Coastal Development

Development along the U.S. coastline is linked to the
declining health of the nation's ocean habitats and resource.

- Pew Oceans commission report, 2002

Historically people settled around natural harbors and some of the world's biggest cities are located on bays and harbors because of the access to trade and commerce that these coastal locations offer.

While people have lived along sea coasts for thousands of years, it only during roughly in the last century that megacities have emerged. With their emergence these population centers have rapidly degraded natural marine and reduced the vitality of coastal habitats.

The construction of urban infrastructure such as roads, homes, shops, factories, airports, and ports replaces natural habitats. Bays, estuaries, deltas, and their rivers are often dredged and deepened to cope with increased shipping.

Added to this are impacts such as increased erosion due to coastal development, increased pollution, and increased boat traffic. These all lead to further habitat loss and place increased pressure on marine species.

The cities of Hong Kong, Singapore, Manila, and Honolulu, for example, once had thriving coral reefs immediately off shore. Human pressures have destroyed these fertile areas largely because of a kind of coastal development that is insensitive to the impacts of human structures on the surrounding natural environment.

Additionally, in order to protect development, dykes, seawalls, and other developments are typically constructed. These are seen as necessary to protect coastal towns, cities, and farmland from storm surges and high tides. This is most often the case for reclaimed or drained land. However, while these constructions may protect the human environment, they eliminate the ability of the natural coastal environment to fulfill its normal functions. What is often forgotten is that human society and its economy are only able to function in the context of a healthy natural environment.

Along the U.S. coastline development is often linked to the declining health of the ocean environment. As coastal populations grow – and around the U.S. it has been growing at roughly 2 million residents per year over the past decade – this leads to a deepening decline in ocean health.

"Americans have long enjoyed living, working, and playing along the coasts," said Leon Panetta, former White House chief of staff and current Secretary of Defense. "However, we see increasing evidence that this love of the coasts and oceans comes at a cost to the very beauty that attracts us there in the first place."

In a report issued by the Pew Foundation's Ocean Commission, entitled, "Coastal Sprawl: The Effects of Urban Design on Aquatic Ecosystems in the United States," Dana Beach of the South Carolina Coastal Conservation League explains the effects of urban design and land use

practices on aquatic ecosystems. Mr. Beach offers new strategies and tools that communities may use to preserve the same ecosystems that attract residents, tourists, and businesses to the coasts.

Beach reports that runaway land consumption, poorly planned suburban development and exponential growth in automobile use lead to pollution and habitat degradation on the coast. Some large coastal metropolitan areas consume land 10 times as fast as they add new residents.

Across America, driving has increased three to four times faster than population has increased. Beach concludes that if current rates of land consumption continue, more than 25% of coastal acreage will be developed by 2025 - up from 14% fifteen years ago in 1997.

"These trends are a prescription for serious ecological damage," says Beach. "Research on rivers and estuaries confirms that when impervious surfaces cover more than 10% of a watershed, the rivers, creeks, and estuaries that they surround become biologically degraded."

Joseph Riley, chair of the Pew Ocean Commission's coastal development committee, adds a note of hope. "Although the problems associated with coastal sprawl are complex, the solutions are straightforward. Communities need to make clear-minded decisions about where and how to grow if they are going to protect their quality of life."

When these coastal development forces are coupled with forecasts of how climate change will increase storm intensities, erode beaches, increase salt water intrusion into fresh water supplies, raise sea levels, and cause more frequent flooding, it can be expected that coastal development and water quality will become highly vulnerable to disaster. Unexpected issues are likely to arise, such as inadvertent sewage spills, trash debris from flooding, and various forms of pollution, some of it highly toxic as was demonstrated by the effects of Hurricane Katrina in Louisiana.

The IPCC suggests that by 2080, sea level rise could convert up to one-third of the world's current coastal wetlands to open water.

A 1989 a similar report to Congress by the EPA estimated that a two foot rise in sea level could eliminate something between 17% to 43% of U.S. wetlands. Over half of this loss will take place in Florida and Louisiana. Around the U.S. coastline, this would remove approximately 10,000 square miles of land. For perspective this area is roughly equal to the combined size of Massachusetts and Delaware.

The problem of coastal development is not only the vulnerability of natural systems. Coastal communities and their infrastructure are also at risk from sea level rise and increased storm surges. As coastal populations grow, more people and assets will occupy potentially high-hazard areas. In many cases, the coastal habitats (e.g. salt marshes, mangroves, barrier islands) that might provide a natural buffering for these communities from storms have been degraded or removed. This was a key factor in the flooding that New Orleans experienced from Hurricane Katrina.

The wheel of coastal development keeps rolling. Here's a recent photo of the intense level of development along Daytona Beach, Florida. Coastal development of this sort is highly vulnerable to increasing storm intensities and sea level rise.