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**ABSTRACT
PROCEEDINGS**

NOVEMBER 12-15, 2001

ALBUQUERQUE, NEW MEXICO

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ABSTRACT PROCEEDINGS
AMERICAN WATER RESOURCES CONFERENCE
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IMPROVING THE SCIENCE USED FOR WATER QUALITY DECISION MAKING

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ABSTRACT: Water quality issues in agriculture are growing in importance. A common theme in efforts to address those issues is the provision of better information to decision makers. Although water quality issues are so complex that such information will never be perfect, over time the information can become more quantitative, comprehensive, and customized to a particular decision maker's situation. Key factors in improving the science is to begin with observed data, extend those data using simulation models, and provide the information in a format appropriate for the required decision.

This study reports the trial of a prototype Decision Support System (DSS) by the Natural Resources Conservation Service (NRCS) and the Agricultural Research Service in the Harrison County Field Office of the NRCS in 1998. This DSS development effort was conceived and initiated by Leonard J. Lane of the Agricultural Research Service in 1991. The observed data were collected at the Deep Loess Research Station (DLRS) near Treynor, Iowa. The GLEAMS field scale simulation model was modified to include a nitrogen leaching component and a crop growth component. An accounting tool was used to convert the crop yield estimates into crop budgets. A model interface was built specify the climate, soil, and topography of the field, as well as the management scenarios for the alternative management systems. For the Deep Loess Hills area of Harrison County, a total of 6 soil and slope groups, with 64 total combinations of management practices forming management systems were defined and simulated based on previously calibrated data from the DLRS.

A multiobjective decision support component was used to examine the tradeoffs in a comprehensive set of variables affected by alternative management systems with farmers in Harrison County. The study concluded that a multiobjective DSS should be developed to support conservation planning by the NRCS. Currently, a larger scale effort to improve water quality decision making is underway. Data from several of the intensively monitored Management System Evaluation Areas will be used with the Root Zone Water Quality Model and other simulation models to provide the best available science relating management to water quality variables of interest. A DSS to implement the NRCS conservation planning process is under development to apply that understanding to improve water quality.

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