Suppressing Vegetation in Multispectral Images

MicroImages has created an SML script that automates processing of multispectral images to suppress the expression of vegetation for geological and soil mapping applications. The script, devegX.sml, implements a "forced invariance" methodology developed by NASA researchers* at the Jet Propulsion Laboratory. Near-infrared and red image bands are used to estimate spatial variations in vegetation abundance. Vegetation suppression can be applied to these bands and to other image bands you select. The script determines the statistical relationship between the values in each band and the vegetation index. Band values are then adjusted so that the average band value for each index level is uniform across all vegetation index levels.

The forced invariance method works well in areas of open-canopy vegetation, such as arid and semi-arid terrains, where many image cells include both vegetation and bedrock or soil. Both bedrock outcrop patterns and the overall contrast of nonvegetative materials are enhanced.

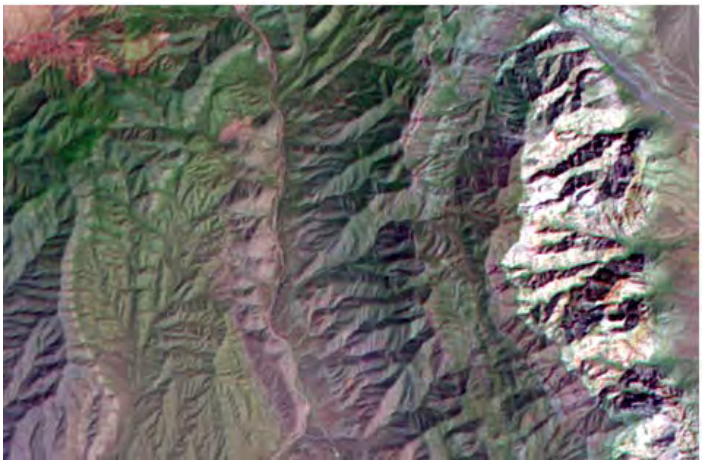
In addition to the adjusted image bands, the script produces a vegetation index raster and, for each devegetated band, a raster scatterplot of band versus vegetation index values and a graph (CAD object) of the smoothed band average versus index values that are used to rescale the band.

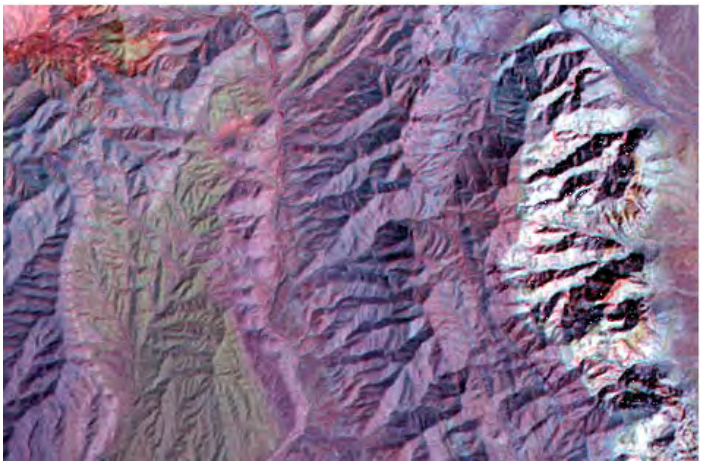
The devegX.sml script is available for free download from:

www.microimages.com/freestuf/smlscripts.htm

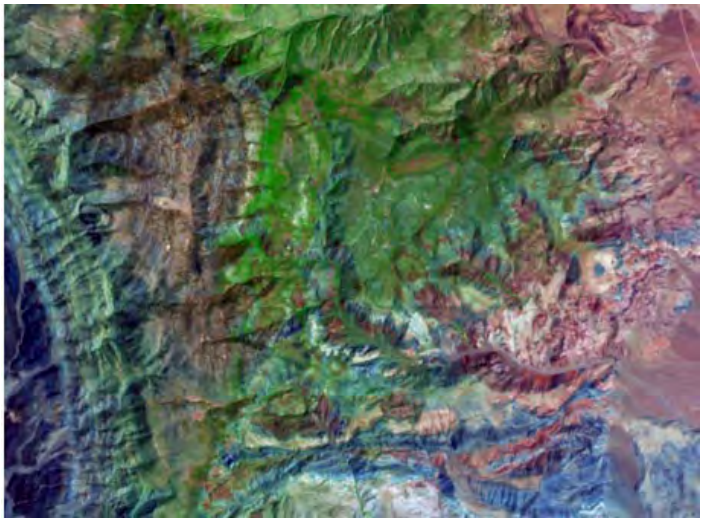
Color displays of Landsat Thematic Mapper images with RGB = Band 7, Band 4, Band 2. Vegetated areas appear green.

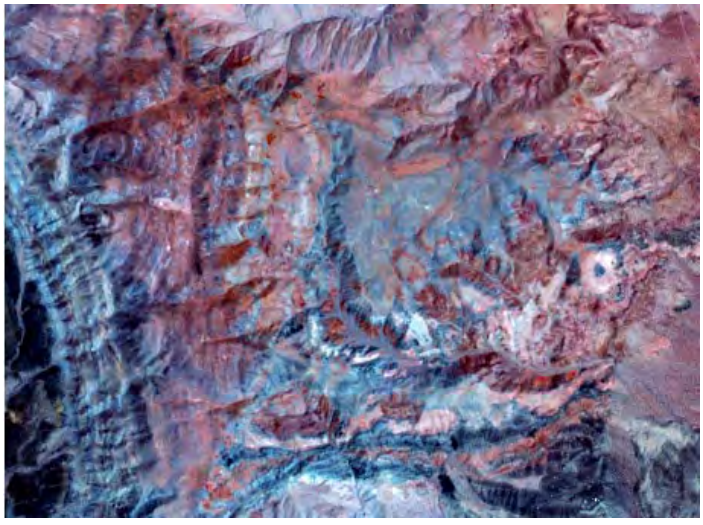
Same image areas and band combination after vegetation suppression by devegX.sml. Bedrock outcrop patterns in vegetated areas are much clearer.





Spring Mountains, southern Nevada, USA. Width of scene is 14.3 kilometers.





Inyo Mountains, eastern California, USA. Width of scene is 13.7 kilometers.

*Crippen, Robert. E. and Blom, Ronald G., 2001, Unveiling the Lithology of Vegetated Terrains in Remotely Sensed Imagery, Photogrammetric Engineering & Remote Sensing, Volume 67, No. 8, pp. 935-943.