

March 28, 2002

Admiral James D. Watkins (U.S. Navy, Retired)
Chair, U.S. Commission on Ocean Policy
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Dear Admiral Watkins:

Thank you very much for your letter on March 7th, and for the attached questions. I will do my best to answer them as fully as possible and welcome further queries and requests as the Commission pursues its mandate.

The question, “Are there communities that are doing coastal zone management right?” exceeds my expertise. I can, however, discuss the issue of urban development along the coast and the efforts that coastal communities are making to manage the way they grow and the impacts of growth on their economies, environment and natural resources, local or historical culture and general quality of life. This, in itself, represents an enormous body of information; I will try to be brief. I am, however, always available to the Commission, to clarify what I have written or provide more detail as necessary.

The Problem. The problem of coastal urbanization and land use change was recently articulated by Dr. Daniel McGrath of the University of Chicago (Sea Grant 2000). His research has led to the prediction that the 20 largest coastal metropolitan regions in the US (including the Great Lakes cities, but excluding Los Angeles or Portland) will increase their populations by 32 million people by 2025. This will result in the expansion of urban land use from ca. 20,000 to 29,000 square miles, i.e., an addition of 9,000 square miles, or 5.8 million acres of land that today is either agricultural land or “open” space. Although many areas in the United States are undergoing rapid growth and development, the coastlines are experiencing about 1.5 times the growth of the nation as a whole. More of the new development is along the East and Gulf coasts, particularly where the water is warm than along the West Coast. (In addition to the cooling influence of the California Current and upwelling on the NE Pacific coast, extensive protections against development have made the California coast a bit less available to developers. Some of these protections are currently being challenged by local and national homebuilders associations.)

A key driver of coastal growth is the redistribution of the aging post-WWII baby boom generation to the coasts. By 2025, it is estimated that 14% of this part of the US population will reside in the Carolinas or Georgia. Among the factors forcing this coastward migration are mobility, technology and wealth. With more than \$10 trillion in inherited assets, and thick retirement portfolios, Americans are seeing the largest production of wealth in history. Many middle class Americans now own second homes on the coast. Others are moving to the coast permanently, either to retire or to continue

working. By having the ability to commute and the availability of the technology for telecommuting, increasing numbers of working people now have the option of living great distances from “the office”.

The emerging coastal demographic is changing sleepy, relatively untouched parts of the country into booming, economically dynamic suburbs and resort communities. A few examples (Ulmann et al. 2000):

“In Maine, the top five counties in employment and GDP growth are all along the coast. Their growth rates are double the state average.

In Massachusetts, the four counties with the fastest job creation include those covering Cape Cod, Nantucket Island and Martha's Vineyard.

In South Carolina, five of the seven counties with the fastest employment growth lie along the coast. Beaufort County, which includes Hilton Head, tops the list with a 46% increase in jobs since 1993, more than three times the state average.

In Alabama, only two of the state's 67 counties touch the coast. One of them, Baldwin County, which borders the Gulf and Mobile Bay, led the state in GDP growth: 51% vs. a statewide average of 24%.

The same boom that is altering the rugged coast of Maine is taking place 1,200 miles south near the lush greens of Hilton Head, S.C. Along a 15-mile stretch of mainland, starting at the bridge from Hilton Head Island, unspoiled Low Country vistas have given way to mass development: golf-oriented retirement communities, shopping malls, banks, office buildings, new car showrooms, hospitals, even a new campus for the University of South Carolina.”

While clearly, the growth in economy should be perceived as positive, the aesthetic, environmental and cultural costs of this economic boom are not always favorable. In fact, even the economic benefits of the “boom” are sometimes unclear to long-time residents, as on average, 80% of all new jobs are filled by non-locals, who then require additional (costly) infrastructure to support them (Fodor 1999). One new resident of the rapidly developing Cape Cod region remarked that the “...Cape has become just another suburb of Boston” (Ulmann et al. 2000).

In short, people want to live in the places they love, but in doing so, they may be loving these places to death. One could ask, “what good is spending a quarter of a million dollars on your dream house, when the place where it’s built looks like the place you just left (only warmer)?”

Aside from aesthetics, enormous environmental quality, ecological integrity, resource management and natural hazards issues are associated with coastal development. Environmental data don't even exist in many of the places where growth rates are among the highest in the nation. Land is changing hands and usage at rates that seriously challenge the effectiveness of resource managers. For example, studies of water and environmental quality in Beaufort County suggest that development at Hilton Head and other locations in the county has altered ecosystems in the Broad Creek and Okatee River estuaries (Van Dolah et al. 2000). Similar findings have been made in Georgetown and Horry Counties, where nearly a decade of research has demonstrated clear impacts to environmental quality due to urbanization along the shores of salt marsh estuaries (Vernberg et al. 1996; Vernberg and Vernberg 2001). There is now clear evidence of water quality degradation and ecological impacts. Grass shrimp recruitment has been reduced in certain estuaries and shellfish diseases and sewage contamination (from wild animal wastes, caused by alteration of wildlife movement patterns as a result of coastal development), as well as elevations in levels of pesticides in salt marsh sediments and organisms, with clear impacts on reproduction, are now documented (Fletcher et al. 1998; Chandler and Scott 1991 ; Fulton et al. 1996; G. Scott personal communication). We know little about the distribution and sources of ground waters along the coast, and we are finding very high levels of nutrients in some of these waters (this may be normal). Very little, in fact, is known about the ground water system in many coastal areas of the country, yet urbanization is altering the hydrology and adding contaminants to it at high rates with little predictability of consequences (Joye et al. 1998).

The federal government's relationship to the coastal zone has been inconsistent, in large part due to its size and complexity. No federal policy better exemplifies the problem than the Federal Flood Insurance Program (FFIP), which has promoted irresponsible development and inflated "beachfront" property values for decades. For example, after Hurricane Hugo, in 1989, the FFIP, i.e., the American taxpayer, not only rebuilt storm-devastated beachfront properties but actually replaced the old, dilapidated beach houses with new large homes. Quite simply, the FFIP encourages investment in hurricanes. In addition, as Ulmann (2000) points out,

"The owners got another gift from the feds in 1992, when the U.S. Army Corps of Engineers agreed to rebuild the beachfront. U.S. taxpayers picked up 85% of the \$15 million tab. The new beach was supposed to last eight years. A few months after the project was completed, a storm washed away 80% of the sand."

When Hurricane Floyd threatened the coast of South Carolina, a few years ago, evacuation routes turned into parking lots. With burgeoning population, the question of emergency evacuation becomes an increasing concern. Many communities are being built on sea- and barrier islands. The consensus in the natural hazards research and policy communities is that the majority of coastal housing would not withstand a direct hit from a powerful storm (which, with continued ocean warming and climate change, will become more likely in the next few years). The question of whether the population could escape such a storm remains uncertain.

One must also consider the scale of development. In the 19th Century, a subdivision development generally involved building fewer than ten units. By the 1940's and early '50's, developers were doing about 50 homes in a subdivision. During the '60s, the scale of low-density subdivision development has increased to hundreds and even thousands of units. While the human scale of development has been high, the rate of land conversion to urban use, to support the population, has been staggering. For example, between 1973 and 1994, the populations of Dorchester and Berkeley Counties, SC doubled (Lacey et al. 1996). However, the amount of land converted to urban use increased by over 700%. In Figure 1, I have provided a comparison of population density per unit urbanized space in communities that underwent major development prior to 1970 (in green) and those that have undergone major growth since then (red). Clearly, the trend appears to be toward lower density. Actually, my research leads to the conclusion that population densities in residential areas generally remain high, between 19 and 30 people per urban hectare (Kleppel et al. in press). But the total amount of urbanized landscape has increased dramatically (as per Lacey et al., above). The result is an apparent decrease in density. Much of the increase in urban surface is in the form of roads and parking lots, impervious surfaces, which contribute to runoff [which may contain nutrients and toxic contaminants (Windom et al. 1998; Shaw et al. 1998)] and ultimately, aquatic ecosystem degradation (Scheuler 1994; 1995; Lerberg et al. 2000). We recently demonstrated that low-density development can be expected to result in an average 8-12% loss in benthic biodiversity in salt marsh tidal creeks in the fastest growing coastal counties in South Carolina, while more traditional urban land uses would result in substantially smaller losses of species (Kleppel et al. 2001).

Finally, there are important issues in the coastal zone that relate to the impact of development on local culture. Many of the coastal regions of the United States are home to indigenous and unique populations. There are unique Native American cultures in the Pacific Northwest, Gullah and Gichee people on the sea islands and coastal enclaves of Georgia and South Carolina and endemic island fishing communities from the Gulf of Maine to Chesapeake Bay found nowhere else in the world. These distinct cultures are perhaps the extremes in a continuum that includes the "just-plain-folks" that have lived in small isolated fishing villages and hamlets of rural, coastal America since before there was a United States. These people, in my opinion, depict the breadth of American cultural diversity.

To witness the subduction of these wonderful cultures into golf-course communities, chain stores and strip malls, is to watch a great tragedy unfold before our eyes. We may not be the greediest generation in American history, but we seem capable of doing the most damage. I lose scientific objectivity when I see some of America's most beautiful and special places being violated by inappropriate development. It seems a blatant disrespect for our culture when Cape Cod is turned into a Boston suburb, and Bluffton, SC is traumatically gentrified to accommodate those who could care less about where they are, as long as it's warm and there's golf. [Please forgive my rantings here. I am very concerned about the cultural changes that are accruing from land use alteration throughout America. I am reminded of the caution of James Kunstler (1994), author of

“The Geography of Nowhere” who asked, “Who will defend America, when there’s nothing left worth defending”?]

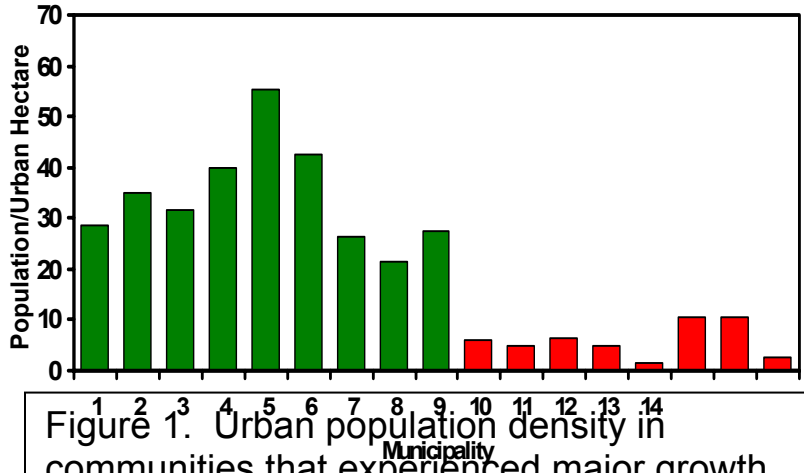


Figure 1. Urban population density in communities that experienced major growth prior to 1970 (green) and after 1970 (red). Data for the first Baltimore estimate and for Chicago, Albuquerque, Atlanta and Los Angeles are from Daniels (1999). Data for Georgetown, SC are from Allen (1999) and for Berkeley and Dorchester Counties are from Lacey et al. (1996). All other data are from municipal web-sites.

- Troy, NY
- Baltimore
- Baltimore
- Boston
- Brunswick, ME

- Chicago
- Georgetown, SC <1970
- Berkeley Co., SC <1970
- Dorchester Co., SC <1970
- Georgetown, SC >1970
- Berkeley Co., SC >1970
- Dorchester Co., SC >1970
- Clifton Pk, NY

- Guilderland, NY

- Albuquerque

- Atlanta
- Los Angeles

How coastal communities respond to rapid growth, increased urbanization and changing land use patterns. Your question was, ‘Are there communities doing coastal zone management right?’ My answer is unequivocally, yes. I will, in what follows, provide examples of such communities. I recognize that part of your mission is to clarify, perhaps even define, the role of the federal government in managing urbanization and land use change along the coast. I will try to be cognizant of these needs in my response.

The take home message, in my experience, is that the best solutions arise at the local level. Far and away, the overwhelming majority of land use decisions are made at the local level (Dale et al. 2000), and few policies have been successfully implemented without local constituency. Therefore, I believe that federal policies can guide the process of coastal zone management but they will not successfully drive it.

An excellent example of local control that worked is provided by Sanibel Island, Florida. Located on Florida's Gulf Coast, this laid back island community with a population of 1000 people in the early '60s, was envisioned as the Miami Beach of the West Coast, with a major highway running from one to the other, and a population of ca. 90,000 (Hampson 2000). Today, the population has swollen to only 6000, and the island is anything but Miami Beach. Although the population is 6-times larger now than in 1960, it's growth rate is below that of the state, overall, and far below that of South Florida. Hampson (2000) articulates the current state of the island:

“Almost two-thirds of the island is wildlife preserve, thanks partly to private contributions. There are laws against bright signs and billboards; chain restaurants (the venerable Dairy Queen was grandfathered in); lights that can be seen from the beach; and seawalls, jetties and groins, even if they are advertised as attempts to "save" the beach.

‘You don't have to save the beach. It moves,’ says Bruce Rogers, the planning director. ‘The problem is people who build too close to the beach.’

At least 75% of the vegetation on a given lot must be native, and pavement can cover no more than one-third of the ground. If there's a gopher tortoise hole where you want to build your house, you have two choices: Move the house, or move the hole. The former might be cheaper.

But it's not a dictatorship; people here want to save the coastal environment.”

Perhaps the major factor in protecting Sanibel Island, aside from the sheer determination of the residents to control their own future, was their realization that to do so, they would need to control land use practices on the island. Therefore, the Sanibel community set about to annex unincorporated parts of the island, where the major portion of the new development was taking place. While successful land use planning seems to be part regulation and part incentive, the placement of those powers in local hands, in this case resulted in a much closer approximation of the lifestyle that the island's residents desired than would have been the case if a higher level of government (i.e., the county) had maintained control over the use of land. Unfortunately, however, Sanibel Island is an anomaly among small communities facing the pressures of urban development.

The most vulnerable places, where development can become overwhelming, are small communities surrounded by large parcels of land that are not profitable to the owners and that are in unincorporated parts of counties. Much of the southeastern and Gulf coasts fit this description. Among the effective approaches to urban growth management in such areas has been the development of regional management plans or councils (providing that they are populated by well informed staff and that they have support from state and federal governments). Such support should not dictate policy, but provide information, facilitate collaboration and assist in converting visions into plans and plans into implemented projects. When regional policies begin to favor large scale extensions of

infrastructure and services to rural areas, particularly through deficit spending, it is necessary to defer to the local level to ascertain whether the impending growth is truly in the interest of the community.

The regional watershed approach has been successful in many respects in the Chesapeake Bay region, where such communities as Annapolis, MD, Baltimore and many small towns on the Eastern Shore of the Chesapeake are struggling, some successfully, to preserve small town, neighborhood and historic context, as well as environmental quality. The Chesapeake Bay Program has led in the purchase and transfer of development rights effects (some of which have been litigious), in the creation of urban service boundaries and in the promotion of “smart growth” approaches to manage the location, extent and rate of development within the watershed, while simultaneously, monitoring environmental quality in the bay and creating information and educational tools that not only enlightened residents within the watershed, but which reach communities far from the Chesapeake.

Aspects of the Chesapeake Bay Program can be criticized. But overall, in my opinion, the program has been a success. The regional approach, focused on the watershed, has had a positive impact on water quality in the bay. Numerous other watersheds, particularly in the Carolinas, Georgia and Florida are shared between states. And no local smart growth program will protect the quality of an estuary that is part of a multi-state estuary system (as is Pensacola Bay for instance). In this case, state and federal collaboration is essential to the development of a regional watershed approach to coastal zone management. The trick to successful management, however, is to drive the process from the local level, up, while providing resources from higher levels down.

The involvement of states in smart growth initiatives is occurring with increasing frequency. Among these, Maryland and Maine have taken a stand to direct new development toward areas where infrastructure already exists, and to encourage communities to develop and implement Smart Growth strategies locally. South Carolina provided counties with the opportunity to reconfigure comprehensive land use plans to curtail sprawling development patterns. Charleston and Beaufort Counties, as well as several inland counties complied and have developed plans that are in various stages of implementation.

For communities that are large enough, development of local, smart growth options are enhanced by the availability of funds, professional planning, legal and technical staffs, as well as infrastructure and financial resources. Nelson (2000) points out that,

“During the 1960s, Oregon's population grew by 300,000 but it lost 3.2 million acres of farmland, about 10 acres for each new resident. Its per capita taxes rose [at a rate that was] twice the national average. Between 1982 and 1992, however, Oregon lost virtually no farmland despite adding about 300,000 residents while its taxes rose [at a rate that was] half the national average. How did it do it? Urban containment leading to smart growth.”

The use of urban growth or urban services boundaries has been effective in managing urban development in certain places, most notably Portland, Oregon. It is also used in parts of the Chesapeake Bay watershed. The Portland growth boundary has been challenged by the homebuilders and it seems to be holding. In smaller communities, however, even the threat of litigation collapses the idea of constraining growth. Nelson (from Georgia Institute of Technology) has written extensively on the containment of urban sprawl and contends that within a decade, tangible effects can be seen both in quality of life and environment. Conservative think tanks have argued that growth boundaries tend to limit the availability of affordable housing (Staley and Mildner 1999). Nelson's data appear to refute that. In fact, housing starts within the boundary have doubled and the Oregon Homebuilders Association has endorsed the growth boundary concept, according to the Greenbelt Alliance (www.greenbelt.org). Further, by removing costly infrastructure extension, the City of Portland seems to have reduced taxes and the cost of living within the city. Various iterations of the urban growth or service boundary are being tried in Washington State, Lancaster County, Pennsylvania and Isle of Wight County, Virginia. At this point, it is too soon to tell whether the experiment will be successful.

Among the most difficult issues in comprehensive land use planning is environmental quality. A great deal is simply not known at this point. For example, how much buffer is needed between a development and a saltmarsh? Do retention ponds work? How do vegetated buffer areas alter wildlife movements and what are the implications to wildlife, human health and safety, and water quality? These and many other questions are unanswered at present, often leaving resource managers to guess at best management practices. The rate of development is so rapid in many places that by the time answers are found the landscape and waterways will already be degraded. Efforts are being made at finding solutions. In the Southeast, the Land Use-Coastal Ecosystem Study is developing a fundamental understanding of coastal resources, and ecological and geochemical processes. The program is also developing scenario-based models that will allow users to visualize impacts of development on specific landscapes and to query the data base for information that will permit them to make informed management and planning decisions.

In summary, the growth of so-called low-density suburbs has created a sprawling urban landscape that is altering the economies, culture and environmental quality of the coasts of the United States at an astounding rate. Efforts to manage growth and urban development seem most successful when initiated and controlled locally. However, the nature of the landscape to conform to watersheds that influence coastal environmental quality enormously, as well as the technical and financial constraints that limit the resources of small communities, argues for the development of regional management approaches. Increasingly, states are backing smart growth initiatives. Communities must rely on academic, state and federal resources for technical information, particularly with regard to natural resource and scientific issues. At this point, the availability of scientific data is not keeping up with the information needs of decision makers. Efforts are underway in some regions to correct this problem by developing techniques that more

fully link fundamental scientific data with the needs of the resource management community. But funding resources to academic and government scientists are extremely limited. Federal efforts to promote the dispersal of information about smart growth has been helpful in informing the public and in promoting planning and action at the local level. The federal government is complex, however. Different agencies and departments have different missions. Thus, while one agency promotes smart growth, another is funding highways or insuring development on hurricane-prone beaches. Mandating policies to create plans and programs from the top down (i.e., fed → states → counties → towns/cities) creates policy but not necessarily progress. For example, almost all of the 35 eligible U.S. states, territories, and commonwealths operate federally approved coastal management programs, and over \$1.6 billion in federal and state matching funds have been awarded to implement state coastal management programs (NOAA 1998). Yet our coasts remain in trouble. What is not needed is more bureaucracy in Washington to fund its own perpetuation, while, if history repeats itself, will not improve the ability of places besieged by development pressure to resolve their problems or avoid them altogether. What is needed, I submit, is to improve the flow of resources and information from the top down and to permit policies to develop from the bottom up. This is how the citizens of Sanibel Island did it.

Once again, please express my gratitude to the Commission for allowing me to participate in this important process, and for your good works and dedication.

As always, I am at your service, and remain

Sincerely,

Gary S. Kleppel
Associate Professor
PI, Land Use-Coastal Ecosystem Study

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