

Sippewissett Association

Newsletter

Tide and Management

at Woodneck Beach

By Arthur G. Gaines, Jr., and Karl Audenaerde

Since 2007, Woodneck Beach and Little Sippewissett Marsh, behind it, have been the focus of sponsored and volunteer field research. Initiated in 2007 by the Falmouth Conservation Commission, these studies address issues related to water quality and the recreational beach. Both of these issues have been the topic of public concern due to swimming closures and storm damage.

One management option proposed to increase flushing of the estuary is to reconnect the small pond south of Woodneck Road, which we call "Hamlin Pond" (see map), to the main estuary. It has been suggested that before the construction of Woodneck Road, tidal flow from Little Sippewissett Marsh regularly flooded this small pond, either through a channel or simply over the marsh at high tide. This report provides additional field information bearing on the feasibility of this idea.

Our measurements in July 2012 showed that Hamlin Pond was nearly fresh (less than 0.5% seawater), has no present connection with the sea, and had not for a long time.

Our measurements of salt content of the pond water were consistent with the observation that frogs and freshwater vegetation thrive in Hamlin Pond. The wetland plants there are not of the salt marsh variety. Fluctuation of the pond surface level showed no evidence of a tidal pattern. The linear drop of about ¼ inch per day probably resulted solely from the balance between input and evaporation of freshwater.

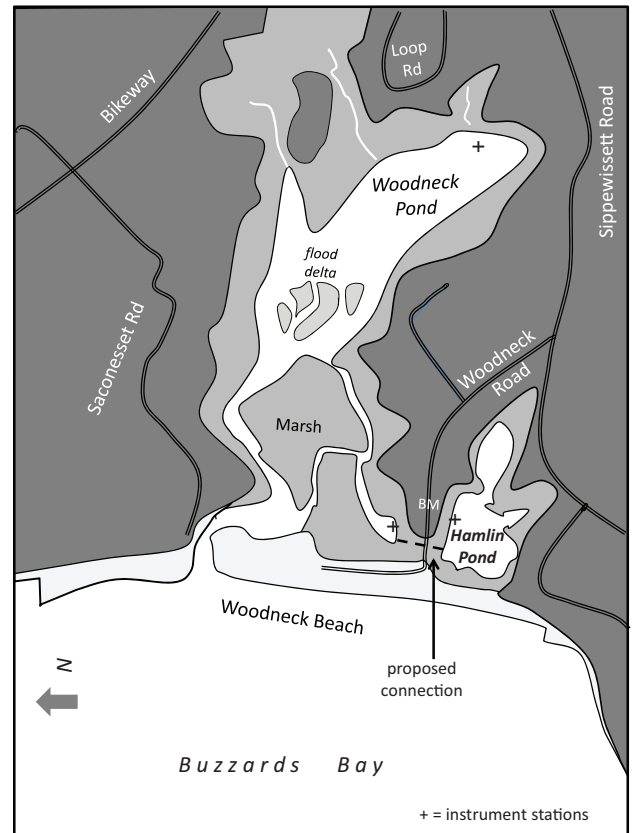
Hamlin Pond has a surface area of about 3.8 acres. The water salinity increase (0.014 ppt or about 9%) associated with the drop in surface elevation over the period of our observations further suggests the pond volume at this stage is about 11,000 cubic yards. The average depth is close to 3 feet.

Tide measurements in the adjacent Little Sippewissett Marsh indicate that Hamlin Pond could be flooded over the marsh during

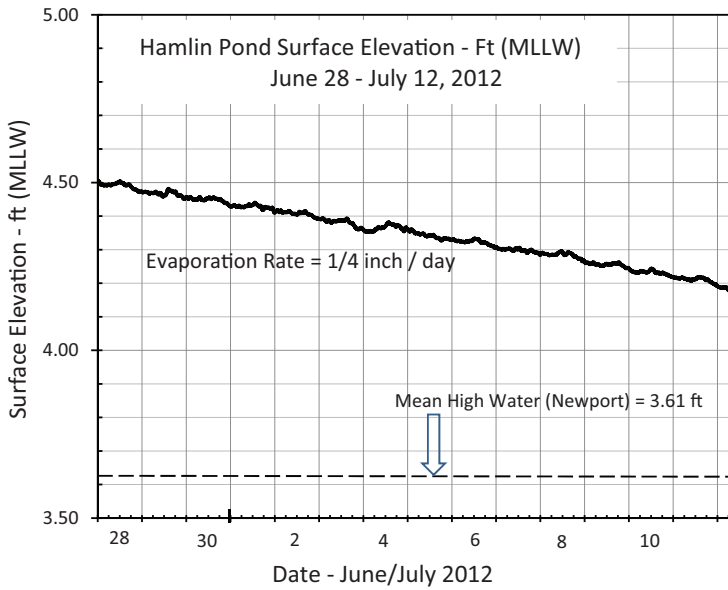
monthly spring tides if the barriers to exchange at Woodneck Road were removed.

At present, occasional direct flooding of Hamlin Pond by the sea can occur in severe storms that breach or overtop the barrier beach to the west, or flood over Woodneck Road from the marsh to the north. Records of extreme water elevations at Newport (R.I.) suggest that the

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The mission of the Sippewissett Association is to: protect and foster the mutual benefit and interests of landowners of the Sippewissett region of the Town of Falmouth, Massachusetts; to promote and encourage cooperation among such landowners in order to ensure that the future development of said region shall be in keeping with its general residential zoning restrictions and to take whatever action or actions may be necessary to this end; and to protect and prevent the misuse of public and common areas in the Sippewissett region.

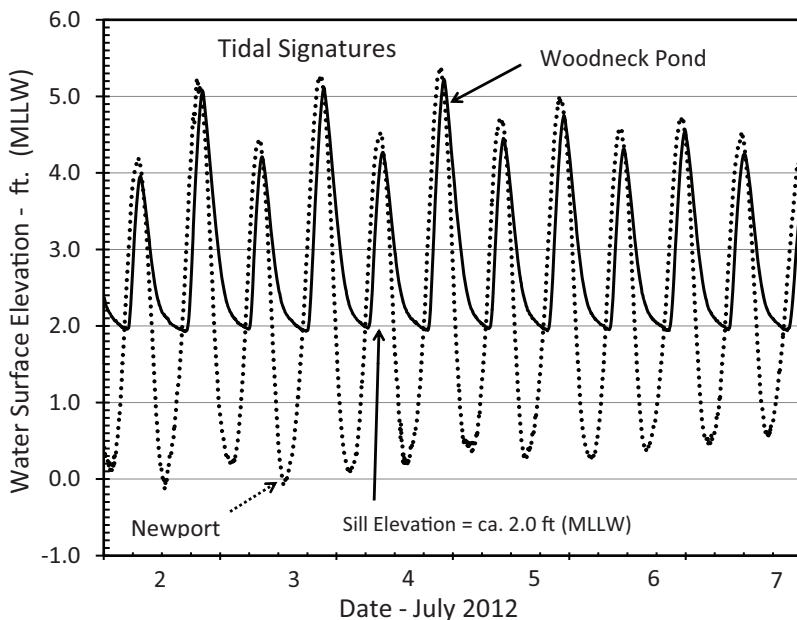
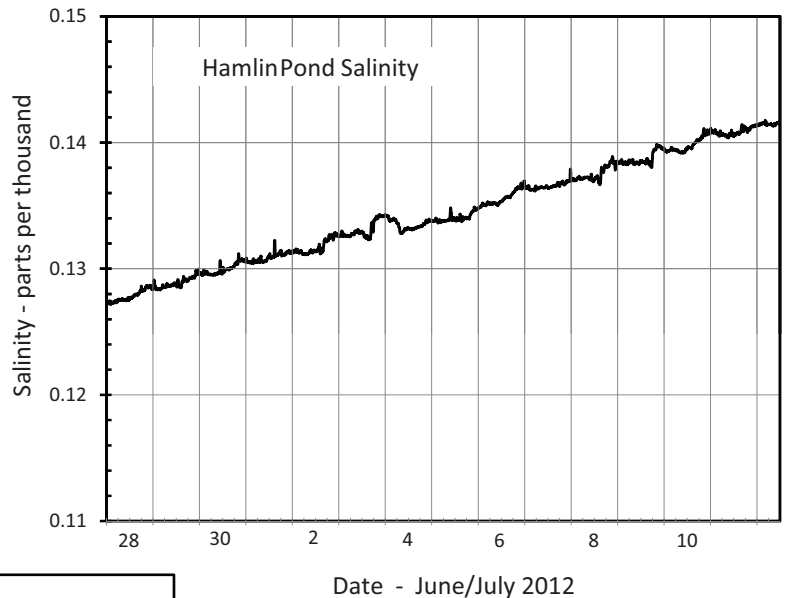


Marsh, where the tide range is 2 to 3 feet. In their 2008 study, John Ramsey and others calculated that this could increase the tidal prism and flushing of Little Sippewissett Marsh by 200,000 cubic feet or 5%.

Arguments in favor are: increased flushing would help check northern migration of the inlet at Woodneck Beach; provide more energy to remove sand from the inlet; and reduce the bar formation at the estuary mouth. In addition, restoration of the connection would raise and stabilize the salinity range of Hamlin Pond and return the habitat to its natural condition before road construction. Currently the salinity varies between that of fresh water and that of full

water level in Buzzards Bay exceeds the present level of the pond nearly every month, so overtopping or breach of the beach would flood the pond. Under present conditions, flooding across Woodneck Road is much less likely because it is not exposed to wave attack. As recently as October 2012, however, an extreme storm tide may have overtopped the roadway.

Though feasible, the question remains whether this management option should be implemented. One specific proposal calls for installation of a 12-foot wide box culvert extending 120 feet from Hamlin Pond northward under the road to a tidal creek in Little Sippewissett



strength seawater, following breaching or overwash events.

Arguments against restoring the connection include: northward movement of the inlet appears to have reached its limit without changed flushing; increased sand movement at the inlet would likely increase sand transport into the marsh, exacerbating an existing sedimentation problem, and shorten the life of future beach nourishment projects; and the dynamic sandbars at the estuary mouth have not been a problem. Furthermore, the current habitat in Hamlin Pond provides a habitat diversity supporting interesting and valuable plant and animal species. Given the cost of reconnecting the pond and
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The Sippewissett Shoreline

What's Goin' On?

By R. Jude Wilber, Ph.D.

Edited by Maureen Conte, Ph.D.



Cape Codder bluff, c. 1890. (from The Book of Falmouth)

Sippewissett is blessed with one of the most beautiful coastlines in New England. Unfortunately, almost all its coastline has been covered over the last 100 years by aggressive coastal armoring: sea walls, groins, jetties and rip-rap. Although such structures may (temporarily) protect adjacent uplands, they spell doom for nearby beaches and coastal systems and expose our shores to greater cumulative damage from large storms and hurricanes.

Sippewissett has what is termed a naturally mobile sedimentary shoreline—the key word here is “mobile.” The uplands (bluffs) undergo erosion and retreat and, in the process, “give” sediment—mostly sand—to the coastal system. The bluffs are a Source of sediment that moves along the shore by a process known as littoral drift. The net direction of transport is determined by the seasonal winds. The sand Streams north with the summer SW breezes and on-shore or south with the winter westerlies and NW

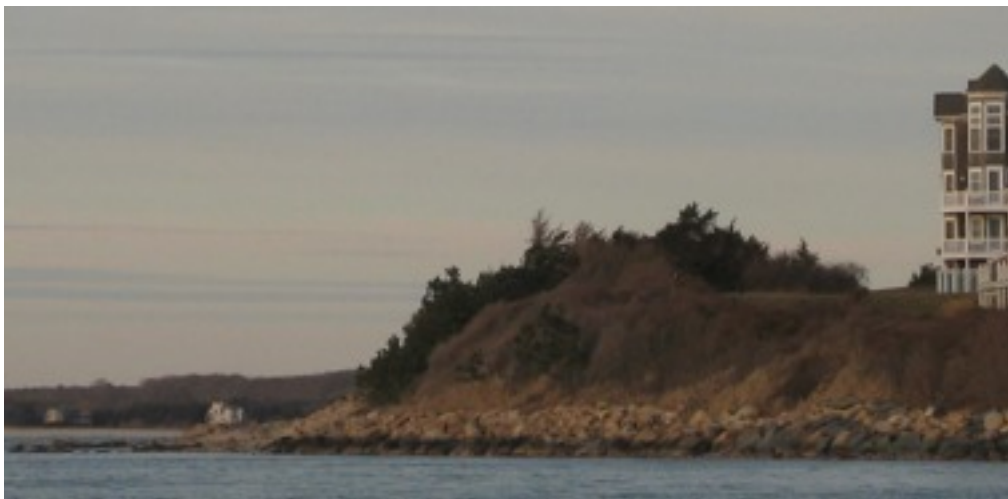
winds. On average, the net littoral drift in Sippewissett is northward.

As material supplied by bluffs moves along the coast it is Sorted—large boulders remain near the source and finer cobbles, pebbles and sand “stretch-out” along the shoreline. When the drift stream enters a coastal embayment, for example Woodneck Beach, the finest sandy material is concentrated. When sand is in an embayment it is very difficult to get it out again. Thus, embayments are Sinks—places where sand comes to rest. These are areas of constant beaches and dunes.

Woodneck is a good example for understanding these processes and how armoring affects them. Bluff highlands to the south (Cape Codder/Beccles) and north (Sacconeset Hills) bound the Woodneck embayment, forming a coastal cell, the fundamental unit where the Source-Stream-Sort-Sink processes occur. With north being the net transport direction to

Woodneck, the Cape Codder/Beccles bluff is the main source of sediment. Understanding what should happen in this well-defined cell is easy.

Two photos tell the story. The first is of the Cape Codder bluff, circa 1890. We see a natural coastal bluff of sand and gravel, the kind of bluff for which Cape Cod is famous. The bluff has a distinctive 34-degree angle to



Cape Codder bluff, today (photo by M. Conte).

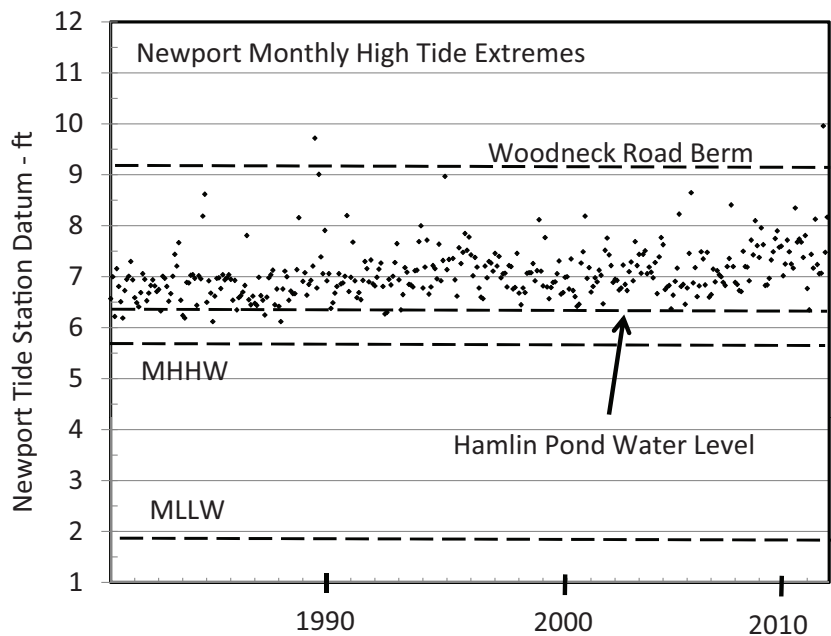
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the estuary, this action may not be justified.

Ultimately, implementation of this management option would depend on the permitting process that applies to any project on wetlands or the intertidal zone. Though many obstacles are inherent to this process, there is currently a positive disposition at the state level toward projects that restore habitat.

Our 2012 data set includes much information that we have not included in this short report. Recording instruments used in this study were provided by Nick Lowell and Rob Reynolds, who also helped with the field installations. GPS equipment used to provide vertical control was provided and operated by Mark Avakian.



Bad News for Oak Trees in Sippewissett

By Nancy McDonald

As we noticed last summer, many black and red oaks along Sippewissett Road and other parts of the area had very noticeable die-back. In some cases the trees never leafed out in the spring. It is believed to be caused by the crypt gall wasp, which was a problem for several other Cape Cod towns as well as Martha's Vineyard.

One of the best articles about this can be found on the Forest Keepers Tree Care website: <http://forestkeepersofcapecod.com>. Scroll down for photos as well as a description and explanation of the problem.

"A cynipid stem gall wasp that is similar to gouty oak gall is the culprit. In some cases, the gall has been active on individual host trees for as long as two years and top die-back is apparent. The galls in the stems are not extremely obvious as with gouty oak gall. Historically, controls are difficult especially if the infestation has been active for two or more years on the same tree... Usually, with such oak stem gall wasps, the attack lasts for several years and then natural controls, in the form of parasites, knock the pest population to low numbers once again. Previously stressed trees, such as from repeated winter moth defoliation, may be at greater risk for attack by this gall-former." (from the UMass Extension Land-



Adult crypt gall wasp, (from Forest Keepers Tree Care website).

scape Message 2012: <http://extension.umass.edu/landscape/landscape-message>.

The Cape Cod Times and the Cape Cod Extension also provide useful information.

- "<http://www.capecodonline.com/apps/pbcs.dll/article?AID=/20120707/NEWS/207070334>"
- "<http://www.capecodextension.org/docs/horticulture/>

If the gall wasps have been in the area for a few years the attack may have run its course, but we will have to wait and see if the oaks rebound in the spring and summer of 2013.

Good News for the Banded Piping Plover

By Nancy McDonald

After a rough summer in 2012, “our” banded female piping plover was spotted back in the Bahamas on October 12, 2012. She is identified by her unique code (ZO DB-W, Z for short), which is based on the color of the bands on her legs.

She spent the 2012 breeding season by the southern edge of the Great Sippewissett Marsh inlet. After losing two nests to predation and bad weather, Z finally produced one chick, late in the season. The chick survived and is assumed to have fledged when it was 4 weeks old.

Z was last seen here at the end of July, but her mate and the fledgling were seen into early August. After the exhausting process of producing three clutches of eggs, and being frequently stressed, she had the energy and determination (instinct) to fly back to North Andros, Bahamas. She was seen at Kamalame Bay, right where she was banded in 2010.

This journey is approximately 1,100 miles each way! Amazing! Where will Z spend the summer of 2013?



“Z,” our banded piping plover (photo by Terry Pomper).

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the water, which indicates a slope that has adjusted to accommodate sediment lost from its base during minor storms. A pebble/cobble beach below indicates that sand lost from the bluff has migrated, (mainly) northward to “feed” Woodneck Beach but also southward to feed Gunning Point Pond Beach. In 1890, the Cape Codder bluff was the keystone *Source* of sand that kept these beaches sandy.

The rest of the story is told by a photo of this same bluff taken in February 2013. A long continuous wall of rip-rap armors a bluff of much steeper angle, effectively sealing it off from Buzzards Bay. This “Great Wall of Sippewissett” has reduced the rate of erosion of the Cape Codder bluff, but in doing so it has starved the system of sand, dooming the Woodneck embayment and causing chronic malnutrition of the Gunning Point Pond beach/dune system.

As sand from the Cape Codder bluff is lost to the Woodneck cell,

areas that have any sand left—beaches and dunes—become the “responsive” areas to large storms. In a process known as coastal auto-cannibalization, they literally eat themselves away, with sand lost both offshore into deep water and onshore into marshes and ponds. The Woodneck embayment we see today is in the terminal stages of cannibalization. It is not a pretty sight.

The most disturbing aspect of this process is its domino effect, accelerating with time. Many who read this today remember the Woodneck Beach of 20, 30, 40 years ago. We are now witnessing the “end-game” in the demise of a once beautiful beach.

Only one coastal cell in Sippewissett in any way resembles native shoreline: the Flume Pond embayment, with limited armoring directly to the north and south. But it, too, has massive armoring within a few hundred feet in either direction. In recent years the Flume Pond

beach/dune line has been breached by westerly storms, pouring perhaps half of the total volume of sand from the beach and dunes into the pond as large storm deltas. The Gunning Point Pond beach/dune line has been similarly breached. Armoring has cut off the sand to resupply these cells.

What can be done? Two options are clear: (1) Keep re-armoring the shore to protect upland property. Just “live with the rock” while watching beaches further degrade as sand is lost from the system; (2) Let time gradually disarm the shore so the uplands once again become a source of nourishing materials to naturally restore our coastline. This option means that buildings that lie close to a “giving” bluff may have to eventually be moved back from the retreating shoreline. Which option do you, as a Sippewissett resident, choose?

The original article by Dr. Wilber was published in the Winter 2006 Sippewissett Association Newsletter.

Coastal Access Committee Reactivated

Given the value of coastal access to our community, the Sippewissett Association has a standing policy to defend legal access to the coast. Approved by vote at the 2003 annual meeting, this policy establishes that the Sippewissett Association will oppose any action or behavior that obstructs legal access by foot along established rights-of-way.

The initial step to implement this policy was the establishment of a Coastal Access Committee (CAC) to assess the status of current access points. Reporting in 2004, the Committee identified 23 access points or regimes between Quissett Harbor and Woodneck Beach, which were administered by state and local government, local land trusts, subdivision entities (or deed-based access), and special private access arrangements.

Reactivated by vote at the 2012 annual meeting, the CAC will revisit the earlier results and set priorities on access issues that require further action. Dr. Arthur Gaines, chairman of the committee, will hold the first meeting in April 2013. People interested in serving on this committee are invited to send letters of interest to The Sippewissett Association, Coastal Access Committee, P.O. Box 501, Falmouth, MA 02541, or by email to againes@whoi.edu.

Save the Date!

*Come in out of the cold
for the*

Sippewissett Association's Winter Social

Sunday, March 17, 2013

3:00–5:00 p.m.

West Falmouth Library

*Join us for hors d'oeuvres
and good conversation*

The Sippewissett Association

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