

## Key Findings from the CEAP-Cropland Assessment of the Effects of Conservation Practices on Cultivated Cropland in the Chesapeake Bay Region

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The Chesapeake Bay region cropland study was designed to (1) quantify the effects of conservation practices commonly used on cultivated cropland in the region, (2) evaluate the need for additional conservation treatment, and (3) estimate the potential gains that could be attained with additional conservation treatment. The study is part of the Conservation Effects Assessment Project (CEAP), a multi-agency USDA effort to quantify the environmental effects of conservation practices. The Chesapeake Bay region study is the second in a series that will cover the conterminous 48 States. The series is a cooperative effort among USDA's Natural Resources Conservation Service (NRCS) and Agricultural Research Service (ARS) and Texas AgriLife Research of Texas A&M University. Key findings from the study:

***The voluntary, incentives-based conservation approach is working.*** Farmers have made good progress in reducing sediment, nutrient, and pesticide losses from farm fields through conservation practice adoption throughout the Chesapeake Bay region. Most cropland acres have structural or management practices—or both—in place to control erosion. Nearly half the cropland acres are protected by one or more structural practices, such as buffers or terraces. Reduced tillage is used in some form on 88 percent of the cropland.

**Adoption of conservation practices** has reduced edge-of-field sediment loss by 55 percent, losses of nitrogen with surface runoff by 42 percent, losses of nitrogen in subsurface flows by 31 percent, and losses of phosphorus (sediment attached and soluble) by 41 percent.

***Opportunities exist to further reduce sediment and nutrient losses from cropland.*** The assessment of conservation treatment needs presented in this study identifies opportunities to contribute to improved water quality in the Bay. The study found that 19 percent of cropped acres (810,000 acres) have a high level of need for additional conservation treatment. Acres with a high level of need consist of the most vulnerable acres with the least conservation treatment and the highest losses of sediment and nutrients. Model simulations show that adoption of additional conservation practices on these 810,000 acres would, compared to the 2003–06 baseline, further reduce edge-of-field sediment loss by 37 percent, losses of nitrogen with surface runoff by 27 percent, losses of nitrogen in subsurface flows by 20 percent, and losses of phosphorus (sediment-attached and soluble) by 25 percent.

***Targeting enhances effectiveness and efficiency.*** Targeting critical acres significantly improves the effectiveness of conservation practice implementation. Use of additional conservation 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 sediment and nutrient per-acre losses by over twice as much as treatment of acres with a low or moderate conservation treatment need.

***Comprehensive conservation planning and implementation are essential.*** The most critical conservation concern related to cropland in the region is the need to reduce nutrient losses from farm fields, especially nitrogen in subsurface flows. Suites of practices that include soil erosion control and comprehensive nutrient management—appropriate rate, form, timing, *and* method of application—are required to simultaneously address soil erosion, nutrient losses in runoff, *and* loss of nitrogen through leaching.