

DR. STANLEY R. RIGGS, interviewed by Glenn Blackburn on January 6, 2012. Dr. Riggs is Distinguished Research Professor of East Carolina University (ECU) and Harriot College of Arts and Sciences Distinguished Professor at ECU. He has written many books and reports about coastal geology; his research for these books and reports has included drilling thousands of holes around the coast to analyze core samples. His most recent book, co-authored with Dorothea V. Ames, Stephen J. Culver, and David J. Mallinson, is *The Battle for North Carolina's Coast: Evolutionary History, Present Crisis, and Vision for the Future* (UNC Press, 2011). He has worked directly with the Coastal Federation on the N. C. Legislative Commission on Climate Change and on specific issues such as the impact of hardened structures on North Carolina's beaches and inlets. In addition, he has presented frequent talks and programs to Federation groups and is very familiar with the Federation's work. The following interview includes several excerpts from "A conversation with Stanley Riggs, co-author of *The Battle for North Carolina's Coast: Evolutionary History, Present Crisis, and Vision for the Future* (University of North Carolina Press, Fall, 2011)" (hereafter cited as "a conversation.")

Dr. Riggs came to East Carolina University (ECU) in 1967 to start a marine science program and develop a research program on the geology of North Carolina's coastal system. He lived and worked in Manteo during his first six years at ECU. He said that a generation of very good coastal scientists – including John Costlow, Orrin Pilkey, Conrad Neumann, Dick Barber, Pete Peterson, and many others -- came to North Carolina universities in the 1960s and 1970s. These scientists were in five different institutions – ECU, UNC-Chapel Hill, UNC-Wilmington, Duke, and N. C. State – but they were teaching and doing research on the same coastal area. They all became good friends, worked together as a team, and had significant influence on public policy regarding the N. C. coast. They helped get CAMA started and also got some important wetlands legislation passed. Dr. Riggs said that in his view this team of N. C. coastal scientists was just as good as the team then working at Woods Hole.

Dr. Riggs pointed out that he and Orrin Pilkey worked together a lot, among other things being co-authors of *From Currituck to Calabash* and *The North Carolina Shore and its Barrier Islands*. He said that Pilkey was responsible for a lot of public awareness on coastal issues, especially the public support for the ban on oceanfront seawalls, groins, jetties, etc.

In Dr. Riggs's view, good science has had a major impact on N. C. coastal policy. He said that he feels very strongly about bringing scientific knowledge to the general citizenry as a mechanism for enabling the public to influence policy. Today, he, Pilkey, and Pete Peterson are three university scientists who are very committed to public education about science and the coastal system and do many workshops and seminars for the public. One problem is that with university budget cutbacks the younger generation of coastal scientists has to teach larger numbers of students and focus on doing their research in order to get tenure, leaving little time for talking with the public and being involved in public policy work.

Still another problem is the legislature that came to power in 2010. Among other things, they drastically cut funding for many state agencies including the Division of Coastal Management and the

Clean Water Management Trust Fund. Many of today's politicians are driven, in Riggs's view, by pro-business and anti-environment attitudes, ignorance of the coastal system, greed, and fundamentalist religion, often with openly hostile attitudes toward science. For years, the Coastal Resources Commission listened to scientists closely, but that is beginning to change. Dr. Riggs cited a recent scientific report on sea level rise. The report incurred a lot of opposition from local governments on the coast with frequent anti-science opinions expressed by legislators.

Dr. Riggs's most recent work on coastal geology and public policy on the coast is *The Battle for North Carolina's Coast*. This book, which he co-authored with three other scientists from ECU, is the product of a decade-long research program on the origin and evolution of North Carolina's coastal system. In "a conversation," Dr. Riggs said that "The coast is a vast and complex natural system that is like a living organism.... It takes a team of experts to dissect the coast and uncover its past history, to understand the present dynamics and interactions, and to project this information into a vision for the future..... The only constant in dynamic coastal systems is that of change. If society does not recognize this, both the economy and the healthy resource base upon which it is totally dependent will be short-lived. The forces that are involved at the land-sea-air intersection are greater than our long-term engineering abilities to protect the status quo. This is both the beauty and power that draws people to the coast. So, let's get serious and build an economy that is based upon the dynamics of change and learn to live as an equal partner with our awesome coastal system."

In the January 6 interview, Dr. Riggs said a new coastal paradigm could revive the fishing and boatbuilding industries and preserve the coastal heritages and natural resources of the downeast "Land of Water Eco-region." These resources and resulting occupations produced a unique culture that could form the framework for a new brand of sustainable ecotourism. He believes that people would come from all over the world to experience this unique geological-biological ecosystem and the resulting sociological culture.

He believes that the vast and highly variable estuarine water bodies, their perimeter marshes, and adjacent swamps, pocosins, and blackwater streams offer another critical component of this new ecotourism paradigm that is totally different from anything Myrtle Beach or Virginia Beach can offer. Great potential exists in providing opportunities to share these natural resources, their evolutionary history, and the resulting human history with a new segment of our population. He said that we need to create excitement about seeing new, interesting places by developing and selling the history and culture of the people who have lived within the coastal system in many different ways.

With regard to the barrier islands, Dr. Riggs said in "a conversation" that "barrier islands are the ocean's 'energy absorbing sponges.' Storms on the Atlantic Ocean produce the physical energy associated with storm surges, waves, and coastal currents that do the work as they impact the ocean's barriers. This is the energy that builds the barrier islands and moves them upward and landward in response to sea-level rise. Thus the barriers are mobile piles of sand that form and move in response to the dynamics of storms and sea-level rise. Everyone loves the mystery and power of the ocean – the barrier islands with their vast shorelines and high energy inlets are the epitome of this mystery and power that draws people to its sandy shores."

In the January 6 interview, Dr. Riggs said that in the face of ongoing sea-level rise and storm dynamics, we need a better way to develop the high-energy ocean front and associated inlets. The present effort to build and protect massive ocean front structures on the highly dynamic and rapidly eroding barrier islands will result in either a major catastrophe or a bankrupt economic system. An alternative, he said, would be to disallow construction of specific types of ocean front structures and create a rolling buffer zone between the ocean and permanent human structures. This buffer zone could then be utilized for developing public tourism and general public access to the ocean beaches. In his opinion, we must learn to back away from the dynamic ocean shoreline, but he noted that this would require major changes in tax structures and land laws.

In “a conversation,” Dr. Riggs underlined the importance and significance of our coastal system. He said “the natural North Carolina coastal system is spectacular without an equal anywhere in the world.” In the January 6 interview, he added that there is no place in the world like the N. C. coastal system. Other places have barrier islands and estuaries, but nowhere is there such a vast coastal system of rivers, wetlands, estuaries, and barrier islands that extends far into the ocean with extensive shore-perpendicular capes and sand shoals forming shallow coastal embayments. This coastal system is intimately inter-connected and inter-dependent, much like the different components of a “living organism.”

He added in “a conversation” that “We are extremely fortunate in North Carolina that our forefathers recognized the wild and changing character of our coastal system and made critical decisions to set aside large portions of our barrier islands as national seashores, state parks, wildlife refuges, etc. Similar resources have largely disappeared in most other coastal states. This availability of wild public lands is one of our strongest assets and attractions for today’s tourist economy..... We don’t have to compete with New Jersey or Florida. Let’s recognize the real value of our resource; people will come because of the vastness, beauty, and high-energy character of this unique coastal resource. We should embrace the historical culture and the wild remoteness and parlay these attributes into our economic advantage.”

With regard to sea-level rise, he said in “a conversation” that “One of the biggest challenges is public education concerning the dynamics of our coastal system... The population generally does not understand that shoreline erosion is the direct product of long-term sea-level rise, which has been ongoing for the past 18,000 years..... To maintain a viable coastal economy and preserve the natural resources upon which that economy is dependent, the public, our managers, and politicians must understand and adapt to the natural dynamics of change on a mobile coastal system. The present approach of unlimited economic growth and development will result in ever-increasing conflicts and catastrophes..... There will always be ocean and estuarine shorelines, with rising sea level they just won’t be in the same place. If we are determined to maintain the status quo by hardening the ocean, inlet, and estuarine shorelines with either engineered structures or increased urbanization, we will not only prevent the coastal system from evolving, but will rapidly increase our disaster-based economy. If we allow the barrier islands and estuaries to respond naturally to the ongoing rise in sea level and storms, we can continue to have a thriving tourist economy with a healthy, high energy, mobile coastal system.”

In the conclusion of *The Battle for North Carolina's Coast*, Dr. Riggs and co-authors offer a "vision for the future," involving a discussion based upon the science as to how we could improve the way we live in a dynamic coastal system. The vision for the southeastern coast focuses on the urbanized barrier islands, what they call "islands of opportunity." Some of these islands, the high and wide islands with an abundant sand supply, can be more developed. Whereas the low and narrow islands that are sediment poor could be developed and managed with minimal urbanization and utilized for alternative measures of economic development. The Outer Banks are rapidly becoming a "string of pearls," a sequence of small island villages connected by a series of ephemeral islands and shallow shoals. In particular, segments of Hatteras Island are increasingly dominated by inlet and overwash dynamics. We should adapt to this by developing some alternative approaches to the infrastructure such as implementing high-tech ferry and float-plane systems that could connect these island villages to mainland villages. The mainland villages could become ferry bases, where restaurants, hotels, etc. could provide some employment for mainlanders. The interior of northeastern N. C. is what the authors call a "land of water," with marshes, swamp forests, and blackwater streams that could become the focus of a new type of sustainable ecotourism. Dr. Riggs noted that, if we let the Outer Banks become a series of islands, there would be more inlets and therefore more flushing of the estuarine waters with increased salinity, astronomical tides, and nutrient fluxes that would help clean out a lot of pollutants that come down the rivers. This would lead to a substantial increase in water quality with the real possibility for a revival of the fishing industry.

Dr. Riggs said on January 6 that this vision has great appeal to growing numbers of the general public. Others, however, think that the present state of affairs on the coast can and should be maintained. Dr. Riggs said that ECU has begun to support initiatives for building a more sustainable ecotourism economy for northeastern North Carolina, and he looks forward to the Coastal Federation's endorsement of this vision for the future.

As for the Federation, Dr. Riggs said that it has done an "awesome" job over the years with a lot of good work in opposing oceanfront seawalls and groins. The Federation has to walk a fine line and not appear to be too extreme, but they do need to work harder on some critical, long-term issues, such as ocean, inlet, and estuarine shoreline setback rules that recognize the long-term changes impacting all of the coastal shorelines. They also need to become more deeply involved in contentious issues like the proposal to build an international super-port in the Cape Fear River.

Finally, on the question of the connection, if any, between religion and concerns for the environment, Dr. Riggs said on January 6 that there are still many fundamentalists who think that humans can and should dominate the earth. However, some religious groups are sensitive to environmental matters and believe that we should be better caretakers of our earth.