

No.	Abbreviation	TI	Description and references
1	<b>UCA</b>	Upslope contributing area	UCA is the area that can potentially produce runoff to a given location (Erskine et al., 2006).
2	<b>DDG</b>	Downslope distance gradient	DDG is a hydrologic measure of the impact of the local slope characteristics on a hydraulic gradient. Values are low on concave slope profiles and high on convex slope profiles (Hjerdt et al., 2004).
3	DDGD	Downslope distance gradient difference	DDGD describes the difference between DDG and local or neighbour gradients (Hjerdt et al., 2004).
4	FLD	Downstream flow length	This describes the downslope distance of a pixel along the flow path to the outlet of a watershed (Greenlee, 1987).
5	ME	Median elevation	ME refers to the median elevation among all DEM pixels in a watershed.
6	<b>Relief</b>	Relief	Relief describes the difference between the highest and lowest elevations within a local analysis window. An $11 \times 11$ grid cell window is used in this paper.
7	Roughness	Roughness	Roughness is calculated as $1/\cos(\text{slope})$ of each DEM pixel.
8	<b>Slope</b>	Slope degree	Slope refers to the slope degree of each DEM pixel (Burrough et al., 2015).
9	<b>LS</b>	Slope length factor	LS is a combined factor of slope length and slope gradient. It represents the ratio of soil loss per unit area on a site to the corresponding loss from a 22.1 m long experimental plot with a 9 % slope (Desmet and Govers, 1996).
10	<b>SCA</b> , also known as <b>A<sub>s</sub></b>	Specific contributing area	The SCA is the upslope contributing area per unit length of contour (Quinn et al., 1991).
11	STRD	Stream density	The STRD is the ratio of the sum of all stream length to watershed area.
12	<b>TCI</b>	Terrain characterization index	$TCI = Cs * \log_{10}(SCA)$ , where Cs is the surface curvature index; the higher positive TCI values reflect higher aggradation of soil materials at a certain point along the hillslope (Park and van de Giesen, 2004).
13	<b>TRI</b>	Terrain ruggedness index	TRI expresses the degrees of difference in elevation among adjacent cells (Riley, 1999). It calculates the sum changes between a grid cell and its eight neighbour grid cells. Higher values indicate more ruggedness of a watershed.
14	TPI	Topographic position index	$TPI \approx 0$ indicates flat area. $TPI > 0$ tends towards ridge tops and hilltops. $TPI < 0$ tends towards the valley and canyon bottoms (Jenness, 2006). A $9 \times 9$ grid cell window is used in this paper.
15	TWI	Topographic wetness index	$TWI = \ln(SCA/\tan(\text{slope}))$ ; this shows the spatial distribution of zones of surface saturation and soil water content (Ambrose et al., 1996; Quinn et al., 1995).
16	Wetland	Wetland coverage	This describes the percentage wetland area to the total watershed area.
17	Length	Length of main river	This refers to the total length of mainstream.
18	Roundness	Roundness coefficient	This is the ratio of watershed area to the area of a circle with the same perimeter. A lower value indicates a longer and narrow watershed.
19	<b>Openness</b>	Positive topographic openness	Openness describes the degree of dominance or enclosure of a location on an irregular surface. Values are high for convex and low for concave forms, respectively (Yokoyama et al., 2002).
20	<b>SA</b>	Surface area	SA describes the land area of each DEM, which may provide a better estimation of the surface roughness than the planimetric area (Jenness, 2004). A lower value indicates a more gentle topography.
21	<b>Perimeter</b>	Perimeter of a watershed	The perimeter of a watershed is utilized.
22	Total	Total curvature	The standard curvature combines profile and planform curvatures (Moore et al., 1991).

Note that bold TIs are selected by the factor analysis test.