

SOUNDINGS

PanGeo Subsea Newsletter

INSIDE THIS ISSUE

Black Box Myth Debunked	1
The Next Generation SBI	1/2
Bibby Athena and d'ROP	2
Gulf of Mexico Pipeline Survey	3
Jan De Nul SBI Survey	3
NorNed SBI Cable Inspection	4
TSS 440 Pipetracker vs SBI	4
Inside PanGeo Subsea	5/6
What's Next for PanGeo	7

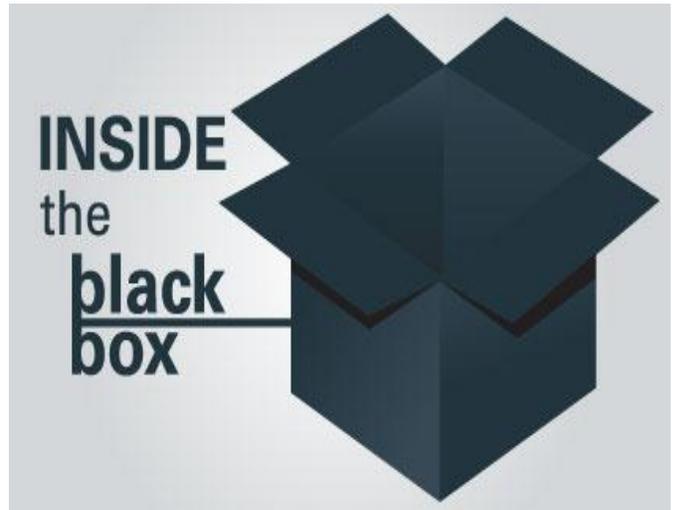
“Our team here at PanGeo Subsea is excited with the continued advancements that we are achieving with our Sub-Bottom Imager (SBI).

We have been listening to the industry and look forward to meeting its expectations by delivering a reliable, accurate and cost effective solution for DoB surveys”

*Moya Cahill – President
PanGeo Subsea*

The SBI’s “Black Box” Myth Debunked.

While the SBI continues to find fast growing favour in the offshore subsea survey market, there always seemed to be a feeling that our results were the product of “black box” technology. This is far from the truth, as the SBI is a highly sophisticated piece of technology that is based on sound scientific principles.



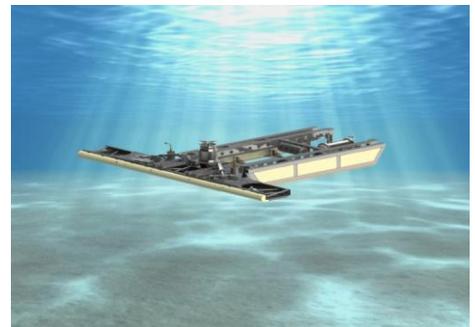
Click the link to read the Technical Report – [Technical Description of the SBI \(PDF\)](#)

The Next Generation SBI

The original SBI was designed for the North Sea Oil and Gas sector in conjunction with large Work Class Remotely Operated Vehicles (WROVs) and, as such, size or weight was never an issue. The generation 1 SBI weighed as much as 880 kg in air and flying these was a challenge for any ROV pilot!



SBI 365 on Panther XT



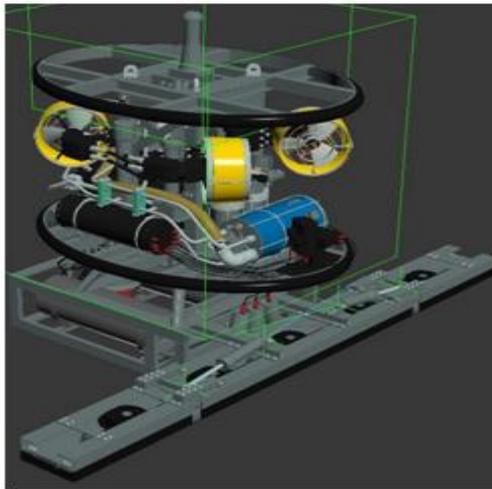
Prototype of SBI

Realising that many potential SBI users wanted to use the technology but were constrained on type of vessel, lifting capacity or just deck space, PanGeo designed an SBI which weighed only 465 kg in air – a significant drop in weight. We did not stop there; with current technology we have been able to deliver a modular 365kg SBI. This will become our standard going forward giving us flexibility to interface on a broader spectrum of ROV's including the light inspection class ROV's such as the Panther XT plus as well as ROTV's.

Technology advances made to date will allow us to reduce this standard SBI-365 to around 300 kg in air and be neutrally buoyant in water. The first of these is due to head to the Far East around 2017.

Our in-house development for interfacing with an AUV is ongoing. This is very achievable and with continued support from the Industry and our Canadian R&D funding agencies Research Development Canada (RDC-IRAP) we will be successful with the module optimization and software enhancements.

Bibby Athena and d'ROP



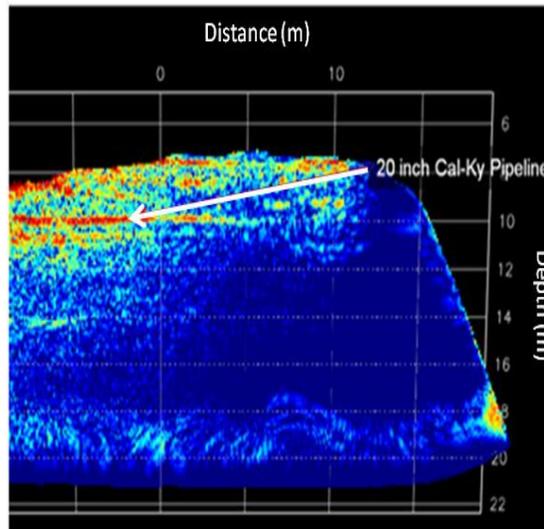
PanGeo is pleased to announce that our co-operation with Bibby Hydromap goes from strength to strength with yet another campaign.

This campaign was a multi-client SBI trial survey in the Southern North Sea. Once again the SBI was interfaced to the d'ROP onboard the Bibby Athena.

The multi-client trial was designed to showcase just how this now proven survey spread surveys pipelines, small diameter cables, fibre optic cables, concrete mattresses and other decommissioning subsea structures and UXOs for various Oil & Gas operators as well as major cable manufacturers and installers and Offshore Wind Farm operators and consultants.

Gulf of Mexico SBI Pipeline Survey

An SBI survey successfully located the buried 20" abandoned Cal-Ky pipeline situated in the busy Pascagoula Channel shipping channel, Mississippi delta. Water depths ranged between 10 and 40 feet across the channel, so the SBI was deployed from a trailing arm pictured below. Vessel traffic and currents made the acquisition challenging, but the pipeline was successfully located and imaged by the SBI.



Left: SBI interfaced onto Trailing Arm for shallow water surveys.

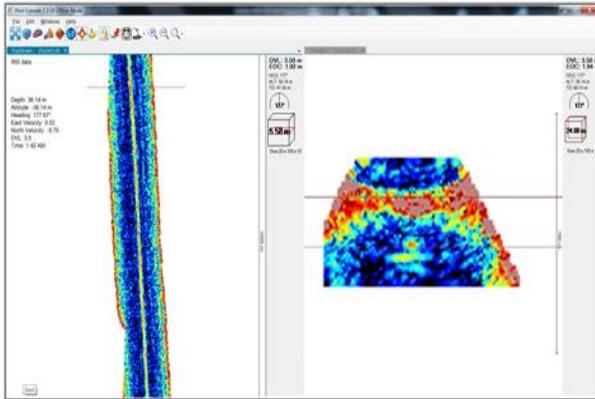
Right: Along track view of the imaged 20" pipeline

Jan de Nul Dong Burbo Bank Depth of Burial Offshore Windfarm Survey



In June 2016, Jan de Nul awarded PanGeo the contract to carry out the post-lay cable Depth of Burial survey on DONG's Burbo Bank Offshore Wind Farm extension. The work was onboard the Simon Stevin and involves the use of two SBI's – one on a WROV and one on JDN's specialist trencher. The project is ongoing and we look forward to its successful conclusion.

NorNed Annual Depth of Burial Cable Inspection



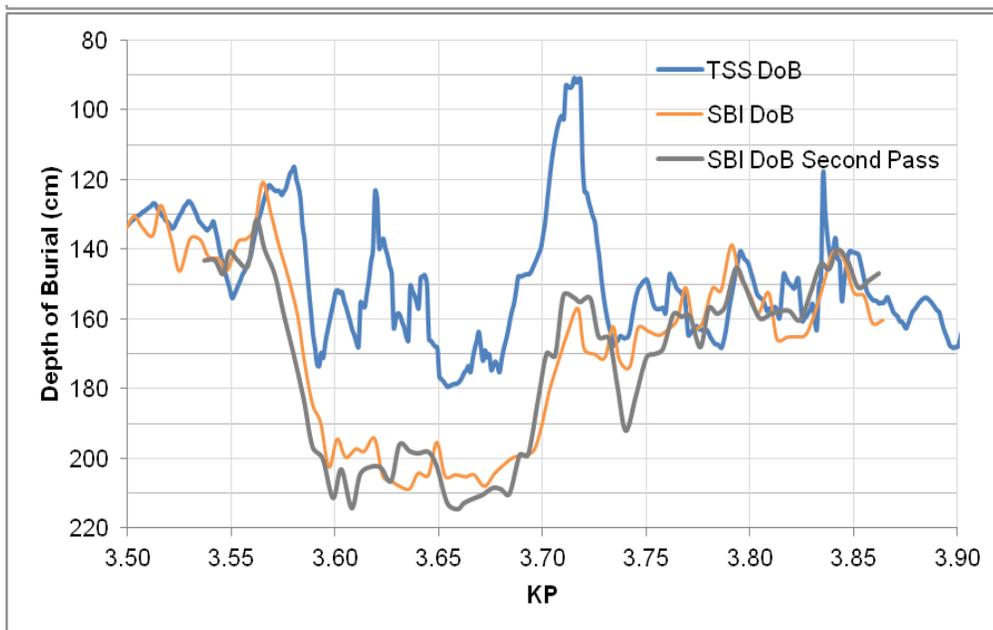
NorNed is a 580 km long HVDC submarine cable which runs from Feda in Norway to Eemshaven in the Netherlands which interconnects both countries electrical grids. NorNed is jointly managed by Statnett and TenneT.

Since 2011 the SBI has been used as the primary sensor for measurement of depth of burial for both the shallow as well as the offshore scope. In July of this year, PanGeo was contracted by MMT to carry out the depth of burial survey over 240kms. The survey was completed in 5 days with 100% coverage of the cable. DoB was delivered onboard the vessel. The screen shot is from PanGeo's "On-Line Viewer" showing real time, the plan view and cross sectional view of the cable in the sub-seabed.

TSS 440 Pipetracker -vs- PanGeo SBI

For many years the TSS Pipetracker was seen as the standard equipment for use on sub-seabed cable surveys. While it has clear advantages in shallow buried cables less than 1.2 – 1.5 m it does have limitations in terms of resolution and identifying cables at depth – something which the SBI can achieve. More and more, clients are looking for higher quality data for their assets and our technology can deliver that in a cost effective manner.

PanGeo had the opportunity this spring to collect SBI data on a cable where previous TSS 440 data existed. A comparison of the TSS 440 and our SBI was done. An example of the result is shown below. Note as well the results of the SBI DoB repeatability. This was demonstrated by making second pass over same cable section, in the opposite direction. Good agreement between passes: DoB correlation coefficient = 92.0%; Depths deviate by 10 cm or less.



The DoB reported by TSS between KP 3.70 and 3.74 would suggest that the cable has been laid out of spec when, in fact, the SBI data on both passes suggests that the cable is buried deeper and, therefore, "within spec".

If the operator or contractor had relied on the TSS data, there would have been an unnecessary and costly requirement to either lower the cable or rock dump in order to have an in spec cable.

In actual fact, the SBI shows that the cable is buried to spec and that no such remedial action is necessary.

Inside PanGeo Subsea Charity Events – Cancer Research UK



Susan Morrison, our HSEQ and Media Co-ordinator, took part in the annual 'Race for Life' in Aberdeen in May to raise money for Cancer Research. Her fundraising target was reached and received further donations!

Cancer Research UK receive no Government funding for their research. The life-saving work relies on the money that is raised through sponsorship. It is from the support through events like Race for Life that helps them to continue their groundbreaking work and help more people survive cancer.

Bungee Jump in aid of the Scottish SPCA



On 24th September, Danielle Kerr, our Office Administration Manager, will be doing a 40m Bungee Jump in aid of The Scottish SPCA.

The Scottish SPCA is Scotland's leading animal welfare charity. With no Government or lottery funding, the Society relies on the generosity of the Scottish public through donations, legacies and fundraising events.

Baby News

It's a Girl! PanGeo Subsea would like to congratulate Adam Young on the birth of his new, happy and healthy baby girl. Juniper Jane Young was born on May 14th weighing 8lbs 4oz.



CEO World Cup Hockey in Australia

Bernie Morrison (CEO) was selected to play for Scotland Veterans Hockey Squad at the recent Veteran's World Cup held in Newcastle, Australia in May. The squad performed admirably ending up 6th in The World having taken the scalps of Japan, Malaysia, New Zealand and Wales in the early rounds before meeting a very strong Netherlands team in the quarter finals. Despite playing some excellent hockey against the Netherlands, Scotland eventually lost 3-1 – the sole consolation being that Netherlands won the Gold Medal by defeating Australia in the final.



PanGeo Cycling for MS in the St. John's Bike Tour



On September 24th PanGeo's President Moya Cahill is leading a group of earnest cyclists in the St. John's MS Bike Tour. MS Bike is the largest cycling series in North America. The funds raised will help support innovative research into the cause, treatment and cure for MS.

CONTACT US TODAY

PanGeo Subsea (Canada)
430-434 Water Street
Suite 300
St. John's, NL, Canada
A1C 1E2

P: +1 709 739 8032
F: +1 709 739 8035
E: sales@pangeosubesa.com
W: pangeosubsea.com

PanGeo Subsea (Aberdeen)
Custom House
35 Regent Quay
Aberdeen, Scotland
AB11 5BE

P: +44 1224 766180
F: +44 1224 766181
E: sales@pangeosubesa.com
W: pangeosubsea.com

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Whats next for PanGeo Subsea?

Recent enhancements to the SBI data processing software has resulted in improvements in buried cable and pipeline images. The improvement is particularly noticeable in rendered data collected in rough seas or high currents. Such conditions impact the stability of the platform whether it be on an ROV, ROTV, trailing arm or surface towed platform. We are excited to respond to the Industry's needs and look forward to sharing future advancements and successes.

Keep an eye for our poster session at AWEA in October Rhode Island where, in partnership with Deepwater Wind are presenting: *"De-risking the installation of Offshore Wind Turbine Foundations in Complex Geology at the Deepwater Wind Block Island Wind Farm using the Acoustic Corer"*.



Moya Cahill – President, PanGeo Subsea

A Message from CEO, Bernie Morrison



While the traditional markets for our SBI and AC technologies are primarily in Europe and the US Eastern seaboard, I am pleased to see that we will be starting our first cable and pipeline DoB survey projects in China and West Africa in the next few months. Our latest smaller SBIs have allowed this to progress.

For more information please visit our website at www.pangeosubsea.com