

2017 COMMUNITY UPDATE



Geotubes covered by a sand template currently protect Baxter Road and homes along 950 feet of shoreline.

After 4th Winter; Geotubes Still Working Great

Thanks to the residents of Nantucket, we've been given a chance to protect our historic community. We have made it through four winter storm seasons, since the installation of the remarkable geotube system in January 2014. The pilot project is still working great to protect the most vulnerable stretch of Baxter Road, without harm to the bluff and nearby beaches.

Is Any Harm Being Done to Others?

Over the past four years we have supplied sand to the top of the geotubes, keeping them covered and providing material that washes away during large storms in a way that mimics the natural erosion process. A series of in-depth scientific monitoring reports submitted to the Nantucket Conservation Commission have determined that **no negative impacts have appeared.** (See *Geotube Monitoring Shows No Harmful Impacts* in this issue)

Time to Expand the Project

The next step is to expand the project. It is great that Baxter Road has been kept open so all can drive to Sankaty Light, and so that the few homes that are most at-risk still have access. Yet we need to protect all of the homes now being impacted

by erosion—an area from Sankaty Light to the halfway point on Baxter Road. Given the success of the project to date, and the lack of negative impact, we hope that approval will be granted sometime in 2018. Meanwhile, we are working hard to develop alternative methods for delivering the large volumes of sand in hopes that we might reduce the amount of truck traffic during the off-season when deliveries are made.

A Transparent, Open Process

Most of you have had a chance to visit our Viewing Area at 87 Baxter Road. We estimate that over 15,000 visited last year. On a typical summer day, more than 250 people stop by to enjoy the amazing view, listen to the Audio Tour, or read the educational panels that tell the story of erosion and what SBPF is doing to protect the bluff and beach in an environmentally responsible way. We hope you will follow our efforts over the coming years as we continue to learn what works, and share our results in a way that might be useful in other settings on island and for other coastal communities.

Josh Posner
President of SBPF

QUICK FACTS

- Erosion has been moving south from Sankaty Light at the rate of 70-80 feet/year on average for the last 30 plus years.
- At its closest point, the top of 'Sconset Bluff is only 29 feet from the public Baxter Road.
- Eight homes on Baxter Road have been moved or demolished leaving vacant lots and 12 more have been moved back toward the roadway.
- The town's tax base has been reduced by over \$100 million in previously taxable assessed value as the bluff erodes away. The process continues costing taxpayers as taxes (approximately \$300,000 in lost tax revenue in 2014 alone) are shifted from properties along Baxter Road to all other island properties.
- Geotubes, measuring seven feet tall with a circumference of 45 feet, are sand-filled sleeves of geotextile fabric, layered in four, step tiers at the base of the bluff.
- The geotubes are covered by sand in the amount equal to approximately 1.5 times the volume that would naturally wash away so nearby beaches are not harmed.
- The project is monitored after every major storm and 'Sconset Beach has been professionally surveyed several times a year since 1994 to track changes from the 'Sconset sewer beds to Wauwinet.

Erosion Protection Project Mimics Mother Nature

Perhaps the most pioneering aspect of the successful Geotextile Tube and Sand Replenishment Project, first installed during the winter of 2013/2014, is the way the system is designed to mimic the natural erosion process.

At the base of the Bluff, erosion protection is provided by the geotextile tubes or geotubes—gigantic sand-filled sausages made from extremely durable plastic mesh. Three to four rows of these tubes, each about 7 feet tall, 19 feet wide, and 100-200 feet long, are stacked in tiers and then covered with a thick layer of mitigation or “sacrificial” sand to form a sand template.

This mitigation sand, about 1,000 truckloads, is excavated from on-island pits and trucked to the site in the off-season. The sacrificial sand that covers the geotubes is designed to wash away during storm events, partially uncovering the geotubes, in a similar manner to bluff erosion where there is no protection.

Instead of the high energy waves hitting and eroding sand from the bluff, the waves crash against the sand-covered geotubes that extend 40 feet seaward from the bluff’s base and wash away part of the geotube’s sand cover. After major storms, sand is then pulled down from the top of the template, covering the geotubes again and getting ready for the next storm.

Sustaining the Sand Mitigation

We are unaware of any other project of this kind that provides the large volume of sand annually that we do here in 'Sconset. Keeping this mitigation effort going is one of the primary challenges over the long term. At the heart of SBPF’s current work is finding answers to the following questions:

- How much sand is actually needed annually? SBPF is currently required to provide annually 1.5 times the amount of sand that is naturally lost to erosion. Since less sand washes away than the amount being delivered, as of June 2017 the template is several feet higher than it was a year ago. There is little room to store any more sand in the template without starting to cover the



TOP: Aerial photo shows how close Baxter Road is to the edge of the Bluff

ABOVE LEFT: Mitigation sand is poured over the Bluff and spread along the sand template in the off-season

ABOVE RIGHT: Geotubes become partially uncovered after a major storm as designed. Sand will be pulled down from the template, covering the geotubes again.

vegetation on the bluff. We hope that we will soon be allowed to have a more adaptive system that provides for larger deliveries in major storm years and less in quieter years.

- How to best deliver sand to the Bluff? SBPF is investigating the possibility of dredging sand from off-shore and delivering it directly to the bluff. We are working cooperatively with island fisherman to make sure that the locations selected are not having a negative impact on the fishery. In this way we can reduce the truck traffic off-season. The costs involved are significant however, and it is unclear whether this approach is financially feasible given the amount of sand our project requires.
- How to fund the mitigation efforts? All aspects of the project including

ongoing sand delivery are paid for from voluntary contributions from area homeowners. No taxpayer funds have been used to date. We are currently working on creating an Erosion Management District that would establish a fair formula for sharing project costs among all properties that benefit from the system.

Pioneering System

During the past four years, SBPF has learned much about how to manage the sand mitigation process that mimics mother nature and makes our project unique. We hope that our efforts at engineering this project and the data we are collecting through extensive monitoring efforts will not only allow us to protect this community, but also to inform the work of others facing similar challenges.

Geotube Monitoring Shows No Harmful Impacts

The Annual Report submitted to the Nantucket Conservation Commission (ConCom) last December, which includes details of extensive monitoring of the shoreline, sand template, fishing habitat and wetlands, has shown that the environmentally friendly project is not causing harmful impacts to the bluff, beach or shoreline.

Types of monitoring being performed

Quarterly Shoreline Monitoring

Monitoring occurs at 46 points along six miles of beach, from the sewer beds in 'Sconset to Wauwinet.

The 2016 shoreline survey confirms:

- The base of the bluff has been stabilized by the geotextile tubes.
- The shoreline's current positions, north and south of the project, are historically where they were in 2005.
- There are no signs of accelerated erosion in front or adjacent to the geotubes.
- There has not been any scouring or scalloping of the beach on either side of the project.

Recommendation:

- Reduce shoreline monitoring from four to two times a year, in keeping with DEP guidance.

Annual Bluff Monitoring

Digital and 3D models made from aerial photographs help engineers determine how much sand is in the sand template and compare the volume of sacrificial sand lost in the project area to the volume of sand lost to erosion in the unprotected or control areas.

SBPF is required by the ConCom to annually provide 1.5 times the average amount of sand that is lost to erosion as part of the overall mitigation program. This is 50 percent more than the DEP guidelines normally require. As a result the amount of sand available on top of the geotubes is growing.

Currently, the sand level in the template is several feet higher than last summer.

Recommendations:

- Aerial bluff monitoring should continue to

occur annually to provide an assessment of bluff volume change in protected and unprotected areas, as well as the volume of sand remaining in the sand template.

- Follow standard practice that 100 percent and not 150 percent of the average volume of sand lost to erosion annually be replaced.

Underwater Video Monitoring

Underwater video monitoring was conducted to determine if the project is having any impact on the nearby ocean bottom.

Video was taken at 10 transects immediately offshore of the geotextile project and its adjacent areas. The survey showed no harm was being done to the cobble bottom or fish habitat, and that the cobble was not covered with mitigation sand.

Recommendation:

- Underwater video monitoring should be required once every 3 years.

Annual Drainage System Monitoring and Wetland Well Monitoring

The storm water drainage system installed on the east side of Baxter Road in 2015/2016 has been successful in stopping rainwater runoff from the top of the bluff from causing deep rivulets into the bluff's face.

Three wells were monitored in the wetland and their water levels remain consistent with historic levels showing the system is performing as designed and is not harming the wetlands.

Recommendation:

- Monitoring of the catch basin is proposed to be continued for one more year. After that time, Nantucket Department of Public Works will monitor the catch basin for maintenance, as is done for other Town catch basins.
- Discontinue monitoring of the wetland wells.

Beach Invertebrate Monitoring

Monitoring the tiny critters living in the beach can determine if the project is having any impact on their habitat. A

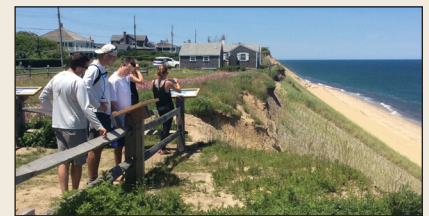
dozen samples collected from four different locations in the project area showed that the organisms—mole crab, beach fleas and other sand life were not markedly different from those species found to the north or the south of the project area.

There is no harm being done to invertebrates that live along the coastline.

Recommendation:

The invertebrate monitoring should be discontinued.

The Geotube and Sand Replenishment Project has been proven by scientific and engineering experts to be environmentally safe. Data from extensive monitoring has shown that year-after-year no harm has been done to the bluff in the project area and to the adjacent beaches. We've learned a great deal from our efforts to protect 950ft of the bluff at its most vulnerable point, and hope to put this knowledge to future use to protect the entire bluff.



VISIT OUR OBSERVATION AREA

Each year, 'Sconset Beach and bluff are at risk for further erosion — in some recent difficult storm years, up to 30 feet or more have been lost from the bluff. Visit our observation area at 87 Baxter Road to learn more about our efforts to protect and preserve this special place.

- Chat with our summer interns (see page 4), who can answer questions and point out project highlights.
- Listen to our audio tour at 508-443-6443.
- Follow us on Facebook (www.facebook.com/sconsetbeach) and Twitter (@SconsetBeach) for regular updates and announcements about events.



Living in 'Sconset

By SBPF Intern Austin Bentley

Spending summers in 'Sconset is paradise. All of us in this community who share this experience are truly blessed. 'Sconset evokes a sense of wonder. If you grew up in our community, poised near an endless horizon of ocean, then you, too, might think of 'Sconset as something more meaningful: home. 'Sconset will be home for the rest of my life, and for generations to come. Sankaty Head Light, a beacon for our community, provides 'Sconset residents with a landmark that we associate with home. Visitors and residents can experience the serenity which characterizes 'Sconset while walking to the lighthouse on the Bluff Walk. The 'Sconset Bluff Walk, which once led to the base of the lighthouse, now ends abruptly; a result of erosion that has occurred in our lifetime. The Geotube Project provides hope of continued public access to Sankaty Head Light by way of Baxter Road.

I love working outside and overlooking the Atlantic from the SBPF bluff observation



site. I have enjoyed talking with visitors to the bluff and educating them about the dynamic issue of erosion. Frequently I am asked when the project will be extended northward to protect Sankaty Head Light. Educating visitors of SBPF's Geotube Project has been a fulfilling internship experience. I am pleased to give back to the community, which has been a cornerstone in my life.

ABOUT SBPF

Siasconset Beach Preservation Fund is a 501 (c) (3) organization that was formed by a group of 'Sconset homeowners concerned about erosion and the threat it poses to the village of 'Sconset. Since the early 1990s, SBPF has worked to research and install, on an experimental basis, a series of measures that might control the erosion of the 'Sconset Beach from south of Sesachacha Pond to south of the 'Sconset sewer beds. The goal has been to find an effective, environmentally benign and economically feasible approach. Virtually all funding has been provided from private, non-governmental sources.

FUNDING

Funding for the efforts of SBPF is provided by our members, local community organizations, and the general public.

PUBLIC PRIVATE PARTNERSHIP

SBPF seeks opportunities to partner with the Town of Nantucket, local organizations, community members and agencies that share our goal of limiting the impact of erosion on 'Sconset Beach and Bluff. We thank the Town of Nantucket for its time and expertise.

CONTACT US

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sconsetbeachpreservationfund@gmail.com

MEET THE INTERNS

JOLIE JAYCOBS is a rising sophomore at Haverford College and grew up year-round in 'Sconset. She is hoping to pursue environmental studies at school, and is also on the track and cross-country teams. This is her first summer as an SBPF intern and she is really looking forward to the experience!



AUSTIN BENTLEY is a senior at the University of Texas studying Geography. He has spent every summer in 'Sconset and was employed by the Town of Nantucket as an Ocean Lifeguard for four years. He is also an Intern for the 'Sconset Trust. After college he plans to attend graduate school to study Architecture.



ALEC SINGER has been a summer resident of Nantucket Island since 2001. For the past eight months, he has been traveling to Cuba, Vietnam, Cambodia, Thailand, and China on gap year trips. He will be attending American University in the fall.



JAMES GENTHNER, a Nantucket native, will be a senior at Nantucket High School this fall. He is interested in studying Marine Science in college. He enjoys fishing, Lacrosse and works as a crewmember on a sailboat charter.



IAN SINGER a senior at the Potomac School in McLean, VA researched renewable energy economic policy in the developing world in a global studies research concentration. Founder of the *Millennial Global Review*, a research publication platform and media outlet for high school students.

