APPENDIX 1

Table A1.1. Overview of data transformations to develop RUSLE factors. All raster files have a cell size of 100x100 meters (1 hectare).

Factor	Input data	Transformation
R	Precipitation data from Mauritius Meteorological Services (2005) and Padya (1984).	For the calculation of pi, the monthly rainfall over 30 years between 1951 and 1980 from 23 stations was interpolated at a 100m resolution. The interpolation was conducted per month (thus resulting in 30 x 12 = 360 maps. Five interpolation methods were evaluated: linear, inverse distance weighted, cubic spline, generalized additive modelling in combination with kriging, and radial basis functions. Elevation, aspect and gradient were evaluated as covariates, along with x- and y-coordinates, in the interpolations. Only elevation appeared to be a meaningful covariate. The performance of each interpolation method was measured by calculating the root mean squared error through leave-one-out cross-validation (Hastie et al. 2009). Through this evaluation, the interpolation by radial basis functions turned out to be the best performing technique (rmsq = 79.9 mm), followed by inverse distance weighted interpolation (rmsq = 114.6 mm). Linear interpolation was the method with the lowest performance. The results from the radial basis function interpolation were used as average monthly precipitation (Pi) to calculate a modified Fournier index (F). Usually, the EI30 rainfall erosivity index (Wischmeier and Smith 1978) is used but in absence of rainstorm intensity data, it was replaced by the modified Fournier index (Arnoldus 1977, 1980) which linearly correlates with the rainfall erosivity index (Ferro et al. 1999). The modified Fournier index was calculated as follows: $$F = \frac{\sum_{i=1}^{12} p_i^2}{P}$$ where Pi = average monthly precipitation (mm) and P is the average annual precipitation (mm). Subsequently, the modified Fournier index was used to calculate an R factor for Mauritius: $$R = rF^a$$ where *r* and *a* are location specific parameters. We have used *r* = 0.00302 and *a* =1.9, following Arnoldus (1980), as cited by Le Roux et al. (2005).

K	Digitized vector map with spatial distribution of soil types from Willaime (1984). Soil erodibility factors from Nigel and Rughooputh (2012).	K values assigned. Digitized vector map converted to raster (100x100m).
LS	Digital Elevation Model (DEM) of Mauritius from (Seul 1999) and Hill (2001).	L is the length factor, λ the slope length (m) and m is the slope-length exponent (m = 0.5 on slopes >5°, 0.4 on slopes between 3° and 5°, 0.3 on slopes between 1° and 3°, 0.2 on slopes <1°). Slope length is normalized for a unit plot of 22.13m. $L = \left(\frac{\lambda}{22.13}\right)^{m}$ Slope steepness is calculated differently for slopes < 9° and for slopes ≥9°: $For\ S < 9°, S = 10.8\ sin\beta + 0.03$ $For\ S \geq 9°, S = 16.8\ sin\beta - 0.50$
P	Land use distribution for six time slices from Vaughan and Wiehe (1937) and references therein, and Page and D'Argent (1997). Support practice factor from Nigel and Rughooputh (2012).	P values assigned. Digitized vector maps converted to raster (100x100m).
C	Land use distribution for six time slices from Vaughan and Wiehe (1937) and references therein, and Page and D'Argent (1997). Cover management factor from Nigel and Rughooputh (2012).	C values assigned. Digitized vector maps converted to raster (100x100m).

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