

DPW Commissioners  
Sediment Transport Presentation  
Peggy Brenner Friend's Room at the library  
Monday, 6/8/15, 6pm

Chairman Sena: Introduced the Applied Coastal representatives John Ramsey and Sean Kelly.

Commissioner Gardner: Provided background on the declining state and deteriorating condition of the seawall.

Scope of Work:

- Shore change analysis
- Wave and sediment transport modeling
- Analysis of beach nourishment and coastal structure alternatives
- Reports and meetings

Historical Beach Profile Change:

The beach lost approximately 1 foot each year (approx. 94.7' since 1851) prior to the seawall; after the seawall was in place, between 1952 and 2013; half a foot was lost each year. After the 1958 wall failure, much of the wall was rebuilt. Approximately 19,079 cubic yards per year move (each way), the material moves back and forth on the beach. Over the 2012 and 2013 winter storm season a significant loss of beach elevation to the seawall was observed. The beach profiles have been relatively stable over the 80+ years and do not indicate a consistent loss in beach elevation. It appears that the fluctuations in beach profile shape may continue to dominate beach elevation along the face of the seawall. As sediment from the beach system continues to disappear in the long-term, the seasonal fluctuation may become more dramatic, leading to potential undermining and perhaps failure of the seawall.

Shore Protection:

- Assess need for shore protection
- Determine project goals
- Review of potential alternatives
  1. Environmental impacts
  2. Ability to meet project goals
  3. Economics

Terms:

**"soft"** beach nourishment, sand fencing, planning

Advantages: Environmentally friendly; mimics natural system

Disadvantages: design life, durability during storm conditions, need for maintenance commitment, large scale of projects

**"hard shore"**

Advantages: ability to hold the line, design life, good last line of defense

Disadvantages: potential alteration to natural processes, loss of fronting beach (scour), loss of sediment source to down drift beaches, often provides false sense of security

## Shoreline Management Alternatives

- Do nothing
- Managed retreat, remove seawall and remove houses/structures (front row first)
- Proactive seawall removal so beach system can rapidly re-adjust to its natural state
- Seawall reconstruction
- Alternative armoring options that may reduce overtopping at lower cost than vertical seawall
- Beach nourishment\*
- Re-establish dune on Cape Hedge Beach - separate

\*Beach nourishment: 825' X 30' = 50,000 yards  
1600' and 30' =100,000 yards

### Estimated Cost Projections:

Managed retreat: \$1.7M for the front row, last for less than 20 years  
Seawall construction: GZA \$10 to \$12M, potentially will last 30 to 50 years  
New fronting revetment: \$7.6M, 20 years  
Beach Nourishment: 50,000 cubic yards \$1.8, will last for 6 years  
100,000 cubic yard \$3.5M, will last greater than 10 yrs  
Cape Hedge Beach Dune Nourishment: \$500,000

### Comments/Questions:

DPW Chair inquired about the source for the sand. J. Kelley said it's expensive; you would use an upland source, probably around \$30/cubic yard.

W. Hess inquired if state or federal funding is available for this. J. Kelley stated there are some grant programs available, they are more for planning, design and permitting. If it is shovel ready, there are grants available, applications are due in July; they are capped at \$3M. CZM would be knowledgeable about them.

Eric Hutchins, 45 Poole's Lane, inquired why the data from the 2013 IPCC report was not incorporated the projections relative to sea level rise. J. Kelley, Applied Coastal, responded that the NOAA predictions have gone up; he said it depends on what sources you're looking at and the data hadn't come out yet.

W. Wagner, Finance Committee, inquired about timeframe for nourishment and reconstruction. J. Kelley said the seawall is easier to permit because it's existing, perhaps 6-9 months of permitting, once funding is in place less than 6 months. Maybe 18 months for nourishment.

Ted Tarr, 156 Main Street, questioned the revetment, he questioned if we provide our own stone; would that have an effect on cost estimates. J. Kelley said certainly, with free materials your cost would be lower.

Gerry Falco, Conservation Committee, questioned Cape Hedge, she asked if this would be the entire beach or just the large dune. J. Kelley, said it's just the large dune, 800' length is what they were asked to look at.

Jim Gardner, DPW Commissioner, inquired how soon before the high tide mark is at the wall every day. He said the water is moving closer and closer to the wall. J. Kelley said you are getting to that point where in the middle of the beach you'll be right at the wall a lot of the time, but not at the ends of the beach.

Mel Michaels inquired the length of time that beach nourishment would last. J. Kelley said there is no guarantee.

Theodore Tarr, 156 Main St., said overtopping can be a problem if we raise the homes, overtopping might ruin the front yards.

Eric Hutchins, spoke about Cape Hedge Beach, he said it's very steep now, every couple of years it's toppling over. It's very different than Long Beach; it could go in the marsh and not be retrievable. J. Kelley said it's in a more efficient place now, he said he doesn't know why it would go over there. There are certainly local impacts on Cape Hedge, parking, etc.

June Michaels, Finance Committee, said we could have three beach nourishments for the same cost as rebuilding. J. Kelley said you need to look at what you're getting out of each option.

DPW Chairman Sena inquired about the revetment in front of the wall. He said with the permit process, how far would we have to go out with the revetment and does that change the permit process. J. Kelley said you would need to go out further.

Z. Seppala, Granite St., questioned the process for nourishment, he asked if the sand would be dumped in the middle and spread out to the ends. He questioned what happens to the ends of the beach, does it get pulled out to the ends. J. Kelley said some comes back and in storms you lose some.

Steve Sheehan, 12 Long Beach, asked if there is a best practice for a municipality where someone tackled a seawall and sand to preserve the beach. He questioned if anyone has done it right; everyone in town has an interest in Long Beach. J. Kelley said Revere Beach did a nice job in 1990. They did some seawall repairs, put significant funds into infrastructure; it's a great recreational beach.

Steve Sheehan questioned where this is going. He said there wasn't a lot of notice for this meeting. J. Gardner, DPW Commissioner, said we started off with Vine Associates/GZA, they redesigned the same wall and they didn't mention anything about erosion or about the structural integrity of the 1930 wall. Rather than moving forward with wall design we needed to determine what was really going on. We wanted to know about other alternatives for land behind the wall and to maintain the recreational beach for everyone. Now we have better information with which to act depending on which direction we want to go.

Beth Sullivan, 4 Summit Ave., questioned if there is a recommendation on which choice should make? J. Kelley said adding sand is going to be a part of any plan.

Mel Michaels questioned how the sand will get to Rockport. J. Kelley, likely it will be trucked in.

Eric Hutchins questioned the next steps. He said this is a broad brush, the secondary impact analysis and cost estimates will be needed. He said long before the permitting process, this would need to be presented to the public before choosing a plan.

Erin Battistelli, Board of Selectmen Chair, said the Applied Coastal report is available in the library and on the website.

Z. Seppala, questioned the permits and what might really fly here. He questioned what CZM would say is the ideal plan.

Beth Sullivan; Summit St., questioned if there are plans to stabilize the wall in the interim and are there recommendations here on which way the town should go. J. Kelley said we are recommending some structural improvements along with beach nourishment.

Paul Sena, DPW Chair, said we don't have anything on the books to make an educated proposal, however repairs to the wall have been in the five year budget.

Adjourned at 7:50 pm