

CMST News

The Newsletter of the Centre for Marine Science & Technology

20 Years of Leading Research & Development

An international yacht race that gripped the nation's imagination two decades ago was also the catalyst for the formation of a leading research centre in marine technology that is still going strong today. In the mid-1980s, the Kookaburra team in the

America's Cup yacht regatta held off Fremantle called on a group of marine researchers to give them the winning edge against Alan Bond's syndicate in the defenders final. That group of researchers was the nucleus of Curtin's Centre for Marine Science and

Technology (CMST), which recently celebrated its 20th Anniversary. Since then, CMST has become a leading marine technology research centre focusing on three main areas of expertise: marine acoustics, hydrodynamics and underwater technology. CMST has been involved in areas such as innovative instruments for measuring

Antarctic sea ice, mapping underwater habitats, ride control systems for fast ferries, and underwater stereoscopic video cameras. The staff at CMST work closely with industry and government and look forward to another 20 years of R&D. Visit the CMST website for a 20 year retrospective. www.cmst.curtin.edu.au/20th



HANS VERSLUIS

America's Cup 12 metre yacht Kookaburra after her launch in 1985

New CMST Director



Dr Kim Klaka commenced the Directorship of CMST in October 2004. Kim is a naval architect who originally joined CMST in 1985. He holds a Masters degree and a PhD in hydrodynamics, with 25 years experience in

marine education and applied research, and six years experience in the small craft industry. He is also a Director of the Curtin spin-off company Sea Gyro Pty Ltd. He was the Regional Manager for the Australian Maritime Engineering CRC 1992-2000 and has taken on the CMST Director's role on three previous occasions (1991, 2000, and 2002). K.Klaka@cmst.curtin.edu.au (08) 9266 7380

Andrew Woods' term as CMST Director finished on 30th September 2004. He has returned to full time research on underwater technology projects at CMST.

Marine Bio-Acoustics

Introducing Dr Chandra Salgado-Kent: Chandra joined CMST as a Research Fellow in bio-acoustics and marine ecology in November 2003. Chandra's background is in the ecology of marine mammals and of tropical estuarine systems. Her consulting activities and research have focused specifically on whale vocalisation, distribution, and migration patterns, as well as plant-animal interactions in mangrove systems, and mangrove restoration. Chandra's most recent position before joining CMST



was as a consultant in design and analysis of studies on marine mammals and as a lecturer in marine ecology at Charles Darwin University in the Northern Territory. C.Salgado@cmst.curtin.edu.au (08) 9266 3104

DSTO Strategic Alliance

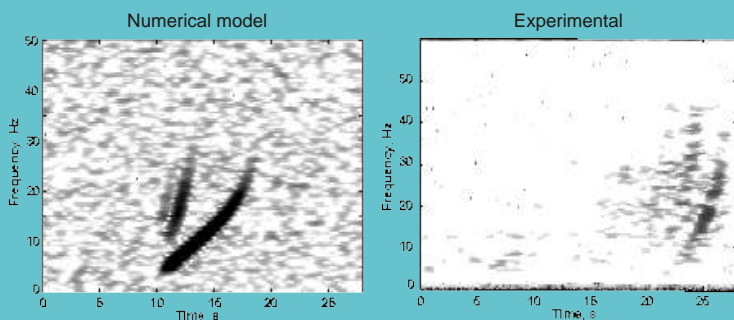
Curtin has signed a Strategic Alliance agreement with the Australian Defence Science and Technology Organisation (DSTO) to facilitate cooperation in research activities between the two organisations. CMST has long standing links with

DSTO particularly in the field of marine acoustics. The agreement formalises the relationship between DSTO and Curtin and will enable both parties to formulate a longer term strategic plan of research.

Antarctic Ice Calving

Professor Alexander Gavrilov recently posed the question: Is it feasible to relax in Augusta with a glass of wine and to listen to ice breaking off the Antarctic shelf? The serious side of this question is whether remote acoustic observation methods can be used to monitor ice calving and ice cracking of the Antarctic ice sheet. Initial results of a project led by Prof. Gavrilov and supported by the Australian Research Council under the Discovery Project Grants Program are very promising. Acoustic recordings obtained from the HA01 hydroacoustic listening station located off Cape Leeuwin (near Augusta) have

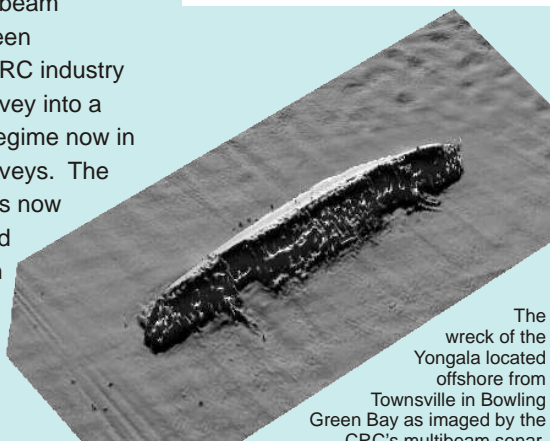
been processed and a large number of recurring acoustic signatures in the records isolated. One of these acoustic events is shown below (right) and is thought to be an ice calving event. Detailed numerical modelling of the transmission of a sound impulse from Antarctica to the HA01 station produces a remarkably similar signature to the signature measured experimentally (below left). The calving activity of the Antarctic ice shelves is one of the major indicators of global climate change hence the ability to remotely monitor ice calving on a long-term basis is an important scientific tool. (see PhD Study Opportunities)



Coastal Zone Habitat Mapping

CMST is a core partner in the Cooperative Research Centre for Coastal Zone, Estuary and Waterway Management through the Coastal Water Habitat Mapping (CWHM) Project. The project began in July 2003 and has been a considerable success, with achievements to date well in excess of those originally targeted. The primary role of CMST has been to develop processing techniques suited to single and multibeam sonar systems, so as to provide information on seabed parameters from backscatter measurements, including

vegetation type and extent. The work on multibeam processing has been incorporated by CRC industry partner Fugro Survey into a data processing regime now in use in seabed surveys. The CWHM project has now completed detailed seabed surveys in the waters of four Australia States, including Cockburn Sound and Recherche Archipelago (WA), Bowling Green Bay and Moreton Bay (QLD), Point Addis (VIC), and Sydney Harbour (NSW).



The wreck of the Yongala located offshore from Townsville in Bowling Green Bay as imaged by the CRC's multibeam sonar.

Naval Architecture Degree

A Memorandum of Understanding (MOU) between Curtin and the Australian Maritime College (AMC) was signed in July 2004. The MOU will further enhance the strong collaboration between the two organisations. As a direct result of the MOU, agreement has recently been reached to provide a full articulation option for

undergraduate students wishing to study naval architecture. From January 2006, students can enrol for their first two years at Curtin in a modified Mechanical Engineering program, then transfer directly into the third year of the naval architecture degree at AMC. Previously, students had to spend all four years at Launceston.

PhD Study Opportunities

CMST has several projects starting in 2006 that would be suitable for PhD studies:

- ▶ Antarctic ice calving
- ▶ Work domain analysis applied to ships & submarines
- ▶ Shallow water effects on ships
- ▶ Hydrodynamic forces on umbilical cables
- ▶ Whale tracking using underwater acoustics

- ▶ Design optimisation for yachts and small craft
- ▶ Navigation and positioning of ROVs

Interested persons are encouraged to apply for an APA Scholarship. Top-up scholarships are also available for some projects. Graduates in the workforce can enrol in part-time study. Contact Kim Klaka at CMST if you are interested.

Completed Research Theses

The past 12 months has been a busy time for both CMST postgraduate students and supervisors. The following research

theses have been recently completed:

- ▶ "An investigation into wave loads on catamarans", Stephen Cook, MSc.
- ▶ "The measurement of underwater noise radiated by a vessel", Alec Duncan, PhD.
- ▶ "Prediction of vessel motions at zero ship speed", Kim Klaka, PhD.
- ▶ "Performance of prawn trawl gear", Dave Sterling, PhD.
- ▶ "Object oriented 2D numerical (acoustic) modeling", Ahmed Zakaria, PhD.

CMST Lunchbox Seminars

CMST holds weekly seminars, with speakers from interstate and overseas, as well as CMST staff.

The schedule of seminars is listed on our website:
www.cmst.curtin.edu.au/seminars

If you would like to receive email updates regarding CMST seminars, simply send an email to the following address:
seminars@cmst.curtin.edu.au

For further information contact:

Centre for Marine Science and Technology
GPO Box U1987, Perth WA 6845, AUSTRALIA
Phone: +61 8 9266 7380 Fax: +61 8 9266 4799
Email: Director@cmst.curtin.edu.au Web: www.cmst.curtin.edu.au