

# THE PINGER

*News from the Marine Team at Quester Tangent*

## Airborne LIDAR Classification Takes Off

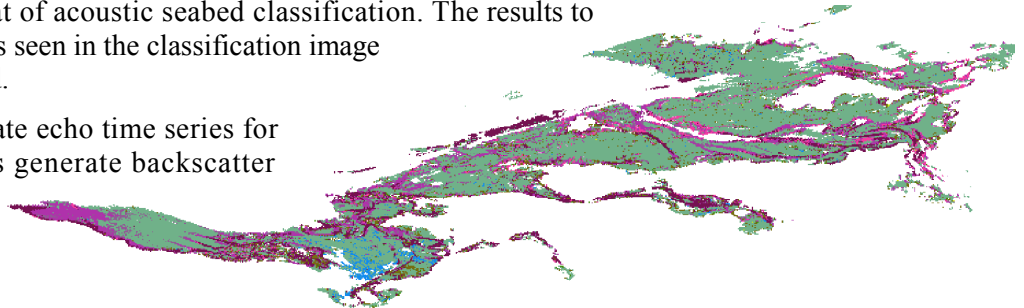
*Traditional methods of acoustic seabed classification are applied to LIDAR data to produce maps of seabed bottom type.*



LIDAR (**L**ight **D**etection **A**nd **R**anging) is a method of detecting distant objects and determining their position or other characteristics by analysis of pulsed laser light reflected from their surfaces. Marine LIDAR uses light waves emitted by a laser to determine the distance from the laser to the sea surface and the seabed. While airborne LIDAR is being applied in coastal environments to produce accurate, high resolution bathymetry and topography maps, the reflectivity data can now be used for characterizing seabed material and features.

LIDAR classification parallels that of acoustic seabed classification. The results to date have been very encouraging, as seen in the classification image (inset right) of Galway Bay, Ireland.

Single beam echo sounders generate echo time series for classification while swath sonars generate backscatter images. Bathymetric LIDAR is capable of generating both types of data. Quester Tangent, in



### ***Congratulations!***

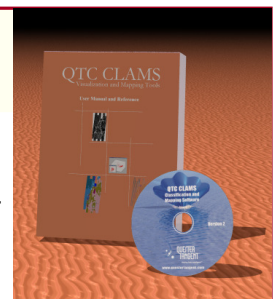
The Marine Team warmly congratulates the Transit Team on the awarding of a US\$2 million contract to supply Train Monitoring and Diagnostics Systems to the ***Southeastern Pennsylvania Transportation Authority***.



*Quester Tangent President, Stephen McKay, signs the contract.*

### **FREE! Baby CLAMS.....** ***Download the new QTC CLAMS free demo***

The latest version of our utility software for data visualisation, presentation, interpolation and complexity mapping is waiting for you to download from our website, [www.questertangent.com](http://www.questertangent.com).



The software enables you to do accurate interpolation of data in discrete classes, to present acoustic class data in “similarity colours” such that acoustically similar classes are presented in colours that are similar, plus other functions that will aid in understanding and presenting your data. And, you don’t have to use Quester Tangent data—other acoustic class data and regular ASCII data can be loaded.

QTC CLAMS now includes many new features such as geoTIFF output capabilities. Downloading baby CLAMS from our website will let you experience all the features, except the final information output. To output any data you will need the mother version—full QTC CLAMS with a license.

Contact Chris at [celliott@questertangent.com](mailto:celliott@questertangent.com) for details.

*Airborne LIDAR cont'd...*

cooperation with Tenix LADS Corporation and the Geological Survey of Ireland (GSI), has embarked on a research and development programme to classify LIDAR data. The research involves classification based on both time series and image analysis.



The Galway Bay classification image shown on the front page was produced in the same way as swath sonar would be classified. Firstly, the LIDAR data are processed on a line-by-line basis. The data are initially compensated to remove artefacts related to instrumental, water-interface, and water-column effects. The resulting reflectivity data are then passed to Quester Tangent classification software for further processing.

In the first step a series of rectangles are placed over the imagery. The rectangle size is adjustable to allow the user to map a variety of scales. A selection of features is extracted from each image patch as defined by the rectangle. The features are designed to capture characteristics of reflectivity including amplitude and texture. In addition, features generated from the associated bathymetric data are also used.

The set of features from each rectangle are then submitted to principal components analysis and clustering to identify the most useful combination with which to segment the total image. Segmentation is the process of dividing a survey area into regions in which the character of the data is homogeneous and distinct from the character in other regions. Thus a map of laser-optical diversity is produced.

The colours on the map represent areas of optically similar seabeds which are given the title of classes. Ground truthing will then identify labels for the classes. The data have been processed as objectively as possible, thereby providing the opportunity to find correlation with other types of data such as sedimentary properties or seabed flora.

In March of 2006 at Oceanology International, London, the GSI, Tenix LADS and Quester Tangent met to explore the future of LIDAR classification. GSI has amassed a significant volume of LIDAR data as part of the Irish National Seabed Survey, and now INFOMAR. Bill Collins said that "LIDAR classification represents an opportunity to exploit the inherent value of the data". Quester Tangent and the GSI are now jointly pursuing the development of a LIDAR classification toolkit to support the necessary research to fully realize this potential.



*Xavier Monteys, Rhys Barker, Eibhlin Doyle and Bill Collins at the Quester Tangent booth at Oceanology International, London*

**Dear Glenda**

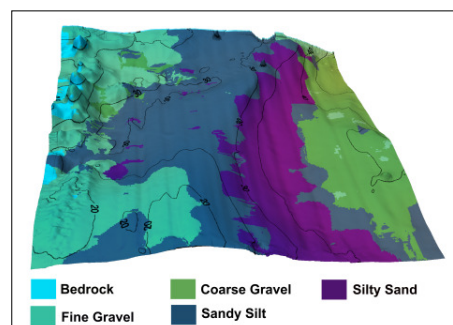
As we have recently released a new version of QTC CLAMS, for this issue Glenda tackles a query related to the software.

**Question:** *The different colours for class maps generated by QTC CLAMS really help with data presentation and visualization. But what do all these choices mean?*

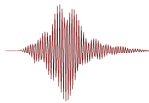
**Glenda:** The primary colours option assigns arbitrary colours to classes, with the ability for any colour to be assigned to any class. This can enable individual classes to be highlighted by means of setting unwanted classes to the background colour, or by using the same colour to group similar classes together.

Similarity Colours use the distribution of classes in feature space to assign colours so that classes with similar features have similar colours. The scaled method emphasizes differences between classes, while the linear method does not.

The Source option selects whether the similarity colours should be generated from a catalogue or from the data set; using the data set will emphasize the diversity in the plot you are making, while the catalogue option allows for the use of the same palette for different maps.



*Classification map using QTC CLAMS Similarity Colours*



**Workshop Update.....**



*Jon leads the discussion at CCOM*

We have recently held three successful workshops in the USA. The first, a two-day event, was hosted by the **Center for Coastal and Ocean Mapping (CCOM)** at the University of New Hampshire in November. Larry Mayer and staff assisted in organizing the workshop. Jon Preston and Glenda Wyatt lead the workshop incorporating an afternoon of presentations and a day of general instruction on our seabed classification software. Attendees were from as close as UNH to as far away as Nova Scotia and Quebec.

Next Glenda was off to Beaufort, NC, on February 9th, for a workshop hosted by NOAA's **Center for Coastal Fisheries and Habitat Research**. This was attended by several NOAA staff and individuals from area universities, government agencies and survey companies. Greg Piniak of NOAA was most helpful in setting up the workshop.

A three-day workshop and users' group meeting co-hosted by **NOAA's Chesapeake Bay** office and the **Virginia Institute of Marine Science** was held at the Smithsonian Environmental Research Center (SERC) in Edgewater, MD, from February 12th to 14th. Helping to organize was Jay Lazar from NOAA. Attendees came from as far away as Florida and Taiwan. Quester Tangent sent Karl Rhynas and Glenda to lead the workshop.



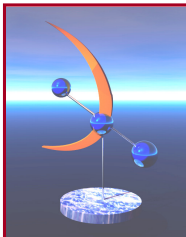
*The SERC team hard at work*



*Ice in Maryland*

Mother Nature descended on Maryland in the form of an ice storm on the night of February 13th. This left the users' group meeting without power on February 14th. Thanks to some quick thinking, a generator was brought in which allowed the meeting to proceed with coffee, snacks and computer power. It was a little dark and a little cool, but the hardy participants braved the weather to pull off a successful meeting.

Thanks to Larry, Greg, Jay, NOAA Beaufort, NOAA Chesapeake Bay, VIMS, SERC and all the attendees for making these workshops a success. Our Sales Representatives in the area, **Ocean Marine Industries** and **Electronic Sales of New England**, also deserve a thank you for their assistance.



**International Partners....Focus on Atlantas Marine, UK**

A reputation for supplying high specification equipment to the UK marine and commercial shipping industry is not something you might expect to find in the heart of rural Somerset. But Atlantas Marine, based in Yeovil, is now recognised as one of the country's leading suppliers of marine equipment to the commercial marine market.

Atlantas, a family owned and managed company was formed in 2001 by Ruth and Charlie Foll and since then has grown to include 5 staff and is able to provide full service, training and support for all of its products. Right from the start, the company has focused on the customer; -customer support, -customer care, -customer satisfaction. These are our main objectives with every job that we win. This philosophy works.

*We strive to project honesty and professionalism and to deliver an excellent service within the customer's budget and timeframe!*

We recognise that one of the main strengths of Atlantas is that being a small company we are not bogged down in bureaucracy, and no-one in our company can hide behind excuses – we work hard to build relationships with our customers and we place great importance on keeping them

We have been working with Quester Tangent since 2001, and with their excellent advice and support, we have established their products as the first choice seabed classification systems in the UK.

Visit the Atlantas website at [www.atlantasmarine.com](http://www.atlantasmarine.com).

*Article Contributed by Ruth Russell—Many thanks Ruth!*



*Charlie of Atlantas.....*



## Introducing you to.... **Glenda Wyatt** Marine Applications Scientist



Glenda joined Quester Tangent in June 2001.

She is the lead marine data processor, handles marine customer service, conducts most QTC MULTIVIEW and QTC SIDEVIEW training courses and organizes Quester Tangent's successful series of workshops. Her education includes undergraduate degrees in Earth and Ocean Sciences from the University of Victoria and Biology from the University of Regina in Saskatchewan. Before joining our team, she worked for the Geological Survey of Canada and the University of Victoria. At the Geological Survey, she regularly

participated in geophysical and multibeam cruises and worked on a variety of research projects.

While Glenda enjoys the extensive travel involved with her work, she also is happy to relax at home. Her "at home" interests include music, reading, exercising and gardening. She also is a volunteer judge for the local science fair and a board member for the University of Victoria Alumni Association.

And for those of you wondering about the name change (her last name used to be Rathwell)... the reason was not wedding bells but simply Glenda going back to her Saskatchewan roots and happily reverting to her maiden name!

Please contact Glenda at [gwyatt@questertangent.com](mailto:gwyatt@questertangent.com) for customer service and information on data processing and training.



## Proud Owners

We don't have the space to tell you about all the new users of our products from the past few months, but we can certainly highlight a few.

**Neotek**, our Sales Representative in France, concluded negotiations for a sale of two licenses of QTC IMPACT to the *Service Hydrographique et Océanographique de la Marine* in Brest. SHOM will use these licenses to process data directly from their Simrad EA400 single beam sounders.

The *Virginia Institute of Marine Sciences* has also purchased QTC IMPACT, in this case to do direct processing of data from a Knudsen sounder. This license complements the QTC SIDEVIEW license that VIMS already uses. Our thanks to Ocean Marine Industries for assisting with this delivery.

On the swath mapping front the *TNO Geological Survey of The Netherlands* took delivery of a QTC SIDEVIEW license for all supported sidescan systems, which includes C-Max sidescan for the first time.

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