United States Department of Agriculture
Natural Resources Conservation Service
Conservation Effects Assessment Project

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Key Findings from the CEAP-Cropland Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Delaware River Basin

Voluntary, Incentives-Based Conservation Approaches Are Achieving Results

Farmers have reduced sediment, nutrient, and pesticide losses from farm fields through conservation practice adoption throughout the Delaware River Basin, compared to losses that would be expected if no conservation practices were in use. Structural practices for controlling water erosion are in place on 48 percent of all cropped acres in the region, including 64 percent of highly erodible land. Forty-five percent of cropped acres meet criteria for mulch till, and 32 percent meet criteria for no-till. Ninety-five percent of cropped acres have structural or tillage and residue management practices, or both. Farmers meet criteria for good nitrogen management—appropriate rate, timing, *and* method of application—on only 11 percent of the cropped acres and good phosphorus management on 26 percent.

Conservation practice adoption—whether through Federal or State programs or through landowners' initiative—has reduced edge-of-field sediment and nutrient losses and sediment and nutrient loads, as shown in the table below.

Reductions in edge-of-field sediment and nutrient losses from cropped acres, Delaware River Basin

Sediment loss	Nitrogen loss		Total phosphorus loss*
	Waterborne	With runoff	
44	34	33	41

*** Phosphorus lost to surface water, which includes sediment-attached and soluble phosphorus. Soluble phosphorus includes not only phosphorus in runoff but also leaching to loss pathways such as tile drains and natural seeps. Much of this lost phosphorus eventually returns to surface water.**

Opportunities Exist to Further Reduce Soil Erosion and Nutrient Losses from Cultivated Cropland

Despite the obvious progress, further reductions are possible. The need for additional conservation treatment in the region was determined by imbalances between the level of conservation practice use and the level of inherent vulnerability. Three levels of treatment need were estimated:

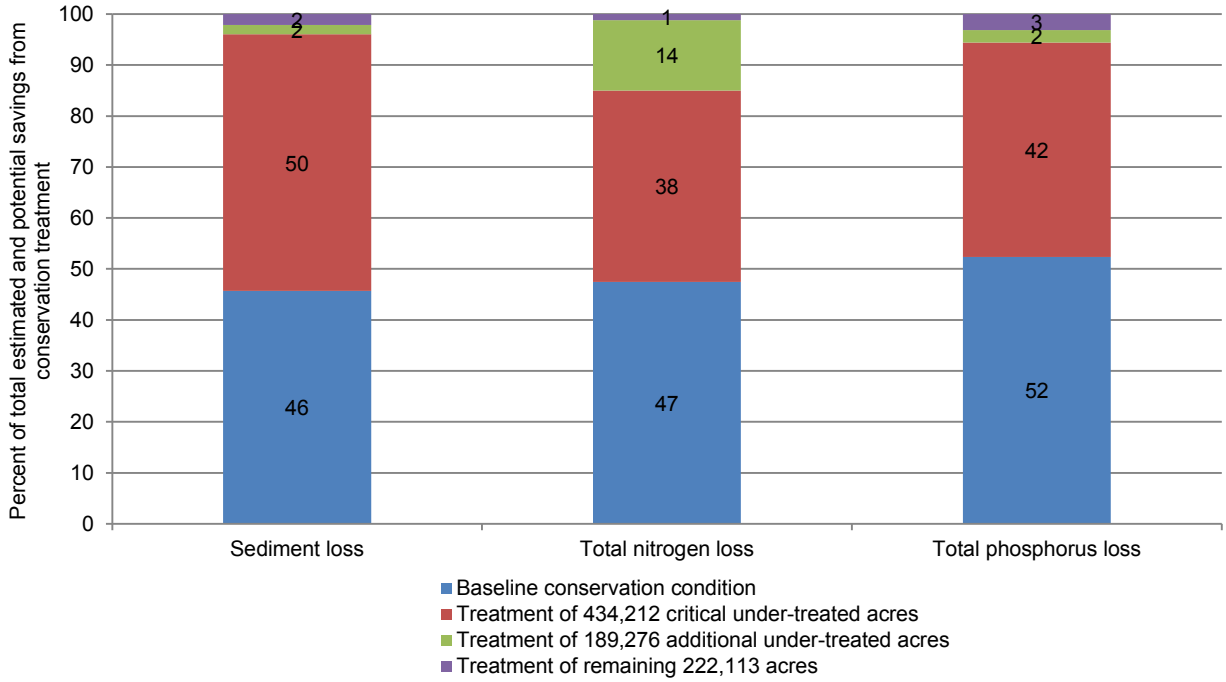
- **A high level of need** for conservation treatment exists where the loss of sediment and/or nutrients is greatest and where additional conservation treatment can provide the greatest reduction in agricultural pollutant loadings. *Some 434,000 acres—51 percent of the cropped acres in the region—have a high level of need for additional conservation treatment.*
- **A moderate level of need** for conservation treatment exists where the loss of sediment and/or nutrients is not as great and where additional conservation treatment has less potential for reducing agricultural pollutant loadings. *Approximately 189,000 acres—22 percent of the cropped acres in the region—have a moderate level of need for additional conservation treatment.*
- **A low level of need** for conservation treatment exists where the existing level of conservation treatment is adequate compared to the level of inherent vulnerability. *Approximately 222,000 acres—26 percent of the cropped acres in the region—have a low level of need for additional conservation treatment.*

Most cultivated cropland needs additional treatment to reduce sediment *and* nutrient losses. Of the 623,000 acres having a high or moderate level of need for additional treatment, significant further reductions in sediment and nutrient loss from baseline levels could be achieved through implementation of suites of conservation practices that include *both* erosion-control practices and nutrient management.

Comprehensive Conservation Planning is Needed, and Targeting Enhances Effectiveness and Efficiency

The edge-of-field reductions in sediment and nutrient loss shown in table 1 represent average annual declines in sediment and nutrient loss resulting from conservation practices in use during the period 2003 to 2006, when compared to the no-practice scenario. As a share of potential savings through full conservation treatment on all cropped acres, these reductions represent 46 percent of potential savings in sediment loss, 47 percent of potential savings in total nitrogen loss, and 52 percent of potential savings in total phosphorus loss. See the chart below. Use of additional erosion- and nutrient-control practices on the acres most prone to runoff or leaching and with low levels of conservation practice use could reduce most edge-of-field losses significantly, especially for sediment and phosphorus losses. Treating the 26 percent of cropped acres that have a low level of need for additional conservation treatment would achieve little additional benefit.

Comparison of estimated edge-of-field savings for the region (total tons saved) due to practices in use in 2003-06 and *potential* savings with additional water erosion control and nutrient management treatment of cropped acres in the Delaware River Basin



The small number of CEAP sample points with data from the NRI-CEAP Cropland Study in the Delaware River Basin precluded (1) assessment of effects of cropland converted to long-term conserving cover, (2) estimates of the effects of conservation practices on reductions in sediment and nutrient loads to rivers and streams, and (3) estimates of reductions in instream loads. In this respect, the Delaware River Basin study differs from the other CEAP basin studies.