



## **USDA-CSREES 2007 National Water Quality Conference**

### [Quantifying Phosphorus Losses from Agricultural Fields](#)

The measurement and modeling of runoff, sediment and phosphorus (P) losses from several farm fields in Wisconsin has been in progress for three years. The measurements include spring snow-melt as well as rainstorms. Measurements include integrated storm values of runoff, total sediment load, sediment-bound P, dissolved reactive P, total dissolved P. Runoff was modeled using a previously developed Precision Agricultural Landscape Modeling System (PALMS), which routes water over a landscape characterized by a detailed topographic map. Sediment detachment and deposition were added to PALMS using the basic approach described in the Water Erosion Prediction Project (WEPP), but generalized to a two-dimensional landscape instead of the hill-slope geometry required by WEPP. Good agreement was obtained between sediment loss values from PALMS and WEPP by applying PALMS to a simple hill slope that WEPP was ideally suited to analyze. A standard P routine was added to PALMS to estimate sediment-bound P from sediment loss values. Total dissolved P also was estimated by combining the runoff information with the soil-test P information on the landscape. Comparisons are made between PALMS predictions and field measurements. When sediment or P losses from farm fields are too high to meet non-point source regulations, riparian buffers have been suggested as a means for reducing sediment and P delivery to streams. PALMS also is designed to predict the effectiveness of riparian buffers for trapping sediment and P. Comparisons also are made between PALMS predictions of buffer effectiveness and field measurements.

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