

Standard Operating Procedure (SOP) for UAV Data Processing in Pix4D: Orthomosaic, DSM & DTM Generation

Step 1: Create Project and save project in Pix4Dmapper:

- Open **Pix4Dmapper**
- Click on **New Project**
- Enter a **Project Name**
- Click **Browse** and select the directory where the project will be saved (*Use the **Create in** option to choose the project folder*)
- Select **Project Type** as **New Project**
- Click **Next** to proceed



This wizard creates a new project.
Choose a name, a directory location and a type for your new project.

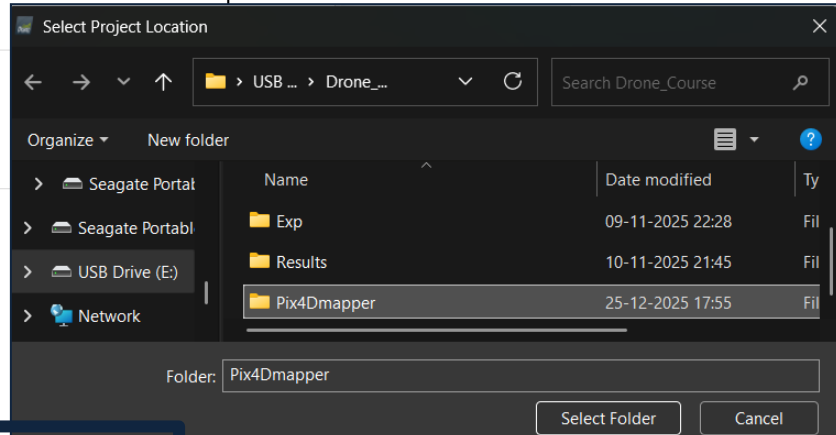
Name:

Create In:

☐ Use As Default Project Location

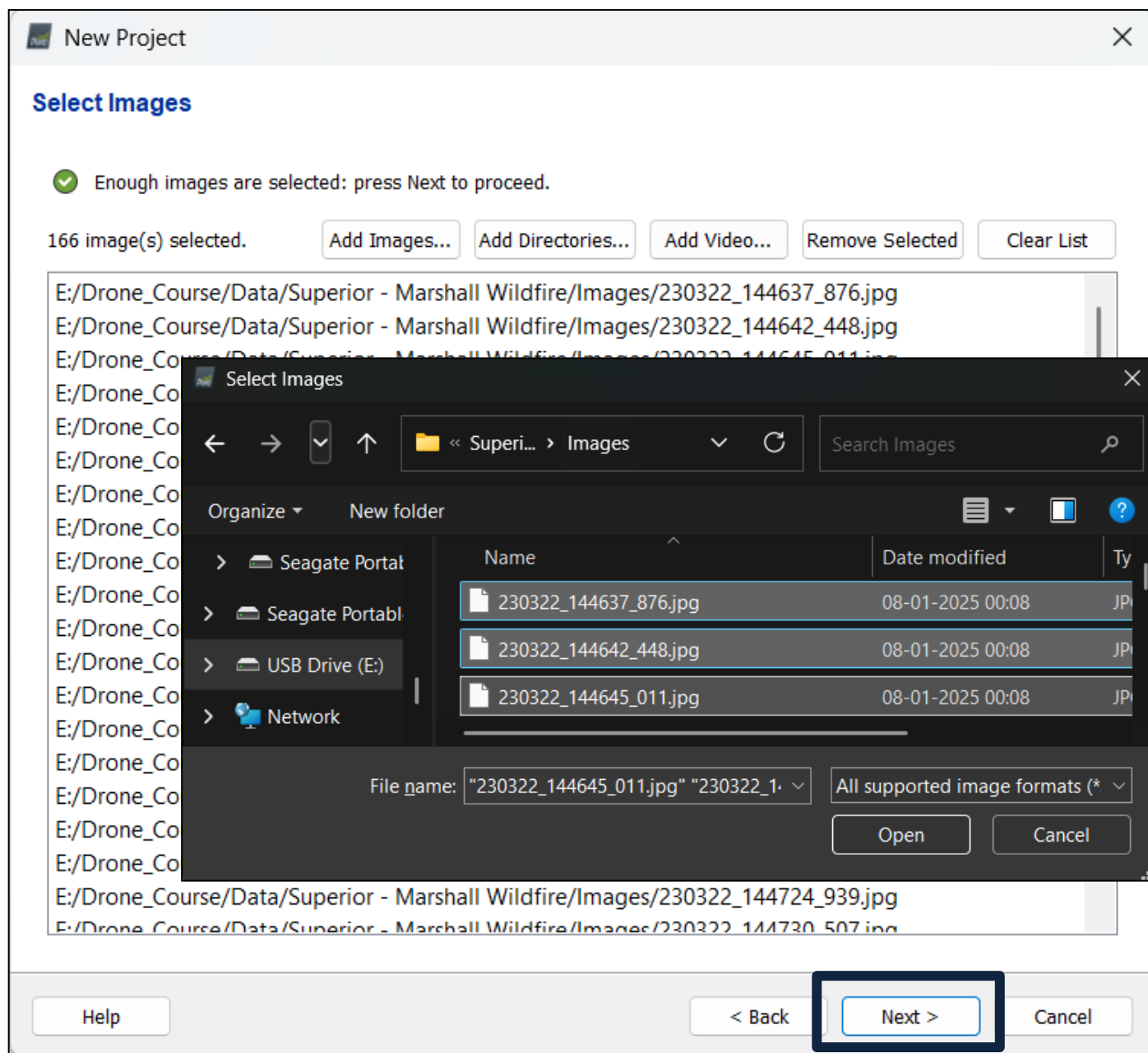
Project Type

- ☒ New Project
- ☐ Project Merged from Existing Projects
- ☐ New Project with Camera Rigs
- ☐ Project Merged from Existing Projects for Camera Rig Calibration



Step 2: Add Drone Images to the Pix4D Project:

1. The **New Project** window will appear
2. Add drone/UAV images using one of the following options:
 - **Add Images** – Select individual or multiple images from the folder
 - **Add Directories** – Import the complete image folder at once (recommended)
3. Verify that all required images are listed correctly
4. Click **Next** to continue



Step 3: Set Image Properties and Geolocation:

1. In the **Image Properties** window, review the **Coordinate System**
 - Under **Datum**, verify or edit the datum as required
 - Example: **WGS 84**
2. Check **Geolocated Images** status
 - Confirm all images are geotagged
 - Example: **166 out of 166 images geolocated**
3. **Ground Control Points (GCPs)** (if available):
 - Select **From File** to import GCPs in CSV format, or
 - Select **From EXIF** if GPS information is embedded in the images (used in this case)
4. Set **Geolocation Accuracy**
 - Select **Standard**
5. Verify the **Camera Model**
 - Use **Edit** if needed
 - Example: **Default camera model**
6. Click **Next** to proceed

New Project

Image Properties

Image Geolocation

Coordinate System

Datum: World Geodetic System 1984; Coordinate System: WGS 84 (EGM 96 Geoid)

Edit...

Geolocation and Orientation

Geolocated Images: 166 out of 166

Clear

From EXIF

From File...

To File...

Geolocation Accuracy:

StandardLowCustom

Import image GPS position from EXIF

Selected Camera Model

ILCE-7RM4A_24mmF3.5DGDN|Contemporary021_24.0_9504x6336 (RGB)

Edit...

Enabled	Image	Group	Latitude [degree]	Longitude [degree]	Altitude [m]
<div><div></div></div>	230322_144637...	group1	39.95400630	-105.17524260	1791.618
<div><div></div></div>	230322_144642...	group1	39.95423300	-105.17524450	1791.474
<div><div></div></div>	230322_144645...	group1	39.95450920	-105.17524300	1791.618
<div><div></div></div>	230322_144646...	group1	39.95464530	-105.17524330	1791.605
<div><div></div></div>	230322_144649...	group1	39.95492980	-105.17524380	1791.610

Help

< Back

Next >

Cancel

Step 4: Select Output Coordinate System:

1. In the **Output Coordinate System** window, select the **Units**
 - Choose **Meters (m)** (default)
2. Set the **Horizontal Coordinate System**:
 - Select **Auto-Detected**
 - Example: **WGS 84 / UTM Zone 13N**
 - Alternatively, choose **Known Coordinate System** and use the **Search** option to select the required CRS
3. Configure the **Vertical Coordinate System**:
 - Select **MSL (Mean Sea Level)**
 - Choose the appropriate **Geoid Model**
 - Example: **EGM 2008 Geoid**
4. Click **Next** to continue

New Project

Select Output Coordinate System

Selected Coordinate System

Datum: World Geodetic System 1984
Coordinate System: WGS 84 / UTM zone 13N (EGM 2008 Geoid)

Output/GCP Coordinate System

Unit: **m**

☐ Arbitrary Coordinate System [m]

☒ Auto Detected: WGS 84 / UTM zone 13N

☐ Known Coordinate System [m]

Vertical Coordinate System

☒ MSL **EGM 2008 Geoid** Expressed in metre above WGS 84

☐ Geoid Height Above WGS 84 Ellipsoid [m]

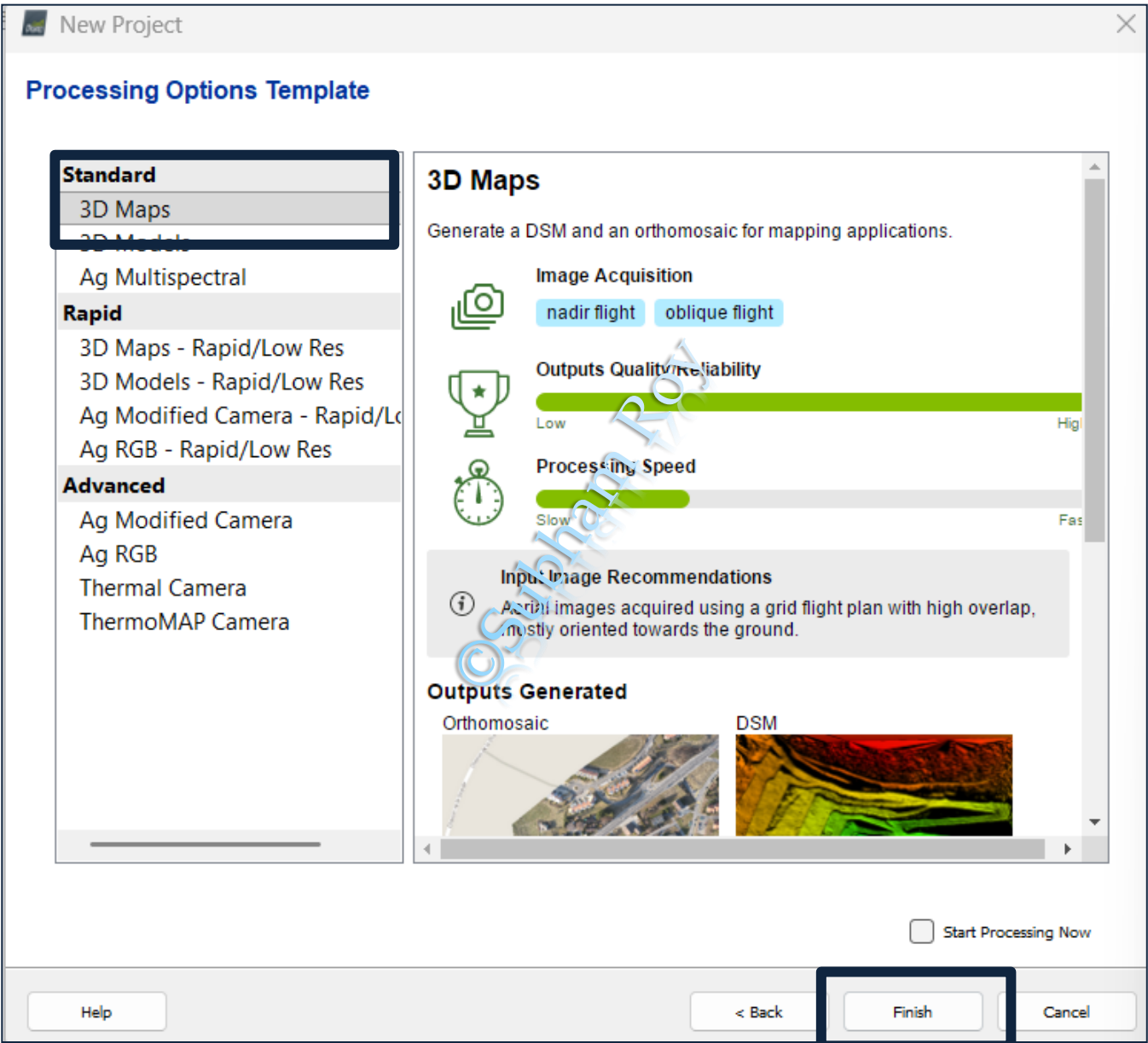
☐ Arbitrary

☒ Advanced Coordinate Options

Buttons: Help, < Back, **Next >**, Cancel

Step 5: Select Processing Options Template

1. In the **Processing Options Template** window, select the required template
 - Choose **3D Maps** under the **Standard** options (*used in this case*)
2. Ensure **Start Processing Now** is **unchecked**
3. Click **Finish** to complete project setup



Step 6: Configure Initial Processing Settings:

1. Click on **Processing Options**

2. Select 1. **Initial Processing**

A. General Options

- **Keypoints Image Scale: Select Full**
- **Enable Quality Report**

B. Matching Options

- **Select Aerial Grid or Corridor** (Used in this case)

C. Calibration Options

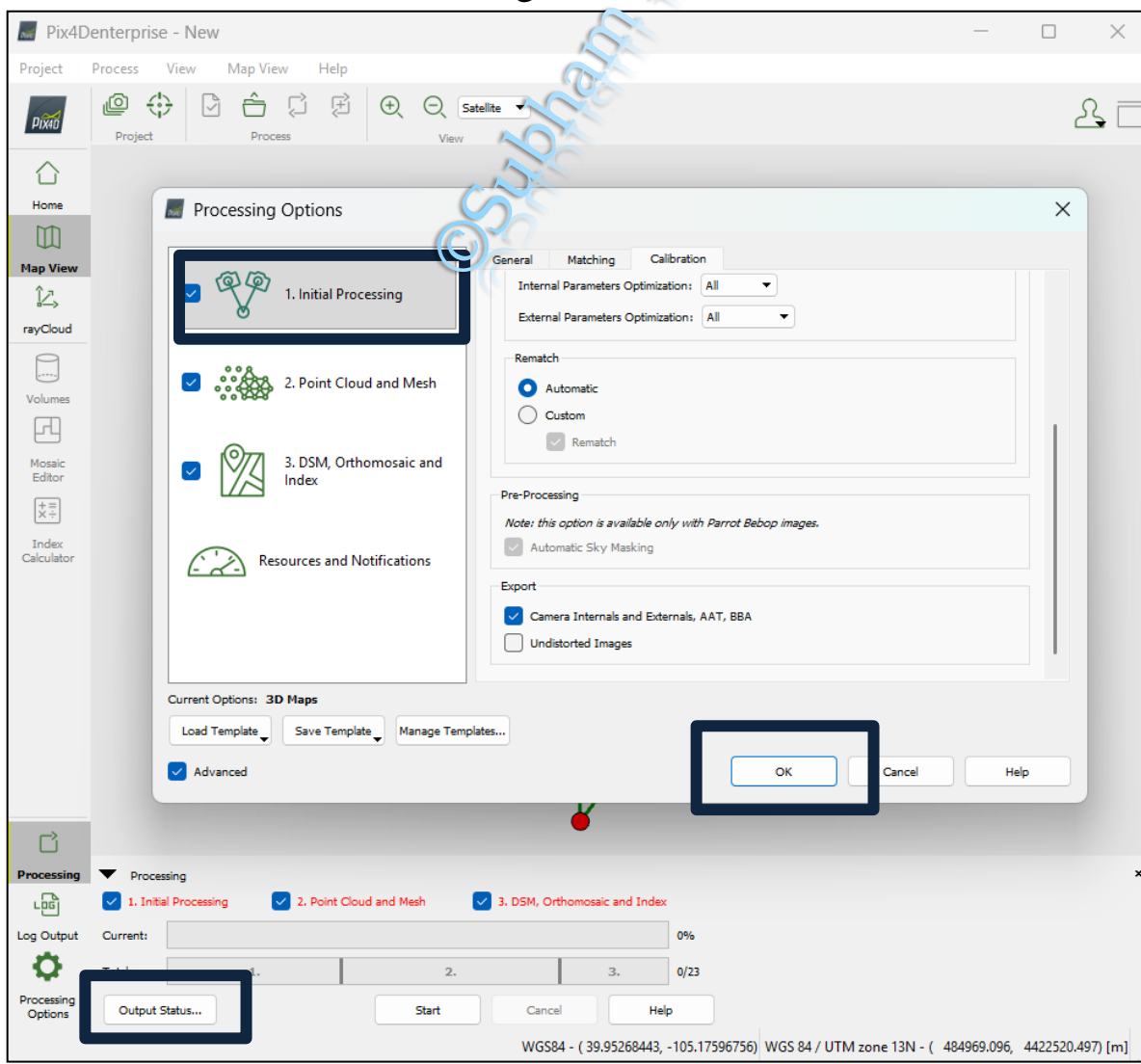
- **Targeted Number of Keypoints:**
 - Select **Automatic**, or
 - Choose **Custom** and set **Number of Keypoints = 10,000**
- **Calibration Method: Select Standard**
- **Rematch: Select Automatic**

D. Export Options

Enable:

- Camera Internals, Externals and AAT, BBA

3. Click **OK** to save the settings



Step 7: Configure Point Cloud and Mesh Settings

- 1. Open **Processing Options**
- 2. Select **2. Point Cloud and Mesh**

A. Point Cloud Densification

- Image Scale: **1/2 (Half Image Size – Default)**
- Enable **Default Multiscale**
- Point Density: **Optimal** (*Selected based on system configuration: 4 GB GPU and 16 GB RAM*)
- Minimum Number of Matches: **3**

B. Point Cloud Classification

- Enable **Classify Point Cloud**

C. Export Options

- Select **LAS** format
- Enable **Merge Tiles into One File**

- 3. Click **OK** to save the settings

Processing Options

☒ 1. Initial Processing

☒ 2. Point Cloud and Mesh

☒ 3. DSM, Orthomosaic and Index

Resources and Notifications

Point Cloud

Textured Mesh

Advanced

Point Cloud Densification

Image Scale: 1/2 (Half image size, Default) ☒ Multiscale

Point Density: Optimal

Minimum Number of Matches: 3

Point Cloud Classification

Note: improves the DTM generation

☒ Classify Point Cloud

Export

☒ LAS

☐ LAZ

☐ PLY

☐ XYZ

Delimiter: Space

☐ Merge Tiles into One File

Current Options: No Template

Load Template

Save Template

Manage Templates...

☒ Advanced

OK

Cancel

Help

Step 8: Configure DSM, Orthomosaic, and Index Settings

1. Open **Processing Options**
2. Select **3. DSM, Orthomosaic and Index**

A. DSM and Orthomosaic Settings

- Resolution: **Automatic (1 × GSD)**

A. DSM Filter

- Enable **Use Noise Filtering**
- Surface Smoothing Type: **Sharp**

B. Raster DSM

- Enable **GeoTIFF**
- Interpolation Method: **IDW**
- Enable **Merge Tiles**

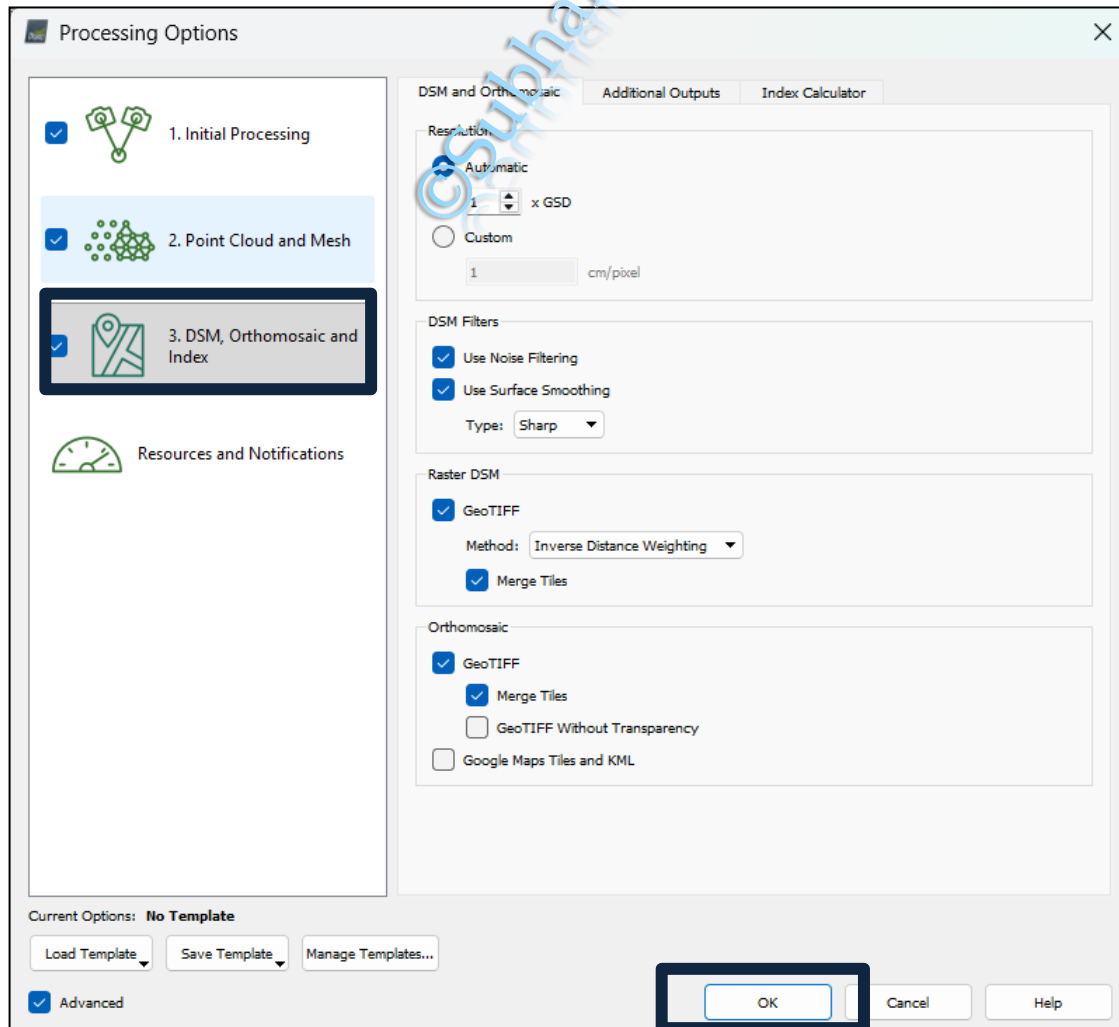
C. Orthomosaic

- Enable **GeoTIFF**
- Enable **Merge Tiles**

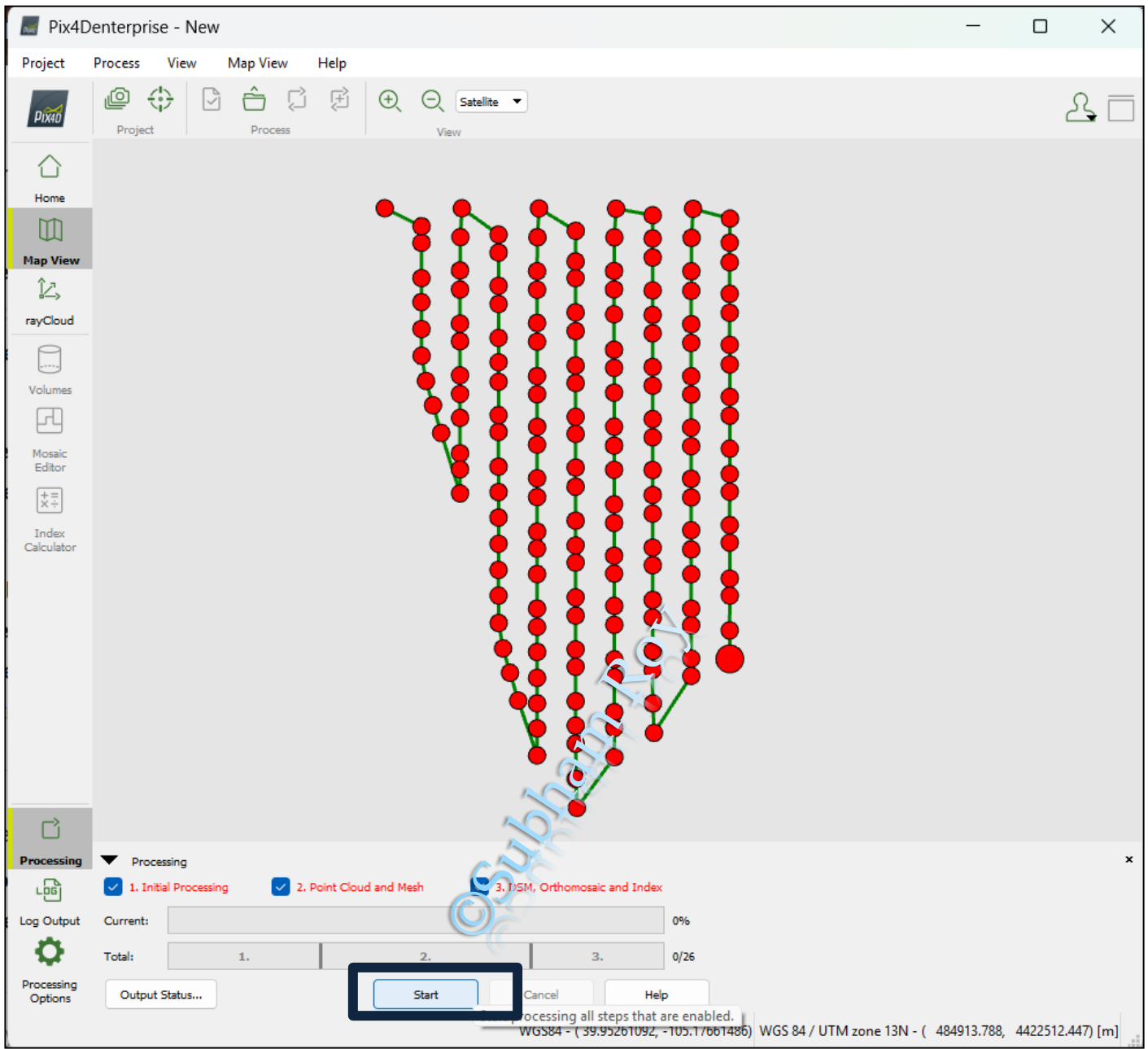
B. Additional Outputs

A. Raster DTM

- Enable **GeoTIFF**
- Enable **Merge Tiles**
- Click **OK** to save the settings



Step 9: Click on Start



Orthomosaic and Digital Surface Model (DSM)

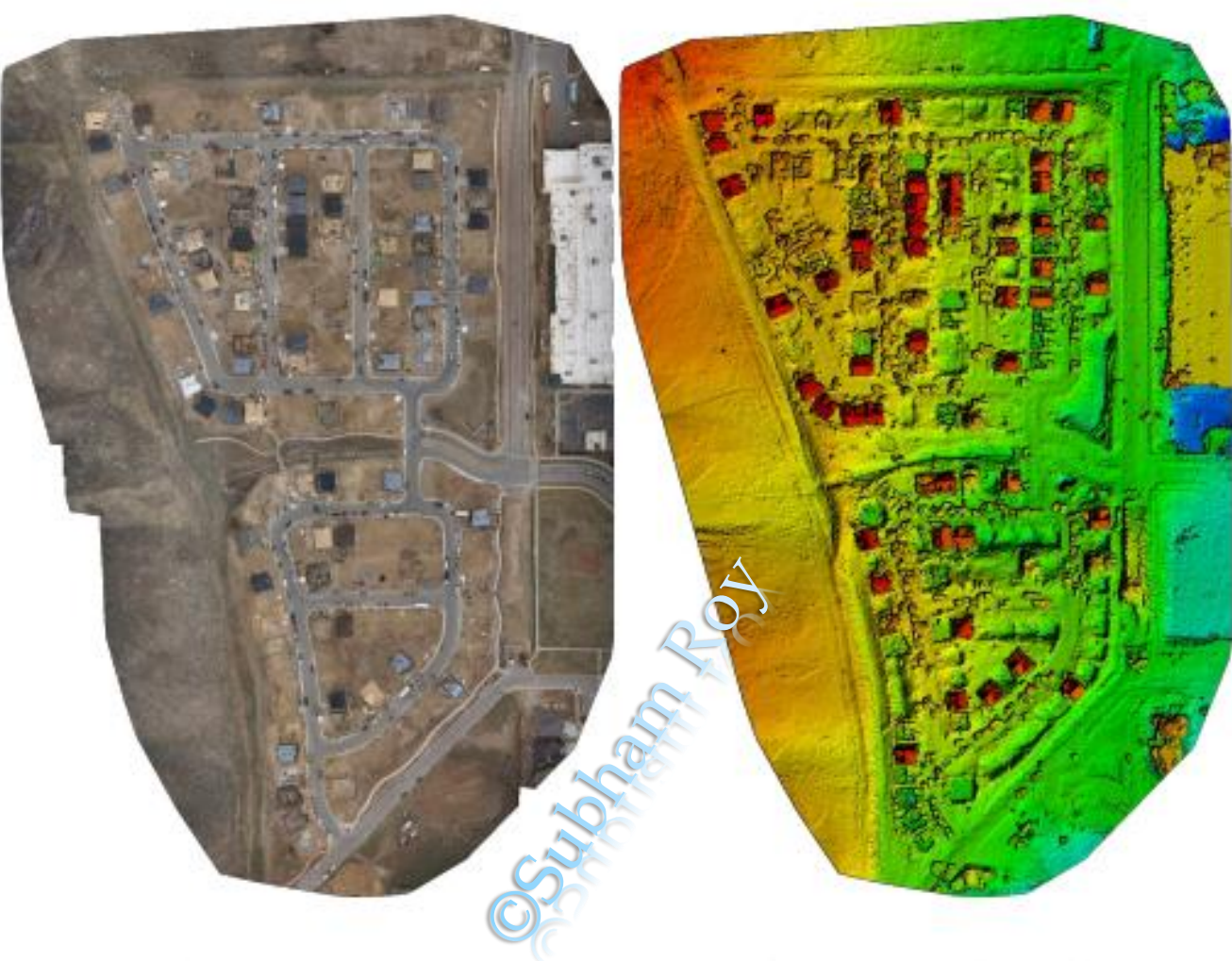
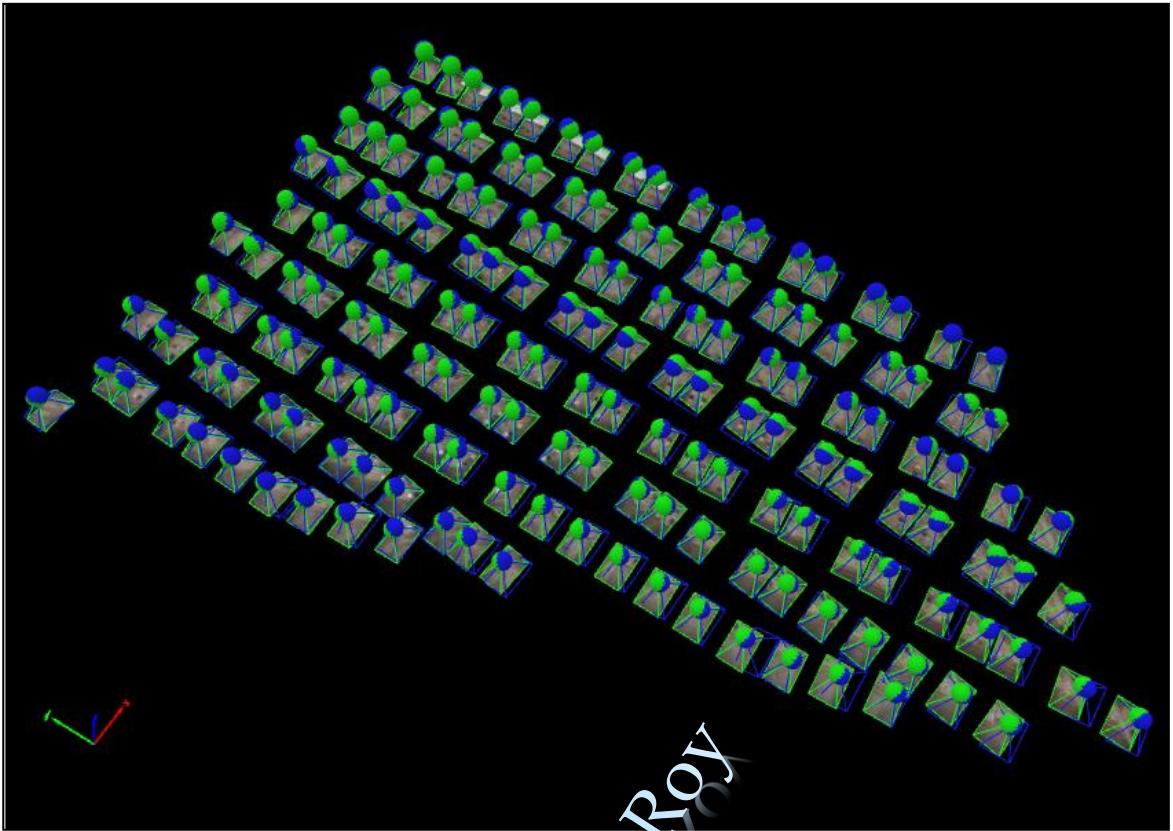


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

Project	ESRI
Processed	2025-12-22 23:35:18
Camera Model Name(s)	ILCE-7RM4A_24mmF3.5DGDN Contemporary021_24.0_9504x6336 (RGB)
Average Ground Sampling Distance (GSD)	1.34 cm / 0.53 in
Area Covered	0.186 km ² / 18.5848 ha / 0.07 sq. mi. / 45.9479 acres
Time for Initial Processing (without report)	21m:52s

Cameras



Tie Points



Point Clouds



Triangles Meshes

