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Planning with POWER
Protecting Our Water and Environmental Resources

Land Use

Protecting Our Water and Environmental Resources

A Model for Incorporating Natural Resources Protection into Local Land Use Decisions

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Land use, water quality, and natural resource stability are inseparable. In fact, nonpoint source water pollution, caused by polluted runoff from the land, is the number one water quality problem in the United States. Efforts to combat this threat are focusing primarily on changing the individual behaviors of land users, but few programs address the impact of land use policies, which are created and enforced at the town, city, and county levels. Ultimately, protection of the nation's water and natural resources will depend upon educating local land use officials about the links between land use and water quality, and providing them with ideas and tools to take action at the local level.

The *Planning with POWER (*Protecting Our Water and Environmental Resources) Project is a statewide educational program that links land use planning with watershed planning at the local level. *Planning with POWER* is coordinated by Illinois-Indiana Sea Grant College Program (IISG) and the Purdue Cooperative Extension Service (CES). The project capitalizes on two successful, ongoing statewide education and technical assistance projects: Purdue's Extension Land Use Team, made up of Extension educators who assist local communities on land use planning issues, and the Conservation Partnership, composed of the Natural Resources Conservation Service (NRCS), Soil and Water Conservation Districts (SWCD), the Indiana Department of Natural Resources (IDNR), and Cooperative Extension Service (CES) staff who assist local communities with natural resource management education and watershed planning.

Photo courtesy of Bob McCormick, Purdue University

Planning with POWER is a model program demonstrating that education of local officials, supported by scientific technology, can become a catalyst for natural resource protection at the local level. This program empowers land use decision-makers and citizens to identify water and environmental resource risks their communities face and to develop strategies and policies that will protect those resources while accommodating

growth in their communities. New technologies and scientific data are used to identify a community's water and other natural resource assets and to weigh land use change and policy options that will allow for growth but protect vital environmental resources.

Planning with POWER helps decision-makers look holistically at all of a community's environmental assets. Indicators of urbanization are used in a zoning-based build-out analysis to identify future environmental problem areas and land use planning actions that will reduce the potential for water pollution and natural resources degradation.

The *Planning with POWER* message is simple. Through a three-tiered strategy of 1) natural resource-based planning, 2) improving site design and using best management practices, and 3) remediation and maintenance, water and other natural resources can be protected while allowing for compatible economic growth.

Once armed with this knowledge, local officials are better able to incorporate natural resource protection into their everyday decisions. In addition, water quality concerns become a part of local debates on topics as different as road width and curbing, landscape and neighborhood design, and open space planning.

Photo courtesy of Brian Miller, Purdue University

Here are some examples of decisions local officials face and natural resource protection measures they might employ.

Plan commissions and local land use decision-makers can address water resource protection in comprehensive plans by:

- Utilizing best management practices (BMPs) to prevent, reduce, and slow storm water runoff.
- Encouraging use of detention and retention basins in subdivision design to slow and hold storm water.
- Preserving and utilizing natural or created wetlands for increased infiltration and storing excess storm water runoff.
- Slowing down the "expressway" of polluted runoff by utilizing grass swales, filter strips, or vegetated buffers in place of curbing and piped drainage whenever possible.
- Ensuring regular maintenance such as sweeping streets, cleaning storm drains, and removing sediment from detention/ retention ponds.
- Enforcing follow through on agreed upon site design with contractors.
- Enforcing proper on-site septic regulations for design and installation
- Encouraging proper maintenance and use of on-site septic systems by homeowners.
- Encouraging development in areas serviced by sewage treatment infrastructures.
- Encouraging common on-site waste disposal for a group of homes or development.

Plan commissions and local land use decision-makers can address water resource protection.

Open space (land without permanent structures) is composed of farm lands, managed green space (parks, golf courses, etc.) and wild lands.

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Plan commissions and local land use decision-makers can protect natural resources, and the lands that provide them by:

- Utilizing agricultural BMPs such as riparian buffers and targeting open space as buffers between agricultural land and water resources.

- Targeting open space to protect critical wildlife habitat and travel corridors Protecting key forest lands for recreation, environmental benefits, and future timber production.
- Protecting prime farm land for future agriculture, food production, and wildlife habitat.
- Targeting open space in areas needed to collect and treat storm runoff.
- Targeting open space to protect ground water and surface water supplies.

Plan commissions and local land use decision-makers addressing runoff can:

- Incorporate improved site designs.
- Minimize impervious surfaces.
- Minimize the disruption of natural drainage and vegetation.
- Use cluster development when feasible which reduces the total area of paved surfaces and increases open space.
- Recommend improved design of sidewalks, roads, and parking lots that reduces total surface area.
- Use brick, crushed stone or pervious pavement in low traffic areas.
- Direct drainage to vegetated swales instead of traditional curbing and piping.
- Encourage designs which reduce grading and filling and retain the natural features of the landscape.

Photo courtesy of NEMO, University of Connecticut

Local officials can promote watershed management protection through:

- Education that increases citizen awareness about protecting water and the environment.
- Storm drain stenciling programs and hazardous waste disposal days.

Photo courtesy of NEMO, University of Connecticut

Local officials can encourage citizen participation by:

- Helping groups organize local citizen water quality monitoring programs.
- Helping school teachers design student projects on local watershed management and land use planning issues.
- Promoting "spin-off" research projects targeting water quality and impacts of local land use decisions.

Collaborative Efforts

Planning with POWER was developed to create an adaptable model for combining Extension education and high technology to educate the critical target audience - local land use officials.

Through a number of collaborations with other agencies and organizations, *Planning with POWER* will be involved in a wide range of education, research, and technical assistance projects that continue to test and expand the model in Indiana.

Planning with POWER is coordinated by Illinois-Indiana Sea Grant College Program and Purdue Cooperative

Planning with POWER **Project Partners**

Purdue Cooperative Extension Service

Illinois-Indiana Sea Grant College Program

Indiana Department of Environmental Management (IDEM)

Indiana Land Resources Council (ILRC)

Indiana Department of Natural Resources (IDNR)

Natural Resources Conservation Service (NRCS)

Soil and Water Conservation Districts (SWCD)

Extension Service. The Indiana Department of Environmental Management has provided critical funding needed to initiate this statewide *(Planning with POWE*R) project. An advisory committee provides direction on the development of this project and includes representatives from the following organizations: Purdue University Cooperative Extension Service; the Natural Resource Conservation Service; IDNR, Division of Soil Conservation; the Soil and Water Conservation Districts; Illinois-Indiana Sea Grant College Program; Indiana Department of Environmental Management (IDEM); and Indiana Land Resources Council (ILRC).

Local delivery and assistance provided by the *Planning with POWER* project is a collaborative effort between the Purdue Extension Land Use Team and the Conservation Partnership composed of CES, NRCS, SWCDs, and IDNR. Additional funding has been obtained from NOAA Coastal Services Center to do Geographic Information Service (GIS) build-out analysis work on three communities in Indiana. These analyses will serve as teaching tools and examples for other communities wishing to employ this approach.

Technical Resources

Purdue University scientists are conducting research and developing products that communities can use when making planning decisions that protect natural resources. Some key projects that provide data and technical resources that can be used by communities that are *"Planning with POWER"* are detailed below:

Purdue Department of Agricultural and Biological Engineering <http://abe.www.ecn.purdue.edu/ABE/>

- *Impacts of Land Use Change on Water Resources:* An analysis tool, Long-Term Hydrologic Impact Assessment (LTHIA), provides estimates of changes in surface runoff, recharge, and nonpoint source pollution resulting from past or proposed land use changes. Additional GIS models and mapping are being developed by the department. <http://danpatch.ecn.purdue.edu.runoff>

- *Purdue Residential Onsite Wastewater Disposal (PROWD)*: An extensive set of publications and resources can guide homeowners and communities in selecting septic or alternative treatment options that are best suited to your soil conditions and treatment and environmental objectives. This Web site <http://www.ces.purdue. edu/Initiative/Onsite> provides onsite wastewater information to help protect the environment:

Purdue Department of Forestry and Natural Resources <http://www.fnr.purdue.edu>

- *Engaging Citizens as Stewards of Ecosystems (ECASE)*: Upper Wabash Basin. This project will result in predictive models of land use change on natural resources to assist communities in making land use planning decisions that are compatible with natural resource objectives.

- *Development and Evaluation of Ecosystem Indicators for Urbanizing Midwestern Watershed*s. This research examines seven watersheds in central Indiana that are in transition from rural to urban. The data from this research is instrumental in assessing the impacts of land use change on watersheds and in determining measures communities can take to reduce these impacts.

Agricultural & Biological Engineering

***Planning with POWER* is funded by:**

Purdue Cooperative Extension Service

Illinois-Indiana Sea Grant College Program

Indiana Department of Environmental Management (Sec. 319 Grant)

NOAA Coastal Services Center

Forestry & Natural Resources

PURDUE UNIVERSITY

The *Planning with POWER* project can help you to:

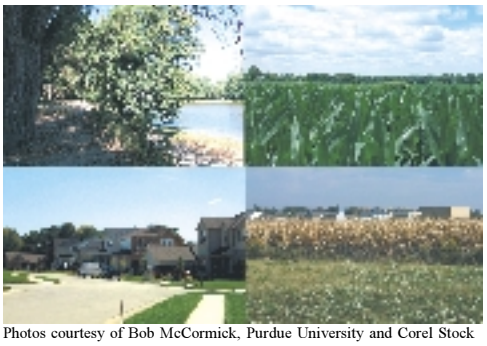
1. Evaluate where your community is in the planning process.

2. Identify the steps needed to incorporate natural resource protection into your community's long-term comprehensive plan.

3. Connect your community with the appropriate technical and educational resources needed to identify natural resources at risk in your community, evaluate management and policy options that can protect those resources, and select practices needed to balance natural resource objectives with economic objectives.

Photo courtesy of Bob McCormick, Purdue University

4. Evaluate your community's progress toward natural resource-based planning and protection and identify additional steps that can be taken.



Photos courtesy of Bob McCormick, Purdue University and Corel Stock

How Your Community Can Start *Planning with POWER*

To learn more about how resources provided by the *Planning with* POWER project can assist your community, please contact:

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