

Truth in Science

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Dr. Orrin Pilkey
Photo courtesy of University
Photographer

Dr. Pilkey is a James B. Duke professor of Geology who has taught at Duke since 1965. He is the former president of both the North Carolina Academy of Sciences and the Society of Economic Paleontologists and Mineralogists. He also edited the *Journal of Sedimentary Petrology* and authored or co-authored 15 books in a series entitled *Living with the Shore* which is a state-by-state discussion of coastal regions. Dr. Pilkey's outstanding achievements were recognized when he received the Francis Shepard medal for excellence in marine geology in 1987.

The case hinged on whether or not the shoreline sediment at the building site consisted of wind-blown or overwashed material. If the sediment should be wind-blown, State Coastal Management laws would allow the wealthy and influential Massachusetts resident to build his beach mansion at the site along the state's South Shore. If the sediment should indicate deposition by crashing storm waves, no construction would be allowed. Examination of the proposed building site revealed that it was covered by grapefruit-sized cobbles which clearly were not the product of onshore winds, even during hurricanes.

Nonetheless, at an administrative hearing, an engineer and a geologist both testified, with deadpan faces, that the well-rounded 5 to 10 pound cobbles were blown in. The wealthy man got his house, in a very unsafe location, and the spirit and letter of the state's Coastal Management laws were violated. The credibility of applied coastal science took another step downward.

I wish I could say that the wind-blown cobble testimony was an unusual example of scientific dishonesty. Unfortunately, it is only unusual in the sense that the testimony was so obviously ludicrous.

Other illustrations of this problem abound. A South Carolina consulting geologist testified that Litchfield Spit was not in danger of being overwashed in a hurricane (and, therefore, could be developed safely). Guess what happened in Hurricane Hugo? The spit was overwashed completely, and all the dunes were destroyed. Luckily, the development hadn't started yet. A North Carolina coastal engineer testified that a proposed high-rise building on rapidly eroding

Topsail Island would never be in danger from the forces of the sea. A University of Virginia scientist (along with the aforementioned North Carolina engineer) testified that the danger of developing Cedar Island, Virginia was greatly overstated; this in the face of its 50 feet per year erosion rate. A State of Maryland scientist estimated that an Ocean City, Maryland replenished beach might last 25 years, in spite of the fact that, so far, no U.S. East coast replenished beaches north of Florida have lasted longer than 5 years. As it turned out, much of the Ocean City replenished beach was lost in the March, 1989 storms, 6 months after the beach was put in place. A Florida engineer estimated that a replenished beach on Assateague Island, Maryland would last at least 40 years.

What is even more distressing to me is what I perceive to be a widespread acceptance of this practice among my fellow coastal scientists and engineers. The reasoning or rationalization goes something like this:

You've got to find the "truth" in the context of your customers' need. If you don't, you'll never be asked to consult again. Besides, in coastal geology, we're dealing with an awful lot of uncertainties and no one knows for sure just how the sand and shoreline will behave.

The possibility of earning a large consulting fee for making a brief client-serving written or oral statement is a temptation many cannot overcome. A number of the consulting coastal scientists or engineers are academicians and the prestige of their universities adds significantly to the impact of their statements. Of course, some consultants are scrupulously honest. Too many think they are. They seem to make two

Continued on page 38

Truth in Science

Continued from page 7

separate worlds out of basic and applied science. They do commendable, even outstanding, work on the basic principles of nearshore sedimentation and sedimentary processes. Yet, when it comes to the world of applied science, they serve the needs of their clients regardless of where the truth lies. It's almost a Dr. Jekyll and Mr. Hyde existence.

The nature of the coastal environment actually is part of the problem. There are a lot of uncertainties such as storms. Because of the uncertainty of the timing of storms, they are often used as cover-up for poor advice. Almost every time a shoreline project fails, a sea wall crashes in, a replenished beach disappears, buildings are flooded, the public is told that an "unexpected" or "unusual" storm did it. Why this is an acceptable excuse is beyond me. Imagine a consulting engineer covering up his poor advice about bridge construction after the bridge falls in by saying an unexpected storm did it.

Dishonesty, even to help a client in need, and no matter the degree of uncer-

tainty, is not acceptable. Once, years ago, I testified for the Audubon Club in what I thought was a very important case with national ramifications. In my enthusiasm for the cause, I shaved a few corners by not quite bringing out all sides of the issue. I didn't tell any lies, I just didn't quite tell the whole truth. After all, it was a most worthy and environmentally important issue. A few weeks later, after some prodding by a graduate student, it slowly dawned on me that I was guilty of the things I most strongly criticize about other consulting scientists.

My Audubon experience was walking a mile in my neighbor's moccasins. Separating science from politics or environmental realities can sometimes be very difficult. I have learned one must accept the fact that at times the whole scientific truth may complicate and even compromise environmentally sound policies. Walking the straight and narrow becomes even more difficult when the opposition is not doing likewise. Personally, I now find the situation so difficult and so uncomfortable that I am reluctant to consult, even for the "good guys." However, I strongly believe that society stands in great need of the unbiased and "unattached" views of

academic scientists and engineers.

What has brought coastal science to this state of affairs? Money—and lots of it! The rush to the shore during the last two decades has brought big money, politics, coastal management and an ocean-loving public all into a jumble at the shoreline.

Attempts to override Coastal Management regulations abound. Since the regulations are usually based in part on science, it takes scientists or engineers to override them. Most of the regulations are in place to promote environmentally and economically sound use of the shore and to save lives and property in the next storm. Thus, most of the unsound or dishonest scientific testimony I object to (including all of the examples above) is against good environmental practices and promotes unsafe development.

Painful and monetarily unprofitable as it may seem, there is no substitute for integrity in applied science. Distortion and half-truths should not be condoned. The same standards of integrity and honesty should apply to both basic and applied science. There should not be a difference between them.