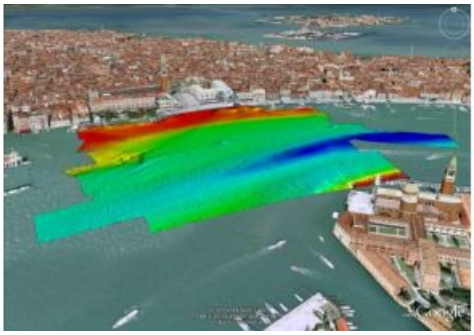
Surveying the Venetian Lagoon



The world's best-known estuarine lagoon has been of tremendous historical importance in sheltering the city of Venice. It is an ever-changing environment with only 8% covered by land, 12% by open water and the remaining 80% by mud flats, tidal shallows and salt marshes. This geographical setting, hosting complex ecosystems, is influenced by tidal cycles entering through three sea inlets and freshwater and sediment supplied by river influx. The Venice Institute of Marine Science (ISMAR-CNR) is engaged in numerous projects regarding researching and monitoring the lagoon.

Monitoring changes to the environment is becoming ever-more important in view of changing sea levels and as the human impact increases, such as with the MOSE flood protection project enabling the closing of the sea inlets and dredging activities.

Kongsberg Geoacoustics was recently invited by the Institute to demonstrate its technology for gathering high-resolution bathymetry data with the aim of effectively covering large, very shallow water areas with a portable installation, thus providing highly repeatable data to allow monitoring of even the smallest changes over time.

Kongsberg Geoacoustics GeoSwath Plus Compact was chosen due to its capabilities to gather data up to the waterline with a coverage of up to twelve times the water depth in a shallow-water environment. Repeat surveys were carried out and showed to be consistent, despite the difficult hydrological conditions, with large tidal currents and fresh water mixing, leading to high temporal and lateral sound speed variations. In addition, the system offers true co-registered and georeferenced side scan data which can be used for seabed classification and textural mapping.

Image: Bathymetry in front of St Mark's Square, Venice. Image courtesy: Kongsberg GeoAcoustics