CompassAA™v3.50 Quick Start Guide – AA Multiple Image Data Demo

Purpose of this Document

This document is meant to introduce the new or beginning user to CompassAA™v3.50. Its intent is that it be used as a guide to quickly open and use a set of known data to check the functionality of the newly installed CompassAA™v3.50 tool. It can also give the user a snapshot of the process and features of the tool.

How Does CompassAA™v3.50 Benefit You?

- ✓ CompassAA™v3.50 is a streamlined, fast, and complete solution to verify the accuracy and quality of orthophotos.
- ✓ Consistently produces documentation using standard statistical methodologies (e.g. NSSDA, CE90, and CE95) for quality assurance of geo-referenced imagery data.
- ✓ This easily mastered tool eliminates over 90% of the time and cost of lengthy, expensive, inconsistent, and outdated manual accuracy verification.
- ✓ Standardizes your data and product accuracy by guiding users through consistent data check process for the producer, customer, and end user of orthophotos.

Conventional Steps to Use CompassAA™v3.50

A more detailed step by step process will be presented in the next section of this document.

1. Open new or existing project.
2. Setup metadata by using Project Information/Add Project Information.
3. Select Project Information/Add Images. Imagery and collected ground control points need to match using a projected coordinate system.

- NEW for CompassAA™v3.50 – There is now the ability to create a tiled index shape-file internal to CompassAA™v3.50. The input files used needs to be .TIF file imagery and to have the correct projected coordinates.

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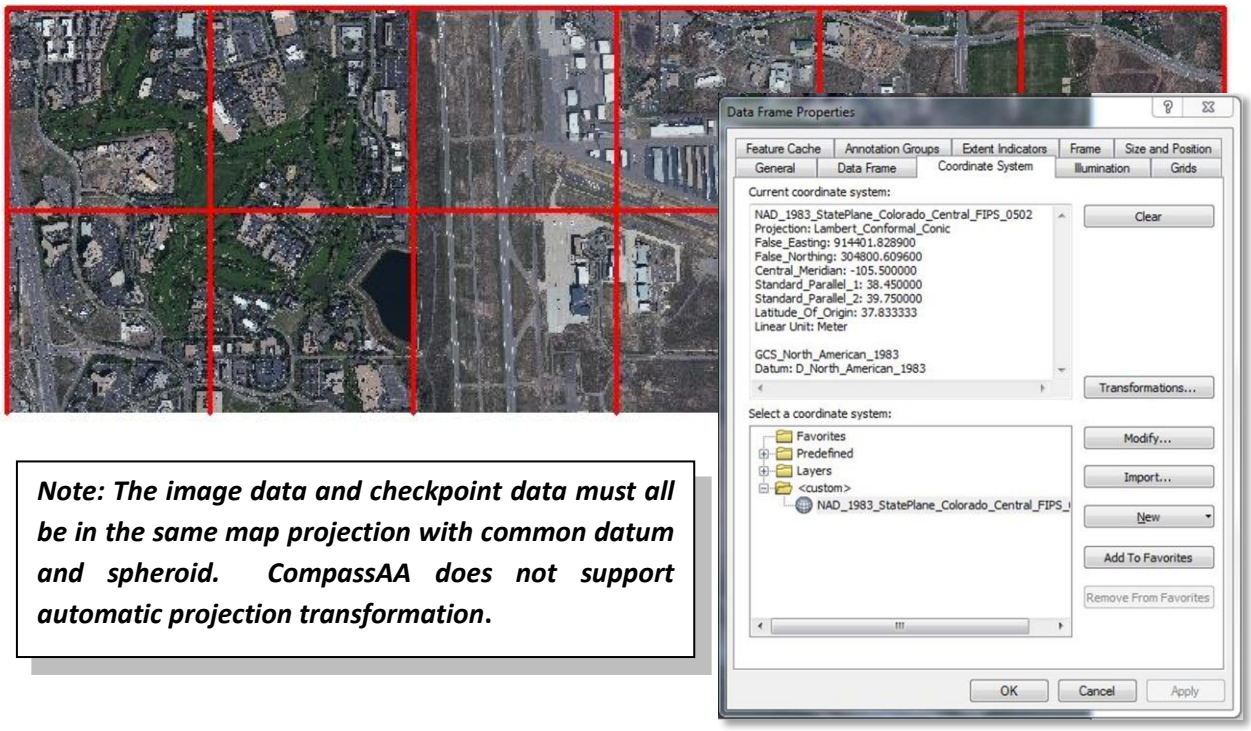

Note: The image data and checkpoint data must all be in the same map projection with common datum and spheroid. CompassAA does not support automatic projection transformation.

4. Add the checkpoint .CSV file by selecting Project Information/Add Surveyed Locations.
5. Use Photo Book and Select Point to visually select photo identifiable Ground Control Points (GCP) to compare to the geo-referenced imagery
6. Explore differences by comparing surveyed locations with orthorectified imagery data. Use the CompassAA Calculate function to view error statistics for a variety of scenarios.
7. Generate Report(s).

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First Steps

Open the CompassAA™v3.50 application by clicking on the desktop icon.

Use the provided demo data (C:\CDIData\CompassAA_Demos\AA_Multiple Image Data Demo) that has been placed in the C:\CDIdata folder - by you, the user)

*****Optional ***** To view the completed CompassAA QuickStart project, open **CompassAA™v 3.50**, click on the menu command, **File -> Open -> Project**. Navigate to **C:\\CDIData\CompassAA_Demos\AA_Multiple Image Data Demo\05_Reports**, and select the **Multiple Image Demo.AAP** file. This .AAP (Accuracy Analyst Project) file contains the saved project data, created from the CompassAA QuickStart instructions below.

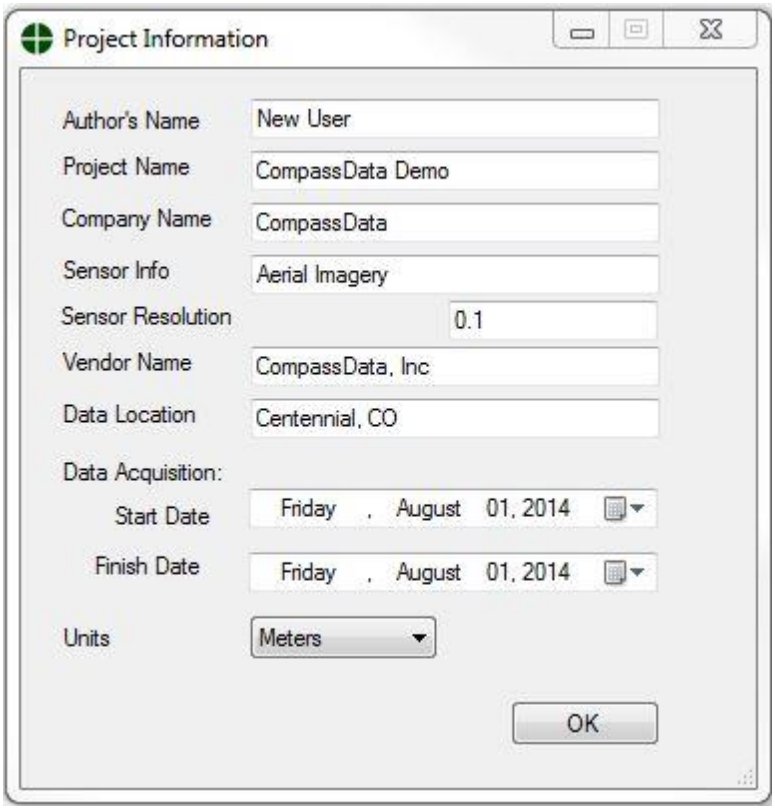
The folder structure in the demo data sets is the structure we use and recommend in our production. However, CompassAA is a flexible tool and can be adapted to your own project data directory structure.

Using CompassAA for the first time

1. Select **File-> New-> Multiple Image Project**

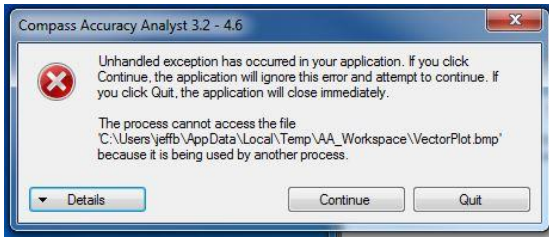
2. Select **Project Information-> Add Project Information**

Fill in the data as suggested in the graphic below. This becomes the metadata for the report. CompassAA will not allow the user to move forward without all the fields being completed.



NOTE

If at any given time you get an error window like below, please click on Continue and proceed with the operation of the tool.



As a normal practice, it is always a good habit to save your work.

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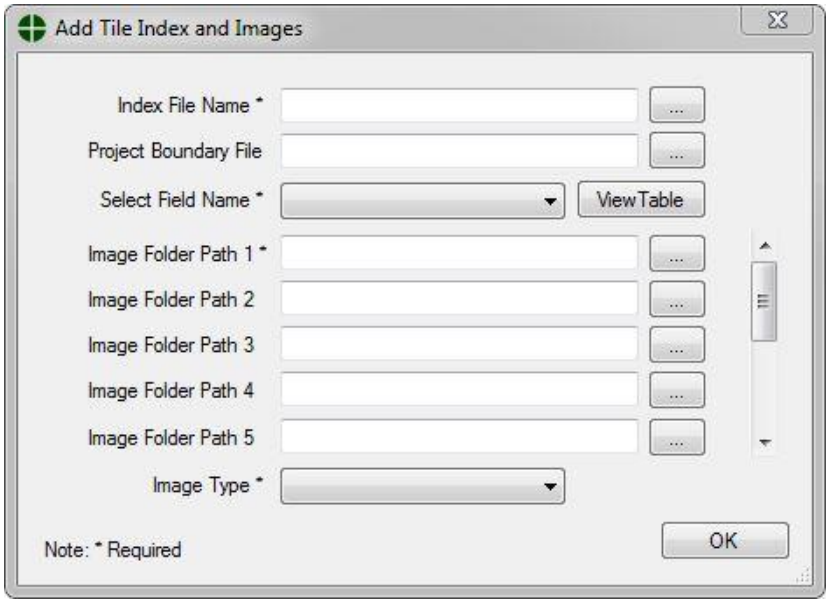
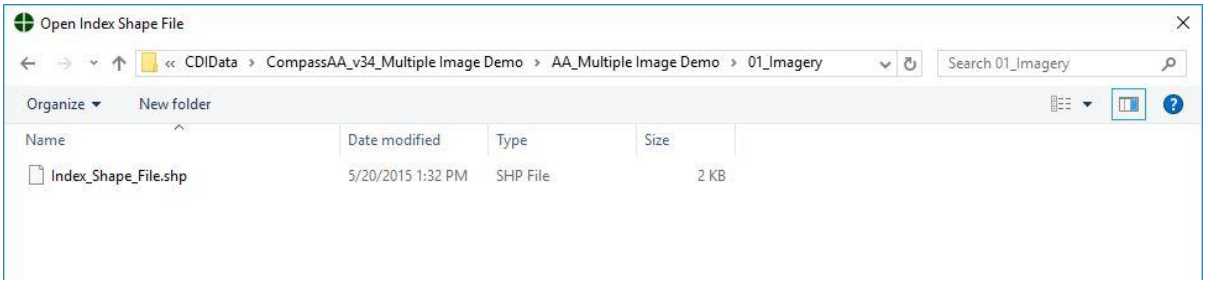
3. Select **Project Information -> Add Index and Images**. A window should appear to let you browse to the project folders containing the project associated images and data. The window below should appear. We will now add the minimum data required (shown by the * next to the fields).



3a. Select the **Index File Name** button and browse to the location below. This is the location of the shapefile (.shp) that has the multiple image index previously created. Select **Index_Shape_File.shp** and **Open** this file. Another method might be used instead of browsing to the shapefile. You can also cut and paste from the Windows Explorer address bar to the Index File Name field or any of the other Folder Path fields.



If you would like to create a new tiled index shapefile use a new feature found in CompassAA v3.50 and use the **GDal TIndex** menu command. On the application main menu, click on **Tools -> Gdal Tindex** and follow the steps.

3b. After selecting the Index_Shape_File.shp file, click on the **Select Field Name** pull down menu. Choose (in this instance) **LOCATION**. This selection tells the program which attribute table column in the Index Shape File contains the names of the images to be used.

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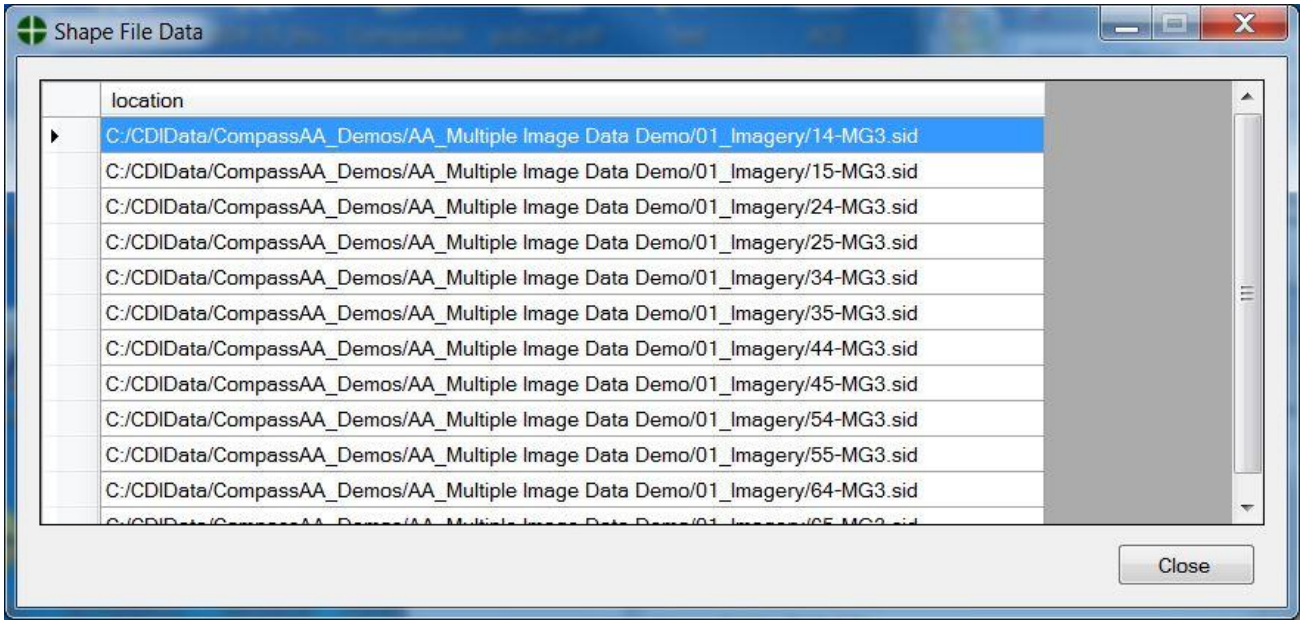
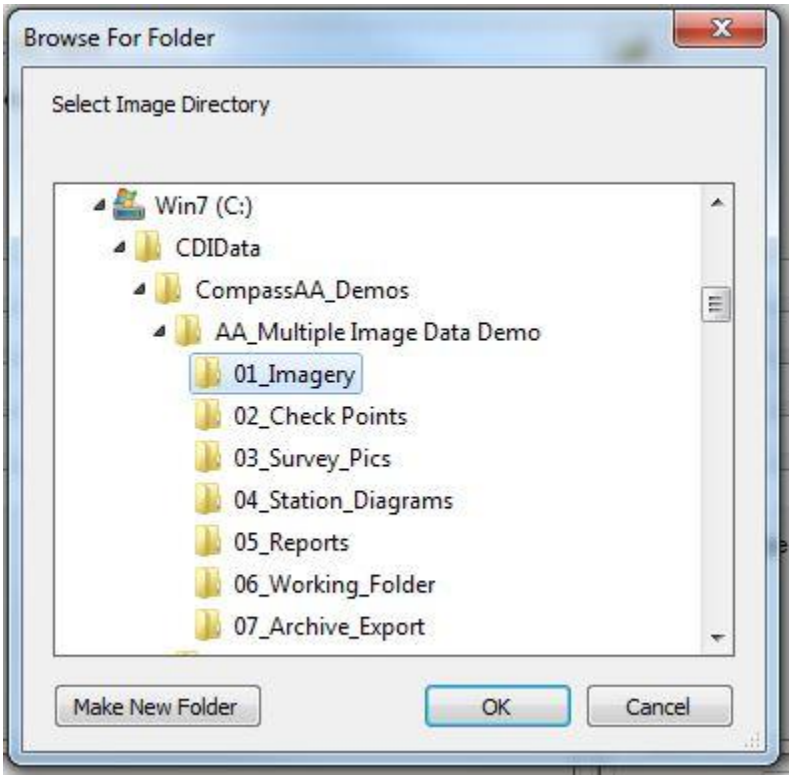


3c. Returning to the Add Tile Index and Images window select the **Image Folder Path 1** button and browse to the **01_Imagery** folder that contains the images used for this demo. Click **OK**.



3d. As a last step in selecting what images you use, click on the **Image Type** pull down menu. For this demo data set we are using **SID** format image files. Click **OK** to close the window.

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3e. Click **OK** in the Add Tile Index and Images window. The window will close and you will see the application window view below.

4. To make sure that everything is working correctly, do the following: Select **Browse Image** in the main menu area and then left click anywhere inside one of the index shapes. By left clicking inside the upper left index shape you should see the single image appear. You can open multiple images by selecting **Drag Load Images**. Move pointer to any displayed index shape after selecting **Drag Load Images** and press the left button down and then drag the pointer diagonally to another shape (creating a selection fence). Multiple images will be displayed.

Experiment with zooming, panning and viewing images using the interactive menu tools highlighted above. These tools are useful to explore the images. Try using more typical Windows adjustments using the mouse click and drag manipulations. Move mouse over the perimeter boundary of the application window. The mouse pointer will change to a respective resizing pointer that will allow you to stretch or shrink the application window. Similar features for modifying the view ports inside the application window are adjustable too. Grab the boundary edge between the Map Image area and the Coordinates and Offsets data display. With the left mouse button held down, you can make the map area bigger or smaller by dragging and releasing. Always select the Full Extent graphic icon (magnifying glass) in the main menu banner to refresh the entire image area after resizing the map area.

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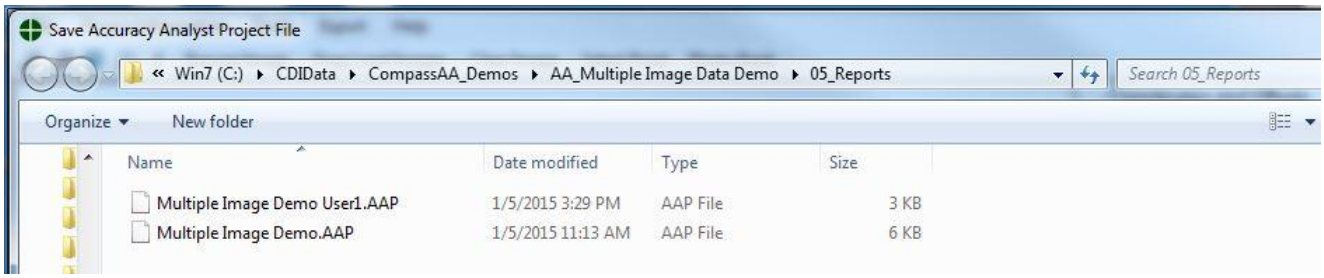
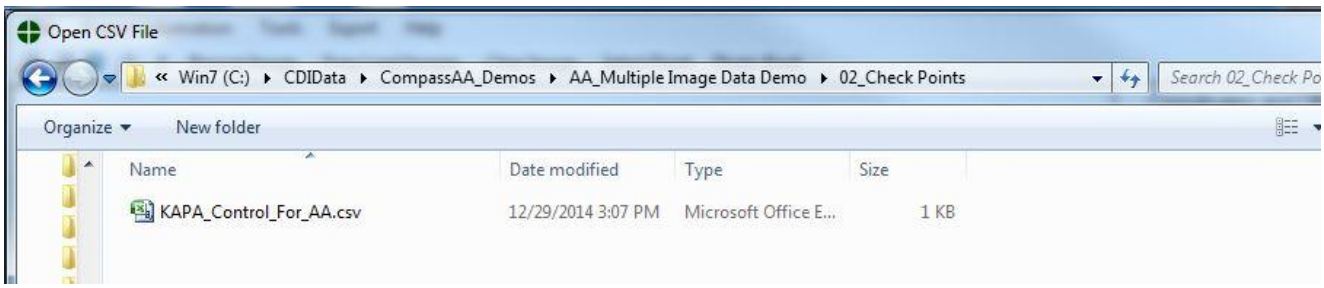
When you are ready to go to the next step, click on the Zoom to Full Extent tool (to the far right of the group) to reset the image view.

5. Save your project file to an .AAP (Accuracy Analyst Project) file for future use. Select **File -> Save As** and then browse to the **05_Reports** folder location below and **Save** the .AAP to a file named **Multiple Image Demo User1.AAP**. You will be prompted that the file does not exist, and asked if you want to create the file. Select **Yes**.



Input of Ground Control Data

6. The next step is to add the surveyed ground control .csv file that also contains file names for ground control photos and site sketches. Select **Project Information -> Add Surveyed Locations -> Load CSV / Checkpoint File.** Browse to the **02_Check Points** folder location below and select the **KAPA_Control_For_AA.csv** file.



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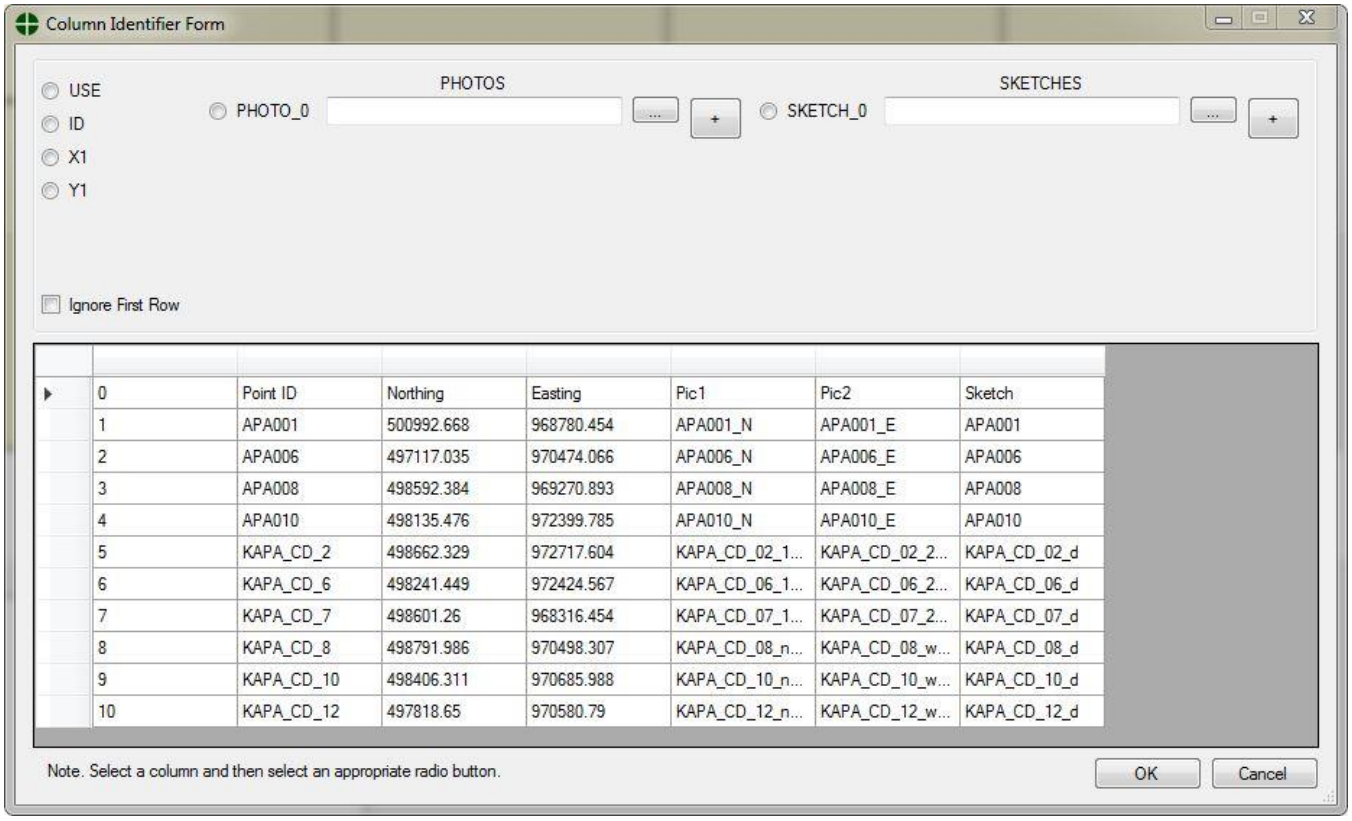
The .csv file is a critical element of CompassAA and a successful user needs to understand it. Take time to look how this demo .csv file is set up and use it as an example for your own future projects. The .csv lists records that correspond to file names found in the demo data sets 03_Survey_Pics and 04_Station_Diagrams folders. Your file names don't need to use the same CompassData naming convention as shown, but a unique, identifying name must be used for photos and site sketches.

	A	B	C	D	E	F
1	Point ID	Northing	Easting	Pic1	Pic2	Sketch
2	APA001	500992.668	968780.454	APA001_N	APA001_E	APA001
3	APA006	497117.035	970474.066	APA006_N	APA006_E	APA006
4	APA008	498592.384	969270.893	APA008_N	APA008_E	APA008
5	APA010	498135.476	972399.785	APA010_N	APA010_E	APA010
6	KAPA_CD_2	498662.329	972717.604	KAPA_CD_02_1_p_1.JPG	KAPA_CD_02_2_p_2.JPG	KAPA_CD_02_d
7	KAPA_CD_6	498241.449	972424.567	KAPA_CD_06_1_p_1.jpg	KAPA_CD_06_2_p_2.jpg	KAPA_CD_06_d
8	KAPA_CD_7	498601.26	968316.454	KAPA_CD_07_1_p_1.JPG	KAPA_CD_07_2_p_2.JPG	KAPA_CD_07_d
9	KAPA_CD_8	498791.986	970498.307	KAPA_CD_08_n_p_2.jpg	KAPA_CD_08_w_p_4.jpg	KAPA_CD_08_d
10	KAPA_CD_10	498406.311	970685.988	KAPA_CD_10_n_p_2.jpg	KAPA_CD_10_w_p_4.jpg	KAPA_CD_10_d
11	KAPA_CD_12	497818.65	970580.79	KAPA_CD_12_n_p_2.jpg	KAPA_CD_12_w_p_4.jpg	KAPA_CD_12_d



0	Point ID	Northing	Easting	Pic1	Pic2	Sketch
1	APA001	500992.668	968780.454	APA001_N	APA001_E	APA001
2	APA006	497117.035	970474.066	APA006_N	APA006_E	APA006
3	APA008	498592.384	969270.893	APA008_N	APA008_E	APA008
4	APA010	498135.476	972399.785	APA010_N	APA010_E	APA010
5	KAPA_CD_2	498662.329	972717.604	KAPA_CD_02_1...	KAPA_CD_02_2...	KAPA_CD_02_d
6	KAPA_CD_6	498241.449	972424.567	KAPA_CD_06_1...	KAPA_CD_06_2...	KAPA_CD_06_d
7	KAPA_CD_7	498601.26	968316.454	KAPA_CD_07_1...	KAPA_CD_07_2...	KAPA_CD_07_d
8	KAPA_CD_8	498791.986	970498.307	KAPA_CD_08_n...	KAPA_CD_08_w...	KAPA_CD_08_d
9	KAPA_CD_10	498406.311	970685.988	KAPA_CD_10_n...	KAPA_CD_10_w...	KAPA_CD_10_d
10	KAPA_CD_12	497818.65	970580.79	KAPA_CD_12_n...	KAPA_CD_12_w...	KAPA_CD_12_d

After selecting the .csv file the window above should appear.

6a. Select the applicable fields to match the proper columns. Remember, Northing is always the Y axis and Easting is always the X axis. Switching these is a common error. Make sure to select the **Ignore First Row** radio button if there is header information in the .csv file. In your future project data, the .csv file can be edited or created in any order that fits your project or your data requirements.

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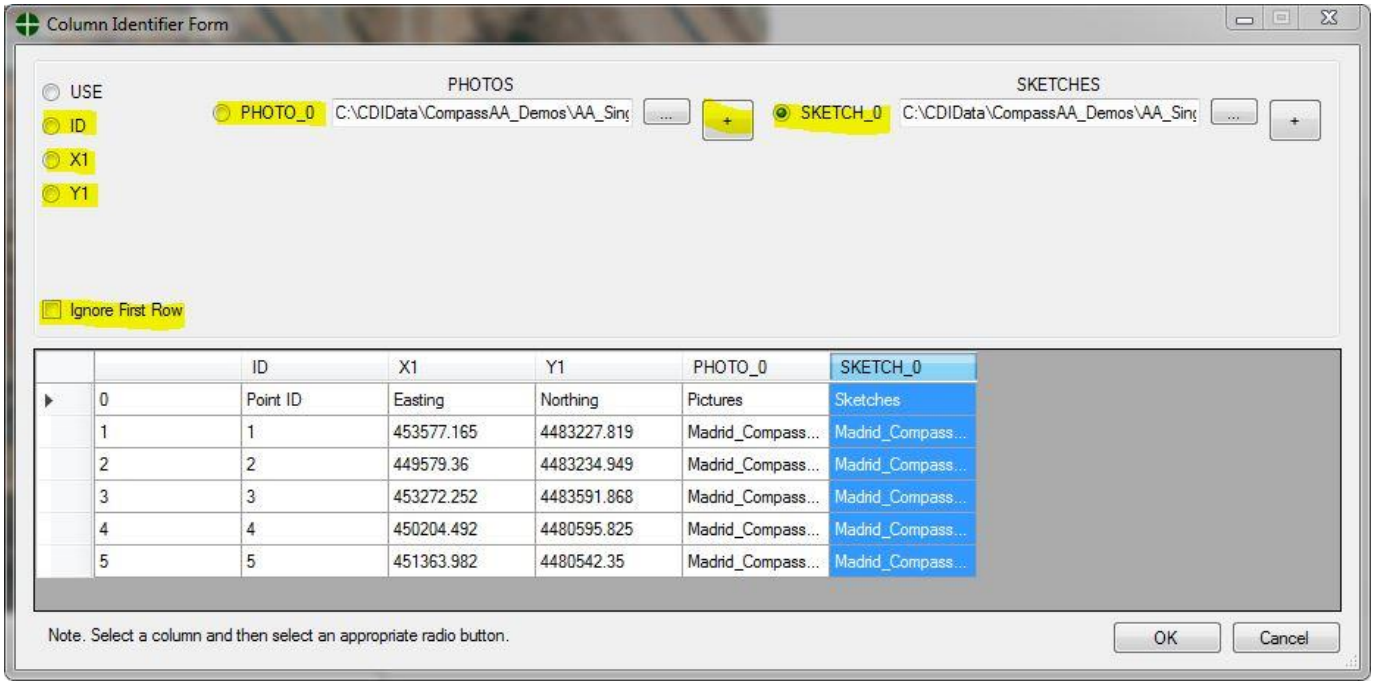
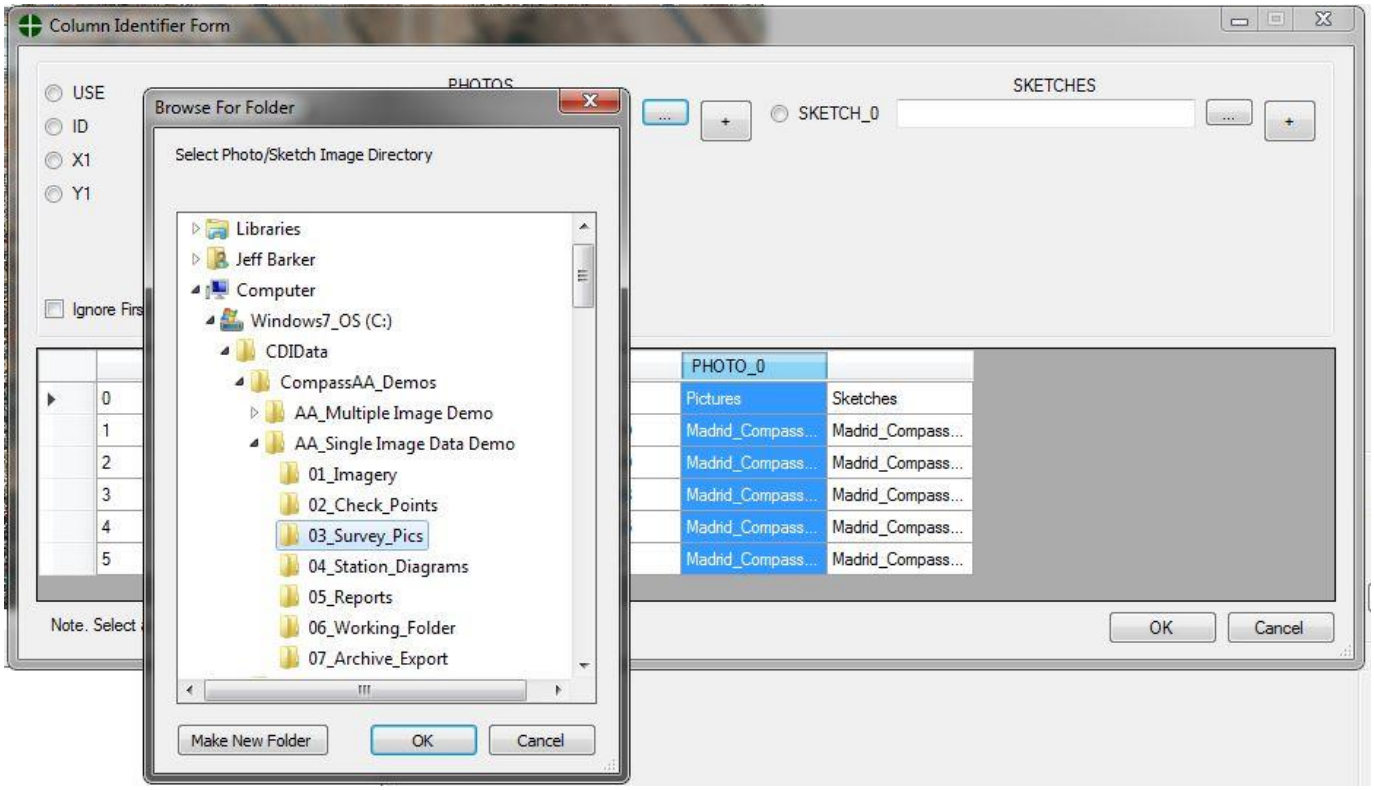


6b. For the Photo and Site Sketch Columns navigate to the **03_Survey_Pics** folder or the **04_Station_Diagrams** folder. To access multiple photo folders, click on the **+** button and browse to the proper folder location. For multiple images, all the site photos can be in the same folder but the names need to be similar to the naming convention in the demo. The files must be in .jpg format.



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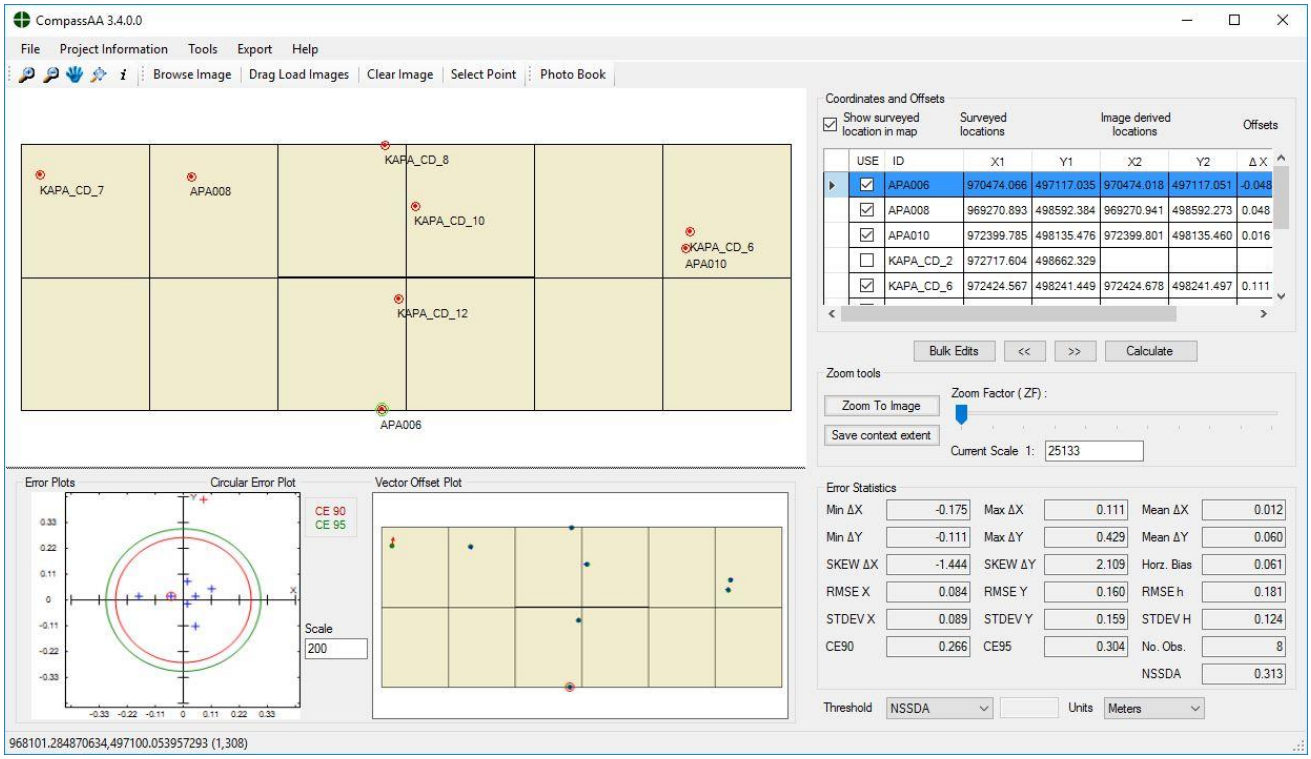
6c. After confirming that the columns of data are selected correctly as in the 6a graphic above, click the Column Identifier Form window **OK** button.

The application window should appear as below.



Visual verification using Photo Book

7. Now, we will photo identify a point and use the provided tools to create a report.

If you have saved your work before, then do so again by clicking **File -> Save.**

Use the **Zoom Factor (ZF)** slide bar to adjust the zoom. You can also type in the **Current Scale** by clicking on the value and entering **150.** (For this demo data satellite imagery 1:150 is a good scale for reviewing and selecting points.) Now left click on the **Save Context Extent** button on the right to stay at the same scale while going from point to point.

Select **Photo Book** from the application command menu. As you click through the different ground control points in the **Coordinates and Offset** table photos in the Photo Book will update itself to match the selected point. The main screen image will also swap out to match the ground control point selected. Also notice that in the Error Plots and the Vector Offset Plot the current point being edited is identified by displaying a red circle around the point.

7a. Click on **Select Point** from the application window menu. When a pointer arrow changes to a crosshair you are ready to choose your first ground control point location. The Green Dot represents the "True Location" of the point as derived from the ground control. Using the Images and Site Sketches in the Photo Book, select the

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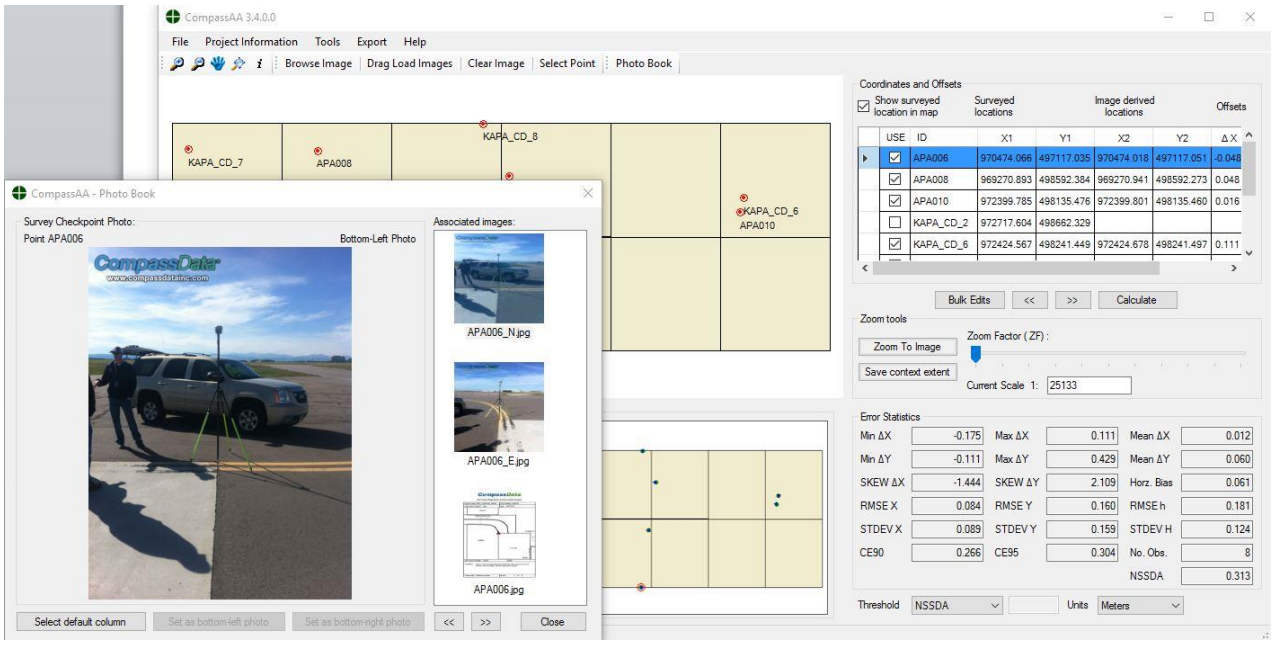
image derived location of the point. If you select a point and then wish to adjust it, just click on the new location and the point will move. You can also zoom in, zoom out and pan using the interactive menu tools.

Notice the automatic calculation of the delta X and delta Y values. These are the values that will be used in our final report.

7b. Select the remaining ground control points using the viewing and selection tools.



Point 3 (ID column) is an example of a point that is unusable, in this instance because the feature is out of bounds (OB). By clicking on the check mark, the point is unselected and a variety of options of why point is unusable are given. Unused points and the reason selected are displayed in the CompassAA produced report. The list of reasons can be customized by the user in the **Tools ->Options** menu.

The Photo Book is important in selecting which images will appear in the report as well. As of v3.3, you can now select up to two photos for each ground control point. These will be placed in the report in the lower left and lower right of the detail page. The bottom-left is the default image. You can select one other image to be placed in the bottom-right. This is done by clicking on the additional image that you would like to appear in the bottom-right corner of the report page.

All images need to be in a .jpg format. Any image could be used if it is in a jpg file format and fits the proportions of a standard sized photo.

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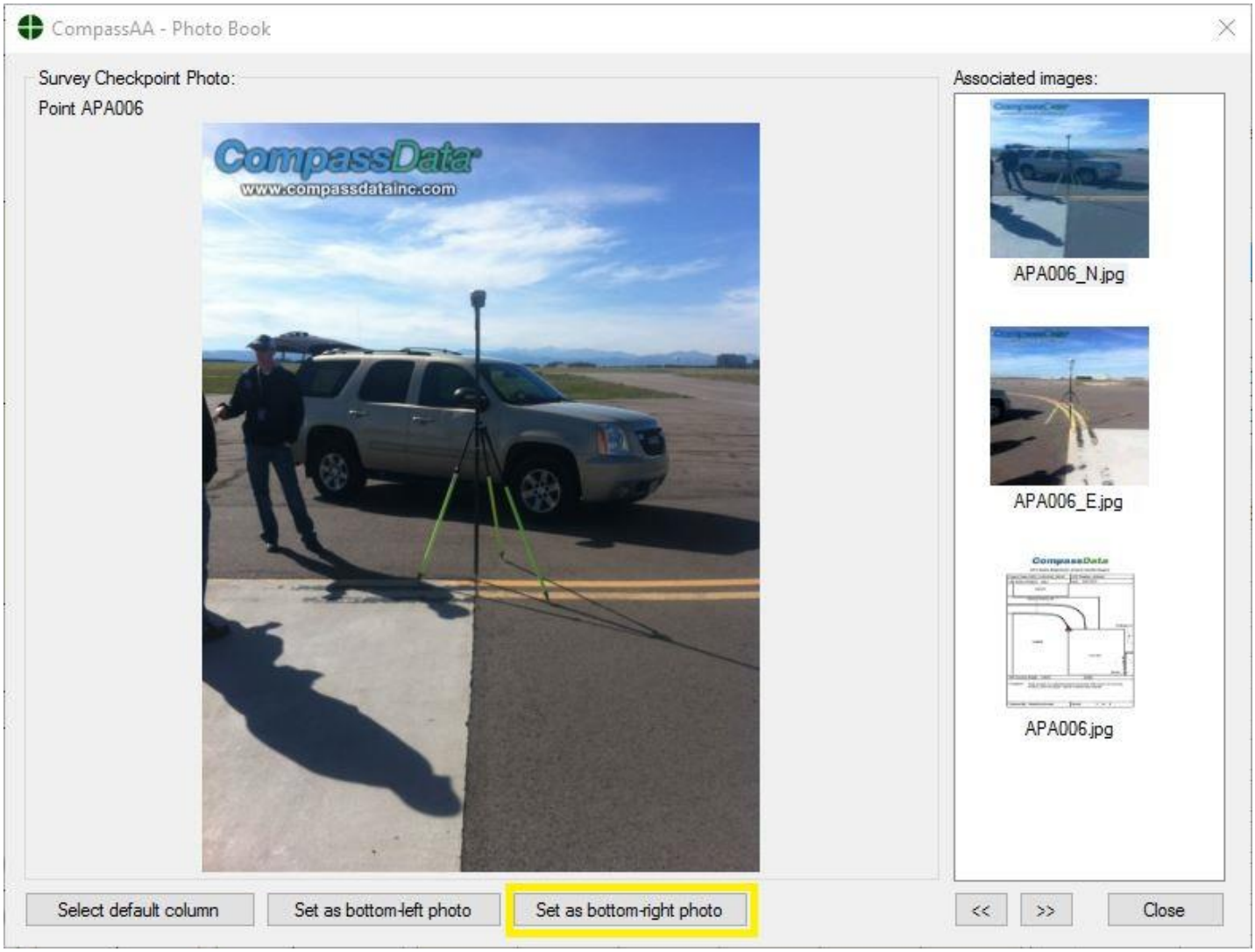

When Select Point process is complete and each viable Ground control point has been reviewed, left click on the **Calculate** button located on the right side of the application window. The error statistics are calculated and graphically displayed in the lower left of the application window.

A useful tool is to adjust the scale of the **Vector Offset Plot** (labeled as Scale to the left of the Vector Offset Plot area). Adjusting the **scale to 400** makes it easier to identify shifts in the imagery, to see which areas of the image has more/less error, to see any Systematic Errors or Outlier Points. As different points are selected in the Coordinates and Offset table, they are highlighted in the Vector Offset Plot.

7c. Left click on the **Close** button in the Photo Book window to close it. Select **File -> Save** to save the current project.

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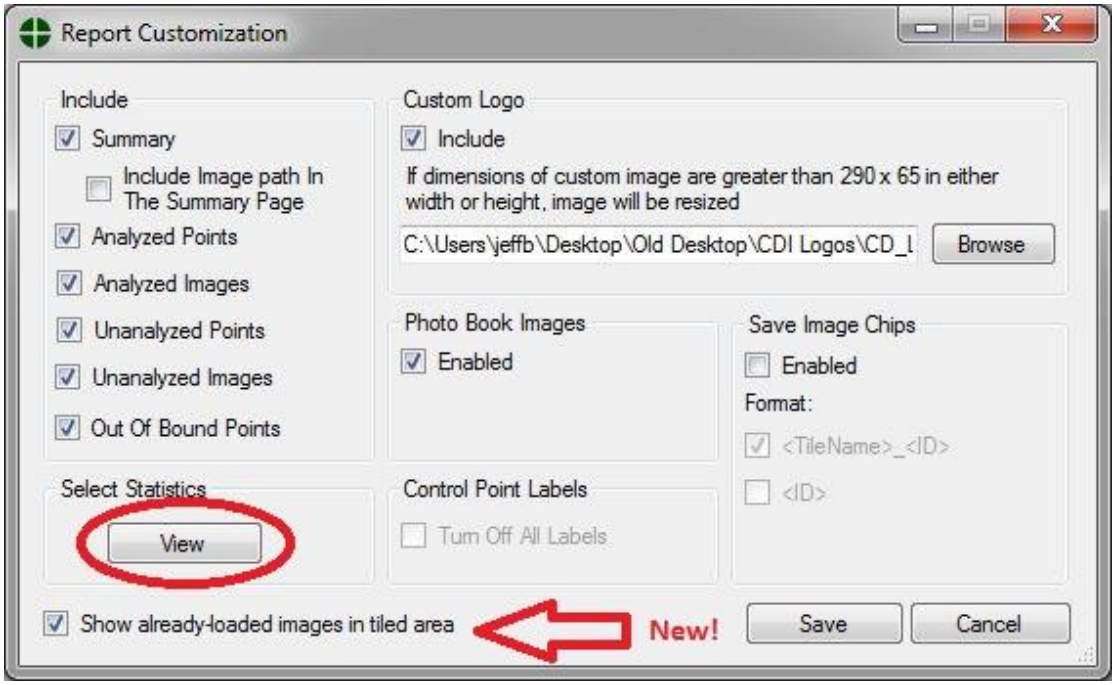
Creating a CompassAA Data Verification and Validation Report

The next step is to create the report. Before creating our first report, review the scale currently in the **Save context extent**. This determines the image size and level of detail of the individual ground control points displayed in the final report.

8. To create a report, select **Tools -> Report** from the application menu.

Choose the Select Statistics **View** button in the Report Customization window to customize the reported statistics.

A company logo can also be easily added to the report by referencing a .jpg saved image of the graphic.



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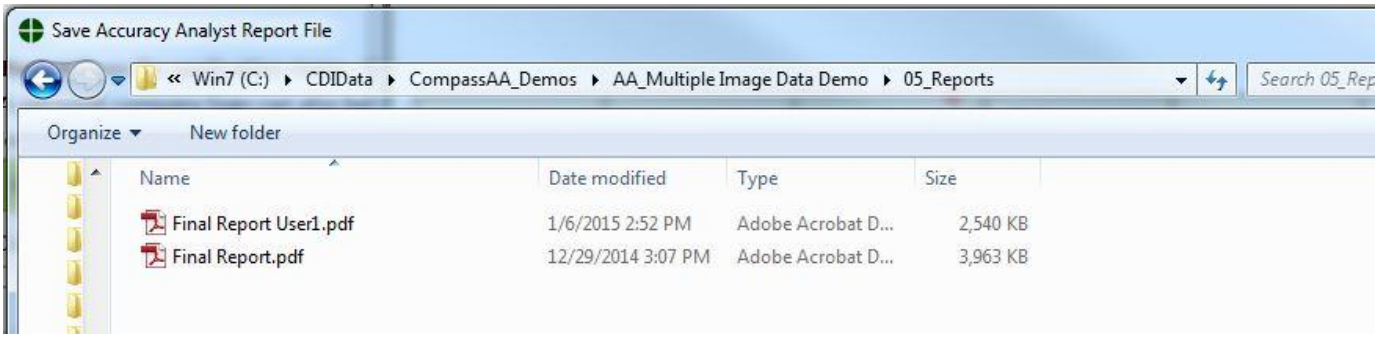
8a. When finished left click on the **Save** button. Browse to the 05_Reports folder location shown below and **Save** the .pdf report to **Final Report User1.pdf**.



The .pdf file will either open automatically or you will need to browse to its saved location and double click on it.

If you wish to save your just processed CompassAA project data, click on File → Save As menu commands and name your project file as needed. Otherwise click on Close or Exit to end your first CompassAA 3.50 session.

Congratulations!

You have now successfully used CompassAA 3.50 to verify the accuracy and quality of georeferenced image data in a consistent, standardized, easily mastered, and fast process. You verified data accuracy, controlled quality, and created a customized professional, meaningful report.

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