

Subpixel Spectral Identification

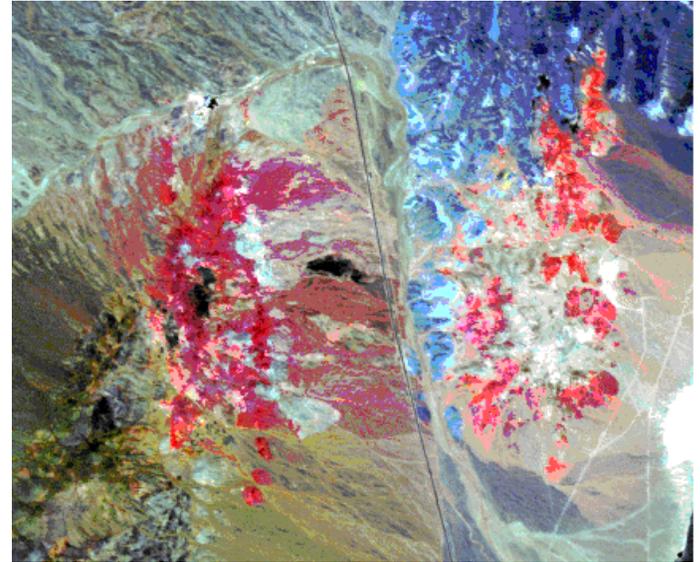
Unlock the information in individual image pixels with Matched Filter Classification in the TNTmips Hyperspectral Analysis process. Matched Filtering identifies specific materials and estimates their fractional abundance in each pixel (raster cell).

Most cells in a hyperspectral image include more than one (and perhaps many) materials, each of which contributes to the composite spectrum of an individual cell. Matched Filtering unmixes these composite spectra, without requiring that you know all of the spectra that might be present. It searches for the target spectra against a background of multiple unknown spectra, and produces a fraction image for each target end member. The fraction image is a grayscale raster with floating point values indicating the degree of match to the target spectrum, expressed as approximate fractional abundance (with 1.0 as a perfect match).

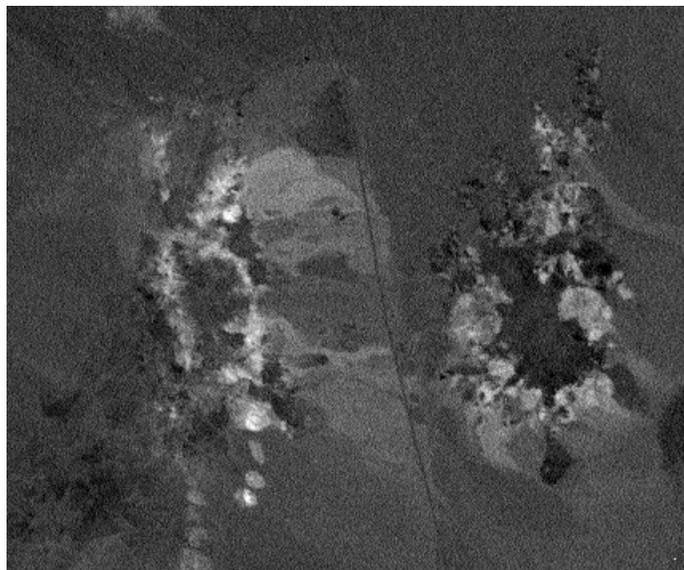
If you know the locations of key surface materials in portions of a hyperspectral scene, you can use the Spectral Profile tool to

extract a spectrum for each from the image. You can extract a spectrum for a single “purest” pixel, or an average spectrum for a small area. Then use these end-member spectra as input to Matched Filtering.

For more information on Matched Filtering, consult the new Getting Started booklet on Hyperspectral Analysis.

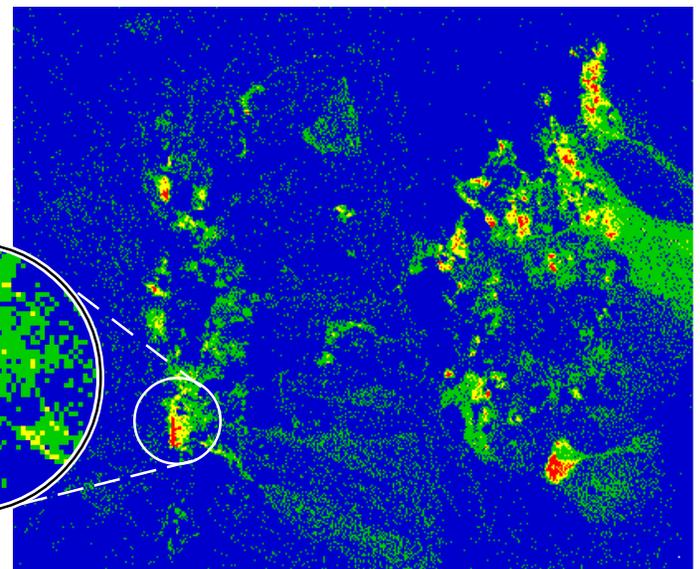


RGB display of selected bands from a hyperspectral (AVIRIS) image of Cuprite, Nevada. Two concentrically-zoned areas of hydrothermal alteration and mineralization are ringed by the red patches.



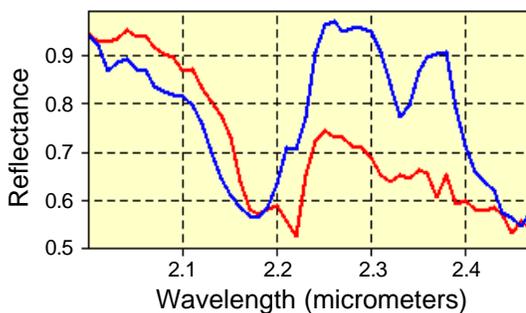
Grayscale fraction image produced by matched filtering for the target image spectrum of the mineral alunite. Bright tones identify image cells with a high proportion of alunite; these cells ring the cores of the altered zones. Most of the image shows low fractions of alunite, resulting in a lack of image detail in darker areas.

KAOLINITE ABUNDANCE (Percent of Pixel)



Fraction image for the target kaolinite image spectrum, with colors keyed to different abundance ranges. Kaolinite is concentrated in scattered areas around the periphery of the altered zones.

Target Image Spectra



— Alunite — Kaolinite

