

Mapping Dense Vegetation and Bare Soils

Satellite image bands that have been calibrated to surface reflectance by the SRFI (Standardized Reflectance Factor Index) geospatial script (see the *Scripts by Jack* color plates entitled *Calibrating Multispectral Satellite Images* and *Calibrate Satellite Images to Surface Reflectance*) can be used to interpret the biophysical properties and condition of surface materials. For example, the calibrated bands can be used to compute vegetation and soil indices in the GRUVI geospatial script (see the color plate entitled *Scripts by Jack: Mapping Vegetation/Soil Biophysical Properties*). Providing appropriate processing parameters for GRUVI requires identification of key biophysical features in the image: “pure” cells representing bare soil and dense green vegetation. These areas can be more easily identified by first computing diagnostic products from the image with the DIAG geospatial script.

The DIAG script operates on a set of SRFI raster objects (processed through the TERCOR geospatial script where appropriate; see the color plate entitled *Scripts by Jack: Correct for Terrain Induced Radiance Effects*). The user is prompted for limiting values from the PVI (Perpendicular Vegetation Index) and PBI (Perpendicular Brightness Index) raster objects previously computed by the SRFI script. The DIAG script uses these limits to identify cells with image spectra indicative of relatively bare soil or dense vegetation. The script creates a new set of raster objects containing SRFI values for these relatively “pure” cells and a null value for all other (mixed-signature) image cells. 2D Raster Correlation scatterplots of SRFI values from the DIAG raster objects do not include the clutter of points from mixed-signature cells, making it easier to identify the purest-signature cells and note their corresponding SRFI values in the red and near-infrared bands for input to the GRUVI script. A sample result from this script is shown to the right. The DIAG script is documented in *FAQs by Jack Part C*.

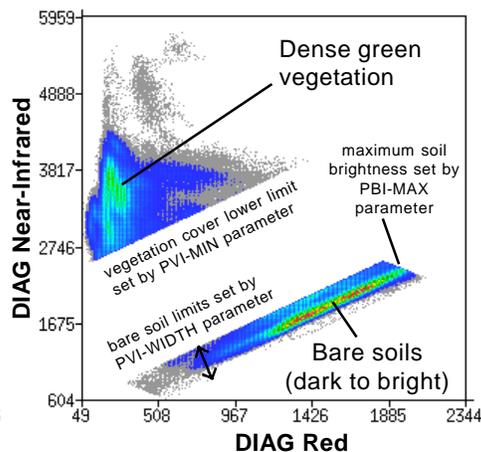
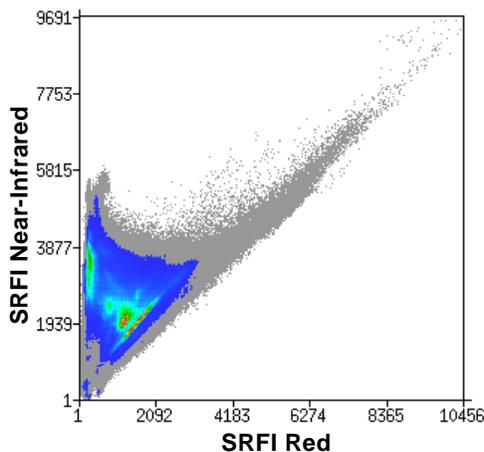
DIAG script results for QuickBird image extract from northeast Colorado, USA
False-color displays with RGB = Near-infrared, red, and green bands, respectively. Vegetated areas appear red and bare soils as gray to greenish-gray.



SRFI-calibrated bands. Circular areas are corn fields irrigated by center-pivot systems.



Bands processed with the DIAG script. Colored cells indicate dense green vegetation and bare soil. White areas are cells that have been set to null by DIAG-script processing.



Comparison of 2D Raster Correlation scatterplots of Near-Infrared versus Red bands for SRFI (calibrated reflectance) rasters (left) and DIAG-processed rasters (right). Axis units are standardized reflectance (in percent) x 100. DIAG processing eliminates cells with spectral signatures indicating a mix of soil and vegetation; the raster objects produced are image bands containing only cells with relatively pure vegetation or soil spectra.

Dr. Jack F. Paris, a private remote-sensing and geospatial consultant/coach, has developed a collection of advanced, model, geospatial **Scripts by Jack™** and associated documentation called **FAQs by Jack™**. These scripts are in the public domain and can be used and modified as desired. For access to the scripts and FAQs, more information, and contact with Jack, go to: www.microimages.com/freestuf/ScriptsByJack.htm