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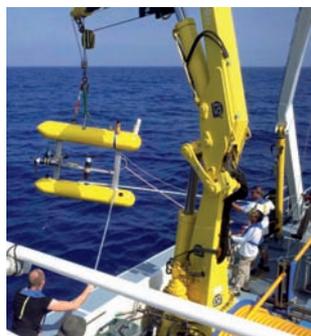
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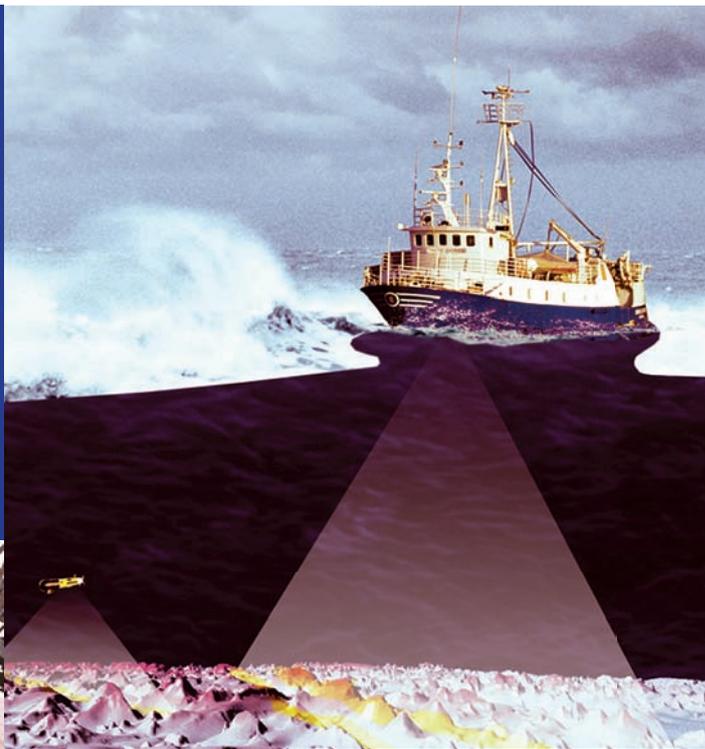


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The cover image shows interims on their survey cruise with Highland Geo Solutions. Also see the feature by Graham Nickersson starting on page 16.

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Buyers Guide

Hydrography is booming — survey companies, data specialists, hydrographers, cartographers, oceanographers... they are all working hard to get the job done. And they need to invest for an improved handling of their clients requests. Time is scarce... that's why Hydro INTERNATIONAL is preparing a Buyer's Guide to facilitate communication between you and your clients.

The Buyer's Guide features Company Profiles, Contact Details and an online directory with a categorised overview of suppliers. The Buyer's Guide is distributed among subscribers of Hydro INTERNATIONAL, visitors to international trade shows throughout the year and is available from www.hydro-international.com/buyersguide — thus it is a valuable information source to consult regularly throughout the year. For further information, please contact herma.lenten@geomares.nl

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**Durk Haarsma**durk.haarsma@geomares.nl

Positive Light

We have been pondering the necessity of good marketing of the profession of hydrography for years now and in this issue we will do so again. We carry interviews with young professionals working in hydrography, being educated as hydrographer or those who have entered the field through a side door, talking about the pros and cons of the profession and ways of making it more attractive for youngsters to choose it as a career. Marketing, it appears, is not the job best executed by those who are responsible for attracting new students. Venessa O'Connell, hydrographic surveyor with the Sydney Ports in Australia mentions that she stumbled upon a website with links to marine careers. On the hydrographic surveyor page a surveyor had written a horrifying short story, talking about hydrographers 'having no social life' and working in 'terrible conditions'. In short, not an appealing article. If it's not a repentant putting other people off by telling how 'insane' it would be to work as a hydrographer, it might be a matter of totally ignoring the fact that hydrography is a niche sector. Hidden in a marine geology class, not clearly recognisable as hydrography, it's simple to miss out on, as Lauren White, contractor with Highland Geo Solutions in North Carolina, United States, experienced herself. Both women luckily pursued and they are now both proclaiming what an interesting career they have because of it in this Hydro INTERNATIONAL. Speaking for myself, I had never heard of hydrography before I became publisher of this magazine almost ten years ago. I now still have to explain almost every week what Hydro INTERNATIONAL is about, in other words what hydrography is about. It's up to those in positions at schools, universities and colleges to tell prospective students about the possibilities of bright and rewarding careers in a fast-growing field. They may want to use this issue of Hydro INTERNATIONAL to pass the information on to interested youngsters. We have tried to compile an issue containing articles on career opportunities, competency management, training and capacity building. We are always talking about the growth in our field and the great opportunities for the blue economy, but it's good to take into account that we need skilled people to seize the opportunities. It's not one or the other, it's both: enough knowledgeable colleagues to make the profession and hydrographic business flourish. Human resources, therefore, are immensely important and marketing is a starting point. Let's go back to Venessa O'Connell, hydrographer with the Sydney Ports, who states "Accounting is the most boring and mundane job on the face of the earth and they always manage to market their career in a positive light." I would like to add that it must be possible to market a career as hydrographer, which certainly isn't boring or mundane, in a more than positive light.



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EMODNet Hydrography Kicks Off in Portugal

The latest phase of the hydrography part of the European Marine Observation and Data Network (EMODNet) has commenced with a meeting in Lisbon, Portugal, hosted by the Portuguese Marine and Atmospheric Institute (IPMA). In addition to IPMA, the project involves leading hydrographic offices and marine institutes, agencies and private companies across Europe. OceanWise is heading the UK effort, with the National Oceanographic Centre (NOC) acting as regional centre for North West Europe. The project is headed by Maris, the Netherlands.

<http://tw.gs/Q4tcix>

Antarctic Survey Data Provided to IHO

As part of the World Hydrography Day celebrations held at the IHB on 20 June, Captain Stephen Wilkins presented Robert Ward, president of the IHO, with the final Report of Survey and Multi-beam Survey Data obtained during recent surveys conducted from his exploration vessel *Xplore* in the Antarctic Peninsula.

<http://tw.gs/Q4tccw>



Xplore in Antarctic waters.

LINZ Launches App to Report Sea Hazards

A smartphone app that streamlines the reporting process for hazards at sea is now available for download thanks to a collaboration between IT company Datacom and Land Information New Zealand (LINZ). 'Hydrographic Notes' – or 'HNotes' – allows users to photograph hazards at sea, note the location, and send the information to the New Zealand Hydrographic Authority (NZHA) at LINZ to be reported to the maritime community.

<http://tw.gs/Q4tcZw>

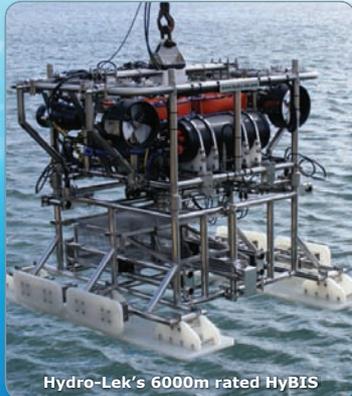
E-boutique from SHOM

The French hydrographic service, SHOM, has launched a webshop for its products. Charts, maps, guides and other digital products can be downloaded online. Moreover, online services such as access to reference data and INSPIRE have been arranged through this channel. Nautical charts can be downloaded from the webshop as PDF and up to 5 copies can be re-used by an organisation. For bigger organisations, licences can be obtained by contacting SHOM. <http://tw.gs/Q4tcca>

20th Position Paper *Navigating the Future IV* Launched

Navigating the Future IV was launched in Brussels, Belgium, on 20 June 2013 in the presence of EU Commissioner Máire Geoghegan-Quinn. The *Navigating the Future IV* series provides regular pan-European summaries of the current status of marine research, priority recommendations and future scientific challenges in the context of European societal needs. The document *Navigating the Future IV* is available online. During the seminar, keynotes were given by Máire Geoghegan-Quinn, EU Commissioner for Research, Innovation and Science and Maria da Graça Carvahlo, MEP and Rapporteur for the Horizon 2020 Specific Programme.

<http://tw.gs/Q4tccV>



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Most Shared

Most shared during the last month from www.hydro-international.com

1. Portable Underwater Lidar System - <http://tw.gs/Q4tbCW>
2. Ancient Continental Breakup Seismic Survey - <http://tw.gs/Q4tbD3>
3. World Hydrography Day 2013: Underpinning the Blue Economy - <http://tw.gs/Q4tbEx>
4. Offshore Activities Shift to Deepwater - <http://tw.gs/Q4tbE4>
5. Geocap Taken Over by Geodata - <http://tw.gs/Q4tbEZ>

Drifter Buoys Contribute to Improved Forecasts

Ten global drifter buoys belonging to Scripps Institution of Oceanography at UC San Diego, USA, were released from the amphibious dock landing ship USS *Pearl Harbor* (LSD 52), on 28 May 2013, during Pacific Partnership 2013. The drifters measure ocean currents at a depth of 15 metres (49 feet) in depth, sea surface temperatures and atmospheric pressure. All are important elements in creating an observation network, allowing for more accurate current and weather forecasts. The buoys were deployed at specific coordinates while USS *Pearl Harbor* transited the Pacific Ocean to Samoa, the first mission port of Pacific Partnership. Both Scripps and the Navy seek to benefit from the drifter drop and subsequent data to be collected. <http://tw.gs/Q4tcg1>

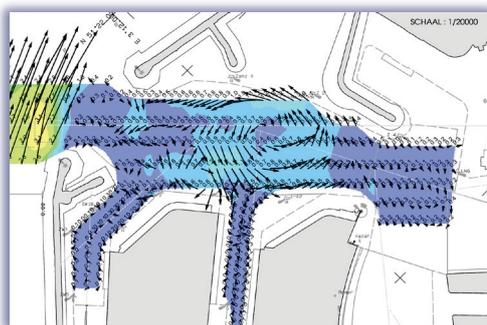
Arbitrator and President Appointed In Case Philippines against China

On 21 June 2013, the president of the International Tribunal for the Law of the Sea, judge Shunji Yanai, appointed Mr Thomas A. Mensah (Ghana) as arbitrator and president in the arbitral proceedings instituted by the Republic of the Philippines against the People's Republic of China under Annex VII to the United Nations Convention on the Law of the Sea on 22 January 2013. Mr M.C.W. Pinto has elected to step down as a member and president of the arbitral tribunal in these proceedings and the vacancy left by his departure needed to be filled. The president is to appoint Mr Pinto's replacement. <http://tw.gs/Q4tcdy>

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RV *Zeeleeuw* when still in Belgian hands.

RV *Zeeleeuw* to Serve for Kenya

The Flemish government's oceanographic research vessel RV *Zeeleeuw* was officially handed over to the Republic of Kenya on 3 May 2013. The ship will sail under the Kenyan flag and will be named RV *Mtaji*, which is Swahili for 'researcher'. The donation of the vessel fell within a collaboration between Flanders Marine Institute (VLIZ) and Kenya Marine and Fisheries Research Institute (KMFRI). On 19 October 2012, the two institutes signed a formal Memorandum of Understanding (MoU) for bilateral collaboration in the field of marine sciences. <http://tw.gs/Q4tchz>

Keynotes Confirmed for OI China 2013



Dr Bernard Montaron, director, Schlumberger China Petroleum Institute, is one of the speakers during the first OI China.

The inaugural Oceanology International China exhibition and conference being held in Shanghai from 3 to 5 September 2013 will get off to a flying start with a

plenary session on the morning of Tuesday 3 September. This session, chaired by Professor Ralph Rayner, sector director Energy and Environment, BMT Group and chairman, Sonardyne International, includes confirmed keynote speakers such as Captain Don Walsh, USN (Retired), International Maritime and honorary president, The Explorers Club; Dr Bernard Montaron, director, Schlumberger China Petroleum Institute (image); and Professor Weicheng Cui, research professor and dean, Hadal Science and Technology Research Centre, Shanghai Ocean University.

<http://tw.gs/Q4tcbw>

First REFMAR Days Successful

The first edition of the REFMAR Days, a seminar on sea level organised by the French hydrographic service SHOM, took place from 17 to 21 June 2013 in Saint-Mandé. The event gathered all important bodies, particularly the producers of tide gauges and users of these tools. Over 130 people participated at the REFMAR Days, with participants from France but also from countries like Algeria, Ivory Coast, Spain, Guinea, Monaco, Portugal, UK, Romania, Tunisia and from intergovernmental organisations like UNESCO.

<http://tw.gs/Q4tciV>

Turnkey Sweep System for USACE St. Paul District

The US Army Corps of Engineers St. Paul District has taken delivery of a turnkey multi-channel sweep system from Ross Laboratories of Seattle, WA, USA. The system is installed on a 24-foot Armstrong Marine aluminium work boat. Ross Laboratories was awarded the contract to provide the boat and survey electronics as a turnkey system. The Ross Mini-Sweep is a small-boat, multi-channel survey system designed for inland rivers and shallow-water surveying. The Mini-Sweep is ideally suited for installation on small trailerable vessels. The turnkey system for the Fountain City Service Base office is installed on a custom-designed 24-foot catamaran hull work boat from Armstrong Marine of Port Angeles, Washington.

<http://tw.gs/Q4tcaW>



The survey launch in operation.

Geo-matching.com Adds CTD

Geo-matching.com has recently added 'CTD Systems' to its product categories. The added category currently features 35 CTD systems from 11 different manufacturers. In addition to general specifications, detailed information is given about the sensors, observation performance, recording and display and software functionality.

<http://tw.gs/Q4w3d1>

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No 3151

TransNav 2013 Highlights World Hydrography Day

The kick-off of the second day of the TransNav 2013 conference in Gdynia, Poland, was primarily focused on World Hydrography Day, which is traditionally celebrated on 21 June. The main opening session on 20 June 2013, chaired by Henryk Nitner and Mathias Jonas, was dedicated to this occasion. Nitner, head of the Hydrographic Office of the Polish Navy, emphasised the importance of national hydrographic organisations. Conventions like SOLAS underline the need of hydrographic services, he said. Further he explained the objectives of the International Hydrographic Organisation (IHO), one of them being promoting the use of hydrography for the safety of navigation.

<http://tw.gs/Q4tcfw>



The sign making delegates aware of the special World Hydrography Day.

Portable Underwater Lidar System

Canadian research institute INO has developed a submarine Lidar to measure the reflectance of the seafloor and water column. The system is used to determine the reflectance of the sea bottom so that the composition can be correlated with relative intensity data from aerial surveys. INO's Lidar system helps to calibrate the results of airborne bathymetric surveys, increasing their accuracy and enhancing understanding of the results. INO is working closely with INRS-ETE to test the maximum depth achievable and calibrate the system in the water. This Lidar prototype has the potential to cover a range of 3 to 50m underwater.

<http://tw.gs/Q4tbCW>

The operation of the underwater Lidar system.



Follow Underwater Mapping Expedition Live

From now until the end of November 2013, exploration vessel *Nautilus* will be exploring the Gulf of Mexico and the Caribbean Sea. The rotating exploration corps aboard *EV Nautilus* will be mapping the geological, biological, archaeological and chemical aspects of these regions to depths of approximately 2,000 metres. Discoveries made during the expedition will be shared live on the web via telepresence technology, bringing the unexplored ocean directly to the screens of visitors to the mission's website.

<http://tw.gs/Q4tcdX>



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A View on Hydrography by a Younger Generation

Hydro INTERNATIONAL Interviews Young Professionals

Hydrographic surveying still requires skilled people. The profession itself is carried out across the world and performed in different fields. Whether the profession involves environmental mapping, charting, oil and gas or port surveying, hydrographers are facing challenging situations. Unfortunately, despite the fact that many people nowadays are looking for jobs, there is still a lack of skilled forces to serve in the hydrographic industry. This has resulted in qualifications such as IHO CAT A and B not always being required by companies and recruiters. This has several reasons. On the one hand there are not enough CAT A and/or B candidates graduating from universities, and on the other hand it seems that the IHO qualification is not seen as the standard for qualified hydrographic surveyors in every part of the world. Furthermore, the profession appears not to be seen as a very positive profession. The latter could be due to the working environment, which should then in turn be the responsibility of the companies. However, the marketing of our profession is also an important factor. A factor that is sometimes underestimated is the 'challenging' factor. Challenge the modern day professionals and make sure they find themselves in a challenging environment. Introducing new technologies and involving employees will help keep them interested in and enthusiastic for the profession. There are still plenty of challenges ahead for the industry to keep professionals, such as the people being interviewed in this Hydro INTERNATIONAL, from losing their enthusiasm.



Hadar Sade, survey operation manager, Yam-Yafo Marine Projects and Data Providers, Israel.

Could you tell the readers about your background, current hydrographic job and activities?

After graduating from the Applied

Hydrographic Surveying training course at Southampton Solent University (UK) in 2006, I joined the Israeli National Bathymetric Survey project led by Dr. John K. Hall (GSI and a member of Hydro INTERNATIONAL's Editorial Advisory Board). In 2010, I received a BSc degree in Computer Science, Geography and Environmental studies from Haifa University. The same year I was selected to attend the intensive IHO Category-A Nippon/GEBCO programme at the Center for Coastal and Ocean Mapping in New Hampshire. I am currently engaged in various marine projects around the world in both the academic and commercial domains.

What has been the most challenging moment in your hydrographic career? That moment would be the Dead Sea (Israel/Jordan) mapping expedition.

This expedition, which carried the flag of the Explorers Club, was a true hydrographic challenge. Numerous challenges such as ultra-high salinity and sound speeds (over 1840m/s) had to be dealt with. These are extremes that do not exist anywhere in the world.

What is your opinion on current international qualifications or professional certifications (such as CAT A and CAT B) for hydrographic surveyors?

CAT A professional certification for hydrographic surveyors, such as the one currently offered at UNH's Center for Coastal and Ocean Mapping, gives both beginning and experienced surveyors the profound theoretical and practical knowledge necessary to best confront survey challenges. Moreover, international qualifications contribute to better hydrographic co-operation between countries.

How do you see the current job market for hydrography?

As technology advances so does the job market for hydrography. In recent years, more resources were shifted to exploration of the seas in almost every industry. This also applies today, and with such broad diversity in hydrographic projects anyone can find his place.

What should be improved or changed in order to make the hydrographic profession even more interesting for future hydrographic students?

“That’s one small step for man, one giant leap for mankind” said Neil Armstrong during the Moon landing. By introducing youngsters and students to the 71% of our Earth which is covered by water you achieve a growing interest. Projects such as GEBCO, the Nautilus-Live broadcast from Bob Ballard’s E/V *Nautilus* and the newly developed Google Oceans are excellent examples of such an effort.



Andres Milan, Lieutenant Commander, Spanish Navy, Spain

Could you tell the readers about your background, current hydrographic job and activities?

I have been a Spanish Navy (SN) officer for twenty-five years, and an SN hydrographer for fifteen years.

I completed the studies of MEng in Geodesy and Geomatics (UNB-Canada). I have been commissioned on several SN Hydrographic Vessels, and been the Commanding Officer of two of them as well as the chief of bathymetric data quality control and validation at the SN Hydrographic Institute. I am currently the Commanding Officer of the SNHV *Malaspina*.

What has been the most challenging moment in your hydrographic career?

When I became the Commanding Officer of a hydrographic vessel. The task of accomplishing demanding survey works while keeping a positive working environment has certainly been the most challenging goal.

What is your opinion on an international qualification programme or professional certification (such as CAT A and CAT B) for hydrographic surveyors?

I completely agree with it. The harmonisation in the different hydrographic fields has been one of the main goals of the IHO, and allows hydrography to benefit from the work of international teams in the different necessary levels of performance (technical and management). In addition, it helps the job market to contract hydrographers with a proven professional level.

How do you see the current job market for hydrography?

In Spain, there is a broad market for hydrography, but survey companies often have a shortage of qualified professionals. Since the SN has been the only responsible agency for nautical chart certification, studies to obtain the international categories are given by the Navy for Navy personnel. A collaboration between the Navy and the universities is being considered to offer civilians the opportunity of studying at the SN Hydrographic School.

What should be improved or changed in order to make the hydrographic profession more interesting for future hydrographic students?

In my opinion, more intuitive and visually attractive software and learning methods will be key to attracting young students to hydrography. On the other hand, the more you own a task the more you enjoy it. The more the hydrographic offices and companies invest in the updating of the training of hydrographers (in the technical as well as in the management fields), the more attractive the job will appear to future students.



Venessa O'Connell, hydrographic surveyor, Sydney Ports Corporation, Australia

Could you tell the readers about your background, current hydrographic job and activities?

I have a Bachelor of Surveying Degree and began my career in land surveying. I then moved into hydrographic surveying by gaining hands-on experience in the Australian Army Reserves. I have worked as a hydrographic surveyor at Sydney Ports for the past 10 years. In 2006, I gained Level 1 SSSI certification under the Australasian Certification Scheme. My role involves collection

IHO is open minded regarding different ways people gain experience and knowledge

and processing of hydrographic and topographic data for Sydney's Ports including outer ports within NSW. Surveys are routinely performed for safety to navigation, however, we also carry out surveys for, dredging, environmental management, engineering, positioning and monitoring. Calibration and maintenance of tide gauges is also another part of my role.

What has been the most challenging moment in your hydrographic career?

I know you want me to talk about a challenging job or situation but I try to ensure my job remains challenging and interesting at all times otherwise I wouldn't keep doing it! However, I do have a vivid memory of being five months pregnant doing a survey in slightly rough seas trying to keep my lunch down!

What is your opinion on current international qualifications or professional certifications (such as CAT A and CAT B) for hydrographic surveyors?

In Australia, we currently have no civilian CAT A or CAT B courses available. In the past year, the IHO has now recognised our SSSI Certification system internationally. This is a fantastic move forward and shows the IHO are open minded regarding the different ways people gain experience and knowledge in today's global and digital world.

How do you see the current job market for hydrography?

In Australia, we have numerous offshore projects requiring qualified surveyors. The demand for skilled hydrographic surveyors has remained high and should continue to do so into the future. In the past few years, we have had a significant influx of overseas qualified hydrographic surveyors in order to fulfill our skill shortage.

What should be improved or changed in order to make the hydrographic profession even more interesting for future hydrographic students?

Marketing is the key! Only this morning I stumbled upon a website with links to marine careers. The hydrographic surveyor page had a short story written by a surveyor which was horrifying! It talks about hydrographic surveyors being 'insane', never staying in the career for their whole working life, having no social life, working in terrible conditions... it went on and on. Accounting is the most boring and mundane job on the face of the earth and they always manage to market their career in a positive light. In Australia, the SSSI Hydrographic Commission is currently embarking on a new DVD to market to young people. I am hoping all the positive facets of our profession are captured in the 3-4 minute DVD.



Lauren White, hydrographic surveyor, Highland Geo Solutions, Canada

Could you tell the readers about your background, current hydrographic job and activities?

My background is in geology, but in graduate school I focused on the marine aspect and conducted extensive fieldwork in the sounds of North Carolina. Currently I work for Highland Geo Solutions as a contractor. They've

sent me all over the world to work as a hydrographic surveyor and navigator, but I'm hoping to get more geophysical jobs in the future.

What has been the most challenging moment in your hydrographic career?

The most challenging aspect of this job is waiting for a contract to come in and then leaving your life at a moment's notice to go offshore for a month or more. It's not for everybody, but I enjoy the lifestyle.

What is your opinion on an international qualification programme or professional certification (such as CAT A and CAT B) for hydrographic surveyors?

I sort of fell into this industry, I had no idea there were schools for hydrographic surveying or boards to certify workers. Most of the people I've worked with have similar stories. I don't know much about international qualifications or professional certifications, but having international standards that everyone upholds would benefit everyone.

How do you see the current job market for hydrography?

The current market is booming. Three years ago there was a serious slump and a pronounced lag between contracts. This year is shaping up to be the best so far and I'm excited to see where it will go from here.

What should be improved or changed in order to make the hydrographic profession more interesting for future hydrographic students?

I think the biggest thing is getting the word out to students. When I was in college I had no idea that hydrography was a thing. We had a fledgling hydrography programme hiding within the marine geology

The job market for hydrographic surveyors is buoyant

class, but I missed out on it. Now that class is filled every semester with students eager to break into the industry. Hopefully more coastal colleges and universities will add hydrography classes to their curriculum and inspire more students to get involved.



Al Rumson, project surveyor, DOF Subsea Norway, Norway

Could you tell the readers about your background, current hydrographic job and activities?

I entered the hydrographic industry after completing a BSc Ocean Exploration at The University of

Plymouth. After the second year of the course I was able to gain offshore placements during the summer, then during subsequent holidays. Since graduating I have worked in a number of roles and projects and the job has taken me to many countries around the world. In terms of types of surveys I have worked with, these range from small scale inshore surveys of wind farms, transition zone seismic surveys in Cuba, installation of wind turbines off Belgium using a 8700 Tonne lift capacity Heavy lift vessel, cable route surveys around the Mediterranean, numerous stints in construction support roles, working with ROVs on jobs related to wind farms, cable installation, oil field support and diver operations. These roles have taken place on vessels in the North Sea, off North and West Africa, various parts of the Mediterranean, South East Asia and Australia.

What has been the most challenging moment in your hydrographic career?

I am currently working as a project surveyor for DOF Subsea Norway, based in Bergen. In this current position I am responsible for the organisation of survey operations and various stages of planning and execution of projects. This year my time has been taken up working on multiple subsea engineer projects, acting as the survey point of contact for the project. I have recently been tasked with routes design for replacement flowlines and umbilicals for an oil field in the North Sea. This has been a real challenge, as I have been overseeing ongoing operations concurrently; also as the client's requirements have been continually changing and we have been required to devise an improvised procedure to fulfil these.

What is your opinion on an international qualification programme

or professional certification (such as CAT A and CAT B) for hydrographic surveyors?

I think that an international qualification programme is a good idea, and this should look beyond conventional full-time university courses as there are many people entering the industry from other backgrounds who require industry-specific training that is recognised internationally, given that this is a truly international career path.

How do you see the current job market for hydrography?

It is obvious that the job market for hydrographic surveyors is buoyant and anybody considering entering the profession should see it as a lucrative move, given the high demand for surveyors and lack of skilled personnel.

What should be improved or changed in order to make the hydrographic profession more interesting for future hydrographic students?

One thing that put me off the industry when I first entered it was the monotony of being parachuted into an online slot on a routine job that was already running. I think it would be beneficial for new entrants to the industry to rotate through various roles and participate in different phases of an operation, so they can develop skills and gain a broader understanding of operations. 🌐

Mapping the Future by Mapping the Past

How Maritime Archaeological Research is Training Tomorrow's Marine Scientists

This article describes the internship programme that has been offered over the past six years while performing maritime archaeological projects in the Mediterranean. This collaborative effort between academia and industry provides affordable manpower, whilst interns have a chance to learn and experiment on significant discoveries as part of a closely-knit group. After their internship, motivated interns benefit from broad experiences and contract opportunities. This introduction to quasi-professional employment contrasts with typical commercial operations in terms of pressure and learning opportunities; an approach that translates into continued success for the organisation and the majority of summer interns being motivated to further their career in hydrography.



Graham Nickerson,
Highland Geo
Solutions, Canada

THIS IS THE BEST JOB ANYONE could ever have. Each prospective intern is told this during casual banter and discussion over studies and career plans. This is a summer job involving sun, exotic locations and the opportunity to help rewrite history - and getting paid to do it. A great, low-pressure environment to experiment with a broad range of survey systems, this internship is structured to organically allow people to learn by doing. It is a unique opportunity to give young people the chance to explore hydrographic mapping techniques without the high pressure of commercial survey work. Yes, there are production goals, but this is a tightly-knit survey team and we help each other out. Personal memories of literally running from a helicopter into the chair of an unfamiliar acquisition system still linger. On-the-job training consisted of sitting in the inventory room and breaking out a litany of operation and technical manuals after a monotonous 12-hour shift looking at ancient cathode ray tubes. The soul-draining effort of trying to figure out a web of technical drawings and poorly written 'training' documents experience remain: as a strong reminder of how not to structure an HR policy.

The summer internships first came to be purely by serendipity. A colleague had been approached by a private maritime archaeology foundation based in Key West, Florida and passed along a recommendation. Having just started, Highland Geo Solutions had an open slate. As it turned out, Dr. Jeff Royal of RPM Nautical Foundation (RPMNF) was attending a CARIS training course in Fredericton. It took all of five seconds to start laying out ways in which the two companies could help each other. An initial visit to the R/V *Hercules* in Malta was conducted to take a look at the operation. The results of the changes made and the impacts have been presented at several venues such as the CARIS Conference and Femme. Part of that improvement process was the provision of a commercial marine surveyor to oversee the summer survey operations. One outstanding issue that came to light was the survey technicians being used. RPM found the selection process to be a drain on resources and the results were not always satisfactory. Highland Geo Solutions worked with RPMNF to broaden the scope and to incorporate potential employment opportunities as an add-on to the summer programme. The programme quickly

took shape with a three-pronged approach: encouraging student participation, gender advancement and employment opportunities. Royal recalled that RPM really needed somebody riding the front wave of technology and working with industry helped address that deficiency.

Archaeological Successes

The first approach of the programme had students participating in some very exciting archaeological programmes throughout the central Mediterranean. These regions introduce students to the local culture and a long maritime history dating back to the ancient Greeks. For example, survey work in 2005 and 2006 spanned the central Mediterranean and resulted in numerous shipwrecks being discovered off the coast of Marmaris, Turkey and in Eastern Sicily. One of the goals of the Sicilian project was defining the site of one of the most significant naval battles of the classical age. In 264 BC, the Romans and Carthaginians were caught in crises similar to a more familiar calamity repeated two millennia later. As the military escalation in Serbia hurled the world into World War One, a global conflict that



Figure 1 :
Deploying sound
velocity probe in
Malta.



Figure 2: Hercules
crew retrieving
ROV off the coast
of Turkey.

saw the end of no less than four Imperial dynasties (Russia, Ottoman, Germany and Austria-Hungary), so too did an isolated conflict in eastern Sicily catapult the ancient western Mediterranean into the largest military conflict up to that time: The First Punic War. Rome emerged the victor and annexed widespread territories as a result and stood sole superpower of the entire western Mediterranean for centuries to come. Key to their success was the development of a powerful navy. After early growing pains, the Romans engaged the Carthaginian fleet off the western coast of Sicily and soundly defeated it. Since 2008, RPM Nautical Foundation has committed a great deal of resources mapping this area. To date, artefacts include eight ship's rams (Rostrum) and four legionary helmets, with further ROV investigations of multi-beam targets to be carried out this summer.

Other large mapping projects have also been ongoing along the Adriatic coast as part of the Illyrian Coastal Exploration Program (ICEP). In the course of assisting the countries of Albania, Montenegro and Croatia in cataloguing their maritime heritage, some noteworthy discoveries have

occurred in the form of both ancient and modern wrecks. To date, this work has resulted in the discovery of 20 ancient wrecks and the recovery of artefacts such as amphoras, tiles and a sprinkling of other items. Additionally, a number of First and Second World War wrecks have been discovered and/or mapped along the Adriatic coast. The circumstances surrounding the mining of the destroyer *HMS Volage* have had interesting modern implications.

Discovery of the bow section of this ship reopened a case of cold war subterfuge gone wrong when in 1946 the ship mysteriously struck a mine. Insisting Albania had mined international waters and demanding reparations, the British could not explain why the bow section of the vessel was recently found well within Albanian territorial waters. Years of work still lay ahead investigating recent finds and mapping other areas of interest.

Gender Advancement

It has been a long-standing practice for RPMNF to actively encourage female internship candidates in order to promote female participation in science, technology, engineering, and math (STEM) related studies and careers. Dr Royal pointed out anecdotally that in his experience females were underrepresented in the marine mapping field. This has certainly been the author's experience in industry as well. A quick scan of Highland Geo Solutions' current pool of contractors and professional network illustrates the gender disparity further; only 13% are female. A 500 member sample of one of the hydrographic social networking groups indicates only 9% are female. Another hydrography-themed educational group has 33% female members registered. Moss-Racusin (2012) shows women in the STEM fields are still facing barriers when competing with males in terms of perceived competence and

When interns get into more demanding situations, they will have the skills in place for success

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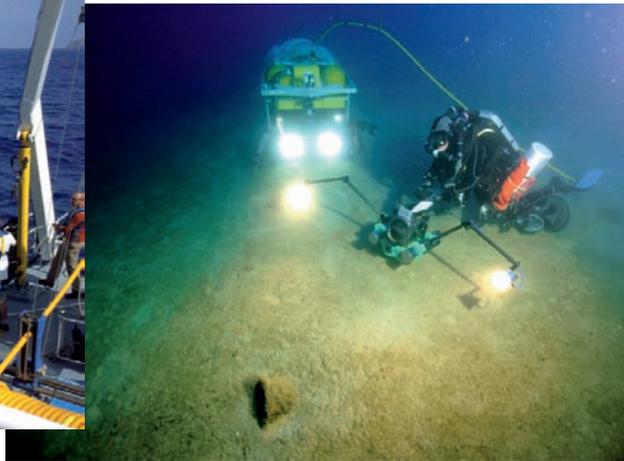
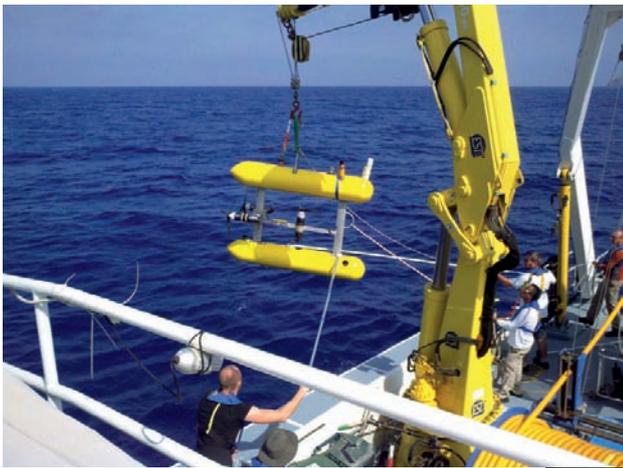


Figure 3: ROV Deployment.

Figure 4: Working on the sea floor.

qualifications. Figures presented in 'Women in Energy: Closing the Gender Gap' (website 1) confirm companies like Shell have been compelled to work towards a gender balance and have established quotas for female technical staff at 20%. One in three RPMNF internships has been filled by female candidates. A policy of encouraging females in STEM is promising, but it is clear there is still a long way to go.

Employment Opportunities

Finally, the internship programme focuses on career development by actively trying to mould interns' career trajectories by progressively introducing more responsibility. Students who participate as interns can often come back as the surveyor in charge in successive years. At this point, the work really starts to involve survey management, shift supervision and mentoring. Additionally, interns are acquainted with the business aspects of contract work such as expenses, taxation, invoicing and investing in one's own professional development. This programme gives the trainees so much hands-on responsibility that when interns do get into more demanding situations, the skills are in place for success. At no time are interns ever intentionally thrown in over their heads; trainees walk away from the programme feeling really positive. Students have had a chance to put into practice what has been studied in school. In the proper operational environment, if interns make an effort they actually enjoy the work. The statistics say it all: of the internships offered, half of the interns have elected to go into the industry.

The remainder have gone on to government hydrography, education, or to continued studies in science and engineering, including one person doing their Category A certification and two people currently working towards their Doctorate of Philosophy degrees. Only one of the interns elected not to continue in a field related to hydrography or mapping; that is nearly a 95% success rate.

Conclusion

There are further plans to expand the programme both in equipment (provided by GeoMara, Inc.) and in scope via strategic partnerships with institutes such as the University of Malta, the Maritime Studies Programme at East Carolina University, the University of Washington, the University of Southampton, the College of Charleston, and government institutes in Ireland, Malta, Tunisia, and the United States. According to Dr Aaron Micallef, marine geosciences and seafloor mapping are new fields of research at the University of Malta. This collaboration has been fundamental in acquiring both skills and data that allow the university to continue carrying out cutting-edge research into the future. In terms of interdisciplinary skill development and outreach, a new project is planned for September. Work with industry and academia has allowed the introduction of a 10-day course to introduce the fundamentals of survey and data analysis. The goal is to bring together differing skillsets, show them the tools and how they work. Students will be collecting data for use with a variety of output

products addressing geology, biology, archaeology and environmental components of the data collected. This course nicely follows up on the internship and should increase the number of survey software and hardware systems.

The overriding philosophy in the approach to teaching and learning by doing with the oversight of sector specialists still stands. Derek Smith, RPMNF Internship co-ordinator, feels that although internship programmes are often viewed as a revolving-door process where participants gain limited experience and then depart the organisation, the key to future success is striving to build long-term relationships with the next generation of professionals and assure their continued growth. 🌐

Acknowledgement

Thanks are due to Derek Smith and Dr Jeff Royal for editing suggestions and providing imagery.

Further Reading

Archaeology; Mar/Apr2011, Vol. 64 Issue 2, p26

The Author

Graham Nickerson's professional career has been diverse, ranging from data acquisition for oil and gas, environmental restoration and cable surveys. He has also worked as a software consultant for industry leading companies designing data processing and visualisation software. In 2006, Graham started Highland Geo Solutions.



1. http://www.world-petroleum.org/docs/docs/wpc_women.pdf

The Right Tool for the Right Job

Personnel with a Competence Profile are Fast becoming the Norm

It can be said that the modern world is far less forgiving when it comes to experienced personnel. In times past, a person's experience would speak for itself; they could get by on word of mouth, a confident approach and a CV detailing their experience. While in part this is still applicable today, increasingly we find ourselves faced with the requirement to somehow demonstrate this experience, in short, to show competence.



Darioosh Naderi,
Atlas Services
Group, UK

IF WE LOOK AT THE CASE OF A surveyor seeking employment, they have two routes they can go down. First is permanent employment. This is where the surveyors have one chance to open the door, and that is with their CV. This alone will not stop them from getting sent back out the door, and having it closed behind them, as they will have to pass the all-important interview. The interview allows them to sit in front of a would-be employer, and their peers, and present their case for employability, whilst also navigating an obstacle course of technical questions. This process helps paint a picture for the would-be employer to assess the candidate's suitability, and also to gauge their potential competence for the role.

The second route is that of freelance employment. The freelancer serves a variety of purposes: providing cover for a staff member who is suddenly unavailable, allowing the survey company to complete their numbers when taking on extra work, or providing a skill set that is not available to the client amongst their own staff. In the same way that the world of surveying seems to be held together by duct tape and cable ties, it is also propped up by freelance

personnel. However, there is one problem with this: how does the employer know what to expect from the freelancers when they arrive on site? The employer did not have the luxury of being able to interview the candidates, assess their suitability or bombard them with technical questions. They have one tool only, and that is their CV. For the freelance surveyors, this has been their best asset, allowing them to detail all the projects and roles they have performed, whilst also highlighting what equipment and software they are familiar with. It does miss one

key thing though: how well did they perform these roles? In other words, how competently can they do their job?

Roots of the Freelancer

One of the simple truths about employing freelance personnel is that an employer wants a readymade surveyor, engineer, etc. They do not want to invest the time or resources to train them for their specific needs. The freelancer has to be able to hit the ground running and have all relevant skills, experience, and prior training to fulfil their role and



Joanne Davies,
party chief.



complete tasks competently. All this prior training and experience starts with permanent employment. Although it varies per individual, most freelance personnel have had at least a few years in permanent employment. Going through the process of being a trainee, learning the ropes, and attending any and every training course they get sent on, is what allows an individual to develop the competence to be able to offer their services for freelance employment. And in addition, there must be a willingness to be flexible, adaptable, and taking pride in their work. Even though they may never return to the same vessel or project again, the employer wants someone who will perform their duties with the same professionalism as any of their permanent employees in the same role. Although when times are busy, the work can be plentiful, in less prosperous times, work options can soon start to diminish for those who do not exhibit this professional attitude.

Competency

While there is a pool of highly skilled and competent individuals out there, some of which are well known, and respected, there are also those who are less capable and dare we

say it, in some cases, incompetent. Though incompetent personnel are rare and, as mentioned, may find the opportunities for contract work diminishing, there are always new ones to replace them. The question is: How do we identify the good, the bad and all those in-between? This is where schemes, such as the ones based on the competence framework laid out by the International Marine Contractors Association (IMCA), come into place. They provide a mechanism

build up a picture of their capabilities, and at a suitable point in time, have this evidence verified by a suitable person onshore. This verification will help determine the person's grade, ranging from trainee through to supervisory grades.

Recording competence means several things to both the individual and the employer. First of all, individuals now have a way of not only identifying their strengths, but also their weaknesses. They can use this to

Employers can now match the right skills to the right job with less risk

for offshore survey personnel to record their competency and use this to demonstrate it to potential employers. The idea is a simple one; while performing their duties and daily tasks, they can record evidence of this, and have someone else (someone competent) assess them in doing this. This assessment is recorded in a file, or a log book belonging to that individual. He or she can then add to this record and so

highlight areas for improvement or further training, taking ownership of their own career development. Secondly, it allows any employer to determine if the candidate has the relevant skills for the job at hand, or potentially how far away they are from reaching certain targets. For permanent staff, it makes it easier for the employer to see areas for improvement or future training. For freelance personnel, it means that the

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Surveyor Dave Stark on board the *Kommandor Stuart* (Calecore Ltd.).

no guarantee of work beyond a few short months, and for this reason, may utilise the services of multiple agents - meaning that not one single agency takes responsibility for that individual. This is a risky approach though, as it results in freelance personnel with little or no support for training or career development, save for those determined few.

Atlas Services Group takes a slightly different approach. Whilst Atlas has thousands of individuals registered for work, ranging from surveyors, to project managers, engineers through to party chiefs, they are all afforded the same opportunities, regardless of loyalty to one (or no) agency. Atlas has an ongoing commitment to helping develop individual's skills, whilst leaving ownership in their hands. One example of this is the training partnership Atlas has with EIVA. The training courses are not hosted where it is most convenient for Atlas as an agency, but where the individuals need them. This year alone, training courses have been hosted in Aberdeen, Singapore and Naples, with more to follow. These courses are not only hosted for those who declare their unwavering loyalty to Atlas, but also to external employers of permanent staff. Another example is the provision of external lectures and training to the industry, whether this be guest lecturing to hydrographic students in the Netherlands, or hosting introductory hydrographic presentations during Ocean Business.

It may seem strange to assist in the training of permanent staff that do not, and may never work for a specific agency, but ultimately having a competent workforce in the offshore industry cannot be a selfish thing. As mentioned, competency and safety go hand in hand and it should be every individual's and every employer's goal to make the offshore workplace a safe place. 🌐

The Author

Darioosh Naderi works as an account manager and technical consultant at Atlas Services Group, where he also assists external groups with training requirements. Prior to this, Darioosh worked as an offshore surveyor for Stolt Offshore, before moving on to Sonardyne International Ltd. and working as part of the Survey Consultancy Group.

employer can now match the right skills to the right role with less risk. But above all, for someone to have

part in their career. This role is quite clearly defined for an employer; they employ them, take some

Anyone sending individuals to a project also plays a part in their career

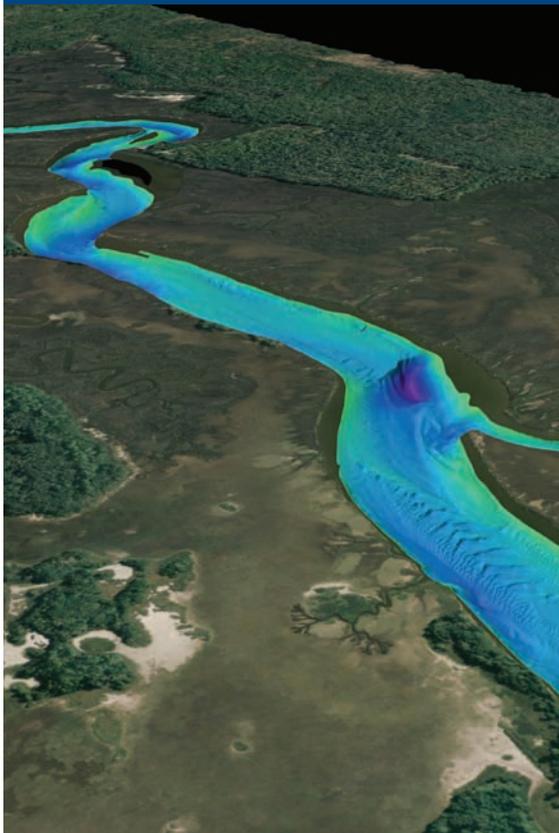
demonstrated a level of competence in any task, they must have done this safely. And for anyone who has ever stepped foot on that rattly, smoky tug boat, converted for some impromptu survey, or even a large offshore construction barge, they know that safety must always come first.

The Role of the Agency

Whilst it is true that individuals take ownership of their own career development, it is essential that anyone involved in sending individuals to a project also plays a

responsibility for their training needs, and are also there to help them along the way with any curve balls that are thrown at them. However, this is less clearly defined with freelance personnel.

In most cases, there is no direct responsibility or onus upon the agency that represents the freelancer. This can be due to various reasons, one of which is the fact that the tether (or bond) between an agent and freelancer can be rather loose at times. The freelancer usually has



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Approaches to Hydrographic Training and Capacity Building

Technology and Blended Learning for Flexible, Modular Training

The Challenge: To provide a stimulating educational framework that blends relevant theory with practical exercises without removing individuals from their work environment for too long a period and optimising investment in complex and expensive equipment that may only be used a few weeks per year. The IHO FIG/IHO/ICA International Board for Standards of Competence (IBSC) has recognised the need for the competency standards to continue to evolve to meet these contemporary and future requirements. This paper presents an approach taken to modernise the training and capacity building aspects of these challenges.



Derrick Peyton,
IIC Technologies,
Canada

THE DEMANDS MADE UPON THE world's charting authorities continue to ramp up. There is increased competition amongst ports and a growth in the size and number of ships.

Cruise ships are offering more port of calls and global warming is facilitating vessel traffic in uncharted regions. In addition, there are emerging markets like wind farms, marine turbines, habitat and coral reef mapping, which are all providing interesting career options for aspiring hydrographers.

Unless the graduating students have previous experience in the profession, considerable additional investment is required to bring the graduates to the level of competency in the field of work for which they have been hired. In addition, today's survey operations are comprised of sophisticated integrated systems that require knowledge in project leadership, risk mitigation and financial management.

Coupled with this, is the demand placed on existing hydrographic surveyors who already contribute to their organisation's bottom line. They are pressured to maintain Continuous Professional Development (CPD) by their professions, their company and their own self efficacy. There is a

clear demand for programmes that facilitate employee CPD without a prolonged tenure away from the workplace.

Challenges in Recruiting and Training

New approaches to education have to take students from the download generation into account. They are confident, question authority and their leadership may come from enthusiasm rather than experience. Even mature students, who are already employed, are well-adjusted to this new way of thinking. However, existing financial obligations and commitments, as well as personal preferences and circumstances,

require training programmes that do not dislocate them from their work environment for extended periods.

It is too simplistic to make the leap from the profile of millennial learners and assume that a solution like e-learning is the complete answer. Whilst striving towards creating and facilitating a hydrographic programme that adequately provides the necessary domain specific technical training, the appropriate practical framework still needs to be incorporated.

Training Options

We rely heavily on learning institutions that provide the



Shekhar Murthy,
IIC Academy, India



Mike Casey,
IIC Technologies,
Canada

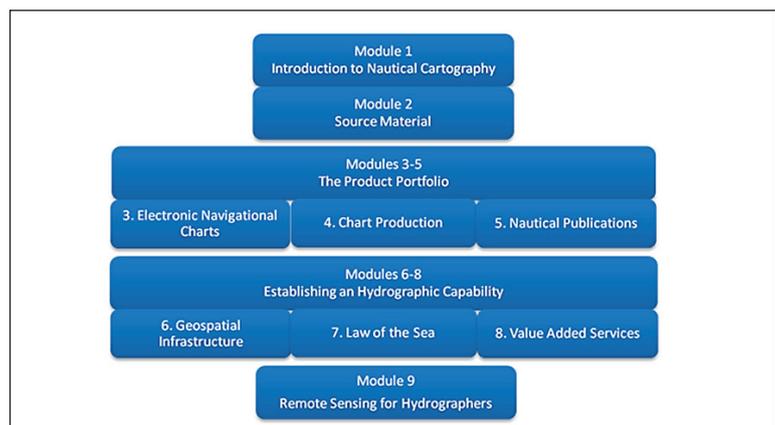


Figure 1: MGI IHO Cat B S8 Modular Programme.

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Figure 2: Subject Matter Expert training of Module M4 (Courtesy of LINZ).

fundamental basis from which the student can evolve. However, once candidates begin focusing on their chosen domain, in this instance hydrography, there are limited options. The same could be said for employees who follow a CPD programme.

A recent communicate from the IHO suggests a proposed new structure will have separate Standards for Category A and for Category B programmes, both in S-5 (Hydrography) and in S-8 (Nautical Cartography). The International Board on Standards of Competence for Hydrographic Surveyors and Nautical Cartographers (IBSC) has recognised the need for the Standards to meet contemporary and future requirements. At the time of writing, the IBSC has awarded recognition to approximately 50 programmes worldwide. A summary of the list indicates that approximately 70% of those programmes are oriented towards government and/or Naval career oriented students. Only approximately 5% of the programmes offer an S8 (Nautical Cartography) course.

Recognising Change – Case Study

IIC Technologies has been producing ENC's and nautical charts on behalf of hydrographic offices for over 15 years. It is important that the competencies of our production team are of the highest standards that enable us to align our business performance to corporate goals. In accomplishing those goals, we have trained nearly 500 people in various components of nautical cartography, as well as photogrammetry and mapping, through the learning arm of IIC,

Sophisticated systems require knowledge in project leadership, risk mitigation and financial management

the IIC Academy (Academy). The Academy is open to both the public and private sector individuals.

The Academy has implemented a Marine Geospatial Information (MGI) learning programme – an IHO Category B recognised course based on the S8 nautical cartography syllabus. The programme was designed by studying the needs of both organisation and individual and focused on the delivery approach as much as on the syllabus in order to maximise the overall effectiveness. Integrated into our operational environment we have a Quality Management System (QMS) whereby our learning programmes are aligned to our organisational strategies and objectives. The effectiveness of training not just with tests and exams following training courses but later through performance metrics using the QMS is reviewed throughout our learning and production processes. The objective of this continuous improvement strategy is to monitor the effectiveness of our educational techniques through graduate performance and the quality of output.

Three main core design principles were implemented during the course development.

Experiential Learning Techniques

Hydrography is well fitted to experiential learning in that the subject matter is highly practical. Most hydrographic and cartographic training has evolved through theory with practical exercises. The subtle but important difference in our approach was a move towards a more conscious adoption of the full cycle, whereby the theory is preceded by learning exercises and followed by group reflection before moving to consolidation.

From the very beginning, IIC designed the MGI course to be modular and to be taken over an extended period. In this way, it was possible to take organisational needs into consideration to balance training and project work. The learning modules and the intervening periods are considered part of a full cycle of experiential learning. In essence, the intervening periods can be considered to be 'work terms' so where practicable, each module will be followed with project work, which will be supported by learning interventions to provide both the reflection and consolidation parts of the cycle.

Blended Learning

It takes effort and resources to facilitate the demand by the current



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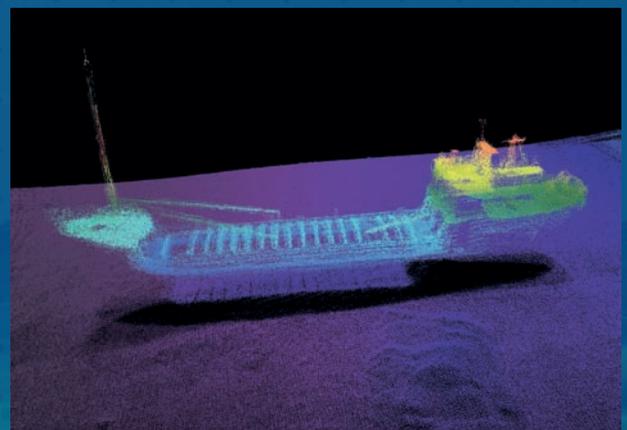
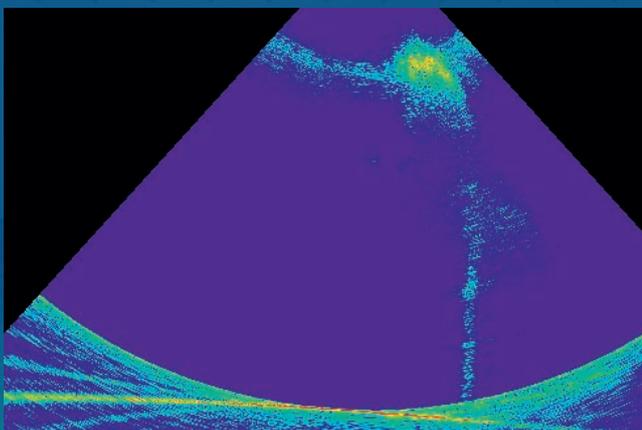
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Learning programmes are aligned to organisational strategies and objectives

generation of learners and their desire to use advanced technology. Our approach was to build a learning resource framework that blended the traditional with the modern. Within our strategy, e-learning components that are considered a supplement, not a substitute, in the learning mix were developed. The purpose is to facilitate flexibility in allowing the student access to additional teaching materials while away from the classroom. An enhancement to the approach is the development of the e-learning around shared experiences and workspaces thus keeping the student in a collaborative relationship with other colleagues.

Another important element in the approach was access to, and working with, Subject Matter Experts (SMEs) in the production environment. SMEs now play several key roles and are our 'virtual faculty'. The SMEs not only keep us current in teaching methods but also provide new case studies based on recent projects in which they are involved.

Leveraging Technology as an Aid

Cost was a primary factor in meeting the challenges of providing quality up-to-date training without removing the individual from their work environment for too long a period. The Academy addressed this challenge, especially from the nautical cartographic practical aspect, by facilitating students to log into the Academy's centralised Citrix server from a remote location for practical exercises. The approach involves the concept of 'desktop virtualisation', whereby a computing device can be turned into a fully functional desktop without sacrificing the users IT security rules.

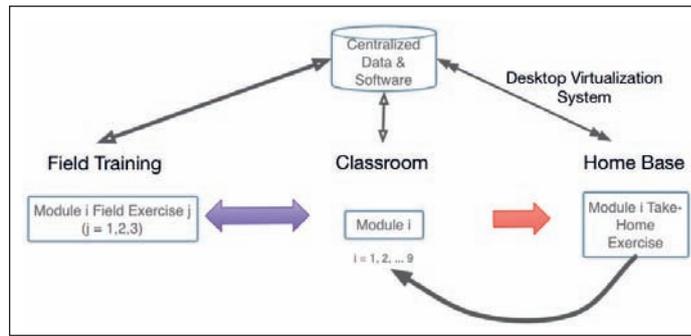


Figure 3: Work flow of the Blended Learning Approach.

In the applied approach, lab data remain at the IIC Academy and is made accessible to the students via Citrix remote access technology. This means that a broadband Internet connection is not required and the costs associated with moving huge amounts of data over the Internet are avoided. The data and the processing horsepower needed are on the IIC Academy server; only the command keystrokes/mouse clicks and an optimised replica of the computer screen are passed across the Internet link, requiring far less bandwidth. A related benefit is better utilisation and version control of software packages used to process data. Thus, the Academy, and the students are operating on up-to-date software versions and laboratory exercises. Thus, the students can reside anywhere and do not need to carry the software with them.

Conclusion

The Marine Geospatial Information (MGI) programme is an example of how IIC has started to blend in direct

theoretical classroom and practical distant learning using remote technology and resources. Individuals wishing to attend are able to adapt the programme to their working environment due to the modular and flexible design. Organisations wishing to sponsor students are able to periodically monitor employee improvement through their Quality Management System. The course has access to the best tools available but these are accessed remotely, which reduces the cost of transporting the equipment, the course setup and the various software licensing issues. 🌐

The Authors

Derrick Peyton is CEO of IIC Technologies and chairman of the Governing Council of the IIC Academy. He has several years of experience in ocean mapping including hydrography, digital charting, offshore surveying and UNCLoS. He has graduated from several programmes related to surveying and mapping.

Shekhar Murthy is president and lecturer of the IIC Academy. Shekhar retired from the engineering branch of Indian Navy in the rank of Commander. He holds a Masters degree in Technology specialising in Systems Engineering and Management; a Masters in Physics; and an MBA in operations management. He has a deep rooted passion in nurturing leadership excellence and competency building, and has written over a dozen papers for international conferences, mainly on holistic lifelong learning, pedagogy, and use of technology to leverage educational interventions.

Mike Casey is vice president of Geospatial Solutions, IIC Technologies. He has held this position since January 2005. Prior to this he served as director Nautical Charting with the Canadian Hydrographic Service from 2001 to 2005. Casey also held several positions in Information Technology prior to this. He graduated from McMaster University, Hamilton, Ontario, Canada in Mathematics.

Further Reading

International Hydrographic Organization
www.iho.int

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Armstrong, Andrew and Furness, Ron and Johnston, Gordon and Seube, Nicolas and Tsoulos, Lysandros (2012) Towards New Standards of Competence for Hydrographers and Nautical Cartographers. HYDRO 2012 <http://proceedings.utwente.nl/217/>

Peyton, Derrick and Ed Kuwalek, Deploying remote desktop connectivity for near-shore hydrographic surveys, Journal of Ocean Technology, Volume 7 Number 2 (Apr - Jul, 2012)



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The *Washington*
in good days.



HURRICANE!

Lives Lost in 1846 in the Pursuit of Scientific Knowledge

Albert E. Theberge Jr.,
Contributing editor,
Hydro INTERNATIONAL

North Atlantic hurricane season is now upon us. Until well into the twentieth century there was little understanding of the nature of hurricanes and no adequate system to warn mariners of these dangerous storms. This often led to disaster. The following is an incident affecting a pioneering oceanographic ship conducting Gulf Stream studies.

ALTHOUGH NINETEENTH century hydrographic ships usually worked in close proximity to ports and the relative safety of inshore waters, in 1845 Alexander Dallas Bache, the second superintendent

of the United States Coast Survey, embarked on a project to systematically study the Gulf Stream including measurements of current velocity, temperatures at the surface and at depth, depth of water, chemistry

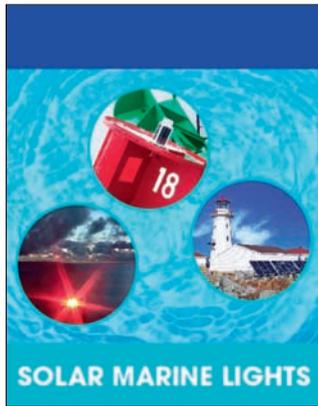
“We feel that we have to be very careful of her in heavy weather”

of the water and other associated parameters. He sent the Coast Survey brig *Washington* to conduct these studies. Although much of this effort involved developing instruments and methods, a successful transect was run to the southeast of Nantucket Island.

In 1846, Bache again sent the *Washington* to study the Gulf Stream. This expedition was under the command of his brother, Lieutenant George Mifflin Bache. At first glance, this would seem to be nepotism;

but both George Bache and another brother, Richard Meade Bache, had been attached to the Survey since 1838, and were amongst its most senior naval officers.

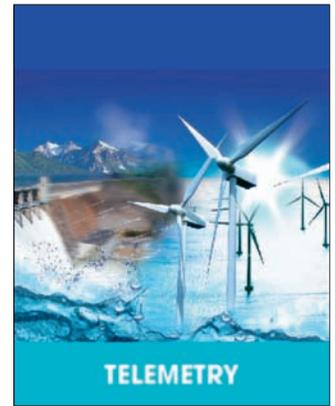
The first 1846 cruise of the *Washington* covered one transect



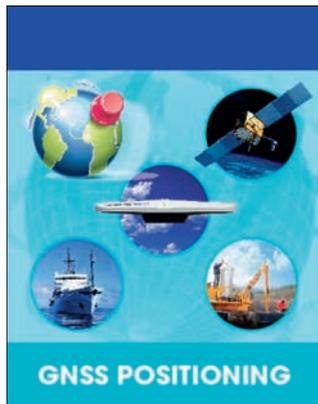
SOLAR MARINE LIGHTS



FIELD PC'S



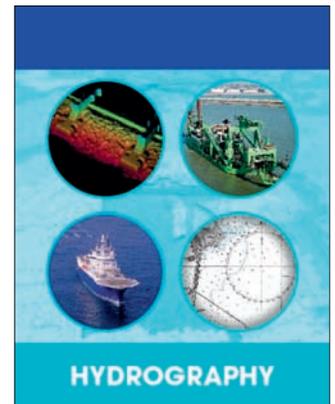
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of the Gulf Stream extending 400 miles offshore to the southeast from Sandy Hook. This cruise resulted in the discovery of the 'cold wall', the relatively abrupt boundary between the distinctly colder inshore waters and the much warmer waters of the western edge of the Gulf Stream. In a letter dated 5 August, George wrote his brother: "I would like to be with you when you look at and admire this section, as admire it you must, and speculate on it together. Here on the left we have the main current of the stream turned to the eastward, by Cape Hatteras, and butting up against a bank of cold water, which it overflows, and on the right mingling with a vast reservoir of warm water, which is probably brought there from the eddies from the stream itself. How beautifully the line is defined to the left or westward...."

Prophetically, Lieutenant Commanding Bache finished his letter: "... we feel that we have to be very careful of her in heavy weather. A good hard gulf sea would rack her very much." George Bache was quite aware of the

danger the *Washington* would face in heavy weather.

The last letter that George Bache wrote to Superintendent Bache was dated 12 August 1846. He noted that at his southeastern-most station he encountered a westerly current in

south. This line ran to the northwest towards Cape Henry, Virginia, and was finished on 7 September.

While finishing the last station at noon on 7 September, the *Washington* experienced moderate breezes from the northeast with cloudy weather

'Cold wall': boundary between colder inshore waters and warmer Gulf Stream waters

warm water after passing the main body of the Gulf Stream. He attributed this to an eddy current which was associated with the Stream. He spoke once again of the cold wall which he hoped "to find permanent, uninfluenced by the seasons," as this would be a marker to help navigators ascertain their position. By 16 August, the *Washington* was working to the southeast from Cape Henlopen, Delaware. This transect was finished on 27 August with a new line begun on 29 August another 150 miles to the

and a heavy swell from the southeast. After completion of the last station at 2:00 pm, the *Washington* made sail for Cape Henry, only about 60 miles distant. Unfortunately, the ship passed a little to the north of the bay entrance as at 11:20 pm Smith Island was sighted. The ship then made for Cape Henry. The ship's log for 8 September 1846 reads:

"Commenced with a fresh breeze from the E. NE., with thick and squally weather; at 12h. 20m. Smith's island

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light bore NW. 1/2W; lost sight of it immediately afterwards; at 2 hauled up NW., called all hands and took two reefs in the topsails; at 2h. 30m. discovered land under the lee; wore ship to the southward and eastward, hauled on a wind, reefed and set the mainsail; got a cast of the lead in five fathoms water; at 3 pitched away the jib boom, and commenced clearing away the wreck.

“From 4 to 8, heavy gales from the northward and eastward; thick haze and rain, with a heavy sea on: at 5h. 30m. the brig much pressed -- took in and furled the foretopsail: at 6h.

“From 4 to 8, heavy gales from the northward and eastward; thick haze and rain”

30m. hauled up the foresail, clewed down the main topsail, split the foretopmast staysail: both the starboard boats filled and tore away from the davits; got the wreck of the jib and flying booms on board: at 8 called all hands: from 8 to meridian heavy gales from the northward and eastward, thick mist and rain: at 8h. 30m. carried away the main yard in the lee quarter, clewed up and furled the main topsail and set the fore trysail, with the bonnet off; bent a new main trysail, reefed and set it; carried away the gaff and both weather boats from the davits: at 10, blowing a hurricane, the water above the lee rails most of the time; hove overboard both of the lee guns, and cut away the mainmast, which brought the foretopmast, the fore yard, and the head of the foremast with it, leaving them hanging up and down the mast; got her before the wind, and hove overboard the two larboard guns; sounded in eight fathoms

water, not able to see a cable's length ahead; the tops of the seas blowing completely over and on board of us, the men clinging to keep from being washed or blown overboard. At 11 let go the stream anchor, with a 6 ½ inch Manila hawser, 180 fathoms in length, bent to it, in order to bring her head to the wind, for the purpose of anchoring. At 11h. 10m., while in the act of letting go the starboard anchor, shipped a heavy sea amidships and on the quarter, sweeping the deck fore and aft, and carrying with it the poop cabin, and nearly all the officers and men. She partly righted; all succeeded in get-

ting on board again, with the exception of George M. Bache, Lieutenant Commanding, James Dorsey, Benjamin Dolloff, and John Fishbourne, quartermasters, Henry Schroeder, sail maker's mate, Francis Butler, Lewis Maynard, Thomas Stamford, and William Wright, seamen, and Peter Hanson and Edward Grennin, ordinary seamen. On regaining the wreck, manned the pumps, cut away the foremast, and let go the starboard anchor, which brought her head to the wind; found the tanks, chains, kentledge, and everything in the hold, had shifted, ripping up the berth deck; cleared away the chain and run it out to the bitter end; at the same time employed heaving overboard the kentledge and shot. The brig gradually righted; the gale abating, she rode to her anchors.”

The last anyone saw of George Mifflin Bache, he was holding on to part of the cabin as if stunned. He had no

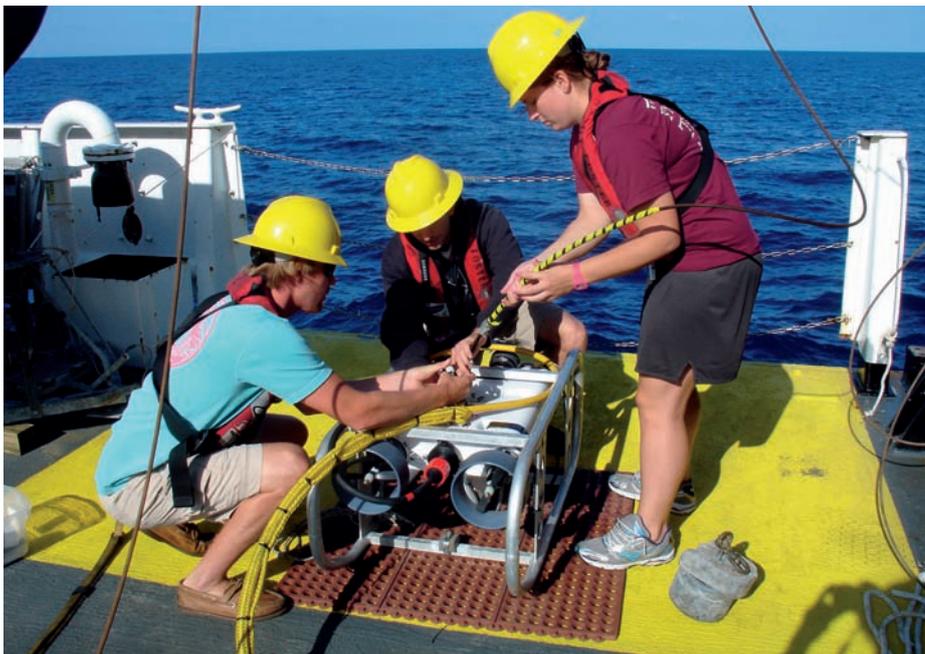
marks on his face and his arms were over the flotsam as if resting while his head was turned and looking toward the brig. The observer, Mr. Ricketson, who was a civilian pilot accompanying the cruise, saw a tremendous sea crash over Bache and then had the same sea come over him on the ship. He never saw Bache again. The surviving officers of the vessel praised Bache: “During the trying scenes which preceded his loss, his coolness and decision were remarkable: everything that seamanlike skill could effect for the safety of the vessel he accomplished. He appeared never to think of himself, but, with his characteristic solicitude for the performance of his duty, only of preserving what related to that upon which he had been engaged during the cruise.”

It was not until 17 September that the *Washington* was taken in tow by the USS *Constitution* bound for Boston from Rio de Janeiro. On 18 September, the *Constitution* provided the *Washington* with 75 gallons of water and 7 ½ gallons of whiskey. A week later the little ship was anchored off the Navy Yard at Philadelphia awaiting repairs.

The next year, the final work of George Bache for the Coast Survey came to an end. Drift bottles had been added to the regimen of observation techniques in 1846 and a bottle tossed overboard from the *Washington* in the axis of the Stream on 31 July 1846, was picked up on the coast near Kerry, Ireland, on 27 June 1847.

A monument stands today in the Congressional Cemetery in Washington, D.C., consisting of a broken mast inscribed with the names of Lieutenant Commanding Bache and the members of the crew who died in the hurricane of 8 September 1846. These men were amongst the first in the United States to lose their lives in the pursuit of scientific knowledge. 

Figure 1: BEAMS Team 2012.



Developing the Ocean Survey Workforce

The BEAMS Programme, College of Charleston and University of Washington



Dr. Leslie R. Sautter,
Dept. of Geology
and Environmental
Geosciences,
College of
Charleston, USA

Developing qualified ocean surveyors for the marine geospatial workforce requires an educational opportunity that goes well beyond the limitation of classroom and laboratory exercises. The BEAMS Programme focuses on strengthening technical and applied skills in the next generation of marine geospatial scientists and workforce.

opportunities and job market in bathymetric mapping, seafloor habitat characterisation, hydrography, and marine geophysics research.

The BEAMS Programme was initiated in 2007 at the College of Charleston (CofC) Dept. of Geology and Environmental Geosciences, teaming with the hydrographic survey software provider Caris. In 2011, the programme was expanded to include the University of Washington (UW) School of Oceanography.

Nearly all participating students have had the opportunity to take part in a dedicated BEAMS training cruise (1 to 4 days), during which they had hands-on experience with multibeam sonar data acquisition, survey operations and deploying numerous ocean-survey related instruments, such as a CTD, ROV, side-scan sonar, sub-bottom seismic profiler and sediment grab sampler. Both the 183' NOAA Ship *Nancy Foster* and 280' UNOLS R/V *Thomas Thompson* (operated by UW) have been used for BEAMS cruises. As the programme evolves, more opportunities are being generated for BEAMS Team students to gain experience with nearshore survey operations using small vessels. In addition to BEAMS cruises, more than 60 berths onboard multi-beam sonar cruises have been filled by BEAMS students who have volunteered as survey technicians.

BEAMS was originally designed to provide training in multibeam sonar bathymetry data acquisition and post-processing to geoscience and oceanography students by offering the foundational course Introduction to Seafloor Mapping (referred to as SeaMap) as part of existing academic programmes leading to Bachelor of Science degrees. Currently, all 'BEAM Team' students achieve success in academic curricula linking marine geology, oceanography and geographic information systems.

To date, 103 students have completed the BEAMS Programme's SeaMap foundation course at either CofC or UW, and over 90 of them have



Dr. Miles Logsdon,
School of
Oceanography,
University of
Washington, WA,
USA

THE RAPID GROWTH IN NEW technologies for the ocean survey field has not been matched by the opportunities available for instruction in undergraduate coursework, nor has this growth been accompanied by a parallel growth of an informed and technology-literate workforce. The BEAMS Programme is designed to address the omnipresent need for qualified ocean surveyors to support the expanding academic



Mr. Paul Cooper,
CARIS USA, USA



Figure 2: Post-processing in the classroom...



Figure 3: ...after having collected the data on the water.

conducted research and presented their work at a symposium/poster session at their respective campus. Thirty-six (51%) of the 70 BEAMS students who have completed their undergraduate degree have continued to use their skills within private industry, government or graduate schools in the sea survey-related workforce. 44% of this workforce is women. Currently 13 alums have been hired full-time within marine geospatial private industry and 10 are in full-time NOAA jobs doing survey work. At least 18 BEAMS Team students (some who are still in college) have been hired for contractual part-time jobs, and more than 20 have had experience as interns. Twelve alums have gone on to graduate school, using their BEAMS skills as part of their research.

BEAMS Team students have contributed to an increasing body of applied scientific understanding of the seafloor, having presented 68 research posters at professional meetings. Examples of studies include: geomorphologic characterisation of critical seafloor habitat; gas methane seeps; oil-producing salt diapir formations; and ancient shorelines from fluctuating sea level. Most recently, BEAMS Team '13 students presented 15 posters at the US Hydro Meeting in New Orleans, and received the top three poster awards.

A BEAMS Programme Endorsement of competency and accomplishment is actively being developed. Members of the marine geospatial profession will aim to recognise the BEAMS Endorsement to signify a student's strong potential for success in the marine geospatial workforce. Endorsement will be awarded when a student has fulfilled the requirements in four areas:

- **Coursework:** A core of required and elective academic coursework related to a comprehensive suite of critical software and other tools for use in ocean surveys.
- **Fieldwork:** Practical experience at sea (seafloor and water column surveys), during which students gain direct experience with technology and field operations.
- **Research:** Conducting research, applying skills to geological and biological studies. Students present their work at their academic institution, and are encouraged to present at a regional or national professional meeting.
- **Internship:** When possible, students complete an internship with a BEAMS industry partner. Internships range in duration, scope and pay.

Planned expansion of BEAMS will allow for inclusion of additional coursework, workshops and field experiences involving side-scan sonar, sub-bottom profiling, water column

processes, and working with AUVs. Industry partnerships will be essential for the programme's continued growth. In addition to BEAMS' founding partner, CARIS, EIVA, QPS, Teledyne Odom, Kongsberg, and HighlandGeo have already made significant contributions, and many BEAMS alumni are offering their ocean survey talents and resources.

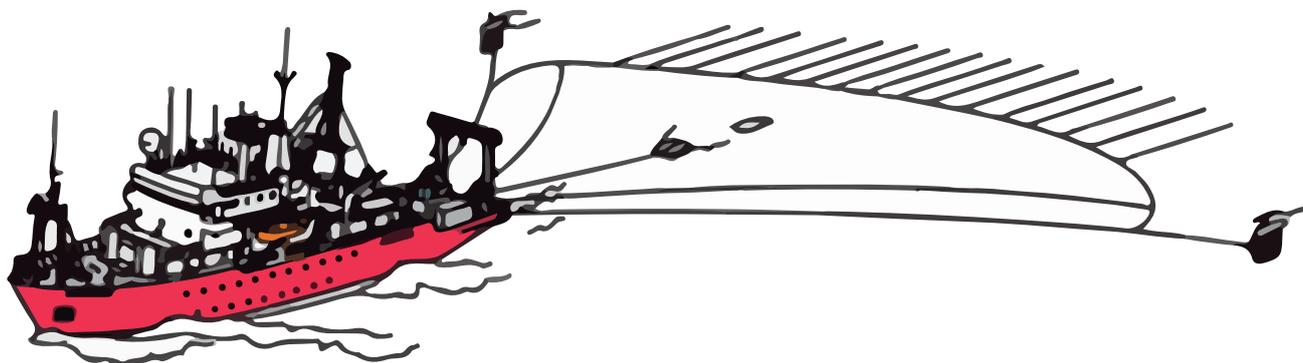
The BEAMS Programme has tremendous potential for generating many qualified ocean surveyors annually. Potential BEAMS Partners who are able to contribute resources are being sought to strengthen the training and experience of BEAMS graduates. 🌐

✉ SautterL@cofc.edu



<http://oceanica.cofc.edu/beams>

Multiple streamer
P-CABLE principle.



Geophysical Instruments for Land, Sea and Air Subsurface Investigations

Geometrics, Inc.



Ross Johnson
VP Magnetometer
Division,
Geometrics, USA

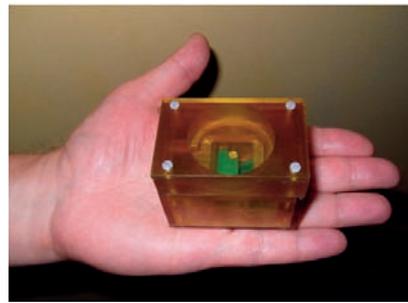
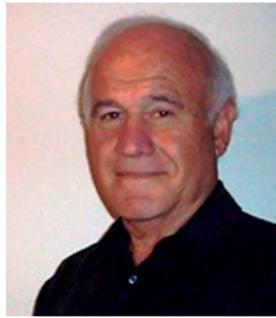
Geometrics Inc., based in San Jose, CA, USA, designs and manufactures rugged, portable and technologically-innovative geophysical instruments for land, sea and air subsurface investigations. The company's main product lines include high speed cesium magnetometers, exploration seismographs, digital marine streamers and electrical conductivity imaging and resistivity systems. Applications include natural resource exploration, geotechnical and environmental assessments, ordnance detection, surveillance, marine tectonic research, archeological and treasure survey, as well as teaching and research.

GEOMETRICS WAS FOUNDED IN 1969 in Silicon Valley by Sheldon Breiner (PhD, geophysics, Stanford), and a handful of former employees of Varian Associates of Palo Alto. The company introduced commercial proton precession magnetometers, which for a decade were the only source of high-resolution systems for oil exploration. Eventually the company expanded into other instrument manufacturing including gamma ray spectrometers, data acquisition and processing software, and airborne survey with company owned planes. Geometrics' early success led to their purchase in 1976 by EG&G, a large government contractor which also managed the nuclear test facility in Nevada. The company grew quickly over the next few years and expanded into designing and manufacturing seismic and geoelectrical instrumentation. Geometrics was acquired in the early 1990s by management buy-out and in 1997 was sold to OYO Corporation of Japan.

Today, Geometrics' geophysical instruments, sensors and data processing software are used globally for energy and resource exploration. Geometrics was founded with a mission to promote a programme of continuous improvement and to ensure delivery of high-quality and reliable products. Geometrics' employees are committed to total customer satisfaction, striving to stand apart as market leaders with innovative products and service. With just over 100 employees, Geometrics views each employee as an integral team member with the responsibility to help improve products by submitting ideas for better product and process control. In addition, Geometrics supports and works with over 50 international sales representative agencies for local sales and support. For fiscal year 2012, the company posted sales of USD27.1 million.

Geometrics' customers include every major natural resource and energy

Sheldon Breiner,
founder.



Macro-FAM
magnetometer
prototype.

Multiple streamer
P-CABLE deployed
off California.



G-882 Transverse
Gradiometer for
UXO.

Driving force over the last few years has been mapping marine Unexploded Ordnance (UXO)

exploration group in the world. Airborne mineral exploration companies such as Fugro and Geotech as well as smaller airborne contractors comprise the gold, iron and base metal exploration groups operating Geometrics magnetometer sensors. Similarly for ground follow-up, land-based portable magnetometers and gradiometers are operated in every exploration venue including S. America, Africa, Australia and Canada. A major driving force over the last few years has been mapping marine Unexploded Ordnance (UXO) from WWII and later conflicts. As part of the Green Energy investment effort, offshore wind farms in the North Sea require direct cabling to shore and hence the cleanup of thousands of acres of dumped explosive and chemical munitions. Over 100 Geometrics marine magnetometer systems have been deployed in the North Sea area for detection and remediation of this dumped UXO.

Our Electromagnetic product line includes the Stratagem, a land-based Augmented Magneto-Telluric measurement system for deep mineral and ground water exploration on land. We also manufacture the 'Metal-Mapper' system which characterises shallow UXO by size and shape. The Metal-Mapper is scheduled for offshore marine tests later this year.

The seismograph product line of land and marine-based survey tools have been a major contributor to the success of Geometrics over the years. Starting with single channel exploration seismographs in the late 70s, the company has continued to innovate to 12, 24, 96 and hundreds of channel networked seismic systems. Approximately 5 years ago Geometrics produced the first high-resolution marine streamer system for shallow oil and gas exploration. Useful in gas hydrate exploration and weathering corrections to deeper

seismic data, the GeoEel and multi-streamer P-Cable systems (see [2](#)) have become industry standard for mapping of offshore fault systems and near seafloor structural geology. [3](#)



1. www.geometrics.com
2. www.geometricspcable.com
3. mfam.geometrics.com

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International Seabed Habitat Mapping Conference - GeoHab 2013

The 12th Geological and Biological Seafloor Habitat Mapping (GeoHab) conference was held in Rome, Italy, from 6 to 10 May 2013, hosted by the Geological Survey of Italy (ISPRA) together with the Institute for Coastal and Marine Environment (CNR). The conference attracted approximately 200 participants from 25 countries and included a range of posters and oral presentations related to scientific and technical aspects of marine habitat mapping.



The Geohab 2013 delegates.

SOME KEY THEMES OF THE conference were:

- Multidisciplinary and multiscale approaches to habitat mapping
- National Seabed Mapping Programmes
- Predictive Habitat Modelling
- Geoscience Characterisation of the Seabed for Environmental Assessment of Marine Renewable Energy Activities
- Habitat mapping in geologically complex areas, with examples from the Mediterranean Sea
- Linking science to marine policies for conservation
- Advances in Technology and Methodology for Mapping Habitats
- Deep-Sea Habitats
- Quantifying change in benthic habitats

The scientific sessions were preceded by a workshop on backscatter processing (held on 6 May), attended by over 90 delegates. Presentations from this workshop will soon be publicly available, with the main outcomes emphasising the immediate

need for standards related to backscatter acquisition and processing.

A key feature of the conference was student participation and this was highlighted by a set of four papers delivered by students who received GeoHab's Ron McDowell student support award to attend the meeting. They were Myriam Lacharité (Canada), Sophie Barton and Alix LaFerriere (New Zealand), and Mary Young (USA), all of whom gave outstanding presentations at the conference. Myriam Lacharité's paper was titled 'An object-based semi-automated method to assess fine-scale benthic complexity in deepwater continental shelf habitats', and her work used digital seafloor photographs to describe biological communities and substrate characteristics in the Gulf of Maine. Sophie Barton's paper was titled 'Predictive substrate and benthic habitat mapping in the active volcanic environment of the Kermadec arc' and her presentation described a nested approach

using multi-beam imagery, underwater video and sampling to map benthic habitats on seamounts. Alix LaFerriere's talk was on the 'Validation of supervised segmentation and classification of backscatter data of Barrett's Reef, Wellington South Coast, using drop-camera video'. Her talk focused on the protocol used for collecting ground-truth data in very shallow-water environments. Mary Young's presentation was titled 'Using species distribution models to evaluate the placement of California marine protected areas' and she evaluated the distributions of species inside and outside the MPAs, finding that the abundances of key resource species are higher inside the MPAs compared to outside. The cost of registration and the conference dinner were also partially covered for several other students at the meeting with GeoHab.

A new art book that is being supported by GeoHab was discussed during the conference. This book will contain examples of acoustic

seafloor imagery that are also deemed to possess artistic value. The editors of *Visual Soundings* (Vanessa Lucieer, Margaret Dolan) requested appropriate acoustic images and associated information from individuals or organisations wishing to contribute to this exciting project.

The last day of the conference (10 May 2013) included a field trip to the Monte Argentario Peninsula, which is a typical location for coastal sedimentary structures known as 'tombolos'. Spectacular views of the tombolos and coastal lagoons were seen from near the 635m summit of Monte Argentario, which were much appreciated and enjoyed by all participants.

GeoHab is an annual forum that brings together geologists, biologists, acousticians, statisticians, spatial analysts and environmental managers from around the world, who are developing new methods and procedures to link remotely sensed data with seafloor geology and marine biology within a geo-spatial environment. The next GeoHab meeting (GeoHab 2014) will be held in the coastal village of Lorne, located in southeastern Australia.

Peter Harris
Senior Marine Science Advisor
Geoscience Australia



1.geohab.org

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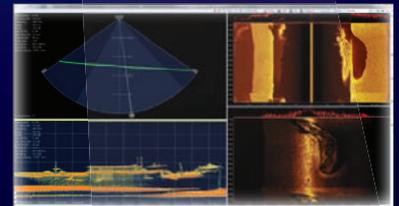
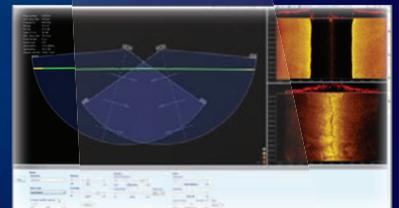
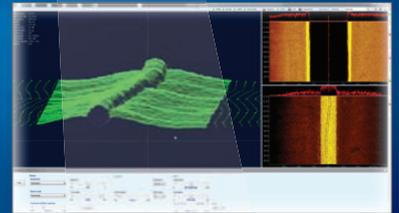
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International Hydrographic Organization

2013 World Hydrographic Day (WHD) Celebration at IHB

On 21 June 2013, World Hydrography Day celebrations took place at the International Hydrographic Bureau in Monaco. The theme of this year's celebrations was 'the blue economy'. Hydro INTERNATIONAL readers are well aware of the economic value of the products resulting from the hydrographic effort contributing to navigation safety and the protection of the marine environment.

This year, the Italian Navy contributed significantly to the celebrations at the IHB by sending its survey vessel *Galatea* (with commanding officer Lieutenant Giorgio Mazzi) to Port Hercule (Monaco's Harbour). The WHD celebrations at the Italian Hydrographic Institute had been held on 13 June 2013 thus permitting the Hydrographer Rear Admiral Andrea Liaci to attend the ceremony in Monaco. In addition, back to back with the WHD, the IHB hosted the meeting of the Black and Azof Seas Working Group with the participation of the hydrographers of Georgia, the Russian Federation, Turkey and Ukraine.



His Excellency Jacques Boisson, Secretary of State of Monaco, and IHB president Robert Ward.

At the evening reception on the IHB terrace the Prince of Monaco was represented by His Excellency Jacques Boisson, Secretary of State. The speech by IHB president Robert Ward followed the theme of this

year's celebrations. In addition, Robert Ward introduced Mr. Stephen Wilkins of the Explore Expeditions Organization, which contributes to the survey data gathering of the Antarctic.



President Ward giving his speech on the IHB Terrace.

This year's WHD celebrations were particularly interesting because of the survey orientation given by the IHB Directing Committee. 🌐

Giuseppe Angrisano,
contributing editor, Hydro INTERNATIONAL
Robert Ward,
president, International Hydrographic Bureau.



🌐 1. www.iho.int

Lidar Allows Sandy River to be Mapped

In September 2012, Watershed Sciences, Inc. (WSI) and Dewberry collected airborne topobathymetric Lidar data for the Sandy River in Oregon, USA. These data are being used to map channel and floodplain morphology and to evaluate the effectiveness of RIEGL's VQ-820-G hydrographic airborne scanner in a Pacific Northwest riverine environment. The shallow river system - including side-channel and off-channel areas that are notoriously difficult to measure using conventional techniques - was successfully mapped using Lidar. <http://tw.gs/Q4tcE2>

Autonomous WiFi-controlled USVs

Deep Ocean Engineering (DOE, Inc, USA) has added two vehicles to its product line, the dual-hull H-1750 and the mono-hull I-1650. Both vehicles are controlled wirelessly by a dedicated WiFi link and have ranges up to 2km. GPS-enabled autonomous movement

is an option where the flip of a switch will send the vehicle onto a predetermined path for a multitude of sampling techniques such as SVP, ADCP, and CTD or even harbour security. For user-controlled navigation, HD video is transmitted back to the pilot box mounted monitor and is used for obstacle avoidance. <http://tw.gs/Q4tdiZ>



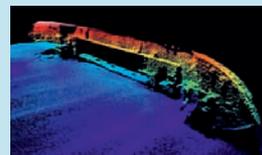
The H-1750 of Deep Ocean Engineering.

Geocap Taken Over by Geodata

Geocap has been taken over by Norway-based Geodata. Geocap specialises in mapping and modelling solutions for use in areas including oil exploration and production. Two years after Geodata acquired GIS-Partner, the GIS integrator is making a new acquisition within the oil and gas sector. Through the purchase of Geocap, Geodata now has access to software and specialist expertise in 3D mapping and modelling solutions. <http://tw.gs/Q4tbEZ>

Sonic 2020 and UHR Upgrade for Rental Pool

UK-based Swathe Services has just purchased the newly launched Sonic 2020 multi-beam and ultra high-resolution upgrade for the Sonic 2024 to add to its rental pool. The Sonic 2020 is a compact high-performance wideband shallow-water multi-beam echo sounder providing over 20x selectable operating frequencies to choose from within the 200 to 400kHz band. In addition to selectable operating frequencies, the Sonic 2020 provides variable swath coverage selections from 10° to 130° as well as ability to rotate the swath port or starboard in real-time. The Sonic 2020 frequency agility, productive swath coverage and narrow focused 2° beam widths provide hydrographic professionals with quality data output for shallow-water survey operations. <http://tw.gs/Q4tcEX>



Sonic 2020 sonar imagery.



Moving Vessel Profiler: Multi-sensor. Multi-purpose.

- Automated underway water column profiling
- Reduced operational costs
- Deploy conventional dipping hardware such as rosettes & grabs

The Moving Vessel Profiler (MVP) greatly enhances the productivity of CTD, Sound Velocity and other specialized profiling by allowing deep-water casts to be made from an underway vessel. Automated underway profiling and on-the-fly calibration of multibeam sonar (via the real-time input of sound velocity data into the multibeam sonar apparatus) provides the user with safer, more cost-

effective operations than traditional profiling methods. The standard MVP configuration consists of a sensor-equipped free fall fish, a robust electro-mechanical tow cable, a computer-controlled high-speed hydraulic winch and a complete cable metering, overboarding and docking system.

Efficiency through automation and innovation

OpenSEA Suite for AUVs and ROVs

Greensea Systems, USA, has launched a commercially packaged software suite for AUVs and ROVs based on the company's Open Software and Equipment Architecture, openSEA. Greensea also released a Software Development Kit to support integrators developing with the openSEA API or integrating with the openSEA Suite applications. The openSEA Suite, a collection of applications built on the openSEA core library, provide off-the-shelf modular software solutions for aided inertial navigation, vehicle control, mission management, device and sensor integration and operator interfaces. Based on a code base of tested technologies from over 200 deliveries, the openSEA Suite offers thousands of hours of at-sea experience on ROVs and AUVs of all sizes.

<http://tw.gs/Q4tcC3>

Seaglider Technology Marketed by Kongsberg

Kongsberg Underwater Technology, Inc. has completed negotiations with the University of Washington's Centre for Commercialisation to obtain the sole rights to produce, market and continue the development of Seaglider technology. iRobot had a licence, but the company halted its maritime activities. Kongsberg Underwater Technology believes that the Seaglider technology offers interesting perspectives. Also, co-operation with existing Seaglider users will be initiated.



<http://tw.gs/Q4tcCV>

The Seaglider seen from below.

GNSS Compass Module

Canada-headquartered Hemisphere GNSS has launched its Crescent Vector H200 GNSS compass module, a high-performance receiver for heading, positioning, heave and attitude. Vector H200 is designed for professional marine, navigation and land applications in challenging and dynamic environments. Vector H200 uniquely processes L1 GPS and GLONASS signals to deliver heading, greater positioning reliability, and better performance in challenging environments. Through using two separate antennas, Hemisphere GNSS' patented Vector technology computes the heading and pitch or roll angle while stationary or in motion.

<http://tw.gs/Q4tcD1>



The GNSS Receiver board.

Altimeter Redesign

OceanTools has presented a redesigned altimeter. DSP electronics combined with frequency-swept CHIRP technology are housed in a robust, hard-anodised aluminium housing rated to 3,000m as standard. The MA500D utilises a new composite transducer array enabling altitude measurement with millimetric accuracy and resolution.

<http://tw.gs/Q4vfd2>

AAM Launches Shallow-water Survey Service

Geospatial services company AAM, headquartered in Australia, has launched a dedicated shallow-water survey team, with hydrographic surveying expert Andy Waddington appointed to lead the team. Under Waddington's leadership, the newly formed team will provide innovative geospatial solutions to support government, environment, resources and infrastructure projects in shallow-water environments. The announcement follows AAM's merger with Vekta in April 2013 and represents another investment in Australia's fast-growing geospatial sector. A former ship's captain in the Royal Navy, Waddington has been active in the development of bathymetric Lidar and remote sensing surveying techniques, particularly in shallow-water and the nearshore regions.

<http://tw.gs/Q4tdZ2>

SonarWiz Supports NOAA Survey Guidelines

Chesapeake Technology Inc. (CTI) has added new features to its SonarWiz to support the National Oceanographic and Atmospheric Administration (NOAA) survey guidelines. The two areas of specific compliance SonarWiz is emphasising with this release are: creating a set of contacts (targets) with NOAA contact naming convention, and presenting sonar imagery with a range-restriction when tow fish altitude drops below 8% of sonar range.

<http://tw.gs/Q4tcEz>



More product news

www.hydro-international.com/news/productnews.php



Australasian Hydrographic Society

AHS Awards

The AHS Awards for 2013 are as follows:

- Patron's Gold Medal: CDRE Rod Nairn AM, RAN
- Award of Merit – Literary and Media Achievement (Non-Fiction): Dorothy Prescott
- Chairman's Letter of Appreciation: Frank Guerts

Congratulations to each of the recipients. The Awards will be presented at various AHS World Hydrography Day events.

East Australia Region

A combined one-day technical seminar and celebratory World Hydrography Day dinner will be held on Friday 16 August 2013. The seminar will coincide with the visit of a delegation from the new Hydrographic Society of Korea (HSK). The Korean delegation is being led by the HSK president. This event will also involve the signing of a Memorandum of Understanding between the Australasian Hydrographic Society (AHS) and the HSK. The president of the HSK has advised us that he will be bringing three professors that have a background in Law of the Sea. The August seminar will therefore have a 'Law of the Sea' theme. The theme is topical noting the recent tensions in the South China Sea and the vital role that hydrographic surveyors play in maritime boundary delineation.



Hydrographic Society Russia

20th Annual General Meeting

As in the past, the 2013 AGM took place in April. 60 HSR members and several guests were present. HSR president Nikolay Neronov reported on the Society activities of the past year and he reminded all those present that the HSR has already operated for more than 20 years. It plays a unifying role for those experts and organisations for whom the destiny of Russian Hydrography is not indifferent. This was shown by the both scientific and practical conference held in June 2012 and the recent memorial event for general Andrey I. Vilkitsky.

The report by the Revision committee was unanimously approved. Then Boris Zolotajkin mentioned the 30th anniversary of the Antarctic expedition by the Soviet oceanographic vessels *Admiral Vladimirsky* and *Faddey Bellinshausen* and he handed a gift to the Society - a memorable bronze medal which was

was issued in honour of this navigation.

Mr. Evgeny G. Drukaryov told briefly about his grandfather hydrographer E.S. Gernet (1873-1943) and presented a book about him.

Vasily Provorov reported on the latest events involving HSR participation; the inspection of vessels sunk during the Second World War in the Finish Gulf near Gogland Island.

Ratmir Berkutov noted that the three-volume edition of *The Annals of the Russian Navy* in which he and HSR members Vitaly Korjakin and Sergey Valchuk participated, has been presented the 'Best Book of the Year' award by the Association of publishers.

Grigory Akulov criticised the HSR Council which, in his opinion, had not started organising a memorable expedition to Severnaya Zemlya, devoted to the 100th anniversary of its discovery. Then there was polemic on this question as well as on HSR participation in activities by domestic and international societies.

AGM participants had hoped to hear a presentation by the chief of the Navigation and

Oceanography Department about the state of affairs in the Russian Hydrographic Service but unfortunately he could not be present at AGM.

The elections for HSR president, vice-president, secretary and council members showed that the members are satisfied with the current activities - everyone was re-elected for another term.

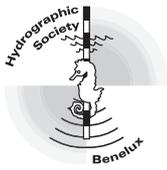
100th anniversary

On 3 September 2013, we will celebrate the 100th anniversary of the last important geographical discovery on our planet. On this day, the Russian Hydrographic expedition of the Arctic ocean under the command of Boris Vilkitsky discovered unknown land to the north of the Tajmyrsky peninsula. After the participants of expedition returned to St. Petersburg in January 1914 this land was named 'Zemlya Imperatora Nikolaya II'. In 1926, it was renamed 'Severnaya Zemlya' so as to remove the name of a 'hated' last Russian Tsar from maps.

HSR will make a note of this anniversary. A group of enthusiastic HSR members will prepare a document for the Russian Government offering to cancel the 1926 decision and to return to the initial historical name for the land discovered.



Participants of the 20th HSR Annual General Meeting.



Hydrographic Society Benelux

Spotlight on Ship Building at Hydrographentag

The 27th Hydrographentag of the German Hydrographic Society (DHYG) was a 'first': the meeting was organised together with the Hydrographic Society Benelux (HSB). More than 90 delegates from Germany and the Netherlands attended the event in Papenburg, Germany.

There were two main topics at the conference. The first session featured three presentations on multibeam echo sounders. The newest developments for various applications were presented. Making use of interesting examples, the potential of water column mapping and



Figure 1: The German and Dutch delegates had an impressive view of a cruise vessel in construction.

object recognition were put in the spotlight.

The Ems River was the focus of attention for the Wednesday. It became clear what hydrography's contribution is in the safe conveyance of ocean giants from Meyer Werft through the

narrow Ems River towards the North Sea, 40km ahead.

The most important event during the two days was an excursion to Meyer Werft. The three-hour visit enabled the participants to observe the construction of a giant cruise vessel and get a first

glance at the new research vessel *Sonne* of which the first parts were being laid.

The participants felt that the event was a great success, and laid ground for improved co-operation between DHYG and HSB in the future.



Figure 2: The attendees of the HSB and DHYG listening to the presentations.

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JULY

Rio Acoustics 2013

Rio de Janeiro, Brasil

→ 24-26 July

For more information:

E: secretariat.riooacoustics@gmail.com

W: www.riooacoustics.org

AUGUST

33rd Annual Western Hemisphere Dredging Conference

Honolulu, HI, USA

→ 25-28 August

For more information:

E: weda@comcast.net

W: www.westerndredging.org

International Cartographic Conference

Dresden, Germany

→ 27-30 August 2013

For more information:

W: www.icc2013.org

International Seminar and Workshop on Hydrography

Batam Island, Indonesia

→ 27-29 August

For more information:

E: seminar@mhi.or.id

W: http://mhi.or.id/seminar

SEPTEMBER

RESON World Tour - Underwater Technology Seminar 2013

Shanghai, China

→ 01-03 September

For more information:

E: marketing@reson.com

W: www.reson.com/worldtour

Hypack Africa 2013

Cape Town, South Africa

→ 02-05 September

For more information:

E: gaynor.deacon@cnav.com

W: http://bit.ly/12AQanw

Seafloor Exploration Training Course

Malta

→ 02-13 September

For more information:

E: micallefaaron@gmail.com

W: http://malta2013.hgiss.com/

Oceanology International China

Shanghai, China

→ 03-05 September

For more information:

W: www.oceanology-international.com/china

Offshore Europe 2013

Aberdeen, UK

→ 03-06 September

For more information:

E: natalie.booth@reedexpo.co.uk

W: www.offshore-europe.co.uk

Oceanology International China

Shanghai, China

→ 03-05 September

For more information:

W: www.oceanology-international.com/china

Operational Oceanography: Synoptic Views of the Sea

Ostend, Belgium

→ 09-13 September

For more information:

E: claudia.delgado@iode.org

W: www.iode.org

YOUMARES 4

Oldenburg, Germany

→ 11-13 September

E: info@youmares.net

W: www.youmares.net

Saudi International Marine Services Exhibition 2013

Dammam, Saudi Arabia

→ 14-15 September

For more information:

E: Subhash@arabianreach.com

W: www.saudimarineshow.com

Underwater Technology Seminar

Copenhagen, Denmark

→ 17-19 September

For more information:

E: marketing@reson.com

W: www.teledyne-reson.com/events/worldtour

OCEANS MTS/IEEE 2013

San Diego, CA, USA

→ 23-26 September

For more information:

W: www.oceans13-mtsieeesandiego.org

ADCPs in Action

San Diego, CA, USA

→ 29 September-02 October

For more information:

E: mnewcombe@teledyne.com

W: www.rdinstruments.com/aia2013.aspx

OCTOBER

19th Asia Upstream / Asia Oil Week 2013

Singapore

→ 02-04 October

For more information:

E: amanda@glopac-partners.com

W: www.petro21.com

General Bathymetric Chart of the Oceans (GEBCO)

Venice, Italy

→ 07-11 October

For more information:

W: www.gebco.net/about_us/meetings_and_minutes/

KONGSBERG AUV

Conference

Lirici, Italy

→ 14-17 October

For more information:

E: katarina.nygaard@kongsberg.com

W: www.viaregi.com/registration/deltagerweb.aspx?kid=2919&aid=34565

Offshore Energy 2013

Amsterdam, The Netherlands

→ 15-16 October

For more information:

E: oe@offshore-energy.biz

W: www.offshore-energy.biz

ABLOS 20 Business Meeting and LoS Seminar

Muscat, Oman

→ 28-30 October

For more information:

W: www.iho.int/mtg_docs/com_wg/ABLOS/ABLOS20/ABLOS20.htm

Digital Hydrography on the Maritime Web

Southampton, UK

→ 29-30 October

For more information:

E: digitalhydro@ths.org.uk

W: www.digitalhydro.org.uk

NOVEMBER

Europort 2013

Rotterdam, The Netherlands

→ 05-08 November

For more information:

E: info@europort.nl

W: www.europort.nl

RETECH 2013

Washington, DC, USA

→ 09-11 November

For more information:

E: smccollum@accessintel.com

W: www.retech2013.com

Teledyne RESON World Tour - Underwater Technology Seminar 2013

Austin, USA

→ 18-21 November

For more information:

E: marketing@reson.com

W: www.teledyne-reson.com/events/worldtour

DECEMBER

IHO Hydrographic Commission on Antarctica (HCA)

Cadiz, Spain

→ 03-05 December

For more information:

W: http://bit.ly/UkkGOE

JANUARY 2014

Offshore West Africa 2014

Accra, Ghana

→ 21-23 January 2014

For more information:

E: tonybm@pennwell.com

W: www.offshorewestafrica.com

MARCH

Oceanology International 2014 (OI2014)

London, UK

→ 11-13 March 2014

For more information:

W: www.oceanologyinternational.com

APRIL

ENC-GNSS 2014

Rotterdam, The Netherlands

→ 14-17 April 2014

For more information:

W: www.enc-gnss2014.com

JUNE

CARIS 2014

Brest, France

→ 02-06 June 2014

For more information:

W: www.caris.com/caris2014

OCTOBER

Extraordinary International Hydrographic Conference (EIHC)

Monaco

→ 06-10 October 2014

For more information:

W: www.iho.int



Calendar Notices

Please send notices at least 3 months before the event date to: Trea Fledgerus, marketing assistant

E: trea.fledgerus@geomares.nl

For extended information on the shows mentioned on this page, see our website: www.hydro-international.com

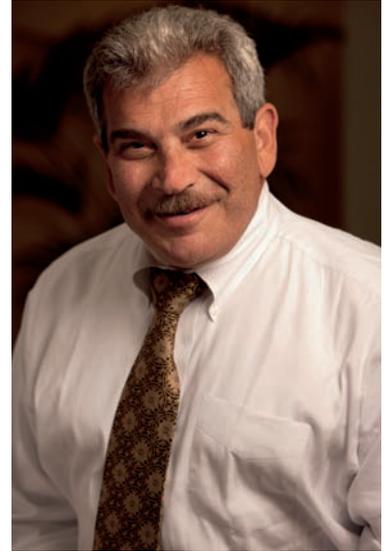
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Coastal and Littoral Studies

A Multi-Sensor, Multi-Discipline, Multi-Partner Approach

For more than a decade, coastal zone studies, including hydrographic survey-based mapping, have been growing in size, complexity and applications. With the growing need to better baseline and define the impacts of sea level rise, programmes are now combining many diverse sensors and data to best map the areas and provide exceptionally high-quality precise information for predictive models. To a large degree, this is a direct result of the continuously expanding success of these programmes. Success can be measured in terms of data quality, performance and the expanded applications to stakeholders and other users, and directly measurable by the accuracy of the models that are eventually applied. As of this writing, worldwide stakeholders and their associated applications have expanded to include multiple levels of government (local, state and federal), members of the general public, industry and academia.



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The Editorial Advisory Board (EAB) of Hydro INTERNATIONAL consists of professionals, from various fields, who independently make recommendations on potential authors and specific topics. The EAB members also contribute to this column. The EAB is served on a non-committal basis.

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David Whitcombe
Chief surveyor for Europe, Shell (UK)

Rear admiral Jonathan White
Hydrographer of the US Navy

Michael Bergmann
Director Maritime Industry Affairs and Services, Jeppesen

SEVERAL RECENT EVENTS HAVE emphasised the importance of these programmes as well as the need to expand applicable technologies, and improve the accuracy of models to better anticipate key impacts such as flooding and coastal erosion. Examples include the significantly reduced global ice pack in the Arctic Ocean which has led directly to increased erosional activity along exposed low lying coasts in Arctic seas of the North American continent. Another example is that the impacts of the 2012 Hurricane Sandy are still being measured and evaluated to baseline the extensive impacts along several hundreds of kilometres of coastline. Whether the concerns be changes in ice covered waters or impacts from hurricanes, the trends require a multi-sensor approach to accurately measure the conditions that are relevant to understanding all aspects of the coast. A typical comprehensive study now includes mapping data from high-resolution airborne digital cameras, Lidar and Radar systems, along with airborne gravity measurements to improve the geoid accuracy.

All of these data lead to a significantly improved ability to develop

comprehensive applications to support research and analysis such as:

- Tsunami/storm inundation models
- Land Use/Land Cover and benthic habitat studies
- Beach erosion/beach replenishment baseline and change detection
- Geologic structure and interpretation, including nearshore active faults
- Sea level rise baseline
- Coastal development and industries, including Renewables

As technologies, experience and global capabilities improved, the programmes became more comprehensive and more multi-dimensional and continue to grow in size. It is not unusual to conduct studies on a country-wide scale or along coastlines in excess of 1,000km in length. This has been an important development in our understanding of coastal processes and impacts. A large-scale programme allows for the inclusion of a regional understanding by countries and communities. As with many similar ideas and concepts, the large-scale approach was first developed and successfully implemented in California as the State Mapping Project (CSMP), which continues to provide exceptional

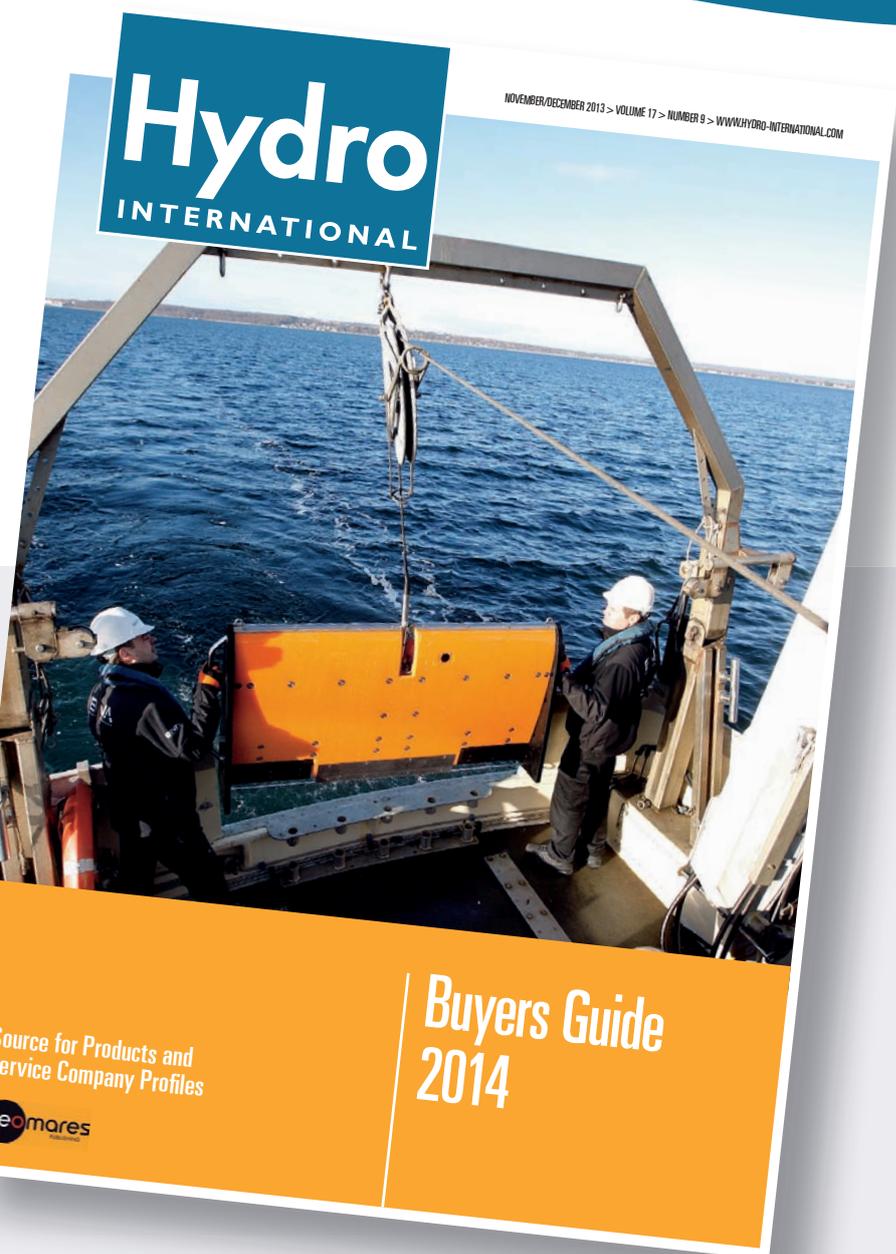
baseline and other data applications for a continuously growing variety of stakeholders.

Large-scale multi-sensor, extended coastline programmes can and should be expanded worldwide to better protect populations and industry located within impact zones on every continent. 

Edward J. Saade, president/managing director
Fugro EarthData, Inc., USA

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