An Evaluation of a proposed Beach Nourishment Project for the Ocean Beaches of Quogue, NY

The following report provides a multi-faceted perspective on the proposed beach nourishment project for the Village of Quogue. The perspective provided is based on an evaluation of a report entitled "Shoreline Erosion Assessment and Plan for Beach Restoration Village of Quogue, New York" which was prepared in July 2011 and has served as the basis for required permit applications to carry out the beachfill project.

In addition, this document contains comments and observations stemming from the author's long experience of evaluating coastal engineering projects and assisting community partners with local project assessment. This evaluation was prepared at the request of the Concerned Citizens of Quogue. It is hoped that this document can provide additional points for discussion as the citizens of Quogue evaluate their options for the future management and protection of the Village's beaches.

The Project Proposal:

The July 2011 report lays out a proposal to spend approximately $14.1 million to add a target volume of 1,100,000 cubic yards of sand to the Village's 2.7 miles of beach. It is argued that this sand is needed to offset erosional sand volume loss to the beach profile out to a depth of around -18 ft and to offset projected future sand loss to erosion over the next 10 years or so.

The authors also divide the Quogue Village beach into three reaches: a western (Reach 1), central (Reach 2), and eastern (Reach 3). It is clear from the report (and from observation and field visits), that Reach 1 has robust dunes with significant building setbacks while Reach 3 has much narrower dunes, buildings situated very close to the beach, and many sections of shoreline with geotextile bags serving as

infrastructure protection. Reach 2 is transitional between the two, but still retains substantial dune volume.

The authors have identified a potential source for beach quality sand for the project, although the availability of this borrow area for Village use had not been confirmed at the writing of this report. In general, beach renourishment projects on Long Island tend to have fairly high quality material available in the nearshore. If the eventual borrow site is adequately evaluated, it is unlikely that there will be significant problems with the fill material (the sand placed on the beach).

The project proposal does not include the construction of dunes. Dune growth will be encouraged through the deployment of sand fencing, as has always been the case in Quogue.

Finally, the proposal shows a representative nourishment profile for each Reach. In these profiles, sand is shown being placed above MHW. The proposal does not make clear, and the author of this report is uncertain about, the need for easements to allow the project to proceed. It would appear that the project would require an easement from the Southampton Town Trustees and possibly individual property owners. The regulatory relationship between the Trustees, the Village, and the State of NY is currently being litigated. How the need for access to carry out a project would be accomplished should be clearly stated by the Village government as citizens are evaluating their options.

Comments on the Project Proposal:

1) It should be clearly understood that the proposal makes no claims about the degree to which property would be protected by the beach nourishment. The proposal makes no claims about reducing the potential for island breaching, nor does the proposal suggest that any property in Quogue Village away from the

oceanfront will derive protection or storm surge reduction benefits from the project.

2) An objective viewing of the proposal and the reality on the ground clearly indicates that there is primarily one section of beach that is at greatest risk. This is in their Reach 3, with the biggest problem area being between roughly #150 and #190 Dune Rd. Areas to the west that are included in the project are substantially better off. In fact, many houses in Reach 1 are about as safe as any barrier island, oceanfront home in America can be.

So, why then, would you include these areas in the beach nourishment project? The primary reason is that larger projects make more sense from a financial and engineering perspective. It is not cost-effective to pump a small project that would benefit a half-mile stretch of beach. The Town of Southampton recently found out the difficulty of using dredged materials for a small project when they had to abandon the idea for Tiana Beach.

In addition, as the proposal makes clear, small projects simply do not last as long as longer projects. In essence, even though only a small area of the Village Beach needs additional sand, the rest is included to make the project feasible.

Along these lines, it should be very clear that the primary benefits of the project will accrue to those who need it the most, and that is a half mile stretch of beach in Reach 3. Many of these property owners have installed substantial geotextile seawalls that extend out onto the beach. A narrowing beach threatens the integrity of those walls and also risks complete loss of the recreational beach in front of those homes. These properties are also at greatest risk from storm hazards: flooding and wave attack. If it were not for this small area in Reach 3, there would be no good reason to even consider a beach nourishment project for the Village.

3) It should also be noted that much of the "deficit" of sand documented in the proposal and future deficit predicted in the proposal comes from erosion of the submerged nearshore beach out to a depth of -18 ft. Why does this matter? Well, the first stated goal of the proposal is the enhancement of recreational opportunities via a wider beach. Recreation, of course, occurs on the dry beach, not the submerged beach. The proposal projects a lifespan of ten years. But, the proposal does not guarantee, nor can it guarantee, a wider recreational beach for 10 years. In fact, coastal engineers will quite frequently judge a project to be a success even if the dry beach has disappeared as long as they can still account for sand remaining in the littoral system (in this case out to -18 ft). Citizens of Quogue should understand that this project would not guarantee them a wider, visible beach for 10 years. This will depend on unpredictable events such as storms, prevailing winds, and their sequence.

4) The proposal states as a goal the preservation of the community tax base. However there is no analysis of the degree to which the tax base will be preserved over the ten years of the project. There is no analysis of exactly which properties are being preserved and what they are contributing to the local tax base. There is no analysis of what would be lost if the project is not built. If citizens of Quogue are asked to fund this project using any public or private funds, this analysis should be conducted to allow for transparent benefit/cost calculation.

5) There has been some suggestion that the area of increased sand deficit may migrate down the shore from east to west increasing the risk for properties in Reach 1 and Reach 2 that are currently at low risk to coastal hazards. This may prove to be true, but it is currently simply a hypothesis that might warrant monitoring and testing.

6) Finally, it has been suggested that if this beach is built, the Federal Emergency Management Agency will pick up the costs for future beach loss do to major storms.

This may be true, but it will require a great deal more effort, planning, and design than a "one-off" beach project. FEMA guidelines are currently as follows:

- *FEMA provides grants for the repair, restoration, reconstruction, or replacement of public facilities on the basis of their design as they existed immediately prior to the disaster (see 44 CFR §206.226). In accordance with 44 CFR §206.226(j)(2), a beach may be considered an eligible facility when:*
    - *The beach was constructed by the placement of imported sand (of proper grain size) to a designed elevation, width, and slope;*
    - *A maintenance program involving periodic renourishment with imported sand has been established and adhered to by the applicant; and*
    - *The maintenance program preserves the original design.*
- *To document eligibility of the beach as a designed and maintained facility, the applicant should provide the following information to FEMA:*
    - *All design studies, plans, construction documents, and as-builts for the original nourishment;*
    - *All studies, plans, construction documents, and as-builts for every renourishment;*
    - *Documentation and details of the maintenance plan, including how the need for renourishment is determined and funded; and*
    - *Pre-and post-storm profiles that extend at least to the seaward edge of the sub-aqueous nearshore zone (closure depth, usually -15 to -20 feet).*
- *The amount of sand eligible for replacement with permanent work funding is limited to the amount lost as a result of the disaster event.*

The pre- and post-storm profiles are used to determine the eligible volume of sand. If pre-storm profiles are not available, the estimated erosion from the design study and renourishment history can be used to determine a pre-storm condition.

- *The cost to replace sand that eroded prior to the disaster is not eligible for FEMA funding. However, the applicant is encouraged to renourish the project to the design.*

In general, qualifying for future FEMA assistance will mean building a long-term plan for maintaining constant beach nourishment and an engineered design profile along the Quogue beach. So, if the Village of Quogue hopes to have their beach considered a "facility" by FEMA, the Village will need to invest more funds in developing a long-term plan for renourishment, and monitoring the fate and progress of any projects.

Recommendations and thoughts:

1) The issues facing the Village of Quogue are similar to those facing coastal communities across the US. "How do we maintain a beautiful, recreational beach that everyone can enjoy, while also protecting the Village's fiscal well being and allowing the reasonable development of the oceanfront?" In addition, there are broader questions for coastal protection projects like the proposed beach nourishment project. "Who will benefit and who should pay?" The fact that these questions do not seem to find universal agreement within the Village of Quogue is a reflection of the fact that not everyone along the beach is currently in need of protection. In my opinion, it also stems from the fact that over the last decade or so, many at the coast have increased their own personal exposure to hazards through risky expansion of their oceanfront properties, building closer to the ocean, and extending protective structure seaward onto the active beach. Figure 1 shows an image of the Quogue shoreline from 2001 and Figure 2 shows an image from 2013.

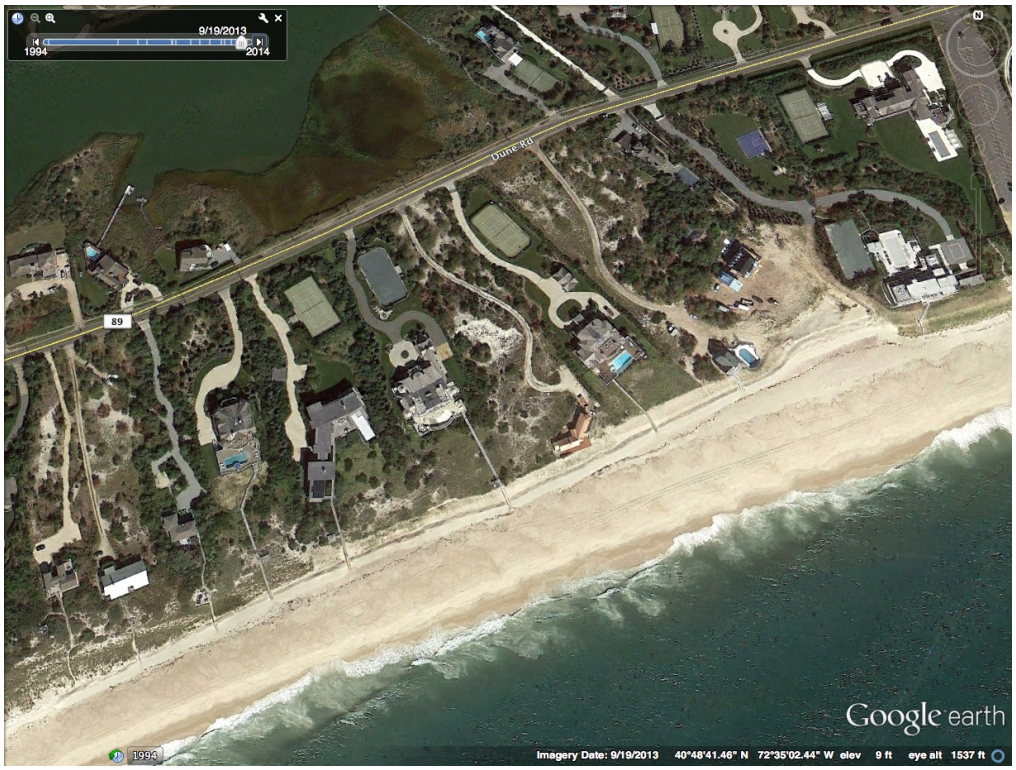

Figure 1 (above) and Figure 2 (below): 2001 and 2013 respectively

This image pair is not intended to criticize any particular homeowner; rather, it is indicative of the problems writ large at the coast today. While we have a greater understanding than ever of coastal storms, coastal erosion, and rising sea level as coastal hazards, we still continue to develop the oceanfront. In this photo pair, one can clearly see that this section of shoreline has transformed from small homes that would be relatively easy to relocate, on open expanses of land with plenty of room to move. The structures have been enlarged, and the footprint of development has been increased as well with the addition of amenities like tennis courts. As development like this continues, the pressures will only increase for the deployment of structural protection for private property like bulkheads, revetments, and geotextile walls. Structures like these don't stop erosion of the beach, they simply provide protection of the property behind the structure. Ultimately, continued large-scale development, and continued use of storm protection devices (often placed seaward of the natural dune line) will threaten the existence of the recreational beach and natural dunes. Beach nourishment projects may temporarily restore the width of the beach and the volume of the dunes, but the entire community must clearly share in the benefits of the project, and be vested in the outcomes. This is especially true if project costs are going to be spread further than the obvious beneficiaries. It is the job of Village leadership to see that this is the case.

2) Given the ongoing debate over the need for the project, and questions regarding the evolution of the beach in Quogue and possible migration of the "erosion hotspot," perhaps a unifying place to begin would be to institute a Village funded shoreline monitoring program to establish high-quality data that can be used to base all further discussion, plans, and proposals. It would also allow any impacts of existing coastal management approaches to be examined and quantified. To be clear, the author of this report would not bid on such a contract.

3) Along with the monitoring suggested in #2, the Village can continue to proactively manage the coast by enhancing dune formation and growth through fencing and vegetation. High quality sand can be brought in following storms to augment dunes in critical areas. All of these mechanisms have been used successfully in the Village for years. In addition, the Village should seriously consider its policy towards the deployment of geotextile bags, tubes, and walls. These kinds of structures have negative impacts on neighboring properties and on the recreational beach. This is particularly true when the structures are placed out on the beach seaward of the prevailing dune line.

Finally, serious discussions need to be had about the feasibility of getting some vulnerable infrastructure and property out of harms way. This is a longer-term solution than trying to hold the shoreline in place forever, at increasing cost. Perhaps incentives could be developed to encourage property owners to consider moving structures rather than building seawalls. Perhaps the Village could set an example by moving some of the vulnerable assets at the Village beach. There are ways to preserve the tax base beyond spending millions to hold beaches in place.

In many ways, the items above, taken together can be viewed as one vision of a coastal management plan for Quogue. And, many parts of it have already been implemented.

Submitted by
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