

# INDIANA WATER RESOURCES RESEARCH CENTER

The Indiana Water Resources Research Center (IWRRC) is one of 54 institutes in the National Water Research Institute Program established by "The Water Resources Research Act of 1964". This national program (based on research, student training, and technology transfer) is a unique network which has links to virtually all research-oriented universities in the United States. The IWRRC is located on the main campus of Purdue University and since its inception in 1964, the Center has provided financial support for more than 175 research projects at Purdue and other educational institutions throughout Indiana. Blending resources from the University, state and local water resource agencies, and Indiana industries, the IWRRC offers an excellent opportunity to define and solve water resource problems within our state. Our program supports research in all areas of water science with particular emphasis on agriculture, civil engineering, biogeochemistry, geology, wildlife management.

Facilitate interdisciplinary approaches to solutions of water resources issues in Indiana by gathering experts in several water-related areas (such as agriculture, biology, chemistry, computer science, economics, engineering, law, political science, sociology, statistics, and wildlife),

Respond to public interest in the conservation, development, and use of water resources, while assisting planning and regulatory bodies at local, state, regional, and federal levels,

Explore new research frontiers in water resources.

## **Recent Projects and Activities**

- Soil Mineralogical Processes Involved in Septic System Failure
- Experimental Constructed Wetlands in the Headwaters of an Agricultural Watershed
- Septic System Permit Database
- Constructed Wetlands: Buffers for Human Activities

*Workshop and Poster Session*

*Keynote Speaker Prof. William Mitsch*

## **Our Mission**

Our mission is to coordinate the intellectual and physical resources of Indiana's universities, state agencies, and industries to resolve technical, economic, and other problems associated with water resources management, use, and preservation.

## **We seek to**

Serve as a resource to state agencies and industries by providing the expert services of IWRRC faculty, conducting advanced research studies, and providing a forum for discussion and exchange of information,

Provide a repository of knowledge and expertise available for use in problem-solving, planning, practical design, policy development, research and education,

Develop a comprehensive water research program with statewide impact by utilizing faculty and facility resources at Indiana's institutions of higher education,

Strengthen student education/training in water-related fields: encourage students to enter these fields, and provide the manpower necessary to solve future water resource problems,

## **For further information**

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## Project Highlight

### Septic System Permit Database

Brad Lee, Department of Agronomy and  
Larry Theller, Department of Agricultural and Biological  
Engineering

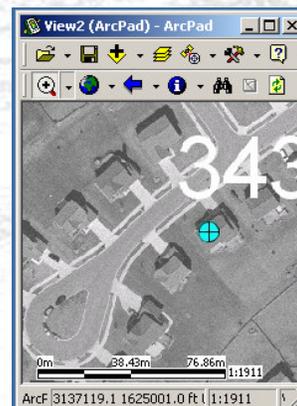
*We are developing a spatial septic system permit database that will utilize GIS, GPS, and portable computers to improve the accuracy and efficiency of current septic system permit databases.*

There are an estimated 800,000 residences and small businesses in Indiana that depend on soil wastewater infiltration systems (SWIS) for the treatment and disposal of their wastewater. Approximately 15,000 SWIS permits are issued each year. This number is expected to grow as 50% of new development is outside the reach of conventional sewers. Currently the Indiana State Department of Health has stated that as many as one quarter (200,000) of these systems are not functioning properly (Dunn, 2001). Both poor design and installation or lack of maintenance can cause system failures and threaten contamination of water resources and wildlife habitats. There are also significant public health and environmental concerns, especially for the approximate 700 small unsewered communities in the state where a concentration of failing systems exists in small land areas, often in close proximity to drinking water wells (Taylor, et al, 1997).

Numerous records of septic systems exist; however most of this information has been archived in paper format and not easily accessible or integrated with other water quality and natural resource database information. Many county health departments continue to use this format because there is not a feasible alternative due to time constraints, staff requirements, and inadequate computer skills.

We are developing a septic system permit database that utilizes a GIS, global positioning systems (GPS), and field computers to improve the accuracy and efficiency of current septic system permit databases. The resulting septic system permit datalayer can be integrated into a larger multilayer spatial database for planning purposes by local decision makers. The Hendricks County Health Department will beta test the system with a sample population and provide feedback so that improvements can be integrated into the final product. The resulting database will be available for use by other county health departments throughout the state.

As more and more counties develop a countywide geographic information system (GIS), there are opportunities to incorporate the septic system permit database into the county GIS to aid in the land use decision making process.



***ArcPad allows user to portray features over images and collect GPS data in the same coordinate system as the image. (In this case State Plane Feet rather than Lat-Long.)***

***ArcPad can require user to enter some information such as parcel ID or septic permit number as it collects data. So the location data is permanently tagged with an identifying number.***