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# Where Can Sea Level Rise?

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# Where Can Sea Level Rise ?

## *Some Case Studies in Connecticut*

*by Joel Stocker*



Waterford, Connecticut

J. Stocker

Nationally and globally there is growing awareness about rising sea levels and the effects the seemingly relentless rising waters can have on the coastline as we know it. Numerous studies identify potential zones of impact, both from a human resource point of view (emergency management, flooding, storm damage, loss of land) and from an ecological perspective (inundation of marshes, landward migration of those marshes, loss of coastal habitat). This article is a sampling of three areas where sea level could rise, with minimal impact, if our urge to hold it back can be controlled.

In the past, the coastal ecological systems in New England adjusted with variations in sea level; losses and gains were limited only by the natural structures of the landscape. Marsh plant species generally moved inland in step with a rise in water level, creating new marsh as they “climbed” into the uplands. Prior to

European settlement the humans also adjusted with these changes, rarely modifying the natural geology itself.

Enter modern European culture and its technology. This is a culture that tends to hold things in place. Seawalls, roads, buildings, impoundments, and simply the basic idea that “we shall-not-lose-land” all create new structural and conceptual limits to landward migration. Caught in between these new barriers and the open rising water are the natural features dependent on a shallow transition zone—now squeezed against non-natural barriers.

Several University, State, and nonprofit projects have identified shoreline areas in Connecticut where uplands would most likely be protected as waters rise in the future, where barriers may be built or enhanced to hold back the ocean. Other areas where barriers

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may not be required are identified. Highlighted here are locations in Connecticut where the future use of major controls is unlikely—Waterford Beach Park, The William A. Niering Natural Preserve at Harkness Park, and a small coastal field managed by a land trust—yet the traditional values for dealing with the rising waters may still limit the natural migration of the bordering marshes. As public lands, these areas provide a unique opportunity to deal with the change in a more natural way.

In each of these sites the land gently slopes toward saltwater marshes. With such gradual slopes a modest rise in water

level can have a “run” into the uplands of several feet; the change in horizontal distance is much greater than the height. The uplands transform as this ground is saturated with brackish water. An example can be seen in the lawn bordering Alewife Cove at Waterford Beach Park. There are visible signs of landward migration along a thin band at the edge of the cove. Sections of the lawn look stressed, turning brown and changing to a rough texture



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This aerial photo shows the lawn at Waterford Beach Park. Note the texture and brown color of the marsh grasses along the edge, where stress is occurring.



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At the William A. Niering Natural Preserve at Harkness Park, the path near the cove is inundated during higher tides.

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as the salt water extends its briny reach. This can happen when a person mowing the lawn has extended that activity into the marsh, but more likely these are sections traditionally landscaped as lawn that are now having problems with salt. The growth of woody plants along the edge hints of an older boundary, of past attempts to push fill and waste material against the marsh. The changes to the lawn above this line show that upland migration may already be taking place, working its way around and through these “barriers”.

An instinctive reaction when dealing with this kind of change can result in walling off the marsh, filling in low areas, or continued mowing in hopes the grass will recover—all with the intent to retain the uplands. While this may seem the only option given the perceived value of coastal land, a preferred reaction is to recognize the gradual migration as natural and plan around it.

Reducing mowing in the zone of change is a good start. Without mowing and compression from equipment, the saltwater marsh grasses could grow and thrive, reaching the taller heights required to support a healthy root system. As the plants adjust, there would be a gradual change in the landscape. In the case of Waterford Park, there is plenty of room for saltwater plants to migrate inland and no structures are threatened. Controls may still be required for invasive plants, but the key difficulty might be the adjustment of our perception of what is right; to understand the value of the process.

A second example is the William A. Niering Natural Preserve at Harkness Park. This is an incredible natural area, with the vibrant warm season grasslands sloping down to the gentle shores of



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During a regular flood event at Goshen Cove, water levels rise onto the Land Trust field after storm tides fill the cove and plug the outlet.



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West Farms Land Trust, Powers Tract field to North - low "tip" area left uncult.

Goshen Cove. Surrounding one of these fields is a mowed path created for access around the natural area and for walking to a bird observation blind. This is a great source for public access, but the

cove is heavily influenced by variations in tides and often floods, filling the lowest sections of the path. During extreme tides the water levels on the path are too deep to walk through and maintenance

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vehicles can rut the softened ground.

Driven by weather events, these higher tides provide a window to the future, visibly showing where the marsh will likely advance with a long term rise in sea level. Here, the park manager has recognized the situation and plans to realign the path away from the areas influenced by the rising water. The path is the only human feature affected in this field, no structures require protection, and it's already a natural area, so this is a win-win situation. Over time the reduction in mowing should allow the marsh species to grow and transition into the field.

A third example, again on Goshen Cove, is a grassland habitat shared and maintained by three home owners and the West Farms Land Trust in Waterford. Again the line of woody plants shows where the original farmers graded to the edge; filling in places to expand the size of the fields. And just like the Niering Preserve, the occasional high tide events provide a glimpse to the new future; the flooded grasses highlighting where upland migration will go. As managers of the habitat, the Land Trust has decided to limit future activities in these flooded sections of the field; avoiding the rutting from equipment and allowing salt water species to grow to full height. The trust will monitor areas over time and try to control invasive species.

These are small samples from a small section of Connecticut, but the concept for dealing with the rising water can apply to many areas in the State. A key

message to understand: from a natural point of view, the coastal habitat retained by the inland migration can be just as important as the upland it replaces. For these and other areas in Connecticut, if there are no serious human-related impacts, allowing for the natural progression can provide great benefits to the health and value of Long Island Sound.

*To see more of Joel's excellent aerial photos, go to this web site: <http://clear.uconn.edu/research/wracklines/>*

#### About the Author:

Joel Stocker is an Assistant Extension Educator with the University of Connecticut's Cooperative Extension System. His specialty is mapping natural resources using Geographic Information Systems (GIS), Global Positioning System (GPS), and Remote Sensing technology. A private pilot, he uses aerial photography to help capture and highlight changes to the landscape, particularly the coastline. To supplement his collection, he recently attached a camera system to a remote controlled plane, and used it for this article. If you look closely you can find him (or Waldo) in three of the images...

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