ALUES: an R package for evaluating land for agricultural use

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Agricultural Land Use Evaluation System (ALUES) is an R package that evaluates land suitability for different crop production. The package is based on the Food and Agriculture Organization (FAO) and the International Rice Research Institute (IRRI) methodology for land evaluation. Development of ALUES is inspired by similar tool for land evaluation, Land Use Suitability Evaluation Tool (LUSET). The package uses fuzzy logic approach to evaluate land suitability of a particular area based on inputs such as rainfall, temperature, topography, and soil properties. The membership functions used for fuzzy modeling are the following: Triangular, Trapezoidal, Gaussian, Sigmoidal and custom models with functions that can be defined by the user. The package also aims on complicated methods like considering more than one fuzzy membership function on different suitability class. The methods for computing the overall suitability of a particular area are also included, and these are the Minimum, Maximum, Product, Sum, Average, Exponential and Gamma. Finally, ALUES utilizes the power of Rcpp library for efficient computation.