
**Introduction**

Soil health has been regarded as the panacea for achieving global environmental conservation. Improving the soil quality is understood to be a strategy to achieve sustainable agricultural management, ecosystem sustainability, and resilience to climate change. However, those conclusions have yet to make a significant impact in the U.S., where most of agricultural land remains under conventional practices, which degrade soil through overuse, mismanagement, and require significant inputs to sustain productivity. Healthy soils ensure greater soil structure, fertility, soil organic carbon, and water holding capacity. These improvements allow for increased agricultural yield, enhancements in resilience against erosion, pests, and loss in agricultural yields.

This analysis evaluates soil in New York identifying soil most susceptible to degradation, agricultural land management, and regions enrolled in federal conservation agriculture (CA) programs. Mapping these indicators allow for a detailed analysis of where the greatest and poorest soils are and the relationship between soil quality and cropland. Furthermore, scholars such as Liz Carlisle (2016) have found the greatest opportunity to encourage farmers to adopt CA is through local campaigns and community lead initiatives. With these indicators, this analysis can identify the suitability of programs for CA in counties which have vulnerable soils, active CA farmers who can influence their neighbors.

**Methods**

*Image 26x1153 to 428x1475*

Part A

Informed by the Revised Universal Soil Loss Equation (RUSLE) principles to identify vulnerable soils, this analysis identifies soils at risk of erosion and degradation and employs the following parameters:

- **Soil Attribute Score = S*OM*LL*K**
  
  This analysis assigns scores to each of the parameters, assigning a high score to a parameter which would increase the overall quality of a soil such as the percentage of organic matter or percent of water holding capacity (LL), and a low score to parameters which could contribute to the erosion or nutrient loss such as percent slope or K-Factor.

**Conclusion and Limitations**

Several assumptions were made to compute the Soil Attribute Score. Although developed in part from the RUSLE equation this analysis incorporates variables such as OM and LL which are not factors in RUSLE. Additionally, RUSLE is typically used field-level measurements allow for extremely precise soil erosion values. This level of detail was omitted to allow for this large scale-state-wide analysis.

The Cropland Data layer used has been found to have some measurement errors, which may have altered the accuracy of the CA-Factor analysis. For a more accurate analysis the data could have been cleaned, however given the scale of this analysis a few minor errors should not have significantly altered the data.

**Results**

The agricultural practices which regenerate soils and qualify for EQIP funding include: crop rotation, cover crops, reduce till, and no till. The figures below identify the acreage of each conservation practice funded through EQIP.