

INTRODUCTION TO SOIL EROSION AND EROSION PREDICTION

Soil erosion is defined as the detachment, transport and deposition of soil particles by erosive agents such as water, wind and gravity. This section describes the erosion processes associated with water and wind erosion and provides guidance on using the soil erosion prediction models for estimating soil loss from water and wind erosion for conservation planning.

All soil loss calculations done in the field for conservation planning purposes should be based on the “dominant critical map unit.” The dominant critical map unit is defined as that map unit with the greatest potential soil loss which makes up a significant portion of the field. It doesn't matter if the field is HEL or NHEL, or whether the map unit itself is HEL or NHEL. Refer to the current edition of the National Food Security Act Manual for guidance on selecting soil map units for compliance purposes. The questions to be answered are which soil map unit has the greatest potential soil loss? And does that map unit make up a significant part of the field?

The first question is easiest to answer. For water erosion calculations it is generally the soil map unit with the greatest slope. However, if multiple map units have similar slopes, the most erosive soil would be the soil with the greatest soil erodibility factor (k_f). In the case of wind erosion the most erosive soil is the soil with the greatest wind erodibility index (I).

The second question requires some judgment on the planner's part as to what is “significant.” The general guidance is that a map unit is considered significant if it makes up more than 15% of the field. However, there are some additional considerations. For example, if you have two soils with similar erosion rates neither of which makes up more than 15% of the field but if combined they would make up more than 15% of the field, calculations should be based on one of those map units as opposed to a map unit with a lower erosion rate which encompasses a larger area.

Another consideration is whether or not it is practical to manage the most erosive portion of a field separately. If the area is too small to manage separately, use the next most critical map unit for the soil loss calculations and explore other options for controlling erosion on the more erosive portion of the field such as structural practices or permanent vegetation. If the area is large enough to manage separately, soil loss calculations for the entire field should be based on the more erosive soil, even if it makes up less than 15% of the total field. Alternatively, that portion of the field could be considered separately in the planning process.