

## Geog 464 Learning Objective Outline

### LOO 17 Implementation Case Study

17.1 What constitutes a workflow task model for land use project implementation-level analysis in Camden County Georgia? *RUGIS* Chapter 11 11.3

State of Georgia has seen rather large population growth over the past few decades. Like in other places around the country, Georgia communities try to provide for residential growth, foster economic development, and protect natural resources requiring a delicate balance between the built and non-built environment. A variety of factors come into play, including land values, the abundance of natural resources, real estate market trends, demographics, local ordinances, and community character. As in many high-growth communities, but particularly coastal communities, information tools like GIS are needed to help people analyze, visualize, and make decisions about growth and development. Featuring coastal Georgia, and in particular area around the City of St. Marys, a St. Marys GIS project provides information and illustrates results applicable to land development in the coastal zone. Web site is at <http://ebmtoolsdatabase.org/project/alternatives-coastal-development-case-study-coastal-georgia>. See below for the three scenarios.

The St Marys GIS project is an example of site specific development, or what we can call land development project implementation. Working in conjunction with Georgia Coastal Management Program, Georgia Conservancy, Georgia Department of Community Affairs, and the City of St. Marys, and with input from additional site and landscape design experts, the staff at the NOAA Coastal Services Center (CSC) developed and evaluated three hypothetical development alternatives using land, resource, and economic information from Camden County, Georgia. The general workflow steps are as follows.

1. Conceptual Work with State Partners
2. Project Location
3. Needs and Benefits Analysis
4. Site Visitation and Data Collection
5. Alternative Site Design Scenarios
6. Indicators
7. Review and Revise
8. Finalizing Scenarios and Indicators
9. Creating 3-D Scenes
10. Final Product

#### 1. Conceptual Work with State Partners

The NOAA CSC team worked with Georgia State partners to define a project in a conceptual manner, and left it to the state partners to identify a site. Together the CSC team and State partners identified and selected appropriate software to carry out “development scenario” comparisons that could be envisioned on a site. The software identified by the project was based on a consultation with GIS professionals and on information needs assessment. The team selected the [CommunityViz](#)<sup>®</sup> ArcView<sup>®</sup> 3.x extension (now running on ArcGIS platform) for indicator development, the SGWater module of the U.S. EPA's (2006) free [Smart Growth Index](#) software for estimating pollutant runoff, and [Visual Nature Studio](#)<sup>®</sup> for creating spatially referenced photorealistic 3-D scenes from each scenario.

## 2. Project Location

CSC relied on the Georgia state-level partner to select a representative study site as a project location. Through the Georgia Coastal Program, a partnership was forged with the City of St. Marys (2006), which provided local data and an actual project site currently under development in the area. From the outset of the project, the partners agreed that the project would not portray, endorse, or grade any actual development on the site. Nor would there be any obligation by the town or developer to implement any project results. [Figure 11.3](#) shows the town of St. Marys and the Coast in relation to the study site and [Figure 11.4](#) shows the State of Georgia, Camden County and the study site.

## 3. Needs and Benefits Analysis

The team conducted an audience analysis, often called an information needs analysis, to better define project end products and to make sure that partners' needs were addressed. An audience analysis identifies potential end users and how they might use and benefit from project products (NOAA 2006). Partner input to the audience analysis helped to ensure that end products would be tailored to meet the needs of the coastal resource managers and others working to address coastal growth issues. Secondary audiences identified included students, interested citizens, and educators. Audience is a synonym for stakeholder.

## 4. Site Visitation and Data Collection

In coordination with project partners and via the state GIS data clearinghouse, CSC technical staff assembled base map data layers for the project area including digital orthophotos and mapped natural resource layers such as soils, hydrography, national wetlands inventory data, and coastal hammocks. The developer provided site-specific layers including project boundary, regulatory lines, jurisdictional wetlands, and elevation contours. In addition, CSC staff created a data layer identifying forest communities on the project site based on photo interpretation of the orthophotos.

## 5. Alternative Site Design Scenarios

A workshop was held in early 2003 during which hypothetical scenarios were created based on real development trends in the country. The project team decided to limit the site designs to three scenarios in order to simplify the analysis and ensure that the quantitative and qualitative results would be meaningful. One project goal was to achieve results showing variation in how different site designs can impact the environment, economy, and the community. A final decision was made to base the scenarios on conventional, conservation, and new urbanist development. None of those designs represented the actual design under consideration at the project study site, but the scenarios were clearly possible in an application of this kind.

St Marys land development project uses **three scenarios**...

- site development under conventional guidelines
- site development under conservation guidelines
- site development under new urbanism guidelines

See scenario graphics on last 2 pages of this document.

## 6. Indicators

The team began with a large list of potential indicators that was gradually culled through the scenario and data development process. Final indicators were chosen for their relevance to all three scenarios, their ability to highlight the quantitative differences among the scenarios, and the availability of required inputs (including level of detail of the scenario designs). As the project progressed, the team continued to discuss and refine the indicators selected for analyzing project results.

## 7. Review and Revise

Project partners took advantage of several opportunities to provide feedback and suggest changes to the scenarios via e-mail, at a meeting and at the Coastal Services Center. Draft digital versions of each scenario were printed on large format maps and displayed for comparison at the meeting. Preliminary results for some of the project indicators were also presented. Additional details for the 3-D scenes such as setback width, sidewalk and trail designation, canopy cover, etc. were documented for each of the scenarios by the groups that created them. Such site design-level details were considered conceptually and only for the purposes of developing the 3-D scenes.

## 8. Finalizing Scenarios and Indicators

Once the scenario designs were finalized by each of the subgroups, the projects indicators were calculated, producing results for each scenario (NOAA CSC 2006). As described previously, the project indicators were evaluated using either the CommunityViz or SGWater Application.

## 9. Creating 3-D Scenes

Once the scenarios were in digital format and final indicators selected, CSC staff used Visual Nature Studio to develop a selection of 3-D views for each scenario. These 3-D scenes help to illustrate the look and feel intended for each design and to highlight differences among scenarios. Visual Nature Studio software was used to create 3-D scene fly-throughs of the three scenarios (3dNature 2006). Visual Nature Studio is a software package that allows users to create photorealistic terrain models, visualizations, and animations that simulate moving through three-dimensional space. The 3-D images and animations presented on the NOAA CSC Web site were generated with Visual Nature Studio. A broad array of GIS data were imported and used to accurately place objects and ecosystems within the landscape. The CommunityViz application also has a spatially referenced 3-D modeling component called SiteBuilder 3-D, but was not exploited for this project.

## 10. Final Product

Project results on the CSC Web site are intended for use in several ways (NOAA CSC 2006). First, the site aims to provide an example of how alternative coastal developments can impact environmental, economic, and social factors. Second, maps and 3-D graphics are intended to help users visualize how alternative design components might look. Third, the Web site has been structured to allow the user to walk through the project processes and to provide users with access to project inputs (NOAA CSC 2006), as well as the results from the calculations.

## References

3dNature 2006. 3d Nature Studio software description.

<https://www.3dnature.com/index.php/products/vns-3/>, last accessed May 7, 2017.

National Oceanic and Atmospheric Administration, Coastal Services Center (NOAA CSC 2011). Alternatives for Coastal Development: One Site, Three Scenarios.

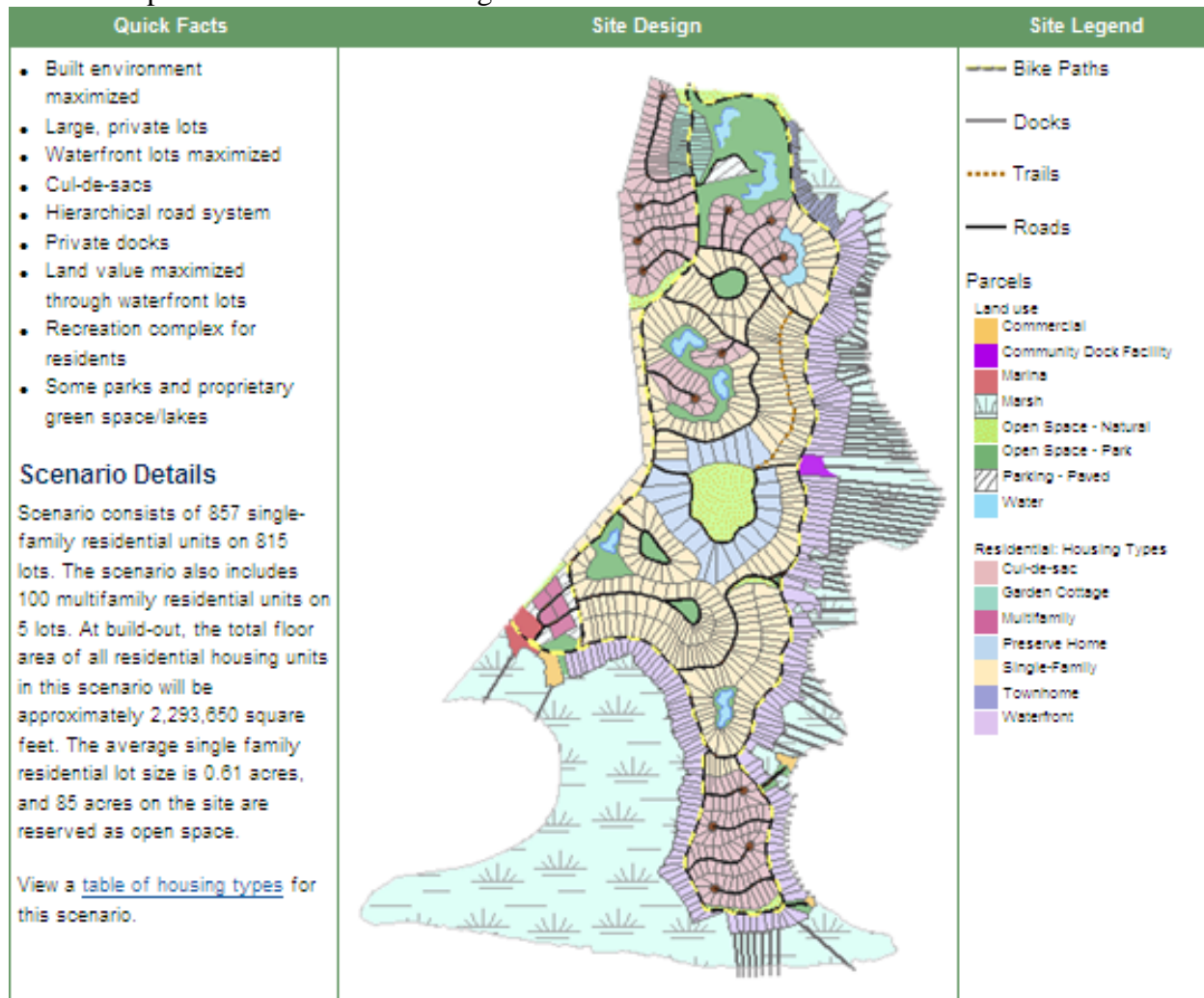
<http://ebmtoolsdatabase.org/project/alternatives-coastal-development-case-study-coastal-georgia>

U S Environmental Protection Agency (US EPA) 2006. Smart Growth Index

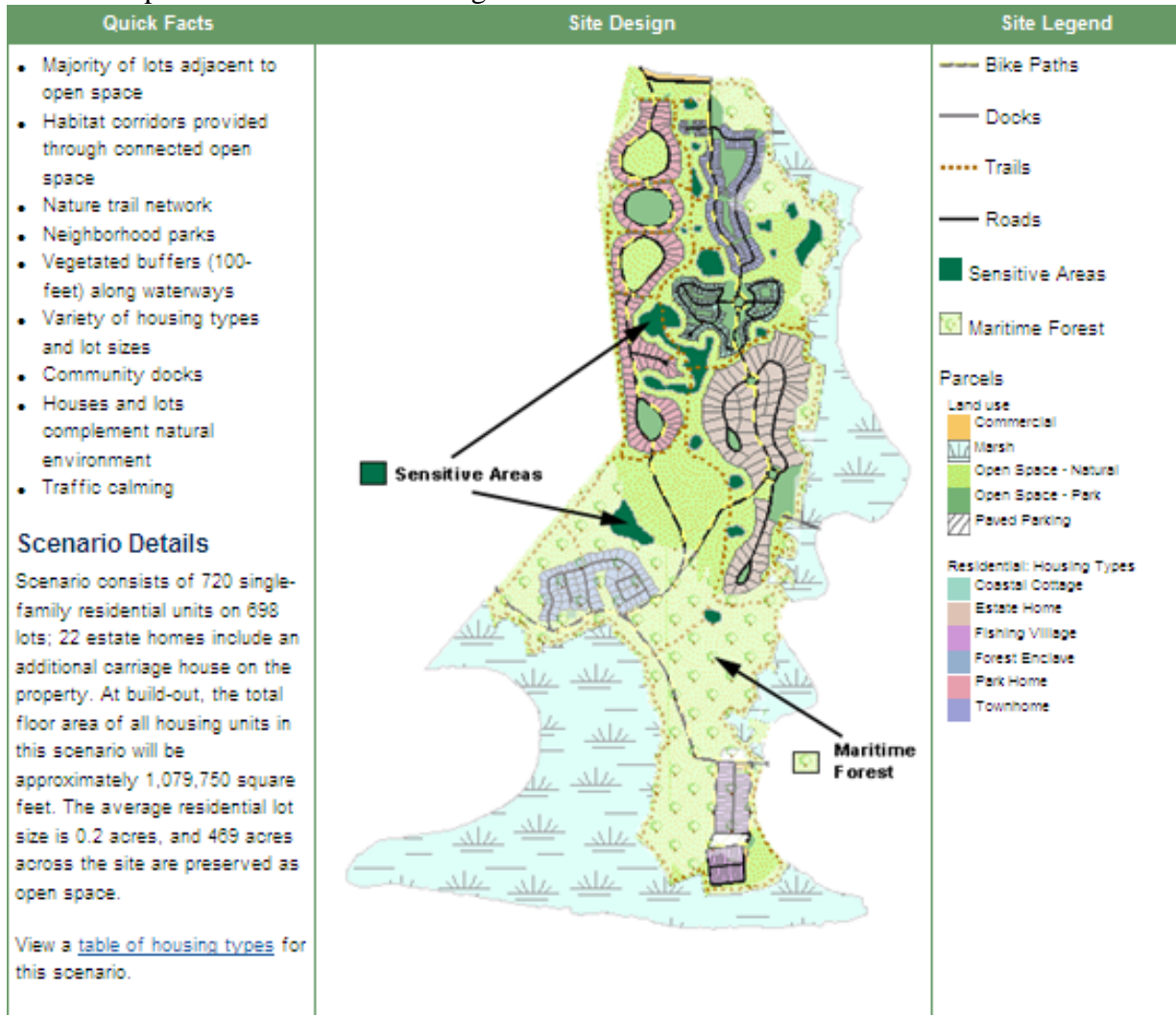
[http://www.epa.gov/smartgrowth/topics/sg\\_index.htm](http://www.epa.gov/smartgrowth/topics/sg_index.htm), last accessed august 22, 2006

The NOAA, Coastal Service Center web pages no longer are available as of last check February 17, 2012. Scenario images appear below.


### Site development under conventional guidelines



# Site development under conservation guidelines



# Site development under new urbanism guidelines

Quick Facts	Site Design	Site Legend
<ul style="list-style-type: none"> <li>• Walkable villages and sidewalks designed around public space</li> <li>• Formal/symmetrical design</li> <li>• Front porches close to sidewalk encourage neighborhood interaction</li> <li>• High-density clustering</li> <li>• Diversity of housing types with connections to adjacent neighborhoods</li> <li>• Trail system for nature and wildlife viewing</li> <li>• Marina and community docks</li> <li>• Neighborhood commercial areas</li> <li>• Residential units (lofts, etc.) above commercial</li> </ul> <p><b>Scenario Details</b></p> <p>Scenario contains 867 single-family residential units on 867 lots. The scenario also includes 70 multifamily residential units on 4 lots. At build-out, the total floor area of all residential housing units in this scenario will be approximately 1,598,125 square feet. The average single-family residential lot size is 0.18 acres, and 445 acres on the site are reserved as open space.</p> <p><a href="#">View a table of housing types</a> for this scenario.</p>	 <p>The site design map illustrates a coastal development layout. It features a central green area representing open space, with roads and trails connecting different zones. The zones include commercial areas (orange), a community dock facility (purple), a marina (red), marshland (light blue), and residential areas with diverse housing types (green, brown, pink, blue, and grey). The map also shows docks (black lines) and trails (dotted lines) along the waterfront.</p>	<p>— Docks</p> <p>..... Trails</p> <p>— Roads</p> <p><b>Parcels</b></p> <p><b>Land use</b></p> <ul style="list-style-type: none"> <li>Commercial</li> <li>Community Dock Facility</li> <li>Marina</li> <li>Marsh</li> <li>Open Space - Natural</li> <li>Open Space - Park</li> </ul> <p><b>Residential: Housing Types</b></p> <ul style="list-style-type: none"> <li>Cottage Home</li> <li>Estate Home</li> <li>Multifamily</li> <li>Townhome</li> <li>Ville</li> </ul>