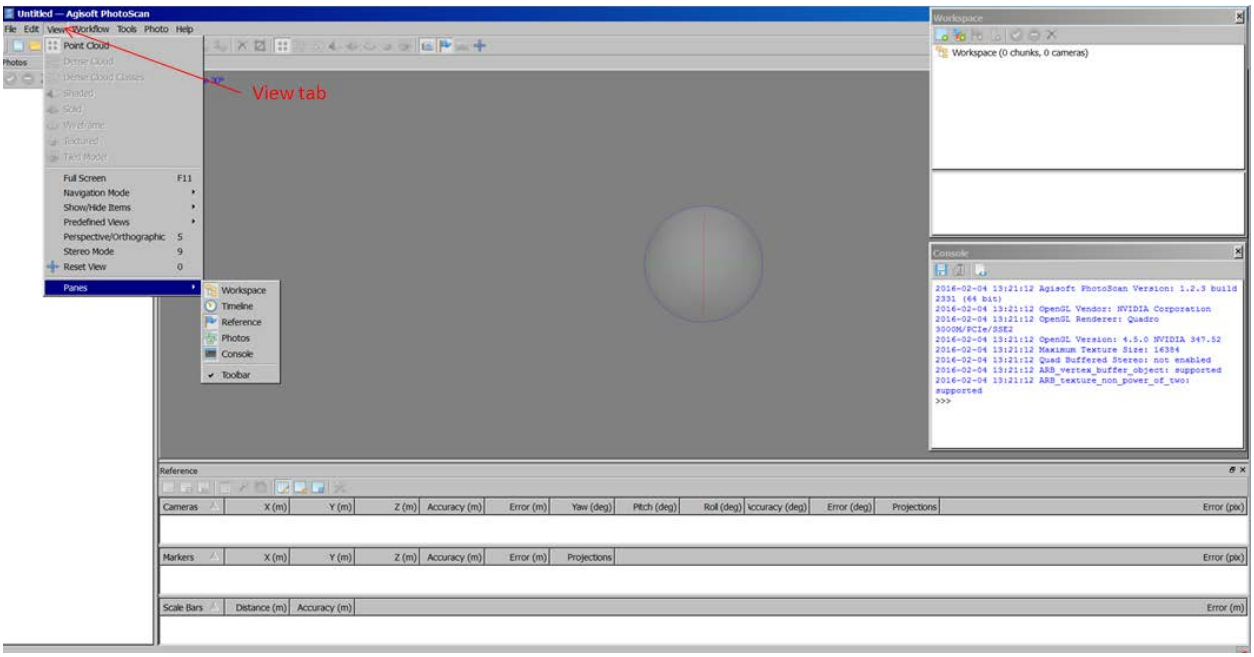
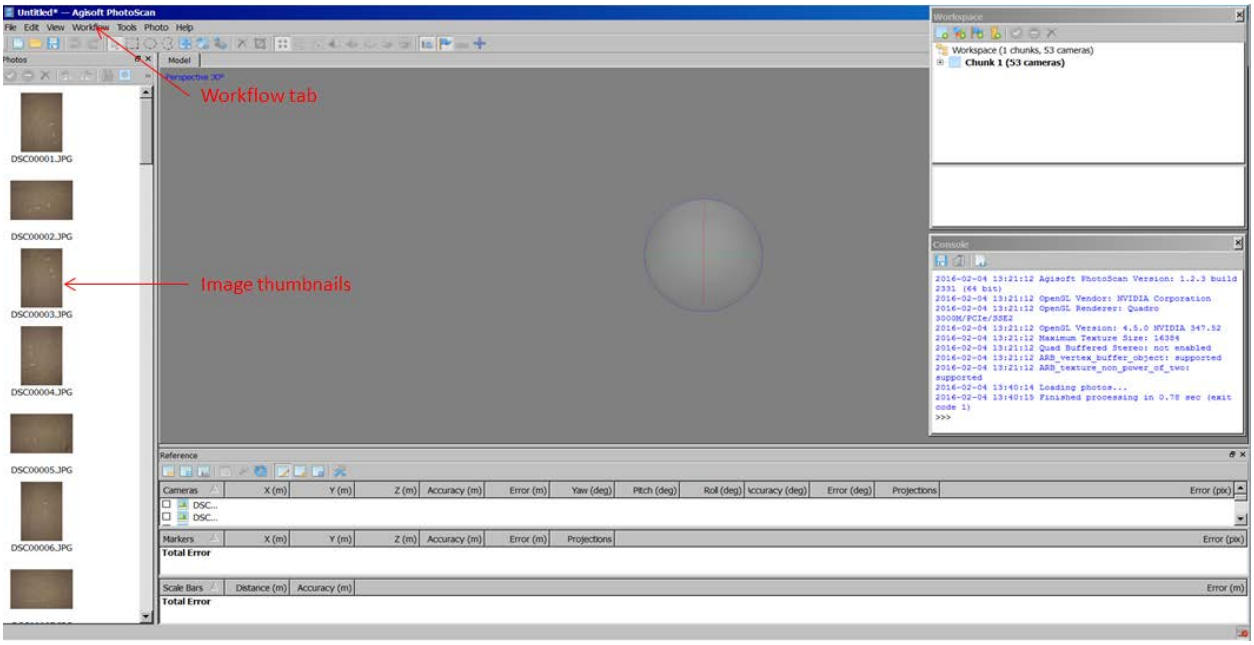
Photoscan v.1.2 processing

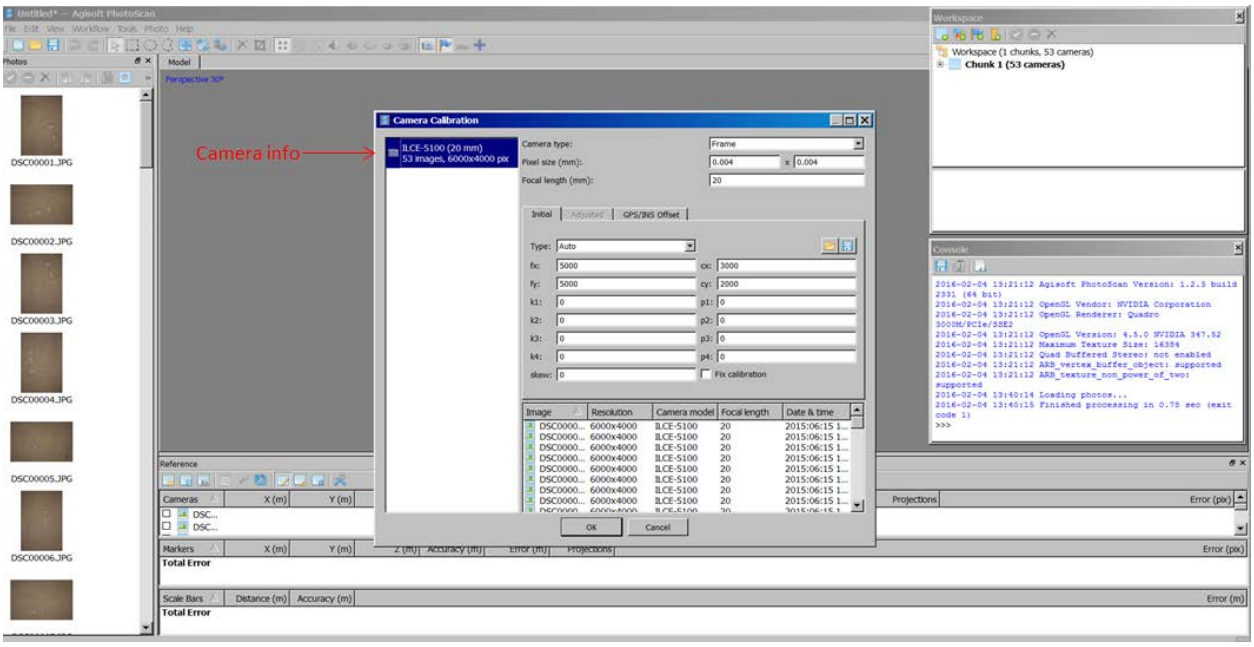
Before beginning data processing, visually inspect a few images for any anomalies. Next, open Agisoft Photoscan, click the **View** tab, and highlight **Panes**. There are several panes that will prove useful during processing. Open the **Workflow**, **Reference**, **Photos**, and **Console** panes. This works best if you have duel monitors. For single monitors, take time to establish screen pane management before beginning processing.



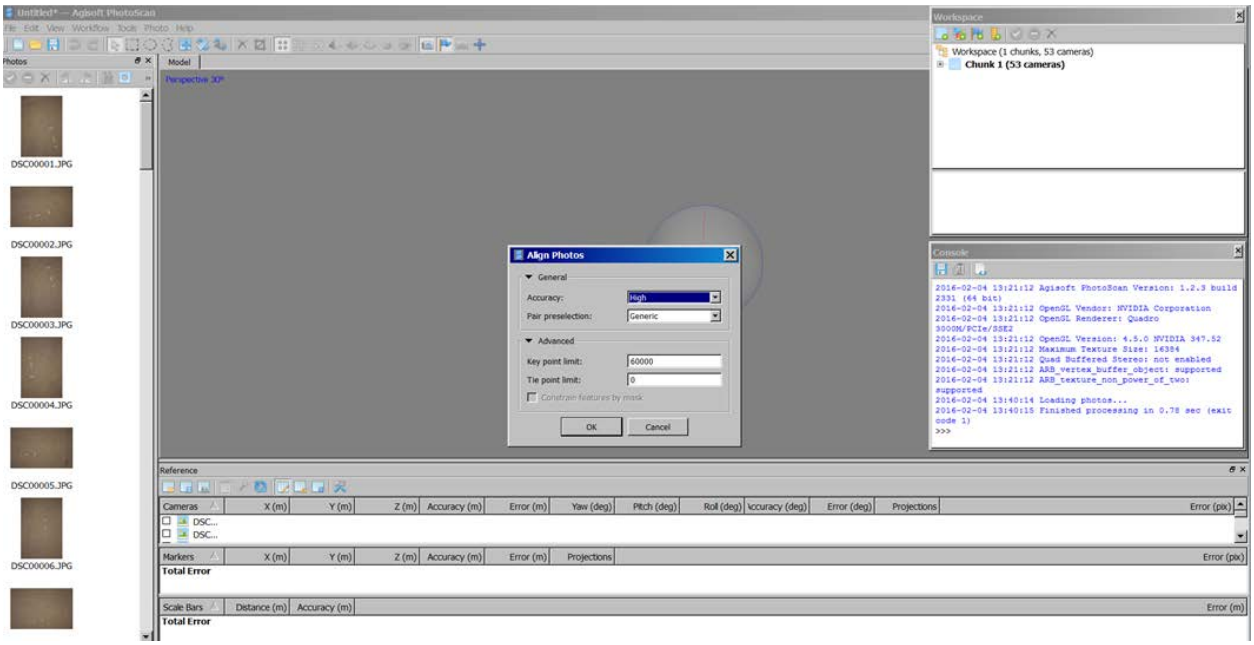
Once you have your panes set, click the **Workflow** tab. Select **Add Photos,** navigate to the folder containing the images, and click **Open**. The image thumbnails should appear in the **Photos** pane.



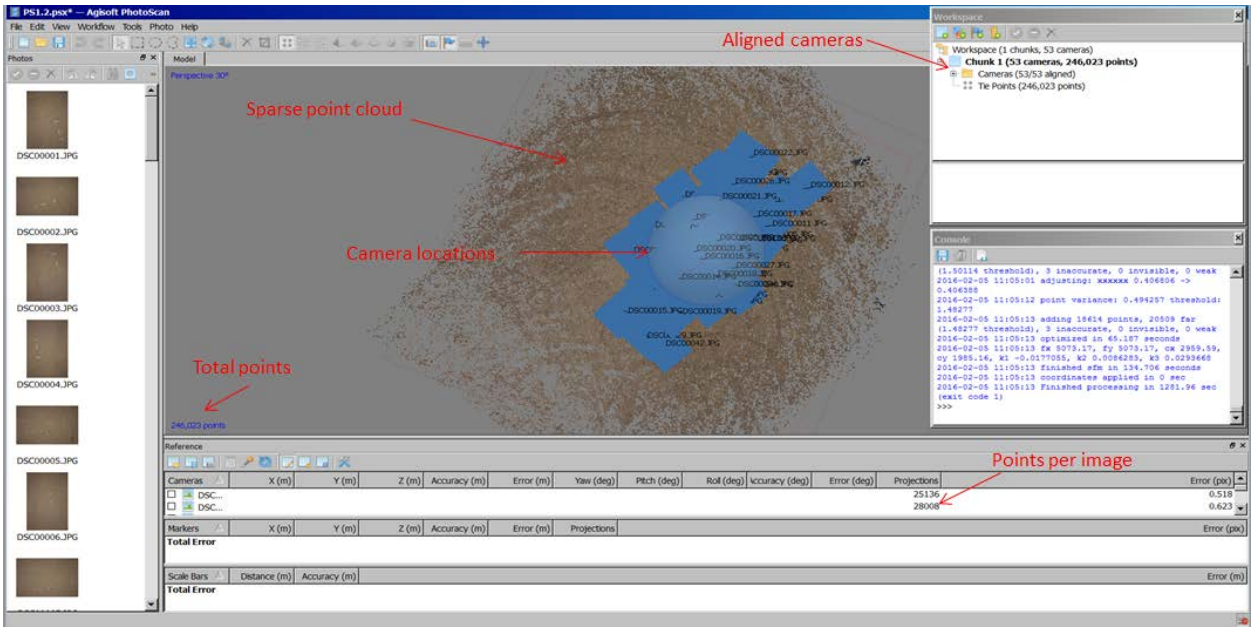
Before beginning the initial alignment, click the **Tools** tab and select **Camera Calibration**. The correct camera name, lens, number of images, and images size in pixels should be displayed in the upper left corner. Images with same focal length should be grouped together.



Next, select the **Workflow** tab and click **Align Photos**. The Align Photos settings box will appear. The processing power and memory of your computer will dictate what settings you can use. Photoscan needs 50 GB of memory per 10,000 images. For several hundred images, **High Accuracy** should be fine. As you increase to thousands of images, you may need to drop your Accuracy. As for **Pair Selection**, **Reference** can only be used if the images are georeferenced. For images with no coordinate system, use the **Generic** or **Disabled** settings. **Generic** should be tried initially. If alignment issues appear, try **Disabled**. Next, click the **Advanced** tab and set **Key Point Limit to 60,000** and **Tie Point Limits to 0**. Click **OK**.

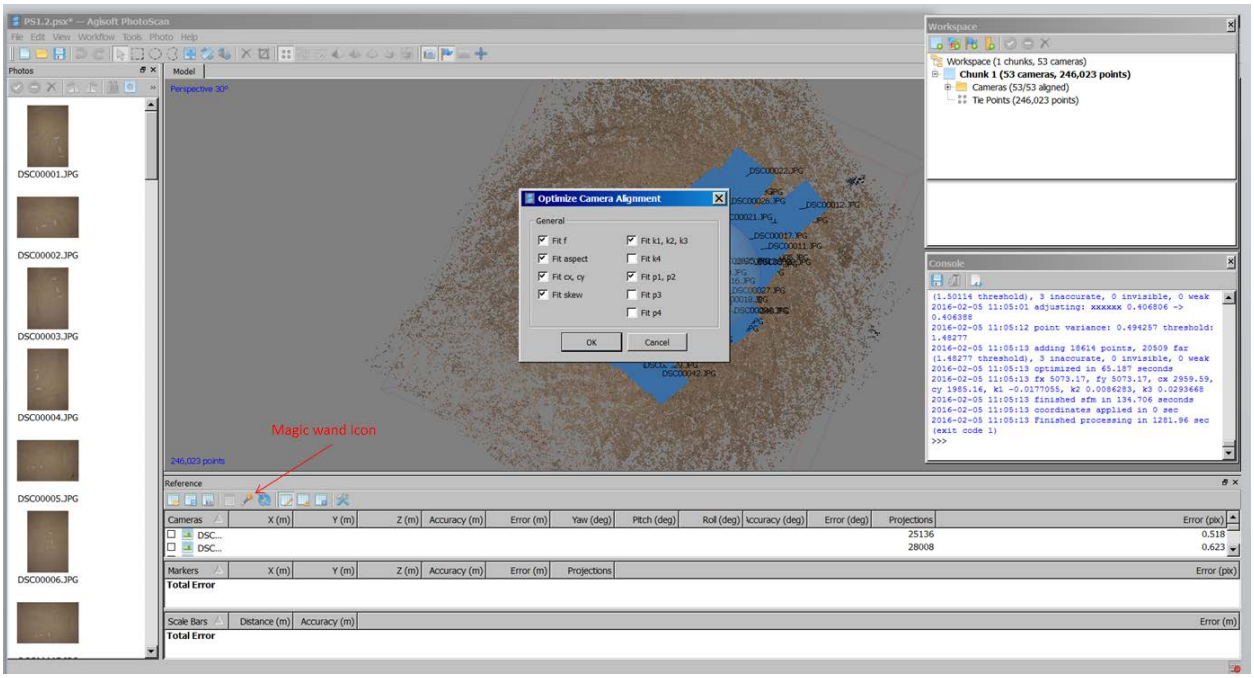


Processing time is based on computer processing ability and number of images. Be aware the initial alignment phase can take several hours. Once the initial alignment is complete, click on **Chuck** in the **Workflow** pane to ensure all images aligned. You should see blue boxes, representing the camera locations and a sparse point cloud of the project area in the main pane. In the lower left corner of the main pane, you will see the total number of points for the sparse point cloud. If you look at the **Reference** pane, you will see the number of points per image is displayed under the **Projections** column. Photoscan eliminates images that have less than 100 points. It is a good idea to monitor image points during the point removal and optimization process.

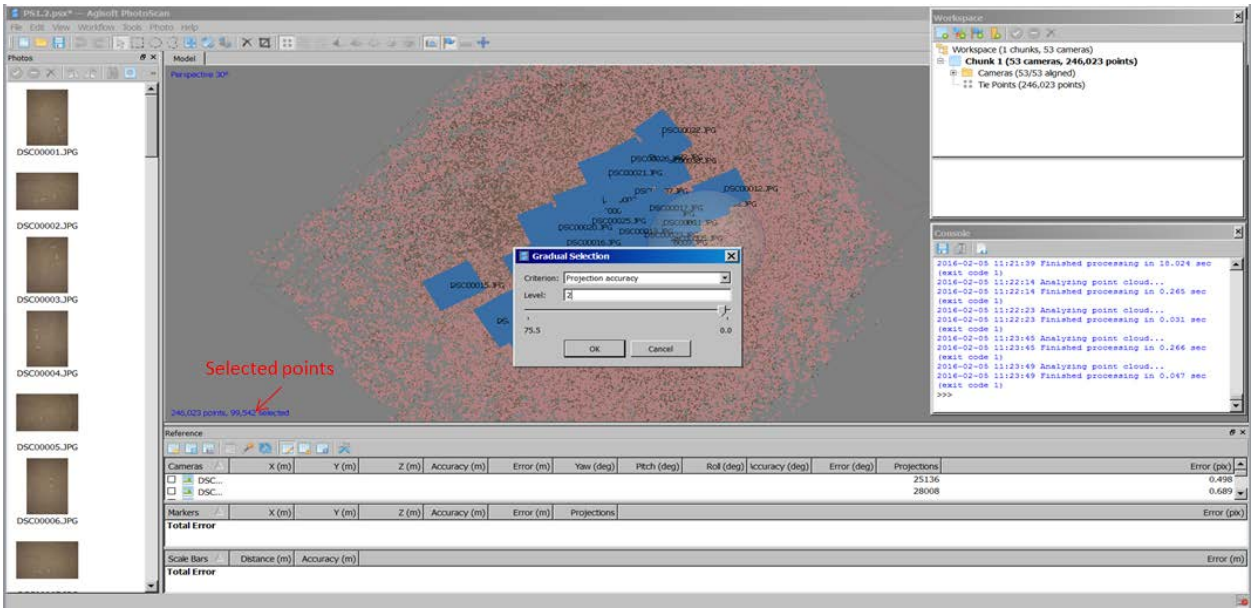


Save the project. Now it is time to do the first optimization (bundle adjustment). On the toolbar of the Reference pane, click on the icon of a magic wand. The Optimize Camera Alignment box will appear.

You will notice some values are unchecked. Select **Fit Aspect** and **Fit Askew**, but leave **Fit k4, p3, and p4** unchecked. They will come into play later in the optimization process. Click **OK**.

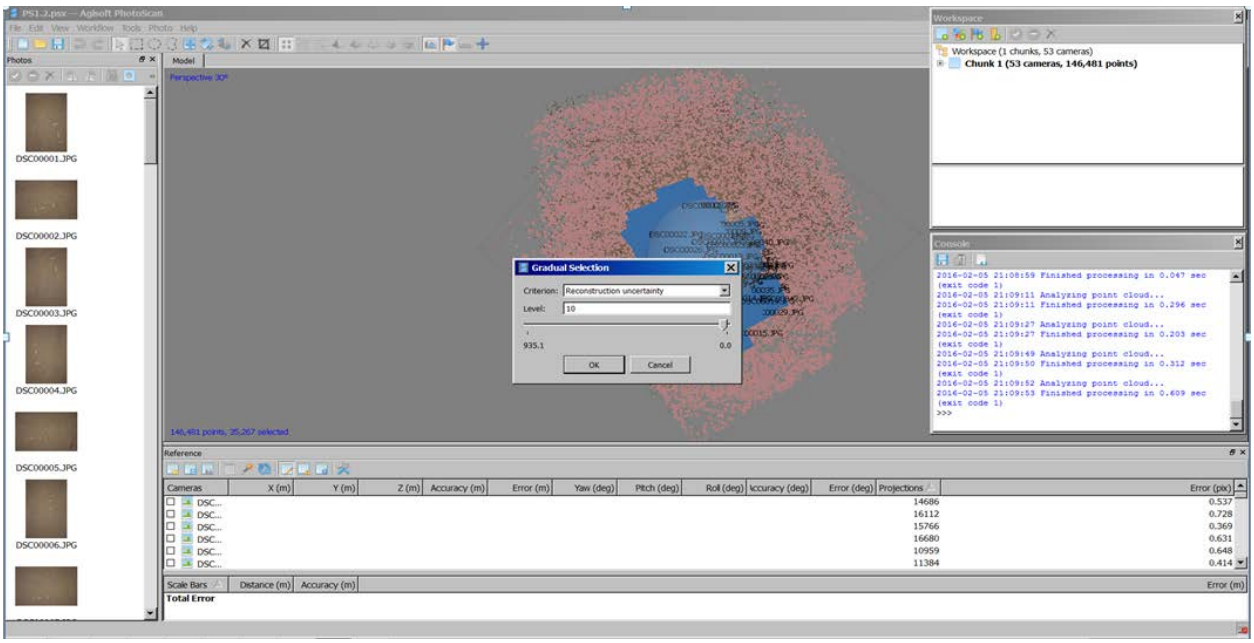


Under the **Edit** tab, select **Gradual Selection**. The **Gradual Selection** box will appear. Select **Projection Accuracy** from the **Criterion** dropdown menu. A **Level** of 2 is optimum. Enter a level of 2 and look at the number of selected points located next to the total points in the main frame. If over half the points are selected, back off the level to 3. When less than half the points are selected, click **OK.** Next, click the **X** icon on the main toolbar and run an optimization using the **Magic Wand** icon as before. Follow the same procedures as the initial optimization.



Repeat the Projection Accuracy gradual selection process to ensure you have met your desired level.

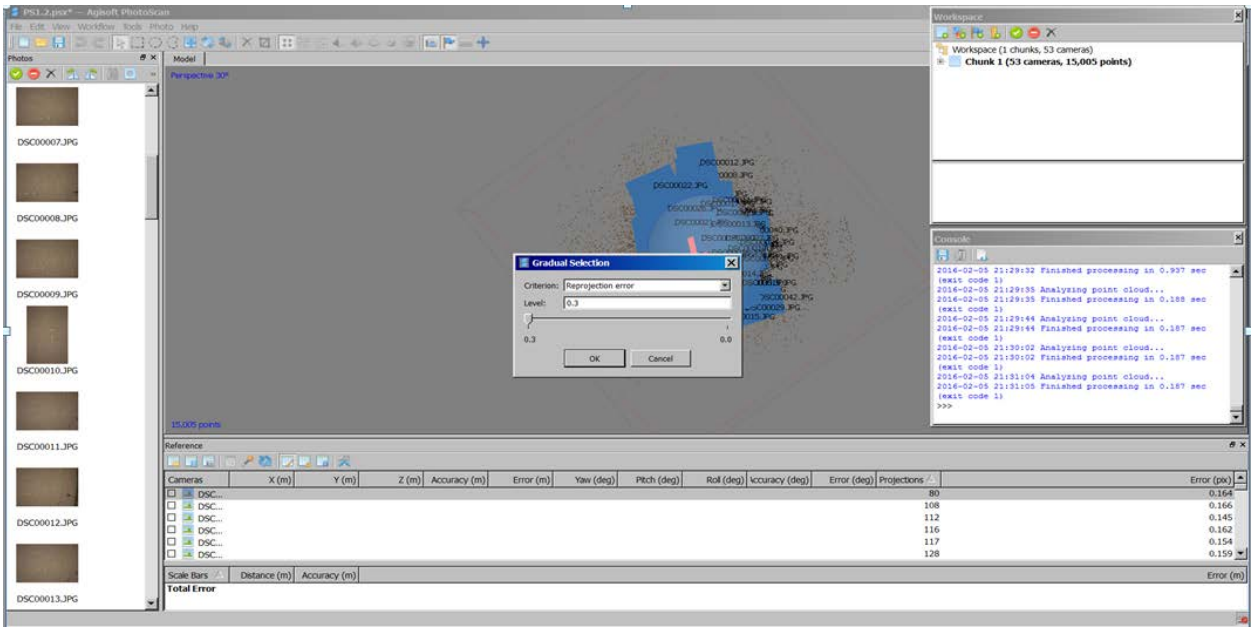
Next, you will do gradual selection for Reconstruction Uncertainty. Click **Edit**, **Gradual Selection**, and set Criterion to **Reconstruction Uncertainty**. The optimum level is 10. Just like Projection Accuracy, if more than half of your points are selected at the optimum level, back the level off. In the case of Reconstruction Uncertainty, try to avoid going higher than a level of 50. When less than half the points are selected, click **OK**. Click the **X** icon on the main toolbar and run an optimization using the **Magic Wand** icon on the Reference pane. Again, select **Fit Aspect** and **Fit Askew**, but leave **Fit k4, p3 and p4** unchecked.



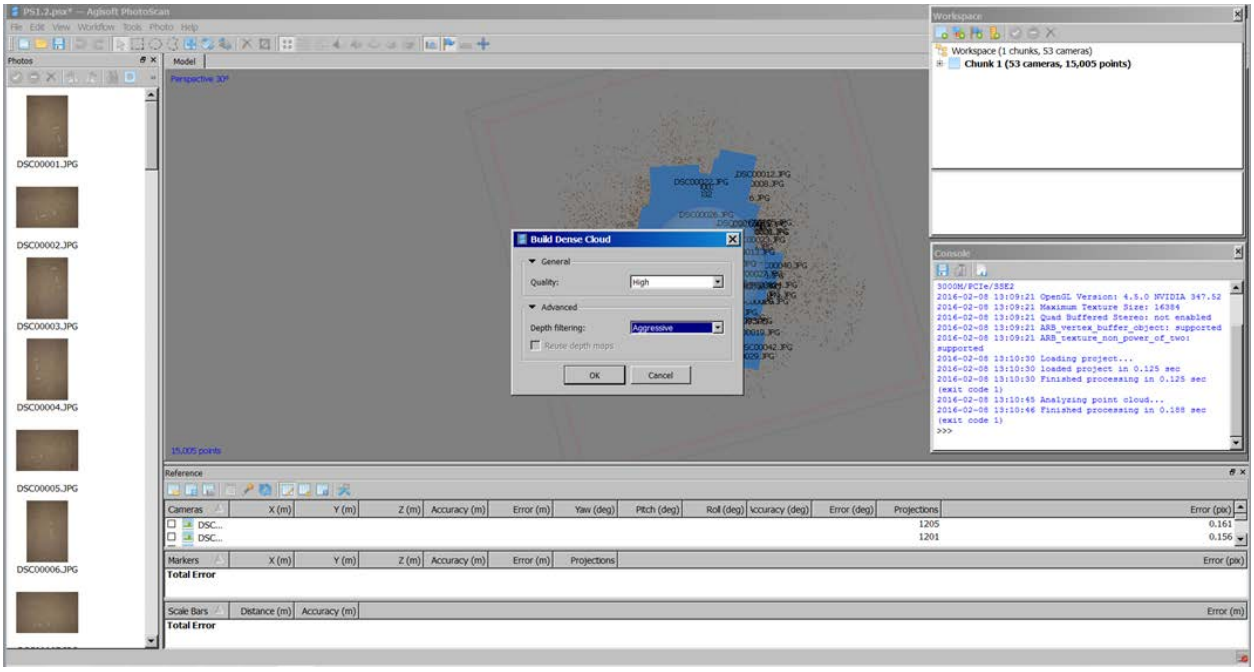
Repeat the Reconstruction Uncertainty gradual selection process to ensure your desired level is met.

For Reprojection Error, the optimum level is 0.3 pixel of error. Click **Edit**, **Gradual Selection**, and set Criterion **Reprojection Error**. Use the slider bar to select around 10% of the total points. Remove the points and optimize, this time selecting the **Fit k4, p3, and p4**. Repeat this process until you have achieved a level of 0.3 pixels of error. It is important to monitor the number of points per photo under

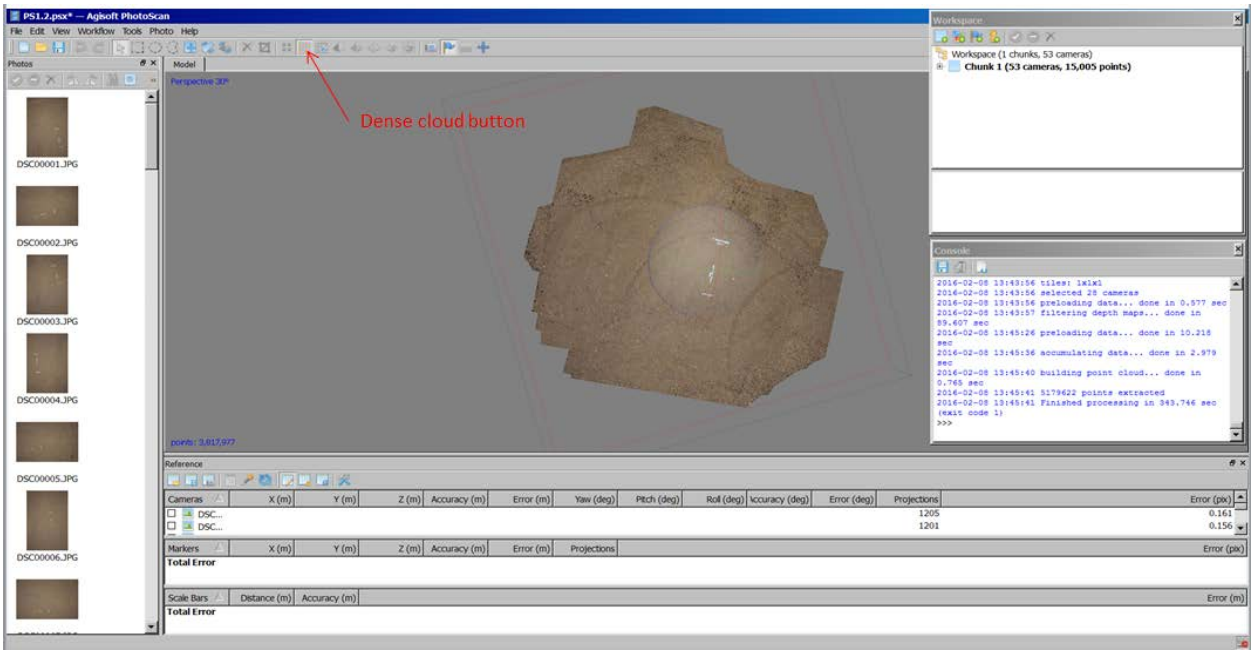
the Projections column in the Reference pane. Click **Save**.



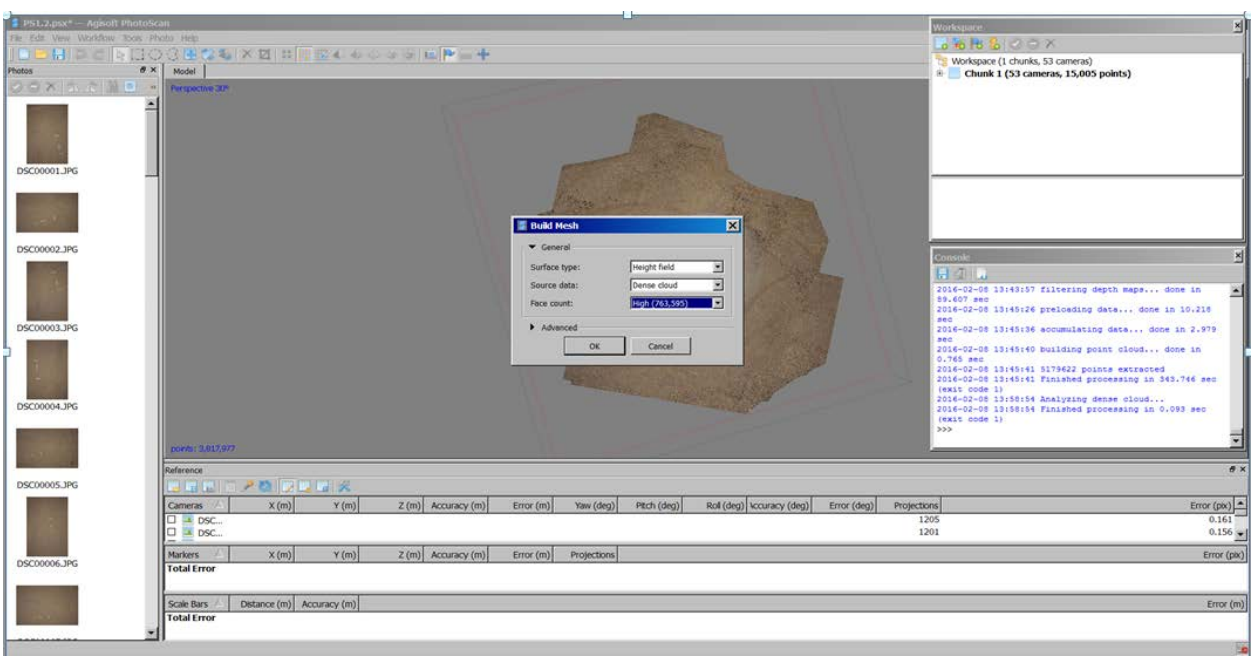
You are now ready to create a dense point cloud. Click **Workflow** and **Build Dense Cloud**. The Build Dense Cloud box will appear. Set the Quality to **High** and Depth Filtering to **Aggressive**. Click **OK**. Depending on the number of images, this process can take several.



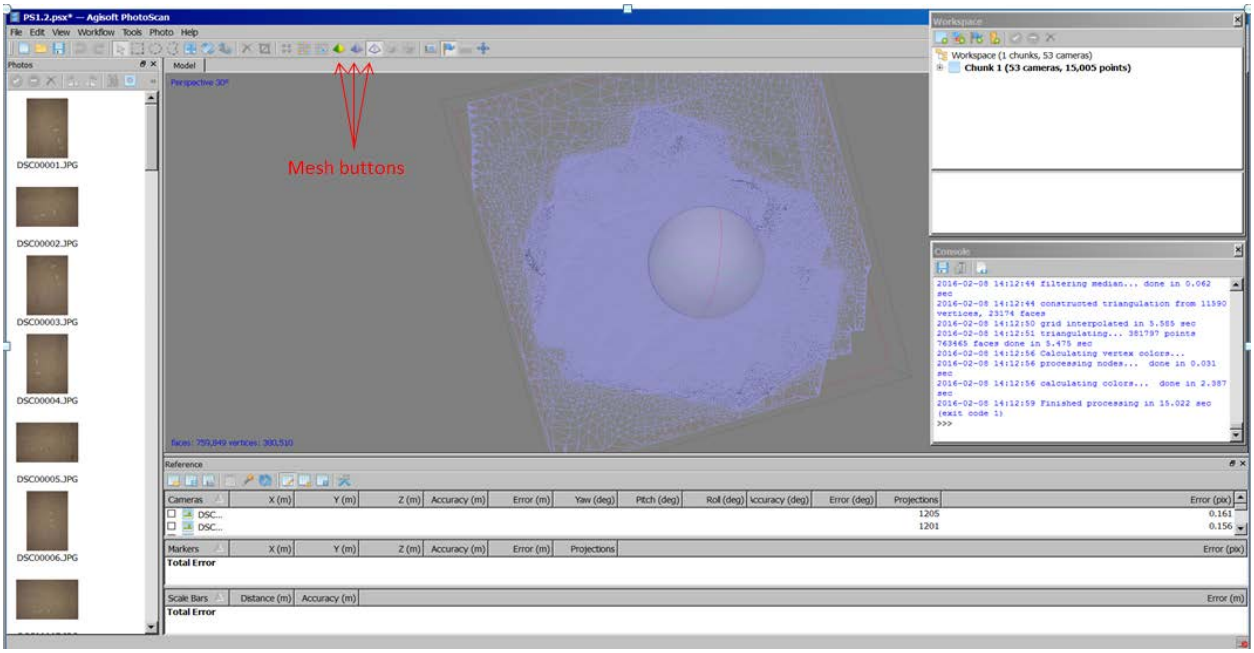
Once the Dense Point Cloud is created, click the **Dense Cloud** button located on the main toolbar.



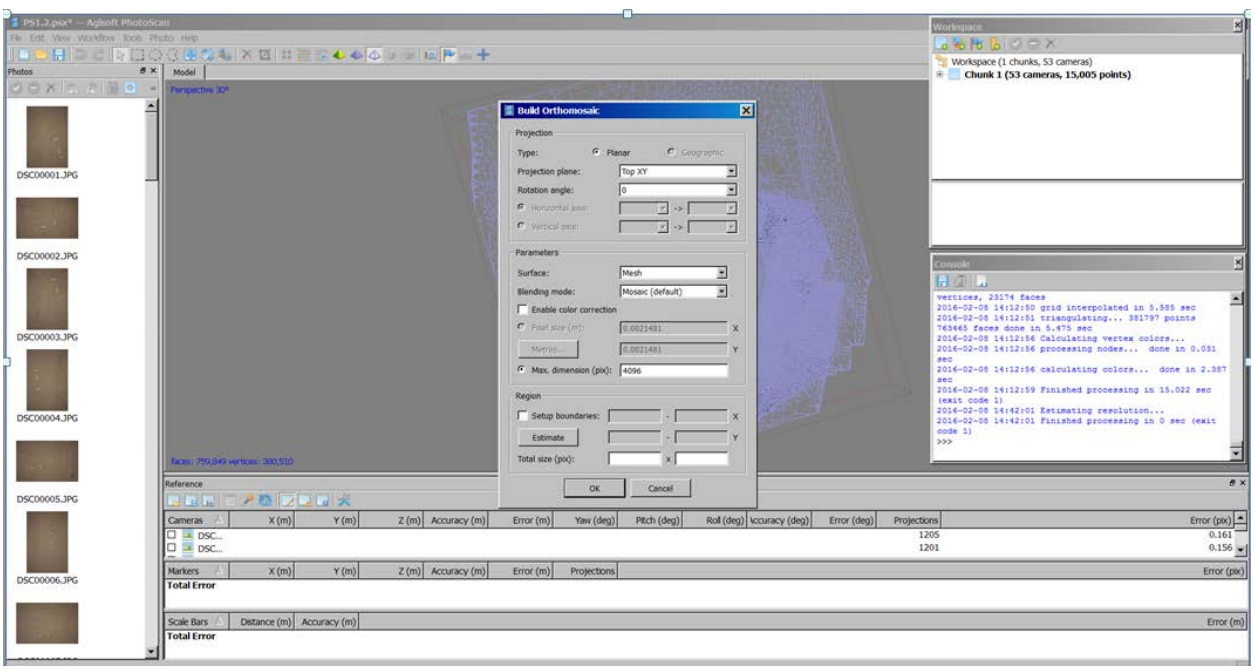
Next, you will need to create a mesh. Click **Workflow** and **Build Mesh**. The Build Mesh box will appear. For Surface Type select **Height Field**. For Source Data use **Dense Cloud**. For Face Count use **High**. Click **OK**.



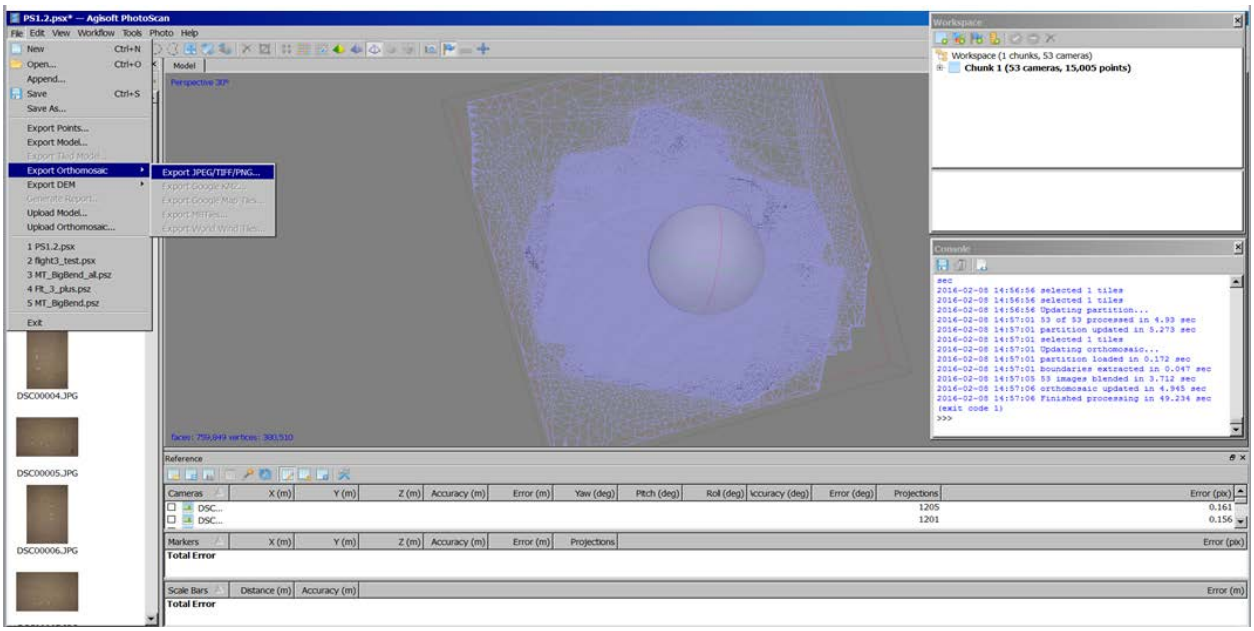
Once the mesh is created, you can view the mesh in one of three views; **Shaded, Solid, and Wire**. All three buttons are located on the main toolbar.



Now you need to build an Orthomosaic. Click **Workflow** and **Build Orthomosaic**. The Build Orthomosaic box will appear. Be sure to select the correct projection if applicable. Click **OK**.



Next select **File, Export Orthomosaic, and Export JPEG/TIFF/PNG**. When the Export Orthomosaic box appears, make sure the correct projection is selected and click **Export**. Navigate to the correct folder and select your desired format. Click **OK**.



You can now create other products from the data. Under File you will see Export Points (.ply, .las), Export Model (3D pdf), and Export DEM (digital elevation model).