

# Shark Fest

Report on SUT Perth Branch Evening Technical Meeting  
Wednesday 8<sup>th</sup> February 2017

*By Terry Griffiths, Perth Branch Committee Member*



When talking about sharks, it's impossible to begin anywhere else but Amity Island and John Williams' Academy Award-winning and universally recognised main "shark" theme, a simple recurring (ostinato) alternating pattern of two notes which "have become a classic piece of suspense music, synonymous with approaching danger. Williams described the theme as grinding away at you, just as a shark would do, instinctual, relentless, unstoppable." (Wikipedia). But for those of us who live in Western Australia, where we have such a strong lifestyle connection with the ocean, our concerns about the risks of shark attack become quite personal – whether it be through swimming, surfing, diving or our community service as volunteer lifeguards. Somewhat unusually for an SUT evening technical meeting then, this topic transcends the boundary between our professional lives as subsea scientists and engineers and becomes personally relevant.

The evening began with SUT Perth Branch's new chair Chris Saunders offering the branch's thanks to outgoing Chair Dr. Julie Morgan, who has lead the branch through the last 2 'very tough' years. He then introduced me as the chair just-for-the-evening, something which is a great honour! I then introduced our first speaker for the evening, Dr Miles Parsons who is a Research Fellow at Curtin University's Centre for Marine Science and Technology.

Miles described the results of a number of research themes which had been investigated over the last few years following a number of fatal and near-fatal shark attacks in Western Australia. He described the fundamentals of sound underwater and the different methods animals, fish and scientific instruments use to sense sound. He also described the results of research to determine whether human activity acts as an acoustic cue for sharks by quantifying the contribution to ambient ocean noise from typical human activities like swimming, surfing and diving/snorkelling. The key observations being that other ocean noise sources dominate, and that he is a somewhat slow / noisy swimmer! Miles then described the research being undertaken to investigate the detection of sharks using sonar and how the physics of subsea acoustics needs to be understood to make useful progress in this work – with some promising results to-date but raising a number of issues for its long-term use as a beach management alert for shark presence.

## Shark Fest (cont.)



I then introduced Lindsay Lyon, CEO & Managing Director of Shark Shield Pty Ltd who described the various sensory receptors and their respective ranges in sharks, and how this has been used to develop the Shark Shield as an effective electrical deterrent to shark attack. He described how in psychology classical conditioning is best known from the experiments by Ivan Pavlov where a stimulus was presented and then the dog was given food, after a few repetitions when the stimulus was presented the dog would salivate. While the potential for Shark Shield to act as a progressive Pavlovian deterrent when used systematically by (for example) surfers, the audience were quite taken with the parallel concept that at present, as a community, we are training sharks to associate humans with food – be it the consistent use by anglers of burley at reefs and points adjacent to surf breaks, the association between spear-gun ‘clicks’ and the resulting ‘free feed’ for the shark, or the deliberate placement of people in cages while sharks are deliberately enticed to come and investigate... troubling indeed!

The final speaker for the evening was Richard Talmage, General Manager for the CleverBuoy™ division of Shark Mitigation Systems Ltd. He described SMS’s work to develop scientific, non-invasive technologies to mitigate shark attacks – including using patterned body-suits and board decoration to appear less inviting to sharks. However the main focus of Richard’s talk was on the CleverBuoy™, a sonar detection and alert system that has been developed for improved beach safety. CleverBuoy™ uses the latest generation of multibeam imaging sonars which when combined with a state-of-the-art shark detection software and processing electronics tool called SharkTec, detects the swim pattern and shape of objects in order to detect approaching sharks and alert authorities. The presentation included very informative examples from the field trials of the system, including the sonar image filtering algorithms and strategies for aggregation of detected objects into the different body-parts of a shark.

The conclusion of the presentations provided the audience with the chance to sincerely thank our sponsors for the evening – Shark Mitigation Systems and the Ocean’s Institute which is based at UWA. We then proceeded to ask the speakers quite a few questions, from purely technical then venturing into the political debate over community safety and (in)effective government management strategies / controls – at which point the just-for-the-evening chair suggested that line of discussion was better suited to continuance over beverages!