MARS® v2025.0 Release Notes

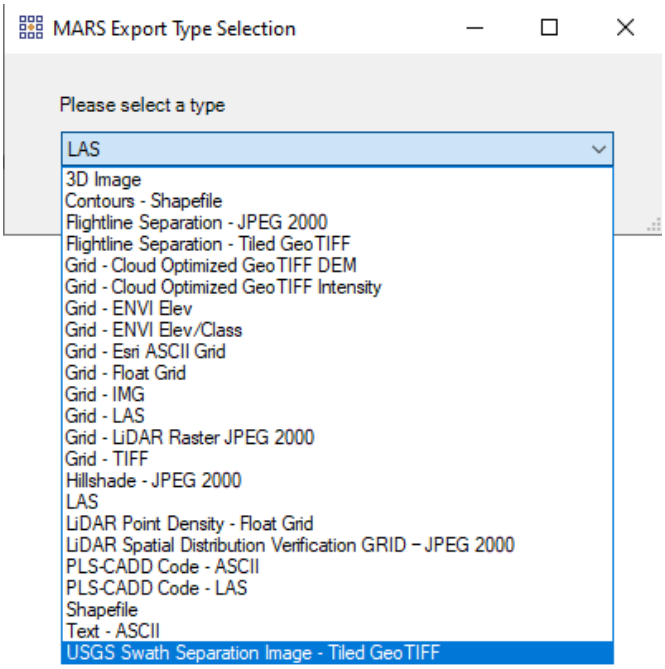
Revised: June 30, 2025 (Builds 8624.01 – 8624.82)

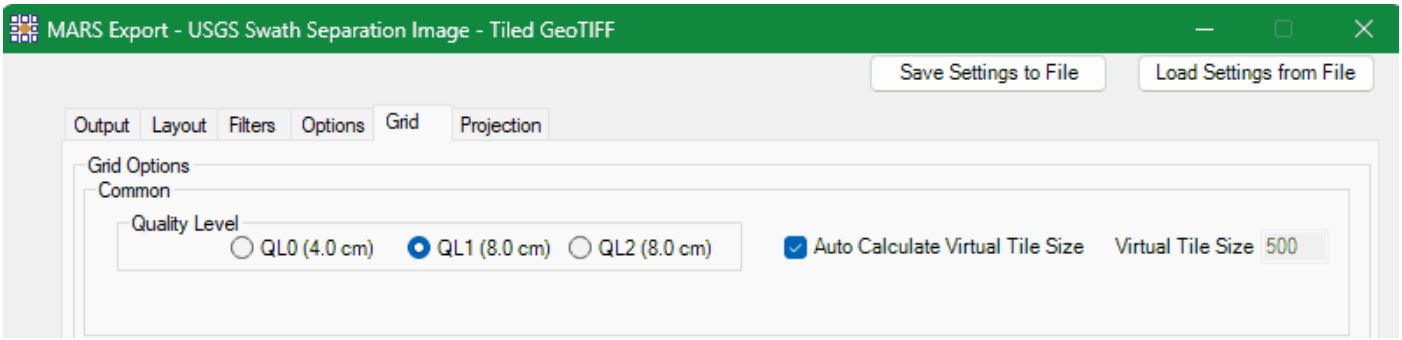
Contents

New Features

New export type for Swath Separation Images (SSI)

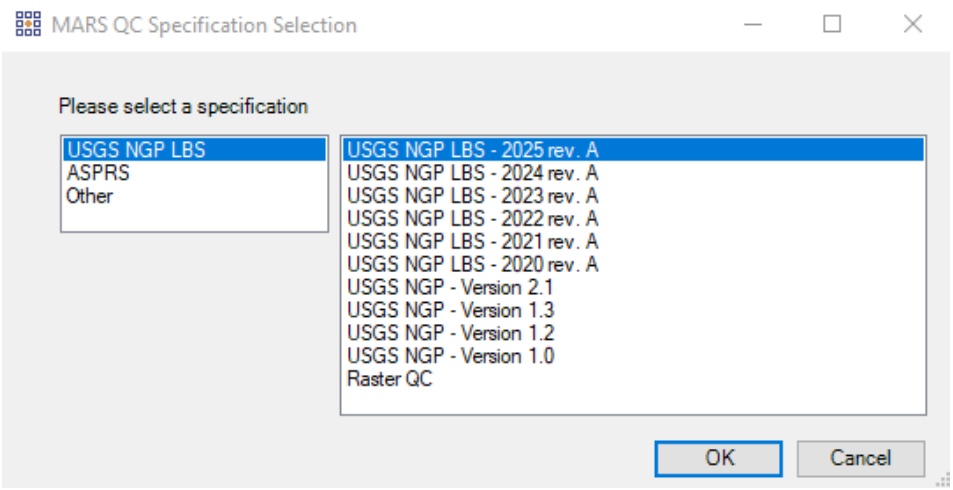
This option exports GeoTIFF rasters based on selected tiles from a loaded tile layout, depicting collection scan (flightline) separation Z difference values with an intensity image background, using pre-determined settings that adhere to the latest USGS NGP LiDAR Base Specification.





QC Module drop-down selection added for USGS 2025 lidar specification

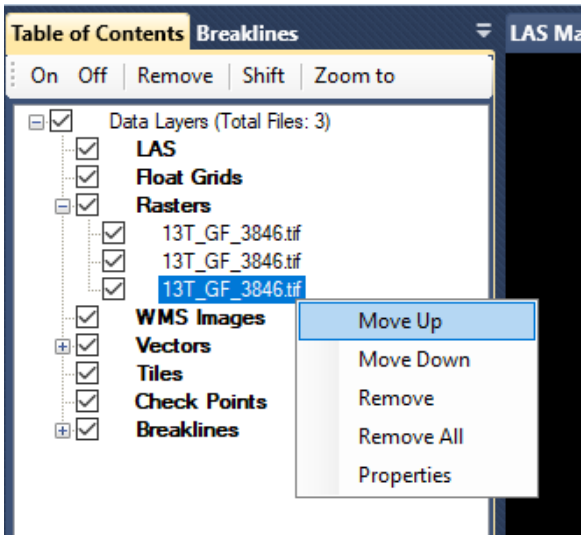
A new option to check LAS data compliance with *USGS Lidar Base Specification 2025 rev. A* (June 2025) has been added to the selection list of the QC Module tool. NOTE that as of the date of this MARS® release, *USGS Lidar Base Specification 2025 rev. A* (June 2025) is the most current lidar specification published by the USGS.



Enhancements

Improvements to raster ordering and display options

Two changes have been made regarding the ordering of rasters in the Table of Contents and the drawing priority of loaded rasters. First - when two or more rasters are loaded, individual rasters can be moved up or down (one position at a time) in the Table of Contents. This is done by right-clicking a raster entry and selecting either 'Move Up' or 'Move Down' from the context menu. The position of a raster in the list affects the second change – the raster listed at the top in the Table of Contents will display last (i.e., on top of) all other rasters being displayed.



Additional statistic presented for ‘USGS NGP LBS – 2024 rev. A’ final reports

In the frequency distribution chart produced for the final PDF reports for test DPH-9.1 of the ‘USGS NGP LBS – 2024 rev. A’ QC Module selection, the statistical mode of the Measurable Flightline Separation raster cell values is now presented along with the RMSDz value.

Enhanced report created for ‘3D Accuracy’ mode of the ‘Check Point Report’ tool

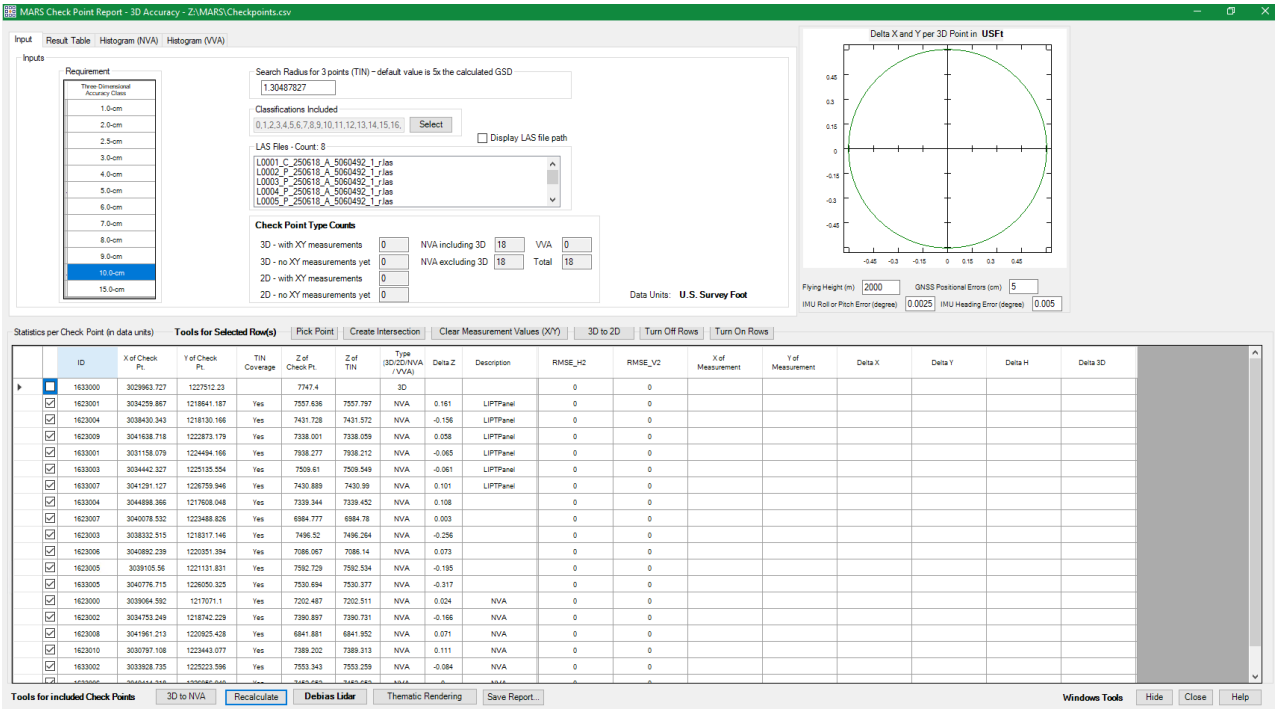
- When saving a report in the ‘3D Accuracy’ version of the ‘Check Point Report’ tool, the information presented on the first page now includes counts for all included check point types that have TIN coverage.

Check Point Type Counts

3D - with XY measurements: 49	NVA including 3D: 146	VVA: 37
3D - no XY measurements yet: 0	NVA excluding 3D: 97	Total: 183

3D points with TIN coverage: 49
NVA points with TIN coverage: 97
VVA points with TIN coverage: 37
Total points with TIN coverage: 183

- The action buttons have been re-organized for clarity, grouping the tools that are usable per check point together and the tools that are usable per project together. Some functions, such as turning off a point to not be used, need a ‘Recalculate’ action to update the loaded check point file. For more detailed information, please refer to the ‘Quality Control’ | ‘Check Point Report’ topic in the Help Manual.



- Added the ability to handle 2D type check points for situations in which the Z value is not usable, but the XY values are. Additionally, 3D points can be converted to 2D when the Z value is found to not be valid.

Additional layout option implemented for the ‘Flightline Separation – Tiled GeoTIFF’ export type

The ‘All Tiles using MBR’ Layout tab option is now enabled when exporting using the ‘Flightline Separation – Tiled GeoTIFF’ export type. This option will export all tiles in the loaded tile shapefile by default if no tiles were pre-selected before starting the export interface.

Test added to both the 2024 and 2023 versions of the ‘USGS NGP LBS’ drop-down in the QC Module

Both the ‘USGS NGP LBS – 2024 rev. A’ and ‘USGS NGP LBS – 2023 rev. A’ options in the QC Module now include an additional test – ‘DPH-13 Report on Scanner Channel Bit Flags.’ This test reports on the values present for the ‘Scanner Channel’ field stored for each point. Single channel sensors should have all points stored as ‘0,’ dual channel sensors should create values of both ‘0’ and ‘1,’ and so on.

Automatic refresh implemented for both histogram tabs in the ‘3D Accuracy’ interface of the ‘Check Point Report’ tool

When either the NVA or VVA Histogram tab is active (displayed), clicking the ‘Recalculate’ button will force a refresh of that histogram.

Check Points in the main MARS window are now colorized to match the histogram bar they belong to when the ‘Redraw Thematically’ option is used.

For both the ‘Vertical Accuracy’ and ‘3D Accuracy’ options of the ‘Check Point Report’ tool, invoking the ‘Redraw Thematically’ option for the ‘Z Error’ histograms will colorize the Check Points in the main MARS window to match the histogram bar they belong to.

Saved Check Point Report now includes the Collection Date field in the output shapefile.

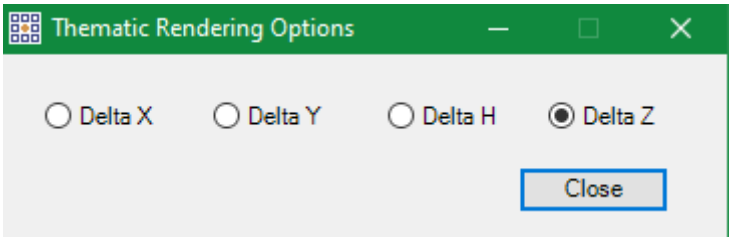
When a ‘3D Accuracy’ Check Point Report is saved (by clicking the ‘Save Report…’ button), the collection date column from the input CSV check points file is carried over as a field named ‘Coll_Date’ to the point shapefile that is produced as part of the output.

Unnecessary button removed from the ‘3D Accuracy’ interface of the ‘Check Point Report’ tool.

The ‘Save to CSV’ button has been removed from the bottom of the ‘3D Accuracy’ interface in the ‘Check Point Report’ tool. Since the input CSV file is updated automatically updated when user XY measurements are made as well as when the ‘3D to NVA’ function is used, the button is not needed.

Additional options available for the thematic rendering function in the '3D Accuracy' method of the 'Check Point Report' tool.

The 'Thematic Delta Z' button has been re-labeled to 'Thematic Rendering' with several new options added. When clicked, the '3D Accuracy' interface will be hidden (not closed), and the rendering of the loaded check points will be based on their Delta Z value. A small control will appear with four options: 'Delta X,' 'Delta Y,' 'Delta H,' and 'Delta Z' (the default). Selecting any other radio button will change the check points' rendering to reflect those values. When the control is closed, the main '3D' Accuracy' interface re-opens with the 'Thematic rendering' button labeled as 'Redraw Normal.' Clicking it will return the check points display to their normal symbology.

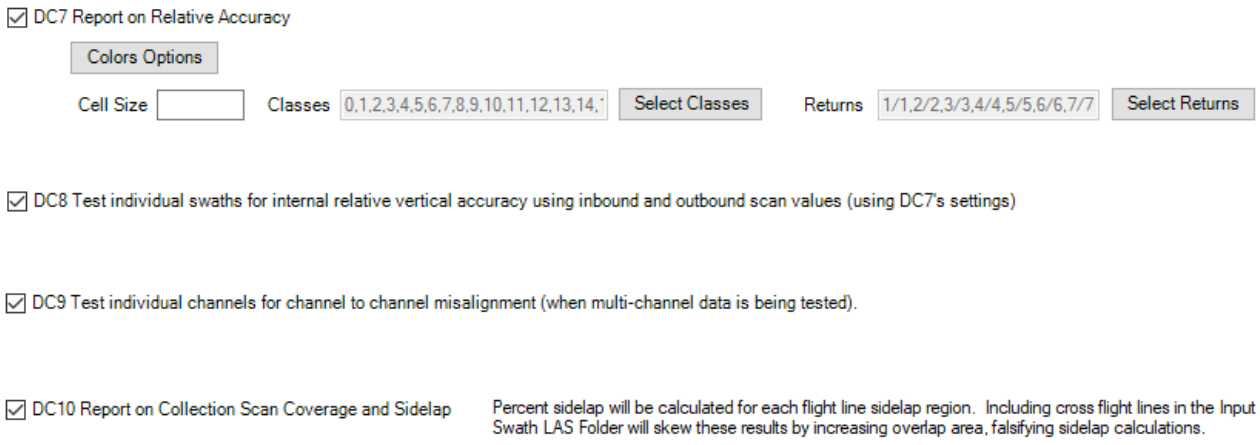


Test added to the 2024 version of the 'USGS NGP LBS' drop-down in the QC Module.

The 'USGS NGP LBS – 2024 rev. A' option in the QC Module now includes an additional test – 'DPH-2 Report on WKT String' to report on the tiled lidar files' WKT strings as compared to the user-entered (expected) CRS information. This test is also available for the latest 'USGS NGP LBS – 2025 rev. A' selection.

Performance improved for several tests in the 'LiDAR Workflow QC – 1 LiDAR Data Checks' drop-down in the QC Module.

On four tests of the 'LiDAR Workflow QC – 1 LiDAR Data Checks' drop-down in the QC Module, performance has been significantly enhanced, and the interface options have been simplified to avoid confusion as to the appropriate settings. The improved tests are DC7, DC8, DC9, and DC10.

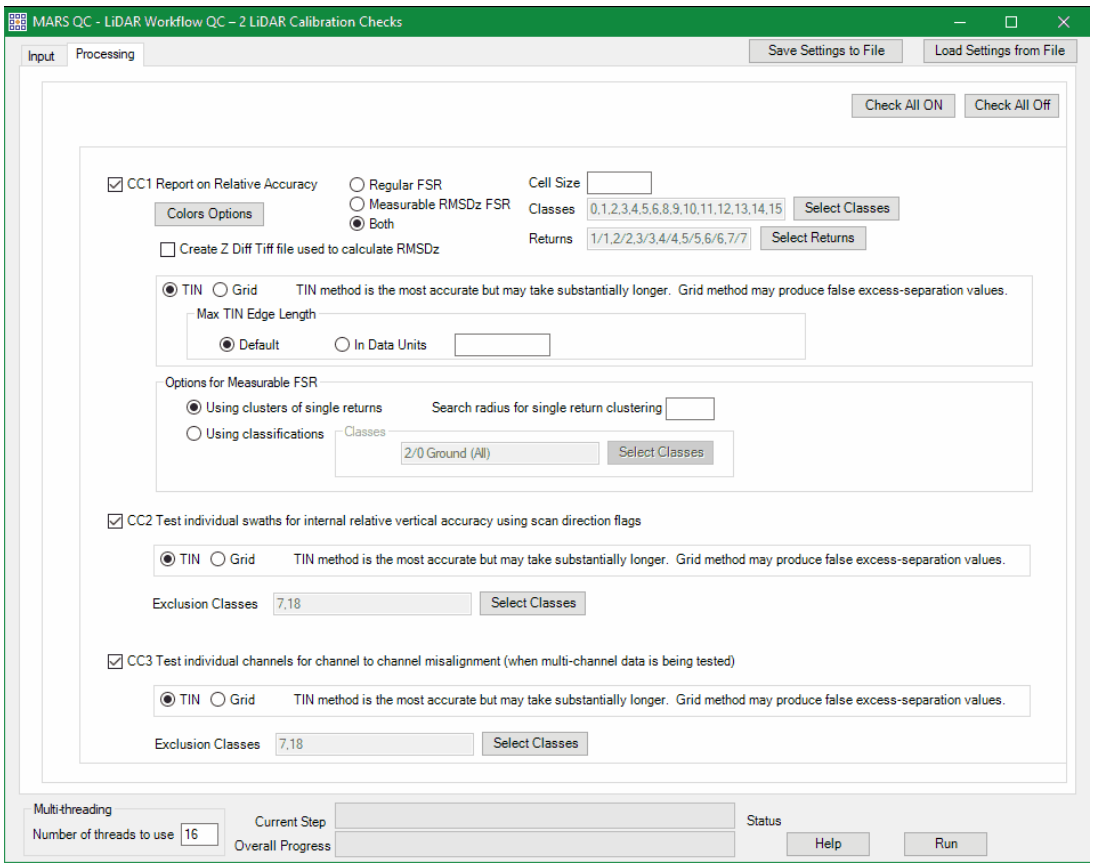


A ‘Time Spent on Each Step’ page has been added to the end of the final report for the ‘LiDAR Workflow QC – 2 LiDAR Calibration Checks’ drop-down in the QC Module.

In the final report PDF created for the ‘LiDAR Workflow QC – 2 LiDAR Calibration Checks’ drop-down in the QC Module, a ‘Time Spent on Each Step’ page has been added to show the impact of each of the three possible tests on the total processing time.

Redesign and clarification of the interface for the ‘LiDAR Workflow QC – 2 LiDAR Calibration Checks’ drop-down in the QC Module.

The ‘Processing’ tab of the interface for the ‘LiDAR Workflow QC – 2 LiDAR Calibration Checks’ drop-down in the QC Module has been resigned to group controls together more logically and to eliminate confusing settings.



Standard Windows file selection controls are now implemented for more tool interfaces.

The standard Windows keyboard/mouse selection controls of ‘Ctrl-click’ and ‘Shift-click’ are now available for selecting and de-selecting files in many more tool interfaces. All tool interfaces that look similar to either:

-- or –

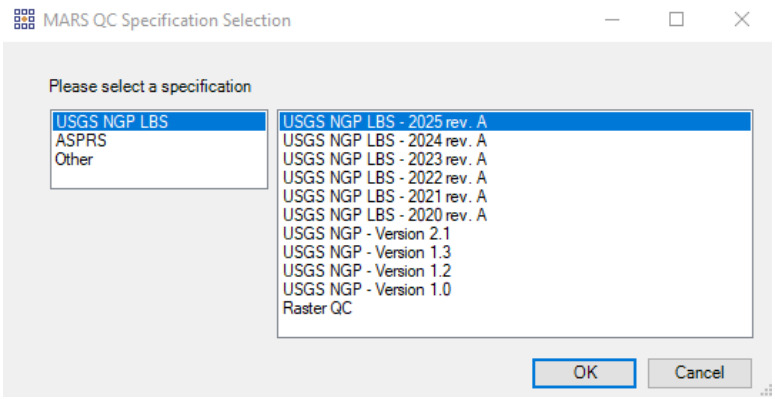
will allow the use of these Windows selection controls.

Enhancement made to the Delta X/Y plot in the ‘Check Point Report’ tool to aid in 3D check point analysis.

To make analysis of 3D check points easier when using the ‘Check Point Report’ tool, any ***Type 3D*** point rows selected in the individual check point table will have their corresponding point marker(s) highlighted by a small red circle on the Delta X/Y circular plot.

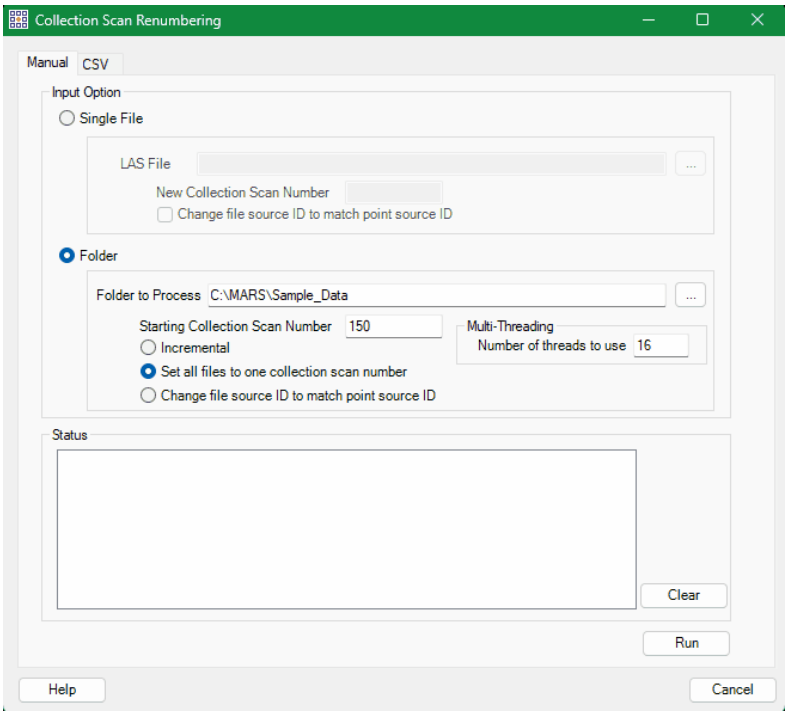
Changes to QC Module Specification Selection Interface.

The QC Module Specification Selection Interface is now divided into 3 categories - USGS NGP LBS, ASPRS, Other - to further clarify each application.



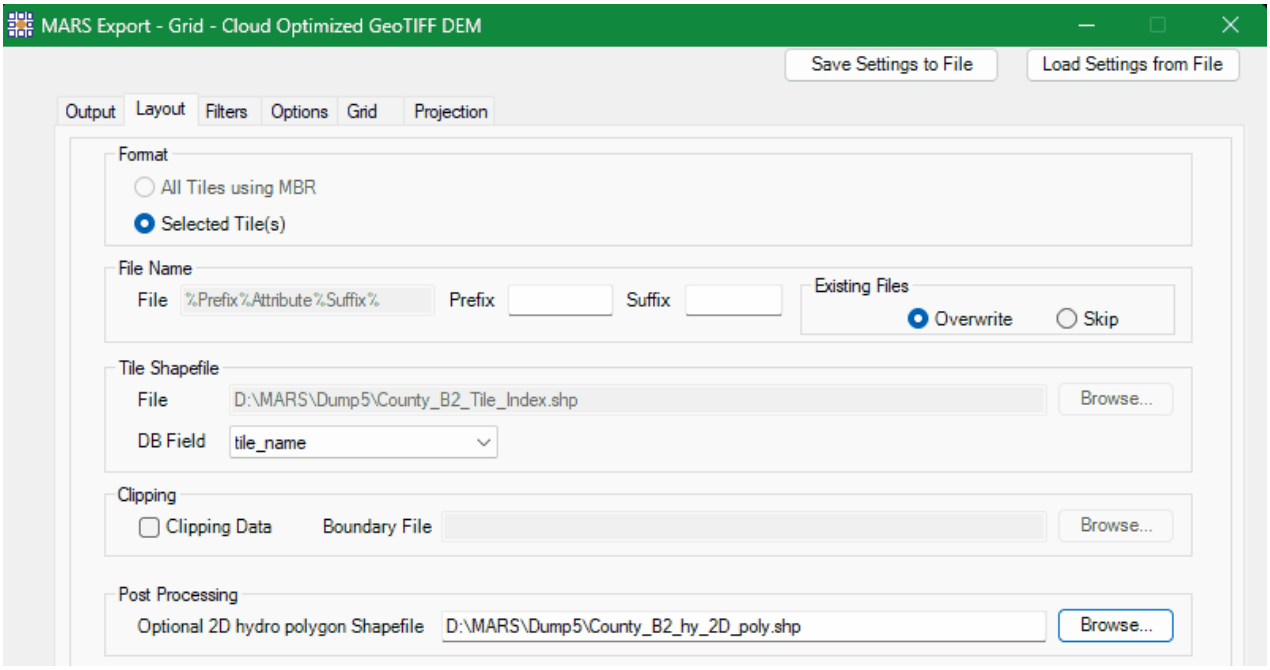
Collection Scan Renumbering Tool enhancement

An option was added to renumber all swaths in a folder to the same PSID.



Option to improve surface appearance of river polygons in two raster export types.

An option specific to the 'Grid – Cloud Optimized GeoTIFF DEM' and 'Grid - Float Grid' export types is available in the 'Post Processing' section of the Layout tab. When using a loaded 3D polyline breakline file to define the shorelines of river polygons, a pre-existing 2D polygon shapefile of river shorelines can be pathed out to improve the elevation modeling of the river surface in the output rasters.



Bug Fixes

- Bug fixed in ‘Flightline Separation – Tiled GeoTIFF’ export that caused RAM usage to reach 100% and crash.
- Bug fixed causing a blank display when the ‘Swipe Raster Over LiDAR’ tool was used.
- Bug fixed in some QC Module USGS versions that occasionally caused test DPH-9.1 to produce a blank raster and frequency distribution chart.
- Bug fixed causing incomplete Float Grid and Hillshade exports.
- Bug fixed in some QC Module USGS versions for test DPH-15 that caused blank rasters for projects with two or more separate boundary areas.
- Bug fixed that crashed MARS or produced no output if a second instance of ‘LiDAR Workflow QC – 2 LiDAR Calibration Checks’ is run with test CC2 checked without closing and re-opening MARS first.
- Bug fixed causing the ‘Help’ buttons on both the ‘Vertical Accuracy’ and ‘3D Accuracy’ interfaces of the ‘Check Point Report’ tool to report an error and not display the correct Help Topic.
- Bug fixed in the ‘Check Point Report’ tool causing updated XY measurements to revert back to previous values when the 3D Accuracy interface is closed and re-opened in the same MARS session.
- Bug fixed in some QC Module USGS versions for test DPH-9.1 that caused a crash if one or more DPA polygons contained lidar points with a single PSID.
- Bug fixed causing empty output when the ‘Flightline Separation – Tiled GeoTIFF’ export type is run with the ‘All Tiles using MBR’ layout option and the lidar data is pathed out (not loaded).
- Bug fixed in ‘Grid – Cloud Optimized GeoTIFF DEM’ export type causing Z errors at tile edges.
- Bug fixed that halted processing in the ‘GPS Time Conversion’ tool when using the ‘GPS Adjusted Time to Week Time’ option.
- Bug fixed for the ‘Hillshade – JPEG 2000’ export type that failed to properly save the ‘Algorithm’ selection of ‘Median Point of Cell’ in the settings XML file.
- Bug fixed for ‘Grid – Cloud Optimized GeoTIFF DEM’ and ‘Grid – Float Grid’ export types that occasionally caused raster artifacts in water bodies when outputting by tile.

MARS® Technical Support – General Information

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