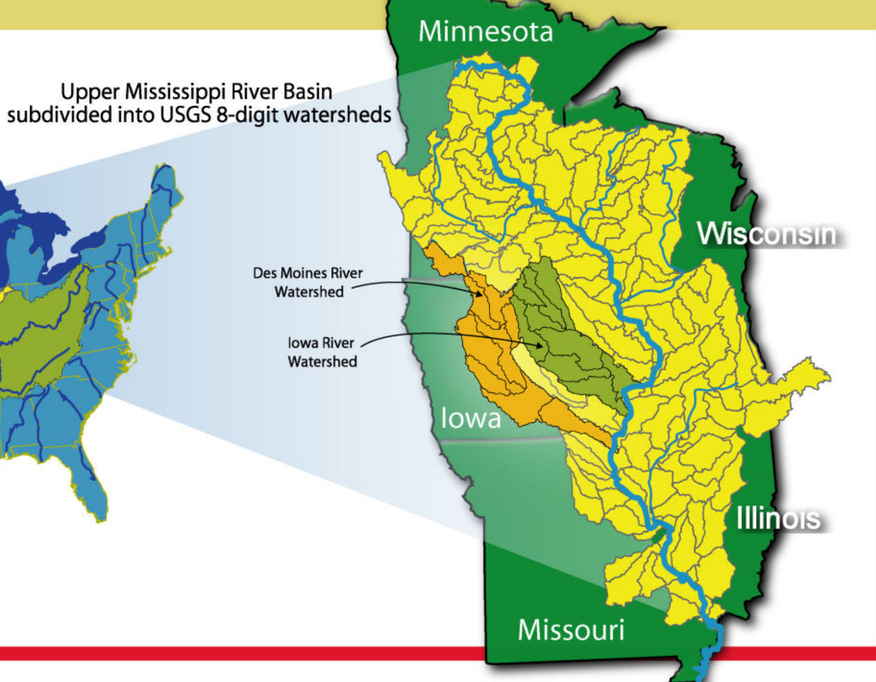
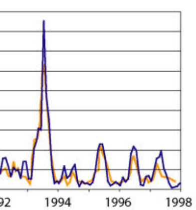
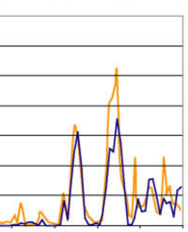
Iowa State University, Ames, IA 50011-1070 (ckling@iastate.edu)



ed*

l	Monthly	
E	R^2	E
.84	0.77	0.65
.91	0.74	0.75
.94	0.83	0.83
.82	0.70	0.46

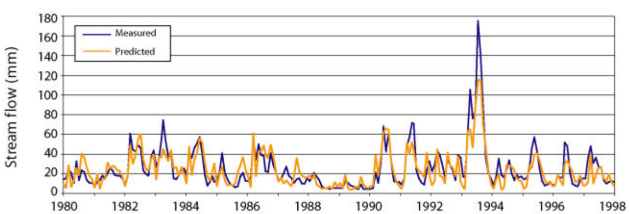


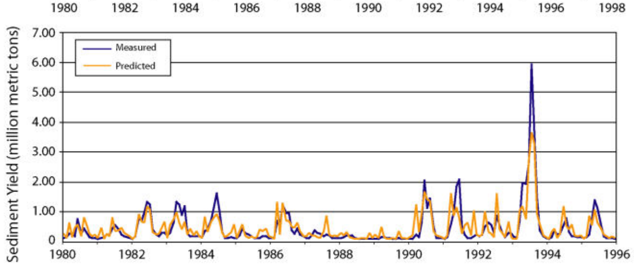


es Moines River at Keosaqua/St. Francis, IA);

Iowa River Watershed***

		Period	Annual R^2	Annual E	Monthly R^2	Monthly E
Calibration	Flow	1980-1989	0.95	0.94	0.65	0.62
	Sediment	1980-1989	0.91	0.84	0.60	0.58
Validation	Flow	1990-1997	0.91	0.80	0.80	0.77
	Sediment	1990-1995	0.95	0.85	0.75	0.76





*Flow and sediment yield comparisons were made at USGS gage #05465500 (Iowa River at Wapello, IA); total drainage area = 12,500 mi ^{2}

SWAT Calibration and Validation

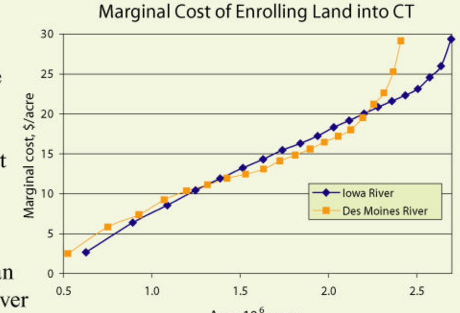
A simulation framework using the Soil and Water Assessment Tool (SWAT) model has been constructed for the UMRB using 131 subwatersheds that coincide with the boundaries of U.S. Geological Survey (USGS) 8-digit Hydrologic Cataloging Unit (HCU) watersheds (Seaber et al., 1987). For this analysis, SWAT was executed for the Iowa and Des Moines River Watersheds, which are comprised of subsets of the 131 8-digit watersheds. Smaller Hydrologic Response Units (HRUs) consisting of homogeneous landuse, management, and soil characteristics were created within each 8-digit watershed to assess the impacts of crop rotation, tillage, and other factors on sediment loss within the two watersheds. The coefficient of determination (r^2) and Nash-Sutcliffe model efficiency (E) statistics were used to evaluate the monthly flow and sediment results.

Costs of Conservation Tillage Adoption

In estimation of the costs of adoption of CT at each NRI point, we draw on the work of Kurkalova et al. (2003) who present empirical estimates of a reduced form, discrete-choice adoption model for Iowa. The model is derived under the assumption that a farmer will adopt CT if the expected annual net return from CT exceeds that expected from conventional tillage plus a premium associated with uncertainty, which in turn depends on the variability of the net returns to conservation tillage and conventional tillage, and other explanatory variables. In the model, the probability of adoption is expressed as a function of the farm's physical and climatic characteristics, the crops grown, county-average farmer characteristics, as well as the expected net return to conventional tillage. In the simulations, the cost of CT adoption at each NRI point is estimated as the amount of subsidy required to bring the probability of adoption to one half.

The two watersheds display notably different distributions of the adoption costs as can be seen from a comparison of marginal costs in the areas.

Marginal Cost of Enrolling Land into CT



The median cost of CT adoption is 12.7 and 10.9 $/acre for the Iowa and Des Moines River Watersheds, respectively. Consistent with these numbers, the 1997 CT adoption rate for Iowa River is estimated to be less than that for Des Moines River Watershed: 54.5% versus 60.7%.

The cost and sedime
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the areas considered
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in the Iowa River wa
the Scenario 1 policy

Table 1. Scenario results fo

Scenario	
Scenario 1 (Iowa River in CT)	
Scenario 2 (Des Moines River in CT)	

*MT = metric tons

The study presents a
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