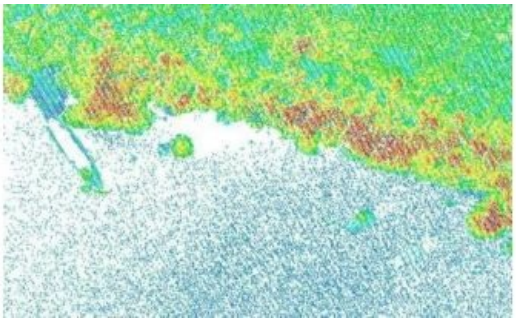
3D Mapping Technology to Locate Sunken Vessels



A team of shipwreck hunters have turned to advanced 3D mapping technology to locate sunken vessels along the South Australian coastline without getting their feet wet. A group of shipwreck hunters are aiming to uncover these long-forgotten hulks by using GIS technology from partners Esri Australia to create digital 3D reconstructions of the ocean floor.

More than 800 shipwrecks lie entombed along the state's coast – particularly beneath the treacherous seas off Kangaroo Island and the Fleurieu and Yorke Peninsulas – victims of raging gales, careless captains and, in some cases, foul play.

ShipShapeSearchers archaeologist Alex Moss said the 3D maps have multiple layers that can be 'peeled back' to reveal any ships that may lie beneath. The team starts with data sourced from non-archaeological sources – including industry, government and research organisations – in particular those that have been conducted using remote sensing techniques, Moss added.

The remote sensing techniques include sonar, satellite surveys and Lidar – which uses light beams fired from a plane to measure ocean depth and terrain up to 30 metres below the water's surface. GIS technology enables the ShipShapeSearchers to combine and process all of this information into a 3D model of the ocean floor that shows in intricate detail the different elements – whether it's vegetation, rocks or sand – that it is comprised of. Researchers can use the technology to 'fly' in and out of the virtual model and peel back each of the element layers to 'bring out' the wrecks beneath. The technology also helps archaeologists determine the types of materials the ships are made of, as well as their condition and age, making it easier to identify the wreck itself, Alex Moss explained.

Mapping technology

The ShipShapeSearchers team, a not-for-profit group, is currently testing the technology in a shipwreck graveyard at North Arm, near Port Adelaide. They have access to more than 20 hulks of varying construction periods, types and materials, and in different environmental conditions, all on the one site. This provides an ideal laboratory for to test their mapping technology and explore which processing and interpretation techniques work best for the detection of wrecks. Once this is established, the team hopes to demonstrate technology that can be used to search for wrecks right along the Australian coast over the coming years.

Esri Australia remote sensing and imagery expert Dr Dipak Paudyal said ShipShapeSearchers' progressive use of 3D and GIS technologies would have ramifications beyond archaeology. As an island nation with a strong nautical history, it's important that researchers, historians and archaeologists use modern technology to gain a clearer view of where we've come from, Paudyal continued.

This approach is now also used on dry land as well, with many of the nation's emergency services agencies using mapping technologies to virtually remove obstructions caused by disasters to survey the situation underneath and safely take action. And by layering new data over old, responders can gain a clear understanding of how an area affected by a natural disaster changes over the duration of a crisis, Paudval stated.

ShipShapeSearchers will be unveiling the findings of their research at Australia's leading geospatial event, Ozri 2013 – happening from 4-6 September 2013 at the Brisbane Convention and Exhibition Centre.

Image courtesy: Airborne Research Australia, School of the Environment, Flinders University.