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Developing a coastal husbandry

By STEPHEN B. OLSEN

Seen from a satellite at night it is the world's coastlines that shine most brightly. It is here that people and their infrastructure are concentrated. Thus, coastlines are the primary habitat of our species. When defined to include a strip 50 miles wide along the shores of the world's oceans, seas and great lakes, coastal regions currently contain about 60 percent of all the world's people - all crammed onto a mere three percent of the inhabited land space.

The numbers of people involved are impressive enough today but there will be many more in the future. In 2025, three-quarters of the world's people will be living along coastlines, and by then their numbers will be as great as the entire world population was in 1990! The largest increases will occur in the tropics, primarily in sprawling coastal cities. A large proportion of these people will live in poverty. Population growth - much of it brought by migration - will also affect places like Rhode Island. South Kingstown, for example, is expecting a population twice as big as today's by mid-century - when today's children are approaching retirement. The problems, however, lie not so much in the numbers of people but in how they relate to one another and to the ecosystems of which they are a part.

As the primary habitat of our species, we need to think carefully about those qualities that give coastlines this unique status. People have already transformed the vast majority of the world's coastal ecosystems. Unfortunately, from a long-term, planetary perspective, it appears that this transformation is degrading or destroying the capacity of coastal ecosystems to produce renewable wealth and to provide human societies with an acceptable quality of life. From this global perspective the transformation of coastal ecosystems appears to be accelerating and the changes this brings have major implications for us today and for what today's children will inherit.

The picture, however, is not all gloom and doom. In nations with well established modern economies like the United States, the transformation process has played out over several generations and people are no longer dependent on their local resources. Billions of dollars have been spent on restoring and protecting important ecosystem qualities - through sewage treatment, restoration of key habitats for important species like the striped bass, protection of wetlands, and stringent controls over the use and disposal of toxics. But most of the world is far less stable politically, is often unable or unwilling to prevent repeating America's mistakes and does not have the wealth to bankroll costly restoration. It is also in poorer nations that population growth is most rapid. There are some examples of effective management in such nations, too, but so far, the scale of success is very small compared to the scale of coastal degradation and misuse.

We do not fully understand why our species is concentrating along coasts. We do know, however, that coastal ecosystems possess an extraordinary endowment of natural resources, and that everyone can benefit from an environment that can provide renewable wealth and a high quality of life for people. If we add to the 50-mile ribbon of coastal land the adjoining coastal ocean - say the continental shelves that are the transition from land to the deep ocean - then we can estimate that together, this mere nine percent of the globe's surface contains a disproportionately large share of the planet's most productive and biologically diverse ecosystems. Coral reefs rival tropical forests in the numbers of species present in a given area and some coastal wetlands are as productive as the most intensively farmed agricultural land. Coastal waters produce ninety percent of the world's fish catch, and contain a major portion of the best farmland - especially in the tropics. In addition to being important to our food supply, coastal regions contain a very large share of the world's industry, energy production and processing, and military installations, and absorb the lion's share of the wastes all these people and industries support. As if all this was not enough, coastal regions are also the favored playgrounds. The world's biggest industry is tourism, and a very large proportion of the tourist destinations are also coastal.

A major challenge, today and tomorrow, is to balance among these competing - sometimes incompatible - activities and to sustain the qualities of coastal ecosystems that have made them our primary habitat. This year marks the 25th anniversary of the URI Coastal Resources Center (CRC), an organization founded at the Graduate School of Oceanography which explores these issues and offers practical ways of responding to the problems and the opportunities that governing coastal regions offer in such abundance. CRC began by developing the policies and plans that regulate how this little state's coastal waters and coastline will be developed and, hopefully, how some of its most important qualities can be sustained. That led to addressing issues affecting the region and the nation, and beginning in 1985, to working on similar issues in countries around the world.

This experience has impressed us with the common traits of the issues and the process by which positive forward progress can be made. Much is said about cultural differences, but they are real and provide a great richness. But people's sense of what is fair and what makes our quality of life good or bad are remarkably similar. Lessons we learned in Rhode Island about how to involve the public in defining how decisions are made and how to resolve conflicts among competing interest groups have been applied successfully by CRC in nations as different as Ecuador, Sri Lanka or Kenya.

The transformation process itself is also remarkably similar. Coastal Ecuador lived through a cholera epidemic three years ago and

water quality is an increasingly severe problem in many estuaries since sewage treatment is non-existent or nearly so. It is easy to forget that cholera epidemics in Providence and the stench of polluted waters led this state to build the first municipal sewage treatment plant in 1901. Estuarine fisheries are collapsing throughout the tropics. Fish were once so abundant in Narragansett Bay that it could - for a brief period - support hundreds of floating traps. The first big collapse here came in the late 1860s and overfishing offshore is dramatically evident today. We have seen a lucrative farmed oyster industry that once provided hundreds of jobs boom and bust - a pattern now being repeated with shrimp farming in many tropical nations. The differences lie in whether such changes are taking place today or 50 or 100 years ago, and the speed with which they happen.

Here in the U.S. our local world feels fairly stable and compared to most of the planet's people, we are extraordinarily wealthy. These differences should not make us feel guilty or defensive but require careful consideration and sustained action. The qualities and health of our primary habitat will effect us all, socially, economically and politically, at both the local to the worldwide scale. Increasingly we are one big global society.

We have learned that good coastal management requires the very best insights that science can offer us. It also requires the very best political process and a strong concern for the ethics that lie at the center of the decisions we make on who gets to enjoy a beach, who gets to catch and who gets to eat a fish, how a decision is made to build a factory or a hotel, and how a conflict between traditional fishermen and new users of the coast are resolved. To believe that the free market alone will produce the best result is naive. Our own American experience teaches us that the process of striking a sustainable and equitable balance is difficult and requires constant adjustment.

We have much to share, and much more to learn. Central to effective management of our coastal habitat is an ethic of community stewardship and a long-term perspective on the implications of the decisions we make. That stewardship ethic is alive and well here and in societies around the world. We must learn how to harness it and give it practical expression. The outpouring of anger over the recent North Cape oil spill is an example of a growing public awareness that events which affect the well-being of the ecosystems of which we are a part is of critical importance to our own well-being today and tomorrow.

- Stephen B. Olsen is director of URI's Coastal Resources Center, now celebrating its 25th anniversary.