilize the AUV to its maximum potential.

Kongsberg Maritime Cameras raise the bar for Deep-Sea Exploration

Kongsberg Maritime's OE14-502 High Definition Cameras raised the bar for deep-sea exploration during a recent expedition of China's manned deep-sea submersible Jiaolong to the Mariana Trench in the western Pacific Ocean this June. The Jiaolong has been equipped with two ultra deep water versions of Kongsberg Maritime OE14-502D High Definition Cameras along with an ultra deep OE14-208 Digital Stills Camera and two OE14-364 Compact Fixed Colour Cameras. The Jiaolong made a total of six dives altogether, reaching a depth of 7062 meters on its final dive. This surpassed a national record depth

of 7020 meters reached just a few days previously. While at the ocean bottom, scientists captured high quality video, conducted geological surveys, placed markers and gathered samples of organisms living on the ocean bed. The HD video footage is the deepest recorded using KONGSBERG HD cameras. This, along with numerous past deep water marine research applications around the globe where KONGSBERG cameras have been used in depths in excess of 8000 meters, demonstrates KONGSBERG's ability to manufacture the most rugged harsh environment underwater cameras available.



An example of a KONGSBERG underwater camera, OE14-308

Appointed Area Sales Manager for AUVs



Lars Magnus Torp was appointed as Area Sales Manager for AUVs in January. Lars Magnus graduated from the Royal Norwegian Naval Academy in 1983 as an operational officer. He served for 22 years in the Royal Norwegian Navy, of which 11 years were spent on board Norwegian frigates. He also had significant involvement in the New Frigate Program (Fridtjof Nansen-class) and in addition served many years in the Norwegian Defence HQs in Bodø.

He retired as a Commander and Commanding Officer of the frigate HNoMS Trondheim in 2001 and started as a sales manager in the Missile Division in Kongsberg Defence Systems (KDS). Before joining Kongsberg Maritime Subsea he worked in the Naval Systems at KDS responsible for the Australian market. In his present position he will focus on HUGIN and REMUS AUVs in the military segment.

Newly appointed Area Sales Manager for AUVs



Richard Mills was appointed as an Area Sales Manager for AUVs in September and has recently relocated to Tolvsrød, Norway with his wife. Richard is a former Royal Air Force officer and helicopter pilot. During his military career he flew various types of aircraft including the Jet Provost, Gazelle, Wessex and Sea King. He also taught leadership, team skills and communication at the Department of Initial Officer Training. While serving with the RAF, Richard gained a Master of Science degree in Military Sciences. After leaving the Air Force, Richard joined a civilian company as an instructor supporting the UK Army as they introduced the WAH-64 Apache helicopter. Before moving to Norway Richard has lived in the UK, Qatar and Canada. For the last four years he worked for another subsea vehicle manufacturer selling AUVs, ROVs and manned submersibles. He will concentrate on sales to the commercial offshore market.

Marylou Gentilhomme joins Kongsberg Maritime Geoacoustics as Customer Support Engineer



On 1 July 2012, Marylou Gentilhomme joined Kongsberg Maritime Geoacoustics as Customer Support Engineer. Her main responsibility will be to support customers using Geoacoustics technology in the field. With 200 GeoSwath wide swath multibeam systems and over 1000 side scan sonars supplied to clients worldwide, Marylou will be responsible for the systematic support of the sophisticated GeoSwath technology and global customer base. Marylou has substantial market knowledge. She is a graduate engineer in hydrography and oceanography and has worked for an international dredging company in the Middle East. Until recently, she was an R&D member of the development team at CARIS, the Canadian software company. Marylou's expectations are to get closer to clients and reconnect to her engineering and acoustics skills. At the same time she is proud of becoming a staff member of the Kongsberg Maritime group.

FEMME 2013, Boston – USA

Please remember to register for FEMME 2013, Multibeam User Conference in Boston, USA!



For more information, visit the FEMME 2013 web page <http://www.viaregi.no/femme2013> or contact us by e-mail: km.femme.2013@kongsberg.com



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