



ST. GEORGE

## WORKING WATERFRONT VULNERABILITY STUDY

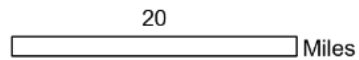
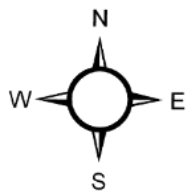
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January 2024



Midcoast Council of Governments

St. George Working Waterfront Vulnerability Study

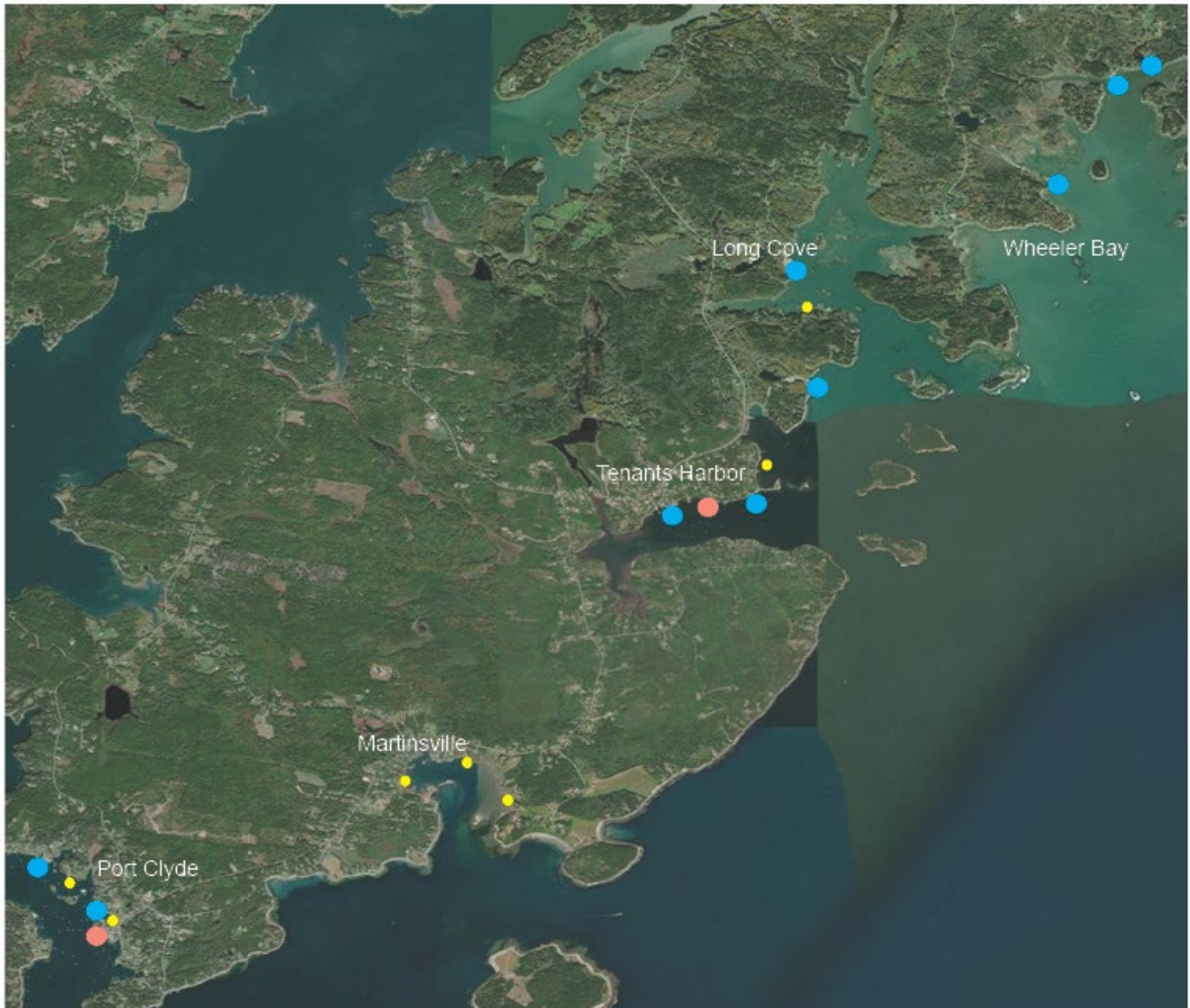


Map prepared by Midcoast Council of Governments

## ST. GEORGE'S WORKING WATERFRONT

### KEY:

- Hubs: coops & shared wharves
- Waterfront businesses
- Discrete wharves





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Report prepared by Midcoast Council of Governments with assistance from Northbound Research and Consulting

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*Jim Belano, Quincy Berglund, Ryan Cline, Gerry Cushman, Rick Erb, Dan Falla, Glenn Libby, Justin Libby, Scott Lord, Maine Coast Fishermen’s Association, Josh Miller, Kurt Olish, Dave Schmanska, Antonia Small, St. George Resilience Committee, Van Thompson, Krista Tripp, and Jason Witham*



*Tenants Harbor Boat Yard and Art's Lobsters*

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## INTRODUCTION

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St. George, located in Midcoast Maine, is a close-knit community with a robust fishing heritage, a vital component of its identity. Fishing boats anchor in its harbors, inlets, and bays, and commercial wharves dot the shoreline. Complementing this coastal landscape is a thriving Pre-K through 8th-grade school system, two general stores, two post offices, inns, a light house and several art galleries and restaurants.

The following work is designed to provide an initial assessment of St. George's marine industries community, the economic benefits it generates and its vulnerability to shifts in economies and climate change. The purpose of the assessment is to identify the potential impact a decline or shift in the marine industry would have on the St. George community. It also offers some areas to consider for investment in new opportunities as the fishing industry looks to diversify itself and reduce dependence on a single product. In that sense, it is a way in which St. George can reinvest in its fisheries future.



*Fishing boats in Port Clyde Harbor*

## FINDINGS AND RECOMMENDATIONS

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Based on data, mapping, community meetings, and individual interviews, several interconnected themes emerge to highlight strengths and vulnerabilities in the fishing and aquaculture interests in St. George:

### **Social and Economic Importance of Fishing and Aquaculture**

St. George's working waterfronts are vital for the local economy, seafood industry, and tourism, and provide economic opportunities for the community. Indeed, nearly half of the workers in St. George are in some way connected to marine related activities. The waterfronts are crucial for lobstering, ground fishing, clam harvesting, and farming oysters and kelp. Once, ground fishing and species diversity was popular and the norm. A decline led many to switch to lobstering, which is still a successful way to earn money. In 2022, the lobster fleet in St. George harvested a catch valued at almost \$15 million.

Aquaculture is becoming more important in St. George, and different types of aquaculture leases suggest it might keep growing. St. George's fishing and aquaculture activities also attract tourists, generating revenue through short-term rentals, restaurants, inns, art galleries and retail stores.

Recommendations:

- Investigate options for maintaining and expanding capacity of privately operated coops.
- Prioritize municipal improvements on roadways serving ports.
- Highlight the benefits of local fishing and aquaculture including its heritage and economic contributions.

## Need to Ensure Permanent Commercial Access to the Water

As the waterfront is bought by families from away, traditional access points are shrinking. Not only is the high cost of waterfront properties well beyond the financial resources of younger harvesters, but newcomers may not understand traditional uses and restrict access for commercial farming or harvesting.

Recommendations:

- Encourage state legislators to support programs for buying, maintaining, and upgrading waterfront access points. This helps keep the existing access areas in good shape and offers a mechanism for acquiring new ones.
- St. George and adjacent towns should investigate using land use regulation, conservation programs, and incentives to preserve more working waterfront and access areas.
- Explore financing mechanisms from public funding sources that will help preserve commercial working waterfronts and assist private holdings that contribute to the fishing industry.

## Addressing the Challenge of Rising Tides and Severe Storms

Many of St. George's working waterfronts face an immediate threat of flooding due to intense storm surges. Repairing damaged wharves and docks, replacing damaged equipment, reinforcing existing structures, and relocating operations to higher ground require significant financial investment. Older fishermen nearing retirement are hesitant to make such expenditures at this stage of their lives. If docks are left unrepaired, they will likely become unusable in the future, or worse yet, removed as a result of storm damage, further limiting waterfront access. For many, insurance is increasingly unaffordable. Finally, the current permitting process is both time-consuming and costly.

Recommendations:

- Upgrade infrastructure to be more resilient to flooding and storm surges.
  - Consider bulk purchases for materials needed to reinforce docks and wharves.
  - Accommodate the transition to new technology such as electric motors, clean energy supply and energy efficient building equipment.
  - Investigate “flexible resiliency” investments that allow for physical adjustments over time, recognizing that projecting climate change improvements is at best, an imperfect science.
- Create a source of financing and grants for public and private improvements. Some of the currently available options include:
  - Community Development Block Grants – funding projects that help local communities grow and improve their economy. These projects mainly help people with low to moderate incomes.
  - Tax Increment Financing (TIF) – a way for a city or town to use future increases in property taxes to fund and support current development projects. When an area undergoes redevelopment or an increase in property value through market sales, property values increase, generating increased property tax revenue. By sheltering this tax increment from state and county taxes via a TIF, communities can create new sources of revenue for projects that aim to enhance and improve infrastructure upgrades in support of a stable and diverse fishing industry.
  - Northern Border Regional Commission (NBRC) grants – a federal-state partnership that funds economic and community development projects. Create a program for working waterfronts similar to the successful Forest Economy Program.



- Midcoast Council of Governments (MCOG) – provides loans and assistance to businesses within its territory. Loan sources include MCOG's loan assistance pool, Maine's State Small Business Credit Initiative (SSBCI), Federal Rural Development, the Small Business Administration, and the Finance Authority of Maine (FAME). When putting together loan assistance, MCOG often works with area businesses, providing "gap" financing. Businesses within MCOG's member communities can receive assistance in understanding the various programs, preparing to meet the needs of those loan programs, and in application assistance.
- Finance Authority of Maine (FAME) – supports the capital needs of businesses in Maine by providing loan insurance and direct loans for small and large businesses, along with investment tax credits to facilitate early-stage equity investments. Additionally, FAME has set up programs for bond financing, both taxable and tax-exempt. These programs enable creditworthy businesses in Maine to obtain capital at favorable rates and terms.
- US Rural Development - provides loans, grants, and loan guarantees to support economic development and essential services. They promote economic development by supporting loans to businesses through banks, credit unions and community-managed lending pools, and offer technical assistance and information to help agricultural producers and cooperatives get started and improve the effectiveness of their operations.
- US Economic Development Administration (USEDA) – provides a variety of funding to carrying out regional economic development plans, including funding to build resilient municipal infrastructure.
- FEMA/MEMA – grants for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.
- Shore + Harbor Planning Grants – funded through Maine Department of Marine Resources, provides support for planning activities related to shoreline access, waterfront and harbor planning, solving conflicts in waterfront use, and planning, feasibility, and design efforts for strong and durable waterfront structures.
- Island Institute Grants and Loans –funding for a variety of activities for municipalities, businesses and entrepreneurs.

### Coping with High Operating and Living Costs

As many harvesters approach retirement, the next generation is grappling with higher debt and elevated operating expenses. Higher operating costs include bait, fuel, and boat maintenance, along with the need to purchase bigger boats for fishing farther offshore in pursuit of changing lobster population dynamics. Moreover, the scarcity of workforce housing prevents sternmen and dock workers from residing locally, contributing to a diminishing and unreliable labor pool. The following Investments are needed to reduce risk and volatility:

- Prioritize workforce housing in comprehensive planning and provide financial support to preserve workforce housing on the coast for marine and associated industries.



*Lobster traps stacked in winter.*

- Support partners working on workforce housing issues such as the St. George Community Development Corporation and Midcoast Housing Trust.
  - Strengthen connections with working fishing communities so they are included in conversations around workforce housing solutions.
  - Coordinate work between the communities and partners in identifying gaps and types of housing needed (see MCOG Housing Gaps Analysis).
  - Identify local developers willing to invest in and construct new workforce housing.
  - Review local ordinances and establish incentives and density bonuses that support workforce housing.

### **Importance of Diversification**

Diversification is crucial for economic resilience, risk reduction, and the long-term well-being of individuals, businesses and the community as a whole. The significance of diversification in this context lies in enhancing long-term sustainability. Lobstering is the primary economic driver, far outpacing ground fishing, harvesting and aquaculture. While lobsters are currently plentiful (though harder to find), future projections for the industry beyond five years are worth monitoring. Historically, fishing families were able to catch a multitude of species over the course of the year. Relying solely on one type of fishery is risky, leaving it vulnerable to declining stocks. With this concern, many fishermen in St. George see the advantage to diversifying.

Diversification not only involves catching different species but extends to acquiring a range of skills. In addition to mastering the skills needed for fishing, harvesters also must understand the science behind fisheries management, comply with numerous regulations and continue to adopt sustainable practices. Broader skill sets can enhance adaptability and resilience as the fishing industry evolves and reacts.

A good way to keep kids in the community who want to fish is to have programs available that teach trade skills such as welding, electronics, aquaculture, and small engine repair. Supporting and expanding K-12 programs offered by the St. George School's MakerSpace and the Midcoast School of Technology's technical curriculum will be helpful and prepare the local workforce for diverse professions, in and outside fishing.

#### **Recommendations:**

- Advocate for increased state funding to support marine adjacent trade education.
- Provide local public and private support for the MakerSpace.
- Seek diversification through the research and development of alternative species development.
- Identify financially feasible fishing alternatives, the cost for doing so and identify a source for supportive funding options.
- Provide training for harvesters in business development and business management as well as marine science, aquaculture and other income enhancing skills.
- Organize a local job clearing house for off-season work.

### **Adapting Wild Harvest Fisheries**

As waters in the Gulf of Maine continue to warm, existing fisheries may continue to become more unpredictable in their migratory patterns, as was noted in interviews with St George lobstermen. With warming, there may be opportunities for new fisheries to become commercially viable (i.e. blue crab or black seabass). Similarly, is the invasive green crabs issue an opportunity for a new market, a new bait source or other new product(s) that also

protects the local harvesters? Are there alternative farming methods that increase sustainability and resiliency, while also permitting multiple species development? In our forums, we heard that fishermen are open to these options and restrained only by the resources it takes for implementation.

There has been interest from members of the 5-town Georges River joint shellfish committee to pursue further efforts to reintroduce naturally occurring locations of mussel, oyster, or clam habitats. This could provide an exciting opportunity to work with marine research organizations in the state to study reseeding efforts, green crab harvesting options, alternative farming methods to enhance multiple species, while always looking to enhance wild harvest.

Recommendations:

- Strongly integrate multi-species management within natural harvest systems.
  - Reseed selected shellfish beds to address the decline in populations and enhance the overall health and productivity of these ecosystems.
- Foster continued cooperation with harvesters in determining best management practices and multi-species farming options.
- Pursue multi-species farming activities that respect wild harvesting.
- Pursue commercial marketing for green crabs.

### Aquaculture's Challenges

The transition from harvesting to aquaculture is a sustainable way to adapt to changing fisheries dynamics and potential environmental challenges. While lobstering is still viewed as viable, aquaculture is seen as a proactive diversification strategy. The main hurdle lies in the substantial upfront costs, delayed returns and small-scale farms, with some relying on lobstering profits to sustain their aquaculture ventures. In addition, initiatives to limit aquaculture by some waterfront property owners, as well as possible impacts on natural harvesting, pose a potential threat to the expansion of aquaculture across the region.

Regulatory barriers and concerns about climate change impact on species also pose challenges, prompting farmers to advocate for streamlined permitting and legislative changes to support the growth of the St. George aquaculture industry. Aquaculture business owners, many with ties to traditional harvesting, are concerned with present growth impacts and the local aquaculture supply chain. Harvesters believe that a more accessible supply of materials and an expanded market could mitigate the high startup costs in aquaculture.

Recommendations:

- Aquaculture is a young industry, and it lacks a body of knowledge that farmers can rely on. Create a one stop shop or 'library' type resource center where people can go for help for technical support and funding information. Combine resources from the Darling Marine Center, Coastal Enterprises, Inc. and the Island Institute, or create a UMaine cooperative extension program for aquaculture, for example.
- Starting an aquaculture business is very expensive and takes years to be profitable. Currently, only those with existing wealth can make such investments. Create a state fund to grow the aquaculture industry, including incentives, "slow money" or support systems for small businesses to invest in aquaculture farms and maintain those farms until profitable.
- Support the development of a robust aquaculture supply chain, especially predictability in seed and trap equipment.

- Continue to develop market options, building on the reputation of the St. George fishermen.

## Prepare for the Future

In light of the crucial role played by fishing and aquaculture in St. George's economy, there is a pressing need to ensure a robust industry a decade from now. As families adapt to the evolving dynamics of the fishery, the community finds itself at a pivotal juncture. St. George must proactively engage in comprehensive planning and project implementation that will fortify the resilience of the vital fishing, aquaculture, and secondary businesses (tourism, hospitality). Through strategic action and collaborative efforts, St. George can navigate the challenges posed by environmental changes and foster a strong and sustainable foundation for the future of St. George's economy.

### Recommendations:

- Establish a waterfront working group composed of representatives from the fishing and aquaculture community, non-profit organizations, regional planning organizations and the municipality to serve as a collaborative platform. By convening diverse stakeholders, the working group can facilitate comprehensive coordination and communication, ensuring an approach to address the challenges faced by the industry. Through the collaborative endeavors of this working group, St. George's can enhance its capacity for effective planning and project implementation.
- Fund a dedicated working waterfront project manager. This role would enhance the community's capacity to manage immediate challenges in the fishing and aquaculture sectors, streamline efforts, and ensure a prompt response to emerging issues. This proactive approach, combined with the collaborative efforts of the working waterfront working group, strengthens the foundation for a robust and adaptable fishing and aquaculture community in St. George.
  - Possible funding sources include Shore and Harbor Planning Grants, Island Institute Shore Up Grants, Coastal Communities Grants and others.
- Engage Maine Coast Fishermen's Association to create a "St. George Scuttlebutt" publication designed for newcomers to inform them of what it's like to live in a traditional fishing village, connecting the community as a whole.

## SUMMARY OF ECONOMIC BENEFITS

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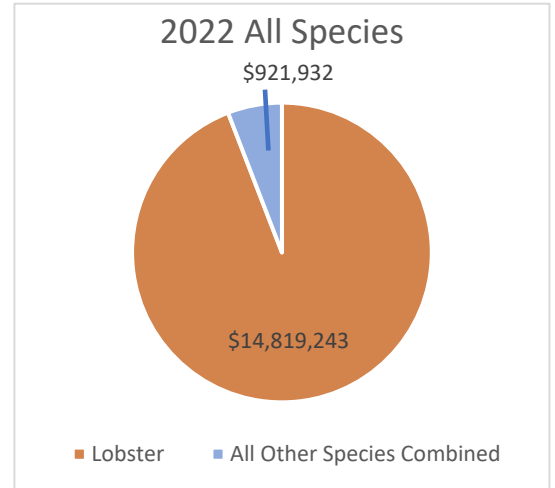
The activities associated with St. George's working waterfronts center principally on lobstering, ground fishing, clam harvesting, and aquaculture. Those activities contribute to a key part of Maine's economy; the state's seafood sector is worth upwards of \$3.2 billion annually.<sup>1</sup> Seafood from St. George is eaten locally, throughout New England, and is exported to countries in Europe and the far east, providing economic benefits that ripple through local, regional, and global economies.

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<sup>1</sup> Wallace, Ryan and Colgan, Charles (2023) The Economic Impacts of the Maine Seafood Sector prepared for Seafood Economic Accelerator for Maine.

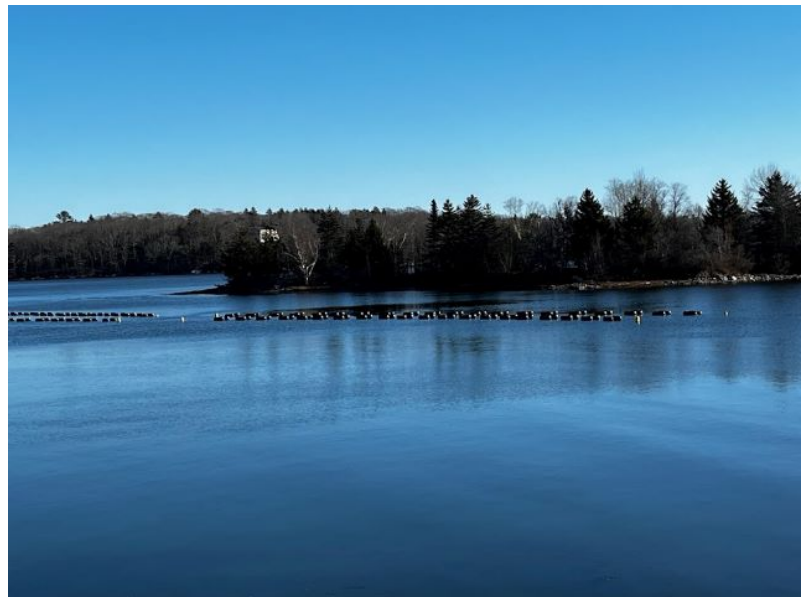
Collectively, the ports in St. George rank #7 out of 114 ports in Maine in terms of the value of their catch. These ports are located in Port Clyde, Tenants Harbor, Long Cove, and Wheeler Bay (see Map 1). In total, 275 individuals contribute to harvesting a catch valued at \$15.25 million. A variety of species are harvested including soft shell clams, Jonah Crab, Atlantic Halibut, American lobster, Atlantic Menhaden, Eastern/American Oyster and Atlantic Bluefin Tuna. However, the lobster harvest has by far the most value.

Harvesters report that as early as 2009, ground fishing was the most active with “dozens of boats in the harbor.” A subsequent decline in fish stocks prompted a significant shift, leading many fishermen to transition to lobstering. Despite the rebound in ground fishing, lobsters continue to be a lucrative and abundant source of income. St. George’s lobster fleet includes 153 harvesters who collectively caught lobsters valued at \$14.8M, or 97% of the total fishery.<sup>2</sup>



Local aquaculture is another source of marine-related activity in St. George. Economic data is not available for individuals, but a review of local aquaculture leases shows growing activity in this sector. There are different types of commercial leases granted for aquaculture:

- Limited Purpose Aquaculture leases are small, at up to only 400sf, and allow only for cultivating certain species of shellfish in a single location.
- Experimental leases allow for commercial research on sites before a longer or larger lease is needed. Experimental leases are limited in size to a maximum of 4 acres. They have a maximum lease length of 3 years that cannot be renewed unless the site is used for scientific purposes.
- "Standard" leases are larger in size (up to 100 acres), longer in duration (up to 20 years), and can be renewed.<sup>3</sup>



*Oyster farming in Long Cove*

Usually, a site is tested with limited purpose and experimental leases before a standard lease is sought.

<sup>2</sup> 2022, Maine Department of Marine Resources landings data.

<sup>3</sup> <https://www.maine.gov/dmr/aquaculture/applications-and-forms>

The table below shows that sites suitable for aquaculture are moving through this progression, suggesting future growth in aquaculture businesses.

Commercial Lease Type	Number of Leases
Limited Purpose Aquaculture	27
Pending Experimental	4
Current Experimental	4
Pending Standard	7
Current Standard	0

Source: Maine Department of Marine Resources

Fifteen individuals or entities hold various leases. For these people, aquaculture may serve as their primary source of income, or it could offer additional revenue for those engaged in fishing or lobstering, allowing them to diversify their income streams. The economic impact of aquaculture in Maine, contributing \$223 million to the seafood industry, further emphasizes growth and significance.<sup>4</sup>

Additionally, there are indirect economic benefits to St. George's fishing and aquaculture activities. Marketing materials showcasing Maine's charming fishing villages and local seafood play a key role in visitor attraction. St. George features a stunning coastline with iconic villages, waterfront eateries, fishing boats anchored in its harbors and bays. With 151 short-term rentals generating annual revenue of just over \$284,000<sup>5</sup>, the indirect economic benefits, of visitor attraction and tourism revenue highlight the broader positive impact of St. George's fishing and aquaculture activities on the local economy. Authentic working waterfronts contribute to the area's appeal as a tourist destination.



Port Clyde waterfront is attractive to visitors.

In summary, St. George's working waterfronts are economically vital for the seafood industry as a whole and support robust local fishing, aquaculture, and tourism activities. In the context of St. George, income diversification is returning but the area remains heavily dependent on lobstering.

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<sup>4</sup> Wallace et.al. The Economic Impacts of the Maine Seafood Sector.

<sup>5</sup> AirDNA.com; American Community Survey 5-year census data.

## SOCIO-ECONOMIC ACTIVITY AND VULNERABILITIES

Shifting focus from the broad economic benefits produced by fishing and aquaculture to the individuals and businesses driving these activities reveals a more intricate snapshot of St. George dynamics. Income, the quantity of harvesters, wage structures, and marine-related businesses show how local workers depend on marine industries and indicate where opportunities and vulnerabilities exist.

The assessment consists of two sets of data: 1) demographic and business activity collected from a variety of sources and 2) a qualitative assessment developed through interviews with key stakeholders in the marine fisheries industry.

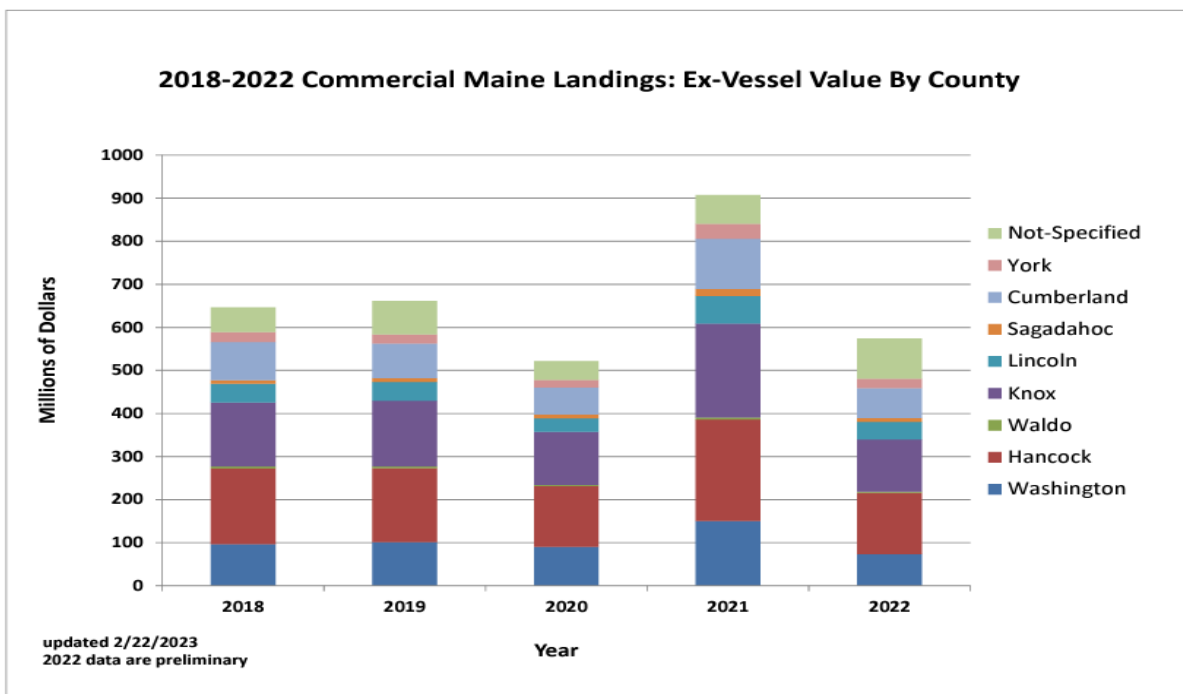
### Quantitative Assessment

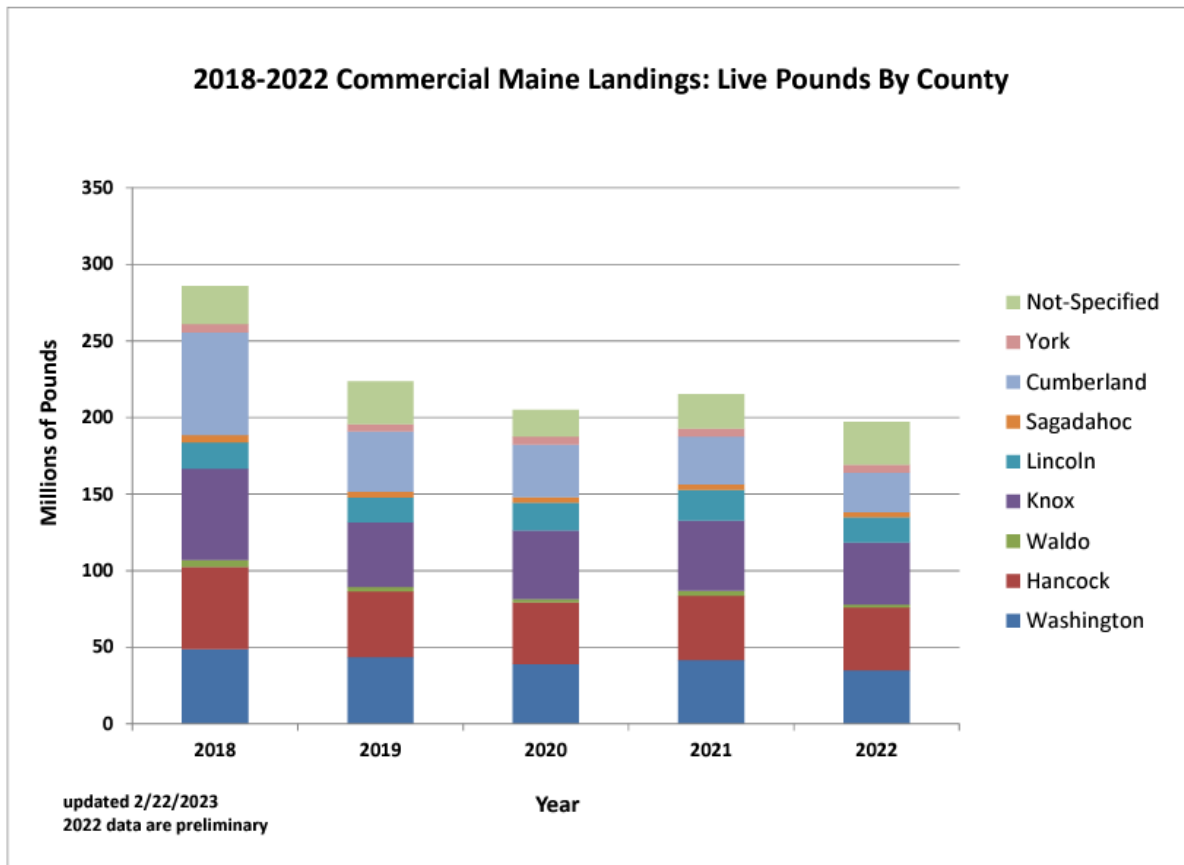
#### Income Derived from the Fishing Industry

Most economic clusters are driven by income. This information is reported by County in Maine. Knox County is one of the top fish landings in the state of Maine:

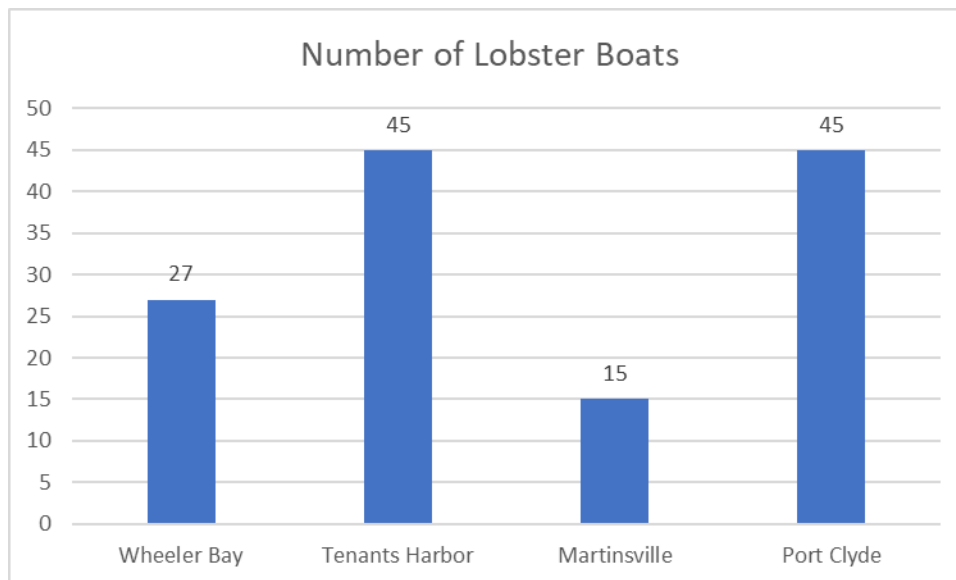


"Band of Buoys" local family markers, Maine Lobstermen's Association





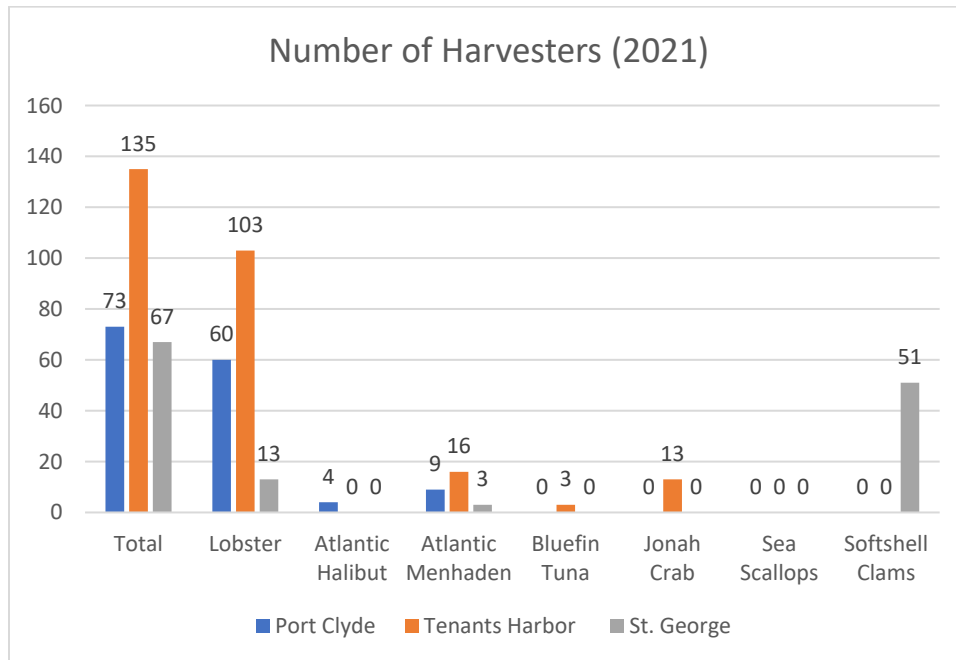
St. George’s Comprehensive plan notes that the following number of Lobster Boats are registered in St. George:



A third way to examine the fisheries cluster is the number of harvesters by the type of species. Of the 275 harvesters identified by the Department of Marine Resources (below), 64% are fishing for lobsters. The next



largest species, menhaden is further indicative of the cluster (bait support) and represents another 10%. Soft shell harvesters make up 19% of the harvester total.



Stakeholders report that historically, the successful fisherman was one who fished year-round, for multiple species, being able to keep crew and equipment at work. With regulatory restrictions and shifting fisheries patterns, that diversity has been harder to sustain. This may have a direct impact on the survival of local fishing industry in St. George. In 2023, there were 62 boats with various permits for fishing. 67% of those boats had permits for lobstering only. The remaining 33% had multiple permits for other species, ranging from 3-11 species permits. Harvesters report some confidence in being able to diversify their catches as ground fishing is rebounding and they are having success with other species. Continued access to multiple fisheries is key and a reason that the aquaculture industry is seen as one of the opportunities to increase fishing diversity.

### Marine Related Businesses

According to the St. George Comprehensive Plan, there are 5 types of registered marine related businesses in St. George. This does not include individual lobstermen or diggers that operate and report independently. The businesses outlined below define the “cluster”<sup>6</sup> of marine businesses that St. George is dependent upon.

St George Marine Related Businesses			
Bait	BoatBuilders/Maintenance	Co-op/Buyers	Other Marine
Superior Bait Company	Tenant's Harbor Boat Yard	Port Clyde Fishermen's Co-Op	Monhegan Boat Line
	J. Parker Boatbuilder	Tenants Harbor Fisherman's Co-op	Allied Marine Transport
	Star Boat Company	Port Clyde Fresh Catch	Port Clyde Kayaks
	C. Stickney Boatbuilders	Art's Lobster	
	Clark Island Boat Works	Teel Cove Fisheries	
		Port Clyde Lobster	
<i>Updated data from St George Comprehensive Plan, 2018</i>			

<sup>6</sup> A business cluster is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field.

### Workers

The 2020 Census reported 2,066 people living in St. George, 1,213 workers, 16 years or older. Consistent with a fishing community, 26% are self-employed (Maine as a whole is roughly 10%). 148, or 12.2% of those workers identify their occupations as the agricultural or fishing industry. Another 435 workers or 36% work in the production, movement, sales or supportive occupations, likely tied to St. George’s fishing industry. St. George’s unemployment rate was 3.1%, below state and federal averages and suggesting a lack of labor supply at the local level. In interviews, stakeholders identified the shortage in line workers (bait and sternmen, wharf hands, mechanics) as a key challenge to the continued operations.

The Department of Labor reports wages paid to those working for fishing establishments in St. George. These reported wages, averaged over the last 7 quarters (\$30,182), are roughly 50% of the household median income of \$62,455 (U.S. ACS, 2021), but on par with the census reported annual earnings rate of \$36,700 (U.S. ACS, 2021).

### Local Wages

Local wages over the last two reporting periods range from \$450 to \$937 per week. These wages do not reflect the income of the fishermen but do reflect the line workers necessary for the fleet to produce. The range of wages likely speaks to the variability of available work that stakeholders suggest is heavily influenced by changes in fishing patterns, regulatory oversight, and the increasing cost of doing business (fuel, bait, etc.).

Saint George: Fishing Establishments by Wages						
Year	Time Period	Establishments	Average Employment per Establishment	Average Weekly Wages	Annual Projection	
2022	Q3	21	14	\$ 610	\$ 31,720	
	Q2	21	13	\$ 457	\$ 23,764	
	Q1	21	14	\$ 538	\$ 27,976	
2021	Q4	21	21	\$ 937	\$ 48,724	
	Q3	22	19	\$ 542	\$ 28,184	
	Q2	22	16	\$ 509	\$ 26,468	
	Q1	22	10	\$ 470	\$ 24,440	
Maine Department of Labor						

This level of personal income for line workers in the marine industry, makes living in St. George, or nearby, difficult (see the assessment comments below). St. George’s single family affordability ratio of .47 is already one of the lowest in the region, 7 points below the MCOG regional average (1 or above being average affordability or better). The median income needed to purchase a \$218, 828 home in St. George is \$65,024. The median sales price on record for 2022 is \$465,00, more than twice what median income can afford. An affordable rent for a two-bedroom unit in the St. George area (Rockland region) is estimated by Maine Housing to be \$1,000 (2020). That amount is above the amount Maine Housing deems affordable, \$957.

More recent data from Maine Housing's Homeownership Affordability<sup>7</sup> Indexes indicates that between 2019 and 2022, the median home price in St George increased sharply from \$233,875 to \$465,000. At the same time, the median income has only increased from \$62,245 to \$65,024. These increases have effectively priced out over 95% of households from being able to afford a median home price in St George. This means that those who work in St George in working waterfront businesses will increasingly have to commute from further and further off the peninsula, creating increased time and financial costs for travel to work. Within the present wage structure for the marine workforce industry, housing affordability is challenged. To live locally, workers will require local investment and subsidy to create workforce housing options.

There are data gaps identified in this preliminary study for St George related to housing and travel that, if gathered via local surveying, could help inform local housing policy goals. We know from current available data and anecdotal evidence that workers are traveling to work on the peninsula from many of the surrounding towns. However, the data is not granular enough to tell us specific numbers of workers commuting to St George from each other town, or whether these workers are strictly engaged in marine related businesses. Voluntary surveying of the crews at the various co-ops or other buyers throughout the town could provide specific information on how many marine business workers are commuting from other towns, which towns they're more heavily commuting from, and whether or not the worker would prefer to live in St George if housing were available to them.

**Summary.** An analysis of the socio-economic data reveals a complex landscape of both opportunities and challenges for St. George. Marine activities play a pivotal role, providing livelihoods for almost half of the local workforce and fostering a deep-rooted sustainable fishing ethic passed down through generations.

However, challenges loom large, particularly in the realm of workforce housing for sternmen, dock workers, and other lower-income employees. This housing dilemma poses a tangible obstacle, underscoring the need for strategic solutions to ensure the sustainability of the industry and the well-being of those integral to its functioning.

## Qualitative Assessment

The purpose of this qualitative assessment was to learn from those working in the industry their sense of risk and vulnerability. These personal insights can help policy makers understand the short and long term risks the fishing industry experience and permit more effective planning, as St. George begins to understand the impacts from a decline or shift in the marine related businesses.<sup>8</sup>

Those interviewed explained that historically, the waters around St. George were harvested year-round. The area's diversity of fisheries enabled harvesters to balance and rotate through worming, clamming, scalloping, shrimping, pogies, lobsters, and ground fishing, depending on the season. This diversification meant harvesters were not only

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<sup>7</sup> <https://www.mainehousing.org/data-research/housing-data/housing-affordability-indexes>

<sup>8</sup> 10 interviews were conducted by Alexis Mann for MCOG as part of this study (4 lobstermen, 4 aquaculture, 1 sternmen, 1 municipal leader). Eddy and Mann also attended the St. George area Harvester meeting to collect additional insight.

able to earn an income on the water year-round, but that limited success in one fishery could be offset by their catch in another, diffusing the risk inherent with natural resource harvesting.

### Evolution Towards Aquaculture

The lobstermen and aquaculturists interviewed for this study are acutely aware of the loss of many of these fisheries. All the aquaculture business owners are either themselves lobstermen or have a spouse involved with harvesting in the more traditional sense (ground fishing, for example). Unknown at this time is the current state and potential for growth of the state, regional, and local aquaculture supply chain. An increase in the availability of input sources for materials needed for business start-up could lower the upstart cost barrier. Growth in the number of available buyers, processors, and end retailers could increase the dock price for ocean farmers, increasing rate of return and reducing risk. This may help reduce the high cost of business start-up in aquaculture.

At a statewide level, industry research leaders, including GMRI, Island Institute, Maine Aquaculture Association, and the University of Maine are currently working on a related study of Understanding the Aquaculture Supply Chain<sup>9</sup> that will hopefully provide useful related information that St. George can utilize to encourage local aquaculture business growth.

***In moving from harvesting to farming***, those surveyed see aquaculture as the next phase in maintaining a sustainable natural resource that might allow themselves and their family to continue making a living on the water. While they believe lobstering is still a viable industry, they '*see the writing on the wall*' and want to diversify before that fishery disappears (either because of warming waters driving the lobsters further north or east or because of increasingly tight regulations). Another important calculation for turning to aquaculture is that they can rely on family to help with the business and don't need to look for outside labor as is more necessary (and unreliable) with lobstering.

The primary challenge again is the high overhead costs and long runway for return on investment for oyster and kelp farming. Several of the oyster farmers use the profits they earn from lobstering to invest in the high cost of infrastructure and upkeep of the farm, along with staff salaries, and do not expect to turn a profit from aquaculture until year 6 or 7. In addition to the high startup financial costs, regulatory barriers to entering the industry due to cumbersome lease application processes can take years making business difficult. At a state-wide level, industry leaders are prioritizing a push for streamlining this process that responsibly balances applicant needs and opportunity with public input on lease applications. A related next step for the town could be to continue to support legislative changes that lower the regulatory and time/financial cost burdens to getting into aquaculture.

Aquaculturists, more so than those lobstering, are worried about what they see as ***the acute negative effects of climate change*** on their crops. They explain that warming waters, changes in PH levels, and more frequent storms with higher surfs have the potential to undermine shell density, support the proliferation of predators like green crabs, and smother crops.

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<sup>9</sup> <https://gmri.org/projects/understanding-aquaculture-supply-chain/>

## Lobstering and Its Impact in St. George

The lobstermen interviewed are still making a good living, earning upwards of \$90,000 a year, though they point out that volatility in the price of lobster (more so than the volume of catch), can have a big impact on annual income. While all spouses work, over 75% of the household income comes from lobstering.

To sustain this livelihood, lobstermen depend on a network of very small local businesses. In the Midcoast these include:

- Spruce Head Marina (South Thomaston)
- Journey's End Marina (Rockland)
- J+H marine - small engine repair/maintenance (South Thomaston)
- Clark Island Boatworks- boat repair (St. George)
- Hamilton/Midcoast Marine (Rockland)
- Brooks Trap Mill (Thomaston)
- Friendship Trap Company (Friendship)
- Alewife Woven Traps (location unknown)
- Atwood Lobster - bait dealer (Spruce Head)
- O'Hara - bulk bait (Rockland)
- Local fuel companies (various locations)
- Wiscasset Ford

While this study primarily examines the vulnerability of the working waterfront in St. George, it must be acknowledged that businesses supporting the working waterfront are dispersed across the Midcoast region and extend throughout the state.

## Shared Background

All lobstermen interviewed grew up in a lobstering family which, they explained, accounts not only for their love of being on the water, but their ability to secure a lobster license (most got their student license while they were in grade school). Perhaps more importantly – the inheritance of boats, traps, land in St. George and connections necessary to access increasingly fewer water access points is seen as critical. They all own their own home, with many of those units built on family land. Taken together this inherited infrastructure reduced the upfront cost (or debt) associated with lobstering. A data gap identified in this study is a lack of information related to the experience of lobstermen who did not grow up in the industry and received their license via the adult apprenticeship program. As a next step to understanding different backgrounds, follow up targeted interviews with those fishermen who specifically did not grow up in the industry to investigate their ‘all in’ start-up costs would help quantify the investment gap between those who have grown up in the industry and those who came to it later in life.

## Risk and Vulnerability

Those interviewed broke risk and vulnerability into the following:

Regulations: Lobstermen see looming regulation as the largest and most immediate threat to their livelihood. Some believe that corporate special interests such as wind energy are trying to eliminate the lobstering industry. They explain that the **working waterfront is one of the few remaining small business-dominated industries** (without corporate interests), which makes them a target/vulnerable.

Climate Change (CC): All the lobstermen spoken with believe climate change is happening, but none believe it has or will in the near-term impact the number of lobsters (or their potential haul) in a given year. What they do say is that because of CC, the predictability of where the lobsters will be and when has changed dramatically. They can no longer rely on the ‘playbook’ they’ve been using for the past 30 years on where the lobsters are going to be in a given month or year. Increased difficulty in predicting where the catch might be at a given time of year can create a higher ‘cost of doing business’, as lobstermen may have to slow down their pace of operations and burn more fuel to shift gear around more often. ***This has created tremendous stress and a sense of pushing themselves harder and harder to maintain a living they have come to depend on.***

Cost of Living/Water Access: Disappearing water access in St George is a huge concern for both lobstermen and aquaculture businesses. In Tenants Harbor, one lobsterman recalls there used to be 618 commercial fishing docks on the water, now there is just one. ***Permanent commercial access to the water comes up again and again as a huge need.*** As land is purchased by families from away, not only is water access shrinking but the cost of living (purchasing or renting a home) in St. George is becoming less and less affordable/possible. As the town seeks to preserve and maintain working waterfront access points the town should encourage state legislators to consider funding programs for municipalities to increase working waterfront preservation. The town should also consider land use ordinances that are designed to preserve access that presently exists. Legislative support for increased funding and increased flexibility of types of water access points (public and private that can receive state funding (such as Land for Maine’s Future’s Working Waterfront Access Protection Program<sup>10</sup>) could also provide capital to maintain working waterfront facilities. Additionally, capital funding for existing facility maintenance, including improvements in long term resiliency, must be developed.

The cost of living on the coast also directly impacts the availability of workers the lobstermen rely on to get their catch to market. Sternmen, dockworkers etc. can’t find housing on the coast and have been moving west as far as Augusta, shrinking, an already unreliable labor pool.

Overhead Costs: The cost of lobstering has increased substantially since the 1990s. A barrel of bait, for example, used to cost \$30 and now runs \$250. This pattern is true for all aspects of the lobstering industry: fuel, maintenance of boats, the price of traps. All the lobstermen in this survey have been in the industry for over 20 years and note that for the younger generation to break even or turn a profit they need to work longer and harder with bigger boats, meaning more expensive overhead. In the 1970’s for example, the boats averaged 36ft and today are upwards of 50ft. ***Practically, this has meant that younger lobstermen are looking at loan payments on million-dollar boats, higher fuel and bait costs and increasingly limited housing and labor options, which taken together substantially increases the financial risk associated with lobstering and fishing diversification.***

## CLIMATE RELATED RISK TO INFRASTRUCTURE, BUSINESSES AND POPULATIONS

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Climate change is affecting the Gulf of Maine in different ways and will continue to impact working waterfronts. This section looks at the risk of flooding caused by higher tides and stronger storm surges to understand how these changes could pose threats to the working waterfronts infrastructure and associated economic activities.

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<sup>10</sup> <https://www.maine.gov/dacf/lmf/funds/wwapp.shtml>

### Sea level Rise, Highest Astronomical Tide, and Storm Surge.

Sea level rise (SLR) is a consequence of climate change, primarily driven by global warming, which leads to the melting of polar ice and the expansion of seawater. In response to this, Maine's Climate Council has set goals to "commit to manage" a 1.3-foot rise in sea level by 2050 and a 3.9-foot rise by 2100. As sea levels gradually increase, this shift impacts the baseline for tidal predictions, such as the "highest astronomical tide" or HAT, which occurs when the sun, moon and earth are in alignment under normal meteorological circumstances resulting in higher high tides and lower low tides. HAT serves as a benchmark in the design of coastal structures like wharves, piers, and sea walls, taking into consideration both natural astronomical forces and the anticipated rise in sea level due to climate change.

Sea level rise and storm surge are interconnected factors contributing to coastal flooding. Similar to future HAT predictions, higher sea levels act as a starting point for storm surges, temporary increases in sea level during severe weather events. Storms bring strong winds and low atmospheric pressure that push water toward the coast, creating a surge, amplified by the elevated sea level from climate-induced sea level rise. This combination results in more frequent and severe coastal flooding, posing substantial risks to vulnerable working waterfronts.

As recent storms show, storm surges are particularly dangerous and damaging because they can inundate coastal areas, causing flooding, erosion, and destroy infrastructure. The height and extent of a storm surge depend on various factors, including the intensity and size of the storm, the shape of the coastline, and the local topography. Preparedness and timely evacuation measures are crucial to mitigate the impact of storm surges on coastal communities.

To address these challenges, effective coastal management strategies must consider both the gradual sea level rise and the acute impacts of storm surges, implementing measures such as resilient infrastructure and early warning systems to enhance preparedness and reduce the potential for damage.

## JANUARY 2024 FLOODING



*January 2024 storm surge, Port Clyde*

The early January 2024 occurrence of two storms underscored the significant impact of storm surges on working waterfronts. The combination of these storms, coupled with astronomical high tides, resulted in widespread damage to commercial waterfronts along the coast of Maine. This unfortunate event highlights the vulnerability of these vital areas and emphasizes the pressing need for proactive measures to enhance resilience and mitigate the potential consequences of future weather-related challenges. In St. George specifically, varying degrees of damage were observed, with some wharves affected while others remained unharmed. Flooding damaged equipment, prompting concerns among fishermen who foresee the possibility of more severe damage in the future.

St. George has three main types of working waterfront infrastructure<sup>11</sup>:



**1. Single Wooden Pile-Supported Piers (SWP):**

These small piers are used periodically for equipment storage and boat access.



**2. Small to Mid-Sized Wharves (SMW):**

These wharves, constructed on piers and/or fill, support vehicle access, small to medium-sized buildings, fuel stations, hoists, and areas for storing traps and other equipment.



**3. Larger Wharves (LW):** Constructed over fill and/or pier for heavier weigh loads, these substantial wharves not only support various maritime activities but also accommodate significant structures.

If infrastructure remains at current elevations, many sites will experience increased flooding at HAT + 1.3', and all will experience moderate to severe flooding at HAT + 3.9' as shown in Maps 1-3.

Sea, Lake, Overland Surge from Hurricanes, or SLOSH maps created for this study focusing on several areas indicate the level of flooding expected during category 1 and 2 hurricanes, similar to recent high tide storm surges. Areas

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<sup>11</sup> Descriptions are based on a visual field survey of working waterfronts. See Appendix A: Field Survey of St. George Working Waterfronts.



include (from north to south) Wheeler Bay, Atwoods Quarry Road, Seavy Cove, Tenants Harbor, Port Clyde and Horse Point Road. Mapping indicates flooding to some extent at all of these locations as shown in Maps 4-14.

- Limited: No areas or structures inundated.
- Moderate: Some areas and structures likely inundated to some degree.
- Severe: Some areas and all structures likely inundated to some degree.

Location	# of sites	Types	FEMA flood zone	Inundation HAT + 1.3'	Inundation HAT + 3.9'
Wheeler Bay	3	SMW	VE	Moderate	Severe
Seavey Cove	2	LW, SWP	AE	Limited	Moderate
Long Cove	1	LW	AE	Limited	Severe
Tenants Harbor	3	SMW	AE	Moderate	Severe
Port Clyde	7	SMW, SWP	AE	Moderate	Severe
Horse Point Road	1	SMW	AE	Moderate	Severe



January 2024 storm in Tenants Harbor showing storm surge inundation on commercial wharves Photo: Hal Oaks

### Warming Ocean Temperature

From 1985 to 2014, the estimated number of lobsters in the Gulf of Maine (GoM) increased by a whopping 515%. This remarkable growth was influenced partly by the warming of water temperatures, creating better conditions for successful lobster breeding and survival. Other factors contributing to this boom include Maine's lobster

conservation practices, such as protecting larger lobsters and reproductive females, and the reduced presence of large predators, like Atlantic cod, due to fishing.

Looking ahead, scientists predict that the waters in the Gulf of Maine will continue to warm, making the lobster fishery vulnerable to future temperature increases. Warmer waters have been linked to a decrease in suitable habitats for young lobsters and an increase in epizootic shell disease, which could harm the current high abundance of lobsters. Projections suggest a decline in lobster abundance ranging from -62% to -40% compared to the peak in 2014, aligning more with abundance levels seen between 1990 and 2010.

However, it is expected that Maine's sustainable conservation practices will likely offset negative impacts and strengthen positive effects of ecosystem changes. This should help the fishery become more resilient and sustainable in the coming decades.<sup>12</sup>

## PORT CLYDE CO-OP COST BENEFIT ASSESSMENT 2023-24

Staff of Midcoast Council of Governments met with Gerry Cushman in Port Clyde on December 19, 2023, to interview Gerry on the current state of operations and facilities of the Port Clyde Co-op, along with his expectations for the infrastructure needs and the economic outlook for future Co-op operations.

### Current Operations

Lobster remains far and away the highest value and poundage species landed at the Co-op – in recent years in total the Co-op has landed an impressive 1.3-1.5 million pounds of lobster per year.

In addition to lobster landings, a wide variety of other wild harvested or farmed marine species are also landed at the Co-op. These include crab, bait fish such as menhaden (pogies), oysters, mussels, and kelp. Some, like lobster and crab are sold to the Co-op, who then sells these products to Luke's Lobster to be shipped and consumed around the world. Other harvesters, like those landing kelp, simply use the Co-op dock and hoist systems to get their product off the boat to be shipped to processors.

The Co-op also rents facilities space to various marine businesses, including kelp growers and Ocean Explorer LLC, which serves St. George and surrounding areas with year-round mooring and diving services.



*A variety of fishing boats at Port Clyde Coop*

<sup>12</sup> Le Bris, *et al.*, Climate vulnerability and resilience in the most valuable North American fishery. *Proceedings of the National Academy of Sciences of the United States of America* 115:1,831–1,836 (2018)

## Membership

All told, Gerry estimates that between 70 and 80 boats land one or more harvested species at the Co-op docks, although not all may be members for selling lobster and crab. The cost of joining the Co-op currently is \$6,000 per member share. The Co-op then holds back a set amount per each pound sold by a member to cover operating expenses for the year. At the end of the year, the Co-op returns the percentage remaining of what was held back from each individual fisherman that was not needed to cover the year's operating expenses. By holding back a buffer amount, the Co-op ensures that it has the funds on hand necessary to cover any unexpected expenses that may arise. Once a final determination of operating expenses is made for the year, the remaining percentage of those reserves are returned to the Co-op members. Gerry noted that they try to get as much end of year bonus returned to the Co-op members as possible so that they can keep the price per pound the fishermen receive competitive with other buying docks in the region.

## Operating Expenses and Staffing

The estimated total operating expenses for the Co-op range between \$180,000 and \$250,000 per year, based on several factors: maintenance needs and volatility in bait, fuel, or materials prices. Gerry did not mention any figures for average annual revenue, and it should be noted that the annual revenue could vary considerably from year to year based on price volatility and catch total, a hard number to predict.

The Co-op would generally like to have 3-4 dock workers on staff; however, they have had trouble keeping employees and experience a high degree of position turnover. Gerry noted that currently they only had one consistent dock worker and had gone through 7 different people this year in trying to keep positions filled. The Co-op members make up for the lack of staffing during short-handed times by self-servicing along with their crew members for tasks such as loading bait onto boats or refueling.

Two notable topics of conversation for annual expenses were property taxes and insurance costs. Gerry noted that the Co-op does pay full value property taxes for their valuation. Insurance, and flood insurance in particular, increasingly became a thorn in the Co-op's side following the rapid rise in national flood insurance rates post Hurricane Katrina in 2005. The flood insurance costs had been manageable at around \$3,000 per year, then increased to \$12,000, then \$30,000, with predictions from insurers that the rates would continue to rise in excess of \$40,000. At that point, the Co-op members made the decision to pool resources and pay off their remaining mortgage on the property so that they could give up their flood insurance coverage.

The facilities on the wharf's surface are designed to be as resilient to most flooding events as possible. The electrical wiring in the building has been raised, flooring is concrete or wooden dock planks, so the facility can withstand significant short-term flooding and still go back to 'business as usual' when storm surge recedes.

## Infrastructure Upgrade Needs

Although the facilities on the wharf can survive flooding, the underlying granite foundation needs shoring up soon to ensure the long-term stability of the Co-op's infrastructure. Currently, storm surge pushes water into the cracks between the larger granite foundation blocks. The incoming water gets pressurized while squeezing between the cracks, and when each wave recedes it pulls small granular material out from under the foundation. This process over time undermines the foundation and puts the overlying infrastructure at risk. To refill material that has been lost and make repairs to the existing foundation structure, the estimated cost is between \$130,000 and \$160,000. Extending the protective seawall underpinning around the remainder of the wharf's perimeter will further protect

the foundation structure and is estimated to cost \$70,000-\$80,000. Total repairs cost estimate would be \$200,000-\$240,000.<sup>13</sup>

The project plan is to do much of the work in house to keep costs down, and the Co-op is looking at some grant funding opportunities to cover as much of these costs as they can. As a start for funding, the Co-op members voted to collect an extra \$1,000 from each member to go towards repairs, creating a base fund of roughly \$80,000. It is unclear where the Co-op will be able to come up with the remaining gap of funding needed for these repairs, but Gerry was confident that they had to get going and just find a way to make it work. When asked if any remaining major projects needed to be done, Gerry noted that nothing else big was needed, and when these projects were done, “we should be good for a hundred years.”

### **Future of the Co-op and Working Waterfront in Port Clyde**

Throughout the interview, Gerry stressed his opinion that, all things considered, lobstering was thriving - much more so than in past generations. Lobster landings for the Co-op have increased steadily over the years. Despite pressures on the industry from a number of directions, the Co-op feels optimistic about their future.<sup>14</sup> Warming water temperatures were also not a concern in his mind even if it does mean changes in some fisheries – “climate change was great for lobster; devastating for shrimp.” He mentioned that his father and grandfather would have been shocked to see annual landings numbers as high as they’ve had in recent years.

The Co-op is looking to balance as best it can by taking care of the upkeep work that needs to be done to ensure that they remain in business for a long time to come, while being careful to keep as much of the revenue as possible in the hands of the member fishermen.

Ultimately, Gerry offered an optimistic viewpoint for the future of the working waterfront in Maine, and Port Clyde in particular, noting that the variety of species coming into the wharf, including increasingly lucrative kelp and shellfish aquaculture was encouraging, and that the lobster population in his mind didn’t seem to be preparing for a decline any time soon. Even if the lobster population does someday decline, Gerry also believes new fisheries will open up and those who work on the water will adapt to harvest what they have available, because “there’s always something the Gulf of Maine’s going to provide.”

Key to the Co-op's long-term viability will be maintaining this flexible, ‘get the job done any way we can’ approach, not only in how they fish, but in funding strategies and project plans for wharf maintenance. Following the storm damage of January 10<sup>th</sup> and 13<sup>th</sup>, 2024, state and federal agencies, could play a positive role in support of future maintenance and repairs of waterfront infrastructure in Port Clyde and statewide by offering streamlined permitting and increased, more flexible grant funding opportunities.

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<sup>13</sup> Note that the Co-op's underpinning sustained significant additional damage following this interview in the storms of January 10th and 13th 2024. Gerry estimated that there was perhaps an additional \$100,000 dollars’ worth of repair work needed now.

<sup>14</sup> <https://mcspolicycenter.umaine.edu/maine-policy-matters/maine-policy-matters-season-3/what-does-the-future-hold-for-maines-lobster-industry/>

## SUMMARY OF COMMUNITY ENGAGEMENT

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Community engagement is vital to understanding the full range of social, economic and environmental issues facing St. George’s working waterfronts. Tapping into local knowledge, involving stakeholders and providing opportunities for the community at large to participate were all key aspects of this project. The goals of community engagement were to:

- Increase public awareness of the social and economic benefits of the local fishing and aquaculture industries.
- Increase awareness of climate-related impacts to working waterfront infrastructure and the socio-economic risks of vulnerable populations associated with working waterfronts at risk.
- Increase participation in decision-making.
- Develop a working waterfront strategy built on stakeholder engagement.
- Provide information to residents, businesses, and decision-makers for future planning, fundraising and project implementation.

The biggest challenge was bringing together a group of stakeholders to meet multiple times over the project timeline. Lack of time and “discussion fatigue” were the largest issues. For these reasons, we pivoted to one-on-one interviews, which yielded good results, in addition to public meetings.

Activities included:

**Project Introduction & Overview Presentation** on February 28, 2023. Advertised through flyers at the Tenants Harbor General Store, the Tenants Harbor Post Office, Port Clyde Post Office, St. George Town Office, Library and on the St. George Town website. In addition, flyers were mailed to approximately 225 residents abutting study sites, and local waterfront businesses. Approximately 15 people attended via Zoom, and 3 people attended in person. The low turnout was due to a winter storm that evening.

**Preliminary Data Presentation** on May 5, 2023. Advertised as above and through social media, “Sneak Peak” event was held at the St. George School gym to show the results of Sebege Technique’s survey of vulnerable sites as part of St. George’s Community Resilience Partnership Community Action Grant. MCOG staff used the opportunity to highlight economic benefits of the working waterfront and to solicit engagement. Approximately 75 people attended.

**One-on-one interviews** with ten people who farm oysters, kelp and/or harvest lobsters. The interviews were conducted over several weeks in late spring/early summer of 2023.

A **small group** focus group of lobstermen scheduled for September 26, 2023, was cancelled due to COVID, and lack of participants.



*“Sneak Peak” meeting*

**Working Waterfront Forum** – In partnership with Maine Coast Fishermen’s Association, a public forum was held on January 18, 2024. The purpose of the meeting was to share information on the economic benefits of fishing and aquaculture, and to provide a venue for panelists representing ground fishing, lobstering, and oyster and kelp farming to provide information to the community, and for community members to participate in the open discussion.

Moderator: Monique Coombs, Director of Community Programs, Maine Coast Fishermen’s Association.

Panelists: Scott Lord (oyster and kelp farming/lobstering), Justin Libby (ground fishing, Antonia Small (oyster farming), Josh Miller (lobstering/scalloping).



*Panel (from left) Monique Coombs, (moderator), Scott Lord, Justin Libby, Antonia Small, Josh Miller*

Emerging themes included:

- Shift from multiple-species fishing to lobstering. There used to be “dozens” of boats ground fishing. Now “lobstering pays all the bills.”
- **Loss of waterfront access.** The number of commercial wharves are diminishing due to changes in fish stocks, unrepaired damage and private purchase. Overland access is also in jeopardy as traditional access is denied when property changes ownership. Clammers are especially impacted.
- **Several factors pose challenges for aquaculture.** Department of Environmental Protection permitting process is challenging, and there is a backlog at the state level to approve permits. There is a long lead time to get product to market – it takes between 18 months and 3 years for an oyster to get to market size. Economies of scale are a tough challenge, as many farms are relatively small. It is a young industry and it lacks a body of knowledge that farmers can rely on. It also lacks infrastructure to bring product to market so those tasks fall to the farmers themselves.
- **Harvesters need a diversity of skills to succeed.** Panelists suggested that fishing is not a free-for-all. “It’s not the wild west....you can’t just jump in a boat” and go fishing. They spoke about how fishing and aquaculture is now more complicated given the science behind fisheries management, changing licensing and regulatory requirements, changing stocks, and evolving markets.
- **Recent heavy storms are a “wake-up call.”** Panelists and audience members noted that there have been enough warning signs over the years, and they need to do better in preparing for sea level rise and heavier storms as a “new normal.” It was noted that the local wharves that survived recent storm flooding were “built to last” with granite seawalls, although undermining is a serious issue. Other infrastructure can be built to flood.
- **Eat seafood!** A great way to contribute to the local economy is by being mindful of the origin of your seafood and opting for local options. According to one panelist, "Eating seafood is also eating local." Being aware of the source of your fish is significant, considering that various sources are subject to different regulations. People can make a positive impact by choosing local seafood and supporting the community.
- **Regulations play a significant role:** It was highlighted that the commercial fishing industry is one of the most heavily regulated sectors of American businesses, surpassing even the oil and gas industry and pharmaceuticals in the number of regulations.

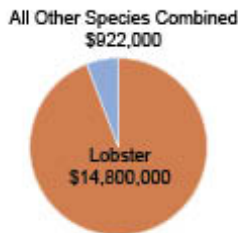
- **Bright Prospects for the Future:** Despite the challenges ahead, panelists and audience members shared what they are optimistic about, highlighting:
  - Exploring multi-species farming that goes beyond oysters, incorporating sea urchins and other commercially viable species.
  - Positive signs of recovery in ground fishing stocks; one panelist mentioned that, in his 25 years of fishing, it's the best he's ever witnessed.
  - St. George is a town that values its working waterfronts and fishing industry.
  - There will always be something to harvest from the ocean.

Fact sheet highlighting economic benefits.

# St. George Working Waterfronts

Do you know how fishing and aquaculture in St. George benefits the local, state and world-wide economy?

- The seafood industry contribute's **\$3.2 billion** to Maine's annual economy.
- Combined, St. George's ports rank **#7 out of 114** Maine ports for value of their catch.
- **275** People in St. George catch seafood, like lobster, Atlantic halibut, Atlantic menhaden, Bluefish tuna, and Jonah crab, among other types of fish.
- Value of St. George's catch:
  - St. George lobsters ship around the world.



- Aquaculture is rapidly growing in Maine, and the midcoast contributes **\$70M** to Maine's seafood industry. Aquaculture in St. George is also growing.
- Fishing and aquaculture create a ripple effect, helping other businesses like fuel and bait sellers, boat builders, trap suppliers, wholesale distributors, and processors.
- **48%** of St. George workers are connected to the fishing and aquaculture industries.

This presentation was prepared by Midcoast Council of Governments under award CZM3NA0229054190131 to the Maine Coastal Program from the National Oceanic and Atmospheric Administration, U.S. Department of Commerce.

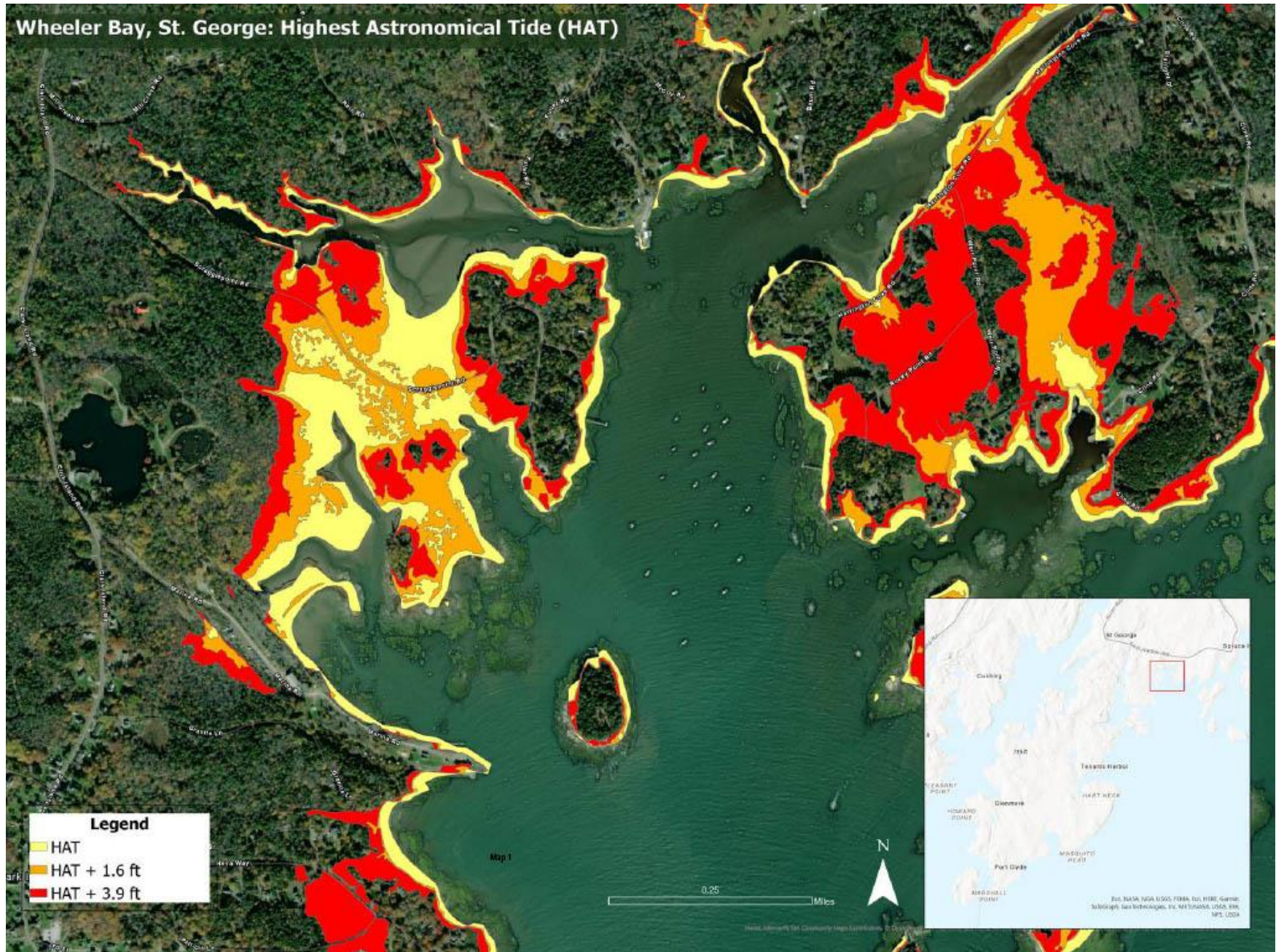




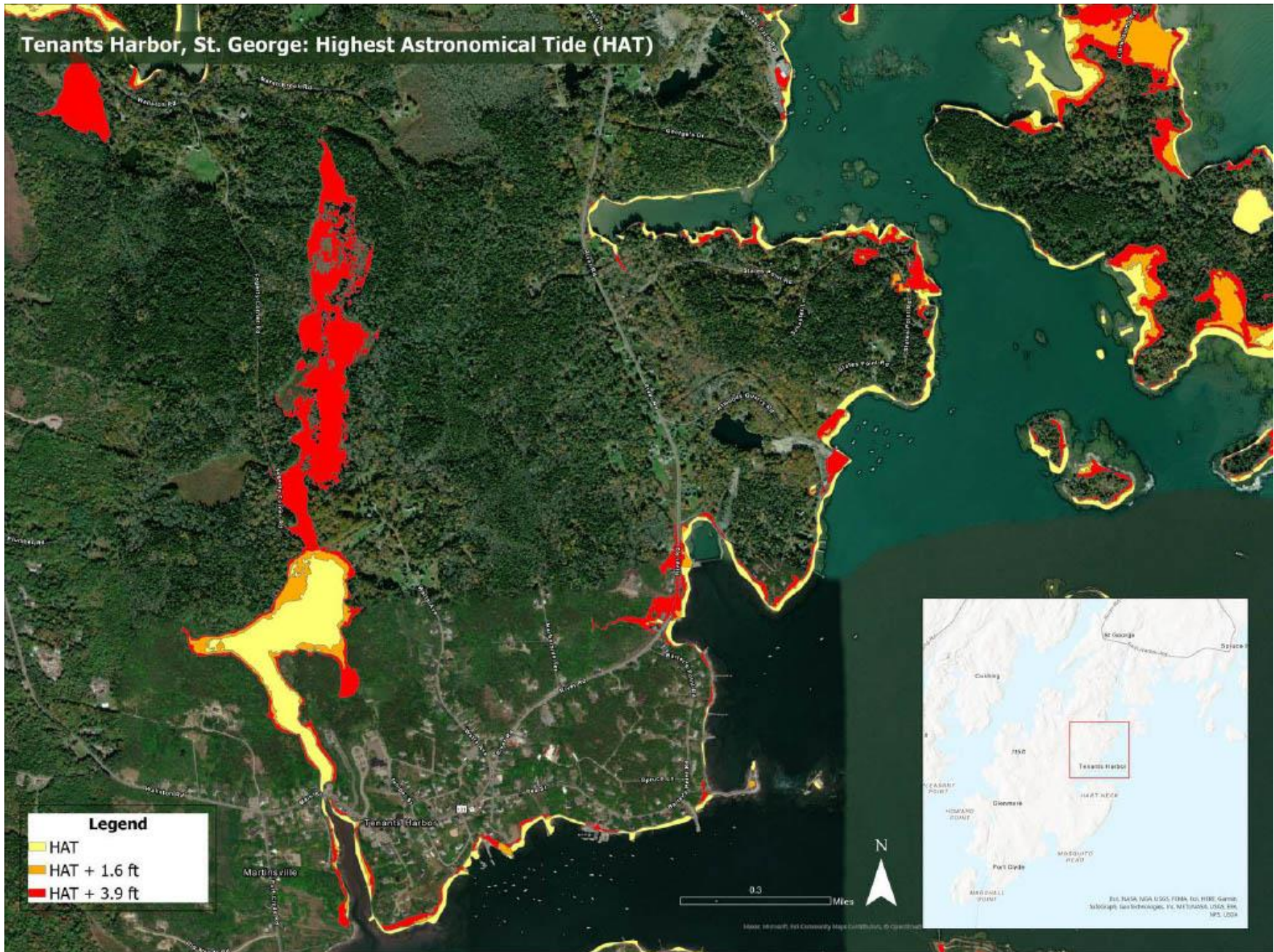




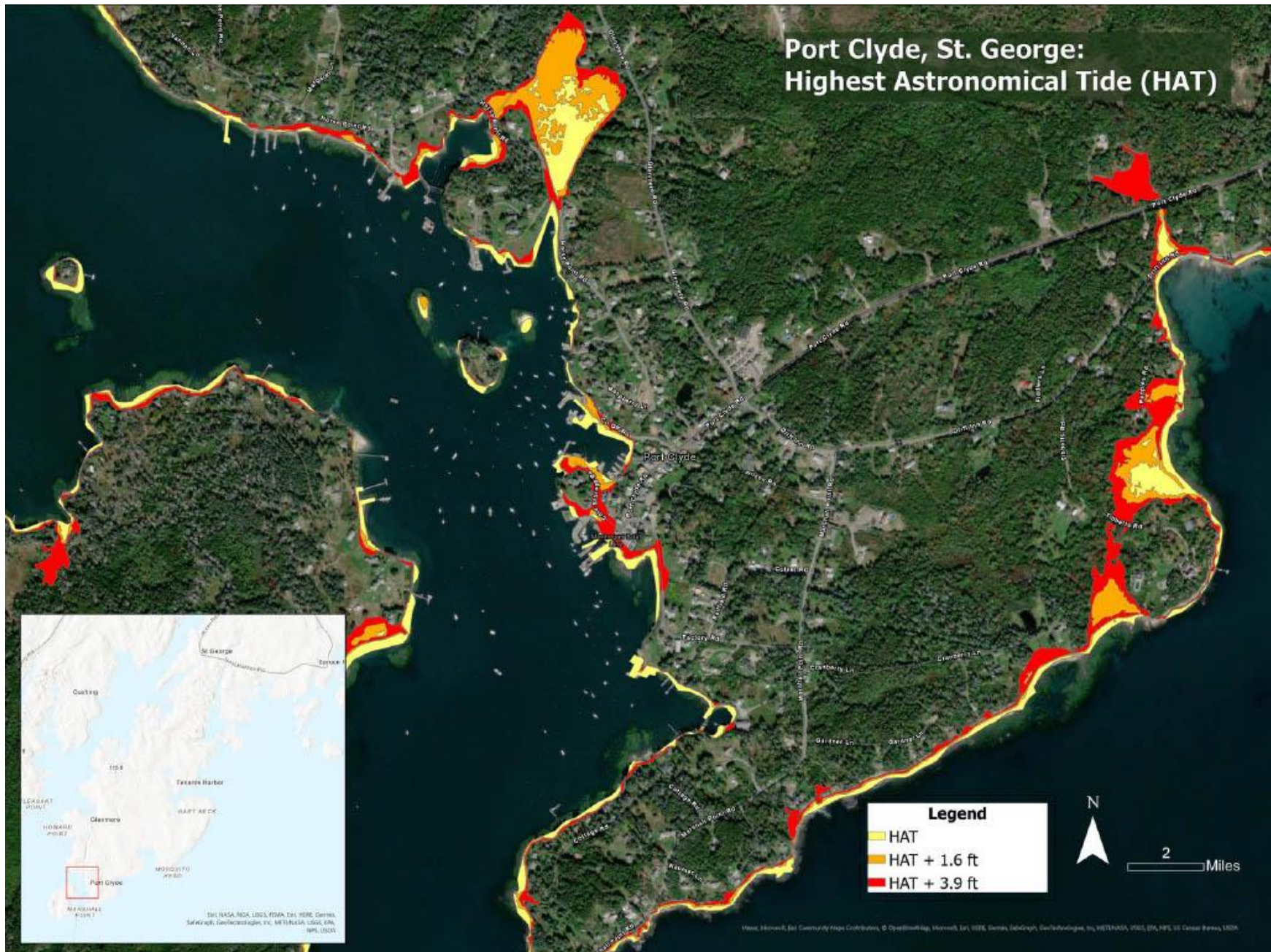
# Wheeler Bay, St. George: Highest Astronomical Tide (HAT)



Map 1



Map 2



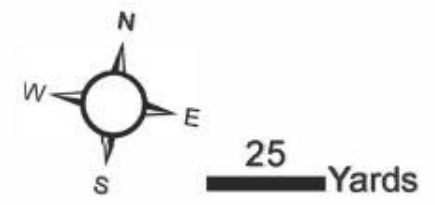
Map 3



# Wheeler Bay

**Legend**

- HAT
- HAT + 1.6ft
- HAT + 3.9ft



Prepared by Midcoast Council of Governments

# Wheeler Bay

### Legend

- Storm Surge Category 1
- Storm Surge Category 2



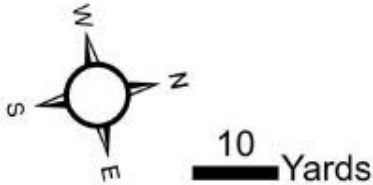
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# Atwood Quarry Road

**Legend**

- HAT
- HAT + 1.6ft
- HAT + 3.9ft



Prepared by Midcoast Council of Governments





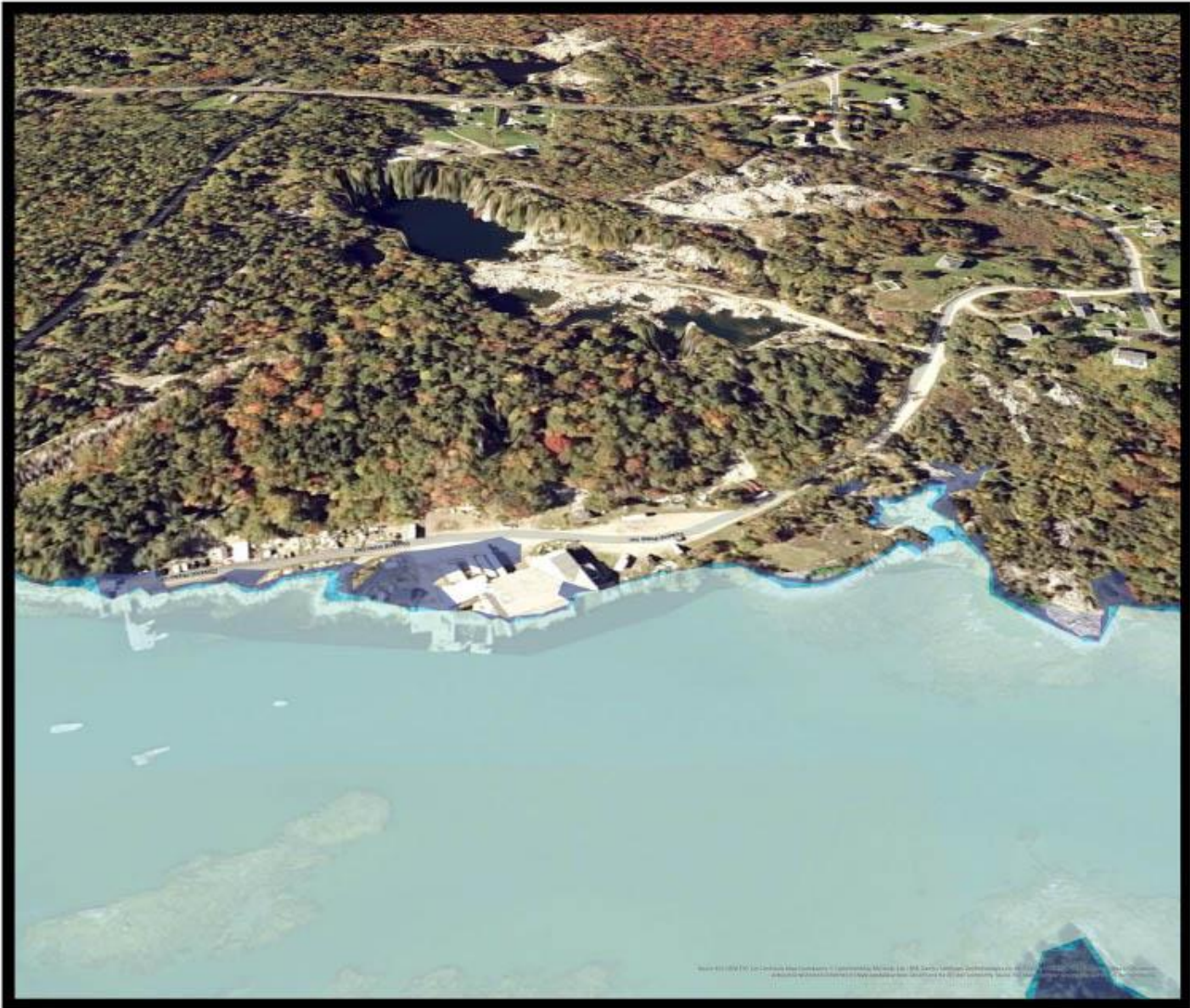
# Atwood Quarry Road

**Legend**

- Storm Surge Category 1
- Storm Surge Category 2



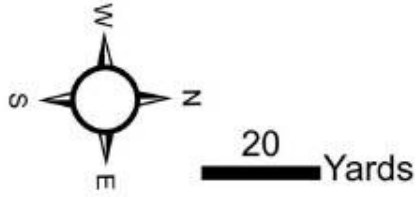
Prepared by Midcoast Council of Governments



# Seavey Cove

**Legend**

- HAT
- HAT + 1.6
- HAT + 3.9



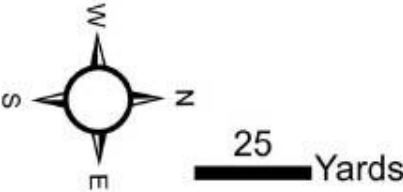
Prepared by Midcoast Council of Governments



# Seavey Cove

**Legend**

- Storm Surge Category 1
- Storm Surge Category 2



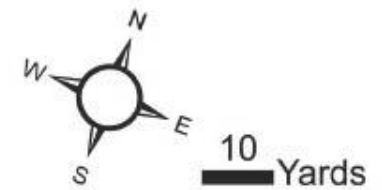
Prepared by Midcoast Council of Governments



# Tenants Harbor

**Legend**

- HAT
- HAT + 1.6ft
- HAT + 3.9ft



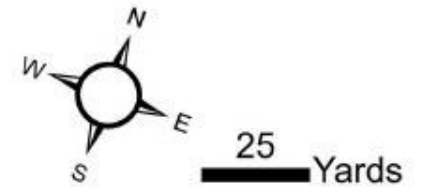
Prepared by Midcoast Council of Governments



# Tenants Harbor

## Legend

- Storm Surge Category 1
- Storm Surge Category 2



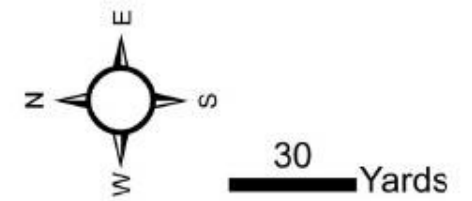
Prepared by Midcoast Council of Governments

# Port Clyde



## Legend

- HAT
- HAT + 1.6ft
- HAT + 3.9ft



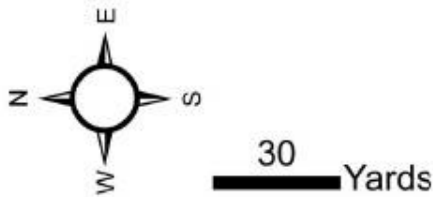
Prepared by Midcoast Council of Governments

# Port Clyde



**Legend**

- Storm Surge Category 1
- Storm Surge Category 2



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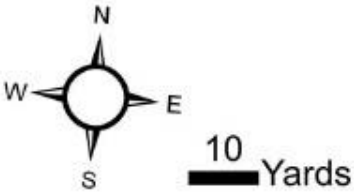
Map 13



# Horse Point Road

**Legend**

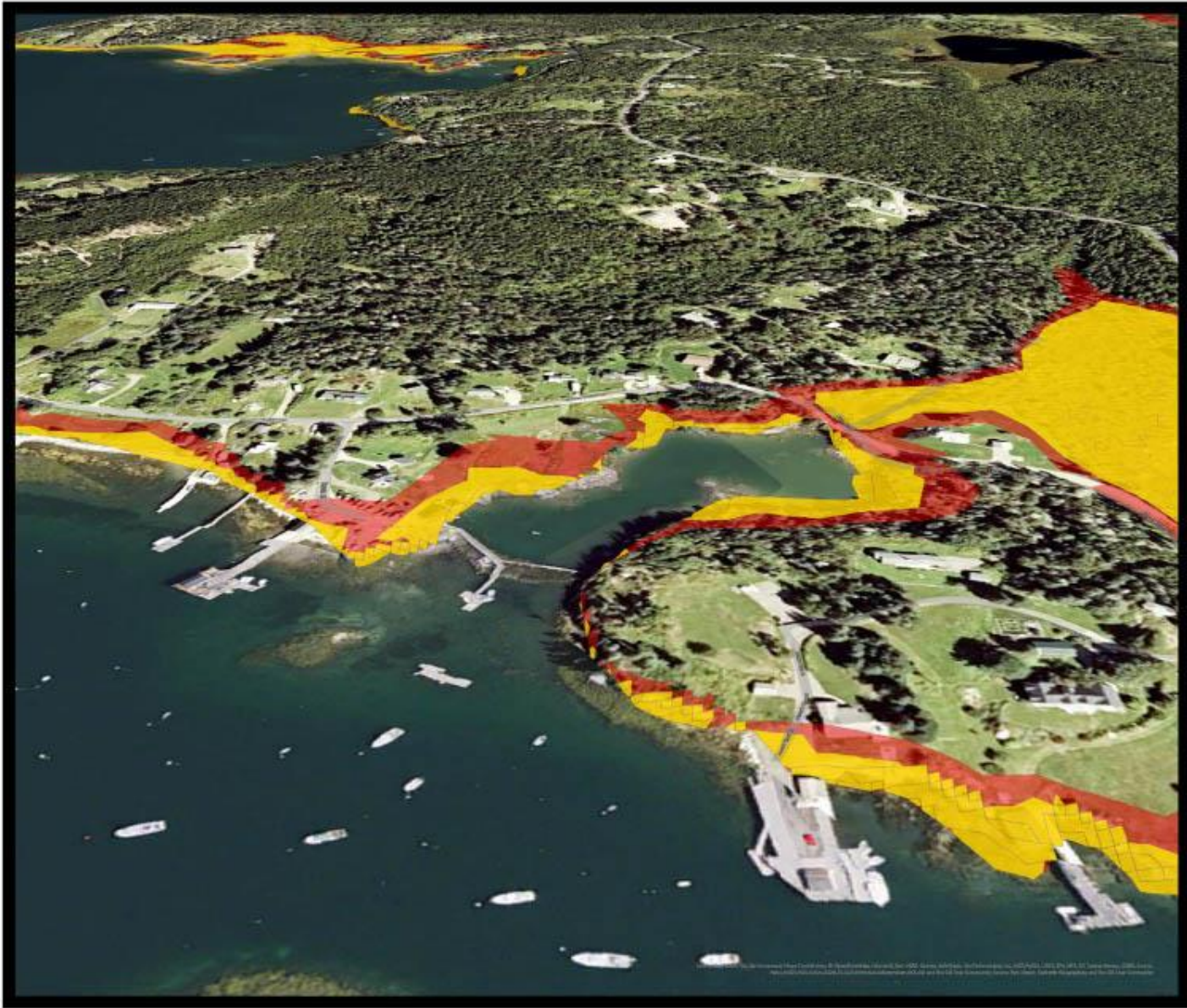
- HAT
- HAT + 1.6ft
- HAT + 3.9ft



Prepared by Midcoast Council of Governments

Map 14

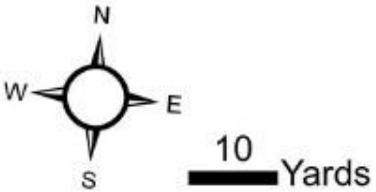




# Horse Point Road

**Legend**

- Storm Surge Category 1
- Storm Surge Category 2



Prepared by Midcoast Council of Governments



## APPENDIX A WORKING WATERFRONT FIELD SURVEY

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This field survey represents a variety of St. George's working waterfronts. It is not a complete survey of all working waterfront sites as some were not accessible.

### Wheeler Bay



Atwoods Quarry Road



Arts Lobster & Tenants Harbor Boat Yard



Tenantst Harbor Coop



Port Clyde Coop

