

Survey by divers

Principle: With the mixed gas (nitrox) techniques that have become common over the last years the efficient bottom time of scuba divers at depths down to around 30 m has increased significantly.

Basic features: Wall-to-wall survey of larger seafloor areas by divers is a relatively slow method that needs to be applied in areas of significantly heightened potential that cannot be distinguished in any other way (eg. sub-bottom profiling, sidescan/multibeam, ROVs, etc.).

A typical search pattern is to let the divers cover the area to be surveyed swimming parallel lines with a distance between them that is chosen on the basis of the local visibility. The use of suspended guidelines or swimming after a compass can facilitate a good coverage of the survey area. However, the precision will be significantly reduced over larger distances. It is obvious that looking for small pieces of worked flint exposed on the surface will not allow many meters between the lines. In case of zero visibility the divers' observations will be restricted to what they can feel with their hands.

Apart from objects and features directly observable on the bottom the divers can obtain information about the near sub-bottom by making small test holes by their hands or by regular probing with different types of probes. The application of such techniques, however, make the survey considerably more time consuming and moreover some types of features can be difficult to distinguish under water.

Resolution and horizontal precision: The best registration of find positions is by acoustic transponders interacting with the ship's DGPS positioning system. This can provide sub-meter precision. Registration of the positions of find spots from buoys on the surface will – depending on the depth – normally include a considerable offset because of the current.

Platforms: Divers can operate from a base on land or from boats/ships.

Advantages:

- Direct visual control with the sea floor – when visibility better than zero
- Better possibility for distinction of worked flint, bone fragments, etc. than from a video images
- Well suited for very shallow water situations (1 m depth and less)
- Reasonably good precision/resolution with transponder-positioning or in shallow water with DGPS on a pole.
- Small objects (cm range) can be detected

Disadvantages:

- No detailed information about sub-bottom features
- Not suited for detection of Stone Age sites not exposed on the sea floor
- Time consuming when surveying for small and often visually difficult distinguishable small objects such as those typically related to Stone Age sites
- Not economical below approximately 30 m where much more expensive diving techniques than scuba must be applied.

Literature:

Dean, M., Ferrari, B., Oxley, I., Redknap, M., Watson, K. (eds.): *Archaeology Underwater, The NAS Guide to Principles and Practice*. Published by the Nautical Archaeology Society, Archetype Press, 1992



Diver photodocumenting detail during underwater survey