

## PROJECT SUMMARY

**Title:** Development of Tools to Address Groundwater in Comprehensive Planning

**Project I.D.:** WRI #: WR04R005; GCC #: 05-BMP-01

### **Investigators:**

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**Period of contract:** 7/1/2004 – 6/30/2005

### **Background/Need:**

Groundwater, lakes, rivers, streams, and wetlands are among Wisconsin's greatest natural resources. Fish, wildlife, and plants depend on these water resources to give them life. In order for communities to plan for the future, it is essential that both the quantity and quality of groundwater be protected. Land use decisions can have significant and unanticipated consequences for groundwater resources. Declining water levels and reductions in water quality have already occurred in many parts of the state.

Legislation adopted in Wisconsin in 1999 requires that by January 1, 2010 all communities that make specified land use decisions base those decisions on a comprehensive plan. Despite widespread understanding among groundwater scientists and planners that groundwater needs to be addressed throughout a comprehensive plan, there have been no efforts to track how groundwater is being addressed in the plans.

### **Objectives:**

The objectives of this project are to improve local groundwater planning efforts, and more importantly implementation efforts, by providing examples of high quality plans and real-life examples illustrating how local governments have implemented their plans.

### **Methods:**

We reviewed comprehensive plans that were completed after 2000, submitted to the Wisconsin Department of Administration, and adopted by their respective communities. Our plan review consisted of two phases: Phase I was a preliminary review where we broadly examined how groundwater is being covered in each of the nine comprehensive planning elements. Phase II was a detailed review where we selected a small pool of plans based on the preliminary results to analyze the types of data, policies, and goals included in the plans. In each phase, templates for gathering and analyzing data from the plans were developed with guidance from the advisory group. To minimize any inconsistency between reviewers, an intercoding reliability score was calculated for each plan.

### **Results and Discussion:**

In the Phase I review, content analysis on 79 adopted plans found the word "groundwater" appeared most frequently in the agricultural, natural, and cultural resources element of plans, followed by the utilities and community facilities element. The housing and transportation elements, respectively, contain little to no mention of groundwater. Four plans did not mention groundwater in any element.

In the Phase II review, the types of groundwater-related goals, policies and data were analyzed in 29 plans. The number of groundwater-related goals mentioned in these plans was limited. The average number of groundwater goals per plan was 1.4. The average number of groundwater related policies per plan was 8.5. The most common policy category was waste management while the least common policy category was remediation. Only a few of the plans had policies that provide clear information about who will implement the policy and by when. The most common groundwater data include surface watersheds, soil types, and groundwater susceptibility. The least common groundwater data include impervious surface inventory, changes in water table depth, and estimated community groundwater pumping rate.

Our plan review yielded a number of interesting results. The importance of groundwater varies by community and those communities with moderate or high groundwater susceptibility had significantly higher groundwater goal scores than communities with low groundwater susceptibility. We also found communities in counties that have a groundwater protection plan and communities with municipal water systems included more groundwater data in their plan than communities without these resources. Finally, data scores did not correlate with goal or policy scores; nor did goal scores correlate with policy scores.

We also developed five case studies highlighting rural Wisconsin communities that have implemented groundwater protection or remediation measures:

- Municipal well remediation and water conservation: City of Waupaca
- Groundwater education about water quality of private wells and associated policy development: Iowa County and towns therein
- Payments to farmers to grow low nitrogen input crops near municipal well: City of Waupaca
- Municipal well remediation and wellhead protection ordinance: City of Chippewa Falls and Chippewa County
- Groundwater study included in comprehensive plan and groundwater ordinance addressing future development adopted: Town of Richfield, Washington County

### **Conclusions/Implications/Recommendations:**

Based on our review of plans and development of case studies, we recommend the following actions to enhance how groundwater is addressed comprehensive plans:

- Increase citizen activism to heighten the priority of groundwater in local communities
- Hire local government staff and consultants that value groundwater
- Provide education about the costs of groundwater contamination and depletion
- Provide education to help plan writers better interpret and use groundwater information
- Improve the accessibility of groundwater data to plan writers
- Provide funding to support further groundwater studies

### **Related Publications:**

Comprehensive Planning in Wisconsin: Are Communities Planning to Protect Their Groundwater? Part I, Land Use Tracker, Spring 2005

Comprehensive Planning in Wisconsin: Are Communities Planning to Protect Their Groundwater? Part II, Land Use Tracker, Winter 2005

**Key Words:** groundwater, planning, goal, objective, policy, case study, community

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