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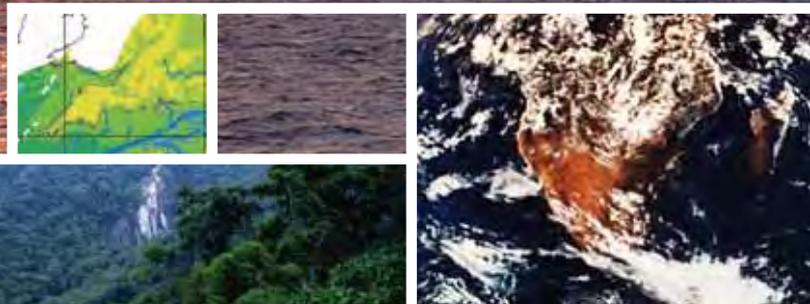
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Steve Sargison was a member of the team during the filming of the BBC documentary Amazon Abyss. Here he explains how a small portable package with a BBC laptop, Simrad chartplotter / echosounder, and Olex 3D mapping software helped with some of the stunning finds in the depths of the Amazon river

ABYSS

Steve has owned and operated a DSV (Diving Support and Survey Vessel) called Discovery. He would take archival information and search using magnetometers, side scan sonar, ROV and divers for shipwrecks and recover the cargo. He steamed his ship from Brixham in South Devon to the Philippines and the BBC made a documentary about this called "Priceless Cargo" in a series called "Journeys To The Bottom Of The Sea." Steve is now working as a consultant in survey and salvage with his own company, SEAWREXS.

Amazon abyss

Richard Bull, Health and Safety Advisor for Diving for the BBC had recently returned from accessing the requirements and feasibility of filming the depths of the Amazon for the proposed documentary 'Amazon Abyss'. He approached me looking for any ideas on how to survey the depths and the best ROVs available, which would solve the problems they had highlighted during the assessment.

One of the problems encountered was that the charts for the river were either too basic or incorrect. This made the search for the deep holes, which the locals spoke of, very difficult with the standard fish finder type sonar. They could find the holes but found it very difficult to measure dimensions or visualise the image. Another challenge was that the water was also found to be more like fast flowing silt and mud with a continuous flow sometimes-reaching 2 - 3 knots.

I had recently received information from a

ships electronics expert, Richard Lees of Selenia Communications, Brixham. He had told me about a system called Olex, from Simrad Ltd, that the fishing fleet had been using to some effect and that I might be interested in for deep ocean surveys. I had been very impressed by the results I had seen on their website, www.olex.no.

In combination with Simrad's CX34 NavStation, a small unit with a seven-inch screen that provides echosounder, chartplotter and radar all in one, Olex can be made into a very compact package. With this in mind, it is ideally suited to small vessels of opportunity that give real time results, ideal for this Amazon project.

Operational brief

Contacting Les Smith of Simrad in Buckie on behalf of the BBC's Natural History unit in Bristol, I asked if they would be happy to loan a system for the Amazon filming. The BBC and Simrad continued the negotiations and I visited the Simrad Ltd headquarters in Gosport where I received an Olex operational brief and hands on presentation.

It was very impressive. Olex has been designed to be virtually automatic in operation and required very little operator input but did have the facility to filter and check the data at a higher level if required.

On the strengths of the operational benefits and portability of the package, the Olex and CX34E (for echosounder) package was taken to the Amazon and used on several vessels from 20ft to 90ft. Surveys

were carried out for several weeks on journeys both up and down stream, based out of a large City called Manaus.

The results were very well received by everyone. The local Captains and crews were astounded by the information that they could see, especially as it was live. This was the first time they had confirmation of what the riverbed actually looked like in comparison to the thoughts and beliefs of the local population.

Local knowledge

Many boats do not even have an echosounder so Amazon Captains share information and many refuse point blank to use a chart, as they say that knowledge shared is far more accurate, as the river is ever changing. This story was substantiated when on several occasions according to the chart plotter we steamed merrily overland. Of course not the plotter or even chart's fault as these can only display the data that was taken from the original chart survey!

We surveyed several deep holes that looked like prehistoric waterfalls. This was river erosion cutting into the riverbed followed by a deep vertical drop with a sump at the bottom. The Olex / CX34E system was a very efficient way of ascertaining the edges and boundaries of the holes and it became a very quick and easy task to fill in the data.

Screen technology

Though the bulk of the survey work from the package was centred around the Olex,

the Simrad CX34E and DGPS proved itself in an at times, pretty inhospitable environment. A huge benefit was that the Simrad CX34E we used had the first prototype bonded screen installed.

This technology is hugely important and the new screen was indeed a delight to work with; the images were very crisp and sharp. It remained just as clear even in the extremely high humidity immediately following the torrential Amazon rainstorms in the very hot, strong sunlight. It was a severe test that the screen passed with flying colours. I had spent the last five years in the Far East and the Philippines surveying from small vessels and wished I had had this screen with me then.

We also found the display on the sounder a major benefit in cross checking and interpreting the image instantaneously being rendered on the laptop by the Olex system.

Our Amazon Olex surveys were a vital part of the operation not only to gain information on the river bed but they also formed part of the safety risk assessments needed when planning the dives for filming.

We used the Olex to drop the anchors and position the vessel at the depth and location requested by Richard, the diving supervisor. This was achieved with great speed and accuracy much to the delight of all involved, especially those kitted up in diving equipment in the sweltering heat of the Amazon!

We needed to be exactly on station, very near the edge of the vertical drop off into the

holes because of the appalling visibility and lack of diving time at depth. A few meters out and the divers could drop into extremely deep water, too far from the edge they could miss the drop off all together in the gloom.

Virtual camera

Everyone onboard, from the filming crew, sound men, divers and ships crew all spent some time looking at the information provided by the Simrad package. Initially for pre-dive orientation but then just for the enjoyment of playing with the system, flying with the Olex remote camera in a virtual



reality type scenario down the sides and gullies of the deep Amazon Abyss.

Everyone was impressed that such a small and cost effective package could provide such a detailed amount of information with so little operator training or input. Amazon Captains who had never even seen or used a sounder soon became very proficient in using Olex and the CX34E, which provided the accurate data that enables the Olex to be such a powerful tool.

The package also made my work as the ROV Pilot much easier.

The BBC Director and Producer found it very easy to understand where we had been and the ROV's current location therefore enabled them to instruct me exactly to where they would like me to fly.

Sharing data

The makers of Olex, based in Norway, share owner's data online, therefore amassing a huge amount of data that can be reviewed prior to deployment of a survey ship. This can prove to be a very cost effective option for any marine works.

After having such a positive experience with Simrad and the Olex system during filming of the Amazon Abyss, I have looked into possible expanded uses and one in particular stands out: an advanced warning system for towing sonar in deep water.

Utilising the systems ability to real time map without post processing, the camera can be placed at the same depth as the sidescan sonar looking in the direction of the vessels heading, giving an advanced view of the seabed terrain and indicating any possibility of impact or entanglement. This should give a response time sufficient for the master of the vessel or the operators of the sonar to take action in advance and save a very expensive piece of equipment from being lost or damaged, and the associated down time. This is an important factor when initially locating a shipwreck or surveying close by in the debris field.

Special thanks to Steve Sargison. steve@seawrecks.com