

A modeling approach to setting conservation priorities in Worcester County, Maryland

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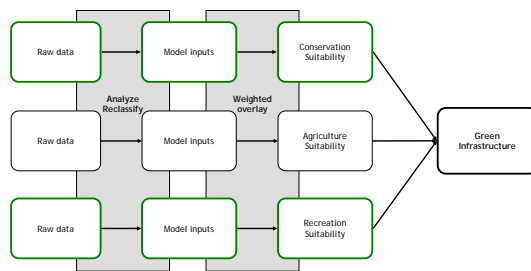
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Green Infrastructure

Rapid and poorly planned low density residential development (sprawl) is one of the most significant threats to Maryland's natural resources and working farms. Green infrastructure planning seeks to blend conservation and development goals, focusing on the maintenance of functioning ecosystems as well as healthy social systems and economies. The goal of green infrastructure planning is to create a connected network of forests, wetlands, working lands and other critical habitats and culturally relevant spaces. These spaces constitute a place's "green infrastructure", a physical network just as critical to a healthy region as a well-functioning circulatory system is to a healthy human body.

Working with the Worcester County Department of Comprehensive Planning, I developed a raster-based suitability model to guide county green infrastructure planning using Spatial Analyst and Model Builder in ArcGIS 9.X. The model attempts to identify conservation, recreation and agricultural land protection priorities using data layers obtained from the state and county, such as land use and zoning, land cover, hydric and prime agricultural soils, sensitive species habitat, and groundwater recharge areas - supplied by the County and the State of Maryland.

Basic structure of the model



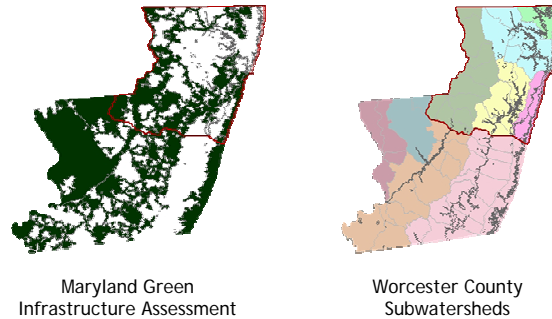
The model, which focuses on the northern half of Worcester County, should be considered a first step in an ongoing green infrastructure planning process. Focusing on the northern half of the county was intentional due to its relatively more developed state and continued development pressure. The model identifies additional areas, primarily forested and prime agricultural areas, not included within the State Green Infrastructure Assessment that may be strategic targets for conservation of valuable ecological functions, preservation of agricultural production, promotion of cultural heritage, and the creation of recreational opportunities.

Questions Addressed

- Where are the highest priority places for natural resource conservation?
- Where are the highest priority places for agricultural preservation?
- Can the connections made between priority places also support a network of recreation areas?

Methodology

Methods from existing state, regional, and local green infrastructure plans as well as conservation and development goals from county and town plans within and surrounding Worcester County informed the model. Data were collected, limited to a northern county study area, and transformed to be analyzed using a weighted overlay. Data analysis and intermediate results were documented by using Model Builder, a tool within ArcGIS Spatial Analyst.

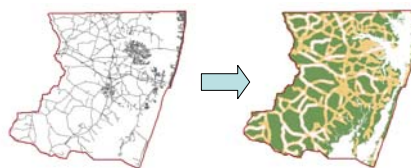


Data Transformation

Feature to Raster

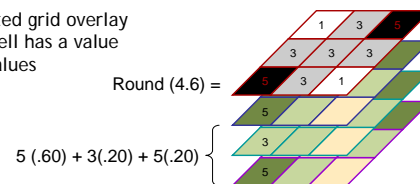


Line Density



How the Model Works

- Weighted grid overlay
- Each cell has a value
- Sum values



Conservation Suitability

- Major roads
- Unsuitable
- Low suitability
- -
- Moderate suitability
- -
- Highest suitability
- Developed areas



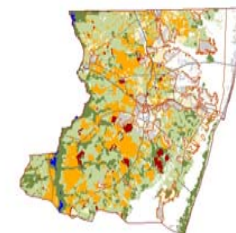
Recreation Suitability

- Major roads
- Unsuitable
- Low suitability
- -
- Moderate suitability
- -
- Highest suitability
- Developed areas



Agricultural Preservation Priorities

- Major roads
- Unsuitable
- Low suitability
- -
- Moderate suitability
- -
- Highest suitability
- Developed areas



Model Results and Protected Areas

- Major roads
- Unsuitable
- Low suitability
- -
- Moderate suitability
- -
- Highest suitability
- Developed areas
- Green infrastructure (MD)
- Protected areas

