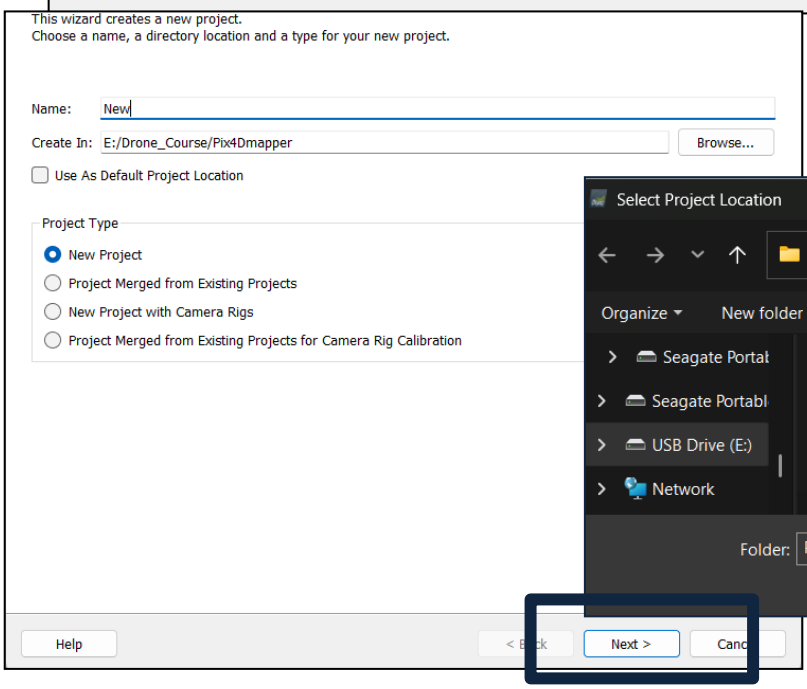
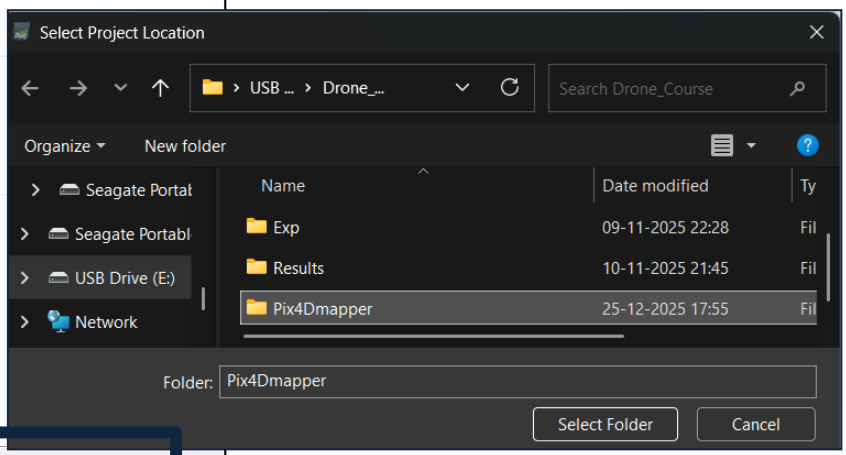
Standard Operating Procedure (SOP) for UAV Data Processing in Pix4D: Orthomosaic, DSM & DTM Generation

Step 1: Create Project and save project in Pix4Dmapper:

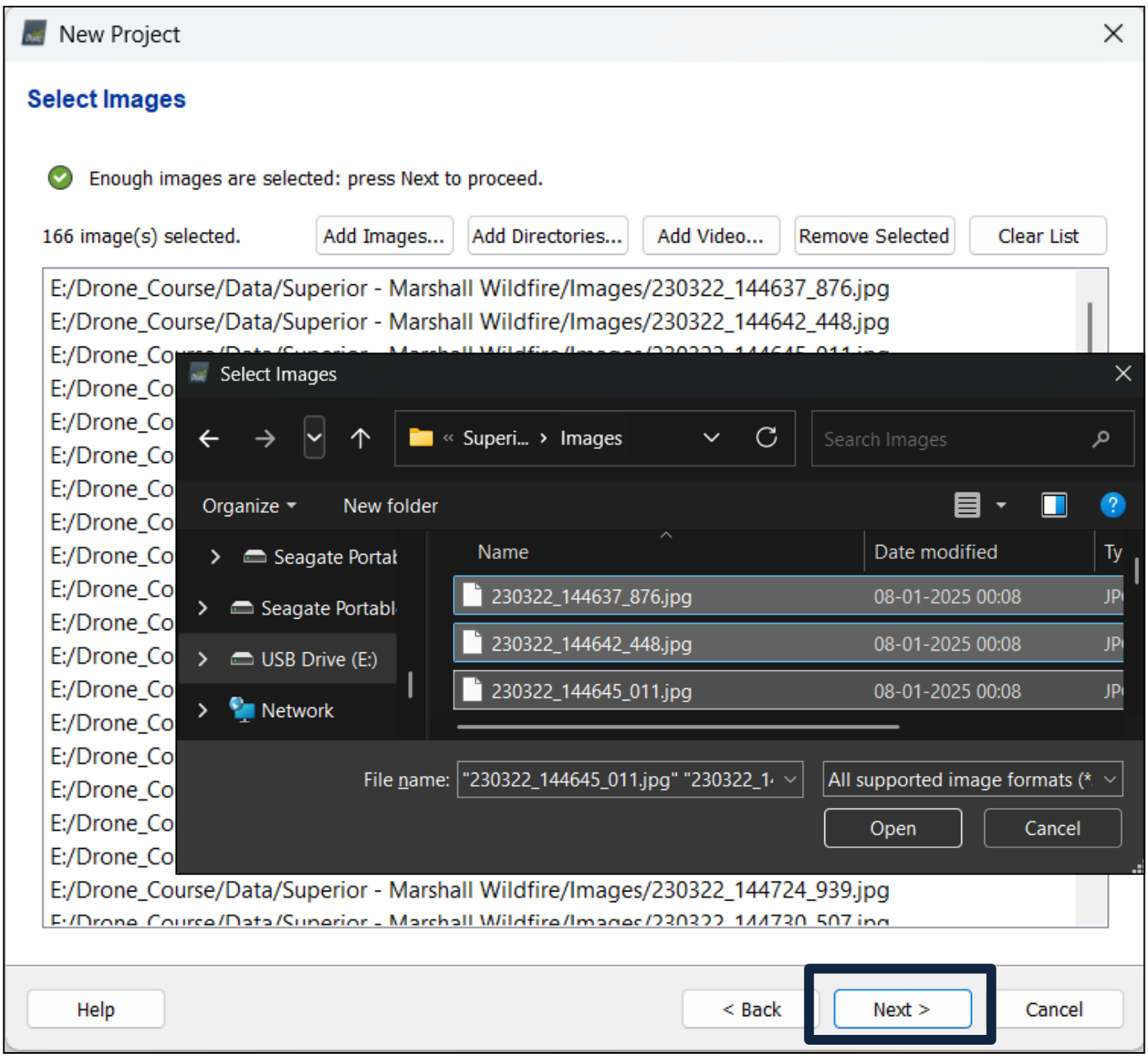
- Open **Pix4Dmapper**
- Click on **New Project**
- Enter a **Project Name**
- Click **Browse** and select the directory where the project will be saved *(Use the **Create in** option to choose the project folder)*
- Select **Project Type** as **New Project**
- Click **Next** to proceed





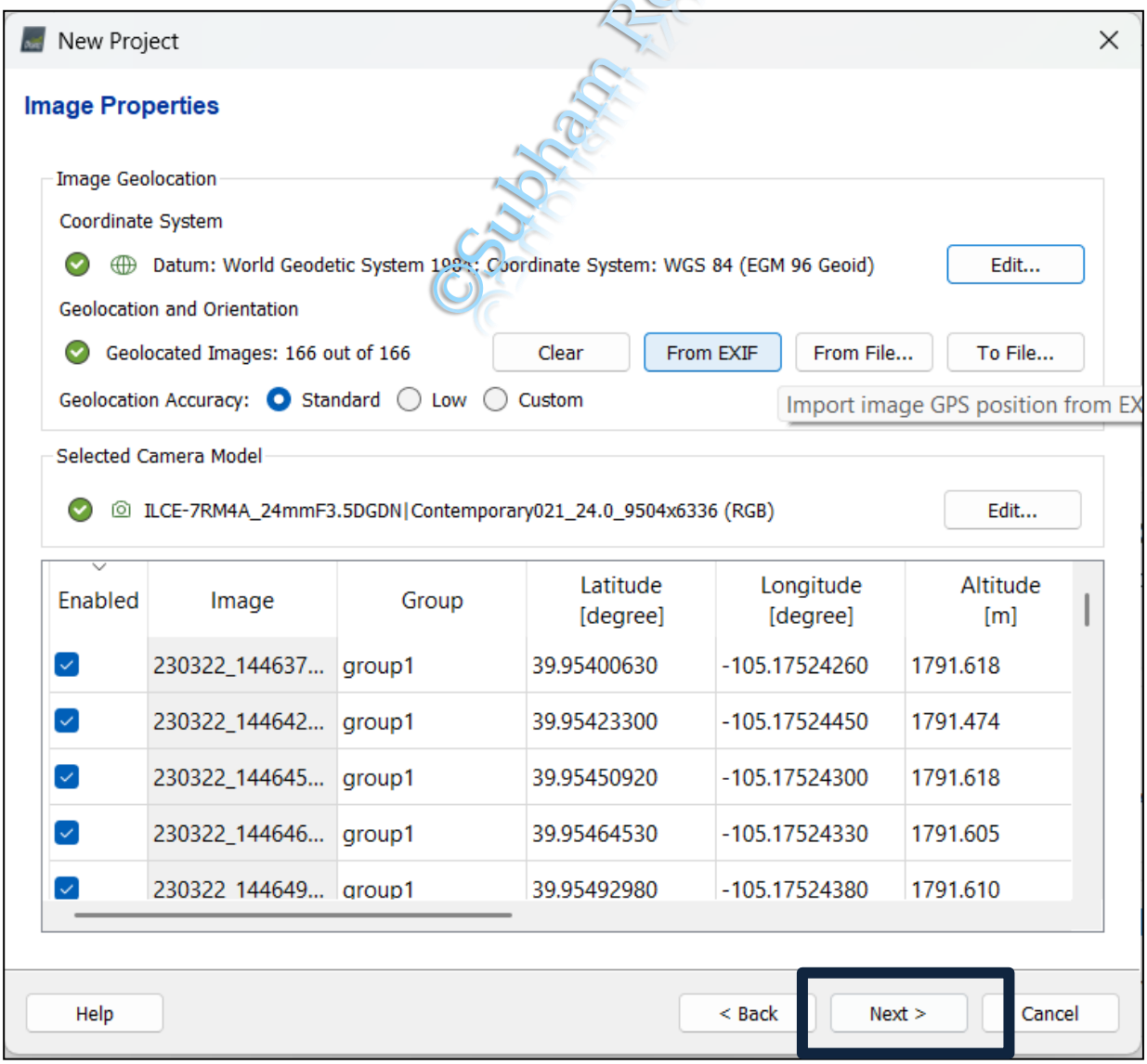
Step 2: Add Drone Images to the Pix4D Project:

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



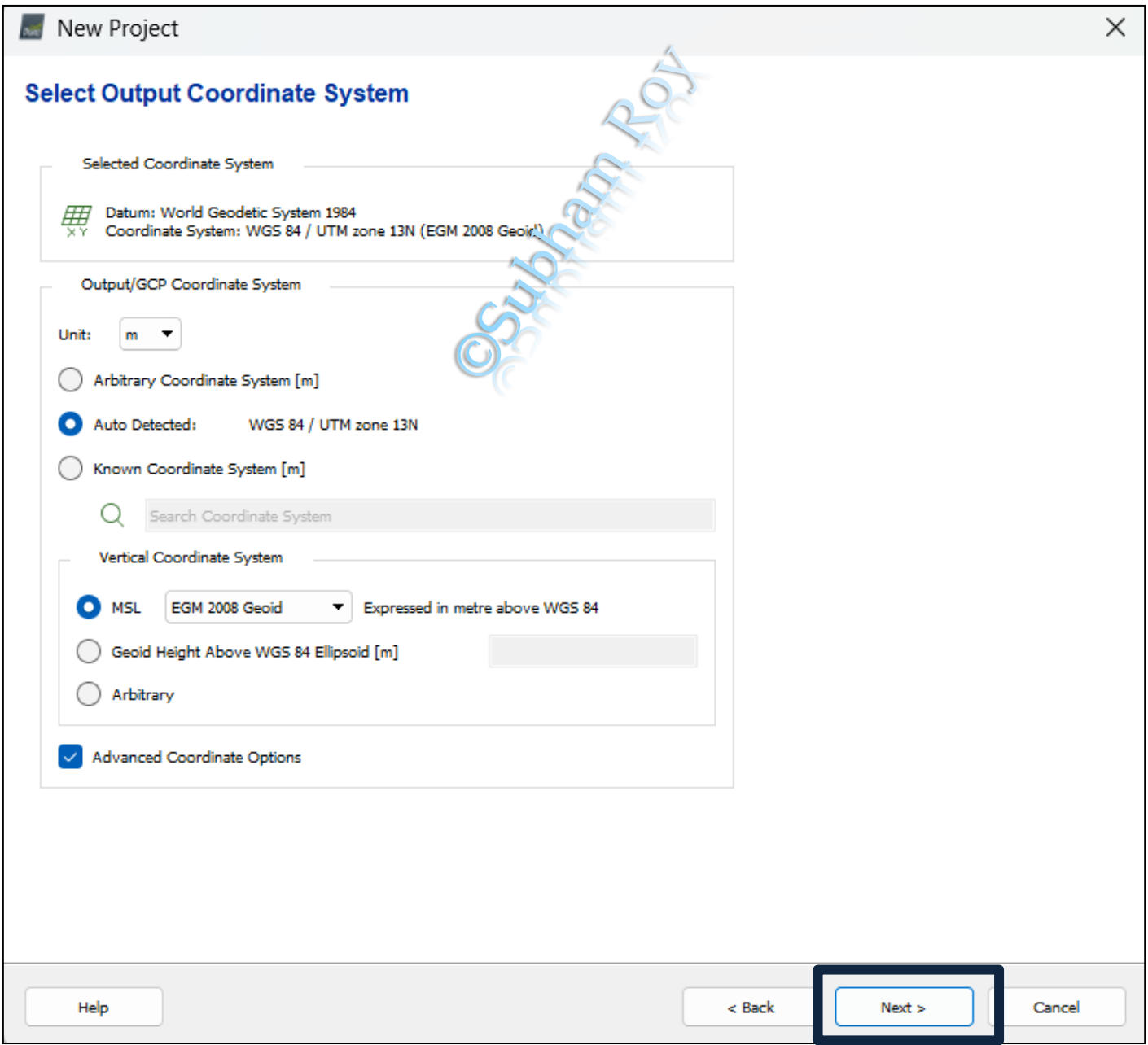
Step 3: Set Image Properties and Geolocation:

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



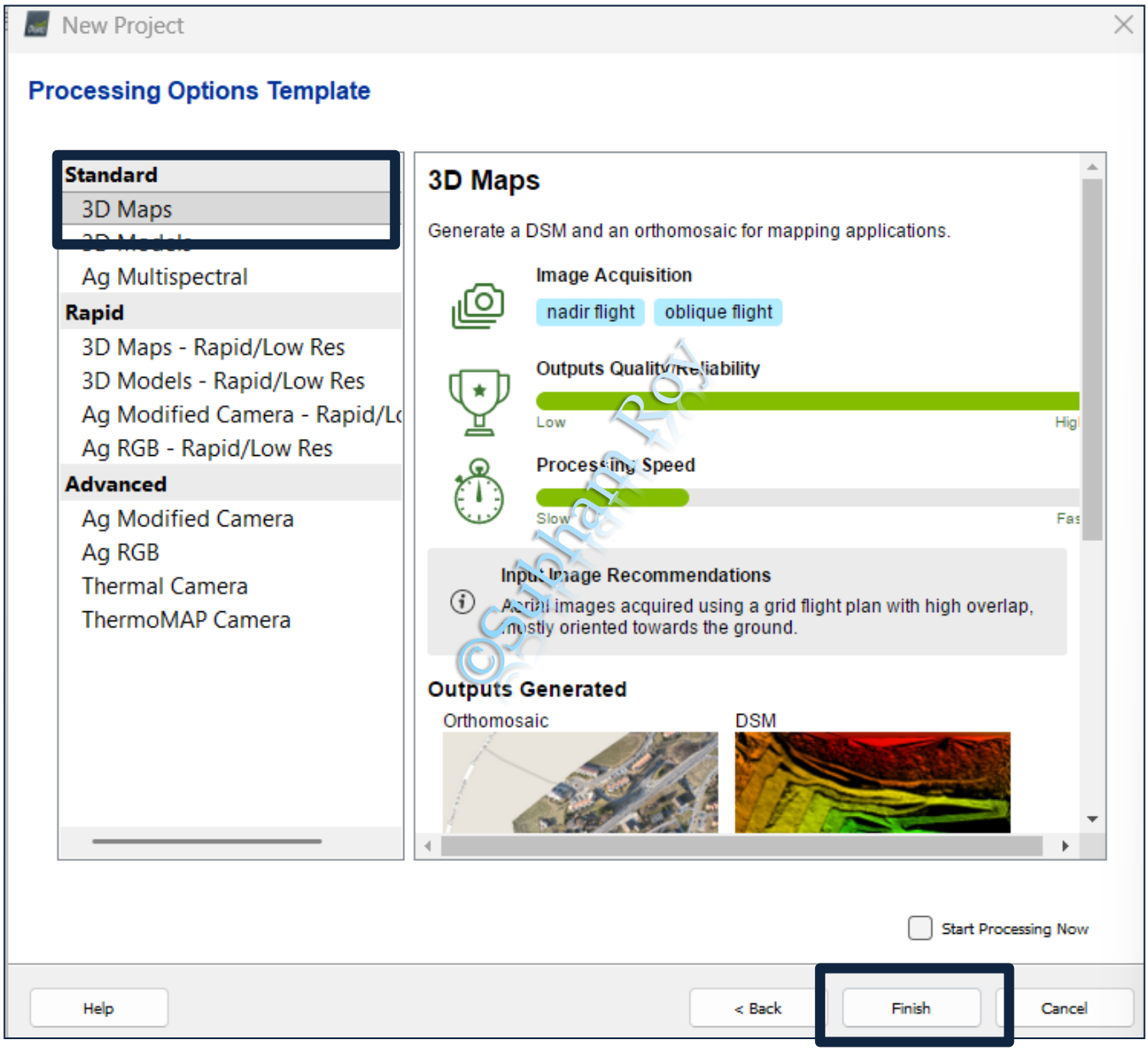
Step 4: Select Output Coordinate System:

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



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

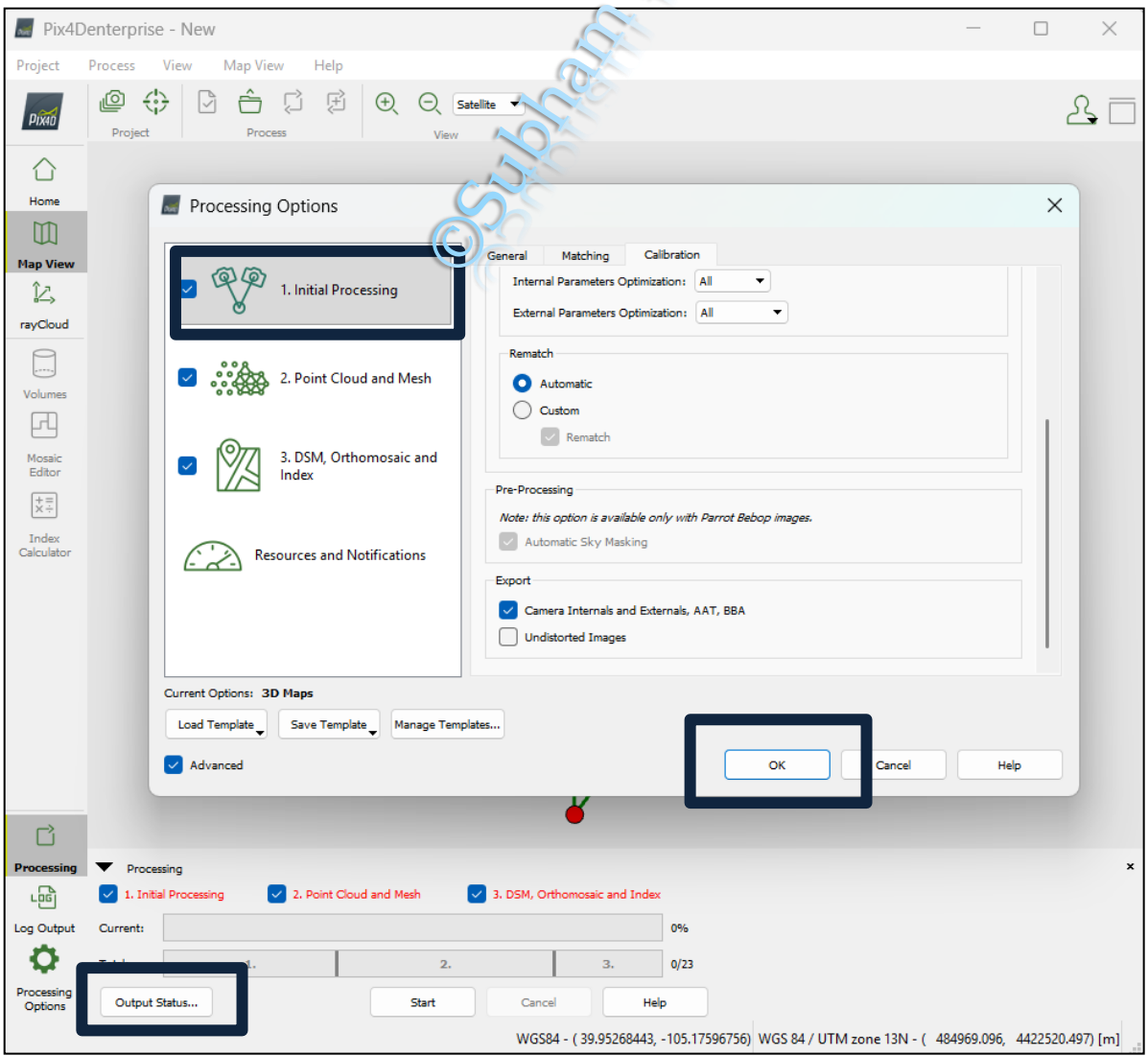
- **Targeted Number of Keypoints:**
  - Select **Automatic**, or
  - Choose **Custom** and set **Number of Keypoints = 10,000**
- **Calibration Method: Select Standard**
- **Rematch: Select Automatic**

D. Export Options

Enable:

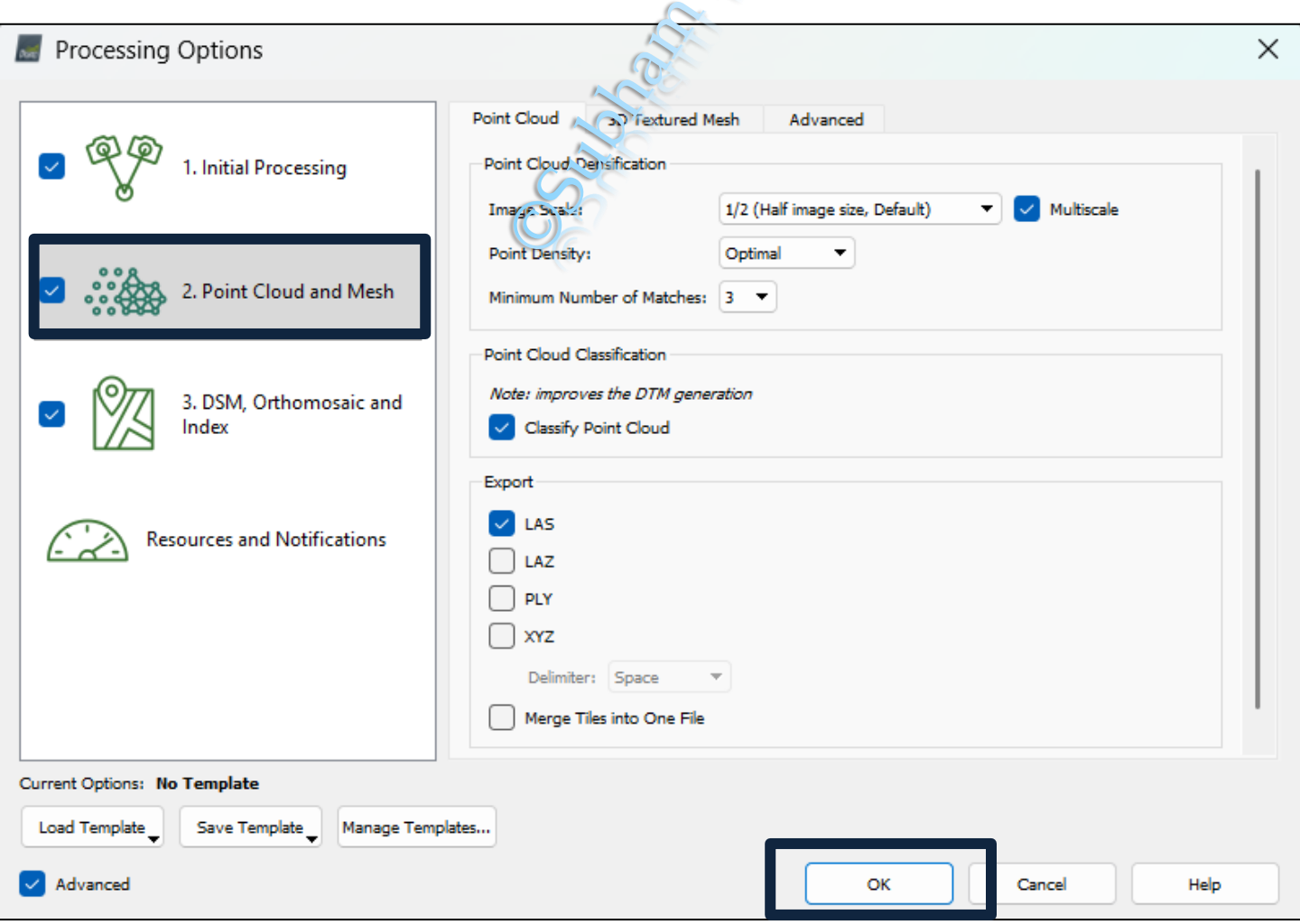
- Camera Internals, Externals and AAT, BBA

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



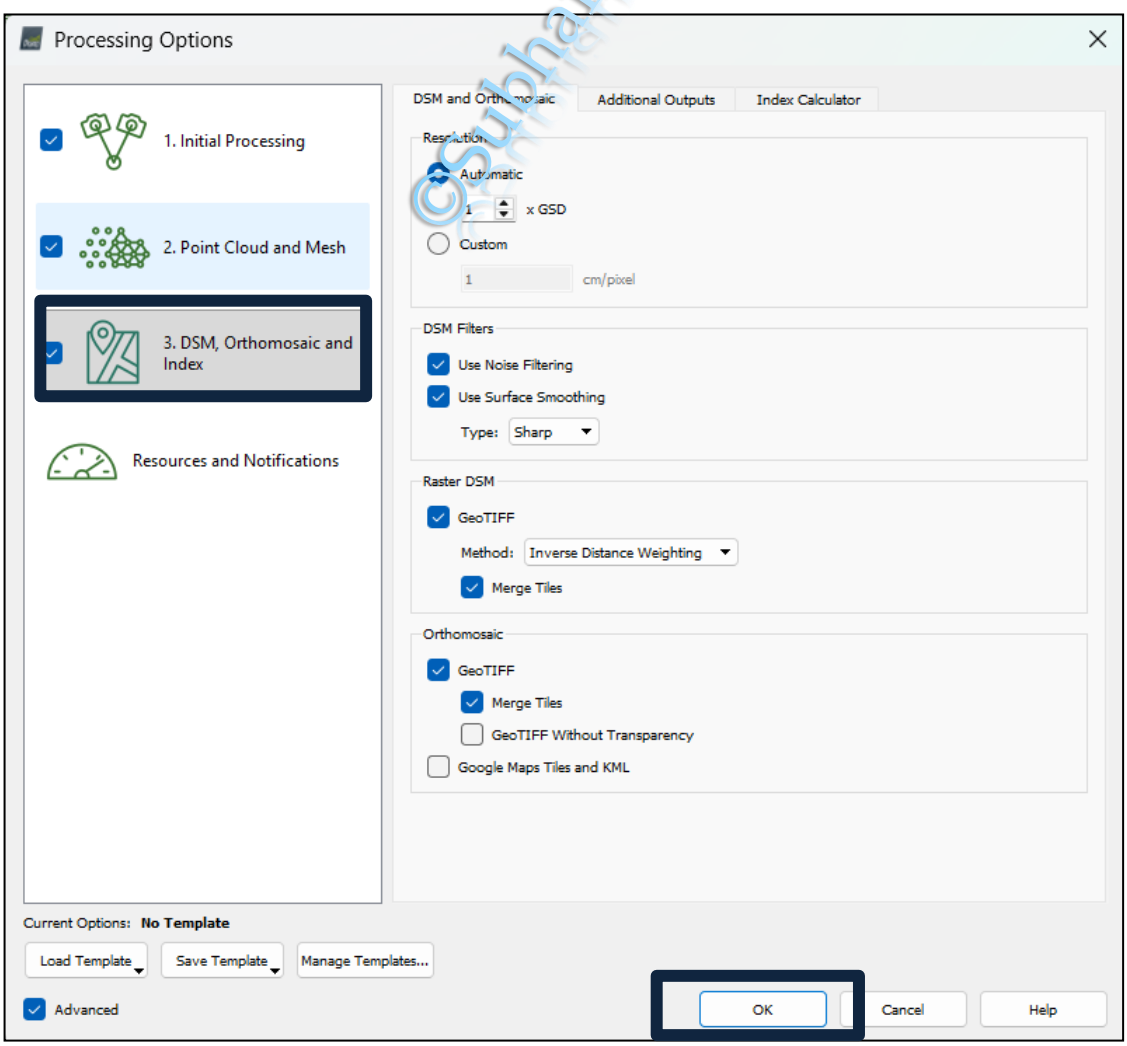
Step 7: Configure Point Cloud and Mesh Settings

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

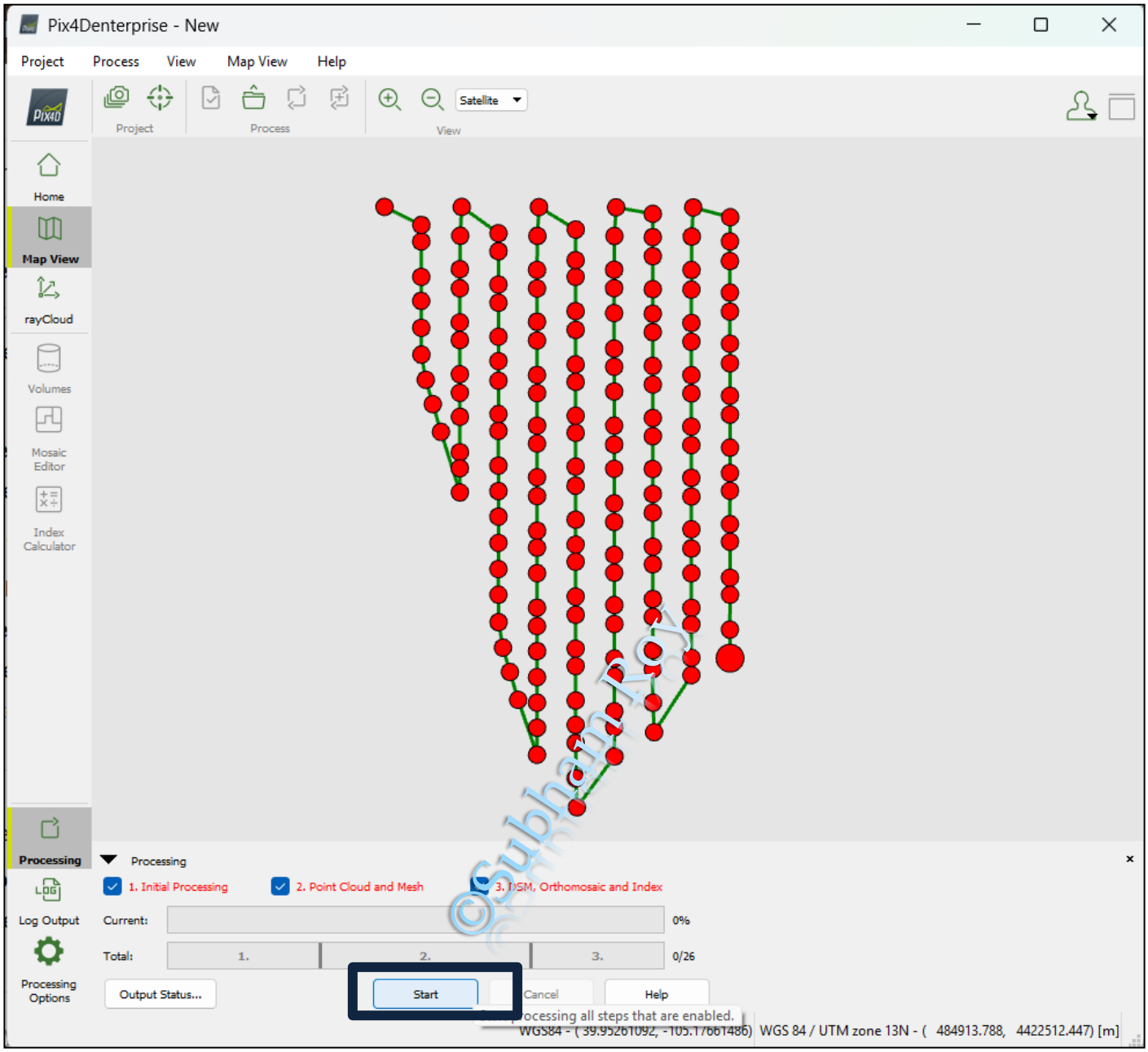


Step 8: Configure DSM, Orthomosaic, and Index Settings

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)

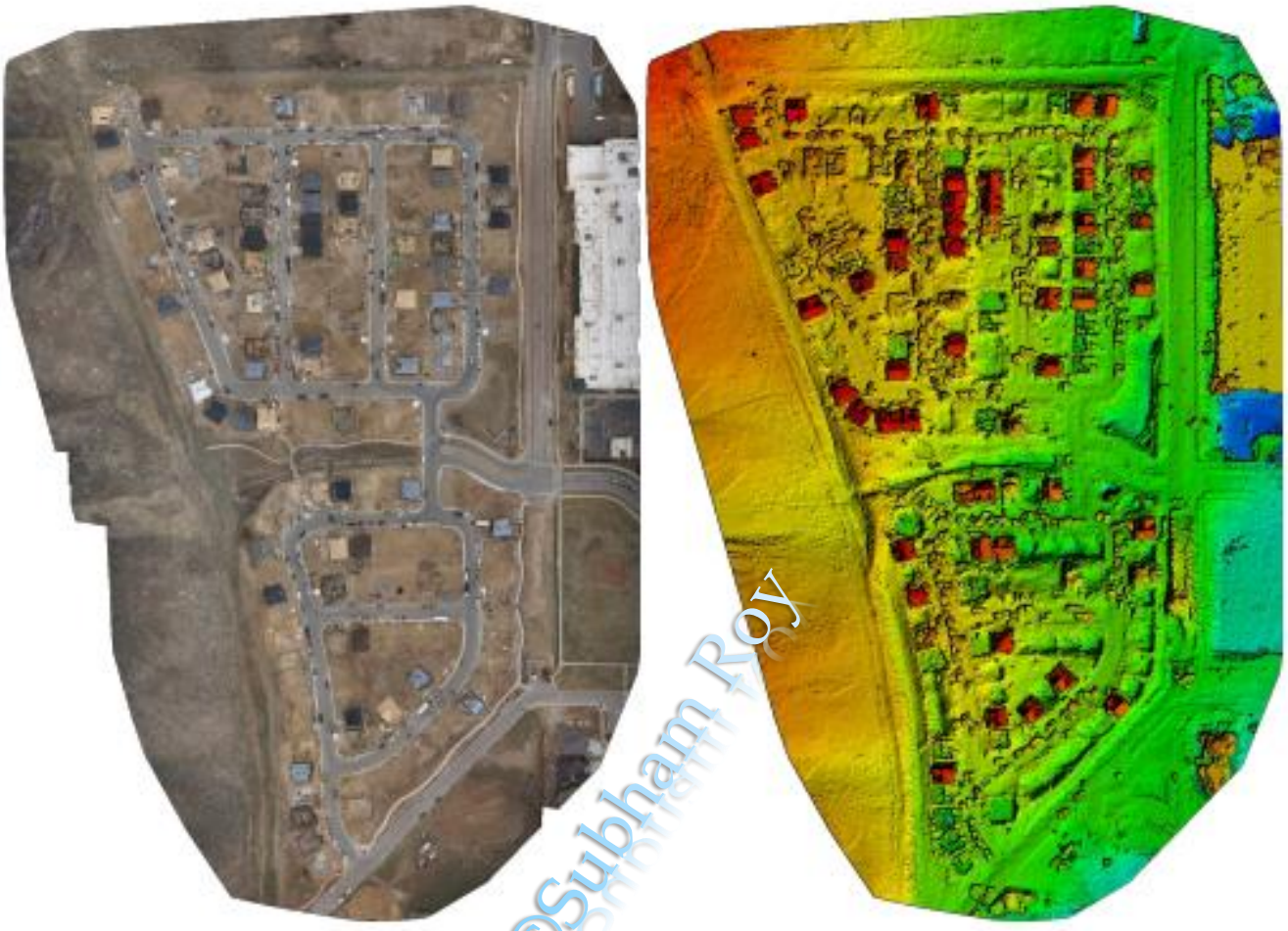
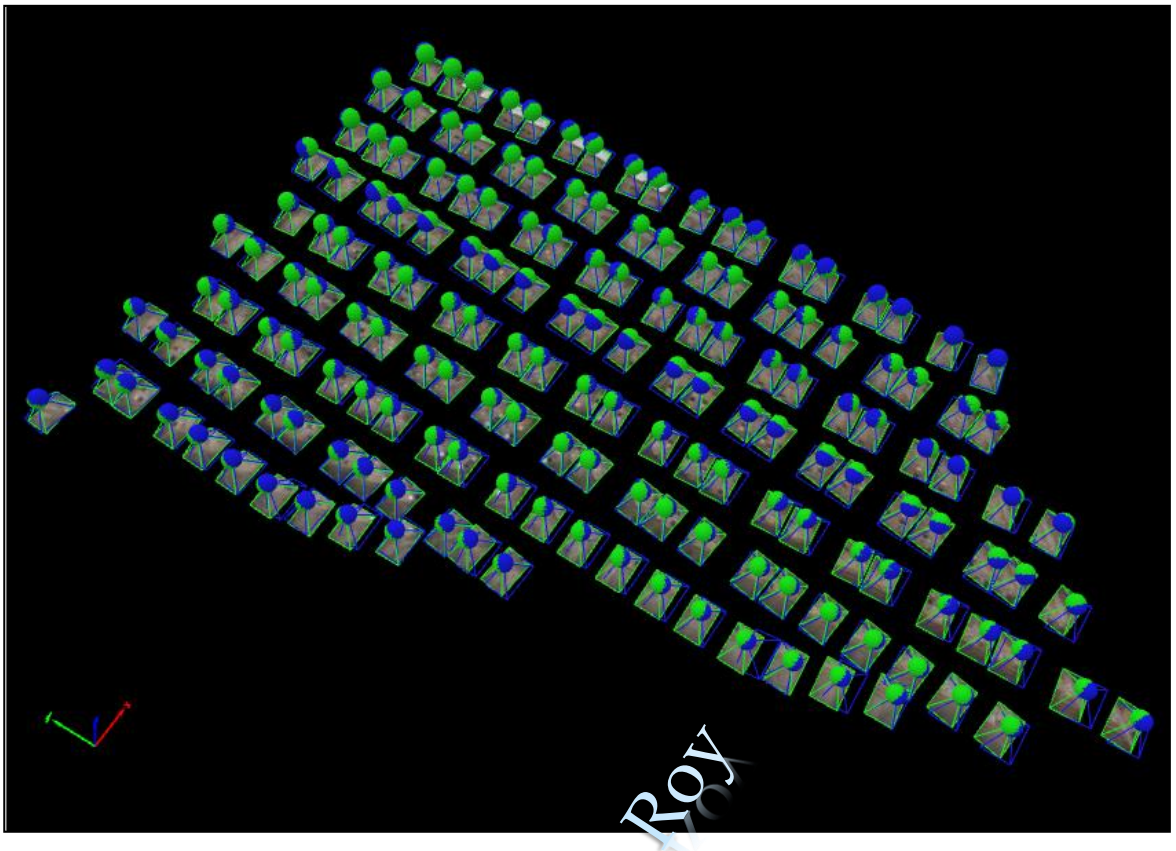


Figure 1: Orthomosaic and the corresponding sparse Digital Surface Model (DSM) before densification.

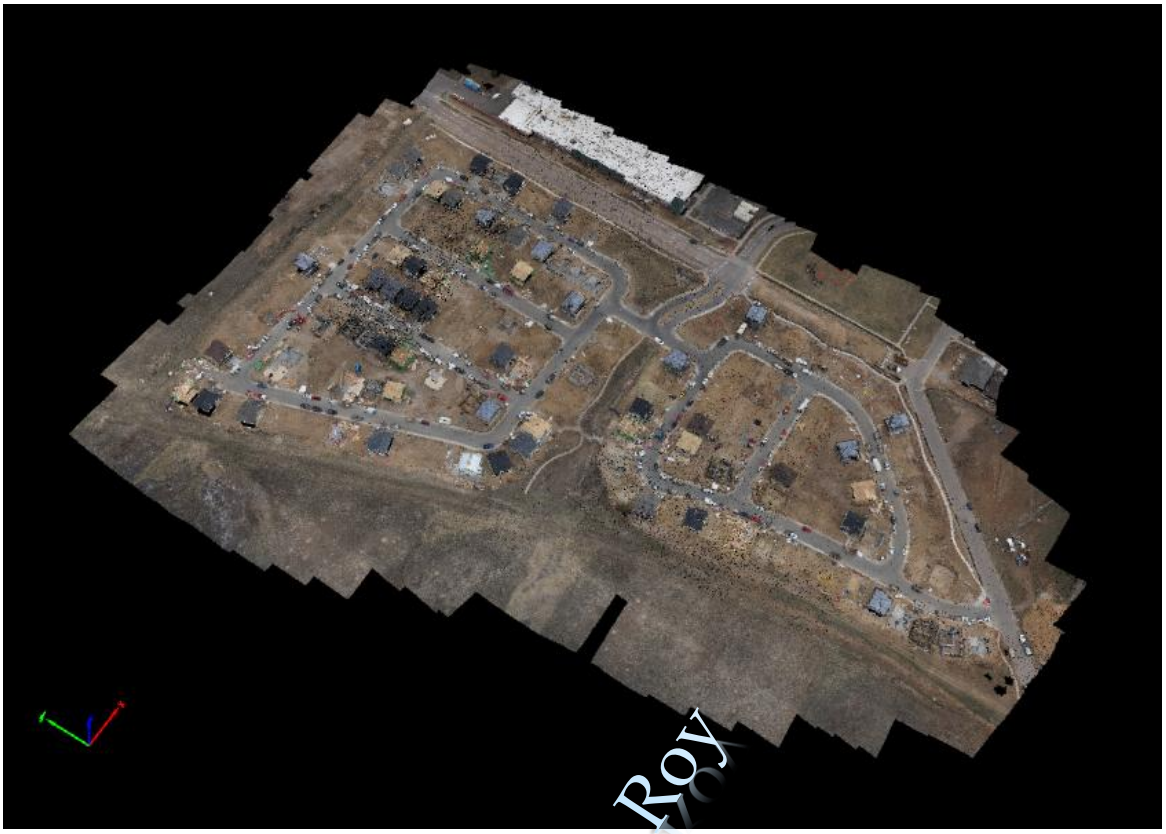
Project	ESRI
Processed	2025-12-22 23:35:18
Camera Model Name(s)	ILCE-7RM4A_24mmF3.5DGDN|Contemporary021_24.0_9504x6336 (RGB)
Average Ground Sampling Distance (GSD)	1.34 cm / 0.53 in
Area Covered	0.186 km^2 / 18.5848 ha / 0.07 sq. mi. / 45.9479 acres
Time for Initial Processing (without report)	21m:52s

Cameras



Tie Points

Point Clouds



Triangles Meshes