Geogiga Seismic Pro 9.3 Release Notes

GEOGIGA
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Introduction

This document introduces the release of *Geogiga Seismic Pro* 9.3.

Geogiga Seismic Pro is a complete seismic data processing and interpretation software package adapted for near-surface geophysics. It contains 18 standalone applications handling the full range of seismic survey methods from Reflection, Refraction, and Surface Wave to Borehole Seismic. There are also utilities for wavefield modeling, velocity model plotting, and much more.
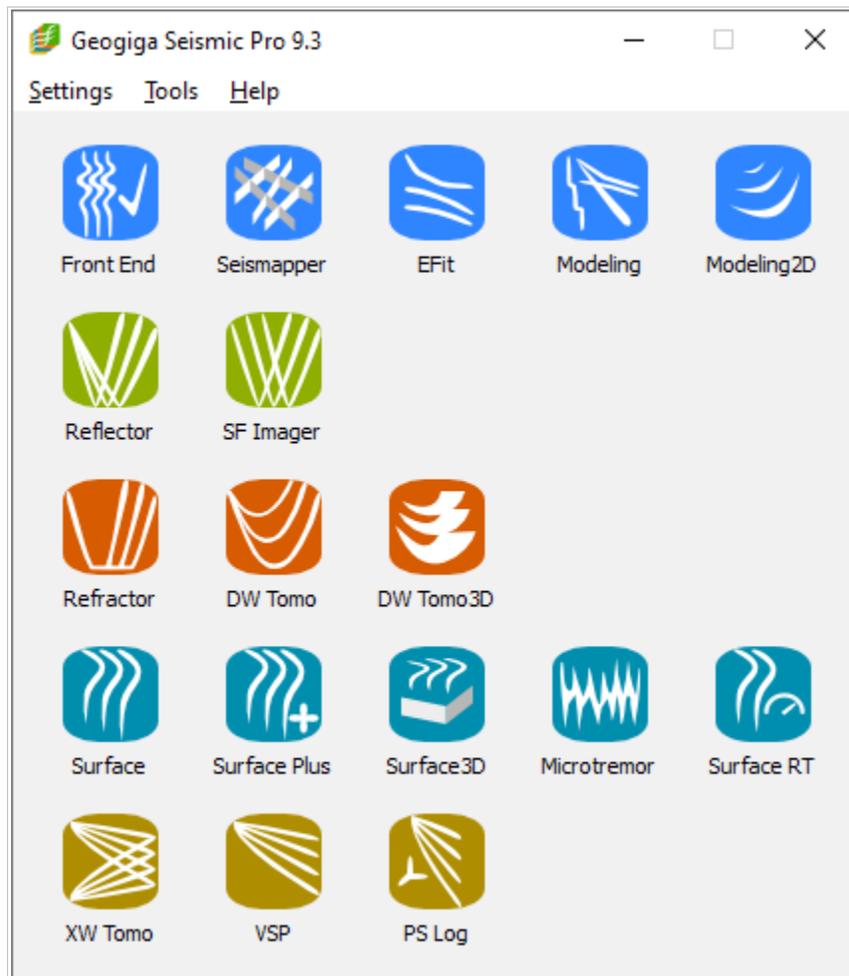
Geogiga Seismic Pro 9.3 Launchpad

Version 9.3 is a minor release, intended for minor feature updates and bug fixes. The release notes are provided in the following order:

➤ Part 1 – Feature updates.

➤ Part 2 – Bug fixes.

Part 1 – Feature Updates

This section lists the common feature updates to *Seismic Pro* 9.3, and then describes the updates in each individual module.

General Updates

The following updates apply to most of the modules in *Seismic Pro*:

➢ When individual records are imported, irregular shot point and receiver coordinates of all records can all be defined at once by loading geometry information from a text file, such as in CSV format. The coordinates of shot points and receivers of all records can also be saved together to a text file.

➢ In a geometry table, the receiver coordinates of an entire spread can be quickly assigned by interpolating coordinates of multiple selected receivers.

➢ Elevation data can be loaded from a file in CSV format.

➢ Large coordinates, e.g., GPS data, are no longer displayed in scientific notation to minimize input errors and improve convenience.

➢ When the **Custom Size** option is used to plot and save seismic traces to an image file, a prompt will appear if the specified scale is not appropriate.

➢ In a 3D view window, pressing and holding the **Home** key will simultaneously reset the scales of X, Y, and Z axes.

Updates to Individual Modules

Following are the updates to each individual module in *Seismic Pro*:

Front End

- ➢ In vibroseis correlation, the sweep signal can be chosen from either a file or the recorded vibroseis traces.

- ➢ The computational efficiency of vibroseis correlation is significantly improved.

- ➢ The geometry information is kept unchanged after multiple records are merged.

- ➢ When single-station data collected from nodal seismometers are merged, the list of files can include either filenames or filenames and station coordinates.

- ➢ A simpler text file format of seismic data is supported.

Seismapper

- ➢ The boundary of jointed velocity sections can automatically be smoothed.

Modeling

- ➢ A zero-phase wavelet can be specified for modeling reflected waves.

Modeling2D

- ➢ A dip angle can be defined for a layered velocity model.

- ➢ A finer grid can be specified to simulate wavefields for a higher frequency wavelet.

- ➢ The shot point and receivers can be located in a borehole.

- ➢ Vertical and/or horizontal components can be selected for modeling.

- ➢ Wavefield and seismogram snapshots can be saved to the same image file in order to conveniently create animation frames.

- ➢ The value range for the display of wavefield is automatically set to the appropriate value to avoid image flicker in the early stage of wavefield simulation.

Reflector

➢ Station numbers are no longer required in defining geometry of seismic records.

➢ Irregular coordinates of shot points and receivers are supported.

➢ CMP coordinates can be saved to a text file.

➢ The calculation of velocity spectra is more optimized, and the **Semblance Spectra** and the **Velocity Scan** dialog boxes are reorganized.

➢ A set of menu commands is dynamically added to adjust the display of subwindows during velocity analysis and when instantaneous attributes are built.

SF Imager

➢ Position instead of offset of the first trace is used in quickly assigning the geometry of other traces.

➢ A set of menu commands is dynamically added to adjust the display of subwindows when instantaneous attributes are built.

Refractor

➢ Surface velocity is calculated according to the regression lines of TT curves with shot depth correction applied instead of the distances between shot points and receivers.

➢ More third-party picks formats are supported.

DW Tomo

➢ More third-party picks formats are supported.

DW Tomo3D

➢ The upper and lower boundaries of a velocity model are automatically adjusted according to the survey geometry and the grid size of the model.

Surface and *Surface Plus*

➢ An interval velocity section can be plotted without interpolating adjacent layers.

➢ A more reasonable default time window for muting noise in active surface wave data is set, and the area outside the time window is darker instead of lighter.

➢ An option to plot the colorbar of a dispersion image is added.

Surface Plus only

 ➢ Dispersion images of multiple passive surface wave datasets with different array sizes can be combined.

 ➢ The focus of the dispersion image of the active surface wave data can be adjusted in order to balance the dispersion energy distributions of passive and active surface waves.

Surface RT

 ➢ The maximum waiting time for loading the next record can be adjusted.

 ➢ A group of buttons is added in the dispersion image window to vertically and horizontally zoom the dispersion image.

Microtremor

 ➢ The frequency spectra of three components and HVSR curves can be saved to a text file.

VSP

 ➢ A set of menu commands is added to separately adjust the display of original record, downgoing waves, upgoing waves, and stack.

Part 2 – Bug Fixes

This section lists the general bug fixes in *Seismic Pro* 9.3, and then describes the bug fixes in each individual module.

General Bug Fixes

The following bug fixes apply to most of the modules in *Seismic Pro*:

➢ The defined scales for curve display were always reset to their default values when the curve display window was reopened.

➢ When a plot of traces with color density was directly printed or saved to an image file with a custom size, the **Reverse** option for colormap did not work.

➢ The program stopped responding if the vertical scale value was too small when the **Custom Size** option was selected in outputting a trace image.

➢ The image size shown on the **Save Image** dialog box included the size of title and axis annotations, which caused confusion with the plot scale settings.

Bug Fixes in Individual Modules

Following are the bug fixes in each individual module:

Seismapper

➢ The program crashed when two parallel and very close sections were jointed.

Reflector

➢ Stacking was not conducted when the **Apply** button was re-clicked after the parameters in the **Stacking** dialog box were modified.

➢ The mouse cursor stopped providing feedback when some processing functions were applied.

SF Imager

➢ First arrivals picked on a previous seismic record were not cleared in memory and were wrongly displayed on a newly loaded record.

Refractor

➢ The shot depths were not saved in the picks file, causing incorrect depth section when first arrivals were loaded without seismic data.

DW Tomo

➢ If the input X coordinate at the highest elevation point was not within the range of a receiver spread, the shot points and receivers were incorrectly marked on the velocity section.

DW Tomo3D

➢ When the surface elevation varies greatly, the ray tracing in forward modeling was incorrect, causing large travel time errors.

➢ Channel numbers of receivers were not automatically assigned when individual records were imported.

➢ Refreshing the 3D view was abnormally slow when large coordinates were used.

➢ After the array geometry was modified, the maximum offset was not promptly updated and could not provide a reference depth for building the initial velocity model.

➢ The 3D view did not refresh after the parameters of an initial velocity model were modified, and the newly built model could not be viewed immediately.

Surface Plus

➢ The dispersion image of active surface wave data could not be generated if the **Remove Noise** option was selected when combining the dispersion images of passive and active surface wave data.

➢ When the dispersion images of two different sets of surface wave records were combined, extra traces were not involved in the calculation of dispersion images if the second dataset had more traces.

➢ When the dispersion images of two passive surface wave records with different sampling length were combined, the program crashed if the sampling length of the second record was shorter and was not an integer multiple of the segment length.

Microtremor

➢ The maximum values of frequency spectra and HVSR saved in the result file were obtained from the whole frequency range instead of the defined range.

➢ When the frequency spectra and HVSR were graphed on a logarithmic scale, the program stopped responding if the frequency interval was set to 1.

PS Log

➢ The plot of traces saved to an image file with a custom size was inconsistent with that in the display window: the S+ and S- waves were not overlaid, and the receiver depths were not annotated.

Technical Support

If you have questions or need technical assistance, please contact us using the information below:

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