

3DSS Sonar Data Example: Bathymetry in the Presence of Water Column Targets

Sonar Model: 3DSS-DX-450
Sonar Mount: Over-the-bow pole mount on 20' boat
Sonar Depth: Approximately 1m below surface,
Sonar Control Software: 3DSS-DX Control Application (by Ping DSP)
Sonar Display Software: 3DSS-DX 3D Sidescan Display (by Ping DSP)
Data Location: Sidney, BC, Canada
Average Water Depth: 28m

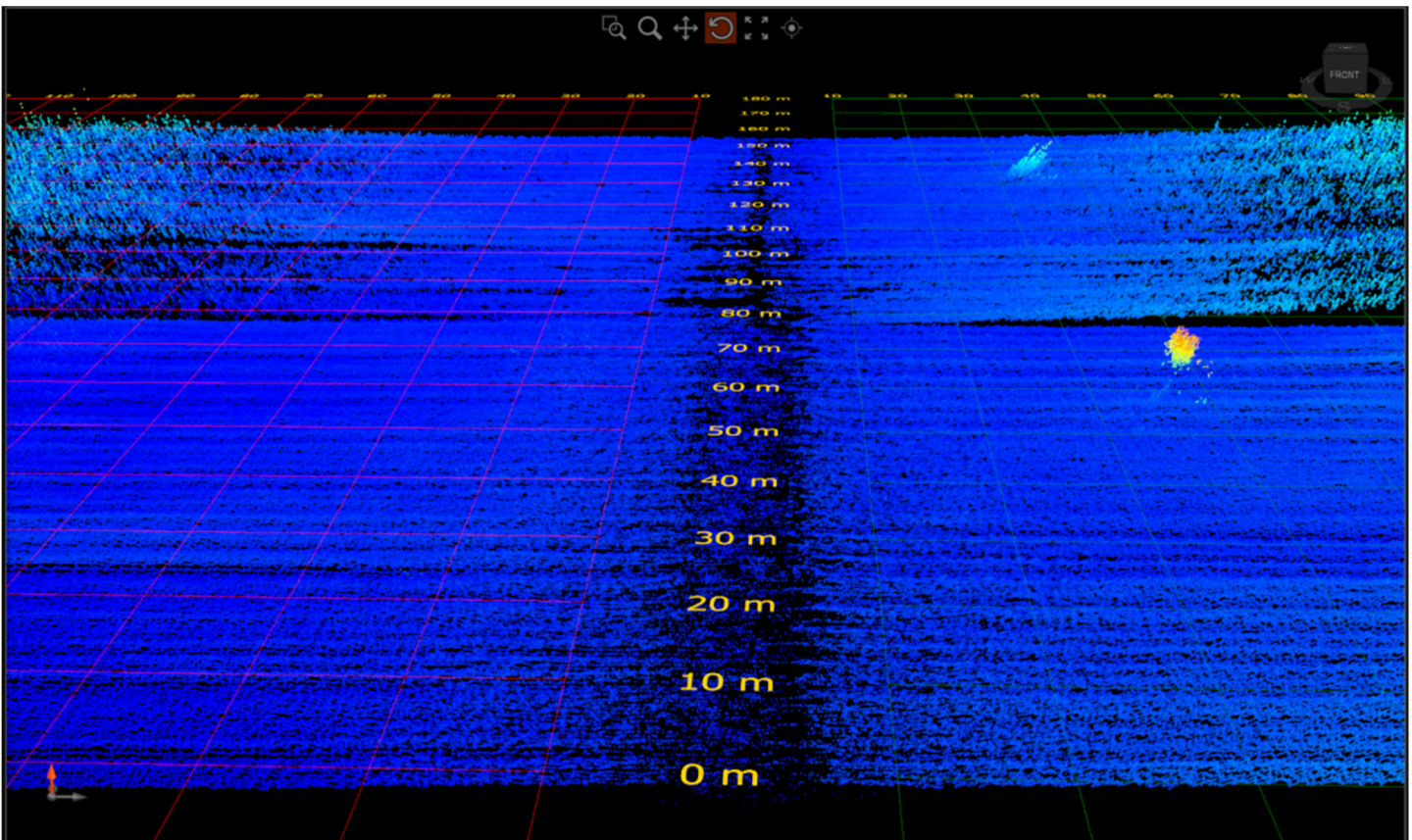


Figure 1: 3D Sidescan data set with a water column target cluster repeated to compare for Multi-Angle processing (foreground) versus Interferometry (background).

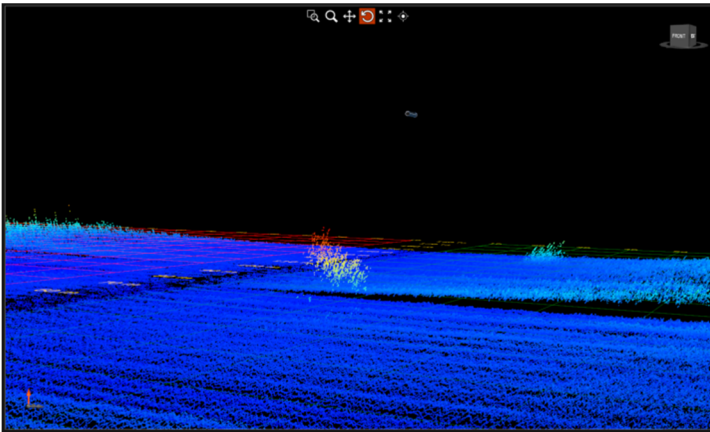


Figure 2: Zoomed view with Multi-Angle result in foreground.

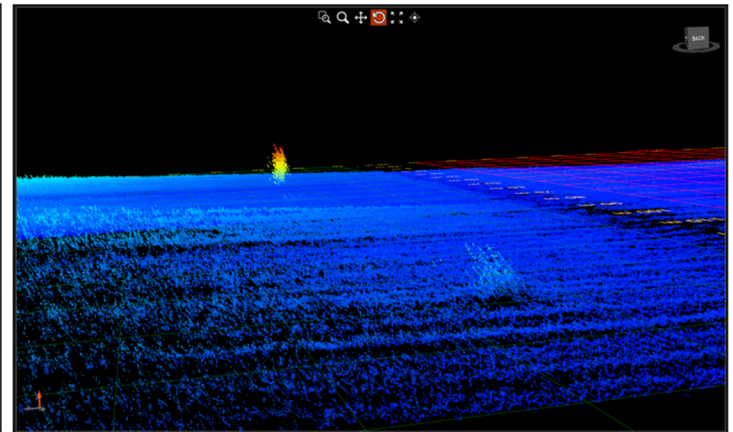


Figure 3: Zoomed view with Interferometry result in foreground.

File: **JamesIsland12.3dss-sx**

Data Description: Boat traveling in open water, over predominately flat sandy seafloor and past a distributed water column target (likely a school of herring). The same data set is shown twice with different 3DSS processing parameters to demonstrate the benefit of 3DSS-DX CAATI processing to resolve multiple concurrent arrival angles in comparison with interferometric processing to resolve single arrival angles.

Display Descriptions: *Ping DSP 3DSS-DX Control Application* showing the 3DSS parameters used for reprocessing recorded data. The same application is also used for real-time sonar operation as well as playback without reprocessing. In all three cases, the output maybe streamed into the Ping DSP 3D Sidescan Display as well as third party sonar acquisition software systems such as Hypack (Hypack Inc), SonarWiz5 (Chesapeake Technologis Inc), and GeoDAS (Ocean Imaging Consultants Inc).

Ping DSP 3DSS-DX 3D Sidescan Display showing the same data set repeated with different 3DSS processing parameters. The data set is from a predominantly flat seafloor with a distributed water column target (likely a school of herring) that occurs in the latter pings. The display shows results based on processing for 4 angles-of-arrival in the foreground (the *multi-angle* result), and shows results based on processing for 1 angle-of-arrival (as in interferometry) in the background (the *single angle* result). All other processing and display parameters for the multi-angle and single angle results are identical.

Remarks:

In comparing the single angle (interferometric) and multi-angle (CAATI) results, the *3DSS-DX* multi-angle results exhibit:

1. reduced bathymetric uncertainty at greater swath widths, as demonstrated by the visible seafloor variance as a function of cross track distance and,
2. virtually no bathymetric bias due to interfering targets, as demonstrated by the distinct separation of water column targets and the seafloor in the multi-angle result in comparison with the blended water column and seafloor backscatter in the single angle result.