4-1-2010

Fun, Fun, Fun Till the Waters Take the Beaches Away

Briana Ellis
Marquette University

Undergraduate recipient (Freshman/Sophomore category) of the Library's Maria Dittman Award, Spring 2010. Paper written for English 1001 (Rhetoric and Composition) with instructor, Emily Blanchard.

Briana Ellis
RC 1.176, FA 09
Emily Blanchard
Unit 3 Essay

Fun, Fun, Fun, Till the Waters Take the Beaches Away

A perfect scene: smoothie in hand, favorite music blasting in your ears, and the feeling of the sun warming winter-white skin. Now imagine this without the smooth sand beneath your towel and the sound of waves crashing in the background. The beaches populated by relaxing vacationers face danger of being wiped away in addition to the small coastal towns that rely on them for financial success. Even though ocean waters consume the environment that many unique animals call home, beach erosion often takes a backseat to other environmental concerns such as global warming. About 70 percent of the world's beaches currently experience erosion trends (Deidun 96). This figure is estimated to be even higher in the United States and the problem will just keep getting bigger as water levels continue to rise. Although scientists cannot agree on a clear solution to the erosion problem, beach nourishment projects have the most potential for saving these natural treasures before it's too late.

Scientists have been successful in charting the trends of beach erosion using maps, aerial photos, and global positioning systems (Pajak and Leatherman). By viewing historical shoreline positions, it is apparent that the rate of erosion has recently increased due to a variety of factors, both natural and anthropogenic. The global temperature increase weakened the current systems that pull water away from the shore and melted polar ice, causing the land to rise. According to David A. Fahrenthold, an author for *National Wildlife* magazine, man-made greenhouse gases are largely at fault for producing the warmer water that expands in volume, therefore causing higher, stronger, and more damaging waves (Fahrenthold). Alan

Deidun, a University of Malta biology professor, emphasizes that the construction of tourist facilities and roads also alters the sediment supply to beaches (96). Port Canaveral, a ship channel built to facilitate movement of water traffic in Florida, caused erosion of Cocoa Beach due to the absence of a sand bypassing system. A total of one billion cubic yards of sand, enough to fill a football field over 100 miles high, has been removed by human factors (Douglass 43).

The erosion resulting from these unintentional threats has a negative impact on animal life and the economy, especially along the mid-Atlantic coast, where sea levels rise one-eighth of an inch every year, faster than any other area of the world. In Calvert County, Maryland, the rare northeastern beach tiger beetles, diamond terrapins, endangered turtles, beach mice, and plovers depend on the coastal environment to survive. Erosion killed several maritime forests that used to be hundreds of yards inland, exposing roots and leaving only blackened tree trunks. A resident of Calvert County claims that the beach that first drew visitors to the small town in 1890 is now “three blocks long and so skinny that a Frisbee could be thrown clear over it”. The town depends on the beach to support its economy and spends at least $25,000 each year to rebuild it with “trucked-in” sand. Efforts to rebuild the beaches are often made too late, evident in at least five Maryland towns where the only beach that remains is in the name (Fahrenthold). As average global temperatures continue to rise, something must be done to save the wildlife and residents who call the beaches home.

One method often thought to successfully protect coastal areas is armoring. Armor can include man-made seawalls or rock piles. At a conference at the Skidway Institute of

Oceanography in Savannah, Georgia, coastal geologists concluded that fixed shoreline structures such as these simply prolong the life of beach buildings but "almost always accelerate the natural rate of beach erosion", resulting in total loss or severe destruction of an open beach (Dean 16). James Titus, the author of an Environmental Protection Agency study of sea-level rise in the mid-Atlantic, explains, "The beach just continues to erode right up to the wall … You put a wall in the way, and you have a wall and the water" (qtd. in Fahrenthold). Armor is expensive to install and maintain and often gives developers the impression that more construction is feasible. However, erosion is typically not a problem in areas where no buildings or farms are present (Dean 16). Rocky breakwaters increase the incidence of downstream erosion and cause birds and shellfish to lose their habitats. Despite these negative outcomes, over one-quarter of Maryland's shoreline is armored while 20 miles are armored each year in Virginia (Fahrenthold).

Scott L. Douglass, a civil engineering professor at the University of South Alabama, claims that beach nourishment is a better solution to the erosion problem. His book, *Saving America's Beaches: The Causes of and Solutions to Beach Erosion,* explains that nourishment widens the coast through the "placement of large amounts of good quality sand on the beach" (57). Each project is specifically designed using geology, oceanography, ecology, and civil engineering techniques and high-tech computer simulations. Over 300 miles of coast have been saved, including the beaches of Miami Beach in Florida, Santa Monica in California and Coney Island in New York (59). Nourishment quickly restores ecological value if the new sand is somewhat similar in grain size and distribution, shell fragment, color, and mineral content to the native sand. These factors also determine project cost and physical performance (69). The

best sources for qualified sand are often underwater sand deposits, ebb-tidal or flood-tidal shoals, ancient offshore sand deposits, or navigation channels that need dredging (70). One project in southern Florida imported sand from the Bahamas (71).

Although most professionals such as Douglass oppose armoring techniques, some also claim that beach nourishment is not a viable solution. Re-nourished beaches don't feel the same, often due to the slightly different texture or color of imported sand (Dean 115). Many beach nourishment projects have been criticized as "unnatural, expensive, and ultimately futile because it washes away". In recent years, every President of the United States, regardless of political party, has tried to convince Congress to no longer fund the projects with federal money (Douglass 79). Even though the re-nourishment of Miami Beach was successful, the project cost more than originally thought and sand washed away faster than anticipated. After observing several project outcomes, the National Research Council stated that "there is still not an adequate methodology to predict their [artificial beaches'] detailed performance" (Dean 95). More must be known about how the sand moves before the longevity of each individual project can be determined.

We should, however, begin beach nourishment projects in order to save the world's beaches because the negative claims are outnumbered by positive outcomes. Douglass, a consultant on coastal engineering projects nationwide, emphasizes that although sand used to re-nourish an eroding beach will eventually wash away, it travels downstream only to feed another beach (66). Most beaches will need to be re-nourished a second time, but for each consecutive restorative effort, less sand is needed (64). Beach nourishment can save coastal

homes and shoreline sands much like armoring techniques have proven to do. During a storm, a wide, healthy beach acts as a "buffer zone". For example, homes behind nourished beaches along the Carolina coast were not damaged during hurricanes Dennis and Floyd in 1999, but homes at the end of beaches did suffer extensive damage (60). Spending $20 to $120 per year per foot of sand (76) may seem like a waste of federal and private money, but compared with the total economic value of the beach, nourishment serves as a relatively inexpensive solution (78). As Howard Marlowe, a Washington lobbyist for beach communities, puts it, "… beach replenishment is worth the investment- for our economic infrastructure, environment, and the beauty of coastal regions" (qtd. in Douglass 76). Nourishment remains the most promising solution for the sake of residents, animals, and tourists.

Many areas of the United States rely heavily on sandy beaches for a healthy economy. Ocean City, Maryland, spent $7 million in 2006 on 100,000 dump trucks full of sand in order to save the area's tourist appeal (Fahrenthold). A Florida Atlantic University economics professor estimates that about 400,000 jobs and about $8 billion in payroll come from tourism associated with the state's beaches (Douglass 4). These areas can't afford to lose the beaches and neither can the wildlife that requires the unique environment for survival. Stephen P. Leatherman, director of the Laboratory for Coastal Research at the University of Maryland says in reference to the dire situation of our nations beaches: "… almost everything being done to combat it [erosion] was pointless, pernicious, or unaffordable" (qtd. in Dean 15). Beach nourishment, however, is not "pointless". Virginia Beach, Virginia, has replenished millions of tons of sand over the past several decades. Those relaxing on this beach, smoothie in hand and sand beneath their towel, have nourishment to thank for a perfect scene.

Works Cited

Dean, Cornelia. *Against the Tide: The Battle for America's Beaches.* New York: Columbia University Press, 1999. Print.

Deidun, Alan. "Beaches- more than just sand and fun." *Biologist* 56.2 (2009): 92-97. *EBSCOHOST: Academic Search Complete.* Web. 29 October 2009.

Douglass, Scott L. *Saving America's Beaches: The Causes of and Solutions to Beach Erosion.* Singapore: World Scientific Publishing Co., 2002. Print.

Fahrenthold, David A. "Slip Sliding Away." *National Wildlife* 47.6 (2009): 38-41. *Academic Search Complete.* Web. 29 October 2009.

Pajak, Mary Jean, and Stephen Leatherman. "The High Water Line as Shoreline Indicator." *Journal of Coastal Research* 18.2 (2002): 329-337. JSTOR. Web. 29 October 2009.