Old Saybrook Coastal Resilience Committee

OSCRC Report No. 2

Meeting Summary

April 21, 2022
Old Saybrook, CT

Compiled by: **Edwin Rajotte**
Joseph Russo
Thomas Tokarz

Introduction

The Old Saybrook Coastal Resilience Committee (OSCRC) was formed in 2021 to assess the needs of the dozen or so local beachfront and riverfront communities as a response to sea level rise. This report is a summary of the OSCRC's second meeting held in the Old Saybrook Town Hall on April 21, 2022.

Each beach community (association, tax district, borough, etc.) sent a representative to the second meeting. The attendee list from the first and second meetings is in Appendix 1. Representatives of town governments were also in attendance. The focus of the second meeting was a risk assessment for each of the problems identified by the beach communities in the first meeting. Risk Assessment is the next step in the resilience framework (Figure 1), which was introduced in the first meeting.

Figure 1. Steps to Resilience. Graphic by Anna Eshelman, NOAA (https://toolkit.climate.gov/image/3354). The Steps to Resilience framework has five steps: 1. Explore Hazards, 2. Assess Vulnerability and Risk, 3. Investigate Options, 4. Prioritize and Plan, and 5. Take Action.

The second meeting agenda called for introductions, a brief presentation of the various problems that posed a risk to beach communities, a brainstorming session, the next step for the OSCRC, and a strategy discussion for securing public funding to support the eventual actions agreed upon by the OSCRC.

Following introductions, the meeting began with an announcement by Chris Costa about a recent proposal submission. There was a subsequent discussion about the proposal by the attendees. Following the proposal discussion, a brief presentation was given on the various problems that posed a risk to beach communities (Appendix 2). The goal of the presentation was to provide a common understanding, through descriptions and terminology, of the problems and their risks.

Brainstorming Session

The brainstorming session addressed step 2, assess vulnerability and risk, in the resilience framework. A form was distributed to attendees. It listed, in rows, the nine problems identified in the first meeting and, in columns, the likelihood of each problem being a risk today, seasonally, or in five years (Figure 2). Attendees were asked to mark with a check the period (today, seasonally, or in five years) when any of the listed problems would be a risk in their beach community. Attendees were also asked to write a comment about a problem that was not covered in the list or one that needed more detail.

Name: ________________________________

Problem v	Every Day	Seasonally	In 5 Years
Sand deposition			
Sand erosion			
Tidal flooding			
Tidal wetland			
Storm surge			
Drainage			
Seawalls			
Jetties, piers			
Septic systems			

Comment:

Figure 2. Layout of form to be filled out by attendees. Attendees put a check mark in one of the three columns if a listed problem is a threat to their beach community. If there is no risk from a problem, the columns are left blank. Form also included space for a comment.

Individual responses were organized by beach community and presented in three tables representing the three periods of risk (Appendix 3). Comments included with responses are also given in Appendix 3. A summary of all beach community responses to the nine problems by the periods of risk is given in Table 1.

Table 1. Summary of all beach community responses to the nine problems and three periods (Every Day, Seasonally, and In 5 Years) of risk.

Problem	**Every Day**	**Seasonally**	**In 5 Years**
Sand deposition	1	2	0
Sand erosion	3	6	0
Tidal flooding	2	7	2
Tidal wetland	2	4	4
Storm surge	1	7	2
Drainage	3	4	0
Seawalls	1	5	4
Jetties, piers	1	3	3
Septic systems	3	2	1

The entries in Table 1 represent the number of beach communities identifying a listed problem as occurring every day, seasonally, and in 5 years. It should be noted that seasonally could mean a problem that is associated with a weather event during a year. If the “Every Day” and “Seasonally” responses are viewed together, then sand erosion, tidal flooding, and storm surge are the top problems. Closely following these top problems are tidal wetland, drainage, and seawalls. Sand deposition, jetties, piers, and septic systems rounded out the bottom as being problems. Not surprisingly, tidal wetland, seawalls, and jetties, piers were marked as becoming problems in five years. A tidal wetland becomes a problem due to long-term encroachment, while seawalls, jetties, and piers become a problem because they deteriorate over time.

The distributed form (Figure 2) allowed for comments from attendees. These comments, which are listed at the end of Appendix 3, bring to light additional issues that are either directly or indirectly related to the listed problems on the form. A few examples help highlight specific concerns. For one, excess sedimentation in a channel impedes the movement of boats. For another, there is the issue of more rocks being deposited on beaches with rising tidal water. The rocks are becoming an increasing hazard to swimmers. Lastly, septic system flooding due to tide gate being undersized and not working. As a whole, comments were particularly useful because they cite immediate issues that need attention in the context of the general problems listed on the form.

The ranking of problems in Table 1 satisfies the second step, assess vulnerability and risk, in the resilience framework (Figure 1). The next step in the framework, investigate options, can now move forward using the prioritized problems as a guide. These options will be presented and discussed in the next meeting.

Next Steps

The brain storming session identified problems that need immediate and future attention. The next step, as outlined in the resilience framework (Figure 1), is to investigate options. This investigation involves two avenues of inquiry. The first is to find studies that provide evidence for successful mitigation practices. The second avenue is to reach out other beach communities in the eastern United States to determine which options worked for the problems identified by OSCRC. And, most importantly, which options were cost effective and provided a long-term benefit.

Securing Public Funding

As mentioned in the first meeting, concurrent with the next steps of the resilience framework, OSCRC needs to identify stakeholders, including local, state federal government officials, non-governmental organizations, and the public-at-large, who could help both in planning mitigation responses and securing funds to implement those responses. To this end, a few attendees brought up names of individuals who could help secure public funding and agreed to contact them.

As a final note on the public funding discussion, all attendees were encouraged to pass along any names and contact information to the report authors below. These names and their contact information will be shared with everyone participating in the OSCRC.

Ed Rajotte (Fenwood District) – Email: rajottes@comcast.net
Joe Russo (Knollwood Beach Association) – Email: jmr2649@gmail.com
Tom Tokarz (Fenwood District) – Email: tomtokarz0@gmail.com

Appendix 1. Attendee List in Alphabetical Order

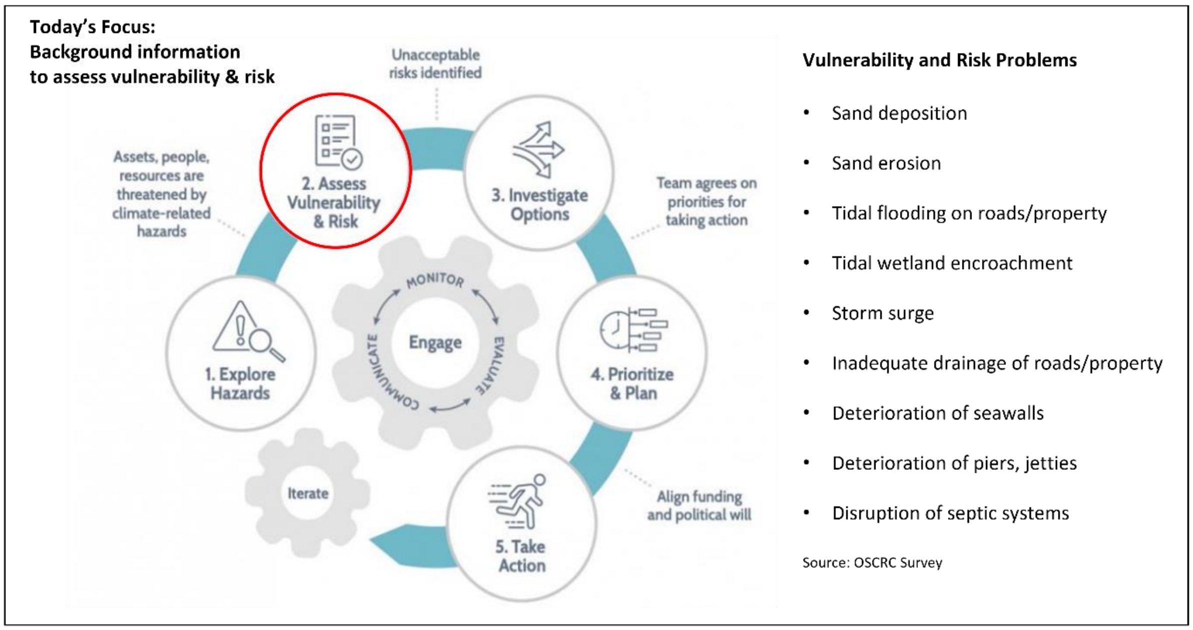
Attendees at the April 21, 2022 meeting are in bold text.

Name	Association	Email
Gary Albanese	Chalker Beach	gjalbanese@sbcglobal.net
Tom Armstrong	Great Hammock Beach	tarmstrongenv@gmail.com
Joanne Breen	Saybrook Manor Cove	joanne.breen@era.com
Jeffrey Brødersen	Saybrook Manor	Jeffrey.Brodersen@gmail.com
Linda Cannarella	Saybrook Manor Cove	lindacannarella@gmail.com
Marie Cerino	Great Hammock Beach	mariecerino521@gmail.com
Arcangela Claffey	Bel Aire Manor	tnclaffey@gmail.com
Michael Cohen	Chalker Beach	cohenx4@aol.com
Tim Conklin	Cornfield Point	tconklin@magner.com
Christina Costa	Town Planner, CZEO	Chris.costa@oldsaybrookct.gov
Jay Costello	Indian Town	jay.a.costello@comcast.net
Pat DeVito	Knollwood Beach	patdevito@sbcglobal.net
Carl Fortuna	First Selectman	Carl.fortuna@oldsaybrookct.gov
Peter Gillespie	Town of Westbrook	pgillespie@westbrookct.us
John Kennedy	Otter Cove	John.Kennedy@JKennedyTechLaw.com
Marilyn Ozols	Borough of Fenwick	zeo@fenwicknews.com
Dave Pettinicchi	Saybrook Manor	neech1214@gmail.com
Robert Pulito	Saybrook Manor Cove	rpulito@slamcoll.com
Edwin Rajotte	Fenwood District	rajottes@comcast.net
Ileen Roth	Indian Town	iroth@travelers.com
Michael Roth	Indian Town	ournextboat@comcast.net
Joseph Russo	Knollwood Beach	jmr2649@gmail.com
Thomas Tokarz	Fenwood District	tomtokarz0@gmail.com
Rose Ziegler	Indian Town	rose.ziegler@sbcglobal.net

Appendix 2. Brief Presentation on Assessing Vulnerability and Risk

A presentation of the vulnerability and risk associated with the problems identified by the OSCRC beach communities was given by Joe Russo, who is a representative of the Knollwood Beach Association. The goal of the presentation was to provide a common understanding, through descriptions and terminology, of the identified problems and their risks. The presentation, in the form of a PowerPoint slides, has been duplicated in this appendix. Notes are provided to emphasize the main point of each slide.

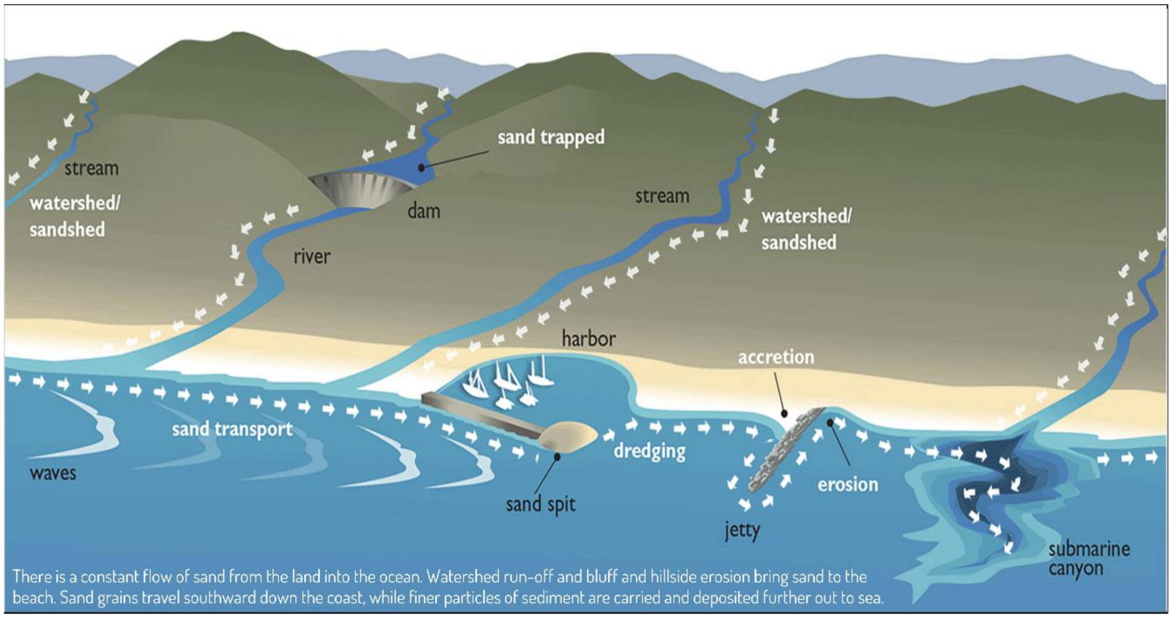
Slide 1: Resilience Framework Steps



Source: Graph - U.S. Climate Resilience Toolkit. 2022. https://toolkit.climate.gov/steps-to-resilience/steps-resilience-overview

Slide 1 Note: The focus of the second meeting was to deliver background information for Step 2: Assessing Vulnerability and Risk. Vulnerability and risk were associated with nine problems identified in an OSCRC survey. The problems and listed in the right side of this slide.

Slide 2: Sand Flow Resulting in Deposition and Erosion Along Shoreline



Source: https://explorebeaches.msi.ucsb.edu/sandy-beach-life/sand-movement

Slide 2 Note: An idealized picture of sand flow deposition and erosion along a shoreline.

Slide 3: Subtidal Water Exchange in Eastern Long Island Sound

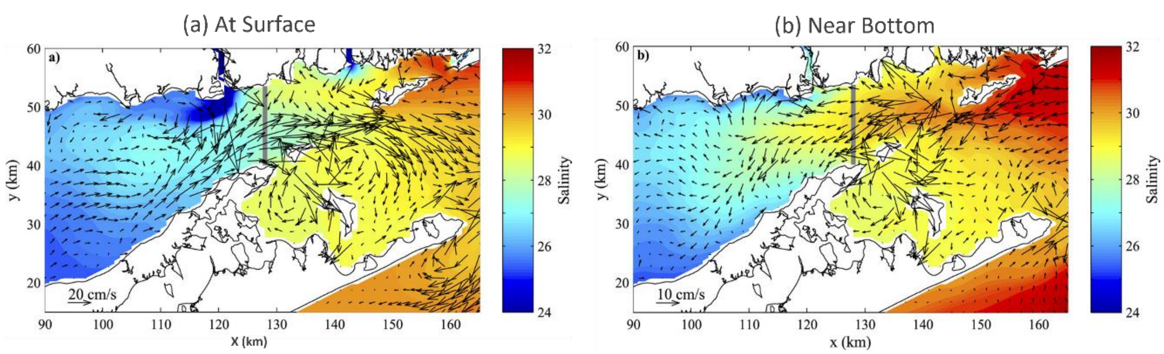
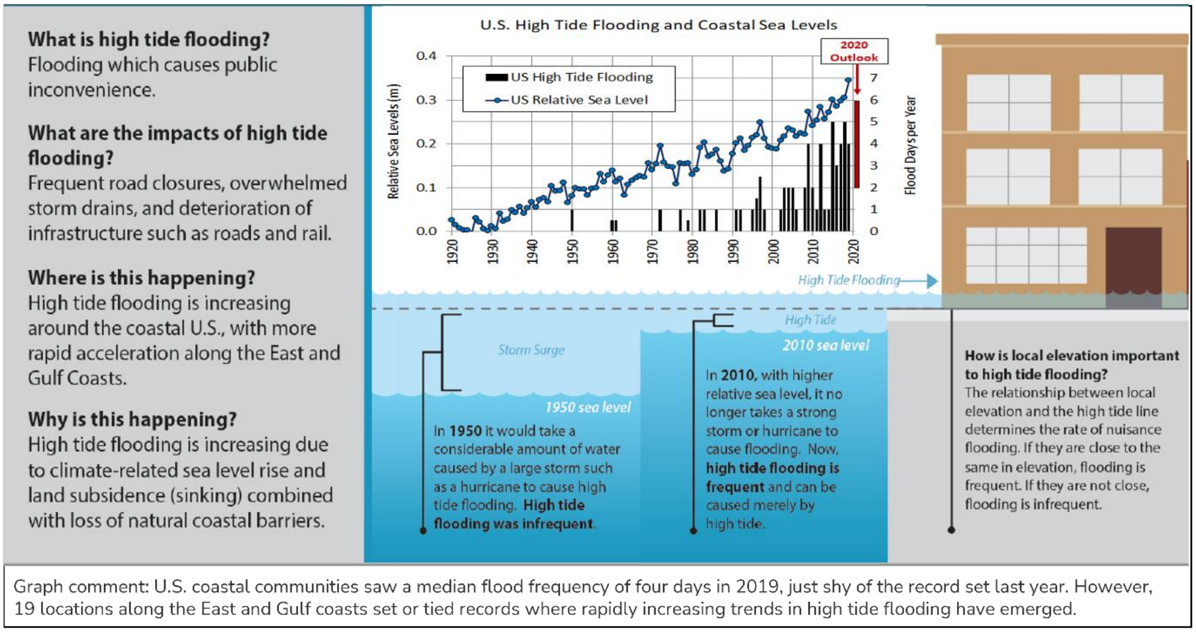


FIGURE. Salinity (color contoured) and subtidal currents (vectors) at (a) the surface and (b) near the bottom. Model results are regime averaged for the mean tide, mean discharge, and low wind regime. The main transect is marked with a gray line. Note: white arrow is path of sample locations.

Source: Whitney, M.M., D.S. Ullman, and D.L. Codiga. 2016. Subtidal Exchange in Eastern Long Island Sound. Journal of Physical Oceanography 46, 8; 10.1175/JPO-D-15-0107.1

Slide 3 Note: Subtidal water exchange in eastern Long Island Sound based on modeled mean tide, mean discharge, and low wind regime. The exchange shows sand deposition and erosion patterns along the Connecticut shoreline.

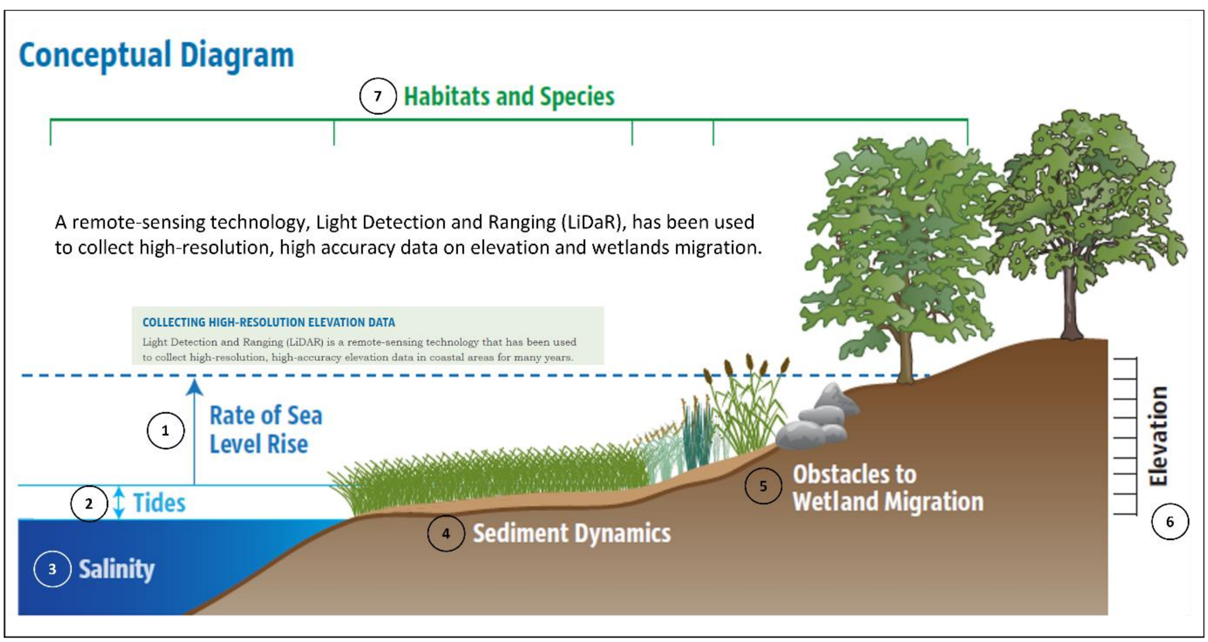
Slide 4: Tidal Flooding on Roads and Property



Sources: Image: https://oceanservice.noaa.gov/facts/high-tide-flooding.html. Imbedded Graph: https://www.noaa.gov/media-release/us-high-tide-flooding-continues-to-increase.

Slide 4 Note: Explanation of tidal flooding, including impacts, where its happening and why. Graph in upper center of slide shows the steady increase flood days nationally over the last century.

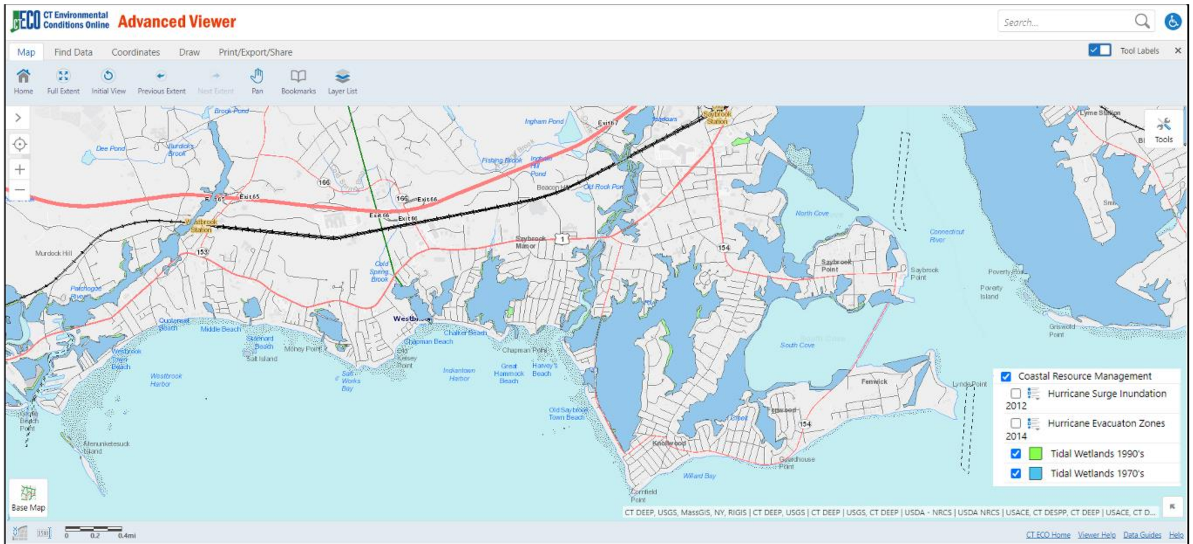
Slide 5: Tidal Wetland Encroachment - Key Parameters



Source: www.nature.org/ourinitiatives/habitats/oceanscoasts and www.csc.noaa.gov.

Slide 5 Note: A conceptual depiction of key parameters (numbered in image) responsible for tidal wetland encroachment.

Slide 6: Tidal Wetland Encroachment - 1970's to 1990's

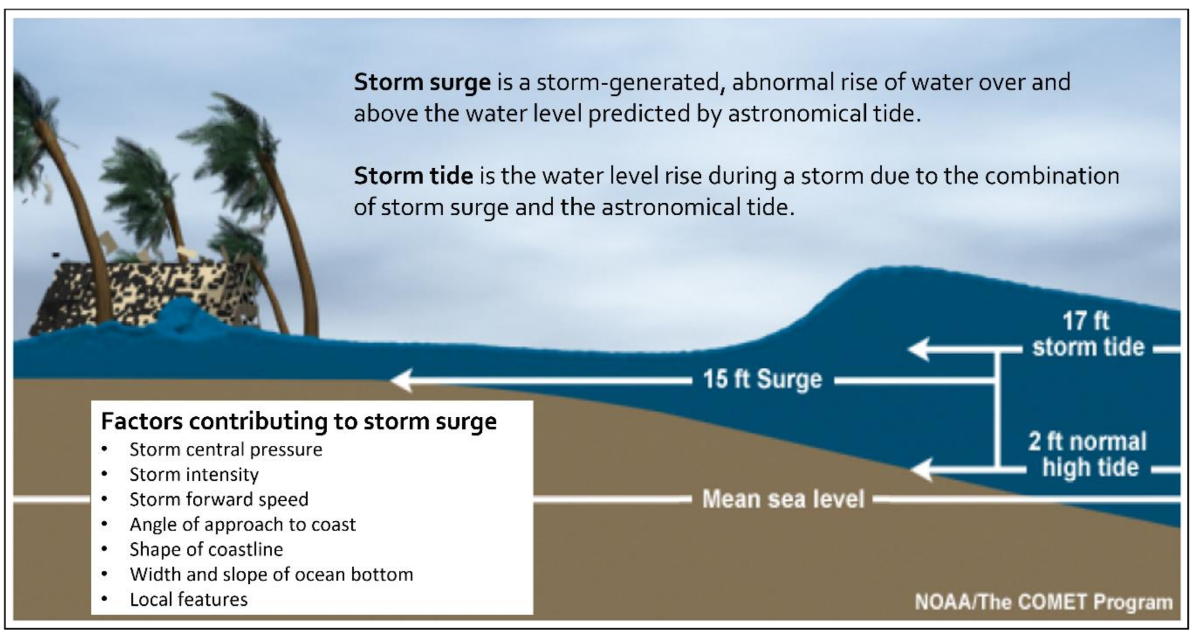


HARTFORD, Conn. – Jan. 17, 2020. The Connecticut Department of Energy and Environmental Protection (CT DEEP) received $63,750 in grants from the U.S. Environmental Protection Agency (EPA) for state-led programs and projects that will protect, manage and restore wetlands across the state, and EPA expects to award a second round of these grants in the same amount later this year. Contact John Senn (senn.john@epa.gov)(617) 918-1019.

Source: https://cteco.uconn.edu/viewer/index.html?viewer=advanced

Slide 6 Note: Difference from 1970's (blue shade) and 1990's (green shade) in tidal wetland encroachment along the shoreline encompassing Old Saybrook, CT. Lower banner in slide is a notice of the CT DEEP receiving a grant from the EPA in 2020.

Slide 7: Storm Surge



Source: https://www.nhc.noaa.gov/surge/#INTRO

Slide 7 Note: Definitions of storm surge and storm tide, along with the factors contributing to storm surge.

Slide 8: Inadequate Drainage of Roads and Properties

Factors contributing to inadequate drainage

- Rutting or shoving of surface.
- Discontinuity of surface level between the pavement and shoulder (shoulder drop-off).
- Accumulation of earth or debris.
- Erosion channels on ditch side slopes.
- Silt or debris accumulation in ditch.
- Headwalls and drainage structures that are not flush with the ground.
- Damage to drainage structures.
- Drains blocked by soil and debris.
- Side slopes steepened due to erosion.
- Erosion around all roadside structures such as headwalls, sign posts, and guardrail posts.

Source: https://safety.fhwa.dot.gov/local_rural/training/fhwasa09024/

Slide 8 Note: Factors contributing to the inadequate drainage of roads and properties.

Slide 9: Marine Structures - Definitions

Seawall (also called a bulkhead, revetment) – Structure built of concrete, wood, steel or boulders that run parallel to the beach at the land/water interface. They are designed to protect roads, buildings, and property by stopping the natural movement of sand by the waves.

Breakwater (also referred to as artificial reefs) – Structure is a large pile of rocks built parallel to the shore. It is designed to block the waves and surf, and built to provide calm waters for harbors and artificial marinas. Submerged breakwaters are built to reduce beach erosion.

Wharf (also called a quay) - A concrete, stone, wood or metal platform built parallel to the bank of a waterway for use as a landing place.

Jetty - Structure built with concrete or stone perpendicular to a shore and extending to water bottom. Jetties are installed in pairs at the sides of an inlet to maintain navigable waterways. They stabilize an inlet by intercepting the longshore transport of sand that would otherwise fill it in or cause the channel to shift position.

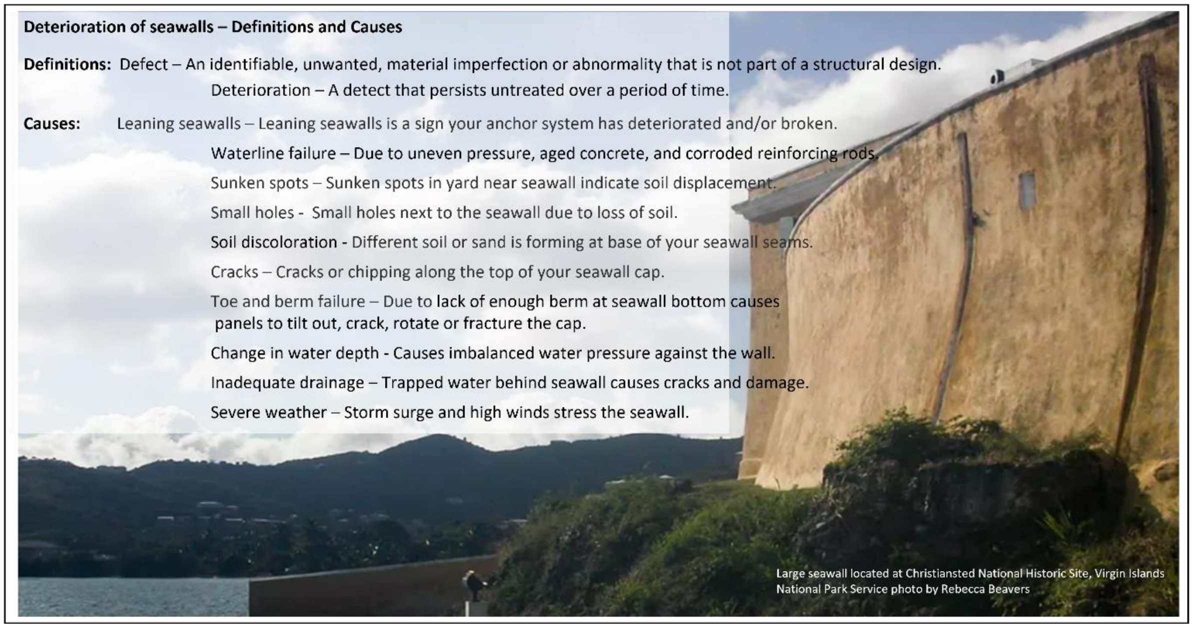
Groin (type of jetty) - Structure built with boulders, concrete, steel, or wood perpendicular to a shore and extending to water bottom to interrupt and trap the longshore flow of sand. Sand builds up on one side of the groin (updrift accretion) at the expense of the other side (downdrift erosion).

Pier – An above-water, pile-supported platform built with concrete, steel, wood or composite materials perpendicular or at an angle to a shore. It is designed to berth small boats, unload cargo, or serve as a promenade for people.

Source: https://beachapedia.org/Shoreline_Structures

Slide 9 Note: Definitions of marine structures.

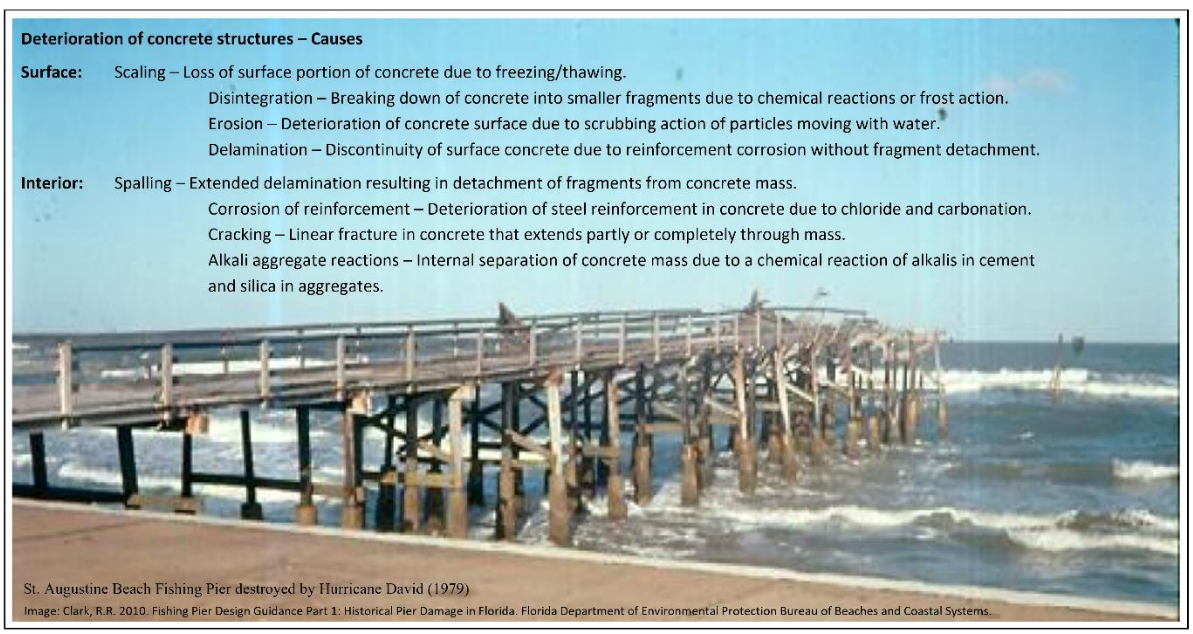
Slide 10: Deterioration of Seawalls



Sources: Text: https://stokesmarine.com/blog/5-reasons-seawalls-fail-and-how-prevent-it. Text: https://nbc-2.com/nbc-2-wbbh/2019/04/05/5-signs-your-seawall-is-failing/

Slide 10 Note: Definitions and causes for the deterioration of seawalls.

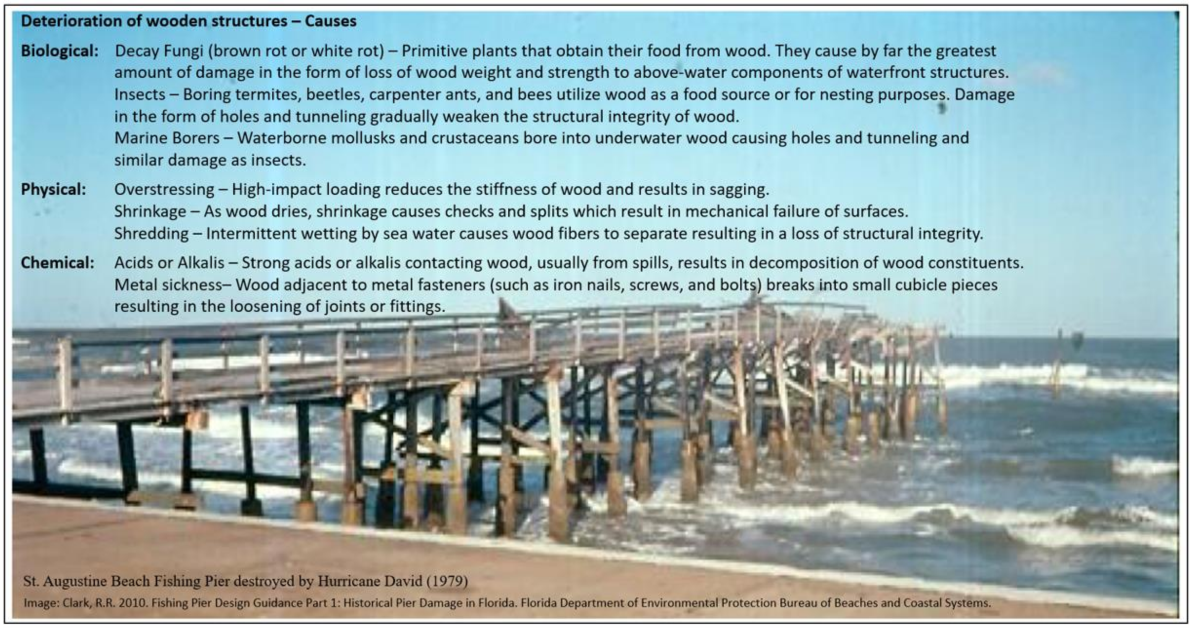
Slide 11: Deterioration Concrete Marine Structures



Source: Text: Deterioration of Concrete Structures. 2016. FprimeC Solutions. (fprimec.com/deterioration-of-concrete-structures/https://www.nhc.noaa.gov/surge/#INTRO)

Slide 11 Note: Causes of surface and interior deterioration of concrete marine structures.

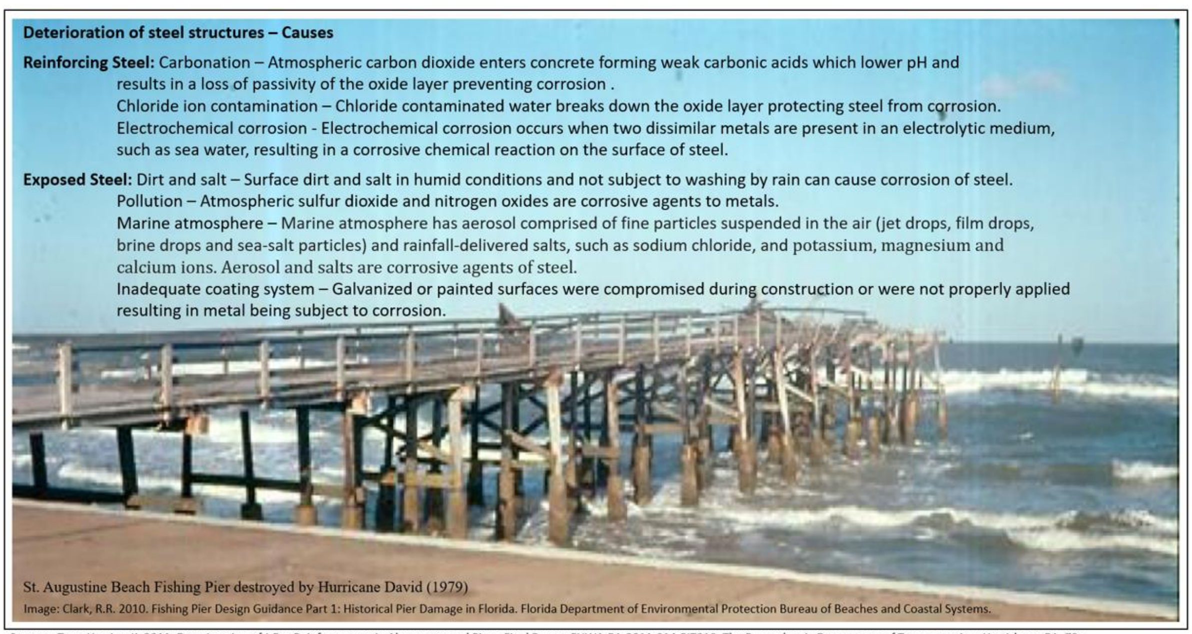
Slide 12: Deterioration of Wooden Marine Structures



Source: Text: Highley, T. and T. Scheffer. 1989. Controlling Decay in Waterfront Structures. Research Paper FPL-RP-494. USDA. 26 p.

Slide 12 Note: Causes of biological physical and chemical deterioration of wooden marine structures.

Slide 13: Deterioration of Steel Marine Structures



Sources: Text: Harries, K. 2011. Deterioration of J-Bar Reinforcement in Abutments and Piers. Final Report FHWA-PA-2011-014-PIT010. The Pennsylvania Department of Transportation, Harrisburg, PA. 72 p.
Text: Alcántara, J. D. de la Fuente, B. Chico, J. Simancas, I. Díaz and M. Morcillo. 2017. Marine Atmospheric Corrosion of Carbon Steel: A Review. MDPI, Basel, Switzerland.

Slide 13 Note: Causes of reinforcing and exposed steel deterioration of steel marine structures.

Slide 14: Disruption of Septic Systems

Disruption of Septic Systems – Causes

Nutrients and Contaminants - When the soil is saturated, nutrients and biological contaminants can move much greater distances (in some cases, up to several hundred feet). When septic systems close to a shore are saturated during high water periods, they become likely to leak wastes into the sea. When shorelines erode, the distance between the septic system and the shoreline becomes shorter, making it more likely that liquid waste could move through the soil to the bank and then into the water.

Health Concerns - Liquid wastes from a septic system that reach a shore increase the possibility that swimmers could catch a variety of ailments and diseases, some serious, that are associated with these wastes.

System Failure - Soils saturated by water, pipes blocked by roots, crushed tile, improper location, poor original design, poor installation, or improper maintenance by homeowners can lead to major problems.

Indicators that contaminants are reaching a shore.

- Excessive weed or algae growth in the water.
- An increase in infections or illnesses associated with area swimming.
- Unpleasant odors, soggy soil, or liquid waste flow over the land surface.
- Test results indicating the presence of biological contamination.
- Indicator dye put into your septic tank reaches the lake.
- Lush green grass over the absorption field, even during dry weather.
- Slow flushing of your toilets.
- Sewage backup in your drains or toilets.

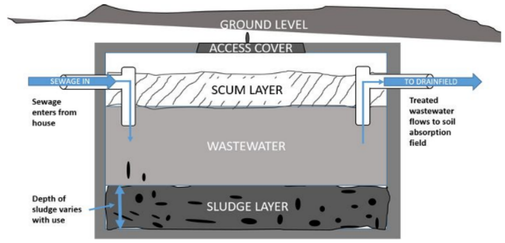


Diagram of single cell septic tank. Graphic by Beth Clawson, Michigan State University Extension.
Source: https://www.canr.msu.edu/news/why-do-i-need-to-clean-my-septic-tank-every-three-years

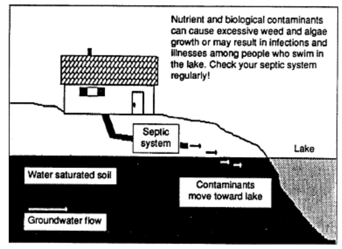


Diagram: Joseph Schumacher, South Dakota State University Extension.
Source: https://www.sdstate.edu/agricultural-and-biosystems-engineering/septic-systems-shoreline-property

Source: Text: https://www.sdstate.edu/agricultural-and-biosystems-engineering/septic-systems-shoreline-property

Slide 14 Note: Causes of disruption of septic systems and indicators that contaminants are reaching a shore.

Appendix 3. Summary of Each Beach Community Response to Distributed Form

On a distributed form, each attendee was asked to mark with a check the period (today, seasonally, or in five years) when any of the listed nine problems would be a risk in their beach community. The following three tables are their responses for each period.

Appendix Table 3.1. Problems that are a risk today for each beach community.

Today

Beach Community	Sand Deposition	Sand Erosion	Tidal Flooding	Tidal Wetland	Storm Surge	Drainage	Seawalls	Jetties, Piers	Septic Systems
Bel Aire Manor									
Borough of Fenwick									
Chalker Beach				x		x			
Cornfield Point									
Fenwood District		x		x	x				x
Great Hammock Beach									
Indian Town	x	x	xx			xxx			xx
Knollwood Beach		x							
Otter Cove									
Saybrook Manor			xx			xxx	x	x	xxx
Saybrook Manor Cove									

Appendix Table 3.2. Problems that are a risk seasonally for each beach community.

Seasonally

Beach Community	Sand Deposition	Sand Erosion	Tidal Flooding	Tidal Wetland	Storm Surge	Drainage	Seawalls	Jetties, Piers	Septic Systems
Bel Aire Manor									
Borough of Fenwick		x	x	x	x		x	x	
Chalker Beach		xx	xx		xx	x	xx	x	xx
Cornfield Point									
Fenwood District			x			x			
Great Hammock Beach			x	x	x	x	x		
Indian Town	xx	xx	x	xx	xxx		xx	xx	
Knollwood Beach		xx			x	xx			x
Otter Cove		x	x		x				
Saybrook Manor	xxx	xxx	x	xxx	x		x		
Saybrook Manor Cove									

Appendix Table 3.3. Problems that are a risk in 5 years for each beach community.

In 5 Years

Beach Community	Sand Deposi-tion	Sand Erosion	Tidal Flooding	Tidal Wetland	Storm Surge	Drainage	Seawalls	Jetties, Piers	Septic Systems
Bel Aire Manor									
Borough of Fenwick									
Chalker Beach									
Cornfield Point									
Fenwood District								x	
Great Hammock Beach			x	x	x		x		
Indian Town				x			x	x	x
Knollwood Beach			xx	xx	x		xx	x	
Otter Cove				x					
Saybrook Manor							xx		
Saybrook Manor Cove									

Comments

Otter cove: We are on the CT river. Tidal wetland loss and road and property flooding (5 years).

Saybrook Manor: Channel is rapidly filling. Boat passage is a problem with sand bars.

Saybrook Manor: When rain, Neptune Cove (street) floods. Channel filling so boats have difficulty.

Great Hammock: Losing tidal wetlands. Much of Great Hammock requires seawalls. Have 15+ piers, but most are stepover. Boat pier is a problem due to destabilization caused by water velocity in Back River.

Fenwick: Seasonally means that it occurs now either with storm or extremely high tide- but not necessarily related to season.

Fenwood: Dangerous situation with rocks gathering in swimming area. This is increasing with rising water levels.

Knollwood: We lose sand routinely. The seawall and pier are okay now, but may not be in 5 years. Drainage issues are spotty and sporadic depending on rain amount and other conditions.

Chalker Beach: All storm related. Septic system flooding due to tide gate not working properly and undersized. Seawalls need to be replaced with curved-surface. Square seawalls add to beach erosion. Storm water collects because the town refused to clean swales and spot pave to gain better pitch.