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June 2005

Poor Results Prove Need for Overhaul of Beach-Fill Policy

*Investigative Series: 3 of 3. [Read part I] [Read Part II]
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As this summer approached, bulldozers bellowed smoke, dredges chipped away at the continental shelf, and millions of cubic yards of sediments were deposited on Florida beaches. The Florida Dept. of Environmental Protection (DEP) had permitted 34 dredge-and-fill projects for beaches around the state. Among these, a rapid shoring up of beaches in St. Lucie County, affected by last fall's Atlantic hurricanes.

In April, Coastal Planning & Engineering had sediments trucked in from an inland mine at the corner of Indrio Road and I-95 for a shoreline restoration project in St. Lucie County. Typically, the mine produces roadbed material, mostly clay, fine sediments and crushed rock. The sediments were steamrolled into a hard-packed berm onto the beach face. St. Lucie beaches have ranked second in turtle nest numbers in the state and boasted vast, healthy nearshore reefs. The beaches are famous for pompano fishing.

Dr. Hal Wanless, Chair of Geological Sciences at the University of Miami, drove up to inspect the damage.

Wanless said, "The sediment they put down here is unsuitable. There are clods of clay and such a high proportion of fine material. It has nothing to do with the beach sand on any of Florida's beaches. This is going to be a permanent time release of mud into the system."

For weeks, water color and consistency resembled diarrhea along Hutchinson Island.

"But it met DEP standards," insisted Richard Bouchard, St. Lucie County's coastal engineer. Bouchard is a director on the board of the Florida Shore & Beach Preservation Association, the organization that lobbies state and local legislators for coastal dredging and related "shore-protection" projects. Martin County engineer (and Chair of FSBPA) Don Donaldson hadn't visited the St. Lucie site, even though only an arbitrary county line divides Hutchinson Island and Martin County's tremendous fish habitats, directly downstream.

DEP is analyzing the sediments, and Dr. Wanless doubts they meet DEP standards, which Debbie Flack (FSBPA's lobbyist) helped write, and which Wanless says aren't strict enough. He also analyzed the sediments recently placed over four miles of Martin County beaches, in the proximity of some of the state's most biologically diverse nearshore reefs.

"Contrary to what the people who are promoting this practice are saying," said Wanless, "both the St. Lucie and Martin County projects will erode rapidly, and turbidity is going to be a serious problem for a long while. The finer sediments will smother reefs."

At the southern end of Florida's Atlantic coast, yet another debacle ensued.



"A permanent time release of mud, "is how a visiting geologist described the goo dumped onto St. Lucie County beaches in April. The claylike stuff came from a site miles inland.

In April, Army Corps of Engineers Project Manager Penny Cutt, and John Studt, Chief of the Corps' regulatory branch, kick-started an 11-mile project in Broward County. Permits required contractors to transplant 2,000 doomed corals, required extensive pre-construction monitoring of these transplanted organisms' health, and required the distribution of education modules for dredge operators on techniques for reef protection. As of May 1, only a few hundred corals had been transplanted—none successfully. The monitoring hadn't been completed, and the Corps passed out education modules only after the Environmental Protection Agency (EPA) and National Marine Fisheries Service (NMFS) sent stern letters.



At left is natural sand from a beach north of Fort Pierce Inlet; at right is offshore borrow material that was pumped onto Martin County beaches. Given a shake, the natural sand settled out in seconds, while the borrow material fouled the water indefinitely.

"The contractor destroyed existing nearshore hardbottom with giant boulders they brought in to imitate low-relief reefs," said Dan Clarke, director of Cry of the Water, an independent monitoring group.

"They're just big, algae-covered, slimy boulders," said Dr. Ray McAllister, Professor Emeritus of Ocean Engineering at Florida Atlantic University, and author of the popular dive guide, *McAllister's Guide to Reefs*. "A few of the transplanted corals are alive, but they have white plague. In short, the mitigation is a dismal failure."

"We're hoping to resolve this locally," said Miles Croom, from NMFS Habitat Conservation Division. NMFS recently proposed elkhorn and staghorn corals for listing as threatened species under the Endangered Species Act. Acres of staghorn are threatened by the Broward project.

In certain areas, appropriate beach-fill projects may be necessary to maintain turtle and shorebird nesting habitats. But Wanless and other leading geologists say that if maintaining biological diversity in coastal Florida is a

goal, more rigorous testing for sediment compatibility and durability is a must.

"For lots of reasons what's good for turtles is good for Floridians," said David Godfrey, executive director of the Caribbean Conservation Corporation, our nation's oldest sea turtle conservation group. "Like people, turtles need clean healthy beaches, sandy dry areas, clean water and healthy reefs."

Howard Marlowe, a Congressional lobbyist, often touts massive beach-fill projects as turtle-habitat restorations.

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Tampering with beach composition and topography jeopardizes nearby coral reefs and endangered sea turtles, inset.

But, experts say that a one-size-fits-all, big-square-template actually harms turtles. According to Duke University geologist Dr. Orrin Pilkey, filled beaches erode two to twelve times faster than native beaches, and leave high dropoffs, called escarpments, that turtles can't climb. The long beaches can cause "false crawls," and if compacted, sediments can make it difficult for adults to dig nests and juveniles to climb out. Plus, the dark material elevates nest temperatures—turtle sex is determined by nest temperature.

One avenue to reform involves defining a healthy beach by its natural attributes rather than by width. And that would entail DEP moving toward a system of beach-by-beach erosion analysis, and custom beach-fill templates.

"Look at the Archie Carr Refuge, look at Tortuguero, Costa Rica. The most productive turtle-nesting beaches in the world are narrow, high-energy beaches," said Godfrey.

Other erosion-control engineering solutions have been implemented with varying success around the world. Sand transfer plants, such as those at Palm Beach Inlet, restore the natural littoral flow of sediments where jetties have interrupted the process. The world's most sophisticated sand transfer system, in Tweed River, Australia, annually deposits 600,000 cubic meters of high-quality sand—nearly half the volume of one of Florida's larger dredge-and-fill projects—on the downstream side of the inlet. But, so far, South Florida has only one major fixed transfer plant and it can't keep up with sediment migrating into the inlets, and its maintenance has been erratic. So, periodic inlet maintenance dredging is required. Generally, the sand in the inlets is of high quality, and can be used to re-nourish the erosion hotspots that invariably occur on the south side of jetties on Florida's Atlantic coast.

Offshore breakwaters that absorb wave energy have also been used to stabilize beaches. Dr. Kerry Black, an oceanographer from New Zealand, seems to have successfully stabilized a beach on Australia's high-energy Gold Coast, and in the process created excellent marine habitat. But not all coastal experts are sanguine about breakwaters.

"If you place a hard structure in the surf zone it will likely cause some erosion nearby," said Pilkey .

"We're still looking for the silver bullet," said DEP's Phil Flood.

It seems that sound sustainable development policies and a retreat strategy are the only medium- to long-term ways to have healthy beaches and navigable inlets.

"In places where the shoreline is critically eroding, beachfront property is sort of like the new swampland in Florida. We don't really know how long it's going to be there, and you're taking a great risk by buying, building or living in these hazardous areas," said Godfrey.

California and North Carolina have both set managed retreat precedents, but Florida has yet to address this issue (see managed retreat case studies at www.kqed.org/coastalclash.)

"We need to explore incentive-driven ways to move back in some areas, in ways that aren't confrontational, through programs such as tax advantages and conservation easements," Godfrey said.

Many interest groups spent 30 years convincing the Corps that shoreline armoring isn't sustainable, and even the American Shore and Beach Preservation Association (ASPBA) may support some alternatives to seawalls and massive dredge-and-fill projects. Marlowe, for example, is excited about an artificial reef/breakwater pilot program in California. And, outdoorsmen working under the ASBPA aegis suggest a different tack.

"Shorelines are dynamic, and the concept of allowing the shoreline to retreat conflicts markedly with 'static' perspectives and perhaps also the short-term nature of politics and lobbying considerations," said Bob Battalio, a waterman, coastal engineer and California Shore & Beach Preservation Association board member. "I think this is the 'undercurrent' that's pulling us down and it needs to be addressed."

But in response to the second report, Howard Marlowe sent Florida Sportsman the following email.

"Perhaps you will find this 'appalling.' I, however, find your poor excuse for journalism to be appalling," he wrote.

As noted in the second report, Marlowe aggressively attacks anyone who questions the environmental impacts or the social/economic equity of large-scale coastal dredging. We suggest the really appalling claims reside within Marlowe's uniquely arrogant and ignorant press releases, for example the absurd attacks on independent biologists in a March 2004 press release (go to www.floridasportsman.com).

Influential lobbyists may try to drown the voices of recreational users, independent scientists, and taxpayers far from beachfront properties. But the author and editors associated with this investigative series are comfortable in asking rigorous and overdue questions about the excessive reliance on massive dredge-and-fill projects for erosion control, serious conflicts of interest that result from the dredge lobby and associated consultants governing our beaches, the continued denial of any possible impacts to reefs and fisheries, and regulatory impotence stemming from the Army Corps of Engineers' uniquely powerful tripartite position as advocate, funder, and permitting body for massive dredging projects.

Florida Sportsman will keep a badly needed spotlight on Florida coastal management, and we encourage readers to come to us with their concerns.

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