

# SEABED

## GAZETTE

---

2017

*The Seabed  
end of Summer  
Demo Days*

At the  
Expo's

*What's that sound?  
A History of measuring depth*



Getting to the bottom of things

# CONTENTS



**Seabed Portable  
Lightweight  
Multibeam Set (SPLMS)**

Seabed is introducing the first lightweight multibeam set in the world that can be transported as check-in luggage with any airline with no extra charge. The SPLMS is ideal for projects where rapid mobilization is required and where logistical challenges are taken into account due to the simple deployment.



- 4** Seabed end of Summer demo Days
- 8** Client tales #1: DEME
- 11** Meet the Seabed Team
- 16** What's new at Seabed
- 18** A History of measuring depth
- 20** Client tales #2: Te.Ma.snc
- 26** Seabed at the Expos
- 28** Meet Wouter Tuinstra
- 32** A good start / MB survey with MIWB
- 34** Client tales #3: BPM
- 37** Transport: A world of difference
- 43** Meet Sebastiaan van Essen
- 44** Client tales #4: Port of Amsterdam
- 48** Client tales #5: Roel v. d. Stoel b.v.
- 50** Cartoons / Contact
- 51** Prize Puzzle/ Colophon



# Seabed end of Summer Demo Days



In September 2016 Seabed organised their first end of Summer Demo Days. 2 days with continuous demonstrations of Seabed products such as the GNSS Receiver SGR6-D and the Inertial system IMU S2, as well as Dealer products such as the Base X2 from AML, the iWBMS integrated Multibeam from Norbit, QINSy software from QPS, the Admodus density probe from Synergetik and the Intelas Mobile lidar System from ilinks.



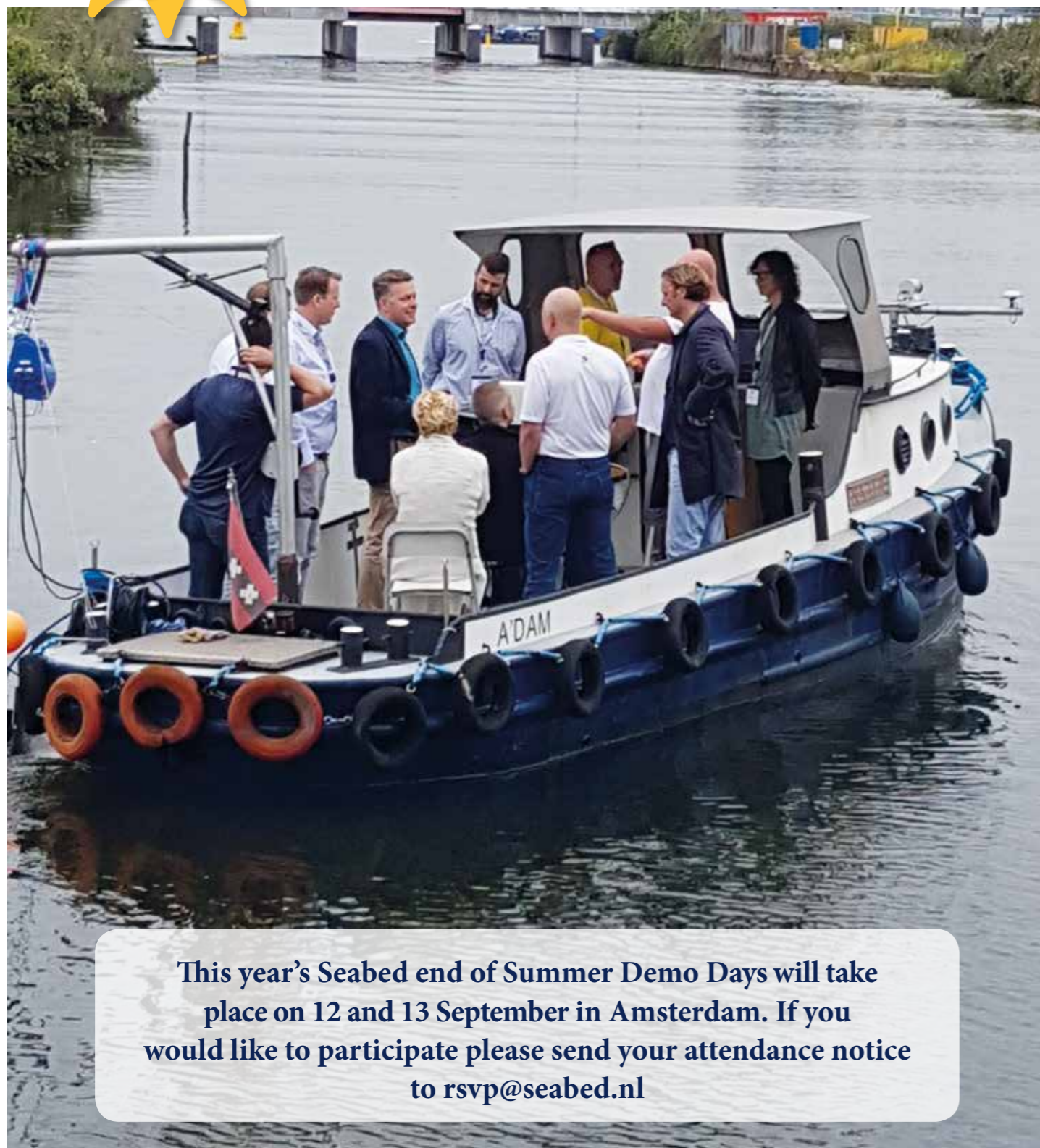
# SEABED END OF SUMMER DEMO DAYS

Representation from all the dealers was available to explain the products and answer the customers questions. Demonstrations took place on Seabed's vessel and by car.

The end of Summer Demo dDays were visited by 50 people from about 30 different companies, who had a chance to catch up with old acquaintances or

meet new faces while having a drink and a snack.

Hydro International posted a short movie with an impression of the days:  
[www.hydro-international.com/content/news/seabed-demo-days-for-hydrographic-equipment](http://www.hydro-international.com/content/news/seabed-demo-days-for-hydrographic-equipment)



This year's Seabed end of Summer Demo Days will take place on 12 and 13 September in Amsterdam. If you would like to participate please send your attendance notice to [rsvp@seabed.nl](mailto:rsvp@seabed.nl)

## Release Seabed's new SGR7 GNSS Receiver



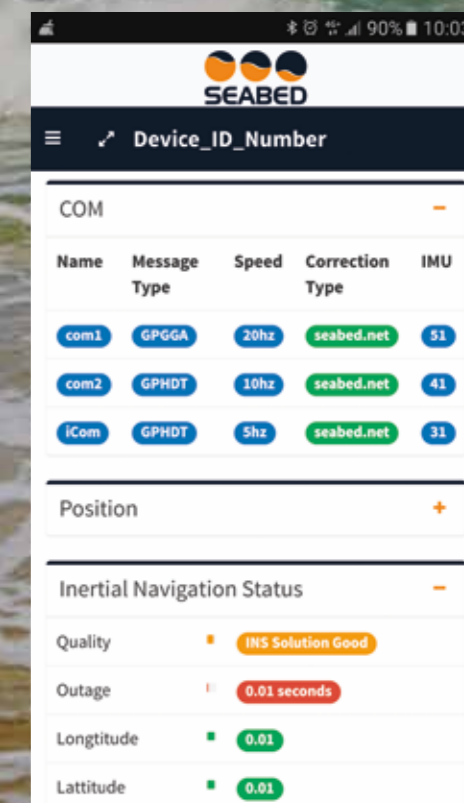
End of the second quarter of 2017, Seabed will release the new GNSS Receiver SGR7. The SGR7 is a robust, high precision receiver, with RTK delivers centimetre level real-time positioning or go base free with centimetre and decimetre PPP solutions using Oceanix L-Band corrections. Capable of tracking all current and upcoming GNSS constellations including GPS, GLONASS, Galileo, Beidou, QZSS and IRNSS. It is software upgradeable to track upcoming signals as they become available.

### Some new features are:

- Web Interface
- Modem
- 555 channel, all-constellation, multi frequency heading and positioning solution
- Advanced interference visualization and mitigation features
- Double ethernet port
- Multiple serial and event outputs
- IP67
- 16GB internal storage

### Possible features:

- Display
- Wifi
- Double /triple antenna
- RTK Assist
- Heading
- INS Enabled
- Oceanix L-Band corrections
- Internal storage upgradeable



### Web Interface

For more information visit us at our stand V18 on Ocean Business or contact us at [Sales@seabed.nl](mailto:Sales@seabed.nl)



Getting to the bottom of things

# Client tales #1



**DEME**

Dredging, Environmental  
& Marine Engineering

## Seabed is not what is understood as a standard equipment supplier or dealer.

People at Seabed know the instruments from their portfolio by heart and actively assist the clients and manufacturers to improve them. This results in a professional and trustful relationship. Seabed is an example of how a dealer can have an added value between client and manufacturer. Their added value consists in first line feedback and troubleshooting but also actively bring all parties together.

Lorentz Lievens, Department Manager - Survey  
DEME, Dredging, Environmental & Marine Engineering



Aiming to answer your training needs



## Skilltrade B.V.

Skilltrade specializes in hydrographic training and courses for the hydrographic survey, dredging and offshore construction industry since 2000. Courses and training developed by people who gained their experience in the field and taught by those same individuals. The heart of the company is that the skills its people possess can be traded or exchanged with others, thus improving their hydrographic knowledge and understanding.

Skilltrade provides courses and training in three areas by combining theoretical with field experience material:

1. Hydrographic Survey Category B course - We offer an intense course, a 13 week course in IJmuiden (including 1 week Safety training) preceded by a 13 weeks e-learning programme. The course is fully intertwined with visits, workshops and guest lecturers from companies that support the curriculum. The course received continued recognition (in accordance with the Standards of Competence for Hydrographic Surveyors FIG/IHO/ICA S-5, Edition 11.1.0, December 2014) in April 2016.
2. Short courses in hydrography and related topics. On request for a quotation these courses can be adjusted to specific training requirements and be given at any desired location.
3. E-learning Modules: Mathematics, Physics, Bathymetry, Geodesy, Global Navigation Satellite Systems.

The various existing modules provide a starting point for almost all company specific courses, allowing for specific requirements to be included. Skilltrade aims to answer your training needs.



[www.skilltrade.nl](http://www.skilltrade.nl)

# Meet the Seabed Team



## A Sound Velocity Solution for Any Occasion

### SVP, CTD, or both

Known for their rugged performance and ease of use, Base•X<sub>2</sub> and Minos•X cover all your profiling needs. Shallow water profiler Base•X<sub>2</sub> features embedded WiFi and GPS, and transforms from SVP to CTD with the switch of a single sensor head. Traditionally configured for SVTP or CTD, deep water profiler Minos•X is also available as the most compact CTD/SVP on the market. Profiling has never been so simple.

### Surface SV

Designed primarily for MBES, hull-mounted applications, and vehicle integration, Micro•X pairs with Base•X<sub>2</sub> or Minos•X to provide a total SV package. Cables compatible with all major multibeam systems are available.



1-250-656-0771

[www.AMLoceanographic.com](http://www.AMLoceanographic.com)



Hans Tuinman  
Sales



Elice Collewijn  
Sales



Eva Brans  
Hydrographic Surveyor



Evert Bootsman  
Engineer



Jolanda de Cock  
Financial Assistant



Wouter Tuinstra  
Hydrographic Surveyor



Sebastiaan van Essen  
Engineer



Champ  
Company mascotte

SLC

# RTK Handheld using your Tablet or Phone as Display



**Centimeter-level position in your palm**  
**GNSS sensor for any positioning application**  
**BlueTooth connection to any operation system**  
**Scandinavian design, Swedish quality**

# NORBIT 3D Sonar for Dredging Applications

By: Pawel Pocwiardowski

Dr. Pawel Pocwiardowski PhD. has worked at NORBIT since 2013 as Product Director for Sonar Systems. He has over 15 years of experience working with multibeam systems and underwater acoustics. His main interest is the design of the underwater equipment and adapting it to the growing needs of the remote sensing market

## 1. Dredge Solution

Since the beginning of dredging operations, the fundamental issue has been how to see underwater and monitor the operation. The dredging business has grown over the years, and the complexity of operations reached the point where the real-time monitoring is essential to the success of the mission. The operators and users call for a real-time monitoring that is not just a visual but also an accurate measurement system that would allow dredging operations to function efficiently and develop for the current and future applications.

There have been several attempts in the industry to utilize the acoustic sensors for dredging monitoring with greater or lesser success, but until now there has been no single key solution to meet customers' needs.

NORBIT Subsea has recently developed a 3D sonar for dredging applications that allows observing the 3D bathymetry and imagery in real time during the dredging operation. The transmitting antenna has a capability of electronically changing the direction of the emitted sound wave. That process is called "beam steering" or, similarly to the receiving beamforming, we call it "transmit beamforming operation". The transmit and receive beamforming processes are outlined in Fig. 2.



Fig. 1. NORBIT #D 400kHz bathymetry sonar for dredging operations.

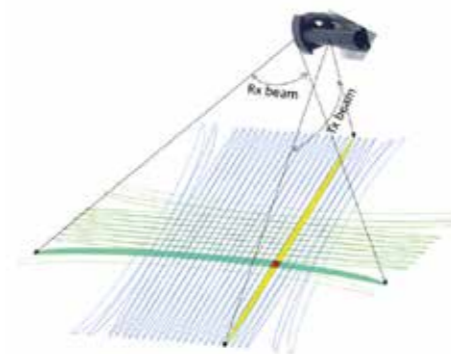


Fig. 2. Transmit and receive beamforming in STX.



Fig. 3. The 3D 200kHz sonar integrated with Applanix Wavemaster for pole installation.

The 3D-scanning sonar can be mounted on any type of installation. The system's weight and size, as well as a low power consumption, follow NORBIT's novel approach to multibeam integration and operation. The 3D system is just a hair taller than the standard 0.9 x 0.9 deg. WBMS product. The system comes in two versions: with a 400kHz and a 200kHz long range projector. Integration efforts are minimal as the system can be easily equipped with high-end GNSS navigation system, in the same way as other NORBIT sonars.

**2. Backscatter Data (Snippet, Side-scan, Water-column)**

Apart from bathymetry, the system has a capability to output several types of backscatter data. They are outlined in the user manual and all are applicable to STX. The example below shows the snippet backscatter data collected during the trial.

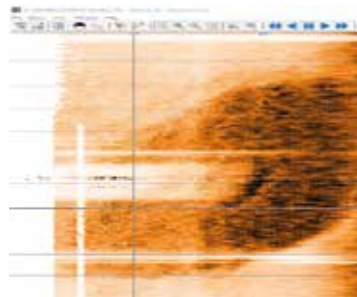


Fig. 4. Example of snippet backscatter data collected during the trial

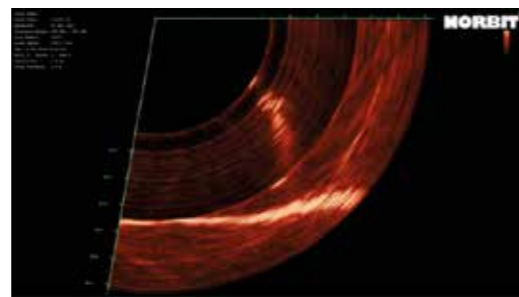


Fig. 5. Water-column display during rock dumping

The snippet backscatter data is a good way to see some artifacts in the bottom type which are not easily visible on bathymetry relating hardness and other physical properties of the seabed. NORBIT STX offers water column output which can be easily recorded into the file and into the QINSY (starting version 8.12).

The new 3D scanning sonar has been used already in several applications e.g. for rock dumping operation or pre- and post-survey after dredging operation. In all cases, the system offers excellent improvement for accurate monitoring of the operation in real time, especially for the rock dumping operation as high dynamics operation requires careful and precise monitoring of the deposited material. This operation has both financial and legal implication if the deposited material amount and location do not meet the specification. Usually, for this type of application, the pre-mission activities will consist of careful preparation for the rock dumping operation by conducting a bathymetric survey. After that, the rock dumping operation is conducted followed by the post-survey which confirms the location and amount of deposited rocks.

In such scenario it is often necessary to repeat the operation as either a number of deposited rocks or their location has not reached the assumed goal which causes the operation to take longer time, adds the uncertainty to the planning efforts, and costs money. However, the new real-time 3D bathymetry sonar from NORBIT allows monitoring of the rock dumping operation in real-time and accurately measures the distribution of the deposited material. That gives the instant information to the operators where to move the outlet of the material and how much material is there still to be put in place.

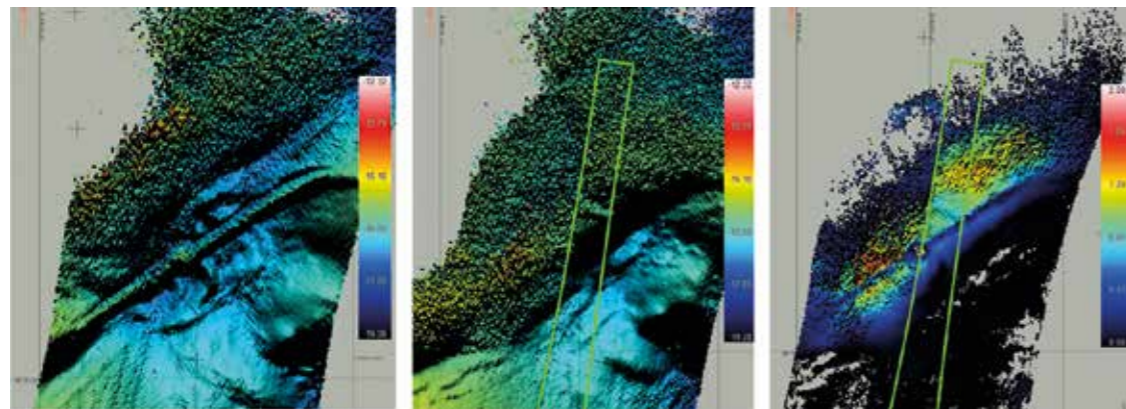


Fig. 6. The real time display (QINSY) observed by operator of the NORBIT 3D 400kHz bathymetry sonar in rock dumping operations: green sector is a 3D coverage of the sonar. The left hand side is the first run, the middle is the current real time grid display and the right hand side is the difference showing the distribution and amount of the rock deposited on spot

Fig. 6, at the bottom of the previous page, shows a real-life picture of the display available to the NORBIT 3D sonar operator. The sonar seamlessly integrates with a survey software such as QINSY via the same data format as used in other NORBIT bathymetry systems. The display is continually updated with the latest available data from the sonar and instantly displayed to the operator. The integration with the popular survey software allows the customer to instantly get the system into the workflow and use the current tools and operators to perform the work.

The sonar sweeps the transmit beam stepping through a pattern predefined by the operator. For example, with the usual (for dredge depths) ping rate of 15Hz, the sector visible inside the green area in the picture is updated every second. Therefore, every second the operator sees the entire path of the accurately measured DTM being updated on the screen with all the markings and features of the state of the art bathymetry setup.

The 3D bathymetry system can act as a standard high-resolution bathymetry system in the same way as other NORBIT bathymetry systems, which reduces the need for multiple sensor installations on the vessel, minimizes the time required to train the personnel and keep data consistently at high quality. A dredge or rock-dumping operation require a pre-survey and post-surveys as well as monitoring of the operation in real-time. The examples of the pre- and post-surveys are presented in the figures below.

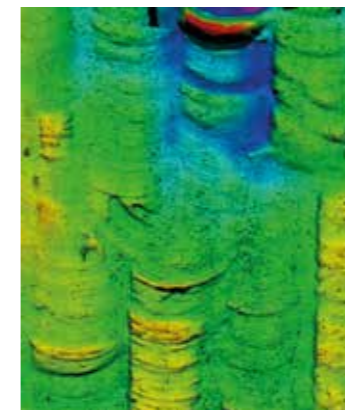


Figure 2. NORBIT 3D 400kHz bathymetry sonar used for post survey in dredging operations.

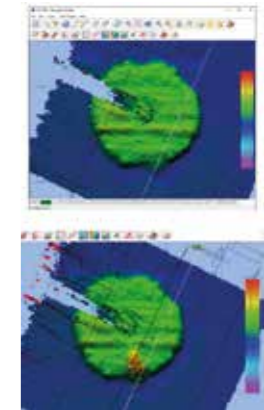


Figure 3. NORBIT 3D 200 kHz bathymetry sonar used for pre- and post-survey in rock-dumping operation.

For rock-dumping operation, the sonar can be used in three different ways. For bathymetry survey done before the rock dump (pre-survey), for monitoring during the dumping operation and for post-survey done after the dumping as a final check. The accurate bathymetry measurement obtained during the dumping process provides grid and digital charts updated in real-time. In many cases this allows the operator to omit the entire post-survey to optimize the operation time and lower the cost of the work.

For dredging operation, the similar advantages follow when the 3D DTM is continually updated during the dredging operation. If not strictly required, the post-dredging survey can be avoided to save operation time and money.

**3. Summary**

The new 3D sonar from NORBIT is based on a proven platform for WBMS family of bathymetric integrated systems, and the new transmitting section allows to insonify the 3D sector by slicing it with the narrow electronically controlled transmit beam and receive the signal with the state of the art cylindrical NORBIT receiver.

NORBIT's new offering vastly optimizes the operation time for many dredging, and rock dumping application and delivers high-resolution 3D bathymetry that meets and exceeds IHO Special Order, CHS Exclusive Order & USACE New Work and is suitable for any platform due to a small size and easy integration.





# What's new at Seabed



Moraine Lake, Canada

## Calibration Lab AML

Seabed has started creating a European Calibration Lab for AML sensors. Before all the different sensors were sent to AML Oceanographic in Canada, now Seabed can do the calibration in house. This will tremendously cut down on inbound duties, transport costs and turnaround time for customers all over Europe. Seabed will be able to calibrate the Pressure Xchange sensor, Temperature Xchange sensor, Sound Velocity Xchange sensor and Turbidity Xchange sensor. To provide a reliable calibration, Seabed has set up a clean room with all the necessary equipment to achieve quality calibrations, to comply with the standards of AML Oceanographic in Canada.

## Web Interface

To make equipment more user friendly Seabed produced a Web Interface. The first version is made for the GNSS Receiver SGR7 system and will make setting up the Receiver an easy task. Key point when developing the web interface were clarity, consistency and aesthetic integrity. All of which were implemented while building the interface. The web interface consist out of wizards which will make you fly through the settings of the SGR7. Adding new message and changing settings will be easier as ever before. If you don't like to use wizards, the Web Interface gives you the opportunity to do it all by yourself. The main screen consist of an overview which makes it possible for the operator to see if the system is functioning as it should. All of this with a simple click of a mouse button. In the future the Web Interface can also be used to setup other equipment such as the Timing module, Orinoco Solo (Tide Gauge) and Lidar systems.

## STM

The Seabed Timing Module can be used to time whatever device you like. The module gives you the opportunity to time your system with GNSS and PPS timing accuracy as easily as humanly possible. After time tagging is done the module sends the string over Ethernet using the UDP protocol. The module has a depth rating of 100 meters (500 meters when oil filled) so if you like you can send it down to the bottom with the system you want time tagged. All together Seabed Timing Module, always, anywhere, anytime.

## 3D printer

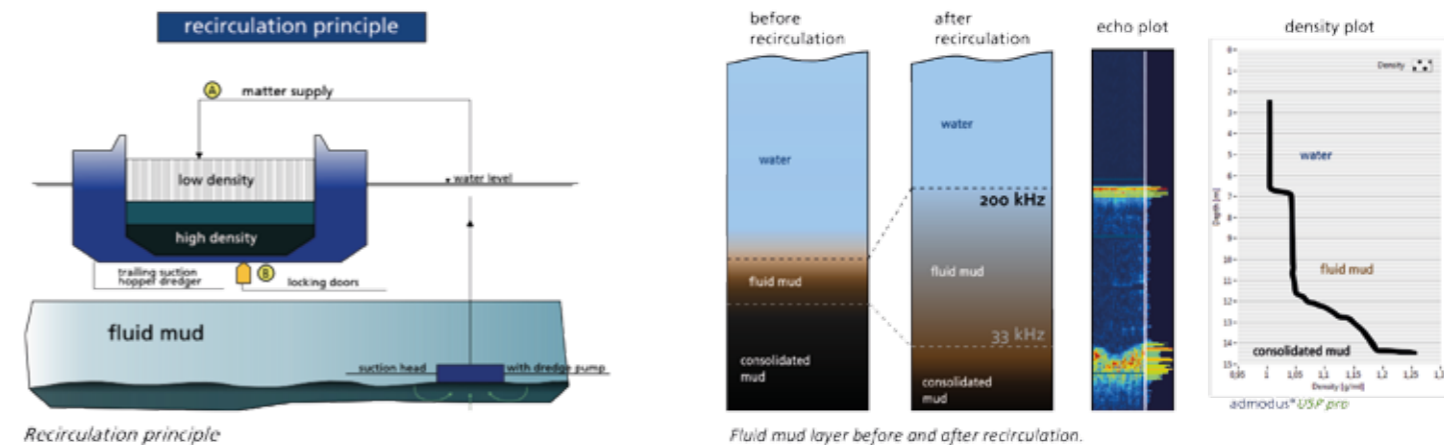
One of the new pieces of equipment at Seabed is the 3D printer and Solid Works software. With this software and 3D printer we can make prototype housings for a new product which was previously outsourced and therefore very time consuming. The use of the 3D printer and the drawing software shortens the development process by many weeks. The 3D printer can also be used to make molds for cables.

# DENSITY matters...

Port of Emden, Germany  
reducing dredging costs by 90%

In many of the world's largest harbours, appropriate hydrographic survey is a necessary requirement in order to keep dredging costs low. The port of Emden succeeded in reducing the dredging costs by 90% with the help of a new dredging management and hydrographic survey using the density probe **admodus<sup>®</sup> USP pro**.

In 1994, after many years of research, the port authority managed to maintain the fluidity of suspended sediments, which were carried into the harbour basin by the river Ems. This so called "sediment conditioning" is mainly based on the prevention of the fluid mud's reconsolidation process by a regular treatment (recirculation). As a result, these sediments no longer have to be removed from the harbour basin and a lot of disposal costs can be saved.



## The challenge:

How to monitor the density of this 'fluid mud' or measure the nautical depth in the harbour basin in a fast and reliable way, in order to guarantee navigability?

After 10 years of experience and development, **admodus<sup>®</sup> MARITIME DEVICES** released the new **admodus<sup>®</sup> USP pro** in 2013, with improved precision, ruggedness, better software and easier handling like the one-man-automatic-mode. The port of Emden was the first customer who purchased and still uses this device with great success.



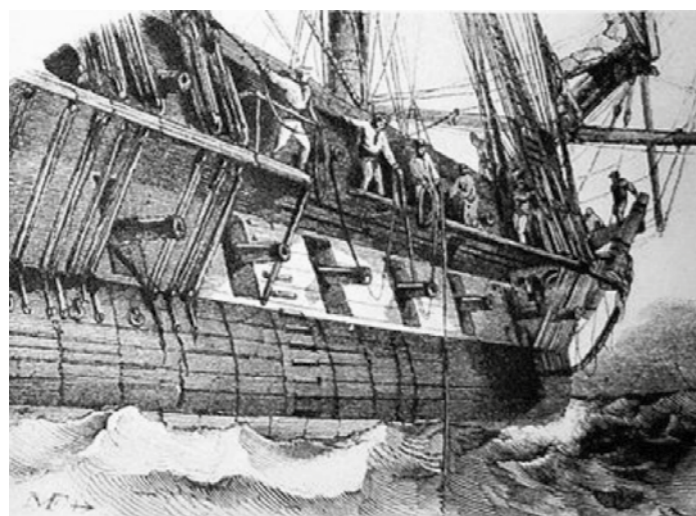
## Conclusion

A lot of maintenance costs can be saved by an intelligent dredging management. Investigations in recent years have shown, that ships can navigate safely through fluid mud layers up to a density of 1.15kg/dm<sup>3</sup> at the port of Emden. This 1.15kg/dm<sup>3</sup> horizon is often much deeper than the 200kHz horizon of an echo sounder. Thus, there is 'more water' under the keel with less dredging.

# What's that sound?

## A History of measuring depth

“Sounding” derives from the Old English *sund*, meaning swimming, water, sea; it is not related to the word *sound* in the sense of noise or tones. Data taken from soundings are used in bathymetry (the name comes from Greek *βαθύς* (*bathus*), “deep”, and *μέτρον* (*metron*), “measure”) to make maps of the floor of a body of water, and were traditionally shown on nautical charts in fathoms and feet.



Lead and line sounding

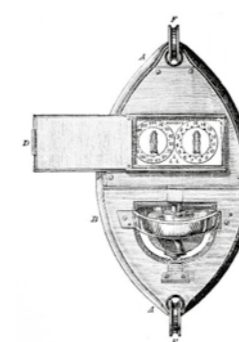
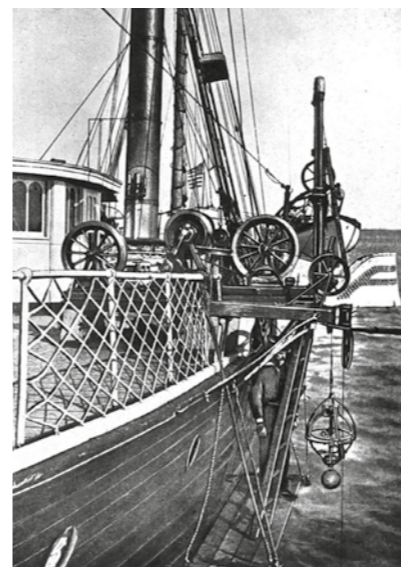
### Lead and Line

Before we had the comfortable use of Echo Sounder a sounding line or lead line was used. A sounding line or lead line is a length of thin rope with a plummet, generally of lead, at its end. Regardless of the actual composition of the plummet, it is still called a “lead.” Leads were swung, or cast, by a leadsman, usually standing in the chains of a ship, up against the shrouds.

Measuring the depth of water by lead and line dates back to ancient civilization. Greek and Roman navigators are known to have used sounding leads, some of which have been uncovered by archaeologists. Sounding by lead and line continued throughout the medieval and early modern periods. The Bible describes lead and line sounding in Acts, whilst the Bayeux Tapestry documents the use of a sounding lead during King Harold’s landing in Normandy. Throughout this period, lead and line sounding operated alongside sounding poles, particularly when navigating in shallower waters and on rivers.

At sea, in order to avoid repeatedly hauling in and measuring the wet line by stretching it out with one’s arms, it became traditional to tie marks at intervals along the line. These marks were made of leather, calico, serge and other materials, and so shaped and attached that it was possible to “read” them by eye during the day or by feel at night. The marks were at every second or third fathom, in a traditional order: at 2, 3, 5, 7, 10, 13, 15, 17, and 20 fathoms. The “leadsman” called out the depth as he read it off the line. If the depth was at a mark he would call “by the mark” followed by the number, if the depth was between two marks, he would call “by the deep” followed by the estimated number.

Source: Wikipedia



Edward Massey's sounding machine

### Mechanization

During the nineteenth century, a number of attempts were made to mechanize depth sounding. Designs ranged from complex brass machines to relatively simple pulley systems. Navies around the world, particularly the Royal Navy in Britain, were concerned about the reliability of lead and line sounding. The introduction of new machines was understood as a way to introduce standardized practices for sounding in a period in which naval discipline was of great concern.

One of the most widely adopted sounding machines was developed in 1802 by Edward Massey, a clockmaker from Staffordshire. The machine was designed to be fixed to a sounding lead and line. It featured a rotor which turned a dial as the lead sank to the sea floor. On striking the sea floor, the rotor would lock. Massey’s sounding machine could then be hauled in and the depth could be read off the dials in fathoms. By 1811, the Royal Navy had purchased 1,750 of these devices: one for every ship in commission during the Napoleonic Wars. The Board of Longitude was instrumental in convincing the Royal Navy to adopt Massey’s machine.

Massey’s was not the only sounding machine adopted during the nineteenth century. The Royal Navy also purchased a number of Peter Burt’s buoy and nipper device. This machine was quite different from Massey’s. It consisted of an inflatable canvas bag (the buoy) and a spring-loaded wooden pulley block (the nipper). Again, the device was designed to operate alongside a lead and line. In this case, the buoy would be pulled behind the ship and the line threaded through the pulley. The lead could then be released. The buoy ensured that the lead fell perpendicular to the sea floor even when the ship was moving. The spring-loaded pulley would then catch the rope when the lead hit the sea bed, ensuring an accurate reading of the depth.

Both Massey and Burt’s machines were designed to operate in relatively shallow waters (up to 150 fathoms). With the growth of seabed telegraphy in the later nineteenth century, new machines were introduced to measure much greater depths of water. The most widely adopted deep-sea sounding machine in the nineteenth

century was Kelvin’s sounding machine, designed by William Thomson (Lord Kelvin) and patented in 1876. This operated on the same principle as lead and line sounding. In this case, the line consisted of a drum of piano wire whilst the lead was of a much greater weight. Later versions of Kelvin’s machine also featured a motorized drum in order to facilitate the winding and unwinding of the line. These devices also featured a dial which recorded the length of line let out.

Both lead and line and sounding machines continued to be used right throughout the twentieth century. However, the development of echo sounding largely displaced both of these technologies by the beginning of the twenty-first century. The first practical fathometer (aka Echo Sounder) was invented by Herbert Grove Dorsey and patented in 1928.

### Echo sounders – fathometer

Echo-sounding, first developed in the early 1920s, proved to be the critical advance in the field. An operator sent signals to the ocean floor, and listened on headphones for a returning echo. Using a variable-control mechanism, the operator would determine the depth. Surveyors from the United States Coast and Geodetic Survey used this Sonic Depth Finder to take deep-water soundings from Norfolk, Virginia, to San Diego, California. But the technology had clear limits. Operators needed to be highly skilled to deploy signals and recognize the echo. The instruments themselves could be unreliable, and they did not sound in less than 100 fathoms.



Dorsey fathometer

1933 marked a further advance in this technology with the development of the Dorsey fathometer. What made the Dorsey fundamental for hydrographic work was its incorporation of a transmitter and a receiver into a single mounted unit called a transceiver. It had an operating range of 1 to 275 meter. By 1939, it could record depths automatically, thanks to the incorporation of Hughes Veslekari’s graph-recording instrument.

In 1940, the 808 fathometer was released. It became the standard device for shallow to intermediate surveying for the next twenty-five years. By the mid-1960s, digital technologies were invented for surveying the ocean floor, leading to computerized data collection systems. Accuracy increased in the 1970s with the creation of single-beam frequency systems, which, by the 1980s, were bolstered by the deployment of dual frequency beams. They combined a narrow high-frequency beam for precision and a wider low-frequency beam to sample the surrounding area.

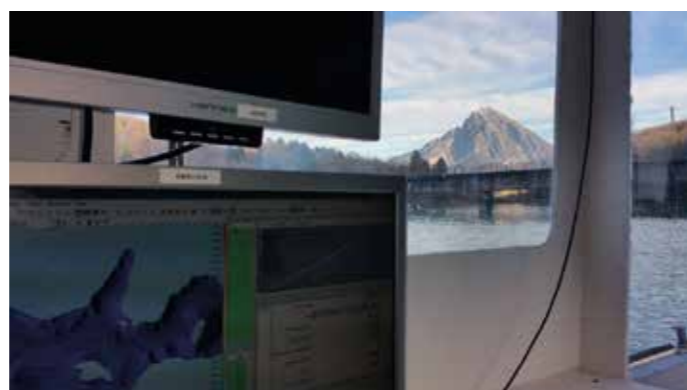
# Client tales #2



Te.Ma.snc is a leading survey company based in Italy, offering highly specialized services to both national and international clients. Since 1982, Te.Ma.snc provides marine and land technical services. Applying both traditional and advanced technologies to perform high quality topographic, bathymetric, geophysical, geotechnical and environmental surveys.

Our partnership with Seabed began in 2011, finding an excellent support in providing innovative equipment and customized solutions for our needs. Our last purchase was the Norbit iWBMS, an advanced wide swath bathymetric system. Te.Ma. snc have successfully applied the system in high resolution surveys of the Mo.S.E. mobile barriers for the defense from floods of the Venice Lagoon. In this view, we consider Seabed a reliable and strong partner for the continuous development of our business.

Matteo Castelli, owner Te.Ma.snc

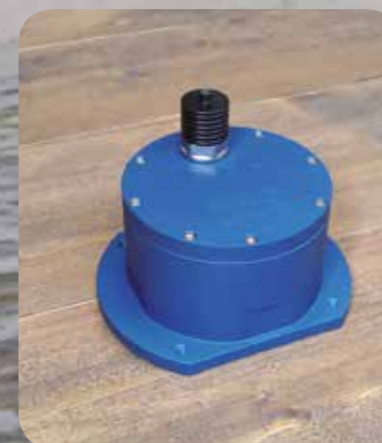


## Seabed inertial measurement units



The Seabed-IMU-S family are submersible inertial measurement units. An inertial measurement unit, or IMU, is an electronic device that measures and reports a vessel/vehicle's velocity, orientation, and gravitational forces, using a combination of accelerometers and gyroscopes, sometimes also magnetometers.

When integrated with SPAN technology, the SBD-IMU-S family is ideal for maritime, airborne and ground applications that require accurate 3D position, velocity and attitude (roll, pitch and azimuth) data.



SBD-IMU-S1  
mems based



SBD-IMU-S2  
mems + fog based



SBD-IMU-S3  
mems + fog based

### Accuracy up to 0.005°

#### Benefits

- Tactical grade IMU performance
- Commercially exportable IMU
- Ideal for size constrained applications
- Continuous, stable positioning



Getting to the bottom of things

# Falmouth Scientific

## CHIRPceiver™ Family

CHIRP Side Scan Sonar, Sub-Bottom,  
and Combined SS/SB Systems



HMS-624  
Side Scan Sonar

HMS-624 Dual Simultaneous CHIRP 100/400 KHz Side Scan

HMS-625 Combined 100/400 KHz SS with 1-10 KHz SB



HMS-622  
Dual Frequency  
CHIRP Sub-Bottom  
Transceiver

Complete CHIRP Sub-Bottom  
Systems & Solutions

Hull Mount, Side Mount, Towed  
HF / LF / ULF Frequency Bands  
True 24-Bit Resolution

Upgrade & Retrofit Older Systems



Sensors  
Systems  
Service

fsi@falmouth.com ♦ www.falmouth.com

BUBBLE GUN™  
Low Frequency  
Seismic Systems



ACPLUS  
Current  
Wave  
Tide



A Division of Falmouth Scientific, Inc.

Advertorial

# Skilltrade: Essential training for hydrographic surveyors



Today's ever more complex maritime industry seeks confirmation of certification and competences in every sphere, with hydrographic surveying no exception. Johan Stam, CEO of Dutch hydrographic training institute Skilltrade, will explain the structure, courses, and competences registration for hydrographic surveyors.

The educational programme is devolved by the International Hydrographic Organisation (IHO), Stam explained, the global authority whose aim is to ensure that all the world's seas, oceans, and navigable waters are surveyed and charted, and whose mission is to create a global environment in which countries provide adequate and timely hydrographic data, products and services, and ensure their widest possible use.

In terms of courses, these are detailed through various categories. With its many working groups, and from recommendations at its 'Assembly of Member States' – held every three years with the next from 24-28 April 2017 – IHO, together with the International Federation of Surveyors (FIG) and the International Cartographic Association (ICA), amends and updates course requirements from time to time through the FIG/IHO/ICA International Board for Standards of Competence (IBSC).

As well as establishing standards, the IBSC reviews submissions by academic and training institutions wishing to gain recognition for their courses against those standards. In terms of hydrographics, if the IBSC determines that a curriculum adequately covers the requirements, a certificate of recognition is issued, at either a Category A or Category B level, whichever is appropriate.

The 'Hydrographic Survey Category B' course curriculum encompasses all the basic and essential competencies needed by a hydrographic surveyor, as defined by the IBSC and officially recognised as such in July 2008.

To remain effective, the standards – and hence the training programmes – must continually be adjusted to account for advances in technology and practice. Accordingly, programme recognition is granted for only six years: after that a re-submission is required. Training institutes such as Skilltrade are accredited by IBSC to educate hydrographic surveyors not just initially, but with advanced and practical studies during their working lives.

### What's on offer

"At Skilltrade, and in co-operation with Nova College in IJmuiden, we are pleased that IBSC has recognized our course amendments for the next six years, in line with their latest updates," Stam stated.

"We also offer introductory and general courses in hydrography, land survey, positioning and mathematics, as well as courses covering depth sensors, motion sensors, survey sensors, underwater acoustics, offshore construction, and earth sciences.

"In addition, we offer advanced courses in geophysical sensors,

ROV sensors, and electronic trouble shooting, plus e-learning modules.

“Our e-learning courses are well received,” Stam noted, “and we’ve developed new e-learning modules in bathymetry, geodesy, and global navigation satellite systems, which are supported by our books.

“In order to simplify access to e-learning, we’ve also developed an app to allow students to study at any location – as some students have told us, that includes the train to work! E-learning can also be undertaken as a separate course, with an exam that’s based on a IHO level and invigilated by an authorised supervisor. “For mathematics and physics,” Stam continued, “we have developed our own e-learning modules in line with hydrographic experiences in the field. And in the ‘Hydrographic Survey Category B’ [Cat.B] curriculum we’ve also added more geographic information system (GIS) details in co-operation with such companies as GIS specialists ESRI and marine and coastal data group Ocean Wise, who support us with full-day workshops.

“Our ‘Field Training Project’ (FTP) practical task description was also well received by IBSC. Most students wish to complete their theoretical diploma with this practical part of the curriculum, which is usually executed in co-operation with the student’s employer.

“Skilltrade has assigned a special FTP supervisor,” Stam added, “and during the 12-week Cat.B course we also encourage experienced visitors to attend, usually for a day or two, either for introductions or to provide more background to certain subjects.

“At the end of our course, students execute their own project, which starts in week five with a tender. The class is split into two groups and various procedures need to be proposed before execution of the field work – where, of course, students are eager to prove their practical knowledge.

“Their final reports, with their processed charts, prove (or not...) their competences and ability to work in a team,” Stam said.

“Since 2008, we’ve noticed an increased demand with regard to certification and competences,” he added. “and have added a logbook which needs to be completed by students over two years in order for them receive a diploma. It’s important as it adheres to International Marine Contractors Association (IMCA) guidelines, and qualifies them for Grade I – senior surveyor.

“We call these two years a ‘Field Proficiency Period’ (FPP), and they are supervised by Skilltrade together with the student’s local supervisor, who must be known and approved by Skilltrade’s examination board.

“The logbook confirms a surveyor’s experience and competence, and we’ve noted that several major maritime companies have assigned a manager to support this aspect of our work.”

#### Axel de Meijer and G2

Stam and Skilltrade take pride in the fact that students have turned their education and FPP experiences into high-profile careers and even businesses.

“Axel de Meijer is a good example,” Stam noted. “Founder of Netherlands-based company G2, he needed confirmation of his competences and certification in order to qualify for survey tenders for the Dutch government and water boards.

“With upcoming projects in the northern part of the Netherlands, his time was limited. He contacted Skilltrade and explained that his vision was to serve the general Dutch market ... but his qualifications did not match the required standards set by Rijkswaterstaat (the Dutch infrastructure and waterways ministry). “He first attended our four-week ‘Basics’ course, coming into positive contact with classmates from many different backgrounds. He then decided to finish the full 12 weeks of courses.

“We recognised his capabilities during the lectures, and his



support to the other students, and Axel was later approached to lecture our ‘Introduction to Hydrography’ course.

“He continues to enjoy meeting Skilltrade course attendees from many different countries,” Stam said, “and was able to tender for, and was awarded, several projects because of his certification.” Skilltrade is also influential in Scandinavia.

“Most employees of the Swedish maritime administration have passed our Cat “B” course,” Stam said, “and it is a pleasure to hear that they all are doing well. Hydrography has much to offer specialists, who discover the importance of the discipline during construction phases.

“We are proud too that our success story includes convincing students that this profession opens many doors, overlapping as it does with GIS, environmental projects, dredging, oil & gas exploration, and more. A hydrographer even became head of pilots in the port of Mombasa after completion of our Cat “B” course!”

#### Finally

“It’s been a changing landscape,” Stam states. “With more than 170 students of different nationalities since 2008, we’ve noticed that freelancers wish to confirm their status or take courses to become multi-functional.

“We have also noticed that Middle Eastern land surveyors look to provide more services by obtaining our certification, and that they subsequently apply for advanced posts in the region. And senior surveyors wish to obtain our certification in order to become consultants after retirement.

“We remain focused on education in the Netherlands, in co-operation with Maritime Institute Willem Barendsz, which is running a ‘Hydrographic Survey Category A’ course.

“Co-operation with other universities has also led to further support – the wheel should not be re-invented!” Stam concluded.

#### Skilltrade’s Upcoming courses

The 20st course, in IJmuiden, will start 4 September 2017, and the e-learning training for this course should be started on or before 3 June 2017. Skilltrade will run further Cat B courses in September 2017 and January 2018, both of which are open for registration.

The planning of the associated e-learning path has also been adjusted. We noticed that some clients wish to split the course in two– e-learning first, mathematics and physics, followed by the four-week basic training.

We have also developed an advanced hydrography introduction course with Saipem in Milan, planned in conjunction with Seaway Heavy Lifting and Peel Ports later this year. In addition, and for Heerema, we have developed a seabed surveying ROV course for starters, available for registration on our website.



# Seabed<sup>at</sup><sub>the</sub> Expos

Here's where you can meet us this year:  
Ocean Business 2017 and Hydro 2017



World Water Works, 2016



Wodcon, 2016



Geo Business, 2016



Oceanology International, 2016



AquaVision, 2016



# Meet... **Wouter Tuinstra** Hydrographic Surveyor

**Date of birth? And what is it you like to do on your birthday?**  
My birthday is on 7 March, and I love to celebrate it together with my family and friends.

**Single, in a relationship or married?**  
Single.

**Any hobbies?**  
I love to go for a swim. I have been a volunteer as a lifeguard on the beach of Texel in the summer for the last 5 years and want continuing to go every year. I want to explore different kinds of watersport like wave surfing.

**Fast food, bistro or Michelin starred restaurant?**  
A place to go to for diner will be a good restaurant to explore different kind of food, as long as it isn't fish.

**Netflix or the cinema? And what is your favourite TV-series or movie?**  
I don't have Netflix and I don't go to the cinema very often. I like

a variety of crime series and the same applies for movies. I like lot of movies but none is my favorite.

**What kind of job did you want growing up?**  
Well, I have picture when I was four that I wanted to be a carpenter. So that's something completely different. But what can you expect, I didn't know what the world has to offer at that age.

**What is it you like most about your current job?**  
The diversity of activities and to work on projects to help customers for custom solutions.

**What do you learn from your colleagues?**  
The expertise of my colleges makes me learn every day and they stimulate me to explore the possibilities.

**If you would win the lottery, what would your life look like?**  
First of all I will give half of it away to charities. And use a good part by going around the world to visit the most extraordinary places in the world.



**SUBSEA TECH**  
Marine and Underwater Technologies

## Unmanned solutions for bathymetry and 3D modelling works

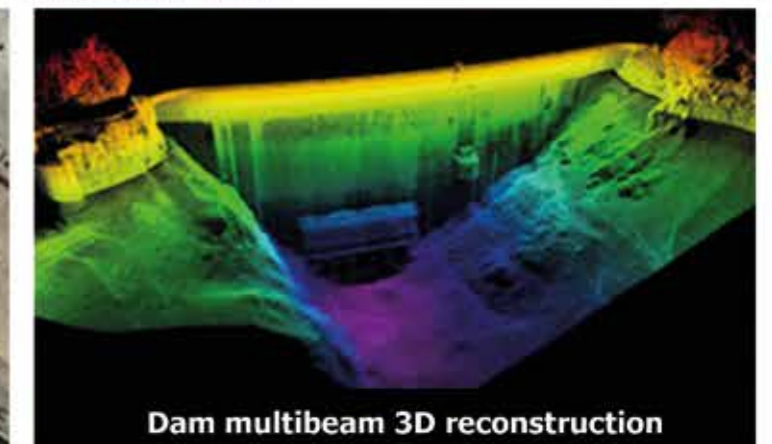
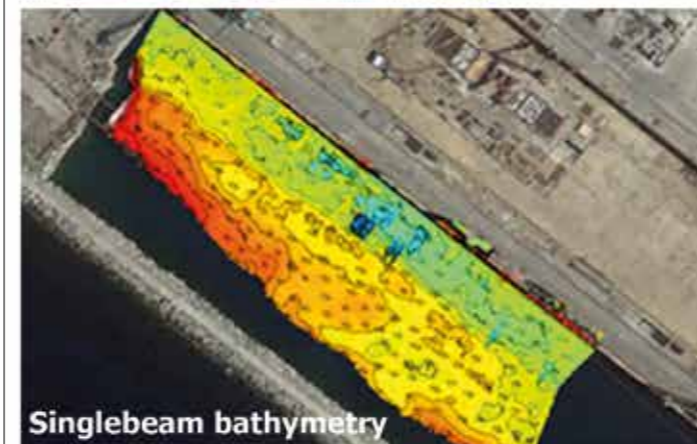
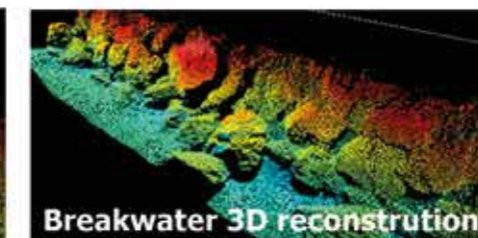
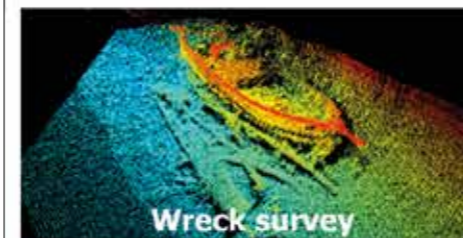


### USV CAT-Surveyor Coastal and harbour areas

- Length: 3 m
- Weight: 270 kg
- Payload: 80 kg
- Autonomy: 12 h
- Range: 5 km

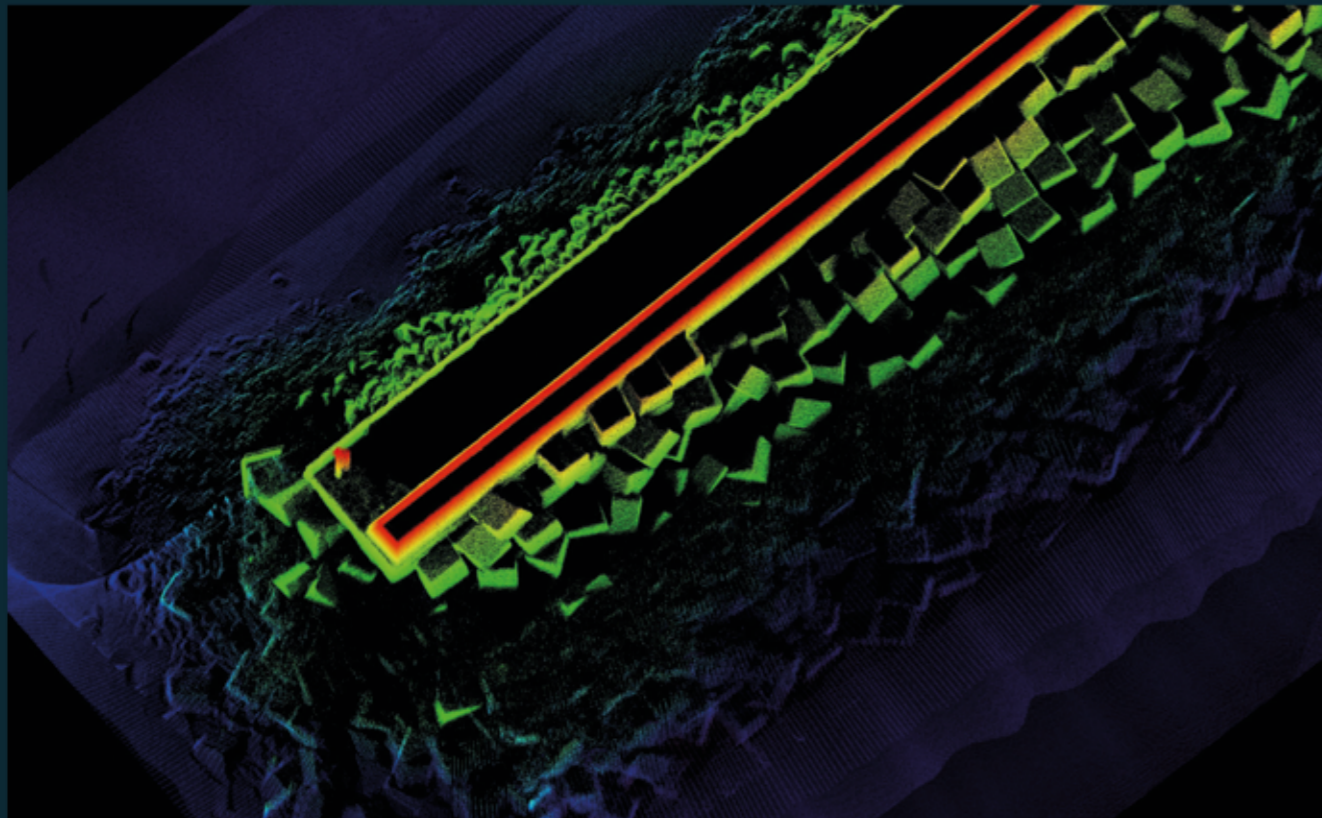
### USV Catarob ATS-03 Inland waters

- Length: 1,8 m
- Weight: 50 kg
- Payload: 15 kg
- Autonomy: 4 h
- Range: 1 km



www.subsea-tech.com / st.sales@subsea-tech.com / +33.4.91.51.76.71

## Ultra-Portable Turn-key Multibeam Bathymetry, FLS and LiDAR



# Satlab SLC: the RTK Handheld using your Tablet or Phone as display

Current modern tablets and smartphones allow an effective data collection using internal sensors, onboard software and background maps. Integrated GPS receivers in these handhelds became a standard; the APP stores for all operation systems offer a large choice of mapping and GIS software solutions for any positioning application. But what about the accuracy? The positioning accuracy of integrated GNSS chips in smartphones or tablets can be sufficient for some applications but the reliability of a supposed 3-5 meter accuracy is very questionable. So, for any surveying job requiring a reliable accuracy, an external GNSS sensor is a must.

The solution is to call a professional surveying company and pay for a precise positioning performed by “heavy equipment” or to do it on your own. This article would like to explain you that you can do it in a very smart way by an easy clicking of your tablet or phone to a precise GNSS receiver/sensor which serves as a mount of your PC.

The Satlab SLC, manufactured by Swedish based Survey and GIS equipment maker Satlab Geosolutions AB, is a high precision GNSS RTK receiver sending cm level position NMEA data to the user's tablet or phone. You can see it also as black box running a positioning application. The unique design includes a mounting plate for mounting the user's device so it acts as the handheld's display. No cable needed: the BlueTooth connection is sending all positioning data in high frequency rates to your device. Alternatively, the included USB/RS232 port can connect to your tablet and the you can also charge the SLC by the USB cable from your PC. With optional remote antenna and pole or fixed mount accessories, the SLC can be configured as a sensor for various machine control applications.

There are different ways to obtain a positioning information from an external GNSS receiver. The easiest is the “Geolocation method”, available for practically any mapping software. The user simply activates the so called mock functionality on his/her iPhone or Android phone and makes sure that the phone is paired and connected to the external device. As soon as connection is achieved, the position from the phone is overwritten by the position from external GNSS receiver. Geolocation method, however, has limited number of attributes to represent location information like latitude, longitude, heading or speed. The user also does not obtain any data about the accuracy of his/her position: DOP values and especially the standard deviation information about positioning errors are missing.

“NMEA parsing method” is a more complex approach, supported already by majority of professional surveying and GIS software. The NMEA protocol is sending all position relevant data to a terminal. Such data can be easily decoded and used by the application software, so that the user immediately sees his current positioning status. He/she just waits for a “green light” appearing on his screen at moment when there are sufficient healthy satellites and the position is RTK-fixed.

Satlab SLC Toolbox is a simple software configuration tool running on Android or Windows. This software is used to define internet connection parameters, method of receiving GNSS

correction signals and NMEA streams. It supports both above mentioned methods of providing positioning information and it is used just once to set up the users' system. After the initial setup the user controls the SLC by his/her application software and can check the status by the control LED's on receiver's front panel.

Flexibility is the key in the Satlab product: SLC can not only be combined with any tablet or smartphone but also with any data collection application software running on Windows, Android or iOS. Precise positioning information coming from GNSS sensor can be used in numerous fields of industry from land surveying, high accuracy GIS, web based facility management and precise farming over to hydrography, geophysics or aeronautics.

SLC has a built-in Lithium Ion battery and GNSS antenna for up to 12 hours portable operation. It also includes a Telit 3.5G GSM modem for operation as a RTK Base or Rover, transmitting or receiving corrections from NTRIP networks or from Satlab's free Internet RTK service. Internet RTK allows you to stream corrections to one of 3 Satlab servers located around the world via IP connection and any Satlab Rover device can connect to that same IP connection to receive free corrections.

## Flexibility is the key in the Satlab product

“Our new Scandinavian designed SLC handheld device is the first of its kind, leveraging Tablets as a display, offering RTK cm level positioning at an incredible price”, commented Bjorn Agardh, CEO and Partner of Satlab, with our simple Software utility, users set up the SLC once and it remains configured every time it is used” he added.

Satlab Geosolutions – see [www.satlabgps.com](http://www.satlabgps.com) - is a European based company with its head office near Gothenburg Sweden. The Satlab team combine many years' experience in the GNSS survey and GIS industry applying their application knowledge to create innovative and robust products at competitive prices. Satlab's objective is to provide solid products and solutions over experienced and competent dealers. Therefore, the team of Satlab is extremely pleased to announce a new partnership with Seabed BV. Mutual respect and friendship over decades for each other is now resulting in Seabed being the official reseller of Satlab Geosolutions in Netherlands. Moreover, Seabed is authorized to sell Satlab products in international markets in which Seabed team is active.

Contact: Tomas Blaha  
Tel: +420 734 637 390



## A good start of the New year!

To start the year off well, Seabed sold 12 AML Base X2 instruments with SV X and P X Sensors to Macartney, who was rewarded with the tender from the Belgian Navy.

Also from Belgium, The flamish Institute for the Ocean, purchased a Seabed Portable lightweight system with the IMU S2 as Inertial system.

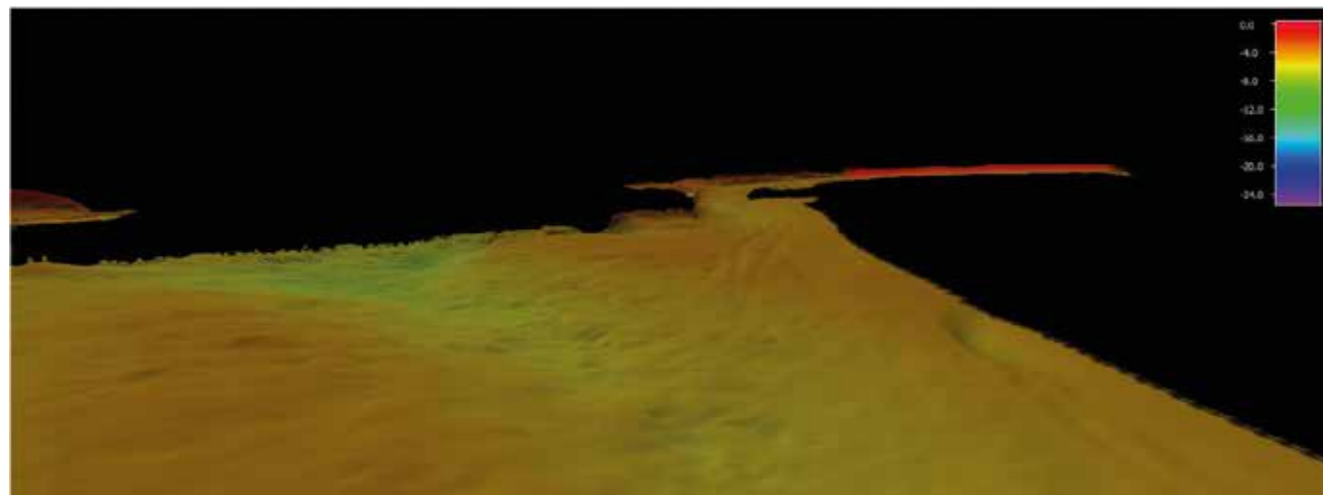
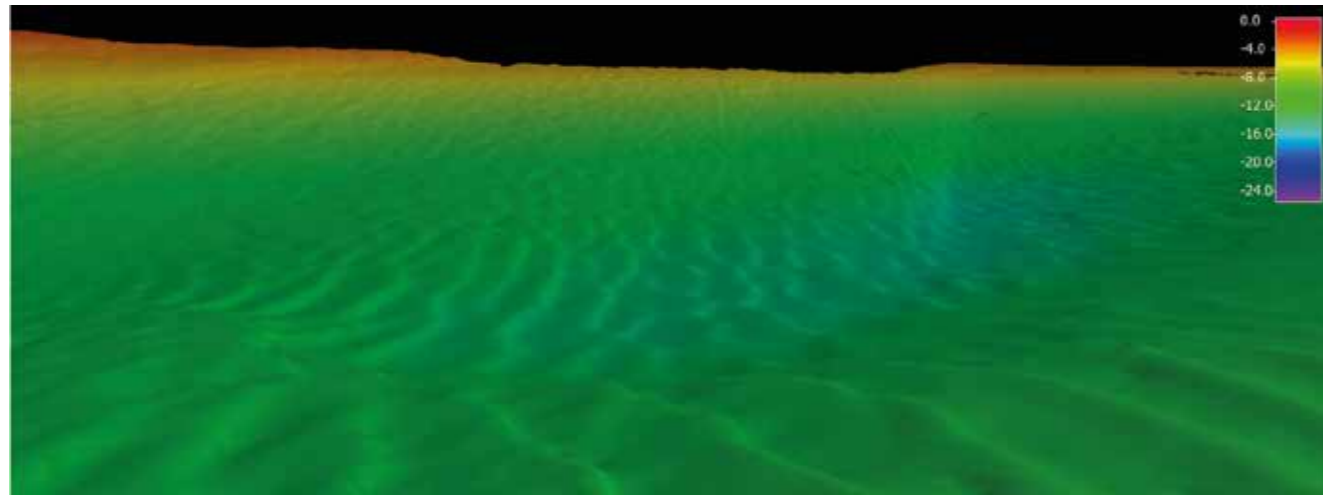


## MB survey with MIWB

On the 19th of June Seabed travel up to Terschelling to visit the Maritime Institute Willem Barentsz. We brought the Seabed lightweight multibeam set for them to use during their survey weeks. After a short explanation the students went off and installed the system onboard of their survey vessel. Within a day they were ready to perform a patch test and do their survey. They surveyed a part of the harbor and the Schuitengat the images that came out of Qimera are amazing:



Maritiem Instituut  
Willem Barentsz



## Environmental Monitoring?

Whether deploying for days or years, versatile Metrec • XL is the optimal multiparameter sonde for environmental monitoring and scientific research.

Conductivity - Temperature

Pressure

Turbidity

pH

Chlorophyll A

BGA Phycoerythrin

BGA Phycocyanin

PAR

Dissolved Oxygen

CDOM/FDOM

Fluorescein

Rhodamine

Refined Fuels

Crude Oil



Metrec • XL

## We've got you covered.

Biofouling should not dictate a project's schedule.

Deploy with UV • Xchange or Cabled UV to expand monitoring timelines, reduce maintenance costs, and experience superior sensor performance. AML sensors protected by UV • Xchange deliver month after month of consistent data.

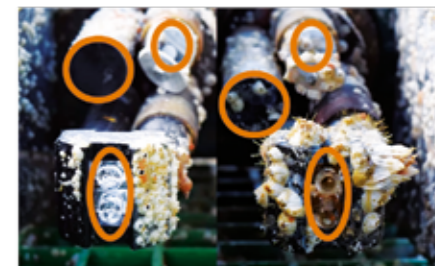
A sample comparison: On the left, clean sensor faces (circled) after nine months in situ with UV • Xchange installed to protect the sensors. On the right is identical instrumentation without UV • Xchange. Photo courtesy of Ocean Networks Canada.



Cabled UV



UV • Xchange



1-250-656-0771  
www.AMLoceanographic.com

# Client tales #3

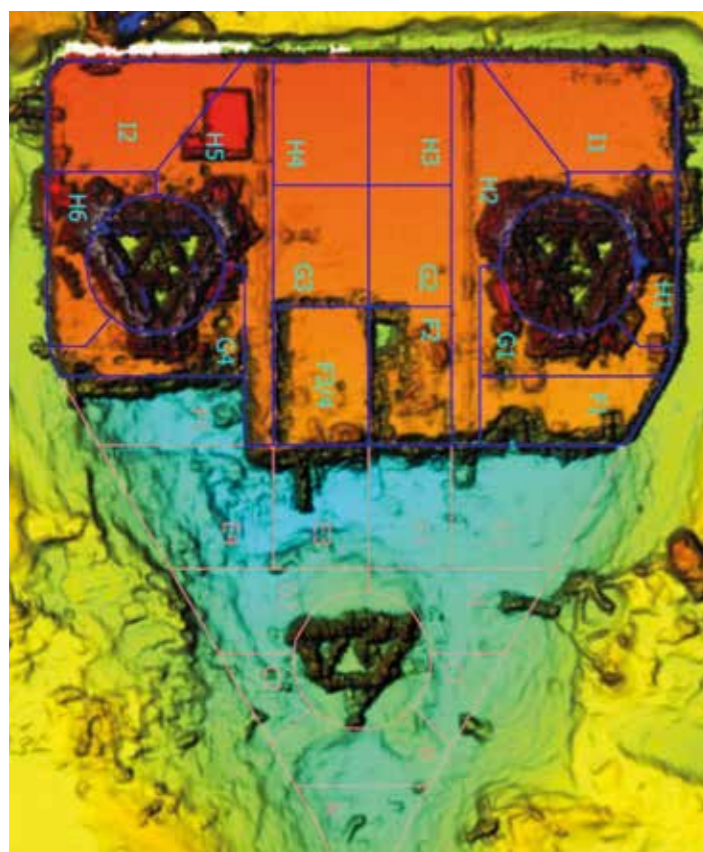
**BPM SUBSEA** Jack-up drilling rig Troll Solution, weighing approximately 7,000 tons, collapsed while carrying out maintenance work on a Pemex wellhead platform CAAN-A on May 5, 2015, killing two workers and injuring dozens aboard the jack-up. The rig came to a rest on the seabed in approximately 30 meters of water and within just two meters from the active platform.

After initial efforts to refloat and salvage the jack-up were unsuccessful, Ardent was hired on to remove the vessel from the Mexican seabed.

To do so, Ardent deployed assets from several countries, including the 1,400-ton lifting capacity Conquest MB-1 crane barge, used by Titan Salvage in the Costa Concordia wreck removal in Italy, as well as a 1,000-ton hydraulic wreck grab from the Netherlands. For the cutting operation, Ardent used a newly designed Guided Guillotine to dismember the jack-up into pieces, instead of cutting with more conventional methods, which it would then lift by crane.

BPM took it up on itself to do the Multibeam Survey part of the job. They came to Seabed to rent an Seabed Portable Lightweight Multibeam set with an S2 IMU and Base station. The job took a total of 6 months and the performance of the system was exemplary. There were some small issues with setting up the base station, but with the quick support of Seabed the problems were swiftly solved. In the end BPM had a satisfied customer and so did Seabed.

**Ben Leimere, BPM**



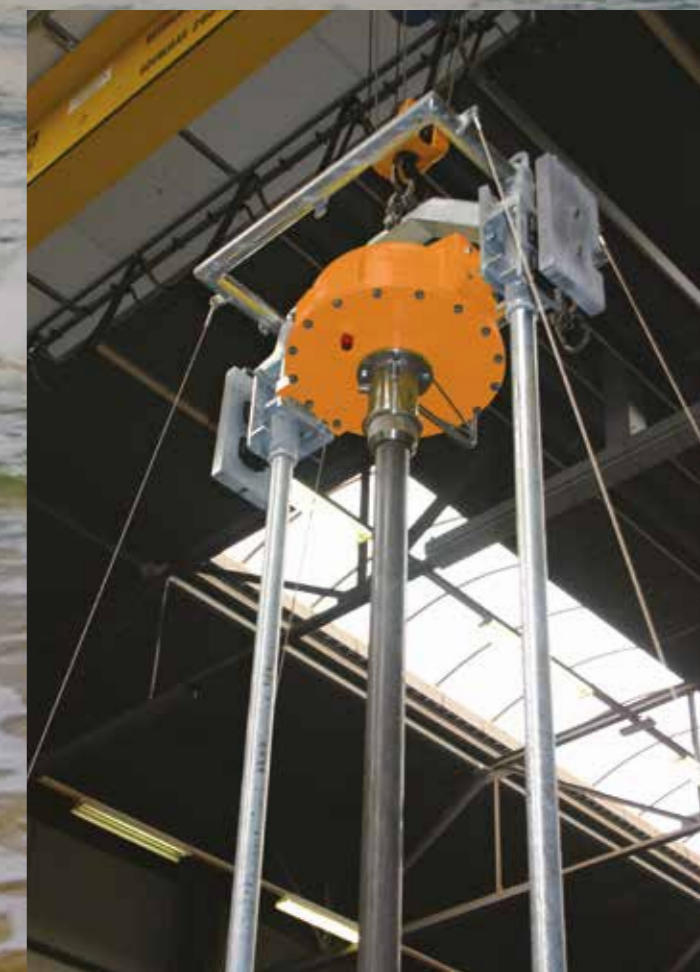
A Survey print-out shows removed sections of the Troll Solution jack-up as the wreck removal case was ongoing. Image credit: Ardent



Source: [http://gcaptain.com/photos-troll-solution-largest-wreck-removal-of-2016-completed-in-gulf-of-mexico/#.WEk0ksHfa\\_8](http://gcaptain.com/photos-troll-solution-largest-wreck-removal-of-2016-completed-in-gulf-of-mexico/#.WEk0ksHfa_8), facebook, and BPM

## Seabed Electric Vibrocoror (SVC) series

The SVC-series have a long track record and are successfully being used by our clients world wide on various types of soil including soils containing gravel. The Seabed vibrocorer has been designed to obtain cylindrical cores in soft, cohesive soils at a maximum water depth of 200 meters.



Getting to the bottom of things

Only 5% of the world's oceans have been explored.

That leaves 95% for you.

NovAtel's SPAN GNSS/INS marine positioning technology provides precise 3D position, velocity and attitude measurements – the perfect solution for systems exploring and mapping the ocean depths.

OEM options range from miniature, entry-level choices for compact, shallow-water systems to high-grade options for deep-water hydrographic surveys. Complete workflow solutions, with GNSS and IMU hardware and post-processing software, provide the performance your application demands.

Learn more at [NovAtel.com/marine](http://NovAtel.com/marine)



Integrate success into your application!

# TRANSPORT

## A world of difference

Transport is a very important factor within a smooth delivery flow. Seabed has been working with 2 excellent partners for years. What makes a partner excellent in the eyes of Seabed? The partners Seabed is working with both exceed in customer satisfaction and go beyond their regular duties to accomplish this.

For regular sized transport Seabed works with InXpress. On the InXpress website you can easily arrange pick up and transport for your standard packages. But for transport to exceptional foreign countries we always contact Pim Sanders at InXpress. He will ask for the weight and dimensions of the package and will arrange everything from there. Same goes for import packages. The suppliers are in direct contact with Pim so all taken care by smoothly without any interference of Seabed. Customs handling are not part of the regular duties but Pim is always more than willing to handle these issues.



Contact:  
Pim Sanders  
+31 630 74 22 18

For the transport and packing of large and heavy equipment Seabed works with Kistenfabriek de Boer and de Boer Cargo. Just a phone call or mail to Cees Dekker and everything is taken care of. From the packing to the shipping, either by air or sea or truck and sending the necessary documents to the recipient. Also foreseen and unforeseen issues with customs are taken care off. They are always there, ready to assist.

Kistenfabriek de Boer b.v.  
Industriële verpakkingen



De Boer International Cargo



Contact:  
Cees Dekker  
+3175-6170605

Special thanks to Pim and Cees. You make life so much easier!



# CAT-Surveyor played its role in the city of movie stars!

The walkers might even not have seen it, navigating between the Super Yachts moored along the Jean Reveille quay in ST Tropez, the international summer gathering of movie stars. But it was there, surveying, modelling and gathering the necessary structural data that would ensure the safety of the biggest.

It – Subsea Tech’s CAT-Surveyor – was deployed early December 2016 in St Tropez harbour to carry out a structural assessment of the 500 m long pier (under and above water). This pier, constructed in the late 1940s, is largely exposed to open sea waves but also to the constant traction forces exerted by the numerous Yachts moored along it all year long.



Saint Tropez harbour

surveys such as dam bathymetry, bridge footers inspection in ultra-shallow waters and harbour dredging works monitoring using the Norbit WBMS multibeam echosounder and its associated INS and GPS RTK delivered by our partners SEABED from The Netherlands.

CAT-Surveyor offers several advantages over conventional surveys systems:

- Fully automated operation (reduced time loss)
- No operator at risk (unmanned system)
- Ultra-shallow waters operations (< 0.4 m)
- Light craft (< 270 kg) easy to transport and deploy
- Real time sonar and video images onshore
- Reduced operating crew (2 operators max)
- All weather operations
- 12 hours autonomy (24 hours with extra batteries)
- On board PC with high bandwidth communication
- Easy integration of all kinds of survey sensors (embedded PC with Windows OS and 80 kg payload)



Developed in 2014, CAT-Surveyor was initially designed under an R&D contract with the French MOD to carry out the detection and classification of UXOs (Unexploded Ordnances) and underwater mines in harbour environment. For that purpose, it was equipped with a Teledyne Blueview M900 imaging sonar and a Tritech Starfish side scan sonar combined to an onboard mini ROV (Observer from Subsea Tech) which gives the system the ability to do real time visual identification of suspicious targets.

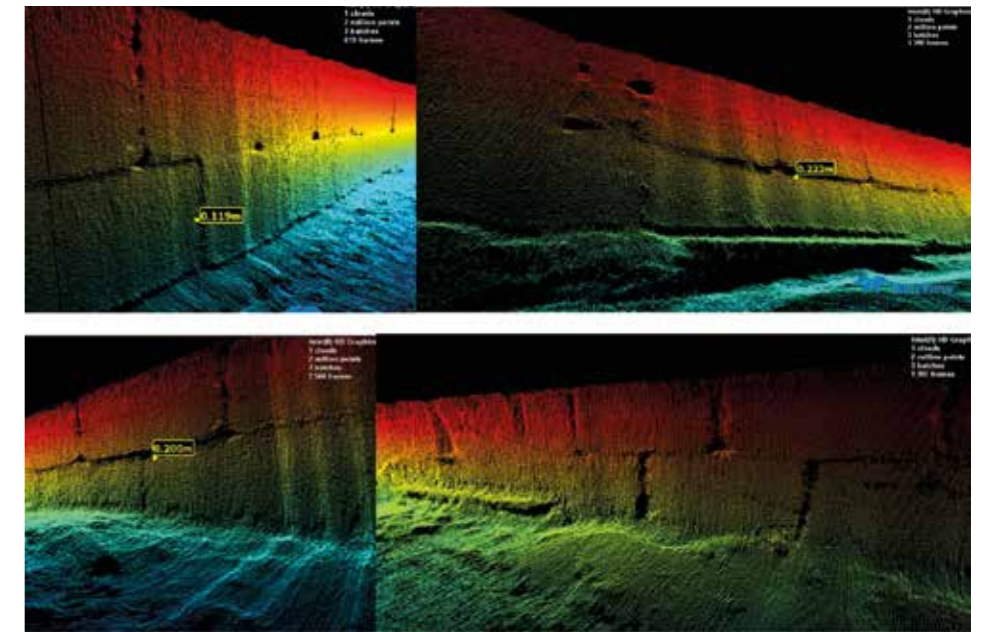


Besides its autonomous navigation system, CAT-Surveyor also hosts an automatic target detection and classification software, using the Blueview imaging sonar, which allows selecting targets of interest and guiding automatically the mini ROV to them.

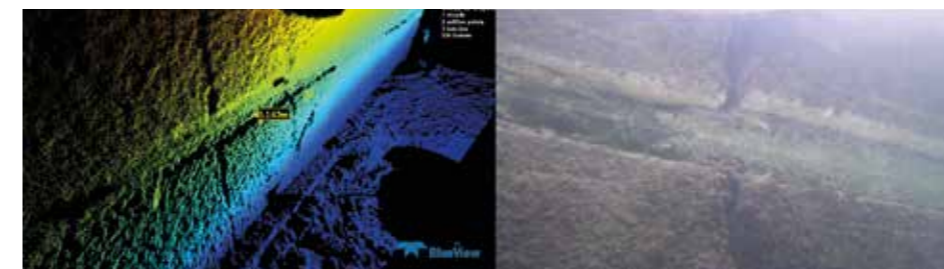
Since then, CAT-Surveyor has now also been involved in several

The inspection works in Saint Tropez were carried out in 2 days using Cat-Surveyor and the Norbit WBMS multibeam sonar to produce a complete 3D model of the 500 m quay, allowing to spot at a glance the suspicious zones, and especially the protruding stones.

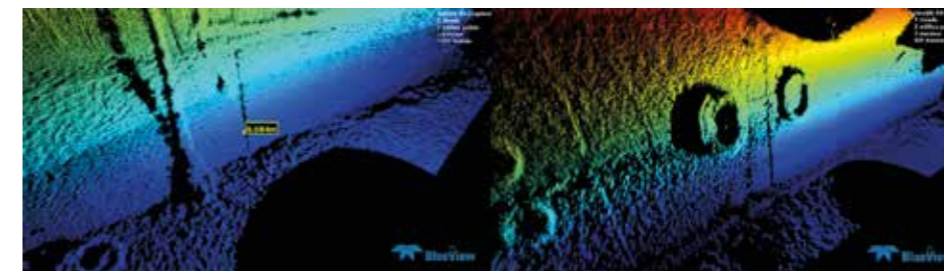
Those protrusions were then accurately measured in the 3D model, as shown below:



3D models of the pier, evidencing the protruding stones, the holes and some bottom reinforcing concrete beams.



Fine modelling of stone joint with BV 5000, showing displacement and confirmed by video.



Great details of mooring lines, fender tyres and bottom debris captured with BV 5000.

Additionally, our team used a high resolution (1.35 MHz) 3D imaging sonar BV5000 from Teledyne Blueview, operated from the quay itself, to model the specific defects in even greater details, completed by a ROV video inspection of the same.

The BV 5000 is a scanning 3D imaging sonar allowing ultra-high resolution modelling of underwater objects and infrastructures, with a spherical 20 m radius range. The system is mounted on a tripod with a 360° pan & tilt and is therefore especially suited for local 3D modelling.

By combining these equipment, Subsea Tech offers a complete inspection solution for underwater infrastructures in any visibility condition.

Cat-Surveyor open new possibilities for safe and cost effective survey works, offering both video and sonar imaging, with also above water LIDAR 3D modeling to carry out global infrastructures monitoring.

Cat-Surveyor has been developed and is commercialized by Subsea Tech, a France (Marseille) based engineering company which specializes in the design and the fabrication of underwater observation systems, including mini ROV, USV and associated sensors.



# Hydrography – growing in importance

Safety for maritime traffic and harbours



International trade is booming, and shipping along with it. Given the ever growing quantity of shipments and the expansion of harbour locations, there is a corresponding increase in requirements for the secure maintenance of waterways and harbour basins.

In many of the world's largest harbours, appropriate hydrographic monitoring of suspensions accumulating as fluid mud, as well as sediments in the form of more or less consolidated silt, is a necessary requirement in order to keep dredging costs for maintaining a satisfactory nautical bottom<sup>[1]</sup> within commercially sensible limits.

Every year in Germany alone action taken to secure the prescribed water depth produces an accumulation of around 45 million cubic metres of dredged material, the disposal of which entails high financial and environmental costs. Accurately determining the nautical bottom allows for a considerable reduction in operating costs, since dredging work can be carried out more systematically and efficiently.

[1] The nautical bottom is defined as „the level where physical characteristics of the bottom reach a critical limit beyond which contact with a ship's keel causes either damage or unacceptable effects on controllability and manoeuvrability". (Joint IAWC-IAPH Report on Approach Channels: A Guide for Design, Vol. 2, 1997)

# admodus®- solutions for cost-effective waterway management

Echo-sounding is an internationally recognised technique for establishing the depth of a body of water. Dual frequency echo sounders such as the admodus®**SONAR** work with signals of differing frequency. Where there is a firm subsurface, both signals deliver identical readings for the depth of water, and in this case the readings correspond to the nautical bottom. However, if the results show greater variance this indicates the presence of sediment suspension: while the high frequency signal is dispersed at layers of low density, the low frequency signal penetrates through the suspended matter almost entirely, and is only reflected from deeper, more solid layers. Even though this technique succeeds in identifying accretions of low-viscosity suspended matter and fluid mud, it is not possible to determine the exact location of the nautical bottom. For this, an additional in situ analysis is required.

A method of analysis still frequently used, albeit one which is very time- and cost-intensive, is that of sampling combined with subsequent offline analysis in the laboratory.

An innovative and significantly more cost-effective option is the highly accurate online characterisation of suspensions and sediments achieved using the admodus®**USP pro** depth-profiling probe. The probe is lowered from the vessel, and can thus carry out real-time measurement of the density profile of the layers through which it penetrates, as well as record other parameters of rheological value. With the help of this profile, the nautical bottom can be established on the spot and with great accuracy<sup>[2]</sup>.

[2]The nautical bottom can be defined area-dependently by a limiting density of approximately 991.20 g/cm<sup>3</sup>. „Determining the Nautical Bottom", Markus Jänen



## Determining nautical depth in real time



The admodus®USP pro is an innovative in situ measuring probe for online monitoring of the nautical bottom in harbours and waterways. The system provides a depth-dependent density profile quickly and reliably, as well as a variety of other indicators for characterising suspended matter and sediments.

The probe is a robust and easy-to-use device made of seawater-resistant stainless steel. With its high inherent weight it can be used even in extreme flow conditions

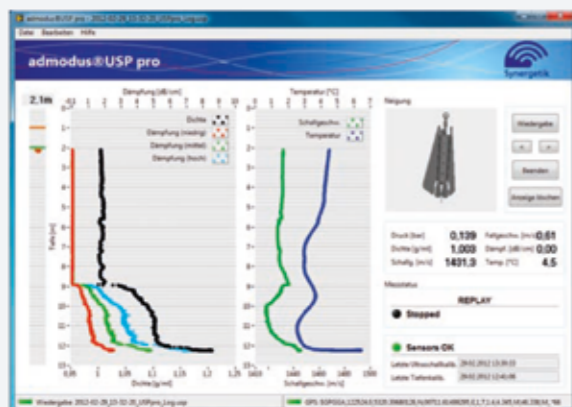
The admodus®USP pro is linked via high-speed Ethernet to a PC which displays all measurement data clearly laid out and in real time, stores them, and exports them as a PDF report as required. The user software features an automatic recording mode which permits serial measurements without interaction.

As the probe descends it continuously records its depth and inclination, as well as the density, frequency-dependent acoustic loss, speed of sound and temperature of the medium.

The measurement data ascertained can be stored together with the GPS data of an external receiver, so that the precise location of measuring points and a correlation with echo sounder bearings are both easily achieved.

The highly accurate point-by-point measurements achieved with the admodus®USP pro, combined with the area data capturing of the dual-frequency admodus®SONAR echo sounder, are one of the most accurate methods for hydrographic surveying currently available.

- Monitoring the navigability of harbours and waterways
- Supporting intelligent dredging management by technically efficient measurement
- Silt and sediment characterisation
- Analysis of fluid mud layers (e.g. in estuaries)
- Monitoring in sedimentation basins
- Investigation of sediment transport
- Online analysis in place of costly sampling



## Meet...

## Sebastiaan van Essen Engineer

**Date of birth? And what is it you like to do on your birthday?**  
19-08-1980.

On my birthday I like to go on short (weekend) trips with my wife, seeing a nice town in another country. We started giving each other trips as presents and really enjoy seeing other places. It also seems that I am only able to read when staying in a hotel, so strangely I do lots of reading when it's my birthday too.

**Single, in a relationship or married?**

I got married last year, we had been living together for a couple of years before that. We have two cats

**Any hobbies?**

Driving, taking city trips and board/cardgames. I also love to make stuff, from woodworking to hobby robotics. Series and movies are also something I love, and I am a bit of a music lover. I have a self-built set of amplifier and speakers that I just love to listen to.

**Fast food, bistro or Michelin starred restaurant?**

Anywhere that has legendary spareribs. Good pancake restaurants (only for breakfast) and gourmet burgers (not the cat food brand) are among my favourites. Very small restaurants that only do one thing, but do it good are also great. I do not go to Michelin star restaurants often, mostly because of the price.

**Netflix or the cinema? And what is your favourite TV-series or movie?**

I go to the Cinema 4 to 6 times a year, love it but just for the "special" movies that you need to see in cinema. Netflix is great, and mostly used at home. I do not watch normal TV because of the commercials. And let's be honest, who has time to wait for a show or movie to start nowadays?

**What kind of job did you want growing up?**

Never really knew. I found my calling later in life.

**What is it you like most about your current job?**

The diversity of work. Getting to put my mark on products in development, learning new skills. Also, having a company boat doesn't hurt.

**What do you learn from your colleagues?**

Having different disciplines of specialists here there is something to learn every day. It is also very interesting to see everyone's opinion when it comes to design choices because that's where you really notice the difference in disciplines.

**If you would win the lottery, what would your life look like?**

I would buy an RV and travel around northern America, looking for a nice place to start a homestead with some animals.

# Client tales #4

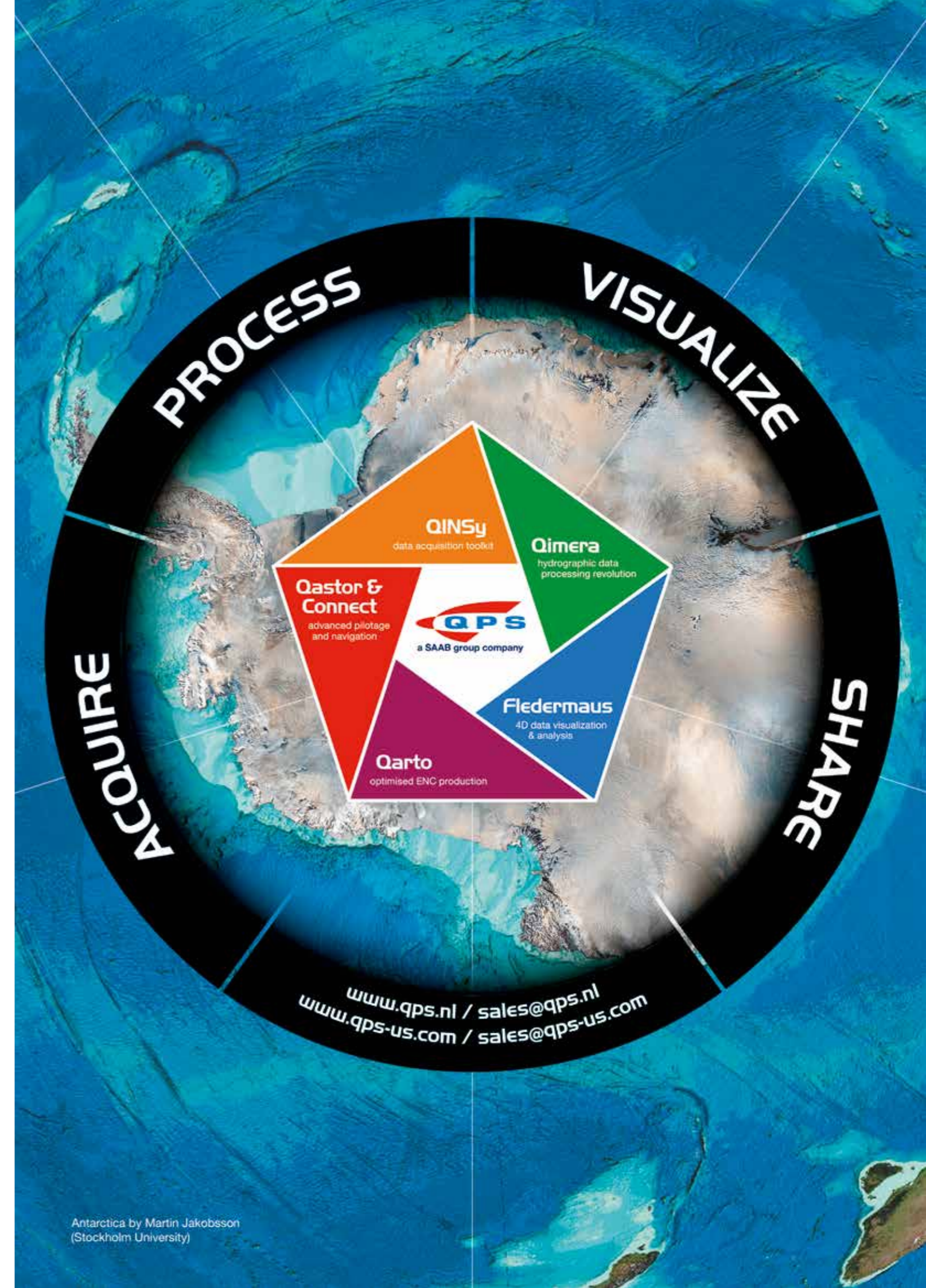
## Port of Amsterdam

**Amsterdam Port Authority Manages a dredge site where dredging is deposit by means of hoppers or split barges. Dredging deposits can take place 24 hours a day, seven days a week, but on an annual basis concerns only a small number of deposits. Therefore making use of personnel at the landfill does not make sense.**

That is why we asked Seabed several years ago to develop a system that uses GPS-registration in an innovative way to define the transport route, landfill location and time of deposit. The registration takes place by means of a so-called Probox, which is mobilized on the vessel by Seabed at the start of the job and demobilized at the end. The Probox also records any interruptions of the system (malfunction, damage and the like).

In this manner we control, in a very effective way with a closed system, the dredging deposits with which the Port Authority meets the authorization provisions. The years of collaboration between the Port Authority and Seabed runs very smoothly through short lines and in a cost effective manner, where both parties benefit.

Remco Barkhuis, Port of Amsterdam



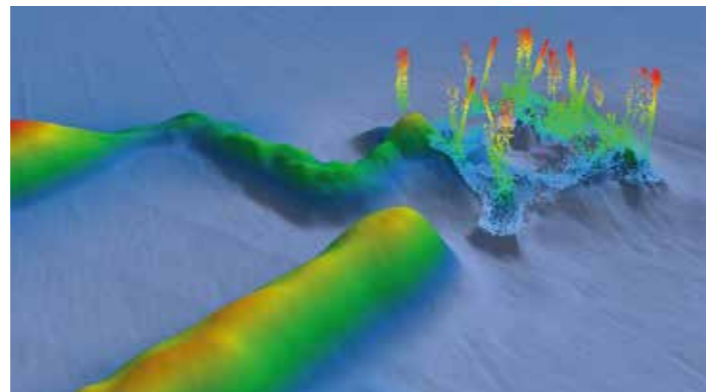
# QPS: Quality and Disruptive Innovation

Established in 1997, Bibby HydroMap provide a range of hydrographic, geophysical, geotechnical and ROV survey services to clients mainly from the oil and gas, offshore renewables and subsea cables industries. Their fleet of dedicated survey vessels work throughout the UK and Northern Europe, are permanently mobilised with high-specification survey equipment from industry leading suppliers.

The company is typically involved in most stages of a project lifecycle, from initial site suitability and investigation surveys, Unexploded Ordnance (UXO) survey, pre-construction survey, post-construction survey, monitoring and pre and post-decommissioning. The acquisition, processing and reporting of bathymetry data forms an integral element of these surveys and QPS products have for many years been a part of each stage at Bibby HydroMap.

QPS QINSy is the core software used by Bibby HydroMap for online data acquisition and integrates sensor data concisely from the onboard survey suite into one database file. There is also an extensive suite of options for creating user-defined files online and database templates can be easily be revised to adapt to client requirements.

Recent significant technological developments combined with Bibby HydroMap's response and integration of such developments has seen the scale of projects increase significantly. Data quantities not only cover large spatial areas, but technological advances have influenced requirements for denser data coverage for enhanced seafloor ensonification and target detection. Consequently larger volumes of data are generated per square kilometre of seabed. This is particularly pertinent in relation to offshore renewables, as represented in the figure below.

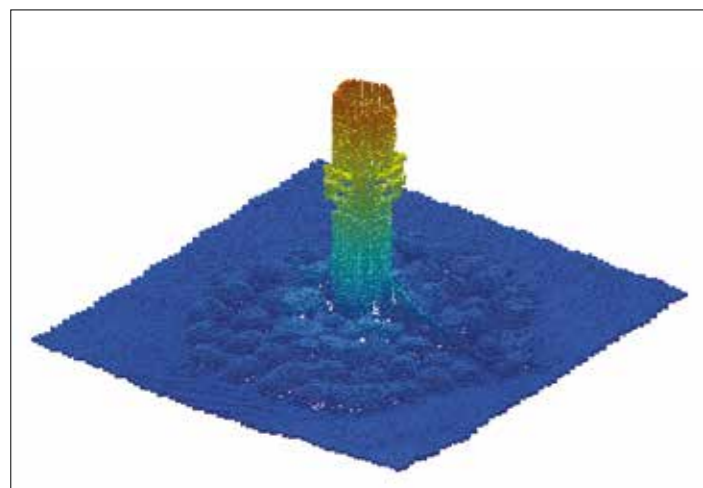


Offshore sub station foundation, as 3D point cloud with seabed DTM

Part of Bibby Line Group's and Bibby HydroMap's core values are to 'be better' and 'be innovative'. These principles drive workflows for handling and processing increasingly large data volumes, and for enhancing their final product deliverables. The company proudly became the first QPS customer to integrate QPS Qimera into their Management System.

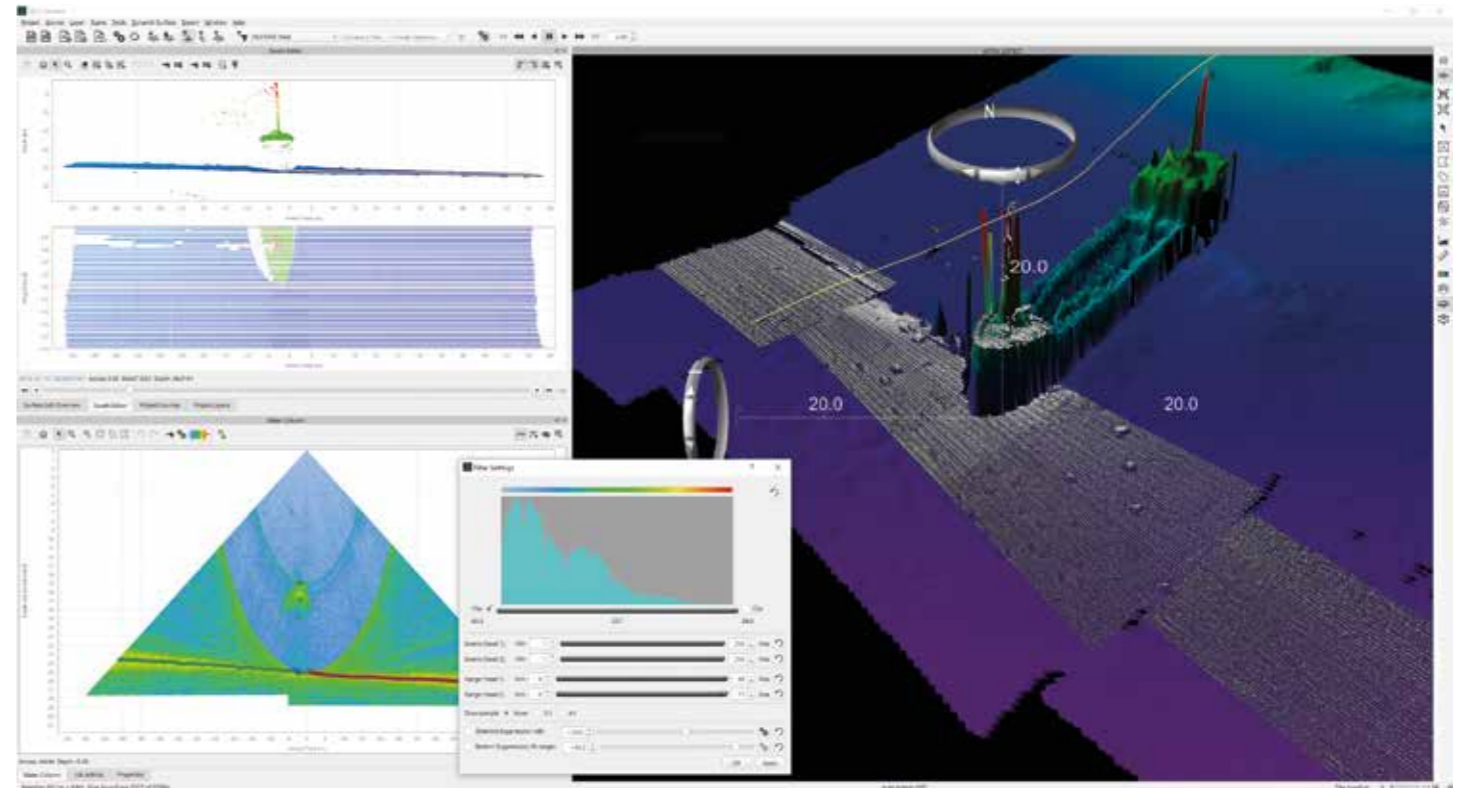
Tom Davenport MRICS (Operations Manager @ Bibby HydroMap) "QPS Qimera has delivered a significantly increased data processing efficiency. It's really user friendly and feature rich software, and gives us the full integration of 3D visualisation within the primary multibeam data processing suite. Qimera has successfully married the key processing tools from QINSy Processing Manager with the data quantity and visualisation capabilities of Fledermaus to form a powerful one-stop processing hub". The new utilities like the Wobble Analysis tool and the Time Series multi-plot have provided extra dimensions for data QC and allow operators to spatially review data and statistically analyse potential sources of error.

Bibby HydroMap now have Qimera licences to match all of their QINSy licenses, meaning that once recorded, online databases can be straightaway transferred to a Qimera project folder for the data QC and subsequent processing workflow stages. Time after time we manage to impress our Clients with the imagery and fly-through 4D scenes of the data we produce with QPS Fledermaus, and we're already exploring the new features of QPS Fledermaus 7.5.



Offshore wind turbine foundation and j-tubes, as 3D point cloud

Looking ahead, Bibby HydroMap is keen to further integration of the user-designed software tools within the QINSy - Qimera - Fledermaus suite. The close working relationship with QPS helps to ensure that the company continues to provide a unique and market-leading approach to coastal seabed survey.



QPS Qimera with support for Extra Detections and Water Column processing

**“QPS Qimera has delivered a significantly increased data processing efficiency. It's really user friendly and feature rich software.”**

**ACQUIRE - PROCESS - VISUALIZE - SHARE** QPS has since 1986 been based in The Netherlands, now with offices in USA, Canada and UK. In 2012 QPS became a member of the Saab (Sweden) group of companies. QPS makes industry leading software for collection, post processing and visualisation of navigation and survey data. Our products QPS QINSy, QPS Qimera, QPS Fledermaus and QPS Qarto aim to solve problems and gain efficiencies for maritime related geospatial business.

[www.qps.nl](http://www.qps.nl) • [www.qps-us.com](http://www.qps-us.com) • [www.bibbyhydromap.com](http://www.bibbyhydromap.com)





# Client tales #5



ROEL v.d. STOEL b.v.  
AANDEEMINGS- EN TRANSPORTBEDRIJF  
G.W.W., MILIEU- EN SLOOPWERKEN

**As a contractor specialized in construction we work on all sorts of different projects, the one more challenging than the other. Regularly we have dredging jobs where we need to bring waterways or geophysical structures at depth.**

Our machines are equipped with a 2D / 3D systems, which is essential in carrying out our work. In wet excavation a digital drawing is generated based on a pre-executed multi-beam or single beam measurement. In dry excavation the new posts and/or the footings to be excavated will be processed in the digital drawing.

From that moment we get going! We order and reserve a 3D set from Seabed which our crane operator or our subcontractor can pick up. Hooking up the system is child's play, and operating it as well. Drawings may, if desired, be loaded on to the system through TeamViewer from our office. The systems works properly

and in case of failure our operator can always give a call to the Seabed support team. If the systems still don't function properly after the telephone consultation, the seabed support staff can always check the system through TeamViewer remotely to solve the problem. If all of this does not solve the problem, in no time an employee of Seabed is on site to fix the problem.

The quality of the equipment, the flexible attitude of the company and the staff helpfulness ensure that we have been a satisfied customer, and continue to be!

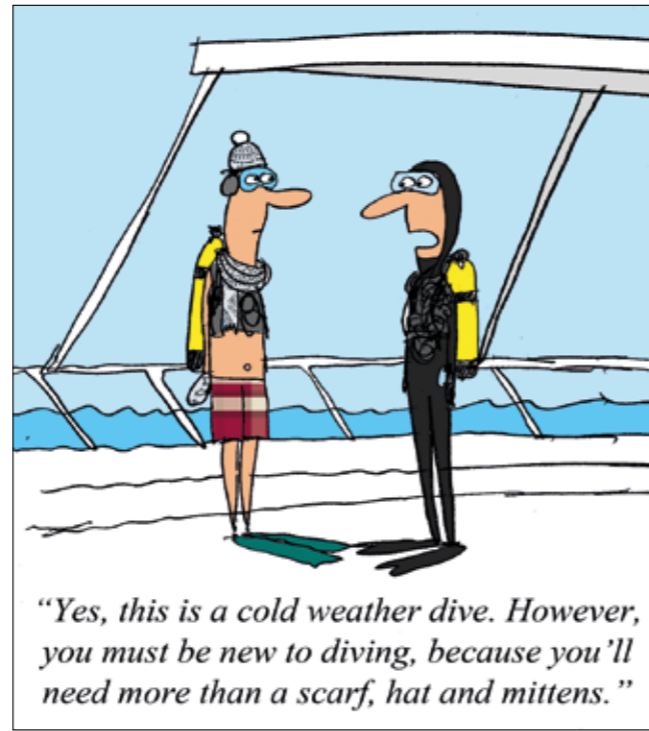
**Erik van der Stoel, Director Roel v. d. Stoel**



## Seabed Orinoco Solo V3

Based on the successful Orinoco line of tide gauges, the OrinocoSolo V3 is the latest offspring. The basic unit is a high capacity data logger with up to eight analogue inputs and up to four RS232 inputs (optional) and one serial data output which supports multiple formats.





© Jerry King

# Make them laugh

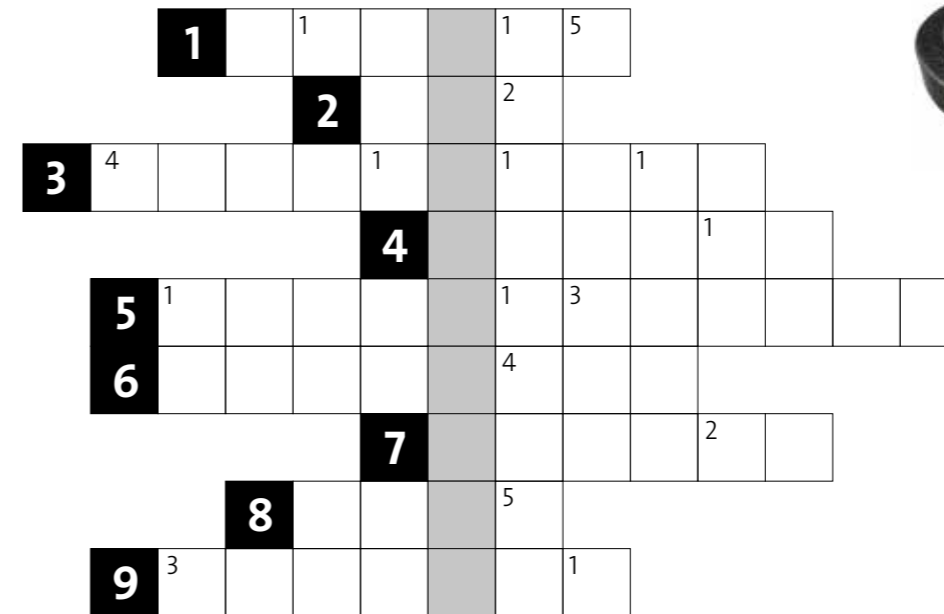


## Contact

Seabed BV  
 Asterweg 117  
 1031HM Amsterdam  
 Tel: +31 (0)20 6368443  
 E-mail: sales@seabed.nl

Website: www.seabed.nl

## Prize Puzzle

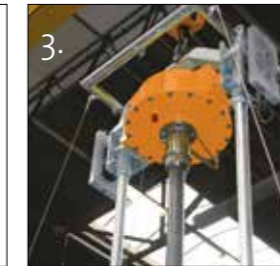


The object of the puzzle is to find words using the hints below. The letters in the grey column will form the prize word. Solutions have to be submitted before november 1st 2017. The winner will receive a drone worth 400 euros.

Please send your solution to: [sales@seabed.nl](mailto:sales@seabed.nl)

1. Backside or lowest part.

2. Sea-...  
King size-...  
Flower-...



4. Body of water where ships seek shelter.

5. Study of the physical and biological aspects of the ocean.

6. A person who gets a gift is a....



8. Multi-...  
Sun-...  
Wooden-...

9. European GNSS system.



## Colophon

Editor: Elice Collewijn  
 Design: RBREG Concept & Art Direction  
 Words: Eva Brans, Elice Collewijn, Ray Breg  
 Photography: Elice Collewijn, Ray Breg, Stock

© 2016 Seabed BV

Elice Collewijn with last year's winner of the prize puzzle: **Klaas Visser** (Deep BV).



# Seabed for rent

Seabed has a complete range of rental products available. For rates and availability please contact us at [sales@seabed.nl](mailto:sales@seabed.nl)



Orinoco Solo V3



Portable Lightweight Multibeam Set (SPLMS)



Seabed's new SGR7 GNSS Receiver



Electric Vibrocoror