



Key Findings from the CEAP-Cropland Assessment of the Effects of Conservation Practices on Cultivated Cropland in the South Atlantic Gulf Basin

National Resources Conservation Service
Conservation Effects Assessment Project

June 2014

These findings represent the baseline conservation condition, using conservation practices reported in the 2003–06 NRI-CEAP Survey for the South Atlantic Gulf 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 South Atlantic Gulf 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 36 percent of all cropped acres in the region, including 65 percent of highly erodible land. Forty-six percent of cropped acres meet criteria for mulch till, and 35 percent meet criteria for no-till. Ninety-three 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 16 percent of the cropped acres and good phosphorus management on 12 percent.

Conservation practice adoption on cropped acres—whether through Federal or State programs or through landowners’ initiative—has reduced wind erosion by 24 percent and edge-of-field waterborne sediment losses by 56 percent, nitrogen loss with runoff by 34 percent, nitrogen loss through leaching by 15 percent, and total phosphorus loss by 36 percent. See the table on the next page.

Opportunities Exist to Further Reduce Soil Erosion and Nutrient Losses from Cultivated Cropland. 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 soil 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 6.7 million 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 4.1 million acres—31 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 soil vulnerability. *Approximately 2.4 million acres—18 percent of the cropped acres in the region—have a low level of need for additional conservation treatment.*

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

A comprehensive conservation planning process is required to identify the appropriate combinations of enhanced erosion-control practices and nutrient management techniques that will simultaneously address soil erosion and sedimentation as well as nutrient losses. This process will identify the specific soil vulnerability factors that determine the potential for sediment and nutrient losses through the dominant loss pathways.

We estimate that treatment of the 10.8 million cropland acres having high and moderate treatment needs with combinations of additional erosion-control and nutrient management practices could further reduce edge-of-field sediment losses by 77 percent from the baseline (200306) level, nitrogen losses with runoff by 51 percent, nitrogen losses through leaching by 47 percent, and total phosphorus losses by 67 percent. See the table on the next page.

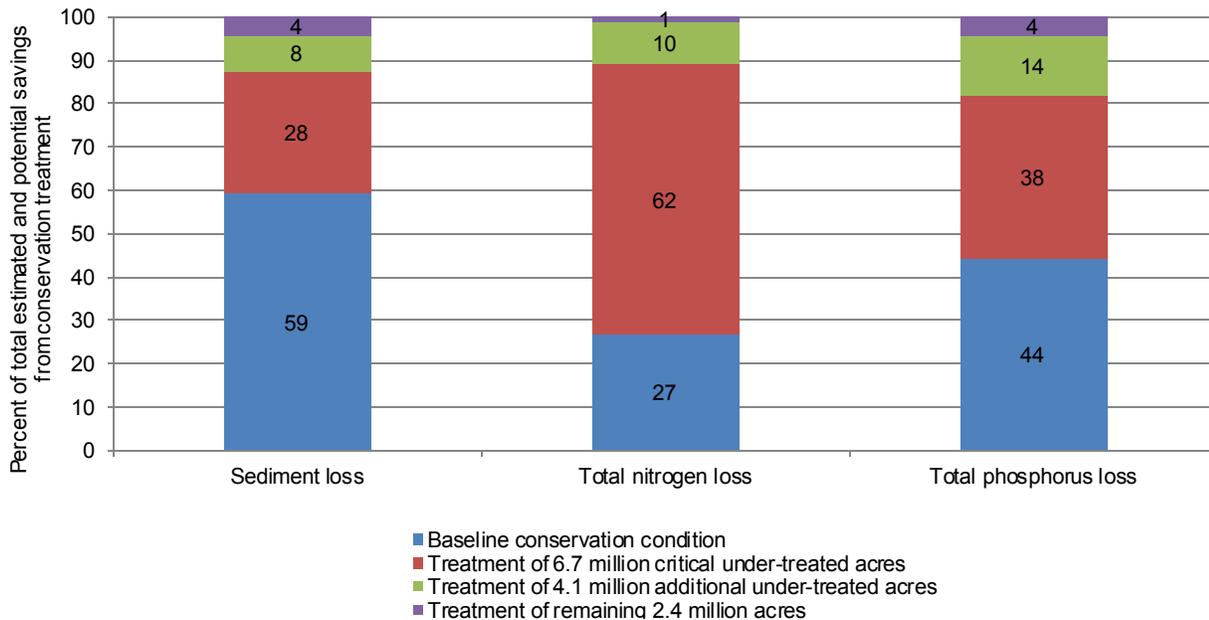
Comparison of baseline (2003–06) reductions in edge-of-field sediment and nutrient loss from cropped acres, to potential for further reductions beyond baseline levels through comprehensive conservation treatment of high- and moderate-treatment-need cropland, South Atlantic Gulf Basin

Reductions	Sediment		Nitrogen		Phosphorus*
	Windborne	Waterborne	With runoff	Through leaching	
Baseline (2003-06)	24	56	34	15	36
Potential	10	77	51	47	67

* Phosphorus lost to surface water 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.

The edge-of-field reductions in sediment and nutrient loss shown above 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 (total tons saved) through full conservation treatment on all cropped acres, these reductions represent about 59 percent of potential reductions in sediment loss, 27 percent of potential reductions in nitrogen loss, and 44 percent of potential reductions in phosphorus loss. Significant additional per-acre reductions in sediment and nutrient losses could be achieved by focusing on the 10.8 million high- and moderate-treatment-need cropland acres. Use of additional erosion- and nutrient-control practices on acres that have a high need for additional treatment—acres most prone to runoff or leaching and with low levels of conservation practice use—can reduce most edge-of-field losses by about twice as much or more compared to treatment of acres with a moderate or low level of need. Treating the 18 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 South Atlantic Gulf Basin



Cultivated cropland makes up only about 9 percent of the land base of the region but contributes 27 percent of the loadings of sediment, 30 percent of the nitrogen, and 30 percent of the phosphorus to rivers and streams in the region. Urban point and nonpoint sources also make up about 9 percent of the land base and account for about the same proportion of sediment and nitrogen loads and a higher proportion of phosphorus loads. Additional conservation treatment of the 10.8 million high- and moderate-treatment-need cropland acres would reduce annual sediment delivery from cultivated cropland to rivers and streams by 72 percent from baseline levels, nitrogen loads by 38 percent, and phosphorus loads by 62 percent. Because of the extent of loadings from other sources, this level of conservation treatment would reduce instream loads to the Ocean and the Gulf from all sources by 6 percent for sediment, 12 percent for nitrogen, and 18 percent for phosphorus.