

---

### SUSTAINABLE COASTAL DEVELOPMENT

#### KEY QUESTIONS

- What are the options for “developing” the U.S. coastline?
- What are the costs and benefits of these options?
- Who are the stakeholders in coastal development?
- Who decides how the coastline will be developed?

#### COASTAL POPULATION GROWTH

Beaufort (pronounced *BYEW-fert*), South Carolina, is known as *beautiful Beaufort* because of its extensive networks of salt marsh-lined creeks and moss-draped oak trees, hallmarks of the South Carolina lowcountry. The natural beauty of the area combined with the relaxed pace of life has attracted transplants, predominantly retirees from the Northeast, and this has resulted in a building boom. From 1990 to 2000, the population of Beaufort County grew from 86,425 to 120,937, an increase of 39.9 percent. By 2010, it had increased to 162,900.

**Question 25-1:** By what annual percent did the population increase between 1990 and 2010?

**Question 25-2:** Based on this rate, when would Beaufort County’s population double (recall the doubling time formula used throughout this book)?

In North Carolina, coastal Brunswick County grew even faster over the same period, from 50,985 to 73,143 (43.5 percent). By 2010 it had reached 107,431. As fast as Beaufort and Brunswick counties are growing, they can’t compare to the nation’s fastest growing county, Flagler County, on Florida’s northern coast, which grew 10.7 percent from 2004 to 2005 alone.<sup>1</sup> By 2010, it had reached 95,696.

<sup>1</sup> All population numbers, unless otherwise stated, are from [www.census.gov](http://www.census.gov).

Coastal areas of the United States make up about 17 percent of the country's land area, but they hold about 53 percent of the total population. Of the twenty-five most densely populated counties in the United States, twenty-three are coastal. All regions of the coastal United States (Northeast, Southeast, Gulf of Mexico, Pacific, and Great Lakes) are expected to grow faster than the national average. The Southeast, which in 2003 was the least populated coastal region in the United States, is expected to grow the fastest, hurricanes to the contrary. Some Florida and North Carolina counties are projected to grow by as much as 16 to 17 percent over that period. Population densities are highest in the Northeast coastal region. Densities increased over the period 2003 to 2008 from 641 to more than 660 persons per square mile.

**Question 26-3:** There are 260 hectares in a square mile. What is the northeast coastal density expressed in persons per hectare? Compare this density to that of Houston, TX, at 14, from the last Issue, or London, at 50.

**Question 25-4:** Growth of the magnitudes presented above has been described as a mixed blessing. What do you think this means? Be specific and use examples.

**Question 25-5:** Carl Laundrie, a Flagler County, Florida, administration spokesman, said, "There isn't a county in the world that's prepared for 10 percent growth" a year.<sup>2</sup> Discuss ways in which a county might be unprepared for high growth rates.

In Issue 3, you analyzed and evaluated population growth in Bangladesh, an impoverished country vulnerable to natural disasters. In this Issue, you will do the same for the Southeast coastal region. Using a case study developed by the National Oceanic and Atmospheric Administration's (NOAA) Coastal Services Center, you will study three options to develop a small coastal area in Georgia. Then, you will analyze the environmental, economic, and social impacts of these developments.

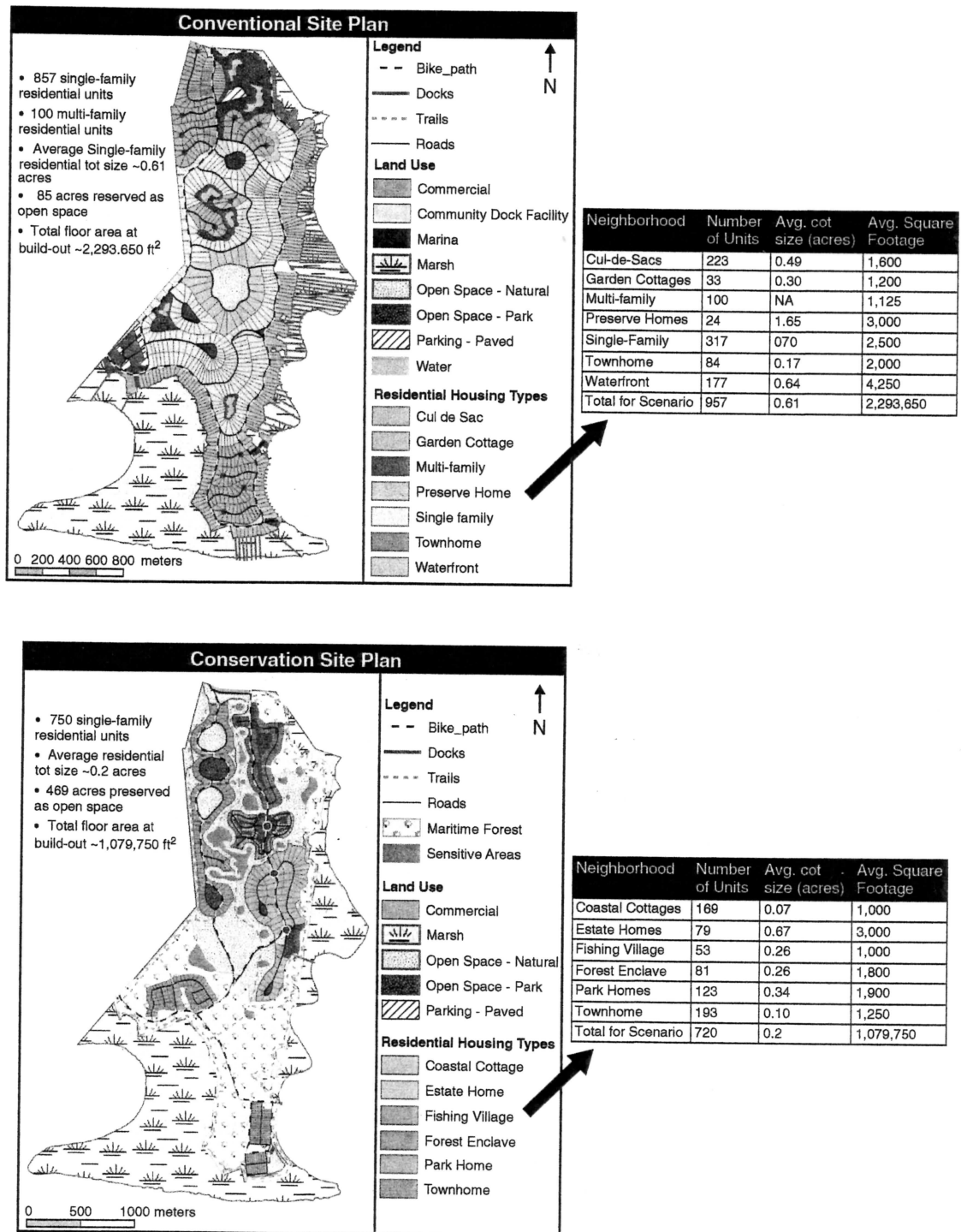
## THE COASTAL GROWTH MODEL

The NOAA Coastal Services Center's model is called *Alternatives for Coastal Development: One Site, Three Scenarios*.<sup>3</sup> The site used in the model, a peninsula surrounded by

<sup>2</sup> [www.wilmingtonstar.com/apps/pbcs.dll/article?AID=/20060316/NEWS/60315042/-1/frontpage](http://www.wilmingtonstar.com/apps/pbcs.dll/article?AID=/20060316/NEWS/60315042/-1/frontpage).

<sup>3</sup> The original website, [www.csc.noaa.gov/alternatives](http://www.csc.noaa.gov/alternatives), is no longer functional. However, an archived version is at <http://web.archive.org/web/20090307215818/http://csc.noaa.gov/alternatives/>.

tidal creeks and marshes, is a real 1,100-acre location in Georgia that is currently being privately developed. The three development designs are Conventional (*Point Peter Estates*), Conservation (*Point Peter Preserve*), and New Urbanist (*Point Peter Villages*) (Figure 25-1).



**FIGURE 25-1** The three design models for the development of Point Peter Peninsula. (www.csc.noaa.gov)

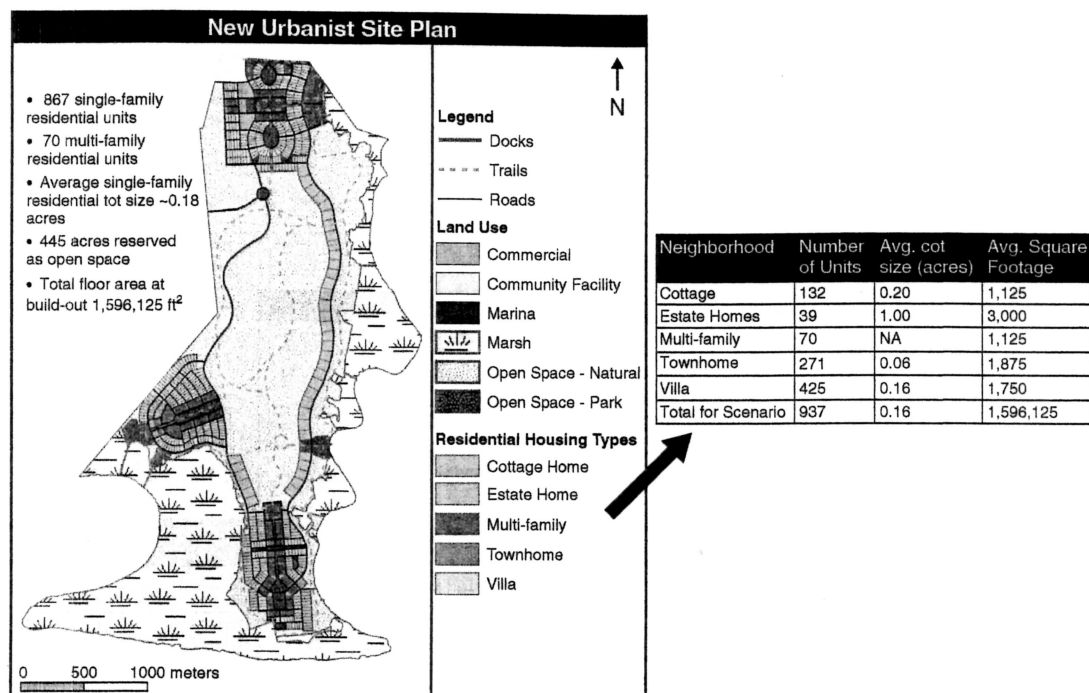


FIGURE 25-1 (cont.)

**Question 25-6:** Study Figure 25-1, then describe the key features of each design.

**Conventional Design:**

**Conservation Design:**

**New Urbanist Design:**

**Question 25-7:** In which of the three communities would you most prefer to live? Explain your answer.

TABLE 25-1 ■ Environmental indicators of the three coastal development alternatives

Indicator	Conventional	Conservation	New Urbanist	Description
<b>Open Space</b>				
Percent of Site	15 %	71 %	67 %	Amount of land left undeveloped (natural) or as parks, playgrounds, etc. (managed).
Total Acres	85	469	445	
Natural acres	28	432	403	
Managed acres	57	37	42	
<b>Docks</b>				
Total dock length (feet)	43,721	1,013	2,086	Total linear feet of all docks and total area covered by docks.
Total dock area (feet <sup>2</sup> )	262,326	6,078	12,518	
<b>Paths, Trails, and Sidewalks</b>				
Total (linear feet)	32,159	78,846	127,134	Total length of trails with the total broken into total pervious and impervious lengths
Impervious	32,159	26,946	78,859	
Pervious	0	51,900	48,275	
<b>Water Consumption</b>				
Estimated total gallons/day	358,926	231,584	287,765	Estimated water consumption totals for residential and park parcels based on national and local averages
<b>Impervious Surface</b>				
Percentage (of total site)	26 %	12 %	18 %	Amount of impervious surface.
Total Acres	169	82	119	
<b>Pollutant Runoff</b>				
Change in total runoff volume to surrounding waters	53.13 %	28.28 %	42.39 %	Results are the change between the amount of runoff from the undeveloped site and the amount of runoff from the site if developed.
Change in total nitrogen	153.32 %	84.46 %	114.39 %	
Change in total phosphorus	640.07 %	297.79 %	357.35 %	
Change in total suspended solids	61.16 %	43.31 %	68.86 %	

Source: Adapted from [www.csc.noaa.gov/alternatives/environmental.html](http://www.csc.noaa.gov/alternatives/environmental.html).

The three communities have different environmental impacts. Table 25-1 provides an overview of some of the environmental features of each design.

**Question 25-8:** Which of the three communities has the lowest environmental impact? Cite evidence from Table 25-1 to support your answer.

Economically, the New Urbanist design was projected to be the most profitable, due to a number of factors including lower construction and infrastructure costs and increased property values arising out of the exclusivity of the development.

**Question 25-9:** One widely accepted definition of sustainability encompasses the triple bottom line of people, planet, and prosperity (sometimes listed as *profit*). Which of the three designs is the most sustainable, according to this definition? Which is the least? Explain the reasoning behind your answer.

**Question 25-10:** Discuss whether any of these developments can be called sustainable considering that each replaces natural landscape with a built environment and that many residences in this type of development are second, vacation homes.

**Question 25-11:** This model you just examined is hypothetical, yet it is based on a real area that is being developed. Land Resources Companies is calling its development Cumberland Harbour, and promotional material on its website implies that the company is using a conventional design.<sup>4</sup> Based on your analysis of the three development alternatives, in the space below compose a letter to the developer either supporting or opposing their design. Support your decision with evidence.

---

<sup>4</sup> <http://www.cumberlandharbourlots.com/>. Click on the *satellite photo* or *site map* buttons on the sidebar to see an aerial or map view of the development.