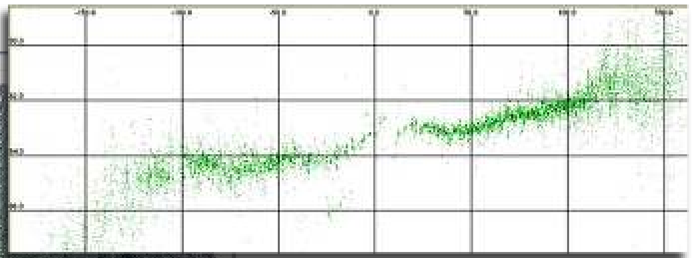
Comparison of WASSP and interferometric sonars

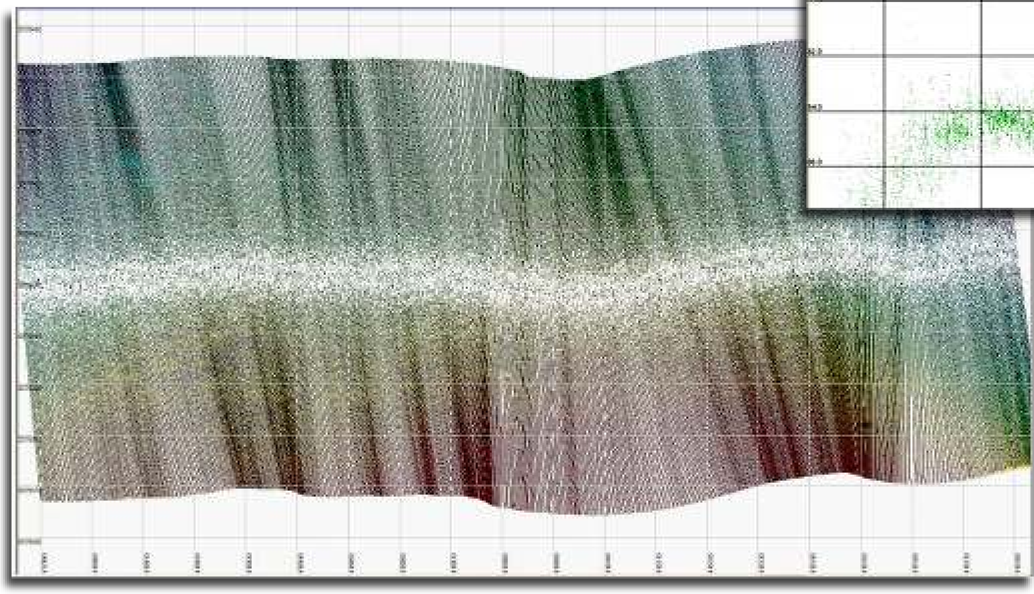
The main practical parameters affecting the performance of any sonar system are:

- Acoustic operating frequency
- Swath width (i.e. how widely splayed is the swath)
- Across track beam density (number of beams across the swath)
- Beam width (i.e. the precision of beam focus)
- Ping rate

The above features are effectively hard wired into the system and are a product of the technology and hardware used to manufacture a particular sonar. Software and processing are also important and, for example, the way a system caries out its "bottom detection" algorithm will obviously affect performance.

The two key differences that will be noticeable when comparing data between the WASSP and an interferometric sonar are swath width and beam density. An interferometric system and should reliably produce swath coverage >6 times the operating water-depth. The trade-off with this technology is that the area directly below the sonar (nadir) is poorly covered (see below).

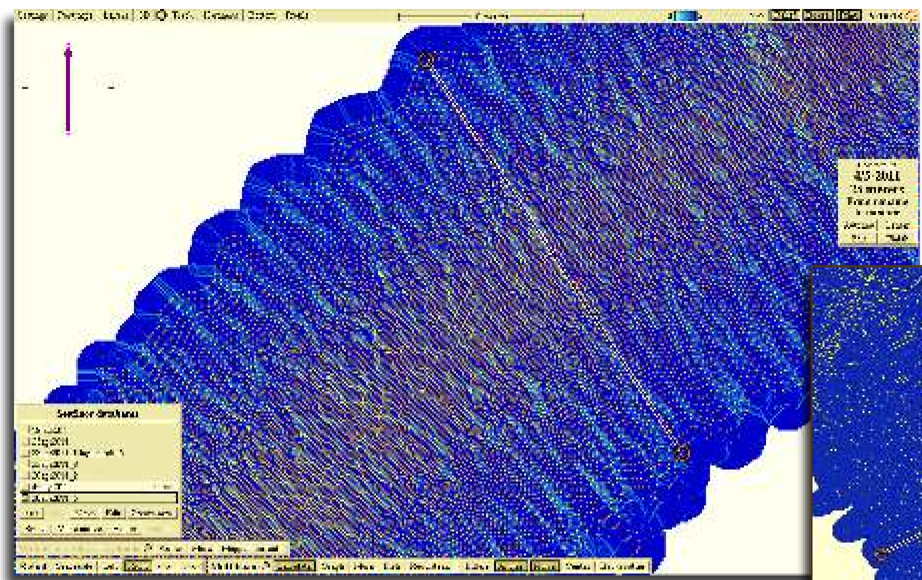


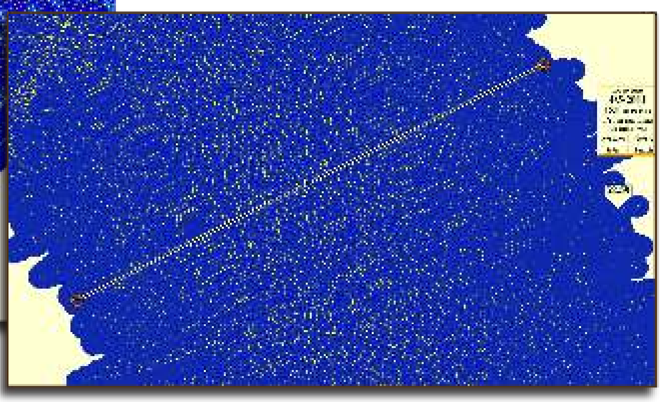


Above: Sector view of raw ping density of interferometric sonar

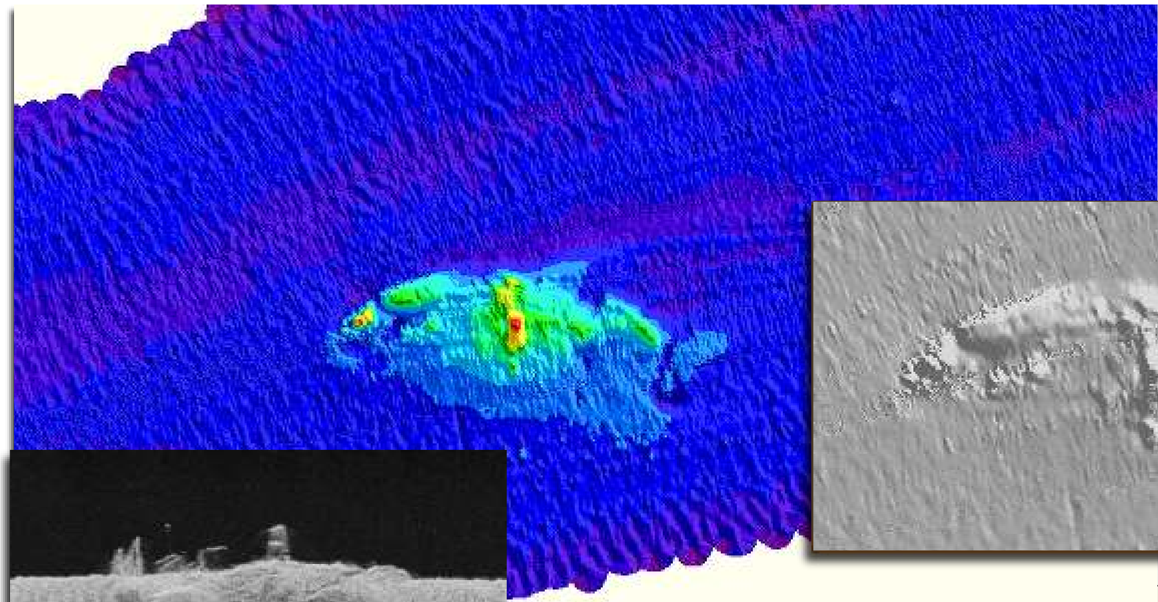
Left: Plan view of interferometric data pings showing the inherent reduction in density of soundings in the centre.

In contrast the WASSP sounder is a beamforming multibeam with 112 beams spaced at an equal angle across its 120^{O} swath width. In the examples below you can see the higher density of beam in the centre of the swath with 25 m swath coverage in ~7 m of water and 180 m coverage in ~ 50 m of water. The other thing to note is that the maximum ping rate of the WASSP is 10 Hz and this will start to have a noticeable effect on the density of along-track soundings above 8 kts.

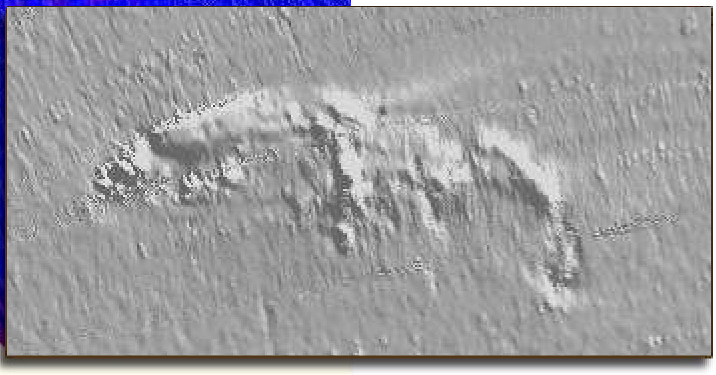


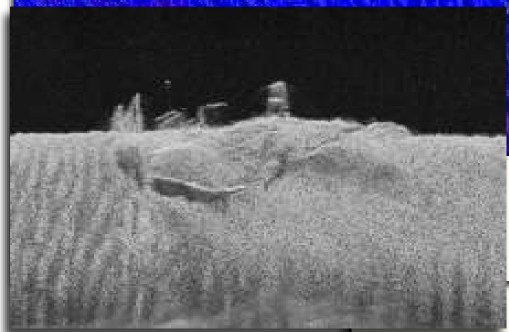


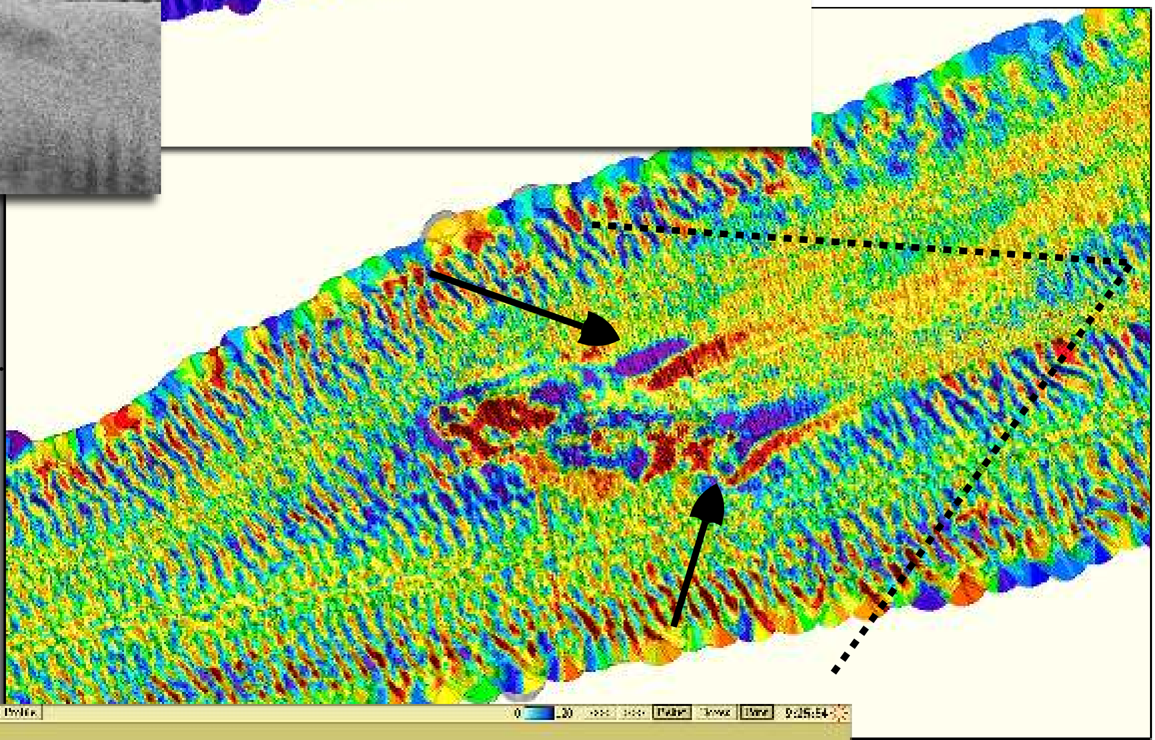
Data examples from recent WASSP installation



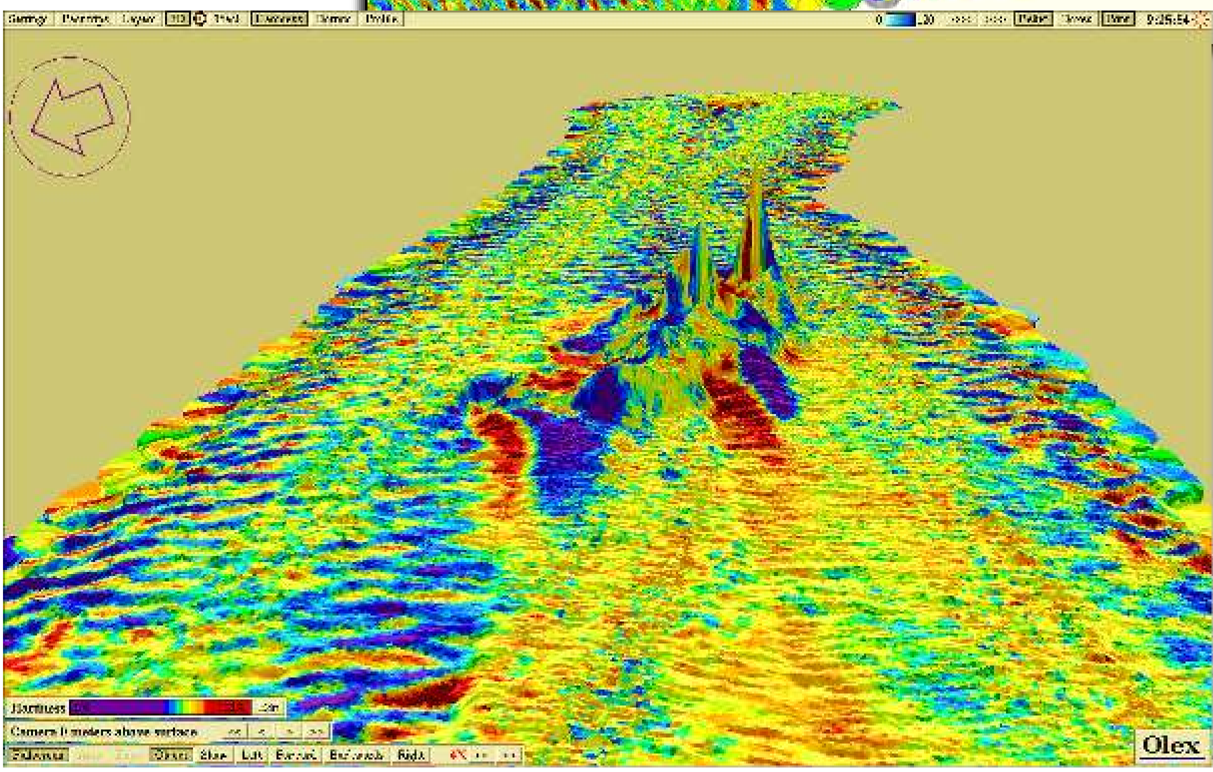
Colour-shaded relief-map of wreck between 12 and 20 m water depth.







Backscatter map (red=high reflectivity, purple=low reflectivity). Note comet-shaped tails of sediment in lee of wreck.



3D perspective view of wreck (field of view indicated by dotted-lines above).