

RiMAP

User Guide

V1.3

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1. Product Overview

RiMAP is a software extension, or Add-In, to Esri's desktop GIS application [ArcGIS Pro](#) that improves the workflow and efficiencies of *RIEGL* customers who wish to store, manage, visualize, analyze and/or share the information collected by *RIEGL* LiDAR scanning systems within Esri's ArcGIS Platform.

RiMAP improves the management of information such as where and when collections have been performed so that others with access to the collection data can more easily search and discover this information.

The goals of RiMAP are to enable users to:

1. Quickly and easily generate appropriate Esri data structures (polygon and polyline feature classes) from their *RIEGL* kinematic scanning projects (RiPROCESS projects).
2. Manage the metadata of their projects in a visually appealing and understandable way.
3. Publish the metadata to an Esri Portal – either ArcGIS Online or ArcGIS Enterprise – where it can be accessed via RiMAP web applications, allowing the ability to:
 - a. Search and identify where and when collections have been performed to easily locate projects that have already been flown.
 - b. Use project metadata to facilitate sensor operations management.
 - c. Gain an overview of project key statistics.
 - d. Gain an insight into the processing status of the RiPROCESS project.

Unless otherwise specifically stated this document describes version V1.3 of the RiMAP product.

2. Version 1.3 – What’s New

RiMAP v1.3 is compatible with ArcGIS Pro v3.4 (or above), ArcGIS Online and ArcGIS Enterprise configurations. RiMAP is NOT backwards compatible with previous major version of ArcGIS Pro or previous RiMAP versions.

2.1. Databases

By default, RiMAP uses a local geodatabase which it uses to store all the necessary RiMAP items. RiMAP v1.3 also allows the use of **SQLServer** and **Postgres** SDE enabled databases as well. When setting up a RiMAP Workspace a Database Connection File to a SQLServer or Postgres database can be used, or a RiMAP geodatabase will be created.

2.2. Portal

RiMAP v1.3 is compatible with ArcGIS Online and **ArcGIS Enterprise v11.3**.

For information on whether an Esri user has adequate role and user type to successfully use RiMAP, please see section **6.1. Permissions**.

3. Good to Know - Before You Start

3.1. Requirements

RiMAP Import requirements:

- ArcGIS Pro v3.4 (or above)
- ArcGIS Pro Basic license (or better)
- RiPROCESS project file (*.rpp) [for best results v1.9 or above]
- Fully processed trajectory (pof/pofx) and scan data files (rds/rdbx) within the default folder structure (example below)

Publish requirements:

- ArcGIS Online, or
- ArcGIS Enterprise v11.3

3.2. RiMAP is Read Only

RiMAP is read only. None of the data in the RiPROCESS project folders is modified by RiMAP. However, RiMAP does require access to the project and project files.

3.3. RiPROCESS and Folder Structure

RiMAP ingests processed kinematic *RIEGL* project data into the Esri ecosystem.

The *RIEGL* default folder structure and related data created by RiACQUIRE and RiPROCESS is shown in Figure 1. It is **strongly** recommended that RiMAP users do not change the folder structure unless they really know what they are doing.

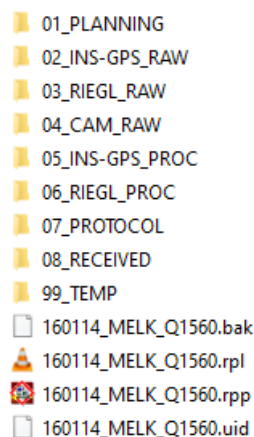


Figure 1: RiPROCESS Folder Structure

There should only be one scan collection per RiPROCESS project.

RiMAP will import data created by any version of RiPROCESS, however, for RiPROCESS versions prior to 1.9 limited functionality may apply.

RiMAP will process either pof or pofx trajectory files in a project, but not both. If RiMAP finds **any** pofx files it indicates the project has been processed in version 1.9 of RiPROCESS (or higher), or has been converted from an older version. It is assumed that the whole project has been converted and as such RiMAP will only process the pofx files.

Note: Please follow RIEGL's best practices in terms of handling, storing, and processing data as much as possible to ensure the best results from RiMAP.

3.4. RiMAP Workspace

RiMAP workspaces give the user options on how to best utilize their data. Setting up a RiMAP workspace is the first step before project data can be ingested.

A workspace saves the configuration of RiMAP geodatabase (or database connection file) and portal (ArcGIS Online/Enterprise), in a location uncoupled from an ArcGIS Pro project.

This concept allows for multiple RiMAP instances to be created at the users will – including different constellations of database and portal, or groupings of kinematic projects.

RiMAP workspaces are accessible from the AddIn in any ArcGIS Pro project.

Different workspaces can be opened in a Pro project but only one at a time.

3.5. Recommended Workflow

First off, the kinematic scan projects need to be processed in RiPROCESS (pofx trajectory and rdbx scan files must be present).

Then, in ArcGIS Pro a RiMAP workspace needs to be configured from the RiMAP AddIn.

Once a workspace is established, *RIEGL* kinematic projects (*.rpp) can be imported into RiMAP either individually or in a batch import. The import creates Esri data structures from RiPROCESS data.

The RiMAP projects can then be Published to a folder within the selected portal from the Data Management window. The publish includes 3 web applications which can be shared to others for viewing. In the Data Management window, the user can decide which projects are visible in which applications before publish.

More projects can be added at any time via the Import tools. They can also be deleted from the database in the Data Management window.

Changes to the RiMAP database in ArcGIS Pro can be synchronized with the published data in Portal from the Data Management window. Changes include addition of new projects to the database, deletion of projects from the database, and updates to projects (from RiPROCESS), as well as project visibility changes for the web applications.

*Note: RiMAP **never** edits or deletes data from the RiPROCESS folder.*

Note: RiMAP is a closed system. Do not manipulate the RiMAP items in anyway besides with the appropriate tools. Manually deleting or adding projects to any of the feature classes can cause problems.

3.6. Accessing Projects on a Network

RiMAP does accept projects located on a network server for both single and batch import.

RiMAP requires the user to be logged into the network and to have adequate permissions to access and open files on the network during the **whole** import process. If your project and its associated files are on a secure server or behind a firewall where special permissions are required for access, you may need to manually allow access to RiMAP and ArcGIS Pro.

If the network connection is broken while RiMAP is importing a project from the network, it will report an error due to not being able to access the files.

Once a project is imported successfully into ArcGIS Pro using RiMAP, the connection is no longer necessary.

3.7. Coordinates and Units

RiMAP data is always imported in Esri's default coordinate system WGS 1984 Pseudo Web Mercator (auxiliary sphere).

3.7.1. Trajectory

Note: The trajectory feature class is a Z-enabled polyline. The Z coordinates are the ellipsoidal heights of the trajectory (GNSS heights) while Esri's default elevation service is in orthometric heights.

3.7.2. Web App units

The field data displayed in the RiMAP feature classes and published in the feature service is **ALWAYS** in metric units.

During the first RiMAP Publish to a Portal folder, the user may choose to change the display units for the Dashboard display. This does not change the data in the feature classes nor feature service but makes the data intuitive to understand for the viewer.

3.8. Log files

If errors are encountered and support needs to be contacted, we request that you **please include the RiMAP log file**. The log file can be located in the users "AppData\Local\RIEGL\RiMAP\Log" folder.

Tip: This can be accessed easily by typing the following in the directory bar of a windows explorer "%LocalAppData%/RIEGL/RiMAP/Log".

4. Starting RiMAP

4.1. Installation

RiMAP is delivered in the form of an ESRI AddInX file. To install the Add-In, download the RiMAP.ESRIAddInX file from the Esri Marketplace, double click on the download and an installation utility is opened, as shown in Figure 2.

Ensure there is no running instance of ArcGIS Pro open, and then simply select “Install Add-In” to install.

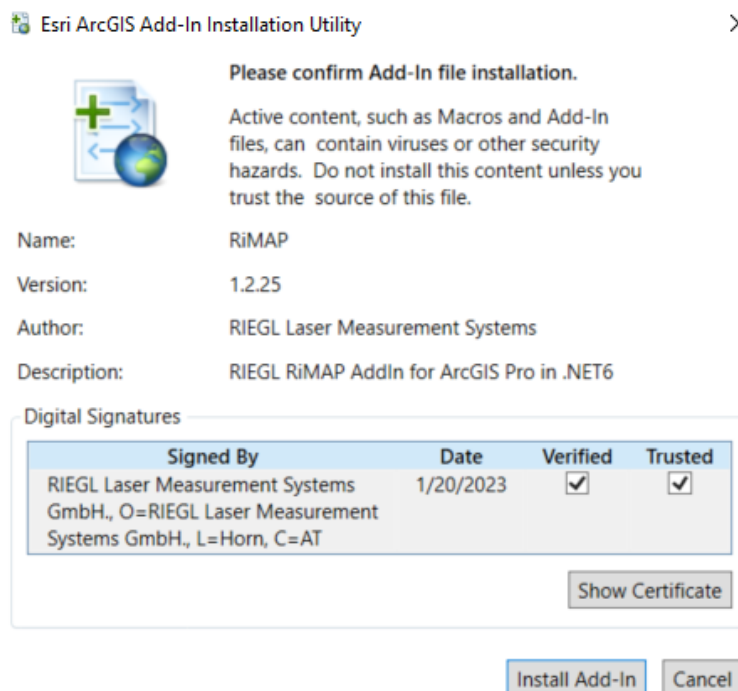


Figure 2 Install Add-In

Now, when you startup ArcGIS Pro there will be a new tab named “RiMAP” added to the ribbon, as shown in Figure 3.

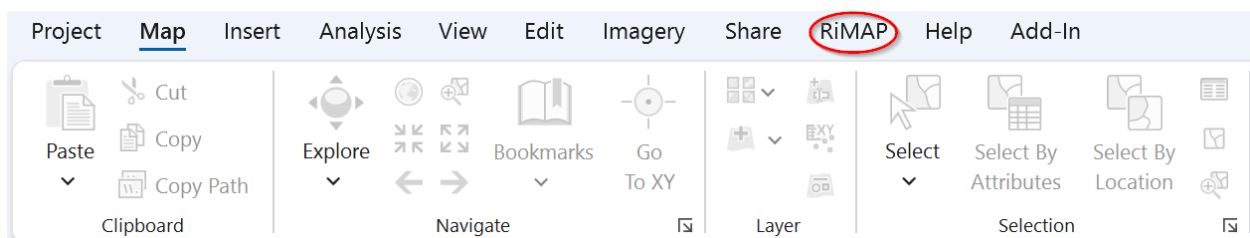


Figure 3 RiMAP on ribbon at start

4.2. Setup a RiMAP Workspace

Once the AddIn has been installed a RiMAP tab will appear on the ribbon of ArcGIS Pro. A RiMAP workspace needs to be configured before any projects can be imported. If this is the first time using RiMAP or the RiMAP configuration file has been removed, the ribbon will display the “Set Up RiMAP Workspace” button.

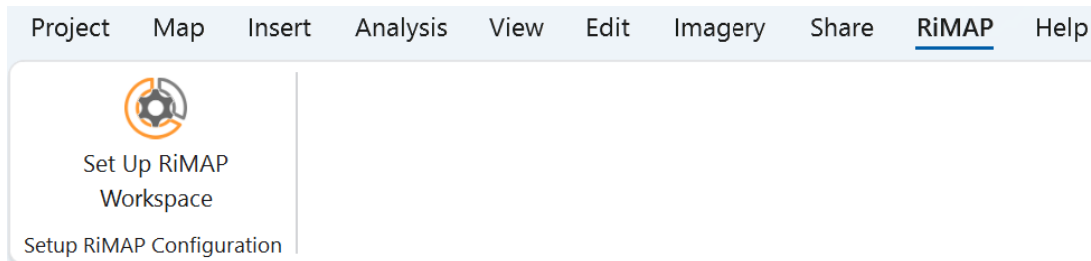


Figure 4 Configure RiMAP workspace

This will launch the RiMAP Workspace Manager tool. The “Configure workspace” tab allows you to set up a RiMAP Workspace.

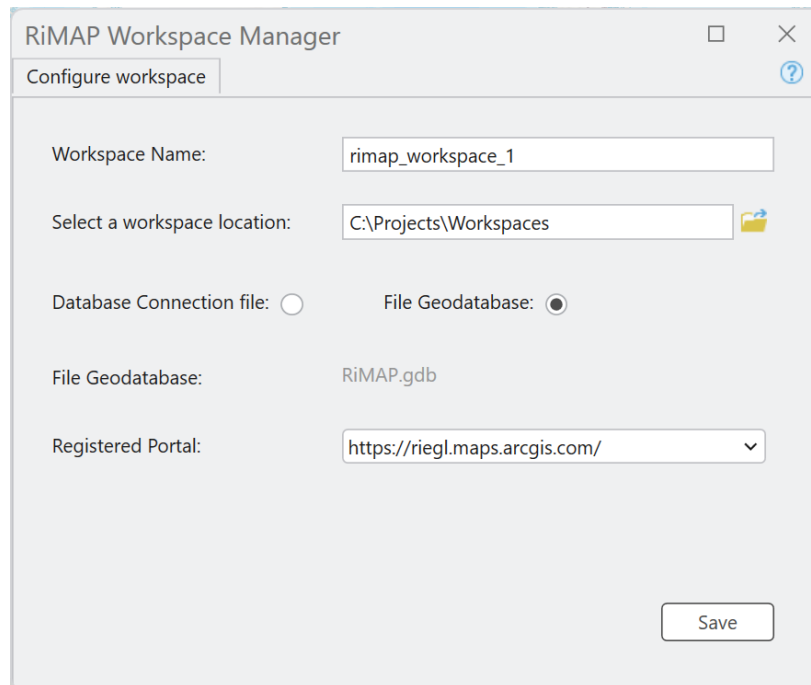
1. Give your workspace a name.
This name will be used to identify the workspace map and folder.
2. Select the folder location for the workspace where your RiMAP data will be stored.
This folder can be located wherever you wish and does not have to be associated with the ArcGIS Pro project. It can be local or on a network if required. Keep in mind that the RiMAP tool needs to have access to this folder.

Note: be careful not to use a temporary folder location.

3. Select a database platform.
For SQL Server or Postgres databases you will have to have a database connection file already setup. Browse to and select the database connection file. A copy of this will be placed in your workspace and added to the current ArcGIS Pro project.
If choose to use a file geodatabase, a default RiMAP.gdb will be created in your workspace and then added to the current ArcGIS Pro project.
4. Select the portal that is to be associated with your workspace.
A list of your managed portals is available in the “Registered Portal” dropdown. If the portal you require is not there, go to ‘Manage Portals’ in ArcGIS Pro and add it, then restart the Workspace Configuration tool.

5. Select “Save” to create your workspace.

The workspace will be created and new tools will become available in the RiMAP ribbon. These tools are associated with the Selected RiMAP workspace only.



The screenshot shows the 'RiMAP Workspace Manager' dialog box with the 'Configure workspace' tab selected. The fields are as follows:

- Workspace Name: rimap_workspace_1
- Select a workspace location: C:\Projects\Workspaces
- Database Connection file: ☐ File Geodatabase: ☒
- File Geodatabase: RiMAP.gdb
- Registered Portal: https://riegl.maps.arcgis.com/
- Save button

Figure 5 Example workspace configuration

In the “RiMAP Workspace Info” tool you can check which workspace you are working with under “RiMAP Info”.

You can also switch to another workspace or create a new one anytime at “RiMAP Workspace Info” > “Tool menu for workspace” > “Select a Workspace”. This will launch the RiMAP Workspace Manager.

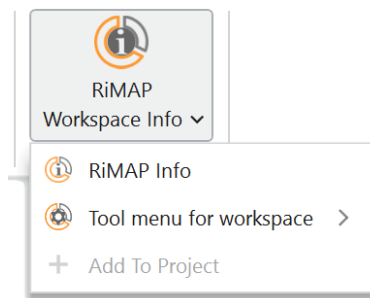


Figure 6 Workspace Info

4.3. A Note on Databases

Be careful when using a database connection file. This is a direct connection to your database which means the RiMAP items need to be treated as any other feature in your database.

If you ever need to delete or remove **all** the RiMAP items from you SQL Server or Postgres database, please ensure you do this within ArcGIS Pro and **not** from the respective database management software. This will ensure the features are deleted correctly.

If you need to delete individual projects from the RiMAP items, this can be done through the RiMAP Data Management tool.

If file geodatabase is selected, a default “RiMAP” geodatabase will be created within the workspace folder.

4.4. Saving a Workspace

Data added to a RiMAP workspace is saved automatically to that workspace upon RiMAP Import. The workspace and ArcGIS Pro project are independent from each other.

A selected workspace is saved in an ArcGIS Pro project when the Pro project itself is saved. If while in an ArcGIS Pro project a workspace was created and data was imported to that workspace, then the Pro project was closed without being saved – the workspace and data imported would still be saved in the workspace but not in the Pro project. The workspace can be retrieved again and re-added to the project in the “Workspace Manager”.

The current workspace saved in the Pro project can be identified by going to Project > Options > RiMAP Project Settings.

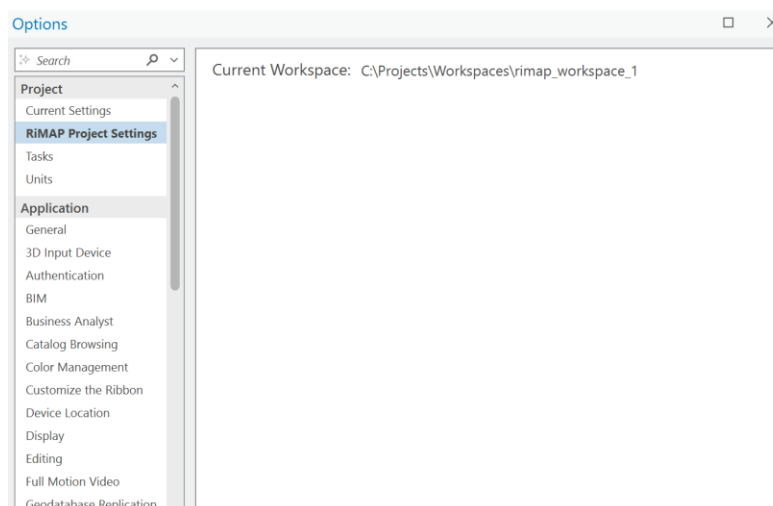


Figure 7 Example workspace saved in project

4.5. Select a RiMAP Workspace

When starting an ArcGIS Pro project where a RiMAP workspace has not been saved (but at least one has been set up since the AddIn was installed) no workspace will be loaded. The RiMAP tab on the ribbon will show the “Select a Workspace” tool. This tool allows you to select and load a RiMAP workspace you have created previously or create a new one.

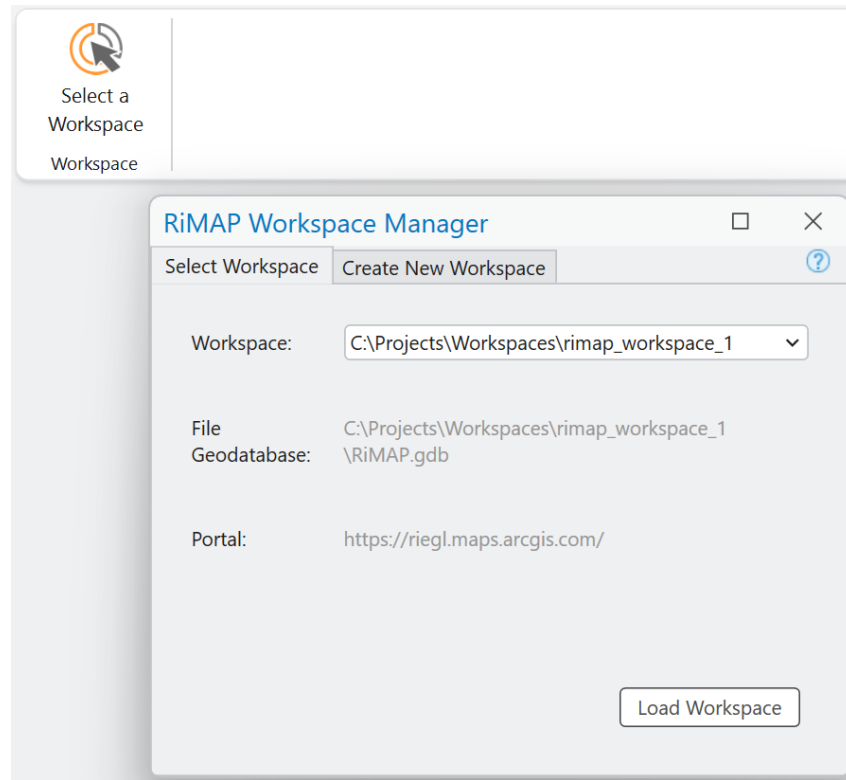


Figure 8 Example Select Workspace

5. Import *RIEGL* Project Data

RiMAP imports appropriate *RIEGL* dataset metadata from a RiPROCESS project and generates ArcGIS Pro data structures. RiMAP creates a “Trajectories”, “Project Overview”, “Project Location”, and “Extent” feature class; a “Project” table; and relationship classes in the database. The feature classes represent the individual scan trajectories (Trajectories) and rough project coverage (Project Overview) and are populated with project specific metadata garnered from the respective RiPROCESS project. The projects are named according to their rpp name. The RiMAP data, once created, can be published to a Portal (ArcGIS Online or Enterprise) along with three RiMAP web application.

NOTE: The Overview feature class is calculated from the trajectories and the known data about the scanner. This is a rough estimate of the area covered by scan data. No LiDAR data is read or imported to create this feature class.

5.1. Feature Classes

Specific metadata captured by RiMAP includes:

5.1.1. Trajectory metadata:

Project name	name of the rpp project
Record name	record folder of the scan data
RDB name	scan data file name
Scanner type	<i>RIEGL</i> scanner type
Scanner serial number	serial number of the scanner
PRR (Pulse Repetition Rate)	from the scan data. Default is -1 if no prr was found
Average altitude	average altitude of the trajectory during data capture
Start altitude	altitude of the trajectory when data capture started
Stop altitude	altitude of the trajectory when data capture finished
Start date/time of trajectory acquisition	date and time at the beginning of data capture
Stop date/time of trajectory acquisition	date and time at the end of data capture

Scan duration	time taken for data capture
Average speed of the vehicle	average speed of the vehicle during data capture
Scan capture distance	distance covered during data capture
Has waveforms*	yes/no field indicating whether waveforms were found in the rdbx file
Tie Points*	number of tie points recorded in the rdbx
Noise removal*	yes/no field estimates if noise was removed from this scan record if the noise removal workflow was run on the file (i.e. "Isolated point classifier" and "Delete points")
Colorized*	yes/no field depicting whether "Colorizing points from images" was run on the file
Classification*	yes/no field depicting whether a classification tool was run on the file
Classification codes*	estimation of the class codes that could be in the file based on which classification was run. As class codes can be changed and edited per user preference these are based off of the industry standard.
Creation date*	Date the rdbx file was created
Modified date*	Date the time the rdbx was modified

these fields reflect transactions run on the rdbx file represented by the trajectory line. They are provided to give an **indication of the level of processing done on the scan data file and are **not** definitive.*

**these data are collected from the rdbx files (processed in RiPROCESS 1.9 or higher). If no rdbx file is present, these fields will be left as defaults.*

**this data is required for the Status dashboard (see section RiMAP in Portal – Status Dashboard)*

5.1.2. Project Table metadata:

Project Name	name of the rpp project
Project Path	directory path to the rpp file
Project Type	field of application of the project defined in the scan data
Project Date	date of acquisition
Number of Sensors	number of sensors referenced in the rpp
Sensor Type	list of scanner types referenced in the rpp
IMU type	list of IMUs referenced in the rpp
Number of Records	number of records in the rpp
Number of Processed Scan Data Files	number of rdbx files or processed scan files referenced in the rpp
Number of Raw Scan Data Files	number of rpx files or raw scan files referenced in the rpp
Number of Control Objects	number of control objects referenced in the rpp
Total Number of Tie Objects	number of tie objects referenced in the rpp
Waveform Analysis	yes/not found field. Response of search for file only present if waveform analysis has been run during processing
Has Camera Data	yes/no field. Response if camera data is associated with scan data in the rpp
Number of Image Files	number of imagery files located in the project folders [.png, .jpeg, .tiff, etc.]
Number of Raw Image Files	number of raw imagery files located in the project [.dng, .pgr, .iiq]
Total Capture Distance	total distance the system traveled during acquisition
Scanner On Distance (m) (total distance the scanner moved while on)	total distance the system traveled while it was on during the project acquisition
Average Capture Speed (km/h)	average speed of the system during data capture. This is calculated in km/h
Total Capture Time	total time the system was capturing data during data capture

Total Scanner On Time (total amount of time the scanner was running)	total time the scanner was on during project acquisition
Acquisition Time ratio in % (total vs capture)	percentage of time during the project acquisition that the scanner was collecting data
Rpp Last Modified Date/Time Last modified date of the project	date and time the rpp file was last modified
Comments	additional comments added by the user during single import or manually
Global Id	RiMAP project ID

5.2. Import Data

To run RiMAP, make sure the AddIn is installed (see section *Installation*), then start ArcGIS Pro and click on the new RiMAP tab in the ribbon. Then select the “*RIEGL Data Import*” button and choose to either import a single RiPROCESS project or run a batch import to import multiple projects at once.

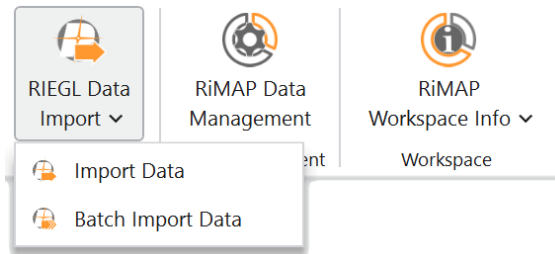


Figure 9 Import

5.2.1. Single Project Import

For a single project, select “Import Data”. Then browse to and select the RiPROCESS project file (*.rpp) to be imported, as shown in Figure 10.

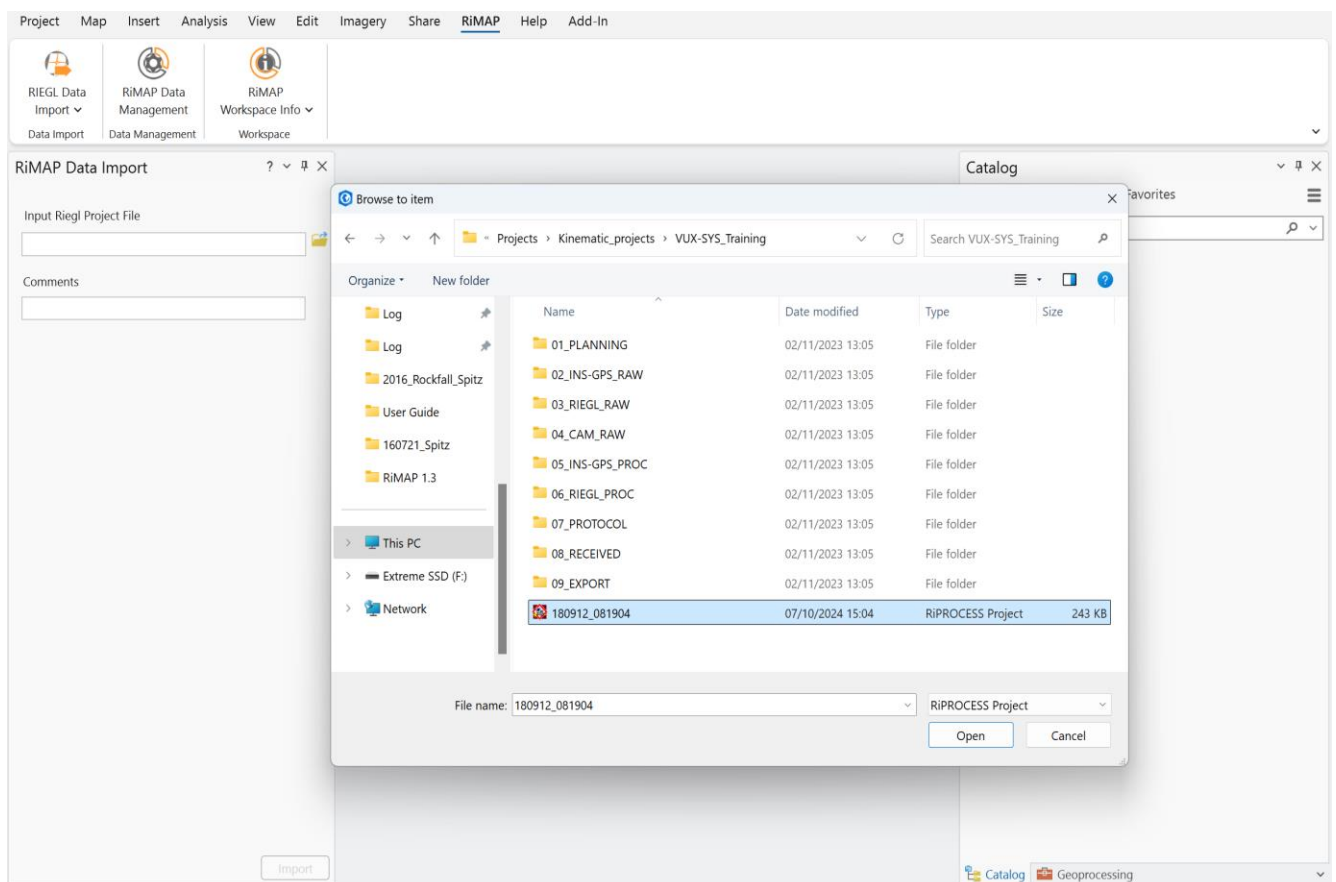


Figure 10 Browse to rpp

Note: Make sure you are selecting an rpp file with fully processed trajectories and scan data that is contained within the RIEGL best practices folder structure setup. Files should be available within this folder structure as they would be during scan data processing.

The rpp is checked for validity. When it passes the checks the *Import* button will become available. If any errors or warnings are found with the rpp file or project folders (see section *Folder Structure* above), an error message will appear.

Note: Please see the Section titled How to Submit a Bug Report if you are unable to resolve an error.

You may write additional comments about this project if you would like in the “Comments” text block. These will be added to the Project table in a separate comments fields upon Import.

Once a RiPROCESS project has been selected and optional comments added, press the *Import* button.

If you try to import a project which has already been imported and is still present in the RiMAP feature classes, you will be prompted whether you would like to overwrite the project in the feature classes or not.

If it is the first time RiMAP is performing an Import to the specified database, the data structures will be built first. For a file geodatabase – the geodatabase itself is created in this step. If all the necessary RiMAP data structures are found in the database then they will be edited and updated with the new project data.

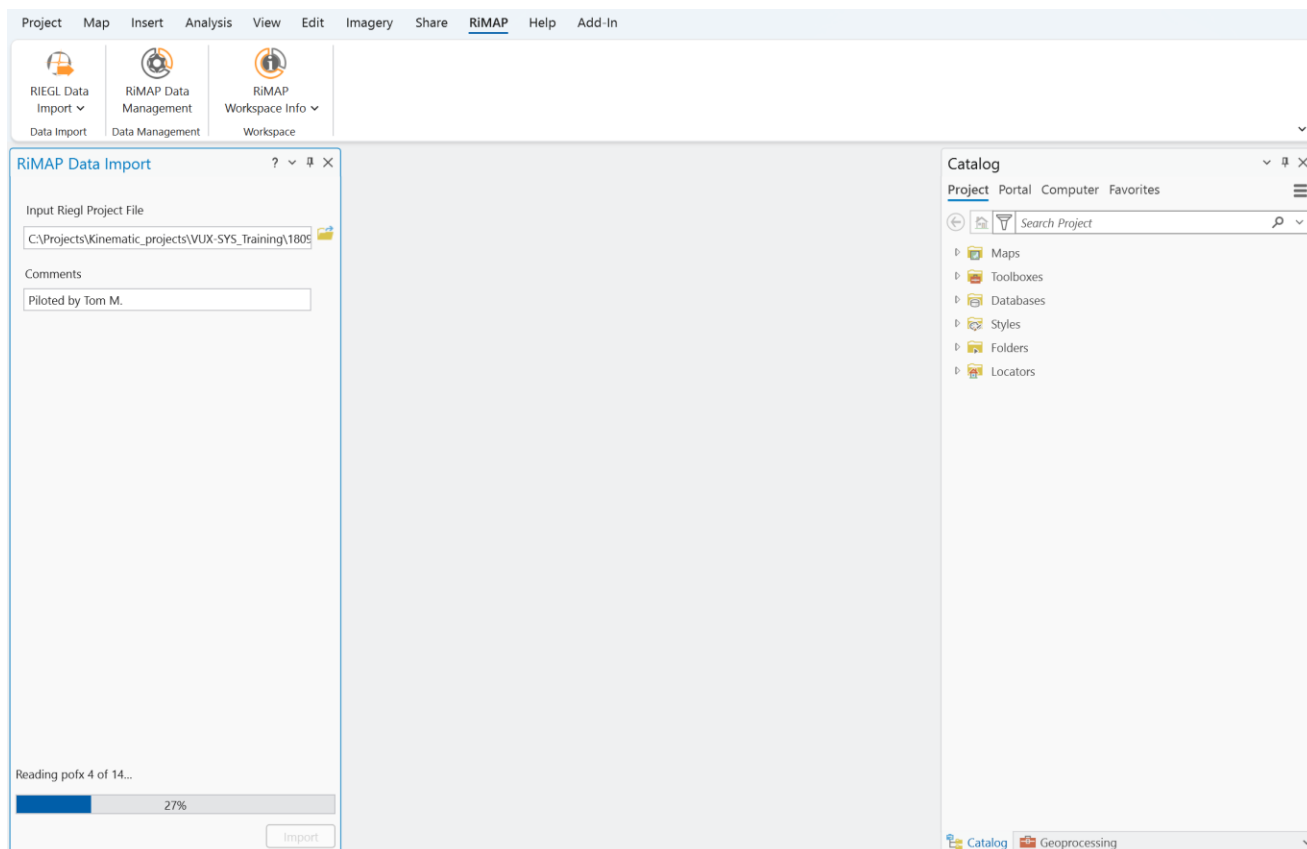


Figure 11 Import running

RiMAP will display a progression bar as it imports the project data. Upon successful importing of the project data RiMAP will display the newly created feature classes as feature layers in a new map named after the workspace, as shown in Figure 12, which is opened automatically upon completion of the Import.

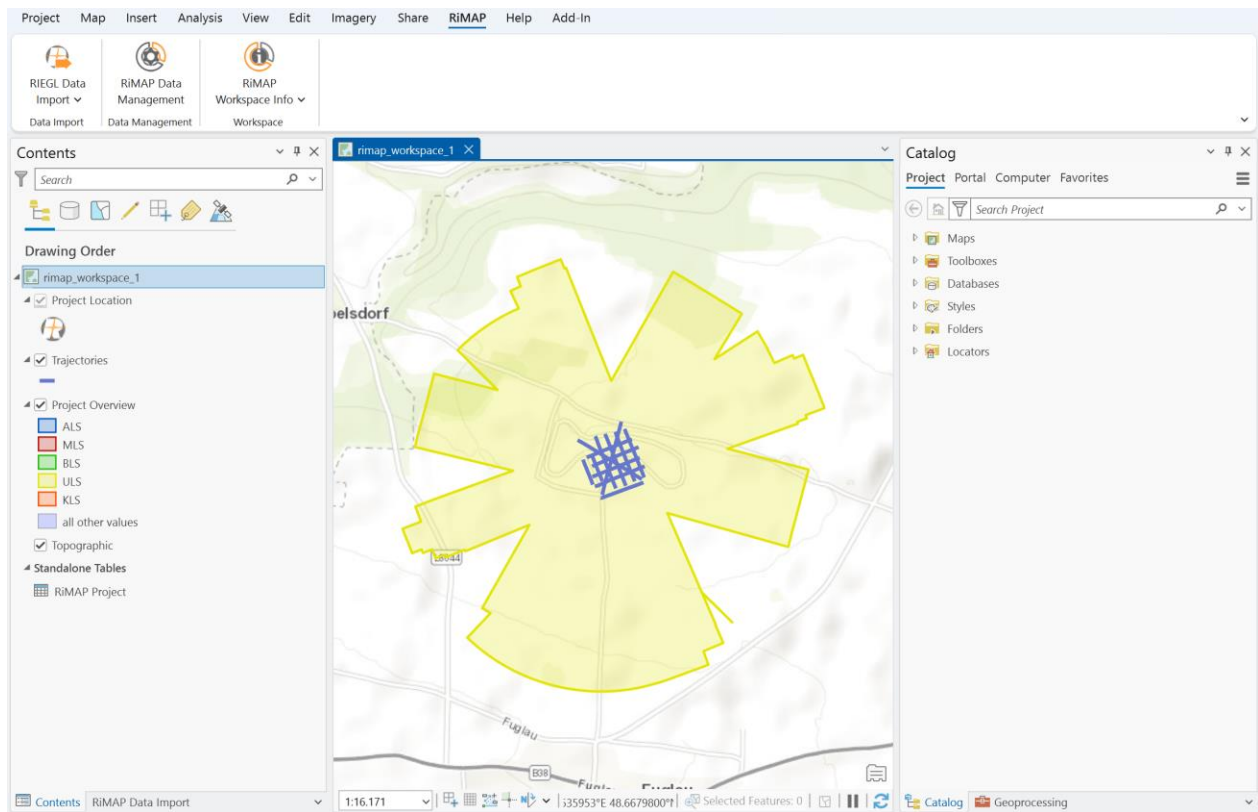


Figure 12 Successful Import

5.2.2. Batch Project Import

To setup and run a batch import procedure of multiple project, from the “*RIEGL* Data Import” button in the ArcGIS Pro ribbon, select “Batch Import Data”.

The Batch Import wizard works as follows:

- Select a folder which will be parsed for RiPROCESS projects. The projects found are displayed in a table format. RiMAP will only recognize the rpp files at the top level of a *RIEGL* project folder. If you would like to import rpp’s located in subfolders of a project (e.g. backups), check the “Include rpp’s in subfolders” checkbox.
- Select from the table which projects you are interested in.
- Save these to a RiMAP list file (*.rmpl), as shown in Figure 9. An rmpl file can be loaded into this tool at a later stage so as to avoid the need to parse and relocate projects to update them. This is particularly useful for the monitoring of RiPROCESS projects statuses.

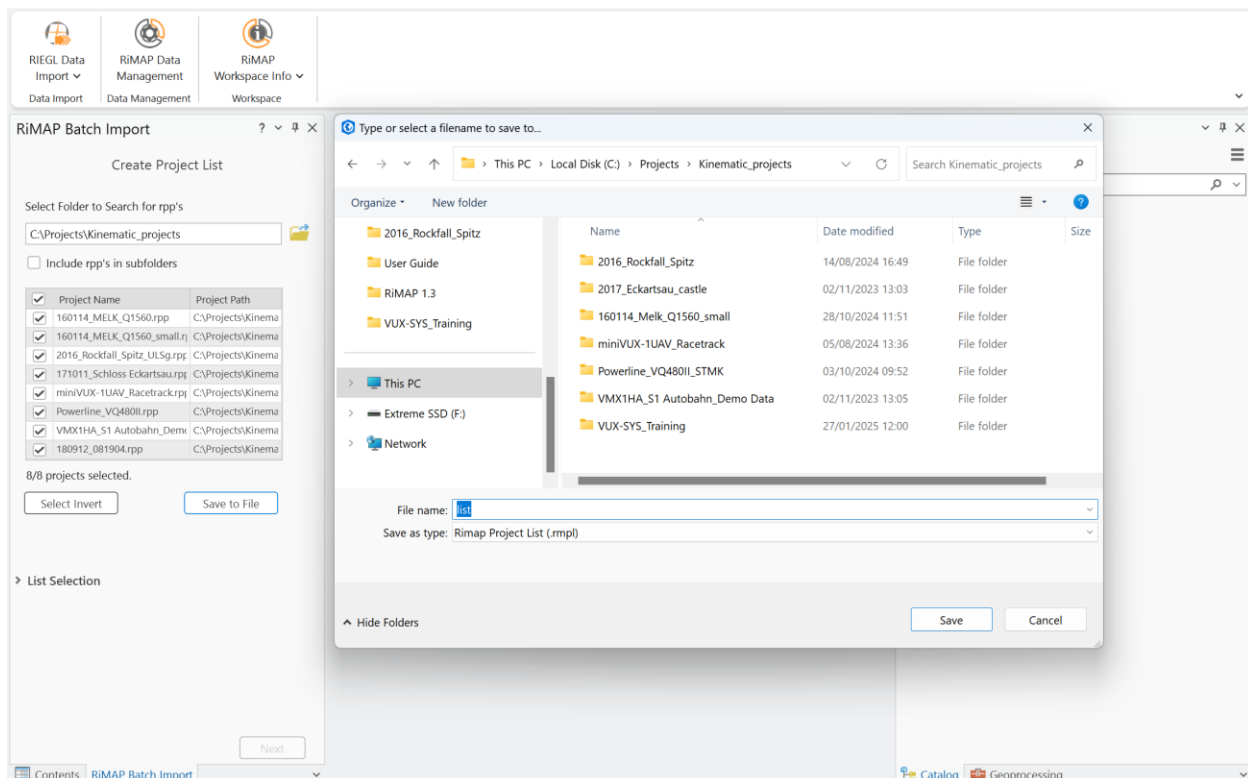
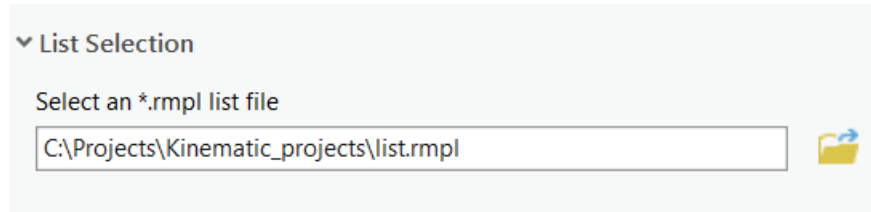
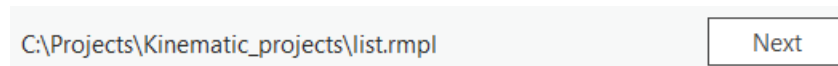


Figure 13 Save an rmpl file list of projects

If an rmpl list file has already been created and you would like to use that file, there is no need to select a folder. Simply open the “List Selection” dropdown and browse to the rmpl file.



- Once an rmpl file has is selected (either by saving one or selecting one) the path to that file will be displayed at the bottom of the tool and the “Next” button of the wizard will be activated.



- Select *Next*.
- The second part of the batch import wizard displays a table of the projects from the rmpl file. From this table, select which projects you would like to import. By default all projects are selected.
- Before an import can begin, the selected projects need to be validated. Select the “Validate Batch” button on the GUI.

After the projects have been validated a report* will be displayed. Here you can see if any abnormalities were detected and see the error report if there were problems with specific projects. Please consult this report before importing the projects.

If projects with the same name have already been imported and are present in the RiMAP geodatabase, a popup window will ask if these projects are to be removed from the import list. If they are left in the import, the projects with the same name will be overwritten. This is the workflow for managing the process status of a RiPROCESS project with RiMAP.

- Once valid projects are detected, a pop up window will announce the completion of the validate process. Select *OK* and the “Import” button will be activated.

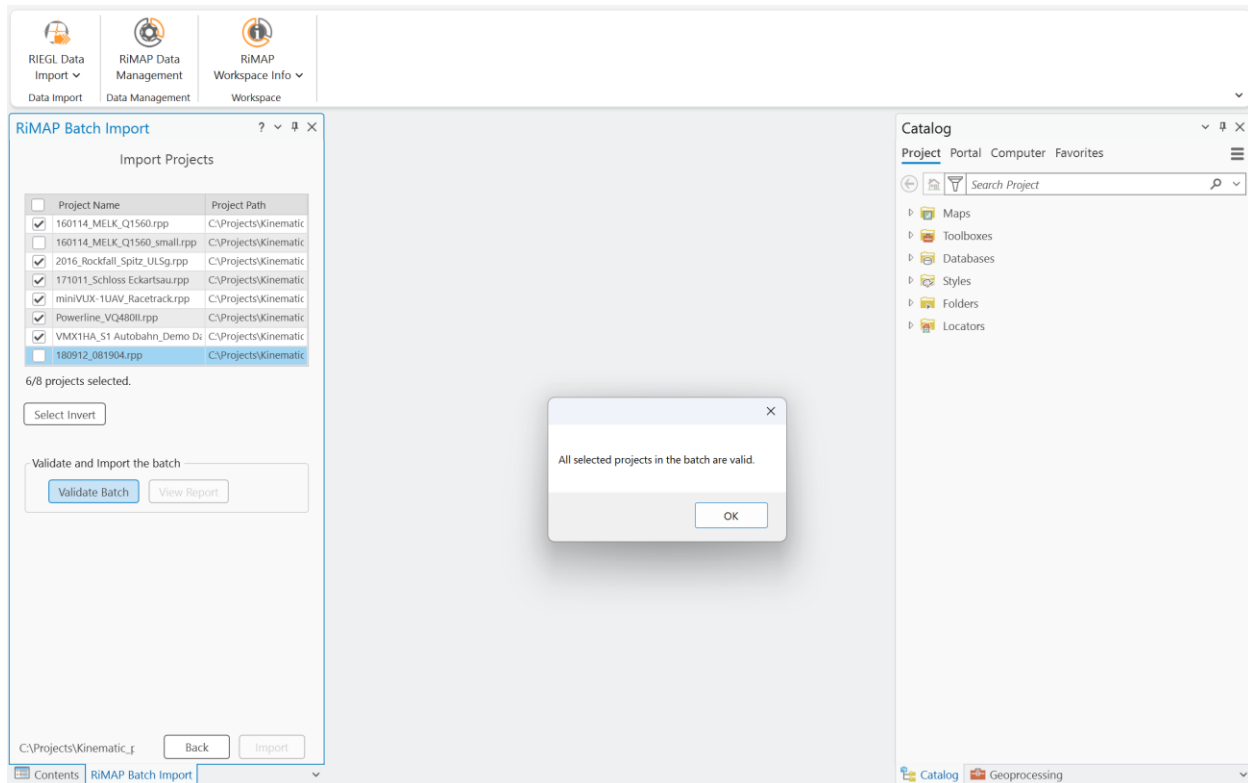


Figure 14 Validate successful

- Select the “Import” button to begin importing the valid selected projects.

Projects are imported consecutively, one at a time. Two progress bars will be displayed: one to display the project number with respect to the other projects selected for import, and one to display the status of import per project.

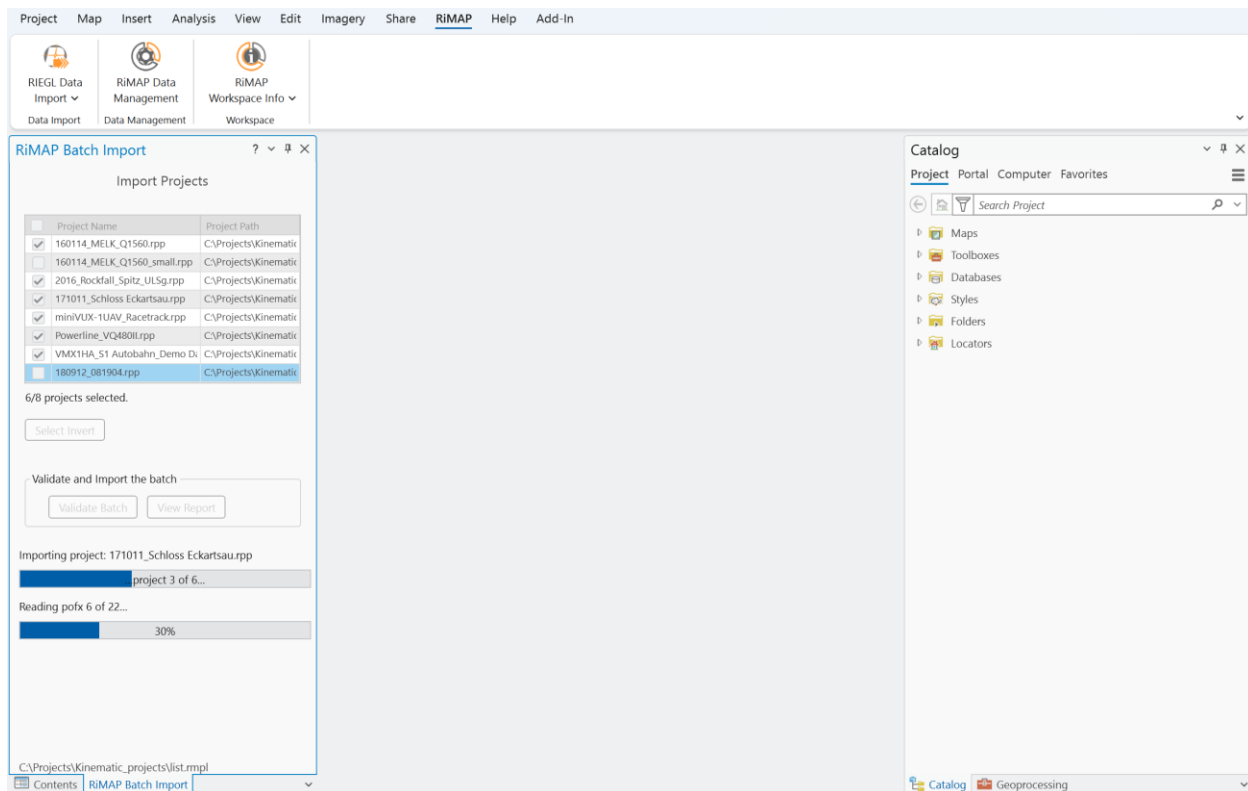


Figure 15 Batch import running

- Once the Import has completed the map is opened, the feature layers are displayed, and a final report* from the Import is opened. The report displays the status of the imported projects, if any errors or warning occurred, and why.

**The reports can be accessed again if they have been closed by selecting the “View Reports” button on the Import Projects pane of the wizard or as a log file.*

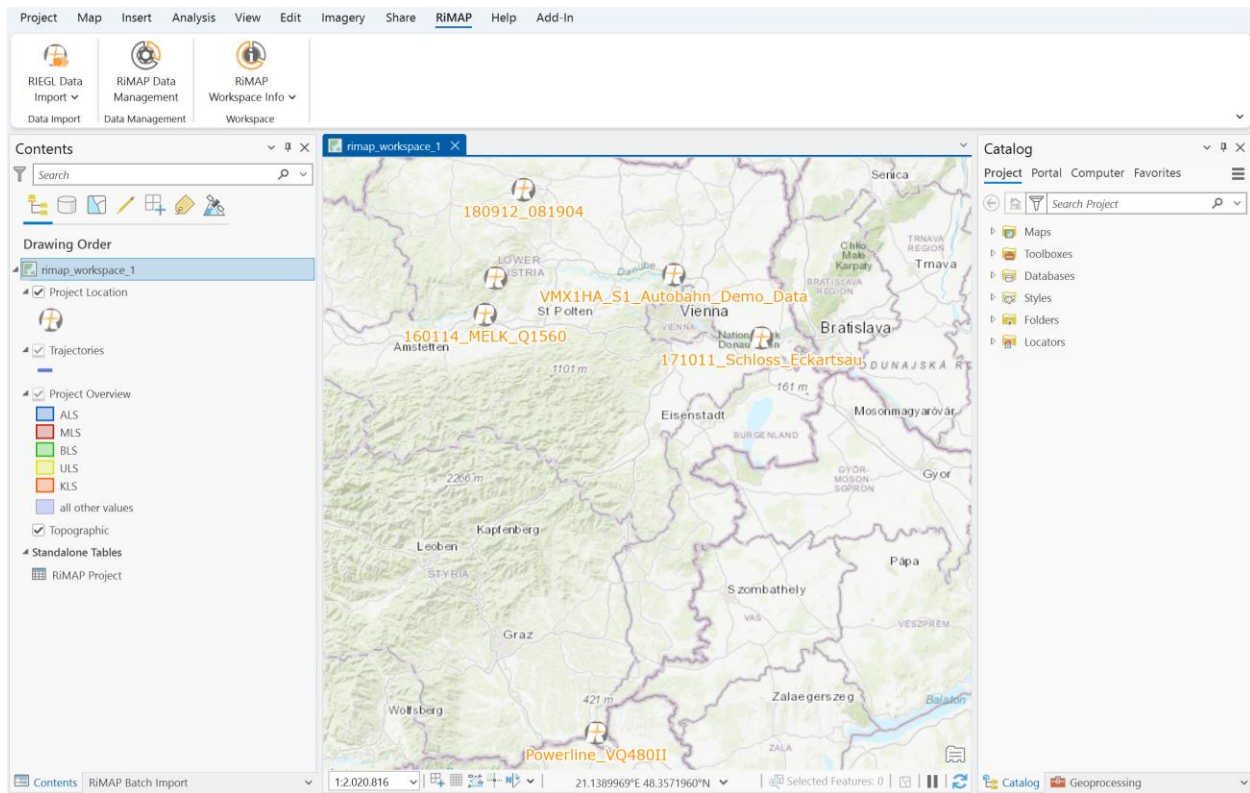


Figure 16 Successful batch import

6. Manage and Publish

Once a RiMAP database has been established/created and projects added to it, the RiMAP Data Management tool can be used.

This tool is designed to:

- manage local RiMAP projects
 - delete local projects from database
 - update projects that have been modified in RiPROCESS
- publish RiMAP items to a portal
- manage published items in the portal
 - synchronize local changes (delete / update/ add)
 - change visibility of projects in web applications



Select the “RiMAP Data Management” button from the RiMAP tab on the ribbon. This will open the management window. Upon activation of this window, RiMAP checks the access to the workspace portal and loads the available folders. RiMAP also tests each local project path in order to obtain and compare its ‘processed state’.

The *Workspace* section shows a summary of the workspace that you are currently using. If the portal is not signed in, it will indicate that and you will not be able to select a folder. To sign in to the portal go to Portal Management in Pro.

Note: Hover the mouse cursor over the workspace name to get the location path of the workspace and the database registered to it.

Under “Portal Folder” you may select a folder from the portal, or create a new one, where your RiMAP items will be published.

It is recommended to start by creating a new folder. To do this, select the dropdown arrow and then “Create new folder” from the dropdown list and type in a folder name, then press Enter.

Note: you can also click on the textbox and type a folder name in immediately.

Upon Publish, RiMAP publishes 6 items to the portal. It is recommended to keep these items in their own folder. Only one set of RiMAP items can be published to a folder. However, the portal can have multiple RiMAP folders.

RiMAP publishes the following items to a portal folder:

- RiMAP Feature Service created from the local RiMAP database items.
- 3 web applications: RiMAP Projects Dashboard; RiMAP Status Dashboard; and RiMAP Searcher Application.
- 2 web maps utilized by the web applications.

These items are created within the users account and are, by default, private and delete protected. The sharing of these items is up to the user and can be changed manually in the portal.

NOTE: Remember that when changing the sharing settings for an app, the map and feature services sharing settings need to be updated too or they will not be visible in the app.

If you do want to delete the RiMAP items from the portal, you need to go to the settings of the items in portal and turn off the delete protect before you can delete them.

6.1. Permissions

Publishing the geodatabase feature classes to a portal and creating the RiMAP web applications requires that the user has access to the selected portal **and** has the right user credentials.

*Note: For **Enterprise portal**, these credentials vary based on the version. Please make sure you have adequate credentials, based on your version, to use RiMAP with your Portal.*

A detailed look at the user credentials for **ArcGIS Online**, with respect to RiMAP requirements, is as follows:

Roles

- *Administrator, Facilitator, and Publisher* roles can publish RiMAP items.
- *Data Editor, User, and Viewer* roles cannot publish RiMAP items.
- RiMAP **does not** accept custom roles.

User Types

- *Creator, Professional, Professional Plus* users can publish RiMAP items.
- *Viewer, Contributor, and Mobile Worker* users cannot create/publish/own RMAP items but can view RiMAP items shared with them in ArcGIS Online.

Licenses

- RiMAP works with both ArcGIS Pro Basic and ArcGIS Pro Advanced licenses.

Please contact your ArcGIS administrator if you experience problems associated with roles, user types and licenses.

6.2. Data Management Table

Once a folder is selected the data management table and units option becomes visible.

#	Available	Up-To-Date	Project Name	No. Traj	Project Type	Feature Service	Searcher App	Projects Dash	Status Dash
1	yes	yes	180912_081904	13	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	no	not found	160114_MELK_Q1560	16	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	yes	yes	2016_Rockfall_Spitz_ULSg	1	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	yes	yes	171011_Schloss_Eckartsau	20	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	yes	out-of-date	miniVUX_1UAV_Racetack	8	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	yes	yes	Powerline_VQ480II	2	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	yes	yes	VMX1HA_S1_Autobahn_Demo_Data	12	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Figure 17 Data Management Table

“Display Units for publish items” refers to the units certain widgets in the Projects dashboard will use to display project data. This can be set to Meters or Feet. This setting can **only** be set once on the initial Publish. Once the web applications are published this setting cannot be changed at a later stage i.e. during synchronization of the databases.

NOTE: all metadata is calculated and displayed in meters in the geodatabase. This setting is for display purposes for the user only. No data is changed.

The table displays the RiMAP projects in the database and is split in two parts, the local section and the portal section.

6.2.1. Local section

Manage RiMAP Data

Data Management | Delete Projects

Workspace

Current workspace: rimap_workspace_1

Portal: https://riegl.maps.arcgis.com/

Portal Folder: RiMAP_wsp1

Display Units for publish items: Metric

#	Available	Up-To-Date	Project Name	No. Traj	Project Type	Feature Service	Searcher App	Projects Dash	Status Dash
1	yes	yes	180912_081904	13	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	no	not found	160114_MELK_Q1560	16	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	yes	yes	2016_Rockfall_Spitz_ULSg	1	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	yes	yes	171011_Schloss_Eckartsau	20	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	yes	out-of-date	miniVUX_1UAV_Racetrack	8	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	yes	yes	Powerline_VQ480II	2	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	yes	yes	VMX1HA_S1_Autobahn_Demo_Data	12	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Click 'Publish' to deploy RiMAP content to the selected portal.

Update Local | Publish | Sync

Figure 18 Example local section

- **Available:** The first column of the table indicates if the corresponding RiPROCESS project path (the path of the rpp that was used to import the project) is currently available to RiMAP.
 - Green “yes” => the rpp is in the same location and is accessible.
 - Grey “no” => the rpp path used for the import of this project is not available.
- **Up-To-Date:** The available rpp is then checked to see when it was last modified.
 - Green “yes” => the rpp has not been modified since the import into RiMAP.
 - Orange “out-of-date” => the rpp has been modified since the import into RiMAP. When this occurs, the “Update Local” button in the bottom left hand corner of the window will be activated. (see section *Update Local* below)
 - Grey “not found” => is displayed when the project’s rpp was not available to be queried.
- **Project Name:** Name* of the project as it was imported into RiMAP.
- **No. Traj:** Number of trajectories recorded and digitized by RiMAP.

- **Project Type:** The *Riegl* project type based on the scan data used. This is set during import.

**The project name in RiMAP is taken from the name of the rpp when it was imported.*

6.2.2. Portal section

Manage RiMAP Data

Data Management Delete Projects

Workspace

Current workspace: rimap_workspace_1

Portal: https://riegl.maps.arcgis.com/

Portal Folder: RiMAP_wsp1

Display Units for publish items: Metric

#	Available	Up-To-Date	Project Name	No. Traj	Project Type	Feature Service	Searcher App	Projects Dash	Status Dash
1	yes	yes	180912_081904	13	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	no	not found	160114_MELK_Q1560	16	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	yes	yes	2016_Rockfall_Spitz_ULSg	1	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4	yes	yes	171011_Schloss_Eckartsau	20	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	yes	out-of-date	miniVUX_1UAV_Racetrack	8	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	yes	yes	Powerline_VQ480II	2	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7	yes	yes	VMX1HA_S1_Autobahn_Demo_Data	12	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Click 'Publish' to deploy RiMAP content to the selected portal.

Update Local Publish Sync

Figure 19 Default portal section

When a folder is selected the portal is parsed to see if that folder exists. If it does not exist in the portal, the table is set to default and the “Publish” button is activated. If it does exist, RiMAP checks the following.

- **Feature Service:** this column indicates the status of the project (project name) in the RiMAP feature service in the portal.
 - Grey => no RiMAP feature service was found.
 - Green => the project name was found in the feature service and is up-to-date with the project in the local geodatabase.
 - Orange => the project name was found in the feature service but is not up-to-date with the project in the local geodatabase.
 - Red => a RiMAP feature service is available in the portal but this project name was not found in it (i.e. this is a new project)

The checkboxes in the table indicate the state of whether or not the project is present in the specific web application or not. These checkboxes can be used to hide or unhide the project from a specific web app. When the state of a checkbox is changed for items that have already been published, the “Sync” button will be activated.

*Note: The change in state of a project will **only** be updated upon synchronizing of the databases.*

- **Searcher App:** default is checked.
 - Checked => project is visible in the application or will be set to visible in the application.
 - Unchecked => project is hidden from the application or will be hidden in the application.
- **Projects Dashboard:** default is checked.
 - Checked => project is visible in the application or will be set to visible in the application.
 - Unchecked => project is hidden from the application or will be hidden in the application.
- **Status Dashboard:** default is unchecked. The status dashboard is embedded in the Projects dashboard. In order for a project to have its own Status dashboard, it needs to be visible (box checked) in the Projects dashboard.
 - Checked => project has a Status dashboard or one will be created for it.
 - Unchecked => project does not have a Status dashboard or it will no longer have one.

Note: The Status Dashboard is populated with data collected from the rdbx scan files upon Import to RiMAP. If these are not present or the project is using rdb files, then this data in the Status dashboard will not be populated.

6.3. Update Local

Upon activation of the Data Management window, each project in the RiMAP file geodatabase is checked to see if it is still up-to-date with its corresponding RiPROCESS project.

If a project is found to be out-of-date with its RiPROCESS project file (rpp) used in the import, the “Update Local” button in the bottom left hand corner of the window will be activated. Selection of “Update Local” will re-import and overwrite **all projects which are out-of-date** with their original rpp. If all projects are up-to-date or the original rpp cannot be accessed, this button is disabled.

This is an optional tool for the users convince. It is not necessary to update out-of-date projects for RiMAP to run correctly.

6.4. Delete Projects

Projects can be deleted from the local RiMAP geodatabase from the “Delete Projects” tab in the Data Management window.

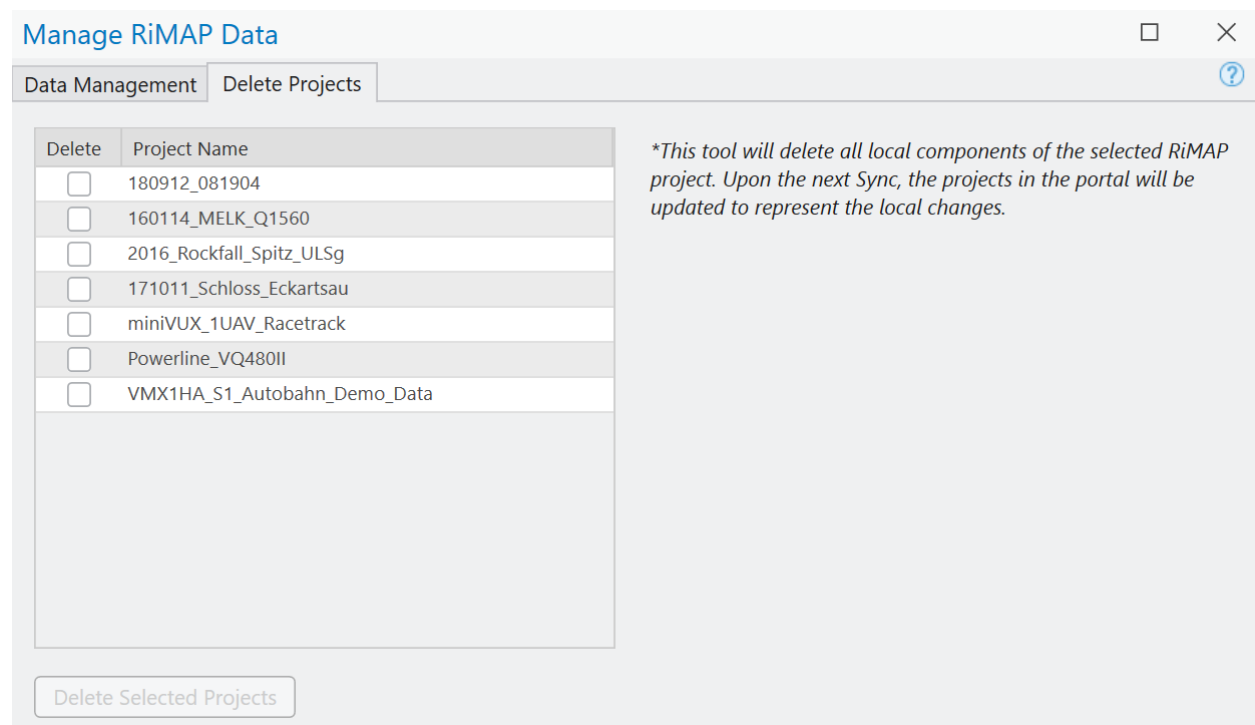


Figure 20 Delete projects tab

Select the project or projects in the table that you wish to delete and select “Delete Selected Projects”. The delete tool will delete **all local** components of the selected project from the RiMAP geodatabase.

*Note: These changes will **not** automatically be reflected in the portal items. A Sync will need to be run from the Data Management table in order to remove the deleted projects from the RiMAP items in the portal.*

6.5. Publish

If no RiMAP items are found in the selected portal folder, the first step is to publish them. Before a Publish, the checkboxes in the table can be changed and set as desired. When “Publish” is selected for a new folder, the folder is created in the portal and the appropriate RiMAP items are created within this folder.

Manage RiMAP Data

Data Management | Delete Projects

Workspace

Current workspace: rimap_workspace_1

Portal: <https://riegl.maps.arcgis.com/>

Display Units for publish items: Metric

Portal Folder: RiMAP_wsp1

#	Available	Up-To-Date	Project Name	No. Traj	Project Type	Feature Service	Searcher App	Projects Dash	Status Dash
1	yes	yes	180912_081904	13	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	yes	yes	160114_MELK_Q1560	16	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	yes	yes	2016_Rockfall_Spitz_ULSg	1	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	yes	yes	171011_Schloss_Eckartsau	20	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	yes	yes	Powerline_VQ480II	2	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	yes	yes	VMX1HA_S1_Autobahn_Demo_Data	12	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	yes	yes	miniVUX_1UAV_Racetrack	8	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Publishing RiMAP data and applications...

20%

Update Local | Publish | Sync

Figure 21 Example publishing data

When the Publish is complete, the table is refreshed to display the current state of RiMAP data. Hyperlinks for easy access to the RiMAP Searcher Web App, Projects Dashboard, and RiMAP Feature Service are displayed in the top right-hand corner of the Data Management window.

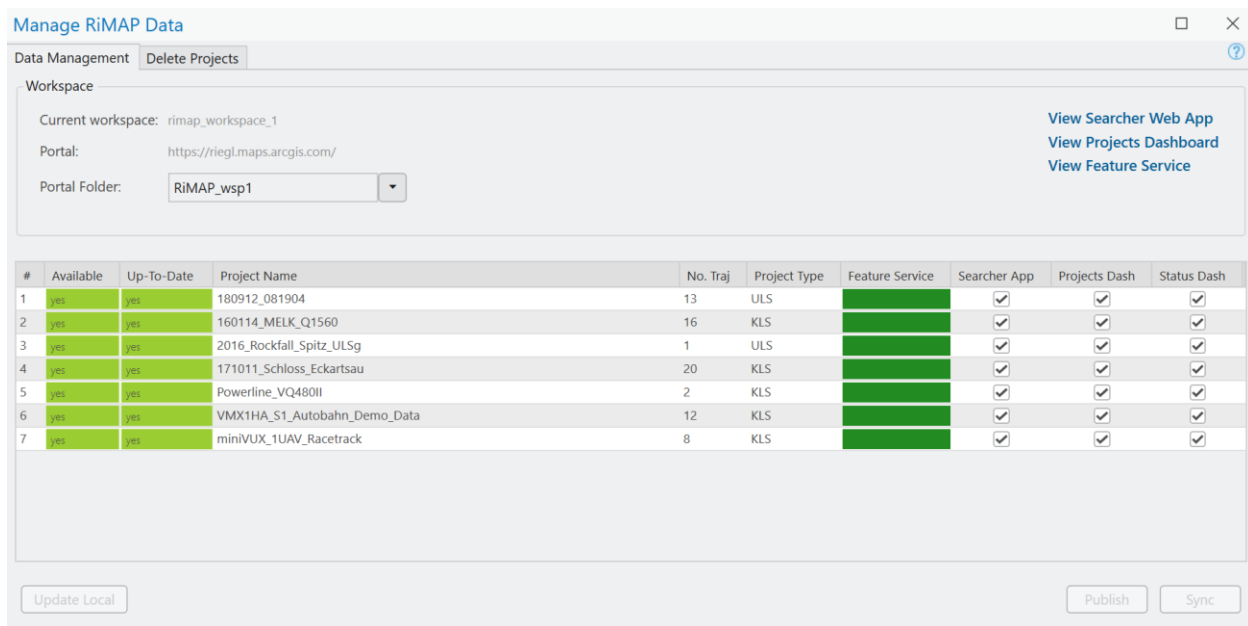


Figure 22 Publish successful

6.6. Sync

Once RiMAP items have initially been published to a portal, the synchronize function can be used to keep the portal items up-to-date and synched with the local geodatabase.

*NOTE: The Sync function is a **one way** function. It ensures the portal items represent the state of the local geodatabase. Changes made to the portal items are **not** be synchronized back with the local data.*

When the Data Management window is opened and changes are detected between the local and the portal databases or changes are made in the data management window, the “Sync” button in the bottom right hand corner of the window will become activated.

Portal items are not updated automatically. So when new projects are added, updated or deleted from the local geodatabase, or changes are made in the Data Management table, the data needs to be synced. A popup window will notify the user if there are outstanding changes that have not yet been synchronized.

Manage RiMAP Data

Data Management

Delete Projects

Workspace

Current workspace: rimap_workspace_1

Portal: https://riegl.maps.arcgis.com/

Portal Folder: RiMAP_wsp1

[View Searcher Web App](#)
[View Projects Dashboard](#)
[View Feature Service](#)

#	Available	Up-To-Date	Project Name	No. Traj	Project Type	Feature Service	Searcher App	Projects Dash	Status Dash
1	yes	yes	180912_081904	13	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
2	yes	yes	160114_MELK_Q1560	16	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3	yes	yes	2016_Rockfall_Spitz_ULSg	1	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	yes	yes	171011_Schloss_Eckartsau	20	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
5	yes	yes	Powerline_VQ480II	2	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
6	yes	yes	VMX1HA_S1_Autobahn_Demo_Data	12	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	yes	yes	miniVUX_1UAV_Racetrack	8	KLS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	yes	yes	240220_131118	4	ULS		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Update Local

Publish

Sync

Figure 23 Example new project added and Sync activated

7. RiMAP in Portal

The RiMAP web applications are accessible on any device with a web browser and internet connection. The applications' sharing setting is private and can be changed in portal if needed.

Note: The RiMAP items are delete protected. To delete the RiMAP items in your ArcGIS Online account, you need to change the settings of each item to remove the delete protection and then delete them. This is not recommended but if you do need to delete these items make sure to delete all 6 RiMAP items contained in the RiMAP folder to avoid future conflicts when managing data.

7.1. RiMAP Searcher Web Application

The RiMAP Searcher App allows the user to search for published projects based on project name, capture date, camera data availability (whether imagery is integrated – see section *Feature Classes - Project Table metadata*), or by location.

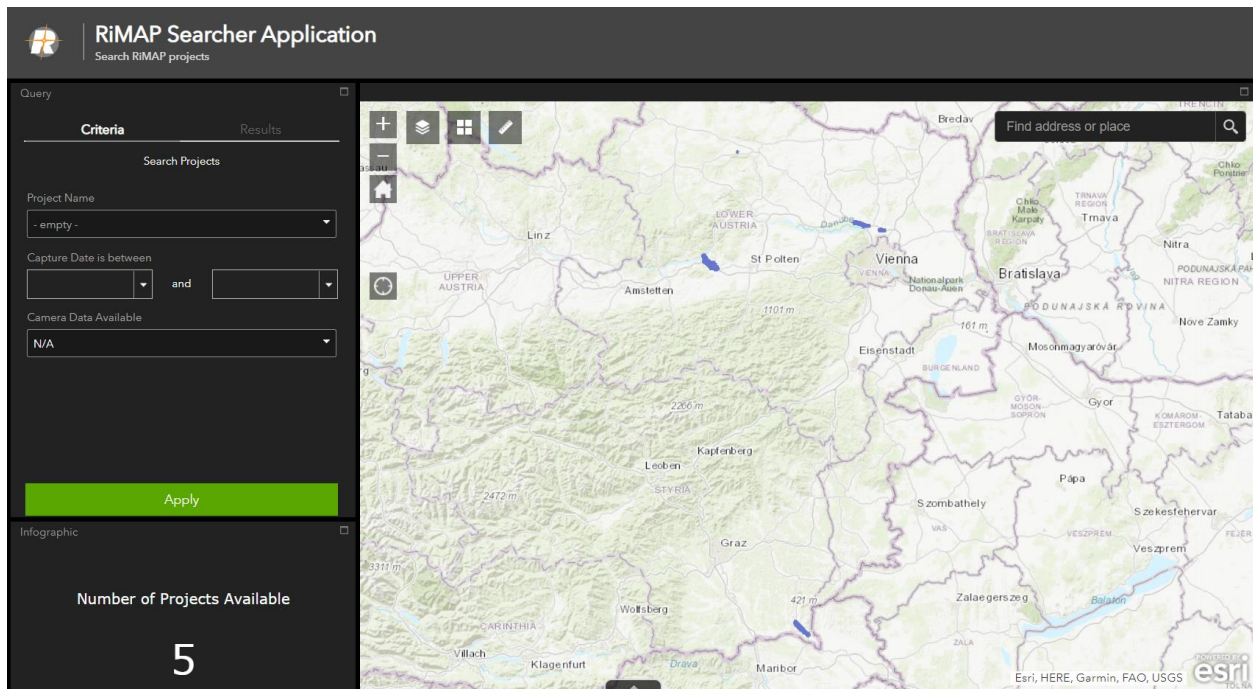


Figure 24 Searcher application

A “Measurement” widget is available in the map which can measure distances and areas on the map.

There is also a “My Location” widget. When the app is run on a GNSS enabled device, this widget can be used to see the current location of the device it is running on in relation to the project data on the map.

NOTE: the My Location tool is only as accurate as the positioning data captured by the device the app is being run on.

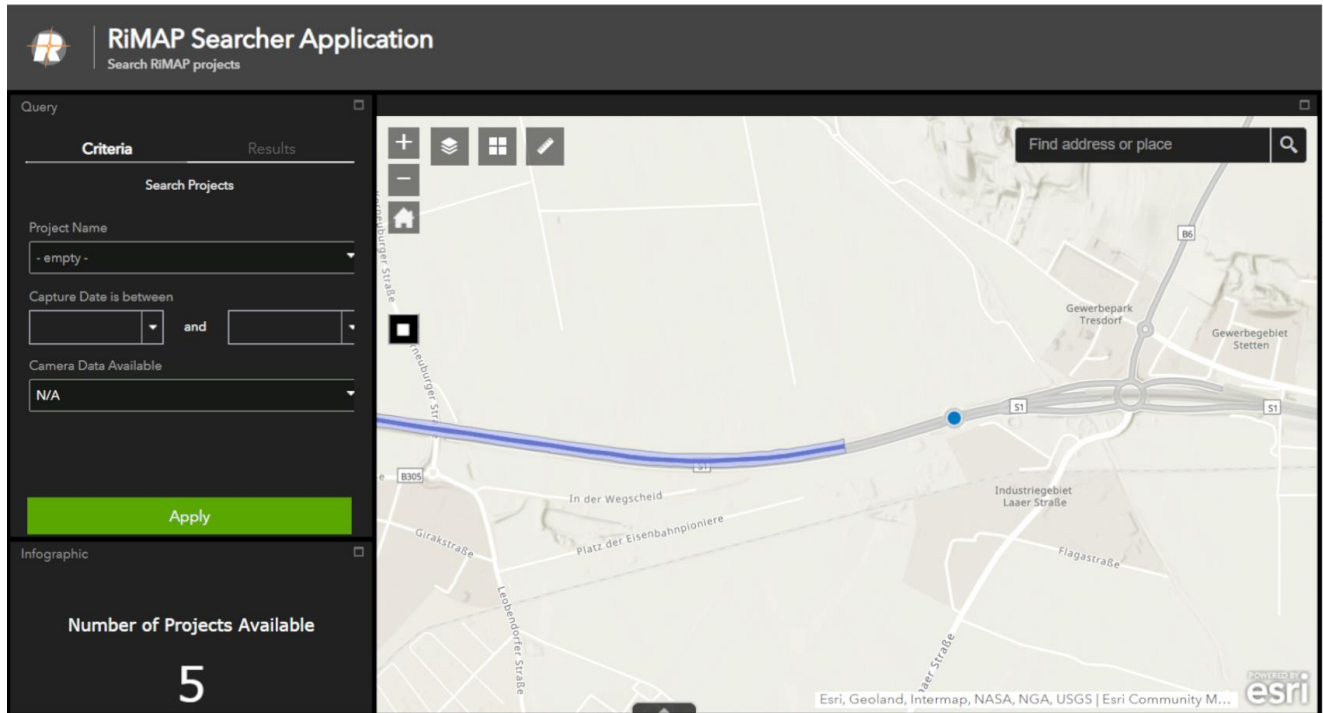


Figure 25 My Location tool

7.2. RiMAP Projects Dashboard

The RiMAP Projects Dashboard App displays metadata and statistics for projects that have been published by RiMAP. The widgets are interactive and update according to selection and the map view.

Figure 20 RiMAP Project Dashboard

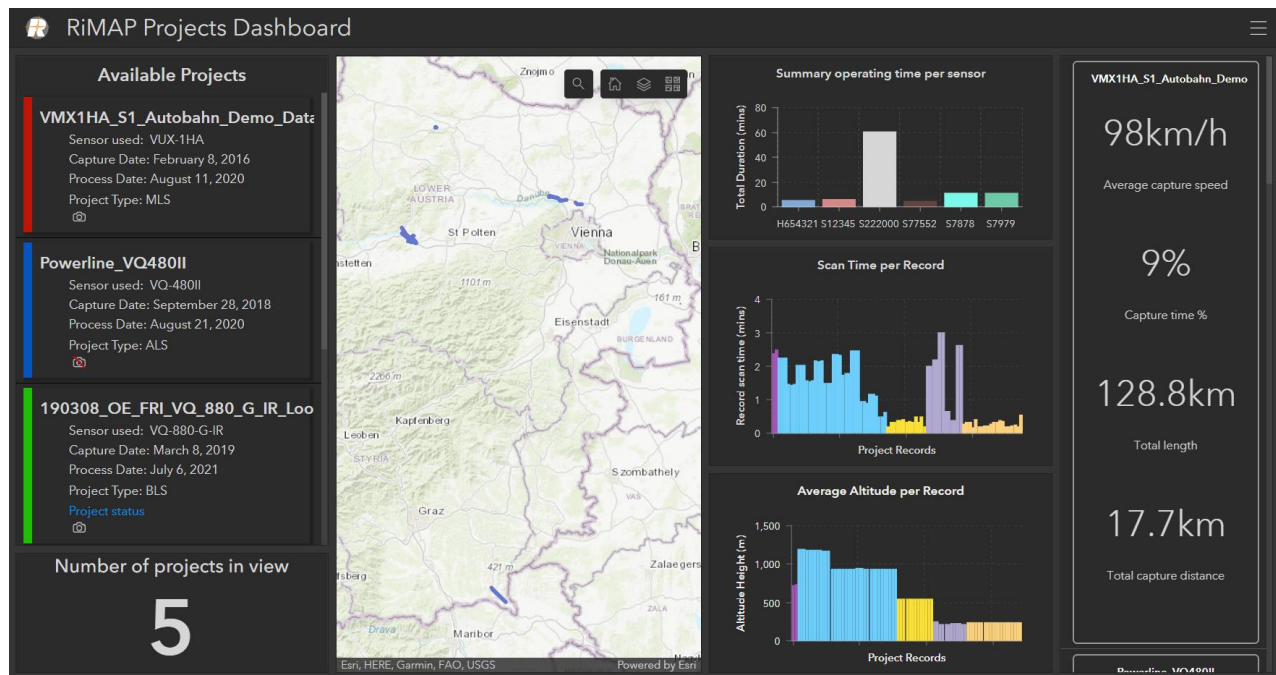


Figure 26 RiMAP Projects Dashboard

The “Available Projects” widget displays the projects that are visible within the map view. It details which sensor was used, when data was captured, when data was processed, what project type it is [ALS, MLS, ULS, BLS, KLS], and whether or not camera data was available in the project. The project is highlighted in the list according to its project type.

- ALS – Airborne Laser Scanning project – Blue
- ULS – Unmanned Laser Scanning project – Yellow
- MLS – Mobile Laser Scanning project – Red
- BLS – Bathymetric Laser Scanning project – Green
- KLS – Kinematic Laser Scanning project – Orange

The “Summary operating hours per sensor” graph shows the cumulative total scanning time, in hours, per sensor identified by their serial numbers.

Note: This summary information is only in accordance to the projects that are available in the current RiMAP Projects Dashboard.

The “Scan Time per Record” graph shows the total scanning time of each scan data record in terms of minutes.

The “Average Altitude per Record” graph shows the average height, in meters, per scan data record.

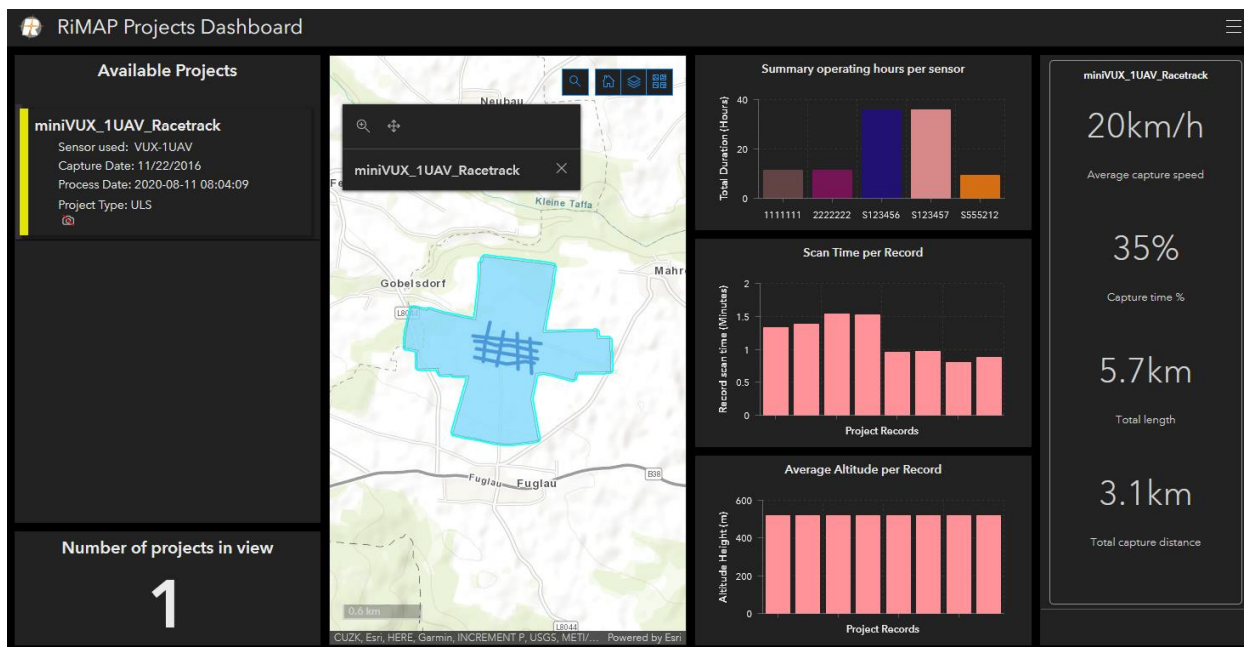


Figure 27 single selected project

7.2.1. RiMAP Status Dashboard

The RiMAP Status dashboard displays data that represents the processing state of the RiPROCESS project. It is a more in depth, project specific dashboard. This dashboard is built to be accessed through the Project Dashboard via a hyperlink in the “Available Projects” widget. It is not created by default and therefore needs to be manually selected in the Data Management table for each project that requires one.

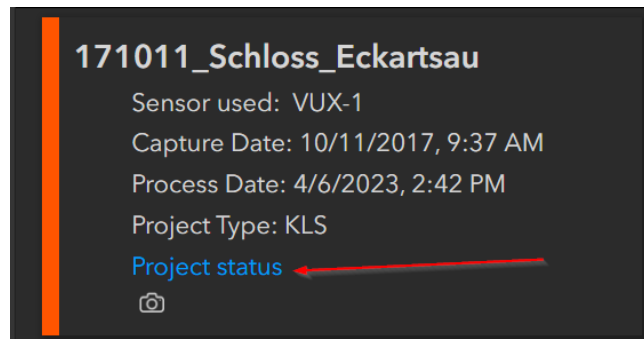


Figure 28 Example with project status hyperlink

Note: The status data displayed in the Status dashboard can only be obtained from rdbx files. That means the RiPROCESS project needs to be processed in RiPROCERSS v1.9 or higher or, for older projects, the scan data files need to be converted to rdbx files (there are tools to do this in RiPROCESS v1.9). If a project is from an older version of RiPROCESS, this dashboard will be empty.

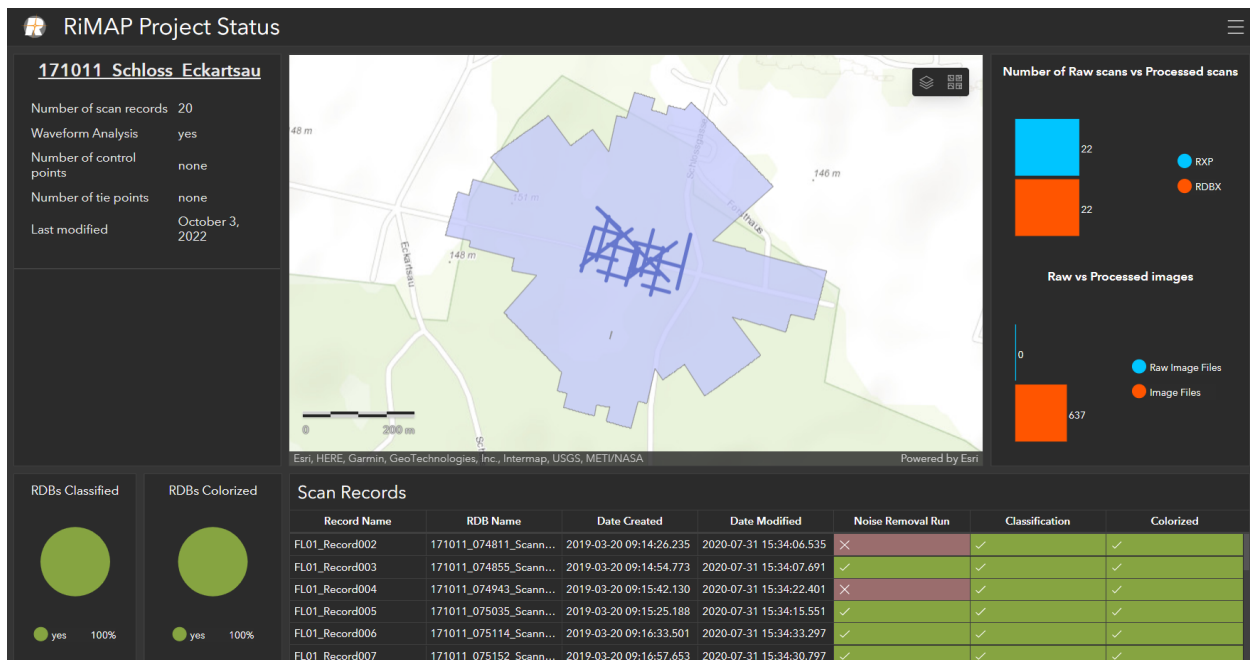


Figure 29 Example of Status Dashboard

The widgets show in-depth project specific information including:

Info widget on left-hand side:

- Number of scan records
- Whether or not waveform analysis was performed
- Number of control points
- Number of tie points
- Last modified date

Graphs on right-hand side show:

- Percentage of the rdbx's classified
- Percentage of the rdbx's colorized
- Number of raw scans and the number of processed scans
- Number of raw image files and the number of processed image files.

The table displays the individual scan record processing state:

- Record name
- RDB name
- Date created
- Date modified
- *Whether RiPROCESS noise removal tools have run on it
- *Whether RiPROCESS classification tools have run on it
- *Whether RiPROCESS colorizing tools have run on it

The pie charts and scan records table in the Status Dashboard are interactive and will update the map view when selected as well as be updated if the map view is changed (e.g. when zooming in to the project)

this data is aimed to give the user an idea of how much the data has been processed. It is **not an accurate representation of the data.*

8. RiMAP Product Support

8.1. How to Submit a Bug Report

If RiMAP is not functioning as anticipated, then please submit a Bug Report using the following procedure:

Create an email and address it to RiMAPsupport@rieglusa.com.

1. In the email title please add the phrase “**RiMAP Issue**”.
2. **Add the RiMAP log file to the email.**

The RiMAP log file is a small text file that contains information about the internal procedures and data being used by RiMAP when the error was taking place.

To find and copy the RiMAP log file:

- a. Open File Explorer
 - b. In the File Explorer address bar enter %LocalAppData%/temp/log to gain access to the Local App Data folder on your windows machine. The RiMAP log is stored in the temp/log folder.
 - c. Select the rimap.log text file and attach it to the email.
3. In the body of the email please send any notes or observations that may help us resolved the problem, such as what you were having RiMAP do when the issue occurred, what steps you took leading up to the issue, etc.
 4. Send the email.

8.2. How to Submit RiMAP Suggestions

If you have some ideas on how to improve RiMAP, or if you want to heap praise on the RiMAP development team, then please submit your suggestion using the following procedure:

1. Create an email and address it to RiMAPsupport@rieglusa.com.
2. In the email title please add the phrase “**RiMAP Suggestion**”.
3. In the body of the email please describe your suggestion.
4. Send the email.

9. Glossary

AGOL	ArcGIS Online – Esri cloud-based mapping software.
ArcGIS Pro	Esri's Flagship GIS application desktop software.
ESRI	Esri (www.esri.com) develops and supports the leading mapping and location analytics platform named ArcGIS Pro.
Feature Class	A feature class refers to the geodatabase element that contains information attributes and geometry (e.g. point, line, polygon).
Feature Layer	A feature layer is a representation of a specific feature class on a map (found in the Contents Pane).
Global Scene	A global scene is a 3D environment displaying data in a world coordinate system on a sphere.
Local Scene	A local scene is a 3D environment displaying data in a projected coordinate system on a planar surface.
Map	A map is a 2D map.
.pof	.pof is a file storing trajectory data information.
.pofx	<i>RIEGL</i> Database format version 2 storing trajectory information. Trajectory files containing timestamped position and attitude measurements of the acquisition platform.
RiMAP	Add-In to ArcGIS Pro designed to efficiently bring <i>RIEGL</i> LiDAR scanner data into the ArcGIS Platform.
.rdbx	<i>RIEGL</i> Database format version 2 within which the processed point clouds are stored.
RiACQUIRE	The <i>RIEGL</i> acquisition software used in conjunction with <i>RIEGL</i> scanners to capture point cloud data.
RiPROCESS	The <i>RIEGL</i> processing software used to processed kinematic scan projects.
.rpp	RiPROCESS Project file.