

# STONINGTON WATERFRONT ADAPTATION PLAN

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AN ASSESSMENT OF CURRENT CONDITIONS &  
RECOMMENDED FUTURE STEPS.

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## INTRODUCTION

This report identifies current conditions and anticipated future needs of the Stonington waterfront. It recommends strategies to increase the resiliency of key waterfront facilities against sea level rise and increased storm surges. Maintaining the working waterfront is important to the broader Eastern Maine region since Stonington is one of the major commercial fishing ports in Maine. DMR data show that between 2009 and 2014 the ex-vessel value of its catch was the highest among the top ten ports in Maine. Preliminary DMR data for 2013 show a \$46.1 million value. The next highest yielding port is Portland with a preliminary 2013 estimate of \$32.1 million.

This report consists of three sections. The first is a needs assessment of the key waterfront and adjacent facilities. It discusses various trends that affect the town. This is followed by an analysis of specific facilities.

The next section is the Capital Improvement Program (CIP). *These are recommended improvements.* The final decision on any capital improvement depends on town meeting approval. Its purpose is to schedule needed improvements over a multi-year period to avoid having too many expenditures occur in a given year. The CIP is reviewed and, if necessary, revised annually. This allows the town to add unanticipated items to the CIP. The town may also decide to delay purchases. The third section is an Action Plan. It identifies the specific steps involved in implementing the recommendations.

This report was prepared with input from several sources. These are described in Appendix 1. There were also two public outreach meetings. The first meeting included presentations on changes in marine resources and anticipated storm surges. Participants identified the Hagen Dock and the sewer system as the top priority. The primary message from participants in the second workshop was that the town should address the many needs gradually. This is due to the fiscal limitations the town faces.

This report focuses on public facilities and services. It does not address the impact of sea level rise or storm surges on the private sector. As seen on the maps referred to in this report, there will likely be major impacts on private property.

# I. STONINGTON WATERFRONT NEEDS ANALYSIS

## PURPOSE

This chapter assesses the current and future adequacy of Stonington's waterfront public facilities that are subject to storm surges or flooding. It first reviews socio-economic conditions. It then discusses the current vulnerability of key town facilities to storm damage. Based on projected changes in sea level, demographics, and the area economy, future needs are estimated. The major capital needs are summarized in the Capital Improvement Program (see following chapter).

### 1. A Brief Summary of Projected Trends in Stonington

#### 1. a. Demographic Trends

Stonington is losing year-round population. Between 2000 and 2010 its population decreased from 1,152 to 1,043. The town is presently (2015) projected to have a population of 636 by 2030. The population is getting older. In 2010, Stonington had a median age of 51.6 years compared to 45.2 years for Hancock County and 42.7 years for the state. It is one of the older towns in the oldest state. The population is projected to continue to age. County-wide projections show that the percentage of the population age 65 and older will increase from 18 percent of the population in 2010 to 32 percent in 2030.

The town has a large number of second homes. The 2010 US Census reported that there were 432 second homes in town, about 43.5 percent of the total 993 units. This compares to 338 second homes in 2000 (37.2 percent of the total of 909). The high demand for second and retirement homes makes it harder for those dependent on local jobs to find affordable housing. It also means that there is a high rate of commuting into town. According to the most recent Census Commute to Work data, only 335 of the 701 people employed in town are Stonington residents, the rest commute from out of town.

#### 1. b. Marine Resource Trends

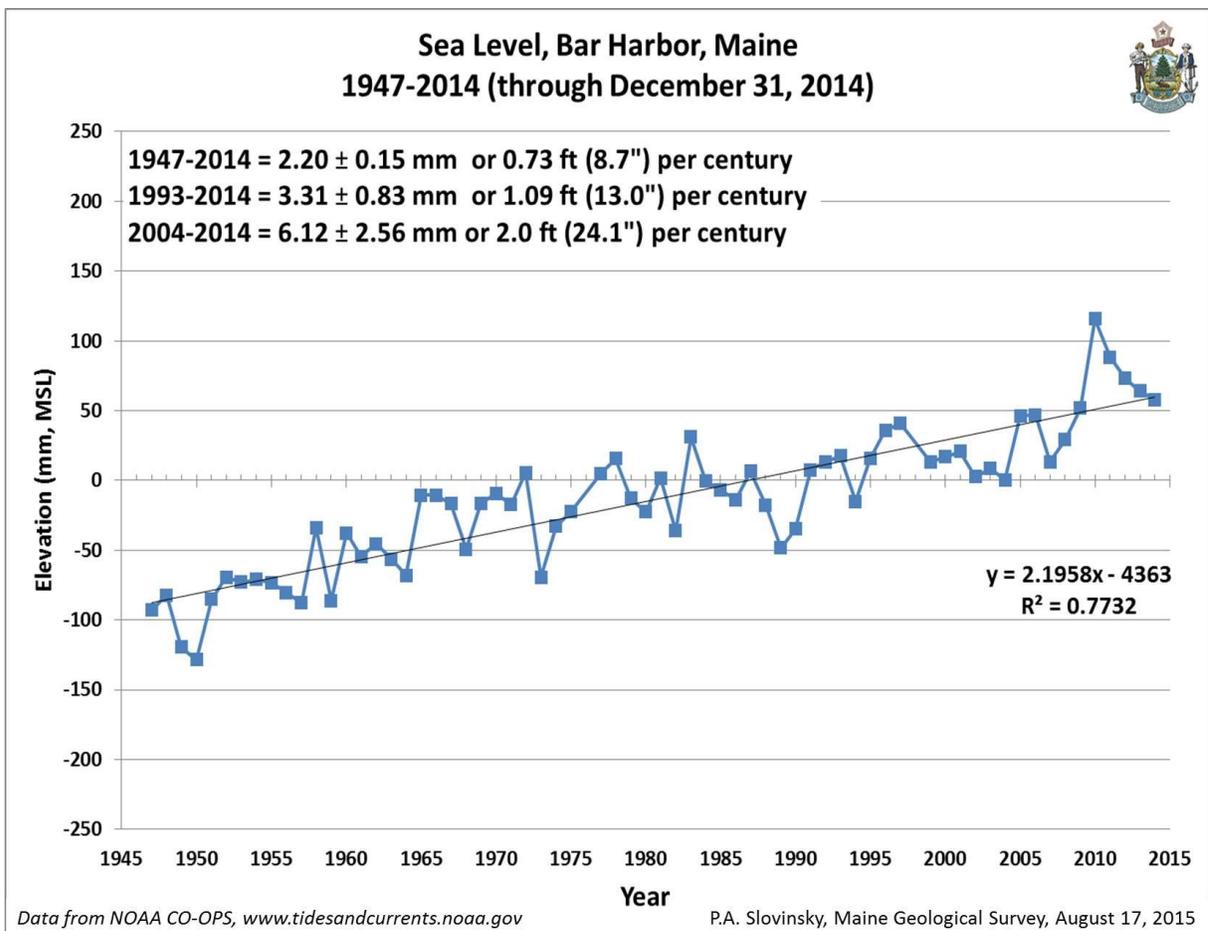
The fishing sector is changing. Warming waters in the Gulf of Maine mean southern species like Black Sea Bass and long fin squid are appearing in New England waters, and traditional fisheries, such as shrimp are suffering. Increased levels of ocean acidification threaten both ocean fishing and shellfish harvesting in mud flats. Ground fish stocks have collapsed. Lobsters are now the primary source of fisheries income.

Another change in the marine sector is less local processing of marine products. Only a small portion of lobsters caught in Maine waters are processed in the state. Between half and two-thirds of Maine lobsters are processed in Canada. The shift in fisheries may mean new opportunities for processing species that are now appearing in local waters.

**2. Projected Changes in Sea Level and Storm Surges**

A 2015 Maine Geological Survey (MGS) of the Maine Department of Agriculture, Conservation, and Forestry (DACF) analysis of tide gauge data from Bar Harbor, ME showed that sea level has risen at a rate of about 2.2 mm/yr., or about 8.7 inches per century from 1947 to 2014. Over the past 20 years, this rate has increased to about 3.3 mm/yr., which is consistent with global ocean sea level changes. Over the past 10 years, the rate has been approximately 6.1 mm/yr. (Figure 1), which is almost twice as fast as global ocean changes.

**Figure 1:**

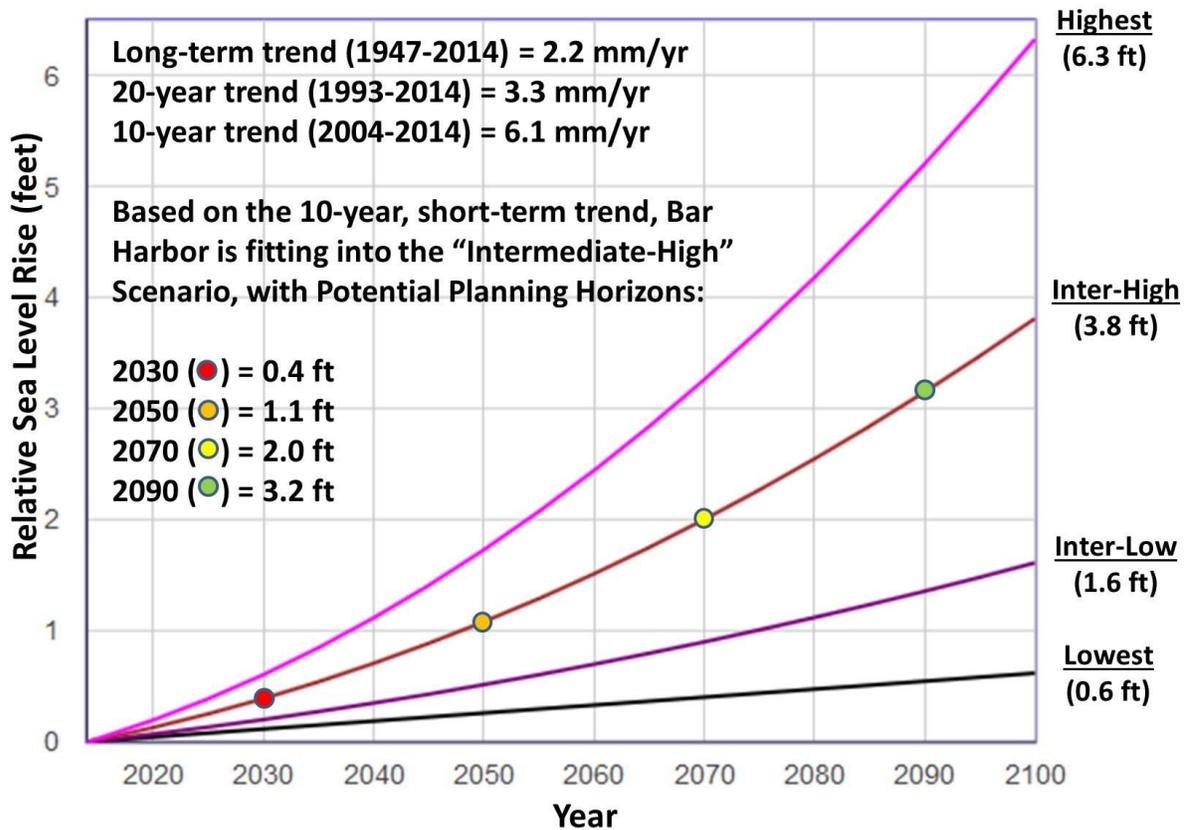


Using these data in conjunction with the potential sea level rise scenario curves from the US National Climate Assessment suggest that sea levels may be from 0.5 to 6.3 feet higher by 2100 (see Figure 2 and maps at: <http://www.hpcme.org/stonington/coastal/index.htm> . Current short-term decadal data at Bar Harbor (2004-2014) fits best into the “Intermediate-High” scenario. This scenario predicts sea level rise of 1 foot by 2050, 2 feet by 2070 and potentially 3.7 feet by 2100. These estimates are based on Bar Harbor data and variations are

possible for Stonington. The analysis of Stonington’s vulnerability in this report assumes two feet of sea level rise. These scenarios are subject to change and will require periodic review.

**Figure 2:**

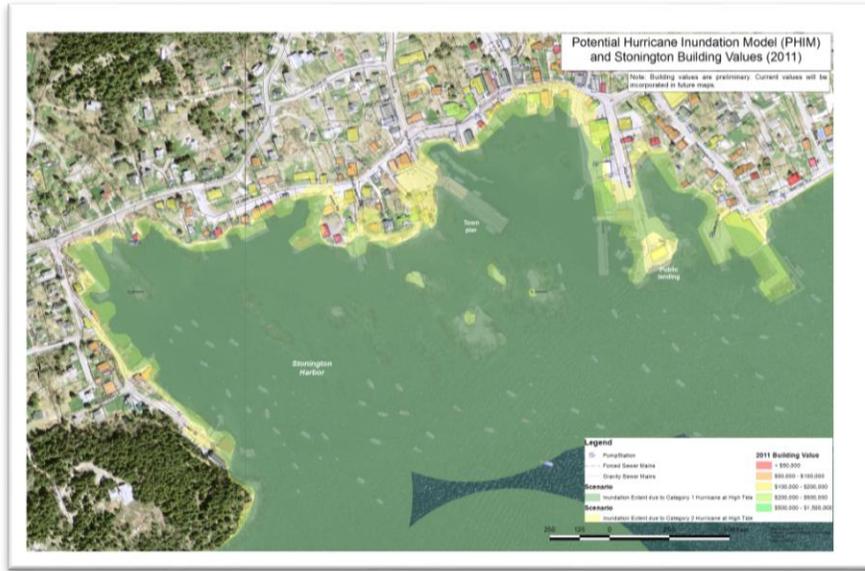
**Potential Sea Level Rise at Bar Harbor, ME (2014 start date)**



**SOURCE:** Maine Geological Survey, Maine Department of Agriculture, Conservation, and Forestry

A related trend is changes in storm surges and frequency and intensity of storms. The University of Maine Climate Program assessed rainfall levels over the past sixty years. It found that rainfall events have increased in intensity, with extreme events happening with greater frequency (see Figure 3) It should be noted that these long term data are based on an inland location (Corinna, Maine) rather than Stonington.

The increase in storm activity means that Stonington’s waterfront faces more challenges. There is the risk of greater flood damage and costly infrastructure repairs. If no action is taken, it will be increasingly difficult to preserve the commercial fishing sector and recreational uses of the harbor. Map 1 shows various hurricane inundation scenarios.



**Source:** Map 1: Potential Hurricane Inundation Scenarios for Stonington Harbor. (For a more detailed view of this and other maps, see the links listed in Appendix 2.)

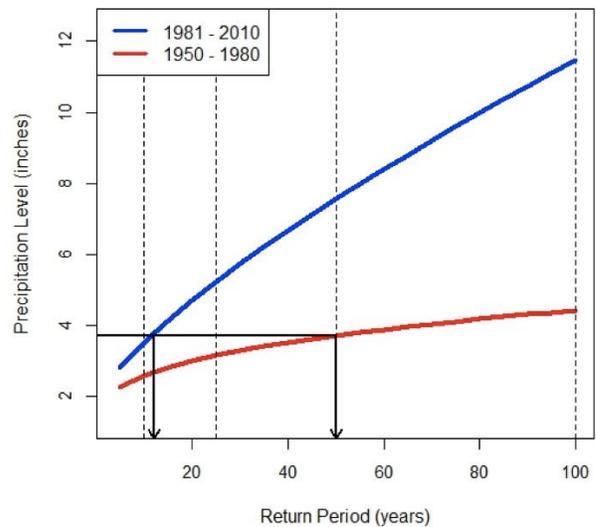
Sea level rise may also affect the town’s tax base as shorefront property becomes inundated. Map 1 shows the estimated valuation of property threatened by flooding under various scenarios. A category one hurricane (with winds between 75 and 94 miles per hour) would affect land valued at \$4.92 million and buildings valued \$2.47 million. These estimates are based on 2011 town valuation data. They do not imply that these properties would lose all value. Rather, some value may be lost as properties face increased flooding.

### 3. Assessment of Public Facilities and Services

This section assesses the current conditions of the various public facilities and services and discusses their vulnerability to storm damage. It then discusses their future adequacy.

**Increasing Storm Frequency**

**Figure 3:**



**Source:** [umaine.edu/maineclimatenews/home/adapting-to-extreme-rainfall](http://umaine.edu/maineclimatenews/home/adapting-to-extreme-rainfall)

### 3.1 Hagen Dock

The Hagen Dock is one of the key components of the working harbor and is the focal point of downtown Stonington. It is a public dock space, a parking area, and houses the fire station. It is also adjacent to a private business and the headquarters of a non-profit. There are sewer and, water lines, a pump station, and electrical conduits running below the surface.

#### a. Current Conditions

The original fill and some of bulkheads are over 100 years-old. The more recent sections of the dock were built in the 1960s. It does not meet current construction standards and has been repaired on a patchwork basis. Its deficiencies were highlighted in a December 2013 analysis by Andrew McCullough Engineering Consultants. The analysis noted serious problems such as water flowing through the retaining wall, resulting in an uneven surface and between 29 and 31 sinkholes in the pavement and pooling of water. Water infiltrates through the fill and carries sediment particles from the fill into the harbor. The dock floods during some storm events.

There are large gaps between some of the joints in the retaining wall. The granite used for the bulkhead was not uniformly cut and some of the blocks have shifted and lack deadmen to stabilize the wall. The older parts of the filled area consists of a variety of items. This makes the substructure vulnerable to tidal damage.

These deficiencies are being partially addressed with Community Development Block Grant funding in 2016 as this report is being finalized. Funded activities include improvements to the retaining walls and replacing the fill, with interlocking granite fill of varying sizes to strengthen the facility. The surface water drainage will be improved by resurfacing and adding a slight pitch toward the water.

It was not feasible to increase the height of the land mass at this time. If the height were increased, it would result in additional flooding of the fire station and adjacent properties. They would remain at a lower level than the rest of the dock and be subject to runoff from the higher areas. However, the engineering plan is designed to allow the height to be increased by two feet in the future.

The public landing floats are connected by a gangway to Hagen Dock. The gangway and the floats are removed during storms because of their vulnerability to severe weather. There is a minimized “winter configuration” for the floats. The ramps do not meet ADA requirements.

#### b. Future Needs

More vessel boat docking spaces are needed and the vehicle parking space issue must also be addressed. Relocating the fire station would create more space for parking. The entire land mass area needs to be raised at least two feet to reduce its vulnerability to flooding.

The dock would be configured to create more docking space. A designated space could be reserved for a Coast Guard boat and other vessels carrying passengers with emergency medical needs. There would also be more space for parking nearby. The town would like to create walkways with guardrails along the bulkhead. These improvements would complement other downtown revitalization measures. These include creating an adjacent park and adding lighting so the area could be used for evening outdoor events during the summer.

### 3.2 Stonington Municipal Fish Pier

The pier is the only publicly owned access point for commercial fishermen. Since commercial fisheries are the primary industry in Stonington, it plays an essential role in both the local and broader regional economy. It has fuel tanks, fuel pumps, hydraulic hoists, and dinghy floats. There is also a parking area for fishermen. The harbor master's office is located on the pier.

#### a. Current Conditions

The pier is vulnerable to flooding, including the harbormaster's office. The electrical panels, computers, security cameras, marine communications, supplies, and maintenance materials are all at risk. The fuel tanks, pumps, electrical lines, cables, hydraulic hoists, and motors are also prone to flooding. The ramp that connects to the dinghy floats rides on metal poles with the tides. During severe storm events, the metal pole attachments twist and bends on the ramp during extreme high/low tide and storm events. They require periodic welding. Sediment gathers under the floats, requiring dredging.

**The Fish Pier Ramp**



The pier was not designed for the current rate and type of use and needs expansion and dredging. Docking spaces and hoists are inadequate. There are frequent waiting lines for loading and unloading products. There is not sufficient space for parking, and equipment and

bait storage. The pier also needs more fuel tank capacity, an additional fuel pump and a waste oil collection system. The current office is too small and lacks a hot water supply.

b. Future Needs

A harbor depth study is needed for the pier area and adjacent floats to assess the extent of sediment deposits. This will determine how much dredging will be required. The study should also review pier expansion options. The harbormaster's office needs to be enlarged to allow adequate space for equipment storage. The office and all electrical and cabling need to be raised above projected flood elevation levels. The expansion plans should also address the need for more hoists and explore options for parking. These options include creating a filled area adjacent to the pier and expanding the pier to accommodate more parking spaces.

### 3.3 Colwell Ramp

The Colwell Ramp is owned jointly by the towns of Stonington and Isle Au Haut. It serves as a public boat launch ramp, a kayak launch site, and a commercial equipment and material loading site for nearby islands including Isle au Haut. It features a partially completed granite pier with a float, an ADA-approved ramp, and spaces for temporary tie-ups.

a. Current Conditions and Future Needs

The entire facility is open to wave action. Storage space for the ramp and floating dock is inadequate. If the float were left in place during a storm, it could be damaged beyond repair. The ramp would also be at risk of damage. An excessive tide could break the ramp's welded attachment hinges.

One of the top priorities for this facility is to complete the pier. The ramp needs to be widened, lengthened, and moved to the other side of the pier so it is less vulnerable to wave action. Its angle should be adjusted to allow for better access. The town would also like to install a hoist for loading equipment onto vessels. It would also like to add a dedicated kayak launching site and acquire more land for vehicle and boat trailer parking.

### 3.4 Sewer System

a. Current Conditions

The Stonington Sanitary District manages the sewer system. The system consists of about 29,000 linear-feet of gravity and forced mains installed in 1992-93. In 2014 the system had an average winter flow of 40,000 gallons per day (gpd) compared to 50,000 gpd in the summer. It is designed for a 175,000 gpd flow. The highest recorded flow was 229,464 gpd. This high flow is at least partially due to infiltration (water seeping into the mains during storm events.) Most of this infiltration is due to leaks in manholes. There are 257 residential customers and 40 others (including commercial establishments, churches, and town-owned properties).

The system is one of 31 in the United States that is exempt from primary treatment. Rather, the wastewater is handled through individual septic tanks that separate solids from the water. The wastewater then flows into a central tank for chemical treatment located under Main Street before it is discharged into the harbor. DEP records indicate that as of 2015 the system is fully compliant with its licensed discharge requirements.

The sewer system has several deficiencies. According to a 2013 analysis by Olver Associates, the ductile iron sewer pipe serving the Hagen Dock area is severely deteriorated and corroded. Olver Associates maintains that this corrosion is likely due to pipes being exposed to salt water. About two-thirds of the system has been examined for leaks by video camera. The rest of the system needs to be examined.

Nine of the seventeen pump stations are in the flood zone. This makes them vulnerable to failure during a flood event. The situation is aggravated by infiltration. This also increases the risk of pipes leaking and contaminating the area with sewage. The collection system is largely within the flood zone.

The sanitary district operations building is also within the flood zone. Some of the electric panels and two of the generators are less than two feet above the current sea level and will have to be elevated. With pump failure and the potential rupturing of lines, there is the risk that sewage could back up and overflow onto roadways.

b. Future Needs

Unless the elevation of Main Street were raised so the manholes were above the projected flood levels, portions the wastewater system will remain vulnerable to flooding. The operations building, electric panels, and telemetry systems need to be moved out of the flood plain. The remaining one-third of the mains should be examined by video camera for leaks. The manholes found to be the source of leaks need to be repaired.

Due to the time it takes to fabricate a new pump, the district should acquire some spare pumps. The chlorination chamber will need replacement at some point in the future. There are also plans to expand the system to portions of Sunset Avenue.

### 3.5 Public Water System

a. Current Conditions

The Water Company reports no current problems with its treatment and distribution system due to increased flooding. One potential problem is the age of some pipes. As seen in Table 1, there are about 12,720 linear feet that are in poor condition (about 54 percent of the total.) These older lines are more prone to leaks and may be affected by a failure in the sewer lines. However, the Company is gradually upgrading its distribution system. It is replacing 1,000 linear feet of the 100 plus year-old 6-inch pipe with 6-inch PVC pipe. It has pending funds to replace all the 2.25-inch pipe and the small remaining segments of galvanized pipe. It is also

seeking funding to replace 1,500 linear-feet of 6-inch cast iron pipe on North Main Street with 8-inch pipe.

<b>Table 1 Stonington Water System: Condition of Pipes, January 2015</b>				
<b>Linear Feet</b>	<b>Age</b>	<b>Type</b>	<b>Condition</b>	<b>Percent of Total</b>
7,900	100+ years	8" cast iron	Poor	33.6%
4,180	100+ years	6" cast iron	Poor	17.8%
410	100+ years	4" cast iron	Poor	1.7%
230	50+ years	2.25" cast iron	Poor	1%
240	50+ years	8" ductile iron	Fair	1%
1,300	30+ years	6" ductile iron	Fair	5.5%
410	30+ years	1.25" galvanized iron	very poor	1.7%
110	50+ years	1" galvanized iron	very poor	.5%
210	20+ years	1.5" copper	Good	.9%
670	50+ years	3/4 " copper	Good	2.9%
7,850	20+ years	3/4" - 2" HDPE	Fair	33.4%
<b>Total 23,510</b>				<b>100%</b>
<b>SOURCE:</b> Stonington Water Company				

b. Future Needs

The primary need of the Water Company is continued replacement of the older lines. As mentioned above, this is already underway. This would include the main feed line from the pump station to the water tower. The replacement of old hydrants should continue.

### 3.6 Stormwater Drainage and Flooding

a. Current Conditions

The town has upgraded about half its roads to FEMA standards for ditches and cross culverts. This reduces potential damage from washouts and flooding. There are several local road segments where conditions have worsened in recent years. These include Oceanville Road by the marsh where the road bed needs to be raised. Hatch Cove Road has an inadequate gravel base and portions of Airport Road are subject to flooding according to the new FEMA maps. Bayview Street needs major reconstruction due to sinkholes and uneven pavement. The Ames Pond section of Indian Point Road is subject to periodic flooding and Whitman Road experiences washouts from tidal action. The road system's most pressing need is the segments (such as Oceanville and Indian Point Roads) that provide the sole means of access to peninsulas from the rest of town. These are both places where flooding or storm damage could disrupt road access.

There have also been increased drainage problems in the eastern part of the downtown area and Thurlow's Hill. Higher stormwater flows and plugged stormwater pipes have resulted in cracked pavement. The town-owned segments in the downtown have largely been upgraded.

Most of the remaining segments are the responsibility of Maine Department of Transportation. Another problem is stormwater runoff from private property.

b. Future Needs

The town needs to undertake an infrastructure improvement plan that addresses the stormwater drainage and flooding problems. The plan should set top priorities for road and other infrastructure improvements.

3.7 Public Works

a. Current Conditions

Town employees are responsible for routine maintenance and snow plowing. Larger jobs are handled by contractors. The public works garage is adequate for current and immediately foreseeable needs. It is not vulnerable to flooding. Equipment needs to be replaced on a regular basis.

b. Future Needs

The public works budget covers regular maintenance but does not include major storm-related damage. The town may have to seek additional funding from sources such as FEMA for major repairs. As mentioned in Section 3.6, several road segments need major improvements. The town needs to assure it has access to safety equipment to respond to road and infrastructure emergencies. These would include adequate signage and barriers to block off damaged areas. Since the town relies on contractors with special equipment for major repairs, it does not plan to acquire such equipment itself.

3.8 Fire Department

a. Current Conditions

The Stonington fire station is located on Hagen Dock and has numerous deficiencies. It was built in the 1970s and does not meet current Department of Labor, National Fire Protection Association (NFPA), and insurance requirements. The overhead doors and spiral staircase do not comply with current standards. The station was not designed to accommodate new technologies for filling air tanks and specialized equipment such as thermal imaging cameras. The building height makes it difficult for trucks to fit in the bays. The small size of the bays means the department cannot buy larger trucks.

Storage space is inadequate. The lower level cannot be used for reliable storage due to flooding during severe storm events. There is insufficient space for training. Since the

station shares the area with other facilities, there is a shortage of parking spaces during the summer season. This sometimes slows the response time of on-call fire fighters since they must search for place to park their vehicles when responding to a call. Response time may be further delayed if the fire trucks encounter vehicle congestion on the pier.

b. Future Needs

Hagen Dock is not an appropriate location for a fire station. It is not practical to elevate the station above the flood zone. The department needs a new facility that meets contemporary standards. It should be in a location served by town water with access to a fire hydrant. Easy road access is also important.

It needs six heated bays so all trucks and specialized equipment (such as the bush truck, 4-wheeler, and rescue boat) can be stored easily. The facility should have a wash room for cleaning turn-out gear. There need to be separate areas for equipment repair, storage, and training.

## **II. PROPOSED CAPITAL IMPROVEMENTS**

### **PURPOSE**

This chapter presents the proposed capital improvements that increase the resiliency of the waterfront against more severe storms and sea level rise. This draft is t is subject to revision and, as currently presented, does not reflect town policy. Any use of town funds will require town meeting approval as would the borrowing of money and acceptance of most grant funds.

#### **1. An Overview**

This chapter identifies and ranks capital improvement priorities. It proposes a schedule, potential funding sources, and cost estimates. The proposed improvements focus on adjustments necessary to accommodate a two-foot sea level rise scenario and more severe storms. These improvements would be reviewed by the department heads, selectmen, and town manager as they update the Capital Improvement Plan (CIP). The CIP is part of the long-range budgeting process. It identifies the major capital expenses (such as a new fire truck or town building). These expenses are distinct from operating costs such as salaries, fuel, and the annual school budget. The CIP is reviewed annually as part of the town budget preparation process to determine if any changes are needed. Since climatic predictions are revised continually, the sea level scenario may require updating. This could affect the proposed capital improvements.

The town operates under severe budget constraints. Data from the Property Tax Division of the Maine Revenue Service list the town's 2013 full value taxation rate at \$11.12 compared to the county average of \$9.99. The town's rate is 12.1 percent (1.2 percentage points) greater than the county average. Stonington has, according to 2013 data from the American Community Survey a median household income of \$37,500, which is about 81 percent of the county median of \$46,383. These low incomes limit the ability of residents to raise more taxes. Some of the recommended expenditures may have to be postponed.

#### **2. Priorities for the 2016-2021 Period**

The large number of capital needs and the town's tight fiscal situation restrict how many investments can occur in a set time period. Table 2 below shows the top priorities for 2016 – 2021. These are finishing the Hagen Dock improvements, building a new fire station in a different location, and continuing the improvements to the water company's facilities. The next section provides background information on each improvement.

<b>Table 2: Proposed Schedule of Waterfront Capital Improvements, 2016-2021</b>			
<b>Project</b>	<b>Target Year</b>	<b>Estimated Cost</b>	<b>Funding Source</b>
Finish Hagen Dock	2016 -2017	\$1,070,000	CDBG, other harbor grants, and town
New fire station	2019-2021	\$1 million	Town and USDA loan
Water Company	Until 2021	\$1 million	Maine Drinking Water Program, CDBG, grants and, loans

### **3. Rationale for Priority Projects, 2016-2021**

#### **3.1 Hagen Dock**

As mentioned in the Waterfront Needs Analysis chapter, this facility is one of key pieces of the working waterfront. The improvements started in 2015 need to be completed. The new bulkhead is designed to allow the entire dock area to be raised if sea levels continue to rise. This project is a high priority due to its location in the center of town. It is also an important point of access for both commercial and pleasure boats. In a tight fiscal situation the raising of the dock could be postponed a few years.

The remaining improvements would ease congestion problems. A designated docking space would be added for emergency craft. The expansion would also enhance the downtown and create more space for outdoor events.

#### **3.2 Fire Station**

The fire station cannot be expanded in its current location on the Hagen Dock. The CIP recommends construction of a new facility that provides adequate space for all fire department operations. It is high priority due to the many deficiencies with the current facility and its location in a congested area. The actual date of construction will depend in part on the loan rates from USDA Rural Development or grant funds

#### **3.3 Water Company Improvements**

As mentioned in the Needs Analysis, these improvements are already underway. The company would save money in the long term by completing the work promptly rather than repairing the lines on a patchwork basis.

#### 4. Priority Projects 2022-2035

The target year for the improvements in Table 3 are based on current assumptions. A major storm event could alter this schedule. For example, if the sewage system were to fail it would be shifted in the priority schedule.

<b>Table 3 Proposed Waterfront Capital Improvements, 2023-2038</b>			
<b>Project</b>	<b>Target Year</b>	<b>Estimated Cost</b>	<b>Funding Source</b>
Fish Pier Engineering	2024	\$60,000	Grants
Colwell Ramp	2026	\$400,000	Grants & Savings
Establish road reserve fund	Annually	\$15,000	Town
Fish Pier electrical work	2025	\$100,000	Grants
Sanitary District Improvements	2023 - 2026	\$1,600,000	Grants, savings, and loans
Fish Pier Expansion/Harbor Dredging	2030	\$500,000	US Army Corps of Engineers
Upgrade Oceanville and Indian Point Roads	2028	\$100,000	loans
Upgrade other road segments	2028-35	\$100,000	Loans
<b>NOTE:</b> for more information on funding sources, see Appendix III.			

#### 5. Rationale For Priority Projects, 2023-2038

The recommended improvements are based on need, impact on the tax base and funding sources. The guiding principle is to avoid having too many expenditures occur either through direct town appropriation of borrowing in a given year. Given the tight fiscal situation faced by the town, some of the proposed improvements may have to be postponed until after the 2023-2038 time frame.

##### 5.1 Stonington Municipal Fish Pier

This is a multi-year project. The first step is a comprehensive engineering study that would also assess dredging needs. This study would determine the schedule and costs for the remaining work. The most pressing improvement is to raise the electrical lines and other

cables out of the flood zone. Longer term needs include expanding the dock and upgrading the harbor master's office. The dock needs to be designed to allow the berthing of more boats. This may require dredging.

## 5.2 Colwell Ramp

This multi-purpose ramp is another important waterfront facility. It serves as an access point to the off-shore islands. The recommended improvements include a freight hoist, completion of the pier and expansions to the ramp. Additional land needs to be acquired for vehicle and trailer parking.

## 5.3 Stonington Sanitary District (SSD)

As discussed in the Needs Analysis, the system needs a major overhaul. The CIP proposes addressing the improvements in phases. The first phase involves raising the district operations building, electric panels and the generators above the flood zone. The second phase would focus on eliminating or reducing major sources of infiltration. The system may need additional improvements if it is unable to comply with DEP operating requirements. The SSD trustees are contemplating turning over management of the system to an engineering firm.

## 5.4 Improvements to Flood-Prone Roads

The Oceanville and Indian Point Roads are the top priority since they provide the only road access to certain parts of town. This means that households risk being isolated from the rest of town during a flood event. The CIP recommends that these roads and associated drainage facilities such as culverts be rebuilt to allow safe passage during flood scenarios. There are also other flood-prone roads in town, but they do not serve as the sole access and are not ranked as one of the top priorities.

# 6. Other Needs

This section discusses other capital needs. While they are not ranked as top priorities, the town may want to add them to the CIP in future years. They are grouped into three categories: downtown revitalization; harbor improvements; and general needs.

## 6.1 Downtown Revitalization

Stonington has been gradually improving its downtown with help from the Downtown Network of the Maine Downtown Center. Some of these improvements need to be coordinated with the water and sewer line replacements to avoid multiple construction-related tearing up of the streets and MDOT. When these improvements are identified, they should be added to the CIP.

## 6.2 General Improvements

The Stonington road system requires ongoing repairs. The town needs to assure that its road and drainage standards reflect more intense storms and greater flooding. It may want to coordinate its work with that of MaineDOT. Improvements to state roads could alter drainage patterns and affect local roads.

Given the high cost of housing, the town might want to work with affordable housing providers to establish opportunities for first-time home-buyers, the elderly and those with limited incomes in the immediate downtown area. The town might want to invest in some of the infrastructure (such as water and sewer) that would serve the development.

## **7. Long-Term Issues**

Stonington faces some common long-term challenges with its neighboring towns and much of the coast of Maine. These challenges include the decrease in year-round population and a higher percentage of the population over the age of 65. Long-term capital investment planning will need to consider how these shifts will affect municipal services. An increase in the number of elderly may create more demand for retirement housing that provides a graduated level of care services.

### III. ACTION PLAN

#### PURPOSE

This is a summary of the steps the town proposes to make its waterfront more resilient and maintain its fisheries heritage. These include capital improvements and town regulations and operating policies.

#### 1. Capital Improvement Program (CIP)

**General Recommendation:** Stonington uses its CIP to schedule the improvements recommended in this report.

**Responsible Party:** department heads work with the board of selectmen and the town manager.

**Schedule:** on a yearly basis during the budget preparation process

#### Implementation Steps:

1. The town manager circulates a standard form each year to the department heads to gather information on capital improvement needs and meets to provide a budget and options for Selectmen to consider for annual town meeting.
2. The town reviews its current capital reserve accounts and determines if it should add funds for anticipated projects. This would require town meeting approval.
3. The town continues to pursue grants as a funding source and assesses its ability to borrow money.

#### 2. Town Ordinance Amendments

**General Recommendation:** The town updates its ordinances to reflect the latest guidelines on stormwater runoff, sea level rise, and flood plain management. These guidelines are available from Hancock County Planning Commission. The revised ordinances will use NOAA Atlas 14 precipitation data for hydrologic calculations. The standards would apply only to new construction or expansion of existing uses. They would not apply to existing uses.

**Responsible Party:** Planning Board

**Schedule:** shoreland zoning amendments were submitted for vote at the 2016 regular town meeting. A special town meeting to adopt the new flood plain standards will be held before the July 20, 2016 deadline mandated by FEMA. Revisions to other ordinances will be proposed in future years when deemed necessary and appropriate by the planning board.

### 3. Town Operating Policies

**General Recommendation:** Town enacts a set of best management practices for town services and facilities that reduce stormwater runoff and promote a more resilient infrastructure.

**Responsible Parties:** Public works department with direction from the Town Manager. Sources of technical assistance include the Local Roads Center of the Maine Department of Transportation, Maine DEP, and Hancock County Planning Commission.

#### **Implementation Steps:**

1. Enact resiliency construction standards for town buildings and properties: These are addressed through the following measures:
  - a. With the exception of water dependent uses, no new town-owned facilities shall be built within the flood plain and areas of projected sea level rise.
  - b. Town-owned water-dependent uses shall be designed to accommodate sea level rise.
2. Enact Best Management Practices for town roads: These practices refer to steps that minimize stormwater runoff from roads and also promote a more resilient road system. This report recommends the following steps:
  - a. Conduct an assessment of town roads to identify segments that are vulnerable to damage due to flooding or high levels of stormwater runoff. Rank the segments in terms of the anticipated degree of damage. For example, a low degree of damage would mean the segment would still allow safe passage of vehicles. A moderately damaged road could be repaired at a minor cost and a high degree of damage would involve major reconstruction;
  - b. Use this assessment in establishing priorities in road maintenance and improvement plans. The final list of priorities would also include factors such as the volume of traffic, safety and importance of the segment for other reasons;

- c. Assure that all new culverts and other drainage infrastructure are built to recommended state standards and reflect the anticipated stormwater flows and flooding.
  - d.. Maintain estimates and details of needed improvements for all planned projects. This information will be useful documentation in the event a state or federal disaster declaration makes the town eligible for emergency funding from FEMA or comparable grant sources; and
  - d. When feasible, coordinate local road improvements in conjunction with those planned by MaineDOT.
3. Emergency Preparedness Planning: The emergency preparedness planning in town should be coordinated with the planning for sea level rise and storm surges. The following steps are recommended:
- a. Share the information gathered during the development of this needs assessment with emergency management personnel. The primary focus should be on facilities most at risk from flooding and storm surges;
  - b. Assure that provisions for emergency shelters reflect the potential temporary relocation of households served by public water and sewer if these systems fail;
  - c. Identify approximate location of households accessible only by flood-prone roads to facilitate evacuation; and
  - d. Work with Deer Isle town officials, Hancock County Emergency Management Agency and various state agencies to ensure that contingency plans are in place in the event the Deer Isle causeway is closed.

**APPENDIX I**

**2016 STONINGTON WATERFRONT  
ADAPTATION PLAN**

**SOURCES OF DATA & PROJECT SUPPORT**

This project involved input and data collection from various sources. Specific sources include:

1. Sea level rise and potential inundation: Peter A Slovinsky, Marine Geologist, Maine Geological Survey, Maine Department of Agriculture, Conservation, and Forestry
2. Preliminary Engineering Studies: Andrew McCullough Engineering prepared an eight-page summary of options for Hagen Dock. Oliver Associates Engineers drafted preliminary specifications on replacing about 250 linear feet of sewer line serving the Hagen Dock area.
3. Marine resource trends: Penobscot East Resource Center (PERC) provided the data on the status of fisheries resources.
4. Municipal Facilities and Services: HCPC sent data collection forms to the harbor master, sanitary district, water company, harbor master, and town manager. HCPC compiled the responses to these surveys and incorporated them into a draft narrative. HCPC staff met twice with the Steering Committee to review and revise this document.

General Review of draft document: Robin Alden of PERC and Natalie Springuel of Maine Seagrant.

## **APPENDIX II**

### **WEB-LINKS FOR STONINGTON WATERFRONT ADAPTATION PLAN MAPS & RELATED DATA**

The following maps can be viewed at: <http://www.hpcme.org/stonington/coastal/index.htm>

1. Two feet sea level rise
2. Estimated Valuation of Property Threatened by Flooding Under Various Scenarios
3. Potential Hurricane Inundation
4. Contour map showing Vulnerable Buildings

For additional maps, see: [http://www.hpcme.org/stonington/coastal/additional\\_maps.html](http://www.hpcme.org/stonington/coastal/additional_maps.html)

For selected photographs of the Waterfront at October 9, 2014 highest annual tide, see:  
<http://www.hpcme.org/stonington/coastal/Photos.html>

# APPENDIX III

## Funding Resources for Waterfront Improvements

### Introduction

This list is intended for general reference. Funding sources and grant guidelines change constantly. It is best to check the web sites for the most recent information. This list distinguishes between funding specifically targeted at harbor and port improvements and multipurpose sources that can be used for projects identified in this plan.

### I. Harbor Improvement Funding

1. MDOT/Small Harbor Improvement Program: provides funds to protect/enhance harbor infrastructure. Eligible activities include commercial and municipal pier and wharf improvements, hoists, ramps, and pilings.
2. Shore and Harbor Planning Grants Program: provides funding to promote sound waterfront planning, harbor management, and balanced development of shore and harbor areas to improve marine infrastructure and assure access to the shore. Grants of up to \$30,000 are available for municipal and regional projects in coastal towns.
3. Boating Infrastructure Grant (BIG) Program: This program is administered by Maine DOT with funding from the U.S. Fish and Wildlife Service for projects that may benefit 26 feet or larger recreational transient boats. These improvements are eligible for both public or private facilities.

### II. Other Funding Sources

1. Community Development Block Grant (CDBG) program funds public infrastructure (such water and sewer), economic development, and housing improvements. Grants must either primarily benefit low to moderate income households or eliminate slums and blight. For more information, see: <http://www.maine.gov/decd/meocd/>

2. **Maine Municipal Bond Bank** provides towns, school systems, water and sewer districts, and other governmental entities access to low cost capital funds through the sale of its tax-exempt bonds. Its programs include:
  - A. **GENERAL BOND FUND RESOLUTION PROGRAM** For municipalities, schools districts, water districts, sewer districts and other local governments requesting loan financing through the General Resolution program. Under this tax-exempt bond financing program, the proposed debt will be paid from a General Resolution pledge of the municipality or municipalities. For details, see: <http://www.mainebondbank.com/GBR.aspx>
  - B. **CLEAN WATER SRF PROGRAM:** The Maine Municipal Bond Bank serves as financial manager of the Clean Water State Revolving Loan Fund in cooperation with the Maine Department of Environmental Protection. Examples of eligible projects include, but are not limited to, wastewater treatment facilities, infiltration and inflow correction, interceptors, pumping stations, force mains, and abatement of combined sewer overflows. Certain sewer extensions and areas of failing septic systems also qualify. For more information see: <http://www.mainebondbank.com/CWSRF.aspx>
  - C. **DRINKING WATER SRF PROGRAM:** the Maine Municipal Bond Bank serves as the financial manager of the Drinking Water State Revolving Loan Fund. The Maine Department of Health and Human Services serves as the project manager. Examples of eligible projects include, but are not limited, to treatment facilities, aging infrastructure, and main replacement. For more information, see: <http://www.mainebondbank.com/DWSRF.aspx>
  - D. **GARVEE BOND PROGRAM:** Working in cooperation with the Maine Department of Transportation (MaineDOT), the Bank issues revenue bonds where the principal and interest of which is repaid with revenues paid to the state by the Federal Highway Administration. Bond proceeds from the sale of GARVEE bonds are used at the direction of MaineDOT to pay for eligible projects around the state. For more information, see: <http://www.mainebondbank.com/Investors.aspx>
  - E. **TRANSCAP BOND PROGRAM:** Working in cooperation with MaineDOT, the Bank issues revenue bonds where the principal and interest of which is repaid with state revenues dedicated to the program in state statute. Bond proceeds from TransCap bonds are used at the direction of MaineDOT to fund eligible projects around the state. For more information, see: <http://www.mainebondbank.com/Investors.aspx>

3. **USDA RURAL DEVELOPMENT:** Rural Development is a division of the United States Department of Agriculture. It offers the following public facility and infrastructure programs:
  - A. **COMMUNITY FACILITIES DIRECT LOAN & GRANT PROGRAM:** provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service the orderly development of the community in a primarily rural area. For more information, see: <http://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program/me>
  - B. **WATER & WASTE DISPOSAL LOAN & GRANT PROGRAM:** Provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas. For more information, see: [www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/me](http://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/me)
  
4. **FEMA Hazard Mitigation Grant Program:** The Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance (HMA) grant programs provide funding for eligible mitigation activities that reduce disaster losses and protect life and property from future disaster damages including the Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM), Flood Mitigation Assistance (FMA). For more information see: <http://www.fema.gov/media-library/assets/documents/103279>