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Riparian strip efficiency assessment in agricultural landscapes using stereoscopic very high spatial resolution satellite imagery

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Riparian strips are used worldwide to protect riverbanks and water quality in agricultural zones because of their several environmental benefits. A metric called the Riparian Strip Quality Index, which is based on the percentage area of riverine vegetation found on the riparian strip, is used to evaluate their ecological condition. This index could be considered an indicator of the potential capacity of riparian strips to filter sediments, retain pollutants, and provide shelter to terrestrial and aquatic species. Thus, in order to know if a riparian strip is truly efficient in agricultural lands, which means that it is fulfilling those ecological functions, it is necessary to understand their ability to intercept surface runoff. The latter is the major cause of water pollution and erosion in these productive areas. Besides vegetation coverage, topographic and hydrologic parameters must be included to model the intensity and spatial distribution of runoff streamflow at local scales. The geospatial information used to assess the ecological efficiency of riparian strips was extracted from very-high-spatial-resolution WorldView-2 satellite imagery. This information was then processed using current geospatial techniques such as object-based image analysis and was used to develop a Riparian Strip Efficiency Index. The results show that this index might be used to assess the efficiency of riparian strips, which will enable land managers to monitor changes occurring over time, identify priority areas for restoration activities. This, in turn, might ensure optimal allocation of private or public funds towards the most inefficient and threatened riparian strips.