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## *Development of an efficient survey methodology for the prospection of buried palaeolandscapes and archaeology in the southern North Sea*

Within the framework of the SeArch project ([www.sea-arch.be](http://www.sea-arch.be)) an efficient, generic survey methodology was developed for the prospection of buried palaeolandscapes and archaeological features in the southern North Sea. Standard geophysical techniques, such as marine seismic reflection, are mainly used on an ad hoc basis (if at all) and these techniques are often not well adapted for archaeological investigations. Detailed acoustic imaging is often hindered by the (hard) sandy seafloor which induces strong echo's that obscure the image, and the presence of large sand banks which absorb the sound waves. Moreover the widespread occurrence of shallow (biogenic) gas limits the acoustic penetration, especially in the nearshore area. For this study a wide range of seismic sources and receivers were tested over the past 3-4 years, including different multichannel configurations. Where possible, different sources and receivers were used simultaneously in so-called 'one-sweep' surveys. The results show that sparker sources generally provide the best trade-off between image resolution and penetration depth. Surprisingly, multichannel recording significantly improved the image resolution already for shallow target depths. Special attention was also paid to acoustic imaging in gassy areas, using not only conventional (P-)waves but also non-conventional surface waves and refracted waves. This highly unique test involved the simultaneous use of 2 research vessels (RV Belgica and RV Simon Stevin). The preliminary results indicate that relevant sub-bottom information can be obtained in gassy areas using a 'smart' acquisition and processing design. This opens important perspectives for the prospection of nearshore areas with regard to engineering and environmental projects.

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