

***Balancing Competing
Demands: the Sustainable
Environment for Quality
of Life (SEQL) Project***

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EPA, Office of Research and Development

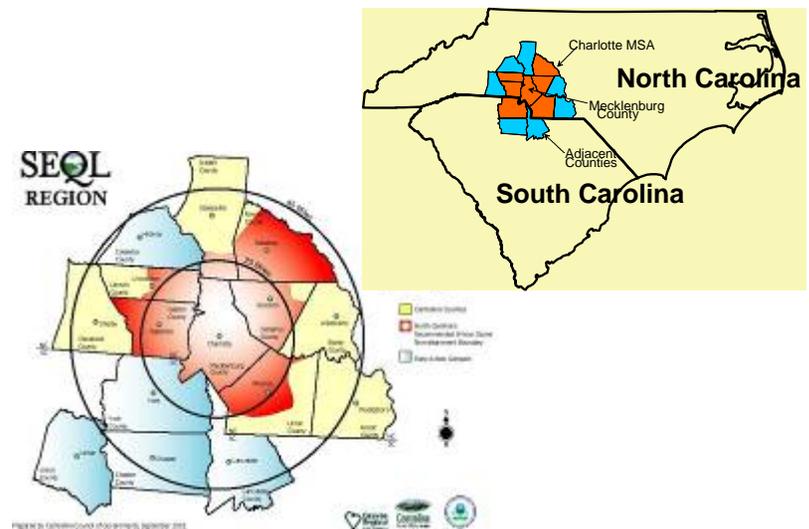
www.epa.gov/reva

Outline of Talk

- **Project Background**
- **Integrated Planning and ReVA's Role**
 - **Background on ReVA**
- **What the Future Might Look Like**
- **Other Pieces of the Picture**
- **Evaluating the Alternatives**
- **Where We Are and Next Steps**



What is SEQL?



- Sustainable Environment for Quality of Life
- Promotes integrated planning to protect the environment and quality of life while promoting economic win-wins
- Landmark regional partnership for integrated planning
- One of the first of its kind in the nation

Who Is Involved with SEQL?



*N.C. Department of
Environment & Natural Resources*



*S.C. Department of
Health & Environmental Control*

- **Local governments**
- **Businesses/developers**
- **Environmentalists**
- **Community groups**
- **Citizens**



Phases of SEQL

- **Four Year Project:**
 - **Phase 1 (2001-2002):** Develop regional environmental concern for core communities
 - **Phase 2 (2003):** Expand regional environmental concern and demonstrate early successes
 - **Phase 3 (2004-2005):** Develop and find early implementers for integrated planning approach



Starting from the EPA Sustainability Project, SEQL has become...

- **Larger...over 100 jurisdictions**
- **Led by Centralina and Catawba Regional COGs with EPA support**
- **More inclusive—reaches out to business and the civic/ environmental community**
- **Action-oriented**
- **Focused on longer-range integrated planning**
- **Still voluntary**



SEQL Goals

- Implement regionally-endorsed environmental initiatives
- Engage in ongoing regional Integrated Environmental Planning and action
- Institutionalize environmental considerations in local and regional decision-making



Because the way we develop our land impacts how much we drive, our air quality, our water quality, and our long-term quality of life



In support of SEQL Goals 1 and 2: ReVA's Integrated Assessment Framework

- **Data acquisition/preparation**
- **Extrapolation/interpolation**
- **Model development/forecasting**
- **Synthesis**
- **Scenario Analysis**
- **Visualization/Communication/Access to Information**

EDT

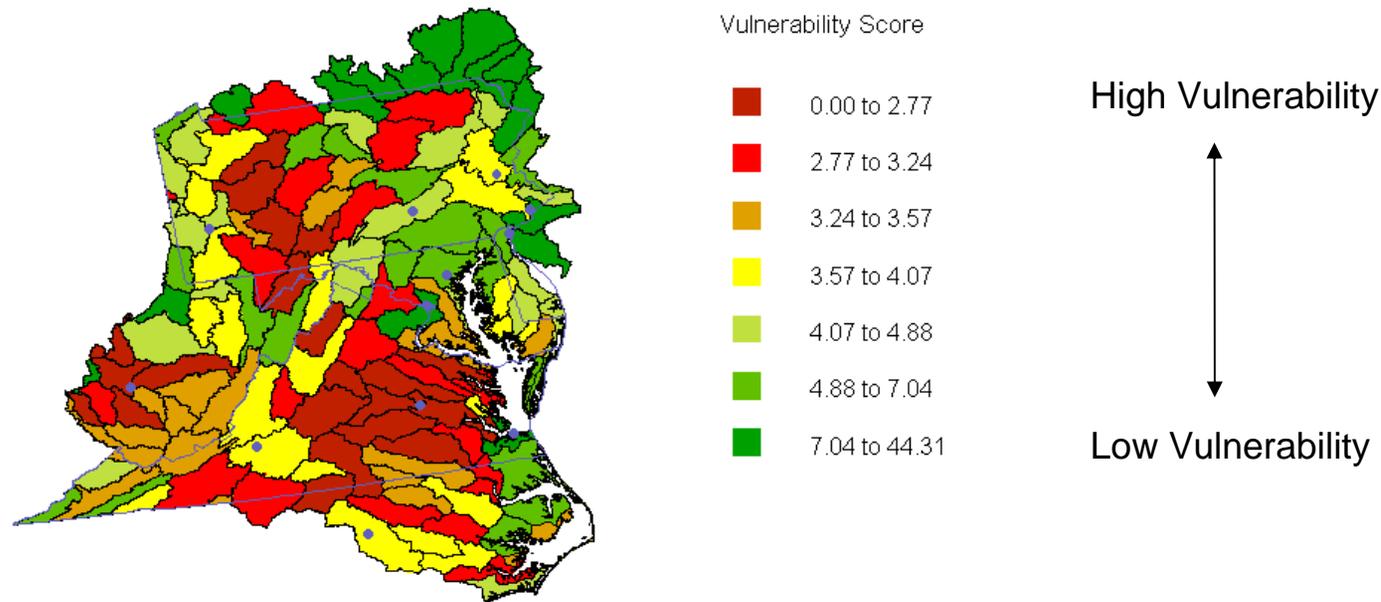
EDT = ReVA's web-based Environmental Decision Toolkit



RESEARCH & DEVELOPMENT

Building a scientific foundation for sound environmental decisions

ReVA synthesizes environmental data and model results to inform decision-making



Data on resource condition and sensitivity

+

Modeled distributions of stresses

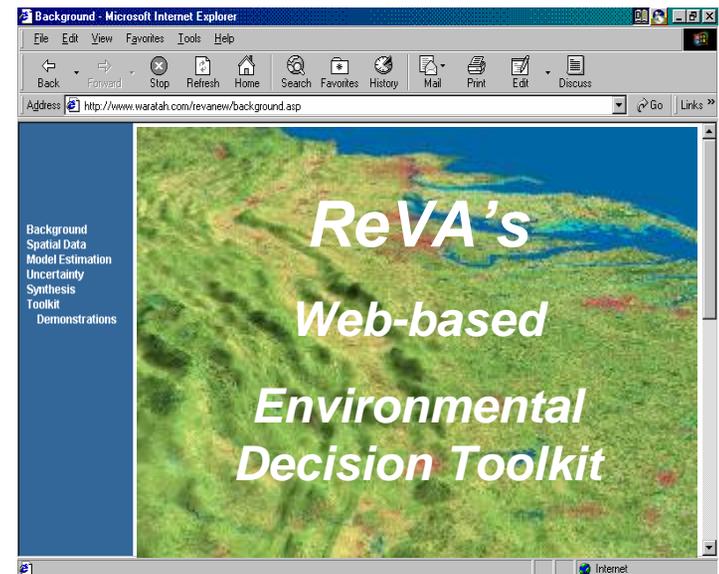


RESEARCH & DEVELOPMENT

Building a scientific foundation for sound environmental decisions

Turning Spatial Data into Information for Decision-Makers

- Web-based integration and visualization
- Data diagnostics and data preparation
- Integration of data in selectable subgroups
- Weighting in support of multi-criteria decision making
- Data access (summarized by reporting unit)



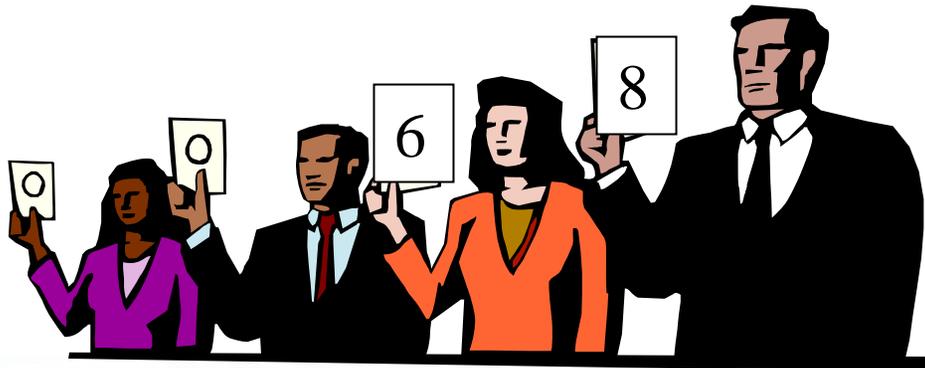
How are Decisions Made to Reduce Risk for Vulnerable Ecosystems?

- **Multiple Criteria**

Stakeholder Input, Politics, Economics, Feasibility, Scientific Understanding

- **Evaluation of Trade-offs**

Costs/ Benefits of Alternatives





*SUSTAINABLE
ENVIRONMENT
for QUALITY of LIFE*



Demonstrations - Display Maps Comparing Variables for All of SEQL - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media

Address <http://www.waratah.com/revanew/Toolkit/Demonstrations/VariableSummaries/CompareIndMaps.asp?Indicator1=D155OLVEDP&area=8&IndGroup1=W&Indicator2=D155OLVI> Go Links

Compare Variables

First map groups: Water

First map data: Dissolved phosphorus

Data for second map: Higher density scenario

Second map groups: Water

Second map data: Dissolved phosphorus

Construct Maps

Low Density High Density

Watershed Summary Method Comparison

- LHS +2 groups
- LHS +1 group
- Same
- RHS -1 group
- RHS -2 groups

Difference Map

Done Internet

Partners:

NERL, OAQPS, OTAQ, OPIE, Centralina COG, Catawba COG, NC DENR, SC DEHQ, UNCC, Duke University, University of Maryland, USGS, TVA, NRMRL

Enabling Informed Decision-making Using an Integrative Approach:

- **Alternative Future Scenarios of Development**
- **Impacts to Air, Water, Ecological Goods and Services, Quality of Life**
- **Support for Multi-criteria Decision-making**



RESEARCH & DEVELOPMENT

Building a scientific foundation for sound environmental decisions

Demonstration scenarios

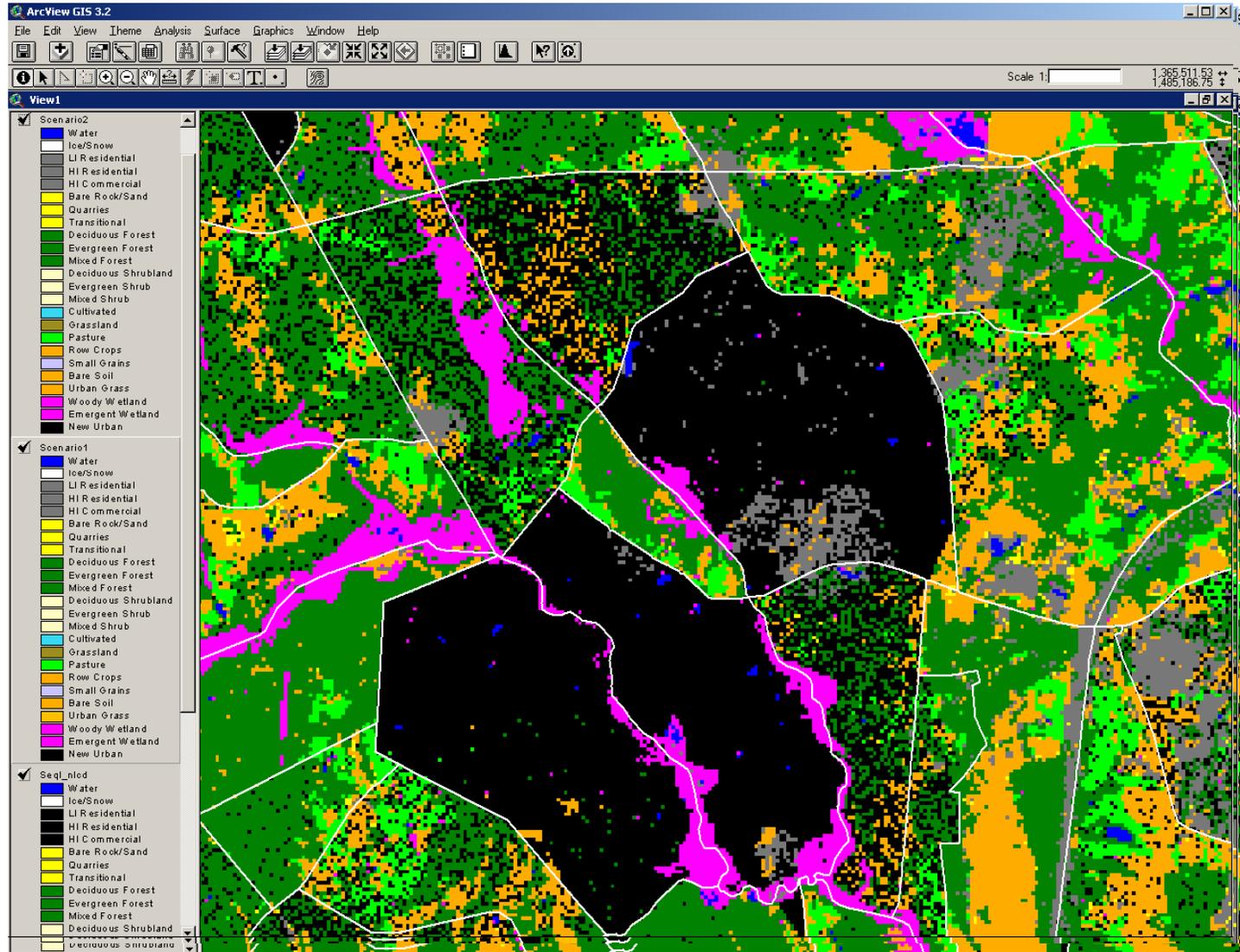
The core data 30 meter 1992 NLCD data.

Using projected population growth, new urban was added to the 1992 data.

Two different scenarios.

1) Minimizes sprawl by using higher development densities. Development outside urban areas is at suburban densities and infill is added at higher density.

2) Develops at lower density; all infill development is at suburban densities and rural development is at one unit per acre.



	Scenario1	Scenario2
Infill	9	4.5
Suburban	4.5	4.5
Rural	4.5	1



SUSTAINABLE
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for QUALITY of LIFE



DEMO ONLY

Air

Display Maps Comparing Variables for All of SEQL Subareas

Data for first map: High density

First map groups: Air

First map data: Annual emission of VOC/HH

Data for second map: Low density

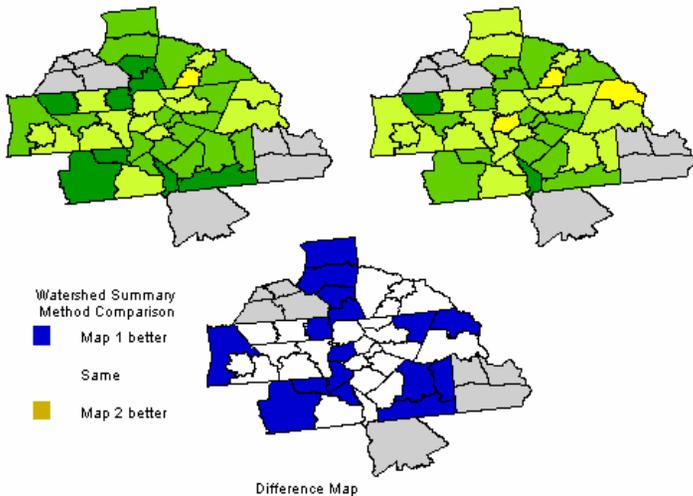
Second map groups: Air

Second map data: Annual emission of VOC/HH

Construct Maps

High Density

Low Density



Water

Display Maps Comparing Variables for All of SEQL

Data for first map: High density

First map groups: Terrestrial

First map data: Percent impervious land cover

Data for second map: Low density

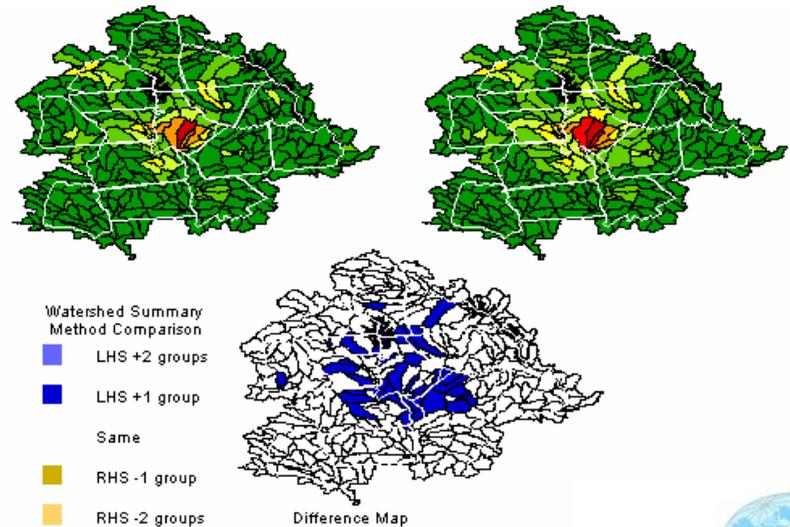
Second map groups: Terrestrial

Second map data: Percent impervious land cover

Construct Maps

High Density

Low Density

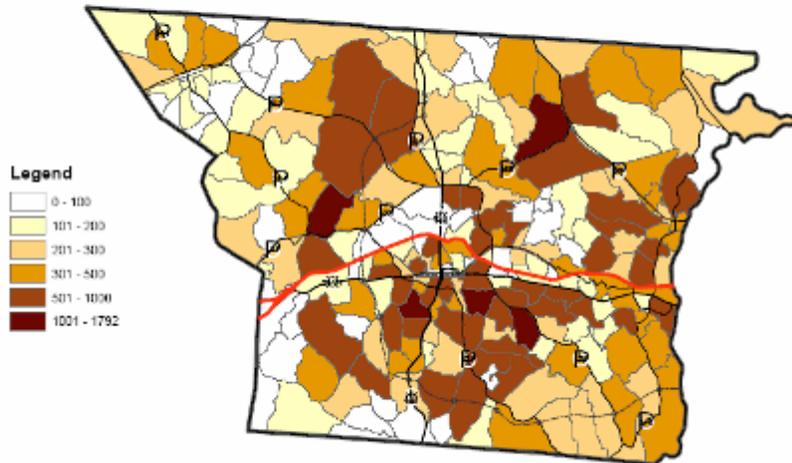


Future Scenarios

- **Baseline (Growth as Usual) – Charlotte DOT**
- **Centers and Corridors Model – developed by SEQL partners**
- **Open Space Loss Model (Iovanna) – to test impact of policies**

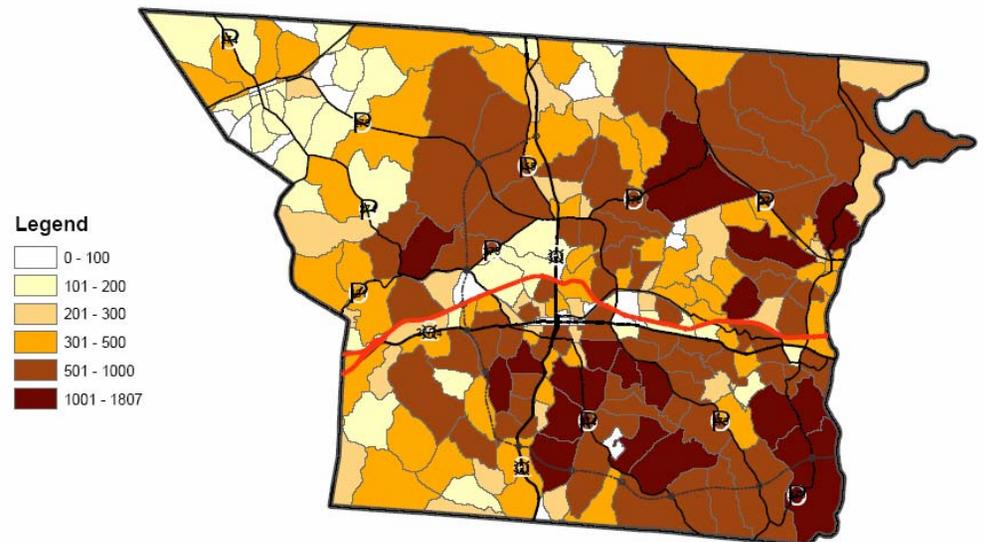
Growth as Usual

Gaston County - Number of Households 2000



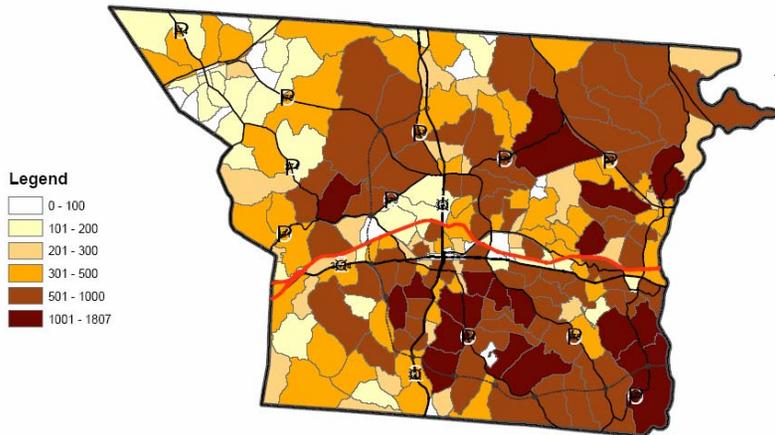
Prepared by Centraline Council of Govts

Gaston County - Number of Households 2030



Centers and Corridors Model

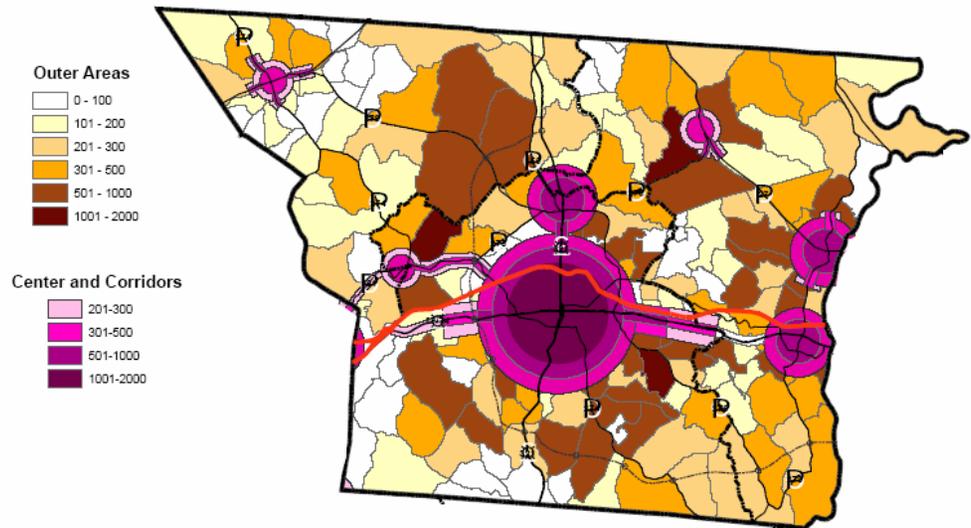
Gaston County - Number of Households 2030



← **Growth as Usual**

Gaston County - 2030 Centers and Corridors Scenario

**Centers and
Corridors** →

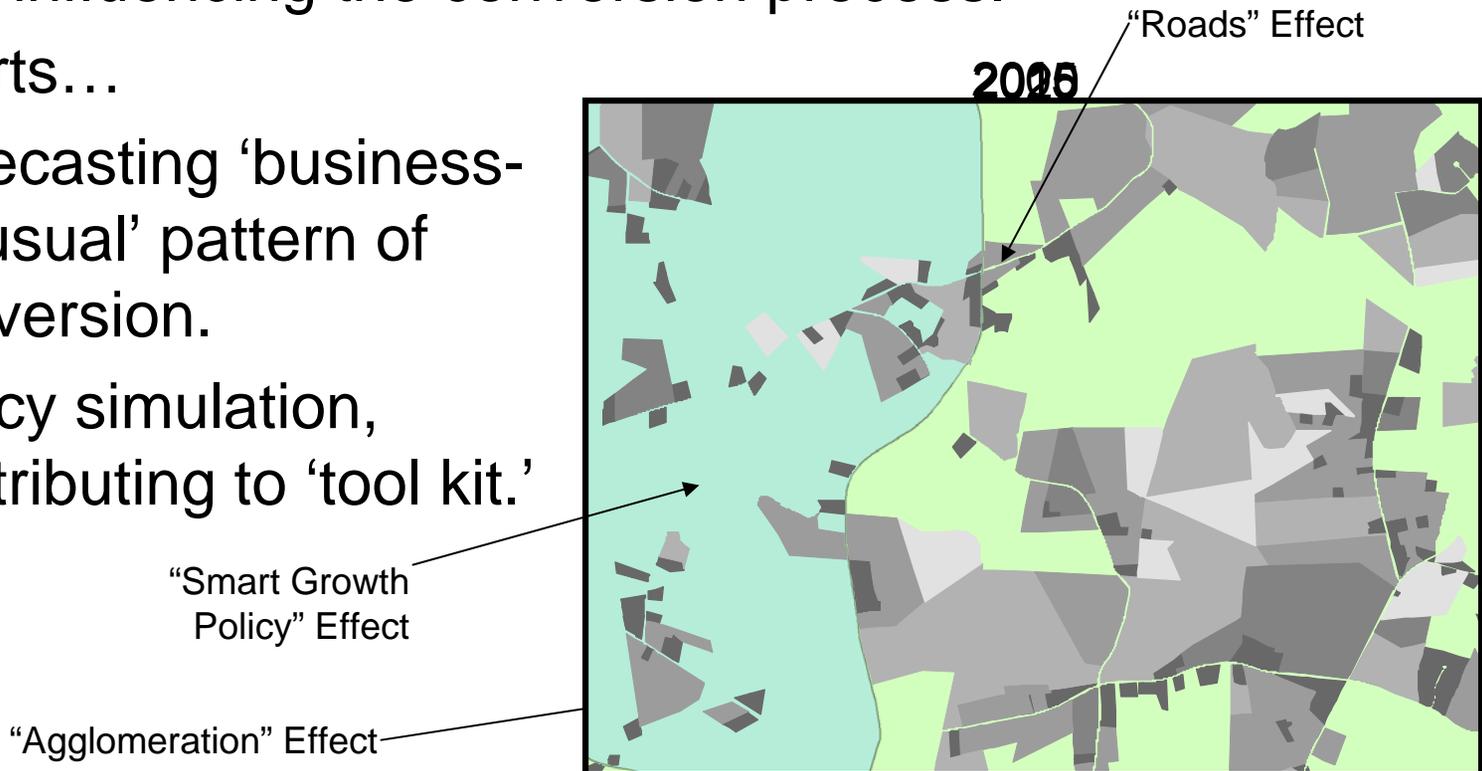


Modeling Open Space Loss

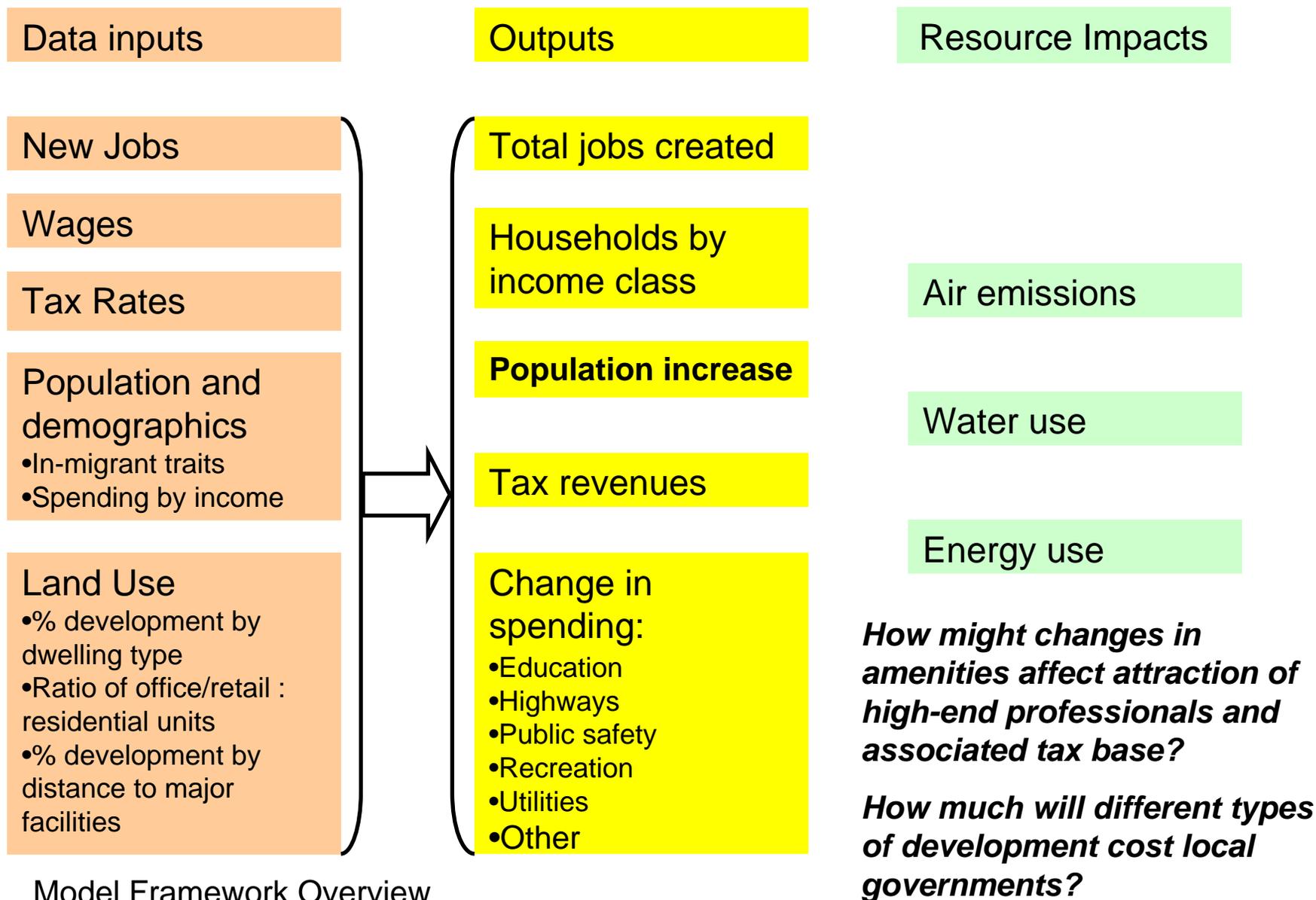
- The likelihood that open space is converted to other uses is a critical piece of the habitat vulnerability puzzle.
- A predictive, spatially-explicit statistical model can use historical trends to identify and gauge the relevance of factors influencing the conversion process.

- Supports...

- Forecasting 'business-as-usual' pattern of conversion.
- Policy simulation, contributing to 'tool kit.'



Socio-Economic Modeling (U MD, UNCC, SEQL)

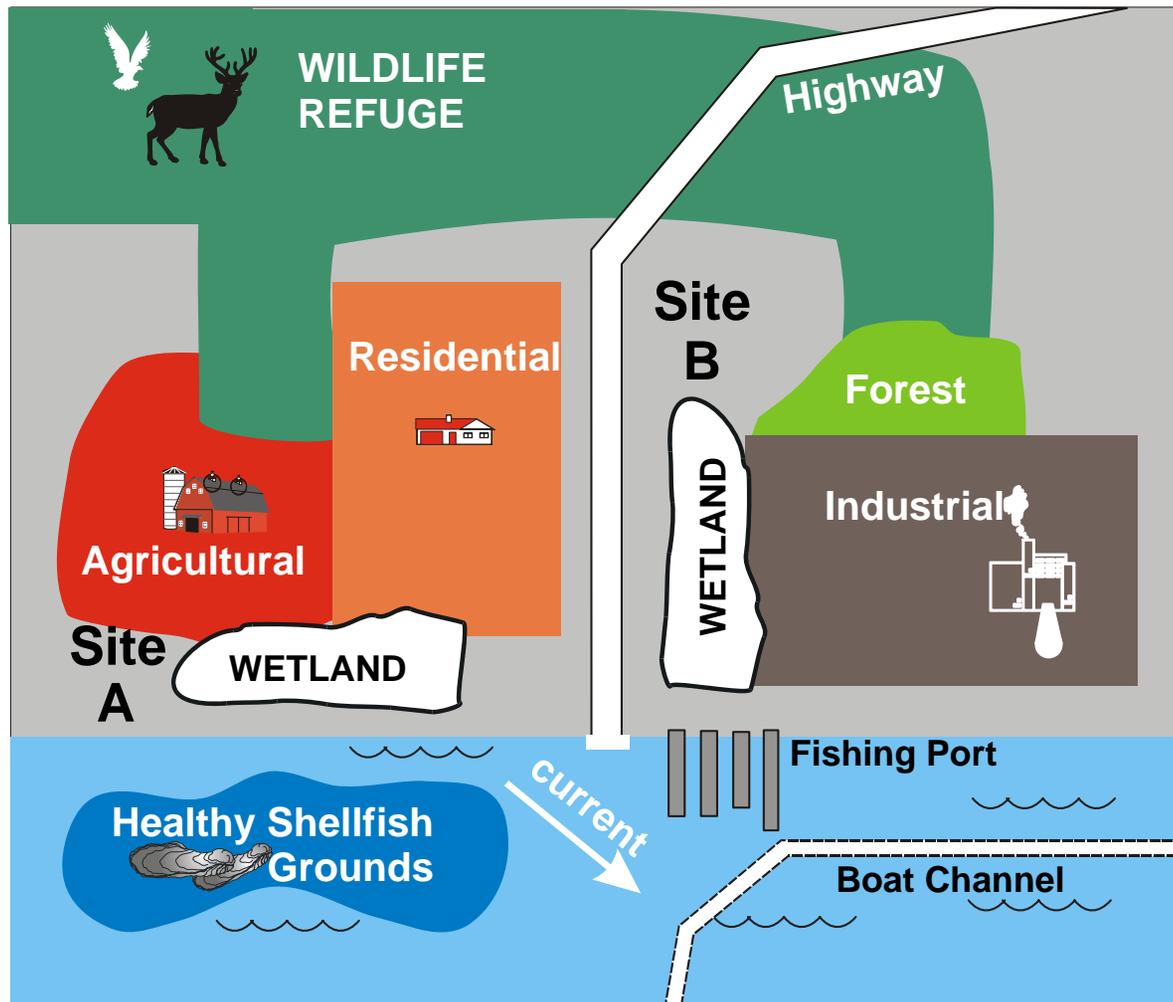


Model Framework Overview

Draft June 11, 2004 by L. Wainger, not for distribution or citation

Importance of Landscape Context

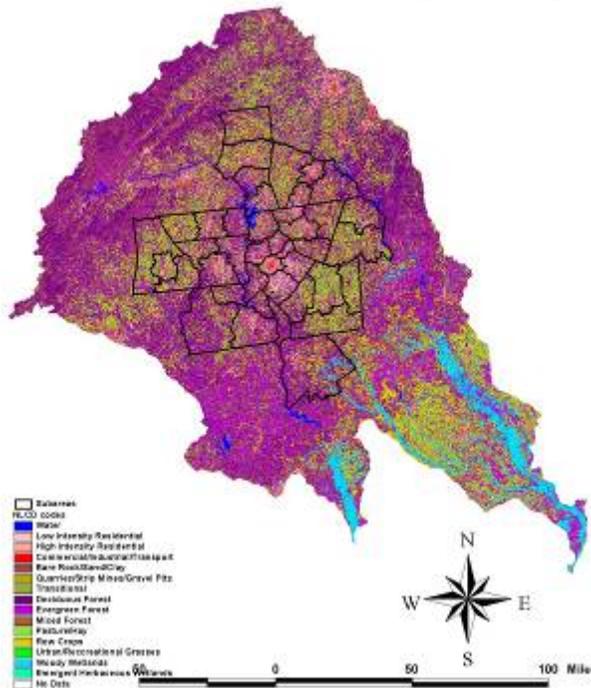
Trading, Prioritizing Areas for Restoration



Spatially-explicit scoring based on feasibility and results

Next Steps

SEQL Land Cover (NLCD)

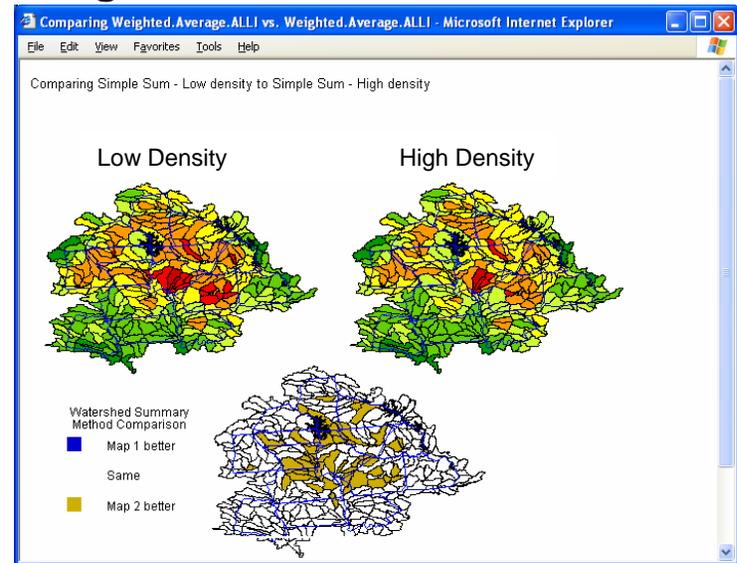


- Recalculate variables for every scenario and add to EDT
- Run models to estimate changes in water, air, quality of life and add results to EDT
- Refine EDT based on client input and feedback
- Set up SEQL version of EDT on UNCC server; provide training in use

Next Steps

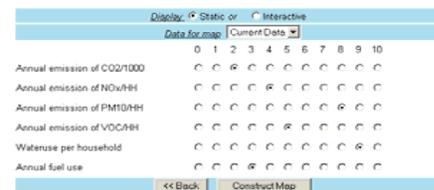
- Review/Revise EDT in consultation with American Planning Association
- Make EDT available to Regional Planning Alliance, Policy Makers, Local Government Offices, Planning Directors/Offices, State Government Offices
- Let Users Compare Alternatives and Decide *What is Best for Region*

Integrated Index of all variables

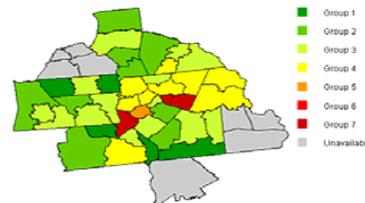


Water Use vs. NO_x Emissions

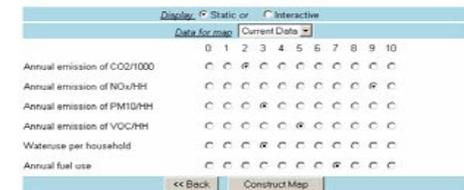
Weight by Variables Map for All of SEQLSubareas



Weighting by Indicators



Weight by Variables Map for All of SEQLSubareas



Weighting by Indicators

