

# WILLINGNESS TO PAY FOR GROUNDWATER PROTECTION

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*REFERENCE:* *Proceedings of the 1991 Georgia Water Resources Conference*, held March 19 and 20, 1991 at The University of Georgia. Kathryn J. Hatcher, Editor, Institute of Natural Resources, The University of Georgia, Athens, Georgia.

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## INTRODUCTION

Increasing chemical use has enhanced agricultural production and helped provide reliable supplies of food and fiber at reasonable costs. However, the same practice represents one of the main non-point sources of groundwater contamination. Yet groundwater is a source of drinking water for almost 50 percent of the US population. Rural Americans obtain over 97 percent of their drinking water from underground sources.

In Georgia, over 500,000 private wells are not under federal, state, or local regulations for testing. Of these wells, 25 percent are shallow (less than 75 feet deep) and are at the highest risk for nitrate contamination (EPA, 1986).

For these reasons, several agencies are developing strategies to reduce risks to water quality associated with chemical use. Programs to encourage lower chemical use are part of the 1990 farm bill. However, these programs, and potentially lower yields and higher food prices, represent a cost for groundwater protection. An important question is how much the public is willing to pay for improvements in water quality resulting from changes in agricultural practices?

This study will explore people's preferences for clean water and attempt to estimate their willingness-to-pay (WTP) for improved water quality resulting from certain agricultural practices.

## NITRATE LEACHING

One of the sources of groundwater contamination is nitrate leaching. Recent research has focused on the management of agricultural nitrate contamination of groundwater. Halstead et al. (1989) and Diebel et al. (1989) found that a 40% reduction in nitrate loading led to a nearly 10% reduction in farm's net returns. Ongoing research at the Georgia Experiment Station has as an objective to evaluate several winter annuals for rooting depth and residual nitrogen recovery and to measure the

influence of a cover crop on the amount of nitrate leaching. The project will provide an initial cost/benefit analysis for the use of winter cover crops to improve groundwater quality. It can be expected that the use of cover crops and low-input reduced tillage will result in water quality improvement. However, these practices represent costs to farmers. Since the benefits from groundwater quality improvements will accrue to both producers and consumers, an important question is how much people are willing to pay for the improvement in water quality and will this amount cover the costs that producers will incur?

## METHODS

For decades, economists have grappled with the challenge of valuing non-market goods such as improvements in air or water quality. The contingent valuation method (CVM) is one of a number of ways economists have developed to accomplish this difficult task. The method represents the most promising approach yet developed for determining the public's willingness-to-pay for public goods (Mitchell and Carson, 1989). In this study the CVM will be used to obtain an estimate of people's willingness-to-pay for improvement in groundwater quality.

The method relies on survey questions to elicit people's WTP (in dollars). The questionnaire presents respondents with a detailed description of the good being valued (groundwater quality improvement). The ongoing research at the Georgia Experiment Station and its effects on the quality of groundwater will be described to the respondents. We will make clear to respondents the hypothetical circumstance under which the improved groundwater will be made available. Respondents will then be asked for their WTP for specified improvements in groundwater quality. Questions to elicit people's WTP will be designed to facilitate the valuation process without themselves biasing respondent's WTP amounts.

The questionnaire will also help obtain information

about respondent's characteristics (age, income, sex, race, residence), their preferences for groundwater quality improvements, and their use of this good. These data will be used in regression equations to estimate valuation function(s) for the groundwater quality improvement. A successful estimation, using theory-identified variables as predictive of people's WTP, is partial evidence for the reliability and validity of the estimate of benefits from groundwater quality improvement (Mitchell and Carson, 1989). Based on a representative sample, the respondents' WTP amounts will be used to estimate the total benefits (for the State) from improving the quality of groundwater.

Given the shortage of data and empirical applications of economic models to the efforts to reduce pollution due to agriculture, we expect that the results from this study will be useful for State and national policy-makers.

The questionnaire was sent to the nearly 600-member Georgia Consumer Panel. The panel is maintained as a continuing effort of the Department of Agricultural Economics, Georgia Experiment Station. The results reported here will be based on the returned questionnaires from the winter of 1991. A larger and statistically more appropriate sample will be conducted during the summer of 1991.

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