

SHORE Break

BY LYNN R. PARKS | PHOTOGRAPHS BY CHUCK SNYDER

Shoreline changes that follow beach replenishment projects spark complaints from wave riders — and safety concerns from others

Jim McGrath isn't certain of the exact day. But sometime in July 2014, he wandered down to the beach from his Bethany Surf Shop and noted how rough the surf was.

"There must have been a storm out in the ocean," he says. "Whatever it was, the swell was big and there were some really nasty shore breaks."

The waves were crashing onto the sand with such intensity, he recalls, that "people were getting hurt like crazy." He told a nearby member of the Bethany Beach Patrol that the beach should be closed. "Swimming in that was a good way to get killed," he recalls.

And sure enough, a short time later

the beach was closed. Lifeguards posted signs warning that it was not safe to venture into the water.

Of course, Delaware's Atlantic beaches have always had their occasional days of heavy surf — days that wave riders of all sorts welcomed with relish. But in recent years the state's shoreline has changed so much that a day at the beach, heavy surf or not, sometimes isn't as much fun as it used to be, McGrath asserts.

Sand replenishment projects have made the slope steeper, he notes, and have covered up groins and jetties that used to make waves start to curl farther from shore. Now, waves don't break until



An incoming wave carries a line of surfers and boogie boarders to shore.



People familiar with coastal Sussex beach conditions say renourishment projects have reshaped the shore break, creating dangerous conditions for swimmers like these young women, surfers and people just wading in shallow water.

Groins and Jetties

Although many Delaware beachgoers refer to the rock-and-timber structures jutting out from local beaches as “jetties,” they are more accurately called “groins.”

Groins are built perpendicular to the shoreline. Intended to control erosion, their purpose is to trap sand being carried along the coast, suspended in the waves.

Jetties are much larger structures, typically constructed to stabilize shorelines along waterways, such as at Indian River Inlet and Roosevelt Inlet in Lewes. ■

tively impacted surfing in Delaware by steepening shore slope angles, causing waves to break closer to shore, and by burying groins in sand,” the report says. The beaches it cites where waves are no longer good for surfing: Cape Henlopen at Gordons Pond, Rehoboth Beach, Dewey Beach, Delaware Seashore Tower Road, the north side of the Indian River Inlet, Bethany Beach and Fenwick Island.

And to some, there’s more to this situation than simply a loss of surfing spots. Herlihy and McGrath both say that the new beach conditions are dangerous — for swimmers as well as for surfers and even anyone who just likes to wade in the shallows.

“The waves now come in with such force,” McGrath says. “Even a small wave throws you down so hard that you can be injured.”

Dan Herlihy, Colin’s dad, has been surfing Delaware waters for more than 50 years. “The changes are quite

they hit the shore, making many of the state’s beaches unsuitable for surfing.

“In the old days, we used to surf for an hour a day, or even two,” McGrath says. “Now, that’s all gone, gone, gone.”

Colin Herlihy agrees. A native of Bethany Beach and owner of the Wave Riding School in Ocean City, Herlihy has been surfing for 30 years — since he was 4: “I would ride my bike to the beach every day to surf. Now, I don’t even try. They have ruined it for surfing. Sometimes, I just stand on the boardwalk and look out over the ocean. It definitely makes me sad.”

When Herlihy and McGrath want to surf, they head south to Assateague Island. There has been no beach replenishment project at that barrier island, and the waves break the same as they always have.

In a 2014 report titled “The State of Surfing in Delaware,” the Delaware chapter of the Surfrider Foundation (an international group dedicated to protecting the world’s beaches) says that of the nine coastal Sussex beaches that used to attract surfers, only two — at Cape Henlopen State Park’s Herring Point and the south side of the Indian River Inlet — remain surfable.

“Most surfers agree that beach nourishment has nega-

obvious,” he says. “I saw a big difference as soon as the first replenishment project was done. Now just a 2-foot wave is potentially dangerous.”

Joe Donnelly is captain of the Bethany Beach Patrol. He acknowledges that following replenishment projects, waves that roll ashore aren’t great for surfing.

“Beach nourishment changes the topography and the way that waves break and we don’t get those rolling waves that people like to ride,” he allows.

But he disagrees that the beach is less safe than it used to be: “There is a noticeable difference in the beach and I understand that for a lot of people, that’s a very emotional issue. And I know that it’s a common belief among a lot of surfers that the beach is more dangerous. But there is no evidence to support that. The statistics don’t back them up.”

The Army Corps of Engineers, which oversees the replenishment projects, echoes this. “It’s important to bear in mind that the oceanfront itself is an inherently haz-

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Beach replenishment work takes place in Rehoboth in 2012. Supporters say pumping sand to widen beaches and fortify dunes helps offset erosion and lessens damage during storms.

A Fisherman's View

Surfers aren't the only people complaining about the effects of beach nourishment. Rich King, a regular surf fisherman and owner of the website *Delaware Surf Fishing*, says that with the seaward beach extensions, the fishing isn't as good as it used to be.

"Replenishment changes the 'structure' — holes, sandbars and shoals — that hold fish," he says. "When that structure is filled in, it no longer holds fish."

Over time, King says, currents move sand around, which re-creates the structure. But that process can take a couple of years.

King would like to see the planning for beach replenishment have a broader focus. "Recreation is never considered by these projects," he said. "Planners just think about protecting property, and creating pretty beaches for people to sit on and enjoy the view."

And that runs contrary to the history of coastal Sussex, he adds: "Most if not all of our beach towns were created around the fishing and recreation industries." ■

ardous environment," says Edward Voigt, spokesman for the corps' Philadelphia office. "The presence of lifeguards in almost every beach community is testament enough to that fact. We simply have found no statistical, factual basis for directly correlating beach nourishment one-on-one with swimming or surfing injuries."

What the numbers say

Delaware's first major beach project was done in 2005 in Rehoboth Beach, Dewey Beach and Fenwick Island. Major projects followed in Bethany Beach and South Bethany in 2008. Beaches were extended seaward to provide more room between the surf and oceanfront properties and to allow space for construction of grassy protective dunes.

Replenishment projects were done again in 2009 (Rehoboth, Dewey, Bethany and South Bethany), 2011 (Bethany, South Bethany and Fenwick Island) and 2012 (Rehoboth, Dewey, Bethany and South Bethany). Another project in 2013 at all five beaches restored areas damaged in October 2012 by Hurricane Sandy.

The wider beaches and the dunes were credited with limiting Sandy's impact on Sussex County's ocean resort communities. But the wide beaches also meant that groins that had extended into the ocean, many of which were built in the 1930s, were buried in sand. The Surfrider Delaware chapter says that construction of those groins is what made for surfable waves in the first place. When water runs into the structures, the natural flow of sand that is riding in on the waves is interrupted and sandbars form. Those



Jason Wilson, of Dewey, says the new surf conditions are favorable for skimboarding, but detrimental to surfing and even swimming.

deposits of sand mean that waves, traveling over an uneven ocean floor, start curling sooner than they would otherwise.

In addition, replenishment projects made the beaches higher, creating a steeper slope down to the ocean. Waves are affected by their "swell period," the length of time that they travel over shallow water. As the friction of the ocean floor slows them down, the wave energy is pushed upward, causing an increase in height. A gradually sloping ocean floor makes for a taller wave as well as one that curls over more slowly, something that surfers love. More steeply sloping bottoms result in a faster wave with a more upright face.

Jason Wilson, owner of Alley-Oop Skim in Dewey Beach, says that for skimboarders, especially experienced ones, the new surf conditions are good, because they can ride up the waves that roll onto the beach. "We like heavy shore break," he says.

But, he adds, "as a general statement, I would say that beach replenishment has made surfing conditions on our beaches worse. The waves don't roll into the beach as much. You have deep water, then you get to the shoreline, and the waves just slam onto the beach."

And he agrees with Herlihy and McGrath that the beach isn't as safe as it once was: "Swimming conditions are potentially dangerous. You walk in and all of a sudden you are in chest-deep water. The waves are slamming into the beach and it's hard to swim. It's tough even just to hang out on the shore." ►

A Physician's Perspective

While the University of Delaware and the state study whether Sussex beaches are different from how they used to be, Dr. Paul Cowan, chief of emergency medicine at Beebe Healthcare, is conducting an investigation too. It has nothing to do with beach replenishment; rather, he is trying to figure out what environmental variables make it more likely that someone standing or swimming in the surf will be injured. The variables being examined include water temperature, wind speed and direction and wave height.

The Beebe study, being done in collaboration with DNREC, the University of Delaware and five ocean beach patrols, is in its sixth year. It started when Cowan noticed that people coming to the emergency department with surf-related injuries seemed to come in clusters. "Some days, we would see a lot of injuries, then we would have a period of time where there were very few," he says. Cowan wanted to find out why that was, so beachgoers could be warned of conditions more likely to cause injuries.

He keeps a record of people who arrive at the emergency department during the summer months with injuries incurred while in the surf. Those injuries range from scrapes and abrasions to broken bones, even death. Some have occurred when the injured person was only ankle-deep in water.

Through Labor Day 2014, 1,519 people had been included in the study, which Cowan says isn't extensive enough to draw any conclusions. But he does offer one piece of advice for anyone going to the beach: "Never turn your back on the waves. You wouldn't try to cross Route 1 blindfolded. Ignoring the ocean when you're on the beach is kind of the same thing." ■


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“There are so many variables that go into whether someone gets in trouble.”

Donnelly of the Bethany Beach Patrol says that records simply don't back up that assertion. In the past 10 years, he says, the number of medical emergencies on Bethany Beach has remained fairly steady.

Even so, those records do show an increase in medical emergencies following the initial beach rebuilding project. In the summer of 2008, the first summer with the new, wider beaches, lifeguards responded to 28 medical emergencies requiring that an ambulance be called. That number was up from 11 the year before. (The beach patrol records don't break out the number of medical emergencies that involve a surf injury. Included in those 28 calls could have been people having heart attacks, for example, or suffering from sunstroke.)

In 2009, following the second project, there were 24 medical emergencies. Since then:

- 2010, no replenishment project — 15 emergencies
- 2011, no project — 19
- 2012, after third project — 20
- 2013, no project — 15
- 2013, after post-Sandy repairs — 15
- 2014, no project — 10

Donnelly insists that there is no rhyme or reason to explain when surf injuries occur. “There are so many variables that go into whether someone gets in trouble,” he says. “The weather. The number of people on the beach. Whether it's raining or hot or sunny. Whether the surf is heavy or light. It's so random; to try to draw conclusions based on anything is a frustrating process.

Doing Right by Surfers at Herring Point

In its report “The State of Surfing in Delaware,” the state chapter of the Surfrider Foundation points to Herring Point, on the southern end of Cape Henlopen State Park, as one place where the state took into account the concerns of surfers in a project to replace dilapidated groins with new ones. That project “demonstrated the potential success in collaborative shoreline management planning,” the report says. Other projects, to replenish washed-away beaches, have been completed “with little or no consideration of surfing.”

Herring Point is the one of two spots where surfing is still possible in Delaware, the group says. A photograph in the report, titled “Surf Break Created by Groin Effect,” shows the beach at Herring Point; several waves are rolling into shore after beginning to break on the seaward end of the stone groin.

According to Kimberly McKenna, a coastal geologist with the division's Shoreline and Waterway Management Section, groins were initially built at Her-

ring Point by the U.S. Navy, when the area was still part of Fort Miles. The structures — low seawalls built at a right angle from the shore — helped to protect a bluff in which one of the fort's batteries was built. The construction probably occurred in the 1960s, she says.

That section of the shoreline was turned over to the state by the federal government in the 1970s.

Thirty years later, the groins were falling apart and the bluff was threatened with erosion. “So around 2006, [representatives with] the Shoreline and Waterway Management Section met with local stakeholders — surfers, surf fishermen, beach users and historical interest groups — to discuss options for protecting the bluff,” McKenna says. The group decided to rehabilitate the two existing groins.

McKenna acknowledges that that project did take into account what the surfers wanted. “But the design had to satisfy the needs of all the user groups,” she adds. ■

People want a reason for something. They want to pinpoint something, I understand that. But in this case, you can't pinpoint anything.”

Douglas Scott, emergency medical services chief with the Bethany Beach Volunteer Fire Co., agrees with Donnelly that there isn't any correlation between sand replenishment and the number of surf injuries his department responds to. Even so, he acknowledges that the beach has changed. “I grew up here and I know that there's a difference in the beach,” he says. “The waves used to roll in nice and easy. Now, there really is a shore break. People just have to be careful.”

Kent Buckson, captain of the Rehoboth Beach Patrol, tells a different story. He has coined a new phrase for the area where water meets sand: the “impact zone.” The slope of the replenished beach is such that there is a “trough” between it and the surf, he says.

“People get caught in that trough,” Buckson explains. “When they see a big wave coming, they try to run out and it's hard because the beach is so steep. They

turn their backs on the waves to run better, then they get caught from behind and the wave slams them down on the beach. That's when we see injuries.”

For people riding waves on boards, “that slope makes for a dead stop,” he adds. “There's no more just gliding in on a wave.”

Statistics from Buckson's beach patrol seem to back him up. Between 2001 and 2014, the number of spinal (including neck) injuries that lifeguards responded to peaked at 38 in 2005, the summer that first rebuilding project was completed. The previous year, there were 12. The number has dipped below 20 only two years since then, in 2007 (17) and in 2013 (six). Last year, lifeguards in Rehoboth responded to 28 spinal injuries.

“I understand that beach replenishment is necessary,” Buckson allows. “We don't want to have property damage in storms. But the way the beach is now can hurt a lot of people.”

Tim Ferry, captain of the Fenwick Island Beach Patrol, says that immediately following sand nourishment projects,

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surf conditions are pretty rough. But he notes that in Fenwick, natural sand movement soon takes care of that. This summer, he says, “the beach is in great shape.”

And he disagrees with Buckson that the beach replenishment projects have made the beaches less safe than they used to be. “I don’t see any significant increases in beach medical injuries after beach replenishment,” he says.

Slope and sand grains

In the face of complaints from the surfing community, the state’s Watershed Stewardship Division and the University of Delaware’s Center for Applied Coastal Research are conducting a study to determine what changes, if any, have occurred along the state’s ocean shoreline. Kimberly McKenna, a coastal geologist with the division’s Shoreline and Waterway Management Section, says that the study was started in August 2014 and is expected to be completed in August 2016. Scientists are collecting information about the beach profile from the landward toe of the dune, through the surf zone and out to a water depth of 30 feet and making

comparisons to see how it has changed over time.

The state has consistently measured the beaches since the 1990s and has some data dating back to the 1960s, McKenna says. Now, measurements are taken twice a year, in the winter and again in the summer.

“We have been hearing complaints for many years now, and this study will give us a good scientific base so we know what’s happening,” she explains. “After we know what the data says, we will sit down with the people who design the beaches to identify the key elements in future designs.”

The cost of the study is \$236,521, with funding provided through the state’s Beach Preservation Act.

McKenna is hesitant to say whether beach replenishment is causing the problems that surfers and others describe. “That is something that we are trying to answer,” she says.

Dr. Jack Puleo, an associate professor with the UD Center for Applied Coastal Research who is working on the study, notes that the quality of the sand pumped onto the beach from offshore — its density

as well the size of its grains — could affect the beach slope.

Indeed, the coarseness of the imported sand is something else that Herlihy, McGrath and Wilson have noticed. “Now, it’s almost like a cobblestone shoreline,” Wilson says. “It’s not the fine sand that we used to have.”

“After that 2005 project, the beach was made up of pebbles and rocks,” Buckson says. “It was a nightmare.”

McKenna acknowledges that that early project deposited “more gravel than was expected.” Sand used in recent projects has come from the Fenwick Shoal, the shallow area just off the Atlantic coast that the Fenwick Island lighthouse was intended to warn sailors to stay away from. The shoal “has been a good source for sand and matches the ‘native’ grain size,” she says.

Seeking a better way

Fenwick beach patrol captain Ferry asserts that as the sand replenishment projects have progressed, they have gotten better. In addition to a higher quality of sand, the grading has improved to create a more natural beach.

Buckson agrees about the sand. But he isn’t so sure about the grading. He’d like to see Rehoboth Beach kept at a lower elevation, lessening the drop-off to the water.

Buckson also suggests that the state replace the groins and put sandbars in about 100 yards offshore of the state’s resort towns. That suggestion has the support of the local Surfrider chapter. “The state of surfing in Delaware will continue to deteriorate unless shoreline managers begin to consider surf break restoration in the design and implementation of projects,” its 2014 report says.

Those groins would act as the old ones did: to encourage waves to start curling farther out. They would also, Buckson predicts, lessen the energy of the waves so that beach erosion would be diminished and replenishment projects wouldn’t have to be repeated so frequently. Now, the resort beaches are slated for renourishment every three years.

Colin Herlihy, the veteran Bethany Beach surfer, believes that the solution lies in the Army Corps of Engineers taking into consideration surfing and other beach recreation activities when they design replenishment projects. “It seems like they don’t even know what a good surfing wave is,” he complains.

But the projects that the state has conducted so far are designed with one purpose in mind, and that’s to protect the beach and oceanfront property from flooding. “The goal here is storm protection,” McKenna says. “It would have to be up to the design engineers to determine if the modifications proposed by the surfers would work.”

“We design these projects based on optimal level of storm protection; all other benefits are ancillary,” says Voigt with the Army Corps of Engineers. At the request of a community, the corps “will consider recreation,” he adds. But any changes to the plan cannot “compromise flood risk management benefits, increase cost or delay construction.”

Buckson believes that making the beaches better for recreation would be worth whatever effort or money it would take.

“When you do projects that change something that is visited by thousands of people, you need to design them so that they don’t hurt anybody,” he says. ■

Lynn R. Parks is a regular contributor to Delaware Beach Life.

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