

Release notes

GeoTeriC 2018.2

Volumetrics calculation is an essential step for understanding and quantifying the size of plays, leads, prospects and fields to track changing hydrocarbon volumes over time. Together with improved data loading, GeoTeriC ensures fast and effective evaluation of volumetrics can be made at any point during horizon interpretation, to enable confidence to take operations forward.

Key areas of updates in GeoTeriC 2018.2

Volumetrics

Validate

Data Loading & Exporting

Well Path Deviations and Checkshots

Bug Fixes

Volumetrics

A new process for the calculation of volumetrics within a structure. There are three types of calculation implemented together with some constant properties and fluid contact.

- **Horizon:** Volumetrics calculated from a combination of interpreted surfaces, one fluid contact and an area of interest (polygon).
- **Area-Volume:** Depth-Area-Volume calculations based on slices through an interpreted structure
- **Geobody:** Volumetrics calculated from a geobody
- **Output** .CSV sheet and saved volumetrics cases

Validate

As requested during evaluations the wedge model now indicates thickness measurements throughout the wedge in project units. The velocity is automatically taken from the linked layer or manually entered and the thickness is calculated which can be shown in metres or feet versus time. The wedge thickness scale and tuning graph can now be shown independently. Other changes include:

- Improved detection of wells in Arbitrary Line sessions
- Bug-210 Fixed the issue of the amplitude changing when the polarity is flipped. Additionally the amplitude of the model changed if the polarity of the wavelet was reversed, this has now been fixed as well
- Bug-214 There is now an alert for the user when selected well markers are outside the depth range of one or more well logs in the well log set. This is because the well log data is stretched to fit these well markers. The message is informational and does not prevent their usage
- Bug-226 Validate sessions are now stored by creation date and last access date, instead of alphabetically

- Bug-228 It is now possible to delete an old Validate session and rename an existing or new Validate session with the same name as the old deleted Validate session

Data Loading

Links for Decision Space Desktop and Petrel have been updated.

Decision Space:

- Allow all valid characters in volume name and ensure they work throughout GeoTeric
- Fix bug for volume unit which comes across as 'samples'
- Support for non-ASCII characters in particular support for UTF-8 characters
- Support for more naming variations for survey units
- Fixed failures when transferring volumes from GeoTeric to Decision Space, which were caused by naming conflicts
- Better logging has been enabled when transferring items such that the items have enough detail attached to help identify them by name / file location, and there is enough info to ensure good dimensions and placement
- Removed 'Timeout' when starting a new project from Decision Space
- Bug-50 Issue fixed which caused the connection to drop, together with an error pop-up after running Noise Expression (Windows only problem)

Petrel

- Update the link to enable support for Petrel 2018 version
- Select a global log to be brought across the link rather than requiring selecting individually the same log for multiple wells. All existing wells are updated with the new transferred logs
- Support for non-ASCII characters in particular support for UTF-8 characters

Data Loading SEG Y

- When starting the loading, the SEG Y will be put through an initial 'fast scan' to determine byte locations and the input file format
- Fast scan on import should now be able to detect most SEG Ys and show a survey outline
- File Header will show text header automatically, and then the full trace headers after running 'Analyse Headers'
- If the fast scan isn't successful, then the format can be selected or byte locations can be input manually
- New Full scan option should be able to take care of those SEG Ys that don't result in a valid survey from the Fast Scan, once the correct byte locations have been selected/input
- The old SEG Y loader can be accessed via the Advanced Setup for the options that are not yet available on the new loading process. All the selections from fast scan screen will be included in this loading procedure
- Load multiple SEG Ys in one go, when all are the same format
- Automatically applies offset to s8 data and imports it as u8 + text to inform user of what it will do

Data Loading Cultural Data

- Cultural data/Shape files: on import, select which attribute field should be used as the 'name' label in the 3D scene and as the polygon shape name in the project tree.
- Polygons: on import automatically give the imported polygon the name of the imported file.
- Zmap+ polygons: now uses the correct Z value column. Therefore the polygon is now loaded to the correct Z value instead of at a value of '1'.
- Load multiple polygons from within one file directly into one folder in the GeoTeric tree, thereby eliminating the need to move them into a folder once loaded.

Data Loading Checkshots

- Support for checkshots in Seconds and OWT
- Well and checkshot loaders scan first 200 lines of input files
- Bug-74 Fix for issues with poor well path trajectory rendering due to very high resolution checkshots surveys. See description below for '[Well Deviation and checkshots](#)'
- Connect to trace option for checkshots on loading

Data Loading Wells:

- Well and checkshot loaders scan first 200 lines of input files
- Well log import (LAS files) selection is now more user-friendly by enabling 'shift' button to select multiple columns
- Negate depth values when loading well markers
- On import of wells you can now type the values for name, XY coordinates and elevation into the loader's fields
- Bug-153 Editing of well markers by adjusting their time value caused the well marker to be incorrectly calculated and positioned
- Bug-154 Well loading: During loading of well trajectories, the process does not hang or crash when values contain the unit together with the value (e.g. 1234.56m)

Data Export SEG Y

- UI improvements for easy export of multiple SEG Ys in one go
- Automatic headers, which are easily editable
- Headers include any processing notes
- Headers are marked 'Full' or 'Truncated', depending on whether the notes exceed the SEG Y Header character limit
- Edit multiple headers when exporting multiple SEG Ys
- Exported headers now say 'Exported from GeoTeric' and show XY values
- Exporting to u8 uses 'AutoScale'
- When converting to float, disable 'Autoscale' option

Well Deviations and Checkshots

Updates have been made to improve well path deviations in terms of the calculation for the well trajectory for visual placement within the 3D scene and all 2D windows, Expression Tools and Validate.

Additionally calculations using checkshots surveys from depth to time have been corrected.

The changes lead to:

- Better extrapolation of well path trajectory when checkshots surveys do not extend through the entire length of the well, in time domain projects
- Accurate positioning in the time domain, due to better reference with checkshot data.
- Accurate positioning in the time domain for very deviated well paths
- Accurate well marker positioning in time and depth domain due to correct calculation for Measured Depth (MD).

These issues impacted the visual display of the well location and well markers and did not affect the original well data which is stored within GeoTeric.

For which wells was this not an issue?

Wells specified in TVD, X and Y and shown in depth domain were not impacted.

Wells loaded using the plug-in links connected to Petrel or Decision Space Desktop were not impacted as long as they used the synthetic checkshot data loaded through the links.

Well Path Trajectory Calculation in Time Domain

Issues:

- The checkshot survey did not cover the entire length of the deviation survey
 - For example when the well deviation survey extended beyond the last point in the checkshot survey
- Where the MD did not start at 0.

The well deviation trajectory was incorrectly extrapolated in the time domain for wells where the checkshots did not continue to the very end of the well. The well trajectory calculated would continue in the same direction as the last point encountered by the checkshot, ignoring any deviation information for the remaining points. This has been corrected by using the last interval velocity for all remaining MD points in the well after mapping the MD values back to the well path trajectory to give an accurate (change in Z) DZ.

Visual Display, & MD Calculation (depth to time & well marker placement)

Issue:

- The well deviation survey data-points were sparse compared to the checkshot survey
- The checkshot survey data-points were sparse compared to the well deviation survey.

For all wells loaded using MD, Inclination and Azimuth, a calculation was performed to save the well path into GeoTeric using X, Y and Z, correctly using minimum curvature.

Once calculated, the well path trajectory was displayed visually using straight lines between all the loaded deviation data-points without using minimum curvature.

This led to errors later in the calculation of MD for depth to time conversion and for placement of well markers. The fewer the well deviation data-points loaded (ie. sparse data), the greater the apparent visual error and in processes using MD.

Wells with detailed deviation points where there was a small distance between the deviation data-points, would appear correct visually, but would still be drawn with a straight line between these points. The error was smaller and probably not visually noticeable or as apparent in well marker placement and depth to time workflows.

Highly deviated or horizontal wells were the most impacted visually.

This has been corrected by re-sampling the data at high resolution (0.5 well vertical units). This is performed for visual well placement in the scene, and for calculation of depth to time and placement of well markers.

Depth to Time Calculation

Issue:

- Checkshot data-points which did not coincide exactly with MD data-points in the well deviation survey

Interval velocity was incorrectly calculated using delta MD instead of delta TVD. If the well path was not vertical, then this value of delta MD was a poor approximation and led to incorrect extrapolation. This has been corrected by using the correct delta TVD.

Well Markers

The well path deviation is used to position any well markers which are saved within the project. Well marker positioning is calculated according to their MD values as loaded and saved. The MD value of the well marker is used with reference to the well path as calculated using the new resampling as described above. Therefore it is possible that the well markers position will be updated along with the well path.

What action is required?

There is no requirement to reload any existing well data.

The well path visualization calculations are performed on the fly when a project is opened. Therefore the project can be opened in GeoTeric 2018.2 or in GeoTeric 2018.1.2 or earlier versions and the wells will be calculated using the existing formula contained within each version. No data is saved to the project during this calculation. Original loaded data is always stored without alteration.

The first time a project is opened in GeoTeric 2018.2, and the project contains wells, a popup will request that you QC the wells, since they may have been moved due to the new calculations.

Any projects subsequently re-opened in earlier versions of GeoTeric such as GeoTeric 2018.1.2 will use the original deviation and checkshot calculations for wells. Therefore well positioning will potentially be incorrect on those earlier versions.

Other

Can now use any characters in project item names

Bugs

37 further legacy bugs have been fixed in GeoTeric 2018.2.

- Bug-263 Calculating the well velocity no longer causes crashes
- Bug-262 GeoTeric now gives a warning on start-up if drivers are not NVIDIA CUDA supported drivers (issue happened in particular with Mirror drivers)
- Bug-261 Wells are now displayed on arbitrary lines in Validate
- Bug-260 The 'add well to cross section' option was missing and has been fixed
- Bug-259 Editing the blend within the 2D RGB viewer was displaying the changes to that blend only in the 3D scene. Now the changes are also displayed in the 2D RGB viewer as expected
- Bug-253 When picking arbitrary lines, GeoTeric would crash if an overlay was turned on where the overlay source did not exist in the project
- Bug-252 Editing colour blends in the 3D scene now visually updates automatically, without having to remove the object from the scene and display the object again, to get the update.
- Bug-251 IPS: Applying the iso-proportional map to an exported horizon from iso-proportional slicing would cause a crash
- Bug-246 An update to the IFC+ wells which were giving markers in the incorrect position in time due to the sparse MD log. This has been fixed together with the issues described in the update to well trajectories described in 'Well Deviations & Checkshots' section above
- Bug-244 Colourblends: Contrast Enhance is now applied without having to reapply the 'scale recalculated'
- Bug-230 Spectral Expression was popping-up a message to say that "Processing cancelled at user request" which was not the case. This occurred with volumes which had NAN values. The process now runs without error messages
- Bug-228 Validate. It is now possible to delete an old Validate session and rename an existing or new Validate session with the same name as the old deleted Validate session
- Bug-227 Validate: Very long volume names can now be viewed in the drop-down menu for the volume or blend display in the Forward Model window
- Bug-226 Validate sessions are now stored by creation date and last access date, instead of alphabetically
- Bug-216 IsoProportional RGB post-scale settings were not remembered and were different in the preview and in the 3D scene
- Bug-214 Validate: There is now an alert for the user when selected well markers are outside the depth range of one or more well logs in the well log set. This is because the well log data is stretched to fit these well markers. The message is informational and does not prevent their usage
- Bug-210 Validate: Fixed the issue of the amplitude changing when the polarity is flipped. Additionally the amplitude of the model changed if the polarity of the wavelet was reversed, this has now been fixed as well
- Bug-183 Base Map: When opened initially the base Map will open with a default size which enables the user interface to offer all functionality buttons and options so that they can be easily chosen and used. This does not prohibit the user to change the size of the user interface
- Bug-181 In the Interpretation window on a Z-slice, the well symbols are now larger and linked to the well

- Bug-175 Interpretation Window: A slice which had been viewed in the interpretation window and then updated e.g. from inline to crossline would cause the window to be blank. The interpretation window is now updated correctly
- Bug-170 IFC+ does not now allow selection of volumes or blends with different data types, e.g. 16-bit and 32-bit volumes). Previously selection of these would cause a crash or incorrect results
- Bug-154 Well loading: During loading of well trajectories, the process does not hang or crash when values contain the unit together with the value (e.g. 1234.56m)
- Bug-153 Editing of well markers by adjusting their time value caused the well marker to be incorrectly calculated and positioned.
- Bug-151 Spectral expression: Fixed a crash when using a long trace Butterworth bandpass filter
- Bug-148 NoiseExpression Structurally Orientated Noise footprint: Can now run in batch process with a maximum up to 13 to match the functionality available in the Noise Expression Tools
- Bug-147 IsoProportional attribute: No longer gives a blank geomage on export in most instances, with exception of some mobile graphics cards
- Bug-146 When the PC was busy during the start-up of GeoTeric it could cause a blank screen, which required a re-start, which has now been fixed
- Bug-139 Expression Tools: if the colourmap was compressed due to low amplitude data, the low amplitude data in the Expression tools (all product x viewers) were washed out. This effect has been fixed
- Bug-138 When reversing the colourbar, the legend in the scene is now also updated
- Bug-131 ISO Proportional Slicing: No longer crashes when using a colourmap which was imported from Petrel
- Bug-130 Hidden (transparent) voxel values are now reported either as the value of the hidden voxel or as 'no value' depending on which is selected, instead of as a zero value in the location reporting
- Bug-115 ISO Proportional display and the 3D scene were showing differences even through the same object was viewed in both. This was due to the post-scale which was not being applied correctly to the 3D result
- Bug-74 Detailed checkshots with high resolution were not being used correctly to calculate the well trajectory in time. See section '[Well deviations and checkshots](#)'
- Bug-50 Transferring volumes from GeoTeric to Decision Space via the link was causing an error pop-up and the transfer was not possible. This has been fixed
- Bug-47 Fixed an issue where a Geobody overlay did not display
- Bug-23 Either inline or crossline border was misaligned with respect to the actual inline and crossline. The movement of the slice was also restricted when this issue was present. This issue is now fixed
- Bug-17 Visualised inline, crossline or time slices lose their 'bold' selection in the project tree in many situations. This has been fixed and the 'bold' status should remain during various functionality workflows