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An Efficient Cost-Sharing Program to Reduce Nonpoint-Source Contamination: Theory and an Application to Groundwater Contamination

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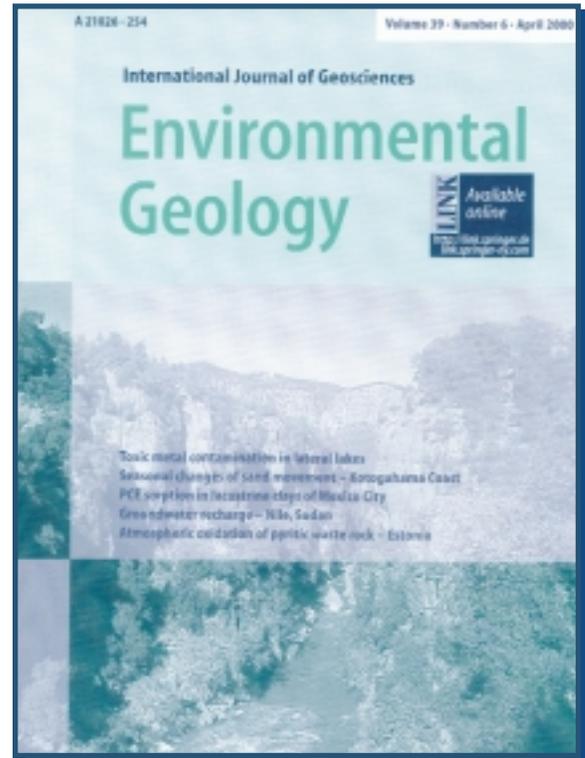
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In the 1996 Farm

Act the U.S. Congress established the agricultural cost-share program known as the Environmental Quality Incentive Program (EQIP). In doing so, Congress recognized the public's increased concern about agricultural

nonpoint-source contamination, and the importance of using cost-sharing programs to reduce this contamination source by encouraging producers to adopt resource-conserving and/or environmentally-beneficial agricultural practices. This paper examines rigorously the economics of cost-sharing improved irrigation technologies to reduce agricultural nonpoint-source contamination. Irrigation and fertilization inefficiencies are simultaneously addressed within a new theoretical economic model to evaluate both private and public costs of technology adoption and its effect on groundwater nitrate-contamination levels. Using a central Nebraska application, results indicate that even without a current government subsidy, a farmer is economically better off switching from gravity-flow to surge-flow irrigation rather than a center-pivot system. An annual government subsidy of \$22.50 per hectare (\$9.11 per acre) per year is required over the life of a center-pivot system to make the farmer financially indifferent. However, cost-sharing center-pivot adoption improves the groundwater contamination level, while other irrigation systems result in continued deterioration of groundwater quality. These results also imply that there are environmental as well as economic reasons for a government cost-share program, and that environmental benefits can be more important in the cost-share decision than the private economic gain.