

Application Note

GeoTexture - Habitat Mapping Posidonia Oceanica



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KONGSBERG GEOACOUSTICS GeoTexture

GeoTexture

GeoTexture is a unique software package from Kongsberg GeoAcoustics for analysing side scan sonar data and other generic image formats (tiff, jpeg, bmp...). It has a powerful suite of tools for normalising side scan sonar data across the swath, rejecting effects of the side scan sonar sensor and seafloor bathymetry to reveal the backscatter strength of the seafloor material. This significantly improves the quality of the side scan mosaics for human and machine interpretation. It can be trained to remember and recognise multiple textures across and between the normalised images, and produce classified maps. This makes GeoTexture an invaluable tool for interpreting images of the seabed environment for applications ranging from civil engineering site survey to biological habitat mapping. As well as standard side scan and image data formats, GeoTexture can also read the side-scan output files from Kongsberg Geoacoustics GeoSwath Plus shallow water wide swath bathymetric sonar, offering significant benefits to existing GeoSwath Plus users in Side Scan normalisation, image creation, and texture mapping.

GeoSwath Plus

GeoSwath Plus is a portable shallow water multibeam system producing high resolution wide swath bathymetry and co-registered geo-referenced side scan data. It is available in three frequencies: 125, 250, 500 kHz for portable and fixed boat mounts as well as for AUV and ROV deployment.

Sonar 2094 Digital

Kongsberg Geoacoustics digital side scan system offers simultaneous dual frequency operation of 114 and 410 kHz with 24 bit data output and extended range capability through digital over sampling technology.

Habitat Mapping

Accurate seabed habitat maps are an invaluable resource for anyone making decisions about the management of our marine environment as they provide a better understanding of the distribution and extent of marine habitats.

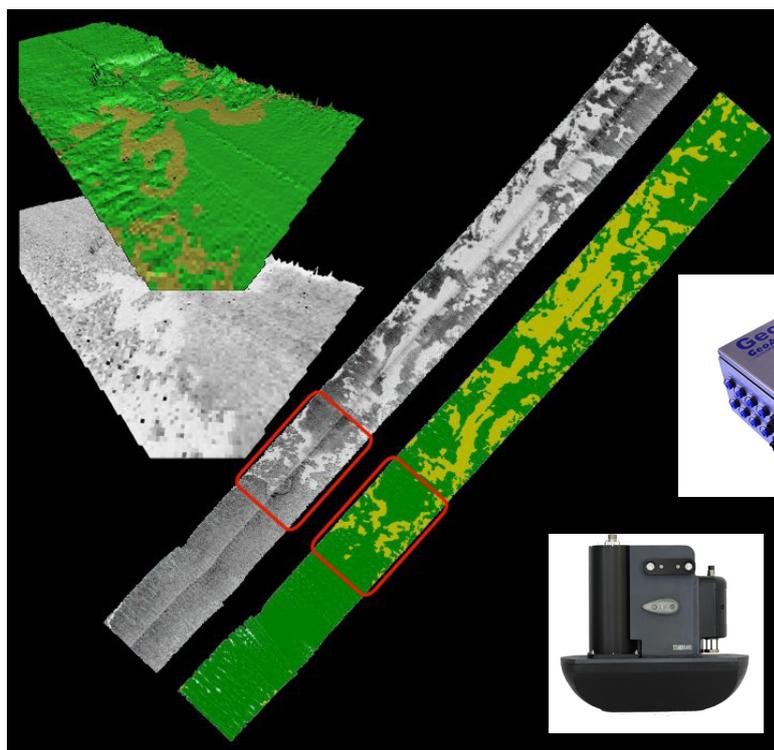
In recent years new methods and technologies have been developed to allow rapid site evaluation and appraisal. Such technologies include multi-beam echo-sounding, side-scan sonar and acoustic ground discrimination systems combined with ground truthing techniques (sediment grabs, camera tows, dredging...) in order to create detailed habitat maps.

In this context, GeoTexture is the

perfect tool to process the acoustic backscattering images of the seafloor generated through those techniques and provide sea bed classified maps.

Case of Study 1 Posidonia Habitat Mapping using Kongsberg Geoacoustics GeoSwath Plus and GeoTexture. Villajoyosa, Spain

Areas of Posidonia Oceanica growth on sandy seafloor near Villajoyosa, Spain. Geo-referenced GeoSwath side-scan record and texture classified images. The imagery is draped over high resolution bathymetry data allowing combined interpretation of terrain and the classified growth areas.



GeoSwath Plus
Compact

Case of Study 2

Posidonia Mapping using Kongsberg Geoacoustics Sonar 2094 Digital (xtf data format) and GeoTexture.

Villajoyosa, Spain

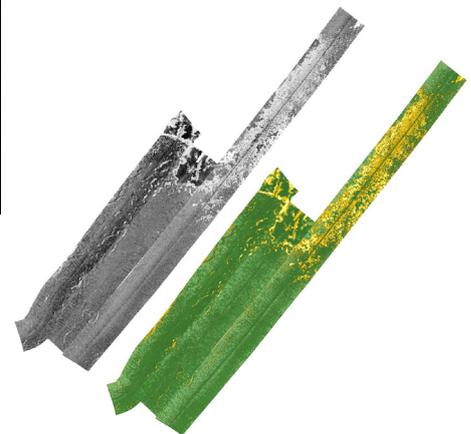
Side-scan record of an area near the one in the previous case of study. The side-scan data was gathered in XTF format using third party acquisition software. The texture classified image shows large Posidonia meadows in sandy seafloor.



Case of Study 3

Posidonia Mapping using Kongsberg Geoacoustics Sonar 2094 Digital (proprietary 24-bit data format) and GeoTexture. Villajoyosa, Spain

Side-scan record of the entrance to Villajoyosa's harbour. The side-scan data was gathered directly from the fish using the proprietary 24-bit format. The texture classified image shows Posidonia patches in sandy seafloor. Dark areas in the classified image correspond with breakwater walls.



Conclusions

GeoTexture has proved to successfully handle different side-scan data formats to perform texture classification of the seafloor. For Sonar 2094 Digital, both XTF files generated by third party acquisition software and proprietary 24-bit data format were properly processed to generate classified texture images. For GeoSwath data files, classified side-scan records combined with high resolution bathymetry allow the user to generate classified 3D images of the seabed.

Sonar 2094 Digital



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