

Frequently Asked Questions (FAQ)

Why am I having problems copying files off the DVD?

All DVDs have been checked to ensure files are readable and uncorrupted. It is common that one DVD reader will not copy the files, but another one will. If you have more than one DVD reader available, please attempt to copy files off of the DVD using all available DVD readers.

Why does the 2006 imagery appear flatter than the 2002 imagery?

The 2006 imagery has been processed to provide as much detailed information as possible for analysis and interpretation purposes.

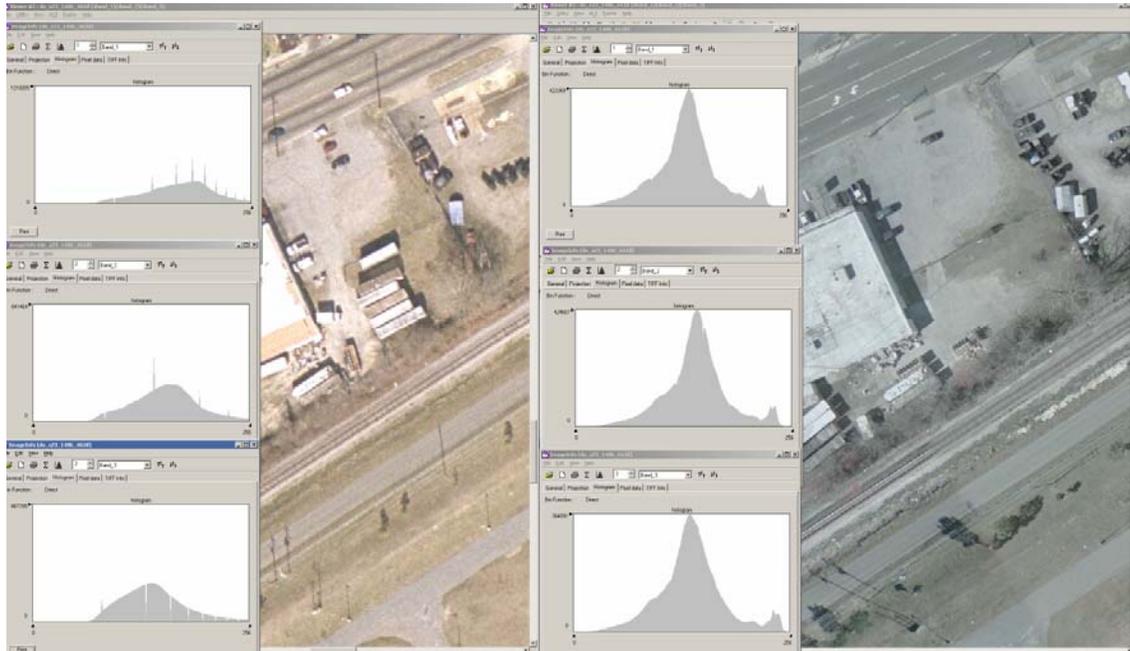
Because of the subjectivity of image aesthetics, the Commonwealth worked closely with Sanborn at the onset of the project to establish guidelines for the balancing of the image radiometry and capturing the maximum amount of interpretive information from the photographs. Although the imagery acquired in 2006 and 2007 is significantly different from the 2002 imagery, the State contends it is of much higher quality and contains more information supported by the technical discussion below.

The use of radiometric balancing techniques requires significant expertise because it is very easy to distort an image or lose detail. Sanborn has balanced the imagery to be representative of the ground by using the maximum spectrum for image detail. After the optimal characteristics were approved, all other images had their contrast and brightness values adjusted to that of the prototype signatures.

One of the tools that can be used for analysis of the quality of the imagery is a 'histogram' of the imagery. A histogram is a type of graph of pixel values in the imagery. The horizontal bar illustrates 256 pixel values, where black pixels carry a '0' value and white pixels a '255' value. The vertical component represents the number of pixels in the image that are of that value. All pixels in between vary in intensity level for each band of color; red, green, blue (RGB) and from darkest on the left end of the scale and lighter on the right end of the scale. Ideally, a histogram of the imagery should generally be bell-shaped, with a majority of the pixel values in the middle range. There should be very little pixels in the 0 (black) or 255 (white) ranges.

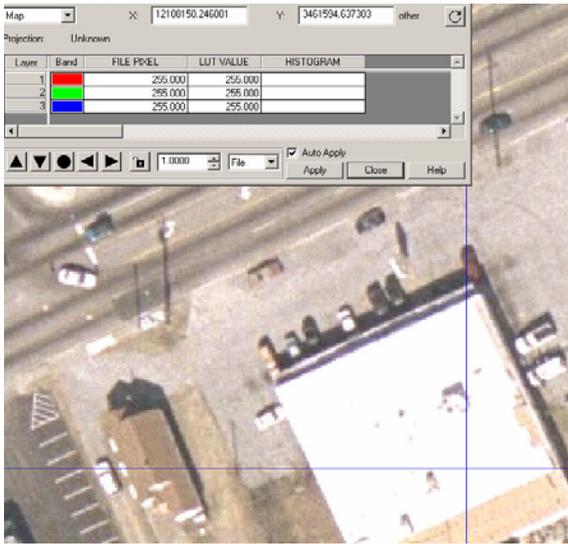
Although histograms can be biased by various ground features such lakes (a large lake will result in high number of dark pixels), in general the histogram should appear as a standard bell curve.

Two histograms are shown below, both within the Virginia project area. The one on the left was one from 2002 and the one on the right from 2006. It is easy to see that the 2002 lacked clarity and information and that the 2006 imagery is radiometrically superior.

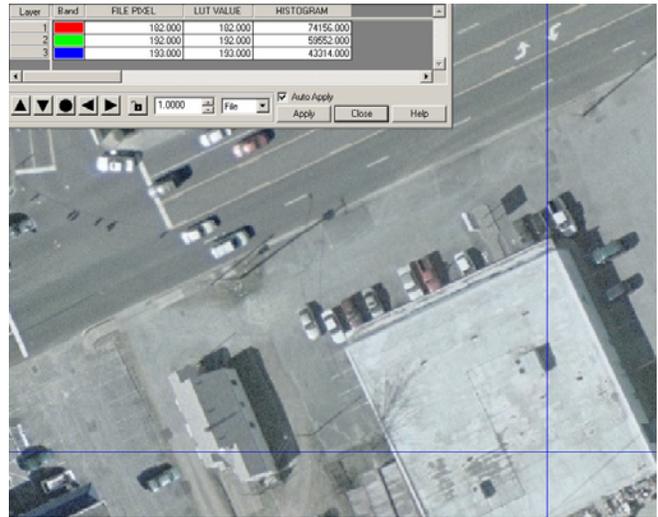


After extensive use of the 2002 imagery, users have become accustomed to the radiometry of that imagery. The Commonwealth feels users will see over time that the 2006 imagery is of better radiometry, provides more information for interpretive purposes, and offers more true color than previous imagery.

Another method for analyzing the quality of imagery is to view the pixel values for each band in a particular area of the image. In the sample below, note how the building rooftop in the left image from 2002, contains pixel values of 255, for each band (pure white). Most of the pixels on the roof are white, resulting in 'blown out' imagery with loss of detail. The building on the right shows values of 182 (degree of brightness). You can also see that the image from 2006 contains extensive detail information on the roofline, and the 2002 shows no detail at all.



2002 Imagery



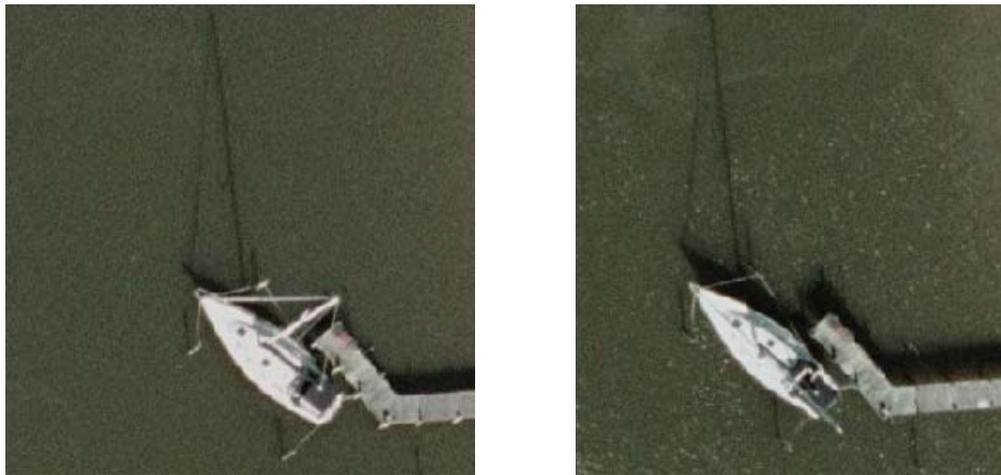
2006 Imagery

As illustrated above, the 2002 imagery has a much higher contrast level than the 2006 imagery. However, this results in loss of information. Higher contrast imagery may at first glance appear sharper since the higher contrast tends to result in sharper edges, giving the appearance of better resolution. The State has provided the imagery to the jurisdictions while maintaining as much information as possible. Users have the flexibility to ‘stretch’ the histogram and force the imagery to be of higher contrast. Please note if high contrast imagery was provided initially, the ‘lost’ pixels along the ends of the imagery would have been impossible to recover. If the maximum interpretive information is provided (as has been with the 2006/2007 imagery), individual users have the flexibility to modify the data as desired, with the highest quality starting point.

You will also see variations in color saturation between orthophotos. Again, users have the option to saturate the color values of the imagery to adjust for what best appeals to the individual viewer. A user can choose saturation values in the PhotoShop environment and batch process the remainder of the TIFF files to match.

Why do buildings on the imagery appear offset?

The only truly accurate part of a photograph is the exact center or ‘nadir’ of the image. All other features in the photo are radially distorted outward from the nadir. This is best illustrated by the two photos below, taken from separate angles. The mast of the boat leans in an outward direction in both photos. Based on the camera angle, the mast is distorted in two different directions.



The more elevation a feature has, the more distorted it is from the nadir. Knowing the elevation throughout the photograph allows for adjustment of the distortion. The imagery is orthogonally projected down to its original position. This is the basis of the nomenclature 'orthophoto'. The elevation is provided through the Digital Terrain Model (DTM) that is stereo-compiled in 3-D from the raw aerial photography. The DTM models the ground terrain information and not above-ground features such as buildings. Therefore, the base of the building on the ground is rectified (adjusted) to the proper position. The building top is not rectified and therefore remains distorted on the image. This is an inherent part of orthophotography. The only way this can be resolved is with true orthophotography, in which buildings are modeled in 3-D. However, this is a very costly solution and is generated in rare circumstances, typically in dense urban areas.

What are the parameters for Leaf-on?

The Commonwealth made decisions in both 2006 and 2007 on when to cease flying. The decision was based on the amount of leaf-out weighed against the desire to complete as much photography as possible for each jurisdiction in one year. In general, leaf-out is allowed for ornamental trees such as cherry, pear, etc. These trees are generally small and minimally obscure ground features. The focus is on large hardwood trees, which obscure ground features much more.

What are obscured contours?

Contours for the project meet accuracy specification for 2' contours and 4' contours based on the source 1"=600' and 1"=1,200' photography, respectively. In areas of dense vegetation or shadow, it may be impossible for the stereo compilation technician to accurately see the ground. The operator places masspoints as best as possible, extending breaklines through shadowed areas or placing points on the ground as is visible through the vegetation. Since the ground is obscured, the



contours cannot be guaranteed to meet accuracy specifications for the specified contour interval.