

APPLICATION NOTE

GEOSWATH PLUS

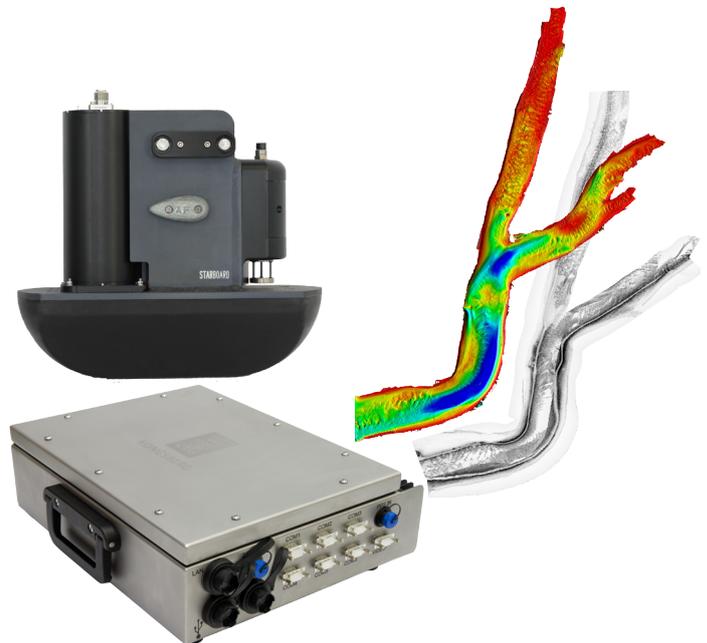


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FEATURE FILTER

GEOSWATH PLUS

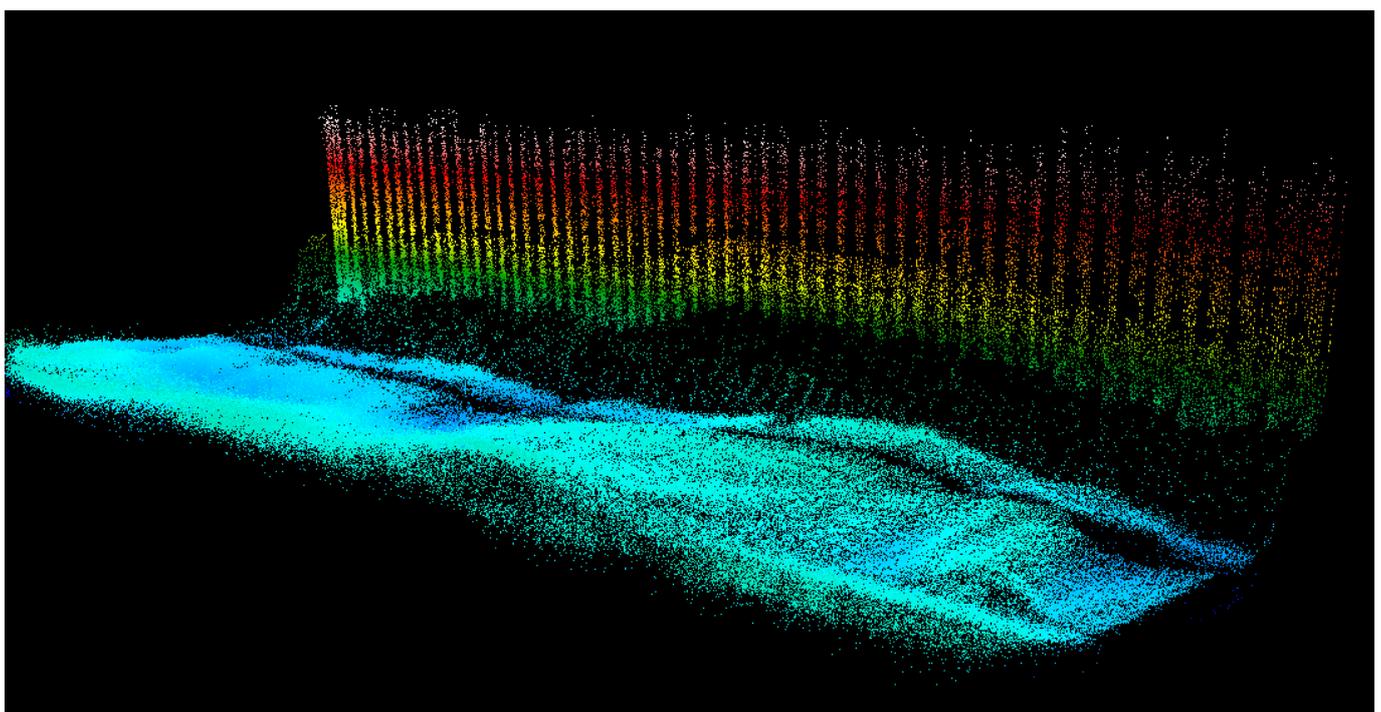
GeoSwath Plus is a wide swath bathymetry sonar system for shallow water environments that meets IHO specifications for hydrographic surveying. It simultaneously acquires swath bathymetry and side scan data for reliable bottom classification and object detection. It is a productive survey tool for the shallow water environment. With a 240° opening angle it achieves a swath coverage of up to 12 times the water depth. The system is available in three frequencies: 125, 250 and 500 kHz with depth performances of 200, 100 and 50 m respectively to match the survey requirements. The system can be deployed on dedicated survey vessels as well as on vessels of opportunity in a variety of configurations, including over-the-side, bow, moon pool or hull mount. GeoSwath Plus Compact can be mounted easily on small, open vessels, including RIBs, where portability and water protection are imperative. Versions for installations on AUVs, ROVs and USVs are also available.



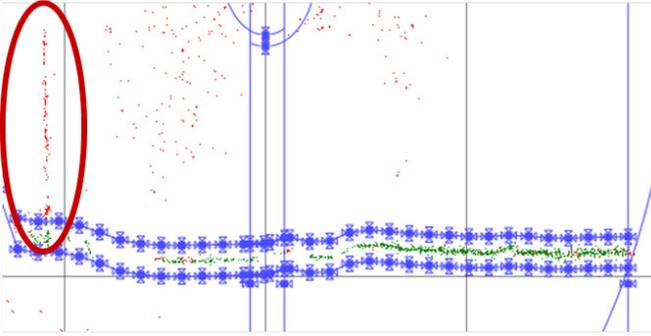
GS4 AND FEATURE FILTER

GS4 is the software supplied with the system for data acquisition and processing. It replaces GS+ and has been developed based on years of experience and valuable customer feedback. It features a state-of-the-art user interface, increased speed and many new functionalities, including the *feature filter*. An intrinsic part in processing phase measuring bathymetry data is filtering the seafloor return from the raw data, which also includes background noise of electronic

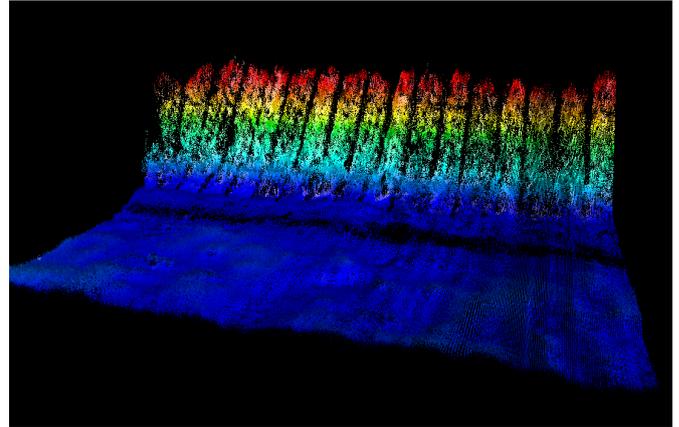
and acoustic origin, water column returns and sea surface backscatter. Previous filters were developed assuming a relatively smooth seafloor. It has been a labour intensive task adopting the filter parameters to maintain vertical structures and large objects. *Feature filter* automates this task with a large gain in processing speed even in terrain that was considered difficult to process previously, for example harbour environments, engineering structures, shipwrecks and debris.



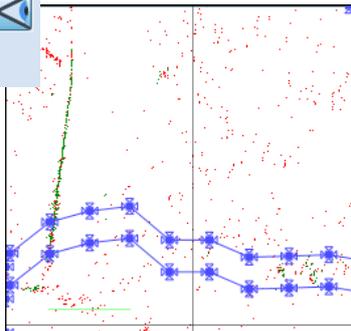
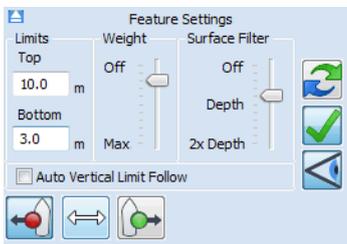
Harbour wall. The vertical structures are preserved by the *feature filter* in GS4 software.



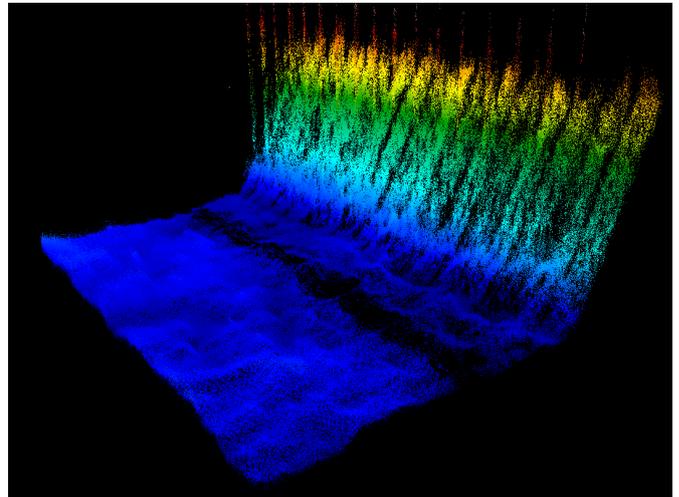
The standard set of filters are designed to maintain the seafloor signal while omitting noise and reflections within the water column. Therefore there is a risk that vertical structures are filtered out if the filter parameters are set inaccurately and not adopted quickly to changing situations. *Feature filter* automates the task with minimum user interference.



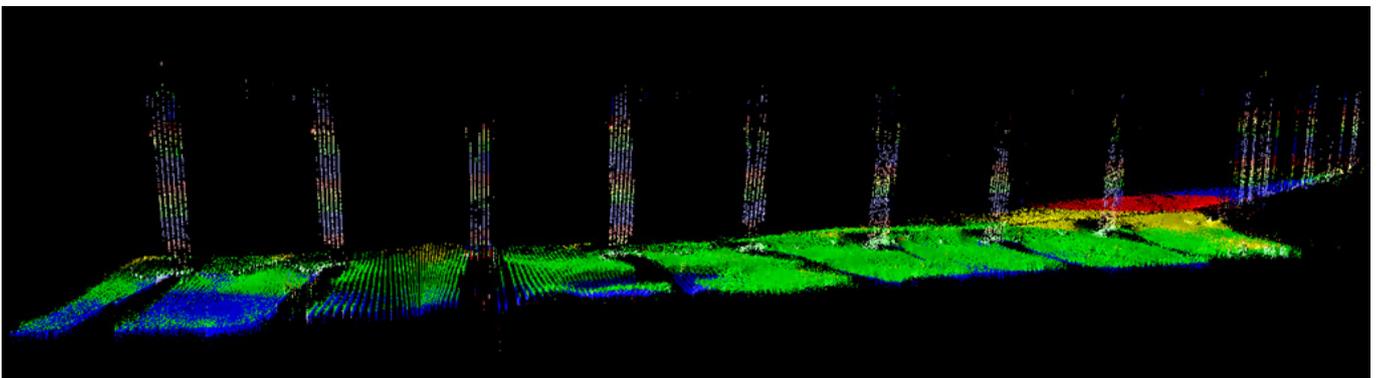
Inadequate filtering sometimes results in loss of vertical structures, shallow soundings of seabed features and objects. It can even lead to data gaps in the presence of steep seafloor slopes. In this example pilings along a river bank have been filtered inappropriately and were lost.



Feature filter is applied after the standard seafloor filters. It identifies clusters in the previously filtered data and inserts these in the final data output, thus preserving vertical structures and features protruding from the seafloor. The *feature filter* works automatically and is controlled by a small set of parameters including search limits above and below the seafloor.



Applying *feature filter* preserves the pilings along a river bank with minimum user interference.



Pilings in a harbour environment are well defined by the *feature filter*.

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