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On the evaluation of vegetation resilience in Southern Italy by using satellite VEGETATION, MODIS, TM time series

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Satellite technologies can be profitably used for investigating the dynamics of vegetation re-growth after disturbance at different temporal and spatial scales. Nevertheless, disturbance -induced dynamical processes are very difficult to study since they affect the complex soil-surface-atmosphere system, due to the existence of feedback mechanisms involving human activity, ecological patterns and different subsystems of climate. The remote sensing of vegetation has been traditionally carried out by using vegetation indices, which are quantitative measures, based on vegetation spectral properties, that attempt to measure biomass or vegetative vigor. The vegetation indices operate by contrasting intense chlorophyll pigment absorption in the red against the high reflectance of leaf mesophyll in the near infrared. The simplest form of vegetation index is simply a ratio between two digital values from these two spectral bands. The most widely used index is the well-known normalized difference vegetation index NDVI = [NIR-R]/ [NIR+R]. The normalization of the NDVI reduces the effects of variations caused by atmospheric contaminations. High values of the vegetation index identify pixels covered by substantial proportions of healthy vegetation. NDVI is indicative of plant photosynthetic activity and has been found to be related to the green leaf area index and the fraction of photosynthetically active radiation absorbed by vegetation. Therefore variations in NDVI values become indicative of variations in vegetation composition and dynamics.
In this study, we analyze the mutiscale satellite temporal series (1998 to 2008) of NDVI and other vegetation indices from SPOT VEGETATION and Landsat TM data acquired for some significant test areas affetced and unaffected (Southern Italy) by different type of environmenta diturbances (drought, salinity, pollution, etc). Our objective is to characterize quantitatively the resilient effect of vegetation cover at different temporal and spatial scales