Dec. 7, 2014

Dear Friends,

As you probably know, the town's Squibnocket advisory committee (which I'll call SAC) has voted on its recommendations and given the two associations 90 days, I believe, to agree with each other and begin work. It is my understanding that the situation will relapse to the starting point if nothing is agreed upon and initiated by the two groups of owners by that point, so time is of the essence.

After reviewing the three conflicting proposals – SAC's, FOS's and SFHA's – I'd like to suggest that a synthesis of their strengths might provide a solution that would satisfy everybody. But first we must identify their current defects. Here is how Ì perceive them.

1) FOS: I've always seen the southern half of the FOS's proposed roadbed across the wetland part of its route as a problem, since it would obstruct overwashed sediment from accreting to the northwest, where land needs to be formed to permit future iterations of the road/causeway. The northern half of the wetland section, on the other hand, already has land between it and the ridge and is too far from the coast to benefit from overwash for more than 50 years, so it isn't problematic. When I tried to persuade FOS to make the southern half a causeway a couple of months ago, its engineers took the more conservative route of adding culverts, which are hard to maintain and are not nearly as effective at allowing the movement of alluvia from one place to another.

2) SAC: The town's indecision or delay in advocating the creation of a dune along the foreseen arc where the effective high tide line will stabilize (after the removal of the revetments that the town has advocated) opens the route across the wetland to the danger of flooding for at least a year, as the US Geological Survey pointed out in its reports of Nov. 25th and 28th. The weakest stretch, as was noted in my previous analysis, will be in the zone occupied by the present causeway - in other words, between the current parking lot and gate - since it will be relatively low and narrow after the revetments are removed, and the coast will rapidly encroach towards the pond.

3) SFHA: The idea of anything as high as the previously proposed bridge, which was 14 feet high at the roadbed, with a 4 to 5 ft. railing (depending on the iteration) above that, will:
A) be completely overbuilt for an area much farther back from the coast than the original SFHA route, if there is a protective 15-20 ft. dune between it and the ocean,
B) cost less than the original proposal for a bridge, since it will "only" be 280 feet long, as opposed to 400 feet, but will still cost much more than necessary, and
C) make it almost impossible for SFHA to reach an agreement with FOS.

Now, if we look at the defects of the three plans, the following solution, which might satisfy everyone, comes into focus.

1) The dune should be built just north of the arc where the high water mark is likely to stabilize after removal of the revetments (as shown on the Google Earth photo in my last report). In passing, it should be noted that the US Geological Survey correctly observed on Nov. 25th that it would be foolish to build a dune up to the present shoreline, since it would be scoured away in that position once the revetments are removed and the shore begins to recede at a rapid rate until it stabilizes about a year later. Unfortunately, the USGS did not follow through on this observation by noting that the creation of an artificial dune just inland

from the *expected stabilization line* would be a reasonable and cost-effective solution to the risk of flooding for at least a year that the USGS also identified. Such an artificial dune would protect SFHA's access even more than the lower ones to the southwest along the barrier beach, and would do so for years to come.
The $280,000 State grant to the town for:
- removing the revetments,
- building a parking lot that's moved back from the shoreline,
- improved access to the pond, and, most importantly, given the subject,
- "managed retreat",

is highly relevant here.
The costs for removing the revetments has been estimated at $20,000 while building the 40-space parking lot suggested by the town will probably cost about $30,000. That leaves $230,000, which could be spent on the dune. This will greatly mitigate the cost for SFHA, but I'd still suggest that the town may want to commit itself to paying a modest sum – say $7,000 a year after the construction of the dune – to pay for part (in some years it may be all) of its annual maintenance because of the benefit the town will derive from the dune and beach.

2) The 280 ft. route across the wetland on the path laid out by FOS (and now SAC) should be divided into:
- a northern section, which can be a simple raised roadbed, since damming of sediment will be insignificant so far from the coast, and
- a southern section, which should be raised just enough to prevent it from obstructing alluvia from moving to the northwest. This section could be as short as 95 feet long, since that would give it a 50-year lifespan, if the coast continues to recede at the present rate of 2.3 feet a year. But, as we know from my previous report, that rate is too optimistic, so I recommend making the raised section 140 feet long. That length is more likely to give the SFHA about 50 years of use.

I'd also design the 140 ft.-long elevated section so it has 3 feet of clearance above grade, which would be more than ample to allow overwashed sediment to move unimpeded to the northwest. Such an elevation would also keep the causeway out of harm's way as Squibnocket Pond's level rises along with the ocean's. The deck would add another 2 feet, as would a 2-ft. high guardrail/curb, bringing the total elevation to 7 feet. It is important to realize that the entire 280 ft. section of the route across the wetlands (comprised of the 140-ft.-long elevated causeway and 140-ft.-long raised roadbed to its north) would lie among phragmites, which would hide everything but the tops of vehicles (since the average car roof would be 4.6 feet above the 5 ft. high deck, and the reeds grow up to 10 feet tall).

Splitting the wetlands portion of the path proposed by both FOS and SAC into two halves, with only the southern part being elevated, would also prevent the fragmentation of the wetland and reduce the footprint of the route on it to under 4,000 sq. ft., including pilings, which is far below the 5,000 sq. ft. threshold for limited projects.

Next, making the elevated section just 5 feet high at the roadbed, and 7 feet high at the guardrail will make it easier to repair the end points, when and if they are eventually scoured out, since fill could easily be introduced to reconnect the causeway to the roadway. That would NOT be nearly as easy if the deck were over 10 feet high, which would be over-built, not to mention absurd, unless there was no protective dune between it and the sea (in which case, it would be doubly monstrous).

Another advantage of a relatively low, 140-ft.-long, elevated causeway is that the southern end could be shortened, one section at a time, as the shoreline and dune receded towards it. This adaptabilty also applies to the other end (the northern one), where sections could be added as needed, although that probably wouldn't be necessary for more than 50 years.

Finally, a low hybrid route through the wetlands with a dune to protect it would be dramatically cheaper than previous proposals for elevated access routes, since the raised segment would be over 61% lower (7 vs. 18/19 feet) and 65 % shorter (140 vs. 400 feet) than the SFHA bridge that was on the table until last week. The result is a solution that will work for 50 years for all three parties (SAC, SFHA & FOS) while providing increased adaptability, allowing for sediment flow to the northwest, satisfying all regulatory constraints, and even hiding the structure from the neighbors, making it much more likely that an agreement can be negotiated between all parties immediately. In closing, I recommend that the two owners associations enter into an agreement to implement the above plan* and take it to the town for a final vote in the near future, so the clock does not get set back to zero.

* It's just a codecil, but I also recommend, unlike SAC and SFHA, that the utilities should be separated from the raised causeway since that will make it easier to adapt it in the future by adding segments to the north and subtracting them at the south. Horizontal drilling under the wetlands just to the north of the route would provide flexibility in the maintenance of the route itself.

My best wishes,

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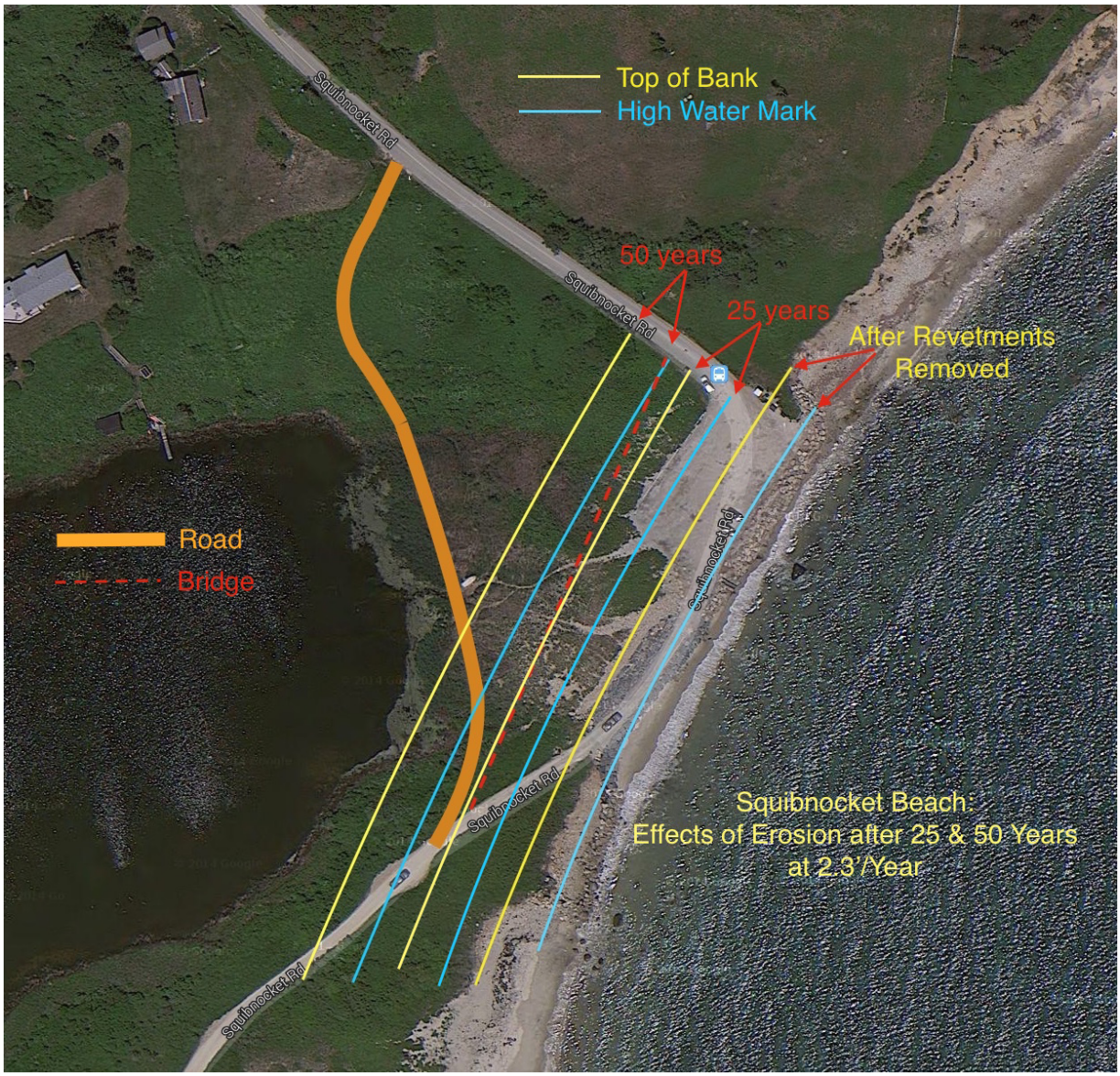
Top of Bank
High Water Mark
50 years
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Road
Bridge
Squibnocket Rd
Squibnocket Rd
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Squibnocket Beach:
Effects of Erosion after 25 & 50 Years
at 2.3'/Year