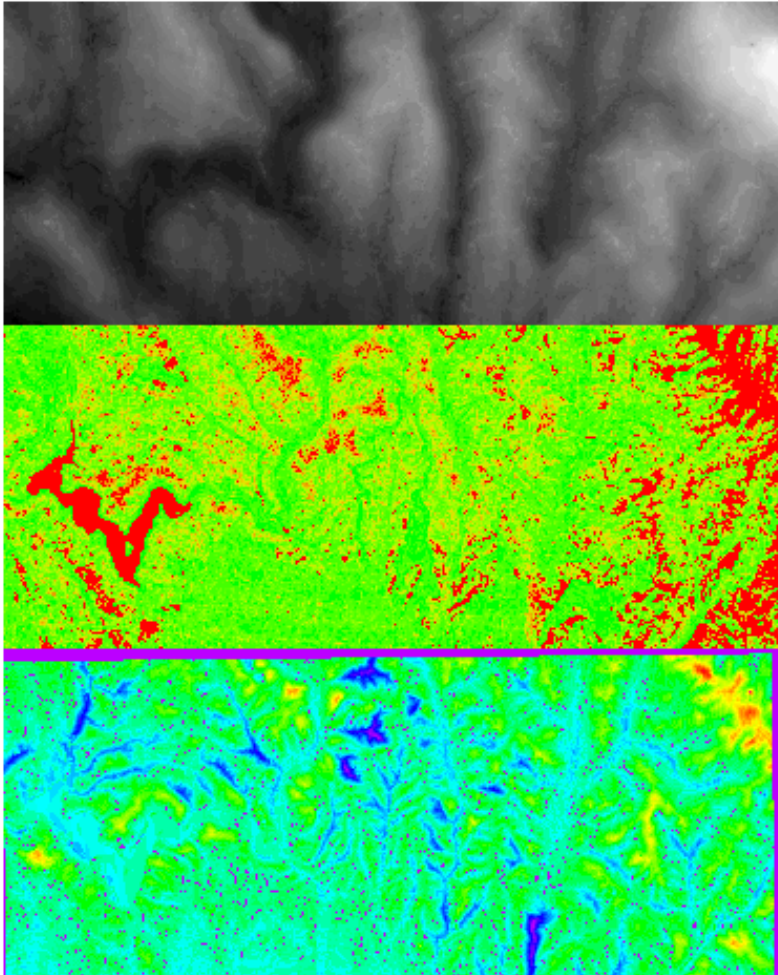


# Evaluating DEM Extraction Results

The TNTmips® DEM Extraction process is at the heart of the Stereoscopic Modeling process. The TNT sample data on the San Francisco atlas CD-ROM provides project materials both for performing the DEM extraction, and for visually evaluating the results of the setup and processing values you select. The Hayward NHAP airphotos from the east side of the San Francisco Bay can be used for DEM extraction, and the USGS DEM for Hayward can be used to evaluate the result. NOTE: The sample airphotos represent relatively poor input. The camera survey height was 40,000 feet, and the photos were scanned on an inexpensive scanner at 400 dpi. The number of pixels that represent Left-Right parallax is too small for optimal results.



## Extracted DEM

The extracted DEM produced from the RED band of NHAP photos 145 and 146 from the Hayward series. 12 correlation points were used to produce a LEFT-RIGHT epi-polar pair, and 562 more correlation points were added (about two hours work) for DEM Extraction.

## Correlation Raster

The associated correlation raster object shows how successful the DEM Extraction process was in establishing correlation. Red marks areas where no correlation was established. A color spread from orange to green shows areas of weaker to stronger correlation.

## Difference Raster

The extracted DEM is compared to the USGS "reference" DEM by simple raster subtraction. This signed, 8-bit difference raster shows small and moderate elevation differences in yellow, green and cyan. Larger differences show as orange, red, blue and magenta.

This 16-bit **extracted DEM** was produced with an 11 x 11 correlation window at a 2x sampling rate. The Shepard smoothing method was used with a Light smoothing value equal to 1. The process found 26,046 reliable points and derived 272,900 correlated points. The Reliable Point correlation value was 0.790 and the Minimum Cross Correlation value was raised from the default .534 to .790.

The **Correlation raster** shows no correlation for Lake Chabot in the west, and significant areas of no correlation in the northeast corner on a featureless, barren ridge. The process found strong correlation in the urban areas of the lower left center, but had less success along the series of vegetated ridges across the north edge. The online and supplemental documentation for the Stereoscopic Modeling process in TNTmips 5.2 includes suggestions for improving the solution.

The **Difference raster** shows reasonable results across most of the model area. Elevation values were too low on some of the ridges (showing orange and red), and too high in some of the valleys (blue and magenta). Notice that many areas of larger elevation difference correspond with areas of poor correlation where the result could be improved by adding more explicit tie points.