**Calculation of the Topographic Index**

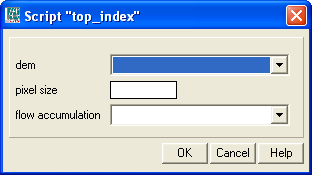
Digital elevation model, having metric coordinate system (e.g. UTM)

Pixel size (in meters)

Flow Accumulation Map, can be produced using the ILWIS DemHydro Processing module, select first the options Fill, Flow Direction and subsequently Flow Accumulation.

Copy the script files in the ILWIS \Scripts sub-directory. Start ILWIS and from the menu select “Operations” > “Scripts” and select the script “top\_index”.

**Figure 1: input parameters required to run the top\_index script**



Script Listing and short description:

//first derivative in X direction

dfdy\_1.mpr{dom=value;vr=-1000:1000:0.1}:= MapFilter(%1,DFDY.fil,value)

calc dfdy\_1.mpr

//first derivative in Y direction

dfdx\_1.mpr{dom=value;vr=-1000:1000.7:0.1}:= MapFilter(%1,DFDX.fil,value)

calc dfdx\_1.mpr

// calculate slope map in percentage

slp\_perc:=100\*(hyp(dfdx\_1,dfdy\_1)/PIXSIZE(%1))

calc slp\_perc.mpr

// calculate slope map in degrees

slp\_deg:=RADDEG(ATAN(slp\_perc/100))

calc slp\_deg.mpr

**//Eventually change 0 degree slopes to 0.0001 degree**

//Calculate the flow accumulation area or upslope area (A)

flowacc\_area{dom=value;vr=-1000:10000000000000000000000000:1}:=%3\*%2^2

calc flowacc\_area.mpr

// ln(a/tan(slope in degree)

//a = (flowacc\_area/gridsize or horizontal resolution of the DEM)

// Calculate the topographic index map

topographic\_index{dom=value;vr=-1000:1000:0.001}=LN((flowacc\_area/%2)/(TAN(DEGRAD(slp\_deg))))

calc topographic\_index.mpr