

INTEGRATED RESEARCH – WATER QUALITY, SOCIOLOGICAL, ECONOMIC, AND MODELING – IN A REGULATED WATERSHED: JORDAN LAKE, NC

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Jordan Lake watershed is regulated by state rules in order to reduce nutrient loading from point and both agricultural and urban nonpoint sources. The agricultural community is expected to reduce nutrient loading by specific amounts that range from 35 - 0 percent nitrogen, and 5 - 0 percent phosphorus. In addition, trading is allowed and the development community is anxious to purchase credits within the agricultural community in the form of buffers. This multidisciplinary research project has explored different facets of agricultural nonpoint source abatement in Jordan Lake watershed. Two paired watershed experiments have detailed nutrient reductions through conservation systems on pasture or cropland. A detailed key-informant survey of farmer beliefs relative to conservation practice adoption and trading has documented that views about conservation practice adoption are complex and vary based on farmers’ experiences, social-networks, and personal beliefs about each practices’ utility, impact and outcomes. Socioeconomic analysis indicates that despite general support for water quality improvements, the majority of farmers were disinterested in participating in the trading program for financial, environmental, and pragmatic reasons related to the specifics of the trading program. Water quality modeling suggests that nutrient loads are reduced in agricultural areas relative to urban areas. Furthermore many agricultural fields have no nitrogen credits to trade and those that can trade have only a small amount. Lastly, economic analysis indicates that the price of nutrients available for trades likely will be too high for trades to occur, especially when the costs of trading are considered. Supply of credits is very low, which significantly increases transaction costs. In addition, a survey of local farmers showed that they would require a significant financial premium above the cost of conservation practices to adopt them since they are unfamiliar with the conservation practices and lack trust about how the program would work. Financial compensation from developers increases the likelihood of participation, but will likely be insufficient to initiate trades in this region.

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