

**ESTIMATING EPHEMERAL GULLY EROSION**

Annual soil loss predictions for planning purposes are now made with the Revised Universal Soil Loss Equation (RUSLE2), the Wind Erosion Equation (WEQ), or both. RUSLE2 accounts only for sheet and rill erosion. When needed, an additional value may be included to account for erosion from large gullies using the method described in the next section. Soil loss caused by seasonal, concentrated flow channels or ephemeral gully erosion may be estimated using the method below.

This procedure should only be applied on soils with slopes of 3% or greater.

For computing ephemeral erosion, refer to Table 4 below and the map of Ephemeral Gully Erosion Codes (Figure 2).

1. Use the map (Figure 2) to determine the correct code for your county.
2. Match the code number for your county with the correct values in Table 4. For example, Buffalo County is in a Code 3 area, which has a value from Table 4 of 30 percent for untreated land and 5 percent for treated.
3. Compute the RUSLE2 value for sheet and rill erosion.
4. Multiply the RUSLE2 value times the percentages from Table 4 to arrive figures for ephemeral erosion in before and after situations.

**Table 4:** Percentage of sheet & rill erosion used to estimate ephemeral erosion in T/Ac/Yr likely to result on a given field.

EGEC*	Untreated Land	After Treatment**
1	10	0
2	20	0
3	30	5
4	40	10

\* Ephemeral Gully Erosion Code from Map

\*\* One or more of the following practices must be planned: Terrace, Diversion, Stripcropping, Contour Buffer Strip or Grassed Waterway. If cropland is converted to perennial vegetation (range or pasture planting) the After Treatment percentage will always equal zero.

The appropriate value from Table 4 should be multiplied by the RUSLE2 calculated soil loss for sheet & rill erosion for a given field.

Example: An 80-acre field in Otoe County is having conservation measures installed, which will include a terrace system. The area of the field to be terraced consists of 15 acres of highly erodible land.

1. Checking the "Ephemeral Gully Erosion Codes" map, the code for Otoe County is 4.

2. For purposes of this example, assume that the RUSLE2 estimated soil loss for the portion of the field to be terraced is 20 tons/acre/year. The total annual soil loss for that part of the field would be:

$$20 \text{ tons/acre/year} \times 15 \text{ acres} = 300 \text{ tons/year}$$

3. The ephemeral gully erosion rate for Code 4 on Table 4 is estimated to be 40 percent of sheet and rill for untreated land. Therefore, the estimated annual soil loss from ephemeral gully erosion would be:

$$300 \text{ tons/year} \times 40\% = 120 \text{ tons/year}$$

The total estimated soil loss for the area to be treated would be 420 tons/year.

4. Next recalculate the RUSLE2 soil loss for the field after terracing. Assuming the RUSLE2 soil loss after terracing was 4 tons/acre/year the total annual soil loss from sheet and rill erosion would now be:

$$4 \text{ tons/acre/year} \times 15 \text{ acres} = 60 \text{ tons/year}$$

5. Table 4 shows erosion "After Treatment" of 10 percent for Code 4. Therefore, the estimated annual soil loss from ephemeral gully erosion after treatment would be:

$$60 \text{ tons/year} \times 10\% = 6 \text{ tons/year}$$

The total estimated soil loss for the area after treatment would be 66 tons/year.

For the area treated, the amount of soil saved due to reduction of ephemeral erosion is 120 tons/year - 6 tons/year = 114 tons/year. This is in addition to the 240 tons/year saved through reduction of sheet and rill erosion.

Questions on ephemeral erosion and its computation should be directed to the Resource Conservation Staff.

Figure 2: Ephemeral Gully Erosion Codes

