



Vegetation indices derived from a modified digital camera in combination with different blocking filters

Karl Krainer (1), Albin Hammerle (1), Georg Wohlfahrt (1,2)

(1) University of Innsbruck, Ecology, Innsbruck, Austria (albin.hammerle@uibk.ac.at), (2) European Academy of Bolzano, Bolzano, Italy

Remote and proximal sensing have become valuable and broadly used tools in ecosystem research. Radiation reflected and scattered at and from the vegetation is used to infer information about vegetation biomass, structure, vitality and functioning, just to name a few. To this end numerous vegetation indices have been established, which relate reflectance in different wavelengths to each other. While such indices are usually calculated from reflectance data measured by spectro-radiometers we did a study using a commercially available digital camera, from which the infrared (IR) band elimination filter was removed. By removing this filter, the camera sensor became sensitive for IR radiation besides the visible spectrum. Comparing measurements with this modified camera and a hyperspectral spectro-radiometer over different vegetation and surfaces we determined the potential of such a modified camera to measure different vegetation indices. To this end we compared 71 vegetation indices derived from spectro-radiometer data with 63 indices derived from the modified digital camera.

We found that many of these different indices featured relatively high correlations. Especially the rgR (green/red ratio) and NDI (normalized difference vegetation index) calculated from data of the modified camera do correlate very well with vegetation indices that are known for representing the amount and vitality of green biomass, as these are the NIDI (normalized infrared vegetation index) and the LIC (curvature index).

We thus conclude from this experiment, that given a proper inter-calibration, a commercially available digital camera can be modified and used as a reasonable alternative tool to determine vegetation biomass and/or vitality. In addition to these measurements currently different band elimination filters are used to improve the information content of the digital images.