

# Report for 2005DE56B: Landowner Perceptions of the Stringency of Water Quality Regulations in Delaware

## Publications

- Water Resources Research Institute Reports:
  - Duke, Joshua, Rhonda Aull Hyde, and Matthew Lee, 2006, Landowner Perceptions of the Stringency of Water Quality Regulations in Delaware, Delaware Water Resources Center, University of Delaware, Newark, Delaware, 15 pages.
- Other Publications:
  - Boyd, Amy, ed., 2005, Delaware Water Resources Center WATER NEWS Vol. 6 Issue 1 "DWRC Announces New Undergraduate Interns for 2005 – 2006", <http://ag.udel.edu/dwrc/newsletters/Summer2005.pdf>, p. 4-5.
  - Boyd, Amy, ed., 2006, Delaware Water Resources Center WATER NEWS Vol. 6 Issue 2 "2005-2006 DWRC Undergraduate Internships News: Spotlight on Three Projects: Spring Internship Winners", <http://ag.udel.edu/dwrc/newsletters/Fall 2005 - Winter 2006.pdf>, p. 5.

## Report Follows

## Undergraduate Internship Project #4 of 17 for FY05



*Matthew Lee* was advised by Dr. Joshua Duke and Dr. Rhonda Aull Hyde of the *University of Delaware* Department of Food and Resource Economics for his *DWRC / Institute of Soil and Environmental Quality at the University of Delaware* co-sponsored internship project “*Landowner Perceptions of the Stringency of Water Quality Regulations in Delaware.*” Matthew surveyed perceptions of policies in order to investigate landowner compliance costs. These costs may suggest making new policies or creating new concepts, goals, or enforcement strategies for existing laws.

*“Through my DWRC research project I have become aware of current efforts to protect Delaware and Maryland’s surface water quality through federal, state, and county regulations. I have had the opportunity to communicate with environmental agency policy-makers to develop a survey testing landowner’s perceptions of these regulations. I feel that understanding these perceptions will help in making future recommendations to policy-makers.” -- Matthew Lee*

### Abstract

The objectives of this project were: (1) to develop a measure of landowners’ relative, perceived stringency for the major command-and-control policies affecting surface water quality in Delaware; and (2) to develop a measure of how policy makers think landowners perceive this regulatory environment. Eight relevant policies were identified. A population of landowners owning at least 5 acres in Sussex County, Delaware, was identified and a sample was drawn. A mail survey of 233 landowners resulted in a 45.5% response rate.

The mail survey instrument focused on three aspects of the restrictiveness of water quality policies: (1) landowners level of familiarity with the eight policies; (2) landowners beliefs about which policies apply to their land; and (3) the relative, perceived restrictiveness of the applicable policies. The third type of data was collected so that the Analytic Hierarchy Process could be applied to the data. In addition, a parallel set of data were collected from Delaware policy makers to measure their expert views on landowners’ perceptions of the water quality policy environment.

The principal applicability results show that landowners were more likely than policy makers to believe that all policies (except *Nutrient Management*) apply to them. Yet, policy makers correctly predicted that owners were most familiar with *Nutrient Management* and least familiar with *Water Quality Certification*. Additionally, policy makers closely predicted the landowners’ quantitative level of familiarity on all policies except *Water Quality Certification* and *Delaware Permit to Impact Water Bodies*. The relative, perceived restrictiveness of each policy was available only for the landowner

survey. Merely a partial ranking—not precise relative restrictiveness measure—was available for policy makers because there were limited data points and a marked lack of disagreement on the restrictiveness of several policies, which prevented the application of the AHP method. The owners reported that *Nutrient Management* and the *Delaware Permit to Impact Water Bodies* were the most restrictive policies and that the *Federal Permit to Impact Wetlands* and *Forest Erosion* were the least restrictive policies. In fact, 48.9% of the owners' perceived restrictiveness was due to three policies; *Nutrient Management*, *Delaware Permit to Impact Water Bodies*, and *Federal Permit to Impact Water Bodies*.

A combined analysis of policy maker rankings data and landowner AHP results on the policy-grouping level shows that landowners perceived *Activities Impacting Crop and Forest Land* policies to be more restrictive than *Activities Impacting Wetland* policies which in turn were about as restrictive as *Activities Impacting Water Body* policies. This did not correspond with the responses of the policy makers who perceived *Activities Impacting Crop and Forest Land* policies to be least restrictive. Within the policy groups, the owners and policy makers tended to rank restrictiveness differently. However, both agreed that *Delaware Permit to Impact Water Bodies* was most restrictive in its group.

Overall, the landowners tend to overestimate the applicability of policies relative to the policy makers. Additionally, policy makers tend to perceive correctly the landowners' level of familiarity. However, for most policies, the owners' perceptions of the restrictiveness of each policy do not align well with the policy makers'. The quantitative difference in these perceptions is unknown.