

SPECTRAL EVOLUTION

Using Vegetation Indices

Vegetation indices are based on the fact that different surfaces reflect types of light differently. Vegetation that is photosynthetically active absorbs more of the red light that strikes it and reflects most of the near infrared light. A vegetation index, like the popular Normalized Difference Vegetation Index (NDVI) works as an indicator that describes the greenness or density and health of vegetation based on the measurement of absorption and reflectance using a spectroradiometer or spectrometer. NDVI is calculated as the normalized difference between the red and near infrared bands of a spectral measurement according to the formula: $NDVI = (NIR - RED) / (NIR + RED)$. The bigger the difference/higher the measurement, the heavier, greener, and healthier the vegetation. The lower the difference/measurement, the closer to bare dirt.

SPECTRAL EVOLUTION spectroradiometers, like the PSR-3500, are well-suited for vegetation remote sensing studies in the field. These systems are lightweight, reliable and deliver high resolution spectra for researchers. The PSR-3500 covers the full 350-2500nm , UV-VIS-NIR range with auto-shutter, auto-exposure, and auto-dark correction, for one-touch operation with no optimization step.

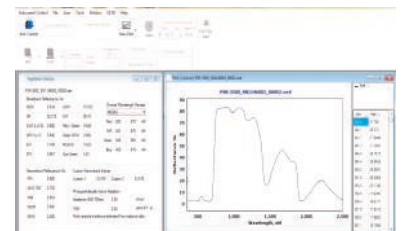
All spectroradiometers and spectrometers include DARWin SP Data Acquisition software that acts as a GUI front-end for collecting and saving measurements. In addition, DARWin provides pull down menus for fast access to the 19 vegetation indices it includes. In addition to NDVI, these indices include:

- ◆ GRVI (Green Ratio Vegetation Index)
- ◆ SR (Simple Ratio Vegetation Index)
- ◆ DVI (Difference Vegetation Index)
- ◆ SAVI (Soil Adjusted Vegetation Index)
- ◆ Red/Green (Red Green Ratio)
- ◆ ARVI (Atmospherically Resistant Vegetation Index)
- ◆ Green NDVI (Green Normalized Difference Vegetation Index)
- ◆ EVI (Enhanced Vegetation Index)
- ◆ MSAVI2 (Modified Soil Adjusted Vegetation Index Type II)
- ◆ IPVI (Infrared Percentage Vegetation Index)
- ◆ Sum Green (Summed Green Vegetation Index)
- ◆ PRI (Photochemical Reflectance Index)
- ◆ NDVI 705 (Red Edge Normalized Vegetation Index)
- ◆ WBI (Water Band Index)
- ◆ NDWI (Normalized Difference Water Index)
- ◆ PAR (Photosynthetically Active Radiation)

Applications can include: vegetation dynamics, plant phenological changes, biomass production , measurement of canopy greening, soil moisture, pasture condition, range land changes, estimation of crop yields, carbon influx or sequestration, plant photosynthesis, leaf area index (LAI) measurement, land cover classification, and more.



The PSR-3500 field portable spectroradiometer for remote sensing includes access to 19 vegetation indices



Within our standard DARWin SP Data Acquisition software, the user can access 19 vegetation indices, including NDVI, using pull down menus.

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