

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

August 2013

These findings represent the baseline conservation condition, using conservation practices reported in the 2003–06 NRI-CEAP Survey for the Lower Mississippi River Basin.

Although Voluntary, Incentives-Based Conservation Approaches Are Achieving Results, Opportunities Exist to Further Reduce Soil Erosion and Nutrient Losses from Cultivated Cropland. Farmers have reduced sediment, nutrient, and pesticide losses from farm fields through conservation practice adoption throughout the Lower Mississippi 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 21 percent of all cropped acres in the region, including 42 percent of highly erodible land. Fifty-three percent of cropped acres meet criteria for mulch till, and 33 percent meet criteria for no-till. Ninety percent of cropped acres have structural or tillage and residue management practices, or both. Farmers meet criteria for good nitrogen management on more than 14 percent of the cropped acres and good phosphorus management on 17 percent.

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 6.3 million acres—33 percent of the cultivated cropland 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 10 million acres—53 percent of the cultivated cropland 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 2.6 million acres—14 percent of the cultivated cropland in the region—have a low level of need for additional conservation treatment.*

The table below shows reductions in edge-of-field losses sediment, nitrogen, and phosphorus through application of conservation treatment on cultivated cropland in the Lower Mississippi River Basin. It also shows potential further reductions sediment and nutrient losses through implementation of suites of conservation practices on cropped acres having high or moderate levels of treatment need.

Comparison of baseline (2003–06) reductions in edge-of-field sediment and nutrient loss from cultivated cropland, to potential for further reductions beyond baseline levels through comprehensive conservation treatment of high- and moderate-treatment-need cropland, Lower Mississippi River Basin

| Reductions | Sediment | Nitrogen | | Phosphorus * |
|-----------------------------|----------|-------------|------------------|--------------|
| | | With runoff | Through leaching | |
| -----Percent reduction----- | | | | |
| Baseline (2003–06) | 27 | 26 | 5 | 39 |
| Potential | 83 | 48 | 44 | 62 |

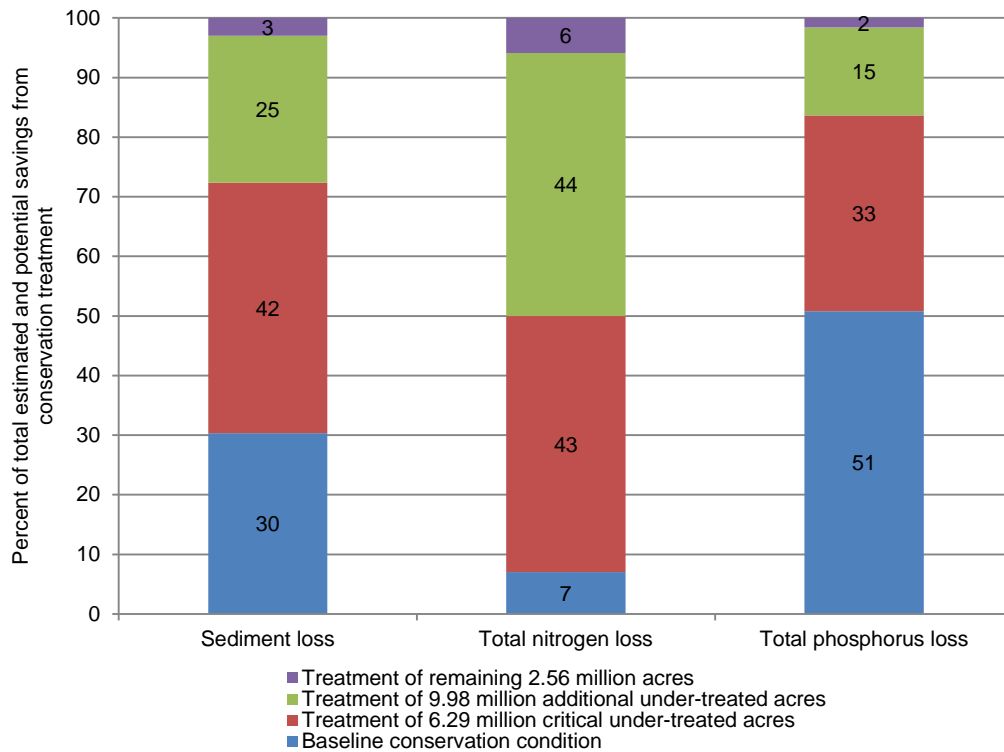
* Phosphorus lost to surface water includes sediment-attached and soluble phosphorus. Soluble phosphorus includes not only phosphorus in runoff but also leaching to loss pathways such as tile drains and natural seeps. Much of this lost phosphorus eventually returns to surface water.

NOTE: Not all edge-of-field losses of sediment and nutrients reach rivers and streams. Some are captured by buffers, wetlands, or other nonagricultural lands.

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

The practices in use during the period 2003 to 2006 achieved about 30 percent of potential reductions in sediment loss, 7 percent of potential reductions in nitrogen loss, and 51 percent of potential reductions in phosphorus loss. Significant per-acre reductions in sediment and nutrient losses could be achieved by focusing on the 16.3 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 level of need.

Comparison of estimated sediment, nitrogen, and phosphorus savings (field-level) due to practices in use in the baseline conservation condition and potential savings with additional water erosion control and nutrient management treatment of cropped acres in the Lower Mississippi River Basin



The Lower Mississippi River Basin is more subject to intensive tropical systems than are the upstream basins in the Mississippi River drainage system. Even though soil erodibility in the region is considered to be generally low, the high rainfall duration and intensity associated with this climate and its periodic tropical storms results in high sediment and nutrient losses from farm fields. More than the other basins in the Mississippi system, the Lower Mississippi River Basin requires enhanced soil erosion control practices and high levels of nutrient management, even on soils that have low or moderate potential for sediment and nutrient losses.

Sediment losses, nitrogen losses through surface and subsurface pathways, and phosphorus losses are higher in the Lower Mississippi than in any of the other regions in the Mississippi River drainage. Reductions in sediment and nitrogen losses due to conservation practice use are lower in the Lower Mississippi than in the other regions. Only in the Ohio-Tennessee River Basin are phosphorus loss reductions less than in the Lower Mississippi. As a result, the percentage of high- and moderate-treatment-need cropland in the Lower Mississippi River Basin is much higher than in the other four regions.