



Changes between GLOBEClaritas 2023.1.1 and 2023.2.1

1st January 2023 to 30th June 2023

GLOBEClaritas is excited to deliver the 2023.2.1 release to clients, with significant improvements to the user experience and technical capabilities.

We would like to take this opportunity to remind users of our email addresses for support (support@globeclaritas.com) and for general information (info@globeclaritas.com) We appreciate your continued support of the GLOBEClaritas software and welcome your feedback - it enables us to continually improve the software.

[Follow us on LinkedIn](#) to keep up to date with the latest news and information from the Claritas team.

Release Highlights

- A new dedicated receiver de-ghosting solution for high resolution and ultra high resolution seismic datasets.
- New QSEIS application provides improved functionality over the existing SLI and SETDISCFOLD utilities for viewing and updating dataset information.
- A new UI interface for Claritas utilities provides an improved user experience.
- Available as a Beta application is a new 2D/3D seismic viewer providing better 3D display capability
- Further updates and improvements to the Job Editor driven by user feedback.

Supported platforms

Supported platforms for 2023.2.1 are:

- RHEL7/8, CentOS7, AlmaLinux8
- Ubuntu 20.04/22.04,

and on Windows via,

- Windows Subsystem for Linux (WSL1/WSL2)

Please note: CentOS8 operating system is no longer available. We are now building on AlmaLinux8.

New HR and UHR Receiver de-ghosting solution

The HRDEGHOST module performs trace-by-trace deghosting for high-resolution marine seismic. Primarily it is aimed at shallow-tow (tens of cm to a few metres) using high-frequency sources (sparker) with small displacements between sources and channels. It is intended to cope with the situation where the positions of the streamer and the sea-surface are not sufficiently well-constrained meaning that the usual methods of deghosting (e.g., 2-D FFT and 2-D deghosting operator) can be not applied.

To elaborate further, a shallow tow streamer must be more precisely positioned than a more deeply towed one because any small variation in depth has a greater effect on the ghost notch position in the frequency domain. Furthermore, the sea-surface is dynamic meaning that: the streamer depth is less well constrained; the sea-surface can interact with the streamer, meaning that there will be a variable static shift in the traces; and the reflection may be complicated by undulation of the sea-surface.

HRDEGHOST works in three phases. The first phase is an estimation of the arrival times of the primary and ghost, and their waveforms, at each channel within a window encompassing the top few milliseconds of each trace (see *****HRQC**).

Note: The first phase of the processing uses computational tools from the HiresQC application. Therefore, it is advised that the user first tests their seismic files in that application in order to determine whether the parameters given to HRDEGHOST are correct and whether there are any shots that should not be included when processing using the HRDEGHOST module.

The results of the first phase are used as initial values for the second phase. Within the second phase HRDEGHOST uses short-time FFTs (STFTs) - spanning each trace - as observation data to estimate numerous parameters: the reflection coefficients (R), delay factors (DF), the delay (D), ghost-free spectra (F), shot-spectra (S), and amplitude factors (A).

The R and DF parameters are estimated on a grid defined in offset and two-way travel time coordinates and are constant across shots. D is an updated estimate of the delay between primary and ghost times estimated in the first phase. These are calculated for each trace.

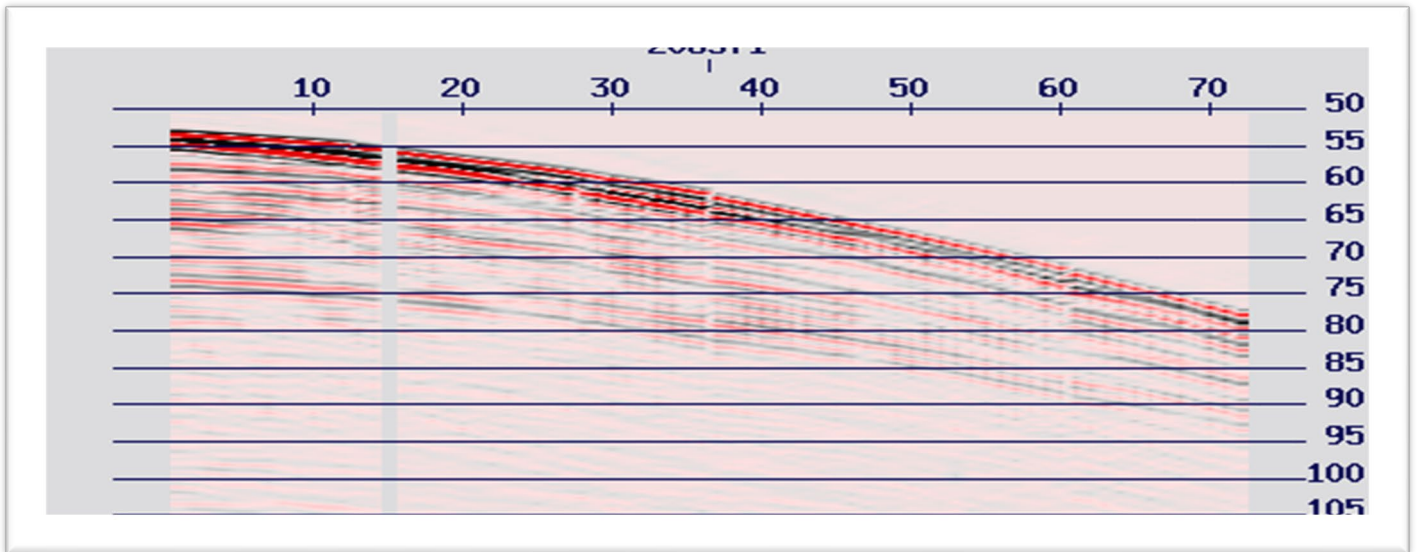
Note that the delay between primary and ghost at any offset-time point is calculated as D multiplied by DF. The F parameters is estimated on a separate grid defined in the same coordinate system but are usually calculated on a coarser grid. S is estimated for each shot and is used to estimate the variation of the shot spectra between shots. The amplitude factor (A) is estimated for each observation, i.e., there is an A value for each STFT.

The third phase is the actual deghosting process which is trace-by-trace, i.e., it uses only one-dimensional rather than two-dimensional FFTs. This means that it does not specifically deghost based on the angle (slowness) of the wavefront. Instead, it uses R, DF, D and the spectral estimates from F and S to perform causal Wiener deconvolution.

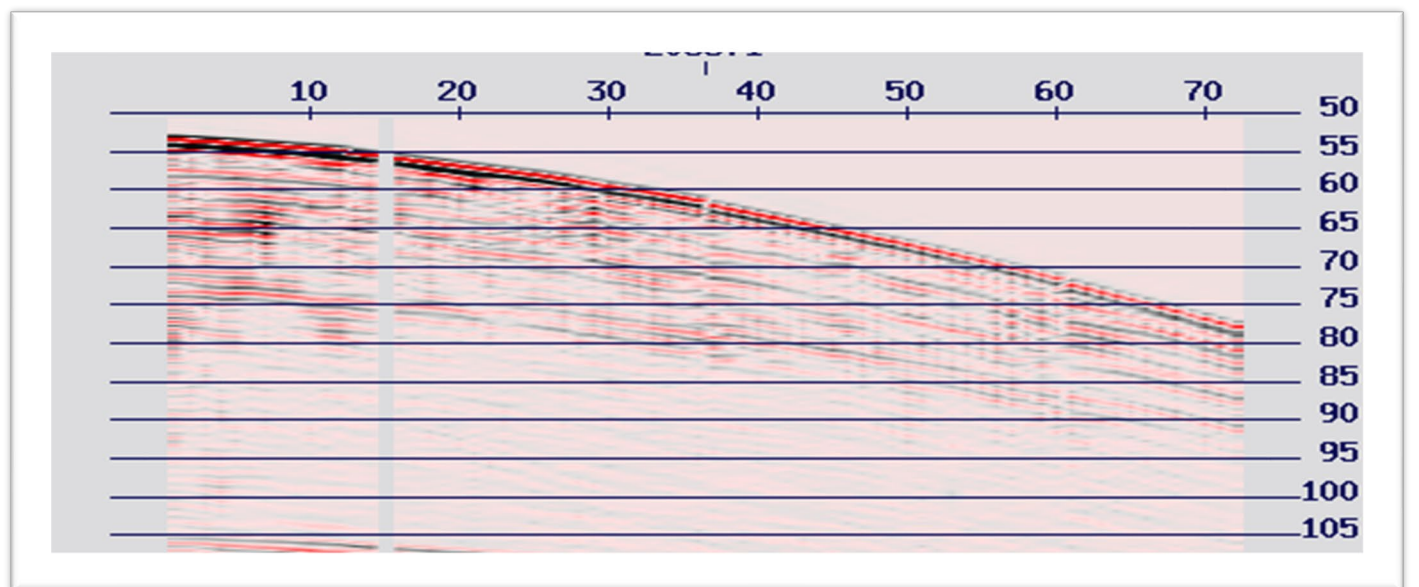
HRDEGHOST processes a user defined number of shots within each estimation. The premise being that the parameters R, DF and F will be relatively smoothly varying in offset, time and shot

location. The assumption is made that within a small number of neighbouring shots these parameters will be constant.

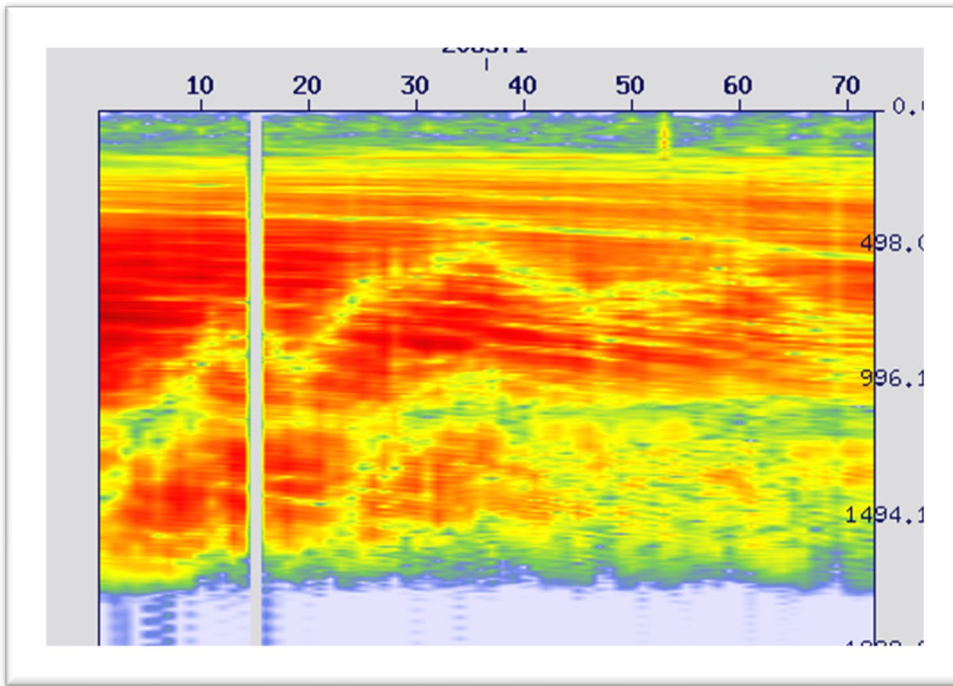
The overall result of this is that HRDEGHOST will determine regions spanning the shots and small distances in offset and time within which the deghosting parameters are relatively constant. These regions can be thought of as representing certain combinations of wavefront arrival angles which we are characterising through these parameters. Thus, instead of explicitly estimating wavefront angles and performing deghosting based on that (the usual 2-D FFT method), it is estimating an approximation in ghost delay and reflection coefficient that best deghosts that patch of the signal.



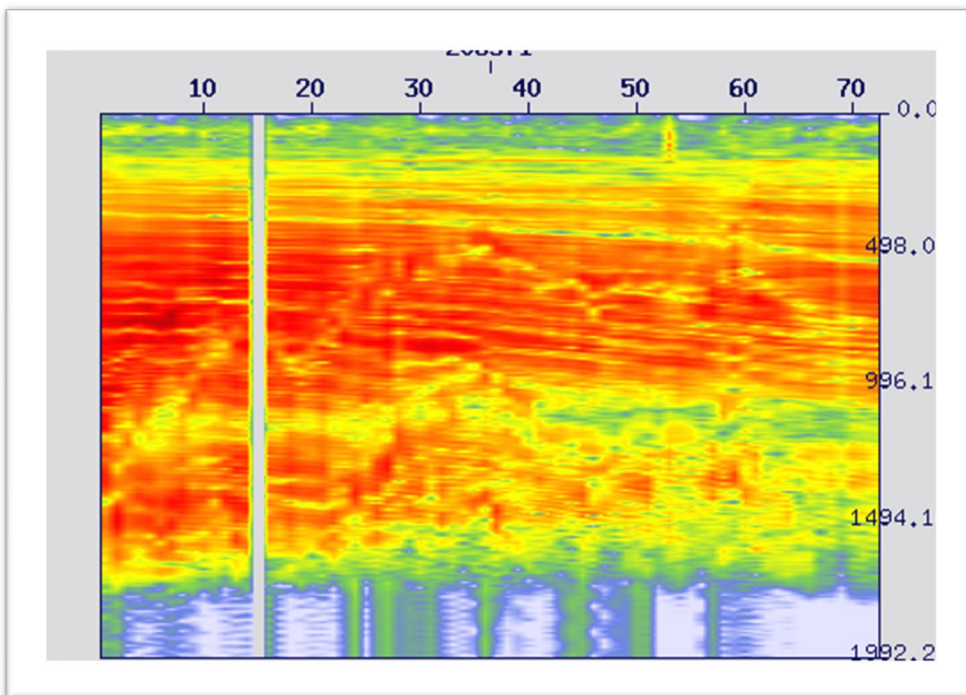
Shot gather before HRDEGHOST



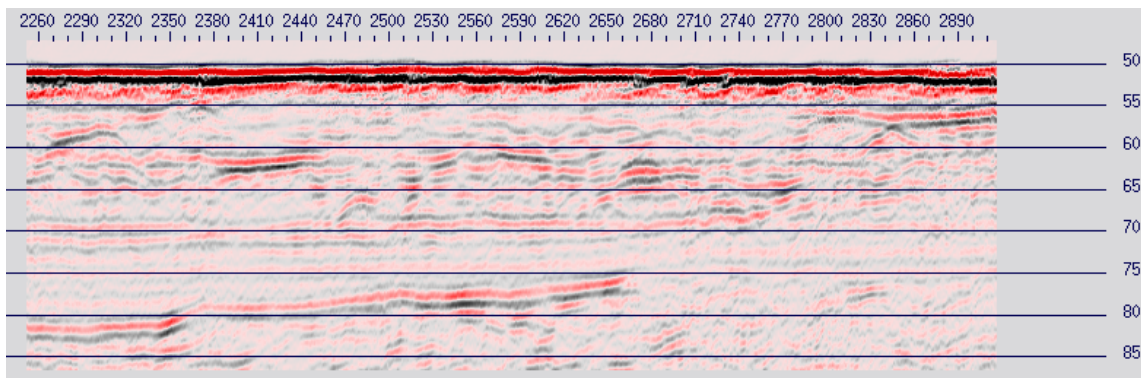
Shot gather after HRDEGHOST



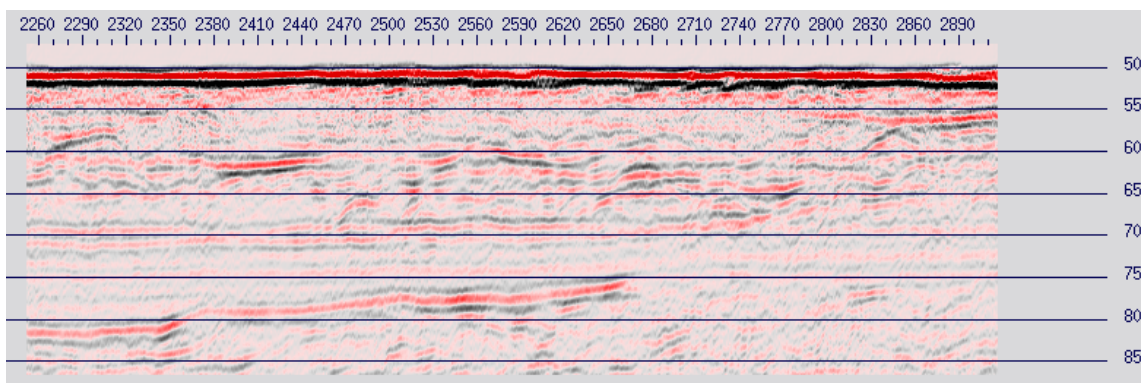
Shot gather – Amplitude spectra traces before deghosting, receiver ghost can be seen meandering across the gather from around 1200HZ to 750HZ as a low amplitude artefact.



Shot gather – Amplitude spectra traces after deghosting, receiver ghost has been corrected for and is no longer as obvious on this data.



Stack – Pre receiver deghosting



Stack – Post receiver deghosting

For further information about theory and method see “Receiver Deghosting of High-Resolution Shallow-Tow Seismic Data”, Henderson et al, 2023.

New QSEIS application

The qseis application replaces the sli and setdiscfold utilities. It displays the same key file header values (sample-rate, fold, sort-keys, etc.) as did sli, but also includes a tabbed display to show the processing history, support-files table, character and binary reel headers, trace header ranges and the option to list selected trace headers over a user-specified trace range.

qseis can be launched from modules with input/output capability such as SEISREAD and DISCREAD, Claritas applications such as SV/CVA and SMAP and from the SeisCAT application by selecting a dataset and from the right mouse button dropdown menu selecting the qseis option. The qseis application can also be run from the command line.

The main use for qseis is to be able to quickly display key information about a seismic input file, and supports SEG-Y Revision 0 and 1 files, Claritas extended SEG-Y, and Claritas HDF5 input formats. However, qseis can also be used to modify certain file header values (shot, CDP or file fold, primary & secondary keys, and so on).

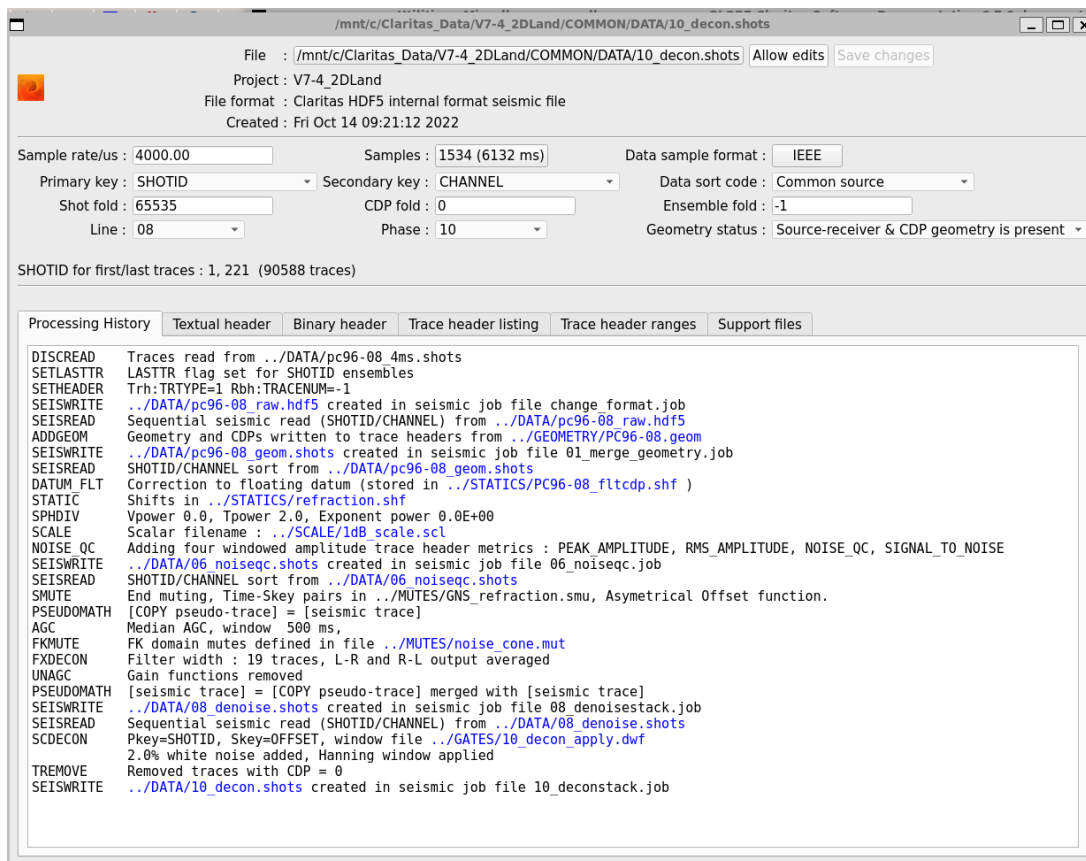
To put qseis into edit mode, click the “Allow edits” button. If editing is enabled on the input file, then the values that can be modified will be displayed in green, and any modified values will be in orange. If any values have been modified, then a “Save changes” button will be enabled; click on this to rewrite the binary header of the input file to receive the modified values.

You can select a different file to display, by clicking on the filename at the top of the qseis window and selecting a different file. The next section displays key file information including sample rate,

number of samples, primary/secondary keys, the data sample format, shot/CDP and file fold, line, phase and geometry status. Most of this information is editable when the Allow edits button has been pressed.

The final part of the display is tabbed to optimise display of information,

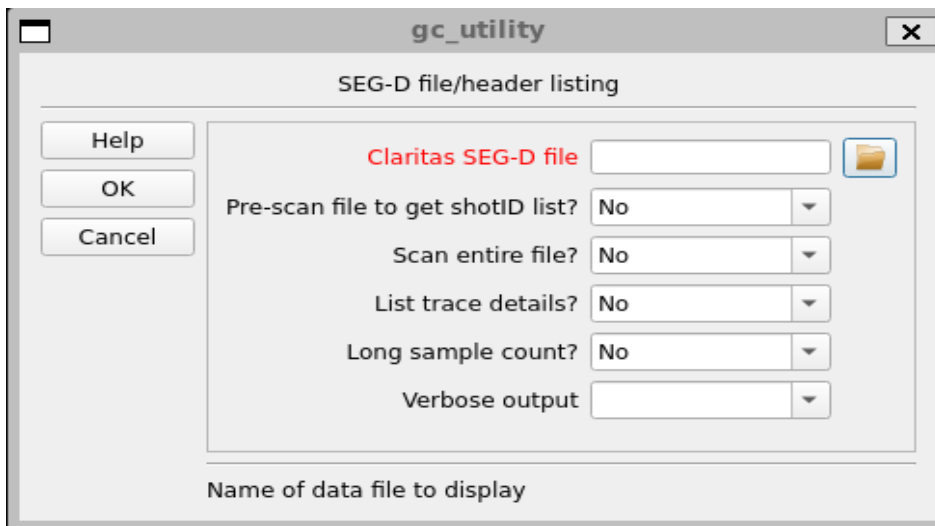
- Tab 1 displays the processing history for the dataset
- Tab 2 shows the Seg-Y Textual (EBCDIC/ASCII) header
- Tab 3 shows the contents of the file binary header
- Tab 4 provides a trace header listing – this tab allows the user to select which headers to list and the number of traces to display the listing for,
- Tab 5 provides the min/max ranges of all populated trace headers(HDF5 files only)
- Tab 6 lists the contents of the support files table (HDF5 files only).



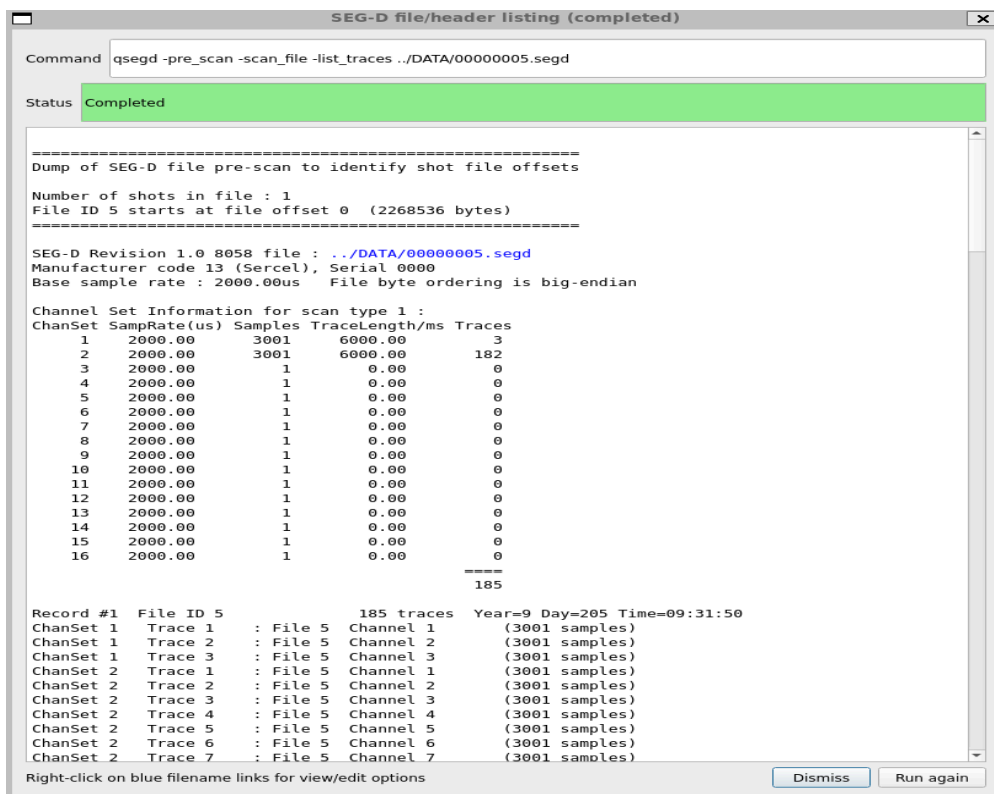
QSEIS Interface – Tabbed display to optimise viewing of information.

Update to the User Interface of Claritas utilities.

As part of efforts to modernise the User Interface for GLOBEClaritas we have implemented a standard look and feel for all of our utilities using a new PyQT application gc_utility as a wrapper to the utilities themselves as a result all our commonly used utilities like ASC-SUR/SPS/ASC-OBL/SPS, Initialise.nmo and QSEGD for example now display the parameter form using the gc_utility wrapper for both the parameter forms and output display where appropriate:-



QSEGD parameter form.



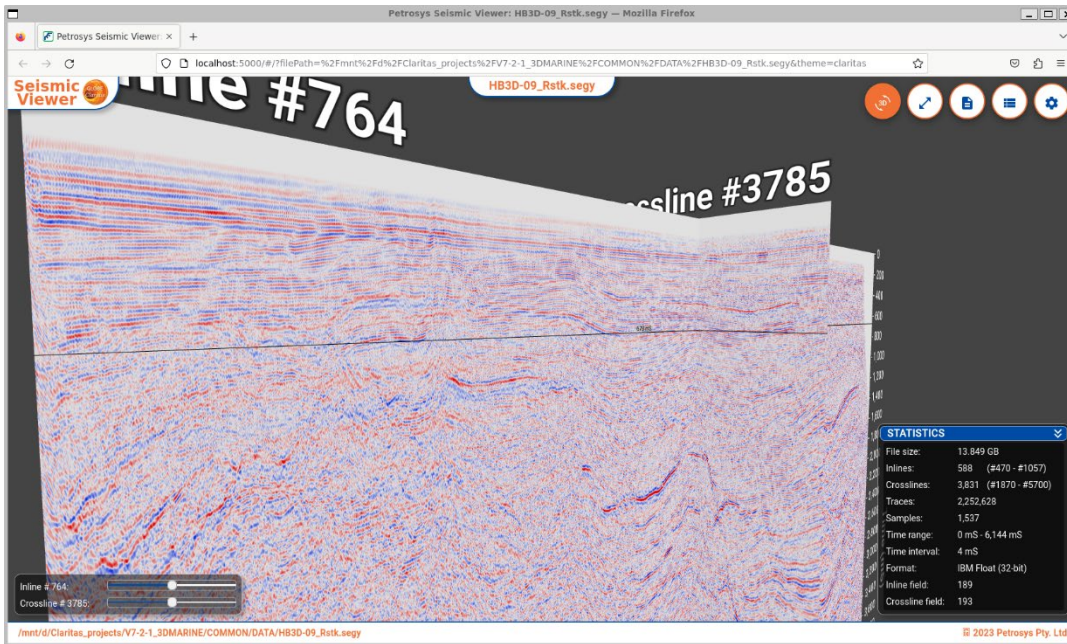
QSEGD Log file.

The resulting logfile shares a common look and feel to the Claritas JobEditors logfile.

New Seismic Data Viewer available as a Beta application.

As part of this release we have integrated a new 2D/3D data viewer developed by the wider Petrosys software team into the Claritas environment, this is available as a Beta application release, and is only able to work with SegY revision 1 format datasets, we aim to add support for CSEG Y and HDF5 format files as part of the 2023.1 release.

The application can display seismic data in a simple 2D view of Inline or a full 3D display that can be zoomed or panned interactively using standard mouse key interactions and displays Inlines and Crosslines. The applications uses HTML web viewer technology to provide a fast interactive experience leveraging the power of your GPU to visualise the data.



The four circular buttons on the top right of the web display provide the following functionality :-



- Button 1 with 3D and arrows allows user to swap between 3D view and 2D display.
- Button 2 is fit to screen/display all.
- Button 3 opens windows to display EBCDIC or Binary header
- Button 4 opens window to display trace headers.
- Button 5 dialogue window to choose colourmap and switch between VD and VAWG displays

The slider bars on the bottom right allow you to navigate through the data in the inline and Crossline domains.

Bottom right corner displays stats on the dataset being displayed :-

STATISTICS

File size:	13.849 GB
Inlines:	588 (#470 - #1057)
Crosslines:	3,831 (#1870 - #5700)
Traces:	2,252,628
Samples:	1,537
Time range:	0 mS - 6,144 mS
Time interval:	4 mS
Format:	IBM Float (32-bit)
Inline field:	189
Crossline field:	193

The viewer works with both 2D and 3D datasets with a simple 2D display ideal for 2D lines or for paging through inlines or crosslines, to swap between viewing Inline or Crossline click on the relevant slider bar.

2D Inline display :-

Petrosys Seismic Viewer: HB3D-09_Rstk.segy — Mozilla Firefox

localhost:5000/#/?filePath=%2Fmnt%2Fd%2FClaritas_projects%2FV7-2-1_3DMARINE%2FCOMMON%2FDATA%2FHB3D-09_Rstk.segy&theme=claritas

Seismic Viewer HB3D-09_Rstk.segy

Inline #635

Time (mS)

2031 mS

Crossline

Inline # 635: [Slider]

Crossline # 3785: [Slider]

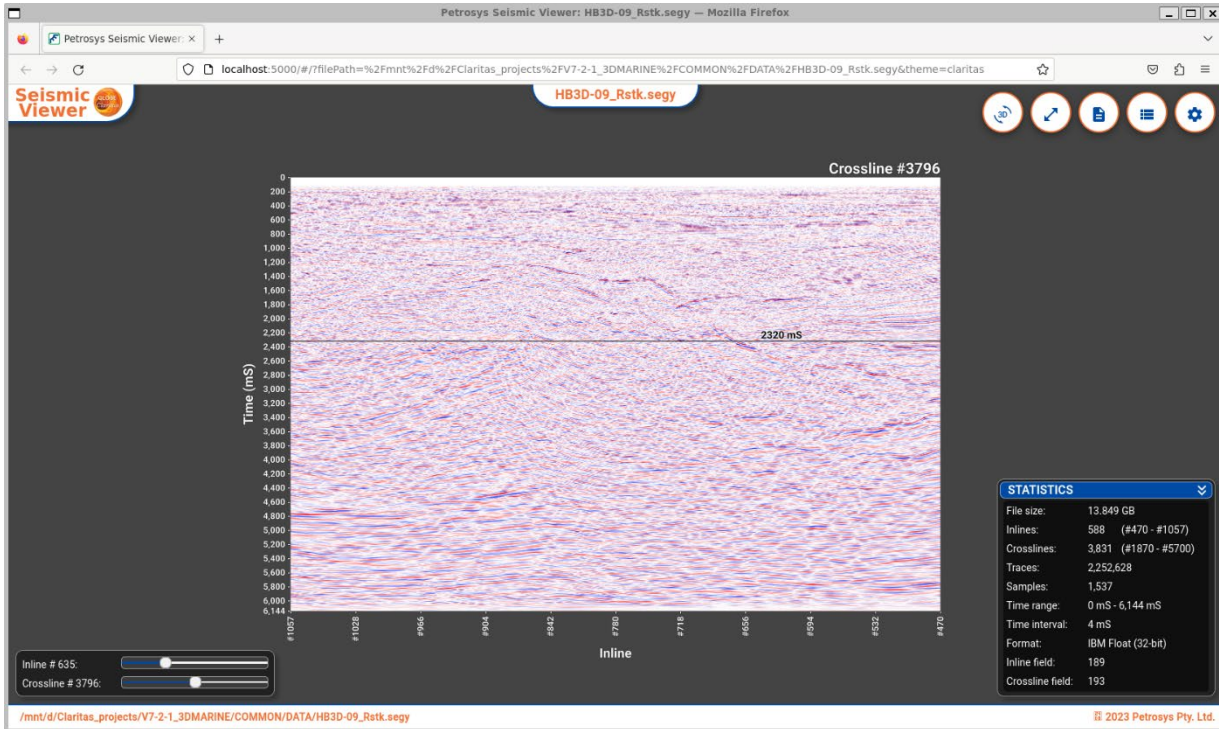
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/mnt/d/Claritas_projects/V7-2-1_3DMARINE/COMMON/DATA/HB3D-09_Rstk.segy

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2D Crossline display:-



We would be happy to receive your feedback on this viewer.

Job Editor - improvements

As part of this release we have resolved a number of small issues, bugs and improvement requests for the JobEditor delivered in the 2023.1.1 release. This includes decreasing the line spacing between modules and providing control to the user for the font size used by the JobEditor for the modules and parameter forms. This was a user request to allow the maximum number of modules in the window pane to provide similar functionality as the old xsje job editor.

In addition we were also asked to implement a similar module search capability as was present in the old job editor allowing users to find and add a module with ease into the job flow.

JobEditor no longer highlights the contents of a parameter field when the user is using the cursor to moved through the parameter, reduces the likelihood of a parameter being accidentally updated by the user.

There are a number of significant other improvements/bug fixes including updating of support files table by the JobEditor, missing MPI parameters in some IMAGE suite modules, prevent the JobEditor writing job files with incorrect suffix if the user mistypes, prevent the application crashing if the project directory is missing. Improved behaviour when opening a parameter form, previously opened at the same width as the JobEditor pane, it now opens at a size suitable to display all parameters in the module effectively. Original release it was possible to comment out or delete the SEISJOB module which is mandatory in the job flow, this unwanted gfeature has been removed.

Bugs found and fixed

CLARITASBUGS-331 – Provide user control of colour of the pick symbol for the first break picking function.

CLARITASBUGS-3920 – TOMO3D was failing to load first break pick information, this was as a result of allowing users to select which seismic trace header read, caused issues for the loading of .pic files.

CLARITASBUGS-3783 – Python environment changes.

CLARITASBUGS-3921 – XVIEW zoom windows now have the same functionality for selecting the colour map when displaying in VD mode as the main window.

CLARITASBUGS-3923 – JobEditor had a problem with a flow where the data sample rate changed within the processing flow, this has been resolved.

CLARITASBUGS-3925 – Job editor could create jobs with the wrong extension.

CLARITASBUGS-3926 – Port the new 3D Viewer from Petrosys Pro into Claritas

CLARITASBUGS-3927 – Added the SETDISCFOLD application as an option from the SeisCAT application.

CLARITASBUGS-3928 – ViewStatics can now display statics from the trace header.

CLARITASBUGS-3929 – If the original dataset was a SEG Y file, the 3200 Byte EBCDIC header is preserved and maintained in the Claritas dataset.

CLARITASBUGS-3931 – Provide user control of symbol and font size used by the first break pick symbols.

CLARITASBUGS-3933 – Update SV documentation to remove misleading information.

CLARITASBUGS-3936 – Update python-pptx to resolve o/s level issue with Pythom3.10

CLARITASBUGS-3937 – SeisCAT preserves choice of Line/Phase specified by User until removed by the user.

CLARITASBUGS-3938 – Updates to the VSPSTACK module.

CLARITASBUGS-3939 – Possible to remove or comment out SEISJOB module.

CLARITASBUGS-3940 – Resolve issue with reading PIC files by Tomo3D and REFSTAT3D.

CILARITASBUGS-3941 – JobEditor provides misleading warnings when user mistypes module name in command line.

CLARITASBUGS-3942 – Prevent users from removing the SEISJOB module.

CLARITASBUGS-3943 – HiresQC application added to the APPS menu,

CLARITASBUGS-3944 – Tomo3D crashing after pic and geometry files loaded.

CLARITASBUGS-3945 – JobEditor – Field contents highlighted when user navigates through parameter form using cursor.

CLARITASBUGS-3946 – JobEditor module width needs to automatically adjust so all fields visible

CLARITASBUGS-3947 – JobEditor when using the arrow keys to scroll down through parameter form should also scroll the form down to make new fields visible.

CLARITASBUGS-3948 – PRT_DEMULT add a C wrapper to allocate workspace arrays.

CLARITASBUGS-3949 – Reduce the number of compiler warnings produced by init phase modules.

CLARITASBUGS-3950 – SV was writing out incorrect primary key information in trace edit files.

CLARITASBUGS-3951 – ADDGEOM – Automatically create required binary headers for 3D gathers.

CLARITASBUGS-3952 – JobEditor – Penultimate field in the job editor parameters file has no label.

CLARITASBUGS-3955 – SV –Doesn't remember the VAWG gain or plot direction from the sv,xview file.

CLARITASBUGS-3956 – SV – Giving HDF5 error messages when exiting.

CLARITASBUGS-3957 – HiresQC.py failing when user selects to output wavelets.

CLARITASBUGS-3958 – Refstat – Improve the way layers are fixed

CLARITASBUGS-3959 – Viewmodel – Replace old xgrabsc screen grab with new png option.

CLARITASBUGS-3960 – Under WSL some of the pathnames can be very long, and some X11 gui's have a character limit.

CLARITASBUGS-3961 – Geometry – When saving floating datum statics to a ,shf file that file is written out before the geom database is updated resulting in a timestamp mismatch.

CLARITASBUGS-3962- ASCSUR – The point index column is being left blank – should be a 1.

CLARITASBUGS-3963 – JobEditor will crash if the project directory can not be found.

CLARITASBUGS-3964 – Prevent users specifying a directory or pathname with an unsupported character.

CLARITASBUGS-3965 – Create a new receiver deghosting solution for HR and UHR datasets

CLARITASBUGS-3968 – HiresQC should skip dead or zero amp data without aborting.

CLARITASBUGS-3969 – HiresQC -output wavelets – improved header information written out.

CLARITASBUGS-3972 – JobEditor – Implement module search capability.

CLARITASBUGS-3973 – Strange behaviour with JobEditor and multiple if loops for repeat job.

CLARITASBUGS-3976 – Geometry fix bug in new colourbar sees no colourbar appear And X11 error messages to screen

CLARITASBUGS-3980 – Provide a modern looking interface to the utilities.

CLARITASBUGS-3983 – HiresQC application missing modules..

CLARITASBIGS-3985 – Help buttons not displaying te correct section in HTML.

CLARITASBUGS-3986 – New qseis application replacing the sli and setdiscfold utilities.

CLARITASBUGS-3987 – SeisCAT won't launch Viewshf/ViewStatics on .shf files.

CLARITASBUGS-3989 – Allow MULMOD module to run within an MPISTART.END loop.

CLARITASBUGS-3990 – SYNGEOM – Should set rbh(SeisR_Geometry) to 2 if CDP's are present in the .geom file.

CLARITASBUGS-3991 – FBQC – Corrupting input datasets.

CLARITASBUGS-3992 – Improve documentation for SHOTPOINT module.

CLARITASBUGS-3994 – VSPSTACK – Fix bug introduced by recent updates.

CLARITASBUGS-3996 – TRFUDGE DOCS – explain more clearly about linking to gc_get_trhdr and get_put_trhdr.

CLARITASBUGS-3998 – IMAGE_3DKP and other Image suite modules missing MPI params in new JobEditor.

CLARITASBUGS-4001 – READSEGD not skipping past corrupt shots as it should.

CLARITASBUGS-4006 – JobEditor – not updating support files table.

CLARITASBUGS-4010 – JobEditor – decrease line spacing in tableau and allow font size change.

CLARITASBUGS-4011 – stb – valgrind errors.

CLARITASBUGS-4014 – FDMIG failing on extremely long profiles.

CLARITASBUGS-4024 – QSEGD – Failing to launch from SeisCAT.

CLARITASBUGS-4026 – HRDEGHOST parameter form not populating when module added to new JobEditor job flow.

CLARITASBUGS-4027 – HRDEGHOST module fails with python call failed.

CLARITASBUGS-4032 – Annoying behaviour when loading a license file into the License Manager application.

CLARITASBUGS-4033/4040 – Fix issue with Roaming licenses.

CLARITASBUGS-4034 – Update latest RLM release.

CLARITASBUGS-4037 – ViewStatics application highlight to user if incorrect geometry selected to display a shf file.

CLARITASBUGS-4038 – New JOB Editor Seg Faults when th x button on module param form is used to close the form.

CLARITASBUGS-4041 – HRDEGHOST – Failed if the number of channels varied across the dataset.

CLARITASBUGS-4044 – FDMIG – Fix a small bug causing one automated tests to fail.

CLARITASBUGS-4045 – Update to viewmodel to warn the user if the model file is badly formatted.

CLARITASBUGS-4048 – New 3D Data viewer not displaying data on Almalinux8 and Ubuntu20.04