

Calculate NDVI from MODIS using Raster Calculator

NDVI is well established in the literature as being a good representation of vegetation growth and phenology. NDVI is calculated from surface reflectance in the near-infrared ρ_{NIR} and red ρ_R portions of the electromagnetic spectrum, using the following formula:

$$NDVI = (\rho_{NIR} - \rho_R) / (\rho_{NIR} + \rho_R)$$

NDVI index varies between -1 and 1 where its values for vegetated land are generally greater than 0.2, with values exceeding 0.5 indicating dense vegetation.

The MODIS Surface-Reflectance Product (MOD 09) is computed from the MODIS Level 1B land bands 1, 2, 3, 4, 5, 6, and 7 (centered at 648 nm, 858 nm, 470 nm, 555 nm, 1240 nm, 1640 nm, and 2130 nm, respectively). The product is an estimate of the surface spectral reflectance for each band as it would have been measured at ground level if there were no atmospheric scattering or absorption.

MODIS Surface Reflectance Bands 1 and 2 can be used to calculate NDVI using the following formula:

$$NDVI = (\text{Band 1} - \text{Band 2}) / (\text{Band 1} + \text{Band 2})$$

The only problem is one might get whole numbers (Raster calculator seems to automatically round the decimals to the nearest whole number in some cases) for NDVI instead of pixel values in decimals. The best way to avoid this problem is to add *float* to the start of the equation.