

Title: GIS Mapping of Groundwater Contaminant Sources Quality and Contamination Susceptibility for Door County

Project I.D.: DNR Project No. 93

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Contract Period: July 1, 1991 through June 30, 1993

Background/Need: A multitude of groundwater quality data, spill, and waste disposal practice information exists within the Department of Natural Resources. Since this information is in segregated hard copy files, it is relatively irretrievable by individuals outside the program of interest. This project addresses that massive information management problem with the design of a geographic information system for groundwater-associated data for Door County Wisconsin.

Objectives: The principal objective of this project was to create a single useable computer file for retrieval of all groundwater contaminant source locations in Door County.

Methods: This project has required the examination of numerous spills and groundwater quality monitoring files. This retrieval was rather protracted since, generally, no single file contains all the District's groundwater information. As part of this project much of the WDNR Lake Michigan District spill and groundwater contamination information has been assembled into a relatively updated paper file also. This has been updated and digitized with other information to produce quality maps, which are variable by user request, and provide much improved groundwater resource management capability for district spills and groundwater management concerns.

This file of spill locations and associated groundwater quality information has been merged with other existing groundwater contamination susceptibility information for Door County. This includes all the karst geologic features mapped on the "Groundwater Pollution Potential and Pollution Attenuation Potential Map for Door County". All historical land use as orchards and lead/arsenate pesticide mixing areas have also been mapped and plotted as an overlay with the karst features layer. Lake Michigan District WDNR has produced quality digitized groundwater information with a 36" x 48" digitizing table, 36" plotter, and 486 computer work station with PC ARC/INFO GIS software located in the office. PC ARC/INFO Software was used to assemble the information at the district level for groundwater resource management and watershed decisions.

Results: With the completion of this project, a single comprehensive groundwater data package was created with visual outputs by subject or locale, for future and current users of data acquired through groundwater investigations within Door County. The completed products of this project include:

1. Quality base maps with user control over scale, detail, and subject.
2. A computerized, digitized, spill/groundwater contamination file that can be updated with:
 - A. new spills;
 - B. newly contaminated wells; and
 - C. new topics (soil, depths, lithology, etc.)

3. An integrated computer format that allows groundwater quality data to be plotted, interfaced and retrieved with soil samples, sediment samples, surface water samples, geologic features, apple and cherry orchards, etc.
4. A system that is additive and need not be bounded by the geography of the Door County Project alone. Edge matching to adjacent counties will be simplified since all base maps and plotted points are relative to USGS 7.5 minute quad sheets.

Conclusions/

Recommendations: The mapping of potential groundwater contamination sources in Door County with GIS has been very successful. Data management can be simplified by accurate and systematic documentation of new potential sources as they occur. This point is paramount to maintaining the most complete and accurate mapping database. In the Lake Michigan District the following categories were selected for mapping:

1. Leaking Underground Storage Tanks (LUST) Sites
2. Environmental Repair and Restoration Program (ERRP) Sites
3. Municipal Wells (Potential Receptors)
4. Other than Municipal Wells (Potential Receptors)
5. Special Well Casing Areas
6. Pesticide Storage/Handling Sites
7. General Discharge Sites (WPDES)
8. Municipal Discharge Sites
9. Industrial Discharge Sites
10. Abandoned Landfills
11. Active Landfills
12. Auto Salvage Yards
13. Wastewater Lagoons

This list is not an all inclusive inventory of potential groundwater contamination sources. For example other sources may include: salt sheds, land disposal of liquid waste and past or present septic waste spreading sites. This list contains information that can be obtained in a reasonable period of time and has a reliable amount of accuracy of the data.

Key Words: Geographic Information System (GIS), Door County

Funding: DNR

Final Report: A final report containing more detailed information on this project is available for loan from Wisconsin's Water Library, University of Wisconsin - Madison, 1975 Willow Drive, Madison, Wisconsin 53706 (608) 262-3069.