



As individuals and communities renew their commitment to healthy and vital places, work to protect future generations from environmental harm, and mobilize support for wildlife conservation, they need thorough information about the natural and cultural world.



## CASE STUDIES

This issue of Futurity News addresses planning from the perspective of information management.

In the first of two case studies, Futurity demonstrates how certain data sets can play a key role in conservation planning. Futurity analyzes digital aerial photography and parcel map data to develop an inventory of open space.

The second case study defines the steps required to construct an information infrastructure. Futurity builds a relationship map, connecting the impacts of land use to information needs.

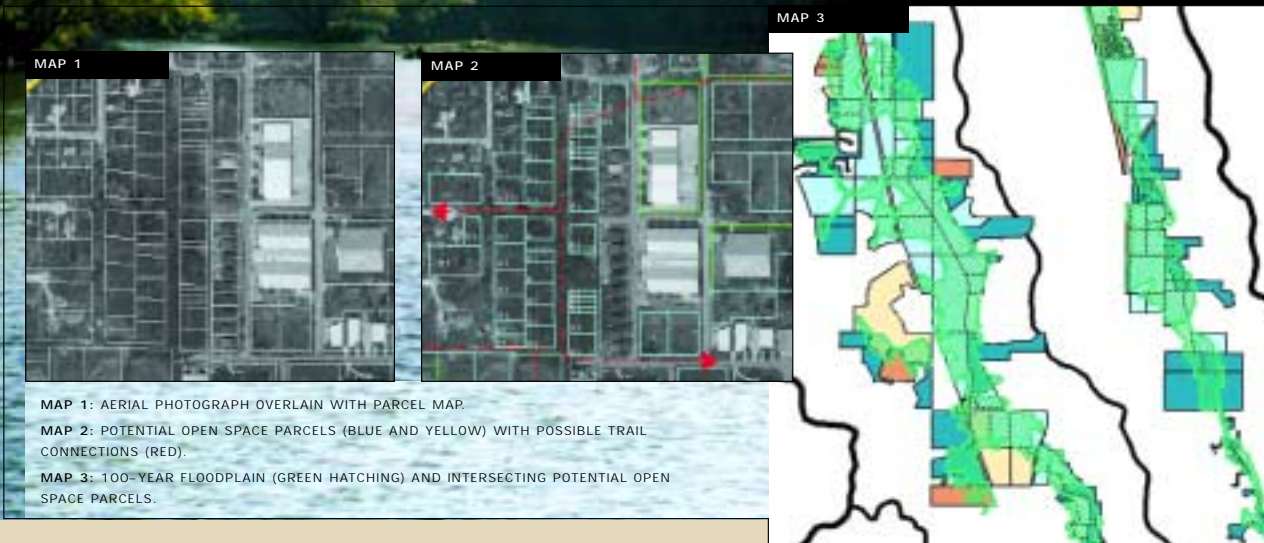


## TOOLBOX

Effective plans for managing natural resources incorporate various levels of analysis, ranging from regional (multi-county) to county to local jurisdiction. Each level involves a different perspective. One of the tools that Futurity uses to span this range is the digital parcel map, which provides detailed land information at the local level. The configuration of parcels, coupled with attribute information such as ownership, enables precise analysis to be conducted.

Parcel-based analyses strengthen the credibility of plans and recommendations. Rather than speaking in generalities, plans can address specific properties. Parcels can be used to establish priorities for action (these are critical for habitat protection, those are secondary, etc). Individual parcel information can be aggregated to any level of scale—local, county and regional. This facilitates communication and engagement among the public, private and non-profit entities that operate at these various levels. Parcel-based analyses can speak to each of them.





## THE VALUE OF A PARCEL-BASED OPEN SPACE INVENTORY

The potential benefits offered by fragmented open space lands may be difficult to visualize, but they are significant. Fragments of open space can be used to buffer or increase habitat, reduce flooding, build greenway connections, or satisfy recreational needs. To achieve the benefits of such spaces requires coordinated strategies for land acquisition and management. An open space inventory provides the foundation for the process.

In this case study, Futurity explores the benefits of using digital aerial photography interpretation and a geographic information system (GIS) to identify undeveloped lands, and to build an open space inventory. Map 1 shows an aerial photograph overlain with a parcel map (see ‘Toolbox’ for a discussion of parcel maps). The photo provides a high-resolution image of the project area, which can be used to determine both land cover and land use. The parcel map displays boundaries which provide a clear basis for mapping open space and developing acquisition and management strategies. Each parcel is linked to an attribute table containing information such as owner name and improved/unimproved value.

During the identification process, the analyst overlays the data in a GIS and then pans the study area from

parcel to parcel. Each parcel is assigned an open space value (open, partially-open, or developed). The value is recorded in an attribute table. Mapping open space by parcel boundary provides various benefits:

- GIS is an ideal means for simultaneously identifying, evaluating and documenting open space. The analyst can assess open space within the discrete boundaries of individual parcels. Parcel boundaries also define unnoticeable interstitial spaces such as undeveloped road right-of-ways, which offer unique potential as trail connections (Map 2).
- Preliminary visual observations of open space can be verified using assessor information such as improvement value. This information also aids in the development and implementation of planning strategies.
- The parcel is a fundamental unit for local government decision-making. When open space is mapped by parcel boundary, individual parcels can be readily associated with policy documents such as zoning maps and comprehensive plans. The parcel boundary also enables regional natural resource management plans to be translated into action at the local level (Map 3).

## CONSTRUCTING AN INFORMATION INFRASTRUCTURE

Environmental planning often involves making the best of an undesirable situation. Effective planning depends on the ability to identify, monitor and respond to land use trends. The basis for effectiveness is access to information, and a proper information infrastructure ensures that necessary information is in place and accessible when needed.

The process of building an information infrastructure can be broken into two tasks: a needs assessment and an action plan. The first step in the needs assessment is to develop a thorough understanding of a natural system or environmental condition. For example, this may mean investigating how a stream functions or clarifying the importance of native habitat. The assessment continues by identifying:

- Land use trends that could impact the system or condition
- Conditions that will need to be monitored
- Data required to monitor

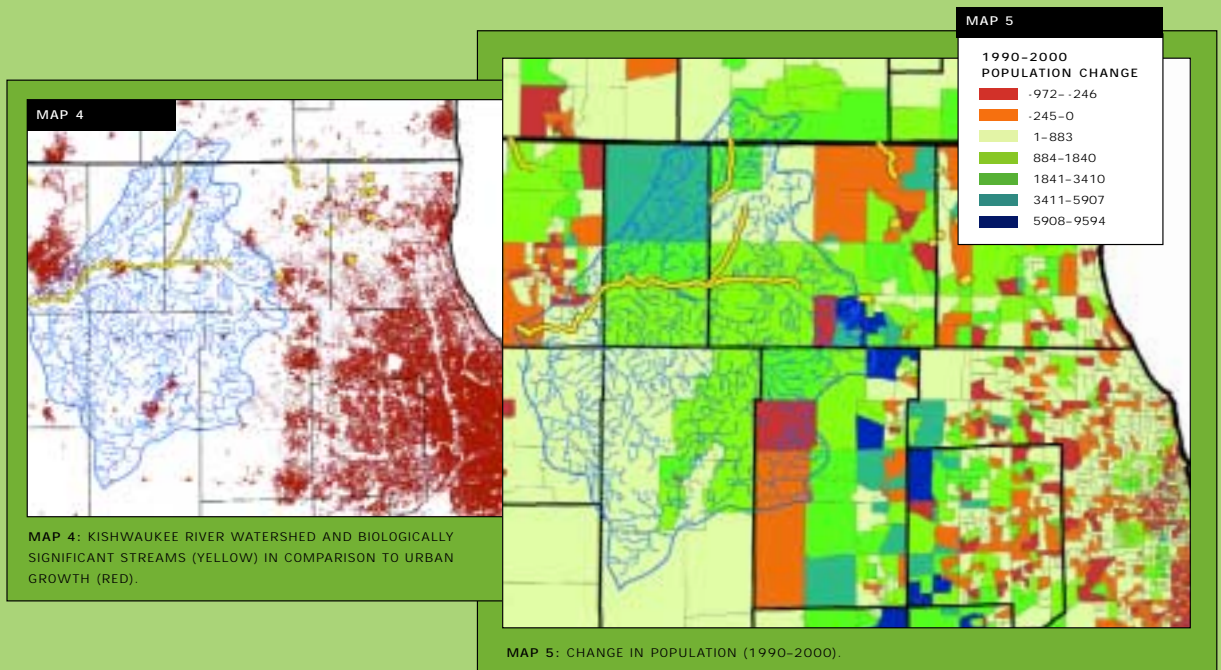
• Agencies and departments as sources for these data  
 Findings from the assessment(s) are then used to define an action plan. The action plan:

- Recognizes the importance of a particular dataset and its components
- Anticipates and describes data needs
- Defines responsibilities for continued gathering of information
- Establishes a timeline for data development
- Advances cooperation and coordination

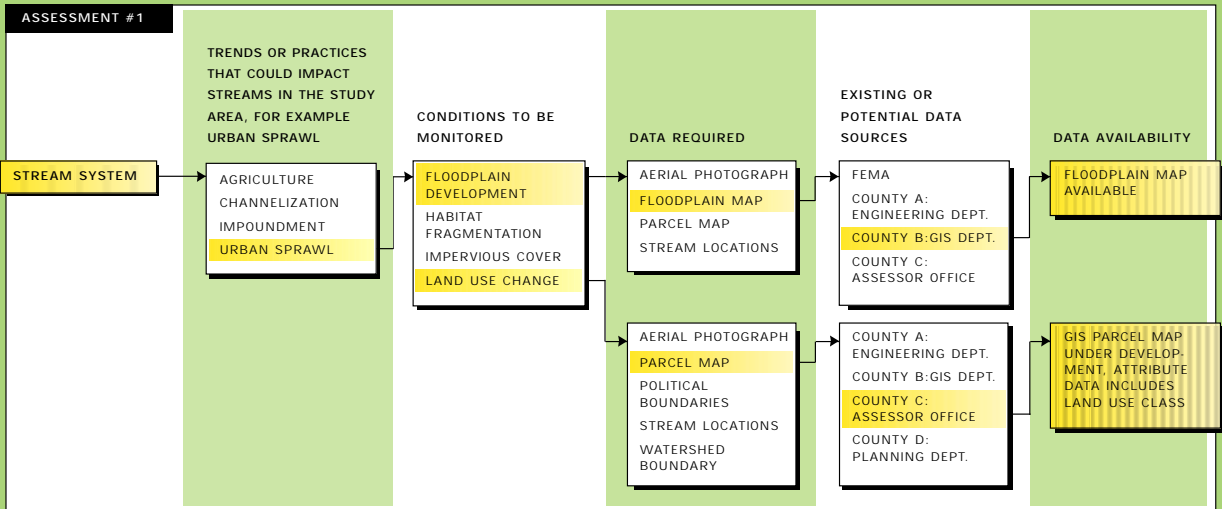
Throughout this process, it is important to recognize areas of overlap. Such areas may highlight the importance of particular datasets or may indicate redundancy of effort. The following sub-story is provided as an example of this process.

## COMPLETING A NEEDS ASSESSMENT FOR THE KISHWAUKEE RIVER WATERSHED

THREE AREAS OF THE KISHWAUKEE RIVER WATERSHED ARE RECOGNIZED AS BIOLOGICALLY SIGNIFICANT STREAMS BECAUSE OF THEIR MUSSEL AND FISH DIVERSITY. THESE STREAMS PROVIDE THE BEST OPPORTUNITIES IN THE BASIN FOR THE PROTECTION OF LARGE NUMBERS OF NATIVE SPECIES.<sup>1</sup> URBAN SPRAWL FROM CHICAGO IS ENCRACING ON THE VULNERABLE HEADWATERS OF THESE STREAMS. PROTECTION OF THIS UNIQUE RESOURCE HINGES ON THE ABILITY TO IDENTIFY, MONITOR AND RESPOND TO KEY LAND USE TRENDS WITHIN THE WATERSHED. A NEEDS ASSESSMENT WILL HELP TO ENSURE THAT AN INFORMATION INFRASTRUCTURE IS DEVELOPED.



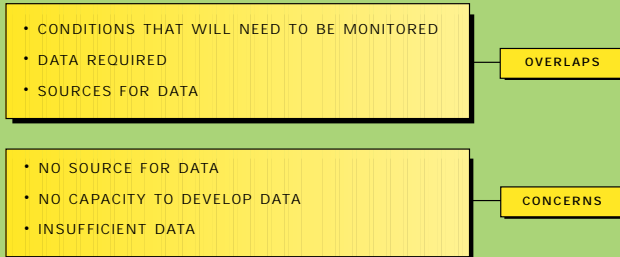
**A NEEDS ASSESSMENT FOR THE KISHWAUKEE RIVER WATERSHED MIGHT BEGIN BY EVALUATING THE INFORMATION REQUIRED TO MONITOR CONDITIONS THAT COULD IMPACT THE STREAM SYSTEM.**



**THE NEEDS ASSESSMENT CONTINUES IN A CYCLICAL FASHION, EVALUATING:**

- AVAILABILITY OF OTHER DATA
- DATA REQUIRED TO MONITOR OTHER CONDITIONS
- POTENTIAL IMPACTS OF OTHER TRENDS

**FINDINGS HELP TO IDENTIFY:**



THE ASSESSMENT CAN BE A SHORT INVENTORY EXERCISE OR A DETAILED INVESTIGATION DEPENDING ON AVAILABLE RESOURCES. FINDINGS ARE THEN USED TO DEFINE AN ACTION PLAN FOR BUILDING AN INFORMATION INFRASTRUCTURE.

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**SOURCES FOR MAPS—CASE STUDY #2:**

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