

ACOUSTICS2008/2144
Acoustic methods in extremely shallow water for reconstruction of ancient environments

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A large area of the Venice Lagoon was surveyed through a modified traditional echosounder. For the first time, acoustic methods together with geological analysis were used systematically to investigate natural and anthropogenic morphologies buried in the lagoonal sediments. The shallowness (with depths often $< 1\text{m}$) of the Venice Lagoon represents a challenge for underwater acoustic methods. The results we present in this paper show that such methods are very useful for detailed geomorphological and archaeological reconstruction and can be extended to other similar environments. In this context, a general methodology of multidisciplinary data collection was developed. As a synthesis of our acoustic and geoarchaeological investigation, maps of the ancient lagoonal environment were produced.