

SEDIMENTATION

SEDIMENTATION utilizes patch-level output from the [RUSLE](#) modeling tool to evaluate the net soil movement (erosion or deposition) within patches, fields, or river basins (catchments). If data are analyzed at the river basin scale, a sediment delivery ratio may be input to determine the sediment leaving the catchment.

Related Modules: [RUSLE](#)

SEDIMENTATION Operation

Before running the SEDIMENTATION module, you must produce the required patch images by running the [RUSLE](#) module.

1. Specify whether the data to be analyzed are at the river basin or field level.
2. Input the patch ID image, the patch total soil loss image and the DEM used in [RUSLE](#).
3. If the data is at the field level, enter the field ID image (the same image used in [RUSLE](#)).
4. If the data is at the river basin (catchment) level, specify a Sediment Delivery Ratio (SDR) and indicate whether to apply this ratio at patch level or by using a river image. If using a river image, enter its name.
 - If the SDR is unknown, it is recommended that you specify a value of 1.0 (default) for the SDR (see Notes section below).
 - Applying ratio at patch level assumes each patch to be a micro catchment.
 - If using a river image, the SDR will be applied only to those patches that directly touch a stream segment.
5. Specify the unit choice to calculate the net soil loss or deposition, either tons/acre/year or


tons/hectare/year.

6. Enter an output prefix for the net soil loss and net soil loss per area unit images to be produced at the patch level.
7. If the data is at the field level, enter an output prefix for the field image.
8. Click OK.

Table output will also be displayed after running SEDIMENTATION showing the detail by patch or field.

[Macro Command](#)

SEDIMENTATION Notes

1. The Sediment Delivery Ratio (SDR) is determined from the average annual sediment yield 

Sediment yield is the amount of soil loss (erosion) that reaches a stream and is transported within the waterway. The SDR is the ratio between the amount (sediment yield) reaching the stream and the soil loss in the analysis unit ($\text{SY}/\text{Soil Loss} = \text{SDR}$).

2. Determining net erosion or deposition begins with the total soil loss by patch produced from the [RUSLE](#) module. To determine net soil loss or deposition in each patch, SEDIMENTATION first determines the average elevation for each patch. Then the highest elevation in the river basin (catchment) or the highest elevation in each field is located. The direction of movement of the soil is then established by the relative elevation differences between contiguous patches. Movement is always in the downslope direction. The amount of soil loss that moves into the surrounding lower patches is proportional to the length of the common boundary between the higher patch and the lower patches.

Next, the net soil loss or deposition in all lower patches is calculated as follows. Using the output from [RUSLE](#), the proportional soil loss for the higher patch is compared to the soil loss for the lower patch. The difference between the amounts of soil loss from the higher patch to the lower patch represents the net soil loss or deposition in the lower patch. For example if in the initial state the proportional soil loss in Patch A (the higher patch) delivered to the lower patch B is 1 t/yr, and Patch B's initial soil loss is 3 t/yr (RUSLE soil loss value), SEDIMENTATION then determines the difference between the amount of sediment coming into the patch and the patch's RUSLE soil loss value. In our example, $3 (\text{Patch B}) - 1 (\text{moved from Patch A}) = \text{net soil loss for Patch B of } 2 \text{ t/yr}$. If soil loss from Patch A was 5 t/yr and Patch B initial soil loss was 2 t/yr, the difference is $2 - 5 = -3$ which is interpreted as 3 t/yr net deposition in patch B.

After net soil loss or deposition is determined for every patch, these values are then summed and the net annual soil loss or deposition for the study units is determined.

3. If the river basin option is chosen, but no river image is utilized, the SDR is applied to every patch. In this condition each patch is assumed to be connected to a waterway (rill to stream). The sediment delivery from each patch is then summed and this value is assumed to be the annual sediment yield of the basin. If a river image overlay was utilized, only the patches that touch a river segment are summed when determining the annual sediment yield of the catchment.

