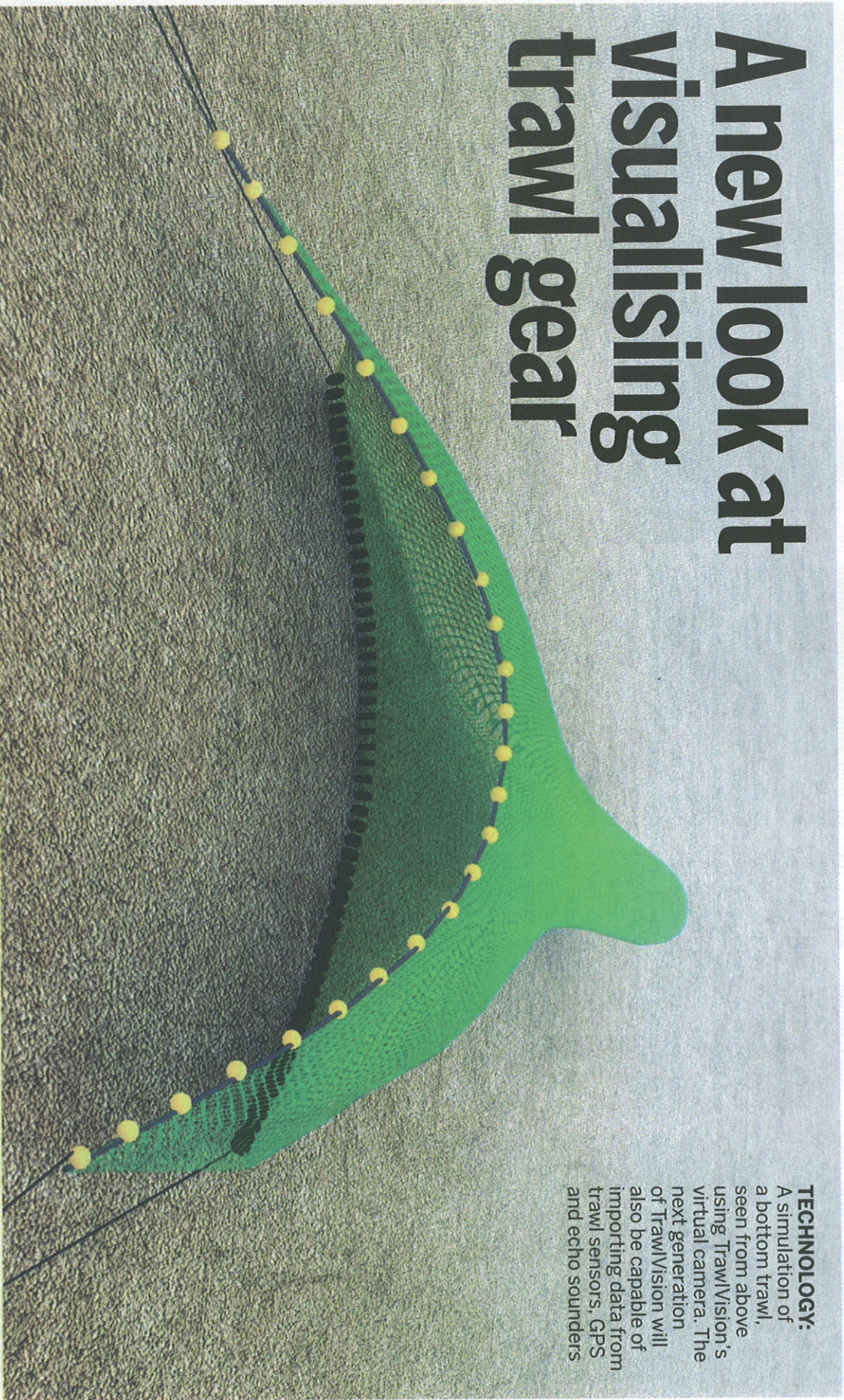# GEAR TALK

A new look at visualising trawl gear

Quentin Bates

TECHNOLOGY: A simulation of a bottom trawl, seen from above using TrawlVision's virtual camera. The next generation of TrawlVision will also be capable of importing data from trawl sensors, GPS and echo sounders

A new departure in trawl simulation has been developed by Uruguayan software company AcruxSoft with its TrawlVision package. When trawler skipper Frank Chalkling was looking for ways to optimise trawl gear, he started working on a way of looking at his gear in simulation to allow both the catching vessel and its entire fishing gear to be presented on screen. Frank Chalkling's primary aim with TrawlVision is to make possible reductions in fuel costs and to optimise selectivity measures.

Already in use in Argentina, Uruguay and Spain, TrawlVision is now being handled in Europe by Sodena, which already has one of the fishing industry's best-known plotters among its star fishing industry products.

According to Daniel Perez of AcruxSoft, the company set up by Frank Chalkling to develop his ideas, TrawlVision operates in real-time to visualise both vessel and gear – and now the company is working with sensor manufacturer Simrad to combine trawl simulation with real-time data from the trawl sensors.

"Information can be entered by the skippers, but in future, the software will collect data from the trawl sensor signals," said Daniel Perez.

TrawlVision is able to simulate a variety of fishing methods. As well as single-rig bottom trawling, TrawlVision is capable of simulating twin-rig trawl gear with two or three warps, pair

trawls and pelagic trawl gear. The result is a three-dimensional screen presentation of a trawler's gear. The software analyses the results to produce a database and a system of virtual cameras allow the entire fishing gear setup to a depth of 2000m to be visualised.

"The aim is to analyse the fishing gear in use and to give the skipper the opportunity to make corrections. The target of trawl simulation software is to optimise the fishing gear and reduce fuel costs," Daniel Perez commented.
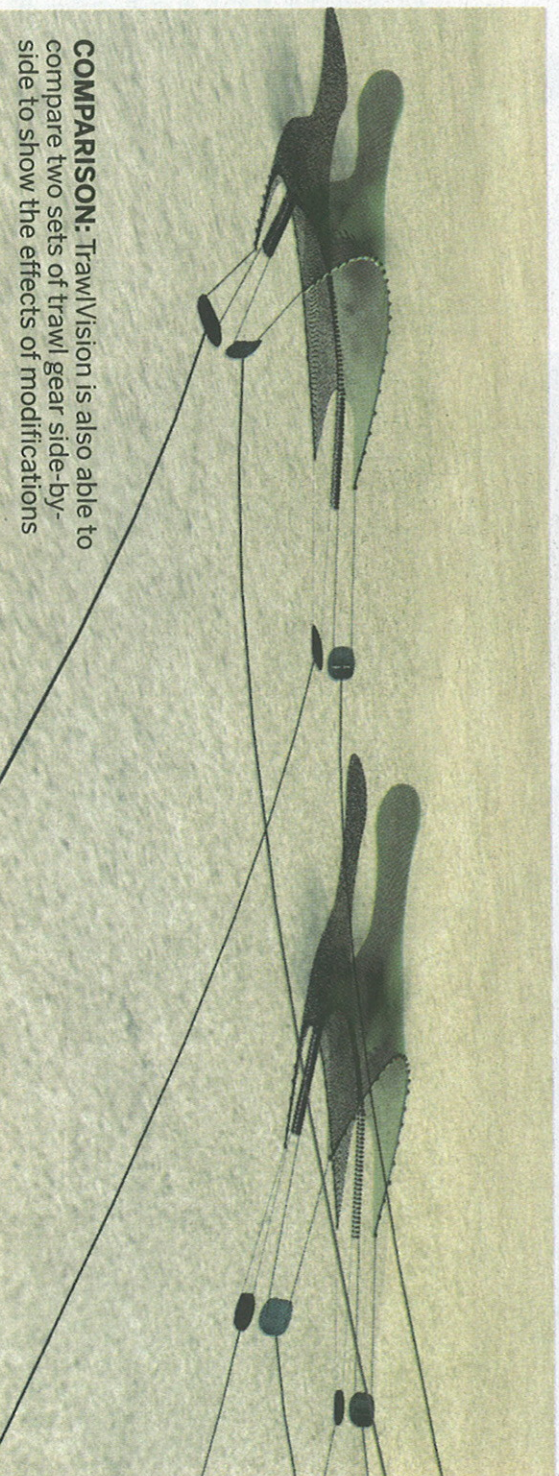
Unlike some of the highly sophisticated trawl simulators already in existence that require extensive data input before the simulation can be used, TrawlVision allows user to enter trawl details to create a simulated set of gear, modify an existing design, or to produce a detailed analysis of the trawl design's characteristics, both in
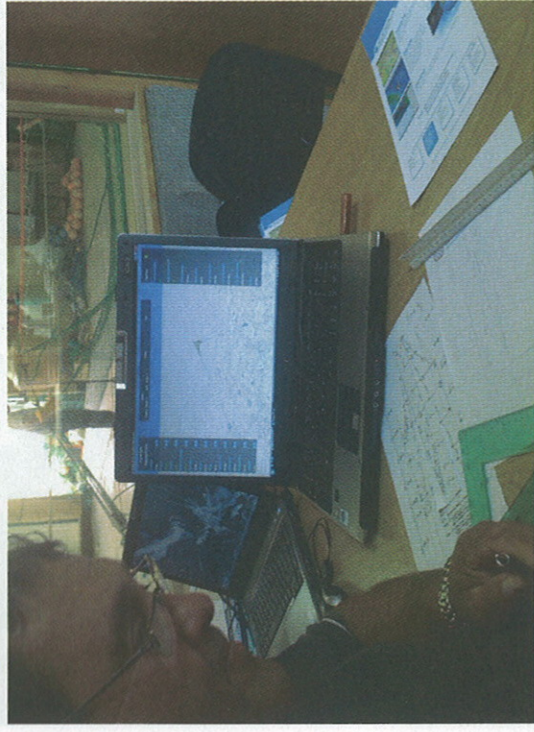
simulation and in graphs.

As well as entering the trawl data, the user needs to enter information on the trawl doors and also the catching vessel, including its bollard pull, main engine power and the type and pitch of the propeller. This makes it possible to simulate and analyse the trawl gear as the speed of the vessel changes, calculating and presenting changes in the spread and opening of the gear under changing conditions.

TrawlVision evaluates the results and presents possibilities for corrections, makes a 3D projection of the gear and creates a database of integrated results from the simulation. This brings together an evaluation of costs and consumption with fishing gear data that includes warps, doors, sweeplines and the trawl itself to provide the skipper with options to refine his gear, with the option of displaying 'before

SIMULATION: TrawlVision simulates the vessel, warps and doors as well as the trawl

COMPARISON: TrawlVision is also able to compare two sets of trawl gear side-by-side to show the effects of modifications
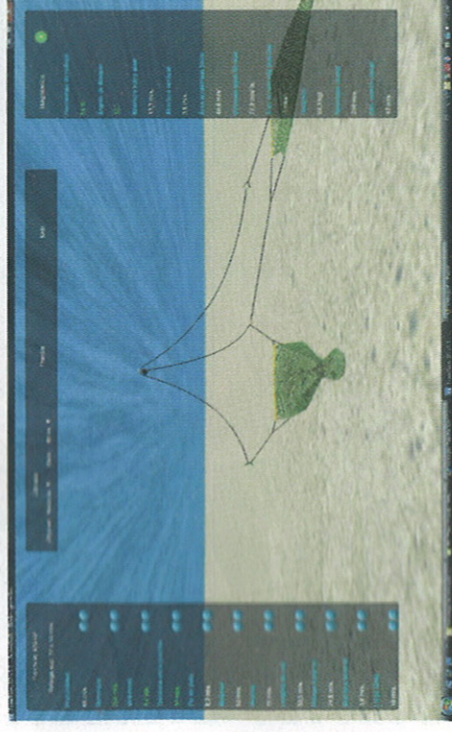
PERFORMANCE: Argentinean netmaker Luis Georgetti has used AcruxSoft's software to design gear for Alpesca's trawlers
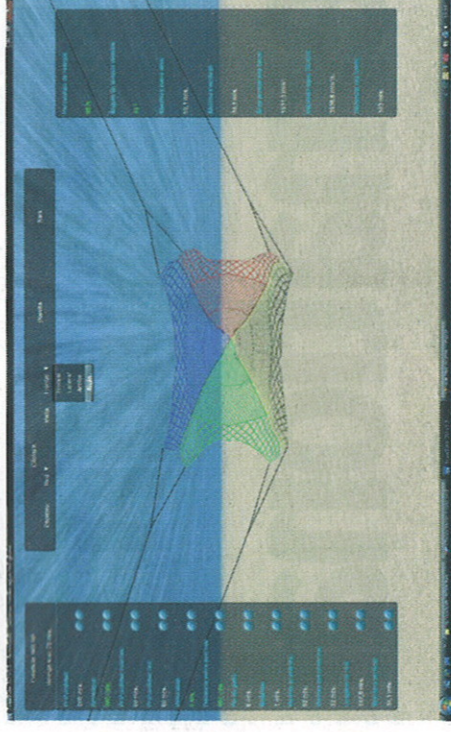
and after graphical representations of the gear.

TrawlVision and other simulation packages do not work on the same principles, making a direct comparison difficult, but TrawlVision does offer a tool that can be used with relative ease and at a fairly low cost.
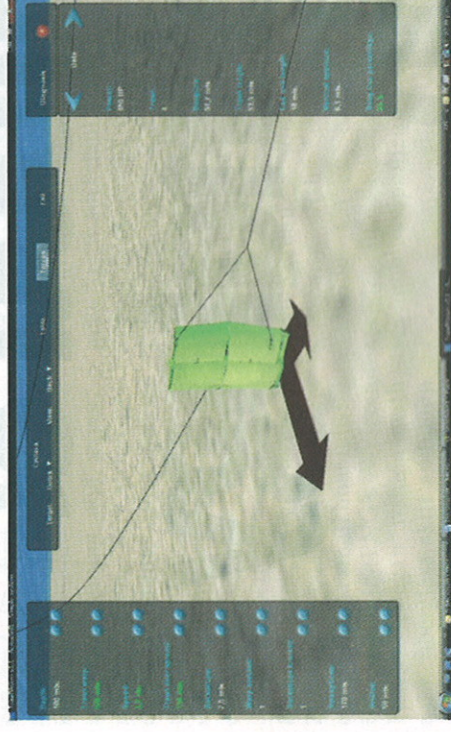
"The basic version of TrawlVision costs around €3000, although this can be more depending on the information, drawings and special designs incorporated for each customer – so we prefer to tailor each customer's package individually and calculate a price on that basis," Daniel Perez said.

Unlike some simulation packages available, AcruxSoft can also be supplied with a library of data, including trawl door information supplied by manufacturers.

"This is important information for selecting a suitable pair for a particular fishery, or for comparing doors before buying a new set. The information comes from the trawl door manufacturers and this includes the CL and CD values for different working angles."

"TrawlVision is software that fishermen can use ashore to select the most suitable gear for where they expect to be fishing or in the wheelhouse when a quick answer on a gear adjustment is needed," he said, adding that while the calculation precision of TrawlVision is not in the same class as more sophisticated software packages, it can still provide valuable information quickly.

"A few minutes with the simulator is enough to tell you what changes will happen if you switch doors for a larger pair or how much warp you need for a particular spread."

"It's also a good tool for a skipper or trawlmaker to work on a new trawl design, or to take an existing design to modify or look at the drag or spread parameters."

Real-time data with next generation

Daniel Perez told *FNI* that AcruxSoft is developing an interface with trawl sensor manufacturers to bring sensor data into the TrawlVision display, to provide more realistic image showing trawl performance in real time, linked to GPS and echo sounder data to give combined representation of the trawl, marks of fish and the seabed.

Agustin Mayans at Simrad in Spain, AcruxSoft's partner in developing the new generation of TrawlVision and the sensor interface, as well as selling the software in Spain, said that as well as taking sensor data, the next version will be a more valuable tool.

"So far we have been supplying this to netmakers, door manufacturers and research institutes, and have been getting some positive responses. But this is something that fishermen should find increasingly useful, as the real-time data will not only visualise trawl gear but calculates fuel consumption as well," Agustin Mayans said.

"This is in development now and we are looking at a tool that will be more accessible to fishermen. The 3D imaging is also improved and what we can see on the screen looks incredible."

Software takes off in Argentina

AcruxSoft software has been successfully used in Argentina by the Mar del Plata fisheries school, the University of the Comahue in San Antonio Oeste and by the Georgetti net loft which supplies around three hundred trawlers with gear in Mar del Plata, Rawson, Port Madryn and San Antonio Oeste.

Trawlmaker Luis Georgetti has used TrawlSim and AcruxSoft 2.0 software to design trawl gear using netting in a T90 configuration in some sections and with refined trawl geometry for Port Madryn company Alpesca's trawlers.

"Alpesca have reported back that the new gear is both more efficient in terms of fuel consumption and also in selectivity," Daniel Perez told *FNI*.

"Luis Georgetti has been able to combine his knowledge and experience with the evaluation and analysis possibilities of our software to come up with this new trawl design that reduces fuel costs and needs minimal adjustment at sea.

Instructor and former FAO skipper Luis Martini at the National Fisheries College in Mar del Plata has also started to use the same software to teach his students," he added.

VISUAL: Twin-rig trawl gear towed on three warps as shown by TrawlVision's virtual camera

DESIGN: A four-panel pelagic design simulated by AcruxSoft TrawlVision software

REAL TIME: A trawl door simulation using AcruxSoft's TrawlVision

Traceability for profitability

TRACKING: the eTrace project tracks from net to retailer

TAGS: Marten Gustavsson labels boxes of fish as part of the tracking system

eTrace, a project within SafeFoodEra, conducted a traceability pilot in Sweden recently and showed increased profits for traceable seafood products.

The pilot tracked fish all the way from fishing boats in Simrishamn, through the supply chain to a retailer in Gothenburg, Sweden. Through the use of RFID tagging and the EPCIS standard, it succeed in providing customers with information about where specific fish came from. A website provided retailers with direct access to information and maps for each fish, showing where it was caught and how it came to the store.

"Traceability has been a driver for increase sales", said Peter Kallstrom, the owner of Fiskelyckan, a retailer in Gothenburg. "Next to the cod, we posted a map showing where the fish was caught and processed. The map told the history that consumers have been waiting to hear, namely that the fish is local. Instead of selling just a few kilos a day, I sold more than 150k over 4 days. This is a very significant increase for us."

eTrace is a international project involving a wide range of organisations. Participants and partners included SINTEF Fisheries and aquaculture(NO), TraceTracker (NO), Lund University (SE), ROI4U (SE) and The Swedish Board of Fishery (SE). The main objective was to test the feasibility of using a electronic product code standard called EPCIS in seafood supply chains.